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

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NMED Hazardous Waste Bureau

OCT 18 2012

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: Review of Savannah River Site - Central Characterization Project Waste Stream Profile Form Number SR-KAC-HET

Dear Mr. Kieling:

The Department of Energy, Carlsbad Field Office has approved the Waste Stream Profile Form (WSPF) Number SR-KAC-HET, K-Area Interim Surveillance Program Debris Waste, for the Central Characterization Project at the Savannah River Site.

Enclosed is a copy of the WSPF as required by Section C-5a of the Waste Isolation Pilot Plant, Hazardous Waste Facility Permit, No. NM4890139088-TSDF.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions, please contact Mr. J. R. Stroble, Director of the Office of the National TRU Program, at (575) 234-7313.

Sincerely,

José R. Franco, Manager
Carlsbad Field Office

Enclosure

cc: w/enclosure

S. Holmes, NMED	* ED
T. Kliphuis, NMED	ED
RCRA Chronology Record	ED
WIPP Operating Record	ED
CBFO M&RC	

*ED denotes electronic distribution

121033

CBFO:NTP:NC:PG:12-0555:UFC 5900.00

Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: SR-KAC-HET					
(2) Generator site name: Savannah River Site			(3) Generator site EPA ID: SC1890008989		
(4) Technical contact: Beverly Schrock			(5) Technical contact phone number: 575-234-7444		
(6) Date of audit report approval by New Mexico Environment Department (NMED): May 23, 2012					
(7) Title, version number, and date of documents used for WIPP-WAP Certification: CCP-PO-001, CCP Transuranic Waste Characterization Quality Assurance Project Plan, Revision 20, June 16, 2011; CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 26, July 14, 2011; CCP-PO-004, CCP/SRS Interface Document, Revision 31, October 1, 2012					
(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					
(10) WIPP ID: SR-KAC-HET			(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris Waste			(13) Waste Stream Name: K-Area Interim Surveillance Program Debris Waste		
(14) Description from the ATWIR: This waste stream consists of plutonium contaminated debris resulting from destructive and non-destructive examination of containers used to store plutonium material.					
(15) Defense TRU Waste: YES	X	NO			
(16) Check One: CH	X	RH			
(17) Number of SWBs: NA (17a) Number of SLB2s: NA	(18) Number of Drums: 6 55-gallon drums 5 55-gallon drums/per year projected			(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: NA					
(22) Applicable TRUCON Content Numbers: SR 125 / SR 225, SQ 154					
(23)**Acceptable Knowledge Information**					
(For the following, enter the supporting documentation used [i.e., references and dates])					
Required Program Information					
(23A) Map of site: CCP-AK-SRS-18, Revision 0, April 3, 2012, Figures 1 and 3					
(23B) Facility mission description: CCP-AK-SRS-18, Revision 0, April 3, 2012, Section 4.2					
(23C) Description of operations that generate waste: CCP-AK-SRS-18, Revision 0, April 3, 2012, Section 4.4					
(23D) Waste identification/categorization schemes: CCP-AK-SRS-18, Revision 0, April 3, 2012, Section 4.7.2					
(23E) Types and quantities of waste generated: CCP-AK-SRS-18, Revision 0, April 3, 2012, Section 4.7.1					
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-SRS-18, Revision 0, April 3, 2012, Section 4.7.3					
(24) Waste certification procedures: CCP-TP-030, Revision 30, May 21, 2012					
(25)Required Waste Stream Information					

