



**Department of Energy**

Carlsbad Field Office  
P. O. Box 3090  
Carlsbad, New Mexico 88221  
November 14, 2000



Mr. John Kieling, Manager  
Hazardous Waste Permits Program  
Hazardous and Radioactive Materials Bureau  
New Mexico Environment Department  
2044-A Galisteo  
Santa Fe, New Mexico 87505

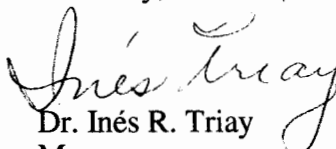
Subject: Transmittal of Approved Waste Stream Profile Forms for INEEL

Dear Mr. Kieling:

The Department of Energy, Carlsbad Field Office has approved the INEEL Waste Stream Profile Forms INW247.001R1 and INW296.001, Rev 1. Enclosed is a copy of the approved forms as required by Section B-4(b)(1) of the WIPP's Hazardous Waste Permit No. NM4890139088-TSDF.

Please contact Kerry Watson at 505-234-7357 should you have any questions regarding this matter.

Sincerely,

  
Dr. Inés R. Triay  
Manager

Enclosure

cc:

S. Zappe, NMED  
E. Rose, CBFO  
B. Stroud, CBFO  
C. Zvonar, CBFO  
C. Walker, TechLaw  
G. Barnes, WID  
J. Epstein, WID  
K. Mikus, WID  
L. Stevens, WID



## WIPP WASTE STREAM PROFILE FORM

Waste Stream Profile Number: INW247.001  
Generator site name: INEEL Technical contact: Dr. Rodney Arbon  
Generator site EPA ID: ID4890008952 Technical contact phone number: (208) 526-1867  
Date of audit report approval by NMED: July 17, 2000  
Title, version number, and date of documents used for WAC certification: See continuation sheet 1 - Heading: WAC Certification

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

Rocky Flats Environmental Technology Site, CO7890010526

### Waste Stream Information<sup>1</sup>

WIPP ID: IN-W247, IN-W245 Summary Category Group: S5000  
Waste Matrix Code Group: S5122 Waste Stream Name: Raschig Rings  
Description from the WTWBIR: See continuation sheet 1 - Heading: Waste Description  
Defense TRU Waste: ☒ Yes ☐ No Check One: ☒ CH ☐ RH  
Number of SWBs 0 Number of Drums 714 Number of Canisters 0  
Data report numbers supporting this waste stream characterization: See Characterization Information Summary, Table 6  
List applicable EPA Hazardous Waste Codes:<sup>2</sup> F001, F002, D008 See continuation sheet 2 - Heading: Hazardous Determination

Applicable TRUCON Content Codes: ID118, ID218, ID125, ID225

### Acceptable Knowledge Information<sup>1</sup>

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

#### Required Program Information

- Map of site: Acceptable Knowledge Document for INEL Stored Transuranic Waste - Rocky Flats Plant Waste, January 1998, INEL-96/0280, Figure 3.1; Drawing 175603 (BBWXT), Rev. 7, 2/24/00.
- Facility mission description: INEL-96/0280, Section 3.1; PLN-579
- Description of operations that generate waste: INEL-96/0280
- Waste identification/categorization schemes: INEL-96/0280, Section 3.3.2
- Types and quantities of waste generated: INEL-96/0280, Section 3.5, Sections 5-26; Inventory report from Transuranic Reporting, Inventory, and Processing System (TRIPS)
- Correlation of waste streams generated from the same building and process, as appropriate: INEL-96/0280, Section 3.2, Sections 5-26
- Waste certification procedures: PLN-579

#### Required Waste Stream Information

- Area(s) and building(s) from which the waste stream was generated: INEL-96/0280, Section 19, Waste Stream Summary Sheet - Raschig Rings, EDF-1594
- Waste stream volume and time period of generation: INEL-96/0280, Table 19-1, TRIPS
- Waste generating process description for each building: INEL-96/0280, Section 19.1
- Process flow diagrams: Figure 12.1 and Figure 14.1, Waste Stream Residue Identification and Characterization for Building 777, Rocky Flats Plant, May 1992 (P079), Figure 16.1, Waste Stream Residue Identification and Characterization for Building 559, Rocky Flats Plant, September 1991 (P076)
- Material inputs or other information identifying chemical/radionuclide content and physical waste form: INEL-96/0280, Section 19;

Waste Stream Summary Sheet - Graphite, EDF-1594

- G.E. Dials, "Identification of Defense Waste Streams Generated at Rocky Flats Environmental Technology Site (RFETS)," U. S. Department of Energy, memorandum to Jessie M. Robertson and John M. Wilczynski, May 20, 1997.
- Which Defense Activity generated the waste: (check one)
- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Weapons activities including defense inertial confinement fusion             | <input type="checkbox"/> Naval Reactors development          |
| <input type="checkbox"/> Verification and control technology   | <input type="checkbox"/> Defense research and development    |
| <input type="checkbox"/> Defense nuclear waste and material by products management                               | <input type="checkbox"/> Defense nuclear material production |
| <input type="checkbox"/> Defense nuclear waste and materials security and safeguards and security investigations |  |

#### Supplemental Documentation

INEL 96/280 encompasses several different reference sources. Many of the references used fall into the supplemental documentation category.

- Process design documents: N/A

### WIPP WASTE STREAM PROFILE FORM

- Standard operating procedures: N/A
- Safety Analysis Reports: N/A
- Waste packaging logs: N/A
- Test plans/research project reports: N/A
- Site databases: 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<sup>2</sup>

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

- Radiography: RWMC Technical Procedure (TPR)-1572, Operating the Real-Time Radioscopic (RTR) System (Rev. 29, Rev. 30)
- Visual Examination: HFEF-OI-6890, Waste Characterization None of the drums reported in this WSPF have visual data, but this is the procedure used to visually examine drums used in establishing miscertification rates., Rev. 4c, 7/17/00

#### Headspace Gas Analysis

- VOCs: ACMM-9930, GC/MS for VOCs in Gas, Rev. 4, ACMM-9910, Analysis of Gas Samples for VOCs by GC/FID, Rev. 3, ACLP-4.10, Determination of Method Detection Limits for Gas Analysis, Rev. 2; ACLP-4.45, Gas Transfer Manifold Systems, Rev. 1
- Flammable: ACMM-9920, Analysis of Gas Samples for Hydrogen and Methane by GC/TCD (Rev. 3)
- Other gases (specify): N/A

#### Homogeneous Solids/Soils/Gravel Sample Analysis

- Total metals: N/A for debris
- PCBs: N/A for debris
- VOCs: N/A for debris
- Nonhalogenated VOCs: N/A for debris
- Semi-VOCs: N/A for debris
- Other (specify): N/A for debris

#### Waste Stream Profile Form Certification:

I hereby certify that I have received 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.

John E. Blum  
Signature of Site Project Manager

Red E. Arban SPM Designee  
Printed Name and Title

11-7-00  
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 signed Characterization Information Summary documenting this determination.

## WIPP WASTE STREAM PROFILE FORM

### Continuation Sheet 1:

#### WAC Certification Documents:

- Program Plan for Certification of INEEL Contact-Handled Stored Transuranic Waste, Rev. 1, May 18, 2000, PLN-579
- TRUPACT-II Authorized Methods for Payload Compliance (TRAMPAC) Plan, PLN-577, 3/14/00
- INEEL TRU Waste Characterization, Certification, And Transportation Quality Program Plan, Rev 5., INEEL-PLN-182, 5/18/00
- Quality Assurance Project Plan for the Transuranic Waste Characterization Program, Rev. 6, PLN-190, 8/17/00

#### Waste Description:

WIPP-ID	Item Description Code (IDC)	Description
IN-W247	442	This waste consists of raschig rings which are borosilicate glass rings used to maintain subcritical conditions in fissile solution storage tanks that were not safe by dimension. The boron in the rings is a neutron poison, an element that absorbs neutrons. The volume of the ring displaces a proportionate volume of solution and, in combination with the boron, creates a critically safe configuration. When the rings were replaced, they were assayed. If the plutonium content was above the economic discard limit (EDL), they were assigned to IDC 442. Generation buildings 371, 707, 771, 776 and 777.
IN-W245	441	This waste consists of raschig rings which are borosilicate glass rings used to maintain subcritical conditions in fissile solution storage tanks that were not safe by dimension. The boron in the rings is a neutron poison, an element that absorbs neutrons. The volume of the ring displaces a proportionate volume of solution and, in combination with the boron, creates a critically safe configuration. When the rings were replaced, they were assayed. If the plutonium content was below the economic discard limit (EDL), they were assigned to IDC 441. Generation buildings 707 and 771.

## WIPP WASTE STREAM PROFILE FORM

### Continuation Sheet 2:

#### Hazardous Determination:

#### Toxicity:

The majority of sources for raschig rings indicate that there are no toxicity compounds present. However, the INEEL does have one source which indicates that lead is a potential chemical contaminant in this waste stream. The source is the S. A. Anderson letter to S. Marcia Caregeorges (Benchmark Environmental Corporation), SAA-004-01, RCRA Part B Permit Information on Rocky Flats Waste, EG&G Rocky Flats, May 1, 1991. This letter does not actually recommend that the D008 code be assigned to this waste. However, the D008 code was assigned by individuals at the INEEL to the waste. It is certainly possible that some of the drums of IDC 442 will contain lead items. Therefore to be consistent with the longstanding code assignment at the INEEL and a conservative approach to hazardous waste number assignments, the code of D008 will continue to be assigned to this waste stream.

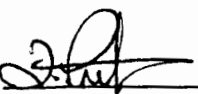
#### Listed Waste:

Waste oils containing carbon tetrachloride and 1,1,2-trichloro-1,2,2-trifluoroethane spent solvents and 1,1,1-trichloroethane were used for machining and degreasing of plutonium metal. When the raschig rings were changed out, these solvents were used to flush out the tanks. Therefore, this waste group is assigned EPA Hazardous Waste Numbers F001, and F002. Headspace gas sampling (See Table 2) supports this evaluation with concentrations above the 90% upper confidence level for 1,1,1-trichloroethane.

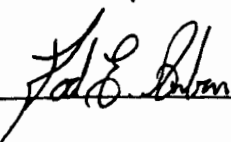
The INEEL has also indicated that potential codes assignments are associated with IDC 441 for tetrachloroethylene, trichloroethylene, and methanol. The source of these code assignments are two headspace gas samples taken a number of years ago. Reasonable statistical evaluations cannot be conducted with just two samples, therefore codes will not be assigned on these basis of these constituents.

