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

JUN 2 3 2010

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 CCP-ORNL Waste Stream Profile Form Number, OR- CHEM- CH-HET, Heterogeneous Debris from Analytical Chemistry Laboratory Operations

Dear Mr. Bearzi:

The Department of Energy Carlsbad Field Office (CBFO) has approved the Waste Stream Profile Form OR-CHEM- CH-HET, Heterogeneous Debris from Analytical Chemistry Laboratory Operations.

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

If you have questions on this matter, please contact me at (575) 234-7300.

Sincerely,

David C. Moody
Manager

Enclosure

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

cc: w/o enclosure
J. Kieling, NMED ED
G. Basabilvazo, CBFO ED
N. Castaneda, CBFO ED
C. Fesmire, CBFO ED
C. D. Gadbury, CBFO ED
S. McCauslin, CBFO ED
J. R. Stroble, CBFO ED
K. Watson, CBFO ED
W. Ledford, 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:10-1401:UFC 5900.00

100650

Attachment 2 –CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: OR-CHEM-CH-HET							
(2) Generator site name: Oak Ridge National Laboratory					(4)Technical contact: Richard Kantrowitz		
(3) Generator site EPA ID: TN1890090003					(6) Technical contact phone number: 575-234-7511		
(5) Date of audit report approval by New Mexico Environment Department (NMED): April 24, 2008; April 3, 2009							
(7) Title, version number, and date of documents used for WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 17, June 23, 2009. CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 23, April 7, 2010 CCP-PO-027 CCP/TRU Waste Processing Center/Oakridge National Laboratory Interface Document, Revision 1, February 17, 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: OR-CHEM-CH-HET					(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste					(13) Waste Stream Name: Heterogeneous Debris from Analytical Chemistry Laboratory Operations		
(14) Description from the TWBIR: Waste consists of CH-TRU debris from analytical chemistry operations at ORNL.							
(15) Defense TRU Waste:	YES	X	NO				
(16) Check One:	CH	X	RH				
(17) Number of SWBs: N/A	(18) Number of Drums: 210 55-gallon				(19) Number of Canisters: N/A		
(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: D004, D005, D006, D007, D008, D009, D011, D019, D022, F002, and F005							
(22) Applicable TRUCON Content Numbers: OR 125, OR 225, SQ154							
(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-ORNL-005, Revision 0, September 24, 2009, Figures 3, 4, and 5							
(23B) Facility mission description: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 4.2							
(23C) Description of operations that generate waste: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Sections 4.4 and 5.3							
(23D) Waste identification/categorization schemes: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 4.5							
(23E) Types and quantities of waste generated: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Sections 4.6.1 and 5.2							
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 4.6.2							
(24) Waste certification procedures: CCP-TP-030, Rev. 27, CCP CH TRU Waste Certification and WWIS/WDS Data Entry, December 14, 2009							
(25)Required Waste Stream Information							

(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Section 5.3			
(25D) Waste Process flow diagrams: CCP-AK-ORNL-005, Revision 0, September 24, 2009, Figures 8 and 9			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-ORNL-005, Revision 0, September 24, 2009, 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: OR-CHEM-CH-HET			
(26) 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
X	Defense nuclear waste and material by products management		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#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27C) Safety Analysis Reports: See S3 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27D) Waste packaging logs: NA			
(27E) Test plans/research project reports: See S5 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27F) Site databases: See S6 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27G) Information from site personnel: See S7 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27H) Standard industry documents: NA			
(27I) Previous analytical data: See S9 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27J) Material safety data sheets: See S10 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27K) Sampling and analysis data from comparable/surrogate Waste: See S12 AK#s on Attachment 1 to Summation of Aspects of AK Summary Report			
(27L) Laboratory notebooks: NA			
Confirmation Information[2]			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP-TP-053, Revision 7, October 21, 2009		
(29)	Visual Examination: NA		

(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:** **March 1, 2010**
Reviewed by STR (if necessary):	**YES** [X]	**NA** [ ]	**Date:** **March 4, 2010**

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)	(32) Richard Kantrowitz	(33) 6/17/10
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.

CHARACTERIZATION INFORMATION SUMMARY

WSPF # OR-CHEM-CH-HET

Lot 1

TABLE OF CONTENTS

CCP Characterization Information Summary Cover Page

Waste Stream # OR-CHEM-CH-HET Lot #: 1

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

SPM Review: Richard Kantrowitz Date: 5/18/2010

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. 6	03/04/08	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Non Destructive Assay (NDA):

CCP-TP-166	Rev. 3	02/26/10	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-166	Rev. 2	12/05/08	CCP Drum Waste Assay System Imaging Passive/Active Neutron Operations
CCP-TP-168	Rev. 3	11/17/09	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-168	Rev. 2	12/02/08	CCP DWAS IPAN/SGS Data Generation Level Validation
CCP-TP-169	Rev. 2	11/18/09	CCP Operating the Mobile Segmented Gamma Scanner
CCP-TP-169	Rev. 1	06/19/08	CCP Operating the Mobile Segmented Gamma Scanner
CCP-TP-169	Rev. 0	10/12/07	CCP Operating the Mobile Segmented Gamma Scanner

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 13	03/19/07	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 6	07/12/07	CCP Headspece 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-173	Rev. 0	05/03/07	CCP Analysis of Gas Samples for VOCs by GC/FID
CCP-TP-175	Rev. 1	03/29/10	CCP Analysis of Gas Samples for VOCs by GC/MS
CCP-TP-175	Rev. 0	05/02/07	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-002	Rev. 21	08/04/09	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 20	08/18/08	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. 16	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 18	11/16/06	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 28	05/12/10	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 27	12/14/09	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 26	05/27/09	CCP CH TRU Waste Certification and WWIS Data Entry

WAP Certification:

CCP-PO-001	Rev. 17	06/23/09	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 23	04/07/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 22	01/12/10	CCP Transuranic Waste Certification Plan
CCP-PO-002	Rev. 21	01/26/09	CCP Transuranic Waste Certification Plan
CCP-PO-027	Rev. 2	04/22/10	CCP/TWPC/ORNL Interface Document
CCP-PO-027	Rev. 1	02/17/10	CCP/TWPC/ORNL Interface Document
CCP-PO-027	Rev. 0	10/02/07	CCP/TWPC/ORNL Interface Document

