This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

Document number: SD-WM-DP-103

Section 8 **of** 10

Title: Final Report for Tank 241BY106
Cores 64 & 65 & 121
[Pgs 2613 Thru 3035]

Date: 07/13/1996 **Revision:** R001

Originator: Bell KE
Co: WHC

Recipient:
Co:

References: ECN-629027

LABCORE Data Entry Template for Worklist# 268

Analyst: AKL **Instrument:** AB00 12 **Method:** LA-220-101 D-1

Worklist Comment: Sr90 Determine SS using Ludlum, or contact Scot Fitzgerald.

Seg	Type	Sample#	Rep	Al	Test	Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01 SR90-01	SOLID			N/A	uCi/
1	BLNK-PREP				@SR90-01 SR90-01C	SOLID			N/A	% Re
1	BLNK-PREP				@SR90-01 SR90-01E	SOLID			N/A	% Ct
2	STD 51B52				@SR90-01 SR90-01	SOLID			N/A	uCi/
2	STD 51B52				@SR90-01 SR90-01C	SOLID			N/A	% Re
2	STD				@SR90-01 SR90-01E	SOLID			N/A	% Ct.
3	SAMPLE	S94T000314	0	F	@SR90-01 SR90-01	SOLID	N/A			uCi/
3	SAMPLE	S94T000314	0	F	@SR90-01 SR90-01C	SOLID	N/A			% Re
3	SAMPLE	S94T000314	0	F	@SR90-01 SR90-01E	SOLID	N/A			% Ct.
4	DUP	S94T000314	0	F	@SR90-01 SR90-01	SOLID			N/A	uCi/
4	DUP	S94T000314	0	F	@SR90-01 SR90-01C	SOLID			N/A	% Re
4	DUP	S94T000314	0	F	@SR90-01 SR90-01E	SOLID			N/A	% Ct.
5	SAMPLE	S94T000315	0	F	@SR90-01 SR90-01	SOLID	N/A			uCi/
5	SAMPLE	S94T000315	0	F	@SR90-01 SR90-01C	SOLID	N/A			% Re
5	SAMPLE	S94T000315	0	F	@SR90-01 SR90-01E	SOLID	N/A			% Ct.
6	DUP	S94T000315	0	F	@SR90-01 SR90-01	SOLID			N/A	uCi/g
6	DUP	S94T000315	0	F	@SR90-01 SR90-01C	SOLID			N/A	% Rec
6	DUP	S94T000315	0	F	@SR90-01 SR90-01E	SOLID			N/A	% Ct.
7	BLNK-PREP				@SR90-01 SR90-01	SOLID			N/A	uCi/g
7	BLNK-PREP				@SR90-01 SR90-01C	SOLID			N/A	% Rec

Data Entry Comments:

Data for S94T000315 was mistakenly rejected - results were re-entered under worklist #322

12-28-94

Units shown for QC (SPK) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 322

Analyst: AKL **Instrument:** AB00 12 **Method:** LA-220-101 D-1

Worklist Comment: Data re-entry for sample 315

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
1	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec
1	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
2	STD				@SR90-01	SR90-01	SOLID			N/A	uCi/g
2	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
2	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
3	SAMPLE	S94T000315	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
4	DUP	S94T000315	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
4	DUP	S94T000315	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
4	DUP	S94T000315	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.

Final page for worklist # 322

Analyst Signature **Date** 12-28-94

Data Entry Comments: Data re-entry for sample 315 which was mistakenly rejected - see worklist 268.

12-28-94

Units shown for QC (SPK) may not reflect the actual units.

Page: 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							BLANK
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLANK	TOTAL COUNTS	(TC)	54	GROSS WEIGHT	(W2)		8.0263
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9311
268	BACKGROUND in cpm	(BKG)	2.2	NET WEIGHT	(W3)		0.0952
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (hours)	(DT)		8.00
@SR90-01	DILUTION FACTOR	(DF)	101	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		3.20
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	2.4576	CRITICAL LEVEL	(Lc)		0.89
S94T314,315	SEPARATION TIME	(ST)	01:30 PM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/21/94	DETECTION LIMIT	(Ld)		1.88
WB27811	TIME OF COUNT	(TOC)	09:30 PM	Sr-89/90 CONC. in µCi/g =			2.7258E-01
Analyst	DATE OF COUNT	(DOC)	12/21/94				
AKL							
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
12/21/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/						
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)						
10:00 AM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))						

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

			DETECTION LIMIT
Sr-89/90 CONCENTRATION =	2.73E-01	µCi/g	
RELATIVE COUNTING ERROR =	53.4%		
PERCENT CARRIER RECOVERY =	95.2%		1.60E-01 µCi/g

Data Entry by:	[signature]	Date:	12/22/94
Approved by:	[signature]	Date:	12/27/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
STANDARD	TOTAL COUNTS	(TC)	9519	GROSS WEIGHT	(W2)	8.0761
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9818
268	BACKGROUND in cpm	(BKG)	2.2	NET WEIGHT	(W3)	0.0943
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (hours)	(DT)	8.18
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)	0.4660
LIQUID	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)	949.70
Sample #	DIGEST DILUTION FACTOR	(DDF)	1	CRITICAL LEVEL	(Lc)	0.89
S94T314,315	SEPARATION TIME	(ST)	01:30 PM	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	12/21/94	DETECTION LIMIT	(Ld)	1.88
WB27811	TIME OF COUNT	(TOC)	09:41 PM	Sr-89/90 CONC. in µCi/L =		9.9179E-01
Analyst	DATE OF COUNT	(DOC)	12/21/94			
AKL						
Date						
12/21/94						
Time						
10:00 AM						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 µCi/L = Rs*1000mL/L *DF*DDF/
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*Rec.*2220000dpm/µCi)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))
Sr-89/90 µCi/mL = (Sr-89/90 µCi/L) / 1000mL/L
Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	9.92E-04	µCi/mL	DETECTION LIMIT
RELATIVE COUNTING ERROR =	2.0%		
PERCENT CARRIER RECOVERY =	94.3%		1.96E-06 µCi/mL

Data Entry by:		Date:	12/22/94
Approved by:		Date:	12/27/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

						SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	131	GROSS WEIGHT	(W2)	8.0044
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9124
266	BACKGROUND in cpm	(BKG)	2.2	NET WEIGHT	(W3)	0.0920
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (hours)	(DT)	8.40
@SR90-01	DILUTION FACTOR	(DF)	101	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)	0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)	10.90
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	2.4576	CRITICAL LEVEL	(Lc)	0.89
S94T314	SEPARATION TIME	(ST)	01:30 PM	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	12/21/94	DETECTION LIMIT	(Ld)	1.88
WB27811	TIME OF COUNT	(TOC)	09:54 PM	Sr-89/90 CONC. in µCi/g =		9.5693E-01
Analyst	DATE OF COUNT	(DOC)	12/21/94			
AKL						
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
12/21/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/					
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)					
10:00 AM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))					

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	9.57E-01	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	22.2%		
PERCENT CARRIER RECOVERY =	92.0%		1.65E-01 µCi/g

Data Entry by:		Date:	12/22/94
Approved by:		Date:	12/27/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUPLICATE	TOTAL COUNTS	(TC)	112	GROSS WEIGHT	(W2)	8.0046
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9114
268	BACKGROUND in cpm	(BKG)	2.2	NET WEIGHT	(W3)	0.0932
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (hours)	(DT)	8.62
@SR90-01	DILUTION FACTOR	(DF)	101	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)	0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)	9.00
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	2.4796	CRITICAL LEVEL	(Lc)	0.89
S94T314	SEPARATION TIME	(ST)	01:30 PM	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	12/21/94	DETECTION LIMIT	(Ld)	1.88
WB27811	TIME OF COUNT	(TOC)	10:07 PM	Sr-89/90 CONC. in µCi/g =		7.7136E-01
Analyst	DATE OF COUNT	(DOC)	12/21/94			
AKL						
Date						
12/21/94						
Time						
10:00 AM						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 µCi/g = Rs*1000mL/L*DF/
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	7.71E-01	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	25.2%		
PERCENT CARRIER RECOVERY =	93.2%		1.61E-01 µCi/g

Data Entry by:		Date:	12/22/94
Approved by:		Date:	12/27/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-103, REV. 1

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	931	GROSS WEIGHT	(W2)	8.0168
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9208
268	BACKGROUND in cpm	(BKG)	2.2	NET WEIGHT	(W3)	0.0960
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (hours)	(DT)	8.70
@SR90-01	DILUTION FACTOR	(DF)	101	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)	0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)	90.90
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	2.6772	CRITICAL LEVEL	(Lc)	0.89
S94T315	SEPARATION TIME	(ST)	01:35 PM	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	12/21/94	DETECTION LIMIT	(Ld)	1.88
WB27811	TIME OF COUNT	(TOC)	10:17 PM	Sr-89/90 CONC. in µCi/g =		6.9994E+00
Analyst	DATE OF COUNT	(DOC)	12/21/94			
AKL						
Date						
12/21/94						
Time						
10:00 AM						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 µCi/g = Rs*1000mL/L*DF/
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	7.00E+00	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	6.7%		1.45E-01 µCi/g
PERCENT CARRIER RECOVERY =	96.0%		

Data Entry by:	[signature]	Date:	12/22/94
Approved by:	[signature]	Date:	12/27/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUPLICATE	TOTAL COUNTS	(TC)	933	GROSS WEIGHT	(W2)		8.0780
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9834
268	BACKGROUND in cpm	(BKG)	2.2	NET WEIGHT	(W3)		0.0946
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (hours)	(DT)		8.88
@SR90-01	DILUTION FACTOR	(DF)	101	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		91.10
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	2.6688	CRITICAL LEVEL	(Lc)		0.89
S94T315	SEPARATION TIME	(ST)	01:35 PM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/21/94	DETECTION LIMIT	(Ld)		1.88
WB27811	TIME OF COUNT	(TOC)	10:28 PM	Sr-89/90 CONC. in µCi/g =			7.1280E+00
Analyst	DATE OF COUNT	(DOC)	12/21/94				
AKL							
Date							
12/21/94							
Time							
10:00 AM							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 µCi/g = Rs*1000mL/L*DF/
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	7.13E+00	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	6.6%		1.47E-01 µCi/g
PERCENT CARRIER RECOVERY =	94.6%		