(25A) Area(s) and building(s) from which the waste stream was generated CCP-AK-SRS-18, Revision 0, April 3, 2012, Section 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-SRS-18, Revision 0, April 3, 2012, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-SRS-18, Revision 0, April 3, 2012, Section 5.3			
(25D) Waste Process flow diagrams: CCP-AK-SRS-18, Revision 0, April 3, 2012, Figure 4			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-SRS-18, Revision 0, April 3, 2012, Section 5.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See table entitled "Waste Stream SR-KAC-HET Waste Material Parameters" in Summation of Aspects of AK Summary Report: Waste Stream SR-KAC-HET			
(26) Which Defense Activity generated the waste:			
	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 P170, P171, P172, P173, P174, P175, P176, P177, P178, P179, P180, P181, P182, P185 and P186 in the Summation of Aspects of AK Summary Report: Waste Stream SR-KAC-HET, Source Documents.			
(27C) Safety Analysis Reports: See D096 in the Summation of Aspects of AK Summary Report: Waste Stream SR-KAC-HET, Source Documents.			
(27D) Waste packaging logs: NA			
(27E) Test plans/research project reports: See D094 in the Summation of Aspects of AK Summary Report: Waste Stream SR-KAC-HET, Source Documents.			
(27F) Site databases: NA			
(27G) Information from site personnel: See C144 in the Summation of Aspects of AK Summary Report: Waste Stream SR-KAC-HET, Source Documents.			
(27H) Standard industry documents: NA			
(27I) Previous analytical data: See D094, M075, M076, M078 and M087 in the Summation of Aspects of AK Summary Report: Waste Stream SR-KAC-HET, Source Documents.			
(27J) Material safety data sheets: NA			
(27K) Sampling and analysis data from comparable/surrogate Waste: NA			
(27L) Laboratory notebooks: NA			
Confirmation Information			
For the following, when applicable, enter procedure title(s), number(s) and date(s)			
(28)	Radiography: CCP-TP-053, Revision 12, August 22, 2012		
	Visual Examination: NA		

(29) Comments: For a list of the waste characterization procedures used and date of respective procedures see the list of procedures on the attached CIS.

Reviewed by AK Expert: YES [X] Date: 10-4-2012

Reviewed by STR (if necessary): YES [X] N/A [ ] Date: 10-5-2012

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.

BSSchrock	Beverly Schrock	10/5/12
Signature of Site Project Manager	Printed Name	Date

CHARACTERIZATION INFORMATION SUMMARY

WSPF # SR-KAC-HET

Lot 1

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CCP Characterization Information Summary Cover Page

Waste Stream #	SR-KAC-HET	Lot #:	1
AK Expert Review:	N/A	Date:	N/A
SPM Review:	Richard Kantrowitz RLKtz	Date:	10/11/2012

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. 12	08/22/12	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/11	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Non Destructive Assay (NDA):

CCP-TP-191	Rev. 1	10/20/09	CCP Box Neutron Assay System (BNAS) Operating Procedure

Headspace Gas Sampling and Analysis (HSG):

CCP-TP-093	Rev. 16	09/07/11	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 7	12/29/10	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-175	Rev. 3	08/02/11	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. 20	09/27/12	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. 24	12/28/11	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. 18	12/29/10	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 24	11/28/11	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/11	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 30	05/21/12	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
CCP-TP-030	Rev. 29	04/26/11	CCP CH TRU Waste Certification and WWIS/WDS Data Entry

WAP Certification:

CCP-PO-001	Rev. 20	06/16/11	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-002	Rev. 26	07/14/11	CCP Transuranic Waste Certification Plan
CCP-PO-004	Rev. 31	10/01/12	CCP/SRS Interface Document
CCP-PO-004	Rev. 30	10/17/11	CCP/SRS Interface Document

CIS002

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream: # SR-KAC-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	
KAC0900001	SRLBC0706	SR4RTR0257	N/A	N/A	N/A	N/A	SRHSG1210	ECL12018M	N/A
KAC0900011	SRLBC0706	SRSRTR0574	N/A	N/A	N/A	N/A	SRHSG1210	ECL12018M	N/A
KAC0900023	SRLBC0707	SRSRTR0575	N/A	N/A	N/A	N/A	SRHSG1210	ECL12018M	N/A
KAC0900024	SRLBC0706	SR4RTR0257	N/A	N/A	N/A	N/A	SRHSG1210	ECL12018M	N/A
KAC1000013	SRLBC0706	SR4RTR0256	N/A	N/A	N/A	N/A	SRHSG1210	ECL12018M	N/A
KAC1100007	SRLBC0707	SRSRTR0573	N/A	N/A	N/A	N/A	SRHSG1210	ECL12018M	N/A

