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

JUN 0 6 2001

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

RE: Transmittal of Approved Waste Stream Profile Form for Rocky Flats Environmental Technology Site, Waste Stream Profile Form Number RF005.02

Dear Mr. Zappe:

The Department of Energy, Carlsbad Field Office has approved the Rocky Flats Environmental Technology Site, Waste Stream Profile Form for Waste Stream RF005.02. 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) 361-0265.

Sincerely,

for Kerry W. Watson
Assistant Manager
Office of National TRU Program

Enclosure

cc: w/o enclosure
S. Hunt, CBFO
H. Johnson, CBFO
J. Kieling, NMED
C. Walker, TechLaw
J. Cotton, WTS
B. Kehrman, WTS
C. Riggs, CTAC

CBFO:NTP:JDV:VW:01-1033:UFC 5822

WASTE STREAM PROFILE FORM

Waste Stream Profile Number: RF005.02

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 7, 2001 and June 5, 2001

Title, version number, and date of documents used for WAC certification: Rocky Flats Environmental Technology Site TRU Waste Characterization Program Quality Assurance Project Plan, Revision 5, 95-QAPjP-0050, April 2001, Transuranic (TRU) Waste Management Manual, Revision 4, 1-MAN-008-WM-001, December 2000. WIPP Waste Acceptance Criteria, Revision 7, DOE/WIPP-069, November 1999.

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-TR0404 (RF-W103), RF-TR0405 (RF-W103), RF-TR0406 (RF-W103), RF-TR0407 (RF-W103), RF-TR0408 (RF-W103), RF-TR0409 (RF-W103), RF-TR0410 (RF-W103), RF-TR0411 (RF-W103), RF-TR0412 (RF-W103), RF-TR0413 (RF-W103), RF-TR0414 (RF-W103), RF-TR0415 (RF-W103), RF-TR0416 (RF-W103), RF-TR0418 (RF-W103), RF-TR0427 (RF-W103), RF-TR0429 (RF-W103), RF-TR0433 (RF-W103), RF-TR0434 (RF-W103), RF-TR0473 (RF-W103), RF-TR0654 (RF-W103), RF-MR-0365 (RF-W058), RF-MR-0409 (RF-W058), RF-MR-0411 (RF-W058), RF-MR-0413 (RF-W058), RF-MR-0414 (RF-W058), RF-MR-0434 (RF-W058)

Summary Category Group: S3000 | Waste Matrix Code Group: Salt Waste (S3141)

Waste Stream Name: Misc. Pu Recovery Byproducts/TRU, Misc. Pu Recovery Byproducts/TRM[3]

Description from the WTWBIR: Generated during plutonium recovery operations such as direct oxide reduction, molten salt extraction, electrorefining, and salt scrub. Includes chunks and powdered mixed salts, a probable presence of magnesium, sodium, and potassium metals.[3]

Defense TRU Waste: ☑ Yes ☐ No

Check one: ☑ CH ☐ RH Number of SWBs N/A Number of Drums 378 Number of Canisters N/A

Batch Data Report numbers supporting this waste stream characterization: See Table 7.

List applicable EPA Hazardous Waste Codes[2]: None

Applicable TRUCON Content Codes: RF 124B, RF 124D, RF 124E, RF 124F, RF 124FF, RF 124G, RF 124GF, RF 124H, RF 124HF

Acceptable Knowledge Information[1]

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

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. 16, 17
- 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

WASTE STREAM PROFILE FORM

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

- Process design documents: N/A
- Standard operating procedures: Reference List, No. 22
- Safety Analysis Reports: N/A
- Waste packaging logs: N/A
- Test plans/research project reports: N/A
- Site data bases: N/A
- Information from site personnel: N/A
- Standard industry documents: N/A
- Previous analytical data: N/A
- Material safety data sheets: N/A
- Sampling and analysis data from comparable/surrogate Waste: N/A
- Laboratory notebooks: N/A

Sampling and Analysis Information[1]
[For the following, when applicable, enter procedure title(s), number(s) and date(s)]

- ☑ Radiography: Reference List, Nos. 7, 8
- ☑ Visual Examination: Reference List, Nos. 9, 23
- ☑ Headspace Gas Analysis
  - VOCs: Reference List, No. 10
  - Flammable: Reference List, No. 10
  - Other gases (specify): N/A
- ☑ Homogeneous Solids/Soils/Gravel Sample Analysis
  - Total metals: Reference List, Nos. 13, 14, 15
  - PCBs: N/A
  - VOCs: Reference List, No. 11
  - Nonhalogenated VOCs: Reference List, No. 11
  - Semi-VOCs: Reference List, No. 12
  - 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) — 6/5/01 (Date)

NOTE (1) Use back of sheet or continuation sheets, if required.
(2) If radiography, visual examination, headspace gas analysis, and/or homogeneous solids/soils/gravel sample analysis were used to determine EPA Hazardous Waste Codes, attach Characterization Information Summary documenting this determination.
(3) The waste stream name and description from the WTWBIR are incorrect. The correct waste stream name is TRU Stabilized Pyrochemical Salts. The waste stream is not a mixed waste and is not a reactive or a pyrophoric waste. The waste stream consists of pyrochemical salts that have been thermally stabilized prior to repackaging.

