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

FEB 0 2 2005

ENTERED

RECEIVED
FEB 2005
NMED Hazardous
Waste Bureau

Mr. Steve Zappe, WIPP Project Leader
Hazardous Waste Permits Program
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2905 E. Rodeo Park Drive, Bldg. 1
Santa Fe, NM 87505

Subject: Transmittal of Approved RFETS WSPF Number RF119.01, TRM Incinerator Sludge

Dear Mr. Zappe:

The Carlsbad Field Office (CBFO) has approved Rocky Flats Environmental Technology Site (RFETS), Waste Stream Profile Form RF119.01. Enclosed is a copy of the approved form as required by Section B-4(b)(1) of the WIPP Hazardous Waste Facility Permit No. NM4890139088-TSDF.

If you have any questions on this matter, please contact me at (505) 234-7357 or (505) 706-0066.

Sincerely,

Kerry W. Watson, Director
Office of Characterization and Transportation

Enclosure

cc: w/o enclosure

J. Kieling, NMED	*ED
C. Walker, TechLaw	ED
M. Strum, WTS	ED
R. Chavez, WRES	ED
L. Greene, WRES	ED
K. Zbryk, WRES	ED
W. Ledford, CTAC	ED
WIPP Operating Record	
CBFO M&RC	

050203

*ED denotes Electronic Distribution
CBFO:OCT:KWW:GS:05-0186:UFC 5822.00

WIPP WASTE STREAM PROFILE FORM

Waste Stream Profile Number: RF119.01
Generator site name: RFETS Technical contact: Eric D'Amico
Generator site EPA ID: CO7890010526 Phone number: (303) 966-5362
Date of audit report approval by NMED: March 9, 2000 as amended February 6, 2001; May 24, 2001; June 5, 2001; April 5, 2002; April 8, 2002; August 20, 2002; August 29, 2002; December 20, 2002; April 8, 2003; September 19, 2003; December 30, 2003; July 14, 2004 and September 14, 2004
Title, version number, and date of documents used for WAP certification: Rocky Flats Environmental Technology Site TRU Waste Characterization Program Quality Assurance Project Plan, 95-QAPjP-0050, Version 10, August 2004. Transuranic (TRU) Waste Management Manual, 1-MAN-008-WM-001, Version 8, November 2004. Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, Revision 2.0, November 2004.
Did your facility generate this waste? ☑ Yes ☐ No If no, provide the name and EPA ID of the original generator:

Waste Stream Information[1]

WIPP ID: RF-MR0292
Summary Category Group: S3000[2] Waste Matrix Code Group: Solidified Inorganics[2]
Waste Stream Name: TRM Incinerator Sludge (D004, D005, D006, D007, D008, D009, D010, D011, D009, F001, F002, F005)[2]
Description from the WTWBIR: This waste form is sludge. Some of it has had cement added to it to try to solidify it.[2]
Defense TRU Waste: ☑ Yes ☐ No
Check one: ☑ CH ☐ RH Number of SWBs N/A Number of Drums .116 Number of Canisters N/A
Batch Data Report numbers supporting this waste stream characterization: See Table 7.
List applicable EPA Hazardous Waste Codes[3]: D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F005
Applicable TRUCON Content Codes: RF111A/RF211A, RF111B/RF211B, RF111D/RF211D, RF111DF/RF211DF, RF111E/RF211E, RF111H/RF211H, RF111J/RF211J, RF111K/RF211K, RF111M/RF211M, RF111P/RF211P, RF111PF/RF211PF, RF127L/RF227L

Acceptable Knowledge Information[1]

Required Program Information
- Map of site: Reference List, No. 3
- Facility mission description: Reference List, No. 3
- Description of operations that generate waste: Reference List, Nos. 1, 2, 3, 6
- Waste identification/categorization schemes: Reference List, Nos. 13, 14
- Types and quantities of waste generated: Reference List, Nos. 1, 2, 3, 6
- Correlation of waste streams generated from the same building and process, as appropriate: Reference List, Nos. 1, 2, 6
- Waste certification procedures: Reference List, No. 5

Required Waste Stream Information
- Area(s) and building(s) from which the waste stream was generated: Reference List, Nos. 1, 2, 6
- Waste stream volume and time period of generation: Reference List, Nos. 4, 6
- Waste generating process description for each building: Reference List, Nos. 1, 2, 6
- Process flow diagrams: Reference List, Nos. 1, 2.
- Material inputs or other information identifying chemical/radionuclide content and physical waste form: Reference List, Nos. 1, 2, 3, 6
- Which Defense Activity generated the waste: (Check one) Reference List, No. 3

☑ Weapons activities including defense inertial confinement fusion
☐ 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

Supplemental Documentation:

- Process design documents: Note 4
- Standard operating procedures: Note 4
- Safety Analysis Reports: Note 4
- Waste packaging logs: Note 4
- Test plans/research project reports: Note 4
- Site data bases: Note 4
- Information from site personnel: Note 4
- Standard industry documents: Note 4
- Previous analytical data: Note 4
- Material safety data sheets: Note 4
- Sampling and analysis data from comparable/surrogate Waste: Note 4
- Laboratory notebooks: Note 4

Sampling and Analysis Information(1)

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

☑ Radiography: Reference List, Nos. 21, 22, 23
☑ Visual Examination: Reference List, Nos. 17, 24, 25, 26
☑ Headspace Gas Analysis
VOCs: Reference List, No. 7, 19, 20
Flammable: Reference List, No. 7, 19, 20
Other gases (specify): N/A
☑ Homogeneous Solids/Soils/Gravel Sample Analysis
Total metals: Reference List, Nos. 10, 11, 12, 31, 32
PCBs: N/A
VOCs: Reference List, No. 8, 28
Nonhalogenated VOCs: Reference List, No. 8, 30
Semi-VOCs: Reference List, No. 9, 29
Other (specify): N/A

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	G. A. O'Leary, Manager TRU Programs Printed Name and Title	Date 1/25/05
Signature of Site QA Officer	C. L. Ferrera, TWCP Site QAO Printed Name and Title	Date 1/25/05

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

(2) The Waste Stream Name "Particulate Sludge/TRM" in the WTWBIR has been changed to TRM Incinerator Sludge (D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F005). The description in the WTWBIR requires clarification; the waste stream is not a semi-fluid material and cement or nonhazardous absorbent was added during generation or repackaging to solidify any liquid waste. The Hazardous Waste Numbers in the WTWBIR are incorrect. The Waste Stream Name, Description, Summary Category Group, and EPA Hazardous Waste Numbers are based on acceptable knowledge (see attached Acceptable Knowledge Summary).

(3) EPA Hazardous Waste Codes were determined using acceptable knowledge and confirmed using solids and headspace gas sampling and analysis (see attached Characterization Information Summary documenting this determination).

(4) See the References section in the Acceptable Knowledge Summary (attached) for additional backup documentation associated with this waste stream.

