0036446

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 600936

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.		4. Date
Supplemental []	A. D. Rice, Program Support, T6-06, 373-5878		05/06/94
Direct Revision [X]	5. Project Title/No./Work Order No.	6. Bldg./Sys./Fac. No.	7. Impact Level
Change ECN []	105-KE FILTER BACKWASH PIT-SFBWP-TRANSFER CHANNEL	105-KE/100K	Q
Temporary []			
Standby []			
Supersedure []	8. Document Numbers Changed by this ECN (includes sheet no. and rev.)	9. Related ECN No(s).	10. Related PO No.
Cancel/Void []	WHC-SD-WM-DP-057, Rev. 0	N/A	N/A

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

This ECN is being generated in order to exchange pages iii, 9 and 18. Pages 9.1 and pages 939 through 1,013 are being added. These changes are being initiated in order to update/add additional information not included in the initial release.

MAY 1994 RECEIVED EPIC

13a. Justification (mark one)							
		Criteria Change	[]	Design Improvement	[]	Environmental	[]
As-Found	[]	Facilitate Const.	[]	Const. Error/Omission	[]	Design Error/Omission	[X]

13b. Justification Details

This ECN will complete the documentation process for this document.

14. Distribution (include name, MSIN, and no. of copies)

See Attached Distribution Sheet

RELEASE STAMP

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A-7900-013-2 (06/92) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1) ECN-600936

15. Design Verification Required	16. Cost Impact						17. Schedule Impact (days)	
	ENGINEERING			CONSTRUCTION				
[] Yes	Additional	[]	$	Additional	[]	$	Improvement	[]
[X] No	Savings	[]	$	Savings	[]	$	Delay	[]

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]		[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

20. Approvals

	Signature	Date		Signature	Date
OPERATIONS AND ENGINEERING			ARCHITECT-ENGINEER		
Cog Engineer A.D. Rice	A.D. Rice	5-9-94	PE		
Cog. Mgr. J.G. Kristofzski	JG Kristofzski	5/9/94	QA		
QA J.C. Langford	J.C. Langford	5/9/94	Safety		
Safety			Design		
Security			Environ.		
Environ.			Other		
Projects/Programs					
Tank Waste Remediation System					
Facilities Operations			DEPARTMENT OF ENERGY		
Restoration & Remediation			Signature or Letter No.		
Operations & Support Services					
IRM			ADDITIONAL		
Other					

SUPPORTING DOCUMENT

1. Total Pages 1023

2. Title
105-KE FILTER BACKWASH PIT-SFBWP-TRANSFER CHANNEL

3. Number
WHC-SD-WM-DP-057

4. Rev No.
0-A

5. Key Words
105-KE, TRANSFER CHANNEL, FILTER BACKWASH PIT, SFBWP

APPROVED FOR PUBLIC RELEASE

KMB 5/10/94

6. Author
Name: A. D. Rice

Signature

Organization/Charge Code 8E480/J1240

7. Abstract
N/A

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9. Impact Level Q

10. RELEASE STAMP

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DATE MAY 11 1994
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RECORD OF REVISION	(1) Document Number WHC-SD-WM-DP-057	Page A

(2) Title
105-KE FILTER BACKWASH PIT-SFBWP-TRANSFER CHANNEL

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release (5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) Initially released 01/10/94 on EDT-140728.	A. D. Rice	J. Kristofzski
0-A RS	Incorporate per ECN-600936.	A. D. Rice 5-9-94	J. Kristofzski 5/9/94

A-7320-005 (08/91) WEF168

Uranium Analysis (Sample J1285) 753
Uranium Analysis (Sample J1285) 762
Uranium Analysis (Sample J1285) 771
Uranium Analysis (Sample J1286, J1287) 780
Uranium Analysis (Sample J1286, J1287) 794
Uranium Analysis (Sample J1286, J1287) 808
Uranium Analysis (Sample J1289) 822
Uranium Analysis (Sample J1289) 831
Uranium Analysis (Sample J1289) 840

Inductively Coupled Plasma Spectrographic Analysis (Sample J1285, J1286, J1287, J1288, J1289). 849

X-Ray Analysis (Sample J1252, J1153) 934
X-Ray Analysis (Sample J1290) 937

Plutonium Analysis (Sample J1289) 939
Plutonium Analysis (Sample J1289) 977

This report consists of pages 1 through 1013, plus page 9.1.

5.4 Plutonium 238/239/240

All plutonium results met the applicable QC acceptance criteria. A rerun was requested for J1285 (S3059-05) due to low tracer recoveries. This rerun was canceled due to the very short supply of tracer material. The only significant effect of the low tracer recoveries is the unusually poor detection limits reported for Pu-238. Precision and accuracy requirements were easily met.

A rerun was requested and performed on J1286 (S3059-06) due to contamination of the blank. The results presented on the spreadsheet are from the rerun, although the two sets of data differed only slightly, with an initial analysis average of 5.3 uCi/g and the rerun of 5.0 uCi/g. It appears that the blank contamination did not significantly affect the first set of results.

No Pu-238 was present above detection limits. The large variation in detection limits is due primarily to poor tracer recovery. Increasing the sample size would result in better detection limits, but could also result in greater amounts of tracer material being consumed. This material is very expensive, and in short supply.

Following completion of this data package, questions arose concerning the accuracy of the plutonium analysis for sample J1289. When compared to data available from PNL, the values for J1289 appeared about two fold high. The initial analysis had passed all acceptance criteria, and all calculations were verified to be correct. A plutonium reanalysis of J1289 was requested. Two reanalyses were performed, because the first reanalysis failed the accuracy criteria. Apparently the plutonium spike was not added to the spike and spike duplicate samples, because the recovery in each case was essentially zero. Both reruns produced sample results that were about 60% of the original value. The second rerun has been added to the plutonium summary sheet, and is identified as a rerun.

5.5 Americium 241

Difficulty was encountered analyzing for Am-241 by separation and Alpha Energy Analysis (AEA). Precision and accuracy criteria could not be met in all cases, as indicated on the spreadsheets by shaded cells and footnotes. Tracer recoveries were lower than desirable for J1285 (S3059-05). Sample J1285 was analyzed three times. The final analysis was acceptable with the exception of the spike recovery, which was low at 66%. Sample J1289 (S3059-08) was also analyzed three times. Two sets of data for this sample appear on the spreadsheet (one marked "RERUN"). The first set demonstrated acceptable precision, but failed the accuracy criteria. The second set passed all QC criteria, but demonstrated significant contamination of the blank. Contamination of the sample did not appear to be a problem however, because the batch

with the contaminated blank provided slightly lower results (about 15 percent) than the non-contaminated batch.

Americium results are also available for three of the samples by gamma energy analysis (GEA). The average Am-241 result from the GEA, which is an independent detection technique, is compared to the average AEA result below.

SAMPLE	AEA(uCi/g)	GEA(uCi/g)
J1285	34.6	37.2
J1287	2.25	2.57
J1289	3.39/2.87	3.13

TRANSFER CHANNEL
Pu-239/40

SAMPLE ID	LAB ID	SAMPLE	DUPLICATE	TRIPLICATE	MEAN	PRECISION	SPIKE	SPIKE DUP	STANDARD	REAGENT BLK
		uCi/g	uCi/g	uCi/g	uCi/g	2RSD (%)	% REC	% REC	%REC	uCi/ml
S3059-05	J1285	4.57E+01	4.61E+01	4.52E+01	4.57E+01	2.0	111.0	106.0	105.7	<8.46E-06
S3059-06	J1286	4.96E+00	4.92E+00	5.17E+00	5.02E+00	5.5	106.9	97.1	108.0	<8.65E-04
S3059-07	J1287	2.91E+00	3.00E+00	3.08E+00	3.00E+00	5.7	104.1	108.0	99.6	<1.73E-03
S3059-08	J1289	7.51E+00	7.63E+00	6.72E+00	7.29E+00	13.6	101.0	87.9	105.0	<2.04E-03
S3059-08	J1289 RERUN	4.08E+00	4.13E+00	4.32E+00	4.18E+00	6.1	96.3	99.3	96.1	<1.15E-05

TRANSFER CHANNEL
Pu-238

SAMPLE ID	LAB ID	SAMPLE	DUPLICATE	TRIPLICATE	MEAN	PRECISION	SPIKE	SPIKE DUP	STANDARD	REAGENT BLK
		uCi/g	uCi/g	uCi/g	uCi/g	2RSD (%)	% REC	% REC	%REC	uCi/ml
S3059-05	J1285	<6.17E+01	<2.42E+02	<2.08E+01	NA	NA	NA	NA	NA	<1.52E-04
S3059-06	J1286	<4.87E+00	<8.29E-01	<2.40E+00	NA	NA	NA	NA	NA	<3.45E-03
S3059-07	J1287	<3.49E+00	<4.34E+00	<5.25E+00	NA	NA	NA	NA	NA	<1.36E-02
S3059-08	J1289	<4.32E+00	<2.52E+00	<9.53E+00	NA	NA	NA	NA	NA	<5.80E-02
S3059-08	J1289 RERUN	<7.03E-01	<6.82E-01	<9.75E-01	NA	NA	NA	NA	NA	<1.46E-05

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-057
REV 0A

Lab Segment Serial No. J1289	Customer ID: KE24A
Analysis: PU 239/40	Sample Prep: DIRECT .100-10-.500

Instrument: WB537237	Procedure/ Rev: LA 503-156 D-0
Technologist: J M VAN SANT	Date: 03/09/94
Starting Time: 0900	Temperature 25 C
Ending Time: 1530	Chemist: L L FRITTS

Comments: BATCH 2782

	Description	Lab ID		Description	Lab ID
1	LMCS	J1284-5581	11		
2	BLANK	J1519-5681	12		
3	SAMPLE	J1289-5781	13		
4	SAMPLE DUP	J1289-5781	14		
5	SAMPLE TRIP	J1289-5781	15		
6	SPIKE	J1289-5981	16		
7	SPIKE DUP	J1289-5981	17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	83B43	.100-10-.100ML		
SPIKE	84B43	.100mL		
		939		

OA
RK

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-503-156

DATE START: March 9, 1994

PREPARED BY: S. A. Catlow

DATE COMPLETE: March 15, 1994

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 83B43	J1284	Pu-239/40	1.36E+02						96.1	1.28E-02	2.0
BLANK	J1519	Pu-239/40	< 1.15E-05						33.1	1.15E-05	100.0
								6.1 ~~227~~ 3.28.94			
KE24A	J1289	Pu-239/40	1.70E-02	1.72E-02	1.80E-02	1.74E-02	4.9E-04	~~1.0~~	55.6	2.32E-03	2.4
									59.5	2.22E-03	2.4
									38.9	3.45E-03	2.8
KE24A	J1289	239 Spike	96.3	99.3							
STD 63B43	J1284	Pu-238	<1.59E-02						N/A	1.59E-02	9.5
BLANK	J1519	Pu-238	<1.46E-05						33.1	1.46E-05	100.0
KE24A	J1289	Pu-238	<2.93E-03	<2.84E-03	<4.06E-03	N/A	N/A	N/A	55.6	2.93E-03	4.7
									59.5	2.84E-03	4.6
									38.9	4.06E-03	5.4

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#9 1595 **KEKUN** Batch #2782

Serial No	Sample Point	Date	Time Issued	Priority
J 1284.-5581	BECHTOLD	11- 4-93	8:47	18

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	% RECOVERY	E14157	3

Sample Size	Customer ID
.100mL-10-.100mL	STD

Remarks, Calculations, Results

EDP R211 AR001

STD# 83B43 RESULT 1,3633 E+2

STD VAL. 1,42 E+2 %REC 96.09

.100mL 84B43

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 3-10-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-9-94		

54-6800-061 (R-10-83)

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

Serial No.					STANDARD
	Date Counted		03/10/94	Pu 236 AEA Frac. (C236)	0.442
J1284-5581	Sample Volume in mL	(SS)	0.100	Pu 238 AEA Frac. (C238)	0.011
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac. (C239)	0.525
2782	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts	5458
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min) (TC)	30
3	Tracer Book No.		84B43	Background in cpm (Bkg)	8
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm	35.26
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	2566.9	Pu 238 cpm	0.91
Date	Pu-236 Decay Corr'd value	(dpm/mL)	2522.84	Pu 239 cpm	41.86
03/09/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time (min)	480
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L	1.3633E+02

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of ((1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))) * 1.96 * 100

WHC-SD-WM-DP-057
REV 0A

Pu 239/240	µCi/mL	=	1.36E-01	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	2.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 1.28E-02
Pu 238	µCi/mL	=	< 1.59E-02	
Relative Counting Error		=	9.5%	Pu 238 1.59E-02
Pu 236 Tracer Recovery		=	60.9%	

Data Entry by:		Date:	11-Mar-94
Approved by:		Date:	14 Mar 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 3-9-94 J1284-5581

5458/30 -8

BEST AVAILABLE COPY

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#3 3724 -RERUN

Serial No	Sample Point	Date	Time Issued	Priority
J 1519.-5681	BECHTOLD	2-17-94	10:52	26

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	2

Sample Size	Customer ID
1mL	BLANK

Remarks, Calculations, Results

REAGENT BLANK

COUNT AS uCI/L

.100mL 84B43

WHC-SD-WM-DP-057
REV 0A

VanSant

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
		Raymond		
Hrs	Hrs	Hrs	Hrs	Hrs
		3-10-94		
Date	Time Completed	Lab Unit Mgr		
3-9-94				

54-6800-061 (R-10-83)

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

						BLANK
Serial No.	Date Counted		03/10/94	Pu 236 AEA Frac.	(C236)	0.894
J1519-5681	Sample Volume in mL	(SS)	1.000	Pu 238 AEA Frac.	(C238)	0
Batch ID	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0
2782	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		1429
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
2	Tracer Book No.		84B43	Background in cpm	(Bkg)	1
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm		19.47
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	2566.9	Pu 238 cpm		0
Date	Pu-236 Decay Corr'd value	(dpm/mL)	2522.84	Pu 239 cpm		0
03/09/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time	(min)	480
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L =	<	1.1538E-02

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of ((1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))) * 1.96 * 100

NOTE: Pu 239\240 Result is a LESS THAN Value.