## Characterization Information Summary Report

Lot Number: INW247.001

SQAO Review: 

Date: 11-07-00

SPM Release: 

Date: 11-7-00

SQAO Signature indicates that the information presented in this package is consistent with analytical batch reports.

SPM Release concurrence with all information presented in this report.

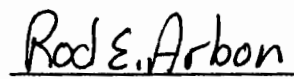
### Reconciliation with Data Quality Objectives

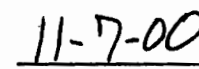
I certify by signature (below) that sufficient data have been collected to determine the following Program-required waste parameters:

Check	Reconciliation Parameter
✓	Waste Matrix Code as reported in WWIS.
✓	Waste Material Parameter Weights for individual containers as reported in WWIS.
✓	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
✓	The TRU activity reported in WWIS demonstrates that the waste is TRU waste and not low-level radioactive waste.
✓	The potential flammability of TRU waste headspace gases.
✓	Mean concentrations, upper 90% confidence limit (UCL <sub>90</sub> ) values for the mean concentration standard deviations, and the number of samples collected for each VOC in the headspace gas of each container were calculated and compared with the program required quantitation limits, as reported in Waste Stream Characterization Summary Table 2, and additional EPA codes were assigned as required.
N/A	Mean concentrations, UCL <sub>90</sub> for the mean concentrations, standard deviations, number of samples collected for metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in Waste Stream Characterization Summary Table 3, and EPA codes were assigned as required.
N/A	Mean concentrations, UCL <sub>90</sub> for the mean concentrations, standard deviations, number of samples collected for total VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in Waste Stream Characterization Summary Table 4, and EPA codes were assigned as required.
N/A	Mean concentrations, UCL <sub>90</sub> for the mean concentrations, standard deviations, number of samples collected for total SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in Waste Stream Characterization Summary Table 5, and EPA codes were assigned as required.
✓	Waste stream evaluated to determine if it exhibits toxicity characteristic (TC) under 40 CFR Part 261, Subpart C and TC codes assigned as appropriate.
N/A	Sufficient number of samples were taken to meet statistical sampling requirements, as documented on Summary Data Report Table 1.
✓	Only validated data were used in the above calculations, as documented through the site data review and validation forms and process.
✓	Waste containers were selected randomly for sampling, as documented in site procedures.
✓	Sufficient number of waste containers have been visually examined to determine the UCL <sub>90</sub> for the misclassification rate is less than 14%.
✓	All TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the WAP prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
✓	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
✓	The PRQLs for all analyses were met.

Check (✓) indicates that data are sufficient to determine the waste parameters and that the waste parameters have been reported in the listed document or database. NA indicates that parameter not applicable to the waste stream.

  
 Signature of Site Project Manager

  
 Printed Name

  
 Date

**Table 1. Solid sampling summary.**

<b>Determination of Number of Containers to Sample (S3000, S4000)</b>
<b>Preliminary Estimates of Mean, Variance, and Coefficient of Variation:</b>
Attach a table(s) that correlates container identification numbers to data packages, if different from containers used for characterization.
Description of Source Data <u>N/A</u>
Samples Randomly Selected from Waste Stream (yes/no)? <u>N/A</u>
Treatment of less-than-detectable measurements: <u>N/A</u>
Analytes that are listed as spent solvents and therefore are not included in the calculation to determine the number of containers to sample: <u>N/A</u>
Selected coefficient of variation and associated analyte: <u>N/A</u>
Total Calculated number of containers to sample: <u>N/A</u>
Attach preliminary estimates: <u>N/A</u>
<b>Sampling Results</b>
Samples Randomly Selected from Waste Stream (yes/no)? <u>N/A</u>
Analytes that are listed as spent solvents and therefore are not included in the UCL <sub>90</sub> Estimate calculation to determine the toxicity characteristic: <u>N/A</u>
Largest Coefficient of Variation and associated analyte: <u>N/A</u>
Comparison of largest coefficient of variation with coefficient of variation selected from Preliminary estimate <u>N/A</u>
Treatment of less-than-detectable measurements: <u>N/A</u>
Transformations applied to data and justification: <u>N/A</u>



**Table 2.** Headspace gas summary data.

Analyte	Number of samples	Number of samples above MDL <sup>a</sup>	Mean (ppmv)	Standard deviation (ppmv)	Maximum Concen. (ppmv)	Upper 90% confidence limit (ppmv)	PRQL (ppmv)	EPA Code
1,1,1-Trichloroethane	20	20	28.9	24.1	96	36.0	10	F001/F002
1,1,2,2-Tetrachloroethane	20	0	0.105	0.085	0.33	<sup>b</sup>	10	N/A
1,1,2-Trichloro-1,2,2-Trifluoroethane	20	5	0.159	0.250	0.74	0.331	10	F001/F002
1,1-Dichloroethane	20	14	0.342	0.428	1.5	0.496	10	N/A
1,1-Dichloroethylene	20	4	0.113	0.124	0.37	0.214	10	N/A
1,2,4-Trimethylbenzene	20	0	0.086	0.094	0.33	<sup>b</sup>	10	N/A
1,2-Dichloroethane	20	14	0.255	0.193	0.6	0.325	10	N/A
1,3,5-Trimethylbenzene	20	0	0.061	0.048	0.19	<sup>b</sup>	10	N/A
Acetone	20	20	11.1	12.1	47	14.7	100	N/A
Benzene	20	13	0.273	0.241	0.86	0.363	10	N/A
Bromoform	20	0	0.081	0.046	0.205	<sup>b</sup>	10	N/A
Butanol	20	2	0.288	0.231	0.83	0.791	100	N/A
Carbon Tetrachloride	20	12	0.145	0.144	0.47	0.202	10	F001/F002
Chlorobenzene	20	7	0.106	0.056	0.24	0.136	10	N/A
Chloroform	20	20	0.788	0.350	1.3	0.891	10	N/A
Cis-1,2-Dichloroethylene	20	0	0.064	0.051	0.2	<sup>b</sup>	10	N/A
Cyclohexane	20	0	0.039	0.027	0.115	<sup>b</sup>	10	N/A
Ethyl Benzene	20	2	0.068	0.051	0.2	0.179	10	N/A
Ethyl Ether	20	0	0.124	0.068	0.305	<sup>b</sup>	10	N/A
Methanol	20	0	4.91	0.575	5.5	<sup>b</sup>	100	N/A
Methyl Ethyl Ketone	20	17	1.27	1.72	6.3	1.83	100	N/A
Methyl Isobutyl Ketone	20	0	0.082	0.083	0.3	<sup>b</sup>	100	N/A
Methylene Chloride	20	20	2.66	2.24	6.3	3.33	10	N/A
Tetrachloroethylene	20	0	0.05	0.036	0.145	<sup>b</sup>	10	N/A
Toluene	20	20	0.979	0.655	2.2	1.17	10	N/A
Trichloroethylene	20	20	0.929	0.764	2.5	1.16	10	N/A
m&p-Xylene	20	2	0.082	0.051	0.19	0.193	10	N/A
o-Xylene	20	0	0.076	0.055	0.225	<sup>b</sup>	10	N/A

Did the data verify the Acceptable Knowledge? Yes ☒ No ☐

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

- When a measurement is reported as below detection, one-half the analysis method detection limit (MDL) is used. Note that the MDL for a given analyte may vary from sample to sample.
- The mean and standard deviation presented are the mean and standard deviation of the method detection limits (after dividing by 2) since all measurements (or all but one) are below detection. Therefore, there are no degrees of freedom associated with the t statistic and the upper 90% confidence limit cannot be calculated.

**Table 2B.** Headspace gas summary data – tentatively identified compounds.

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
Methyl chloride	6.4	1	5
Did the Data verify the Acceptable Knowledge      Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
If no, describe the basis for assigning the EPA Hazardous Waste Codes: N/A			

**Table 3. Metals summary data. – Not applicable to debris**

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>90</sub> (mg/kg)	RTL (mg/kg)	EPA Code <sup>a</sup> (D004-11)
Arsenic	N/A	N/A	N/A	N/A	100	N/A
Barium	N/A	N/A	N/A	N/A	2000	N/A
Cadmium	N/A	N/A	N/A	N/A	20	N/A
Chromium	N/A	N/A	N/A	N/A	100	N/A
Lead	N/A	N/A	N/A	N/A	100	N/A
Mercury	N/A	N/A	N/A	N/A	4	N/A
Selenium	N/A	N/A	N/A	N/A	20	N/A
Silver	N/A	N/A	N/A	N/A	100	N/A
Antimony	N/A	N/A	N/A	N/A	N/A	N/A
Beryllium	N/A	N/A	N/A	N/A	N/A	N/A
Nickel	N/A	N/A	N/A	N/A	N/A	N/A
Thalium	N/A	N/A	N/A	N/A	N/A	N/A
Vanadium	N/A	N/A	N/A	N/A	N/A	N/A
Zinc	N/A	N/A	N/A	N/A	N/A	N/A

Did the data verify the Acceptable Knowledge? Yes N/A No       

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

**NOTES:**

<sup>a</sup> No entry indicates no associated EPA Code assigned to the waste stream.

**Table 4A. Total VOC summary data. – Not applicable to debris**

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>95</sub> (mg/kg)	RTL (mg/kg)	EPA Code * (D018-40,43)
1,1-Dichloroethylene	N/A	N/A	N/A	N/A	14	N/A
1,2-Dichloroethane	N/A	N/A	N/A	N/A	10	N/A
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	150	N/A
Benzene	N/A	N/A	N/A	N/A	10	N/A
Carbon Tetrachloride	N/A	N/A	N/A	N/A	10	N/A
Methyl ethyl ketone	N/A	N/A	N/A	N/A	2000	N/A
Chloroform	N/A	N/A	N/A	N/A	120	N/A
Chlorobenzene	N/A	N/A	N/A	N/A	4000	N/A
Pyridine	N/A	N/A	N/A	N/A	100	N/A
Tetrachloroethylene	N/A	N/A	N/A	N/A	14	N/A
Trichloroethylene	N/A	N/A	N/A	N/A	10	N/A
Vinyl chloride	N/A	N/A	N/A	N/A	4	N/A

ANALYTE	# Samples	Mean (mg/kg)
1,1,1-Trichloroethane	N/A	N/A
1,1,2-Trichloro-1,2,2-Trifluoroethane	N/A	N/A
1,1,2-Trichloroethane	N/A	N/A
Acetone	N/A	N/A
Butanol	N/A	N/A
Carbon disulfide	N/A	N/A
Ethyl benzene	N/A	N/A
Ethyl ether	N/A	N/A
m-Xylene	N/A	N/A
Methanol	N/A	N/A
Methylene chloride	N/A	N/A
o-Xylene	N/A	N/A
Ortho-Dichlorobenzene	N/A	N/A
p-Xylene	N/A	N/A
Toluene	N/A	N/A
Butanol	N/A	N/A
Ethyl ether	N/A	N/A
Formaldehyde	N/A	N/A
Hydrazine	N/A	N/A
Isobutanol	N/A	N/A
Methanol	N/A	N/A

\* No entry indicates no associated EPA Code assigned to the waste stream.