REFERENCE LIST

1. Backlog Waste Reassessment Baseline Book, Waste Form 34, Pyrochemical Salts, March 2000.
2. Waste Stream and Residue Identification and Characterization (WSRIC), Revision 6, and archived versions.
3. RFETS TRU Waste Acceptable Knowledge Supplemental Information, RF/RMRS-97-018, Revision 8, December 2000.
4. Waste and Environmental Management System (WEMS) database.
5. Transuranic Waste Certification, 1-PRO-X05-WC-4018, Revision 2, December 2000.
6. Acceptable Knowledge TRU/TRM Waste Stream Summaries, RMRS-WIPP-98-100, Revision 10, January 2001.
7. Real-Time Radiography Testing of Transuranic and Low-Level Waste, 4-W30-NDT-00664, Revision 4, February 2001.
8. Real-Time Radiography Testing of Transuranic and Low-Level Waste in Building 569, 4-I19-NDT-00569, Revision 5, February 2001.
9. Visual Examination for Confirmation of RTR, 4-H80-776-ASRF-007, Revision 4, March 2001.
10. GC/MS Determination of Volatile Organics Waste Characterization, L-4111-U, December 2000.
11. GC/MS Determination of Volatile Organic Compounds (Solids, Liquids, and TCLP Extracts), L-4165- J, October 2000.
12. GC/MS Determination of Total SVOCs for WIPP, L-4215-C, May 2000.
13. Waste Analysis by Atomic Absorption Spectroscopy, L-4151-J, September 2000.
14. Mercury Analysis in Waste (Cold-Vapor Technique), L-4152- J, September 2000.
15. Trace Metals by ICP Spectrometry (Solids, Liquids, and TCLP Extracts), L-4153-H, September 2000.
16. Waste Characterization, Generation, and Packaging, 1-PRO-079-WGI-001, Revision 3, December 2000.
17. Waste Characterization Program Manual, 1-MAN-036-EWQA-Section 1.6.1, Revision 2, September 2000.
18. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Headspace Gas Analysis Data Evaluation Report For Waste Stream Profile RF005.02 (TRU Stabilized Pyrochemical Salts) Lot 1, TRG-002-01, January 2001.
19. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Evaluation Report For Waste Stream RF005.02 [TRU Pyrochemical Salts (Stabilized/Repackaged)] Lot 001 For The Residue Salt Project, TRG-035-01, March 2001.
20. RCRA Characterization Of TRU Waste To Be Disposed Of At WIPP, PRO-945-WIPP-009, Revision 4, September 2000.
21. Interoffice Memorandum from Thomas R. Gatliffe to Eric L. D'Amico, Statistical Solid Analysis Data Control Chart Evaluation Report For Waste Stream RF005.02 [TRU Pyrochemical Salts (Stabilized/Repackaged)] Lot 001 For The Residue Salt Project, TRG-032-01, March 2001.
22. Salt Residue Stabilization, Building 707, 4-W84-RS-0114, All Revisions.
23. Repack Sampling, Building 371, PRO-860-RS-0156, Revision 1, January 2001
24. Interoffice Memorandum from Scott Smith to Eric D'Amico, Tentatively Identified Compounds in Stabilized Salt Waste, SMS-001-2001, March 2001.

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 # RF005.02

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	✓	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. NO indicates data are insufficient.

Signature of Site Project Manager | G. A. O'Leary, Printed Name | 6/5/01, Date

Data Summary Report—Table 1: Solid Sampling Summary

WSPF # RF005.02

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 19.

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. Raw data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. Data were also evaluated using Ln-transformation in which less-than-detectable measurements were mathematically and graphically fitted based on the information provided by the distribution of detected values such that no fitted result was assigned a value greater than the reported MDL. See Reference List, No. 19

Analytes that are listed spent solvents and therefore not included in the calculation to determine the number of containers to sample: None

Largest Calculated Sample Size selection and associated analyte: Pertains only to toxicity characteristic or listed waste analytes. Largest value is 0.69 for Lead.