REFERENCE LIST

1. Backlog Waste Reassessment Baseline Book, Waste Form 1, Incinerator Ash, Heel, Soot, Sludge, and Fire Brick, October 2004.
2. Waste Stream and Residue Identification and Characterization (WSRIC), Version 7, December 2004, and archived versions.
3. RFETS TRU Waste Acceptable Knowledge Supplemental Information, RF/RMRS-97-018, Revision 14, October 2004.
4. Waste and Environmental Management System (WEMS) database.
5. Transuranic (TRU) Waste Certification, PRO-X05-WC-4018, Version 9, November 2004.
6. Acceptable Knowledge TRU/TRM Waste Stream Summaries, RMRS-WIPP-98-100, Section 7.37, Revision 0, December 2004.
7. GC/MS Determination of Volatile Organics Waste Characterization, L-4111-X, January 2002.
8. GC/MS Determination of Volatile Organic Compounds (Solids, Liquids, and TCLP Extracts), L-4165- M, March 2003.
9. GC/MS Determination of Total SVOCs for WIPP, L-4215-F, March 2003.
10. Waste Analysis by Atomic Absorption Spectroscopy, L-4151-L, October 2003.
11. Mercury Analysis in Waste (Cold-Vapor Technique), L-4152- L, October 2003.
12. Trace Metals by ICP Spectrometry (Solids, Liquids, and TCLP Extracts), L-4153-J, October 2003.
13. Waste Characterization, Generation, and Packaging, 1-PRO-079-WGI-001, Revision 4, May 2002.
14. Waste Characterization Program Manual, 1-MAN-036-EWQA-Section 1.6.1, Revision 3, May 2002.
15. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Headspace Gas Analysis Data Evaluation Report For Waste Stream Profile 119.01 Lot 1, TRG-413-04, December 2004.
16. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Evaluation Report For Transuranic Mixed (TRM) Incinerator Sludge [D004-D011, F001, F002, F005], Sampling Lot 1 (Waste Stream Profile 119.01) - TRG-307-04, September 2004.
17. TRU/TRM Waste Visual Verification (V^2) and Data Review, PRO-1031-WIPP-1112, Version 3, March 2004.
18. Interoffice Memorandum from Vivian S. Sendelweck to Eric D'Amico, Tentatively Identified Compounds in TRM Incinerator Sludge (D004-D011, F001, F002, F005) Waste Solid Sampling Lot 1, VSS-0362004, September 2004.
19. Headspace Gas Sampling And Analysis Using An Automated Manifold, L-4231-F, March 2002
20. Headspace Gas Sampling and Analysis Using An On-Line Integrated System, PRO-1676-HGAS-S&A, Version 2, January 2004.
21. Real-Time Radiography Testing of Transuranic and Low-Level Waste, 4-W30-NDT-00664, Version 11, July 2004.
22. Real-Time Radiography Testing of Transuranic and Low-Level Waste in Building 569, 4-I19-NDT-00569, Revision 5, January 2002.
23. Mobile Real-Time Radiography Testing of Transuranic and Low-Level Waste, PRO-1520-Mobile-RTR, Version 5, October 2004.
24. Glovebox and C-Cell Waste Operations, PRO-1358-440-VERP, Version 7, July 2004.
25. RTR Visual Examination Confirmation, Building 371, PRO-1608-VECRTR-371, Revision 0, October 2002.
26. Visual Examination for Confirmation of RTR, 4-H80-776-ASRF-007, Revision 5, June 2001.
27. Interoffice Memorandum from M. L. Johnson to E. L. D'Amico, Solid Sampling Control Chart Effectiveness Evaluation for Waste Stream RF119.01, MLJ-104-04, December 2004.
28. Volatile Organic Compounds by Gas Chromatography Mass Spectrometry, ACMM-9260, Revision 9, July 2003.

REFERENCE LIST (Continued)

29. Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry, ACMM-9270, Revision 5, April 2003.

30. Determination of Nonhalogenated Volatile Organics by Gas Chromatography, ACMM-9441, Revision 8, April 2003.

31. Determination of Mercury by CVAA for TRU Waste Characterization, ACMM-2810, Revision 2, April 2003.

32. Determination of Metals by ICP-AES for TRU Waste Characterization, ACMM-2901, Revision 2, April 2003.

Form A
Reconciliation with Data Quality Objectives

I certify by signature (below) that sufficient data have been collected to determine the following Program-required waste parameters:

WSPF # RF119.01

Item	Check Box[a]	Reconciliation Parameter
1	✓	Waste Matrix Code as reported in WEMS.
2	✓	Waste Material Parameter Weights for individual containers as reported in WEMS.
3	✓	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	✓	Container mass and activities of each radionuclide of concern as reported in WEMS.
5	✓	Each waste container of waste contains TRU radioactive waste.
6	✓	Mean concentrations, UCL_{90} for the mean concentrations, standard deviations, and the number of samples collected for each VOC in the headspace gas of waste containers in the waste stream/waste stream lot.
7	✓	Mean concentrations, UCL_{90} for the mean concentrations, standard deviations, and number of samples collected for VOCs in the waste stream/waste stream lot. Summary Categories S3000 and S4000.
8	✓	Mean concentrations, UCL_{90} for the mean concentrations, standard deviations, number of samples collected for SVOCs in the waste stream/waste stream lot. Summary Categories S3000 and S4000.
9	✓	Mean concentrations, UCL_{90} for the mean concentrations, standard deviations, and number of samples collected for metals in the waste stream/waste stream lot. Summary Categories S3000 and S4000.
10	✓	Sufficient number of samples was taken to meet statistical sampling requirements.
11	✓	Only validated data were used in the above calculations, as documented through the site data review and validation forms and process.
12	✓	Waste containers were selected randomly for sampling, as documented in site procedures.
13	✓	The potential flammability of TRU waste headspace gases.
14	✓	Sufficient number of waste containers was visually examined to determine with a reasonable level of certainty that the UCL_{90} for the miscertification rate is less than 14 percent.
15	✓	Whether the waste stream exhibits a toxicity characteristic (TC) under 40 CFR Part 261, Subpart C.
16	✓	All TICs were appropriately identified and reported in accordance with the requirements of the WIPP WAP prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
17	✓	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WIPP WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
18	✓	The RTLs (i.e., PRQLs) for all analyses were met prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
19	✓	Appropriate packaging configuration and DAC were met and documented in the headspace gas sampling documentation and the drum age was met prior to sampling.
20	✓	Whether the waste stream can be classified as hazardous or non-hazardous at the 90-percent confidence limit.

[a] Check (✓) indicates that data or acceptable knowledge are sufficient to determine the waste parameters and that the waste parameters have been reported in the listed document or database. N/A indicates parameter does not apply to waste stream. NC indicates data are insufficient.

Signature of Site Project Manager

G. A. O'Leary
Printed Name

1/25/05
Date

Data Summary Report—Table 1: Solid Sampling Summary

WSPF # RF119.01

Determination of Number of Retrievably Stored Waste Containers to Sample (S3000,S4000)

Preliminary Estimates of Mean, Variance, and Coefficient of Variation:

Attach a table(s) that correlates container identification numbers to data packages if different from containers used for characterization.

Description of Source Data: Preliminary samples were collected and analyzed in compliance with all requirements (specified in the WIPP Waste Analysis Plan Section B2-2a) for being counted as part of the total number of calculated required samples. Sufficient preliminary samples were collected to demonstrate sampling sufficiency – i.e., collection of additional samples other than the preliminary samples was not required. See Reference List, No 16.

Samples Randomly Selected from Waste Stream (yes/no)? Yes.

Treatment of less-than-detectable measurements: This pertains only to data for analytes in which at least one detectable measurement was obtained. Data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. See Reference List, No. 16.

Analytes that are listed spent solvents and therefore not included in the calculation to determine the number of containers to sample: Benzene, Carbon Tetrachloride, Chlorobenzene, Methyl Ethyl Ketone, Pyridine, Tetrachloroethylene, and Trichloroethylene.

Largest Calculated Sample Size selection and associated analyte: Pertains only to toxicity characteristic or listed waste analytes and only to those analytes where the associated EPA hazardous waste number is not assigned (i.e., it only applies to those cases where a site intends to establish that the constituent is below the regulatory threshold and the associated EPA hazardous waste number does not apply). Largest value is 0.148 for beryllium.

Minimum number of containers to sample: 5 (based on WIPP Waste Analysis Plan Section B2-2a requirement that preliminary estimates be based on samples from a minimum of 5 waste containers).

Attach preliminary estimates: See Reference List, No. 16. Preliminary estimates are identical to final results because sufficient preliminary samples were collected and analyzed in compliance with all requirements for being used as required samples.

Data Summary Report—Table 1: Solid Sampling Summary (continued)

Retrievably Stored Waste Sampling Results

Analytes that are listed spent solvents and therefore not included in the UCL_{90} estimate calculation to determine the toxicity characteristic: Benzene, Carbon Tetrachloride, Chlorobenzene, Methyl Ethyl Ketone, Pyridine, Tetrachloroethylene, and Trichloroethylene.

Largest Calculated Sample Size and associated analyte: Pertains only to toxicity characteristic or listed waste analytes and only to those analytes where the associated EPA hazardous waste number is not assigned (i.e., it only applies to those cases where a site intends to establish that the constituent is below the regulatory threshold and the associated EPA hazardous waste number does not apply). Largest value is 0.148 for beryllium. Although antimony, cadmium, chromium, lead, mercury, nickel, vanadium and zinc all have larger calculated sample sizes than beryllium, these sample size values are not used because there either is no EPA hazardous waste number associated with these analytes or the associated EPA hazardous waste number for the analyte has been assigned to, and is being retained for, the waste stream.

Comparison of largest calculated sample size with largest calculated sample size selected from preliminary estimate: 0.148 vs. 0.148 (beryllium).

Treatment of less-than-detectable measurements: This pertains only to data for analytes in which at least one detectable measurement was obtained. Data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. See Reference List, No. 16.

Transformations applied to data and justification: Logarithmic or Square Root transformations were applied to the data as necessary to achieve (or better achieve) a normal probability distribution of the data for UCL_{90} comparison to RTL values.