Pu 239/240	µCI/mL	=	< 1.15E-05	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	100.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 1.15E-05
Pu 238	µCI/mL	=	< 1.46E-05	
Relative Counting Error		=	100.0%	Pu 238 1.46E-05
Pu 236 Tracer Recovery		=	33.1%	

Data Entry by:		Date:	11-Mar-94
Approved by:		Date:	14 Mar 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 3-9-94. J1519-5681

1429/30 -1

BEST AVAILABLE COPY

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#10 1595 RERUN

Serial No	Sample Point	Date	Time Issued	Priority
J 1289.-5781	BECHTOLD	11- 4-93	9: 2	18

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	7

Sample Size	Customer ID
.100-10-.500mL	KE24A

Remarks, Calculations, Results

COUNT AS uCI/L

Sample

.100mL 84B43

1mL 8M 4N03

1.70 E-2

ATTACH PRINTOUT

WHC-SD-WM-DP-057
REV 0A

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
		Raymond		
Hrs	Hrs	Hrs	Hrs	Hrs
		3-10-94		

Date	Time Completed	Lab Unit Mgr
3-9-94		

54-6800-061 (R-10-83)

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

						SAMPLE
Serial No.	Date Counted		03/10/94	Pu 236 AEA Frac.	(C236)	0.525
J1289-5781	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0.068
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.389
2782	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		4108
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
7	Tracer Book No.		84B43	Background in cpm	(Bkg)	1
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm		32.03
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	2566.9	Pu 238 cpm		4.13
Date	Pu-236 Decay Corr'd value	(dpm/mL)	2522.84	Pu 239 cpm		23.77
03/09/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time	(min)	480
Sample Type						
LIQUID	<<<<<<<<<< Enter a Sample Type <<<<<<<<<<			Pu 239/240 µCi/L		1.7009E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of ((1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))) * 1.96 * 100

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCI/mL	=	1.70E-02	
Relative Counting Error		=	2.4%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 2.32E-03
Pu 238	µCI/mL	=	< 2.93E-03	
Relative Counting Error		=	4.7%	Pu 238 2.93E-03
Pu 236 Tracer Recovery		=	56.6%	

Data Entry by:		Date:	11-Mar-94
Approved by:		Date:	14 Mar 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 3-9-94 J-1289-5781

4108/30 -1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#8 8793 RERUN

Serial No	Sample Point	Date	Time Issued	Priority
J 1289.-5781	BECHTOLD	11- 4-93	9: 2	18

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	8

Sample Size	Customer ID
.100-10- .500mL	KE24A

Remarks, Calculations, Results

COUNT AS uCI/L
Duplicate
.100mL 84B43
1mL 8M HNO3
VanSant

1.72 E-2

ATTENTION PRINTOUT

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 3-10-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-9-94		

54-6800-061 (R-10-83)

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

						SAMPLE
Serial No.	Date Counted		03/10/94	Pu 236 AEA Frac.	(C236)	0.521
J1289-5781	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0.067
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.391
2782	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		4444
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
8	Tracer Book No.		84B43	Background in cpm	(Bkg)	4
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm		33.11
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	2566.9	Pu 238 cpm		4.27
Date	Pu-236 Decay Corr'd value	(dpm/mL)	2522.84	Pu 239 cpm		24.8
03/09/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time	(min)	480
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		1.7228E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * e to the power of {(-ln2 * Decay Time) / 1040.95 }

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of ((1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))) * 1.96 * 100

WHC-SD-WM-DP-057
REV 0A

Pu 239/240	µCI/mL	=	1.72E-02	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	2.4%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 2.22E-03
Pu 238	µCI/mL	=	< 2.84E-03	
Relative Counting Error		=	4.6%	Pu 238 2.84E-03
Pu 236 Tracer Recovery		=	59.5%	

Data Entry by:		Date:	11-Mar-94
Approved by:		Date:	14 Mar 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 3-9-94

J1289-5781

4444/30 -4

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#6 6054 RERUN

Serial No	Sample Point	Date	Time Issued	Priority
J 1289.-5781	BECHTOLD	11- 4-93	9: 2	18

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	9

Sample Size	Customer ID
.100-10-.500mL	KE24A

Remarks, Calculations, Results:
COUNT AS uCI/L
Triplicate
.100mL 84843
8mM
1mL ~~Fe~~ 4h03 AM.
1.80 E-2

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 3-10-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-9-94		

54-6800-061 (R-10-83)

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

						SAMPLE
Serial No.	Date Counted		03/10/94	Pu 236 AEA Frac.	(C236)	0.514
J1289-5781	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0.071
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.402
2782	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		2982
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
9	Tracer Book No.		84B43	Background in cpm	(Bkg)	4
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm		22.52
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	2566.9	Pu 238 cpm		3.12
Date	Pu-236 Decay Corr'd value	(dpm/mL)	2522.84	Pu 239 cpm		17.61
03/09/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time	(min)	480
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		1.7954E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = {(Total AT Counts / TC) - Bkg * 2 * C238} - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / {(Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS}

Relative Counting Error = Square Root of {(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))} * 1.96 * 100

WHC-SD-WM-DP-057
REV 0A

Pu 239/240	µCI/mL	=	1.80E-02	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	2.8%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 3.45E-03
Pu 238	µCI/mL	=	< 4.06E-03	
Relative Counting Error		=	5.4%	Pu 238 4.06E-03
Pu 236 Tracer Recovery		=	38.9%	

Data Entry by:		Date:	11-Mar-94
Approved by:		Date:	14 Mar 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 3-9-94

J1289-5781

2982/30 -4

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#7 7579 RERUN

Serial No	Sample Point	Date	Time Issued	Priority
J 1289.-5981	BECHTOLD	11- 4-93	9: 2	18

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	5

Sample Size	Customer ID
.100-10- .500ml	KE24A

Remarks, Calculations, Results

SAMPLE SPIKED ID 83843 .100-10- .100ml

SPIKE ID 84B43

SPIKE VOLUME

COUNT AS uCI/L .200ml

spike 1ml 84B43

ATTACH PRINTOUT

1.37x10²

96.3%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
		Raymond		
Hrs	Hrs	Hrs 3-10-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-9-94			

54-6800-061 (R-10-83)

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

Serial No.					CHK EXT NO.
J1289-5981	Date Counted		03/10/94	Pu 236 AEA Frac. (C236)	0.477
	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac. (C238)	0.038
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac. (C239)	0.461
2782	Tracer Volume in mL	(SPKV)	0.200	Total AT Counts	9313
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min) (TC)	30
5	Tracer Book No.		84B43	Background in cpm (Bkg)	1
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm	55.82
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	2566.9	Pu 238 cpm	4.45
Date	Pu-236 Decay Corr'd value	(dpm/mL)	2522.84	Pu 239 cpm	53.94
03/09/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time (min)	480
Sample Type					
LIQUID	<<<<<<<<<< Enter a Sample Type <<<<<<<<<<			Pu 239/240 µCi/L	4.4371E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = {(Total AT Counts / TC) - Bkg * 2 * C238} - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / {(Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS}

Relative Counting Error = Square Root of {(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))} * 1.96 * 100

$(44.371 - 12.009)\left(\frac{1010}{202}\right) = 1.3681 \times 10^2$

96.3%

WHC-SD-WM-DP-057
REV 0A

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	4.44E-02	
Relative Counting Error		=	1.7%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 4.94E-03
Pu 238	µCi/mL	=	< 6.17E-03	
Relative Counting Error		=	4.4%	Pu 238 6.17E-03
Pu 236 Tracer Recovery		=	58.5%	

Data Entry by:		Date:	11-Mar-94
Approved by:		Date:	15 Mar 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 3-9-94

J1289-5981

$\frac{93B}{30}$ -1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#5 5145 **RERUN**

Serial No	Sample Point	Date	Time Issued	Priority
J 1289.-5981	BECHTOLD	11- 4-93	9: 2	18

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	6

Sample Size	Customer ID
.100-10-.500ml	KE24A

Remarks, Calculations, Results

SAMPLE SPIKED ID 83843 .100-10-.100mL

SPIKE ID 84843

SPIKE VOLUME .200mL

COUNT AS uCI/L

Duplicate spike 1.41x10^2

Tm8m4403 99.3%

ATTACH PRINTOUT

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
		3-10-94		

Date	Time Completed	Lab Unit Mgr.	
3.9.94		SA Cotton	

54-6800-061 (R-10-83)

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

						CHK EXT NO.
Serial No.	Date Counted		03/10/94	Pu 236 AEA Frac.	(C236)	0.472
J1289-5981	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0.039
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.467
2782	Tracer Volume in mL	(SPKV)	0.200	Total AT Counts		11604
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
6	Tracer Book No.		84B43	Background in cpm	(Bkg)	8
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm		79.45
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	2566.9	Pu 238 cpm		6.57
Date	Pu-236 Decay Corr'd value	(dpm/mL)	2522.84	Pu 239 cpm		78.62
03/09/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time	(min)	480
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		4.5425E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-236 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of ((1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))) * 1.96 * 100

$(45.425 - 17.228)\left(\frac{1010}{202}\right) = 1.41098 \times 10^2$

99.3%

WHC-SD-WM-DP-057
REV 0A

Pu 239/240	µCI/mL	=	4.54E-02	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	1.4%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 4.12E-03
Pu 238	µCI/mL	=	< 5.35E-03	
Relative Counting Error		=	3.6%	Pu 238 5.35E-03
Pu 236 Tracer Recovery		=	70.9%	

Data Entry by:		Date:	11-Mar-94
Approved by:	SA Cotton	Date:	15 Mar 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 3-9-94 J1289-5981

11604/30 -8

3-10-94

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
J1284-5581
File ID: 9a1595.CNF

WHC-SD-WM-DP-057
REV 0A

Counted on: 3/10/94 @ 1:47
Detector: AEA9
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1176.5	1176.5	364.740	364.740	10.000	3.618	5.000	1.434
2	24.4	24.4	305.541	305.406	12.000	4.835	6.000	1.474
3	1588.0	1588.0	230.698	230.698	10.000	3.808	5.000	1.960

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.442	5.796	5.779	0.017	0.02	35.26	1.5	293.8	0.132E-03
	Cm243		5.786	5.779	0.007				402.5	0.181E-03
2	Pu238	0.011	5.499	5.506	-.007	0.02	0.91	10.2	10.5	0.474E-05
	Am241		5.480	5.506	-.026				8.1	0.363E-05
3	Pu239	0.525	5.143	5.163	-.020	0.02	41.86	1.4	348.8	0.157E-03
	Pu240		5.144	5.163	-.019				348.8	0.157E-03
		---					---			
Totals:		0.979	<--valid peaks only-->				78.03			

DETECTOR CALIBRATION
Energy(MEV) = 4.102 + (0.0046)*Channel
Energy range (MeV): 4.102 TO 6.457
Efficiency = 0.1200 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	38276.0	100.000
Smoothed	38276.0	100.000
Composite fit	37454.8	97.854
Residuals	821.3	2.146