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

10/11/2012
Date

CIS003

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: SR-KAC-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
Acetone	Log	6	6	2.64	2.08	0.34	2.28	100	4.61		
Benzene	Log	6	6	2.04	1.24	0.51	1.54	10	2.30		
Bromoform	Log	0	6	-1.97	-2.24	0.22	-2.11	10	2.30		
Butanol	No	6	6	2.30	1.47	0.57	1.81	100	N/A		
Carbon Disulfide(2)	Log	4	6	0.53	-0.07	0.59	0.29	10	2.30		
Carbon tetrachloride	Log	0	6	-1.47	-1.78	0.23	-1.63	10	2.30		
Chlorobenzene	Log	0	6	-1.17	-1.47	0.22	-1.33	10	2.30		
Chloroform	Log	0	6	-1.12	-1.42	0.23	-1.28	10	2.30		
Chloromethane(2)	Log	0	6	-0.16	-0.47	0.24	-0.33	10	2.30		
Cyclohexane[a]	Log	0	6	-0.79	-1.09	0.23	-0.95	10	2.30		
1,1-Dichloroethane	Log	0	6	-0.90	-1.20	0.23	-1.06	10	2.30		
1,2-Dichloroethane	Log	0	6	-0.95	-1.25	0.23	-1.11	10	2.30		
1,1-Dichloroethylene	Log	0	6	-0.88	-1.17	0.23	-1.04	10	2.30		
cis-1,2-Dichloroethylene[a]	Log	0	6	-0.90	-1.20	0.23	-1.06	10	2.30		
trans-1,2-Dichloroethylene	Log	0	6	-0.90	-1.20	0.23	-1.06	10	2.30		
1,2-Dichloropropane(2)	Log	0	6	-1.04	-1.32	0.22	-1.19	10	2.30		
Ethyl benzene	Log	0	6	-1.17	-1.47	0.23	-1.33	10	2.30		
Ethyl ether	Log	0	6	-0.60	-0.91	0.23	-0.77	10	2.30		
Methanol	Log	6	6	2.83	2.26	0.36	2.48	100	4.61		
Methyl ethyl ketone	Log	3	6	0.18	-0.50	0.53	-0.18	100	4.61		
Methyl isobutyl ketone	Log	0	6	-1.06	-1.36	0.23	-1.22	100	4.61		
Methylene chloride	Log	0	6	-0.69	-0.97	0.22	-0.84	10	2.30		
1,1,2,2-Tetrachloroethane	Log	0	6	-1.47	-1.76	0.23	-1.63	10	2.30		
Tetrachloroethylene	Log	0	6	-1.45	-1.76	0.24	-1.61	10	2.30		
Toluene	Log	6	6	4.36	3.96	0.28	4.13	10	2.30	Yes	(3)
1,1,1-Trichloroethane	Log	0	6	-1.17	-1.47	0.23	-1.33	10	2.30		
Trichloroethylene	Log	0	6	-1.14	-1.43	0.23	-1.29	10	2.30		
Trichlorofluoromethane(2)	Log	0	6	-1.14	-1.44	0.23	-1.30	10	2.30		

CI5004

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: SR-KAC-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
1,1,2-Trichloro-1,2,2-trifluoroethane	Log	0	6	-1.45	-1.73	0.22	-1.60	10	2.30		
1,3,5-Trimethylbenzene[a]	Log	0	6	-1.26	-1.56	0.23	-1.42	10	2.30		
1,2,4-Trimethylbenzene[a]	Log	0	6	-1.20	-1.51	0.23	-1.37	10	2.30		
m,p-Xylene[b]	Log	2	6	0.26	-1.02	0.74	-0.57	10	2.30		
o-Xylene	Log	0	6	-1.14	-1.43	0.23	-1.29	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 CCP-PO-003, CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC) and are flammable VOCs that do not appear in CCP-PO-001. 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.

CH5005

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.

(3) Toluene exceeded the PRQL, but HWN F005 was not applied. After AKE evaluation, the toluene levels were found to come from waste packaging and not introduced in the waste process and therefore the HWN is not applied to the waste stream.

Signature of Site Project Manager

Richard Kantrowitz
Printed Name

10/11/2012
Date

CCP Headspace Gas Summary Data

Waste Stream Number SR-KAC-HET Lot Number (s) 1

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

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 [signature] Date 10/11/2012

CFS006

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream Number: SR-KAC-HET Lot(s)#: 1

Container Number	RTR Prohibited Items [a,b]	Visual Examination Prohibited Items [a,b]
See correlation of container ID numbers for list of remaining drum numbers in this Lot.	None of the containers in this lot had prohibited items identified during RTR.	VE was not performed on any of the containers in this Lot.

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: RTR was selected as the characterization method for the containers because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for waste stream SR-KAC-HET.