**Table 4A. (continued)**

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>90</sub> (mg/kg)	PRQL (mg/kg)	EPA Code <sup>a</sup> (F001-5)
Benzene	N/A	N/A	N/A	N/A	10	N/A
Carbon tetrachloride	N/A	N/A	N/A	N/A	10	N/A
Methyl ethyl ketone	N/A	N/A	N/A	N/A	100	N/A
Chlorobenzene	N/A	N/A	N/A	N/A	10	N/A
Pyridine	N/A	N/A	N/A	N/A	100	N/A
Tetrachloroethylene	N/A	N/A	N/A	N/A	10	N/A
Trichloroethylene	N/A	N/A	N/A	N/A	10	N/A
1,1,1-Trichloroethane	N/A	N/A	N/A	N/A	10	N/A
1,1,2-Trichloro-1,2,2-Trifluoroethane	N/A	N/A	N/A	N/A	10	N/A
1,1,2-Trichloroethane	N/A	N/A	N/A	N/A	10	N/A
Acetone	N/A	N/A	N/A	N/A	100	N/A
Butanol	N/A	N/A	N/A	N/A	100	N/A
Carbon disulfide	N/A	N/A	N/A	N/A	10	N/A
Ethyl benzene	N/A	N/A	N/A	N/A	10	N/A
Ethyl ether	N/A	N/A	N/A	N/A	100	N/A
m-Xylene	N/A	N/A	N/A	N/A	10	N/A
Methanol	N/A	N/A	N/A	N/A	100	N/A
Methylene chloride	N/A	N/A	N/A	N/A	10	N/A
o-Xylene	N/A	N/A	N/A	N/A	10	N/A
Ortho-Dichlorobenzene	N/A	N/A	N/A	N/A	10	N/A
p-Xylene	N/A	N/A	N/A	N/A	10	N/A
Toluene	N/A	N/A	N/A	N/A	10	N/A

Did the data verify the Acceptable Knowledge? Yes N/A No             
If no, describe the basis for assigning the EPA Hazardous Waste Codes. N/A

**NOTES:**

<sup>a</sup> No entry indicates no associated EPA Code assigned to the waste stream.

**Table 4B.** Total VOC summary data – tentatively identified compounds. – Not applicable for debris

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
Did the Data verify the Acceptable Knowledge                      Yes <u>      N/A      </u> No <u>                    </u>		
If no, describe the basis for assigning the EPA Hazardous Waste Codes: N/A		

**Table 5A.** Total SVOC summary data. – Not applicable for debris

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>90</sub> (mg/kg)	RTL (mg/kg)	EPA Code <sup>a</sup> (D027-38)
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	150	N/A
2,4-Dinitrotoluene	N/A	N/A	N/A	N/A	2.6	N/A
Cresols	N/A	N/A	N/A	N/A	4000	N/A
Hexachlorobenzene	N/A	N/A	N/A	N/A	2.6	N/A
Hexachloroethane	N/A	N/A	N/A	N/A	60	N/A
Nitrobenzene	N/A	N/A	N/A	N/A	40	N/A
Pentachlorophenol	N/A	N/A	N/A	N/A	2000	N/A
Pyridine	N/A	N/A	N/A	N/A	100	N/A

ANALYTE	# Samples	Mean (mg/kg)
2,4-Dinitrophenol	N/A	N/A
Aroclor 1016	N/A	N/A
Aroclor 1221	N/A	N/A
Aroclor 1232	N/A	N/A
Aroclor 1242	N/A	N/A
Aroclor 1248	N/A	N/A
Aroclor 1254	N/A	N/A
Aroclor 1260	N/A	N/A
Ortho-Dichlorobenzene	N/A	N/A

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>90</sub> (mg/kg)	PRQL (mg/kg)	EPA Code <sup>a</sup> (F004)
Cresols	N/A	N/A	N/A	N/A	40	N/A
Nitrobenzene	N/A	N/A	N/A	N/A	40	N/A

Did the data verify the Acceptable Knowledge? Yes N/A No \_\_\_\_\_

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

**NOTES:**

<sup>a</sup> No entry indicates no associated EPA Code assigned to the waste stream.

**Table 5B.** Total SVOC Summary data – tentatively identified compounds. – Not applicable for debris.

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
Did the Data verify the Acceptable Knowledge      Yes <u>      </u> N/A      No <u>      </u> If no, describe the basis for assigning the EPA Hazardous Waste Codes: N/A		



**Table 6.** Correlation of container identification numbers to data package.

Container Number	Barcode	Headspace Gas Data Package <sup>(a)</sup>	RTR Data Package	RA Data Package	Visual Examination Data Package	PRF Headspace Gas Sampling Data Package
IDRF000238164	023625	ECL00080	RTR000092	SAS000094	N/A	PRF000062
IDRF000239663	023232	ECL00080	RTR000091	SAS000094	N/A	PRF000062
IDRF000239806	010263	ECL00072	RTR000090	SAS000093	N/A	PRF000055
IDRF000239807	010444	ECL00080	RTR000092	SAS000094	N/A	PRF000062
IDRF000239820	010373	ECL00079	RTR000089	SAS000093	N/A	PRF000061
IDRF000240961	009475	ECL00072	RTR000088	SAS000090	N/A	PRF000055
IDRF000501718	030465	ECL00079	RTR000091	SAS000093	N/A	PRF000061
IDRF000501770	029308	ECL00072	RTR000090	SAS000093	N/A	PRF000055
IDRF000501785	030117	ECL00079	RTR000091	SAS000094	N/A	PRF000061
IDRF000501798	028662	ECL00079	RTR000092	SAS000094	N/A	PRF000061
IDRF000501920	021901	ECL00080	RTR000092	SAS000095	N/A	PRF000062
IDRF000501921	021888	ECL00080	RTR000092	SAS000094	N/A	PRF000062
IDRF000501950	011134	ECL00079	RTR000093	SAS000095	N/A	PRF000061
IDRF001704559	029406	ECL00079	RTR000092	SAS000093	N/A	PRF000061
IDRF002200721	029321	ECL00072	RTR000088	SAS000090	N/A	PRF000055
IDRF002200736	029244	ECL00072	RTR000086	SAS000081	N/A	PRF000055
IDRF002202081	023436	ECL00080	RTR000092	SAS000094	N/A	PRF000062
IDRF004101391	023665	ECL00072	RTR000091	SAS000093	N/A	PRF000055
IDRF004101404	022375	ECL00080	RTR000092	SAS000095	N/A	PRF000062
IDRF004101407	022473	ECL00080	RTR000092	SAS000095	N/A	PRF000062

a. An ECL Gas Data Package is composed of three separate reports. For example, ECL00080 contains ECL00080M, ECL00080G, and ECL00080C.

**Table 7. RTR/VE Summary of Prohibited Items and AK Confirmation**

Container Number	Barcode	RTR Prohibited Items <sup>a</sup>	Visual Examination Prohibited Items <sup>a</sup>	AK Confirmation <sup>b</sup>
IDRF000238164	023625	None	N/A	Complete
IDRF000239663	023232	None	N/A	Complete
IDRF000239806	010263	None	N/A	Complete
IDRF000239807	010444	None	N/A	Complete
IDRF000239820	010373	None	N/A	Complete
IDRF000240961	009475	None	N/A	Complete
IDRF000501718	030465	None	N/A	Complete
IDRF000501770	029308	None	N/A	Complete
IDRF000501785	030117	None	N/A	Complete
IDRF000501798	028662	None	N/A	Complete
IDRF000501920	021901	None	N/A	Complete
IDRF000501921	021888	None	N/A	Complete
IDRF000501950	011134	None	N/A	Complete
IDRF001704559	029406	None	N/A	Complete
IDRF002200721	029321	None	N/A	Complete
IDRF002200736	029244	None	N/A	Complete
IDRF002202081	023436	None	N/A	Complete
IDRF004101391	023665	None	N/A	Complete
IDRF004101404	022375	None	N/A	Complete
IDRF004101407	022473	None	N/A	Complete

- a. See Table 6 for the associated RTR and Visual examinations. None of the listed drums contains prohibited items.
- b. Acceptable Knowledge confirmations are conducted using checklist SPO-RTR-VER-1. This checklist can be accessed through the batch listed in Table 6.