Analyzed by: _____
VR

Spectrum 9a1595.CNF

.1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 10082.4


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.3.
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.............................3.
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2
2
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2
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.1
... 1
.......... 1
...........................1..
.....................................................1
.........1.
```

Raw Data Dump for AEA Spectrum: 9a1595.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
11	1.	1.	1.	0.	1.	0.	0.	0.	0.	0.
21	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
31	2.	0.	1.	0.	0.	1.	1.	0.	0.	0.
41	0.	1.	1.	1.	0.	2.	0.	0.	0.	1.
51	0.	1.	0.	0.	0.	0.	0.	0.	2.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
71	2.	1.	2.	2.	1.	0.	1.	1.	1.	1.
81	0.	1.	1.	0.	1.	1.	3.	0.	0.	4.
91	2.	1.	1.	0.	3.	0.	0.	2.	1.	2.
101	1.	2.	2.	1.	1.	2.	0.	1.	1.	1.
111	1.	2.	2.	0.	0.	2.	1.	1.	1.	1.
121	0.	1.	0.	2.	0.	1.	1.	1.	1.	3.
131	5.	0.	1.	0.	2.	5.	1.	2.	1.	2.
141	1.	3.	2.	1.	5.	4.	4.	5.	1.	2.
151	3.	4.	1.	4.	3.	1.	8.	3.	3.	1.
161	8.	4.	4.	3.	6.	9.	4.	6.	10.	6.
171	6.	6.	13.	8.	7.	7.	8.	11.	7.	10.
181	15.	7.	17.	11.	16.	17.	15.	20.	17.	27.
191	22.	25.	26.	23.	26.	21.	28.	36.	34.	45.
201	44.	48.	49.	59.	72.	72.	88.	70.	89.	106.
211	110.	131.	147.	175.	214.	236.	283.	353.	431.	440.
221	523.	585.	639.	738.	818.	989.	1187.	1369.	1624.	1736.
231	1897.	1758.	1379.	909.	474.	218.	106.	43.	12.	5.
241	2.	3.	2.	3.	1.	7.	4.	3.	2.	1.
251	5.	5.	6.	2.	5.	2.	0.	2.	0.	2.
261	3.	0.	0.	2.	4.	2.	0.	1.	0.	1.
271	4.	3.	6.	4.	0.	5.	1.	3.	6.	3.
281	3.	6.	8.	3.	5.	4.	8.	11.	6.	10.
291	5.	12.	8.	9.	9.	14.	23.	20.	10.	12.
301	18.	18.	26.	18.	29.	38.	24.	17.	14.	14.
311	12.	7.	5.	12.	7.	8.	14.	7.	8.	14.
321	9.	12.	16.	15.	23.	17.	13.	24.	31.	20.
331	31.	39.	26.	37.	38.	30.	49.	57.	55.	52.
341	75.	71.	84.	100.	105.	132.	132.	160.	218.	253.
351	296.	375.	436.	480.	583.	588.	660.	673.	690.	763.
361	848.	962.	1148.	1321.	1371.	1323.	1055.	701.	308.	125.
371	41.	9.	0.	1.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	0.	0.	0.	0.	0.	1.	0.	1.	1.
481	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Haymore
3-10-94

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
J1519-5681
File ID: 3a3724.CNF

WHC-SD-WM-DP-057
REV 0A

Counted on: 3/10/94 @ 1:44
Detector: AEA3
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	436.3	436.3	361.492	361.492	16.000	9.565	8.000	2.627

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.894	5.786	5.748	0.038	0.04	19.87	2.0	185.5	0.836E-04
	Pu236		5.756	5.748	0.008				138.2	0.622E-04
		---					---			
Totals:		0.894	<--valid peaks only-->				19.87			

DETECTOR CALIBRATION
Energy(MEV) = 4.085 + (0.0046)*Channel
Energy range (MeV): 4.085 TO 6.440
Efficiency = 0.1467 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	10666.0	100.000
Smoothed	10666.0	100.000
Composite fit	9537.6	89.421
Residuals	1128.4	10.579

Analyzed by: _____
VR

Spectrum 3a3724.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 2940.6


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Raw Data Dump for AEA Spectrum: 3a3724.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	2.	2.	0.	0.	3.	0.	1.	1.
31	0.	0.	0.	0.	1.	0.	0.	0.	1.	2.
41	1.	1.	0.	0.	0.	0.	0.	0.	1.	0.
51	0.	2.	3.	1.	0.	0.	1.	0.	1.	1.
61	0.	1.	0.	0.	0.	0.	0.	1.	1.	0.
71	0.	0.	2.	2.	0.	1.	3.	0.	1.	0.
81	0.	2.	1.	0.	1.	1.	2.	0.	1.	0.
91	1.	0.	1.	0.	1.	0.	1.	0.	3.	2.
101	1.	1.	1.	1.	0.	0.	1.	1.	2.	1.
111	0.	3.	0.	2.	3.	0.	1.	3.	0.	3.
121	2.	0.	1.	0.	0.	1.	0.	2.	1.	0.
131	1.	2.	2.	2.	0.	1.	1.	0.	1.	2.
141	0.	2.	2.	1.	0.	0.	2.	0.	1.	1.
151	1.	3.	0.	2.	1.	1.	1.	4.	2.	1.
161	4.	2.	2.	0.	0.	0.	2.	2.	1.	1.
171	1.	1.	1.	1.	2.	1.	2.	0.	2.	1.
181	3.	3.	4.	4.	4.	5.	2.	1.	4.	4.
191	4.	5.	1.	2.	4.	0.	1.	2.	1.	5.
201	2.	5.	2.	1.	3.	3.	5.	4.	3.	3.
211	5.	5.	3.	3.	6.	4.	3.	8.	1.	2.
221	3.	5.	2.	4.	4.	3.	5.	3.	5.	3.
231	3.	3.	5.	3.	5.	6.	8.	9.	3.	2.
241	2.	4.	9.	6.	3.	4.	2.	6.	3.	8.
251	5.	6.	2.	6.	5.	7.	7.	2.	5.	4.
261	4.	5.	6.	5.	5.	7.	8.	10.	8.	8.
271	15.	12.	16.	6.	13.	9.	9.	11.	9.	11.
281	11.	10.	13.	11.	6.	10.	8.	11.	13.	15.
291	23.	18.	9.	13.	22.	11.	20.	27.	17.	12.
301	16.	16.	8.	22.	16.	16.	18.	20.	16.	28.
311	13.	18.	25.	29.	22.	28.	21.	28.	29.	25.
321	35.	33.	26.	33.	35.	32.	36.	44.	39.	38.
331	41.	45.	56.	61.	67.	58.	68.	57.	70.	81.
341	83.	95.	108.	123.	104.	169.	162.	220.	213.	251.
351	255.	292.	299.	321.	343.	404.	392.	429.	433.	462.
361	432.	451.	475.	400.	358.	344.	272.	181.	138.	71.
371	52.	30.	8.	3.	3.	2.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WJ 3-10-94

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J1289-5781
File ID: 10a1595.CNF

Counted on: 3/10/94 @ 1:47
Detector: AEA10
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1136.2	1136.2	364.124	364.124	10.000	3.321	5.000	1.418
2	133.9	133.9	305.103	305.089	12.000	3.792	6.000	1.454
3	877.2	877.2	230.521	230.521	12.000	4.517	6.000	2.420

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.525	5.796	5.778	0.018	0.02	32.03	1.6	231.1	0.104E-03
	Cm243		5.786	5.778	0.008				316.5	0.143E-03
2	Pu238	0.068	5.499	5.506	-.007	0.02	4.13	4.4	41.4	0.187E-04
	Am241		5.480	5.506	-.026				31.7	0.143E-04
3	Pu239	0.389	5.143	5.163	-.020	0.02	23.77	1.8	171.5	0.772E-04
	Pu240		5.144	5.163	-.019				171.5	0.772E-04
		---					---			
Totals:		0.982	<--valid peaks only-->				59.93			

DETECTOR CALIBRATION
Energy(MEV) = 4.103 + (0.0046)*Channel
Energy range (MeV): 4.103 TO 6.458
Efficiency = 0.1386 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	29294.0	100.000
Smoothed	29294.0	100.000
Composite fit	28767.5	98.203
Residuals	526.5	1.797

Analyzed by: _____
VR

Spectrum 10a1595.CNF

Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 7394.9


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Raw Data Dump for AEA Spectrum: 10a1595.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	2.	0.	2.	1.	1.	0.	0.	2.	0.	0.
21	2.	2.	0.	0.	1.	0.	3.	0.	1.	0.
31	2.	3.	1.	1.	2.	1.	1.	0.	0.	2.
41	1.	2.	1.	2.	0.	0.	2.	0.	2.	2.
51	0.	1.	1.	0.	2.	1.	1.	0.	0.	2.
61	1.	1.	0.	1.	2.	1.	1.	3.	0.	2.
71	2.	0.	0.	0.	1.	0.	1.	2.	2.	1.
81	1.	1.	3.	2.	3.	1.	1.	1.	1.	0.
91	1.	0.	0.	1.	2.	3.	1.	2.	0.	3.
101	3.	4.	0.	1.	4.	1.	0.	2.	1.	2.
111	3.	4.	1.	1.	1.	2.	2.	1.	1.	3.
121	2.	0.	2.	3.	0.	4.	6.	3.	2.	2.
131	1.	2.	1.	2.	2.	0.	3.	3.	4.	2.
141	3.	2.	5.	2.	3.	2.	1.	7.	6.	3.
151	2.	2.	2.	1.	1.	4.	3.	6.	3.	4.
161	4.	3.	1.	1.	6.	3.	6.	3.	9.	4.
171	7.	6.	3.	6.	6.	5.	4.	6.	6.	7.
181	6.	7.	5.	9.	5.	14.	7.	9.	6.	12.
191	10.	13.	13.	19.	13.	11.	14.	11.	14.	21.
201	28.	23.	26.	18.	32.	35.	42.	41.	33.	40.
211	46.	75.	72.	93.	95.	148.	144.	198.	216.	267.
221	296.	328.	392.	409.	462.	570.	678.	852.	931.	1004.
231	1020.	922.	768.	509.	349.	189.	73.	19.	5.	2.
241	0.	2.	2.	4.	0.	3.	4.	1.	4.	1.
251	2.	2.	4.	5.	2.	2.	3.	1.	2.	3.
261	2.	4.	5.	6.	3.	8.	3.	6.	5.	8.
271	5.	9.	6.	7.	5.	9.	5.	8.	9.	7.
281	9.	8.	10.	13.	15.	14.	16.	21.	28.	23.
291	35.	31.	41.	47.	61.	82.	82.	99.	82.	82.
301	90.	115.	135.	151.	150.	144.	164.	83.	44.	18.
311	19.	4.	6.	3.	14.	8.	9.	7.	14.	7.
321	13.	8.	14.	11.	14.	16.	21.	18.	21.	21.
331	24.	23.	29.	17.	30.	21.	45.	27.	39.	38.
341	50.	65.	66.	75.	93.	105.	119.	121.	192.	251.
351	307.	383.	474.	531.	599.	561.	528.	556.	635.	753.
361	876.	1025.	1183.	1374.	1331.	1096.	776.	346.	154.	42.
371	13.	1.	0.	0.	1.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
421	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
481	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

3/10-11

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J1289-5781
File ID: 8a8793.CNF

Counted on: 3/10/94 @ 1:46
Detector: AEA8
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	897.0	897.0	362.151	362.151	16.000	8.126	8.000	3.135
2	110.4	110.4	305.015	304.893	14.000	7.563	7.000	2.541
3	728.9	728.9	231.169	231.169	16.000	7.852	8.000	3.596

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.521	5.796	5.793	0.003	0.04	33.11	1.6	298.8	0.135E-03
	Cm243		5.786	5.793	-.007				409.3	0.184E-03
2	Pu238	0.067	5.499	5.524	-.025	0.04	4.27	4.5	53.6	0.241E-04
	Am241		5.480	5.524	-.044				41.0	0.185E-04
3	Pu239	0.391	5.143	5.178	-.035	0.04	24.80	1.8	223.8	0.101E-03
	Pu240		5.144	5.178	-.034				223.8	0.101E-03
		---					---			
Totals:		0.979	<--valid peaks only-->				62.18			

DETECTOR CALIBRATION
Energy(MEV) = 4.091 + (0.0047)*Channel
Energy range (MeV): 4.091 TO 6.498
Efficiency = 0.1108 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	30476.0	100.000
Smoothed	30476.0	100.000
Composite fit	29847.8	97.939
Residuals	628.2	2.061

Analyzed by: _____
VR

Spectrum 8a8793.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 6081.0


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Raw Data Dump for AEA Spectrum: 8a8793.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	3.	0.	3.	2.
21	2.	1.	1.	3.	1.	1.	0.	0.	3.	1.
31	2.	2.	1.	1.	1.	1.	2.	1.	1.	1.
41	3.	0.	0.	1.	1.	2.	1.	0.	0.	1.
51	1.	1.	1.	1.	2.	0.	1.	4.	2.	2.
61	2.	1.	1.	3.	3.	3.	2.	5.	1.	2.
71	5.	3.	0.	1.	1.	0.	5.	0.	2.	1.
81	3.	0.	1.	0.	4.	2.	2.	0.	2.	2.
91	2.	3.	2.	1.	3.	4.	3.	2.	1.	2.
101	3.	1.	0.	3.	2.	1.	2.	1.	3.	2.
111	3.	0.	1.	1.	3.	5.	2.	1.	1.	3.
121	2.	1.	1.	3.	5.	0.	1.	4.	3.	4.
131	2.	3.	4.	1.	2.	3.	2.	5.	5.	4.
141	4.	2.	3.	2.	4.	4.	2.	6.	1.	4.
151	3.	5.	4.	2.	8.	8.	7.	5.	3.	11.
161	7.	4.	5.	7.	3.	6.	6.	4.	5.	4.
171	4.	6.	2.	9.	3.	9.	5.	6.	12.	6.