Site Project Manager Signature	Printed Name	Date
	Richard Kantrowitz	10/11/2012

CI5007

CCP Reconciliation with Data Quality Objectives

WS# SR-KAC-HET Lot # 1

Sampling Completeness

RTR/VE:

Number of Valid Samples: 6 Number of Total Samples Analyzed: 6
Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 6 Number of Total Samples Analyzed: 6
Percent Complete: 100 (QAO is 100%)

HSG

Number of Valid Samples: 6 Number of Total Samples Collected: 6
Percent Complete: 100 (QAO is ≥90%)
Number of Valid Samples: 6 Number of Total Samples Analyzed: 6
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%)

CIS008

CCP Reconciliation with Data Quality Objectives

WS# SR-KAC-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.

CIS009

CCP Reconciliation with Data Quality Objectives

WS# SR-KAC-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	N	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.

Signature of Site Project Manager | Richard Kantrowitz (Printed Name) | 10/11/2012 (Date)

CI5010

Summation of Aspects of AK Summary Report: Waste Stream SR-KAC-HET

Overview

Waste stream SR-KAC-HET consists of contact-handled (CH) Transuranic (TRU) heterogeneous debris waste generated by the K-Area Interim Surveillance (KIS) Program at the Savannah River Site (SRS). This waste was generated by the KIS Program operations located in the K-Area Complex (KAC). The mission of the KIS Program in KAC is to support long-term plutonium storage by performing surveillance operations as required by the Department of Energy (DOE). The Surveillance operations include non-destructive and destructive examination of 3013 containers with plutonium oxide, sampling of the plutonium oxide, and subsequent analysis.

The 3013 containers to be processed through KIS originated from SRS, Rocky Flats, Hanford, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory. The oxides, which include weapons-grade plutonium and fuel-grade plutonium, were produced primarily from defense programs but also included non-defense programs. The oxides from these different programs were historically commingled during processing and blending of the fuels. Therefore, the DOE atomic energy defense activity that applies to this waste stream is defense nuclear waste and materials by-products management.

This summation of the Acceptable Knowledge (AK) Summary Report includes information to support Waste Stream Profile Form (WSPF) number SR-KAC-HET for heterogeneous debris generated at SRS. The primary source of information for this Summation is CCP-AK-SRS-18, *Central Characterization Project Acceptable Knowledge Summary Report For Savannah River Site, K-Area Interim Surveillance Transuranic Waste, Waste Stream: SR-KAC-HET*, Revision 0, April 3, 2012.

Waste Stream Identification Summary

Wastes Stream Name:	K-Area Interim Surveillance Program Debris Waste
Waste Stream Number:	SR-KAC-HET
Dates of Waste Generation:	December 2008 to December 2010
Waste Stream Volume – Current:	6 55-gallon drums
Waste Stream Volume – Projected:	5 55-gallon drums per year
Summary Category Group:	S5000
Waste Matrix Code Group:	Heterogeneous Debris Waste
Waste Matrix Code:	S5400, Heterogeneous Debris
TRUPACT-II Content Code:	SR 125/SR 225/SQ 154
Annual Transuranic Waste Inventory Report (ATWIR) Identification Number:	SR-KAC-HET

Waste Stream Description and Physical Form

Waste stream SR-KAC-HET is comprised primarily of organic and inorganic debris waste items. Examples of waste items include iron-based metals (e.g., containers, cutter wheels, drill bit assemblies, dowel pins, filings, fittings, gaskets, hose clamp, sources, tools, transmitter, vials), aluminum-based metals (e.g., blocks, foil, pins), other metals (e.g., alkaline batteries), cellulosics (e.g., cardboard, cloth, leather gloves, mop heads, paper, rags, swipes, wipes), rubber (e.g., gloves), plastic (e.g., bags, glove rings, heat-seal assembly, sheet, strippable coating, tape), and High Efficiency Particular Air (HEPA) filters of various sizes.

The waste stream meets the definition of waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity. This waste stream was generated by the KIS Program in the KAC during the surveillance of plutonium oxide containers and associated maintenance and housekeeping operations.

Point of Generation

Location

Waste stream SR-KAC-HET was generated at the SRS in Aiken, South Carolina. The waste is currently stored at the SRS E-Area TRU waste storage pads.

Area and/or Buildings of Generation

Waste stream SR-KAC-HET is generated by the KIS Program operations conducted in Room 910-A and the KIS Vault which are located in the KAC Assembly Area.