Minimum number of containers to sample: 13 (based on minimum sample size for evaluating the applicablity of control charting as newly generated waste).

Attach preliminary estimates: See Reference List, No. 19. 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.

Analytes that are listed spent solvents and therefore not included in the UCL_{90} estimate calculation to determine the toxicity characteristic: None

Largest Calculated Sample Size and associated analyte: Pertains only to toxicity characteristic or listed waste analytes. Largest value is 0.69 for Lead.

Comparison of largest calculated sample size with largest calculated sample size selected from preliminary estimate: 0.69 vs. 0.69 (for Lead)

Treatment of less-than-detectable measurements: This pertains only to data for analytes in which at least one detectable measurement was obtained. Raw data were evaluated using one half the method detection limit (MDL) for less-than-detectable observations. Data were also evaluated using Ln-transformation in which less-than-detectable measurements were mathematically and graphically fitted based on the information provided by the distribution of detected values such that no fitted result was assigned a value greater than the reported MDL. See Reference List, No. 19

Transformations applied to data and justification: Ln-transformations applied to data to achieve approximate normal data distribution. See Reference List, No. 19.

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:

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

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 and sampling and analysis was conducted using the retrievably stored characterization strategy (Reference List, No. 21).

Data Summary Report—Table 2: Headspace Gas Summary Data

WSPF # RF005.02

Sampling and Analysis Method (check one):

☐ 100% Sampling ☑ Reduced Sampling

2A

ANALYTE	# Samples[b]	Maximum (ppmv)	Mean[e]	SD[e]	UCL_{90}[e]	RTL[c] (ppmv)	EPA Code[a]
1,1-Dichloroethane						NA	
1,2-Dichloroethane						10	
1,1-Dichloroethylene						10	
cis-1,2-Dichloroethylene						NA	
1,1,2,2-Tetrachloroethane						10	
1,1,1-Trichloroethane						10	
1,1,2-Trichloro-1,2,2-Trifluoroethane						10	
Acetone	11	6.9	3.09	1.79	3.72	100	
Benzene	1	0.84	0.2	0.18	0.26	10	
Bromoform						NA	
Butanol						100	
Carbon disulfide	2	2.4	0.44	0.77	0.71	10	
Carbon tetrachloride						10	
Chlorobenzene						10	
Chloroform						10	
Ethyl benzene	2	0.85	0.22	0.19	0.28	10	
Ethyl ether						100	
Methanol	10	69	24.38	20.71	31.58	100	
Methyl ethyl ketone						100	
Methyl isobutyl ketone						100	
Methylene chloride						10	
o-Xylene						10	
m,p-Xylene	1	0.65	0.18	0.13	0.23	10	
Tetrachloroethylene						10	
Toluene	13	9.8	3.41	3.01	4.46	72.02[d]	
Trichloroethylene						10	

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

WSPF # RF005.02

2B

TENTATIVELY IDENTIFIED COMPOUND	Maximum Observed Estimated Concentrations (ppmv)[b]	# Samples Containing TIC[b]
No TICs included in the 40 CFR 261 Appendix VIII list were detected in at least 25 percent of the headspace gas samples for the waste stream lot.		

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

Data confirm acceptable knowledge that waste stream is not a hazardous waste.

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

NOTES:

[a] No entry indicates no associated EPA Code assigned to the waste stream.
[b] Analysis was performed for all analytes identified. No entry indicates no detectable measurements available for statistics. Samples were not composited.
[c] RTLs for headspace gas analysis results correspond to the analyte PRQL for analytes that are hazardous waste constituents. "NA" means the analyte is not a hazardous waste constituent and so has no associated regulatory threshold.
[d] Limit used for evaluating EPA Hazardous Waste Code for toluene (Reference No. 3).
[e] Statistics based on using ½ MDL for less-than-detectable observations.

Data Summary Report—Table 3: Metals Summary Data

WSPF # RF005.02

Sampling and Analysis Method/Units (check one):

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

ANALYTE	# Samples[c]	Mean[d]	SD[d]	UCL_{90}[d]	RTL[b] (mg/L)	EPA Code[a]
Antimony					NA	
Arsenic					5	
Barium	11	0.518	0.348	0.649	100	
Beryllium[e]	3	0.018	0.007	0.021	NA	
Cadmium	4	0.064	0.055	0.084	1	
Chromium	4	0.462	0.594	0.686	5	
Lead	5	1.557	4.066	3.087	5	
Mercury	3	0.0019	0.0024	0.0028	0.2	
Nickel	9	2.728	3.735	4.970	NA	
Selenium					1	
Silver					5	
Thallium					NA	
Vanadium					NA	
Zinc	12	1.505	1.184	1.950	NA	

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

Data confirm acceptable knowledge that waste stream is not a hazardous waste.

