ENTERED RECEIVED
OCT 7 2014
NMED
Hazardous Waste Bureau

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

OCT 6 2014

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: Review of Advanced Mixed Waste Treatment Project Waste Stream Profile Form Number BN510.4, *Supercompacted Debris Waste*

Dear Mr. Kieling:

The Department of Energy, Carlsbad Field Office has approved the Waste Stream Profile Form (WSPF) Number BN510.4, *Supercompacted Debris Waste* for the Advanced Mixed Waste Treatment Project.

Enclosed is a copy of the WSPF as required by Section C-5a of the Waste Isolation Pilot Plant, Hazardous Waste Facility Permit, No. NM4890139088-TSDF.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions, please contact Mr. J. R. Stroble, Director, CBFO TRU Sites and Transportation Division, at (575) 234-7313.

Sincerely,

Jose R. Franco, Manager
Carlsbad Field Office

Enclosure

cc: w/enclosure

S. Holmes, NMED	*ED
T. Kliphuis, NMED	ED
R. Maestas, NMED	ED
C. Smith, NMED	ED
C. Walker,TechLaw	ED
WIPP Operating Record	ED
CBFO M&RC	

*ED denotes electronic distribution

141013

CBFO:TSTD:JRS:GL:14-1990:UFC 5900.00

Waste Stream Profile Number: BN510.4

Generator site name: Advanced Mixed Waste Treatment Project
Technical contact: Eric Schweinsberg

Generator site EPA ID: ID4890008952
Technical contact phone number: (208)557-6425

Date(s) of audit report approval by NMED: 4/29/05 (Revised 5/3/05), 6/16/06, 1/18/08, 1/9/09, 1/8/10, 1/25/11, 5/1/12, 9/10/13

Title, version number, and date of documents used for WAP certification:
Certification Plan for INL Transuranic Waste, MP-TRUW-8.1, Rev. 24, June 10, 2013
Quality Assurance Project Plan, MP-TRUW-8.2, Rev. 17, June 11, 2013
CCP Transuranic Authorized Methods for Payload Control (CCP-CH-TRAMPAC), CCP-PO-003, Rev. 13, July 31, 2013

Did your facility generate this waste? ☒ Yes ☐ No If no, provide the name and EPA ID of the original generator:

Waste Stream Information

WIPP ID: IN-BN510.4[3]
Summary Category Group: S5000

Waste Matrix Code Group: Heterogeneous Debris Waste
Waste Stream Name: Supercompacted Debris Waste

Description from the ATWIR: BN510.4 is a newly generated debris waste stream generated from supercompacted 55-gallon containers of debris waste.[3]

Defense TRU Waste: ☒ Yes ☐ No
Check One: ☒ CH ☐ RH

Number of SWBs: 40
Number of Drums: 4000
Number of Canisters: 0

Batch Data report numbers supporting this waste stream characterization: See Characterization Information Summary Report

List applicable EPA Hazardous Waste Numbers:[2] D004, D005, D006, D007, D008, D009, D010, D011, D022, D027, D028, D029, D030, D032, D033, D034, D037, D043, F001, F002, F004, F005, F006, F007, F009, P030, P098, P099, P106, U003, U103, U108, U134, and U151

Applicable TRUCON Content Codes: ID121

Acceptable Knowledge Information[1]

(For the following, enter the supporting documentation used [i.e., references and dates])

Required Program Information

Map of site: Reference Nos. 2 and 3
Facility mission description: Reference No. 11
Description of operations that generate waste: Reference Nos. 1 and 3

Waste identification/categorization schemes: Reference Nos. 1, 3, 4, 5, and 6
Types and quantities of waste generated: Reference No. 1
Correlation of waste streams generated from the same building and process, as appropriate: Reference Nos. 1 and 3

Waste certification procedures: Reference Nos. 7 and 20

Required Waste Stream Information

Area(s) and building(s) from which the waste stream was generated: Reference Nos. 1 and 3
Waste stream volume and time period of generation: Reference No. 1
Waste generating process description for each building: Reference Nos. 1 and 3
Documentation regarding how site has historically managed the waste: Reference Nos. 1 and 3
Process flow diagrams: Reference Nos. 1 and 3

Material inputs or other information identifying chemical/radionuclide content and physical waste form: Ref. Nos. 1, 3, 4, 5, 6, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, and 28

Waste Material Parameter Weight Estimates per unit of waste: Reference No. 1

Which Defense Activity generated the waste: (check one)

- ☒ Weapons activities including defense inertial confinement fusion[4]
- ☐ Verification and control technology
- ☐ Defense nuclear waste and material by-products management
- ☐ Defense nuclear waste and materials security and safeguards and security investigations
- ☐ Naval Reactors development
- ☐ Defense research and development
- ☐ Defense nuclear materials production

Additional Acceptable Knowledge Documentation

Process design documents:	N/A
Standard operating procedures:	Reference Nos. 1 and 3
Safety Analysis Reports:	Reference No. 13
Waste packaging records:	N/A
Test plans/research project reports:	N/A
Site databases:	Reference No. 14
Information from site personnel:	N/A
Standard industry documents:	N/A
Analytical data relevant to the waste stream:	N/A
Material safety data sheets:	Reference Nos. 1, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, and 28
Sampling and analysis data from comparable/surrogate waste streams:	N/A
Laboratory notebooks:	N/A

Characterization Information[2]

For the following, when applicable, enter procedure title(s), number(s) and date(s)

Radiography:	Reference Nos. 8, and 29
Visual Examination:	Reference Nos. 9 and 10

Waste Stream Profile Form Certification:

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature of Site Project Manager	Eric Schweinsberg Printed Name	9/2/14 Date

NOTE: (1) Use back of sheet or continuation sheets, if required.

(2) If radiography, visual examination were used to determine EPA Hazardous Waste Codes, attach signed Characterization Information Summary documenting this determination.

(3) This waste stream is currently not identified in the ATWIR. The ATWIR will be updated at the time of the next data call to include the following: BN510.4 waste stream is a newly generated debris waste stream generated from supercompacted 55-gallon containers of debris waste.

(4) The debris waste identified as feedstock to the AMWTP supercompactor originated from various defense-related sources that include verification and control technology, weapons activities including defense inertial confinement fusion, defense nuclear waste and material by products management, defense nuclear waste and materials security and safeguards security investigations, Naval reactors development, defense research and development, and defense nuclear materials production. Currently the largest contributing debris feedstock is associated with debris wastes generated from defense-related weapons activities associated with one or more of eight U.S. Department of Energy (DOE) sites.

Reference List

1. RPT-TRUW-83, Acceptable Knowledge Summary for Supercompacted Debris Waste, Rev. 9, June, 2014
2. DWG-5232-52-0101, Site Plan of the Advanced Mixed Waste Treatment Facility, Rev. 0, April 1999
3. RPT -TRUW-06, Acceptable Knowledge Baseline Document for AMWTP Waste, Rev. 15, October 23, 2013
4. RPT-TRUW-12, AMWTP Waste Stream Designations, Rev. 23, April 16, 2014
5. RPT-TRUW-05, Waste Matrix Code Reference Manual, Rev. 35, March 19, 2014
6. RPT-TRUW-07, Determination of Radioisotopic Content in TRU Waste Based on Acceptable Knowledge, Rev. 20, TBD
7. MP·TRUW-8.5, TRU Waste Certification, Rev. 29, June 11, 2013
8. INST -OI-12, Real Time Radiography Operations (Drum), Rev. 53, February 26, 2014
9. INST.OI-34, Non-Facility Visual Examination Operations, Rev. 28, September 3, 2013
10. INST-FOI-17, Facility Visual Examination Operations, Rev. 27, September 3, 2013
11. RPT-PEP-01, Project Execution Plan, Rev 6, October 03, 2012
12. MP-TRUW-8.2, Quality Assurance Project Plan, Rev. 17, June 11, 2013
13. RPT·DSA-02, Documented Safety Analysis, Rev. 10, December 18, 2013
14. AMWTP Waste Tracking System (WTS).
15. RPT-TRUW-30, Acceptable Knowledge Summary for Supercompacted Debris Waste (BN510), Rev. 7, July 02, 2012
16. RPT -TRUW-56, Acceptable Knowledge Document for INL Stored Transuranic Waste-Rocky Flats Plant, Rev. 5, May 09, 2012
17. RPT-TRUW-04, Acceptable Knowledge Document for the Battelle Columbus Laboratories, Building JN-4 Plutonium Laboratory, Rev. 6, June 25, 2012
18. RPT-TRUW-13, Acceptable Knowledge Document for INL Stored Transuranic Waste-Mound Plant Waste, Rev. 7, July 05, 2012
19. RPT-TRUW-79, Acceptable Knowledge Document for Materials and Fuels Complex Waste, Rev 3, September 30, 2013
20. MP-TRUW-8.1, Certification Plan for INL Transuranic Waste, Rev. 24, June 10, 2013
21. RPT-TRUW-89, Acceptable Knowledge Baseline for Argonne National Laboratory-East Waste, Rev. 1, March 20, 2013
22. RPT-TRUW-91, Acceptable Knowledge Document for Pre-1980 INL-Exhumed SDA Waste, Rev. 2, February 17, 2014
23. RPT-TRUW-92, Acceptable Knowledge Document for Select Idaho National Laboratory (INL) Facilities, Rev. 1, June, 2014
24. BN510.1 Waste Stream Profile Package, February 26, 2013
25. BN510.2 Waste Stream Profile Package, September 9, 2013
26. BN510.3 Waste Stream Profile Package, November 27, 2013
27. RPT-TRUW-82, Acceptable Knowledge Document for Hanford Debris Waste Shipped to AMWTP, Rev. 3, October 19, 2011
28. RPT-TRUW-93, Acceptable Knowledge Document for Los Alamos National Laboratory Debris Waste, Rev. 1, August 1, 2013
29. INST-OI-60, Real-Time Radiography Examinations (Non-Certified Scan), Rev. 18, August 19, 2013

WSPF Number: BN510.4 **Lot Number:** 1

Characterization Information Summary Introduction

The Advanced Mixed Waste Treatment Project (AMWTP) has compiled Acceptable Knowledge (AK) information for waste stream BN510.4 Supercompacted Debris Waste as required by MP-TRUW-8.1, Certification Plan for INL Transuranic Waste and MP-TRUW-8.2, Quality Assurance Project Plan, (QAPjP). In addition, AMWTP has conducted characterization using Acceptable Knowledge (AK), Real Time Radiography (RTR) and Non-Destructive Radioassay (NDA/RA).

Justification for Selection of RTR as an appropriate method for characterizing the waste

Radiography is the appropriate method for the direct feed line because it can be readily accomplished per the QAPjP (MP-TRUW-8.2) on direct feed drums. The selected containers in the initial lot have undergone the appropriate RTR and NDA characterization techniques in addition to characterization by AK. The physical form was confirmed to match the AK physical form description for the applicable IDC prior to compaction and all containers have been assigned to the correct waste matrix code.

Table 1 presents the correlation of Container Identification Numbers to Data Packages. Table 2 presents the RTR summary of prohibited items for each container in the lot.

The Site Project Manager (SPM) signature certifies that through AK, testing and/or analysis that the waste included in this waste stream is not corrosive, ignitable, reactive, or incompatible with the WIPP Treatment, Storage, and Disposal Facility (TSDF) and does not contain observable liquids or other prohibited items (See RPT-TRUW- 83 for more information).

HWNs are assigned based on AK. The HWN assignment for this waste stream includes:

- Toxicity characteristic metals – D004 through D011
- Toxicity characteristic organics – D022, D027, D028, D029, D030, D032, D033, D034, D037 and D043
- F-Listed HWNs – F001, F002, F004, F005, F006, F007 and F009
- P-Listed HWNs – P030, P098, P099, and P106
- U-Listed HWNs – U003, U103, U108, U134, U151

SPM

Printed Name: Eric Schweinsberg Signature: Eric Schweinsberg Date: 9/3/14

2nd SPM

Printed Name: Wes Skaar Signature: Wes Skaar Date: 9/3/14

SPM signature indicates that the information presented in this package is consistent with batch data reports and indicates concurrence with all information presented in this report.

WSPF Number: BN510.4 **Lot Number:** 1

Characterization Information Summary

Characterization Description:

Containers listed below were characterized by RTR (INST-OI-12, Real Time Radiography Examinations) and NDA (INST-OI- 14, Drum Assay Operations).

Table 1. Correlation of Container Identification Numbers to Data Package.

Container No.	RTR Data Package	RA Data Package	VE Data Package
10011620	RTR14-00007	ASY14-00102	N/A
10011637	RTR13-00105	ASY13-03318	N/A
10011686	RTR14-00007	ASY14-00100	N/A
10011836	RTR14-00007	ASY14-00100	N/A
10011852	RTR14-00009	ASY14-00102	N/A
10034452	RTR14-00093	ASY14-01047	N/A
10070563	RTR10-00101	ASY12-00176	N/A
10103438	RTR10-00101	ASY12-00235	N/A
10368557	RTR14-00005	ASY14-00730	N/A

WSPF Number: BN510.4 **Lot Number:** 1

Table 2. RTR/VE Summary of Prohibited Items.

Container No.	RTR Prohibited Items	VE Prohibited Items
10011620	None	N/A
10011637	None	N/A
10011686	None	N/A
10011836	None	N/A
10011852	None	N/A
10034452	None	N/A
10070563	None	N/A
10103438	None	N/A
10368557	None	N/A

I certify by signature below that data of sufficient type, quality, and quantity are collected to meet WAP DQOs.

WSPF No.: BN510.4

Data Quality Objective	Yes	No	N/A	Comment
1. Have all containers in the lot been assigned the correct Waste Matrix Code?	☒	☐	☐	
2. Have waste material parameter weights been established for each container in the lot?	☒	☐	☐	
3. Does each waste container of waste contain transuranic (TRU) radioactive waste?	☒	☐	☐	
4. Does the waste stream exhibit a toxicity characteristic (TC) under 40 CFR Part 261, Subpart C?	☒	☐	☐	
5. Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR, Part 261, Subpart D?	☒	☐	☐	
6. Can the waste stream be classified as hazardous or nonhazardous?	☒	☐	☐	The waste is classified as mixed waste.
7. Have the overall completeness, comparability, and representativeness quality assurance objectives (QAOs) been met for each of the testing procedures as specified in MP-TRUW-8.2, Sections C3-2 and C3-3, for the lot?	☒	☐	☐	
8. Was an Open nonconformance report (NCR) search performed for all containers/pucks/source containers on the final list for the waste stream profile/reconciliation lot?	☒	☐	☐	

WSPF No.: BN510.4

Data Quality Objective	Yes	No	N/A	Comment
9. Was an Open NCR search performed for all batches in the final list for the waste stream profile/reconciliation lot?	☒	☐	☐	
10. Were all batches identified in the waste stream profile form (WSPF) or reconciliation lot complete through site project manager (SPM) signature release? List any batches identified as not complete through validation.	☒	☐	☐	
11. Were any open NCRs found that are applicable to the waste stream profile/reconciliation lot? List NCR, container, and batch.	☐	☒	☐	
12. Is there an approved AK Sufficiency Determination for this waste stream?	☐	☒	☐	The AMWTP has not sought an AK Sufficiency Determination for this waste stream.

Site Project Manager: Eric Schweinsberg (Printed name) — Signature — 9/2/14 (Date)

2nd Site Project Manager: Wes Skaar (Printed name) — Wes Skaar (Signature) — 9/3/14 (Date)

Acceptable Knowledge Summary for Supercompacted Debris Waste

Advanced Mixed Waste Treatment Project

Approval:

(Signature on file. See DCR-13311.)