**Table 8.** Sample identification number cross-correlation table.

Container Number	Headspace Gas Sample Number	Solidified Sample Number(s)
IDRF000238164	ID101000EI362	N/A
IDRF000239663	ID101000EI312	N/A
IDRF000239806	ID100400EI436	N/A
IDRF000239807	ID101000EI831	N/A
IDRF000239820	ID100900EI168	N/A
IDRF000240961	ID100400EI136	N/A
IDRF000501718	ID100900EI308	N/A
IDRF000501770	ID100400EI562	N/A
IDRF000501785	ID100900EI616	N/A
IDRF000501798	ID100900EI485	N/A
IDRF000501920	ID101000EI371	N/A
IDRF000501921	ID101000EI476	N/A
IDRF000501950	ID100900EI342	N/A
IDRF001704559	ID100900EI470	N/A
IDRF002200721	ID100400EI519	N/A
IDRF002200736	ID100400EI415	N/A
IDRF002202081	ID101000EI824	N/A
IDRF004101391	ID100400EI095	N/A
IDRF004101404	ID101000EI498	N/A
IDRF004101407	ID101000EI472	N/A

Document ID: EDF-1594  
Revision ID: 0  
Effective Date: 11/07/00

# Engineering Design File

## INEEL Acceptable Knowledge Waste Stream Summary – Raschig Rings

Prepared for:  
U.S. Department of Energy  
Idaho Operations Office  
Idaho Falls, Idaho

**INEEL**  
Idaho National Engineering & Environmental Laboratory  
BECHTEL BWXT IDAHO, LLC

Form 412.14  
10/05/99  
Rev. 02

ENGINEERING DESIGN FILE  
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1. Project File No.: N/A      2. Project/Task: RWMC/SWEPP Programs
3. Subtask: Transuranic Waste Characterization Program Acceptable Knowledge

4. Title: Waste Stream Summary Sheet – Raschig Rings				
5. Summary: As required by MCP-2988, "Confirmation, Resolution and Re-evaluation of Acceptable Knowledge Information," this Engineering Design File (EDF) formally issues the Waste Stream Summary (WSS) sheet for Raschig rings (IDC 441 and IDC 442). The WSS sheet for Raschig rings combines some basic acceptable knowledge information on Raschig rings with the results of the characterization performed at INEEL to date. Cited references can be obtained from the Acceptable Knowledge Expert (AKE).				
6. Distribution (complete package): M. J. Adams, 4210; M. Anderson, 3690; R. E. Arbon, 4201; L. Blackwood, 3779; W. S. Blair, 4201; D. M. Blattner, 4201; D. Bryngelson, 6000-774; J. M. Connolly, 4201; P. Contreras, 4202; M. S. DeHaan, 3730; E. Dumas, 4201; B.K. Ford, 4201; L. R. Frost, 4201; C. M. Gomez, 4201; P. C. Gomez, 4201; S. M. Hailey, 3690; Y. Harker, 2114, G. R. Hayes, 4201; T. H. Johnsen, 4201; B. D. Lowman, 4201; V. J. Medina, 4210; D. E. Menkhaus, 4202; T. H. Monk, 4201; Northwind (5 copies), 3690; D. G. Pound, 4201; T. W. Preston, 4201; S. J. Sailer, 5210; M. T. Sharp, 3720; N. E. Stanley, 4201; G. K. Tedford, 4201; B. J. Tolman, 4201; J. Wells, 1118; Project EDF File Log, EDF Serial No. Log  Distribution (summary package only):				
7. Review (R) and Approval (A) Signatures: (Minimum reviews and approvals are listed. Additional reviews/approvals may be added.)				
	R/A	Typed Name/Organization	Signature	Date
Performer	R	S. M. Hailey (AKE)	<i>[Signature]</i> for S. Hailey	11-6-00
		B. J. Tolman	<i>[Signature]</i> for B. Tolman	11-6-00
Independent Reviewer	R	L. R. Frost	<i>[Signature]</i>	11-4-00
Requestor	A	S. M. Hailey (AKE)	<i>[Signature]</i> for S. Hailey	11-6-00
Approver	A	R. E. Arbon	<i>[Signature]</i>	11-6-00
Quality Assurance	A	T. W. Preston	<i>[Signature]</i>	11-06-00
Site Project Manager	A	T. H. Monk	<i>[Signature]</i>	11-6-00 <i>at</i>

EDF-RWMC-1594 REV.0 EO-RS-6131  
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## INEEL Acceptable Knowledge Waste Stream Summary Raschig Rings

*Note: Unless otherwise indicated information as been obtained from Reference 1.*

Waste Stream: Raschig Rings Waste, RFP IDC 441, IDC 442

Generation Buildings: Buildings 371, 559, 707, 771, 776, and 777

Waste Stream Volume: 714 55-gallon drums

Generation Dates: April 1973 – June 1988

TRUCON Content Codes<sup>3,9</sup> ID118A, ID218A, ID125B, ID225B

### Waste Stream Description:

TRU Raschig rings waste consists of unleached Raschig rings (IDC 441) and leached Raschig rings (IDC 442). The following descriptions present the waste matrix codes (WMCs) and waste material parameters for Raschig rings waste.

#### **IDC: 441, Unleached Raschig Rings Waste Matrix Code (WMC): S5122<sup>4</sup>**

**WMC Description:** WMC S5122 should consist of >80% by volume glass debris.<sup>5</sup>

Individual containers within the waste stream may contain raschig rings in the 50% - 80% range. On the whole, the waste stream consists of greater than 80% by volume.<sup>38</sup>

#### **Waste Description/Inner Packaging:**

Borosilicate glass rings used to maintain subcritical conditions in fissile solution storage tanks. Raschig rings contaminated with plutonium below the EDL were assigned IDC 441.

Raschig rings removed from a tank were contained in up to three polyvinyl chloride or polyethylene bags and placed into a Fibre-Pak. Fragmented Raschig rings from the laboratory were placed in 4-liter polyethylene bottles and double-bagged out of the glovebox.

#### **Miscellaneous Items:**

None identified.

#### **Absorbent:**

April 1973 – February 1982: 1 to 2 quarts of Oil-Dri  
February 1982 – June 1986: 3 to 12 pounds of vermiculite

For the most part, oil-dri was the absorbent used through February 1982 and vermiculite was the predominant absorbent material used after February 1982. However, there may be some containers that have a different than expected absorbent.

**Drum Packaging Configurations:**

1972-1986 90 mil rigid liner (All drums)

**One of the following combinations of drum bags:**

- 1 polyethylene round bottom drum liner
- 2 polyethylene drum bags
- PVC o-ring bag and a polyethylene drum bag
- 1 o-ring bag<sup>31</sup>

**In addition:**

Fiberboard liner and discs may also have been used. Fiberboard liners may be referred to as cardboard liners.

Note: There may be a number of combinations of drum bags, poly bags, and o-ring bags identified by SWEPP. Any combination of these plastic bags provided that 5 layers of containment are not exceeded does not impact acceptability of the drum. Drums that exceed TRUPACT-allowed containment layers will be reviewed by the transportation certification official (TCO) on a case-by-case basis. RTR may also identify drum bags without horsetails. These packaging configurations are unusual, but do not impact WMC assignment or hazardous waste number assignment. The IDC and hazardous waste number are not impacted by these atypical packaging configurations.

Potential Waste Material Parameter	Description
Steel (packaging materials)	55-gallon drum
Plastics (packaging materials)	90 mil drum liner, o-ring bags, drum bags, inner container bags, possible poly bottles
Other Inorganic Materials	Raschig rings, vermiculite, oil-dri
Cellulosics	Cardboard liner, fibre-pak
Other Metals	Lead Liner

**IDC: 442, Leached Raschig Rings**  
**Waste Matrix Code (WMC): S5122<sup>4</sup>**

**WMC Description:** WMC S5122 should consist of >80% by volume glass debris.<sup>5</sup>

Individual containers within the waste stream may contain raschig rings in the 50% - 80% range. On the whole, the waste stream consists of greater than 80% by volume.<sup>38</sup>

**Waste Description/Inner Packaging:**

Raschig rings contaminated with plutonium above the EDL, leached in nitric acid to remove the contamination.

Raschig rings out of the leaching glovebox line were bagged into two plastic bags and placed in a Fibre-Pak. Based on RTR examinations some Raschig rings may not have been placed in bags prior to placements in Fibre-Paks.<sup>36</sup> Fragmented Raschig rings from the laboratory were placed in 4-liter polyethylene bottles and double-bagged out of the glovebox.

RTR examination indicates that Fibre-Paks were not used in some instances.<sup>20</sup>

#### Miscellaneous Items:

The following table lists some of the items that have been identified in a small percentage of the containers during examination of Raschig rings.

Item	Source	Comment
Miscellaneous Plastic Items	AK-00-182 <sup>27</sup> AK-00-183 <sup>28</sup>	The following items are examples of miscellaneous plastic: bags, containers, tubing, piping, handles, sleeving, clamshell containers, 90 mil liner lids, horsetails, and poly sheeting. <i>This category can include other miscellaneous plastic waste items not specifically identified above.</i>
Inorganic Liquid	AK-00-180 <sup>25</sup>	

#### Absorbent:

1979 – February 1982: 0 to 2 gallons of Oil-Dri<sup>10, 12, 23, 24, 37</sup>  
February 1982 – June 1988: 0 to 15 pounds of vermiculite<sup>16, 23, 24, 30</sup>

For the most part, oil-dri was the absorbent used through February 1982 and vermiculite was the predominant absorbent material used after February 1982. However, there are some containers that have a different than expected absorbent.<sup>11,26</sup>

#### Drum Packaging Configurations:

1979-1988: 90 mil rigid liner (All drums)

##### One of the following combinations of drum bags:

- 1 polyethylene round bottom drum liner
- 2 polyethylene drum bags
- PVC o-ring bag and a polyethylene drum bag
- 1 drum bag<sup>17</sup>
- 7 drum bags<sup>15</sup>
- 1, 2 or 3 o-ring bags<sup>13, 18, 19</sup>

##### In addition:

Fiberboard liner and discs may also have been used. Fiberboard liners may be referred to as cardboard liners.

Lead drum liners placed between the drum and rigid liner were also used in some instances.

Note: There are a number of combinations of drum bags, poly bags, and o-ring bags that may be identified by SWEPP. Any combination of these plastic bags provided that 4 layers of containment are not exceeded does not impact acceptability of the drum. Drums that exceed



TRUPACT-allowed containment layers will be reviewed by the transportation certification official (TCO) on a case-by-case basis. RTR may also identify drum bags without horsetails. These packaging configurations are unusual, but do not impact WMC assignment or hazardous waste number assignment. The IDC and hazardous waste number are not impacted by these atypical packaging configurations.<sup>13, 15, 17, 18, 19, 29</sup>

Potential Waste Material Parameter	Description
Steel (packaging materials)	55-gallon drum
Plastics (packaging materials)	90 mil drum liner, o-ring bags, drum bags, inner container bags, possible poly bottles
Other Inorganic Materials	Raschig rings, vermiculite, oil-dri
Cellulosics	Cardboard liner, fibre-pak
Other Metals	Lead Liner

### Areas of Operation

TRU Raschig ring wastes were primarily generated by the following operations:

- Plutonium Production
- Plutonium Recovery and Purification
- Waste Treatment
- Laboratory
- Maintenance

### Generation Processes

During plutonium weapons production at RFETS, Raschig rings were used to maintain subcritical conditions in fissile solution storage tanks that were not safe by dimension. Raschig rings are borosilicate glass rings. The boron in the Raschig rings is a neutron poison, an element that absorbs neutrons. The volume of the ring displaces a proportionate volume of solution and, in combination with the boron, creates a critically safe configuration.