181	7.	8.	9.	14.	10.	11.	13.	10.	4.	14.
191	7.	16.	19.	15.	14.	15.	13.	24.	26.	26.
201	29.	35.	29.	40.	37.	42.	41.	49.	54.	58.
211	66.	79.	79.	108.	118.	145.	142.	177.	208.	238.
221	266.	328.	371.	408.	478.	582.	653.	734.	686.	831.
231	784.	777.	748.	647.	471.	407.	313.	218.	145.	94.
241	54.	29.	10.	6.	6.	1.	2.	8.	8.	1.
251	3.	3.	1.	2.	4.	1.	5.	4.	0.	7.
261	6.	2.	2.	0.	7.	2.	4.	4.	9.	11.
271	12.	8.	3.	4.	9.	6.	12.	15.	7.	10.
281	18.	6.	19.	13.	14.	24.	29.	23.	23.	26.
291	34.	38.	50.	41.	61.	80.	72.	91.	76.	98.
301	90.	124.	110.	120.	124.	111.	115.	104.	73.	55.
311	37.	36.	25.	16.	12.	14.	15.	8.	18.	12.
321	18.	14.	15.	17.	22.	18.	22.	28.	33.	31.
331	24.	29.	28.	42.	45.	42.	50.	57.	52.	59.
341	78.	93.	93.	135.	158.	170.	186.	285.	269.	361.
351	384.	483.	512.	570.	599.	630.	699.	787.	876.	887.
361	957.	978.	952.	873.	827.	664.	508.	408.	270.	166.
371	100.	57.	26.	14.	4.	0.	0.	1.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	1.	0.	1.	0.	0.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

3-10-94

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J1289-5781
File ID: 6a6054.CNF

Counted on: 3/10/94 @ 1:45
Detector: AEA6
Geometry number: 1
Count time: 28805. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	414.8	414.8	355.920	355.920	26.000	27.012	13.000	11.568
2	60.5	60.5	298.614	298.537	22.000	16.653	11.000	4.749
3	361.5	361.5	223.567	223.564	24.000	21.028	12.000	9.300

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.514	5.786	5.763	0.023	0.12	22.52	1.9	240.3	0.108E-03
	Pu236		5.756	5.763	-.007				179.0	0.806E-04
2	Am241	0.071	5.480	5.499	-.019	0.08	3.12	5.3	25.8	0.116E-04
	Pu238		5.499	5.499	0.000				33.7	0.152E-04
3	Pu239	0.402	5.143	5.154	-.011	0.10	17.61	2.1	137.1	0.618E-04
	Pu240		5.144	5.154	-.010				137.1	0.618E-04
		---					---			
Totals:		0.987	<--valid peaks only-->				43.25			

DETECTOR CALIBRATION
Energy(MEV) = 4.126 + (0.0046)*Channel
Energy range (MeV): 4.126 TO 6.481
Efficiency = 0.1284 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	21027.0	100.000
Smoothed	21029.1	100.010
Composite fit	20763.6	98.747
Residuals	263.4	1.253

Analyzed by: _____
VR

Spectrum 6a6054.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3214.0


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Raw Data Dump for AEA Spectrum: 6a6054.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	1.	1.	0.
21	0.	0.	3.	0.	0.	0.	4.	2.	2.	3.
31	0.	0.	2.	0.	1.	1.	0.	1.	1.	1.
41	1.	2.	3.	1.	1.	1.	3.	0.	3.	1.
51	1.	1.	1.	0.	2.	1.	3.	1.	0.	1.
61	0.	3.	1.	0.	1.	1.	0.	0.	1.	6.
71	2.	3.	0.	1.	0.	3.	0.	1.	0.	4.
81	0.	0.	3.	0.	4.	1.	1.	1.	1.	3.
91	3.	4.	0.	1.	0.	0.	1.	2.	0.	1.
101	0.	0.	1.	0.	1.	1.	1.	1.	2.	1.
111	0.	1.	1.	2.	2.	2.	1.	2.	0.	5.
121	3.	0.	0.	1.	2.	3.	3.	2.	2.	0.
131	0.	2.	3.	2.	2.	0.	0.	6.	1.	3.
141	5.	9.	1.	3.	3.	0.	1.	0.	3.	2.
151	1.	1.	3.	4.	1.	4.	6.	6.	4.	2.
161	4.	2.	4.	2.	4.	3.	5.	4.	3.	6.
171	4.	7.	5.	3.	7.	4.	7.	4.	7.	5.
181	3.	4.	6.	7.	7.	6.	7.	9.	11.	11.
191	10.	13.	15.	22.	23.	24.	26.	23.	37.	37.
201	40.	48.	43.	53.	87.	80.	99.	107.	108.	141.
211	152.	182.	178.	210.	237.	269.	251.	317.	352.	372.
221	328.	408.	373.	377.	364.	361.	308.	329.	271.	250.
231	235.	222.	206.	164.	117.	112.	83.	70.	48.	38.
241	33.	23.	16.	10.	11.	8.	9.	6.	6.	6.
251	5.	6.	7.	4.	6.	1.	2.	2.	6.	7.
261	5.	6.	5.	2.	5.	4.	6.	7.	3.	3.
271	3.	7.	7.	9.	12.	12.	18.	9.	14.	22.
281	22.	24.	14.	23.	35.	24.	30.	35.	43.	71.
291	51.	58.	53.	65.	55.	61.	55.	67.	60.	71.
301	57.	42.	50.	54.	26.	32.	33.	29.	25.	12.
311	15.	19.	12.	10.	9.	13.	7.	14.	13.	7.
321	14.	18.	20.	15.	21.	25.	24.	26.	40.	47.
331	43.	54.	56.	61.	70.	74.	98.	114.	129.	160.
341	159.	153.	189.	189.	256.	246.	271.	302.	324.	350.
351	405.	357.	414.	432.	415.	470.	386.	389.	413.	405.
361	390.	353.	319.	279.	261.	231.	215.	167.	147.	158.
371	105.	100.	65.	54.	40.	24.	29.	12.	13.	8.
381	5.	7.	2.	1.	2.	2.	0.	1.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	1.	0.	0.	0.	0.	1.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
451	0.	0.	1.	1.	0.	1.	0.	0.	0.	2.
461	0.	0.	0.	1.	0.	0.	2.	0.	2.	2.
471	1.	3.	2.	4.	1.	3.	0.	0.	1.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	1.	0.	1.	0.	5.	5.	10.	3.	0.	0.
511	0.	0.								

3-10-94

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J1289-5981
File ID: 7a7579.CNF

Counted on: 3/10/94 @ 1:46
Detector: AEA7
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1497.1	1497.1	363.572	363.572	16.000	9.303	8.000	3.843
2	116.1	116.1	305.396	305.318	16.000	9.308	8.000	3.595
3	1558.4	1558.4	231.857	231.856	16.000	9.354	8.000	4.814
4?	12.8	12.8	160.379	160.345	98.000	1.000	49.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	0.477	5.756	5.776	-.020	0.04	55.82	1.2	490.2	0.221E-03
	Cm243		5.786	5.776	0.010				658.1	0.296E-03
2	Am241	0.038	5.480	5.508	-.028	0.04	4.45	4.4	40.8	0.184E-04
	Pu238		5.499	5.508	-.009				53.2	0.240E-04
3	Pu239	0.461	5.143	5.170	-.027	0.04	53.94	1.2	464.2	0.209E-03
	Pu240		5.144	5.170	-.026				464.2	0.209E-03
4		????		4.841			1.02	8.9		
Totals:		0.976	<--valid peaks only-->				114.22			

DETECTOR CALIBRATION
Energy(MEV) = 4.103 + (0.0046)*Channel
Energy range (MeV): 4.103 TO 6.459
Efficiency = 0.1162 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	56162.0	100.000
Smoothed	56162.0	100.000
Composite fit	55318.2	98.497
Residuals	843.8	1.503

Analyzed by: _____
VR

Spectrum 7a7579.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 10963.5


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Raw Data Dump for AEA Spectrum: 7a7579.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	4.	1.	4.
21	2.	3.	3.	0.	5.	4.	2.	2.	5.	4.
31	3.	2.	5.	4.	1.	5.	2.	2.	3.	1.
41	2.	3.	2.	1.	4.	3.	3.	2.	3.	5.
51	2.	1.	3.	3.	4.	3.	4.	5.	3.	4.
61	3.	2.	3.	3.	6.	3.	1.	4.	5.	6.
71	3.	4.	3.	4.	4.	4.	2.	5.	5.	1.
81	5.	3.	1.	5.	4.	3.	3.	5.	4.	2.
91	5.	6.	3.	2.	1.	5.	3.	1.	7.	0.
101	4.	4.	6.	4.	1.	1.	3.	5.	5.	5.
111	8.	4.	9.	2.	6.	6.	4.	7.	7.	3.
121	5.	2.	7.	3.	9.	6.	4.	7.	6.	4.
131	6.	7.	3.	10.	11.	6.	7.	8.	8.	7.
141	9.	12.	7.	7.	13.	10.	5.	6.	6.	8.
151	14.	6.	9.	9.	8.	19.	13.	12.	8.	16.
161	11.	15.	7.	13.	9.	13.	11.	15.	11.	16.
171	9.	6.	15.	16.	15.	17.	15.	14.	12.	22.
181	13.	16.	6.	23.	19.	24.	13.	22.	22.	29.
191	30.	22.	31.	22.	18.	30.	44.	33.	38.	48.
201	43.	46.	51.	46.	55.	58.	66.	86.	85.	98.
211	99.	133.	139.	156.	193.	229.	255.	305.	415.	446.
221	540.	573.	707.	827.	930.	1102.	1283.	1430.	1498.	1653.
231	1675.	1705.	1627.	1479.	1336.	1192.	961.	691.	526.	359.
241	237.	171.	102.	73.	47.	31.	14.	6.	9.	8.
251	3.	8.	5.	7.	2.	9.	3.	4.	7.	5.
261	6.	5.	7.	9.	7.	2.	9.	3.	14.	6.
271	8.	5.	13.	10.	10.	8.	5.	5.	13.	11.
281	12.	19.	15.	16.	19.	12.	20.	21.	25.	35.
291	31.	25.	43.	50.	61.	55.	58.	71.	72.	86.
301	93.	125.	108.	124.	130.	139.	102.	117.	91.	71.
311	65.	47.	43.	31.	23.	25.	20.	18.	15.	25.
321	28.	23.	32.	28.	23.	28.	23.	29.	35.	27.
331	40.	43.	51.	59.	39.	48.	63.	85.	74.	82.
341	84.	100.	130.	148.	170.	218.	240.	321.	364.	485.
351	494.	626.	724.	781.	906.	899.	1055.	1142.	1229.	1392.
361	1449.	1618.	1555.	1655.	1500.	1418.	1226.	1048.	838.	637.
371	427.	292.	200.	130.	90.	40.	26.	11.	7.	1.
381	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
471	0.	0.	0.	1.	0.	0.	0.	1.	0.	0.
481	0.	0.	0.	0.	1.	1.	1.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	4.	0.								

3-10-94

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J1289-5981
File ID: 5a5145.CNF

Counted on: 3/10/94 @ 1:45
Detector: AEA5
Geometry number: 1
Count time: 28806. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1605.0	1605.0	360.034	360.034	20.000	16.157	10.000	4.972
2	123.3	123.3	301.356	300.753	24.000	16.833	12.000	4.477
3	1700.0	1700.0	228.773	228.771	20.000	14.938	10.000	5.152
4?	18.5	18.5	152.482	152.303	82.000	1.000	41.000	0.100
5?	1.8	1.8	132.885	132.327	4.000	0.000	2.000	1.843

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.472	5.786	5.772	0.014	0.08	79.45	1.0	805.6	0.363E-03
	Pu236		5.756	5.772	-.016				600.1	0.270E-03
2	Am241	0.039	5.480	5.494	-.014	0.08	6.57	4.1	51.7	0.233E-04
	Pu238		5.499	5.494	0.005				67.6	0.304E-04
3	Pu239	0.467	5.143	5.155	-.012	0.07	78.62	1.0	581.9	0.262E-03
	Pu240		5.144	5.155	-.011				581.9	0.262E-03
4		????		4.796			1.47	7.5		
5		????		4.702			0.00	1000.		
Totals:		0.978	<--valid peaks only-->				164.64			

DETECTOR CALIBRATION
Energy(MEV) = 4.080 + (0.0047)*Channel
Energy range (MeV): 4.080 TO 6.487
Efficiency = 0.1351 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	80782.0	100.000
Smoothed	80782.0	100.000
Composite fit	79746.8	98.719
Residuals	1035.2	1.281

Analyzed by: _____
VR

WHC-SD-WM-DP-057
REV 0A

Spectrum 5a5145.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 12933.9


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Raw Data Dump for AEA Spectrum: 5a5145.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	1.	3.	3.
21	3.	4.	5.	5.	2.	3.	6.	7.	3.	4.
31	2.	3.	4.	3.	4.	4.	3.	5.	3.	3.
41	5.	5.	8.	5.	4.	5.	5.	8.	6.	5.
51	2.	3.	5.	2.	5.	6.	3.	7.	7.	9.
61	5.	7.	2.	2.	8.	4.	8.	8.	6.	6.
71	3.	6.	4.	4.	6.	6.	2.	10.	5.	5.
81	2.	3.	5.	8.	3.	8.	1.	5.	5.	6.
91	8.	5.	8.	2.	8.	8.	6.	5.	6.	9.
101	12.	9.	11.	13.	8.	2.	11.	7.	5.	7.
111	15.	10.	5.	11.	7.	9.	10.	5.	13.	6.
121	10.	11.	7.	9.	7.	16.	10.	8.	6.	11.
131	14.	7.	18.	12.	8.	12.	10.	11.	9.	6.
141	13.	14.	20.	15.	14.	18.	22.	18.	15.	13.
151	19.	23.	24.	18.	15.	15.	23.	18.	19.	21.
161	21.	13.	29.	26.	36.	34.	37.	29.	29.	27.
171	40.	34.	33.	34.	42.	36.	40.	51.	41.	59.