Pending CBFO approval
Date

REVISION LOG

Revision Number	Date Approved	Pages Affected	Description of Revision
0	09/10/2010	All	DCR-9081. Initial issue.
1	01/12/11	Various	DCR-9747. References modified to accommodate reference changes within AK baseline document for Hanford waste. Revised to incorporate WIPP WAP permit renewal changes. Editorial corrections
2	01/31/12	Various	DCR-10508. Added changes approved by CBFO in Change Notice 1 to BN510.1 waste stream profile. Incorporated BLUESHEET-077.
3	09/17/12	5, A1, A2	DCR-11583. Added changes approved by CBFO in Change Notice 2 to BN510.1 waste stream profile.
4	02/07/13	Various	DCR-12077. Added changes approved by CBFO in Change Notice 3 to BN510.1 waste stream profile. Periodic review.
5	03/18/13	Various	DCR-12123. Changes made to address NWP and CBFO DRR comments.
6	09/09/13	All	DCR-12229. Entire document revised. Changed to update the document to reflect addition of MFC waste, to incorporate both BN510.1 and BN510.2 into same document, and to incorporate new WIPP permit requirements.
7	11/27/13	All	DCR-12760. Document changed to reflect the addition of SDA debris waste as Supercompactor feedstock. The new WSP is designated as BN510.3.
8	01/28/14	All	DCR-13010. Update document to include LANL debris waste as feedstock to the Supercompactor.
9	Pending CBFO approval	All	DCR-13311. Updated document to include new INL debris waste IDCs as feedstock to the supercompactor. Updated Table 3. Document also updated for the following: to make corrections; to clarify waste generation operations; to update/clarify defense and land withdrawal act determinations (e.g., consolidated SNF and HLW statements under LWA section); to include new supporting AK information and applicable references; and to add new WMPs estimates.

CONTENTS

FIGURES

TABLES

ACRONYMS

AE	Argonne National Laboratory-East (generator site prefix)
AFCI	Advanced Fuel Cycle Initiative
AK	acceptable knowledge
AL/CL	Analytical Laboratory/Casting Laboratory
AMWTF	Advanced Mixed Waste Treatment Facility
AMWTP	Advanced Mixed Waste Treatment Project
ANL-E	Argonne National Laboratory-East
ANL-W	Argonne National Laboratory-West
ARA	Auxiliary Reactor Area
ATR	Advanced Test Reactor Complex, formerly the Test Reactor Area
ATWIR	Annual Transuranic Waste Inventory Report
AW	Materials and Fuels Complex (generator site prefix)
BC	Battelle Columbus (generator site prefix)
BN	AMWTP (generator site prefix)
CBFO	Carlsbad Field Office
CCP	Central Characterization Project
CFA	Central Facilities Area
CH	contact-handled
CH-TRAMPAC	Contact-Handled Transuranic Waste Authorized Methods for Payload Control
CITRC	Critical Infrastructure Test Range Complex, formerly the Power Burst Facility
CPP	Chemical Processing Plant
CWS	Chemical Warfare Service
D&D	decommissioning and dismantling
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOHE	Drum Opening Hood Enclosure
DOS	drum opening station
DOT	U.S. Department of Transportation
DRS	Drum Repacking System
DU	depleted uranium
DWHE	Drummed Waste Handling Enclosure
DWPG	drummed waste packaging glovebox
EBR-II	Experimental Breeder Reactor II
EDMS	electronic document management system
EMOP	eight-drum metal overpack pallet
EPA	U.S. Environmental Protection Agency
EU	enriched uranium
EWR	early waste retrieval
FMF	Fuel Manufacturing Facility
HEPA	high efficiency particulate air
HENC	High-Efficiency Passive Neutron Counter

HLW	high-level waste
HRA	Hot Repair Area
HSG	headspace gas
HWMA	Hazardous Waste Management Act
HWN	hazardous waste number
IA	Idaho National Laboratory Auxiliary Reactor Area (generator site prefix)
IC	Idaho National Laboratory Idaho Nuclear Technology and Engineering Center, formerly called Chemical Processing Plant (generator site prefix)
ID	Idaho National Laboratory (generator site prefix)
IDC	item description code
IDR	initial drum retrieval
IF	Idaho National Laboratory Central Facilities Area (generator site prefix)
IN	Idaho National Laboratory Naval Reactor Facility (generator site prefix)
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
IP	Idaho National Laboratory Critical Infrastructure Test Range Complex (formerly called INL Power Burst Facility (generator site prefix)
IR	Idaho National Laboratory Advanced Test Reactor Complex formerly called Test Reactor Area (generator site prefix)
IT	Idaho National Laboratory Test Area North (generator site prefix)
IW	Idaho National Laboratory Radioactive Waste Management Complex (generator site prefix)
LA	Los Alamos National Laboratory (generator site prefix)
LANL	Los Alamos National Laboratory
LLD	lower limit of detection
LLNL	Lawrence Livermore National Laboratory
LSA	low specific activity
MD	Mound Plant (generator site prefix)
MEK	methyl ethyl ketone
MFC	Materials and Fuels Complex
MLLW	mixed low-level waste
MPFPD	Mixed Plutonium Finishing Plant Debris
NBL	New Brunswick Laboratory
NDA	non-destructive assay
NRF	Naval Reactors Facility
NWPA	Nuclear Waste Policy Act
PBF	Power Burst Facility
PCB	polychlorinated biphenyl
PFP	plutonium finishing plant
PK	process knowledge
PMC	plutonium-molybdenum cermet
POS	Plant Optimization System
PPE	personal protective equipment

PPO	pressed plutonium oxide
R&D	research and development
RCRA	Resource Conservation and Recovery Act
RF	Rocky Flats Plant (generator site prefix)
RH	remote-handled
RL	Richland, Washington Hanford Site (generator site prefix)
RLMPFPCD	Richland Mixed Plutonium Finishing Plant Comprehensive Debris
RTG	radioisotopic thermoelectric generators
RTR	real-time radiography
RWMC	Radioactive Waste Management Complex
SCW	special-case waste
SD	pre-1980 INL-Exhumed SDA Waste (generator site prefix)
SDA	Subsurface Disposal Area
SDOP	six-drum overpack box
SMOP	six-drum metal overpack pallet
SNF	spent nuclear fuel
SWB	standard waste box
TAN	Test Area North
TRA	Test Reactor Area
TRU	transuranic
TRUCON	TRU waste content codes
TSA-RE	Transuranic Storage Area-Retrieval Enclosure
TSCA	Toxic Substance Control Act
VE	visual examination
VOC	volatile organic compound
WAC	Waste Acceptance Criteria
WCA	Waste Characterization Area
WETP	WIPP experimental test program
WG Pu	weapons-grade plutonium
WIPP	Waste Isolation Pilot Plant
WIR	Waste Incidental to Reprocessing
WMC	Waste Matrix Code
WMP	waste material parameter

1.0 WASTE STREAM DESCRIPTION

1.1 Waste Stream Number

BN510.4

1.2 Basic Waste Stream Information

1.2.1 Waste Stream Name

Supercompacted Debris Waste

1.2.2 Point of Generation

Advanced Mixed Waste Treatment Facility (AMWTF), Building WMF-676

1.2.3 Waste Stream Volume

Projected Volumes:

4,000 100-gallon drums (1,560 m^3) [100]

40 standard waste boxes (SWBs) (295 m^3) [68, 100]

At a minimum, fifty percent (50%) of the feedstock debris waste is estimated to contain greater than 100 nanocuries per gram (nCi/g) transuranic (TRU) alpha activity. The remaining estimated percentage (e.g., 50%) may contain less than 100 nCi/g TRU alpha activity. [13]

1.2.4 Generation Dates and Rate of Generation

June 2014 – December 2018

The average generation rate for BN510.4 is currently estimated at 50 product drums (19 m^3) per week. [100]

1.2.5 TRUCON Codes

ID121 [2]

1.2.6 Waste Isolation Pilot Plant Waste Stream ID

Waste Stream ID: IN-BN510.4

1.2.7 Summary Category Group

S5000 – Debris Waste [3]

1.2.8 Waste Matrix Code Group

Heterogeneous Debris Waste

1.2.9 Waste Matrix Code

The BN510.4 waste stream is assigned the Waste Matrix Code (WMC) S5490 – Unknown/Other Heterogeneous Debris Category.

The unknown/other-heterogeneous WMC includes waste that is consistent with the definition for the Heterogeneous Debris (S5400), but does not meet the criteria for assignment into the S5410, S5420, S5440, S5450, or S5460 specific-detailed categories.(3) The waste stream consists of supercompacted debris waste.

1.2.10 Description from the Annual Transuranic Waste Inventory Report

The Annual Transuranic Waste Inventory Report (ATWIR) will be updated at the time of the next data call to include the following: BN510.4 waste stream is a newly generated debris waste stream generated from supercompacted 55-gallon containers of debris waste. (27)

1.2.11 Defense and WIPP Land Withdrawal Act Determination for AMWTP Waste

The BN510.4 supercompacted debris waste stream generated at the Advanced Mixed Waste Treatment Project (AMWTP) is the result of compaction of heterogeneous debris waste that originated at one or more of the following facilities: AMWTP (BN), Argonne National Laboratory-East (AE), Battelle Columbus (BC), Idaho National Laboratory (ID),[a] Los Alamos National Laboratory (LA), Materials and Fuels Complex (AW), Mound (MD), Rocky Flats (RF), and the pre-1980 INL-exhumed Subsurface Disposal Area (SDA) waste (SD).[b] The supercompacted feedstock debris waste destined for disposal at WIPP is associated with various defense-related sources that include: verification and control technology, weapons activities including defense inertial confinement fusion, defense nuclear waste and material byproducts management, defense nuclear waste and materials security and safeguards and security investigations, naval reactors development, defense research and development, and defense nuclear materials production.

---

a. The two-character site code "ID" is used in this report to represent a group of subsidiary area codes with the same characteristics: IA, IC, IF, IN, IP, IR, IT, and IW. (35,100)
b. Hanford debris waste (previously identified with the generator prefix "RL") is no longer processed within the Supercompactor.

1.2.11.1 Defense Evaluation

The DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WIPP-WAC), requires generator sites to use acceptable knowledge (AK) to determine if the TRU waste streams to be disposed at WIPP meet the definition of TRU "defense" waste. Based on guidance from the U.S. Department of Energy (DOE), a TRU waste is eligible for disposal at WIPP if it has been generated, in whole or by part, by one or more of the activities listed in Section 42 U.S.C. 10101(3) of the Nuclear Waste Policy Act (NWPA) of 1982. The term "atomic energy defense activity" means any activity of the Secretary (of the U.S. Department of Energy) performed in whole or in part in carrying out any of the following functions: [4, 11, 18, 23, 24, 45]

Naval reactors development

Weapons activities, including defense inertial confinement fusion

Verification and control technology

Defense nuclear materials production

Defense nuclear waste and materials byproducts management

Defense nuclear waste and materials security and safeguards and security investigations

Defense research and development.

The BN510.4 supercompacted debris waste is comprised of heterogeneous debris wastes that were the result of one or more previously noted defense related activities at the following DOE sites:

- Rocky Flats

The TRU debris wastes generated at RF and shipped to the Idaho National Laboratory (INL) were generated through defense program activities, or commingled with non-defense program waste that cannot be segregated. [6, 18]

- Mound

The majority of the MD debris waste was generated during defense-related operations conducted at the MD for a variety of customers, including Lawrence Livermore National Laboratory, Hanford, Oak Ridge National Laboratory, and the Space Program. Plutonium-238 heat sources were designed and developed for spacecraft, generators, and satellites used directly by the U.S. Department of Defense (DOD) or in support of DOD missions. One of the major space programs supported by MD was the Space Nuclear Auxiliary Power System, which was sponsored by the DOD. Operations at the facility included processing and recovering plutonium, developing reactor fuels, conducting reactor fuel waste studies, and recovery of tritium and other isotopes for both DOD and domestic or private entities. The radioisotopic content (e.g., plutonium and other

TRU isotopes of interest) of the MD debris waste is the result of commingling of wastes from both defense-related and domestic activities.[7, 19]

- Battelle Columbus

Debris waste feedstock shipped from BC to the INL was generated during decommissioning and dismantling (D&D) of the JN-3 (Research Reactor Building) and other facilities. Defense-related operations were conducted at BC in support of Army, Navy, and Air Force programs. These operations included weapons-related activities and defense research into plutonium materials properties and development, plutonium metallurgy, actinide joining, and weapons production and assembly. Processing of test shot samples, development of ^{238}Pu heat sources for spacecraft for DOD, and some specialized work for Los Alamos were conducted in the JN-4 Plutonium Laboratory.[8, 20, 21, 22]

- Argonne National Laboratories–East

AE is a multidisciplinary research laboratory that performs work in basic and applied science in the areas of engineering, energy technology, chemistry, physics, materials, biomedicine, and environmental studies. AE has been instrumental in the development of nuclear reactors and associated systems, materials, fuel elements, and components for use in both civilian and defense programs. This work included key participation in the development of essentially all the domestic nuclear reactor systems in use today for isotope production, power generation, and naval submarine propulsion, as well as experimental or proposed applications for weapons destruction, defense waste management, defense security and safeguards, and space propulsion. The New Brunswick Laboratory (NBL), located on the AE campus, serves as the technical extension of the U.S. DOE Office of Safeguards and Security in the areas of nuclear material control and accountability, safeguards, and nonproliferation.[51, 60]

Commingling of waste occurred at AE because waste was often generated in small volumes (i.e., less than 55 gallons) and numerous waste items were placed together in the same container either at the generator level and/or during repackaging. AE waste generators routinely commingled waste with no segregation of defense from non-defense waste. In addition, waste materials generated during the ongoing destructive examination of materials from different programs and contamination from fuel cutting/grinding/polishing activities also occurred within the hot cell examination area. [51, 60]

- Materials and Fuels Complex

The atomic energy defense activities that apply to the TRU wastes generated by the Materials and Fuels Complex (MFC) are naval reactors development, defense nuclear materials productions, and defense research and development (R&D). Defense-related research activities include continuing development of advanced reactor concepts, fuel cycle process development, as well as development of homeland security research, decontamination and decommissioning technologies, and reactor and fuel cycle safety. MFC has engaged in the same or similar waste-

generating activities throughout its operation. Specific examples of defense related activities include the following:[57, 61]

- Analysis of plutonium for gallium content
- Laboratory services for Knolls Atomic Power Laboratory and Argonne National Laboratory–East (ANL-E)
- Analytical support for the Naval Reactors Facility (NRF) was conducted from June 2000 to October 2004
- Lawrence Livermore National Laboratory (LLNL) plutonium oxide disk fabrication
- Experimental Breeder Reactor (EBR)-II fuel and experiments analysis.

Based on the AK review of the MFC process knowledge (PK) documentation and communication with MFC personnel relating to waste-generating processes, the CH-TRU wastes generated at the MFC in the Analytical Laboratory/Casting Laboratory (AL/CL), Fuel Manufacturing Facility (FMF), and Hot Repair Area/Waste Characterization Area (HRA/WCA) were classified as defense-related wastes. All of the sampled waste that was repackaged in the HRA/WCA was generated from defense sites, principally Rocky Flats, and, because of the use of shared facilities throughout MFC, may have been inherently commingled with non-defense waste in the HRA/WCA. CH-TRU waste generated at MFC in the FMF (B704), AL/CL (B752), and HRA/WCA (B785) and shipped to the AMWTP is generated from a variety of defense and non-defense related activities associated with processing of radioisotopes in development of nuclear fuel, spent fuel disposition technology, liquid metal technology, nuclear waste stabilization, and new storage technologies for spent fuel and highly radioactive materials. In addition, TRU debris waste is generated within gloveboxes from laboratory support for waste and nuclear material characterization via sample preparation and analyses. Debris waste generated within these gloveboxes is inherently commingled at the point of generation. Only defense related waste and commingled defense/non-defense CH-TRU waste are accepted at the AMWTP for subsequent disposal at WIPP. Defense and non-defense wastes are not intentionally mixed within TRU debris waste shipped to AMWTP. Non-defense related waste that is not inherently commingled with defense-related waste at the point of generation is not shipped to AMWTP.[57, 61]

- Subsurface Disposal Area (Pre-1980)

From 1954 until 1970, the INL SDA received and disposed of a variety of radioactive waste (including TRU wastes) from multiple sources. The wastes disposed of into the SDA were both defense and non-defense waste. Defense-related wastes initially disposed of within INL Radioactive Waste Management Complex (RWMC) SDA Pits and Trenches were from process and defense-related activities such as: verification and control technology, weapons activities

including defense inertial confinement fusion, defense nuclear waste and material byproducts management, defense nuclear waste and materials security and safeguards and security investigations, Naval reactors development, defense research and development and defense nuclear materials production. Examples of non-defense waste disposed into the INL RWMC SDA include: civilian reactor wastes, medical wastes, United States Geological Service waste, Colorado School of Mines waste, and wastes from various universities. (71, 78)

The debris waste associated with the SDA was generated as a result of pre-1980 exhumations within specific INL pits and trenches. During the mid to late 1970s, the INL conducted two SDA exhumations that resulted in the generation of TRU waste and subsequent transportation to the Transuranic Storage Area-Retrieval Enclosure (TSA-RE). The Early Waste Retrieval (EWR) Project from 1976 through 1978 associated with Pits 1 and 2, Trenches 1, 5, 7, 8, 9, and 10. Of the four pre-1980 ER investigations, only two resulted in waste being exhumed and transferred to the TSA-RE. The two INL SDA exhumations that contributed waste to the TSA-RE were associated with the INL Initial Drum Retrieval (IDR) Project, and the INL EWR Project. Segregation practices of defense and non-defense related waste was not employed during the 1970 exhumations.

