ENTERED

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

MAR 28 2013

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-NIST-HET

Dear Mr. Kieling:

The Department of Energy, Carlsbad Field Office has approved the Waste Stream Profile Form (WSPF) Number SR-NIST-HET, *Heterogeneous Debris Waste from the National Institute of Standards and Technology (NIST)* 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,

George T. Basabilvazo for

Jose 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

CBFO:NTP:JRS:GL:13-0456:UFC 5900.00

130322

Attachment 2 – CCP Waste Stream Profile Form

(1) Waste Stream Profile Number: SR-NIST-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 32, October 25, 2012						
(8) Did your facility generate this waste?	YES		NO	X		
(9) If no, provide the name and EPA ID of the original generator: National Institute of Standards and Technology MD5131531811						
Waste Stream Information						
(10) WIPP ID: SR-NIST-HET				(11) Summary Category Group: S5000		
(12) Waste Matrix Code Group: Heterogeneous Debris				(13) Waste Stream Name: Heterogeneous Debris Waste from the NIST		
(14) Description from the ATWIR: This material consists of a combination of unirradiated Plutonium oxide/Uranium oxide fuel pellets, Pacemaker source and solidified Pu solutions.						
(15) Defense TRU Waste:	YES	X	NO			
(16) Check One:	CH	X	RH			
(17) Number of SWBs: NA (17a) Number of SLB2: NA		(18) Number of Drums: 1 55-gallon drum			(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: SQ 125/225, SR125/225, SQ154						
(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-16, Revision 0, September 7, 2012, Figures 1, 2, 3 and 4						
(23B) Facility mission description: CCP-AK-SRS-16, Revision 0, September 7, 2012, Section 4.3						
(23C) Description of operations that generate waste: CCP-AK-SRS-16, Revision 0, September 7, 2012, Section 4.6						
(23D) Waste identification/categorization schemes: CCP-AK-SRS-16, Revision 0, September 7, 2012, Section 4.7.2						
(23E) Types and quantities of waste generated: CCP-AK-SRS-16, Revision 0, September 7, 2012, Section 4.7.1						
(23F) Correlation of waste streams generated from the same building and process, as applicable: CCP-AK-SRS-16, Revision 0, September 7, 2012, Section 4.7.3						
(24) Waste certification procedures: CCP-TP-030, Revision 31, November 19, 2012						
(25)Required Waste Stream Information						

(25A) Area(s) and building(s) from which the waste stream was generated: CCP-AK-SRS-16, Revision 0, September 7, 2012, Section 5.1			
(25B) Waste stream volume and time period of generation: CCP-AK-SRS-16, Revision 0, September 7, 2012, Section 5.2			
(25C) Waste generating process description for each building: CCP-AK-SRS-16, Revision 0, September 7, 2012, Section 5.3			
(25D) Waste Process flow diagrams: NA			
(25E) Material inputs or other information identifying chemical/radionuclide content and physical waste form: CCP-AK-SRS-16, Revision 0, September 7, 2012, Section 5.4			
(25F) Waste Material Parameter Weight Estimates per unit of waste: See table entitled "Waste Stream SR-NIST-HET Waste Material Parameters" in Summation of Aspects of AK Summary Report: Waste Stream SR-NIST-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
	Defense nuclear waste and material by products management		Defense nuclear material production
X	Defense nuclear waste and materials security and safeguards and security investigations		
(27)Supplemental Documentation			
(27A) Process design documents: NA			
(27B) Standard operating procedures: See P007, P189 and P190 in the Summation of Aspects of AK Summary Report: Waste Stream SR-NIST-HET, Source Documents.			
(27C) Safety Analysis Reports: See D003 in the Summation of Aspects of AK Summary Report: Waste Stream SR-NIST-HET, Source Documents.			
(27D) Waste packaging logs: See D003 and M008 in the Summation of Aspects of AK Summary Report: Waste Stream SR-NIST-HET, Source Documents.			
(27E) Test plans/research project reports: NA			
(27F) Site databases: NA			
(27G) Information from site personnel: See C013 and C139 in the Summation of Aspects of AK Summary Report: Waste Stream SR-NIST-HET, Source Documents.			
(27H) Standard industry documents: NA			
(27I) Previous analytical data: See M002 and M093 in the Summation of Aspects of AK Summary Report: Waste Stream SR-NIST-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:** 1/23/2013

Reviewed by STR (if necessary): YES [X] N/A [ ] **Date:** 1/24/2013

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.