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

NOTES:

[a] No entry indicates no associated EPA Code assigned to the waste stream.

[b] "NA" means the analyte is not a hazardous waste constituent and so has no applicable regulatory threshold.

[c] Analysis was performed for all analytes identified. No entry indicates no detectable measurements available for statistics.

[d] Statistics calculated based on raw data using ½ the MDL values for all less-than-detectable observations.

[e] 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."

Stabilized salt is a manufacturing process waste that is neither a characteristic hazardous waste nor listed in either Section 261.31 or 261.32. Therefore, the stabilized salt waste is not rendered a P015 listed waste by the presence of trace quantities of beryllium.

Beryllium parts were used in the manufacture/assembly of the weapons components at RFETS and residual beryllium contamination of plutonium parts may have occurred. Plutonium parts (from weapons components returned from the field) were purified using molten salt extraction and electro-refining. The beryllium detected here is attributed to extraction of residual beryllium on plutonium parts during the purification process.

Data Summary Report—Table 4: Total VOC Summary Data

WSPF # RF005.02

4A

ANALYTE	# Samples[b]	Mean[d]	SD[d]	UCL_{90}[d]	RTL[c] (mg/kg)	EPA Code[a]
1,1-Dichloroethylene					14	
1,2-Dichloroethane					10	
1,2-Dichlorobenzene					10	
1,4-Dichlorobenzene					150	
1,1,1-Trichloroethane					10	
1,1,2-Trichloro-1,2,2-Trifluoroethane					10	
1,1,2-Trichloroethane					10	
1,1,2,2-Tetrachloroethane					NA	
Acetone					100	
Benzene					10	
Bromoform					NA	
Butanol					100	
Carbon disulfide					10	
Carbon tetrachloride					10	
Chloroform	1	0.562	0.222	0.645	120	
Chlorobenzene					2000	
Ethyl benzene					10	
Ethyl ether					100	
Isobutanol					100	
Methanol	1	5.385	1.387	5.906	100	
o-Xylene					10	
m,p-Xylene					10	
Methyl ethyl ketone					100	
Pyridine					100	
Tetrachloroethylene					10	
Toluene					10	
Trichloroethylene					10	
Trichlorofluoromethane					10	
Vinyl chloride					4	

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

WSPF # RF005.02

4B

TENTATIVELY IDENTIFIED COMPOUND	Maximum Observed Estimated Concentrations (mg/kg)	# Samples Containing TIC
Chloromethane, 74-87-3[e]	2.1	4

Did the data verify acceptable knowledge? ☑ Yes ☐ No

Data confirm acceptable knowledge that waste stream is not a hazardous waste.

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

NOTES:

[a] No entry indicates no associated EPA Code assigned to the waste stream.
[b] Analysis was performed for all analytes identified. No entry indicates no detectable measurements available for statistics.
[c] 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. "NA" means the analyte is not an applicable hazardous waste constituent and so has no associated regulatory threshold.
[d] Statistics calculated based on raw data using ½ the MDL values for all less-than-detectable observations.
[e] The TIC was determined not to be a listed hazardous waste in the waste stream base on a comparison of the TIC identification with acceptable knowledge. (Reference 24)

Data Summary Report—Table 5: Total SVOC Summary Data

WSPF # RF005.02

5A

ANALYTE	# Samples[b]	Mean	SD	UCL_{90}	RTL[c] (mg/kg)	EPA Codes[a]
1,2-Dichlorobenzene					10	
1,4-Dichlorobenzene					150	
2,4-Dinitrophenol					NA	
2,4-Dinitrotoluene					2.6	
Aroclor 1016					NA	
Aroclor 1221					NA	
Aroclor 1232					NA	
Aroclor 1242					NA	
Aroclor 1248					NA	
Aroclor 1254					NA	
Aroclor 1260					NA	
Cresols					40	
Hexachlorobenzene					2.6	
Hexachloroethane					60	
Nitrobenzene					40	
Pentachlorophenol					2000	
Pyridine					100	

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

WSPF # RF005.02
5B

TENTATIVELY IDENTIFIED COMPOUND	Maximum Observed Estimated Concentrations (mg/kg)[b]	# Samples Containing TIC[b]
No TICs included in the 40 CFR 261 Appendix VIII list were detected in at least 25 percent of the SVOC samples for the waste stream lot.		

Did the data verify acceptable knowledge? ☑ Yes ☐ No

Data confirm acceptable knowledge that waste stream is not a hazardous waste.