Due to the condition of some of the exhumed containers and management practices employed during the retrieval operations, the contents of INL exhumed repackaged waste within the TSA RE are assumed to be a composite of the INL SDA waste contributors. While certain TRU waste items may not have been generated directly from defense activities; based on the activities described above and the inability to separate non-defense waste from defense waste. (71, 75)

- Los Alamos National Laboratory

The waste received from LANL for purposes of processing within the AMWTP Supercompactor is generated from defense nuclear materials production, defense nuclear waste and materials byproducts management, and/or defense research and development activities. In accordance with interim guidance, defense wastes also include those wastes generated during work involving only defense activities, or during work in which defense and non-defense wastes were mixed in the past and from which the non-defense portion cannot be segregated. (79, 80) Debris waste received from LANL has been generated directly from defense activities and/or is based on the inability to separate non-defense waste from defense waste. (79, 80)

- Idaho National Laboratory

During the early INL facility operations there was no requirement to segregate defense from non-defense-related waste. Routine and non-routine generated waste was not segregated in accordance with current requirements. As a result, waste and other materials generated during these times may have been from widely different programs. As a result of the early INL waste management practices and the inherent commingling of waste that resulted from some of these various activities (e.g., analytical, decontamination, hot cells, decontamination and decommissioning [D&D] operations), segregation of non-defense waste from defense-related

waste was not conducted at the time of disposal and remains infeasible. While certain TRU waste items may not have been generated directly from defense activities, based on the activities presented below and the inability to separate non-defense waste from defense waste, the waste from the generators noted below is eligible for disposal at WIPP as a commingled defense waste stream that was generated "in part" by atomic energy defense activities. Specific examples of defense related activities include the following:[96, 101]

- Defense research and development
- Defense nuclear waste and materials by-products management
- Radiation and chemical monitoring support for defense activities conducted in other INL facilities
- Analytical support for defense activities conducted in other INL facilities
- Naval reactors development
- Defense nuclear materials security and safeguards
- Defense nuclear materials production.

As a result of the wide range of INL research and development functions, waste management practices and analytical activities on a wide variety of materials; the INL legacy waste currently in the AMWTP inventory is considered to be eligible for disposal at WIPP as inherently commingled defense waste that was generated "in part" by the atomic energy defense activities from defense nuclear waste and materials by-products management. No pure non-defense-related waste was shipped to the AMWTP TSA. Waste currently being received at the AMWTP is subject to evaluation through the Offsite Waste Program's WAC prior to receipt of waste. Waste that is classified as from non-defense activities is not accepted. [96, 101]

- Advanced Mixed Waste Treatment Facility

The waste generated at the AMWTF (WMF-676) is the result of contact with defense related TRU debris waste during treatment, characterization, maintenance, repackaging, and management.[5]

In accordance with interim guidance, defense wastes include those wastes generated during work involving only defense activities, or during work in which defense and non-defense wastes were inadvertently mixed in the past and from which the non-defense portion cannot be segregated.[23, 24]

Based on the above, the supercompactor feedstock waste, the BN510.4 waste stream is classified as defense-related waste.[5, 6, 7, 8, 18, 23, 24, 36, 45, 60, 61, 62, 65, 71, 72, 73, 75, 79, 80, 81, 82, 84, 85, 96, 97, 101, 103, 104]

1.2.11.2 Land Withdrawal Act Evaluation

Public Law 102-579, WIPP Land Withdrawal Act, prohibits the disposal of Spent Nuclear Fuel (SNF) and high level waste (HLW) as defined by the NWPA at WIPP. According to the NWPA, SNF is defined as "fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing." [45, 62]

In addition, the DOE Radioactive Waste Management Manual (DOE M 435.1, Radioactive Waste Management) expands on this definition to clarify that test specimens of fissionable material irradiated for research and development only, and not production of power or plutonium, may be classified as waste, and managed in accordance with the requirements of this Manual when it is technically infeasible, cost prohibitive, or would increase worker exposure to separate the remaining test specimens from other contaminated material.[41] High-level waste is defined by the NWPA as "the highly radioactive material resulting from the reprocessing of SNF, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation." [45]

The supercompacted debris waste in this waste stream originated from, and/or is directly associated with waste that originated from, one or more previously noted defense related activities. There is no AK documentation supporting the shipment or receipt of SNF or HLW at the AMWTP. SNF and HLW are not authorized as feedstock to the supercompactor.[5, 92]

One INL facility (INTEC) reprocessed SNF. The HLW generated from the SNF reprocessing operation underwent calcination (i.e., calcine waste) and is currently stored at the INTEC facility. There have been no calcine wastes sent to the AMWTP. Laboratory and other INTEC operational wastes (e.g., laboratory, D&D) received at the AMWTP since 2001 have undergone Waste Incidental to Reprocessing (WIR) evaluations and are not classified as HLW.[95, 96] AMWTP AK documents for the INTEC facility do not reflect the shipment/transfer of SNF or HLW to the AMWTP. Spent fuel materials were generated at various INL locations (e.g., ARA, NRF, TAN, TRA, INTEC, and PBF). These facilities operated nuclear reactors, which produced SNF, and/or performed various research and experiments on both SNF and test specimens, as defined above. However, although these facilities handled nuclear fuels, there is no evidence that SNF, as defined in the NWPA and DOE M 435.1-1, was sent to the AMWTP TSA. AMWTP AK documents for the INL do not reflect the shipment/transfer of SNF or HLW to the AMWTP. [95, 96, 101, 102]

The AMWTP off-site waste program does not accept SNF or HLW for storage or treatment at the AMWTP. If SNF and HLW wastes are identified the waste will be segregated and managed separately and will not be part of a WIPP waste stream.

Based on the AMWTP's AK documentation for the supercompactor feedstock wastes, the resulting supercompacted debris waste stream (i.e., BN510.4) does not meet the definition of HLW or SNF. [5, 6, 7, 8, 51, 57, 60, 61, 65, 71, 72, 73, 75, 79, 80, 81, 82, 84, 85, 96, 101, 102, 103, 104]

1.3 Waste Stream Description

1.3.1 BN510.4 Supercompacted Debris Waste

The BN510.4 supercompacted debris waste stream is generated from supercompaction of 55-gallon containers of debris waste. The Waste Stream Profile Form for BN510.4 was developed due to the addition of Idaho National Laboratory feedstock debris waste and the addition of the P030 (cyanide), P098 (potassium cyanide), P099 (potassium silver cyanide), P106 (sodium cyanide), U003 (acetonitrile), U103 (dimethyl sulfate), U108 (1,4-dioxane), U134 (hydrofluoric acid) and U151 (mercury) hazardous waste numbers that were not assigned to the BN510.3 waste stream. [92, 96] The addition of Idaho National Laboratory wastes to the supercompactor has been approved by the U.S. Environmental Protection Agency (EPA) through the EPA Tier process. [103, 104] Generation of the BN510.3 waste stream will be discontinued as a result of Carlsbad Field Office approval of the BN510.4 waste stream and subsequent processing of Idaho National Laboratory debris waste into the supercompactor. [92] A list of WIPP-approved TRU feedstock debris by generator and item description code (IDC) for waste being shipped to WIPP is presented in Appendix A.

The supercompacted debris waste (i.e., BN510.4) has a common physical form that contains similar hazardous constituents and is generated from a single process or activity. Table 1 provides a general description of the BN510.4 waste stream.

Table 1. Physical waste form description for BN510.4.

ATWIR Number	IDC	Waste Matrix Code (WMC)	Description
IN-BN510.4	BN-550	S5490	Debris waste from multiple debris waste feedstock sources that has been supercompacted into pucks and packaged into 100-gallon drums.

The BN510.4 waste stream consists of various combustible and noncombustible debris materials that originated from AE, AW, BC, ID, LA, MD, RF, and SD, as well as AMWTP self-generated non-polychlorinated biphenyl (PCB) debris waste within WMF-676. [5, 6, 7, 8, 51, 57, 71, 79, 81, 82, 84, 96]

The BN-550 supercompacted debris waste includes heterogeneous debris such as: paper and rags; gloves; wipes; asbestos; personal protective equipment (PPE); plastic and rubber items; filters; leaded gloves, lead aprons, lead bricks, and lead sheeting; metal with and without lead or cadmium; copper, stainless steel, brass, aluminum, zirconium; floor tiles, piping, sheet rock,

insulation, and glass; raschig rings; crucibles; fire brick; wood; Plexiglas®; Benelex®; pieces of equipment and tools; lab waste; vials, bottles, carboys, cans; ion exchange columns; D&D waste; resins; graphite; grit; aerosol cans; Teflon; ladders; hoses; leather; stainless; pumps; motors; fiberglass; titanium containers; crucibles; PIG® mats/blankets/pillows; asphalt and concrete. Supercompacted debris may contain non-debris waste such as absorbed liquids, soil, sand, absorbent (e.g., vermiculite), dust, unused sample material, or homogeneous solids. Non-debris waste will be less than 50% by volume in each 55-gallon drum of compacted debris. (5, 6, 7, 8, 10, 51, 57, 71, 79, 81, 82, 84, 96)

1.4 Process Description

See waste generation process description in Section 1.4.3.

1.4.1 Areas of Operation

The BN510.4 waste stream is generated by supercompaction of debris waste feedstock at the AMWTP in Building WMF-676. (5, 9, 10, 29, 53, 54, 67, 69, 74)

1.4.2 Process Flow Diagram

Figure 1 presents a flow diagram illustrating the generation and processing of AMWTP supercompacted debris waste.

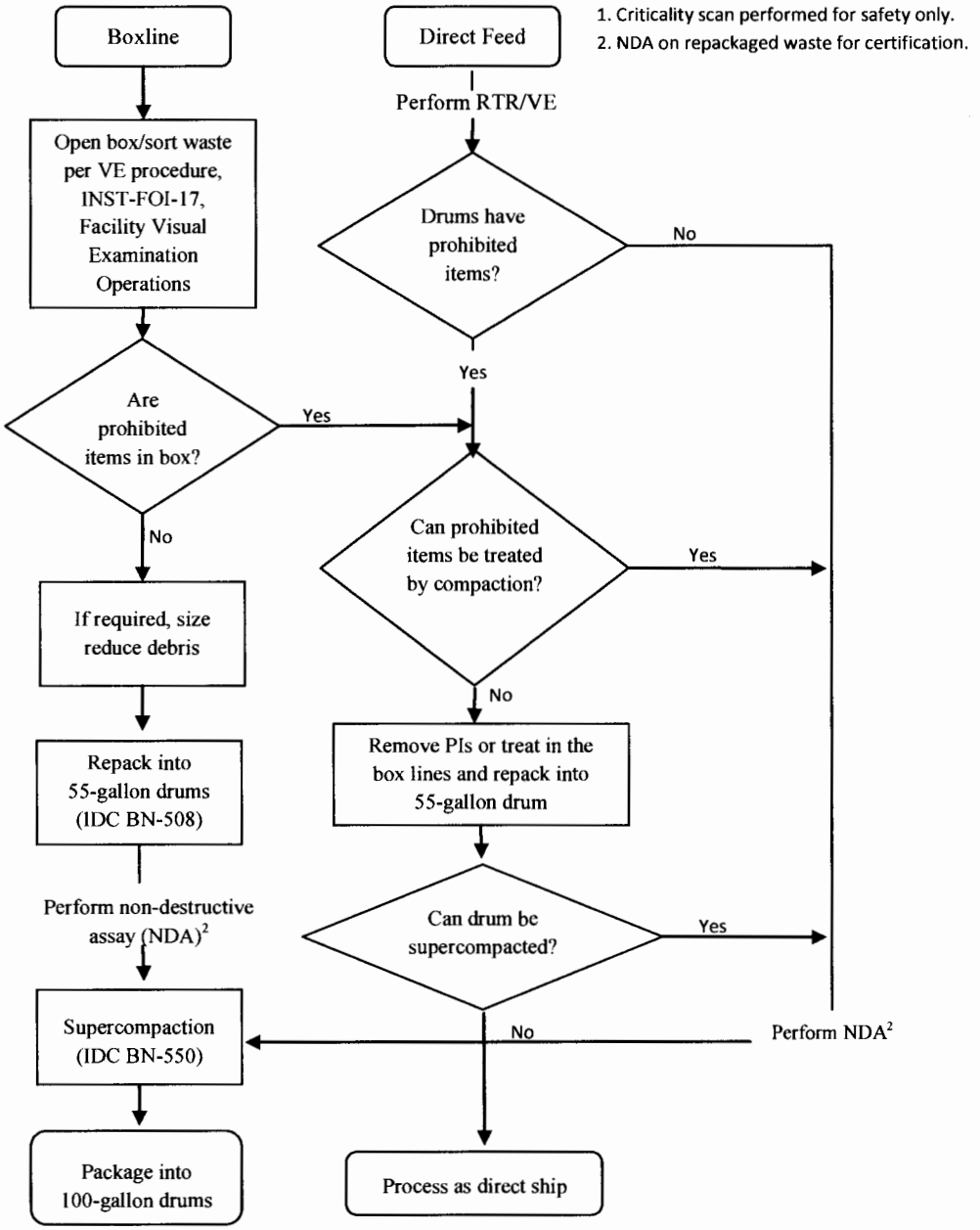

Figure 1. General flow diagram illustrating the generation and processing of AMWTP supercompacted debris waste.

1.4.3 Waste Generating Process - BN510.4 Supercompaction Process

The Supercompactor is a glovebox with a 2,000-ton capacity compactor. The supercompactor size-reduces 55-gallon waste drums to roughly one-fifth their normal size. The supercompacted drums (pucks) are then packaged into 100-gallon containers (puck drums).