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # OR-CHEM-CH-HET

Lot # 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		Transportation
X10C0401575A	OR-DWAS-0341	OR-RTR6-0265	NA	NA	NA		NA	NA	NA	OR09FG4121
X10C0401708A	OR-DWAS-0341	OR-RTR6-0265	NA	NA	NA		NA	NA	NA	OR09FG4121
X10C0401709A	OR-DWAS-0343	OR-RTR6-0258	NA	NA	NA		NA	NA	NA	OR09FG4122
X10C0501607	OR-DWAS-0325	OR-RTR6-0257	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	OR09FG4105
X10C0501693	OR-DWAS-0325	OR-RTR6-0256	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	OR09FG4105
X10C9311145F	OR-DWAS-0338	OR-RTR6-0268	NA	NA	NA		NA	NA	NA	OR09FG4122
X10C9312738A	OR-DWAS-0336	OR-RTR6-0264	NA	NA	NA		NA	NA	NA	OR09FG4117
X10C9313024A	OR-DWAS-0342	OR-RTR6-0258	NA	NA	NA		NA	NA	NA	OR09FG4121
X10C9313640A	OR-DWAS-0343	OR-RTR6-0258	NA	NA	NA		NA	NA	NA	OR09FG4122
X10C9313647A	OR-DWAS-0336	OR-RTR6-0264	NA	NA	NA		NA	NA	NA	OR09FG4117
** These containers were randomly selected for headspace gas sampling and analysis and are included to resolve EPA hazardous waste number assignment only. NDE and NDA BDR numbers for these eight containers are included for information purposes only.										
**X10C0501626A	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501626B	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501626C	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501626D	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501655	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C0501686	OR-DWAS-0325	OR-RTR6-0257	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C9309189A	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA
**X10C9309189B1	OR-DWAS-0321	OR-RTR6-0252	NA	NA	NA		ORHSGS090008	ECL09039M	ECL09039G	NA

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

5/18/2010
Date

CIS 003

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-CHEM-CH-HET **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	0	10	-3.56	-3.58	0.02	-3.57	10	2.30		
Bromoform	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
Carbon Tetrachloride	Log	1	10	-1.90	-4.08	0.77	-3.74	10	2.30		
Chlorobenzene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Chloroform	Log	1	10	-3.02	-3.69	0.24	-3.59	10	2.30		
Cyclohexane[a]	Log	2	10	-2.04	-3.41	0.66	-3.12	10	2.30		
1,1-Dichloroethane	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
1,2-Dichloroethane	Log	1	10	-2.12	-3.48	0.48	-3.27	10	2.30		
1,1-Dichloroethylene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
cis-1,2-Dichloroethylene	Log	0	10	-3.54	-3.57	0.02	-3.56	10	2.30		
trans 1,2-Dichloroethylene	No	0	10	0.04	0.04	0.00	0.04	10	N/A		
Ethyl benzene	Log	1	10	-2.40	-3.67	0.45	-3.47	10	2.30		
Ethyl Ether	Log	0	10	-3.10	-3.12	0.02	-3.11	10	2.30		
Methylene chloride	No	0	10	0.03	0.03	0.00	0.03	10	N/A		
1,1,2,2-Tetrachloroethane	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Tetrachloroethylene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Toluene	No	8	10	7.40	2.83	2.37	3.87	10	N/A		
1,1,1-Trichloroethane	Log	1	10	-1.56	-3.83	0.80	-3.48	10	2.30		
Trichloroethylene	No	0	10	0.02	0.02	0.00	0.02	10	N/A		
Trichlorofluoromethane[c]	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
1,1,2-Trichloro-1,2,2-trifluoroethene	No	0	10	0.01	0.01	0.00	0.01	10	N/A		
1,2,4-Trimethylbenzene[a]	Log	3	10	-1.51	-3.02	0.81	-2.67	10	2.30		
1,3,5-Trimethylbenzene[a]	Log	2	10	-1.90	-3.26	0.60	-3.00	10	2.30		
m,p-Xylenes[b]	SQRT	8	10	0.39	0.25	0.08	0.29	10	3.16		
o-Xylene	No	3	10	0.11	0.05	0.04	0.06	100	N/A		
Acetone	Log	10	10	1.06	-0.57	1.16	-0.07	100	4.61		
Butanol	Log	9	10	0.59	-1.98	1.33	-1.40	100	4.61		
Methanol	No	7	10	190.00	96.83	75.74	129.95	100	N/A	Yes	(2)
Methyl ethyl ketone	No	4	10	0.41	0.15	0.14	0.21	100	N/A		

CT5004

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: OR-CHEM-CH-HET **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	-0.49	-3.00	1.15	-2.50	10	2.30		
Chloromethane[e]	Log	0	10	-3.38	-3.40	0.02	-3.39	10	2.30		
Carbon Disulfide[e]	Log	7	10	2.56	-0.80	2.04	0.09	10	2.30		
1,2-Dichloropropane[e]	Log	1	10	-3.06	-4.11	0.37	-3.95	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.

[e] These compounds are reported by the Laboratory and are included for completeness.

Comments:

(1) For analytes where there were no samples measured above the MDL value, 1/2 of the MDL value was used. (Per section B4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

(2) EPA HWN F003 is not assigned to this waste stream for Methanol because the waste is not liquid and is therefore not ignitable. This is consistent with acceptable knowledge.

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

5/18/2010
Date

CH5005

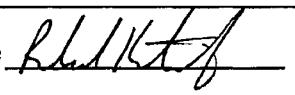
CCP Headspace Gas Summary Data

Waste Stream Number OR-CHEM-CH-HET 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  Date 5/18/2010

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: OR-CHEM-CH-HET 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

Site Project Manager Signature | Richard Kantrowitz (Printed Name) | 5/18/2010 (Date)

CCP Reconciliation with Data Quality Objectives

WSF# OR-CHEM-CH-HET 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# OR-CHEM-CH-HET 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# OR-CHEM-CH-HET Lot # 1

8	Y	The data demonstrates whether the waste stream exhibits a toxicity characteristic under Title 40 Code of Federal Regulations (CFR), Part 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 B3-1 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 B3-2 through B3-9 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

Signature of Site Project Manager | Richard Kantrowitz (Printed Name) | 5/18/2010 (Date)

SUMMATION OF ASPECTS OF AK SUMMARY REPORT: WASTE STREAM OR-CHEM-CH-HET

Overview

Waste stream OR-CHEM-CH-HET is contact-handled (CH) transuranic (TRU) heterogeneous debris waste generated in the Radioactive Materials Analytical Laboratory (RMAL) in Building 2026 at the Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. Building 2026 provided analytical services support to a variety of programs including advanced reactor programs, isotopes production programs, and waste characterization programs as well as analytical development work and research and development (R&D) activities. Building 2026 is being deactivated.

Waste stream OR-CHEM-CH-HET was generated from the analysis of samples originating from defense and non-defense programs. The defense programs included the Liquid-Metal Fast Breeder Reactor (LMFBR) Program, the Light-Water Breeder Reactor (LWBR) Program, the Consolidated Fuel Reprocessing Program (CFRP), the Gunite and Associated Tank (GAAT) characterization program, and the Low-Level Liquid Waste (LLLW) storage tank characterization program. The defense activity that generated waste stream OR-CHEM-CH-HET is "defense nuclear waste and materials by-products management" because the waste was derived from the analysis of samples originating from defense programs. Samples analyzed in Building 2026 originated from defense and non-defense programs; however, waste management practices did not require segregation of the waste derived from the analysis. Therefore, the waste generated from the analysis of these samples is commingled.