181	46.	42.	48.	48.	53.	60.	60.	68.	70.	57.
191	75.	76.	81.	84.	96.	121.	105.	105.	154.	145.
201	139.	155.	188.	211.	215.	207.	249.	292.	340.	337.
211	429.	476.	499.	591.	627.	699.	780.	928.	942.	1109.
221	1204.	1236.	1366.	1486.	1591.	1728.	1769.	1759.	1829.	1734.
231	1596.	1582.	1418.	1233.	1131.	869.	755.	614.	504.	349.
241	305.	209.	121.	87.	69.	44.	30.	20.	15.	12.
251	16.	11.	8.	11.	14.	12.	12.	13.	11.	9.
261	12.	14.	13.	17.	25.	24.	16.	18.	19.	22.
271	18.	25.	17.	21.	26.	27.	25.	34.	23.	30.
281	36.	36.	30.	49.	49.	53.	52.	68.	63.	75.
291	102.	85.	86.	100.	127.	111.	128.	143.	114.	158.
301	137.	132.	133.	139.	105.	131.	111.	115.	90.	100.
311	72.	67.	61.	56.	56.	56.	58.	68.	53.	71.
321	57.	54.	72.	75.	73.	91.	98.	113.	118.	124.
331	148.	138.	158.	183.	204.	216.	236.	250.	293.	382.
341	353.	416.	501.	575.	653.	629.	782.	897.	951.	1087.
351	1166.	1165.	1301.	1343.	1462.	1530.	1578.	1678.	1636.	1694.
361	1633.	1576.	1548.	1374.	1325.	1138.	937.	828.	621.	491.
371	390.	269.	220.	157.	91.	54.	37.	23.	14.	9.
381	4.	1.	0.	0.	1.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	1.	0.	0.	0.	0.	0.	1.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
421	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
431	1.	1.	0.	0.	0.	0.	1.	0.	0.	0.
441	1.	0.	0.	1.	0.	0.	1.	0.	0.	1.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	1.	0.	0.	0.	0.	1.	1.	0.	0.	0.
471	2.	3.	0.	0.	2.	0.	1.	0.	2.	1.
481	2.	0.	2.	0.	1.	2.	1.	0.	0.	0.
491	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WHC-SD-WM-DP-057
REV 0A

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH 2676

Lab Segment Serial No. J-1289	Customer ID: KE24A
Analysis: PU 239	Sample Prep: DIRECT

Instrument: WB537237	Procedure/ Rev: LA-503-156/D0
Technologist: J M VAN SANT	Date: 02/24/94
Starting Time: 1000	Temperature 25 C
Ending Time: 1700	Chemist: L. FRITTS

Comments: BATCH # 2676 **OUT FOR RERUN** No spike recovery KMcGarend 3-2-94

	Description	Lab ID		Description	Lab ID
1	LMCS	J1284-5581	11		
2	BLANK	J1519-5681	12		
3	SAMPLE	J1289-5781	13		
4	SAMPLE DUP.	J1289-5781	14		
5	SAMPLE TRIP.	J1289-5781	15		
6	SPIKE	J1289-5981	16		
7	SPIKE DUPLICATE	J1289-5981	17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	83B43	.100ML-10ML-.100	ML	
SPIKE	84B43	.100ML		

977

A-6000-881 (03/92)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-503-156

DATE START: February 24, 1994

PREPARED BY: S. A. Catlow

DATE COMPLETE: February 28, 1994

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63B43	J1284	Pu-239/40	136						96.5		
BLANK	J1519	Pu-239/40	<4.98E-3						14.9		100
KE24A	J1289	Pu-239/40	1.87E-02	1.86E-02	1.78E-02	1.84E-02	9.80E-03	5.3	19.6	7.80E-03	5.1
									25.6	5.37E-03	3.6
									22.6	6.67E-03	3.6
KE24A	J1289	239 Spike							0		
									0		
STD 63B43		Pu-238							N/A		
BLANK	J1519	Pu-238	<5.59E-3								100
KE24A	J1289	Pu-238	<8.42E-3	<5.99E-3	<7.29E-3	N/A	N/A	N/A	19.6	8.42E-03	7.7
									25.6	5.99E-03	6.9
									22.6	7.29E-03	5.2

NARRATIVE: [ ] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH
LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

WHC-SD-WM-DP-057
REV 0A

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#2 2637 Batch 2676

Serial No	Sample Point	Date	Time Issued	Priority
J1284-5581	BECHTOLL	11-4-93	8:47	12

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239,40	LA-503-156	% RECOVERY	B14167	1

Sample Size	Customer ID
100-10-100 100uL Tracer	STD

Remarks, Calculations, Results

83B43 1.36 E+2

96.5%

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 2-24-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2-24-94			3-2-94

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

						STANDARD
Serial No.	Date Counted		02/25/94	Pu 236 AEA Frac.	(C236)	0.424
J1284-5581	Sample Volume in mL	(SS)	0.100	Pu 238 AEA Frac.	(C238)	0.052
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.498
2676	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		2178
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
1	Tracer Book No.		84B43	Background in cpm	(Bkg)	9
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm		11.08
	-236 Preparation Value	(dpm/mL)	2566.9	Pu 238 cpm		1.35
Date	Pu-236 Decay Corr'd value	(dpm/mL)	2544.78	Pu 239 cpm		13.02
02/24/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time	(min)	480
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		1.3598E+02

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * e to the power of [(-ln2 * Decay Time) / 1040.95]

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 2 * C238] - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / [(Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

WHC-SD-WM-DP-057
REV 0A

Pu 239/240	µCi/mL	=	1.36E-01	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	3.7%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 3.87E-02
Pu 238	µCi/mL	=	< 4.17E-02	
Relative Counting Error		=	8.2%	Pu 238 4.17E-02
Pu 236 Tracer Recovery		=	21.2%	

Data Entry by:		Date:	25-Feb-94
Approved by:		Date:	28 Feb 94

Form 5 Rev. 1.1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 2-24-94 AJ J1284-5581

2178/30 -9

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#3 3693

Serial No	Sample Point	Date	Time Issued	Priority
J 1519.-5681	BECHDOLT	2-17-94	10:52	26

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/240	LA-503-156	uCi/mL	B14167	0

Sample Size	Customer ID
100-10-500	BLANK

Remarks, Calculations, Results

REAGENT BLANK

COUNT AS uCi/L

100 uL Tracer 84B43

SKM 3-1-94

Pu239/240 < 4.98E-03 uci/ml

ATTACH PRINTOUT

Pu238 < 5.59 E-3 uci/ml

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	2-24-94			

Date	Time Completed	Lab Unit Mgr	
2-24-94			3-2-94

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

Serial No.					BLANK
	Date Counted		02/24/94	Pu 236 AEA Frac. (C236)	0.939
J1519-5681	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac. (C238)	0
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac. (C239)	0
2676	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts	695
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min (TC)	30
0	Tracer Book No.		84B43	Background in cpm (Bkg)	3
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm	8.85
	Pu-236 Preparation Val (dpm/mL)		2566.9	Pu 238 cpm	0
Date	Pu-236 Decay Corr'd val (dpm/mL)		2546.47	Pu 239 cpm	0
02/24/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time (min)	480
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L <	4.9774E+00

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = {(Total AT Counts / TC) - Bkg * 2 * C238} - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / {(Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS}

Relative Counting Error = Square Root of {(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))} * 1.96 * 100

NOTE: Pu 239\240 Result is a LESS THAN Value.

Pu 239/240	µCI/mL	=	< 4.98E-03	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	100.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 4.98E-03
Pu 238	µCI/mL	=	< 5.59E-03	
Relative Counting Error		=	100.0%	Pu 238 5.59E-03
Pu 236 Tracer Recovery		=	14.9%	

WHC-SD-WM-DP-057
REV 0A

Data Entry by:		Date:	25-Feb-94
Approved by:		Date:	28 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 2-24-94 AJ

J1519-5681

695 - 3
30

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#4 4199

Serial No	Sample Point	Date	Time Issued	Priority
J 1289-5781	BENHIOLD	11- 4-93	9: 2	18

Determination	Method Standard	Result Units	Charge Code	Reruns
PU239/240	LA-503-156	uCi/ML	B14157	1

Sample Size	Customer ID
100-10-500	KE24A

Remarks Calculations, Results

Sample
100 uL Tracer 84B43
Pu239/240 1.87E-2 uci/ml
Pu238 < 8.42E-3 uci/ml

ATTACH PRINTOUT

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 2-24-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2-22-94		3-2-94

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

Serial No.	Date Counted	02/24/94	Pu 236 AEA Frac. (C236)	SAMPLE
J1289-5781	Sample Volume in mL (SS)	0.500	Pu 238 AEA Frac. (C238)	0.108
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.367
2676	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	1794
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min (TC)	30
1	Tracer Book No.	84B43	Background in cpm (Bkg)	5
Analyst	Tracer Preparation Date	02/12/94	Pu 236 cpm	6.96
	Pu-236 Preparation Val (dpm/mL)	2566.9	Pu 238 cpm	1.65
Date	Pu-236 Decay Corr'd val (dpm/mL)	2546.47	Pu 239 cpm	5.62
02/24/94	Pu-238 Tracer Value (dpm/mL)	67.6	AEA Count Time (min)	480
Sample Type				
LIQUID	<<<<<<<<<< Enter a Sample Type <<<<<<<<<<		Pu 239/240 µCi/L	1.8689E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of ((1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))) * 1.96 * 100

				DETECTION LEVELS in µCi/mL
Pu 239/240 µCi/mL	=		1.87E-02	
Relative Counting Error	=		5.1%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238 µCi/mL	=	<	8.42E-03	7.80E-03
Relative Counting Error	=		7.7%	Pu 238
Pu 236 Tracer Recovery	=		19.6%	8.42E-03

WHC-SD-WM-DP-057
REV 0A

Data Entry by:		Date:	25-Feb-94
Approved by:		Date:	28 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 2-24-94 AJ

1794/30 -5

J1289-5781

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#5 5118

Serial No	Sample Point	Date	Time Issued	Priority
J 1289-5781	PECHIOID	11- 4-93	9: 2	18

Determination	Method Standard	Result Units	Charge Code	Reruns
PU238/40	LA-503-156	uCi/ML	214157	2

Sample Size	Customer ID