BSchrock	Beverly Schrock	3/4/13
Signature of Site Project Manager	Printed Name	Date

NOTE: (1) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.

CHARACTERIZATION INFORMATION SUMMARY

WSPF #: SR-NIST-HET

Lot #: 1

TABLE OF CONTENTS

CCP Characterization Information Summary Cover Page

Waste Stream # SR-NIST-HET Lot #: 1

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

SPM Review: Joshua Houghton Date: 3/4/2013

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-011	Rev. 16	05/02/05	CCP Radiography Inspection Operating Procedure
CCP-TP-011	Rev. 17	11/16/06	CCP Radiography Inspection Operating Procedure
CCP-TP-053	Rev. 10	03/04/11	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 11	07/20/11	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
CCP-TP-053	Rev. 12	08/22/12	CCP Standard Real-Time Radiography (RTR) Inspection Procedure

Headspace Gas Sampling and Analysis (HSC):

CCP-TP-093	Rev. 16	09/07/11	CCP Sampling of TRU Waste Containers
CCP-TP-093	Rev. 17	11/20/12	CCP Sampling of TRU Waste Containers
CCP-TP-106	Rev. 7	12/29/10	CCP Headspace Gas Sampling Batch Data Report Preparation
CCP-TP-106	Rev. 8	02/04/13	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. 17	09/24/07	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 18	08/09/10	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 19	12/29/10	CCP Project Level Data Validation and Verification
CCP-TP-001	Rev. 20	09/27/12	CCP Project Level Data Validation and Verification
CCP-TP-002	Rev. 20	08/18/08	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 21	08/04/09	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 22	06/25/10	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 23	12/29/10	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 24	12/28/11	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-002	Rev. 25	02/11/13	CCP Reconciliation of DQOs and Reporting Characterization Data
CCP-TP-003	Rev. 16	10/02/07	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-003	Rev. 17	11/09/09	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-003	Rev. 18	12/29/10	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-003	Rev. 19	11/02/12	CCP Data Analysis for S3000, S4000, and S5000 Characterization
CCP-TP-005	Rev. 15	03/31/05	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 16	02/27/06	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 17	06/06/06	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 18	11/16/06	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 19	07/06/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 20	11/01/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 21	12/29/10	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 22	04/21/11	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 23	06/30/11	CCP Acceptable Knowledge Documentation
CCP-TP-005	Rev. 24	11/28/11	CCP Acceptable Knowledge Documentation
CCP-TP-030	Rev. 29	04/26/11	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 30	05/21/12	CCP CH TRU Waste Certification and WWIS Data Entry
CCP-TP-030	Rev. 31	11/19/12	CCP CH TRU Waste Certification and WWIS/WDS Data Entry

WAP Certification:

CCP-PO-001	Rev. 17	06/22/09	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 18	06/29/10	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 19	12/29/10	CCP Transuranic Waste Characterization Quality Assurance Project Plan
CCP-PO-001	Rev. 20	05/16/11	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. 29	07/05/11	CCP/SRS Interface Document
CCP-PO-004	Rev. 30	10/17/11	CCP/SRS Interface Document
CCP-PO-004	Rev. 31	10/01/12	CCP/SRS Interface Document
CCP-PO-004	Rev. 32	10/25/12	CCP/SRS Interface Document

CIS-002

CCP Correlation of Container Identification Numbers to Batch Data Report Numbers

Waste Stream # SR-NIST-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	
SR595647	SRLBC0805	SRSRTR0608	N/A	N/A	N/A	N/A	SRHSG1223	ECL12041M	N/A