Drums overpacked for shipment/WWIS tracking (Yes/No)? No.
If yes, overpack container identification number: _____

Sampled drums included in waste stream lot reported here (Yes/No)? Yes.
If no, WSPF # including sampled drums: _____

Newly Generated Waste Sampling Results

Batch or continuous process? N/A[a]

Samples randomly selected from Waste Stream? (yes/no) N/A[a]

Sample locations (part of process): N/A[a]

Treatment of less-than-detectable measurements: N/A[a]

Transformations applied to data and justification: N/A[a]

NOTES:

[a] Control charting for this waste stream was determined not to be applicable (see Reference No. 27) and sampling and analysis was conducted using the retrievably-stored characterization strategy.

Data Summary Report—Table 2: Headspace Gas Summary Data

WSPF # RF119.01

Sampling and Analysis Method (check one):

☑ 100% Sampling ☐ Reduced Sampling

2A

ANALYTE[a]	# Samples[b]	Transform Applied[c]	Normality Test (Pass/Fail)[d]	Max. Value (ppmv)[i]	Mean[d]	Std. Dev.[d]	UCL_{95}[d]	Transformed RTL	Un-Transformed RTL[e] (ppmV)	EPA Code[f]
1,1-Dichloroethane	0			2.6	1.207				10	
1,2-Dichloroethane	0			2.7	1.173				10	
1,1-Dichloroethylene	0			3.2	1.253				10	
cis-1,2-Dichloroethylene	0			3.2	1.3				10	
trans-1,2-Dichloroethylene	0			3.4	1.18				10	
1,1,2,2-Tetrachloroethane	0			3.4	1.325				10	
1,1,1-Trichloroethane	0			2.9	1.213				10	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0			2.6	1.02				10	
1,2,4-Trimethlybenzene	0			2.6	1.178				N/A	
1,3,5-Trimethylbenzene	0			3.3	1.177				N/A	
Acetone	0			36	13.883				100	
Benzene	0			2.7	1.113				10	
Bromoform	0			3	1.097				10	
Butanol	0			33	12.983				100	
Carbon disulfide	0			3.6	1.498				10	
Carbon tetrachloride	1	None	Fail[g]	2.9	1.235	0.385	1.327	NA	10	
Chlorobenzene	0			2.8	1.11				10	
Chloroform	0			2.5	1.157				10	
Cyclohexane	0			3.4	1.263				N/A	
Ethyl benzene	0			2.7	1.08				10	
Ethyl ether	0			3.5	1.24				10	
Methanol	0			30	12.067				100	
Methyl ethyl ketone	0			34	13.717				100	
Methyl isobutyl ketone	0			29	12.667				100	
Methylene chloride	0			3	1.258				10	
o-Xylene	0			2.6	1.15				10	
m,p-Xylene	0			4.9	2.063				10	
Tetrachloroethylene	0			3.1	1.275				10	
Toluene	30	Sq. Rt.	Pass	31	3.629	1.04	3.878	8.4865	72.02[h]	
Trichloroethylene	0			3	1.14				10	

NOTES:

[a] A total of 30 samples were collected and analyzed. Analysis was performed for all analytes identified. Samples were not composited.

[b] Identifies the number of samples in which the associated analyte was detected.

[c] Identifies the type of data transformation used, if applicable, to achieve (or better achieve) a normal probability distribution of the data.

Data Summary Report—Table 2: Headspace Gas Summary Data (continued)

NOTES (continued):

[d] Statistics calculated based on using ½ the MDL for less-than-detectable observations with data transformation as identified (Reference 15). When transformation was applied, the mean, standard deviation, and UCL_{90} values presented are the transformed values (Reference 15). With no detectable concentrations, listed mean reflects average of one-half of reported MDL values for analyte and calculation of standard deviation and UCL_{90} values is not meaningful. With fewer than five detectable concentrations, calculated values for UCL_{90} are subject to potentially large relative error.

[e] RTLs for headspace gas analysis results correspond to the analyte PRQL for analytes that are WIPP WAP target analytes. "N/A" means the analyte is not a WIPP WAP target analyte, but instead a flammable VOC that is analyzed for compliance with the Contact-Handled Transuranic Waste Authorized Methods for Payload Control (CH-TRAMPAC).

[f] No entry indicates that the applicable UCL_{90} value did not exceed the associated RTL.

[g] Data set (with or without transformation) did not pass the test for normality. The data set that most approximated a normal distribution was used for computation of statistics.

[h] Limit used for evaluation of EPA Hazardous Waste Code for toluene (Reference No. 3).

[i] Maximum value represents the largest value reported for the analyte in the data set and includes reported MDL values for samples in which data is reported as less-than-detectable. For analytes with no detectable concentrations reported, the maximum value corresponds to the maximum reported MDL value.

Data Summary Report—Table 2: Headspace Gas Summary Data (continued)

WSPF # RF119.01

2B

TENTATIVELY IDENTIFIED COMPOUND (TIC)	Maximum Observed Estimated Concentrations (ppmV)	# Samples Containing TIC
No TIC listed in 40 CFR 261, Appendix VIII was detected in any of the containers sampled.		

Did the data verify the acceptable knowledge? ☑ Yes ☐ No

Data as reported in Data Summary Report – Table 2 confirms acceptable knowledge in that no additional toxicity characteristic organic or F-listed solvent EPA codes are applicable.

If not, describe the basis for assigning the EPA Hazardous Waste Codes:

Data Summary Report—Table 3: Metals Summary Data

WSPF # RF119.01

Sampling and Analysis Method/Units (check one):

☑ Totals (units are in mg/kg) ☐ TCLP (units are in mg/l)

ANALYTE[a]	# Samples[b]	Transform Applied[c]	Normality Test (Pass/Fail)[d]	Min. Sample Size[d]	Mean[d]	Std. Dev.[d]	UCL_{90}[d]	Transformed RTL	Un-Transformed RTL[e] (mg/kg)	EPA Code[f]
Antimony	10	Log	Pass	1.312	3.225	1.16	3.681	4.605	100	
Arsenic	2	Sq. Rt.	Fail[h]	0.014	2.106	0.696	2.380	10	100	
Barium	12	Log	Pass	0.055	3.812	0.651	4.068	7.601	2000	
Beryllium[g]	11	Log	Pass	0.148	0.853	1.06	1.270	4.605	100	
Cadmium	12	Sq. Rt.	Pass	0.773	14.629	6.549	17.206	4.472	20	D006
Chromium	12	Log	Pass	2718.684	4.628	0.882	4.975	4.605	100	D007
Lead	12	None	Pass	0.941	974.167	621.808	1218.903	NA	100	D008
Mercury	10	Sq. Rt.	Pass	0.215	0.704	0.441	0.877	2	4	
Nickel	12	Log	Pass	26.664	4.332	1.036	4.739	4.605	100	None
Selenium	2	Log	Fail[h]	0.072	-0.501	0.687	-0.231	2.996	20	
Silver	7	Sq. Rt.	Pass	0.029	1.887	1.006	2.283	10	100	
Thallium	0				4.213				100	
Vanadium	11	Sq. Rt.	Pass	0.158	4.347	1.65	4.996	10	100	
Zinc	12	Sq. Rt.	Pass	8.190	11.919	4.027	13.504	10	100	None

Did the data verify the acceptable knowledge? ☑ Yes ☐ No

If not, describe the basis for assigning the EPA Hazardous Waste Codes.

Data as reported in Data Summary Report – Table 3 did confirm acceptable knowledge in that toxicity characteristic metal EPA codes D006 (cadmium), D007 (chromium) and D008 (lead) are applicable. (see Reference List, No. 16). Although the UCL_{90} values for arsenic (D004), barium (D005), mercury (D009), selenium (D010) and silver (D011) were below their associated RTL, EPA codes D004, D005, D009, D010 and D011 are being conservatively retained for the waste stream based on historical acceptable knowledge.

NOTES:

[a] A total of 12 samples were collected and analyzed. Analysis was performed for all analytes identified.
[b] Identifies the number of samples in which the associated analyte was detected.
[c] Identifies the type of data transformation used, if applicable, to achieve (or better achieve) a normal probability distribution of the data.
[d] Statistics calculated based on using ½ the MDL values for all less-than-detectable observations with data transformation as identified (Reference 16). When transformation was applied, the mean, standard deviation, and UCL_{90} values presented are the transformed values (Reference 16). With no detectable concentrations, listed mean reflects average of one-half of reported MDL values for the analyte. No entry for standard deviation or UCL_{90} indicates no detectable measurements available for calculation of statistics.
[e] RTLs correspond to the analyte PRQL for analytes that are not characteristic hazardous waste constituents.
[f] No entry indicates that the applicable UCL_{90} value did not exceed the associated RTL.