The majority of the Raschig ring waste was generated by changing out Raschig rings from the production, recovery, purification, and waste treatment process tanks. Raschig ring change out was a routine maintenance operation in which rings were sampled, removed, and replaced. Raschig rings were replaced in tanks if the assay of a tank exceeded acceptable limits. Change out would also occur when the Raschig rings reached the end of their useful life (about 5 years), or became broken or otherwise damaged. Raschig rings were replaced when the rings could no longer be sampled, or when sampling showed wall thinning in the rings due to corrosion, loss of boron in the rings, or buildup of solid material in the tank. Raschig ring waste was also generated when Raschig ring tanks were removed and replaced with equipment that was safe by geometric design.

New and used Raschig rings were tested at the Building 559 Plutonium Analytical Laboratory to ensure integrity and specification compliance. Used Raschig rings were removed as samples from various tanks. Neutron absorption, chemical resistance, and durability and strength tests were performed on the rings. Nitric acid and sodium hydroxide were used for chemical compatibility testing. The Raschig rings were rinsed and dried before disposal.

Waste treatment operations in Building 771 processed Raschig ring waste to recover plutonium above the EDL. The Raschig rings were leached with hot nitric acid, rinsed with water, and air-dried before packaging.

Raschig ring-filled storage tanks in Building 707 were used to collect halogenated solvents used in production operations. At one time, Raschig ring-filled storage tanks in Building 707 were used to collect 1,1,1-trichloroethane and carbon tetrachloride. The carbon tetrachloride also contained Freon and various oils. These organic liquids were sent to Building 777 to be filtered.

Building 777 contained two organic solvent collection and filtration systems that used Raschig ring-filled tanks. The carbon tetrachloride system collected, filtered, and distributed waste carbon tetrachloride for eventual treatment in Building 774. The 1,1,1-trichloroethane filtration system collected and filtered 1,1,1-trichloroethane from several ultrasonic wash tanks.

Building 771 housed operations that recovered plutonium from waste materials and other sources. Solutions from recovery operations were processed to produce purified plutonium metal to be recycled back into production operations. Potassium hydroxide, potassium fluoride, hydrogen peroxide, and nitric, hydrochloric, and hydrofluoric acids were the primary reagents used for plutonium recovery operations. Raschig ring-filled tanks containing acid or caustic were used in these processes.

Utilities such as fume scrubbers and process vacuum systems contained Raschig rings. Scrubbers used potassium or sodium hydroxide to neutralize acid fumes from various process off-gas streams and glovebox exhaust streams. Process vacuum systems provided an absolute pressure at a vacuum header that served as a means to transfer fluids on demand by valving arrangements.

## RCRA Characterization

The following table presents the EPA Hazardous Waste Numbers currently associated with the TRU Raschig ring waste containers. These EPA HWNs are subject to change as characterization is conducted.

Reference	IDC	Title	EPA Hazardous Waste Numbers
Reference 1	441	Unleached Raschig Rings	D002, F001, and F002 (Note 1)
Reference 21	441	Unleached Raschig Rings	D002, F001, F002, and F003 (Note 1)
Reference 40	441	Unleached Raschig Rings	F001, F002, D008
Reference 1	442	Leached Raschig Rings	F001 and F002
Reference 21	442	Leached Raschig Rings	F001, F002, D008
Reference 40	442	Leached Raschig Rings	F001, F002, D008

**NOTE:** D002 and F003 are applicable only when the volume of free liquid exceeds the amount allowed by the WIPP WAC.

## Radionuclides

The following table provides the prefixes assigned to Raschig rings waste containers, generation buildings, and potential radionuclides contained in the waste. Specific levels of radionuclides are established during assay and are based to some extent on expected mass fractions.<sup>8</sup>

The historical mission of the Rocky Flats Environmental Technology Site (RFETS), formerly the Rocky Flats Plant, was the manufacture of plutonium parts for nuclear weapons. As such, the majority of the TRU waste generated at RFETS was generated through defense program activities. There is no historical record or evidence of spent nuclear fuel or high-level waste ever having been handled at the facility.<sup>9</sup>

IDC	Generation Building	Container Prefix	Prefix Description	Potential Radionuclides
441	?	0089	Note 1	Unknown (Note 3)
	707	0012	Foundry and Casting Operations	WG Pu
	771	0002	Aqueous Recovery	WG Pu
	771/881	0045	Note 1	WG Pu, Am-241, EU, DU, U-233
	776	0019	Size Reduction	WG Pu, Am-241, EU, DU, U-233
	777	0080	Note 1	Not Assessed
	371	0017	Note 1	Unknown (Note 3)
442	371	0032	Aqueous Recovery	WG Pu
	707	0022	Metal Fabrication-Machining	WG Pu (Note 2)
	707	0028	Note 1	WG Pu
	771	0002	Aqueous Recovery	WG Pu
	771	0005	Aqueous Recovery	WG Pu (Note 2)
	771	0042	Chemical Technology	WG Pu, Am-241, EU, DU, U-233
	771/881	0045	Note 1	WG Pu, Am-241, EU, DU, U-233
	776	0003	Pyrochemical Operations	Prefix/IDC Conflict
	776	0019	Size Reduction	WG Pu, Am-241, EU, DU, U-233
	776	0025	Drum Repack	WG Pu, Am-241, EU, DU, U-233
	776	0041	Waste Processing/Final Packaging	WG Pu, Am-241, EU, DU, U-233 (Note 4)
	776	0057	Advanced Size Reduction	WG Pu, Am-241, EU, DU, U-233
	777	0023	Metal Fabrication-Machining	WG Pu, EU
	777	0080	Note 1	Not Assessed

- NOTE:**
1. See Reference 1, Appendix B for an explanation of these prefix descriptions.
  2. There have been isolated incidents of uranium being detected in drums that were packaged in areas where only plutonium is expected to be present.<sup>32, 33</sup>
  3. Plutonium has been detected in an area where potential radionuclides could not be determined by AK.<sup>34</sup>
  4. There have been isolated incidents of U-234 and U-235 being detected in drums that were packaged in areas where these isotopes are not expected to be present.<sup>39</sup>

**References:**

1. LMITCO 1998, Acceptable Knowledge Document for INEEL Stored Transuranic Waste-Rocky Flats Plant Waste, Revision 2. INEL-96/0280.
2. TRIPS, Transuranic Reporting, Inventory, and Processing System, 10/5/00.
3. DOE 1996. TRUPACT-II Content Codes (TRUCON), Revision 9. DOE/WIPP 89-004.
4. LITCO 1997, Engineering Design File. Matrix Parameter Category Groups (MPCG) RWMC-805/INEL-95/029
5. DOE 1995, DOE Waste Treatability Group Guidance, DOE/LLW-217, Revision 0, January 1995.
6. BBWI, EDF-RWMC-1327, INEEL Item Description Code and Shipping Category Cross Correlation, Rev. 0, 4/18/00.
7. WM-F1-82-021, Content Code Assessments for INEL Contact-Handled Stored Transuranic Wastes, October 1982
8. EDF-1242, Default Plutonium Mass Fractions for Rocky Flats Plant Waste, September 1999.
9. G.E. Dials, "Identification of Defense Waste Streams Generated at Rocky Flats Environmental Technology Site (RFETS)," U.S. Department of Energy, memorandum to Jessie M. Robertson and John M. Wilczynski, May 20, 1997.
10. AK-00-066
11. AK-00-165
12. AK-00-166
13. AK-00-167
14. AK-00-168
15. AK-00-169
16. AK-00-170
17. AK-00-172
18. AK-00-173
19. AK-00-174
20. AK-00-175
21. EDF-803, Chemical Constituents in Transuranic Storage Area (TSA) Waste, April 1998. INEL-95/022.
22. WM-F1-82-021, Content Code Assessments for INEL Contact-Handled Stored Transuranic Wastes, October 1982.
23. AK-00-177
24. AK-00-178
25. AK-00-180
26. AK-00-181
27. AK-00-182
28. AK-00-183
29. AK-00-184
30. AK-00-185
31. AK-00-187
32. AK-00-188
33. AK-00-189
34. AK-00-190
35. AK-00-191
36. AK-00-192
37. AK-00-193
38. AK-00-194
39. AK-00-195
40. Waste Stream Profile Form INW247.001

## WIPP WASTE STREAM PROFILE FORM

Waste Stream Profile Number: INW296.001  
Generator site name: INEL Technical contact: Dr. Rodney Arbon  
Generator site EPA ID: ID4890008952 Technical contact phone number: (208) 526-1867  
Date of audit report approval by NMED: July 17, 2000

Title, version number, and date of documents used for WAC certification: See continuation sheet 1 - Heading: WAC Certification

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

Rocky Flats Environmental Technology Site, CO7890010526

### Waste Stream Information<sup>1</sup>

WIPP ID: IN-W296, IN-W294 Summary Category Group: S5000  
Waste Matrix Code Group: S5112, S5110 Waste Stream Name: Non Special Source Metal / (Light Metals)  
Description from the WTWBIR: See continuation sheet 1 - Heading: Waste Description  
Defense TRU Waste: ☒ Yes ☐ No Check One: ☒ CH ☐ RH  
Number of SWBs 0 Number of Drums 889 Number of Canisters 0  
Data report numbers supporting this waste stream characterization: See Characterization (Information Summary, Table 6)

List applicable EPA Hazardous Waste Codes:<sup>2</sup> D006, D007, D008, D009, D011, D028, F001, F002, F003, F005, F006, F007, F009 - See continuation sheet 1 - Heading: Hazardous Determination

Applicable TRUCON Content Codes: ID117, ID217, ID125, ID225

### Acceptable Knowledge Information<sup>1</sup>

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

#### Required Program Information

- Map of site: Acceptable Knowledge Document for INEL Stored Transuranic Waste - Rocky Flats Plant Waste, January 1998, INEL-96/0280, Figure 3.1; Drawing 175603 (BBWXT), Rev. 7, 2/24/00.
- Facility mission description: INEL-96/0280, Section 3.1; PLN-579
- Description of operations that generate waste: INEL-96/0280
- Waste identification/categorization schemes: INEL-96/0280, Section 3.3.2
- Types and quantities of waste generated: INEL-96/0280, Section 3.5, Sections 5-26; Inventory report from Transuranic Reporting, Inventory, and Processing System (TRIPS)
- Correlation of waste streams generated from the same building and process, as appropriate: INEL-96/0280, Section 3.2, Sections 5-26
- Waste certification procedures: PLN-579

#### Required Waste Stream Information

- Area(s) and building(s) from which the waste stream was generated: INEL-96/0280, Section 16, Waste Stream Summary Sheet - Light Metals, EDF-1686
- Waste stream volume and time period of generation: INEL-96/0280, Table 16-1, TRIPS
- Waste generating process description for each building: INEL-96/0280, Section 16.1
- Process flow diagrams: AK Record U091, Process Flow Diagram for IDC 480
- Material inputs or other information identifying chemical/radionuclide content and physical waste form: INEL-96/0280, Section 16;

Waste Stream Summary Sheet - Light Metals, EDF-1686

- Which Defense Activity generated the waste. (check one)  
☒ Weapons activities including defense inertial confinement fusion ☐ Naval Reactors development  
☐ Verification and control technology ☐ Defense research and development  
☐ Defense nuclear waste and material by products management ☐ Defense nuclear material production  
☐ Defense nuclear waste and materials security and safeguards and security investigations

INEL 96/280 encompasses several different reference sources. Many of the references used fall into the supplemental documentation category.