Signature of Site Project Manager

Joshua Houghton
Printed Name

3/4/2013
Date

CTS.003

CCP Headspace Gas UCL_{90} Evaluation Form

WSPF #: SR-NIST-HET **Waste Stream Headspace Gas Lot** 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) (2)	PRQL (ppmv)	UCL_{90} > PRQL Yes	EPA Code
Acetone	No	1	1	2.40	2.40	0.00	2.40	100.00		
Benzene	No	0	1	0.04	0.04	0.00	0.04	10.00		
Bromoform	No	0	1	0.01	0.01	0.00	0.01	10.00		
Butanol	No	0	1	0.04	0.04	0.00	0.04	100.00		
Carbon Disulfide[c]	No	0	1	0.06	0.06	0.00	0.06	10.00		
Carbon Tetrachloride	No	0	1	0.02	0.02	0.00	0.02	10.00		
Chlorobenzene	No	0	1	0.03	0.03	0.00	0.03	10.00		
Chloroform	No	0	1	0.03	0.03	0.00	0.03	10.00		
Chloromethane[c]	No	0	1	0.08	0.08	0.00	0.08	10.00		
Cyclohexane[a]	No	0	1	0.04	0.04	0.00	0.04	10.00		
1,1-Dichloroethane	No	0	1	0.04	0.04	0.00	0.04	10.00		
1,2-Dichloroethane	No	0	1	0.04	0.04	0.00	0.04	10.00		
1,1-Dichloroethylene	No	0	1	0.04	0.04	0.00	0.04	10.00		
cis-1,2-Dichloroethylene[c]	No	0	1	0.04	0.04	0.00	0.04	10.00		
trans-1,2-dichloroethylene	No	0	1	0.04	0.04	0.00	0.04	10.00		
1,2-Dichloropropane[c]	No	0	1	0.03	0.03	0.00	0.03	10.00		
Ethyl benzene	No	0	1	0.03	0.03	0.00	0.03	10.00		
Ethyl Ether	No	0	1	0.05	0.05	0.00	0.05	10.00		
Methanol	No	1	1	2.50	2.50	0.00	2.50	100.00		
Methyl Ethyl Ketone	No	0	1	0.05	0.05	0.00	0.05	100.00		
Methyl Isobutyl Ketone	No	0	1	0.03	0.03	0.00	0.03	100.00		
Methylene Chloride	No	0	1	0.05	0.05	0.00	0.05	10.00		
1,1,2,2-Tetrachloroethane	No	0	1	0.02	0.02	0.00	0.02	10.00		
Tetrachloroethylene	No	0	1	0.02	0.02	0.00	0.02	10.00		
Toluene	No	0	1	0.04	0.04	0.00	0.04	10.00		
1,1,1-Trichloroethane	No	0	1	0.03	0.03	0.00	0.03	10.00		
Trichloroethylene	No	0	1	0.03	0.03	0.00	0.03	10.00		
Trichlorofluoromethane	No	0	1	0.03	0.03	0.00	0.03	10.00		
1,1,2-Trichloro-1,2,2-trifluoroethane	No	0	1	0.02	0.02	0.00	0.02	10.00		
1,3,5-Trimethylbenzene[a]	No	0	1	0.03	0.03	0.00	0.03	10.00		
1,2,4-Trimethylbenzene[a]	No	0	1	0.03	0.03	0.00	0.03	10.00		
m/p-Xylene[b]	No	0	1	0.03	0.03	0.00	0.03	10.00		
o-Xylene	No	0	1	0.03	0.03	0.00	0.03	10.00		

[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] 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 UCL90 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 C4 of the WAP, 1/2 of the MDL value is used in calculating the mean concentration.)

(2) Valid UCL90 generated, however, the W statistic and p-value cannot be computed with less than three values as there is no meaningful covariance. As a consequence, the data could not be evaluated for normailty and the non-transformed data set was automatically chosen. The single data point is shown as the max and the mean as there are no additional data points to change these data points.

Signature of Site Project Manager	Joshua Houghton	3/4/2013
	Printed Name	Date

CIS-004

CCP Headspace Gas Summary Data

Waste Stream # SR-NIST-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 _____ Date 3/4/2013

CTS-005

CCP RTR/VE Summary of Prohibited Items and AK Confirmation

Waste Stream #: SR-NIST-HET Lot #: 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 used to certify any 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 and/or VE: RTR was selected as the characterization method for this lot because the waste was previously packaged and RTR meets all the Data Quality Objectives for NDE for the waste.