Data Summary Report—Table 3: Metals Summary Data (continued)

NOTES (continued):

[g] The EPA hazardous waste number P015, beryllium powder, is not applicable to this waste stream. The applicable regulations controlling the identification of U and P listed hazardous wastes are given in 40 CFR 261.33, Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues Thereof. Within this regulation, it states that "The phrase 'commercial chemical product or manufacturing chemical intermediate having the generic name listed in...' refers to a chemical which is manufactured or formulated for commercial or manufacturing use which consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in paragraph (e) or (f). Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in paragraph (e) or (f), such waste will be listed in either Sec. 261.31 or Sec. 261.32 or will be identified as a hazardous waste by the characteristics set forth in subpart C of this part." Beryllium parts were used in the manufacture/assembly of weapons components, and residual beryllium contamination of plutonium parts may have occurred. As a result beryllium is present in the solidified inorganic waste. The beryllium is present as a contaminant of the process and not as unused commercial chemical product, and therefore is not a P015-listed waste.

[h] Data transformation did not pass the test for normality. The data transformation that most approximated a normal distribution was used for computation of statistics.

Data Summary Report—Table 4: Total VOC Summary Data

WSPF # RF119.01

4A

ANALYTE[a]	# Samples[b]	Transform Applied[c]	Normality Test (Pass/Fail)[d]	Min. Sample Size[d]	Mean[d]	Std. Dev.[d]	UCL_{90}[d]	Transformed RTL	Un-Transformed RTL[e] (mg/kg)	EPA Code[f]
1,1-Dichloroethylene	0				0.431				14	
trans-1,2-Dichloroethylene	0				0.431				10	
1,2-Dichloroethane	0				0.431				10	
1,1,1-Trichloroethane	0				0.431				10	
1,1,2-Trichloro-1,2,2-Trifluoroethane	0				0.445				10	
1,1,2-Trichloroethane	0				0.431				10	
1,1,2,2-Tetrachloroethane	0				0.431				10	
Acetone	0				4.263				100	
Benzene	0				0.431				10	
Bromoform	0				0.431				10	
Butanol	0				4.35				100	
Carbon disulfide	0				0.431				10	
Carbon tetrachloride	0				0.445				10	
Chloroform	1	Sq. Rt.	Fail[g]	0.006	0.65	0.137	0.704	10.954	120	
Chlorobenzene	0				0.431				10	
Ethyl benzene	0				0.431				10	
Ethyl ether	0				4.35				100	
Isobutanol	0				4.263				100	
Methanol	0				4.35				100	
o-Xylene	0				0.431				10	
m,p-Xylene	0				0.431				10	
Methyl ethyl ketone	0				4.35				100	
Methylene chloride	0				0.431				10	
Pyridine[h]	0				1.1				100	
Tetrachloroethylene	0				0.431				10	
Toluene	2	Sq. Rt.	Fail[g]	0.009	0.712	0.173	0.78	3.162	10	
Trichloroethylene	0				0.431				10	
Trichlorofluoromethane	0				0.431				10	
Vinyl chloride	0				0.431				4	

NOTES:

[a] A total of 12 samples were collected and analyzed. Analysis was performed for all analytes identified.
[b] Identifies the number of samples in which the associated analyte was detected.
[c] Identifies the type of data transformation used, if applicable, to achieve (or better achieve) a normal probability distribution of the data.
[d] Statistics calculated based on using ½ the MDL values for all less-than-detectable observations with data transformation as identified (Reference 16). When transformation was applied, the mean, standard deviation and UCL_{90} values presented are the transformed values (Reference 16). With no detectable concentrations, listed mean reflects average of one-half of reported MDL values for the analyte. No entry for standard deviation or UCL_{90} indicates no detectable measurements available for calculation of statistics.

Data Summary Report—Table 4: Total VOC Summary Data (continued)

NOTES (continued):

[e] RTLs correspond to the analyte PRQL for analytes that are F-listed hazardous waste constituents or to the applicable total RTL value as calculated from the TC RTL. RTLs correspond to the analyte PRQL for analytes that are not F-listed or characteristic hazardous waste constituent.

[f] No entry indicates that the applicable UCL_{90} value did not exceed the associated RTL.

[g] Data transformation did not pass the test for normality. The data transformation that most approximated a normal distribution was used for computation of statistics.

[h] Two of the twelve samples were analyzed at INEEL. The other ten were analyzed at RFETS. INEEL analyzes pyridine as a VOC rather than a SVOC, which is the practice at RFETS. Because the RTLs for pyridine as a VOC and SVOC differ, the RFETS and INEEL analytical results could not be combined and are therefore reported separately on the VOC and SVOC tables, as appropriate.

Data Summary Report—Table 4: Total VOC Summary Data (continued)

WSPF # RF119.01

4B

TENTATIVELY IDENTIFIED COMPOUND (TIC) CHEMICAL ABSTRACTS SERVICE (CAS) Number	Maximum Observed Estimated Concentrations (mg/kg)	# Samples Containing TIC
Methane, Chlorodifluoro- (CAS No. 75-45-6)	1.4	1

No TIC listed in 40 CFR 261, Appendix VIII was detected in greater than or equal to 25 percent of the waste containers sampled.

Did the data verify acceptable knowledge? ☑ Yes ☐ No

Data as reported in Data Summary Report – Table 4 confirm acceptable knowledge in that no additional toxicity characteristic organic or F-listed solvent EPA codes, are applicable.

If no, describe the basis for assigning EPA Hazardous Waste Codes.

Data Summary Report—Table 5: Total SVOC Summary Data

WSPF # RF119.01

5A

ANALYTE[a]	# Samples[b]	Transform Applied[c]	Normality Test (Pass/Fail)[d]	Min. Sample Size[d]	Mean[d]	Std. Dev.[d]	UCL_{90}[d]	Transformed RTL	Un-Transformed RTL[e] (mg/kg)	EPA Codes[f]
1,2-Dichlorobenzene	0				0.433				40	
1,4-Dichlorobenzene	0				0.433				150	
2,4-Dinitrophenol	0				0.433				40	
2,4-Dinitrotoluene	0				0.1				2.6	
2-Methylphenol (o-Cresol)	0				0.433				40	
3-&4-Methylphenol (m,p-Cresol)	0				0.433				40	
Hexachlorobenzene	2	None	Fail[g]	0.007	0.163	0.149	0.221	NA	2.6	
Hexachloroethane	0				0.433				60	
Nitrobenzene	0				0.433				40	
Pentachlorophenol	0				0.433				2,000	
Pyridine[h]	0				0.5				40	

NOTES:

[a] A total of 12 samples were collected and analyzed. Analysis was performed for all analytes identified.
[b] Identifies the number of samples in which the associated analyte was detected.
[c] Identifies the type of data transformation used, if applicable, to achieve (or better achieve) a normal probability distribution of the data.
[d] Statistics calculated based on using ½ the MDL values for all less-than-detectable observations with data transformation as identified (Reference 16). When transformation was applied, the mean, standard deviation and UCL_{90} values presented are the transformed values (Reference 16). With no detectable concentrations, listed mean reflects average of one-half of reported MDL values for the analyte. No entry for standard deviation or UCL_{90} indicates no detectable measurements available for calculation of statistics.
[e] RTLs correspond to the analyte PRQL for analytes that are F-listed hazardous waste constituents or to the applicable total RTL value as calculated from the TC RTL. RTLs correspond to the analyte PRQL for analytes that are not F-listed hazardous waste constituents or characteristic hazardous waste constituents.
[f] No entry indicates that the applicable UCL_{90} value did not exceed the associated RTL.
[g] Data transformation did not pass the test for normality. The data transformation that most approximated a normal distribution was used for computation of statistics.
[h] Ten of the twelve samples were analyzed at RFETS. The other two samples were anlyzed at INEEL. RFETS analyzes pyridine as a SVOC rather than a VOC, which is the practice at INEEL. Because the RTLs for pyridine as a VOC and SVOC differ, the RFETS and INEEL analytical results could not be combined and are therefore reported separately on the VOC and SVOC tables, as appropriate.