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

NOTES:

[a] No entry indicates no associated EPA Code assigned to the waste stream.
[b] Analysis was performed for all analytes identified. No entry indicates no detectable measurements available for statistics.
[c] RTLs correspond to the analyte PRQL for analytes that are F-listed hazardous waste constitutents or to the applicable total RTL value as calculated from the TC RTL. "NA" means the analyte is not an applicable hazardous waste constituent and so has no associated regulatory threshold.

Data Summary Report—Table 6: Exclusion of Prohibited Items

WSPF # RF005.02

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
- PCBs in concentrations greater than or equal to 50 ppm
- Waste exhibiting the characteristics of ignitability, corrosivity or reactivity

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

WSPF # RF005.02

Package No.	Inner Can No.	Radioassay Data Package	Solid Sample Batch No.[a]	Metals Data Package[a]	VOC Data Package[a]	SVOC Data Package[a]	Headspace Sample Batch No.	Headspace VOC Data Package	RTR Data Package[b]	VE or VV Data Package[c]
D93056	Z21031	CALG-DP-01475	SS-SB-1001	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-075
D94499	Z07595 Z07629 Z19195	CALG-DP-00139 CALG-DP-00143 CALG-DP-01473					01W0064	HVOC-DP-00407	5T-0166	
D94538	Z19196	CALG-DP-01475	SS-SB-1001	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-075
D95112	Z07777 Z07785 Z19197	CALG-DP-00201 CALG-DP-00199 CALG-DP-01475	SS-SB-1001	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407	5T-0164	VE-2001-003
D95706	Z21029	CALG-DP-01476	SS-SB-1001	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-075
D95735	Z21030	CALG-DP-01476	SS-SB-1001	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-075
D95909	Z21032	CALG-DP-01474	SS-SB-1001	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-075
D95918	Z19198	CALG-DP-01472	SS-SB-1001	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-075
D95919	Z08579 Z21033	CALG-DP-00298 CALG-DP-01474	SS-SB-1001	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407	5T-0166	
D95931	Z08584 Z21034	CALG-DP-00290 CALG-DP-01475	SS-SB-1002	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407	5T-0164	
D98072	Z21035	CALG-DP-01474	SS-SB-1002	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-074
D98355	Z21036	CALG-DP-01474	SS-SB-1002	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-074
D99927	Z10194	CALG-DP-00491					01W0064	HVOC-DP-00407	5T-0164	
DA3458	Z21037	CALG-DP-01476	SS-SB-1002	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-074
DA4436	Z21038	CALG-DP-01472	SS-SB-1002	MTLS-DP-0010	VOCS-DP-0016	SVOA-DP-0023	01W0064	HVOC-DP-00407		SS-DP-074

NOTES:

[a] No entry indicates container was not selected or used for solid sampling.
[b] No entry indicates container was visually examined during repackaging after solid sampling.
[c] No entry indicates container was not selected for visual examination to confirm RTR or visually verified during repackaging after solid sampling.

Acceptable Knowledge Summary

WSPF # RF005.02

RMRS-WIPP-98-100, Acceptable Knowledge TRU/TRM Waste Stream Summaries, Section 6.5, TRU Stabilized Pyrochemical Salts (attached).

CF-CHG-02

6.5 TRU Stabilized Pyrochemical Salts

Profile No. RF005.01 & RF005.02

CF-CHG-02

Acceptable Knowledge Waste Stream Summary

Waste Stream Name: TRU Stabilized Pyrochemical Salts

Generation Building: Building 707 [4,8]

CF-CHG-02

Waste Stream Volume (Current): 574 (RF005.01) + 378 (RF005.02) 55-Gallon Drums [8,10]

Generation Dates (Current): January 1998 – June 2000 [8,10]

Waste Stream Volume (Projected): None[9]

Generation Dates (Projected): Project Complete[9]

TRUCON Content Codes [1]: RF 124B, RF 124D, RF 124E, RF 124F, RF 124FF, RF 124G, RF 124GF, RF 124H, RF 124HF

6.5.1 Transuranic Waste Baseline Inventory Report Information [2]

WIPP Identification Numbers: RF-TR-0404, RF-TR-0405, RF-TR-0406, RF-TR-0407, RF-TR-0408, RF-TR-0409, RF-TR-0410, RF-TR-0411, RF-TR-0412, RF-TR-0413, RF-TR-0414, RF-TR-0415, RF-TR-0416, RF-TR-0418, RF-TR-0427, RF-TR-0429, RF-TR-0433, RF-TR-0434, RF-TR-0473, RF-TR-0654, RF-MR-0365, RF-MR-0409, RF-MR-0411, RF-MR-0413, RF-MR-0414, RF-MR-0434

NOTE: The mixed residue IDCs have been recharacterized as nonhazardous. [6]

Summary Category Group: S3000 Waste Matrix Code Group: Salt Waste

Waste Matrix Code: S3141

Waste Stream Name: Misc. Pu Recovery Byproducts/TRU, Misc. Pu Recovery Byproducts/TRM

Description from the TWBIR: Generated during plutonium recovery operations such as direct oxide reduction, molten salt extraction, electrorefining, and salt scrub. Includes chunks and powdered mixed salts, a probable presence of magnesium, sodium, and potassium metals.