Site Project Manager Signature | Joshua Houghton Printed Name | 3/4/2013 Date

CSS-006

CCP Reconciliation with Data Quality Objectives

Waste Stream #: SR-NIST-HET Lot #: 1

Sampling Completeness:

NDE

Number of Valid Samples: 1 Number of Total Samples Analyzed: 1
Percent Complete: 100 (QAO is 100%)

NDA

Number of Valid Samples: 1 Number of Total Samples Analyzed: 1
Percent Complete: 100 (QAO is 100%)

HSG (Random Sampling Lot 1)

Number of Valid Samples: 1 Number of Total Samples Collected: 1
Percent Complete: 100 (QAO is ≥90%)
Number of Valid Samples: 1 Number of Total Samples Analyzed: 1
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

Waste Stream #: SR-NIST-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 HW Numbers 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.

CBS. 008

CCP Reconciliation with Data Quality Objectives

Waste Stream #: SR-NIST-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

Signature of Site Project Manager | Joshua Houghton (Printed Name) | 3/4/2013 (Date)

CES-609

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

Overview

Waste stream SR-NIST-HET consists of contact handled (CH) Transuranic (TRU) heterogeneous debris waste generated by the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland and is currently managed by the Savannah River Site (SRS). The waste was generated from removal of Special Nuclear Material (SNM) from a laboratory in the NIST Radiation Physics Building that had been used for the Safeguards Analytical Laboratory Evaluation (SALE) Program (References C013, C139).

The mission of the SALE Program was to estimate the measurement capability of participating laboratories to routinely assay SNM in the nuclear fuel cycle for uranium and plutonium and their isotopic compositions, establish a scientifically valid body of measurement data which could be used to quantitatively assess or define routinely achievable measurement capability, and provide a medium for the comparison and dissemination of nuclear materials measurement technology that encourages improvement of measurement performance. Participating laboratories in the SALE Program included those with defense and non-defense missions. Sites with defense missions included Rocky Flats, LANL, Hanford, and others. Another objective of the SALE Program was to characterize and distribute reference materials which could be used to establish traceability to the national measurement system. These Standard Reference Materials (SRMs) were certified and distributed by NIST (References D101, D105).

Since one of the goals of the SALE Program was to obtain high precision and accuracy for analysis of SNM, this program would be considered in part defense-related from the standpoint of nonproliferation of SNM. One tool in nonproliferation is active safeguards measures such as continuous material monitoring and measurement. As the nuclear material form and concentration become more attractive, increasingly stringent safeguards are required which included better measurements (Reference D107). During the course of the SALE program, NIST provided services for virtually every national laboratory (Reference C013). An example of how the SALE Program was defense-related is the distribution of plutonium SRMs for use as working calibration materials for nondestructive assay (NDA) equipment operating in defense facilities such as the LANL plutonium processing facility (Reference D108). The Department of Energy (DOE) nuclear materials security and safeguards program includes activities to assure adequate protection of nuclear materials. Therefore, waste stream SR-NIST-HET was generated by the defense activity "defense nuclear materials security and safeguards and security investigations."

This summation of the Acceptable Knowledge (AK) Summary Report includes information to support Waste Stream Profile Form (WSPF) number SR-NIST-HET for heterogeneous debris waste generated at NIST. The primary source of information for this Summation is CCP-AK-SRS-16, *Central Characterization Project Acceptable Knowledge Summary Report For Contact-Handled Transuranic Waste from the National Institute of Standards and Technology, Waste Stream SR-NIST-HET*, Revision 0, September 7, 2012.