The AMWTP waste generation process is supercompaction of individual 55-gallon drums of debris waste feedstock into pucks (the final waste form). Debris waste is processed as direct feed or is repackaged through the box line operations. (9, 10, 31, 32, 56, 59, 69, 74, 91)

Approved feedstock may be associated with waste container preparation, handling, and repackaging operations within the WMF-676 Drum Repack System (DRS).(74)[c] The Treatment Facility Unoverpacking Project (TFUP) operations are also conducted in the DRS and involves removing 55-gallon drums from 85-gallon drums and sending the 55-gallon drum for direct feed to the supercompactor. (59, 74, 91)

Debris feedstock waste is introduced into the supercompactor from one of the following operations:

- Direct feed (in original 55-gallon drums from the generator site) (59, 74, 91)
- From the WMF-676 DRS where containerized waste can be un-overpacked, treated, sorted, or repackaged (29, 59, 74, 91)
- From the box line(s) where boxed waste is treated, sorted, size-reduced, and repackaged into 55-gallon drums (10, 59, 67, 69, 91)
- From maintenance, hot maintenance cell size reduction, and clean-up operations. (9, 10, 53, 54, 67, 69)

1.4.3.1 Supercompaction Direct Feed

Only non-PCB debris waste in 55-gallon drums with an IDC listed in Appendix A and at least one TRU radionuclide greater than the lower limit of detection (LLD) are included as direct feed debris containers to BN510.4.[d] These containers are characterized and validated through

---

[c] This facility-generated waste is visually examined. AMWTP does not add additional hazardous chemicals or waste constituents to the supercompacted debris waste as a result of this process. (10, 29, 53, 54, 67, 68, 69, 70)

[d] Mixed low-level waste (MLLW) and MLLW IDCs for the MLLW supercompacted waste (BN-702) are non-WIPP feedstock debris and are not included as feedstock for BN510.4. (59, 91)

radioassay and real-time radiography (RTR) or visual examination (VE) to verify waste form and then sent directly to the supercompactor for processing. [31, 32, 33, 34, 59, 74, 91]

1.4.3.2 Supercompaction Box Lines

Boxes of waste undergo RTR and assay and are introduced into a box line for VE sorting and repackaging into 55-gallon drums. [31, 56, 59, 66, 69, 89] Legacy retrievably stored boxes (e.g., steel boxes, bins, fiberglass reinforced plywood boxes, and cake boxes) may be either bulk direct load waste, contain individual drums, or a combination of both. Legacy retrievably stored boxed wastes undergo either certified or uncertified RTR scans to confirm the majority of waste is approved debris feed stock. [31, 89]

Overpack boxes include: (1) six-drum overpack boxes (SDOPs); (2) eight-drum metal overpack pallets (EMOPs); and (3) six-drum metal overpack pallets (SMOPs). An SDOP is a six-drum overpack wood box, an EMOP is an eight 55-gallon drum metal pallet, and an SMOP is a six 85-gallon drum metal pallet. Only WIPP-approved TRU IDCs (See Appendix A) of non-PCB debris waste in 55- or 85-gallon drums are included in overpack boxes. [56, 59, 91]d

The multi-drum overpacks are sent to WMF-676 with one of two types of characterization:

(1) The first type is packaged with characterized debris drums for processing in AMWTF. These contain drums with IDCs confirmed by RTR or VE to be approved feedstock debris waste (BN-519). [31, 32, 56, 59, 89, 91]

(2) The second type is packaged with drums that are not characterized but are labeled with historical AK information that indicates approved feedstock debris waste and undergo RTR to confirm the waste is >50% debris in each drum (BN-541). [31, 55, 56, 59, 89]

Certified VE is then performed on the repackaged box line waste as greater than 50% by volume approved feedstock debris, IDC BN-508. Campaigning of approved feedstock type by generator site or radiological classification does not occur. [10, 59, 91]

1.4.3.3 WMF-676 Newly Generated Waste

Newly generated debris waste associated with WMF-676 operations may be introduced into the supercompactor as direct feed or undergo repackaging within the box lines. Non-PCB debris waste generated from routine WMF-676 supercompactor support operations such as: maintenance, box line cleanout, container preparation, container handling, repackaging of waste within the supercompactor box lines or within the Drum Repack System (DRS) and the

special-case waste (SCW) glovebox may be used as feedstock.[e] Debris waste that is treated, un-overpacked, repackaged, or examined in the WMF-676 DRS (e.g., DWPG), waste from maintenance and WMF-676 cleanup activities are packaged according to procedures, subjected to RTR or VE, and undergo nondestructive assay prior to compaction. (9, 10, 29, 31, 32, 33, 52, 53, 54, 69, 74, 89)

1.4.3.4 Supercompactor Product Drums

After compaction, the TRU drum pucks are loaded into the final 100-gallon drums (IDC BN-550) for shipment to WIPP. (9) No additional chemicals or waste constituents are added to the supercompacted debris waste as a result of this process.

The plant optimization system (POS) is used to optimize processing drums through the supercompactor to produce 100-gallon drums (containing compacted drum pucks) to meet the WIPP Waste Acceptance Criteria (WAC). (4, 9, 26)

1.4.4 Material Inputs

The BN510.4 supercompacted debris waste includes heterogeneous debris (see Section 1.3.1). The approved supercompactor feedstock debris waste originated at multiple DOE sites (i.e., AE, AW, BC, BN, ID, LA, MD, RF and SD). (5, 6, 7, 8, 28, 51, 57, 71, 79, 81, 82, 84, 86, 96) Graphite may be part of the feedstock but does not make up >1% by weight of the feedstock in this waste stream. Supercompacted debris may contain non-debris waste (see Section 1.3.1). Non-debris waste will be less than 50% by volume in each 55-gallon drum of compacted debris. (10, 69, 88)

The waste contributions into the BN510.4 waste stream originated at the following DOE facilities operations: (5)

RF

- Plutonium metal and plutonium-containing materials manufacture, recovery, and treatment (6)
- Plutonium production support operations including maintenance, laboratory activities, and R&D (6)
- Non-routine events including renovations, spills, fires, and decommissioning (6)
- Construction, demolition, and D&D operations. (6)

---

[e] The DRS consists of the drummed waste handling enclosure (DWHE), the drum opening hood enclosure (DOHE), which includes the drum opening station (DOS) and the drummed waste packaging glovebox (DWPG).(29, 74)

MD

- D&D of the Mound Plant Facility [7]
- Pressed plutonium oxide (PPO) sphere and plutonium-molybdenum cermet (PMC) production [7]
- Plutonium and other isotopic recovery [7]
- Plutonium manufacture support such as laboratory activities and R&D [7]
- Facility maintenance. [7]

BC

- Research into the metallurgical and ceramic properties of plutonium and its alloys [8]
- Plutonium processing [8]
- Development of nuclear fuels [8]
- D&D of the BC facilities. [8]

AE

- Support activities associated with the development and testing of various breeder reactor systems [51]
- Laboratory operations associated with R&D/DOE waste management and supporting the examining/evaluating of nuclear fuel [51]
- Repackaging activities [51]
- Decontamination and decommissioning activities [51]
- General plant operations including waste management and maintenance. [51]

AW

- Recovery of actinides such as plutonium and other radionuclides and characterization of nuclear materials [57]
- Experimental fabrication of fuel rods, rodlets, slugs, and blankets [57]
- Transmutation of actinides experiments in support of DOE programs (e.g., Advanced Fuel Cycle Initiative [AFCI], naval reactor, Generation IV Nuclear Reactor, and Space Nuclear Programs) using the recovered plutonium and other actinides [57]
- Maintenance and decontamination of related equipment and gloveboxes [57]
- Characterization of WIPP candidate CH-TRU waste (non-radionuclide processing), i.e., headspace gas sampling, visual examination, coring and sample collection. [57]

SD

- Pre-1980 INL SDA exhumations. (71)

LA

- Defense nuclear materials production (79)
- Defense nuclear waste and materials byproducts management (79)
- Defense research and development. (79)

ID

- Laboratory operations associated with chemical and radiochemical analyses for potential hazardous substances, a comprehensive radiation monitoring program, environmental monitoring, ecological research, radiation safety research and development, and other special projects in support of the DOE's mission at the INL facilities (95)
- R&D activities associated with the operation and testing of various reactor systems and programs (95)
- Hot cell operations for examination and testing of radioactive materials (95)
- Operations associated with R&D management and supporting the evaluation, examination, and testing of nuclear fuels and related materials (95)
- RF and ID repackaging activities (95)
- Decontamination and decommissioning activities (95)
- General operations including storage, waste management and maintenance of laboratories, reactors and radioactive materials. (95)

BN

- WMF-676 characterization activities (5)
- Box line repackaging activities (5)
- WMF-676 waste treatment activities including size reduction of large items, supercompaction, absorption of prohibited liquids, and removal of prohibited items (5)
- Containers retrieved and confirmed to be from WIPP-approved generator IDCs listed in RPT-TRUW-83 but with insufficient information to assign a specific generator IDC (BN-524 and BN-770) (5)
- Facility support operations including waste management and maintenance. (5)

1.4.4.1 Supporting AK Documents

The AK document for AMWTP waste, RPT-TRUW-06, Acceptable Knowledge Document for AMWTP Waste, was compiled to provide AK for the AMWTP newly-generated wastes in accordance with MP-TRUW-8.13, Collection, Review, and Management of Acceptable Knowledge Documentation. [5, 12] RPT-TRUW-56, Acceptable Knowledge Document for INL Stored Transuranic Waste – Rocky Flats Plant; RPT-TRUW-13, Acceptable Knowledge Document for INL Stored Waste–Mound Plant Waste; RPT-TRUW-04, Acceptable Knowledge Document for the Battelle Columbus Laboratories Building JN-4 Plutonium Laboratory; RPT-TRUW-89, Acceptable Knowledge Document for Argonne National Laboratory-East Waste; RPT-TRUW-79, Acceptable Knowledge Document for Materials and Fuels Complex Waste; and RPT-TRUW-82, Acceptable Knowledge Document for Hanford Debris Waste Shipped to AMWTP [f]; RPT-TRUW-91, Acceptable Knowledge Document for Pre-1980 INL-Exhumed SDA Waste; RPT-TRUW-93, Acceptable Knowledge Document for Los Alamos National Laboratory; and RPT-TRUW-92, Acceptable Knowledge Document for Select Idaho National Laboratory (INL) Facilities; are the AMWTP AK documents for the RF, MD, BC, AE, AW, RL, SD, LA, and ID facilities, respectively. [6, 7, 8, 12, 28, 51, 57, 71, 79, 95]

The flow of the AMWTP AK documentation is presented in Figure 2.

f. RPT-TRUW-82 is cited solely for contribution to the F-listed HWN assignment.

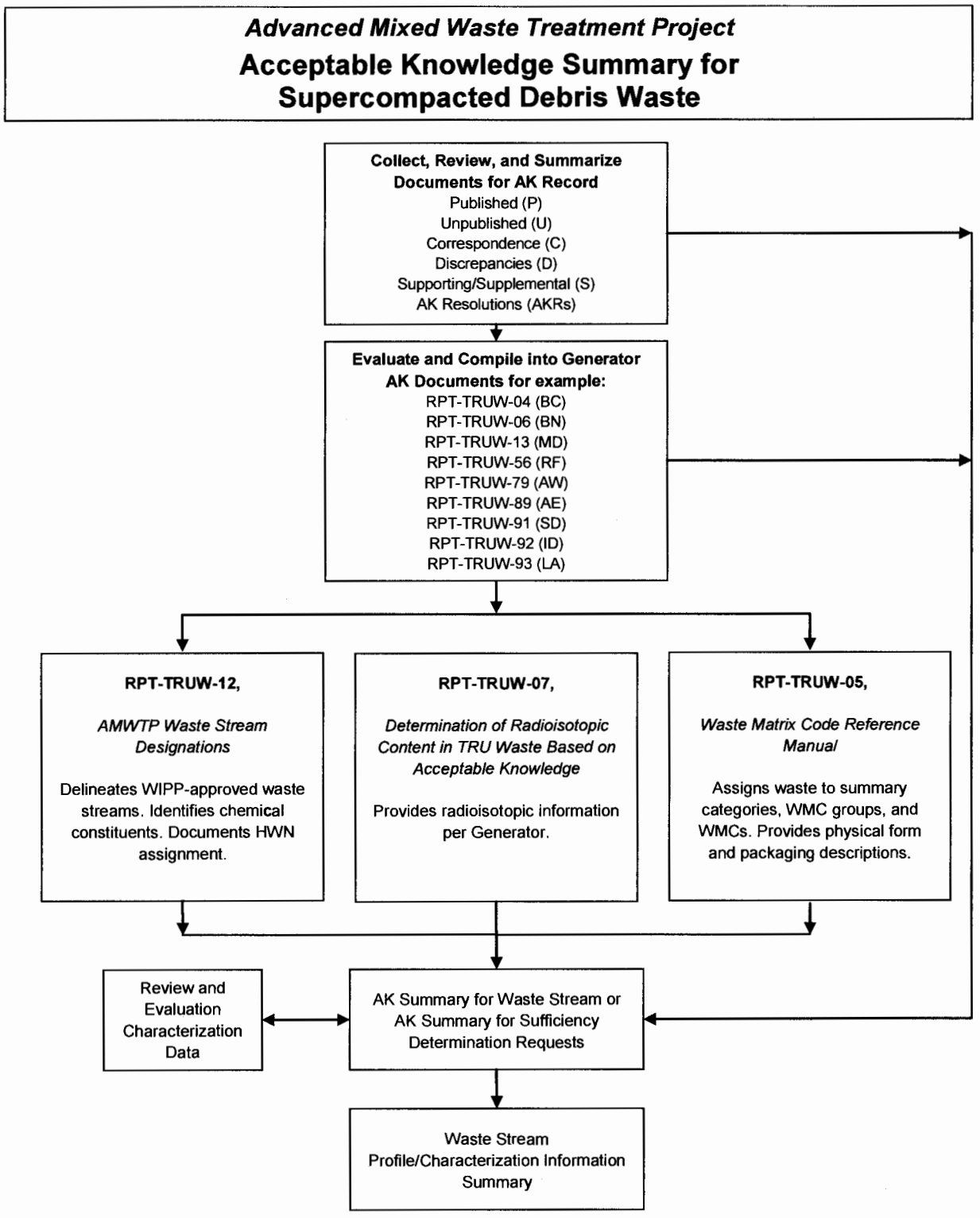

Figure 2. Document hierarchy and information flow for AK.

1.4.5 Waste Material Parameters

The estimated waste material parameters (WMP) weight percentages for this waste stream are based on the VE data for BN510.3 100-gallon product drums. A total of 349 product drums underwent RTR and/or VE between August 5, 2013 and March 21, 2014 and these data were obtained from the AMWTP Waste Tracking System database. The estimated WMP weights (by percent) for the BN510.4 waste stream were calculated in accordance with the requirements of MP-TRUW-8.13. The WMPs for BN510.4 are summarized in Table 2. (12, 1, 88)

Table 2. Waste material parameters for BN510.4. (88)

Waste Material Parameters	Estimated Percent WMP Weight/Unit Waste [1]
Iron-based Metals/Alloys	62
Aluminum-based Metals/Alloys	1
Other Metals	1
Other Inorganic Materials	5
Cellulosics	15
Rubber	1
Plastics (waste materials)	15
Inorganic Matrix	<1
Organic Matrix	<1
Soils/Gravel	<1

[1] Estimated percents of WMPs may be rounded up to the nearest whole number to total 100%.

1.5 AK Sufficiency Determination

No AK sufficiency determinations apply to this waste stream.

1.6 Prohibited Items

The following items are prohibited in waste containers shipped to WIPP as documented in MP-TRUW-8.1, Certification Plan for INL Transuranic Waste, and MP-TRUW-8.2, Quality Assurance Project Plan. [4, 10, 26, 31, 32, 43, 45, 62, 69, 70]

- Liquid waste and prohibited observable liquids
- Sealed containers greater than 4 liters
- Non-radionuclide pyrophoric materials
- Hazardous wastes not occurring as co-contaminants with TRU mixed wastes
- Wastes incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes
- Wastes containing explosives or compressed gases
- Wastes with PCBs not authorized under an EPA PCB waste disposal authorization
- Wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (hazardous waste numbers [HWNs] D001, D002, or D003)
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table C-5 (MP-TRUW-8.2, Section C-1c), unless specifically approved through as WIPP RCRA Permit Modification
- High-level waste and SNF as identified in the WIPP Land Withdrawal Act (and as defined in the Nuclear Waste Policy Act of 1982).
- Any waste container from a waste stream which has not undergone either radiographic or visual examination of statistically representative subpopulation of the waste stream.

Feedstock debris wastes that are identified as containing WIPP or supercompactor prohibited items/conditions by RTR/VE or by VE during box line processing of wastes are either: treated in the box line; treated by supercompaction (as noted below); or have the prohibited item(s) removed and managed separately from the BN510.4 waste stream. [10, 29, 31, 32, 43, 52, 58, 64, 69, 70, 89, 98]

Supercompaction may be used for the treatment of some prohibited items (e.g., unprotected sharp objects, aerosol cans [per criteria below], and sealed containers greater than 4 liters). [43, 58, 64, 70]

Containers with WIPP-prohibited liquids may be treated using the following non-hazardous materials: Aquaset®, Aquaset II-G®, Petroset II® or Petroset IIG®, Micro-Cel® E, PIG®, or SP-400® absorbents or Hg Absorb for mercury to render the waste acceptable prior to shipment. [37, 38, 46, 47, 48, 50, 63, 93, 99]

Prohibited items may be treated in the box lines or processed in the SCW glovebox.[9, 10, 26, 29, 43, 52, 69, 70, 98] Nonhazardous pressurized fire extinguishers or other approved pressurized large cylinders may be vented by a controlled release in the box lines. Box line processes may perform absorption of free liquids in accordance with approved methods and in accordance with the AMWTP's Hazardous Waste Management Act (HWMA)/Resource Conservation and Recovery Act (RCRA) permit requirements.[43] SCW treatment includes management of containers with liquids, pressurized containers, collected free liquids, collected residual liquids, and elemental mercury in accordance with approved methods. [29] After treating, sorting, and/or removal of prohibited item(s), the waste is repackaged into 55-gallon drums as IDC BN-508 if greater than 50% debris by volume. [9, 10, 35, 69]

Some prohibited items are approved for treatment by supercompaction. [43, 58, 59, 64, 69, 70] Supercompaction of 55-gallon drums is the treatment for unprotected sharp objects, pressurized aerosol cans that contain a total liquid volume confirmed by RTR of less than or equal to 49 mL, mixed waste containers with an observable liquid volume confirmed by RTR of not greater than 5% by volume of the waste container, and sealed containers greater than 4 liters. [31, 43, 58, 59, 64, 69, 70, 83] Because there are no layers of confinement following supercompaction, it is also the treatment for excess layers of confinement. [9, 26, 59, 70]

Drums of direct feedstock debris waste identified during RTR/VE as containing PCB items are segregated or sent to DWPG or SCW for item removal. [16, 29, 31, 32, 35, 53, 59, 89] PCB items and prohibited items/conditions identified in box lines that cannot be treated by supercompaction are removed during box line operations. [10, 69, 70] PCB-contamination identified during box line processing is cleaned up in accordance with applicable AMWTP procedures. [43, 52] PCB items removed from feedstock debris waste drums and boxes and/or PCB contaminated items generated during the box line PCB cleanup operation are packaged as newly-generated waste and are not authorized feedstock as part of this waste stream.