This Summation of Aspects of the AK Summary Report includes information to support Waste Stream Profile Form (WSPF) number OR-CHEM-CH-HET for CH TRU heterogeneous debris. The primary source of information for this summation is CCP-AK-ORNL-005, *Central Characterization Project Acceptable Knowledge Summary Report For Oak Ridge National Laboratory Contact-Handled Transuranic Waste from Analytical Chemistry Laboratory Operations, Waste Stream: OR-CHEM-CH-HET*, Revision 0, September 24, 2009. CCP-AK-ORNL-005 includes information obtained from numerous sources, including facility safety basis documentation, historical document archives, generator and storage facility waste records and documents, program/processing documentation, and interviews with knowledgeable personnel.

Waste Stream Identification Summary

Waste Stream Name:	Heterogeneous Debris from Analytical Chemistry Laboratory Operations
Waste Stream Number:	OR-CHEM-CH-HET
Site Where TRU Waste Was Generated:	Oak Ridge National Laboratory
Site Where TRU Waste Is Currently Stored:	Oak Ridge National Laboratory
Facility Where TRU Waste Was Generated:	Building 2026
Waste Stream Volume – Current:	88 55-gallon drums
Waste Stream Volume – Projected:	122 55-gallon drum equivalents (from repackaging of 8 boxes totaling 900 cubic feet)
Dates of Waste Generation:	1971 – 2005
TRUPACT-II Content code (TRUCON):	OR 125, OR 225, SQ 154
Summary Category Group	S5000- Debris Waste

Waste Matrix Code:	S5400, Heterogeneous Debris
Waste Matrix Code Group	Heterogeneous Debris Waste
Waste Stream TWBIR Identification:	OR-CHEM-CH-HET
RCRA EPA Hazardous Waste Numbers:	D004, D005, D006, D007, D008, D009, D011, D019, D022, F002, and F005

Waste Stream Description and Physical Form

Waste stream OR-CHEM-CH-HET is comprised primarily of organic and inorganic debris waste items and generally consists of cellulosics, plastic, rubber, glass, and metal. Examples of waste items include:

- Iron-based metal items consist of angle iron, banding, bearings, clips, containers (e.g., buckets, cans, drums), fittings, gloveboxes (disassembled and packaged into drums), hand tools (e.g., flashlight, forceps, scissors, sprayers, tweezers, vise, wrenches), hardware (e.g., bolts, clamps, nails, nuts, screws, washers), labware (e.g., beakers, funnels, pans, ring stands, stir rods), lids, pipe, planchets, plates, racks, radiation sources (e.g., Am-241, Cd-109), rods, saw blades, screens, weights, and wire.
- Aluminum metal items include cans, foil, manipulator rings, respirator cartridges, sample mounts, and weighing tins.
- Other metals may include copper (e.g., tubing, wire) and lead (e.g., bricks, pigs, and shot).
- Other inorganic materials consist of absorbents/adsorbents (e.g., Nochar [proprietary organic polymer absorbent], Quick-Solid [organic polymer absorbent], silica gel, vermiculite), asbestos, ceramics (e.g., crucibles), charcoal, concrete chunks and chips, glass (e.g., beakers, bottles, burettes, columns, desiccators, flasks, glovebox windows, jars, light bulbs, Petri dishes, pipettes, thermometers, tubing), and graphite.
- Cellulosic items include cardboard (e.g., boxes, cartons, liner inserts), cheesecloth, cloth liners, cloth rags, coveralls, filter paper, Herculite cloth, leather gloves, masking tape, mop heads, paint brushes, paper (e.g., sheet, towels), smears, wipes, and wood (e.g., cart, handles).
- Plastic items include bags, bottle caps, containers (e.g., bottles, buckets, jugs), disks, electrical cord, fittings, hoods, labware (e.g., beakers, pipette tips, vials), nylon belts, pipe, plexiglass, rope, sheeting, suits, tape, tubing, and wax.
- Rubber items consist of bands, booties, bulbs, gaskets, gloves, hose, o-rings, respirators, stoppers, and styrofoam.
- Other waste items may include lab equipment and electrical devices (e.g., alkaline batteries, balance, centrifuge, hot plate, jack, light fixture, motors, muffle furnace, probe, pump, scale, tumbler, and vacuum cleaner), wood and metal framed high efficiency particulate air (HEPA) filters and roughing filters, and small amounts of absorbed liquids, filter cake, floor sweepings, ion-exchange resin, sludge sample residue, and soil samples.

Waste stream OR-CHEM-CH-HET was generated from a single process or from an activity that is similar in material, physical form, and hazardous constituents and is therefore a single waste stream.

Point of Generation

Location

Waste stream OR-CHEM-CH-HET was generated at the ORNL which is located on the DOE Oak Ridge Reservation within the Bethel and Melton Valleys of Roane County, Tennessee, approximately six miles southwest of the city of Oak Ridge and about 23 miles west of downtown Knoxville.

Area and/or Buildings of Generation

Waste stream OR-CHEM-CH-HET was generated in the RMAL in Building 2026 located in the main ORNL area on Hillside Avenue and Third Street. TRU waste from Building 2026 was generated primarily in several glovebox laboratories but also includes some waste from the hot cell containment area and the facility ventilation system.

Generating Processes

Description of Waste Generating Processes

TRU waste was generated in Building 2026 from a wide range of analytical chemistry support activities including inorganic, organic, and radiochemical analyses to both the R&D divisions and plant operations. In addition, the facility performed R&D activities involving a broad range of physical, chemical, and radiochemical measurements on radioactive materials. TRU waste was also generated during facility maintenance and cleanup.

RCRA-regulated chemicals used or present in this waste stream are provided below in Table 1. The use/source of the RCRA-regulated chemicals are provided in the Hazardous Waste Determinations section below. Examples of ignitable, corrosive, and reactive chemicals used in Building 2026 are also provided in the Hazardous Waste Determinations section below.

Analytical Laboratory Operations

Routine sample preparation and analytical activities were conducted following controlled standard analytical methods. Sample preparation techniques include dilution, dissolution, distillation, evaporation, extraction, Florosil cleanup, ion-exchange separation, microwave assisted acid digestion, precipitation, sulfuric acid/permanganate cleanup, and titration. Numerous analytical techniques have been identified and include:

- Alpha Counting
- Alpha Pulse Height Analysis
- Alpha Spectrometry
- Atomic Absorption Spectroscopy
- Beta Counting
- Cold Vapor Atomic Absorption
- Coulometry
- Density Determination
- Electrochemistry
- Electrometric pH Measurement
- Emission Spectroscopy
- Extraction Chromatography
- Free Acid Determination
- Gamma-ray Spectrometry
- Gas Chromatography
- Gas Chromatography-Electron Capture Detection
- Gas Chromatography-Flame Ionization Detection
- Gas Chromatography-Mass Spectrometry
- Graphite Furnace Atomic Absorption

- Gross Alpha Measurement
- Ignitability Determination
- Inductively Coupled Plasma-Atomic Emission Spectroscopy
- Inductively Coupled Plasma-Mass Spectrometry
- Infrared Analysis for Carbon
- Ion Chromatography
- Isotope Dilution Mass Spectrometry
- Liquid Scintillation Counting
- Mercury Porosimetry
- Moisture Content Analysis
- Optical Fluorescence
- Optical Spectrophotometry
- Oxygen and Hydrogen Content Analysis
- Oxygen-to-Metal Ratio
- Particle Size Analysis
- Potentiometric titration
- Spark-Source Mass Spectrometry
- Surface Area Determination
- Thermal Ionization Mass Spectrometry
- Total Organic Carbon
- Total Plutonium Analysis
- Toxicity Characteristic Leaching Procedure
- X-ray Absorption
- X-ray Fluorescence

Research and Development Operations

In addition to the primary analytical laboratory functions, R&D activities were also conducted in Building 2026, as follows.

