Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
MAR 2 3 2011

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Review of Central Characterization Project – Hanford Site Waste Stream Profile Form Number, RLM325D.001, Hanford 325 Building Radiochemistry Laboratory Contact-Handled Transuranic Debris Waste

Dear Mr. Bearzi:

The Department of Energy Carlsbad Field Office has approved the Waste Stream Profile Form, RLM325D.001, Hanford 325 Building Radiochemistry Laboratory Contact-Handled Transuranic Debris Waste.

Enclosed is a copy of the form as required by Section C-5a of the WIPP Hazardous Waste Facility Permit No. NM4890139088-TSDF.

If you have questions on this matter, please contact J. R. Stroble at (575) 234-7313.

Sincerely,

Edward Ziemianski
Acting Manager

Enclosure

cc: w/enclosure
S. Zappe, NMED *ED

cc: w/o enclosure
J. Kieling, NMED ED
J. R. Stroble, CBFO ED
N. Castaneda, CBFO ED
C. Fesmire, CBFO ED
G. Basabilvazo, CBFO ED
S. McCauslin, CBFO ED
K. Watson, CBFO ED
D. Toft, CTAC ED
P. Gilbert, LANL ED
G. Lyshik, LANL ED
C. Walker, TechLaw ED
CBFO, M&RC
*ED denotes electronic distribution

CBFO:NTP:JRS:GS:11-0218:UFC 5822.00

110333

bcc: w/enclosure

J. Pederson-Campbell, WTS	*ED
R. Chatfield, WTS	ED
R. Chavez, WTS	ED
D. Cook, WTS	ED
D. Dewey, WTS	ED
R. Galbraith, WTS	ED
K. Guillermo, WTS	ED
D. Haar, WTS	ED
D. Hofer, WTS	ED
S. Jones, WTS	ED
R. Josey, WTS	ED
R. Kehrman, WTS	ED
S. Kouba, WTS	ED
D. Kump, WTS	ED
W. Most, WTS	ED
M. Pearcy, WTS	ED
D. K. Ploetz, WTS	ED
F. Romo, WTS	ED
M. Sensibaugh, WTS	ED
M. Sharif, WTS	ED
D. Speed, WTS	ED
D. Standiford, WTS	ED
M. Strum, WTS	ED
A. Johnson, WTS	ED
B. Nieman, WTS	ED
K. Urquidez, WTS	ED
M. Walentine, WTS	ED
D. Guevara, WTS RCRA Chronology	ED

*ED denotes electronic distribution

Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: RLM325D.001							
(2) Generator site name: Hanford Site						(4)Technical contact: Veronica Waldram	
(3) Generator site EPA ID: WA7890008967						(6) Technical contact phone number: (575) 234-7187	
(5) Date of audit report approval by New Mexico Environment Department (NMED): September 2, 2010							
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Rev. 19, December 29, 2010 CCP-PO-002, CCP Transuranic Waste Certification Plan, Rev. 25, December 29, 2010 CCP-PO-011, CCP/CH2M HILL Plateau Remediation Company Interface Document, Rev.3, October 05, 2010							
(8) Did your facility generate this waste?	YES	X	NO				
(9) If no, provide the name and EPA ID of the original generator: NA							
Waste Stream Information[1]							
(10) WIPP ID: RL325-01						(11) Summary Category Group: S5000	
(12) Waste Matrix Code Group: Heterogeneous Debris Waste						(13) Waste Stream Name: Hanford 325 Building Radiochemistry Laboratory Contact-Handled Transuranic Debris Waste	
(14) Description from the TWBIR: RLM325D waste stream is a debris waste stream containing waste materials associated with the 325 Bldg. laboratory operations, sample analysis, facility cleanout, and facility waste treatment. Operations waste includes any discarded item used in laboratory analysis (e.g., glass beakers, tweezers, latex gloves, plastic tape, glass pipettes) and facility cleanout (e.g., glassware, wipes, and equipment). Maintenance waste may include filters, wipes, and various types of gloves. Small amounts of solid sample residues (unused samples) generated during lab operations are present in the waste.							
(15) Defense TRU Waste:	YES	X	NO				
(16) Check One:	CH	X	RH				
(17) Number of SWBs: 6	(18) Number of Drums: 801 55-gallon drums					(19) Number of Canisters NA	
(20) Batch Data Report numbers supporting this waste stream characterization: See Characterization Information Summary (CIS) Correlation of Container Identification Numbers to Batch Data Report Numbers							
(21) List applicable EPA Hazardous Waste Numbers:[2] D004, D005, D006, D007, D008, D009, D010, D011, D022, D027, D028, D029, D030, D034, D037, D043, F001, F002, F004, and F005							
(22) Applicable TRUCON Content Numbers: RH125/225							
(23)**Acceptable Knowledge Information**[1]							
(For the following, enter the supporting documentation used [i.e., references and dates])							
Required Program Information							
(23A) Map of site: CCP-AK-RL-102, Revision 1, January 19, 2011, Figures 1, 2, and 3							
(23B) Facility mission description: CCP-AK-RL-102, Revision 1, January 19, 2011, Sections 2.0 and 4.2							
(23C) Description of operations that generate waste: CCP-AK-RL-102, Revision 1, January 19, 2011, Sections 4.4 and 5.3							
(23D) Waste identification/categorization schemes: CCP-AK-RL-102, Revision 1, January 19, 2011, Section 4.5							
(23E) Types and quantities of waste generated: CCP-AK-RL-102, Revision 1, January 19, 2011, Sections 5.2, and 5.4							
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-RL-102, Revision 1, January 19, 2011Section 4.6.1							
(24) Waste certification procedures: CCP-TP-030, CCP TRU Waste Certification and WWIS/WDS Data Entry, Revision 28, May 12, 2010							

Attachment 2 – CCP Waste Stream Profile Form (Continued)

(25)Required Waste Stream Information			
(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-RL-102, Revision 1, January 19, 2011 Sections 4.4 and 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-RL-102, Revision 1, January 19, 2011, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-RL-102, Revision 1, January 19, 2011, Section 4.4 and 5.3			
(25D) Waste Process flow diagrams: CCP-AK-RL-102, Revision 1, January 19, 2011, Figures 5 and 6			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-RL-102, Revision 1, January 19, 2011, Section 5.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See Table 2 of the Summation of Aspects of AK Summary Report: RLM325D.001			
(26) Which Defense Activity generated the waste[3]: (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	X	Defense nuclear material production
	Defense nuclear waste and materials security and safeguards and security investigations		
(27)Supplemental Documentation			
(27A) Process design documents: NA			
(27B) Standard operating procedures: See S2 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: See S4 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27E) Test plans/research project reports: See S5 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27F) Site databases: NA			
(27G) Information from site personnel: See S7 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: See S8 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27I) Previous analytical data: See S9 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: See S10 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
(27K) Sampling and analysis data from comparable/surrogate Waste: NA			
(27L) Laboratory notebooks: See S11 AK# on Attachment 1 to Summation of Aspects of AK Summary Report			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP-TP-053, Revision 9, September 30, 2010		
(29)	Visual Examination: NA		

CHARACTERIZATION INFORMATION SUMMARY

WSPF # RLM325D.001

Lot 1

TABLE OF CONTENTS

Attachment 2 – CCP Waste Stream Profile Form (Continued)

(30)Comments:

For a list of the waste characterization procedures used and date of the respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: YES [X] **Date:** 2-10-2011

Reviewed by STR (If necessary): YES [X] N/A [ ] **Date:** 2-10-2011

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.

(31) Veronica Waldram	(32) Veronica Waldram	(33) 2-10-2011
Signature of Site Project Manager	Printed Name	Date

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

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

(3) This waste was also generated by the following defense activities: defense nuclear waste and materials by-products management, defense research and development

CC[illegible]haracterization Information Summary Cove[illegible]e

Waste Stream # RLM325D.001 Lot #: 1

AK Expert Review: N/A Date: N/A

SPM Review: Veronica Waldram Veronica Waldram Date: 2/10/2011

SPM signature certifies that through Acceptable Knowledge testing and/or analysis that the waste identified in this summary is not corrosive, ignitable, reactive, or incompatible with the TSDF.

A summary of the Acceptable Knowledge regarding this waste stream containing specific information about the corrosivity, reactivity, and ignitability of the waste stream is included as an attachment to the Waste Stream Profile Form. By reference, that information is included in this lot.