Data Entry by:		Date:	12/22/94
Approved by:		Date:	12/27/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							BLANK
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
BLANK	TOTAL COUNTS	(TC)	43	GROSS WEIGHT	(W2)	8.0425
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9525
268	BACKGROUND in cpm	(BKG)	2.2	NET WEIGHT	(W3)	0.0900
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (hours)	(DT)	8.97
@SR90-01	DILUTION FACTOR	(DF)	101	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)	0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)	2.10
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	2.6484	CRITICAL LEVEL	(Lc)	0.89
S94T316	SEPARATION TIME	(ST)	01:45 PM	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	12/21/94	DETECTION LIMIT	(Ld)	1.88
WB27811	TIME OF COUNT	(TOC)	10:43 PM	Sr-89/90 CONC. in µCi/g =		1.7390E-01
Analyst	DATE OF COUNT	(DOC)	12/21/94			
AKL						
Date						
12/21/94						
Time						
10:00 AM						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 µCi/g = Rs*1000mL/L*DF/
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.74E-01	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	75.2%		1.56E-01 µCi/g
PERCENT CARRIER RECOVERY =	90.0%		

Data Entry by: [signature] Date: 12/22/94
Approved by: [signature] Date: 12/27/94

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	213	GROSS WEIGHT	(W2)	8.0768
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9819
268	BACKGROUND in cpm	(BKG)	2.2	NET WEIGHT	(W3)	0.0949
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (hours)	(DT)	9.32
@SR90-01	DILUTION FACTOR	(DF)	101	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)	0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)	19.10
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	2.6484	CRITICAL LEVEL	(Lc)	0.89
S94T316	SEPARATION TIME	(ST)	01:35 PM	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	12/21/94	DETECTION LIMIT	(Ld)	1.88
WB27811	TIME OF COUNT	(TOC)	10:54 PM	Sr-89/90 CONC. in µCi/g =		1.4948E+00
Analyst	DATE OF COUNT	(DOC)	12/21/94			
AKL						
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
12/21/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/					
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)					
10:00 AM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))					

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.49E+00	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	15.7%		
PERCENT CARRIER RECOVERY =	94.9%		1.47E-01 µCi/g

Data Entry by: [signature] Date: 12/22/94
Approved by: [signature] Date: 12/22/94

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUPLICATE	TOTAL COUNTS	(TC)	207	GROSS WEIGHT	(W2)		8.0431
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9465
268	BACKGROUND in cpm	(BKG)	2.2	NET WEIGHT	(W3)		0.0966
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (hours)	(DT)		9.53
@SR90-01	DILUTION FACTOR	(DF)	101	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		18.50
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	2.6588	CRITICAL LEVEL	(Lc)		0.89
S94T316	SEPARATION TIME	(ST)	01:35 PM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/21/94	DETECTION LIMIT	(Ld)		1.88
WB27811	TIME OF COUNT	(TOC)	11:07 PM	Sr-89/90 CONC. in µCi/g =			1.4138E+00
Analyst	DATE OF COUNT	(DOC)	12/21/94				
AKL							
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
12/21/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/						
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)						
10:00 AM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))						

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

			DETECTION LIMIT
Sr-89/90 CONCENTRATION =	1.41E+00	µCi/g	
RELATIVE COUNTING ERROR =	16.0%		
PERCENT CARRIER RECOVERY =	96.6%		1.44E-01 µCi/g

Data Entry by:		Date:	12/22/94
Approved by:		Date:	12/27/94

Form 22010N_C Rev. 1.0

LABCORE Data Entry Template for Worklist# 296

Analyst: AKL **Instrument:** AB00 12 **Method:** LA-220-101 D-1

Worklist Comment: Sr-90 Determine SS using Lundlum, or contact S. Fitzgerald.

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
1	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec
1	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
2	STD 51B52				@SR90-01	SR90-01	SOLID			N/A	uCi/g
2	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
2	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
3	SAMPLE	S94T000306	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
3	SAMPLE	S94T000306	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
3	SAMPLE	S94T000306	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
4	DUP	S94T000306	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
4	DUP	S94T000306	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
4	DUP	S94T000306	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.
5	SAMPLE	S94T000312	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
5	SAMPLE	S94T000312	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
5	SAMPLE	S94T000312	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
6	DUP	S94T000312	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
6	DUP	S94T000312	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
6	DUP	S94T000312	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.
7	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
7	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 296

Analyst: AKL **Instrument:** AB00 12 **Method:** LA-220-101 D-1

Worklist Comment: Sr-90 Determine SS using Lundlum, or contact S. Fitzgerald.

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
7	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
8	STD				@SR90-01	SR90-01	SOLID			N/A	uCi/g
8	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
8	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
9	SAMPLE	S94T000347	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
9	SAMPLE	S94T000347	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
9	SAMPLE	S94T000347	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
10	DUP	S94T000347	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
10	DUP	S94T000347	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
10	DUP	S94T000347	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.
11	SAMPLE	S94T000348	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
11	SAMPLE	S94T000348	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
11	SAMPLE	S94T000348	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
12	DUP	S94T000348	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
12	DUP	S94T000348	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
12	DUP	S94T000348	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.

Final page for worklist # 296

Alta Lewis
Analyst Signature

12-27-94
Date
12/28/94

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							BLANK
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLANK	TOTAL COUNTS	(TC)	47	GROSS WEIGHT	(W2)		8.0096
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9152
296	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0944
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		16.97
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		2.00
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.786	CRITICAL LEVEL	(Lc)		0.99
S94T306,312	SEPARATION TIME	(ST)	10:05 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	03:03 AM	Sr-89/90 CONC. in µCi/g =			1.0773E-02
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
12/27/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/						
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)						
01:30 PM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))						

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

			DETECTION LIMIT
Sr-89/90 CONCENTRATION =	1.08E-02	µCi/g	1.12E-02 µCi/g
RELATIVE COUNTING ERROR =	84.3%		
PERCENT CARRIER RECOVERY =	94.4%		

Data Entry by:		Date:	12/28/94
Approved by:		Date:	12/28/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STANDARD	TOTAL COUNTS	(TC)	11498	GROSS WEIGHT	(W2)		8.0718
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9763
296	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0955
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (hours)	(DT)		17.33
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
LIQUID	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		1147.10
Sample #	DIGEST DILUTION FACTOR	(DDF)	1	CRITICAL LEVEL	(Lc)		0.99
WORKLIST 296	SEPARATION TIME	(ST)	10:05 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	03:25 AM	Sr-89/90 CONC. in µCi/L =			1.0875E+00
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date							
12/27/94							
Time							
01:30 PM							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 µCi/L = Rs*1000mL/L *DF*DDF/
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*Rec.*2220000dpm/µCi)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))
Sr-89/90 µCi/mL = (Sr-89/90 µCi/L) / 1000mL/L
Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

			DETECTION LIMIT
Sr-89/90 CONCENTRATION =	1.09E-03	µCi/mL	
RELATIVE COUNTING ERROR =	1.8%		
PERCENT CARRIER RECOVERY =	95.5%		1.96E-06 µCi/mL

Data Entry by:		Date:	12/28/94
Approved by:		Date:	12/28/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	5260	GROSS WEIGHT	(W2)		7.9422
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.8473
296	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0949
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		18.08
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		523.30
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.786	CRITICAL LEVEL	(Lc)		0.99
S94T306	SEPARATION TIME	(ST)	10:05 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	04:10 AM	Sr-89/90 CONC. in µCi/g =			2.7779E+00
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
12/27/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/						
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)						
01:30 PM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))						

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	2.78E+00	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	2.7%		1.10E-02 µCi/g
PERCENT CARRIER RECOVERY =	94.9%		

Data Entry by:		Date:	12/28/94
Approved by:		Date:	12/28/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUPLICATE	TOTAL COUNTS	(TC)	5263	GROSS WEIGHT	(W2)		8.0552
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9603
296	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0949
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		19.17
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		523.60
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.7828	CRITICAL LEVEL	(Lc)		0.99
S94T306	SEPARATION TIME	(ST)	10:05 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	05:15 AM	Sr-89/90 CONC. in µCi/g =			2.7599E+00
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date							
12/27/94							
Time							
01:30 PM							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 µCi/g = Rs*1000mL/L*DF/
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	2.76E+00	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	2.7%		1.09E-02 µCi/g
PERCENT CARRIER RECOVERY =	94.9%		

Data Entry by:		Date:	12/28/94
Approved by:		Date:	12/28/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	7794	GROSS WEIGHT	(W2)		8.0243
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9281
296	BACKGROUND in cpm	(BKG)	3.6	NET WEIGHT	(W3)		0.0962
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		20.55
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		775.80
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.806	CRITICAL LEVEL	(Lc)		1.14
S94T312	SEPARATION TIME	(ST)	10:10 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.38
WB27811	TIME OF COUNT	(TOC)	06:43 AM	Sr-89/90 CONC. in µCi/g =			3.9384E+00
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date							
12/27/94							
Time							
01:30 PM							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 µCi/g = Rs*1000mL/L*DF/
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

			DETECTION LIMIT
Sr-89/90 CONCENTRATION =	3.94E+00	µCi/g	
RELATIVE COUNTING ERROR =	2.2%		
PERCENT CARRIER RECOVERY =	96.2%		1.21E-02 µCi/g

Data Entry by:		Date:	12/28/94
Approved by:		Date:	12/28/94

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUPLICATE	TOTAL COUNTS	(TC)	6692	GROSS WEIGHT	(W2)		8.0410
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9456
296	BACKGROUND in cpm	(BKG)	3.6	NET WEIGHT	(W3)		0.0954
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		21.05
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		665.60
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.816	CRITICAL LEVEL	(Lc)		1.14
S94T312	SEPARATION TIME	(ST)	10:10 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.38
WB27811	TIME OF COUNT	(TOC)	07:13 AM	Sr-89/90 CONC. in µCi/g =			3.3752E+00
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
12/27/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/						
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)						
01:30 PM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))						

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

			DETECTION LIMIT
Sr-89/90 CONCENTRATION =	3.38E+00	µCi/g	
RELATIVE COUNTING ERROR =	2.4%		
PERCENT CARRIER RECOVERY =	95.4%		1.21E-02 µCi/g

Data Entry by:		Date:	12/28/94
Approved by:		Date:	12/28/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							BLANK
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLANK	TOTAL COUNTS	(TC)	37	GROSS WEIGHT	(W2)		8.0439
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9493
296	BACKGROUND in cpm	(BKG)	3.6	NET WEIGHT	(W3)		0.0946
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		21.55
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		0.10
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.9048	CRITICAL LEVEL	(Lc)		1.14
S94T347,348	SEPARATION TIME	(ST)	10:17 AM	Rmax			1.26
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.38
WB27811	TIME OF COUNT	(TOC)	07:50 AM	Sr-89/90 CONC. in µCi/g =		<	6.0949E-03
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
12/27/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/						
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)						
01:30 PM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))						

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	<	6.09E-03	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =		500.0%		
PERCENT CARRIER RECOVERY =		94.6%		1.15E-02 µCi/g