100-10-500	KE24A

Remarks, Calculations, Results

Duplicate

100 mL Error 84B43

Pu239/240 1.86 E-2 uci/ml

Pu238 < 5.94 E-3 uci/ml

ATTACH PRINTOUT

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 2-24-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2-24-94		3-2-94

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

					SAMPLE
Serial No.	Date Counted		02/24/94	Pu 236 AEA Frac. (C236)	0.506
J1289-5781	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac. (C238)	0.072
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac. (C239)	0.406
2676	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts	2200
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min (TC)	30
2	Tracer Book No.		84B43	Background in cpm (Bkg)	9
Analyst	Tracer Preparation Date		02/12/94	Pu 236 cpm	13.59
	Pu-236 Preparation Val	(dpm/mL)	2566.9	Pu 238 cpm	1.93
Date	Pu-236 Decay Corr'd val	(dpm/mL)	2546.47	Pu 239 cpm	10.88
02/24/94	Pu-238 Tracer Value	(dpm/mL)	67.6	AEA Count Time (min)	480
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L	1.8591E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of ((1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))) * 1.96 * 100

WHC-SD-WM-DP-057
REV 0A

Pu 239/240 µCI/mL	=	1.86E-02	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	3.6%	
NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240 5.37E-03
Pu 238 µCI/mL	=	< 5.99E-03	
Relative Counting Error	=	6.9%	Pu 238 5.99E-03
Pu 236 Tracer Recovery	=	25.6%	

Data Entry by:		Date:	2-25-94 25-Feb-94
Approved by:		Date:	28 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 2-24-94 AJ J1289-5781

2200/30 -9

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#6 6028

Serial No	Sample Point	Date	Time Issued	Priority
J 1289.-5781	BENCHFIELD	11- 4-88	9: 0	18

Determination	Method Standard	Result Units	Charge Code	Reruns
PuC89/40	LA-503-156	uCi/ML	B14157	3

Sample Size	Customer ID
100-10-500	NE34A

Remarks, Calculations, Results

COUNT AS uCI/L

Triplicate

100uL Tracer 84B43

ATTACH PRINTOUT

Pu239/240 1.78E-2 uci/ml

Pu238 < 7.29E-3 uci/ml

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 2-24-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
2-24-94		2-3-2-94

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

Serial No.				SAMPLE
	Date Counted	02/24/94	Pu 236 AEA Frac. (C236	0.461
J1289-5781	Sample Volume in mL (SS)	0.500	Pu 238 AEA Frac. (C238	0.126
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239	0.355
2676	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	1963
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min (TC)	30
3	Tracer Book No.	84B43	Background in cpm (Bkg)	3
Analyst	Tracer Preparation Date	02/12/94	Pu 236 cpm	13.99
	Pu-236 Preparation Val (dpm/mL)	2566.9	Pu 238 cpm	3.82
Date	Pu-236 Decay Corr'd val (dpm/mL)	2546.47	Pu 239 cpm	10.76
02/24/94	Pu-238 Tracer Value (dpm/mL)	67.6	AEA Count Time (min)	480
Sample Type				
LIQUID	<<<<<<<<<< Enter a Sample Type <<<<<<<<<<		Pu 239/240 µCi/L	1.7843E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of ((1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))) * 1.96 * 100

WHC-SD-WM-DP-057
REV 0A

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCI/mL	=	1.78E-02	
Relative Counting Error		=	3.6%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 6.67E-03
Pu 238	µCI/mL	=	< 7.29E-03	
Relative Counting Error		=	5.2%	Pu 238 7.29E-03
Pu 236 Tracer Recovery		=	22.6%	

Data Entry by:		Date:	25-Feb-94
Approved by:		Date:	28-Feb-94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 2-24-94 AJ J1289-5781

1963/30 -3

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#7 7553

Serial No	Sample Point	Date	Time Issued	Priority
J 1289.-5981	BERKHOLD	11- 4-93	8: 2	13

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14167	1

Sample Size	Customer ID
100 -10-250 Sample 100uL Tracer	KE24A

Remarks, Calculations, Results

SAMPLE SPIKED ID 100-10-50 (AE021) 83B43

SPIKE ID 84B43

SPIKE VOLUME FOUND AT 100/L .100mL

WHC-SD-WM-DP-057
REV 0A

ATTACH PRINTOUT

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 2-24-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
			3-2-94

54-6800-061 (R-10-83)

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Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

Serial No.	Date Counted	02/24/94	Pu 236 AEA Frac. (C236	0.718
J1289-5981	Sample Volume in mL (SS)	0.250	Pu 238 AEA Frac. (C238	0
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239	0.265
2676	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	2170
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min (TC)	30
1	Tracer Book No.	84B43	Background in cpm (Bkg)	5
Analyst	Tracer Preparation Date	02/12/94	Pu 236 cpm	20.12
	Pu-236 Preparation Val (dpm/mL)	2566.9	Pu 238 cpm	0
Date	Pu-236 Decay Corr'd val (dpm/mL)	2546.47	Pu 239 cpm	7.42
02/24/94	Pu-238 Tracer Value (dpm/mL)	67.6	AEA Count Time (min)	480
Sample Type				
LIQUID	<<<<<<<<<< Enter a Sample Type <<<<<<<<<<		Pu 239/240 µCi/L	1.7104E+01

CHK EXT NO.

(1.7104 E+1)

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of ((1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))) * 1.96 * 100

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCI/mL	=	1.71E-02	
Relative Counting Error		=	3.8%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 5.10E-03
Pu 238	µCI/mL	=	< 6.33E-03	
Relative Counting Error		=	100.0%	Pu 238 6.33E-03
Pu 236 Tracer Recovery		=	38.0%	

Data Entry by:		Date:	25-Feb-94
Approved by:		Date:	28 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 2-24-94

J1289-5981

2170/30 -5

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

#8 8767

Serial No	Sample Point	Date	Time Issued	Priority
J 1289.-5981	BECHTOLD	11- 4-93	9: 2	18

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu238/24	LA-503-156	% RECOVERY	E14157	2

Sample Size	Customer ID
100-10-250 (sample) 100 ul Tracer	KE24A

Remarks, Calculations, Results

SAMPLE SPIKED ID (100-10-50) AR-001 83B43

SPIKE ID 84B43

SPIKE VOLUME ADDED AS SOLN .100mL

Duplicate spike

ATTACH PRINTOUT

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 2-24-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
2-24-94			3-2-94

54-6800-061 (R-10-83)

Pu 238 & 239/240: LA-503-156 (D-0) LIQUID

Serial No.	Date Counted	02/24/94	Pu 236 AEA Frac. (C236	CHK EXT NO. 0.62
J1289-5981	Sample Volume in mL (SS)	0.250	Pu 238 AEA Frac. (C238	0.075
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239	0.245
2676	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	2769
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min (TC)	30
2	Tracer Book No.	84B43	Background in cpm (Bkg)	5
Analyst	Tracer Preparation Date	02/12/94	Pu 236 cpm	23.01
	Pu-236 Preparation Val (dpm/mL)	2566.9	Pu 238 cpm	2.78
Date	Pu-236 Decay Corr'd val (dpm/mL)	2546.47	Pu 239 cpm	9.1
02/24/94	Pu-238 Tracer Value (dpm/mL)	67.6	AEA Count Time (min)	480
Sample Type				
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<		Pu 239/240 µCi/L	1.8312E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * (e to the power of {(-ln2 * Decay Time) / 1040.95 })

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

Relative Counting Error = Square Root of {(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))} * 1.96 * 100

WHC-SD-WM-DP-057
REV 0A

Pu 239/240 µCI/mL	=	1.83E-02	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	3.5%	
NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240 5.27E-03
Pu 238 µCI/mL	=	< 6.50E-03	
Relative Counting Error	=	5.7%	Pu 238 6.50E-03
Pu 236 Tracer Recovery	=	42.5%	

Data Entry by:		Date:	25-Feb-94
Approved by:		Date:	25 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 2-24-94 AJ J1289-5981

2769/30 -5

BEST AVAILABLE COPY

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J-1284-5581
File ID: 2a2637.CNF

Counted on: 2/25/94 @ 0:50
Detector: AEA2
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	205.6	205.6	360.764	362.389	20.000	9.444	10.000	1.945
2?	5.0	5.0	316.510	316.510	6.000	6.095	3.000	3.047
3?	6.9	6.9	307.583	306.921	14.000	0.000	7.000	6.451
4	7.4	7.4	298.637	295.801	16.000	8.651	8.000	0.377
5	269.1	269.1	228.123	228.114	20.000	16.758	10.000	5.650

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.424	5.796	5.781	0.015	0.04	11.08	2.7	96.4	0.434E-04
	Cm243		5.786	5.781	0.005				132.0	0.595E-04
2		????		5.566			0.15	72.1		
3		????		5.521			0.00	1000.		
4	Am241	0.052	5.480	5.468	0.012	0.04	1.35	9.1	12.5	0.564E-05
	Pu238		5.499	5.468	0.031				16.3	0.736E-05
5	Pu239	0.498	5.143	5.150	-.007	0.08	13.02	2.5	113.2	0.510E-04
	Pu240		5.144	5.150	-.006				113.2	0.510E-04
		---					---			
Totals:		0.973	<--valid peaks only-->				25.45			

DETECTOR CALIBRATION
Energy(MEV) = 4.078 + (0.0047)*Channel
Energy range (MeV): 4.078 TO 6.485
Efficiency = 0.1150 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	12555.0	100.000
Smoothed	12555.0	100.000
Composite fit	12292.7	97.911
Residuals	262.3	2.089

Analyzed by: DM

Spectrum 2a2637.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 2083.5

WHC-SD-WM-DP-057
REV 0A

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Raw Data Dump for AEA Spectrum: 2a2637.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
21	3.	2.	0.	1.	1.	2.	3.	3.	1.	0.
31	0.	0.	1.	1.	3.	0.	2.	0.	0.	0.
41	0.	0.	0.	0.	1.	1.	0.	2.	1.	0.
51	1.	1.	0.	0.	0.	0.	1.	0.	1.	3.
61	1.	3.	0.	0.	2.	0.	2.	1.	0.	0.
71	1.	0.	1.	1.	0.	1.	1.	3.	0.	1.
81	0.	3.	1.	0.	1.	2.	0.	1.	2.	0.