List of procedures used:

Radiography (RTR/NDE):

CCP-TP-053	Rev. 7	10/21/09	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 8	06/30/10	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 9	09/30/10	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Non Destructive Assay (NDA):

CCP-TP-070	Rev. 0	01/11/10	CCP Gamma Energy Assay (GEA) Calibration, Confirmation, and Verification Procedure
CCP-TP-071	Rev. 0	01/11/10	CCP Gamma Energy Assay (GEA) Operating Procedure
CCP-TP-072	Rev. 0	01/12/10	CCP Gamma Energy Assay (GEA) Data Review, Validation, and Reporting Procedure
CCP-TP-072	Rev. 1	01/28/11	CCP Gamma Energy Assay (GEA) Data Review, Validation, and Reporting Procedure

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-093	Rev. 14	12/29/10	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 6	07/12/07	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-106	Rev. 7	12/29/10	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-173	Rev. 1	09/30/09	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 0	05/02/07	CCP Analysis of Gas Samples for VOCs by GC/MS
CCP-TP-175	Rev. 1	03/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS
CCP-TP-175	Rev. 2	12/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS

Project Level Data Validation / DQO Reconciliation:

CCP-TP-001	Rev. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/10	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/10	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 21	06/04/09	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/30/10	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/10	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 17	11/09/09	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-003	Rev. 18	12/29/10	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 18	11/16/06	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/10	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 27	12/14/09	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 28	05/12/10	CCP CH TRU Waste Certification and WWIS/WDS Data Entry

WAP Certification:

CCP-PO-001	Rev. 17	06/23/09	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/30/10	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/10	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 22	01/12/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 23	04/07/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 24	06/30/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 25	12/29/10	CCP Transuranic Waste Certification Plan
CCP-PO-011	Rev. 0	07/22/09	CCP/CH2M Hill Plateau Remediation Company Interface Document
CCP-PO-011	Rev. 1	12/22/09	CCP/CH2M Hill Plateau Remediation Company Interface Document
CCP-PO-011	Rev. 2	07/27/10	CCP/CH2M Hill Plateau Remediation Company Interface Document
CCP-PO-011	Rev. 3	10/05/10	CCP/CH2M Hill Plateau Remediation Company Interface Document

CIS 002

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # RLM325D.001 1

Container ID Number	NDA BDR	RTR BDR	VE BDR	Solids Sampling BDR	Solids Analytical BDR	Load Management/ Overpack Yes	Headspace Gas BDR		
							Sample	Analysis	
RL0058321	RLGEAA0052	RLRTRB0055	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G
RL0058335	RLGEAB0050	RLRTRB0055	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G
RL0058400	RLGEAA0052	RLRTRA0069	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G
RL0061229	RLGEAA0052	RLRTRB0055	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G
RL0061230	RLGEAB0050	RLRTRB0055	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G
RL0061244	RLGEAB0050	RLRTRB0055	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G
RL0061320	RLGEAA0052	RLRTRA0069	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G
RL0062956	RLGEAB0050	RLRTRA0069	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G
RL0063038	RLGEAA0052	RLRTRB0055	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G
RL0063082	RLGEAB0050	RLRTRB0055	NA	NA	NA		RLHSGS100004	ECL10020M	ECL10020G

Veronica Waldram

Signature of Site Project Manager

Veronica Waldram — Printed Name

2/10/2011 — Date

GTS03

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: RLM325D.001 **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Benzene	Log	4	10	1.22	-1.34	1.70	-0.60	10	2.30		
Bromoform	Log	0	10	0.14	-3.35	1.45	-2.72	10	2.30		
Carbon tetrachloride	Log	3	10	5.70	-2.05	3.16	-0.67	10	2.30		
Chlorobenzene	Log	0	10	0.53	-2.94	1.44	-2.31	10	2.30		
Chloroform	Log	6	10	1.87	-1.64	2.10	-0.72	10	2.30		
Cyclohexane[a]	Log	0	10	1.12	-2.37	1.45	-1.73	10	2.30		
1,1-Dichloroethane	Log	3	10	1.06	-2.07	1.45	-1.44	10	2.30		
1,2-Dichloroethane	Log	3	10	0.97	-2.11	1.48	-1.46	10	2.30		
1,1-Dichloroethylene	Log	0	10	1.06	-2.42	1.45	-1.79	10	2.30		
cis-1,2-Dichloroethylene	Log	0	10	0.67	-2.81	1.45	-2.18	10	2.30		
trans-1,2-Dichloroethylene	Log	0	10	1.34	-2.15	1.45	-1.52	10	2.30		
Ethyl benzene	Log	4	10	1.74	-2.15	1.64	-1.43	10	2.30		
Ethyl ether	Log	0	10	1.37	-2.11	1.45	-1.48	10	2.30		
Methylene chloride	Log	3	10	1.01	-2.02	1.36	-1.43	10	2.30		
1,1,2,2-Tetrachloroethane	Log	0	10	0.18	-3.32	1.45	-2.69	10	2.30		
Tetrachloroethylene	Log	8	10	3.71	-0.37	2.25	0.62	10	2.30		
Toluene	Log	7	10	0.69	-1.20	1.04	-0.74	10	2.30		
1,1,1-Trichloroethane	Log	7	10	2.23	-1.74	2.26	-0.76	10	2.30		
Trichloroethylene	Log	2	10	0.77	-2.36	1.56	-1.68	10	2.30		
Trichlorofluoromethane[2]	Log	0	10	0.64	-2.86	1.45	-2.22	10	2.30		
1,1,2-Trichloro-1,2,2-trifluoroethane	Log	0	10	0.26	-3.24	1.45	-2.60	10	2.30		
1,2,4-Trimethylbenzene[a]	Log	0	10	0.88	-2.61	1.45	-1.98	10	2.30		
1,3,5-Trimethylbenzene[a]	Log	0	10	0.96	-2.53	1.45	-1.90	10	2.30		
m,p-Xylene[b]	Log	4	10	2.71	-2.33	1.99	-1.46	10	2.30		
o-Xylene	Log	1	10	0.74	-2.66	1.41	-2.04	100	4.61		
Acetone	Log	6	10	3.76	0.90	1.90	1.73	100	4.61		
Butanol	Log	4	10	1.69	-0.59	1.72	0.16	100	4.61		
Methanol	No	0	10	7.50	7.50	0.00	7.50	100	N/A		
Methyl ethyl ketone	Log	4	10	1.95	-0.22	1.69	0.52	100	4.61		

CIS004

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: RLM325D.001 **Waste Stream Headspace Gas Lot Number** 1 through 1

ANALYTE	Transform Data Used (No, Data-Log, SQRT, other)	# Samples above MDL (1)	# Samples	Maximum (ppmv)	Mean (ppmv)	SD (ppmv)	UCL_{90} (ppmv)	PRQL (ppmv)	Transformed PRQL (N/A or Value)	UCL_{90} > PRQL Yes	EPA Hazardous Waste Number
Methyl isobutyl ketone	Log	5	10	0.99	-1.76	1.20	-1.24	10	2.30		
Chloromethane[2]	Log	5	10	0.97	-1.23	1.36	-0.64	10	2.30		
Carbon Disulfide[2]	Log	7	10	1.44	-1.00	0.97	-0.58	10	2.30		
1,2-Dichloropropane[2]	Log	0	10	0.69	-2.79	1.44	-2.15	10	2.30		
Formaldehyde[c]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrazine[d]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a] These compounds are from the TRAMPAC and are flammable VOCs that do not appear in the QAPjP or the WIPP WAP. These are not part of the target analyte list, but samples may be analyzed for these compounds.

[b] These xylene isomers cannot be resolved by the analytical methods employed in the program. m-Xylene and p-Xylene will be reported as "Total m-p-Xylene."

[c] Required only for homogenous solids and soil/gravel waste from Savannah River Site.

[d] Required only for homogenous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site.

CTS005

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section C4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

(2) The noted analytes are not included in the target analyte list Table C3-2 of HWFP Attachment C3. The analytes are reported in the analysis Batch Data Report provided by the Idaho lab and included on the UCL_{90} for completeness.

Veronica Waldram
Signature of Site Project Manager

Veronica Waldram
Printed Name

2/10/2011
Date

CC Headspace Gas Summary Da

Waste Stream Number RLM325D.001 Lot Number (s) 1

Tentatively Identified Compound	Maximum Observed Estimated Concentrations (ppmv)	# Samples Containing TIC	% Detected
None	NA	NA	NA

Data Supports EPA Hazardous Waste Numbers Assigned by AK? ☑ Yes ☐ No

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

SPM Signature Veronica Waldham Date 2/10/2011

CIS Ode

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: RLM325D.001 Lot(s)#: 1

Container Number	RTR Prohibited Items [a]	Visual Examination Prohibited Items [a]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	RTR Data confirm that none of the containers in this lot contain any prohibited items.	None of the containers in this lot were processed through VE.

a. See Batch Data Reports

b. If AK has assigned U134 to this waste stream, then any liquids in these containers are prohibited items (not acceptable by the TSDF).