None of the supercompacted debris 100-gallon product drums (BN-550) shipped to WIPP will contain prohibited items. [4, 26]

1.7 Resource Conservation and Recovery Act Determination

The waste within the BN510.4 waste stream is (and has been) subject to the State of Idaho HWMA/RCRA requirements (e.g., 40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, and 40 CFR 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities). [43, 44]

1.7.1 EPA Hazardous Waste Numbers

The BN510.4 supercompacted debris waste is characterized as mixed TRU waste. The HWNs assigned to this waste stream include applicable HWNs associated with the feedstock debris waste as originally compiled in AMWTP AK documents. [1, 5, 6, 7, 8, 28,30, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96]

Toxicity characteristic HWNs applied to this waste stream are: [1, 5, 6, 7, 8, 28, 30, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96]

D004 (arsenic), D005 (barium), D006 (cadmium), D007 (chromium), D008 (lead), D009 (mercury), D010 (selenium), D011 (silver), D022 (chloroform), D027 (1,4-dichlorobenzene), D028 (1,2-dichloroethane), D029 (1,1-dichloroethylene), D030 (2,4-dinitrotoluene), D032 (hexachlorobenzene), D033 (hexachlorobutadiene), D034 (hexachloroethane), D037 (pentachlorophenol), and D043 (vinyl chloride).

Listed HWNs and constituents applied to this waste stream are: [1, 5, 6, 7, 8, 28, 30, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96]

F001: 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1,2,2-tetrachloro-1,2-difluoroethane, carbon tetrachloride, methylene chloride, tetrachloroethylene, trichloroethylene, trichlorofluoroethylene, and trichlorofluoromethane

F002: 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1,2-trichloroethane, 1,2-dichlorobenzene, chlorobenzene, methylene chloride, tetrachloroethylene, trichloroethylene, and trichlorofluoromethane

F004: cresols, cresylic acid, and nitrobenzene

F005: 2-ethoxyethanol, 2-nitropropane, benzene, carbon disulfide, isobutanol, methyl ethyl ketone (MEK), pyridine, and toluene

F006, F007, and F009: electroplating waste.

The HWNs assigned to the BN510.4 wastes generated in the WMF-676 facility as a result of supercompaction are derived from the compilation of all applicable EPA HWNs assigned to the approved feedstock debris waste. The RL waste is no longer processed as feedstock and has been shipped. Table 3A identifies the applicable toxicity characteristic metals and organics and F-listed HWNs for this waste stream by generator site. [1, 5, 6, 7, 8, 28, 30, 39, 40, 42, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96] The notes following Table 3A presents the F-listed constituents by generator. Table 3B separately identifies the P and U listed HWNs associated with the INL INTEC and RWMS laboratory operations and the AMWTP newly generated waste. The P and U listed waste is discussed in the Listed Waste section.

Table 3A. Characteristic (D) and F listed HWN assignment by generator site for BN510.4.

Generator Site/Activity	Arsenic D004	Barium D005	Cadmium D006	Chromium D007	Lead D008	Mercury D009	Selenium D010	Silver D011	Chloroform D022	1,4-Dichlorobenzene D027	1, 2-Dichloroethane D028	1,1-Dichloroetthylene D029	2,4-Dinitrotoluene D030	Hexachlorobenzene D032	Hexachlorobutadiene D033	Hexachloroethane D034	Pentachlorophenol D037	Vinyl Chloride D043	Spent Solvents F001	Spent Solvents F002	Spent Solvents F004	Spent Solvents F005	Electroplating waste F006 F007 F009
Rocky Flats (RF) [6]																							
Isotope recovery [b]	•	•	•	•	•	•	•	•															
Laboratory reagents, research	•	•	•	•	•	•	•	•	•													• [a]	
Degreasing, decontamination																			• [a]	• [a]			
Cleaning, spill clean up																						• [a]	
Electroplating																							• [a]
Based on AK/HSG																							
Mound Plant (MD) [7]																							
PPO & PMC production and isotope recovery [b]	•	•	•	•	•	•	•	•															
Cleaning and degreasing																			• [c]	• [c]		• [c]	
Electroplating																							• [c]
Based on AK/HSG									•			•											

Table 3 (continued)

Activity	Arsenic D004	Barium D005	Cadmium D006	Chromium D007	Lead D008	Mercury D009	Selenium D010	Silver D011	Chloroform D022	1,4-Dichlorobenzene D027	1, 2-Dichloroethane D028	1,1-Dichloroetthylene D029	2,4-Dinitrotoluene D030	Hexachlorobenzene D032	Hexachlorobutadiene D033	Hexachloroethane D034	Pentachlorophenol D037	Vinyl Chloride D043	Spent Solvents F001	Spent Solvents F002	Spent Solvents F004	Spent Solvents F005	Electroplating waste F006 F007 F009
Battelle Columbus (BC) [8]																							
Metallurgical research		•	•	•	•	•		•															
Cleaning and degreasing																			• [d]	• [d]		• [d]	
Argonne National Laboratory – East (AE) [51]																							
Laboratory Operations [e]	•	•	•	•	•	•	•	•		•	•	•	•				•			• [e]	• [e]	• [e]	
Research Generated [e]	•	•	•	•	•	•	•	•		•	•	•	•				•			• [e]	• [e]	• [e]	
D&D [e]	•	•	•	•	•	•	•	•		•	•	•	•				•			• [e]	• [e]	• [e]	
Based on AK/HSG [e]	•	•	•	•	•	•	•	•		•	•	•	•				•			• [e]	• [e]	• [e]	

Table 3 (continued)

Activity	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Chloroform	1,4-Dichlorobenzene	1, 2-Dichloroethane	1,1-Dichloroetthylene	2,4-Dinitrotoluene	Hexachlorobenzene	Hexachlorobutadiene	Hexachloroethane	Pentachlorophenol	Vinyl Chloride	Spent Solvents	Spent Solvents	Spent Solvents	Spent Solvents	Electroplating waste
	D004	D005	D006	D007	D008	D009	D010	D011	D022	D027	D028	D029	D030	D032	D033	D034	D037	D043	F001	F002	F004	F005	F006 F007 F009
Hanford [28, 39, 40, 42]																							
PFP plutonium metal production operations and glovebox activities including maintenance, clean out, D&D and stabilization:																							
• RLMPDT.001 (MPFPD)	•	•	•	•	•	•	•	•					•										
• RLMPFPCD	•	•	•	•	•	•	•	•	•				•						• [f]	• [f]	• [f]	• [f]	
Radiochemistry Processing Laboratory operations and maintenance (RLM325D.001)	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	• [f]	• [f]	• [f]	• [f]	
Metallurgy operations, cleanout, and D&D (RLM231ZD.001)			•	•	•	•													• [f]	• [f]		• [f]	

Table 3 (continued)

Activity	Arsenic D004	Barium D005	Cadmium D006	Chromium D007	Lead D008	Mercury D009	Selenium D010	Silver D011	Chloroform D022	1,4-Dichlorobenzene D027	1, 2-Dichloroethane D028	1,1-Dichloroethylene D029	2,4-Dinitrotoluene D030	Hexachlorobenzene D032	Hexachlorobutadiene D033	Hexachloroethane D034	Pentachlorophenol D037	Vinyl Chloride D043	Spent Solvents F001	Spent Solvents F002	Spent Solvents F004	Spent Solvents F005	Electroplating waste F006 F007 F009
Materials and Fuels Complex (AW)[57]																							
Radionuclide Processing CH-TRU Debris Waste	•	•	•	•	•	•	•	•	•										•[g]	•[g]		•[g]	
Ash Stabilization and GGE Debris Waste IDC AW-165	•	•	•	•	•	•	•	•											•[g]	•[g]		•[g]	
HRA/WCA debris IDC AW-164	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•[g]	•[g]	•[g]	•[g]	•[g]
Subsurface Disposal Area (SD)[71]																							
Pre-1980 exhumations	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•[h]	•[h]	•[h]	•[h]	•[h]
Los Alamos National Laboratory (LA)[79, 81, 82, 84]																							
LA-007: Mixed Heterogeneous Debris from TA-55	•	•	•	•	•	•	•	•	•										•[i]	•[i]		•[i]	
LA-009: Heterogeneous Debris from the TA-21	•	•	•	•	•	•	•	•	•										•[i]	•[i]		•[i]	
LA-010: Heterogeneous Debris Waste from TA-50	•	•	•	•	•	•	•	•	•	•	•	•	•				•	•	•[i]	•[i]	•[i]	•[i]	•[i]

Table 3 (continued)

Activity	Arsenic D004	Barium D005	Cadmium D006	Chromium D007	Lead D008	Mercury D009	Selenium D010	Silver D011	Chloroform D022	1,4-Dichlorobenzene D027	1, 2-Dichloroethane D028	1,1-Dichloroetthylene D029	2,4-Dinitrotoluene D030	Hexachlorobenzene D032	Hexachlorobutadiene D033	Hexachloroethane D034	Pentachlorophenol D037	Vinyl Chloride D043	Spent Solvents F001	Spent Solvents F002	Spent Solvents F004	Spent Solvents F005	Electroplating waste F006 F007 F009
Idaho National Laboratory (ID)[96]																							
Operations including the development, research and testing of various reactor systems, research and design work, maintenance operations, container management, facility monitoring, D&D, etc.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•[j]	•[j]	•[j]	•[j]	•[j]
Labs at INTEC and RWMC performing analytical activities	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•[j]	•[j]	•[j]	•[j]	•[j]
AMWTP (BN)[5]																							
Newly generated waste from characterization, repackaging, treatment, and waste management activities	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•[k]	•[k]	•[k]	•[k]	•[k]

Table 3 (continued)

NOTES:

a. RF – F001 = 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, carbon tetrachloride, tetrachloroethylene and trichloroethylene; F002 = 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, methylene chloride, tetrachloroethylene, and trichloroethylene; and F005 = 2-ethoxyethanol, benzene, carbon disulfide, methyl ethyl ketone, and toluene; and F006, F007, and F009 are assigned due to electroplating waste contamination.

b. Process used to recover radioisotopes (e.g., plutonium, americium, neptunium) which caused precipitation of metals as well as the radionuclides.

c. MD – F001 = 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, carbon tetrachloride, and methylene chloride; F002 =1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, and methylene chloride; F005 = benzene, carbon disulfide, MEK, and toluene. F007 and F009 HWNs are assigned due to electroplating waste contamination.

d. BC – F001 = methylene chloride and trichloroethylene; F002 = methylene chloride and trichloroethylene; and F005 = benzene, MEK, and toluene.

e. AE – D019 carbon tetrachloride, assigned to AE waste, is covered under the F001 assigned to the BN510.1 waste stream. F002 = 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, chlorobenzene, methylene chloride, tetrachloroethylene, and trichloroethylene; F004 = nitrobenzene; F005 = benzene, carbon disulfide, isobutanol, MEK, and toluene. Due to the commingling of AE waste and management based on content codes during the early years of shipment, the applicable AE HWNs/constituents associated with AE heterogeneous debris waste are the same for all activities.

f. RL – F001 = 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1,2,2-tetrachloro-1,2-difluoroethane, carbon tetrachloride, methylene chloride, tetrachloroethylene, trichloroethylene, and trichlorofluoromethane; F002 = 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,2-dichlorobenzene, chlorobenzene, methylene chloride, tetrachloroethylene, trichloroethylene, and trichlorofluoromethane; F004 = cresols and nitrobenzene; and F005 = 2-nitropropane, benzene, carbon disulfide, isobutanol, MEK, pyridine and toluene. Listed HWN constituents identified in footnote [f] are the summation from referenced AK and process knowledge (PK) documents. Currently, Hanford waste is no longer feedstock to the supercompactor and as such only the listed hazardous waste numbers are applicable.

g. MFC/AW – F001 = 1,1,1-trichloroethane, carbon tetrachloride, methylene chloride, tetrachloroethylene, and trichloroethylene; F002 = 1,2-dichlorobenzene, 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,2-trichloroethane, chlorobenzene, methylene chloride; tetrachloroethylene, trichloroethylene, and trichloromonofluoromethane (trichlorofluoromethane); F004 = cresols and nitrobenzene; F005 = 2-ethoxyethanol, 2-nitropropane, benzene, carbon disulfide, isobutanol, MEK, pyridine and toluene; and F006, F007, and F009 are assigned due to electroplating waste contamination.

h. SD – F001 = carbon tetrachloride, methylene chloride, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene, trichlorofluoromethane and 1,1,2-trichloro-1,2,2-trifluorethane; F002 = methylene chloride, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene, trichlorofluoromethane and 1,1,2-trichloro-1,2,2-trifluorethane, chlorobenzene, 1,2-dichlorobenzene, 1,1,2-trichloroethane; F004 = cresols and nitrobenzene; F005 = benzene, carbon disulfide, isobutanol, 2-ethoxyethanol, methyl ethyl ketone, 2-nitropropane, pyridine and toluene; F006, F007 and F009 are assigned due to electroplating waste contamination.

i. LA – F001= 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, carbon tetrachloride. methylene chloride, tetrachloroethylene, trichloroethylene, and trichlorofluoromethane; F002= 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, chlorobenzene, methylene chloride, tetrachloroethylene, trichloroethylene, 1,1,2-trichloroethane, 1,2-dichlorobenzene and trichlorofluoromethane; F004= cresols, cresylic acid, and nitrobenzene; F005= Benzene, methyl ethyl ketone (2-butanone), pyridine, toluene, 2-ethoxyethanol, 2-nitropropane, carbon disulfide and isobutanol (isobutyl alcohol); F006, F007, F009= are assigned due to electroplating waste contamination

j. ID – F001 = 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, carbon tetrachloride, methylene chloride, tetrachloroethylene, trichloroethylene, trichlorofluoromethane, and trichlorofluoroethylene; F002 =1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,2-trichloroethane, o-(1,2)-dichlorobenzene, chlorobenzene, methylene chloride; tetrachloroethylene, trichloroethylene, and trichlorofluoromethane; F004 = cresols, and nitrobenzene; F005 = 2-ethoxyethanol, 2-nitropropane, benzene, carbon disulfide, isobutanol, MEK, pyridine and toluene; and F006, F007, and F009 are assigned due to electroplating waste contamination.

k. BN (product drum) – F001 = 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1,2,2-tetrachloro-1,2-difluoroethane, carbon tetrachloride, methylene chloride, tetrachloroethylene, trichloroethylene and trichlorofluoromethane; F002 =1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,2-trichloroethane,1,2-dichlorobenzene, chlorobenzene, methylene chloride; tetrachloroethylene, trichloroethylene, and trichlorofluoromethane; F004 = cresols, cresylic acid, and nitrobenzene; F005 = 2-ethoxyethanol, 2-nitropropane, benzene, carbon disulfide, isobutanol, MEK, pyridine and toluene; and F006, F007, and F009 are assigned due to electroplating waste contamination.