Data Entry by:	[signature]	Date:	12/28/94
Approved by:	[signature]	Date:	12/28/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	826	GROSS WEIGHT	(W2)		8.0788
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9864
296	BACKGROUND in cpm	(BKG)	3.6	NET WEIGHT	(W3)		0.0924
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		21.92
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		79.00
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.9048	CRITICAL LEVEL	(Lc)		1.14
S94T347	SEPARATION TIME	(ST)	10:10 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.38
WB27811	TIME OF COUNT	(TOC)	08:05 AM	Sr-89/90 CONC. in µCi/g =			3.9169E-01
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
12/27/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/						
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)						
01:30 PM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))						

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

			DETECTION LIMIT
Sr-89/90 CONCENTRATION =	3.92E-01	µCi/g	
RELATIVE COUNTING ERROR =	7.3%		
PERCENT CARRIER RECOVERY =	92.4%		1.18E-02 µCi/g

Data Entry by:		Date:	12/28/94
Approved by:		Date:	12/28/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUPLICATE	TOTAL COUNTS	(TC)	1090	GROSS WEIGHT	(W2)		8.0596
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9634
296	BACKGROUND in cpm	(BKG)	3.6	NET WEIGHT	(W3)		0.0962
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		22.10
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		105.40
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.9152	CRITICAL LEVEL	(Lc)		1.14
S94T347	SEPARATION TIME	(ST)	10:10 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.38
WB27811	TIME OF COUNT	(TOC)	08:16 AM	Sr-89/90 CONC. in µCi/g =			4.9851E-01
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
12/27/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/						
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)						
01:30 PM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))						

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	4.99E-01	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	6.2%		1.12E-02 µCi/g
PERCENT CARRIER RECOVERY =	96.2%		

Data Entry by:	[illegible]	Date:	12/28/94
Approved by:	[illegible]	Date:	12/28/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	1608	GROSS WEIGHT	(W2)		8.0730
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9781
296	BACKGROUND in cpm	(BKG)	3.6	NET WEIGHT	(W3)		0.0949
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		22.22
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		157.20
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.9724	CRITICAL LEVEL	(Lc)		1.14
S94T348	SEPARATION TIME	(ST)	10:17 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.38
WB27811	TIME OF COUNT	(TOC)	08:30 AM	Sr-89/90 CONC. in µCi/g =			7.3118E-01
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
12/27/94	Sr-89/90 µCi/g = Rs*1000mL/L*DF/						
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)						
01:30 PM	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))						

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	7.31E-01	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	5.1%		
PERCENT CARRIER RECOVERY =	94.9%		1.11E-02 µCi/g

Data Entry by:		Date:	12/28/94
Approved by:		Date:	12/28/94

Form 22010N_C Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 103 (E-2), 104 (D-1)

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		DUPLICATE 1.000
DUPLICATE	TOTAL COUNTS	(TC)	1620	GROSS WEIGHT	(W2)		8.0081
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9199
296	BACKGROUND in cpm	(BKG)	3.6	NET WEIGHT	(W3)		0.0882
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (hours)	(DT)		22.38
@SR90-01	DILUTION FACTOR	(DF)	1	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Matrix	ENTER MATRIX AS: LIQUID, DIRECT SOLID,			Y-90 EFFICIENCY FACTOR	(C2)		0.4660
SOLID DIGEST	<<<<< or SOLID DIGEST <<<<<			SAMPLE COUNT RATE	(Rs)		158.40
Sample #	DIGEST grams of SOLIDS/L	(Dg/L)	1.9856	CRITICAL LEVEL	(Lc)		1.14
S94T348	SEPARATION TIME	(ST)	10:17 AM	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/27/94	DETECTION LIMIT	(Ld)		2.38
WB27811	TIME OF COUNT	(TOC)	08:40 AM	Sr-89/90 CONC. in µCi/g =			7.8646E-01
Analyst	DATE OF COUNT	(DOC)	12/28/94				
AKL							
Date							
12/27/94							
Time							
01:30 PM							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 µCi/g = Rs*1000mL/L*DF/
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) *SS*(Dg/L)*Rec.*2220000dpm/µCi)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))

Relative Counting Error = (The Square Root of (TC + BKG * CT)) / (TC - BKG * CT) * 1.96 * 100
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours)=((DOC - SD) * 24) + (TOC - ST) /100

v RESULTS v

Sr-89/90 CONCENTRATION =	7.86E-01	µCi/g	DETECTION LIMIT
RELATIVE COUNTING ERROR =	5.0%		
PERCENT CARRIER RECOVERY =	88.2%		1.18E-02 µCi/g

Data Entry by: [signature] Date: 12/28/94
Approved by: [signature] Date: 12/28/94

Form 22010N_C Rev. 1.0

 BY/DG OA

LABCORE Data Entry Template for Worklist# 334

Analyst: DCD **Instrument:** AB00 12 **Method:** LA-220-101/D-1

Worklist Comment: Use ~~.100-10-.100 mL~~ 1.0 mL sample mount. SLF SLF 1-5-95

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
1	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec
1	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
2	STD	51B52			@SR90-01	SR90-01	SOLID			N/A	uCi/g
2	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
2	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
3	SAMPLE	S94T000349	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
3	SAMPLE	S94T000349	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
3	SAMPLE	S94T000349	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
4	DUP	S94T000349	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
4	DUP	S94T000349	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
4	DUP	S94T000349	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.
5	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
5	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec
5	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
6	STD	51B52			@SR90-01	SR90-01	SOLID			N/A	uCi/g
6	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
6	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
7	SAMPLE	S94T000350	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
7	SAMPLE	S94T000350	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec

Data Entry Comments: Sample 349 will be rerun due to high RPD [signature] 1-10-95

Units shown for QC (SPK) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 334

Analyst: DCD **Instrument:** AB00 12 **Method:** LA-220-101/D-1

Worklist Comment: Use ~~100-10-100 mL~~ 1.0mL sample mount. SLF 1-5-95

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
7	SAMPLE	S94T000350	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
8	DUP	S94T000350	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
8	DUP	S94T000350	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
8	DUP	S94T000350	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.

Final page for worklist # 334

David C Dunham
Analyst Signature

1-5-95
Date

M G Brown

1-6-95

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

						STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA	1.000
STANDARD	TOTAL COUNTS	(TC)	9869	GROSS WEIGHT	(W2)	6.9704
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.8729
334	BACKGROUND in cpm	(BKG)	1.5	NET WEIGHT	(W3)	0.0975
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	5.67
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST DILUTION FACTOR	DDF	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	985.40	SR-90 EFFICIENCY FACTO	(C1)	0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.74	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
51852	SEPARATION TIME	(ST)	11:20	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	01/05/95	DETECTION LIMIT	(Ld)	1.57
WB27811	TIME OF COUNT	(TOC)	17:00	Sr-89/90 CONC. in µCi/L =		1.0215E+00
Analyst	DATE OF COUNT	(DOC)	01/05/95			
DCD						
Date						
01/06/95						
Time						
08:00						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.02E-03	µCi/mL	
RELATIVE COUNTING ERROR =	2.0%		
PERCENT CARRIER RECOVERY =	97.5%		

DETECTION LEVEL
1.62E-06 µCi/L

Data Entry by:	MC BIERMAN	Date:	06-Jan-95
Approved by:	SL FITZGERALD	Date:	1-9-95

Form WB Rev. 2.1 220-10n_WB

WESTINGHOUSE HANFORD COMPANY

WHC-SD-WM-DP-103, REV. 1

222-S LABORATORY

RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET

STRONTIUM-SOLIDS ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	DCD	BATCH ID:	0
		ANALYSIS DATE:	January 6, 1995

	UNITS:	µCi/g							
SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *	51B52	Sr-90	1.02E-03				91.9%	1.62E-06	2.0%
BLANK	S94T350	Sr-90	6.67E-04					8.03E-04	98.9%
SAMPLE 1	S94T350	Sr-90	5.09E-01	4.46E-01	4.78E-01	13.2%		7.91E-04	2.0%
DUPLICATE 1	S94T350	Sr-90						7.81E-04	2.1%
SAMPLE 2					N/A	N/A			
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE: **Analyst Comments:**

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:	MC Bierman	Date:	01/06/95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-9-95

Revision 2.1

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		STANDARD 1.000
STANDARD	TOTAL COUNTS	(TC)	9869	GROSS WEIGHT	(W2)		6.9704
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8729
334	BACKGROUND in cpm	(BKG)	1.5	NET WEIGHT	(W3)		0.0975
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		5.67
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	985.40	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.74	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
51B52	SEPARATION TIME	(ST)	11:20	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/05/95	DETECTION LIMIT	(Ld)		1.57
WB27811	TIME OF COUNT	(TOC)	17:00	Sr-89/90 CONC. in µCi/L =			1.0215E+00
Analyst	DATE OF COUNT	(DOC)	01/05/95				
DCD							
Date							
01/06/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.02E-03	µCi/mL
RELATIVE COUNTING ERROR =	2.0%	
PERCENT CARRIER RECOVERY =	97.5%	

DETECTION LEVEL
1.62E-06 µCi/L

Data Entry by:	MC BIERMAN	Date:	06-Jan-95
Approved by:	SL FITZGERALD	Date:	1-9-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							BLANK
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
BLANK	TOTAL COUNTS	(TC)	28	GROSS WEIGHT	(W2)		6.9114
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8154
334	BACKGROUND in cpm	(BKG)	1.5	NET WEIGHT	(W3)		0.0960
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		7.33
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	2.018				
SOLID	SAMPLE COUNT RATE	(Rs)	1.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.74	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T350	SEPARATION TIME	(ST)	11:25	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/05/95	DETECTION LIMIT	(Ld)		1.57
WB27811	TIME OF COUNT	(TOC)	18:45	Sr-89/90 CONC in µCi/g			6.6657E-04
Analyst	DATE OF COUNT	(DOC)	01/05/95				
DCD							
Date							
01/06/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	6.67E-04	µCi/g
RELATIVE COUNTING ERROR	=	98.9%	
PERCENT CARRIER RECOVERY	=	96.0%	

DETECTION LEVEL

8.03E-04 µCi/g

Data Entry by:	MC BIERMAN	Date:	06-Jan-95
Approved by:	SL FITZGERALD	Date:	1-9-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		SAMPLE 1.000
SAMPLE	TOTAL COUNTS	(TC)	10096	GROSS WEIGHT	(W2)		7.1540
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0573
334	BACKGROUND in cpm	(BKG)	1.5	NET WEIGHT	(W3)		0.0967
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		8.08
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	2.018				
SOLID	SAMPLE COUNT RATE	(Rs)	1008.10	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.74	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T350	SEPARATION TIME	(ST)	11:25	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/05/95	DETECTION LIMIT	(Ld)		1.57
WB27811	TIME OF COUNT	(TOC)	19:30	Sr-89/90 CONC in µCi/g			5.0926E-01
Analyst	DATE OF COUNT	(DOC)	01/05/95				
DCD							
Date							
01/06/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	5.09E-01	µCi/g
RELATIVE COUNTING ERROR =	2.0%	
PERCENT CARRIER RECOVERY =	96.7%	