- Nuclear-coating test program which included decontamination factor, radiation resistance, and simulated loss of coolant accident testing
- Nuclear fuel cycle studies including water chemistry of nuclear reactors, nuclear waste management, and separations processes
- Irradiated-fuel fission-product release studies
- Liquid waste treatment and decontamination process development studies
- Separation of Ag-110 from Pd-109 wire for use in cancer therapy

Facility Maintenance and Cleanup

Facility maintenance and cleanup activities included the following:

- Equipment repairs (e.g., refurbishment of the hot cell manipulators, repair of intercell conveyor).
- Removal of obsolete or un-repairable equipment from the hot cells.
- Cell repair (e.g., clearing of clogged drain lines, replacement of drain headers).
- Renovation, decontamination, and painting of the cell interiors.
- Routine exhaust filter changes, and facility ventilation system upgrades.
- Installation and repair of the building drain system.
- Decontamination of the filter pit area.
- Contamination incident cleanup.

Transuranic Waste Processing Center (TWPC)

Repackaging of this waste stream began in 2006 and is an ongoing process.

- Drums containing CH-TRU waste in this waste stream were emptied into sorting trays in the TWPC.
- The waste was sorted and segregated to remove prohibited items and repackaged.
- Prohibited items identified during repackaging of drums and boxes were removed from the waste stream or were remediated.
- Secondary wastes created during waste processing, such as rubber glovebox gloves and tools, were placed into the same TRU waste drums.

Table 1 identifies the toxicity characteristic (TC) and F-listed chemicals, as applicable, in waste stream OR-CHEM-CH-HET.

Table 1 – Metal and Organic Toxicity Characteristic and F-Listed Waste Stream Contaminants

Constituent	CAS #	EPA Hazardous Waste Number
Arsenic	7440-38-2	D004
Barium	7440-39-3	D005
Cadmium	7440-43-9	D006
Chromium	7440-47-3	D007
Lead	7439-92-1	D008
Mercury	7439-97-6	D009
Silver	7440-22-4	D011
Carbon tetrachloride	56-23-5	D019
Chloroform	67-66-3	D022
Chlorobenzene	108-90-7	F002
Methylene chloride	75-09-2	F002
Tetrachloroethylene	127-18-4	F002
Trichloroethylene	79-01-6	F002
1,1,1-Trichloroethane	71-55-6	F002
1,1,2-Trichloroethane	79-00-5	F002
Benzene	71-43-2	F005
Carbon disulfide	75-15-0	F005
Methyl ethyl ketone	78-93-3	F005
Pyridine	110-86-1	F005
Toluene	108-88-3	F005

RCRA Determinations

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. Real Time Radiography (RTR) or visual examination (VE) 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 characteristic 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, compressed gases, or oxidizers, and are not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change. The materials are not liquid, and RTR and/or VE are performed to ensure the absence of prohibited liquids.

Examples of ignitable liquids used in Building 2026 include acetone, benzene, dodecane, methanol, methyl isobutyl ketone, and xylene. Solutions containing oxidizing compounds were also used in Building 2026. Examples of oxidizing compounds include dichromate, hypochlorite, nitrate, perchlorate, permanganate, and peroxide compounds. Waste management practices in the facility prohibited the accumulation of liquids in this waste stream and the waste stream is not liquid waste (References C154, C155, C156, P111, P1174, P1178, P1182, P1183, P1186, P1193, P1225, P1228).

Free liquid, pyrophoric material, and compressed gases were verified to be absent in TRU waste in accordance with the ORNL Health Physics Manual and facility-specific procedures (References P241, P244, P566, P956, P1176, P1184). Small quantities of pyrophoric material were handled in Building 2026 as analytical samples or as analytical reagents or standards. The total amount of pyrophoric materials present in the facility were typical for laboratory operations and were not a significant hazard (Reference P1174). Because hot cells and gloveboxes were operated under an air atmosphere, pyrophoric materials were completely reacted and are not in TRU waste (Reference P1228).

To ensure the waste does not exhibit the characteristic of ignitability, liquid in excess of TSDF-WAC limits are 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).

Corrosivity

This waste does not meet the definition of corrosivity as defined in 40 CFR 261.22. The materials are not liquid, and RTR and/or VE are performed to ensure the absence of prohibited liquids.

Numerous acidic and caustic liquids were used in Building 2026. Examples of acids and caustic liquids include: hydrochloric acid, hydrofluoric acid, nitric acid, oxalic acid, perchloric acid, phosphoric acid, sulfuric acid, ammonium hydroxide, barium hydroxide, potassium hydroxide, sodium carbonate, and sodium hydroxide. Waste management practices in the facility prohibited the accumulation of liquids in this waste stream. (References C154, C155, C156, P111, P1174, P1225, P1228, P1178, P1182, P1183, P1186, P1193, U113, U115).

Free liquid and corrosive materials were verified to be absent in TRU waste in accordance with the ORNL Health Physics Manual and facility-specific procedures (References P241, P244, P566, P956, P1176, P1184).

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

Reactivity

This waste stream does not meet the definition 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.

Releasable cyanides and sulfides were measured in samples but at low concentrations that would not be reactive or explosive (References P090, P228, P1232). The use of alpha radiation as a primary excitation source by mixing americium oxide powder with selected inorganic phosphors (cadmium sulfide-silver, zinc sulfide-copper, and zinc-cadmium sulfide-copper) was also evaluated in Building 2026 (Reference P958). Lithium was the only reactive metal identified as being used in analytical activities. The lithium was used as a reducing agent and was completely reacted during the activity (Reference P958).

Small quantities of explosive material were handled in Building 2026 as analytical samples or standards. The total amount of explosive material did not exceed the limits of Class A, Class B, or Class C explosives (Reference P1174). Several chemicals with explosive properties (e.g. 2,4-dinitrophenol, hydrazine, and perchloric acid) were used in Building 2026 or were detected in samples. Waste management practices in the facility required liquids to be collected separately from solid waste. Therefore, they are not included in this waste stream. Liquids were released to the liquid waste system drains (References C154, C155, C156, P111, P1174, P1178, P1182, P1183, P1186, P1193, P1225, P1228).