91	1.	0.	0.	2.	2.	1.	2.	1.	0.	1.
101	2.	2.	1.	0.	1.	0.	1.	3.	3.	1.
111	2.	4.	1.	1.	4.	2.	1.	1.	1.	1.
121	2.	0.	4.	3.	4.	1.	2.	3.	4.	1.
131	5.	4.	1.	4.	4.	2.	7.	4.	2.	4.
141	2.	4.	4.	5.	5.	6.	3.	1.	3.	3.
151	5.	2.	6.	4.	5.	6.	9.	4.	2.	8.
161	6.	5.	4.	4.	5.	7.	4.	6.	3.	7.
171	7.	4.	5.	4.	7.	2.	9.	16.	6.	14.
181	6.	8.	13.	13.	6.	7.	18.	14.	14.	19.
191	12.	23.	16.	25.	15.	17.	18.	26.	20.	34.
201	33.	26.	32.	46.	34.	58.	47.	56.	59.	74.
211	73.	84.	117.	105.	99.	136.	119.	178.	160.	200.
221	208.	197.	226.	257.	291.	280.	297.	265.	286.	285.
231	241.	227.	221.	180.	171.	156.	126.	103.	84.	65.
241	48.	32.	27.	18.	22.	18.	8.	12.	12.	8.
251	13.	8.	10.	6.	11.	9.	14.	14.	8.	15.
261	8.	9.	10.	9.	8.	7.	7.	6.	7.	10.
271	6.	12.	7.	10.	4.	5.	4.	3.	8.	7.
281	6.	10.	12.	5.	14.	6.	8.	12.	12.	8.
291	5.	7.	8.	14.	13.	15.	15.	9.	16.	13.
301	11.	14.	10.	12.	6.	7.	20.	17.	14.	10.
311	5.	5.	12.	13.	9.	16.	11.	14.	10.	9.
321	7.	8.	10.	17.	23.	15.	14.	19.	21.	22.
331	21.	18.	22.	32.	28.	37.	33.	43.	55.	52.
341	53.	66.	75.	67.	94.	88.	104.	104.	144.	149.
351	155.	176.	178.	184.	210.	199.	210.	215.	203.	221.
361	192.	200.	229.	188.	168.	134.	131.	86.	94.	61.
371	50.	28.	29.	12.	6.	9.	6.	3.	2.	4.
381	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
421	0.	2.	1.	0.	0.	0.	1.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	1.	0.	1.	1.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
451	2.	0.	0.	0.	0.	0.	0.	0.	0.	1.
461	0.	1.	1.	1.	0.	1.	1.	0.	2.	0.
471	0.	1.	0.	3.	1.	0.	0.	1.	1.	0.
481	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J-1519-5681
File ID: 3a3693.CNF

Counted on: 2/25/94 @ 0:51
Detector: AEA3
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	202.2	202.2	361.166	361.166	16.000	8.264	8.000	2.301

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.939	5.786	5.753	0.033	0.04	8.85	3.0	96.2	0.433E-04
	Pu236		5.756	5.753	0.003				71.6	0.323E-04
Totals:		0.939	<--valid peaks only-->				8.85			

DETECTOR CALIBRATION
Energy(MEV) = 4.092 + (0.0046)*Channel
Energy range (MeV): 4.092 TO 6.447
Efficiency = 0.1260 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	4524.0	100.000
Smoothed	4524.0	100.000
Composite fit	4246.9	93.875
Residuals	277.1	6.125

Analyzed by: _____
DM

Spectrum 3a3693.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 1360.8


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Raw Data Dump for AEA Spectrum: 3a3693.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91	1.	0.	0.	0.	0.	1.	0.	0.	0.	1.
101	0.	1.	0.	0.	0.	0.	0.	1.	1.	0.
111	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.
121	1.	1.	1.	0.	0.	1.	0.	0.	0.	0.
131	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
141	1.	0.	0.	0.	0.	1.	0.	1.	1.	0.
151	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
161	0.	0.	1.	1.	1.	0.	3.	0.	0.	1.
171	0.	0.	1.	0.	0.	1.	2.	0.	1.	0.
181	1.	0.	1.	0.	0.	0.	0.	2.	0.	0.
191	1.	0.	1.	0.	2.	2.	0.	0.	0.	0.
201	4.	2.	0.	1.	1.	0.	0.	0.	1.	1.
211	0.	1.	1.	2.	3.	0.	1.	1.	3.	3.
221	1.	5.	2.	3.	0.	2.	0.	3.	6.	2.
231	4.	1.	4.	5.	3.	2.	1.	1.	1.	0.
241	1.	1.	2.	0.	3.	3.	3.	3.	0.	5.
251	5.	2.	2.	7.	4.	4.	2.	2.	2.	6.
261	6.	8.	4.	2.	4.	4.	2.	6.	4.	3.
271	2.	4.	0.	3.	4.	0.	1.	0.	4.	2.
281	3.	2.	6.	6.	3.	4.	5.	2.	5.	5.
291	4.	3.	2.	3.	3.	1.	6.	5.	6.	2.
301	2.	4.	3.	4.	6.	3.	6.	6.	6.	2.
311	6.	5.	2.	3.	3.	4.	4.	6.	8.	5.
321	4.	6.	5.	17.	8.	16.	13.	13.	12.	20.
331	15.	16.	24.	28.	25.	28.	19.	28.	23.	44.
341	39.	44.	58.	64.	63.	68.	72.	95.	109.	112.
351	124.	136.	144.	148.	157.	181.	210.	197.	195.	215.
361	216.	200.	212.	195.	145.	129.	96.	56.	42.	17.
371	17.	1.	2.	2.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J-1289-5781
File ID: 4a4199.CNF

Counted on: 2/25/94 @ 0:52
Detector: AEA4
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	165.1	165.1	359.603	359.603	14.000	7.553	7.000	2.172
2	23.4	23.4	298.850	298.658	22.000	24.069	11.000	4.376
3	136.4	136.4	229.273	229.264	14.000	7.817	7.000	2.376

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	0.455	5.756	5.772	-.016	0.04	6.96	3.4	83.1	0.374E-04
	Cm243		5.786	5.772	0.014				111.6	0.503E-04
2	Am241	0.108	5.480	5.485	-.005	0.11	1.65	7.8	20.6	0.926E-05
	Pu238		5.499	5.485	0.014				26.8	0.121E-04
3	Pu239	0.367	5.143	5.159	-.016	0.04	5.62	3.8	65.8	0.296E-04
	Pu240		5.144	5.159	-.015				65.8	0.296E-04
		---					---			
Totals:		0.930	<--valid peaks only-->				14.22			

DETECTOR CALIBRATION
Energy(MEV) = 4.082 + (0.0047)*Channel
Energy range (MeV): 4.082 TO 6.488
Efficiency = 0.0854 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	7343.0	100.000
Smoothed	7343.0	100.000
Composite fit	6827.5	92.980
Residuals	515.5	7.020

Analyzed by: _____
DM

Spectrum 4a4199.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 1165.3

WHC-SD-WM-DP-057
REV 0A

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Raw Data Dump for AEA Spectrum: 4a4199.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
21	1.	0.	1.	0.	0.	0.	1.	0.	0.	0.
31	0.	0.	0.	0.	0.	1.	1.	1.	1.	0.
41	1.	1.	1.	1.	1.	1.	1.	0.	0.	1.
51	1.	1.	0.	1.	1.	0.	0.	0.	1.	2.
61	0.	1.	0.	0.	1.	0.	0.	0.	0.	1.
71	1.	2.	0.	1.	0.	4.	0.	2.	1.	1.
81	1.	0.	0.	2.	3.	1.	2.	5.	1.	1.
91	0.	2.	0.	3.	1.	1.	1.	1.	1.	2.
101	4.	1.	1.	2.	2.	2.	2.	2.	1.	1.
111	3.	2.	2.	1.	3.	2.	3.	1.	1.	7.
121	4.	2.	4.	1.	2.	2.	3.	3.	4.	3.
131	4.	3.	4.	7.	1.	0.	3.	5.	3.	6.
141	3.	5.	4.	3.	4.	4.	1.	3.	7.	4.
151	2.	5.	3.	6.	6.	5.	10.	4.	9.	6.
161	1.	4.	8.	6.	3.	4.	11.	3.	8.	2.
171	7.	8.	9.	6.	6.	1.	7.	6.	5.	10.
181	5.	8.	8.	7.	11.	14.	9.	14.	12.	10.
191	9.	11.	14.	13.	6.	13.	15.	18.	16.	15.
201	19.	16.	24.	11.	17.	19.	23.	17.	28.	35.
211	31.	35.	40.	36.	44.	47.	58.	67.	64.	86.
221	91.	91.	121.	106.	126.	143.	141.	125.	137.	155.
231	144.	112.	94.	74.	67.	44.	24.	22.	16.	6.
241	4.	4.	7.	5.	3.	7.	2.	4.	4.	5.
251	1.	7.	2.	5.	6.	7.	5.	7.	9.	8.
261	11.	7.	8.	9.	12.	4.	16.	8.	6.	3.
271	10.	3.	10.	6.	10.	11.	4.	9.	5.	9.
281	8.	10.	14.	10.	15.	10.	12.	21.	14.	21.
291	17.	19.	14.	21.	22.	22.	30.	26.	23.	28.
301	29.	9.	31.	26.	19.	14.	19.	15.	15.	13.
311	7.	12.	8.	16.	9.	11.	9.	9.	17.	16.
321	8.	9.	10.	12.	13.	15.	18.	8.	18.	18.
331	12.	12.	22.	18.	18.	16.	25.	29.	29.	23.
341	31.	35.	51.	47.	54.	86.	81.	86.	84.	93.
351	134.	118.	150.	139.	139.	142.	158.	162.	168.	177.
361	191.	130.	133.	120.	84.	55.	36.	14.	6.	3.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
471	0.	1.	0.	0.	1.	0.	1.	1.	2.	0.
481	0.	1.	1.	0.	1.	0.	1.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J-1289-5781 DUP.
File ID: 5a5118.CNF

Counted on: 2/25/94 @ 0:52
Detector: AEA5
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	322.0	322.0	361.360	361.360	20.000	15.515	10.000	7.675
2	43.6	43.6	304.226	304.206	20.000	11.529	10.000	3.670
3	261.8	261.8	231.324	231.322	20.000	13.830	10.000	6.101

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.506	5.786	5.779	0.007	0.07	13.59	2.4	135.7	0.611E-04
	Cm244		5.796	5.779	0.017				99.0	0.446E-04
2	Am241	0.072	5.480	5.510	-.030	0.05	1.93	6.5	15.0	0.675E-05
	Pu238		5.499	5.510	-.011				19.6	0.881E-05
3	Pu239	0.406	5.143	5.168	-.025	0.07	10.88	2.7	79.3	0.357E-04
	Pu240		5.144	5.168	-.024				79.3	0.357E-04
		---					---			
Totals:		0.984	<--valid peaks only-->				26.40			

DETECTOR CALIBRATION
Energy(MEV) = 4.081 + (0.0047)*Channel
Energy range (MeV): 4.081 TO 6.487
Efficiency = 0.1372 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	12881.0	100.000
Smoothed	12881.0	100.000
Composite fit	12674.6	98.398
Residuals	206.4	1.602

Analyzed by: _____
DM

Spectrum 5a5118.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 2304.1


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Raw Data Dump for AEA Spectrum: 5a5118.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
21	0.	1.	1.	3.	0.	2.	0.	1.	2.	0.
31	1.	0.	2.	2.	0.	0.	0.	0.	0.	1.
41	0.	3.	1.	0.	1.	1.	2.	1.	0.	2.
51	0.	0.	2.	0.	1.	0.	0.	0.	4.	0.
61	3.	0.	2.	1.	1.	2.	1.	2.	1.	0.
71	3.	0.	1.	1.	3.	0.	0.	1.	3.	2.
81	1.	0.	4.	2.	0.	3.	0.	0.	2.	1.
91	0.	2.	1.	1.	0.	1.	1.	0.	0.	2.
101	0.	2.	0.	0.	0.	0.	0.	1.	1.	1.
111	0.	1.	1.	1.	0.	3.	1.	1.	1.	1.
121	1.	1.	1.	0.	2.	0.	1.	2.	2.	0.
131	1.	0.	1.	1.	0.	1.	3.	3.	3.	2.
141	1.	1.	0.	2.	2.	1.	2.	1.	1.	1.
151	2.	2.	1.	3.	3.	4.	0.	1.	2.	2.
161	1.	0.	2.	4.	2.	2.	1.	2.	3.	1.
171	4.	1.	2.	3.	1.	1.	1.	2.	1.	1.
181	4.	5.	1.	2.	3.	2.	1.	4.	3.	2.
191	2.	2.	6.	5.	4.	11.	3.	2.	2.	4.
201	8.	8.	6.	5.	8.	13.	10.	13.	19.	25.
211	25.	26.	37.	41.	60.	72.	83.	88.	97.	124.
221	120.	161.	172.	195.	198.	217.	242.	255.	271.	246.
231	287.	279.	263.	225.	218.	207.	162.	159.	120.	97.
241	66.	56.	29.	27.	19.	12.	12.	6.	6.	6.
251	4.	3.	5.	6.	1.	4.	6.	9.	9.	6.
261	3.	3.	4.	10.	6.	9.	8.	2.	3.	8.
271	4.	5.	9.	7.	6.	6.	6.	3.	5.	3.
281	5.	8.	7.	7.	11.	10.	10.	9.	17.	15.
291	17.	19.	20.	20.	27.	28.	30.	28.	30.	22.
301	43.	49.	41.	51.	46.	46.	33.	30.	29.	28.
311	25.	23.	12.	6.	8.	8.	8.	10.	2.	6.
321	3.	2.	5.	4.	4.	7.	3.	4.	5.	9.
331	6.	12.	7.	5.	12.	14.	14.	27.	21.	18.
341	31.	43.	49.	60.	62.	69.	78.	85.	136.	124.
351	152.	205.	215.	239.	249.	262.	287.	300.	348.	349.
361	331.	343.	313.	318.	284.	278.	233.	214.	154.	126.
371	122.	69.	57.	45.	27.	17.	13.	6.	2.	2.
381	1.	1.	0.	0.	1.	1.	0.	0.	0.	1.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	1.	0.	1.	0.	0.	0.	0.	1.	0.	1.
421	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
441	1.	1.	0.	0.	1.	0.	1.	0.	0.	0.
451	1.	0.	1.	0.	0.	0.	1.	0.	0.	0.
461	0.	0.	0.	0.	0.	1.	0.	0.	1.	1.
471	0.	0.	0.	0.	1.	2.	2.	3.	0.	1.
481	1.	0.	0.	1.	1.	1.	0.	0.	1.	1.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J-1289-5781 TRIP