CF-CHG-02

NOTE: The waste stream name and description in the TWBIR are incorrect. The correct waste stream name is TRU Stabilized Pyrochemical Salts. The waste stream is not a reactive or a pyrophoric waste based on the presence of these metals. [6] The waste stream consists of pyrochemical salts that have been thermally stabilized prior to repackaging. [3,4]

6.5.2 Waste Stream Description

Pyrochemical salt IDCs that are feed material to the stabilization process were historically generated by similar molten salt plutonium recovery processes and are similar in material, physical form, and hazardous constituents, and therefore are considered a single waste stream. Table 6-16 presents the waste matrix codes and waste material parameters for TRU stabilized pyrochemical salts.[7]

Table 6-16, Stabilized Pyrochemical Salt Waste Description

IDC	Waste Matrix Code	Waste Material Parameters	Weight % (Average)
411X	S3141, Chloride Salts	Other Inorganic Materials	100%
429X	S3141, Chloride Salts	Other Inorganic Materials	100%
433X	S3141, Chloride Salts	Other Inorganic Materials	100%
454X	S3141, Chloride Salts	Other Inorganic Materials	100%

IDC 411X, Electrorefining Salt: Spent salt from the electrorefining (ER) process in Building 371. Other salts which become IDC 411 for disposal include ER Salt, First Use (IDC 363), ER Salt, Second Use (IDC 364), ER Salt-Final Disposition (IDC 411), impure salt from cell clean-out (IDC 413), reburned IDC 413 (IDC 426), ER Salt Packaged for LANL (IDC 473), and ER Salt from Pu/Np (IDC 654).[4,5]

IDC 429X, Scrub Alloy Spent Salt: Spent salt from the molten salt extraction (MSE) scrub alloy process in Building 776. Other salts which become IDC 429 for disposal include MSE, Unknown % Unpulverized (IDC 405), MSE, Unknown % Pulverized (IDC 406), MSE, 8% Unpulverized (IDC 407), MSE, 8% Pulverized (IDC 408), MSE, 30% Unpulverized (IDC 409), MSE, 30% Pulverized (IDC 410), Pu chloride mixed salt (IDC 415), MSE Salt Packaged for LANL (IDC 418), and scrub alloy spent salt (IDC 429).[4,5]

IDC 433X, Scrub Alloy Spent Dicesium Salt: Spent salt from the MSE scrub alloy process that used dicesium salt. Other salts, which become IDC 433X for disposal, include MSE spent dicesium salt (IDC 427), scrub alloy spent dicesium salt (IDC 433), free calcium containing spent salt (IDC 434), and cerium/calcium spent salt (IDC 435). Salts which also may become IDC 433X for disposal include salt from bad DOR run (IDC 365), MSE Salt, Ca, Zn, K (IDC 404), Gibson salt (IDC 412), DOR salt – unoxidized calcium (IDC 414), Zn-Mg alloy metal (IDC 416) and DOR salt oxidized calcium (IDC 454).[4,5]

IDC 454X, DOR Salt-Oxidized Calcium: Spent salt from the direct oxide reduction (DOR) process. Other salts which become IDC 454X for disposal include salt from bad DOR run (IDC 365), MSE salt, Ca, Zn, K (IDC 404), Gibson salt (IDC 412), DOR salt-unoxidized calcium (IDC 414), Zn-Mg alloy metal (IDC 416), Pu chloride mixed salt (IDC 415) and DOR salt – oxidized calcium (IDC 454).[4,5]

6.5.3 Areas of Operation

TRU stabilized pyrochemical salt wastes are generated in Module A of Building 707.[4]

6.5.4 Generation Processes

Pyrochemical salts are primarily byproducts from a variety of pyrochemical plutonium metal purification and production processes conducted in the past at RFETS.[6] All pyrochemical salts generated are defense wastes.[7] The following processes generated pyrochemical salts.[6]

- Molten Salt Extraction
- Electrorefining
- Direct Oxide Reduction
- Salt Scrub
- Pyroredox

In addition to these processes, IDC 413 salt was generated by the scraping and cleaning of pyrochemical furnace cells, and IDC 416 metal was generated from research and development salt cleanup projects.[6] See archived WSRIC processes 776-1 and 779-2 through 779-8 for process flow diagrams showing historical generation of pyrochemical salts.