Free liquid and explosives were verified to be absent in TRU waste in accordance with the ORNL Health Physics Manual and facility-specific procedures (References P241, P244, P566, P956, P1176, P1184).

To ensure the waste does not exhibit the characteristic of reactivity, liquid in excess of TSDF-WAC limits are removed or immobilized, and compressed gases (e.g., aerosol cans) are removed or vented prior to WIPP disposal. Therefore this waste stream does not exhibit the characteristic of reactivity (D003).

Toxicity

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 conservatively applied to the waste stream.

Several uses and sources have been identified for arsenic, barium, cadmium, chromium, lead, mercury, silver, carbon tetrachloride, and chloroform. Arsenic is a component of Arsenazo (III) used as a color reagent and thorium stripping agent (References P958, P959, P963). Tetraphenylarsonium pertechnetate was used as a precipitation agent (Reference P963). Barium chloride was a stock solution (Reference P1223). Barium hydroxide was used as a precipitation agent (Reference P015). Cadmium oxide was a stock solution (Reference P1223). Cadmium sulfide was a phosphor component (Reference P958). Chromium oxide and chromium fluoride were test materials (References P082, P478). Potassium dichromate was used as an oxidizing agent (References P477, P964, P1192). Lead was used as shielding (e.g., pig) and is present in solder from incandescent

lights used in hot cells (References I028, P015, P034, P053, P054, P080, P085, P090, P221, P228, P246, P961, P963, P964, P1225, P1230, P1231, P1232, P1233). Mercury was used in mercury porosimetry analysis, complexometric titration, and is present in mercury vapor lights used in hot cells (References I028, P011, P015, P034, P053, P054, P080, P082, P083, P085, P090, P133, P221, P228, P451, P477, P958, P959, P960, P961, P963, P964, P971, P976, P1192, P1225, P1228, P1230, P1231, P1232, P1233). Silver oxide was used as an oxidizing agent (Reference P015). Silver nitrate was used as a titrant and a precipitation agent (References P015, P082, P961, P1179, P1191, P1223)

Carbon tetrachloride was used as a chlorination agent and as an organic solvent (References P015, P053, P054, P056, P085, P221, P958, P1225, P1233). Chloroform was used as an organic solvent (References P085, P090, P959).

Since analytical data are not available to demonstrate the concentrations of these metal and organic compounds in this debris waste stream are less than the regulatory threshold, EPA hazardous waste numbers D004, D005, D006, D007, D008, D009, D011, D019, and D022 are assigned to waste stream OR-CHEM-CH-HET (Reference DR014).

Benzene, chlorobenzene, methyl ethyl ketone, pyridine, tetrachloroethylene, and trichloroethylene were used in the process that generated this waste stream. As described below, the F-listed EPA hazardous waste numbers have been assigned for these compounds, and therefore, EPA hazardous waste numbers D018, D021, D035, D038, D039, and D040 are not assigned to the waste stream.

Selenious acid was used in the preparation of analytical standard samples. Based on the concentration of selenium in the standard and presence in discarded material, the concentration of selenium (D010) is below regulatory threshold. Therefore, EPA hazardous waste number D010 is not assigned to the waste stream (Reference DR014).

Toxicity characteristic pesticides and other organic compounds consisting of endrin (D012), lindane (D013), methoxychlor (D014), toxaphene (D015), cresols (D026), 1,4-dichlorobenzene (D027), 1,2-dichloroethane (D028), 1,1-dichloroethylene (D029), 2,4-dinitrotoluene (D030), heptachlor (D031), hexachlorobenzene (D032), hexachloroethane (D034), nitrobenzene (D036), pentachlorophenol (D037), and 2,4,5-trichlorophenol (D041) were used as analytical standards and some of these chemicals were detected in tank waste samples that contaminate the waste. No other use or source for these compounds has been identified. The amount of these compounds present in this waste stream from discarded solid sample material (e.g., sludge) or contaminated secondary waste (e.g., lab equipment, and wipes) is below the regulatory threshold. Therefore, EPA hazardous waste numbers D012, D013, D014, D015, D026, D027, D028, D029, D030, D031, D032, D034, D036, D037, and D041 are not assigned to the waste stream.

Listed Waste

F-Listed Waste

Waste stream OR-CHEM-CH-HET was mixed with or derived from F-listed hazardous wastes from non-specific sources as listed in Title 40 *Code of Federal Regulations* (CFR) 261.31. F002 and F005 listed solvents were used in the Radioactive Materials Analytical Laboratory (RMAL) in Building 2026 and contaminate the waste (Reference DR014).

Although several F001-listed solvents were identified in the AK record (i.e., carbon tetrachloride), these listed solvents were not used in a "large-scale" degreasing operation such as cold cleaning or vapor degreasing. The RMAL in Building 2026 did not conduct large-scale degreasing operations, and therefore, EPA HWN F001 is not assigned to this waste stream.

The F002-listed solvent methylene chloride was used as an organic solvent, elution solvent, and extraction agent, and was detected in tank waste samples (References P034, P053, P054, P080, P085, P221, P228, P1223, P1231, P1233). Therefore, EPA hazardous waste number F002 is assigned to this waste stream.

Tetrachloroethylene was identified in gas scrubbing solution effluent and in tank waste samples (References P085, P963, P1231). 1,1,1-Trichloroethane and 1,1,2-trichloroethane were detected in tank waste samples (References I028, P090). Chlorobenzene and trichloroethylene were used to prepare analytical standards and were detected in tank waste samples (References P053, P085, P1223, P1233). The use of these solvents in the preparation of standards does not constitute solvent use under RCRA, and the specific use of the solvents in tank waste samples has not been identified. However, since this waste stream is assigned EPA hazardous waste number F002 due to methylene chloride solvent use, the F002 HWN is also conservatively assigned for the additional solvents.

The F005-listed solvents benzene, carbon disulfide, methyl ethyl ketone, pyridine, and toluene were used as organic solvents in the laboratory (References P053, P054, P082, P085, P090, P959, P960, P963, P1223, P1225). Therefore, EPA hazardous waste number F005 is assigned to this waste stream.

F003 constituents including acetone, n-butyl alcohol, cyclohexanone, ethyl acetate, ethyl benzene, methanol, methyl isobutyl ketone, and xylene were also used in Building 2026. These solvents are listed solely as ignitable in the liquid form. The waste stream does not exhibit the characteristic of ignitability because it is not liquid; therefore, F003 is not assigned.

The following F-listed constituents may contaminate the waste and are conservatively applied:

F002 – Chlorobenzene, methylene chloride, tetrachloroethylene, trichloroethylene, 1,1,1-trichloroethane, and 1,1,2-trichloroethane

F005 – Benzene, carbon disulfide, methyl ethyl ketone, pyridine, and toluene.