Justification for the selection of RTR and/or VE: RTR was selected as the characterization method for this lot because the waste containers were previously packaged and RTR is an acceptable characterization method to meet all the Data Quality Objectives for NDE of waste stream RLM325D.001.

Veronica Waldram — Site Project Manager Signature

Veronica Waldram — Printed Name

2/10/2011 — Date

CIS 007

CCP Reconciliation with Data Quality Objectives

WSF# RLM325D.001 Lot # 1

Sampling Completeness

RTR:

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is 100%)

HSG

Number of Valid Samples: 10 Number of Total Samples Collected: 10
Percent Complete: 100 (QAO is ≥90%)
Number of Valid Samples: 10 Number of Total Samples Analyzed: 10
Percent Complete: 100 (QAO is ≥90%)

Total VOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total SVOC

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

Total Metals

Number of Valid Samples: NA Number of Total Samples Collected: NA
Percent Complete: NA (QAO is ≥90%)
Number of Valid Samples: NA Number of Total Samples Analyzed: NA
Percent Complete: NA (QAO is ≥90%)

CCP Reconciliation with Data Quality Objectives

WSF# RLM325D.001 Lot # 1

	Y/N/NA	Reconciliation Parameter
1	Y	Waste Matrix Code.
2	Y	Waste Material Parameter Weights.
3	Y	The waste matrix code identified is consistent with the type of sampling and analysis used to characterize the waste.
4	Y	The TRU activity reported in the BDRs for each container demonstrates with a 95% probability that the container of waste contains TRU radioactive waste.
5	N	AK Sufficiency. Is there an approved AK sufficiency Determination for this waste stream?
6	Y	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for each VOC in the HSG of each container were calculated and compared with the program required quantitation limits, as reported in CCP-TP-003 Attachment 3, and additional U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers were assigned as required. Samples were randomly collected (when appropriate).
7a	NA	Mean concentrations, UCL_{90} values for the mean concentration, standard deviations, and the number of samples collected for solids VOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 4, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7b	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for solids SVOCs were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 5, and additional EPA HWNs were assigned as required. Samples were randomly collected.
7c	NA	Mean concentrations, (UCL_{90}) values for the mean concentration, standard deviations, and the number of samples collected for total metals were calculated and compared with the program required quantitation limits and regulatory thresholds, as reported in the Characterization Information Summary, CCP-TP-003 Attachment 6, and additional EPA HWNs were assigned as required. Samples were randomly collected.

CCP Reconciliation with Data Quality Objectives

WSF# RLM325D.001 Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 CFR 261, Identification and Listing of Hazardous Waste, Subpart C, Characteristics of Hazardous Waste.
9	Y	Does the waste stream contain listed waste found in 20.4.1.200 NMAC incorporating 40 CFR Part 261, Subpart D, Lists of Hazardous Wastes.
10	Y	Waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level.
11	Y	Appropriate packaging configuration and Drum Age Criteria (DAC) is applied and documented in the headspace gas sampling documentation, and the drum age met prior to sampling.
12	Y	TICs were appropriately identified and reported in accordance with the requirements of Section C3-1 of the QAPjP.
13	Y	The PRQLs for headspace gas VOCs were met for all analyses as evidenced by the analytical batch data reports.
14		The overall completeness, comparability, and representativeness QAOs were met for each of the analytical and testing procedures as specified in the WAP Sections C3-2 through C3-9 prior to submittal of a waste stream profile form for a waste steam or waste stream lot.

	Completeness	Comparability	Representativeness
Radiography	Y	Y	Y
VE	NA	NA	NA
Headspace Gas Analysis	Y	Y	Y
Solids Sampling	NA	NA	NA
Solids VOCs	NA	NA	NA
Solids SVOCs	NA	NA	NA
Solids Metals	NA	NA	NA

Comments: NONE

Veronica Waldram
Signature of Site Project Manager

Veronica Waldram
Printed Name

2/10/2011
Date

CIS 010

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: RLM325D.001

Overview:

The RLM325D.001 waste stream consists of TRU contact-handled (CH) mixed heterogeneous debris resulting from the 325 Building Radiochemistry Processing Laboratory. The 325 laboratory supports of a wide variety of Hanford Site operations, consisting of laboratory examinations and studies, analyses of fuel reactor samples, and characterization of the chemical and physical properties of tank wastes and immobilized forms of plutonium. Initial 325 Building processes included production and process improvement support for the Reduction Oxidation Facility (REDOX) and uranium metal recovery operations. Actinide separation studies were conducted to develop techniques to reduce activity in high-level waste prior to disposal. Other processes included production of radioactive lanthanum, temporary technical support to the bismuth phosphate process, support studies for tritium production, and basic investigations of plutonium chemistry. The 325 Building processes also included support to the Plutonium-Uranium Extraction Plant (PUREX), the Recovery of Uranium and Plutonium by Extraction Facility (RECUPLEX), and Plutonium Recovery Facility (PRF) production processes. Waste stream RLM325D.001 was generated between 1970 to the present. Some of the waste has since been repackaged to remediate prohibited items or due to container integrity.

TRU waste generated by the 325 Building is contaminated with radiological materials generated from atomic energy defense activities as follows: defense nuclear materials production, defense nuclear waste and materials by-products management and defense research and development. Therefore, this waste is defense related. The 325 Building has provided support to a variety of defense nuclear materials production activities at Hanford, including the following (References C001, C004, P041, P045, P052, P071, P231, P400, P401, P402, P403, P405, P406, P407, and P503):

- REDOX – Operations were conducted in the REDOX facility to recover plutonium (as plutonium nitrate) and to concentrate the plutonium for transfer to PFP, where the plutonium nitrates were purified and converted to plutonium metal or oxide.

- PUREX – The PUREX facility replaced earlier fuel dissolution and plutonium separation facilities and produced plutonium nitrate solutions for further processing at PFP.

- PRF – Plutonium was received from DOE and other (e.g., West Valley) sources under the Plutonium Recycling Program, conducted to reclaim economically valuable plutonium for use in weapons, research, or fueling breeder reactors such as FFTF. Much of this plutonium had been produced in reactors at Hanford and Savannah River, which were operated for defense-related purposes.

- N-Reactor – Designed to be a dual purpose reactor (e.g., producing both plutonium and electricity), N-Reactor began producing plutonium in March 1964 and electrical power sometime later. From 1965 to 1967, tritium (also used in nuclear weapons) was produced at N-Reactor using fuel elements manufactured in the 333 Facility.

More recently, the 325 Building has continued to support defense activities associated with defense nuclear waste and by-product management. Samples of tank waste (e.g., sludge and liquid) resulting from fuel dissolution and plutonium separation for defense purposes have been and continue to be analyzed in the 325 Building laboratories (References P041, P042, P043, P045, P050, P053, P054, and P055).

The RLM325D.001 waste stream also contains waste that was generated during defense research and development activities. In particular, studies were conducted in the 325 Building that were part of the NWVP (Nuclear Waste Vitrification Project) intended to treat tank sludge's resulting from years of processing weapons materials at the Hanford Site. Other research projects involved work on the development of waste forms suitable for long term disposal (such as ceramics) and analysis of Rocky Flats oxides (References C004 and P041).

Due to the nature of the analytical work performed, defense-related analyses were carried out concurrent with other, potentially non-defense, projects across the Hanford Site that required analytical characterization. During these analytical activities, and because of the waste management practices in place at the 325 Building, no attempt was made to segregate the waste originating from non-defense and defense-related processes. Because segregation of waste into defense and non-defense portions is not feasible, waste stream RLM325D.001 is eligible for disposal at the WIPP (References C001 and P041).

This Summation of the Acceptable Knowledge Summary Report includes information to support Waste Stream Profile Form (WSPF) RLM325D.001 for the 325 Building Radiochemistry Laboratory Contact-Handled Transuranic Debris waste. The primary source of information for this report is CCP-AK-RL-102, *Central Characterization Project Acceptable Knowledge Summary Report for Hanford 325 Building Radiochemistry Laboratory Contact-Handled Transuranic Debris Waste, Waste Stream: RLM325D.001,* Revision 1, dated January 19, 2011. This report addresses containers included in the Hanford waste stream described in HNF-30810, *Acceptable Knowledge Document for the 325 Building Radiochemistry Laboratory Mixed Debris Waste Stream, RLM325D.* This waste stream was certified and shipped under the previous Hanford TRU Waste Certification program. The waste stream number identified by Hanford is identical to the waste stream included in this WSPF (RLM325D.001). CCP-AK-RL-102 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents including databases, and interviews with operational and waste management personnel.