Data Summary Report—Table 5: Total SVOC Summary Data (continued)

WSPF # RF119.01

5B

TENTATIVELY IDENTIFIED COMPOUND (TIC) CHEMICAL ABSTRACTS SERVICE (CAS) Number	Maximum Observed Estimated Concentrations (mg/kg)	# Samples Containing TIC
Toluene (CAS No. 108-88-3) [a,c]	13	10
1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester (CAS No. 117-81-7)	1.1	2
Phenol, 2,4-Dichloro- (CAS No. 120-83-2)	1.2	1
Fluoranthene (CAS No. 206-44-0)	3.6	1
Phenol, 2,3,4,5-Tetrachloro- (CAS No. 4901-51-3)	0.6	1
Phenol, 2,3,4,6-Tetrachloro- (CAS No. 58-90-2)	0.62	1
Benzene Pentachloro- (CAS No. 608-93-5)	0.63	1
1,2-Benzenedicarboxylic acid, dibutyl ester (CAS No. 84-74-2) [a]	0.98	6
Phenol, 2,4,6-Trichloro- (CAS No. 88-06-2) [b]	7.4	9
Benzene, 1,2,4,5-Tetrachloro- (CAS No. 95-94-3)	0.44	1

Did the data verify acceptable knowledge? ☑ Yes ☐ No

Data as reported in Data Summary Report – Table 5 confirm acceptable knowledge in that no additional toxicity characteristic organic or F-listed solvent EPA codes are applicable.

If no, describe the basis for assigning EPA Hazardous Waste Codes.

[a] TIC is a constituent in an F-listed waste whose presence is attributable to waste packaging materials or radiolytic degradation and so was not added to the target analyte list for the waste stream. TIC was determined not to be a listed hazardous waste based on comparison of the TIC identification to acceptable knowledge (see Reference No. 18).

[b] TIC was detected in 25 percent or more of the samples and is listed in 40 CFR 261, Appendix VIII. The source of the TIC could not be attributed to waste packaging materials or established as present due to radiolysis. The TIC was added to the SVOC target analyte list for this waste stream. (see Reference No. 18).

[c] TIC was detected in 25 percent or more of the samples and is listed in 40 CFR 261, Appendix VIII, but the TIC is identified as a volatile organic compound (VOC) in Method 8260B and is a VOC target analyte. As such, the TIC was not added to the SVOC target analyte list and was evaluated as a VOC target analyte.

Data Summary Report—Table 6: Exclusion of Prohibited Items

WSPF # RF119.01

The absence of prohibited items is documented through acceptable knowledge. Radiography or visual examination is performed on each container in this waste stream to verify the absence of the following prohibited items:

- Liquids
- Non-radionuclide pyrophoric materials
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes
- Explosives or compressed gases
- Waste exhibiting the characteristics of ignitability, corrosivity or reactivity
- Non-mixed hazardous waste
- Wastes with polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization

Newly generated waste is characterized by visual verification (VV) at the time of waste packaging using the visual examination (VE) technique unless the use of radiography in lieu of, or in combination with, visual verification is justified by any of the following criteria:

- Visual verification was conducted during packaging, but was unacceptable,
- Visual verification requires extensive handling of high gram content waste that results in high radioactive exposure for the VV personnel,
- Situations where waste packaging is conducted at numerous locations generating small quantities of transuranic waste requiring a large number of VV personnel, and/or
- Where waste was originally packaged as low-level waste, but subsequently determined to be transuranic.

Each container of waste is certified and shipped only after radiography and/or VE either:

- Did not identify any prohibited items in the waste container, or
- All prohibited items found in a waste container by radiography or VE are identified and corrected (i.e., eliminated or removed) through the site non-conformance reporting system.

Data Summary Report—Table 7: Correlation of Container Identification to Batch Data Reports

WSPF # RF119.01

Package No.	Inner Can No.[a]	Radioassay Data Package	Solid Sample Batch No.[b,c]	Metals Data Package[b]	VOC Data Package[b]	SVOC Data Package[b]	Headspace Sample Batch No.	Headspace VOC Data Package	RTR Data Package	VE or VV Data Package[d]
D35542	D35542-6*	440IP1-DP-110304	SL-SB-1010	MTLS-DP-00047	VOCS-DP-00055	SVOA-DP-00061	04W0342	HGAS-DP-01057	6T-2195	
D59733	D59733-1*	440IP1-DP-092204	SL-SB-1010	MTLS-DP-00047	VOCS-DP-00055	SVOA-DP-00061	04W0240	HGAS-DP-00956	MT0086	
DA1457*	D56191-1*	440IP1-DP-032304 569IP1-DP-051702	SL-SB-1010	MTLS-DP-00047	VOCS-DP-00055	SVOA-DP-00061	05W0017	HGAS-DP-01110	6T-2201	
DC7594	N/A	440IP1-DP-092304					04W0216	HGAS-DP-00932		VV-771-00035
DC8309	Z26598	440IP1-DP-062204					04W0320	HGAS-DP-01035		SO-DP-020
	Z26623									SO-DP-020
	Z26624									SO-DP-020
	Z26625									SO-DP-020
	Z26626									SO-DP-020
	Z26627									SO-DP-020
	Z26628									SO-DP-020
	Z26629									SO-DP-020
	Z26630									SO-DP-020
	Z26760									SO-DP-020
	Z26761									SO-DP-043
	Z26762									SO-DP-043
DD2542	Z26412	569IP1-DP-080502					04W0263	HGAS-DP-00979		SO-DP-043
	Z26413									SO-DP-029
	Z26414									SO-DP-029
	Z26415									SO-DP-029
	Z26416									SO-DP-029
	Z26417									SO-DP-029
	Z26418									SO-DP-029
	Z26419									SO-DP-029
	Z26420									SO-DP-029
	Z26421									SO-DP-027
	Z26422									SO-DP-029
DD2618	Z26352	371TG5-DP-052002					04W0325	HGAS-DP-01040		SO-DP-029
	Z26353	371TG5-DP-051702								SO-DP-030
DD2621	Z26345	371TG5-DP-051702					04W0314	HGAS-DP-01029		SO-DP-030
	Z26347	371TG5-DP-052002								SO-DP-030
DD2663	Z26348	371TG5-DP-051702					04W0317	HGAS-DP-01032		SO-DP-030
	Z26349	371TG5-DP-051702								SO-DP-030

Data Summary Report—Table 7: Correlation of Container Identification to Batch Data Reports (Continued)

WSPF # RF119.01

Package No.	Inner Container No.[a]	Radioassay Data Package	Solid Sample Batch No.[b,c]	Metals Data Package[b]	VOC Data Package[b]	SVOC Data Package[b]	Headspace Sample Batch No.	Headspace VOC Data Package	RTR Data Package	VE or VV Data Package[d]
DD2665	Z26350	371TG3-DP-051702					04W0379	HGAS-DP-01091		SO-DP-030
	Z26351	371TG5-DP-052002								SO-DP-030
DD2672	Z26346	371TG3-DP-051702					04W0325	HGAS-DP-01040		SO-DP-030
DD2673	Z26423	569IP1-DP-080502					04W0295	HGAS-DP-01010		SO-DP-029
	Z26424									SO-DP-029
	Z26425									SO-DP-029
	Z26426									SO-DP-029
	Z26427									SO-DP-029
	Z26428									SO-DP-029
	Z26429									SO-DP-029
	Z26430									SO-DP-029
	Z26431									SO-DP-029
	Z26432									SO-DP-029
	Z26433									SO-DP-029
DD2676	Z26333	440IP1-DP-091904					04W0226	HGAS-DP-0942		SO-DP-030
	Z26334									SO-DP-030
	Z26335									SO-DP-030
	Z26336									SO-DP-030
	Z26337*		SL-SB-1010	MTLS-DP-00044	VOCS-DP-00055	SVOA-DP-00051				SO-DP-030
	Z26338									SO-DP-143
	Z26339									SO-DP-030
	Z26340									SO-DP-030
										SO-DP-030

Data Summary Report—Table 7: Correlation of Container Identification to Batch Data Reports (Continued)