DETECTION LEVEL

7.91E-04 µCi/g

Data Entry by:	MC BIERMAN	Date:	06-Jan-95
Approved by:	SL FITZGERALD	Date:	1-9-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		DUPLICATE 1.000
DUPLICATE	TOTAL COUNTS	(TC)	8964	GROSS WEIGHT	(W2)		7.0569
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9602
334	BACKGROUND in cpm	(BKG)	1.5	NET WEIGHT	(W3)		0.0967
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		8.58
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	2.034				
SOLID	SAMPLE COUNT RATE	(Rs)	894.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.74	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T350	SEPARATION TIME	(ST)	11:25	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/05/95	DETECTION LIMIT	(Ld)		1.57
WB27811	TIME OF COUNT	(TOC)	20:00	Sr-89/90 CONC in µCi/g			4.4627E-01
Analyst	DATE OF COUNT	(DOC)	01/05/95				
DCD							
Date							
01/06/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	4.46E-01	µCi/g
RELATIVE COUNTING ERROR	=	2.1%	
PERCENT CARRIER RECOVERY	=	96.7%	

DETECTION LEVEL

7.81E-04 µCi/g

Data Entry by:	MC BIERMAN		Date:	06-Jan-95
Approved by:	SL FITZGERALD		Date:	1-9-95

Form WB Rev. 2.1 220-10n_WB

LAB LEADER INFO:

Method:	LA-220-101(D-1)
Test Code	@SR90-01
Matrix:	SOLID
Work List #	334
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/06/95
Time Complete:	08:00
Chemist:	SL FITZGERALD
Analyst:	DCD
Analysis Date:	01/05/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	51B52
BLANK	S94T350
SAMPLE 1	S94T350
DUPLICATE 1	S94T350
SAMPLE 2	
DUPLICATE 2	
ST-END	

PRINT

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	9869
COUNT TIME in MINUTES	10
BACKGROUND in cpm	2
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	11:20
SEPARATION DATE	01/05/95
TIME OF COUNT	17:00
DATE OF COUNT	01/05/95
CARRIER ADDED in mL	1
GROSS WEIGHT	6.9704
TARE WEIGHT	6.8729
STANDARD VALUE	1.1116

RESULT	
SAMPLE COUNT RATE	9.85E+02
CRITICAL LEVEL	7.38E-01
NET WEIGHT	0.0975
DELTA TIME (hours)	5.67
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	1.57
Sr-89/90 CONC in µCi/mL	1.02E-03
Relative Counting Error	2.0%
Percent Carrier Recovery	97.5%

Solid-Blank Run:

INPUT	
TOTAL COUNTS	28
COUNT TIME in MINUTES	10
BACKGROUND in cpm	2
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.018
SEPARATION TIME	11:25
SEPARATION DATE	01/05/95
TIME OF COUNT	18:45
DATE OF COUNT	01/05/95
CARRIER ADDED in mL	1
GROSS WEIGHT	6.9114
TARE WEIGHT	6.8154

RESULT	
SAMPLE COUNT RATE	1.30E+00
CRITICAL LEVEL	7.38E-01
NET WEIGHT	0.0960
DELTA TIME (hours)	7.33
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	1.57
Sr-89/90 CONC in µCi/g	6.67E-04
Relative Counting Error	98.9%
Percent Carrier Recovery	96.0%

Solid-Sample Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Duplicate Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Sample Run:

INPUT	
TOTAL COUNTS	10096
COUNT TIME in MINUTES	10
BACKGROUND in cpm	2
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.018
SEPARATION TIME	11:25
SEPARATION DATE	01/05/95
TIME OF COUNT	19:30
DATE OF COUNT	01/05/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.154
TARE WEIGHT	7.0573

RESULT	
SAMPLE COUNT RATE	1.01E+03
CRITICAL LEVEL	7.38E-01
NET WEIGHT	0.0967
DELTA TIME (hours)	8.08
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	1.57
Sr-89/90 CONC in µCi/g	5.09E-01
Relative Counting Error	2.0%
Percent Carrier Recovery	96.7%

Solid-Duplicate Run:

INPUT	
TOTAL COUNTS	8964
COUNT TIME in MINUTES	10
BACKGROUND in cpm	2
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.034
SEPARATION TIME	11:25
SEPARATION DATE	01/05/95
TIME OF COUNT	20:00
DATE OF COUNT	01/05/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0569
TARE WEIGHT	6.9602

RESULT	
SAMPLE COUNT RATE	8.95E+02
CRITICAL LEVEL	7.38E-01
NET WEIGHT	0.0967
DELTA TIME (hours)	8.58
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	1.57
Sr-89/90 CONC in µCi/g	4.46E-01
Relative Counting Error	2.1%
Percent Carrier Recovery	96.7%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	06-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-9-95

Revision 2.1

2046

WHC-SD-WM-DP-103, REV. 1

By106 .0A

LABCORE Data Entry Template for Worklist# 343

Analyst: RM **Instrument:** AB00 12 **Method:** LA-220-101 D-1

Worklist Comment: Use .100 mL sample size. SLF WHC-SD-WM-DP-103, REV. 1

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	STD 51 B52				@SR90-01	SR90-01	LIQUID			N/A	uCi/r
1	STD				@SR90-01	SR90-01C	LIQUID			N/A	% Rec
1	STD				@SR90-01	SR90-01E	LIQUID			N/A	% Ct.
2	BLNK-PREP				@SR90-01	SR90-01	LIQUID			N/A	uCi/r
2	BLNK-PREP				@SR90-01	SR90-01C	LIQUID			N/A	% Rec
2	BLNK-PREP				@SR90-01	SR90-01E	LIQUID			N/A	% Ct.
3	SAMPLE	S94T000389	0		@SR90-01	SR90-01	LIQUID	N/A			uCi/r
3	SAMPLE	S94T000389	0		@SR90-01	SR90-01C	LIQUID	N/A			% Rec
3	SAMPLE	S94T000389	0		@SR90-01	SR90-01E	LIQUID	N/A			% Ct.
4	DUP	S94T000389	0		@SR90-01	SR90-01	LIQUID			N/A	uCi/r
4	DUP	S94T000389	0		@SR90-01	SR90-01C	LIQUID			N/A	% Rec
4	DUP	S94T000389	0		@SR90-01	SR90-01E	LIQUID			N/A	% Ct.

Final page for worklist # 343

Patrick J. McCown
Analyst Signature

12/31/94
Date

M Bicin 1/3/95

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

LAB LEADER INFO:	
Method:	LA 220-101 (D-1)
Test Code	@SR90-01
Matrix:	LIQUID
Work List #	343
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/03/95
Time Complete:	08:00
Chemist:	SL FITZGERALD
Analyst:	PJM
Analysis Date:	12/31/94
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	51B52
BLANK	S94T389
SAMPLE 1	S94T389
DUPLICATE 1	S94T389
SAMPLE 2	
DUPLICATE 2	
ST-END	

TECH INFO:

Liquids Standard Run		Liquids Blank Run		Liquids Sample Run 2		Liquids Duplicate Run 2	
INPUT		**INPUT**		**INPUT**		**INPUT**	
TOTAL COUNTS	9841	TOTAL COUNTS	22	TOTAL COUNTS		TOTAL COUNTS	
COUNT TIME in MINUTES	10	COUNT TIME in MINUTES	10	COUNT TIME in MINUTES		COUNT TIME in MINUTES	
BACKGROUND in cpm	3	BACKGROUND in cpm	3	BACKGROUND in cpm		BACKGROUND in cpm	
SAMPLE VOLUME in mL	1	SAMPLE VOLUME in mL	0.1	SAMPLE VOLUME in mL		SAMPLE VOLUME in mL	
DILUTION FACTOR	1	DILUTION FACTOR	1	DILUTION FACTOR		DILUTION FACTOR	
DIGEST DILUTION FACTOR	1	DIGEST DILUTION FACTOR	1	DIGEST DILUTION FACTOR		DIGEST DILUTION FACTOR	
SEPARATION TIME	04:30	SEPARATION TIME	04:30	SEPARATION TIME		SEPARATION TIME	
SEPARATION DATE	12/31/94	SEPARATION DATE	12/31/94	SEPARATION DATE		SEPARATION DATE	
TIME OF COUNT	08:45	TIME OF COUNT	10:35	TIME OF COUNT		TIME OF COUNT	
DATE OF COUNT	12/31/94	DATE OF COUNT	12/31/94	DATE OF COUNT		DATE OF COUNT	
CARRIER ADDED in mL	1	CARRIER ADDED in mL	1	CARRIER ADDED in mL		CARRIER ADDED in mL	
GROSS WEIGHT	8.0347	GROSS WEIGHT	8.0321	GROSS WEIGHT		GROSS WEIGHT	
TARE WEIGHT	7.9381	TARE WEIGHT	7.9364	TARE WEIGHT		TARE WEIGHT	
STANDARD VALUE	1.1118						
RESULT		**RESULT**		**RESULT**		**RESULT**	
SAMPLE COUNT RATE	9.81E+02	SAMPLE COUNT RATE	-8.00E-01	SAMPLE COUNT RATE		SAMPLE COUNT RATE	
CRITICAL LEVEL	1.03E+00	CRITICAL LEVEL	1.04E+00	CRITICAL LEVEL		CRITICAL LEVEL	
NET WEIGHT	0.0966	NET WEIGHT	0.0957	NET WEIGHT		NET WEIGHT	
DELTA TIME (hours)	4.25	DELTA TIME (hours)	6.08	DELTA TIME (hours)		DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	0.42	SR-90 EFFICIENCY FACTOR	0.42	SR-90 EFFICIENCY FACTOR		SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	0.47	Y-90 EFFICIENCY FACTOR	0.47	Y-90 EFFICIENCY FACTOR		Y-90 EFFICIENCY FACTOR	
Rmax	N/A	Rmax	N/A	Rmax		Rmax	
DETECTION LIMIT	2.14	DETECTION LIMIT	2.18	DETECTION LIMIT		DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	1.04E-03	Sr-89/90 CONC in µCi/mL	< 1.10E-05	Sr-89/90 CONC in µCi/mL		Sr-89/90 CONC in µCi/mL	
Relative Counting Error	2.0%	Relative Counting Error	176.7%	Relative Counting Error		Relative Counting Error	
Percent Carrier Recovery	96.6%	Percent Carrier Recovery	95.7%	Percent Carrier Recovery		Percent Carrier Recovery	