Waste Stream Identification Summary:

Waste Stream Name:	Hanford 325 Building Radiochemistry Laboratory Contact-Handled Transuranic Debris Waste
Waste Stream Number:	RLM325D.001
Site Where TRU Waste Was Generated:	Hanford
Facility Where TRU Waste was generated:	325 Building
Site Where TRU Waste is Currently Stored:	Hanford
Waste Stream Volume – Current:	801 55-gallon drums 6 SWBs
Waste Stream Volume – Projected:	None
Dates of Waste Generation:	1970 - Present
TRUCON Content Number:	RH125, RH225
Summary Category Group:	S5000
Waste Matrix Code:	S5400
Waste Matrix Code Group:	Heterogeneous Debris Waste
Annual Transuranic Waste Inventory Report Identification Number:	RL325-01
RCRA EPA Hazardous Waste Numbers:	D004, D005, D006, D007, D008, D009, D010, D011, D022, D027, D028, D029, D030, D034, D037, D043, F001, F002, F004, F005

Waste Stream Description and Physical Form:

The RLM325D.001 waste stream consists of TRU mixed heterogeneous debris resulting from laboratory operations and characterization of tank wastes. Based on review of data generated previously by the Hanford TRU Waste Certification program at the 325 Building, examples of potential waste items in the RLM325D.001 waste stream are provided below (References C001, C003, P050 and U001):

Iron-based Metals/Alloys:

- Stainless steel tubing
- Failed machinery
- Lab equipment (balances, drying ovens, heating mantles, pumps and reaction vessels)
- Plumbing fixtures
- Tools

Aluminum-based Metals/Alloys:

- Metal cans
- Aerosol cans

Other Metals:

- Lead (bricks and sheeting)
- Alkaline batteries

Other Inorganic Materials:

- Incandescent light bulbs
- Used lab ware (beakers, pipettes, vials, and tubing)
- Thermometers
- Concrete
- Insulation
- Absorbents (e.g., kitty litter, vermiculite, diatomaceous earth)

Cellulosics

- Diaper paper
- Wipes
- Towels
- Protective clothing
- Cardboard
- Tape
- Ladders
- Step benches
- HEPA Filters

Rubber:

- Gloves

Plastics:

- Plastic liners
- Plastic pipe
- Polyethylene bottles

Organic Matrix:

- Absorbed combustible liquids such as oils, sample residues from fuel pellets, tank waste, ceramics and grouted plutonium in cans

Inorganic Matrix:

- Absorbed inorganic liquids

Although the waste stream as a whole is comprised of more than 50 percent heterogeneous debris, the waste packaging practices were such that any given waste container in this waste stream may include nearly any percentage of the identified waste material parameter. However, no container will contain greater than or equal to 50 percent homogeneous solids (Reference C001, C003, M103, P041, and U001).

The Waste Matrix Code S5400, Heterogeneous Debris, is assigned to the waste stream. The material that comprises waste stream RLM325D.001 was generated from activities at 325 Building Radiochemistry Processing Laboratory during laboratory examinations and studies, analyses of fuel reactor samples, and characterization of the chemical and physical properties of tank wastes and immobilized forms of plutonium from the 100, 200, and 300 Areas. The waste materials have common physical form, contain similar hazardous constituents, and were generated from a single process or activity and is therefore a single waste stream based on the following rationale:

- The waste is similar in process materials originating from 325 Building Radiochemistry Processing Laboratory general laboratory, facility maintenance, and waste management operations. Based on review of historical drum records, containers in this waste stream are identified only as originating from the 325 Building.

Point of Generation

Location

Waste stream RLM325D.001 was generated at the Hanford site. The waste was shipped to either the Burial Grounds or the Central Waste Complex at the Hanford Site

for Storage. Some of the waste has been repackaged at the Waste Receiving Processing Plant, T Plant and Perma-Fix Northwest.

Area and/or Building of Generation

Waste stream RLM325D.001 was generated at the 325 building Radiochemistry Processing Laboratory in the 300 Area of the Hanford Site.

Generating Processes

Description of Waste Generating Processes

Over its operational history, the 325 Building Radiochemistry Processing Laboratory has supported a wide range of activities and projects. Due to the number and nature of the specific projects conducted, development of a comprehensive process flow diagram is not feasible; however, process inputs and waste stream specific outputs are described in this report. The following processes contributed to this waste stream.

The 325 Building Radiochemistry Processing Laboratory houses several laboratories and hot cells (used for high activity samples containing fission products). The 325 Building housed, and continues to house, a wide range of laboratory and research and development projects at the Hanford Site. Examples of the types of projects supported include:

- Isolation and separation of plutonium and other radionuclides (including tritium, Am-241, Pu-239, Cm-244, Cesium(Cs)-137, Sr-90, and Pm-147) from irradiated fuel and target materials;
- Evaluating the chemical durability of ceramic, glass, and cemented monolithic waste forms;
- Evaluating and testing physical properties and pretreatment and vitrification of tank waste;
- Characterization leach testing of waste glass and spent fuel;
- Performing spent nuclear fuel characterization and performance testing;
- Process control studies for plutonium recovery; and
- Supporting decontamination and decommissioning (D&D) activities across the Hanford Site.

Operations in the 325 Building can be divided into two general types: laboratory operations and hazardous waste treatment operations.

Laboratory Operations

Laboratory operations performed at the 325 Building encompassed four broad areas of activity: sample preparation, analytical operations, process development support (e.g., research and development), and general laboratory operations (e.g., maintenance, radiological surveys and control, and spill cleanup).

Typical debris waste items from laboratory operations include stainless-steel vessels, Teflon gaskets, glassware, wipes, plastic, sample residues, thermometers, glovebox gloves, and hand tools (e.g., tweezers and forceps). Laboratory operations generate liquid waste that may be highly acidic (nitric acid) and/or contain a high level of chlorine. This liquid waste is neutralized, and heavy metals that may be present are precipitated as hydroxides and are filtered from the solution. Chlorine, if present above 0.01 Molar (M) limit, may be removed through silver nitrate precipitation. The treated liquids are then discharged to the Radioactive Liquid Waste System (before 1998) or the 325 Building Hazardous Waste Treatment Units (after 1998). Organic waste is segregated from the aqueous waste prior to neutralization to minimize treatment requirements.

Sample Preparation

Sample preparation includes a variety of activities prior to the actual examination of samples. These steps may include:

- Sample fabrication (for example, coring a mixed oxide pellet and then washing the core in deionized water);
- Sample dissolution (dissolving the sample in hot, acid solutions [e.g., nitric, hydrofluoric, or sulfuric acid]);
- Sample mounting/cleaning (which may involve mounting the sample specimen using a combination of clay, paper, and a weak adhesive, and drying/cleaning the sample) with an organic solvent (e.g., ethanol, propanol, or acetone); and
- Pyrohydrolysis to remove fluoride and chloride from uranium oxide powder and pellets, plutonium dioxide powder, and mixed oxide powder and pellets.

Analytical Operations

Analyses conducted at the 325 Building Radiochemistry Processing Laboratory involved a variety of standard methods, including the following:

- Inductively coupled plasma-mass spectroscopy (ICP-MS) - used for bulk elemental chemical analysis of any material or substance (including water, biological materials, inorganic materials, environmental samples, and geological samples);
- Inductively coupled plasma-atomic emission spectroscopy (ICP-AES) – used to determine trace elements in matrices (including unfiltered ground water, aqueous

samples, toxicity characteristic leaching procedure [TCLP] and extraction procedure [EP] extracts, industrial and organic wastes, soils, sludges, sediments, and other solid wastes). Identified chemicals include nitric acid;

- Kinetic phosphorescence – used to determine uranium and lanthanides in various matrices. Identified chemicals include nitric and hydrofluoric acids;

- Thermogravimetric analysis-mass spectrometry (TGA-MS) – used to simultaneously determine the change in weight of a material (either as a function of increasing temperature or isothermally as a function of time) and the identity and concentrations of vapors generated during heating;

- Coulometric titration of plutonium and uranium – used to measure plutonium and uranium concentrations in solution by measuring the concentration of specific ions using a constant electrical current flowing through the solution. Identified chemicals include hydrochloric acid;

- Amperometric titration of plutonium – used to measure plutonium concentrations in solution by means of titration in which the equivalence (end) point is identified through measurement of an electric current. Identified chemicals include nitric acid, mercury, and silver oxide;