WSPF # RF119.01

Package No.	Inner Container No.[a]	Radioassay Data Package	Solid Sample Batch No.[b,c]	Metals Data Package[b]	VOC Data Package[b]	SVOC Data Package[b]	Headspace Sample Batch No.	Headspace VOC Data Package	RTR Data Package	VE or VV Data Package[d]
DD2818	Z26316	569IP1-DP-080502					04W0320	HGAS-DP-01035		SO-DP-030
	Z26317									SO-DP-031
	Z26318									SO-DP-031
	Z26319									SO-DP-031
	Z26320									SO-DP-031
	Z26321									SO-DP-031
	Z26322									SO-DP-031
	Z26323									SO-DP-031
	Z26324									SO-DP-031
	Z26325									SO-DP-031
	Z26326									SO-DP-031
	Z26327									SO-DP-031
	Z26328									SO-DP-031
	Z26329									SO-DP-031
	Z26330									SO-DP-031
	Z26331									SO-DP-031
	Z26332									SO-DP-031
DD2934	Z26496*	440IP1-DP-091904	SL-SB-1010	MTLS-DP-00044	VOCS-DP-00055	SVOA-DP-00061	04W0230	HGAS-DP-00946		SO-DP-031
	Z26497									SO-DP-143
	Z26498									SO-DP-031
	Z26499									SO-DP-031
	Z26500									SO-DP-031
	Z26501									SO-DP-031
	Z26502									SO-DP-032
	Z26503									SO-DP-032
	Z26504									SO-DP-032
	Z26505									SO-DP-032
DD2937	Z26341	569IP1-DP-081302					04W0302	HGAS-DP-01017		SO-DP-032
	Z26342									SO-DP-032
	Z26343									SO-DP-032
	Z26344									SO-DP-032

Data Summary Report—Table 7: Correlation of Container Identification to Batch Data Reports (Continued)

WSPF # RF119.01

Package No.	Inner Container No.[a]*	Radioassay Data Package	Solid Sample Batch No.[b,c]	Metals Data Package[b]	VOC Data Package[b]	SVOC Data Package[b]	Headspace Sample Batch No.	Headspace VOC Data Package	RTR Data Package	VE or VV Data Package[d]
DD2947	Z26355	569IP1-DP-080502					04W0306	HGAS-DP-01021		SO-DP-032
	Z26356									SO-DP-032
	Z26357									SO-DP-032
	Z26463									SO-DP-138
	Z26464									SO-DP-032
	Z26465									SO-DP-032
	Z26466									SO-DP-032
	Z26467									SO-DP-032
	Z26468									SO-DP-032
	Z26469									SO-DP-032
	Z26472									SO-DP-032
	Z26473									SO-DP-032
DD3191	Z26517	440IP1-DP-051804					04W0230	HGAS-DP-00946		SO-DP-037
	Z26518									SO-DP-037
	Z26519									SO-DP-037
	Z26520									SO-DP-037
	Z26521									SO-DP-037
	Z26522									SO-DP-037
	Z26523									SO-DP-037
	Z26524									SO-DP-037
	Z26525									SO-DP-038
	Z26526									SO-DP-038
DD3195	Z26551	440IP1-DP-091904					04W0230	HGAS-DP-00946		SO-DP-039
	Z26552									SO-DP-039
	Z26553									SO-DP-039
	Z26554									SO-DP-039
	Z26555									SO-DP-039
	Z26556									SO-DP-039
	Z26557									SO-DP-039
	Z26558*		SL-SB-1010	MTLS-DP-00044	VOCS-DP-00055	SVOA-DP-00061				SO-DP-143
	Z26559									SO-DP-039
	Z26560									SO-DP-039
	Z26561									SO-DP-039

Data Summary Report—Table 7: Correlation of Container Identification to Batch Data Reports (Continued)

WSPF # RF119.01

Package No.	Inner Container No.[a]	Radioassay Data Package	Solid Sample Batch No.[b,c]	Metals Data Package[b]	VOC Data Package[b]	SVOC Data Package[b]	Headspace Sample Batch No.	Headspace VOC Data Package	RTR Data Package	VE or VV Data Package[d]
DD3376	Z26708	440IP1-DP-091904					04W0226	HGAS-DP-0942		SO-DP-045
	Z26709									SO-DP-045
	Z26710									SO-DP-045
	Z26711									SO-DP-045
	Z26712									SO-DP-045
	Z26713									SO-DP-045
	Z26714									SO-DP-046
	Z26715									SO-DP-046
	Z26716									SO-DP-046
	Z26717									SO-DP-046
	Z26718									SO-DP-046
	Z26719*		SL-SB-1010	MTLS-DP-00044	VOCS-DP-00055	SVOA-DP-00061				SO-DP-143
DD3672	Z26841	440IP1-DP-091904	SL-SB-1010	MTLS-DP-00044	VOCS-DP-00055	SVOA-DP-00061	04W0226	HGAS-DP-0942		SO-DP-048
	Z26842*									SO-DP-143
	Z26843									SO-DP-048
	Z26844									SO-DP-048
	Z26845									SO-DP-048
	Z26846									SO-DP-048
	Z26847									SO-DP-048
	Z26848									SO-DP-048
	Z26849									SO-DP-049
	Z26850									SO-DP-049
	Z26851									SO-DP-049
	Z26852									SO-DP-049
DD5176	Z27064	440IP1-DP-032404	SL-SB-1010	MTLS-DP-00044	VOCS-DP-00055	SVOA-DP-00061	04W0321	HGAS-DP-01036		SO-DP-060
	Z27065									SO-DP-060
	Z27066									SO-DP-060
	Z27067*									SO-DP-143
	Z27068									SO-DP-060
	Z27069									SO-DP-060
	Z27070									SO-DP-060
	Z27071									SO-DP-060

Data Summary Report—Table 7: Correlation of Container Identification to Batch Data Reports (Continued)

WSPF # RF119.01

Package No.	Inner Container No.[a]	Radioassay Data Package	Solid Sample Batch No.[b,c]	Metals Data Package[b]	VOC Data Package[b]	SVOC Data Package[b]	Headspace Sample Batch No.	Headspace VOC Data Package	RTR Data Package	VE or VV Data Package[d]
DD5177	Z27037	440IP1-DP-072403					'04W0306	HGAS-DP-01021		SO-DP-060
	Z27038									SO-DP-060
	Z27039									SO-DP-060
	Z27040									SO-DP-060
	Z27041									SO-DP-060
	Z27042									SO-DP-061
	Z27043									SO-DP-061
	Z27044									SO-DP-061
DD8804	N/A	440IP1-DP-072403					04W0289	HGAS-DP-01005		VV-707-00105
DD8805	N/A	440IP1-DP-031004					04W0355	HGAS-DP-01068		VV-707-00120
DD9604	D57105-11[f]*	440IP1-DP-072503	SC440-SB-1003	MTLS-DP-00050	VOCS-DP-00051	SVOA-DP-00064	04W0288	HGAS-DP-01004		VV-707-00105
DD9611	N/A	440IP1-DP-072303					04W0142	HGAS-DP-00858		VV-707-00105
DD9619	N/A	440IP1-DP-072503					04W0220	HGAS-DP-00936		VV-707-00104
DE5252	D33631-2[g]*	440IP1-DP-070904	SC440-SB-1008	ALD04024M	ALD04019V ALD04020N	ALD04018S	05W0017	HGAS-DP-01110		VV-440-00013
DE5253	D57452-4[h]*	440IP1-DP-070904	SC440-SB-1008	ALD04024M	ALD04019V ALD04020N	ALD04018S	05W0015	HGAS-DP-01108		VV-440-00013

NOTES:

[a] All packages identified were headspace gas sampled. Inner containers that were solid sampled are identified by *. Inner containers were randomly selected for solid sampling as part of the repackaging process and were initially solid sampled prior to actual packaging of the containers into the identified drums. All inner containers are either less than or equal to four liters in volume or are vented prior to packaging into drums.

[b] No entry indicates container was not selected or used for solid sampling.

[c] SL-SB-1010, SC440-SB-1003, and SC440-SB-1008 include sample collection for metals, VOCs and SVOCs.

[d] No entry indicates container was characterized using radiography and did not undergo visual examination (VE) at the time of packaging using the VE technique or selected for visual examination to confirm radiography.

[e] D56191 was repacked into DA1457.

[f] The solid sampled inner container D57105-11 from drum D57105 was repacked into DD9604.

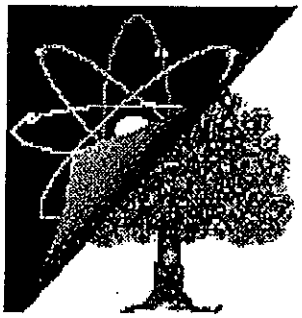
[g] The solid sampled inner container from D33631was repacked into DE5252.

[h] The solid sampled inner container from D57452 was repacked into DE5253.

Acceptable Knowledge Summary

WSPF # RF119.01

RMRS-WIPP-98-100, Acceptable Knowledge TRU/TRM Waste Stream Summaries, Section 7.37, TRM Incinerator Sludge (D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F005) (attached).