Table 3B. Acute Hazardous Wastes (P listed) and Toxic Hazardous Wastes (U listed) HWN assignment by generator site for BN510.4.

Generator Site/Activity	Cyanide P030	Potassium cyanide P098	Potassium silver cyanide P099	Sodium cyanide P106	Acetonitrile U003	Dimethyl sulfate U103	1,4-Dioxane U108	Hydrofluoric acid U134	Mercury U151
Idaho National Laboratory (ID) [96]									
Labs at INTEC and RWMC performing analytical activities (represented by INL facility IDCs ID-150, IC-150, IW-150, IC-527, IW-527 and IC-601)	•	•	•	•	•	•	•	•	•
AMWTP (BN)[5]									
Newly generated waste from characterization, repackaging, treatment, and waste management activities	•	•	•	•	•	•	•	•	•

1.7.2 Hazardous Determination

1.7.2.1 Hazardous Waste Management

The BN510.4 wastes are newly generated. Applicable hazardous waste numbers initially (or historically) assigned to the supercompactor feedstock wastes are applied to the BN510.4 waste stream as a result of the RCRA mixture and the derived-from rules. [1]

1.7.2.1.1 Historical Waste Management

The wastes that comprise the BN510.4 waste stream have historically been managed as mixed TRU waste at the AMWTP. [1, 5]

1.7.2.2 Ignitability

The supercompacted debris waste within the BN510.4 waste stream does not meet the 40 CFR 261.21, Characteristic of Ignitability, definition of ignitability.

Authorized debris feedstock undergoes supercompaction. The resulting supercompacted debris waste is not a liquid waste and is not an ignitable waste. Ignitable liquids may be processed in the box lines (e.g., petroleum ether). [10, 58, 59, 64, 69, 94, 98]

To render the waste acceptable at WIPP, containers identified as having ignitable waste properties or containing prohibited liquids will be treated through one or more of the following actions (as appropriate):

(1) Treated using Aquaset®, Aquaset II-G®, Petroset II®, Petroset IIG®, Micro-Cel® E, PIG®, SP-400®, or Hg Absorb for mercury to make the waste amenable for offsite shipment [37, 38, 46, 47, 48, 50, 63, 93, 99] and/or

(2) Treated by the supercompaction process to remove the excess liquids; [64] or

(3) Undergo removal of the prohibited item(s). [10, 43, 52, 59, 64, 69, 70, 98]

The supercompacted debris waste is not a liquid or a compressed gas and does not contain compressed gases. The waste does not meet the U.S. Department of Transportation definition of an oxidizer as defined in 49 CFR 173, Shippers–General Requirements for Shipments and Packagings; and the waste is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. Containers with prohibited liquids will not be shipped to WIPP. [4, 9, 26] Based on the above, the supercompacted debris waste is not an ignitable waste. The BN510.4 waste stream does not exhibit the characteristic of ignitability (i.e., RCRA/HWMA D001 HWN). [1]

1.7.2.3 Corrosivity

The supercompacted waste within the BN510.4 waste stream does not meet the definition of corrosivity per 40 CFR 261.22, Characteristic of Corrosivity.

Authorized debris feedstock undergoes supercompaction. The resulting supercompacted debris waste is not a liquid waste and is not a corrosive waste. The current State of Idaho RCRA/HWMA Permit allows the AMWTP to process within the supercompactor pressurized aerosol cans with less than or equal to 49 mL and excess liquids that do not exceed a maximum of 5% of the overall container volume confirmed by RTR. [10, 31, 43, 58, 59, 64, 69, 70, 89, 98]

To render the waste acceptable at WIPP, containers identified as having corrosive waste properties or containing prohibited liquids will be treated through one or more of the following actions (as appropriate):

(1) Treated using Aquaset®, Aquaset II-G®, Petroset II®, Petroset IIG®, Micro-Cel® E, PIG®, SP-400® or Hg Absorb for mercury to make the waste amenable for offsite shipment [37, 38, 46, 47, 48, 50, 63, 93, 99]; and/or

(2) Treated by the supercompaction process to remove the excess liquids; [64] or

(3) Undergo removal of the prohibited item(s). [10, 43, 52, 59, 64, 69, 70, 98]

Containers with WIPP-prohibited liquids will not be shipped. [4, 9, 26] Based on the above, the supercompacted debris waste is not a corrosive waste. The BN510.4 waste stream does not exhibit the characteristic of corrosivity (i.e., RCRA/HWMA D002 HWN). [1]

1.7.2.4 Reactivity

The waste materials in this BN510.4 waste stream do not meet the 40 CFR 261.23, Characteristic of Reactivity, definition of reactivity.

Authorized debris feedstock undergoes supercompaction. The resulting supercompacted debris waste is not a liquid waste and is not a reactive waste. The current State of Idaho RCRA/HWMA Permit allows the AMWTP to process within the supercompactor pressurized aerosol cans with less than or equal to 49 mL and excess liquids that do not exceed a maximum of 5% of the overall container volume confirmed by RTR. [31, 43, 58, 59, 64, 70]

To render the waste acceptable at WIPP, containers identified as having reactive waste properties or containing prohibited liquids will be treated through one or more of the following actions (as appropriate):

(1) Treated using Aquaset®, Aquaset II-G®, Petroset II®, Petroset IIG®, Micro-Cel® E, PIG®, SP-400® or Hg Absorb for mercury to make the waste amenable for offsite shipment [37, 38, 46, 47, 48, 50, 63, 93, 99]; and/or

(2) Treated by the supercompaction process to remove the excess liquids; [64] or

(3) Undergo removal of the prohibited item(s). [10, 43, 52, 59, 64, 69, 70, 98]

Although this waste stream contains wastes that are assigned P-listed HWNs for cyanide and F006, F007, and F009 listed HWNs that are associated with cyanide electroplating operations that may also contain sulfides, there is no evidence that full or partially full containers of cyanide were disposed of in this waste stream. [96] If full or partially full containers of cyanide are identified, they will be segregated and managed separately and will not be shipped. [10, 59, 69, 107] Therefore, concentrations of cyanide in the waste stream are not expected to approach those levels necessary for reactivity.

The waste when exposed to a pH between 2 and 12.5 will not generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment. Containers with WIPP-prohibited liquids will not be shipped. [4, 9, 26]

The BN510.4 waste stream is stable and will not undergo violent chemical change, react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. The waste is not capable of detonation or explosive reaction if subjected to a strong initiating source if heated under confinement. The waste is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure. The materials do not contain explosive material and are not forbidden explosives or Division 1.1, 1.2, or 1.3 (Class A or B) explosives as defined in 49 CFR 173. Although the waste contains wastes that are assigned F006, F007, and F009 listed HWNs that are associated with cyanide electroplating operations, the waste when exposed to a pH between 2 and 12.5 will not generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment. Based on the above, the supercompacted waste is not a reactive waste. The BN510.4 waste stream does not exhibit the characteristic of reactivity (i.e., RCRA/HWMA D003 HWN). [1]

1.7.2.5 BN510.4 RCRA Toxicity, Listed and Toxic Substances Control Act (TSCA) Waste

1.7.2.5.1 Toxicity

The BN510.4 supercompacted debris waste stream contains RCRA toxicity constituents associated with toxicity characteristic metals and organics. [1, 5, 6, 7, 8, 28, 30, 39, 40, 42, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106] Table 3 identifies the HWNs and constituents associated with this waste stream, based on AK documentation. [1, 5, 6, 7, 8, 28, 30, 39, 40, 42, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106]

The RCRA toxicity characteristic metal HWNs: D004 (arsenic), D005 (barium), D006 (cadmium), D007 (chromium), D008 (lead), D009 (mercury), D010 (selenium), and D011 (silver) are associated with AE, AW, BC, BN, ID, LA, MD, RF, and SD feedstock for the

BN510.4 waste stream.[1, 5, 6, 7, 8, 30, 51, 57, 71, 76, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106] The HWNs D004, D005, D006, D007, D008, D009, D010, and D011 are assigned to the BN510.4 waste stream. [1]

The HWN D018 (benzene) is associated with LA feedstock to the BN510.4 waste stream.[79, 84, 92] Because F-listed HWN F005 is assigned to the feedstock for this constituent, the D018 HWN is not assigned to the BN510.4 waste stream, but rather is addressed within the F-listed waste section below. [1]

The HWN D019 (carbon tetrachloride) is associated with AE, AW, and LA feedstock to the BN510.4 waste stream. [51, 57, 79, 84, 86, 92] Because F-listed HWN F001 is assigned to the feedstock for this constituent, the D019 HWN is not assigned to the BN510.4 waste stream, but rather is addressed within the F-listed waste section below. [1]

The HWN D021 (chlorobenzene) is associated with LA feedstock to the BN510.4 waste stream. [79, 84, 92] Because F-listed HWN F002 is assigned to the feedstock for this constituent, the D021 HWN is not assigned to the BN510.4 waste stream, but rather is addressed within the F-listed waste section below. [1]

The HWN D022 (chloroform) is associated with AW, ID, LA, MD, RF, and SD feedstock to the BN510.4 waste stream. [6, 7, 30, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106] The HWN D022 is assigned to the waste stream. [1]

The HWNs D027 (1,4-dichlorobenzene); D030 (2,4–dinitrotoluene); and D037 (pentachlorophenol) are associated with AE, AW, ID, LA, and SD feedstock to the BN510.4 waste stream. [51, 57, 71, 76, 79, 82, 86, 92, 96] The HWNs D027, D030, and D037 are assigned to the waste stream. [1]

The HWNs D028 (1,2-dichloroethane) and D029 (1,1-dichloroethylene) are associated with AE, AW, ID, LA, RF, and SD feedstock to the BN510.4 waste stream. [6, 30, 51, 57, 71, 76, 77, 79, 82, 86, 92, 96, 105, 106] The HWNs D028 and D029 are assigned to the waste stream. [1]

The HWNs D032 (hexachlorobenzene) and D034 (hexachloroethane) are associated with AW, ID, and SD feedstock to the BN510.4 waste stream. [57, 71, 76, 86, 92, 96] The HWNs D032 and D034 are assigned to the waste stream. [1]

The HWN D033 (hexachlorobutadiene) is associated with ID and SD feedstock to the BN510.4 waste stream. [71, 76, 86, 92, 96] The HWN D033 is assigned to the waste stream. [1]

The HWN D035 (methyl ethyl ketone) is associated with LA feedstock to the BN510.4 waste stream.[79, 84, 92] Because F-listed HWN F005 is assigned to the feedstock for this constituent, the D035 HWN is not assigned to the BN510.4 waste stream, but rather is addressed within the F-listed waste section below. [1]

The HWN D038 (pyridine) is associated with LA feedstock to the BN510.4 waste stream.[79, 84, 92] Because F-listed HWN F005 is assigned to the feedstock for this constituent, the

D038 HWN is not assigned to the BN510.4 waste stream, but rather is addressed within the F-listed waste section below. [1]

The HWN D039 (tetrachloroethylene) is associated with AW, LA, MD, SD, and RF feedstock to the BN510.4 waste stream. [6, 7, 30, 57, 71, 76, 79, 84, 86, 87, 92, 105, 106] Because F-listed HWN F001 is assigned to the feedstock for this constituent, the D039 HWN is not assigned to the BN510.4 waste stream, but rather is addressed within the F-listed waste section below. [1]

The HWN D040 (trichloroethylene) is associated with LA feedstock to the BN510.4 waste stream. [79, 84, 92] Because F-listed HWNs F001 and F002 are assigned to the feedstock for this constituent, the D040 HWN is not assigned to the BN510.4 waste stream, but rather is addressed within the F-listed waste section below. [1]

The HWN D043 (vinyl chloride) was associated with AW, ID, LA, and SD feedstock to the BN510.4 waste stream. [57, 71, 76, 79, 82, 86, 92, 96] The HWN D043 is assigned to the waste stream. [1]

1.7.2.5.2 Listed Waste

The BN510.4 supercompacted debris waste stream contains constituents associated with RCRA-listed waste HWNs. [1]

F-Listed HWNs

The BN510.4 debris waste stream is assigned the F-listed HWNs F001, F002, F004, F005, F006, F007, and F009 based on AK documentation. These F-listed HWNs were historically assigned to feedstock to the BN510.4 waste stream. [1, 5, 6, 7, 8, 15, 28, 30, 39, 40, 42, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106]

The HWN F001 (1,1,1- trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1,2,2-tetrachloro-1,2-difluoroethane, carbon tetrachloride, methylene chloride, tetrachloroethylene, trichloroethylene, trichlorofluoroethylene, and trichlorofluoromethane) is associated with previous RL feedstock to the BN510.1 and AW, BC, ID, LA, MD, SD, and RF feedstock to the BN510.4 waste stream. [5, 6, 7, 8, 28, 30, 39, 40, 42, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106] Therefore, the HWN F001 is assigned to the waste stream. [1]

The F002 hazardous waste constituents 1,1,1-trichloroethane; 1,1,2-trichloroethane; 1,1,2-trichloro-1,2,2-trifluoroethane; 1,2-dichlorobenzene; chlorobenzene; methylene chloride; tetrachloroethylene; trichloroethylene, and trichlorofluoromethane are associated with previous RL feedstock to the BN510.1, and AE, AW, BC, ID, LA, MD, RF, and SD feedstock to the BN510.4 waste stream. [5, 6, 7, 8, 28, 30, 39, 40, 42, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106] Therefore, the HWN F002 is assigned to the waste stream. [1]

Non-halogenated F003 solvent constituents (e.g., acetone, cyclohexanone, ethyl acetate, ethyl benzene, ethyl ether, methanol, methyl isobutyl ketone, n-butyl alcohol, and xylene,

including other xylene compounds) are associated with the supercompactor feedstock debris waste. The BN510.4 waste stream does not exhibit the characteristic of ignitability. Therefore, the HWN F003 is not assigned to the supercompacted debris waste stream. [1]

The HWN F004 (cresols, cresylic acid, and nitrobenzene) is associated with RL feedstock to the BN510.1 waste stream and with the AE, AW, ID, LA, and SD feedstock to the BN510.4 waste stream. [5, 28, 39, 40, 51, 57, 71, 76, 77, 79, 82, 86, 87, 92, 96, 105, 106] Therefore, the HWN F004 is assigned to the waste stream. [1]

The HWN F005 (2-ethoxyethanol, 2-nitropropane, benzene, carbon disulfide, isobutanol, MEK, pyridine, and toluene) is associated with AE, AW, BC, ID, LA, MD, RF, and SD feedstock to the BN510.4 waste stream and RL feedstock to the BN510.1 waste stream. [5, 6, 7, 8, 28, 39, 40, 42, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106] Therefore, the HWN F005 is assigned to the waste stream. [1]

The HWNs F006, F007, and F009 are associated with AW, ID, LA, RF, and SD feedstock, and HWNs F007 and F009 were also associated with MD feedstock to the BN510.3 waste stream. [5, 6, 7, 15, 57, 71, 76, 77, 79, 82, 86, 87, 92, 96, 105, 106] Therefore, the HWNs F006, F007, and F009 are assigned to the waste stream. [1]

P-, U-, and K-Listed HWNs

The wastes associated with INL INTEC and RWMC laboratory operations are assigned the following P- and U-listed HWNs: P030 (cyanide), P098 (potassium cyanide), P099 (potassium silver cyanide), P106 (sodium cyanide), U003 (acetonitrile), U103 (dimethyl sulfate), U108 (1, 4-dioxane), U134 (hydrofluoric acid), and U151 (mercury) as a result of conducting analysis on P- and U-listed waste sources or as a result of coming into contact with source samples with the same HWNs. [96] In addition, AMWTP cannot rule out the presence of empty containers previously holding unused product in INL waste, and the potential for trace amounts of unused product that may have been discarded and placed into containers of INL waste. [96] Therefore, the HWNs P030, P098, P099, P106, U003, U103, U108, U134, and U151 are assigned to the waste stream. [1] The P- and U-listed wastes listed above were not disposed of or transferred to AMWTP in liquid form.