#### Supplemental Documentation

- Process design documents: N/A
- Standard operating procedures: N/A

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- Safety Analysis Reports: N/A
- Waste packaging logs: N/A
- Test plans/research project reports: N/A
- Site databases: 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<sup>2</sup>***For the following when applicable, enter procedure title(s), number(s) and date(s)*Radiography: RWMC Technical Procedure (TPR)-1572, Operating the Real-Time Radioscopic (RTR) System (Rev. 25, Rev. 26)Visual Examination: HPEF-OI-6890, Waste Characterization None of the drums reported in this WSPF have visual data, but this is the procedure used to visually examine drums used in establishing misclassification rates. Rev. 4c, 7/17/00**Headspace Gas Analysis**VOCs: ACMM-9930, GC/MS for VOC's in Gas (Rev. 4), ACMM-9910, Analysis of Gas Samples for VOCs by GC/FID (Rev. 3), ACLP-4.10, Determination of Method Detection Limits for Gas Analysis, Rev. 2: ACLP-4.45, Gas Transfer Manifold Systems, (Rev. 1, Rev. 2)Flammable: ACMM-9920, Analysis of Gas Samples for Hydrogen and Methane by GC/TCD (Rev. 3)Other gases (specify): N/A**Homogeneous Solids/Soils/Gravel Sample Analysis**Total metals: N/A for debrisPCBs: N/A for debrisVOCs: N/A for debrisNonhalogenated VOCs: N/A for debrisSemi-VOC's: N/A for debrisOther (specify): N/A for debris**Waste Stream Profile Form Certification:**

I hereby certify that I have received 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

Printed Name and Title

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 signed Characterization Information Summary documenting this determination.

Rod E. Arbon SPM Designee 11-13-00

## WIPP WASTE STREAM PROFILE FORM

### Continuation Sheet 1:

#### WAC Certification Documents:

- Program Plan for Certification of INEEL Contact-Handled Stored Transuranic Waste, Rev. 1, May 18, 2000, PLN-579
- TRUPACT-II Authorized Methods for Payload Compliance (TRAMPAC) Plan, PLN-577, 3/14/00
- INEEL TRU Waste Characterization, Certification, And Transportation Quality Program Plan, Rev 5., INEEL-PLN-182, 5/18/00
- Quality Assurance Project Plan for the Transuranic Waste Characterization Program, Rev. 6, PLN-190, 8/17/00

#### Waste Description:

WIPP-ID	Item Description Code (IDC)	Description
IN-W296	480	This waste consists of light metals generated by the plutonium production, recovery, treatment, laboratory, and maintenance operations. Light metal includes iron, copper, aluminum, brass, bronze, galvanized metal, stainless steel, carbon steel, and other metal alloys. The metals consist of mechanical and electrical parts, tools, containers, scrap metals, piping, wire, cable gauges, valves, foil, planchets, and a variety of other metal items. The metals may be contaminated with residual amounts of solvents, acids, bases, and other reagents used in the processes where they were generated. Solvent-contaminated metals were not sorted from nonsolvent-contaminated metals. Generation buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779.
IN-W294	481	The waste consists of light metal that was washed with hot water in Building 776 to remove radioactive surface contamination. Leached light metals consists of iron, copper, aluminum, brass, bronze, galvanized metal, stainless steel, carbon steel, and other metal alloys. The metals consist of mechanical and electrical parts, tools, containers, scrap metals, piping, wire, cable gauges, valves, foil, planchets, and a variety of other metal items. The metals may be contaminated with residual amounts of solvents, acids, bases, and other reagents used in the processes where they were generated. Solvent-contaminated metals were not sorted from nonsolvent-contaminated metals. Generation buildings 371, 707, 771, 776 and 777.

#### HAZARDOUS DETERMINATION:

##### Toxicity:

RTIR and visual examinations performed over time have identified drums of metal waste containing lead items. Based on process descriptions, this waste may also include lead and silver solder; fluorescent bulbs containing mercury; circuit boards containing cadmium, lead, and silver; and

Continuation Sheet 2:

## WIPP WASTE STREAM PROFILE FORM

### Hazardous Determination (Continued):

terne-plated oil filters which contain lead. Metals wastes from strip-out operations in Building 707 and liquid waste treatment operations in Building 374 may be contaminated with sludges containing cadmium, chromium, or lead. Therefore, this waste stream has been assigned D006, D007, D008, D009, and D011.

Arsenic (D004), barium (D005), and selenium (D010) have also been identified as potential toxicity candidates based on contamination with sludges from Building 374. However, preliminary sampling data from the building 374 sludges does not indicate that the sludges have toxic levels of these metals, therefore these toxicity codes will not be added to the metals stream.

Potential organic toxic compounds are carbon tetrachloride, tetrachloroethene, and trichloroethylene used for cleaning and degreasing; benzene used in laboratory analysis as a solvent. Since these compounds were typically used as solvents, the waste will be regulated as a listed waste and applicable toxicity codes will not be added to the metals stream.

1,2-Dichloroethane (D028) has been identified by Rocky Flats as a potential contaminant in this waste stream. Therefore, the code D028 has been assigned to the waste.

### Listed Waste:

Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and 1,1,2-trichloro-1,2,2-trifluoroethane were used in production, laboratory, and maintenance operations. Metals waste may be contaminated with residual amounts of these spent solvents, and is therefore assigned EPA Hazardous Waste Numbers F001, and F002. Headspace gas sampling (See Table 2) supports this evaluation with concentrations above the 90% upper confidence level for 1,1,1-trichloroethane, carbon tetrachloride, 1,1,2-trichloro-1,2,2-trifluoroethane, and trichloroethylene.

Acetone, methanol, and xylene were used in laboratory operations. Acetone may also have been used during production operations. Light metal may be contaminated with residual amounts of these spent solvents, and is therefore assigned F003. None of these constituents were above the 90% upper confidence level. However, acetone was detected in 37 of the 38 samples, so headspace gas does support the evaluation.

Benzene, carbon disulfide, and toluene were used in laboratory operations. Light metals from laboratory operations may be contaminated with residual amounts of these spent solvents, and is therefore assigned F005. Headspace gas sampling (See Table 2) supports this evaluation with a concentration above the 90% upper confidence level for toluene.

Aqueous waste treatment operations in Buildings 374 and 774 treated spent stripping, cleaning, and plating solutions and sludges from Building 444 electroplating operations. Metals may be contaminated with residual amounts of the electroplating wastes, and therefore is assigned EPA Hazardous Waste Numbers F006, F007, and F009.



## Characterization Information Summary Report

Lot Number: INW296.001

SQAO Review: 

Date: 11-13-00

SPM Release: 

Date: 11-13-00

SQAO Signature indicates that the information presented in this package is consistent with analytical batch reports.

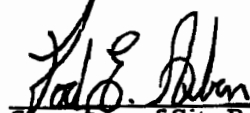
SPM Release concurrence with all information presented in this report

**Reconciliation with Data Quality Objectives**

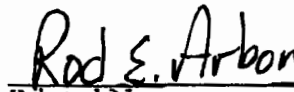
I certify by signature (below) that sufficient data have been collected to determine the following Program-required waste parameters:

Check	Reconciliation Parameter
✓	Waste Matrix Code as reported in WWIS.
✓	Waste Material Parameter Weights for individual containers as reported in WWIS.
✓	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
✓	The TRU activity reported in WWIS demonstrates that the waste is TRU waste and not low-level radioactive waste.
✓	The potential flammability of TRU waste headspace gases.
✓	Mean concentrations, upper 90% confidence limit ( $UCL_{90}$ ) values for the mean concentration standard deviations, and the number of samples collected for each VOC in the headspace gas of each container were calculated and compared with the program required quantitation limits, as reported in Waste Stream Characterization Summary Table 2, and additional EPA codes were assigned as required.
N/A	Mean concentrations, $UCL_{90}$ for the mean concentrations, standard deviations, number of samples collected for metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in Waste Stream Characterization Summary Table 3, and EPA codes were assigned as required.
N/A	Mean concentrations, $UCL_{90}$ for the mean concentrations, standard deviations, number of samples collected for total VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in Waste Stream Characterization Summary Table 4, and EPA codes were assigned as required.
N/A	Mean concentrations, $UCL_{90}$ for the mean concentrations, standard deviations, number of samples collected for total SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in Waste Stream Characterization Summary Table 5, and EPA codes were assigned as required.
✓	Waste stream evaluated to determine if it exhibits toxicity characteristic (TC) under 40 CFR Part 261, Subpart C and TC codes assigned as appropriate.
N/A	Sufficient number of samples were taken to meet statistical sampling requirements, as documented on Summary Data Report Table 1.
✓	Only validated data were used in the above calculations, as documented through the site data review and validation forms and process.
✓	Waste containers were selected randomly for sampling, as documented in site procedures.
✓	Sufficient number of waste containers have been visually examined to determine the $UCL_{90}$ for the misclassification rate is less than 14%.
✓	All TICs were appropriately identified and reported in accordance with the requirements of Section B3-1 of the WAP prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
✓	The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections B3-2 through B3-9 prior to submittal of a waste stream profile form for a waste stream or waste stream lot.
✓	The PRQLs for all analyses were met.

Check (✓) indicates that data are sufficient to determine the waste parameters and that the waste parameters have been reported in the listed document or database. NA indicates that parameter not applicable to the waste stream.