Generating Processes

Description of Waste Generation Processes

The primary objective of the KIS Program is to support 3013 container and 9975 Type B shipping container surveillance operations. The complex-wide and site-specific surveillance programs have chosen to perform surveillance operations on those 3013 containers that contain plutonium-bearing oxides. As a result, the accident analysis developed for the KIS operations was intentionally limited to plutonium-bearing oxides. Therefore, only 3013 containers with plutonium-bearing oxide are allowed inside the KIS Vault; plutonium metals are prohibited. The KIS operations include the following (References D094, D095, D096, M078):

- Surveillance operations on 9975 Type B shipping containers and 3013 containers
- Non-destructive assay (NDA) measurements
- Packaging of plutonium oxide and samples in the KIS Vault
- TRU waste handling operations
- Staging of plutonium-bearing materials in Room 910-A

- Shipment of material to H-Area for disposal and Savannah River National Laboratory (SRNL) for analysis

A limited quantity of waste is generated as a result of 3013 container surveillance and associated maintenance and housekeeping operations. Work in contamination areas/airborne radioactivity areas do not generate TRU waste. TRU waste is generated by glovebox operations in the Destructive Examination (DE) Room (References D094, D095).

Destructive Examination Surveillance

A 3013 container that does not satisfy required surveillance criteria, or is selected for DE, is taken into the DE Room through an airlock between the DE room and the non-destructive examination (NDE) room. Approximately 15 3013 containers are subject for DE annually. In the NDE room, the container is placed in a polyethylene bottle specifically designed for the 10-inch Double Door Transfer Port (DPTE) glovebox port and brought into the glovebox. After verifying that the relative humidity is below the operational set point, the 3013 container is placed in the can puncture device. The 3013 outer can, inner can, and convenience can are punctured and head space gas samples are collected. After removal from the can puncture device, the can is cut open and the plutonium oxide is poured into a pan and weighed. Oxide samples are collected and packaged in stainless steel sample vials. The empty cut up 3013 can (outer, inner, and convenience), gas samples, and oxide samples are removed from the glovebox and moved to the NDE Room for measurement. The samples are packaged and sent to the SRNL for analysis (References M078, D094, D096).

The remainder of the 3013 contents are packaged into new convenience cans for storage. Each convenience can is weighed and bagged out of the glovebox. The bagged convenience can is placed in a non-3013 container (e.g., a vented screw lid container) in the DE room. This non-3013 container is moved to the NDE Room for measurement. Depending upon the amount of material placed in a convenience can, a number of non-3013 containers may be generated from the contents of one 3013 container. When the NDA requirements are met, each non-3013 container is weighed and packaged in a 9975 Type B Shipping Container. The non-3013 container may be packaged in the primary containment of the 9975 Type B Shipping Container to extend the time required before needing to vent any hydrogen buildup. The 9975 Type B Shipping Container is removed from the NDE Room, weighed in Room 910-A, and stored in the 910-B Storage Vault awaiting shipment to H Area (References M078, D094, D096).

Support Operations

In addition to routine DE surveillance operations, TRU waste is also generated from maintenance and housekeeping operations. Routine operations include wiping down glovebox interiors, changing out of glovebox gloves and HEPA filters, and other ventilation work required to maintain the operational status of the KIS facility (References C144, D095, P176, P177, P184). Non-routine maintenance operations include equipment failures and replacements (e.g., glovebox panels, DPTE door). Additional TRU waste may be generated in the future from dismantlement and removal activities as well as facility decommissioning (Reference D095).

Waste Stream Material and Chemical Inputs

This waste stream was determined not to be regulated as a hazardous waste under the Resource Conservation and Recovery Act (RCRA).

RCRA Determinations

Historical Waste Management

Waste stream SR-KAC-HET has historically been managed in accordance with the generator site requirements and in compliance with the requirements of the South Carolina Department of Health and Environmental Control. The waste currently included in this waste stream has been characterized by SRS as nonhazardous waste. A review of available AK documentation has determined that this waste is nonhazardous. Hazardous chemicals/materials were not used during the surveillance of plutonium oxide containers and associated maintenance and housekeeping operations (References M076, M077, M087, P170).

Hazardous Waste Determinations

Ignitability, Corrosivity, Reactivity

Ignitability

A solid waste exhibits the characteristic of ignitability as defined in 40 Code of Federal Regulations (CFR) 261.21 if it has any of the following properties: 1) It is a flammable liquid (flash point less than 60°C), 2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical change, 3) It is an ignitable compressed gas, or 4) It is an oxidizer (a substance such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter).