File ID: 6a6028.CNF

Counted on: 2/25/94 @ 0:53
Detector: AEA6
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	172.3	172.3	354.852	354.936	26.000	31.525	13.000	4.929
2	30.1	30.1	300.022	298.370	16.000	8.547	8.000	0.574
3	147.4	147.4	221.319	218.883	28.000	34.193	14.000	6.998
4	7.4	7.4	93.344	95.078	166.000	1.000	83.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.461	5.786	5.744	0.042	0.15	13.99	2.4	148.2	0.668E-04
	Pu236		5.756	5.744	0.012				110.4	0.497E-04
2	Am241	0.126	5.480	5.478	0.002	0.04	3.82	5.5	31.4	0.142E-04
	Pu238		5.499	5.478	0.021				41.1	0.185E-04
3	Pu239	0.355	5.143	5.104	0.039	0.16	10.76	2.9	83.2	0.375E-04
	Pu240		5.144	5.104	0.040				83.2	0.375E-04
4		0.018		4.522		0.00	0.55	12.9	4.3	0.193E-05
Totals:		0.960	<--valid peaks only-->				29.13			

DETECTOR CALIBRATION
Energy(MEV) = 4.076 + (0.0047)*Channel
Energy range (MeV): 4.076 TO 6.482
Efficiency = 0.1293 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	14568.0	100.000
Smoothed	14572.1	100.028
Composite fit	13982.5	95.981
Residuals	585.5	4.019

Analyzed by: _____
DM

Spectrum 6a6028.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 1305.3


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Raw Data Dump for AEA Spectrum: 6a6028.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	0.	4.	3.
21	0.	5.	6.	3.	8.	4.	3.	2.	3.	2.
31	2.	4.	2.	3.	1.	7.	4.	7.	9.	3.
41	2.	5.	4.	6.	7.	7.	4.	5.	2.	2.
51	4.	8.	7.	5.	3.	1.	4.	8.	5.	2.
61	5.	7.	3.	3.	6.	5.	2.	3.	5.	2.
71	4.	6.	6.	7.	8.	3.	8.	3.	6.	3.
81	7.	4.	10.	2.	6.	3.	2.	4.	6.	11.
91	9.	11.	8.	4.	5.	7.	6.	4.	2.	12.
101	9.	9.	3.	3.	3.	9.	2.	6.	10.	13.
111	7.	7.	4.	5.	5.	8.	7.	7.	11.	10.
121	10.	5.	6.	11.	7.	14.	4.	5.	9.	8.
131	8.	16.	12.	8.	11.	12.	8.	5.	8.	15.
141	7.	11.	7.	19.	16.	21.	11.	17.	13.	9.
151	17.	7.	9.	16.	10.	13.	10.	21.	17.	16.
161	14.	20.	22.	17.	17.	16.	22.	13.	22.	27.
171	22.	16.	24.	18.	15.	25.	24.	27.	31.	31.
181	22.	29.	36.	37.	34.	35.	53.	27.	32.	28.
191	26.	39.	38.	51.	48.	57.	57.	59.	66.	71.
201	66.	85.	73.	84.	92.	89.	103.	116.	94.	130.
211	131.	115.	129.	155.	156.	142.	166.	163.	153.	160.
221	155.	153.	138.	161.	165.	118.	112.	113.	112.	86.
231	91.	74.	75.	62.	55.	57.	36.	35.	29.	22.
241	18.	24.	18.	17.	17.	19.	24.	16.	17.	16.
251	15.	14.	15.	19.	19.	15.	15.	19.	13.	14.
261	26.	20.	19.	11.	28.	29.	14.	18.	21.	20.
271	23.	19.	32.	30.	29.	20.	27.	29.	30.	24.
281	34.	31.	28.	34.	28.	46.	43.	49.	44.	43.
291	39.	34.	29.	34.	50.	38.	44.	43.	57.	49.
301	37.	42.	35.	45.	33.	36.	33.	39.	22.	21.
311	32.	33.	33.	31.	28.	35.	22.	37.	35.	40.
321	53.	48.	35.	60.	42.	49.	58.	55.	51.	73.
331	85.	74.	90.	82.	85.	88.	127.	122.	114.	140.
341	125.	144.	133.	128.	153.	127.	161.	163.	171.	167.
351	182.	162.	157.	182.	175.	178.	158.	137.	157.	162.
361	147.	140.	98.	94.	86.	88.	54.	64.	62.	42.
371	38.	28.	26.	18.	9.	13.	16.	8.	2.	6.
381	1.	2.	0.	1.	1.	1.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
411	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	1.	0.	0.	1.	0.	1.	0.	0.	1.	0.
441	0.	0.	1.	0.	1.	1.	0.	0.	0.	1.
451	1.	1.	0.	0.	0.	0.	0.	2.	0.	0.
461	2.	0.	1.	1.	0.	0.	2.	3.	1.	2.
471	3.	1.	2.	5.	0.	3.	1.	2.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	1.	0.	1.	1.	4.	6.	12.	2.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J-1289-5981
File ID: 7a7553.CNF

Counted on: 2/25/94 @ 0:53
Detector: AEA7
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	162.9	162.9	362.574	362.574	34.000	72.634	17.000	7.450
2	10.6	10.6	275.127	272.754	30.000	117.488	15.000	34.126
3	58.4	58.4	234.345	233.838	32.000	45.513	16.000	3.812

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.718	5.786	5.744	0.042	0.33	20.12	2.0	234.4	0.106E-03
	Pu236		5.756	5.744	0.012				174.6	0.787E-04
2	Th228	0.041	5.430	5.331	0.099	0.54	1.16	21.2	13.9	0.624E-05
	Am243		5.276	5.331	-.055				9.9	0.448E-05
3	Pu239	0.265	5.143	5.152	-.009	0.21	7.42	3.6	63.1	0.284E-04
	Pu240		5.144	5.152	-.008				63.1	0.284E-04
		---					---			
Totals:		1.024	<--valid peaks only-->				28.70			

DETECTOR CALIBRATION
Energy(MEV) = 4.076 + (0.0046)*Channel
Energy range (MeV): 4.076 TO 6.431
Efficiency = 0.1176 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	13451.0	100.000
Smoothed	13450.5	99.996
Composite fit	13777.7	102.429
Residuals	-326.7	-2.429

Analyzed by: _____
DM

Spectrum 7a7553.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 1239.9


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Raw Data Dump for AEA Spectrum: 7a7553.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	2.	1.	3.
21	0.	0.	0.	1.	2.	0.	2.	0.	1.	2.
31	1.	0.	0.	1.	0.	0.	2.	2.	1.	1.
41	2.	1.	1.	3.	0.	0.	4.	0.	1.	2.
51	2.	2.	2.	1.	2.	0.	1.	1.	0.	1.
61	0.	1.	0.	1.	0.	2.	6.	2.	3.	2.
71	1.	0.	1.	0.	1.	4.	0.	2.	0.	0.
81	0.	1.	1.	1.	1.	0.	1.	2.	1.	0.
91	3.	2.	0.	4.	3.	4.	2.	3.	1.	3.
101	1.	1.	3.	4.	1.	3.	7.	2.	2.	5.
111	2.	2.	0.	2.	3.	2.	3.	4.	4.	4.
121	6.	3.	5.	6.	3.	4.	4.	2.	6.	2.
131	11.	6.	11.	8.	6.	2.	3.	4.	3.	5.
141	5.	11.	3.	8.	6.	9.	4.	2.	12.	7.
151	10.	7.	5.	10.	9.	7.	6.	8.	6.	11.
161	14.	4.	5.	10.	15.	11.	10.	6.	16.	11.
171	15.	13.	10.	7.	8.	19.	9.	14.	18.	12.
181	15.	13.	14.	24.	13.	18.	12.	22.	35.	26.
191	32.	21.	22.	25.	22.	26.	32.	30.	33.	34.
201	32.	39.	22.	30.	31.	42.	40.	42.	45.	46.
211	39.	47.	50.	51.	53.	61.	57.	47.	54.	53.
221	58.	75.	63.	59.	54.	61.	54.	58.	67.	64.
231	55.	61.	68.	70.	62.	71.	50.	69.	48.	56.
241	59.	36.	50.	54.	37.	42.	44.	44.	34.	54.
251	23.	38.	27.	33.	27.	38.	36.	32.	30.	34.
261	21.	17.	23.	20.	23.	17.	24.	17.	20.	16.
271	19.	23.	28.	25.	17.	23.	21.	28.	15.	19.
281	14.	30.	17.	28.	13.	21.	24.	14.	23.	29.
291	20.	28.	38.	31.	24.	31.	40.	32.	34.	35.
301	30.	42.	31.	39.	35.	38.	41.	45.	45.	32.
311	53.	36.	48.	44.	57.	56.	45.	39.	46.	50.
321	51.	61.	60.	62.	66.	74.	68.	60.	83.	74.
331	67.	75.	76.	76.	66.	91.	79.	95.	103.	104.
341	112.	144.	132.	118.	131.	139.	129.	157.	142.	130.
351	134.	152.	147.	156.	170.	158.	155.	182.	143.	147.
361	156.	149.	143.	169.	166.	164.	165.	126.	138.	113.
371	115.	114.	120.	107.	80.	100.	97.	89.	84.	82.
381	76.	58.	57.	52.	54.	51.	56.	51.	34.	38.
391	29.	32.	27.	27.	15.	17.	17.	16.	20.	14.
401	7.	7.	7.	8.	8.	2.	6.	7.	4.	2.
411	0.	4.	3.	0.	2.	3.	2.	2.	1.	1.
421	0.	0.	0.	0.	1.	0.	1.	1.	0.	0.
431	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
441	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
511	1.	0.								

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-057
REV 0A

SAMPLE
J-1289-5981 DUP.
File ID: 8a8767.CNF

Counted on: 2/25/94 @ 0:54
Detector: AEA8
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	607.7	607.7	360.660	360.660	14.000	7.973	7.000	2.880
2	49.1	49.1	304.036	303.789	14.000	16.354	7.000	3.780
3	6.3	6.3	264.119	262.955	20.000	6.031	10.000	0.216
4	259.3	259.3	229.606	229.598	14.000	7.894	7.000	3.360

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.620	5.796	5.782	0.014	0.04	23.01	1.9	180.4	0.813E-04
	Cm243		5.786	5.782	0.004				247.2	0.111E-03
2	Am241	0.075	5.480	5.515	-.035	0.08	2.78	5.9	23.2	0.105E-04
	Pu238		5.499	5.515	-.016				30.3	0.137E-04
3	Am243	0.035	5.276	5.323	-.047	0.03	1.30	8.9	10.3	0.462E-05
4	Pu239	0.245	5.143	5.166	-.023	0.04	9.10	3.1	71.3	0.321E-04
	Pu240		5.144	5.166	-.022				71.3	0.321E-04
		---					---			
Totals:		0.975	<--valid peaks only-->				36.18			

DETECTOR CALIBRATION
Energy(MEV) = 4.087 + (0.0047)*Channel
Energy range (MeV): 4.087 TO 6.493
Efficiency = 0.1275 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	17822.0	100.000
Smoothed	17822.0	100.000
Composite fit	17368.0	97.453
Residuals	454.0	2.547

Analyzed by: _____
DM

Spectrum 8a8767.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3817.6


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Raw Data Dump for AEA Spectrum: 8a8767.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	2.	0.
21	1.	0.	3.	1.	1.	2.	3.	1.	1.	2.
31	2.	1.	1.	1.	0.	2.	2.	2.	1.	1.
41	0.	1.	1.	0.	0.	1.	1.	0.	0.	2.
51	2.	4.	1.	0.	0.	0.	3.	2.	0.	1.
61	2.	2.	2.	1.	4.	1.	2.	3.	0.	1.
71	1.	1.	0.	1.	0.	3.	0.	5.	2.	1.
81	1.	1.	1.	0.	0.	2.	3.	4.	1.	4.
91	0.	2.	2.	0.	3.	0.	1.	2.	0.	1.
101	1.	1.	3.	3.	2.	3.	4.	0.	0.	5.
111	5.	1.	0.	1.	6.	0.	1.	1.	0.	4.
121	3.	6.	1.	4.	4.	3.	1.	2.	1.	6.
131	1.	1.	7.	4.	4.	3.	4.	4.	6.	5.
141	6.	5.	10.	5.	1.	4.	7.	2.	4.	5.
151	5.	5.	6.	6.	5.	5.	5.	7.	4.	6.
161	6.	3.	7.	3.	5.	4.	4.	8.	7.	5.
171	11.	9.	6.	11.	5.	13.	8.	13.	8.	8.
181	7.	11.	9.	10.	10.	7.	6.	20.	13.	17.
191	7.	18.	22.	15.	15.	14.	19.	13.	18.	16.
201	23.	23.	15.	30.	27.	26.	36.	23.	28.	31.
211	39.	53.	39.	57.	59.	67.	82.	86.	117.	95.
221	127.	156.	194.	183.	196.	242.	245.	286.	297.	288.
231	274.	243.	217.	164.	145.	114.	59.	45.	24.	16.
241	12.	7.	8.	11.	8.	9.	8.	4.	2.	6.
251	5.	8.	4.	1.	6.	9.	9.	14.	7.	8.
261	12.	6.	9.	13.	10.	11.	5.	5.	8.	10.
271	12.	12.	4.	14.	8.	7.	10.	8.	16.	13.
281	12.	16.	16.	20.	14.	22.	18.	20.	24.	20.
291	30.	31.	28.	39.	24.	38.	56.	37.	41.	51.
301	42.	56.	62.	42.	55.	58.	44.	41.	25.	30.
311	21.	20.	27.	24.	23.	26.	24.	26.	26.	30.
321	24.	28.	32.	42.	29.	33.	36.	33.	31.	42.
331	38.	35.	54.	45.	53.	57.	55.	66.	89.	64.
341	88.	97.	107.	141.	145.	168.	165.	218.	239.	262.
351	356.	382.	354.	416.	464.	486.	520.	541.	647.	661.
361	674.	637.	537.	512.	409.	319.	231.	147.	99.	46.
371	36.	11.	2.	2.	2.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	1.	0.	0.	0.	0.	0.	1.	1.	1.
481	2.	0.	0.	1.	1.	1.	0.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

MAY 11 1994
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