Signature of Site Project Manager



Printed Name

11-13-00  
Date

**Table 1. Solid sampling summary.**

<b>Determination of Number of Containers to Sample (S3000, S4000)</b>
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 <u>N/A</u>
Samples Randomly Selected from Waste Stream (yes/no)? <u>N/A</u>
Treatment of less-than-detectable measurements: <u>N/A</u>
Analytes that are listed as spent solvents and therefore are not included in the calculation to determine the number of containers to sample: <u>N/A</u>
Selected coefficient of variation and associated analyte: <u>N/A</u>
Total Calculated number of containers to sample: <u>N/A</u>
Attach preliminary estimates: <u>N/A</u>
<b>Sampling Results</b>
Samples Randomly Selected from Waste Stream (yes/no)? <u>N/A</u>
Analytes that are listed as spent solvents and therefore are not included in the UCL <sub>90</sub> Estimate calculation to determine the toxicity characteristic: <u>N/A</u>
Largest Coefficient of Variation and associated analyte: <u>N/A</u>
Comparison of largest coefficient of variation with coefficient of variation selected from Preliminary estimate <u>N/A</u>
Treatment of less-than-detectable measurements: <u>N/A</u>
Transformations applied to data and justification: <u>N/A</u>

**Table 2. Headspace gas summary data.**

Analyte	Number of samples	Number of samples above MDL <sup>a</sup>	Mean (ppmv)	Standard deviation (ppmv)	Maximum Concen. (ppmv)	Upper 90% confidence limit (ppmv)	PRQL (ppmv)	EPA Code
1,1,1-Trichloroethane	38	38	111	123	370	137	10	F001, F002
1,1,2,2-Tetrachloroethane	38	0	0.396	0.478	3.1	<sup>b</sup>	10	N/A
1,1,2-Trichloro-1,2,2-Trifluoroethane	38	7	5.11	29.1	180	21.0	10	F001, F002
1,1-Dichloroethane	38	14	1.01	2.15	5.9	1.78	10	N/A
1,1-Dichloroethylene	38	11	0.562	0.755	2.4	0.875	10	N/A
1,2,4-Trimethylbenzene	38	7	0.410	0.482	3.1	0.673	10	N/A
1,2-Dichloroethane	38	3	0.245	0.232	1.5	0.498	10	D028
1,3,5-Trimethylbenzene	38	8	0.323	0.375	1.8	0.511	10	N/A
Acetone	38	37	16.5	16.4	73	20.0	100	F003
Benzene	38	15	0.368	0.353	1.7	0.491	10	F005
Bromoform	38	0	0.245	0.292	1.9	<sup>b</sup>	10	N/A
Butanol	38	12	1.27	1.47	6.7	1.84	100	N/A
Carbon Tetrachloride	38	16	12.0	34.1	110	23.4	10	F001/F002
Chlorobenzene	38	0	0.261	0.356	2.3	<sup>b</sup>	10	N/A
Chloroform	38	23	2.63	6.07	20	4.31	10	N/A
Cis-1,2-Dichloroethylene	38	1	0.247	0.294	1.9	<sup>b</sup>	10	N/A
Cyclohexane	38	1	0.245	0.324	1.9	<sup>b</sup>	10	N/A
Ethyl Benzene	38	9	0.504	0.736	4.3	0.847	10	N/A
Ethyl Ether	38	0	0.447	0.435	2.8	<sup>b</sup>	10	N/A
Methanol	38	0	2.97	1.64	12	<sup>b</sup>	100	F005
Methyl Ethyl Ketone	38	30	3.77	3.83	17	4.68	100	N/A
Methyl Isobutyl Ketone	38	4	0.497	0.577	2.8	0.970	100	N/A
Methylene Chloride	38	12	0.899	1.50	8.5	1.49	10	F001/F002
Tetrachloroethylene	38	0	0.209	0.214	1.4	<sup>b</sup>	10	F001/F002
Toluene	38	37	24.3	27.5	120	30.3	10	F005
Trichloroethylene	38	26	12.9	20.1	66	18.1	10	F001, F002
m&p-Xylene	38	16	0.949	2.13	13	1.66	10	F003
o-Xylene	38	16	0.508	0.723	4	0.750	10	F003

Did the data verify the Acceptable Knowledge? Yes ☒ No ☐

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

- a. When a measurement is reported as below detection, one-half the analysis method detection limit (MDL) is used. Note that the MDL for a given analyte may vary from sample to sample.
- b. The mean and standard deviation presented are the mean and standard deviation of the method detection limits (after dividing by 2) since all measurements (or all but one) are below detection. Therefore, there are no degrees of freedom associated with the t statistic and the upper 90% confidence limit cannot be calculated.

**Table 2B.** Headspace gas summary data – tentatively identified compounds.

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
None	N/A	N/A	N/A
Did the Data verify the Acceptable Knowledge Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
If no, describe the basis for assigning the EPA Hazardous Waste Codes: N/A			

**Table 3. Metals summary data. – Not applicable to debris**

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>90</sub> (mg/kg)	RTL (mg/kg)	EPA Code <sup>a</sup> (D004-11)
Arsenic	N/A	N/A	N/A	N/A	100	N/A
Barium	N/A	N/A	N/A	N/A	2000	N/A
Cadmium	N/A	N/A	N/A	N/A	20	N/A
Chromium	N/A	N/A	N/A	N/A	100	N/A
Lead	N/A	N/A	N/A	N/A	100	N/A
Mercury	N/A	N/A	N/A	N/A	4	N/A
Selenium	N/A	N/A	N/A	N/A	20	N/A
Silver	N/A	N/A	N/A	N/A	100	N/A
Antimony	N/A	N/A	N/A	N/A	N/A	N/A
Beryllium	N/A	N/A	N/A	N/A	N/A	N/A
Nickel	N/A	N/A	N/A	N/A	N/A	N/A
Thalium	N/A	N/A	N/A	N/A	N/A	N/A
Vanadium	N/A	N/A	N/A	N/A	N/A	N/A
Zinc	N/A	N/A	N/A	N/A	N/A	N/A

Did the data verify the Acceptable Knowledge? Yes N/A No       

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

**NOTES:**<sup>a</sup> No entry indicates no associated EPA Code assigned to the waste stream.

**Table 4A.** Total VOC summary data. – Not applicable to debris

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>95</sub> (mg/kg)	RTL (mg/kg)	EPA Code <sup>a</sup> (D018-40,43)
1,1-Dichloroethylene	N/A	N/A	N/A	N/A	14	N/A
1,2-Dichloroethane	N/A	N/A	N/A	N/A	10	N/A
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	150	N/A
Benzene	N/A	N/A	N/A	N/A	10	N/A
Carbon Tetrachloride	N/A	N/A	N/A	N/A	10	N/A
Methyl ethyl ketone	N/A	N/A	N/A	N/A	2000	N/A
Chloroform	N/A	N/A	N/A	N/A	120	N/A
Chlorobenzene	N/A	N/A	N/A	N/A	4000	N/A
Pyridine	N/A	N/A	N/A	N/A	100	N/A
Tetrachloroethylene	N/A	N/A	N/A	N/A	14	N/A
Trichloroethylene	N/A	N/A	N/A	N/A	10	N/A
Vinyl chloride	N/A	N/A	N/A	N/A	4	N/A

ANALYTE	# Samples	Mean (mg/kg)
1,1,1-Trichloroethane	N/A	N/A
1,1,2-Trichloro-1,2,2-Trifluoroethane	N/A	N/A
1,1,2-Trichloroethane	N/A	N/A
Acetone	N/A	N/A
Butanol	N/A	N/A
Carbon disulfide	N/A	N/A
Ethyl benzene	N/A	N/A
Ethyl ether	N/A	N/A
m-Xylene	N/A	N/A
Methanol	N/A	N/A
Methylene chloride	N/A	N/A
o-Xylene	N/A	N/A
Ortho-Dichlorobenzene	N/A	N/A
p-Xylene	N/A	N/A
Toluene	N/A	N/A
Butanol	N/A	N/A
Ethyl ether	N/A	N/A
Formaldehyde	N/A	N/A
Hydrazine	N/A	N/A
Isobutanol	N/A	N/A
Methanol	N/A	N/A

<sup>a</sup> No entry indicates no associated EPA Code assigned to the waste stream.

**Table 4A. (continued)**

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>90</sub> (mg/kg)	PRQL (mg/kg)	EPA Code <sup>a</sup> (F001-5)
Benzene	N/A	N/A	N/A	N/A	10	N/A
Carbon tetrachloride	N/A	N/A	N/A	N/A	10	N/A
Methyl ethyl ketone	N/A	N/A	N/A	N/A	100	N/A
Chlorobenzene	N/A	N/A	N/A	N/A	10	N/A
Pyridine	N/A	N/A	N/A	N/A	100	N/A
Tetrachloroethylene	N/A	N/A	N/A	N/A	10	N/A
Trichloroethylene	N/A	N/A	N/A	N/A	10	N/A
1,1,1-Trichloroethane	N/A	N/A	N/A	N/A	10	N/A
1,1,2-Trichloro-1,2,2-Trifluoroethane	N/A	N/A	N/A	N/A	10	N/A
1,1,2-Trichloroethane	N/A	N/A	N/A	N/A	10	N/A
Acetone	N/A	N/A	N/A	N/A	100	N/A
Butanol	N/A	N/A	N/A	N/A	100	N/A
Carbon disulfide	N/A	N/A	N/A	N/A	10	N/A
Ethyl benzene	N/A	N/A	N/A	N/A	10	N/A
Ethyl ether	N/A	N/A	N/A	N/A	100	N/A
m-Xylene	N/A	N/A	N/A	N/A	10	N/A
Methanol	N/A	N/A	N/A	N/A	100	N/A
Methylene chloride	N/A	N/A	N/A	N/A	10	N/A
o-Xylene	N/A	N/A	N/A	N/A	10	N/A
Ortho-Dichlorobenzene	N/A	N/A	N/A	N/A	10	N/A
p-Xylene	N/A	N/A	N/A	N/A	10	N/A
Toluene	N/A	N/A	N/A	N/A	10	N/A

Did the data verify the Acceptable Knowledge? Yes N/A No         If no, describe the basis for assigning the EPA Hazardous Waste Codes. N/A**NOTES:**<sup>a</sup> No entry indicates no associated EPA Code assigned to the waste stream.