The waste material in waste stream SR-KAC-HET does not meet the definition of ignitability as defined in 40 CFR 261.21. Based on a review of AK documentation, ignitable materials were not identified in the process that generated this waste (References D094, D095, D096, M077, M078). In addition, KIS procedures prohibit ignitable materials in TRU waste (References P174, P175, P176, P179, P181). The waste material in the waste stream is therefore not ignitable waste (D001).

Corrosivity

A solid waste exhibits the characteristic of corrosivity as defined in 40 CFR 261.22 if it has any of the following properties: 1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, or 2) It is a liquid and corrodes steel at a rate greater than 0.25 inches per year.

The waste material in waste stream SR-KAC-HET is not liquid and does not contain unreactive corrosive chemicals; therefore, it does not meet the definition of corrosivity as defined in 40 CFR 261.22. Based on a review of AK documentation, corrosive liquids were not identified in the process that generated this waste (References D094, D095, D096, M077, M078). In addition, KIS procedures prohibit corrosive materials in TRU waste (References P174, P175, P176, P179, P181). The waste material in the waste stream is therefore not corrosive waste (D002).

Reactivity

A solid waste exhibits the characteristic of reactivity as defined in 40 CFR 261.23 if it has any of the following properties: 1) It is normally unstable and readily undergoes violent change without

detonating, 2) It reacts violently with water, 3) It forms potentially explosive mixtures with water, 4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment, 5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between two and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment, 6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement, 7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure, or 8) It is a forbidden explosive, or Class A or Class B explosive as defined in 49 CFR 173, Shippers – General Requirements for Shipments and Packagings.

The waste material in waste stream SR-KAC-HET does not meet the definition of reactivity as defined in 40 CFR 261.23. Based on a review of AK documentation, reactive materials were not identified in the process that generated this waste (References D094, D095, D096, M077, M078). In addition, KIS procedures prohibit reactive materials in TRU waste (References P174, P175, P176, P179, P181). The waste material in the waste stream is therefore not reactive waste (D003).

The containers in the waste stream will be evaluated in accordance with the WIPP-WAP using radiography or visual examination prior to shipment to ensure the waste is not ignitable, reactive, or corrosive.

Toxicity Characteristic

Waste stream SR-KAC-HET does not exhibit the characteristic of toxicity for metals as defined in 40 CFR 261.24. The Operation Safety Requirement (OSR) 29-90 forms for five drums list small amounts of barium, cadmium, chromium, lead, and silver below the regulatory level. The OSR 29-90 forms for two drums include alkaline batteries. Unlike older alkaline batteries that contain higher levels of mercury, the alkaline batteries present in this waste stream are not hazardous waste (References M076, M077). The KIS process generates lead shielding and lead-contaminated wipes; however, the level of radioactive contamination is low and TRU waste is not anticipated (References C142, D095, DR003).

Waste stream SR-KAC-HET does not exhibit the characteristic of toxicity for organic compounds as defined in 40 CFR 261.24. The KIS process did not use toxicity characteristic organic compounds (References D094, D095, D096, M077, M078).

Listed Waste

F-Listed Waste

Waste stream SR-KAC-HET is not an F-listed hazardous waste because the debris wastes were not mixed with hazardous wastes from the non-specific sources listed in 40 CFR 261.31. The KIS process did not use F-listed constituents (References D094, D095, D096, M077, M078).

Headspace gas sampling of Lot 1 resulted in the 90 Percent Upper Confidence Limit for toluene exceeding the Program Required Quantitation Limit. There is no source of toluene in the surveillance of plutonium oxide containers and associated maintenance and housekeeping operations. In addition, policies and procedures are in place to ensure that solvents (i.e., toluene) are not introduced into the operations. There are a number of common uses of toluene

associated with the packaging materials used with this waste stream such as tape, plastic, and adhesives. A discrepancy resolution attributes the presence of toluene to the packaging materials used; therefore, F005 is not assigned to this waste stream (References DR007).

K-Listed Waste

Waste stream SR-KAC-HET does not contain hazardous waste from the specific sources in 40 CFR 261.32 and therefore is not a K-listed waste.

P- and U-Listed Waste

Waste stream SR-KAC-HET does not contain a discarded commercial chemical product, an off-specification commercial chemical product, or a container residue or spill residue thereof as defined in 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. Consequently, P- and U-listed EPA hazardous waste numbers are not assigned to this waste stream.