U, K and P-Listed Wastes

Waste stream OR-CHEM-CH-HET was not mixed with a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof (40 CFR 261.33). Based on the AK documentation reviewed, there is no evidence that unused commercial products were disposed of in TRU waste drums.

Beryllium and beryllium compounds may contaminate this waste stream. Based on the AK documentation reviewed, the form of beryllium used does not meet the definition of commercial chemical product beryllium powder (40 CFR 261.33). 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 OR-CHEM-CH-HET.

Waste stream OR-CHEM-CH-HET does not include any of the manufacturing process wastes from the specific industries or sources listed in 40 CFR 261.32.

Waste Stream OR-CHEM-CH-HET is not assigned any U-, K-, or P-Listed EPA HWNs.

Conclusion

The EPA hazardous waste numbers that apply to the waste stream are D004, D005, D006, D007, D008, D009, D011, D019, D022, F002, and F005.

Headspace Gas/Volatile Organic Compound Information

Headspace gas analysis was performed on 10 randomly selected containers in Lot 1 of this waste stream. One target analyte UCL_{90} value (methanol) exceeded its respective program required quantitation limits (PRQLs). Because this waste is not liquid, F003 (methanol) is not applied. No tentatively identified compounds were identified.

No new EPA hazardous waste numbers were added as a consequence of headspace gas sampling and analysis. The specifics of this information are included in the attached Characterization Information Summary report.

Polychlorinated Biphenyls

This waste stream contains PCBs, and therefore is regulated as Toxic Substances Control Act waste under 40 CFR 761.

Based on discussions with ORNL personnel, some drums in this waste stream contain equipment with small PCB capacitors and pumps that contained PCB oil. The oil was drained from the pumps and is not included in this waste stream. Residual oil that could not be drained from the pump was absorbed. Examples of equipment containing small capacitors include fluorescent light ballasts and electric motors such as a vacuum pump motor. There was no concerted effort to inventory pumps or electrical equipment containing small capacitors to determine if they contained PCBs so these items are potentially present in this waste stream (Reference C308).

Sludge and liquid samples were collected from numerous tanks at ORNL and analyzed for PCBs (References I028, P053, P054, P085, P221, P228, P1230, P1232). Most of the samples did not contain regulated levels of PCBs, but one tank sampled in 1993 did contain sludge with between 105 and 241 parts-per-million (ppm) Aroclor-1248 (Reference P228).

Containers with PCB waste, identified during RTR and/or VE, will be managed in accordance with the PCB disposal requirements in the Waste Isolation Pilot Plant-Waste Acceptance Criteria.

Prohibited Items

The absence of prohibited items is determined and documented through acceptable knowledge and characterization activities. Radiography or VE 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 wastes 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 exhibiting the characteristics of ignitability, corrosivity, or reactivity

- Waste that has ever been managed as high-level waste and waste from tanks specified in Table B-8 of the WIPP HWFP, unless specifically approved through a Class 3 permit modification.
- Any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, as described in WIPP HWFP Attachment B7.

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

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

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameters (WMPs) for waste stream OR-CHEM-CH-HET were derived from limited VE performed at the TWPC. An analysis of the VE data was performed, the results of which are presented in Table 2. This evaluation is documented in a memorandum as required by CCP-TP-005, *CCP Acceptable Knowledge Documentation.*

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

Table 2. Waste Stream OR-CHEM-CH-HET Waste Material Parameter Estimates

Waste Material Parameter	Average Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	16.7%	0% – 43.5%
Aluminum-based Metals/Alloys	2.0%	0% – 6.3%
Other Metals	2.7%	0% – 8.7%
Other Inorganic Materials	3.9%	0% – 12.5%
Cellulosics	30.9%	0% – 64.9%
Plastics (waste materials)	24.2%	0% – 32.4%
Rubber	19.6%	0% – 52.5%
Organic Matrix [1]	<1.0%	0% – <50%
Inorganic Matrix [2]	<1.0%	0% – <50%
Soil/Gravel [3]	<1.0%	0% – <50%

1. Although not identified in limited VE data, small amounts of organic matrix may be present in this waste stream. The TWPC uses NOCHAR Petrobond ® (organic polymer absorbent) to absorb residual liquids. Building 2026 used Quick-Solid (organic polymer absorbent) to absorb residual liquids. Some ion-exchange resin may also be present in the waste stream.
2. Although not identified in limited VE data, small amounts of inorganic matrix may be present in this waste stream in the form of filter cake, floor sweepings, and sludge sample residues.
3. Although not identified in limited VE data, small amounts of soil samples may be present in the waste stream.

List of Any AK Sufficiency Determinations Requested for the Waste Stream

No AK Sufficiency Determinations were requested for this waste stream.

Transportation

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

Beryllium

Beryllium will not be present in amounts greater than 1% by weight of the waste in each drum.

Radionuclide Information

The two most prevalent radionuclides in this waste stream, by weight, based on the un-decayed data reported in AK are U-238 and Th-232. The isotopes expected to be present in this waste stream are listed in Table 3.

Table 3 – Radionuclides in Waste Stream OR-CHEM-CH-HET

WIPP Tracked	Other Radionuclides Present		
Am-241	Co-60	Eu-154	Cm-242
Pu-238	Zr-95	Eu-155	Cm-244
Pu-239	Ru-106	Ac-227	Cf-252
Pu-240	Cd-109	Th-232	
Pu-242	Ag-110m	U-232	
U-233	Cs-134	U-235	
U-234	Ce-141	U-236	
U-238	Ce-144	Np-237	
Cs-137	Pm-147	Pu-241	
Sr-90	Eu-152	Am-243	

Payload management will not be implemented for this waste stream.

Attachment 1, AK SOURCE DOCUMENTS, SUPPLEMENTAL DOCUMENTATION

Source Document Number	AK #	Title	Document Number	Revision	Date
C080	S7	Interview with John Keller: Waste generating activities and waste management practices at Building 2026.	NA	NA	05/09/2005
C154	NA	Interview of John Keller	NA	NA	06/23/2009
C155	NA	Interview of Rob Peacher	NA	NA	06/25/2009
C156	NA	Interview of Harold Hall	NA	NA	06/25/2009
C308	S7	Interview of Jason Taylor, ORNL-PCB Coordinator from 1997 - 2004 re: PCB Management at ORNL	NA	NA	04/08/2008
DR014	S2	Discrepancy Resolution – Waste Stream OR-CHEM-CH-HET EPA Hazardous Waste Number Assignment	NA	NA	12/30/2009
I028	S9	Results of the Characterization and Acid Dissolution Tests of Sludge Samples from Waste Tank W1-I at ORNL	ORNL/CF-98/23	NA	07/1998
M151	S6	EM Waste Database Query	DR-09-001168	NA	04/29/2009
M163	S10	Material Safety Data Sheets for Chemicals Used in Building 2026	NA	NA	NA
P011	NA	Analytical Chemistry Division Annual Progress Report, Period Ending November 30, 1976	ORNL-5244	NA	02/1977
P015	NA	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1979	ORNL-5619	NA	05/1980
P022	S5	Site Descriptions of Environmental Restoration Units at Oak Ridge National Laboratory, Oak Ridge, Tennessee	ORNL/ER-391	NA	02/1997
P034	S5 S9	Characterization of the Old Hydrofracture Facility (OHF) Waste Tanks Located at ORNL	ORNL/TM-13394	NA	04/1997
P053	S9	Characterization of Selected Waste Tanks from the Active LLLW System	ORNL/TM-13248	NA	08/1996
P054	S9	Characterization of the BVEST Waste Tanks Located at ORNL	ORNL/TM-13358	NA	01/1997
P056	S5	Analytical Chemistry Division Annual Progress Report, Period Ending November 30, 1975	ORNL-5100	NA	02/1976
P080	S9	Characterization of the C1 and C2 Waste Tanks Located in the BVEST System at ORNL	ORNL/TM-13546	NA	02/1998
P082	NA	Analytical Chemistry Division Annual Progress Report, Period Ending September 30, 1974	ORNL-5006	NA	01/1975
P083	NA	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1982	ORNL-5949	NA	05/1983