Liquids Sample Run		Liquids Duplicate Run		Liquids Standard End	
INPUT		**INPUT**		**INPUT**	
TOTAL COUNTS	72	TOTAL COUNTS	84	TOTAL COUNTS	
COUNT TIME in MINUTES	10	COUNT TIME in MINUTES	10	COUNT TIME in MINUTES	
BACKGROUND in cpm	3	BACKGROUND in cpm	30	BACKGROUND in cpm	
SAMPLE VOLUME in mL	0.1	SAMPLE VOLUME in mL	0.1	SAMPLE VOLUME in mL	
DILUTION FACTOR	1	DILUTION FACTOR	1	DILUTION FACTOR	
DIGEST DILUTION FACTOR	1	DIGEST DILUTION FACTOR	1	DIGEST DILUTION FACTOR	
SEPARATION TIME	04:30	SEPARATION TIME	04:30	SEPARATION TIME	
SEPARATION DATE	12/31/94	SEPARATION DATE	12/31/94	SEPARATION DATE	
TIME OF COUNT	10:45	TIME OF COUNT	11:05	TIME OF COUNT	
DATE OF COUNT	12/31/94	DATE OF COUNT	12/31/94	DATE OF COUNT	
CARRIER ADDED in mL	1	CARRIER ADDED in mL	1	CARRIER ADDED in mL	
GROSS WEIGHT	8.0688	GROSS WEIGHT	8.0493	GROSS WEIGHT	
TARE WEIGHT	7.973	TARE WEIGHT	7.9528	TARE WEIGHT	
				STANDARD VALUE	
RESULT		**RESULT**		**RESULT**	
SAMPLE COUNT RATE	4.20E+00	SAMPLE COUNT RATE	-2.16E+01	SAMPLE COUNT RATE	
CRITICAL LEVEL	1.04E+00	CRITICAL LEVEL	3.30E+00	CRITICAL LEVEL	
NET WEIGHT	0.0958	NET WEIGHT	0.0965	NET WEIGHT	
DELTA TIME (hours)	6.25	DELTA TIME (hours)	6.58	DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	0.42	SR-90 EFFICIENCY FACTOR	0.42	SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	0.47	Y-90 EFFICIENCY FACTOR	0.47	Y-90 EFFICIENCY FACTOR	
Rmax	N/A	Rmax	N/A	Rmax	
DETECTION LIMIT	2.18	DETECTION LIMIT	6.69	DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	4.40E-05	Sr-89/90 CONC in µCi/mL	< 3.42E-05	Sr-89/90 CONC in µCi/mL	
Relative Counting Error	47.1%	Relative Counting Error	17.8%	Relative Counting Error	
Percent Carrier Recovery	95.8%	Percent Carrier Recovery	96.5%	Percent Carrier Recovery	

Form Completed By:	MC BIERMAN	Signature:	MC Bierman	Date:	03-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[illegible]	Date:	1-3-95

Revision 2.1

2648

WHC-SD-WM-DP-103, REV. 1

WESTINGHOUSE HANFORD COMPANY

WHC-SD-WM-DP-103, REV. 1

222-S LABORATORY

RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET

STRONTIUM-LIQUIDS ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	PJM	BATCH ID:	0
		ANALYSIS DATE:	January 3, 1995

		UNITS:	µCi/mL						
SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD	51B52	Sr-90	1.04E-03				93.8%	2.28E-06	2.0%
BLANK	S94T389	Sr-90	< 1.10E-05					2.29E-05	176.7%
SAMPLE 1	S94T389	Sr-90	4.40E-05	< 3.42E-05	N/A	N/A		2.28E-05	47.1%
DUPLICATE 1	S94T389	Sr-90						6.94E-05	17.8%
SAMPLE 2					N/A	N/A			
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE: **Analyst Comments:**

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	01/03/95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-3-95

Revision 2.1

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
STANDARD	TOTAL COUNTS	(TC)	9841	GROSS WEIGHT	(W2)		8.0347
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9381
343	BACKGROUND in cpm	(BKG)	2.9	NET WEIGHT	(W3)		0.0966
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		4.25
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	981.20	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.03	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
51B52	SEPARATION TIME	(ST)	04:30	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/31/94	DETECTION LIMIT	(Ld)		2.14
WB27811	TIME OF COUNT	(TOC)	08:45	Sr-89/90 CONC. in µCi/L =			1.0425E+00
Analyst	DATE OF COUNT	(DOC)	12/31/94				
PJM							
Date							
01/03/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

2650

v RESULTS v

Sr-89/90 CONCENTRATION =	1.04E-03	µCi/mL
RELATIVE COUNTING ERROR =	2.0%	
PERCENT CARRIER RECOVERY =	96.6%	

DETECTION LEVEL
2.28E-06 µCi/L

Data Entry by:	MC BIERMAN	Date:	03-Jan-95
Approved by:	SL FITZGERALD	Date:	1-3-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		BLANK 1.000
BLANK	TOTAL COUNTS	(TC)	22	GROSS WEIGHT	(W2)		8.0321
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9364
343	BACKGROUND in cpm	(BKG)	3	NET WEIGHT	(W3)		0.0957
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		6.08
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTO	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	-0.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.04	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T389	SEPARATION TIME	(ST)	04:30	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/31/94	DETECTION LIMIT	(Ld)		2.18
WB27811	TIME OF COUNT	(TOC)	10:35	Sr-89/90 CONC in µCi/L		<	1.0973E-02
Analyst	DATE OF COUNT	(DOC)	12/31/94				
PJM							
Date							
01/03/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS w
RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

2651

v RESULTS v

Sr-89/90 CONCENTRATION =	< 1.10E-05	µCi/mL
LESS THAN Value was Determined from Lc.		
RELATIVE COUNTING ERROR =	176.7%	
PERCENT CARRIER RECOVERY =	95.7%	

DETECTION LEVEL
2.29E-05 µCi/mL

Data Entry by:	MC BIERMAN	Date:	03-Jan-95
Approved by:	SL FITZGERALD	Date:	1-3-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
SAMPLE	TOTAL COUNTS	(TC)	72	GROSS WEIGHT	(W2)		8.0688
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9730
343	BACKGROUND in cpm	(BKG)	3	NET WEIGHT	(W3)		0.0958
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		6.25
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	4.20	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.04	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T389	SEPARATION TIME	(ST)	04:30	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/31/94	DETECTION LIMIT	(Ld)		2.18
WB27811	TIME OF COUNT	(TOC)	10:45	Sr-89/90 CONC in µCi/L			4.4041E-02
Analyst	DATE OF COUNT	(DOC)	12/31/94				
PJM							
Date							
01/03/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

26652

v RESULTS v

Sr-89/90 CONCENTRATION =	4.40E-05	µCi/mL
RELATIVE COUNTING ERROR =	47.1%	
PERCENT CARRIER RECOVERY =	95.8%	

DETECTION LEVEL

2.28E-05 µCi/mL

Data Entry by:	MC BIERMAN		Date:	03-Jan-95
Approved by:	SL FITZGERALD		Date:	1-3-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
DUPLICATE	TOTAL COUNTS	(TC)	84	GROSS WEIGHT	(W2)		8.0493
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9528
343	BACKGROUND in cpm	(BKG)	30	NET WEIGHT	(W3)		0.0965
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		6.58
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	-21.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	3.30	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T389	SEPARATION TIME	(ST)	04:30	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	12/31/94	DETECTION LIMIT	(Ld)		6.69
WB27811	TIME OF COUNT	(TOC)	11:05	Sr-89/90 CONC in µCi/L		<	3.4233E-02
Analyst	DATE OF COUNT	(DOC)	12/31/94				
PJM							
Date							
01/03/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

2653

v RESULTS v

Sr-89/90 CONCENTRATION =	< 3.42E-05	µCi/mL	
LESS THAN Value was Determined from Lc.			
RELATIVE COUNTING ERROR =	17.8%		
PERCENT CARRIER RECOVERY =	96.5%		

DETECTION LEVEL

6.94E-05 µCi/mL

Data Entry by:	MC BIERMAN	Date:	03-Jan-95
Approved by:	SL FITZGERALD	Date:	1-3-95

Form WB Rev. 2.1 220-10n_WB

KB

WHC-SD-WM-DP-103, REV. 1 By 10

LABCORE Data Entry Template for Worklist# 385

Analyst: AKL **Instrument:** AB00 12 **Method:** LA-220-101 D-1

Worklist Comment: Use 1.0 mL sample size. SLF

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
1	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec
1	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
2	STD	51B52			@SR90-01	SR90-01	SOLID			N/A	uCi/g
2	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
2	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
3	SAMPLE	S94T000336	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
3	SAMPLE	S94T000336	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
3	SAMPLE	S94T000336	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
4	DUP	S94T000336	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
4	DUP	S94T000336	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
4	DUP	S94T000336	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.
5	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
5	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec
5	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
6	STD				@SR90-01	SR90-01	SOLID			N/A	uCi/g
6	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
6	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
7	SAMPLE	S94T000349	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
7	SAMPLE	S94T000349	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 385

Analyst: AKL **Instrument:** AB00 **Method:** LA-220-101 D-1

Worklist Comment: Use 1.0 mL sample size. SLF

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
7	SAMPLE	S94T000349	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
8	DUP	S94T000349	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
8	DUP	S94T000349	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
8	DUP	S94T000349	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.

Final page for worklist # 385

Alexis Luis
Analyst Signature

1-10-95
Date

MGSiman

1-10-95

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
WHC-SD-WM-DP-103, REV. 1

RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-SOLIDS ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	AKL	BATCH ID:	0
		ANALYSIS DATE:	January 10, 1995

	UNITS:	µCi/g							
SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
							91.2 ~~90.2~~	SLF 1-11-95	
STANDARD *	61B52	Sr-90	1.01E-03				~~91.2%~~	2.36E-06	2.0%
BLANK	S94T336	Sr-90	2.06E-03					1.28E-03	54.4%
SAMPLE 1	S94T336	Sr-90	2.21E+01	2.17E+01	2.19E+01	2.0%		1.28E-03	0.3%
DUPLICATE 1	S94T336	Sr-90						1.25E-03	0.3%
SAMPLE 2					N/A	N/A			
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE: Analyst Comments:

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:		Date:	01/10/95
Chemist Approval:	SL FITZGERALD	Signature:		Date:	1-11-95

Revision 2.1

DATA NOT USED IN PACKAGE

LAB LEADER INFO:	
Method:	LA-220-101(D-1)
Test Code	@SR90-01
Matrix:	SOLID
Work List #	385
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/10/95
Time Complete:	10:30
Chemist:	SL FITZGERALD
Analyst:	AKL
Analysis Date:	01/09/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	51B52
BLANK	S94T336
SAMPLE 1	S94T336
DUPLICATE 1	S94T336
SAMPLE 2	
DUPLICATE 2	
ST-END	

PRINT

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	9679
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	13:55
SEPARATION DATE	01/09/95
TIME OF COUNT	17:40
DATE OF COUNT	01/09/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0278
TARE WEIGHT	6.9296
STANDARD VALUE	~~1.1113~~ 1.1113