Hydrofluoric acid was not used in the KIS process, and therefore, EPA hazardous waste number U134 is not assigned to this waste stream. Beryllium is a potential contaminant of the plutonium oxide; however, its presence does not meet the definition of a P-listed waste. Therefore, EPA hazardous waste number P015 is not assigned to this waste stream (References D094, D095, D096, M075, M076, M077, M078, P175, P178, P181, P182).

Polychlorinated Biphenyls

Waste stream SR-KAC-HET does not contain polychlorinated biphenyls (PCBs) greater than 50 ppm, and therefore is not regulated as Toxic Substances Control Act (TSCA) waste under 40 CFR 761. The final rule banning PCB manufacturing, processing, distribution in commerce, and use was promulgated in May 1979. Waste stream SR-KAC-HET was not generated until December 2008 (Reference M077). The identification and characterization of PCB waste are controlled by procedure (Reference P173).

Prohibited Items

The waste generator inspects waste for prohibited items during packaging (References P171, P176, P179, P181). This waste stream does not contain ignitable, corrosive, or reactive wastes. Liquids in quantities greater than four liters are collected and disposed separately from solid waste (Reference P172). If smaller amounts of liquid (less than four liters) are to be disposed as TRU waste, an approved absorbent is added to the liquid (Reference P173). Because of this, there is a possibility liquids could separate from the absorbent. Therefore, observable liquids are the only potential prohibited item in waste stream SR-KAC-HET.

Any container identified with liquids in excess of the amounts allowed by the WIPP-WAP, or having unpunctured aerosol cans, compressed gas cylinders, or explosives will be segregated from the waste stream and will not be eligible for disposal at WIPP until the prohibited materials are removed and/or remediated (References P185, P186).

Method for Determining Waste Material Parameter Weights per Unit of Waste

The waste material parameter weight percent (wt%) estimates for waste stream SR-KAC-HET are based on generator information provided on the OSR 29-90 forms (Reference M077). A

statistical analysis of the data was performed, the results of which are presented in the Waste Stream SR-KAC-HET Waste Material Parameters table.

Waste Stream SR-KAC-HET Waste Material Parameters

Waste Material Parameter	Weight Percent	Weight Percent Range
Iron-based Metals/Alloys	11.9%	5.7 – 20.9%
Aluminum-based Metals/Alloys	0.1%	0 – 0.5%
Other Metals	0.0%	0 – 0.0%
Other Inorganic Materials	0.0%	0 – 0.0%
Cellulosics	1.1%	0.3 – 2.6%
Rubber	10.2%	4.0 – 15.8%
Plastics (waste materials)	76.7%	64.5 – 87.3%
Organic Matrix	0.0%	0 – 0.0%
Inorganic Matrix	0.0%	0 – 0.0%
Soils/Gravel	0.0%	0 – 0.0%

List of Any AK Sufficiency Determinations Requested for the Waste Stream

There are no AK sufficiency determination requests 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

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

Radionuclide Information

As part of the KIS operation, NDA directly measures certain radionuclides (i.e., Pu-238, Pu-239, U-235) in individual waste cuts. Oxides samples collected during DE operations are sent to SRNL for a variety of analyses, including isotopic analysis. The NDA data are then used in conjunction with the established isotopic distribution (based on the parent 3013 containers from which it is derived) to determine the overall package activity and concentration. The radionuclide quantities are entered on the OSR 29-90 form for shipment when the final waste containers are loaded (References D095, P180). For the six drums currently included in this waste stream, five contain weapons-grade plutonium (approximately 94 wt% Pu-239 and 5.9 wt% Pu-240) and one contains fuel-grade plutonium (approximately 87.5 wt% Pu-239 and 11.0 wt% Pu-240). The uranium in these six drums is enriched in U-235 ranging from about 37 wt% to 95 wt% U-235 (Reference M077). The two most prevalent radionuclides by mass are Pu-239 and Pu-240.