CF-CHG-02

To meet the residue interim safe-storage criteria (ISSC), the pyrochemical salt residues in this waste stream were stabilized by oxidation of the materials in furnaces located in Module A of Building 707.[4] This process drove off any moisture and oxidized any potentially pyrophoric or reactive metals present in the salts (i.e., plutonium, cerium, calcium, sodium, magnesium, and potassium).[3] The process flow diagram for salt stabilization is provided in the WSRIC Book, 707-39 Figure 39.1.[4]

Since all residue salts were molten at the time of the original process operation, which included a stirring operation, the temperatures involved (over 700 °C) would drive off any organic compounds of concern for headspace gas analysis. There were no VOCs introduced as part of the initial reagents, processing, or subsequent handling. Given the fact that the salts were generated by high-temperature thermal processes and then treated using another high-temperature thermal process (salt stabilization), the stabilized salt waste stream is a candidate for reduced headspace sampling.[11]

6.5.5 RCRA Characterization

Table 6-17 presents the chemical constituent codes (CCCs) and EPA Hazardous Waste Numbers associated with the WSRIC Waste Streams assigned to TRU stabilized pyrochemical salt containers.[4]

Although pyrophoric or reactive metals may be entrained in the salt matrix, this waste stream does not exhibit the characteristics of ignitability or reactivity.[6] In addition, the salt residues in this waste stream were oxidized to drive off any moisture and stabilize any potentially pyrophoric or reactive metals in the salts to meet the residue ISSC.[3,4]

CF-CHG-02

Beryllium parts were used in the manufacture/assembly of weapons components, and residual beryllium contamination of plutonium parts may have occurred. Plutonium was recovered and purified from weapons components returned from the field using molten salt extraction and electrorefining, and therefore, trace quantities of beryllium is present in the salts. In addition, a few containers in this waste stream are contaminated with beryllium. The beryllium contamination occurred during the visual examination process, not the original generation of this waste. In both of these instances, the beryllium is not unused commercial chemical product, and therefore is not a P015-listed waste.[6,12]

Table 6-17, Stabilized Pyrochemical Salt Waste RCRA Characterization

IDC	WSRIC Waste Stream	RCRA CCCs	Non-RCRA CCCs	EPA Hazardous Waste Numbers
411X	707 - 39 - 15	00	00	None
429X	707 - 39 - 17	00	00	None
433X	707 - 39 - 14	00	00	None
454X	707 - 39 - 16	00	00	None

6.5.6 Radionuclides

Table 6-18 presents the radionuclides potentially present in TRU stabilized pyrochemical salt wastes.(7)

Table 6-18, Stabilized Pyrochemical Salt Waste Radionuclides

IDC	Radionuclides
411X	WG Pu, Am-241, Np-237
429X	WG Pu, Am-241
433X	WG Pu, Am-241
454X	WG Pu, Am-241

Key:
WG Pu weapons-grade plutonium
Am-241 americium-241
Np-237 neptunium-237

6.5.7 References

1. DOE 1999. TRUPACT-II Content Codes (TRUCON), Revision 12. DOE/WIPP 89-004.
2. DOE 1995. Transuranic Waste Baseline Inventory Report, Revision 2. DOE/CAO-95-1121.
3. RFETS 1998. Salt Residue Stabilization, Building 707 Process Control/Qualification Plan. RS-020-006.
4. RFETS 2000. Waste Stream and Residue Identification and Characterization, Building 707, Version 6.0.
5. RFETS 1998. Solid Radioactive Waste Packaging, 4-D99-WO-1100.
6. RFETS 2001. Backlog Waste Reassessment Baseline Book, Waste Form 34, Pyrochemical Salts.
7. RFETS 2000. RFETS TRU Waste Acceptable Knowledge Supplemental Information, RF/RMRS-97-018, Revision 8.
8. Waste and Environmental Management System (WEMS) database.
9. WASTREN 2000. Interoffice Memorandum from Jeff Harrison to Vivian Sendelweck. JLH-016-2000. August 11.
10. WASTREN 2000. Interoffice Memorandum from Jeff Harrison to Waste Records Center. JLH-015-2000. July 6.

CF-CHG-02

11. Kaiser-Hill 2001. Interoffice Memorandum from V. S. Sendelweck to Jerry O'Leary, et al. Pyrochemical Salts High-Temperature Thermal Process Documentation (Revision 1), VSS-002-01. January 24.

12. WASTREN 2000. Interoffice Memorandum from Michael J. Papp to Eric D'Amico. Beryllium Contamination Associated with Container D95112-MJP-147-2001. March 19.