Waste Stream Identification Summary

Wastes Stream Name:	Heterogeneous Debris Waste from the NIST
Waste Stream Number:	SR-NIST-HET
Dates of Waste Generation:	August 1993
Waste Stream Volume – Current:	One (1) 55-gallon drum
Waste Stream Volume – Projected:	None expected
Summary Category Group:	S5000
Waste Matrix Code Group:	Heterogeneous Debris
Waste Matrix Code:	S5400, Heterogeneous Debris Waste
TRUPACT-II Content Code:	SQ 125/225, SR 125/225, SQ154
Annual Transuranic Waste Inventory Report (ATWIR) Identification Number:	SR-NIST-HET

Waste Stream Description and Physical Form:

Waste stream SR-NIST-HET is comprised of two fuel-grade plutonium/depleted uranium pellet core fuel rods, a plutonium disc, and a plutonium source (encapsulated cylinder) packaged into a capped steel pipe nipple; plutonium sulfate SRM immobilized in concrete (i.e., Portland cement and water) in small poly bottles; and solutions containing plutonium/enriched uranium immobilized in concrete in small poly bottles and metal cans (References D003, M002, M008, M009, M093, M097, P189).

Waste stream SR-NIST-HET meets the WIPP-WAP waste stream definition. The waste stream consists 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 from removal of SNM from a laboratory in the NIST Radiation Physics Building.

Point of Generation

Location

Waste stream SR-NIST-HET was generated at the NIST located in Gaithersburg, Maryland. The waste is currently stored at the SRS E-Area TRU waste storage pads.

Area and/or Buildings of Generation

Waste stream SR-NIST-HET was from a laboratory used for the SALE Program in the NIST Radiation Physics Building (Building 245) (References C013, C139).

Generating Processes

Description of Waste Generation Processes

The activity that generated this waste stream was the removal of the SNM from a laboratory in the NIST Radiation Physics Building. This laboratory was used for the SALE Program (References C013, C139). Characterization measurements (e.g., mass spectrometry) were performed at NIST on the materials prior to their distribution. A specific characterization plan was developed for each material based on the history of the material, the quantity of material, the size and total number of samples prepared, and the applicable methods of measurement. The final plan developed from the available information specified the exact number of randomly chosen samples to be analyzed and the specific measurement methods to be used. Incorporated into every characterization plan was a schedule for concurrent method verification using reference materials suitable for demonstrating traceability to the national measurement system. After the characterization and SALE distribution were completed, quantities remaining were identified for use in the nuclear industry as certified reference materials (References D104, D106, D108).

Waste Stream Material and Chemical Inputs

There were no hazardous chemicals or materials used in the process that generated this waste that caused waste stream SR-NIST-HET to be a Resource Conservation and Recovery Act (RCRA) hazardous waste.

RCRA Determinations

Historical Waste Management

Waste stream SR-NIST-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. Based on historical waste management, a site-specific waste stream was not created for this waste. Instead, the container was managed individually as nonhazardous waste. A review of available AK documentation has determined that this waste is nonhazardous, and therefore, no Environmental Protection Agency (EPA) hazardous waste numbers have been assigned (References D003, M008).

Hazardous Waste Determinations

Ignitability, Corrosivity, Reactivity

Ignitability

The materials in waste stream SR-NIST-HET do not meet the definition of ignitability as defined in 40 Code of Federal Regulations (CFR) 261.21. The material is not a liquid, an ignitable compressed gas, or an oxidizer, and is not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change.

Based on an evaluation of the waste generating process and waste management practices, ignitable materials would not have been placed in this drum. Liquids were immobilized in concrete, and RTR fast-scan did not identify liquids in this drum. The pellet core fuel rods, metal disc, and encapsulated cylinder are not ignitable solids. The SNM in this waste stream is

not an ignitable compressed gas or an oxidizing material (References D003, M002, M008, M093, P189). The waste has been evaluated in accordance with the WIPP-WAP using RTR prior to shipment to ensure the waste is not ignitable. Waste stream SR-NIST-HET is therefore not ignitable (EPA hazardous waste number D001).

Corrosivity

The materials in waste stream SR-NIST-HET are not liquid and do not contain unreacted corrosive chemicals; therefore, they do not meet the definition of corrosivity as defined in 40 CFR 261.22.

Based on an evaluation of the waste generating process and waste management practices, corrosive materials would not have been placed in this drum. Liquids were immobilized in concrete, and RTR fast-scan did not identify liquids in this drum. The SNM in this waste stream will not corrode steel (References D003, M002, M008, M093, P189). The waste has been evaluated in accordance with the WIPP-WAP using RTR prior to shipment to ensure the waste is not corrosive. Waste stream SR-NIST-HET is therefore not corrosive (EPA hazardous waste number D002).