- Thermogravimetry – used to measure the oxygen-to-metal ratio of plutonium and uranium oxides;

- Thermal ionization mass spectrometry (TIMS) – used to measure the isotopic abundances of plutonium and uranium in uranium oxide and nitrate, plutonium oxide powder and nitrate, and mixed oxide. Identified chemicals include acetone, benzene, ammonium sulfate, isopropyl alcohol, nitric acid, and toluene;

- Potentiometric titration – used to determine the concentration of uranium in uranium oxide powder and pellets, mixed oxide powder and pellets, and uranyl nitrate solutions. Identified chemicals include phosphoric acid, sulfamic acid, and potassium dichromate;

- Ion-selective electrode measurement – used to quantify the concentration of fluoride removed from uranium oxide powder and pellets, plutonium dioxide powder, and mixed oxide powder and pellets;

- Constant current coulometry – used to quantify chloride and water in uranium oxide powder and pellets, plutonium dioxide powder, and mixed oxide powder and pellets;

- Spectrophotometry - used to quantify chloride and tungsten in uranium oxide powder and pellets. The process used depends on the ion to be detected (hydrochloric acid, hydrofluoric acid, and nitric acid);

- Gas chromatography – used to quantify the amount of carbon in uranium oxide powder and pellets, plutonium dioxide powder, and mixed oxide powder and pellets;

- Kjeldahl spectrophotometry – used to quantify the amount of trace nitrogen (as nitride) in uranium oxide and mixed oxide powder and pellets. Identified chemicals include hydrochloric acid, hydrofluoric acid, and sodium hydroxide;

- Fusion and gas chromatography – used to determine total nitrogen in samples of uranium oxide, plutonium dioxide, and mixed oxide powder and pellets;

- Combustion and iodometry – used to determine sulfur in samples of uranium dioxide, plutonium oxide, and mixed oxide powder and pellets. Identified chemicals include hydrochloric acid;

- Combustion and turbidimetry - used to determine sulfur in samples of uranium oxide powder and pellets, plutonium dioxide powder, and mixed oxide powder and pellets. Identified chemicals include hydrochloric acid;

- Emission spectrography (direct read and photographic) – used to determine rare earth elements in samples of uranium oxide, mixed oxide, and plutonium oxide using solvent extraction. Identified chemicals include hydrofluoric acid, nitric acid, boric acid, hydrochloric acid, methanol, perchloric acid, and xylene;

- Spark source mass spectrography – used to determine impurities in samples of uranium oxide, plutonium oxide, and mixed oxide;

- Anion exchange and alpha analysis – used to determine Am-241 in unirradiated and irradiated samples of uranium oxide, plutonium oxide, and mixed oxide;

- Gamma spectrometry – used to determine Am-241 in unirradiated samples of plutonium oxide and mixed oxide. Identified chemicals include nitric acid;

- Vacuum outgassing – used to determine gas content of uranium, plutonium, and mixed oxide in pellet form;

- Combustion and infrared spectrometry – used to measure carbon and sulfur in samples of uranium, plutonium, and mixed oxide powders and pellets;

- Modified Brunauer, Emmett, and Teller method – used to determine the surface area of uranium, plutonium, and mixed oxide powders;

- Sedimentation and x-ray scattering – used to determine particle size distributions of uranium oxide, plutonium oxide, and mixed oxide;

- Mercury displacement – used to determine the density and open porosity of uranium, plutonium, and mixed oxide as pellets and pellet fragments. Identified chemicals include mercury, isopropyl alcohol;

- X-ray diffraction – used to obtain various measurements (e.g., lattice parameters, crystallite size, residual stress, orientation effects) of a variety of solid materials, including metals, nonmetals, inorganic, and organic materials in the form of powder, sludge or paste, monoliths, sheets, wires, and other forms;

- Leach testing – used to determine leaching rates of radioactive and non-radioactive constituents from solid materials (e.g., vitrified waste forms). Identified chemicals include nitric acid, sodium hydroxide, solvents [for example, acetone, ethanol] for cleaning/drying specimens, hydrofluoric acid; and

- Ion chromatography – a form of liquid chromatography that uses ion-exchange resins to separate atomic or molecular ions in aqueous samples based on their interaction with the resin.

Process Development Support

Historically, the 325 Building Radiochemistry Processing Laboratory supported a variety of plutonium recovery and purification processes used at Hanford. These processes evolved and knowledge was gained throughout the production history of Hanford, and included the following processes (note that chemicals identified as being used in the process are listed in parentheses):

- Bismuth Phosphate Process (identified chemicals include nitric acid, phosphoric acid, hydrofluoric acid, oxalic acid, and sodium dichromate);

- REDOX process (identified chemicals include methyl isobutyl ketone, aluminum nitrate, ceric ammonium nitrate, nitric acid, sulfuric acid, and oxalic acid);

- PUREX and Metal Recovery (identified chemicals include tributyl phosphate, kerosene, nitric acid, oxalic acid, ammonium fluoride, sodium hydroxide, sulfuric acid, and ceric ammonium nitrate);

- RECUPLEX process (identified chemicals include tributyl phosphate, carbon tetrachloride, nitric acid, oxalic acid, and hydrofluoric acid); and

- PRF process (identified chemicals include tributyl phosphate, carbon tetrachloride, dibutyl butyl phosphonate, butanol, kerosene, and phosphoric acid).

In addition, the 325 Building Radiochemistry Processing Laboratory supported other processes and facilities at Hanford from a research and development standpoint. For N-Reactor, for example, the laboratory supported tests of iodine control during fuel

processing for Pu-238 recovery (involving normal paraffin hydrocarbon, nitric acid, mercuric nitrate, silver, aluminum, and elemental iodine) and post-irradiation examination of the boron thermal shield (made of boron carbon steel plate).

General Laboratory Operations

Maintenance of the gloveboxes and equipment in the fume hoods resulted in the generation of various types of waste including gloves, damaged/worn out equipment, and filters. These materials were removed from the gloveboxes and packaged for disposal.

Routine radiological surveys generated radioactively contaminated cotton swabs and other survey media. Cells were routinely decontaminated to control radiation levels and prevent cross-contamination. Chemicals used during this decontamination included nitric acid, ethanol, acetone, and many commercial (non-hazardous) products from the Turco Corporation.

Laboratory operations performed include sample preparation, analytical operations, process development support and general laboratory operations (i.e. maintenance, radiological surveys and control, and spill cleanup).

Several events occurred in the 325 Building that resulted in wide spread laboratory contamination. Glovebox and hot cell floods created ruptures in gloves and seals causing contamination to be spread across laboratory floors. One incident was caused by improper wiring of the laboratory vacuum system, which caused the hoods and other containment systems to blow contamination across the laboratory. These releases resulted in major cleanup efforts by laboratory personnel involving the decontamination of equipment, flooring, and other surfaces. The spill liquids were collected and packaged with vermiculite and cement in a two to one ratio. Terry cloth towels were also used to mop up liquids and a corn oil mist was used to control the release of airborne radioactive materials.

Hazardous Waste Treatment Operations

Two Hazardous Waste Treatment Units (HWTUs) were permitted by the Washington State Department of Ecology in the 325 Building. The 325 Building HWTUs consist of Shielded Analytical Laboratory (SAL) and the HWTU, which began operations in 1991 (SAL) and 1995 (HWTU).

The SAL includes Rooms 32, 200, 201, 202, and 203 (all located on the main floor) and a double-walled tank, TK-1, located in Room 32 in the basement of the building. The SAL serves two purposes: sample preparation and analyses of mixed waste and highly radioactive materials for various clients and treatment of hazardous waste generated during analytical work within the SAL and onsite and/or offsite facilities. Typical analytical operations in the SAL include weighing, sample dissolution, sample dilution and aliquoting, digestion, distillation, titrimetric analysis, solvent extraction, and ion-exchange separations. Hazardous waste treatment conducted in the SAL includes pH

adjustment, ion-exchange, waste concentration by evaporation, precipitation and/or filtration, solvent extraction, solids washing, and solidification and/or stabilization.

The HWTU consists of two rooms, Rooms 520 and 528, located in the northeast corner of the main floor of the 325 Building. Room 520 is limited to treatment of non-radioactive hazardous waste, while Room 528 is used for treating TRU, low-level, and mixed hazardous waste. Within these rooms, wastes were stored in containers ranging from small laboratory glassware to 55-gallon containers. Treatment processes in the HWTU are typically bench-scale operations that are portable and conducted inside open-faced hoods or gloveboxes and involve small quantities of waste in each batch. Treatment processes used in the unit include pH adjustment, ion-exchange, carbon absorption, oxidation, reduction, waste concentration by evaporation, precipitation, filtration, phase separation, catalytic destruction, and solidification and/or stabilization.