Source Document Number	AK #	Title	Document Number	Revision	Date
P085	S9	Sampling and Analysis of the Inactive Waste Storage Tank Contents at ORNL	ORNL/ER-13	NA	09/1990
P090	S9	Sampling and Analysis of the Inactive Waste Tanks TH-2, WC-1, and WC-15	ORNL/ER-19	NA	02/1992
P111	S5 S7	Review of Opportunities For Consolidation of Operations Within the ORNL Hot Cells	ORNL/M-2971	NA	08/1993
P133	NA	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1980	ORNL-5738	NA	05/1981
P221	S9	Characterization of the MVST Waste Tanks Located at ORNL	ORNL/TM-13357	NA	12/1996
P228	S9	Sampling and Analysis of Inactive Radioactive Waste Tanks W-17, W-18, WC-5, WC-6, WC-8, and WC-11 through WC-14 at ORNL	ORNL/TM-13017	NA	12/1995
P241	S2	Oak Ridge National Laboratory Contact-Handled Transuranic Waste Certification Program Plan	ORNL/TM-10322	Revs. 1, 2, 3	06/1992
P244	S2	Certification Document for Newly Generated Contact-Handled Transuranic Waste	ORNL-5985/R1	Rev. 1	05/1984
P246	NA	Preliminary Radiological Characterization of Fifteen Waste Tanks at Oak Ridge National Laboratory	ORNL/CF-84/203	NA	09/1984
P251	S2	Box Breakdown Area Operations	CH-P-OP-003	Revs. 7, 9, 12, 15	03/13/2007 - 03/23/2009
P252	S2	Glove Box Operations	CH-P-OP-004	Revs. 8, 10, 14, 17	03/13/2007 - 03/23/2009
P253	S2	Drum Bag In/Bag Out and Glove Ports	CH-P-OP-011	Rev. 10, 12, 13, 14	05/02/2007 - 03/23/2009
P254	S2	Contact Handled Waste Repackaging	CH-P-OP-013	Revs. 6, 7, 8, 9	04/30/2007 - 03/23/2009
P256	S3	TRU/Alpha Low Level Waste (LLW) Treatment Project Documented Safety Analysis	T-CM-FW-R-AD-001	Rev. 13	03/01/2007
P364	S5	Analytical Chemistry Division Annual Progress Report for Period ending December 31, 1992	ORNL-6749	NA	04/1993
P432	S3	TRU Waste Processing Center Document Safety Analysis	CM-R-AD-001	Revs. 15, 16, 17	10/31/2007 10/24/2008
P451	NA	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1991	ORNL-6701	NA	02/21/1992
P477	NA	Analytical Chemistry Division Annual Progress	ORNL-6236	NA	05/08/1986

Source Document Number	AK #	Title	Document Number	Revision	Date
		Report for Period Ending December 31, 1985			
P478	NA	Analytical Chemistry Division Annual Progress Report for period Ending December 31, 1984	ORNL-6139	NA	04/19/1985
P485	S10	Problem Safety Summary for Lab-Scale Hot-Cell Studies (Consolidated Fuel Cycle Studies) for Cell 5, Building 2026	CD-65	NA	1984-1994
P566	NA	ORNL Health Physics Manual; Procedures RP-4.1; RP-4.2; RP-5.1	ORNL/M-804	NA	11/02/1994
P905	S2	Health Physics Procedure - Handling and Transfer of Radioactive Materials within the Laboratory and Guide for the Transfer of Materials Between Contaminated Enclosure Systems and Non-Contaminated Areas	Procedure 4.1	NA	01/01/1976
P956	NA	Procedure 5.1 - Segregation and Management of solid Radioactive Waste Materials and supporting Solid Waste Management Documentation	Procedure 5.1	NA	12/15/1983 12/15/1985
P958	S5	Analytical Chemistry Division Annual Progress Report for Period Ending September 30, 1970	ORNL-4636	NA	01/18/1971
P959	S5	Analytical Chemistry Division Annual Progress Report for Period Ending September 30, 1971	ORNL-4749	NA	01/11/1972
P960	S5	Analytical Chemistry Division Annual Progress Report Period Ending September 30, 1972	ORNL-4838	NA	01/12/1973
P961	S5	Analytical Chemistry Division Annual Progress Report Period Ending September 30, 1973	ORNL-4930	NA	01/23/1971
P962	S5	Analytical Chemistry Division Annual Progress Report Period Ending November 30, 1977	ORNL-5360	NA	03/1978
P963	S5	Analytical Chemistry Division Annual Progress Report Period Ending December 31, 1978	ORNL-5518	NA	06/05/1979
P964	S5	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1983	ORNL-6039	NA	05/23/1984
P965	S5	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1986	ORNL-6357	NA	05/20/1987
P966	S5	Analytical Chemistry Division Annual Progress Report for Period Ending December 31, 1988	ORNL-6547	NA	06/01/1989
P971	NA	From: Radioactive Operations Committee, To: Alvin M. Weinberg; F. L. Culler, Subject: Radioactive Operations Committee Review of High Level Analytical Laboratory, Building 2026, November 18, 1971	72-2-3	Rev. 0	02/01/1972
P976	NA	Chemical and Analytical Sciences Division Progress Report for the Period January 1, 1993,	ORNL-6876	Rev. 0	06/1995