RESULT	
SAMPLE COUNT RATE	9.65E+02
CRITICAL LEVEL	1.08E+00
NET WEIGHT	0.0982
DELTA TIME (hours)	3.75
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.25
Sr-89/90 CONC in µCi/mL	1.01E-03
Relative Counting Error	2.0%
Percent Carrier Recovery	98.2%

Solid-Blank Run:

INPUT	
TOTAL COUNTS	68
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.8456
SEPARATION TIME	13:55
SEPARATION DATE	01/09/95
TIME OF COUNT	18:05
DATE OF COUNT	01/09/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.043
TARE WEIGHT	6.9456

RESULT	
SAMPLE COUNT RATE	3.60E+00
CRITICAL LEVEL	1.08E+00
NET WEIGHT	0.0974
DELTA TIME (hours)	4.17
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.25
Sr-89/90 CONC in µCi/g	2.06E-03
Relative Counting Error	54.4%
Percent Carrier Recovery	97.4%

Solid-Sample Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Duplicate Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Sample Run:

INPUT	
TOTAL COUNTS	386643
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.8456
SEPARATION TIME	13:55
SEPARATION DATE	01/09/95
TIME OF COUNT	18:20
DATE OF COUNT	01/09/95
CARRIER ADDED in mL	1
GROSS WEIGHT	6.9933
TARE WEIGHT	6.8961

RESULT	
SAMPLE COUNT RATE	3.87E+04
CRITICAL LEVEL	1.08E+00
NET WEIGHT	0.0972
DELTA TIME (hours)	4.42
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.25
Sr-89/90 CONC in µCi/g	2.21E+01
Relative Counting Error	0.3%
Percent Carrier Recovery	97.2%

Solid-Duplicate Run:

INPUT	
TOTAL COUNTS	389678
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.876
SEPARATION TIME	13:55
SEPARATION DATE	01/09/95
TIME OF COUNT	18:30
DATE OF COUNT	01/09/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0608
TARE WEIGHT	6.9627

RESULT	
SAMPLE COUNT RATE	3.90E+04
CRITICAL LEVEL	1.08E+00
NET WEIGHT	0.0981
DELTA TIME (hours)	4.58
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.25
Sr-89/90 CONC in µCi/g	2.17E+01
Relative Counting Error	0.3%
Percent Carrier Recovery	98.1%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

2657

DATA NOT USED IN PACKAGE

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	10-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-11-95

Revision 2.1

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		BLANK 1.000
BLANK	TOTAL COUNTS	(TC)	68	GROSS WEIGHT	(W2)		7.0430
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9456
385	BACKGROUND in cpm	(BKG)	3.2	NET WEIGHT	(W3)		0.0974
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		4.17
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.8456				
SOLID	SAMPLE COUNT RATE	(Rs)	3.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.08	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T336	SEPARATION TIME	(ST)	13:55	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/09/95	DETECTION LIMIT	(Ld)		2.25
WB27811	TIME OF COUNT	(TOC)	18:05	Sr-89/90 CONC in µCi/g			2.0572E-03
Analyst	DATE OF COUNT	(DOC)	01/09/95				
AKL							
Date							
01/10/95							
Time							
10:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	2.06E-03	µCi/g
RELATIVE COUNTING ERROR =	54.4%	
PERCENT CARRIER RECOVERY =	97.4%	

DETECTION LEVEL

1.28E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	10-Jan-95
Approved by:	SL FITZGERALD	Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
STANDARD	TOTAL COUNTS	(TC)	9679	GROSS WEIGHT	(W2)		7.0278
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9296
385	BACKGROUND in cpm	(BKG)	3.2	NET WEIGHT	(W3)		0.0982
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		3.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	964.70	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.08	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
51852	SEPARATION TIME	(ST)	13:55	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/09/95	DETECTION LIMIT	(Ld)		2.25
WB27811	TIME OF COUNT	(TOC)	17:40	Sr-89/90 CONC. in µCi/L =			1.0138E+00
Analyst	DATE OF COUNT	(DOC)	01/09/95				
AKL							
Date							
01/10/95							
Time							
10:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	1.01E-03	µCi/mL
RELATIVE COUNTING ERROR	=	2.0%	
PERCENT CARRIER RECOVERY	=	98.2%	

DETECTION LEVEL

2.36E-06 µCi/L

Data Entry by:	MC BIERMAN		Date:	10-Jan-95
Approved by:	SL FITZGERALD		Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	386643	GROSS WEIGHT	(W2)		6.9933
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8961
385	BACKGROUND in cpm	(BKG)	3.2	NET WEIGHT	(W3)		0.0972
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		4.42
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.8456				
SOLID	SAMPLE COUNT RATE	(Rs)	38661.10	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.08	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T336	SEPARATION TIME	(ST)	13:55	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/09/95	DETECTION LIMIT	(Ld)		2.25
WB27811	TIME OF COUNT	(TOC)	18:20	Sr-89/90 CONC in µCi/g			2.2078E+01
Analyst	DATE OF COUNT	(DOC)	01/09/95				
AKL							
Date							
01/10/95							
Time							
10:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	2.21E+01	µCi/g
RELATIVE COUNTING ERROR =	0.3%	
PERCENT CARRIER RECOVERY =	97.2%	

DETECTION LEVEL

1.28E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	10-Jan-95
Approved by:	SL FITZGERALD	Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB Page 1 of 1

DATA NOT USED IN PACKAGE

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUPLICATE	TOTAL COUNTS	(TC)	389678	GROSS WEIGHT	(W2)		7.0608
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9627
385	BACKGROUND in cpm	(BKG)	3.2	NET WEIGHT	(W3)		0.0981
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		4.58
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.876				
SOLID	SAMPLE COUNT RATE	(Rs)	38964.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.08	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T336	SEPARATION TIME	(ST)	13:55	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/09/95	DETECTION LIMIT	(Ld)		2.25
WB27811	TIME OF COUNT	(TOC)	18:30	Sr-89/90 CONC in µCi/g			2.1651E+01
Analyst	DATE OF COUNT	(DOC)	01/09/95				
AKU							
Date							
01/10/95							
Time							
10:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	2.17E+01	µCi/g
RELATIVE COUNTING ERROR	=	0.3%	
PERCENT CARRIER RECOVERY	=	98.1%	

DETECTION LEVEL

1.25E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	10-Jan-95
Approved by:	SL FITZGERALD	Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

WESTINGHOUSE HANFORD COMPANY WHC-SD-WM-DP-103, REV. 1
222-S LABORATORY
RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-SOLIDS ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	AKL	BATCH ID:	0
		ANALYSIS DATE:	January 19, 1995

		UNITS:	µCi/g						
SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *	51B52	Sr-90	1.01E-03				91.2%	2.36E-06	2.0%
BLANK	S94T349	Sr-90	7.33E-04					1.27E-03	132.3%
SAMPLE 1	S94T349	Sr-90	9.13E-01	6.35E-01	7.74E-01	35.9%		1.31E-03	1.6%
DUPLICATE 1	S94T349	Sr-90						1.27E-03	1.9%
SAMPLE 2					N/A	N/A			
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE: Analyst Comments:

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	SL FITZGERALD	Signature:		Date:	01/19/95
Chemist Approval:	SL FITZGERALD	Signature:		Date:	1/19/95

Revision 2.1

LAB LEADER INFO:	
Method:	LA-220-101(D-1)
Test Code	@SR90-01
Matrix:	SOLID
Work List #	385
Batch #	
Prepared By:	SL FITZGERALD
Date Complete:	01/11/95
Time Complete:	14:43
Chemist:	SL FITZGERALD
Analyst:	AKL
Analysis Date:	01/09/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	51B52
BLANK	S94T349
SAMPLE 1	S94T349
DUPLICATE 1	S94T349
SAMPLE 2	
DUPLICATE 2	
ST-END	

PRINT

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	9679
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	13:55
SEPARATION DATE	01/09/95
TIME OF COUNT	17:49
DATE OF COUNT	01/09/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0278
TARE WEIGHT	6.9296
STANDARD VALUE	1.1113

RESULT	
SAMPLE COUNT RATE	9.65E+02
CRITICAL LEVEL	1.08E+00
NET WEIGHT	0.0982
DELTA TIME (hours)	3.75
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.25
Sr-89/90 CONC in µCi/mL	1.01E-03
Relative Counting Error	2.0%
Percent Carrier Recovery	98.2%

Solid-Blank Run:

INPUT	
TOTAL COUNTS	45
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.86
SEPARATION TIME	14:00
SEPARATION DATE	01/09/95
TIME OF COUNT	19:10
DATE OF COUNT	01/09/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0856
TARE WEIGHT	6.9887

RESULT	
SAMPLE COUNT RATE	1.30E+00
CRITICAL LEVEL	1.08E+00
NET WEIGHT	0.0969
DELTA TIME (hours)	5.17
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.25
Sr-89/90 CONC in µCi/g	7.33E-04
Relative Counting Error	132.3%
Percent Carrier Recovery	96.9%

Solid-Sample Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Duplicate Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Sample Run:

INPUT	
TOTAL COUNTS	15711
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.86
SEPARATION TIME	14:00
SEPARATION DATE	01/09/95
TIME OF COUNT	18:45
DATE OF COUNT	01/09/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0105
TARE WEIGHT	6.9163

RESULT	
SAMPLE COUNT RATE	1.57E+03
CRITICAL LEVEL	1.08E+00
NET WEIGHT	0.0942
DELTA TIME (hours)	4.75
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.25
Sr-89/90 CONC in µCi/g	9.13E-01
Relative Counting Error	1.6%
Percent Carrier Recovery	94.2%

Solid-Duplicate Run:

INPUT	
TOTAL COUNTS	11270
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.8876
SEPARATION TIME	14:00
SEPARATION DATE	01/09/95
TIME OF COUNT	18:55
DATE OF COUNT	01/09/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0057
TARE WEIGHT	6.9102

RESULT	
SAMPLE COUNT RATE	1.12E+03
CRITICAL LEVEL	1.08E+00
NET WEIGHT	0.0955
DELTA TIME (hours)	4.92
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.25
Sr-89/90 CONC in µCi/g	6.35E-01
Relative Counting Error	1.9%
Percent Carrier Recovery	95.5%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

Form Completed By:	SL FITZGERALD	Signature:	[signature]	Date:	19-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-19-95

Revision 2.1

2663

WHC-SD-WM-DP-103, REV. 1

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
STANDARD	TOTAL COUNTS	(TC)	9679	GROSS WEIGHT	(W2)		7.0278
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9296
385	BACKGROUND in cpm	(BKG)	3.2	NET WEIGHT	(W3)		0.0982
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		3.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	964.70	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.08	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
51852	SEPARATION TIME	(ST)	13:55	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/09/95	DETECTION LIMIT	(Ld)		2.25
WB27811	TIME OF COUNT	(TOC)	17:40	Sr-89/90 CONC. in µCi/L =			1.0138E+00
Analyst	DATE OF COUNT	(DOC)	01/09/95				
AKL							
Date							
01/11/95							
Time							
14:43							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.01E-03	µCi/mL
RELATIVE COUNTING ERROR =	2.0%	
PERCENT CARRIER RECOVERY =	98.2%	