Based on a review of AK, it was determined that the BN510.4 waste stream will contain less than one percent beryllium by weight. Beryllium is a contaminant associated with this waste. The source of the beryllium is not associated with a powdered form and is not associated with unused commercial chemical product, an off-specification species, or a container residue, and does not contain a spill residue thereof. [5, 6, 7, 8, 30, 39, 40, 42, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106] The P015 HWN for beryllium powder is not assigned to this waste stream. [1]

The HWN UN134 (hydrofluoric acid) was assigned to wastes associated with INL INTEC and RWMC laboratory operations as a result of coming into contact with source samples with the same HWN. The waste retained U134 when it was shipped to AMWTP. [96] Although hydrofluoric acid was identified as a chemical contaminant associated with the feedstock debris

waste, only spent forms of hydrofluoric acid would have contaminated the feedstock debris waste and the supercompacted debris waste does not contain observable free liquids. [4, 9, 10, 26]

Although this waste stream contains wastes that are assigned P-listed HWNs for cyanide, the waste is not a RCRA reactive waste. [44] There is no evidence that full or partially full containers of cyanide were disposed of in this waste stream. [96] If full or partially full containers of cyanide are identified, they will be segregated and managed separately and will not be part of a WIPP waste stream. [10, 59, 69, 107]

The waste materials within this waste stream are not hazardous waste from specific sources listed in 40 CFR 261.32, Hazardous Wastes from Specific Sources, (i.e., K-listed hazardous waste) and they have not been mixed with; derived from the treatment, storage, or disposal of K-listed wastes; and do not contain spill residues thereof. [5, 6, 7, 8, 28, 30, 39, 40, 42, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106] The waste materials in this waste stream are not assigned K-listed HWNs. [1]

1.7.2.5.3 TSCA Waste

Waste items with PCB concentrations equal to or exceeding 50 parts per million are not expected in the BN510.4 waste stream. Drums of PCB-contaminated Rocky Flats organic sludges are expected in the SD boxed debris waste. [5, 6, 7, 8, 30, 39, 40, 42, 51, 57, 71, 76, 77, 79, 81, 82, 84, 86, 87, 92, 96, 105, 106]

Direct feed containers of supercompactor feedstock debris waste, identified during RTR/VE as containing PCB items/wastes, are not acceptable feedstock debris waste to the Supercompactor. PCB items and drums of PCB wastes identified in boxed debris (e.g., transformers, RF PCB organic sludge) are removed during box line operations. PCB items, PCB sludge and/or soil, and potential PCB cleanup wastes are removed from the box lines and packaged as PCB waste. Potential PCB contamination identified during box line repackaging and/or removal of PCB waste is subject to AMWTP PCB cleanup requirements. [1, 9, 10, 16, 29, 30, 31, 32, 42, 52, 53, 69, 70]

Asbestos has been identified in some of the approved feedstock debris waste. Any containers identified as containing regulated types or quantities (e.g., greater than 1% of friable asbestos) will be labeled, as required, in accordance with TSCA and Occupational Safety and Health Administration regulations.

1.7.2.5.4 Other Applicable Waste Streams

The following HWNs and associated waste streams are pertinent to the supercompactor operations.

The EPA HWNs assigned to the BN510 waste stream included D004 through D011, D022, D028, D029, F001, F002, F005, F006, F007, and F009. [30]

The EPA HWNs assigned to BN510.1 include D004 through D011, D022, D027, D028, D029, D030, D034, D037, D043, F001, F002, F004, F005, F006, F007, and F009.[77, 87, 105]

The EPA HWNs assigned to BN510.2 include D004 through D011, D022, D027, D028, D029, D030, D032, D034, D037, D043, F001, F002, F004, F005, F006, F007, and F009.[76, 106]

The EPA HWNs assigned to BN510.3 include D004 through D011, D022, D027, D028, D029, D030, D032, D033, D034, D037, D043, F001, F002, F004, F005, F006, F007, and F009.[86, 92]

1.8 Radionuclides

The radionuclides of concern for BN510.4 are ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{241}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, and ^{241}Am. The remaining WIPP-tracked radionuclides, ^{137}Cs and ^{90}Sr, are not expected to be present in measurable quantities in feedstock debris waste from RF except for IDC RF-480, due to disposal of isotopic sealed source material. Cesium-137 and computed ^{90}Sr are anticipated radionuclides for IDC RF-480 feedstock and may be detected during non-destructive assay (NDA). Cesium-137 and ^{90}Sr were identified as potentially present in AE, MD, BC, ID, LA, SD, and AW debris waste.[6, 7, 8, 13, 49, 51, 57, 71, 79, 96]

At a minimum, the ratios of the two most prevalent radionuclides in the isotopic mix are compared to confirm existing AK data in compliance with CH-WAC requirements. The two most prevalent radionuclides expected in the waste stream are ^{238}Pu and ^{241}Pu. This is based on a review of product drums included in the BN510.2 and BN510.3 waste streams; however, the prevalent radioisotopes in some containers of the waste may be a combination of ^{238}Pu and a different second TRU or uranium isotope, due to commingling of wastes.[13]

Table 4 identifies the predominant radionuclides and the principle source of those radionuclides for each of the original generators and for the BN510.4 wastes.[6, 7, 8, 13, 49, 51, 57, 71, 79, 96] For waste containers that have multiple generators and therefore a mixture of weapons grade plutonium (WG Pu), enriched uranium (EU), depleted uranium (DU), heat source isotopes, and fuel grade plutonium, a combination of any two of the common isotopes identified may be detected as the most prevalent. Although the waste stream contains depleted uranium in the feedstock material, the weight of uranium within the overall feedstock material will be less than 1% by weight.[59, 91] Radioassay data are reviewed and assessed by AMWTP NDA personnel as described in the RPT-TRUW-03, Drum Assay Technical Review Report.[14]

The radioisotopic content for each AMWTP supercompacted debris waste 100-gallon product drum will be calculated based on the aggregate of the NDA results for each of the compacted feedstock debris waste drums contained therein. The POS is used to ensure that each 100-gallon product drum does not exceed WAC weight or dose limits and complies with the required TRU activity (greater than 100 nCi/g).[9, 33] The direct feed 55-gallon drums will contain at least one TRU radionuclide greater than the LLD.[59] The 100-gallon product drums that contain puck(s) with TRU radionuclides at less than LLD from the box line feed, as

determined by 55-gallon drum assay, are assayed using the Super HENC (high energy neutron counter) for final TRU determination.[9, 59, 90]

Table 4. Predominant radionuclides expected in debris wastes by generator site.[5, 6, 7, 8, 13, 49, 51, 57, 71, 79, 96]

Generator Site	Principal Plutonium Source	Predominant Radionuclides by Activity
RF	WG	^{239}Pu, ^{240}Pu
RF	WG, DU, EU	^{239}Pu (^{235}U or ^{238}U)
MD	WG	^{239}Pu, ^{240}Pu
MD	Heat source	^{238}Pu, ^{239}Pu
BC	WG	^{239}Pu, ^{240}Pu
AE	Combination WG Pu, fuels-grade Pu	^{241}Pu, ^{239}Pu
AW	Combination WG Pu, fuels-grade Pu	^{241}Am, ^{241}Pu
SD	Combination WG Pu, heat source Pu, uranium, thorium, fuels-grade Pu, DU, EU	^{241}Am, ^{241}Pu
LA	Combination WG Pu, heat source Pu, fuels-grade Pu, reactor-grade Pu, enriched ^{242}Pu	^{241}Pu, ^{238}Pu
ID	Combination WG Pu, fuels-grade Pu	^{241}Am, ^{241}Pu
BN	WG (RF waste)	^{239}Pu, ^{240}Pu
BN	Combination WG Pu, heat source Pu	^{238}Pu, ^{239}Pu
BN	Combination WG Pu, heat source Pu, uranium, thorium, fuels-grade Pu	^{238}Pu (^{240} Pu, ^{241}Pu, ^{239}Pu, ^{241}Am, ^{235}U or ^{238}U)

2.0 SHIPPING CONSIDERATIONS

2.1 Waste Packaging

2.1.1 Direct-Load of 100-gallon Supercompacted Debris Waste Containers Into TRUPACTs

The BN510.4 waste stream consists of supercompacted drums of debris waste (pucks) placed directly into 100-gallon product drums. There is no inner packaging or layers of confinement associated with the 100-gallon product drums. There is a filtered lid on the 100-gallon drums. If 100-gallon drums become damaged, they are packaged into SWBs for shipment to WIPP. [9, 17, 69]

2.2 Flammability Consideration

The payload containers in the BN510.4 waste stream must comply with the Contact-Handled Transuranic Waste Authorized Methods for Payload Control (CH-TRAMPAC) requirements. As specified in the CH-TRAMPAC, a determination of compliance with the flammable gas limits will be performed for volatile organic compounds (VOCs), hydrogen, and methane. Headspace gas (HSG) sampling and analysis is performed when required by the WIPP-Waste Acceptance Plan and/or CH-TRAMPAC. At a minimum, the HSG analytical results are evaluated to determine the total concentration of flammable VOCs present in the waste. Payload containers, including those with HSG results exceeding 500 parts per million flammable VOCs, are evaluated for compliance with applicable CH-TRAMPAC requirements prior to shipment. Payloads containing flammable VOCs are managed in accordance with CCP-PO-003, CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC).[25]

3.0 REFERENCES

NOTE: *Advanced Mixed Waste Treatment Project documents such as procedures, AK reports, and operating instructions, may be cited without revision numbers or dates. The most recent revisions of these documents are available through the AMWTP Electronic Document Management System (EDMS). Previous revisions are available on EDMS.*

1. RPT-TRUW-12, AMWTP Waste Stream Designations, AMWTP, current revision. [P393A]

2. DOE/WIPP 01-3194, CH-TRU Waste Content Codes (CH-TRUCON), Department of Energy, current revision. [P012A]

3. DOE/LLW-217, DOE Waste Treatability Group Guidance, Department of Energy, January 1995. [P670A]

4. MP-TRUW-8.1, Certification Plan for INL Transuranic Waste, AMWTP, current revision. [P396A]

5. RPT-TRUW-06, Acceptable Knowledge Document for AMWTP Waste, AMWTP, current revision. [P400A]

6. RPT-TRUW-56, Acceptable Knowledge Document for INL Stored Transuranic Waste – Rocky Flats Plant, AMWTP, current revision. [P649A]

7. RPT-TRUW-13, Acceptable Knowledge Document for INL Stored Transuranic Waste – Mound Plant Waste, AMWTP, current revision. [P418A]

8. RPT-TRUW-04, Acceptable Knowledge Document for the Battelle Columbus Laboratories Building JN-4 Plutonium Laboratory, AMWTP, current revision. [P417A]

9. INST-FOI-20, Supercompactor and Post-Compaction Operations, AMWTP, current revision. [P414A]

10. INST-FOI-17, Facility Visual Examination Operations, AMWTP, current revision. [P433A]

11. DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, Department of Energy, current revision. [P2003A]

12. MP-TRUW-8.13, Collection, Review, and Management of Acceptable Knowledge Documentation, AMWTP, current revision. [P2004S]

13. RPT-TRUW-07, Determination of Radioisotopic Content in TRU Waste Based on Acceptable Knowledge, AMWTP, current revision. [P398A]

14. RPT-TRUW-03, Drum Assay Technical Review Report, AMWTP, current revision. [P856A]

15. Rocky Flats Environmental Technology Site Backlog Waste Reassessment Baseline Book, RFETS, May 5, 1994-March 5, 2001. [P052A]

16. Summary of PCB AK Sources, Wastren, Inc., September 5, 2001. [C207A]

17. INST-OI-24, Packaging Radioactive Waste, AMWTP, current revision. [P388A]

18. Correspondence from DOE Carlsbad Area Office to J.M. Roberson, RFFO, and J.M. Wilcynski, INEEL, Identification of Defense Waste Streams Generated at Rocky Flats Environmental Technology Site (RFETS), May 20, 1997. [C191A]

19. Operable Unit 9 Site Scoping Report: Volume 7, Mound – Waste Management, February 1993. [P380A]

20. Interview of J.B. Williamson, BCL, regarding Historical Operations Conducted in JN-4, WASTREN, Inc, September 2000. [C258A]

21. Interview of David Freas, BCL, regarding Historical Operations in Building JN-4, WASTREN, Inc, September 2000. [C259A]

22. Interview of William Pardue, BCL, regarding Historical Operations in Building JN-4, WASTREN, Inc, October 2000. [C260A]

23. Department of Energy, Interim Guidance on Ensuring that Waste Qualifies for Disposal at the Waste Isolation Pilot Plant, Department of Energy, 1997. [P203A]

24. Correspondence from Frank Marcinowski to EM-13 (Stan Wolf, 301-903-7962), Process for TRU Waste Defense Determination, Department of Energy, February 2005. [C329A]

25. CCP-PO-003, CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC), Central Characterization Project, current revision. [P672A]

26. MP-TRUW-8.2, Quality Assurance Project Plan, AMWTP, current revision. [P1118A]

27. DOE/TRU-13-3425, Annual Transuranic Waste Inventory Report, Los Alamos National Laboratory, October 12, 2013. [P2023A]

28. RPT-TRUW-82, Acceptable Knowledge Document for Hanford Debris Waste Shipped to AMWTP, October 19, 2011. [P857A]

29. INST-FOI-23, Special Case Waste Operations, AMWTP, current revision. [P403A]

30. RPT-TRUW-30, Acceptable Knowledge Summary for Supercompacted Debris Waste (BN510), AMWTP, July 02, 2012. [P439A]

31. INST-OI-12, Real-Time Radiography Examinations (Certification Scans), AMWTP, current revision. [P407A]

32. INST-OI-34, Non-Facility Visual Examination Operations, AMWTP, current revision. [P387A]

33. INST-FOI-01, In-Plant Drum Assay Operations, AMWTP, current revision. [P843A]

34. INST-OI-14, Drum Assay Operations, AMWTP, current revision. [P1131S]

35. RPT-TRUW-05, Waste Matrix Code Reference Manual, AMWTP, current revision. [P399A]

36. Correspondence from the EPA to Donald C. Cadbury, National TRU Program CBFO, EPA, June 10, 2010. [C869S]

37. Material Safety Data Sheet, Micro-Cel®E, Celite Corporation, January 17, 2007. [P808S]

38. Material Safety Data Sheets, Aquaset® (sodium montmorillonite) and Aquaset II-G® (sepiolite), Fluid Tech, January 1, 2005, and November 11, 2008. [P881S]

39. CCP-PK-RL-101, Central Characterization Project Process Knowledge Summary Report for Hanford Plutonium Finishing Plant Contact-Handled Transuranic Debris Waste, 85-Gallon Overpacked Drums, Waste Stream MPFPDD, Rev. 2, Central Characterization Project, June 4, 2010. [P853A]

40. CCP-PK-RL-102, Central Characterization Project Process Knowledge Summary Report for the Hanford 325 Building Radiochemical Processing Laboratory Contact-Handled Transuranic Debris Waste, 85-Gallon Overpacked Drums, Waste Stream RLM325D.001, Rev. 2, Central Characterization Project, June 4, 2010. [P854A]

41. DOE M 435.1, DOE Radioactive Waste Management Manual, Department of Energy, July 09, 1999. [P1183A]

42. CCP-PK-RL-103, Central Characterization Project Process Knowledge Summary Report for Hanford 231-Z building Contact Handled Transuranic Debris Waste, 85-Gallon Overpacked Drums, Waste Stream RLM231ZD.001, Rev. 2, Central Characterization Project, June 4, 2010. [P855A]

43. ID489008952, AMWTP HWMA/RCRA Permit and interim status documents, State of Idaho, current revision.

44. Resource Conservation and Recovery Act, 40 CFR Parts 260 through 280, EPA, current revision.

45. Nuclear Waste Policy Act of 1982, U.S. Congress, 1982. [P757A]

46. Material Safety Data Sheets for Universal PIG® Absorbents (MSD-014) New Pig Corp., October 10, 2011. [P1376S]

47. Material Safety Data Sheets for Oil-Only PIG® Absorbents (MSD-016) New Pig Corp., August 3, 2011. [P1377S]

48. Material Safety Data Sheets for BLUE PIG® Sock Absorbents (MSD-029) New Pig Corp., February 9, 2011. [P1378S]

49. Box 10130773 and NCR# 72914, AMWTP, October 3, 2012. [C1066S]

50. Material Safety Data Sheets for Water Works SP-400 Absorbent (MSDS-1252), Water Works America Inc., August 23, 2012. [P1432S]