Wastes contributed by HWTU operations include debris items (e.g., glassware, laboratory equipment) and small quantities of solidified liquids. Except for in-tank treatments, hazardous waste treatments performed at the 325 Building HWTUs are generally conducted as small bench-scale operations and may include:

- molten salt destruction
- pyrolysis
- calcination
- chemical fixation, oxidation, precipitation, and reduction
- chlorination
- chlorinolysis
- cyanide destruction
- degradation
- ion exchange
- ozonation
- photolysis
- solvent recovery
- reverse osmosis
- liquid-liquid extraction
- liquid ion exchange

The HWTUs are used to treat hazardous waste materials generated from laboratory operations throughout the 325 Building, and may also be used to treat waste materials from other Hanford 300 Area facilities. Samples (including tank waste, ground water, and solid matrices) from other facilities are received and analyzed at the 325 Building laboratories; consequently, analytical waste from the analysis of samples from these other facilities is included in waste stream RLM325D.001. HWNs in waste treated in the HWTUs are enveloped by the HWNs applied to other materials (for example, tank waste samples) processed through the 325 Building laboratories.

Typical hot cell analytical processes generate liquid waste that is highly acidic and/or may contain a high level of chlorine. The waste is segregated to minimize treatment

needs and is neutralized. If heavy metals are present in the liquids before neutralization, they are precipitated as hydroxides from the solution during neutralization and are filtered from the solution. Chlorine is removed through silver nitrate precipitation. Therefore, the remaining liquid waste is not ignitable, reactive, or incompatible when transferred to the SAL tank (TK-1). Precipitated metals and other solids are solidified and stabilized before being packaged with the other waste materials in 55-gallon containers.

Table 1 identifies toxicity characteristic (TC) and F-listed constituents in waste stream. RLM325D.001

Table 1 –TC and F-Listed Constituents in Waste Stream RLM325D.001

Chemical	CAS Number	EPA Hazardous Waste Numbers
1,1,1-trichloroethane	71-55-6	F001, F002
1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1	F001, F002
1,1-dichloroethylene	75-35-4	D029
1,2-dichlorobenzene	95-50-1	F002
1,2-dichloroethane	107-06-2	D028
1,4-dichlorobenzene	106-46-7	D027
2,4-dinitrotoluene	121-14-2	D030
2-nitropropane	79-46-9	F005
Arsenic	7440-38-2	D004
Barium	7440-39-3	D005
Benzene	71-43-2	F005
Cadmium	7440-43-9	D006
Carbon Disulfide	75-15-0	F005
Carbon Tetrachloride	56-23-5	F001
Chlorobenzene	108-90-7	F002
Chloroform	67-66-3	D022
Chromium	7440-47-3	D007
Cresols	1319-77-3	F004
Freon 112 (1,1,2,2-tetrachloro-1,2-difuoroethane)	76-12-0	F001
Hexachloroethane	67-72-1	D034
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Methyl Ethyl Ketone	78-93-3	F005
Methylene Chloride	75-09-2	F001, F002
Nitrobenzene	98-95-3	F004
Pentachlorophenol	87-86-5	D037
Pyridine	110-86-1	F005
Selenium	7782-49-2	D010
Silver	7440-22-4	D011
Tetrachloroethylene	127-18-4	F001, F002
Toluene	108-88-3	F005
Vinyl Chloride	75-01-4	D043

RCRA Determinations - Hazardous Waste Determinations

Historical Waste Management

Based on review of the Hanford historic waste management practices and characterization performed previously by the Hanford TRU Waste Certification Program, the EPA HWNs assigned to this waste stream have been maintained, with the exception of the assignment of F003. The previous Hanford TRU Waste Certification program assigned F003 for constituents including acetone, ethyl acetate, n-butanol, methanol, methyl isobutyl ketone, and xylene, which are listed solely because these solvents are ignitable in the liquid form. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned to waste stream RLM325.001 (Reference M006 and P081).

Ignitability, Corrosivity, Reactivity

Waste generated in this waste stream does not qualify for any of the exclusions outlined in 40 Code of Federal Regulations (CFR) 260 or 261. AK review identified numerous chemicals that may exhibit the characteristics of ignitability, corrosivity, or reactivity in their pure, liquid, solid, or powder form. However, based on the Hanford waste management practices, no pure or unused chemicals would have been introduced into the waste stream. In addition, all liquids and reactive materials would have been solidified, evaporated, neutralized, and/or deactivated prior to disposal. Real Time Radiography (RTR) is used to verify that the waste stream is not a liquid waste and does not contain explosives, non-radioactive pyrophoric materials, compressed gases or reactive waste. Therefore, this waste stream does not exhibit the characteristics for ignitability (D001), corrosivity (D002), or reactivity (D003).

Ignitability

The waste does not exhibit the characteristic of ignitability as identified in 40 CFR 261.21. The materials are not liquid, ignitable compressed gases, or oxidizers, and are not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change.

Potentially ignitable compounds (such as acetone, n-butyl alcohol, ethyl acetate, ethyl ether, methyl isobutyl ketone, methanol, and xylene) were managed at the facility; however, these materials were absorbed, deactivated, and solidified, as necessary. (References C001, C002, P001, P002, P004, P045, and P051).

To ensure the waste does not exhibit the characteristic of ignitability, liquid in excess of TSDF-WAC limits will be removed or immobilized, and compressed gases (e.g., aerosol cans) will be removed or vented prior to WIPP disposal. Therefore, this waste does not exhibit the characteristic of ignitability (D001). (References C001, C002, P001, P002, P004, P045, and P051)

Corrosivity

This waste does not exhibit the characteristic of corrosivity as defined in 40 CFR 261.22. (References C001, C002, P001, P002, P004, P045, and P051)

Potentially corrosive reagents, such as nitric, hydrofluoric, sulfuric, hydrochloric, sulfuric, and phosphoric acids, were managed by the laboratory; however, these materials were neutralized, absorbed, deactivated, and solidified, as necessary (References C001, C002, P001, P002, P004, P045, and P051).

The debris in this waste stream is not liquid and does not contain any unreacted corrosive chemicals.

To ensure the waste does not exhibit the characteristic of corrosivity, liquid in excess of TSDF-WAC limits will be removed or immobilized prior to WIPP disposal. Therefore, this waste does not exhibit the characteristic of corrosivity (D002).

Reactivity

This waste stream does not exhibit the characteristic of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. Debris materials in this waste stream came in contact with cyanides, sulfides, and pyrophorics. Cyanides and sulfides are rendered non-reactive by neutralization before being packaged for disposal and pyrophorics are treated, prepared, and packaged to be nonreactive. Therefore the waste is not capable of generating toxic fumes of cyanides or sulfides. The waste is not capable of detonation or explosive reaction. (Reference P051)

To ensure the waste does not exhibit the characteristic of reactivity, liquid in excess of TSDF-WAC limits will be removed or immobilized, and compressed gases (e.g., aerosol cans) will be removed or vented prior to WIPP disposal. Therefore, the waste does not exhibit the characteristic of reactivity (D003). (References C001, C002, P001, P002, P004, P043, P045, and P051).

Toxicity Characteristic

This waste stream exhibits the characteristic of toxicity per 40 CFR 261.24. The toxicity characteristic contaminants fall into two categories, metals and organics. Where a constituent has been identified and there is no quantitative data available to demonstrate that the concentration is below regulatory threshold, the applicable EPA HWN is applied to the waste stream.

The waste stream contains or is contaminated with the following toxicity characteristic metals:

- arsenic (D004) – Identified in the 325 Laboratory inventory and used as a reagent
- barium (D005) – Used in laboratory reagents.
- cadmium (D006) – Used as a standards material.
- chromium (D007) – Used as a standards material, chrome plating and an oxidant and hardening agent.
- lead (D008) – Used for spectrometric standard material, shielding, circuit boards, solder, leaded gloves.
- mercury (D009) – Used in electrodes, thermometers and batteries.
- selenium (D010) – Identified in the 325 Laboratory inventory and used as a reagent.
- silver (D011) – Used as a reduction agent, electroplating, and standards material.

The waste stream contains or is contaminated with the following toxicity characteristic organics:

- chloroform (D022) – Used as a cleaning agent and solvent.
- 1, 4-dichlorobenzene (D027) – Identified as a constituent in tank waste.
- 1, 2-dichloroethane (D028) – Used for metal cleaning.
- 1, 1-dichloroethylene (D029) – Identified in the 325 Laboratory inventory.
- 2, 4-dinitrotoluene (D030) – Identified in the 325 Laboratory inventory.
- hexachloroethane (D034) – Identified in the 325 Laboratory inventory.
- pentachlorophenol (D037) – Used as an herbicide and wood preservative.
- vinyl chloride (D043) – Identified as a contaminant in sludge.