Source Document Number	AK #	Title	Document Number	Revision	Date
		through December 31,1994			
P1082	NA	Lockheed Martin Energy Research Corporation, ORNL, Environmental Protection Procedure: Disposal of PCB (Polychlorinated Biphenyl) Oils	EPM-3.1	Rev. 0A	05/01/1993
P1083	NA	Environmental Protection Procedure: Polychlorinated Biphenyls (PCBs)	EPM-4.0	NA	11/20/1989 01/15/1987
P1174	NA	Safety Analysis Report Radioactive Materials Analytical Laboratory Building 2026	ORNL/CASD/2026/SAR	Rev. 0, 2-6	09/09/1999
P1175	S2	Bagging Practices and Techniques for Standard Glovebox Operations	AC-OP-100-0910	Rev. 0	06/14/1990 04/05/1989
P1176	NA	Solid Low Level Waste Certification Pain for the Low-Level Radiochemical Analysis Group	AC-OP-101-2106	Rev. 0	09/12/1994
P1177	S2	Total VOCs and SVOCs Analysis of Homogeneous Solids and Soil/Gravel for the TRU Waste Characterization Project	CASD-OP-RML-WP02	Rev. 1	02/15/1996
P1178	S2	Operating and Safety Rules For The High Radiation Level Analytical Laboratory - Building 2026	AC-OP-104-0103	Rev. 0	08/18/1989
P1179	S2	Palladium Target Processing	AC-OP-104-0906	Rev. 0	08/14/1992
P1180	S2	Cleaning Laboratory Glassware	AC-OP-104-1203	Rev. 0	06/18/1990
P1182	S2	Radiation Reduction Project For Analytical Hot Cell No. 1 ORNL Building 2026	AC-OP-105-0914	Rev. 0	08/26/1991
P1183	S2	UHP Water Pump Operations	AC-OP- 105-1209	Rev. 0	08/21/1991
P1184	S2	Handling and Packaging of Contact-Handled Transuranic Waste (CH-TRU) - HRLAL, Building 2026	AC-OP-105-2101	Revs. 0, 1	02/01/1991 08/30/1993
P1185	S2	Procedure For The Preparation And Disposal Of Solid Low-Level Radioactive Waste (LLW) - Radioactive Materials Analytical Laboratory (RMAL), Building 2026	AC-OP-105-2104	Rev. 0	09/01/1993
P1186	S2	Interim Procedure for Disposal of Liquid Radioactive Waste in the Radioactive Materials Analytical Laboratory, (RMAL), Building 2026	AC-OP-105-210	Rev. 0	10/25/1993
P1189	S2	Hot Cell Operations, Radioactive Materials Analytical Laboratory (RMAL), Building 2026	CASD-OP-RML-HC01	Rev. 2	06/08/2001
P1190	S2	Use of Glove Boxes in the Radioactive Materials Analytical Laboratory, Building 2026	CASD-OP-RML-GB01	Rev. 2	05/25/2001
P1191	S2	Palladium Target Processing, Radioactive	CASD-OP-RML-	Rev. 0	06/08/2001

Source Document Number	AK #	Title	Document Number	Revision	Date
		Materials Analytical Laboratory (RMAL), Building 2026	HC02		
P1192	S2	Immediate Action Directive For CASD-OP-RML-IN04: Activity Based Hazard Analysis	CASD-OP-RML-IN04	Rev. 0	09/30/2005
P1193	S2	Procedure For Disposal Of Liquid Radioactive Waste In The Radioactive Materials Analysis Laboratory, Building 2026	CASD-OP-RML-WM03	Rev. 0	02/24/1995
P1194	S2	Total Metals Analysis of Homogeneous Solids and Soil/Gravel for the TRU Waste Characterization Program (TWCP)	CASD-OP-RML-WP02	Rev. 1	02/15/1996
P1199	S2	Sample Management In The Radioactive Materials Analytical Laboratory (RMAL), Building 2026	CSD-OP-RML-AD02	Rev. 6	09/25/2004
P1200	S2	Use Of Glove Boxes In The Radioactive Materials Analytical Laboratory, Building 2026	CASD-OP-RML-GB01	Revs. 1, 2, 3	11/01/2006 05/25/2001 08/01/1997
P1201	S2	Guidelines for Inductively Couple Plasma Atomic Emission Spectroscopy Operation for the Radioactive Materials Analytical Laboratory.	CSD-OP-RML-IN01	Rev. 1	09/02/2003
P1202	S2	Total Plutonium, 2-Thenoyltrifluoroacetone Extraction Method	CSD-AM-RML-RA11	Rev.1	12/06/2002
P1203	S2	Determination Of Radioactive Strontium In High Level Samples Using Extraction Chromatography	CSD-AM-RML-RA-13	Rev.1	12/06/2002
P1223	S2	Standard Analytical Methods for Radioactive Materials Analytical Laboratory (RMAL) Building 2026	NA	NA	1997
P1225	S5	High Radiation Level Analytical Laboratory Building 2026 Operating And Safety Rules	NA	Rev. 0	11/1987
P1226	S5	Radioactive Operations Committee Review of the Radioactive Materials Analytical Laboratory (RMAL), Building 2026, February 9, 1979	ORNL/CF-79/54	Rev. 0	03/21/1979
P1227	S5	Radioactive Operations Committee Review of the Radioactive Materials Analytical Laboratory (RMAL), Building 2026	ORNL/CF-81/241	Rev. 0	08/11/1981
P1228	S5	Safety Analysis Report - Radioactive Materials Analytical Laboratory (Building 2026)	ORNL/CF-82/31	Rev. 0	04/12/1982
P1229	S2	ORNL Analytical Master Methods Manual	NA	Rev. 0	01/11/1988
P1230	S9 S12	Results of Fall 1994 Sampling of Gunite and Associated Tanks at the Oak Ridge National Laboratory, Oak Ridge, Tennessee.	ORNL/ER/Sub/87-99053/74	NA	06/1995
P1231	S9	Results of 1995 Characterization of Gunite and	ORNL/ER/Sub/8	NA	02/1996

Source Document Number	AK #	Title	Document Number	Revision	Date
	S12	Associated Tanks at Oak Ridge National Laboratory, Oak Ridge, Tennessee	7-99053/79		
P1232	S9 S12	Results of Sampling the Contents of the Liquid Low-Level Waste Evaporator Feed Tank W-22 at ORNL	ORNL-TM-13234	NA	09/1996
P1233	S9	Sampling and Analysis of Radioactive Liquid Wastes and Sludges in the Melton Valley and Evaporator Facility Storage Tanks at ORNL	ORNL-TM-11652	NA	09/1990
U038	S5 S9	ORNL TRU Waste Historical Survey; Volumes 1, 2, and 3	BJC/OR-395	Draft	09/2001
U044	S2 S9	Acceptable Knowledge Summary Report for Oak Ridge National Laboratory Contact-Handled TRU Debris Waste Facility Maintenance Operations	AK-ORNL-001	Revs. 3A, 4	05/24/2006 06/19/2006
U113	NA	Waste Characterization Checklist and Supporting Documentation for Building 2026	WCC-2026-Facility	Revs. 0, 1	05/24/2005 07/11/2005
U115	NA	Waste Characterization Checklist and Supporting Documentation for Separation of Th-229 from U-233 in Building 2026	WCC-2026-U233	Rev. 3	12/05/2006

Alphanumeric Designations

C	Correspondence
DR	Discrepancy Resolution
I	Internal Procedures and Notes
M	Miscellaneous
P	Published Documents
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