Reactivity

The materials in waste stream SR-NIST-HET do not meet the definition of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change without detonating. 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. The materials are not capable of detonation or explosive reaction.

Based on an evaluation of the waste generating process and waste management practices, reactive materials would not have been placed in this drum. Liquids were immobilized in concrete, and RTR fast-scan did not identify liquids in this drum. The SNM in this waste stream does not meet any of the above criteria for reactive materials (References D003, M002, M008, M093, P189). The waste has been evaluated in accordance with the WIPP-WAP using RTR prior to shipment to ensure the waste is not reactive. Waste stream SR-NIST-HET is therefore not reactive (EPA hazardous waste number D003).

Toxicity Characteristic

Waste stream SR-NIST-HET does not exhibit the characteristic of toxicity for metals or organics as defined in 40 CFR 261.24. Toxicity characteristic metals and organics were not used during the SNM removal process. This waste stream consists of SNM removed from a laboratory and does not contain toxicity characteristic organics. It is not uncommon for SNM to contain metal impurities (e.g., cadmium, chromium, and lead), but there is no indication that this waste contains toxicity characteristic metals above the regulatory level (Reference D003, M008).

Listed Waste

F-Listed Waste

Waste stream SR-NIST-HET is not an F-listed hazardous waste because the wastes were not mixed with or derived from the treatment of hazardous wastes from the non-specific sources listed in 40 CFR 261.31. This waste stream consists of SNM removed from a laboratory and

does not contain F-listed constituents, and F-listed constituents were not used during the SNM removal process (Reference D003, M008).

K-Listed Waste

Waste stream SR-NIST-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-NIST-HET is not 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.

There is no evidence that unused commercial products were disposed of with this waste (References D003, M008). Consequently, U- and P-listed EPA hazardous waste numbers, including U134 (hydrofluoric acid) and P015 (beryllium powder), are not assigned to this waste stream.

Polychlorinated Biphenyls

Waste stream SR-NIST-HET does not contain polychlorinated biphenyls greater than 50 parts-per-million, and therefore is not regulated as a Toxic Substance Control Act waste under 40 CFR 761. Based on an evaluation of the waste generating process and waste management practices, PCBs are not present in this waste (References D003, M002, M008, M093, P189).

Prohibited Items

Information provided by NIST states that this waste contains no liquids, no pyrophorics, no pressurized containers, and will not generate flammable or explosive gases (Reference D003). RTR fast-scan did not identify any prohibited items (References M002, M093).

Certified RTR and/or VE are performed by CCP to ensure liquids do not exceed the amounts allowed by the WIPP-WAP and to ensure the absence of ignitable compressed gases and explosives. Any container identified with liquids in excess of the amounts allowed by the WIPP-WAP, or having un-punctured 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.

Method for Determining Waste Material Parameter Weights per Unit of Waste

Based on the specific items in this waste as described above, the following waste material parameters have been identified for this waste stream:

- Iron-based metals/alloys (e.g., cans, capped pipe nipple, fuel rods, disc, cylinder)
- Plastic (bags and bottles)
- Inorganic matrix (solids and liquids immobilized in concrete)

The actinide materials in the fuel rods, disc, and cylinder are not iron-based metal; however, they are encapsulated by stainless steel and therefore will be assigned to the iron-based metal category.

The waste material parameter weight estimates for waste stream SR-NIST-HET are provided below. These estimates are based primarily on weights provided by NIST (Reference P189). The weights of the metal cans, poly bottles, and plastic drum liner bag are based on the waste item weight table in the CCP RTR procedure.

Waste Stream SR-NIST-HET Waste Material Parameters

Waste Material Parameter	Weight Percent
Iron-based Metal/Alloys	18.9%
Aluminum-based Metal/Alloys	0.0%
Other Metals	0.0%
Other Inorganic Materials	0.0%
Cellulosics	0.0%
Rubber	0.0%
Plastics (waste materials)	26.7%
Organic Matrix	0.0%
Inorganic Matrix	54.4%
Soils/Gravel	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 this waste stream.