Rocky Flats Environmental Technology Site

ACCEPTABLE KNOWLEDGE INFORMATION

ACCEPTABLE KNOWLEDGE TRU/TRM WASTE STREAM SUMMARIES

RMRS-WIPP-98-100

Section 7.37

TRM Incinerator Sludge (D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F005)

Profile No. RF119.01

Revision 0

Reviewed for Classification/UCNI
By: Unclassified Not UCNI
Reference Exemption Number CEX-032-00
Date: January 6, 2005

Approval signatures in Site Document Control history file

7.37 TRM Incinerator Sludge (D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F005) Profile No. RF119.01

Acceptable Knowledge (AK) Waste Stream Summary

Waste Stream Name: TRM Incinerator Sludge (D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F005)

Generation Buildings: Buildings 371, 440, 707, 771 [1,6]

Waste Stream Volume (Retrievable): 116 55- gallon drums [1,6]
NOTE: Waste stream consists of retrievably stored and repackaged retrievably stored waste.

Generation Dates (Retrievable): January 1984 – November 2004 [1,6]
NOTE: Date reflects repack date if repackaged retrievably stored waste.

Waste Stream Volume (Projected): None [6]

Generation Dates (Projected): N/A [6]

TRUCON Content Codes [2,16]: RF111A/RF211A, RF111B/RF211B, RF111D/RF211D, RF111DF/RF211DF, RF111E/RF211E, RF111H/RF211H, RF111J/RF211J, RF111K/RF211K, RF111M/RF211M, RF111P/RF211P, RF111PF/RF211PF, RF127L/RF227L

Process Knowledge Demonstrates Flammable VOCs in Headspace < 500 ppm: No (see Sec. 7.37.6)

7.37.1 Transuranic Waste Baseline Inventory Report Information [3]

WIPP Identification Numbers: RF-MR0292 Summary Category Group: S3000

Waste Matrix Code Group: Solidified Inorganics Waste Matrix Code: S3129

Waste Stream Name: TRM Incinerator Sludge (D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F005) See Note

Description from the TWBIR: This waste form is sludge. Some of it has had cement added to it. See Note

NOTE: The Waste Stream Name "Particulate Sludge /TRM" in the Waste Isolation Pilot Plant (WIPP) Transuranic Waste Baseline Inventory Report (WTWBIR) has been changed to Transuranic Mixed Waste (TRM) Incinerator Sludge (D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F005). The description in the WTWBIR requires clarification, since the waste stream is not a semi-fluid material, and cement or nonhazardous absorbent was added during generation or repackaging to solidify any liquid waste. The Hazardous Waste Numbers in the WTWBIR are incorrect; the waste stream is assigned Hazardous Waste Numbers D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, F005 (see Section 7.37.5). The Waste Stream Name, Description, Summary Category Group, Waste Matrix Code, and Environmental Protection Agency (EPA) Hazardous Waste Numbers are based on AK (see Section 7.37.2).

7.37.2 Waste Stream Description

TRM Incinerator Sludge consists of sludge [Item Description Code (IDC) 292] that was originally generated by the incineration process in Building 771 in support of plutonium (Pu) recovery operations. Some of the waste was subsequently repackaged in Building 371, 440, 707, and 771. The material is similar in material, physical form, and hazardous constituents, and is therefore considered a single waste stream. Table 7.37-1 presents the Waste Matrix Code and waste material parameter for TRM Incinerator Sludge. [4]

Table 7.37-1, TRM Incinerator Sludge

IDC	IDC Description	Waste Matrix Code	Waste Material Parameters	Weight % (Average)
0292	Incinerator Sludge	S3129, Unknown/Other Inorganic Sludges	Inorganic Matrix	100%

NOTE: The above waste material parameter addresses the waste material only and does not include internal packaging (e.g., inner bags, metal cans, or plastic bottles), container packaging (e.g., fiberboard liner), absorbent, secondary waste, etc.

IDC 292, Incinerator Sludge: Incinerator sludge was generated as a by-product of the incineration process in Building 771. It was generated by the filtration of the potassium hydroxide scrubber liquid and consists of a diatomite (also called diatomaceous earth) filtrate material and fly ash. Portland cement was periodically added to the sludge during the original packaging process. Nonhazardous absorbents [either inorganic (e.g., Fullers earth or expanded amorphous alumina silicate) and/or organic (e.g., NoChar®, a proprietary polymer solidification agent) were added, as necessary, during repackaging to absorb residual liquid. [5,7,8,9,10,17]

7.37.3 Areas of Operation

TRM Incinerator Sludge waste is generated from the following defense operations in Buildings 371, 440, 707, and 771: [5,6,7,8,9,10]

- Pu recovery
- Waste repackaging

7.37.4 Generation Processes

Incinerator sludge was generated as a by-product of the residue recovery incineration process in Building 771. The Building 771 incinerator was used to volume reduce combustible waste (e.g., plastics, cellulosics, and filter waste) prior to Pu recovery. The hot, acidic exhaust gas from the incinerator was piped through air-to-air heat exchangers and was quenched and neutralized in a caustic solution (i.e., potassium hydroxide) spray chamber which also removed particulate material (fly ash) from the exhaust gases. The caustic solution was then pumped through a gas-liquid separator, and the liquid-free gas piped through two filter plenums before being discharged to the

outside atmosphere via the building Heating, Ventilating, and Air Conditioning (HVAC) system. The caustic solution was processed through a rotary drum vacuum filter to separate the particulate material from the caustic solution. The resulting sludge is comprised of particulate and diatomaceous earth filter media. Portland cement was periodically added to the containers during the original packaging process. See Backlog Waste Reassessment Baseline Book, Waste Form 1, Figure 2.1, for a process flow diagram showing incinerator sludge generation. [5]

Containers of incinerator sludge were also repackaged in Buildings 371, 440, 707, and 771, as necessary, to correct original packaging and waste form deficiencies to meet WIPP Waste Acceptance Criteria (WAC) requirements. A nonhazardous inorganic absorbent (e.g., Fullers earth or expanded amorphous alumina silicate) and/or limited quantities of a nonhazardous organic absorbent (e.g., NoChar®, a proprietary polymer solidification agent) were added during repackaging when necessary to absorb residual liquid. Process flow diagrams for the waste repackaging operations can be found in the Waste Stream Residue Identification and Characterization (WSRIC) Building Books listed in Section 7.37.8. [7,8,9,10,11,17]

7.37.5 Resource Conservation and Recovery Act (RCRA) Characterization

This waste stream is characterized as a mixed waste. The specific Backlog Waste Reassessment Baseline Book (BWRBB) Subpopulations and WSRIC Process Numbers associated with TRM Incinerator Sludge assigned EPA Hazardous Waste Numbers D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, and F005 are listed in the Waste and Environmental Management System (WEMS) AK Waste Stream Summary for Profile Number RF119.01. [6]

Visual examination of waste contents at the time of packaging/repackaging and/or Real-Time Radiography (RTR) is used to verify that the waste stream is not a liquid waste and does not contain explosives, nonradionuclide pyrophoric materials, compressed gases, or reactive waste. Therefore, this waste stream does not exhibit the characteristics of ignitability (D001), corrosivity (D002), or reactivity (D003). [7,8,9,10,11]

This waste stream was characterized as a hazardous waste with the same EPA Hazardous Waste Numbers as incinerator ash (reference WSPF RF118.01, TRM Incinerator Ash D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, and F005), because the incinerator sludge contains fly ash from incinerated materials. EPA Hazardous Waste Numbers F001, F002, and F005 were applied to the incinerator ash based on a review of the characterization of the incinerator feed materials (e.g., combustible, plastic, and filter wastes contaminated with spent solvents including carbon tetrachloride, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1,1-trichloroethane, methyl ethyl ketone, and toluene) and the application of the derived-from rule that would also apply to the incinerator sludge. EPA Hazardous Waste Numbers D004, D005, D006, D007, D008, D009, D010, D011 were applied to the incinerator ash stream, because these regulated metals would be concentrated during incineration and may be present

above the regulatory level. The D-listed organic codes were not applied, because the organics would not be present above the regulatory levels due to the thermal treatment by the incinerator system. Therefore, EPA Hazardous Waste Numbers D004, D005, D006, D007, D008, D009, D010, D011, F001, F002, and F005 are assigned to the waste stream based on AK. [5,7,8,9,10,12]