INTEROFFICE MEMORANDUM

TREN, Inc.
A Multi-Service Corporation

DATE: March 20, 2001

TO: Eric D'Amico, TRU Waste Programs, Bldg. T130J

FROM: Scott Smith, TRU Waste Programs, Bldg. T130J

SUBJECT: Tentatively Identified Compounds in Stabilized Salt Waste, SMS-001-2001

This memorandum is in response to memorandum ELD-029-01 discussing the identification of a tentatively identified compound (TIC) from total VOC analyses of TRU Stabilized Pyrochemical Salts waste stream lot 1 (RF005.~~01~~02-001). An evaluation of the acceptable knowledge for this waste stream was conducted as summarized below.

ELD 6/5/01

The WIPP Waste Analysis Plan, Section B-3d states:

> *TICs found in 25% of the samples and listed in 20 NMAC 4.1.200 (incorporating 40 CFR 261) Appendix VIII will be compared with acceptable knowledge data to determine if the TIC is a listed hazardous waste in the waste stream. ... TICs reported from the Totals VOC or SVOC analyses may be excluded from the target analyte list for a waste stream if the TIC is a constituent in an F-listed waste whose presence is attributable to waste packaging materials or radiolytic degradation from acceptable knowledge documentation. If the TIC associated with a total VOC or SVOC analysis cannot be identified as a component of waste packaging materials or as a product of radiolysis, the site will add these TICs to the list of hazardous constituents for the waste stream (and assign additional EPA listed hazardous waste codes, if appropriate).*

02 ELD 6/5/01

Total VOC analysis on RF005.~~01~~02-001 identified chloromethane, a 20 NMAC 4.1.200 Appendix VIII constituent, as a TIC in 25% of the samples. 20 NMAC 4.1.200 Appendix VIII is EPA's list of RCRA hazardous chemicals. Chloromethane is a U-listed chemical only (i.e., it is not a toxicity characteristic compound or included in any other waste listing). The requirement to determine whether a waste meets the definition of a U-listed waste is in 20 NMAC 4.1.200 (incorporating 40 CFR 261), Subpart D. To meet the definition of a U-listed waste, the chemical must be present in the waste as a commercial chemical product (or off-specification commercial chemical product) or manufacturing chemical intermediate, a residue remaining in a container or an inner liner removed from a container that has held a commercial chemical product or manufacturing chemical intermediate, or a residue or contaminated soil, water, or debris resulting from the cleanup of a spill of any commercial chemical product or manufacturing chemical intermediate. Commercial chemical product or manufacturing chemical intermediate consists of a commercially pure grade, any technical grades, and all formulations in which the chemical is the sole active ingredient.

Research of acceptable knowledge data was performed to determine the potential source of this constituent. Chloromethane has been previously identified and evaluated as a TIC from totals VOC analysis of the Repackaged Pyrochemical Salts waste stream lot 2 (RF009.01-002). The evaluation of acceptable knowledge for the repackaged salts is described in the memorandum

from Jeff Harrison to Eric D'Amico, Tentatively Identified Compounds in Repackaged Salt Waste, JLH-020-2000, September 2000.

The acceptable knowledge documentation reviewed included the:

- Backlog Waste Reassessment Baseline Book (BWRBB), Waste Form 34, Pyrochemical Salts,
- Waste Stream and Residue Identification and Characterization (WSRIC) Building Books,
- RFETS Chemical Tracking System (CTS) database, and
- RFETS Material Safety Data Sheet (MSDS) database.

The review previously conducted is common to both stabilized and repackaged pyrochemical salt waste streams. Chloromethane was identified in the CTS database as being used in on-site analytical laboratories. Consistent with the CTS, an MSDS was identified for chloromethane in the RFETS MSDS database.

In addition to previously reviewed acceptable knowledge documentation, WSRIC process 707-39, Salt Stabilization was reviewed. This describes the stabilization and packaging of historically generated pyrochemical salts to meet WIPP acceptance and shipping criteria. This process does not identify chloromethane or any other organic chemicals being used. Therefore the presence of chloromethane cannot be attributed to the stabilization process.

Because chloromethane is not an F-listed constituent, and it has not been demonstrated that this constituent is present in waste packaging materials or from radiolytic degradation, it must be added to the target analyte list for the stabilized pyrochemical salt waste stream (RF005.~~01~~02) However, the waste does not meet the definition of a U-listed waste, and therefore, no additional EPA hazardous waste codes will be applied to the waste stream.

ED
6/5/01

SMS

cc: V. Sendelweck, Bldg. T130J
S. Schafer, Bldg. T130J
Waste Records Center, Bldg. 850