**Table 4B.** Total VOC summary data – tentatively identified compounds. – Not applicable for debris

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
Did the Data verify the Acceptable Knowledge Yes <u>      N/A      </u> No <u>      </u>		
If no, describe the basis for assigning the EPA Hazardous Waste Codes: N/A		

**Table 5A. Total SVOC summary data. – Not applicable for debris**

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>90</sub> (mg/kg)	RTL (mg/kg)	EPA Code <sup>a</sup> (D027-38)
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	150	N/A
2,4-Dinitrotoluene	N/A	N/A	N/A	N/A	2.6	N/A
Cresols	N/A	N/A	N/A	N/A	4000	N/A
Hexachlorobenzene	N/A	N/A	N/A	N/A	2.6	N/A
Hexachloroethane	N/A	N/A	N/A	N/A	60	N/A
Nitrobenzene	N/A	N/A	N/A	N/A	40	N/A
Pentachlorophenol	N/A	N/A	N/A	N/A	2000	N/A
Pyridine	N/A	N/A	N/A	N/A	100	N/A

ANALYTE	# Samples	Mean (mg/kg)
2,4-Dinitrophenol	N/A	N/A
Aroclor 1016	N/A	N/A
Aroclor 1221	N/A	N/A
Aroclor 1232	N/A	N/A
Aroclor 1242	N/A	N/A
Aroclor 1248	N/A	N/A
Aroclor 1254	N/A	N/A
Aroclor 1260	N/A	N/A
Ortho-Dichlorobenzene	N/A	N/A

ANALYTE	# Samples	Mean (mg/kg)	SD (mg/kg)	UCL <sub>90</sub> (mg/kg)	PRQL (mg/kg)	EPA Code <sup>a</sup> (F004)
Cresols	N/A	N/A	N/A	N/A	40	N/A
Nitrobenzene	N/A	N/A	N/A	N/A	40	N/A

Did the data verify the Acceptable Knowledge? Yes N/A No         If no, describe the basis for assigning the EPA Hazardous Waste Codes. N/A**NOTES:**<sup>a</sup> No entry indicates no associated EPA Code assigned to the waste stream.

**Table 5B.** Total SVOC Summary data – tentatively identified compounds. – Not applicable for debris.

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
Did the Data verify the Acceptable Knowledge Yes <u>      N/A      </u> No <u>      </u>		
If no, describe the basis for assigning the EPA Hazardous Waste Codes: N/A		

**Table 6.** Correlation of container identification numbers to data package.

Container Number	Barcode	Headspace Gas Data Package <sup>(a)</sup>	RTR Data Package	RA Data Package	Visual Examination Data Package	PRF Headspace Gas Sampling Data Package
IDRF000231112	029703	ECL00013	RTR000022	SAS000017	N/A	PRF000010
IDRF000232648	029653	ECL00070	RTR000016	SAS000010	N/A	PRF000052
IDRF000234035	029644	ECL00070	RTR000016	SAS000010	N/A	PRF000052
IDRF000234294	031194	ECL00013	RTR000022	SAS000017	N/A	PRF000010
IDRF000234441	026677	ECL00013	RTR000021	SAS000015	N/A	PRF000010
IDRF000234639	030260	ECL00011	RTR000016	SAS000010	N/A	PRF000007
IDRF000234647	026709	ECL00013	RTR000021	SAS000015	N/A	PRF000010
IDRF000234649	029545	ECL00016	RTR000018	SAS000014	N/A	PRF000011
IDRF000234743	030229	ECL00070	RTR000022	SAS000017	N/A	PRF000052
IDRF000235130	022208	ECL00070	RTR000011	SAS000003	N/A	PRF000052
IDRF000236298	027984	ECL00007	RTR000010	SAS000001	N/A	PRF000004
IDRF000236618	027279	ECL00070	RTR000010	SAS000001	N/A	PRF000052
IDRF000236624	025504	ECL00070	RTR000013	SAS000008	N/A	PRF000052
IDRF000237259	027800	ECL00010	RTR000011	SAS000003	N/A	PRF000006
IDRF000240265	032883	ECL00070	RTR000011	SAS000002	N/A	PRF000052
IDRF000300533	025569	ECL00011	RTR000013	SAS000007	N/A	PRF000007
IDRF000904487	027107	ECL00013	RTR000021	SAS000015	N/A	PRF000010
IDRF001211271	031837	ECL00070	RTR000014	SAS000008	N/A	PRF000052
IDRF001600002	029698	ECL00011	RTR000016	SAS000010	N/A	PRF000007
IDRF001901522	028030	ECL00070	RTR000014	SAS000008	N/A	PRF000052
IDRF002100040	027813	ECL00010	RTR000013	SAS000007	N/A	PRF000006
IDRF002201310	031888	ECL00070	RTR000011	SAS000002	N/A	PRF000052
IDRF002301589	022875	ECL00010	RTR000014	SAS000008	N/A	PRF000006
IDRF002301651	031844	ECL00010	RTR000011	SAS000003	N/A	PRF000006
IDRF002301688	032616	ECL00070	RTR000010	SAS000001	N/A	PRF000052
IDRF002800435	021875	ECL00010	RTR000011	SAS000005	N/A	PRF000006
IDRF002900385	027588	ECL00010	RTR000014	SAS000008	N/A	PRF000006
IDRF003000051	020842	ECL00007	RTR000010	SAS000001	N/A	PRF000004
IDRF003100657	027798	ECL00010	RTR000013	SAS000007	N/A	PRF000006
IDRF003100920	032452	ECL00010	RTR000013	SAS000007	N/A	PRF000006
IDRF003100985	032726	ECL00007	RTR000010	SAS000001	N/A	PRF000004
IDRF003101049	030202	ECL00070	RTR000022	SAS000017	N/A	PRF000052
IDRF003101074	029692	ECL00013	RTR000019	SAS000013	N/A	PRF000010
IDRF003702117	025501	ECL00013	RTR000018	SAS000015	N/A	PRF000010
IDRF003702246	021684	ECL00070	RTR000010	SAS000002	N/A	PRF000052
IDRF004500462	024714	ECL00011	RTR000014	SAS000008	N/A	PRF000007
IDRF004800045	023687	ECL00010	RTR000010	SAS000001	N/A	PRF000006
IDRF005400258	029726	ECL00070	RTR000016	SAS000010	N/A	PRF000052

a. An ECL Gas Data Package is composed of three separate reports. For example, ECL00013 contains ECL00013M, ECL00013G, and ECL00013C.

**Table 7. RTR/VE Summary of Prohibited Items and AK Confirmation**

Container Number	Barcode	RTR Prohibited Items <sup>a</sup>	Visual Examination Prohibited Items <sup>a</sup>	AK Confirmation <sup>b</sup>
IDRF000231112	029703	None	N/A	Complete
IDRF000232648	029653	None	N/A	Complete
IDRF000234035	029644	None	N/A	Complete
IDRF000234294	031194	None	N/A	Complete
IDRF000234441	026677	None	N/A	Complete
IDRF000234639	030260	None	N/A	Complete
IDRF000234647	026709	None	N/A	Complete
IDRF000234649	029545	None	N/A	Complete
IDRF000234743	030229	None	N/A	Complete
IDRF000235130	022208	None	N/A	Complete
IDRF000236298	027984	None	N/A	Complete
IDRF000236618	027279	None	N/A	Complete
IDRF000236624	025504	None	N/A	Complete
IDRF000237259	027800	None	N/A	Complete
IDRF000240265	032883	None	N/A	Complete
IDRF000300533	025569	None	N/A	Complete
IDRF000904487	027107	None	N/A	Complete
IDRF001211271	031837	None	N/A	Complete
IDRF001600002	029698	None	N/A	Complete
IDRF001901522	028030	None	N/A	Complete
IDRF002100040	027813	None	N/A	Complete
IDRF002201310	031888	None	N/A	Complete
IDRF002301589	022875	None	N/A	Complete
IDRF002301651	031844	None	N/A	Complete
IDRF002301688	032616	None	N/A	Complete
IDRF002800435	021875	None	N/A	Complete
IDRF002900385	027588	None	N/A	Complete
IDRF003000051	020842	None	N/A	Complete
IDRF003100657	027798	None	N/A	Complete
IDRF003100920	032452	None	N/A	Complete
IDRF003100985	032726	None	N/A	Complete
IDRF003101049	030202	None	N/A	Complete
IDRF003101074	029692	None	N/A	Complete
IDRF003702117	025501	None	N/A	Complete
IDRF003702246	021684	None	N/A	Complete
IDRF004500462	024714	None	N/A	Complete
IDRF004800045	023687	None	N/A	Complete
IDRF005400258	029726	None	N/A	Complete

- a. See Table 6 for the associated RTR and Visual examinations. None of the listed drums contains prohibited items.
- b. Acceptable Knowledge confirmations are conducted using checklist SPO-RTR-VER-1. This checklist can be accessed through the batch listed in Table 6.

**Table 8.** Sample identification number cross-correlation table.

Container Number	Headspace Gas Sample Number	Solidified Sample Number(s)
IDRF000231112	ID050900EI202	N/A
IDRF000232648	ID092900EI583	N/A
IDRF000234035	ID092900EI438	N/A
IDRF000234294	ID050900EI432	N/A
IDRF000234441	ID050900EI200	N/A
IDRF000234639	ID042500EI458	N/A
IDRF000234647	ID050900EI170	N/A
IDRF000234649	ID052300EI003	N/A
IDRF000234743	ID092900EI444	N/A
IDRF000235130	ID092900EI430	N/A
IDRF000236298	ID032700EI486	N/A
IDRF000236618	ID092900EI443	N/A
IDRF000236624	ID092900EI416	N/A
IDRF000237259	ID041800EI333	N/A
IDRF000240265	ID092900EI410	N/A
IDRF000300533	ID042500EI470	N/A
IDRF000904487	ID050900EI087	N/A
IDRF001211271	ID092900EI440	N/A
IDRF001600002	ID042500EI208	N/A
IDRF001901522	ID092900EI445	N/A
IDRF002100040	ID041800EI766	N/A
IDRF002201310	ID092900EI453	N/A
IDRF002301589	ID041800EI300	N/A
IDRF002301651	ID041800EI327	N/A
IDRF002301688	ID032700EI592	N/A
IDRF002800435	ID041800EI188	N/A
IDRF002900385	ID041800EI345	N/A
IDRF003000051	ID032700EI910	N/A
IDRF003100657	ID041800EI229	N/A
IDRF003100920	ID041800EI870	N/A
IDRF003100985	ID032700EI829	N/A
IDRF003101049	ID092900EI414	N/A
IDRF003101074	ID050900EI215	N/A
IDRF003702117	ID050900EI936	N/A
IDRF003702246	ID092900EI409	N/A
IDRF004500462	ID042500EI336	N/A
IDRF004800045	ID041800EI009	N/A
IDRF005400258	ID092900EI434	N/A