Incinerator-derived wastes (e.g., incinerator ash and incinerator sludge) were previously characterized as F003. This characterization was based on the possibility that combustibles, plastics, and filter wastes being fed to the incinerator may have been assigned F003. However, based on current Site guidance, the waste is not ignitable and should not be characterized as F003 hazardous waste. In addition, a review of historical documentation was performed to determine the source of F003-listed materials that fed the incinerator. This review identified processes that used F003-listed solvents but were not in operation until after the incinerator ceased operations. The residues generated by these processes could therefore not have been fed to the incinerator. There were processes that did use F003-listed solvents during the time period of incinerator operations. However, these residues did not meet the definition of an F003-listed waste as defined in 40 Code of Federal Regulations (CFR) 261.31, because they did not contain spent solvent mixtures/blends containing, before use, one or more F003-listed solvents and a total of 10 percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, or F005. Because the F003 does not apply to the incinerator feed materials, it does not apply to the Incinerator Sludge derived from the incineration process. [5,12]

No discarded chemical products, off-specification species, chemical residues, and spill residues thereof (40 CFR 261.33) were identified as part of the contamination of the feed material to the incinerator, and no hazardous waste from specific sources (40 CFR 261.32) was generated at the Site. Therefore no K, U, or P listings have been applied to this waste stream. [5,7,8,9,10,12]

Confirmatory solid samples were analyzed for total metal, volatile organic compound (VOC), and semivolatile organic compound (SVOC) constituents. Statistics were calculated based on using one-half the method detection limit (MDL) for less-than-detectable observations with data transformation applied where appropriate. Using this "WIPP directed" method, the calculated 90 percent upper confidence limit (UCL_{90}) of the mean concentrations did exceed the associated regulatory threshold limit (RTL) value for cadmium (D006), chromium (D007), and lead (D008), which confirms the AK characterization for these three constituents. Although the UCL_{90} of the mean concentration did not exceed the associated RTL value for the other characteristic metal [i.e., arsenic (D004), barium (D005), mercury (D009), selenium (D010), and silver (D011)], the EPA Hazardous Waste Numbers for these constituents are being conservatively retained for this waste stream based on historical AK. Since the UCL_{90} of the mean concentration did not exceed the associated RTL value for any characteristic organic or F-listed solvents, confirmatory solid sample data confirms that

no additional characteristic or F-listed EPA Hazardous Waste Numbers are required. (5,13)

Headspace gas sampling and analysis of the containers assigned to this waste stream detected two VOCs (carbon tetrachloride and toluene). Statistics were calculated based on using one-half the MDL for less-than-detectable observations with data transformation applied where appropriate. Using this "WIPP directed" method, the calculated UCL_{90} of the mean concentration for these analytes were not found to exceed their associated RTL value. Therefore, the headspace data confirms the AK characterization that no additional characteristic volatile organic or F-listed solvent EPA Hazardous Waste Numbers are required. (5,14)

Beryllium parts were used in the manufacture/assembly of weapons components, and residual beryllium contamination of Pu parts may have occurred; therefore, the TRM Incinerator Sludge may have been contaminated with particulate beryllium, and residual quantities of beryllium may be present in the waste stream. Based on confirmatory solid samples, the back-transformed UCL_{90} of the mean concentration is 8 mg/kg (less than 1 percent by weight); therefore, the total weight of beryllium in an individual drum of TRM Incinerator Sludge will not exceed 5 kg. The beryllium is present as a contaminant of the process and not as an unused commercial chemical product, and, therefore, is not a P015-listed waste. (5,7,8,13)

Three constituents, included in 40 CFR 261, Appendix VIII, were detected as SVOC tentatively identified compounds (TICs) in over 25 percent of the solid confirmatory samples collected. These constituents are toluene [Chemical Abstract Service (CAS) number 108-88-3], 2,4,6-trichlorophenol (CAS number 88-06-2) and 1,2-benzenedicarboxylic acid, dibutyl ester (CAS number 84-74-2). These constituents are F- and U-listed. An evaluation to compare the TICs identification with AK was performed to determine if the TICs are a listed hazardous waste in the waste stream. This evaluation determined that these constituents were not used in the processes that generated this waste stream and are not present as unused commercial chemical products or as F-listed waste. 1,2-benzenedicarboxylic acid, dibutyl ester was used as a plasticizer in plastics for over 70 years, including the plastic bags and bottles used to package this waste. Extended storage of this waste in plastic bags or bottles could account for the presence of 1,2-benzenedicarboxylic acid, dibutyl ester detected in the solid samples. A study of waste packaging indicates toluene is a component in the yellow tape used to close and seal waste confinement bags. In summary, the presence of these TICs neither render the waste stream a U-listed hazardous waste nor require the assignment of any additional F-listed hazardous waste number. (4,15)

7.37.6 Transportation

The payload containers in this waste stream must also comply with the Contact-Handled Transuranic Waste Authorized Methods for Payload Control (CH-TRAMPAC) requirements. Flammable VOCs including methyl ethyl ketone,

toluene and xylenes were identified in this waste stream based on the descriptions in the BWR Baseline Book and WSRIC Building Books. Therefore, flammable VOCs in the payload container headspace have the potential to exceed 500 ppm. All payload containers, including those that exceed 500 ppm flammable VOCs in the headspace gas, are evaluated for compliance with applicable CH-TRAMPAC requirements using the CH-TRAMPAC software compliance evaluation system in the WIPP Waste Information System (WWIS) prior to shipment. Any containers not passing the compliance evaluation are identified and corrected through the Site nonconformance reporting system. [5,7,8,9,10]

Payload management will not be used for this waste stream.

7.37.7 Radionuclides

Table 7.37-3 summarizes the radionuclides potentially present in Incinerator Sludge. [4]

Table 7.37-3, Incinerator Sludge Waste Radionuclides

IDC	Description	Radionuclides
0292	Incinerator Sludge	WG Pu, DU, EU, Am-241, Am-243, Np-237

Key:				
	WG Pu	weapons-grade plutonium	Am-241	americium-241
	DU	depleted uranium	Am-243	americium-243
	EU	enriched uranium	Np-237	neptunium-237

7.37.8 References

1. Interoffice Memorandum from M. L. Johnson to Waste Records Center. Current and Projected Waste Volumes for TRM Incinerator Sludge (D004 – D011, F001, F002, and F005) RF119.01, MLJ-103-2004, December 7, 2004.

2. RFETS 2004. Transuranic (TRU) Waste Management Manual, 1-MAN-008-WM-001, Version 7, November 15, 2004.

3. DOE 1995. Transuranic Waste Baseline Inventory Report, Revision 2. DOE/CAO-95-1121.

4. RFETS 2004. RFETS TRU Waste Acceptable Knowledge Supplemental Information. RF/RMRS-97-018, Revision 14, October 18, 2004.

5. RFETS 2004. Backlog Waste Reassessment Baseline Book, Waste Form 1, Incinerator Ash, Heel, Soot, Sludge, and Firebrick.

6. Waste and Environmental Management System (WEMS) database.

7. RFETS 2004. Waste Stream and Residue Identification and Characterization, Building 371, Version 7.0.

8. RFETS 2004. Waste Stream and Residue Identification and Characterization, Building 440, Version 7.0.

9. RFETS 2003. Waste Stream and Residue Identification and Characterization, Building 707, Version 7.0.

10. RFETS 2000. Waste Stream and Residue Identification and Characterization, Building 771, Version 7.0.

11. RFETS 2004. Solid Radioactive Waste Packing Requirements Manual, 1-M12-WO-4034, Version 15, November 22, 2004.

12. RFETS 2001. WSPF RF118.01, TRM Incinerator Ash D004-D011, F001, F002, F005, September 19, 2001.

13. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Evaluation Report For Transuranic Mixed (TRM) Firebrick Debris [D004 – D011, F001, F002, F005], Sampling Lot 1 (Waste Stream Profile RF119.01), TRG-307-04, September 28, 2004.

14. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Headspace Gas Analysis Data Evaluation Report For Waste Stream Profile RF119.01 Lot 1, TRG-413-04, December 7, 2004.

15. Interoffice memorandum from Vivian S. Sendelweck to E. L. D'Amico, Tentatively Identified Compounds in TRM Incinerator Sludge (F001, F002, F005) Waste Solid Sampling Lot 1, VSS-036-2004, September 28, 2004.

16. DOE 2004. CH-TRU Waste Content Codes (CH-TRUCON), DOE/WIPP 01-3194, Revision 2, December 2004.

17. NoChar, Inc., Material Safety Data Sheets for proprietary polymer solidification agents.