DETECTION LEVEL
2.36E-06 µCi/L

Data Entry by:	SL FITZGERALD	Date:	19-Jan-95
Approved by:	SL FITZGERALD	Date:	1-19-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							BLANK
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
BLANK	TOTAL COUNTS	(TC)	45	GROSS WEIGHT	(W2)		7.0856
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9887
385	BACKGROUND in cpm	(BKG)	3.2	NET WEIGHT	(W3)		0.0969
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		5.17
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.86				
SOLID	SAMPLE COUNT RATE	(Rs)	1.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.08	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T349	SEPARATION TIME	(ST)	14:00	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/09/95	DETECTION LIMIT	(Ld)		2.25
WB27811	TIME OF COUNT	(TOC)	19:10	Sr-89/90 CONC in µCi/g			7.3295E-04
Analyst	DATE OF COUNT	(DOC)	01/09/95				
AKL							
Date							
01/11/95							
Time							
14:43							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	7.33E-04	µCi/g
RELATIVE COUNTING ERROR =	132.3%	
PERCENT CARRIER RECOVERY =	96.9%	

DETECTION LEVEL

1.27E-03 µCi/g

Data Entry by:	SL FITZGERALD	Date:	19-Jan-95
Approved by:	SL FITZGERALD	Date:	1-19-95

Form WB Rev. 2.1 220-10n_WB Page 1 of 1

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
SAMPLE	TOTAL COUNTS	(TC)	15711	GROSS WEIGHT	(W2)		7.0105
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9163
385	BACKGROUND in cpm	(BKG)	3.2	NET WEIGHT	(W3)		0.0942
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		4.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.86				
SOLID	SAMPLE COUNT RATE	(Rs)	1567.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.08	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T349	SEPARATION TIME	(ST)	14:00	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/09/95	DETECTION LIMIT	(Ld)		2.25
WB27811	TIME OF COUNT	(TOC)	18:45	Sr-89/90 CONC in µCi/g			9.1342E-01
Analyst	DATE OF COUNT	(DOC)	01/09/95				
AKL							
Date							
01/11/95							
Time							
14:43							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	9.13E-01	µCi/g
RELATIVE COUNTING ERROR =	1.6%	
PERCENT CARRIER RECOVERY =	94.2%	

DETECTION LEVEL

1.31E-03 µCi/g

Data Entry by:	SL FITZGERALD		Date:	19-Jan-95
Approved by:	SL FITZGERALD		Date:	1-19-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
DUPLICATE	TOTAL COUNTS	(TC)	11270	GROSS WEIGHT	(W2)		7.0057
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9102
385	BACKGROUND in cpm	(BKG)	3.2	NET WEIGHT	(W3)		0.0955
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		4.92
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.8876				
SOLID	SAMPLE COUNT RATE	(Rs)	1123.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.08	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T349	SEPARATION TIME	(ST)	14:00	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/09/95	DETECTION LIMIT	(Ld)		2.25
WB27811	TIME OF COUNT	(TOC)	18:55	Sr-89/90 CONC in µCi/g			6.3520E-01
Analyst	DATE OF COUNT	(DOC)	01/09/95				
AKL							
Date							
01/11/95							
Time							
14:43							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	6.35E-01	µCi/g
RELATIVE COUNTING ERROR	=	1.9%	
PERCENT CARRIER RECOVERY	=	95.5%	

DETECTION LEVEL

1.27E-03 µCi/g

Data Entry by:	SL FITZGERALD	Date:	19-Jan-95
Approved by:	SL FITZGERALD	Date:	1-19-95

Form WB Rev. 2.1 220-10n_WB

 Bvlx 10H

LABCORE Data Entry Template for Worklist# 403

Analyst: AKL **Instrument:** AB00 #10 WB26870 **Method:** LA-220-101 D-1

Worklist Comment: Use 1 mL sample size. SLF

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
1	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec
1	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
2	STD 51852				@SR90-01	SR90-01	SOLID			N/A	uCi/g
2	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
2	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
3	SAMPLE	S94T000375	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
3	SAMPLE	S94T000375	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
3	SAMPLE	S94T000375	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
4	DUP	S94T000375	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
4	DUP	S94T000375	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
4	DUP	S94T000375	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.

Final page for worklist # 403

Cibita Lewis
Analyst Signature

1-12-95
Date

M G Brown

1-13-95

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

Page: 1

LAB LEADER INFO:

Method:	LA-220-101(D-1)
Test Code	@SR90-01
Matrix:	SOLID
Work List #	403
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/13/95
Time Complete:	08:00
Chemist:	SL FITZGERALD
Analyst:	AKL
Analysis Date:	01/12/95
Detector Number:	10
Instrument Code:	WB26870
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	51B52
BLANK	S94T375
SAMPLE 1	S94T375
DUPLICATE 1	S94T375
SAMPLE 2	
DUPLICATE 2	
ST-END	

PRINT

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	9506
COUNT TIME in MINUTES	10
BACKGROUND in cpm	13
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	12:50
SEPARATION DATE	01/12/95
TIME OF COUNT	15:15
DATE OF COUNT	01/12/95
CARRIER ADDED in mL	1
GROSS WEIGHT	6.9884
TARE WEIGHT	6.8909
STANDARD VALUE	1.1111

RESULT	
SAMPLE COUNT RATE	9.38E+02
CRITICAL LEVEL	2.17E+00
NET WEIGHT	0.0975
DELTA TIME (hours)	2.42
SR-90 EFFICIENCY FACTOR	0.41
Y-90 EFFICIENCY FACTOR	0.45
Rmax	N/A
DETECTION LIMIT	4.44
Sr-89/90 CONC in µCi/mL	1.04E-03
Relative Counting Error	2.1%
Percent Carrier Recovery	97.5%

Solid-Blank Run:

INPUT	
TOTAL COUNTS	134
COUNT TIME in MINUTES	10
BACKGROUND in cpm	13
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.1472
SEPARATION TIME	12:50
SEPARATION DATE	01/12/95
TIME OF COUNT	14:45
DATE OF COUNT	01/12/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.062
TARE WEIGHT	6.9642

RESULT	
SAMPLE COUNT RATE	4.00E-01
CRITICAL LEVEL	2.17E+00
NET WEIGHT	0.0978
DELTA TIME (hours)	1.92
SR-90 EFFICIENCY FACTOR	0.41
Y-90 EFFICIENCY FACTOR	0.45
Rmax	2.60
DETECTION LIMIT	4.44
Sr-89/90 CONC in µCi/g	< 1.34E-03
Relative Counting Error	796.2%
Percent Carrier Recovery	97.8%

Solid-Sample Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Duplicate Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Sample Run:

INPUT	
TOTAL COUNTS	3695
COUNT TIME in MINUTES	10
BACKGROUND in cpm	13
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.1472
SEPARATION TIME	12:50
SEPARATION DATE	01/12/95
TIME OF COUNT	15:25
DATE OF COUNT	01/12/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0875
TARE WEIGHT	6.9921

RESULT	
SAMPLE COUNT RATE	3.57E+02
CRITICAL LEVEL	2.17E+00
NET WEIGHT	0.0954
DELTA TIME (hours)	2.58
SR-90 EFFICIENCY FACTOR	0.41
Y-90 EFFICIENCY FACTOR	0.45
Rmax	N/A
DETECTION LIMIT	4.44
Sr-89/90 CONC in µCi/g	1.88E-01
Relative Counting Error	3.4%
Percent Carrier Recovery	95.4%

Solid-Duplicate Run:

INPUT	
TOTAL COUNTS	5203
COUNT TIME in MINUTES	10
BACKGROUND in cpm	13
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.146
SEPARATION TIME	12:50
SEPARATION DATE	01/12/95
TIME OF COUNT	15:40
DATE OF COUNT	01/12/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0386
TARE WEIGHT	6.9414

RESULT	
SAMPLE COUNT RATE	5.07E+02
CRITICAL LEVEL	2.17E+00
NET WEIGHT	0.0972
DELTA TIME (hours)	2.83
SR-90 EFFICIENCY FACTOR	0.41
Y-90 EFFICIENCY FACTOR	0.45
Rmax	N/A
DETECTION LIMIT	4.44
Sr-89/90 CONC in µCi/g	2.62E-01
Relative Counting Error	2.8%
Percent Carrier Recovery	97.2%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

Form Completed By:	MC BIERMAN	Signature:	MC Bierman	Date:	13-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[illegible]	Date:	1-13-95

Revision 2.1

2669

WHC-SD-WM-DP-103, REV. 1

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-SOLIDS

WHC-SD-WM-DP-103, REV. 1

ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB26870	SAMPLE PREP:	0
ANALYST:	AKL	BATCH ID:	0
		ANALYSIS DATE:	January 13, 1995

		UNITS:	µCi/g						
SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *	51B52	Sr-90	1.04E-03				93.6%	4.92E-06	2.1%
BLANK	S94T375	Sr-90	< 1.34E-03					2.30E-03	796.2%
SAMPLE 1	S94T375	Sr-90	1.88E-01	2.62E-01	2.25E-01	32.9%		2.34E-03	3.4%
DUPLICATE 1	S94T375	Sr-90						2.29E-03	2.8%
SAMPLE 2					N/A	N/A			
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE:

Analyst Comments:

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:		Date:	01/13/95
Chemist Approval:	SL FITZGERALD	Signature:		Date:	1/13/95

Revision 2.1

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
STANDARD	TOTAL COUNTS	(TC)	9506	GROSS WEIGHT	(W2)		6.9884
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8909
403	BACKGROUND in cpm	(BKG)	13	NET WEIGHT	(W3)		0.0975
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		2.42
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	937.60	SR-90 EFFICIENCY FACTO	(C1)		0.4051
Sample #	CRITICAL LEVEL	(Lc)	2.17	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
51B52	SEPARATION TIME	(ST)	12:50	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/12/95	DETECTION LIMIT	(Ld)		4.44
WB26870	TIME OF COUNT	(TOC)	15:15	Sr-89/90 CONC. in µCi/L =			1.0395E+00
Analyst	DATE OF COUNT	(DOC)	01/12/95				
AKL							
Date							
01/13/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.04E-03	µCi/mL
RELATIVE COUNTING ERROR =	2.1%	
PERCENT CARRIER RECOVERY =	97.5%	

DETECTION LEVEL
4.92E-06 µCi/L

Data Entry by:	MC BIERMAN	MC Bierman	Date:	13-Jan-95
Approved by:	SL FITZGERALD	[illegible]	Date:	1-13-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							BLANK
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA		1.000
BLANK	TOTAL COUNTS	(TC)	134	GROSS WEIGHT	(W2)		7.0620
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9642
403	BACKGROUND in cpm	(BKG)	13	NET WEIGHT	(W3)		0.0978
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		1.92
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	2.1472				
SOLID	SAMPLE COUNT RATE	(Rs)	0.40	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Sample #	CRITICAL LEVEL	(Lc)	2.17	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
S94T375	SEPARATION TIME	(ST)	12:50	Rmax			2.60
Instrument Code	SEPARATION DATE	(SD)	01/12/95	DETECTION LIMIT	(Ld)		4.44
WB26870	TIME OF COUNT	(TOC)	14:45	Sr-89/90 CONC in µCi/g		<	1.3447E-03
Analyst	DATE OF COUNT	(DOC)	01/12/95				
AKL							
Date							
01/13/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	< 1.34E-03	µCi/g

LESS THAN Value was Determined from Rmax.