Radionuclide Information

To determine isotopic ratios for waste stream SR-NIST-HET, radiological data for the one container were evaluated. The total gram value for each individual radionuclide was divided by the total mass of all radioactive constituents in the waste stream and converted to a percentage. This result is listed as "Total Radionuclide Wt%." The total curie value for each individual radionuclide was divided by the total activity of all radioactive constituents in the waste stream and converted to a percentage. This result is listed as "Total Radionuclide Ci%." As shown in the Waste Stream SR-NIST-HET Radiological Characterization table, U-238 is the most predominant radionuclide by mass and Pu-239 is the second most predominant radionuclide by mass.

Waste Stream SR-NIST-HET Radiological Characterization

Isotope	Total Radionuclide Wt% [1]	Total Radionuclide Ci% [2]	Suspected Present (Yes/No)
WIPP Required Radionuclides			
Am-241	Not reported		Yes [4]
Pu-238	0.75%	19.00%	Yes
Pu-239	**24.80%**	2.29%	Yes
Pu-240	1.25%	0.42%	Yes
Pu-242	0.20%	Trace [3]	Yes
U-233	Not reported		No
U-234	Not reported		Yes [5]
U-238	**70.64%**	Trace [3]	Yes
Cs-137	Trace [3]	Trace [3]	Yes
Sr-90	Trace [3]	Trace [3]	Yes
Additional Radionuclides			
Pu-241	0.51%	78.27%	Yes [4]
U-235	1.86%	Trace [3]	Yes

1. This listing indicates the total wt% of each radionuclide over the entire waste stream.
2. This listing indicates the total activity (curie) percent of each radionuclide over the entire waste stream.
3. Trace indicates less than 0.01 percent.
4. Am-241 is present from the decay of Pu-241. Due to the relatively short half-life of Pu-241, the Pu-241 value will be less than reported in this table.
5. U-234 was not reported in generator data but will be present from decay of Pu-238 and is also a component of both depleted and enriched uranium.

Payload management will not be utilized for this waste stream.

Source Documents

Source Document Number	Source Document Title
C013	Letter from NIST to Ms. Pam Jenkins, United States Department of Energy
C139	E-Mail Correspondence. Subject: Facility Mission and Description for Building 245
D003	WME Technical Review Cover Page
D101	A Unique Institution, The National Bureau of Standards 1950 - 1969
D102	Responding to National Needs, The National Bureau of Standards Becomes the National Institute of Standards and Technology 1969—1993
D103	National Bureau of Standards Radiation Physics Laboratory
D104	U.S. Department of Energy, Progress Report for the Period July 1975 Through September 1977, DOE Research and Development Report
D105	Minutes of the Fourth SALE Program Participants Meeting, July 8 – 9, 1981
D106	Chemical Assay of Plutonium for Safeguards, American Nuclear Society Meeting November 11 – 15 , 1973
D107	Analytical Methods for Safeguards and Accountability Measurements of Special Nuclear Materials (Excerpted)
D108	Measurement Technology for Safeguards and Materials Control (Excerpted)
M002	RTR Quick Screen Data Sheet and Drum Prohibited Items Data Sheet
M008	Transuranic Waste Container Characterization Form and Other Container Paperwork for NIST Drum with FSNs 595647, 595648, 595649, and 595650
M009	Nuclear Material Transaction Reports
M080	Map of the Location of the NIST Facility
M093	RTR Video for Container SR595647
M095	Looking Forward through the Past: Status of the United States Nuclear Safeguards Reference Material Program at New Brunswick Laboratory
M096	U.S. Air Force Fact Sheet, Air Force Technical Applications Center
M097	Certificate of Analysis, Standard Reference Material 944 Plutonium Sulfate Tetrahydrate and Standard Reference Material 948 Plutonium Isotopic Standard
M098	Shipper's Declaration for Radioactive Materials, NIST Shipment No. 93-02
P007	Radioactive Solid Waste Burial Ground Record
P189	NIST Packaging & Documentation Instructions
P190	Storing TRU Waste in Concrete Containers