The AK sources identified the use of other toxicity characteristic compounds, including carbon tetrachloride (D019), tetrachloroethylene (D039), chlorobenzene (D021), creosols (D026), nitrobenzene (D036), benzene (D018), methyl ethyl ketone (D035), and pyridine (D038). Since the more specific F-Listed HWNs have been assigned for these compounds, the corresponding toxicity characteristic EPA HWNs are not assigned. (References DR0014, M006, M012, M311, and U001).

F-Listed Waste

Waste stream RLM325D.001 was mixed with or derived from F-listed hazardous wastes from non-specific sources as listed in 40 CFR 261.31. F001, F002, F004 and F005 listed solvents were used in the 325 Building and contaminate the waste.

The waste stream contains or is contaminated with the following F-listed hazardous wastes:

- carbon tetrachloride (F001) – Used for metal and sample cleaning.
- Freon 112 (1,1,2,2-tetrachloro-1,2 diflouroethane) (F001) – Used as a solvent.
- 1,1,1-Trichloroethane (F001, F002) – Used as a solvent.
- 1,1,2-trichloro-1,2,2-trifluoroethane (F001, F002) – Used as a solvent.

- methylene chloride (F001, F002) – Used as a solvent.
- tetrachloroethylene (F001, F002) – Identified in the 325 Laboratory inventory.
- Chlorobenzene (F002) – Identified in the 325 Laboratory inventory.
- 1,2-dichlorobenzene (F002) – Identified in the 325 Laboratory inventory.
- cresols (F004) - Identified as a constituent in sludge samples
- nitrobenzene (F004) – Identified in the 325 Laboratory inventory.
- 2-nitropropane (F005) – Identified in the 325 Laboratory inventory.
- Benzene (F005) – Used as a cleaning agent.
- Carbon disulfide (F005) – Identified in the 325 Laboratory inventory.
- Methyl ethyl ketone (F005) – Used as a solvent.
- Pyridine (F005) – Identified in the 325 Laboratory inventory.
- Tolune (F005) – Used as a cleaning agent.

F003 constituents, including acetone, ethyl acetate, n-butanol, methanol, methyl isobutyl ketone, and xylene were also used in the 325 Building. These solvents are listed solely as ignitable in the liquid form. The waste stream will not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned (References M006, M012, and P081).

No specific solvent use was documented for some F-listed constituents. If documentation is not available to demonstrate a non-solvent use for an F-listed constituent, the F-listed EPA HWN is assigned to the waste stream. Assignment of codes in this manner is consistent with historical CCP waste characterization practices and is in compliance with RCRA regulations. For this reason, the appropriate F-listed EPA HWN has been assigned for chemicals identified in facility inventories for chemicals that are commonly used for their solvent properties in the types of operations and processes described.

U, K, and P-Listed Chemicals

Waste stream RLM325D.001 was not mixed with a discarded commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33). Chemical products at the 325 Building Radiochemistry Processing Laboratory were maintained outside of gloveboxes to avoid radiologically contaminating the material and limit the amount of hydrogenated liquids in the analytical areas.

Beryllium and beryllium compounds may contaminate this waste stream. Beryllium was present in standards used at the 325 Building Radiochemistry Processing Laboratory, and some of these standards may have been disposed of in the RLM325D.001 waste stream; however, in this form it would be present in trace amounts and in forms other than as a pure metal or oxide. Beryllium was also a trace constituent in tank waste samples analyzed in the 325 Building. Based on the AK documentation reviewed, the form of beryllium used does not meet the definition of commercial chemical product beryllium powder. Therefore, the waste stream does not meet the definition of P015 waste.

The review of the AK source documentation did not identify the disposal of unused hydrofluoric acid (U134) or disposal of materials contaminated with spills of this acid; therefore the EPA HWN U134 is not assigned to waste stream RLM325D.001.

Waste stream RLM325D.001 does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32.

Waste stream RLM325D.001 is not assigned any U-, K-, or P-Listed EPA HWNs. (References 10, C001, C002, M006, P001, P041, P045, P050, P054, P056, and U001).

Headspace Gas/Volatile Organic Compound Information

Headspace gas sampling was completed on 10 randomly selected containers in Lot 1 in this waste stream. No UCL_{90} values exceeded respective target analyte Program Required Quantitation Limits. No tentatively identified compounds were identified in this lot. No New EPA hazardous waste numbers were assigned as a consequence of headspace gas sampling and analysis. The specifics of this information are included in the attached Characterization Information Summary report.

Other Waste Streams Generated from the Same Buildings and Processes

The waste stream, RLM325D.001, previously certified and shipped under the Hanford TRU Waste Program from the 325 Building is similar in physical form and hazardous constituents to this waste stream. Hanford applied F003 because it was used historically. However, the waste stream has been determined to not be ignitable, so F003 does not apply.

Conclusion

EPA hazardous waste numbers (HWNs) assigned to this debris waste stream are D004, D005, D006, D007, D008, D009, D010, D011, D022, D027, D028, D029, D030, D034, D037, D043, F001, F002, F004, and F005.

Polychlorinated Biphenyls

This waste stream contains PCBs, and therefore is regulated as Toxic Substances Control Act waste under 40 CFR 761. Containers with PCB waste, identified during RTR and/or VE, will be managed in accordance with the PCB disposal requirements in the WIPP-WAC. (References C001, M006, M103, P411, and U001)

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. Radiography is performed on each container to verify the absence of prohibited items. The following items have been determined as not present in the waste:

- Liquid waste
- Non-radioactive pyrophoric materials
- Hazardous waste not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous waste)
- Waste incompatible with backfill, seal and panel closure materials, container and packaging materials, or other wastes
- Explosives or compressed gases
- Waste with PCBs not authorized under an EPA PCB waste disposal authorization
- Waste exhibit the characteristics of ignitability, corrosivity, or reactivity
- Waste that has ever been managed as high-level waste and waste from tanks specified in Table C-8 of the WIPP HWFP, unless specifically approved through a Class 2 permit modification.

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

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

Justification for the Selection of Radiography or Visual Examination

Radiography will be used to characterize RLM325D.001 waste. RTR was selected as the characterization method for this lot because the waste containers were previously packaged and RTR is an acceptable characterization method to meet all the Data Quality Objectives for NDE of waste stream RLM325D.001.

Method for Determining Waste Material Parameter (WMPs) Weights Per Unit of Waste

The waste material parameters (WMPs) for waste stream RLM325D.001 were estimated using information obtained from the WIPP Waste Information System (WWIS)/Waste Data System (WDS) from the analysis of actual shipped containers under the previously certified Hanford program.

The WMPs, average weight percent and weight percent range are presented in Table 2.

Table 2. Waste Stream RLM325D.001 Waste Material Parameter Estimates

Waste Material Parameter	Average Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	41%	0 – 97%
Aluminum-based Metals/Alloys	<1%	0 – 7%
Other Metals	2%	0 – 5%
Other Inorganic Materials	26%	0 – 91%
Cellulosics	9%	0 – 88%

Waste Material Parameter	Average Weight Percent	Weight Percent Range
Rubber	4%	0 – 60%
Plastics (waste materials)	18%	3 – 98%
Inorganic Matrix[2]	0%	NA
Organic Matrix[1]	0%	NA
Soils/Gravel	0%	NA

1. Organic Matrix such as cemented organic resins, solidified organic liquids, and sludges are expected.
2. Inorganic Matrix such as kitty litter, vermiculite, diatomaceous earth, and cement used to absorb and solidify aqueous liquids and sludges are expected.

List of AK Sufficiency Determinations

No AK Sufficiency Determinations were requested for this waste stream.

Transportation

This waste stream and its chemical constituents have been reviewed for consistency with listed TRUCON codes and they are consistent.

Beryllium

The level of beryllium contamination in individual drums is expected to be less than one weight percent. Waste determined to contain greater than one weight percent of beryllium will be managed in accordance with the WIPP-WAC.

Radionuclide Information

U-238 and Pu-239 are the two predominant radionuclides by mass. Previous characterization results provided by Hanford were evaluated to determine the radionuclide distribution in the waste stream. The 10 WIPP tracked radionuclides are presented in Table 3 in addition to other radionuclides that are expected in the waste stream.