Waste Stream SR-KAC-HET Radiological Characterization

Isotope	Total Radionuclide Wt% [1]	Radionuclide Wt% Range for Individual Containers [2]	Total Radionuclide Ci% [3]	Radionuclide Ci% Range for Individual Containers [2]	Suspected Present (Yes/No)
WIPP Required Radionuclides					
Am-241	0.57%	0.13% - 2.74%	8.01%	3.77% - 11.80%	Yes
Pu-238	0.04%	Trace [4] - 0.20%	2.68%	0.92% - 4.30%	Yes
Pu-239	**87.11%**	71.89% - 93.35%	22.16%	6.59% - 38.87%	Yes
Pu-240	**6.17%**	4.50% - 10.61%	5.74%	3.03% - 8.86%	Yes
Pu-242	0.12%	0.02% - 0.63%	Trace [4]	Trace [4] - Trace [4]	Yes
U-233	Not reported				No
U-234	Not reported				Yes [5]
U-238	1.08%	0.00% - 3.30%	Trace [4]	0.00% - Trace [4]	Yes
Cs-137	Not reported				Yes [6]
Sr-90	Not reported				Yes [6]
Additional Radionuclides					
Pu-241	0.15%	0.06% - 0.58%	61.40%	46.72% - 74.28%	Yes
Np-237	0.02%	Trace [4] - 0.06%	Trace [4]	Trace [4] - Trace [4]	Yes
U-235	4.75%	0.19% - 22.04%	Trace [4]	Trace [4] - Trace [4]	Yes

1. This listing indicates the total wt% of each radionuclide over the entire waste stream.
2. This listing is the percent range of each radionuclide on a container-by-container basis. Some containers with "0" listed as the lower range, will not contain the specified radionuclide.
3. This listing indicates the total activity Ci% of each radionuclide over the entire waste stream.
4. Trace is less than 0.01 percent.
5. U-234 was not reported in SRS data but will be present along with U-235 and U-238 as well as decay of Pu-238.
6. Cs-137 and Sr-90 were not reported in SRS data but are potentially present in very trace amounts as un-separated fission products.

Payload management will not be utilized for this waste stream.

Source Documents

Tracking Number	Document Title
C138	E-mail Correspondence from gilmore.lunsford@srs.gov to Jeff Harrison. Subject: KAC Projection
C142	Record of Communication re: TRU Waste with Lead Contamination and Projected TRU Waste Volumes for KIS Operations
C143	Request for Carlsbad Field Office Approval of Waste Stream Profile RLHMOX.001 for Waste Stream HMOX.001
C144	E-mail Correspondence from Betsy Westover to Gilmore Lunsford. Subject: KIS Question
D094	Surveillance Operations of 3013 Containers for K Area Interim Surveillance (KIS) Program
D095	K Area Complex (KAC) Transuranic and Mixed Transuranic Waste Certification Program Plan
D096	K-Area Complex Documented Safety Analysis (DSA)
DR003	Attachment 11 - Acceptable Knowledge Source Document Discrepancy Resolution – Lead Waste and Waste Volume Projections
DR007	Discrepancy Resolution for Toluene in Headspace Gas (Waste Stream SR-KAC-HET)
M075	K Area Surveillance (KIS) Drum Segregation List for Drum #KAC0900001
M076	K Area Surveillance (KIS) Shipping Drum #KAC0900001 Characterization Calculation
M077	Transuranic Waste Container Characterization Forms for K-Area Interim Surveillance (KIS) Waste
M078	Criticality Frequency Associated with K Area Interim Surveillance (KIS) Operations (U)
M087	Hazardous Waste Determination for Waste Generated During the K Area Interim Surveillance (KIS) Destructive Evaluation (DE) Evolutions
P170	Waste Characterization and Identification
P171	Waste Verification Controls
P172	Liquid Waste Management
P173	Solid Waste Management
P174	Packaging and Sealing Transuranic (TRU) Waste Into a 5-Gallon Pail
P175	Packaging, Sealing, and Transferring Transuranic (TRU) Waste In a Standard Waste Box
P176	Decontamination and Decontamination Waste Handling Activities
P177	Cleaning and Removing a Containment Device
P178	Packaging and Sealing TRU Waste in 55-Gallon Drums
P179	Bagging Waste Out of a Glovebox
P180	Waste Assay (Pails, Drums, and Individual Items)
P181	Direct Loading Transuranic (TRU) Waste Into Containers
P182	Packaging and Sealing TRU Waste in Direct Loaded TRU Drums
P184	E-Area TRU Pads Transuranic Waste Acceptance Criteria
P185	TRU Drum Repackaging
P186	Absorbing Containerized Liquids
P187	Backlog Waste Reassessment Baseline Book, Waste Form 28 Product
P188	Packaging Sealed Containers With Liquid Waste (U)