51. RPT-TRUW-89, Acceptable Knowledge Document for Argonne National Laboratory-East Waste, AMWTP, current revision. [P1825A]

52. RPT-ESH-079, Advanced Mixed Waste Treatment Facility Box Line PCB Management Plan, AMWTP, current revision. [P1827A]

53. INST-FOI-28, Cleaning and Packaging of Dust/Debris/Material from 1st Floor Cells in WMF-676, AMWTP, current revision. [P2043S]

54. INST-FOI-37, Box Line Quarterly Cleanout, AMWTP, current revision. [P2044S]

55. INST-OI-09, Retrieval Inspection Station Operations, AMWTP, current revision. [P1094S]

56. MP-TRUW-8.45, Virtual Overpack Process and Planning, AMWTP, current revision. [P2045S]

57. RPT-TRUW-79, Acceptable Knowledge Document for Materials and Fuels Complex Waste, AMWTP, current revision. [P890A]

58. EDF-0783, Deflagration Analysis of Aerosol Can Propellant in the Supercompactor Glovebox, AMWTP, November 14, 2012. [P1829A]

59. INST-TRUW-8.13.1, TRU Programs Site Project Office Process, AMWTP, current revision. [P2046S]

60. TV-003-13, Advanced Mixed Waste Treatment Project Defense Determination Evaluation for Argonne National Laboratory-East Debris Wastes Proposed for Inclusion into the Supercompactor Feedstock (i.e., BN-508) – AMWTP, February 06, 2013. [C1277A]

61. TV-002-13, Revised Advanced Mixed Waste Treatment Project Defense Determination Evaluation for Materials and Fuels Complex Debris Wastes Proposed for Inclusion into the Supercompactor Feedstock (i.e., BN-508) – AMWTP, January 30, 2013. [C1276A]

62. Public Law 102-579, WIPP Land Withdrawal Act, U.S. Congress, October 1992. [P1674A]

63. Material Safety Data Sheet for Hg Absorb® (MSDS-560) Lab Safety Supply, Inc., May 19, 2001. [P1398S]

64. RPT-82, Supercompactor Liquid Treatment Capabilities, Evaluation and Conclusion, current revision, AMWTP October 19, 2011. [P859S]

65. EPA Docket No. A-98-49: II-A4-169, Waste Characterization Tier 1 Change Report, Addition of Contact-Handled Transuranic Waste to The Advanced Mixed Waste Treatment Project Approved Program: S3000 and S5000 Waste from Argonne National Laboratory-East and S5000 Waste from Idaho National Laboratory Materials and Fuels Complex, U.S. EPA, January 20, 2013. [C1284A]

66. INST-OI-15, Box Assay Operations, AMWTP, current revision. [P1857S]

67. INST FOI 32, Size Reduction of Large Items, AMWTP, current revision. [P1099S]

68. INST-OI-65, Standard Waste Box Direct Loading, current revision. [P1850S]

69. INST-FOI-16, Box line Operations, AMWTP, current revision. [P415A]

70. LST-EC&P-11, AMWTP HWMA/RCRA Permit WMF-676 Waste Management Criteria, AMWTP, current revision. [P2047S]

71. RPT-TRUW-91, Acceptable Knowledge Document for Pre-1980 INL-Exhumed SDA Waste, AMWTP, current revision. [P1826A]

72. EPA Docket No. A-98-49; II-A4-174, Waste characterization Tier 1 Change Report: Addition of Contact-Handled Transuranic Waste to the Advanced Mixed Waste Treatment Project Approved Program: Pre-1980 INL-Exhumed Subsurface Disposal Area Summary Category Group S3000 and S5000 Waste, United States Environmental Protection Agency, May 01, 2013. [C1306A]

73. EPA Tier approval letter for RPT-TRUW-91 SDA, United States Environmental Protection Agency, July 9, 2013. [C1307A]

74. INST-FOI-21, Drummed Waste Handling Operations, AMWTP, current revision. [P405A]

75. Defense/Non-Defense and Waste Isolation Pilot Plant Land Withdrawal Act Evaluation for Pre-1980 Idaho National Land Exhumed Subsurface Disposal Area Wastes, AMWTP, July 13, 2013. [C1310A]

76. RPT-TRUW-83, Acceptable Knowledge Summary for Supercompacted Debris Waste, Rev. 6, AMWTP, September 9, 2013. [P1996A]

77. RPT-TRUW-83, Acceptable Knowledge Summary for Supercompacted Debris Waste (BN510.1), Rev. 0, AMWTP, September 10, 2010. [P2010A]

78. CCP-AK-INL-001, Central Characterization Program, Acceptable Knowledge Summary Report for Waste Retrieved from Designated Areas Within the Subsurface Disposal Area at the Idaho National Laboratory Central Characterization Program, December 02, 2011. [P647A]

79. RPT-TRUW-93, Acceptable Knowledge Documents for Los Alamos National Laboratory Debris, AMWTP, current revision. [P1851A]

80. TV-010-13, Memo to file, Defense/non-defense and WIPP Land Withdrawal Act Evaluation for Los Alamos National Laboratory (LANL) debris wastes, AMWTP, October 16, 2013.[C1313A]

81. Form-1900, AMWTP Offsite Waste Stream Profile Form for LANL LA-MHD04.001, AMWTP, September 12, 2013. [P1999A]

82. Form-1900, AMWTP Offsite Waste Stream Profile Form for LANL LA-MHD09.001, AMWTP, September 12, 2013. [P2001A]

83. Discrepancy resolution for EDF-0783 and EDF-0768, AMWTP, February 28, 2013. [D109A]

84. Form-1900, AMWTP Offsite Waste Stream Profile Form for LANL LA-MHD01.001, AMWTP, September 12, 2013. [P1998A]

85. EPA Tier 1 approval letter for LANL debris waste as supercompactor feedstock, EPA, September 16, 2013. [C1327A]

86. RPT-TRUW-83, Acceptable Knowledge Summary for Supercompacted Debris Waste, Rev. 7, AMWTP, December 3, 2013. [P2008A]

87. RPT-TRUW-83, Acceptable Knowledge Summary for Supercompacted Debris Waste (BN510.1), Rev. 0, AMWTP, September 10, 2010, and Rev. 3, AMWTP, February 7, 2013.[P2010A]

88. TV-012-13, Waste material parameter evaluation for inclusion of LANL debris into the BN510.3 Supercompacted Debris Waste Stream, AMWTP, December 2, 2013. [C1334A]

89. INST-OI-60, Real-Time Radiography Examinations (Non-Certified Scan), AMWTP, current revision. [P2049S]

90. CCP-TP-146, CCP Super HENC Operating Procedure, Central Characterization Program, current revision. [P2053A]

91. MP-PRPL-22.1, Production Planning, AMWTP, current revision. [P2054S]

92. RPT-TRUW-83, Acceptable Knowledge Summary for Supercompacted Debris Waste, Rev. 8, AMWTP, February 10, 2014. [P2002A]

93. Material Safety Data Sheets, PIG® Acid Encapsulating/Neutralizing, Absorbents, February 5, 2007; and PIG® Packing Material, Absorbents, February 1, 2007. [P866S]

94. Material Safety Data Sheets, Petroleum Ether, Mallinckrodt, April 06, 1989. [P2061S]

95. DOE/ID-10832, Waste-Incidental-to-Reprocessing (WIR) Citation Determination Report for Contaminated Job Waste at the Idaho Nuclear Technology and Engineering Center (INTEC), Department of Energy, October 01, 2001. [P1882A]

96. RPT-TRUW-92, Acceptable Knowledge Document for Idaho National Laboratory, AMWTP, current revision. [P1970A]

97. Docket No. A-98-49; II-A4-178, Waste characterization Tier 1 Change Report: Addition of Contact-Handled Transuranic Waste to the Advanced Mixed Waste Treatment Project Approved Program: Los Alamos National Laboratory Debris Waste, United States Environmental Protection Agency, September 1, 2013. [C1326A]

98. Tailgate (tail gate) training for FOI-16 on treating liquids in box lines, 02/05/14 [C1347A]

99. RPT-NFCS-09, Criticality Safety Analysis Involving the Use of Liquid Sorbents and Immobilizing Agents, current revision

100. RCM-004-14, Waste Volume Estimates for BN510.4 Supercompacted Debris Waste Stream, May 21, 2014. [C1355S]

101. RCM-003-14, Advanced Mixed Waste Treatment Project Defense Determination Evaluation for Idaho National Laboratory Debris Wastes Proposed for Inclusion into the Supercompactor Feedstock (BN-508), May 15, 2014 [C1353S]

102. MP-TRUW-8.40, INL Waste Acceptance and Transfers, current revision.

103. Docket No. A-98-49; II-A4-180, Waste characterization Tier 1 Change Report: Addition of Contact-Handled Transuranic Waste to the Advanced Mixed Waste Treatment Project Approved Program: S3000 and S5000 Waste from Idaho National Laboratory, United States Environmental Protection Agency, February 11, 2014. [P2064S]

104. EPA Tier 1 approval letter for disposal of INL debris and homogeneous solids at WIPP, United States Environmental Protection Agency, February 11, 2014. [C1350S]

105. BN510.1 Supercompacted Debris Waste Stream Profile Package, [P1030A]

106. RPT-TRUW-83, Acceptable Knowledge Summary for Supercompactor Debris Waste (BN510.2) WSPF package, [P1995A]

107. MP-TRUW-8.8, Level I Data Validation, current revision.

Appendix A – Approved Feedstock Debris Waste by Original Generator and IDC

The following table lists the approved feedstock debris waste by original generator and IDC.[30, 76, 77, 86, 87, 92, 105, 106]

Table A-1. WIPP-Approved TRU Feedstock Debris Waste by Original Generator and IDC.

Waste Type	Site	IDC	Description
Combustibles	ID	337	Plastic, Teflon, Wash, PVC, Ret. RF TRU
	RF	010	Paper and Rags
	RF	020	Wood and Benelex
	RF	030	Plastic
	RF	040	Rubber
	RF	33A	WIPP Experimental Test Program (WETP) Bin Program-Combustibles A (IDCs 335, 336, 337, and 339)
	RF	33B	WETP Bin Program – Combustibles B (IDCs 330, 337, and 339)
	RF	302	Benelex® and Plexiglas®
	RF	330	Paper and Rags-Dry
	RF	336	Paper and Rags-Moist
	RF	337	Plastic, Teflon®, Washables, PVC
	RF	339	Leaded Rubber Gloves and Aprons
	RF	430	Unleached Ion Column Resin
	RF	431	Leached Resin
	RF	460	Washables, Rubber, Plastic
	RF	463	Leaded Rubber Gloves and Aprons
	RF	464	Benelex® and Plexiglas®
	RF	833	Plastics, TRU Mixed
	RF	831	Dry Combustibles
	RF	832	Wet Combustibles
	RF	900	Low Specific Activity (LSA) Paper, Plastics, etc.
	RF	970	Wood
Filters	RF	328	Ful-Flo® Incinerator Filters
	RF	335	Absolute 8 × 8 Filters
	RF	338	Insulation and Chemical Warfare Service (CWS) Filter Media
	RF	360	Insulation
	RF	376	Cemented Insulation and Filter Media
	RF	490	High-Efficiency Particulate Air Filters and CWS Filters
	RF	491	Plenum Prefilters

Waste Type	Site	IDC	Description
Graphite	RF	070	Graphite
	RF	300	Graphite Molds
	RF	301	Graphite Cores
	RF	303	Scarfed Graphite Chunks
	RF	310	Graphite Scarfings
	RF	312	Coarse Graphite
Heterogeneous	AE	100	General Plant Waste
	AE	101	Cut up Gloveboxes
	AE	104	Alpha Hot Cell Waste
	AE	106	Special Source Material
	AE	110	Research Generated Waste
	AE	120	D and D Waste Compactable and Combustible Solids
	AW	150	Laboratory Waste
	AW	160	AL/CL Debris Waste
	AW	161	ACL Glassware, Paper, Poly, and Misc.
	AW	162	ANL-W FMF EFL Zr-U-Pu Fuel Cast
	AW	163	ANL-W ACL Cold-Line Ab. Liq. and Debris
	AW	164	ANL-W HRA/WCA Debris
	AW	165	Ash Stabilization and GGE Debris
	AW	167	MFC CH-TRU Heterogeneous Debris
	BC	201	Noncombustible Solids
	BC	202	Combustible Solids-Paper/Cloth
	BN	508	AMWTP Newly Generated Debris
	BN	510	Supercompacted Debris
	BN	524	Pad 1 Cells 1 and 2 Non-PCB Debris
	BN	550	Supercompacted Debris
	BN	770	Debris from RPT-TRUW-83 Generators
	IC[h]	150	Laboratory Waste
	ID	150	Laboratory Waste
	IF	150	Laboratory Waste
	ID	153	Combustible Laboratory Waste
	ID	155	TRU Scrap
	IW	155	TRU Scrap

[h] INL waste may have been accepted at the AMWTP under a general INL IDC (ID) or under a facility-specific IDC (IA, IC, IF, IR, IW, or IT). The waste form identified by the numeric suffix is identical. (96)

Waste Type	Site	IDC	Description
Heterogeneous (continued)	IC	156	Chem Cell Rip-out
	IA	157	Miscellaneous Radionuclide Sources
	IC	157	Miscellaneous Radionuclide Sources
	ID	157	Miscellaneous Radionuclide Sources
	IF	157	Miscellaneous Radionuclide Sources
	IR	157	Miscellaneous Radionuclide Sources
	IT	157	Miscellaneous Radionuclide Sources
	IW	157	Miscellaneous Radionuclide Sources
	IC	527	Laboratory Non-PCB Debris Waste
	IW	527	Laboratory Non-PCB Debris Waste
	IC	601	Alpha Low Level Lab. WIPP Analytical Waste
	LA	007	Mixed Heterogeneous Debris from TA-55
	LA	009	Heterogeneous Debris from the TA-21 DP West Facility
	LA	010	Heterogeneous Debris Waste from TA-50
	MD	801	Rags, Paper, Wood, etc.
	MD	802	Dry Box Gloves and O-Rings
	MD	803	Metal, Equipment, Pipe, Valves, etc.
	MD	804	Plastic, Tygon®, Mani-Boots, etc.
	MD	805	Asbestos Filters
	MD	810	Glass, Flasks, Sample Vials, etc.
	MD	813	Glass Filters and Fiberglass
	MD	814	Graphite Waste
	MD	824	Equipment Boxes, Noncombustible
	MD	825	Equipment Drums, Noncombustible
	MD	826	Equipment Boxes, Combustible
	MD	827	Equipment Drums, Combustible
	MD	838	<10 nCi/g Non-combustible
	MD	847	LSA <100 nCi/g Combustible
	MD	848	LSA <100 nCi/g Noncombustible
	RF	241	Americium Process Residue
	RF	372	Grit
	RF	374	Blacktop, Concrete, Dirt, and Sand
	RF	750	Pits 11 and 12 Debris
	RF	760	Pad 1 Cells 1 and 2 RF Debris
	RF	950	LSA Metal, Glass, etc.
	RF	960	Concrete, Asphalt, etc.
	SD	177	Pre-1980 INL-Exhumed SDA Heterogeneous Debris

Waste Type	Site	IDC	Description
Inorganic Non-Metal	RF	060	Glass
	RF	440	Glass
	RF	441	Raschig Rings, Unleached
	RF	442	Raschig Rings, Leached
	RF	44A	WETP Bin Program – Glass (IDCs 440 and 442)
	RF	368	Magnesium Oxide Crucibles
	RF	370	LECO Crucibles
	RF	371	Fire Brick
	RF	377	Coarse Fire Brick
	RF	391	Crucibles and Sand
	RF	392	Sand, Slag, and Crucible
Lead/Cadmium Metal	RF	488	Glovebox Parts w/Lead
	ID	021	Radioactive Mixed Lead Waste
Uncategorized Metal	ID	154	Sample Fuel
	IR	154	Sample Fuel
	ID	175	DRCT Scrap Metal Waste from TAN
	RF	050	Metal Scrap
	RF	48A	WETP Bin Program – Metals (IDCs 480 and 481)
	RF	320	Heavy Non-special Source Metal
	RF	321	Lead
	RF	416	Zinc Magnesium Alloy Metals
	RF	480	Scrap Metal (Non SS)
	RF	481	Leached Metals (Non SS)