Table 3 – Summary of RLM325D.001Radionuclides

WIPP Tracked	Other Radionuclides	
Am-241	Am-243	K-40
Cs-137	Ac-227	Mn-54
Pu-238	Ba-133	Na-22
Pu-239	Ba-137m	Np-237
Pu-240	Ce-144	Pm-147
Pu-242	Cf-249	Pu-241
Sr-90	Cm-243	Ra-226
U-233	Cm-244	Ru-103/106
U-234	Cm-245	Sb-125
U-238	Co-60	Th-232
	Cs-134	U-232

	Eu-152	U-235
	Eu-154	U-236
	I-131/132	Y-90
		Radioactive lanthanum
		Radioactive mercury

Payload management will not be applied to this waste stream.

Attachment 1, AK Source Documents – Supplemental Documentation

Source/ Data Tracking Number	AK Element #	Title	Document Number	Rev.	Date
C001	NA	Hanford Building 325 Interview with Wayne Larsen	NA	NA	09/11/2003
C002	NA	Hanford Building 325 Radiochemistry Laboratory Interviews with Various Waste Management Personnel (J. Holland, T. Van Arsdale, E. Damberg, and G. Grohs)	NA	NA	10/16/2003
C003	NA	Waste Material Parameter Analysis for Containers Generated from the Building 325 Radiochemistry Lab and HLW Annexes	NA	NA	10/2003
C102	S5	Sr-90 to Cs-137 Ratio for Appendix E of Hanford Site Transuranic Waste Certification Plan for NDA	M4T00-PJC-02-076	NA	04/11/2002
DR001	S9	AK Source Document Deficiency: Isotopic Discrepancies	NA	NA	2003-2006
M006	NA	325 Facility Debris Waste Stream Designation	NA	NA	07/27/2004
M103	NA	NDE Batch Data Reports for Containers in Waste Stream RLM325D	NA	NA	Various
M311	S7	Email – Subject: RE: Chemical Management System	NA	NA	07/17/2010
P001	S2	325 Building Standard Operating Procedure	HW 73112	NA	07/15/1962
P002	S2	Removal of High Dose Low Level Waste	SAL-325-HDLLW-1	NA	09/30/1994
P004	S2	Routine Research Operations	RPL-OP-001	1	03/01/2000
P006	S8	Instructions for PHR-146 Micro Combination pH Electrode	NA	NA	NA
P007	S8	Ross pH Electrodes Instruction Manual	227296-001	C	1999
P008	S8	Model 94-09, 96-09 Fluoride/Combination Fluoride Electrodes Instruction Manual	502700-031	C	1991
P009	S8	Chloride/Chloride Combination Electrode Instruction Manual	502700-078	D	1999
P010	S2	Purification of Plutonium using Lewatit UMP-950 Ion Exchange Resin	325-PU-Purify-1	0	06/12/1998
P011	S2	Leaching Tests Using the PCT Method	MCC-TP-19	NA	04/1993

Source Line Tracking Number	AK Element #	Title	Document Number	Rev.	Date
P012	S5	Evaluation of Monolithic Radioactive Material Immobilization Form Behavior in Fume Hoods	RPL-PRP-Ceramic-Test-1	0	05/2001
P013	S2	Preparation and Viewing of Samples by Microscopy	RPL-EMSP-1	0	11/28/2000
P014	S5	Standard Test Method for Fluoride Ion in Water	D 1179-99	NA	NA
P015	S2	Solids Analysis X-Ray Diffraction	PNNL-RPG-268	1	02/14/2000
P016	S5	Plutonium Immobilization Project Exceptions to ASTM C1220-98 as Pertaining to Static Leach Testing of Monolithic Ceramic Specimens	ASTM C1220-98	NA	11/2000
P017	S2	Laboratory Procedure for Operation of the Differential Scanning Calorimeter (DSC), Thermo gravimetric Analyzer (TG), and High Temperature Differential Thermal Analyzer (DTA) and DSC	ICN-PNL-ALO-508R0.2	0	01/1998
P018	S2	Preparation, Processing and Testing of Radioactive Glass and Ceramics	RPL-PRP-1	2	07/2001
P019	S2	Fabrication of Ceramic Samples	RPL-PIP-2	0	04/1998
P020	S2	Fluoride, Chloride, and pH Measurements with Specific ion Electrode	RPL-PIP-3	0	06/2001
P021	S2	Mounting Radioactive Samples in PIP XRD Sample Holder Base	RPL-PIP-4	0, 2, 3	2001, 2002, 2003
P023	S2	Evacuated Impregnation Method for Apparent Specific Gravity, Bulk Density, and Apparent Porosity Determinations of Consolidated Solids	APEL-PIP-1	1	01/1999
P024	S2	Geometric Density Determination of Consolidated Solids	APEL-PIP-2	3	03/2001
P027	S2	Transfer of SPFT and PUF Vessels Containing Crushed Pu- or Pu-238 Containing Materials	RPL-PIP-SPFT-1	0	05/08/2000
P028	S2	Preparation of Nondispersible Solid Samples Containing Radioisotopes for Magic-Angle Spinning Nuclear Magnetic Resonance Spectroscopy Measurements	RPL-MAS-NMR	0	08/21/2003
P029	S2	Operation of Scintag Pad-V X-Ray Diffractometer (RGD#62)	RPL-XRD-PIP	2	02/01/2003

Source Doc. Tracking Number	AK Element #	Title	Document Number	Rev	Date
P030	S2	Procedure for Surface Area Measurements using BET with the Quantachrome Gas Analyzer in the SAL	GDSP-01-BET	0	01/27/2003
P041	NA	Past Practices Technical Characterization Study-300 Area-Hanford Site	WHC-MR-0388	NA	12/1992
P043	S3	Safety Analysis Report for 325 Building	PNL-7748	NA	06/1992
P045	NA	Characterization of Past and Present Waste Streams from the 325 Radiochemistry Building	WHC-EP-0696	NA	12/1993
P050	NA	Analytical Chemistry Laboratory Manual, Volume 2, Analytical Chemistry Methods for Mixed Uranium-Plutonium Oxide Fuel	MG-28	2	10/1978
P051	NA	Hanford Site Solid Waste Acceptance Criteria	HNF-EP-0063	8	05/2003
P053	S5	Testing and Analysis of Consolidated Sludge Samples from the 105 K East Basin Floor	PNNL-13341	NA	NA
P054	S5	Organic Analysis Progress Report FY 1997	PNNL-11738, UC 200	NA	04/1998
P058	S10	MSDS for Commercial Products	NA	NA	1982-2003
P080	S2	Hanford Site Operating Permit, Operable Unit 5-325 Hazardous Waste Treatment Units	WA7890008967	NA	01/2007
P081	NA	Tank Farms Solid Waste Characterization Guide with Sampling and Analysis Plan Attachment	HNF-SD-WM-PLN-119	1	04/1997
P411	S2	Waste Receiving and Processing Facility Operating procedure for Operation of the Drum Nondestructive Examination System	WRP1-OP-0908	J-2	09/09/2008
P414	S2	Waste Retrieval Process Description	HNF-5597	3	03/31/2004
P415	S3	Transuranic Waste Phase 1 Retrieval Plan	HNF-4781	1	09/28/2000
P416	S3	WRAP Final Safety Analysis Report	HNF-SD-W026-SAR-002	2	07/2001
P506	S2	Load Standard Waste Boxes Storage Containers for TRU Waste	ZO-170-044	F-26	11/04/2004
P508	S2	Waste Isolation Pilot Plant Procedures – TRU Waste Visual Examination	WMP-400	12	03/24/2009

Source Doc. Tracking Number	AK Element #	Title	Document Number	Rev.	Date
P509	S2	Handle TRU/TRU Mixed Waste in 55-Gallon Drums	ZO-170-015	P-3	11/25/2008
U001	S4, S9	RMIS Retrievals – Solid Waste Disposal Requests and Associated Waste Information	NA	NA	1980-2002
U003	S11	Notes on Waste Stream Description for Pu Oxide Characterization Studies	NA	NA	NA

Alphanumeric Designations

C Correspondence
D Documents (e.g. published reports)
DR Discrepancy Resolution
M Miscellaneous (e.g. unpublished data)
P Procedures
U Unpublished Documents

AK Numbers

S1 Process Design Documents
S2 Standard Operating Procedure
S3 Safety Analysis Reports
S4 Waste Packaging Logs
S5 Test plans/research project reports
S6 Site databases
S7 Information from site personnel
S8 Standard industry documents
S9 Previous analytical data
S10 Material safety data sheets
S11 Laboratory Notebooks
S12 Comparable or surrogate sampling and analysis data
NA Not applicable