RELATIVE COUNTING ERROR =	796.2%
PERCENT CARRIER RECOVERY =	97.8%

DETECTION LEVEL

2.30E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	13-Jan-95
Approved by:	SL FITZGERALD	Date:	1-13-95

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA		SAMPLE 1.000
SAMPLE	TOTAL COUNTS	(TC)	3695	GROSS WEIGHT	(W2)		7.0875
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9921
403	BACKGROUND in cpm	(BKG)	13	NET WEIGHT	(W3)		0.0954
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		2.58
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	2.1472				
SOLID	SAMPLE COUNT RATE	(Rs)	356.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Sample #	CRITICAL LEVEL	(Lc)	2.17	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
S94T375	SEPARATION TIME	(ST)	12:50	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/12/95	DETECTION LIMIT	(Ld)		4.44
WB26870	TIME OF COUNT	(TOC)	15:25	Sr-89/90 CONC in µCi/g			1.8778E-01
Analyst	DATE OF COUNT	(DOC)	01/12/95				
AKL							
Date							
01/13/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.88E-01	µCi/g
RELATIVE COUNTING ERROR =	3.4%	
PERCENT CARRIER RECOVERY =	95.4%	

DETECTION LEVEL
2.34E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	13-Jan-95
Approved by:	SL FITZGERALD	Date:	1-13-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							DUPLICATE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUPLICATE	TOTAL COUNTS	(TC)	5203	GROSS WEIGHT	(W2)		7.0386
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9414
403	BACKGROUND in cpm	(BKG)	13	NET WEIGHT	(W3)		0.0972
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		2.83
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	2.146				
SOLID	SAMPLE COUNT RATE	(Rs)	507.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Sample #	CRITICAL LEVEL	(Lc)	2.17	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
S94T375	SEPARATION TIME	(ST)	12:50	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/12/95	DETECTION LIMIT	(Ld)		4.44
WB26870	TIME OF COUNT	(TOC)	15:40	Sr-89/90 CONC in µCi/g			2.6167E-01
Analyst	DATE OF COUNT	(DOC)	01/12/95				
AKL							
Date							
01/13/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	2.62E-01	µCi/g
RELATIVE COUNTING ERROR	=	2.8%	
PERCENT CARRIER RECOVERY	=	97.2%	

DETECTION LEVEL
2.29E-03 µCi/g

Data Entry by:	MC BIERMAN		Date:	13-Jan-95
Approved by:	SL FITZGERALD		Date:	1-13-95

Form WB Rev. 2.1 220-10n_WB

KB

WHC-SD-WM-DP-103, REV. 1 Byl0L

LABCORE Data Entry Template for Worklist# 407

Analyst: ~~BH~~ RWK QB 1/17/95 **Instrument:** AB00 #12 WB27811 **Method:** LA-220-101 D-1

Worklist Comment: Determine sample size using Ludlum (contact Scot Fitzgerald)

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
1	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec
1	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
2	STD 51B52				@SR90-01	SR90-01	SOLID			N/A	uCi/g
2	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
2	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
3	SAMPLE	S94T000392	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
3	SAMPLE	S94T000392	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
3	SAMPLE	S94T000392	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
4	DUP	S94T000392	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
4	DUP	S94T000392	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
4	DUP	S94T000392	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.
5	SAMPLE	S94T000393	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
5	SAMPLE	S94T000393	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
5	SAMPLE	S94T000393	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
6	DUP	S94T000393	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
6	DUP	S94T000393	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
6	DUP	S94T000393	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.
7	SAMPLE	S94T000394	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
7	SAMPLE	S94T000394	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec

Data Entry Comments: Sample size based on ludlum counts S94T392 = 2999 Bq, S94T393 = 11,741 Bq, S94T394 = 2,241 Bq no alpha counts present SR carrier Book# 30016-D

Units shown for QC (SPK) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 407

Analyst: ~~RA~~ RWK 1/17/95 **Instrument:** AB00 _____ **Method:** LA-220-101

Worklist Comment: Determine sample size using Ludlum (contact Scot Fitzgerald)

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
7	SAMPLE	S94T000394	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
8	DUP	S94T000394	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
8	DUP	S94T000394	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
8	DUP	S94T000394	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.

Final page for worklist # 407

Rob King
Analyst Signature

1/14/95
Date

M E Brulman

1-17-95

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-SOLIDS

WHC-SD-WM-DP-103, REV. 1

ERR

TEST CODE: @SR90-01
INSTRUMENT: WB27811
ANALYST: RWK

SAMPLE POINT: 0
SAMPLE PREP: 0
BATCH ID: 0
ANALYSIS DATE: January 17, 1995

UNITS: µCi/g

SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *	51B52	Sr-90	1.05E-03						
BLANK	S94T392	Sr-90	1.36E-03				94.3%	2.12E-06	2.0%
SAMPLE 1	S94T392	Sr-90	3.03E-01	2.91E-01	2.97E-01	4.1%		1.15E-03	71.2%
DUPLICATE 1	S94T392	Sr-90						1.14E-03	2.7%
SAMPLE 2	S94T393	Sr-90	9.49E-01	1.06E+00	1.00E+00	10.7%		1.16E-03	2.7%
DUPLICATE 2	S94T393	Sr-90						1.10E-02	4.8%
STANDARD END								1.12E-02	4.5%
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE:

Analyst Comments:

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	01/17/95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1/18/95

Revision 2.1

LAB LEADER INFO:

Method:	LA-220-101(D-1)
Test Code	@SR90-01
Matrix:	SOLID
Work List #	407
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/17/95
Time Complete:	11:30
Chemist:	SL FITZGERALD
Analyst:	RWK
Analysis Date:	01/14/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	51B52
BLANK	S94T392
SAMPLE 1	S94T392
DUPLICATE 1	S94T392
SAMPLE 2	S94T393
DUPLICATE 2	S94T393
ST-END	

PRINT

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	10069
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	03:00
SEPARATION DATE	01/14/95
TIME OF COUNT	10:20
DATE OF COUNT	01/14/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0605
TARE WEIGHT	6.9653
STANDARD VALUE	1.1108

RESULT	
SAMPLE COUNT RATE	1.00E+03
CRITICAL LEVEL	9.71E-01
NET WEIGHT	0.0952
DELTA TIME (hours)	7.33
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.03
Sr-89/90 CONC in µCi/mL	1.05E-03
Relative Counting Error	2.0%
Percent Carrier Recovery	95.2%

Solid-Blank Run:

INPUT	
TOTAL COUNTS	50
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.884
SEPARATION TIME	03:00
SEPARATION DATE	01/14/95
TIME OF COUNT	09:10
DATE OF COUNT	01/14/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0328
TARE WEIGHT	6.9388

RESULT	
SAMPLE COUNT RATE	2.40E+00
CRITICAL LEVEL	9.71E-01
NET WEIGHT	0.0940
DELTA TIME (hours)	6.17
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.03
Sr-89/90 CONC in µCi/g	1.36E-03
Relative Counting Error	71.2%
Percent Carrier Recovery	94.0%

Solid-Sample Run 2:

INPUT	
TOTAL COUNTS	1779
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.94
SEPARATION TIME	03:10
SEPARATION DATE	01/14/95
TIME OF COUNT	11:20
DATE OF COUNT	01/14/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1018
TARE WEIGHT	7.008

RESULT	
SAMPLE COUNT RATE	1.75E+02
CRITICAL LEVEL	9.71E-01
NET WEIGHT	0.0938
DELTA TIME (hours)	8.17
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.03
Sr-89/90 CONC in µCi/g	9.49E-01
Relative Counting Error	4.8%
Percent Carrier Recovery	93.8%

Solid-Duplicate Run 2:

INPUT	
TOTAL COUNTS	1946
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.936
SEPARATION TIME	03:10
SEPARATION DATE	01/14/95
TIME OF COUNT	11:35
DATE OF COUNT	01/14/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1327
TARE WEIGHT	7.0404

RESULT	
SAMPLE COUNT RATE	1.92E+02
CRITICAL LEVEL	9.71E-01
NET WEIGHT	0.0923
DELTA TIME (hours)	8.42
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.03
Sr-89/90 CONC in µCi/g	1.06E+00
Relative Counting Error	4.5%
Percent Carrier Recovery	92.3%

Solid-Sample Run:

INPUT	
TOTAL COUNTS	5415
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.884
SEPARATION TIME	03:00
SEPARATION DATE	01/14/95
TIME OF COUNT	10:40
DATE OF COUNT	01/14/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.053
TARE WEIGHT	6.9596

RESULT	
SAMPLE COUNT RATE	5.39E+02
CRITICAL LEVEL	9.71E-01
NET WEIGHT	0.0934
DELTA TIME (hours)	7.67
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.03
Sr-89/90 CONC in µCi/g	3.03E-01
Relative Counting Error	2.7%
Percent Carrier Recovery	93.4%

Solid-Duplicate Run:

INPUT	
TOTAL COUNTS	5171
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.884
SEPARATION TIME	03:00
SEPARATION DATE	01/14/95
TIME OF COUNT	10:52
DATE OF COUNT	01/14/95
CARRIER ADDED in mL	1
GROSS WEIGHT	6.9677
TARE WEIGHT	6.875

RESULT	
SAMPLE COUNT RATE	5.15E+02
CRITICAL LEVEL	9.71E-01
NET WEIGHT	0.0927
DELTA TIME (hours)	7.87
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.03
Sr-89/90 CONC in µCi/g	2.91E-01
Relative Counting Error	2.7%
Percent Carrier Recovery	92.7%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	17-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-18-95

Revision 2.1

2678

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							BLANK
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLANK	TOTAL COUNTS	(TC)	50	GROSS WEIGHT	(W2)		7.0328
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9388
407	BACKGROUND in cpm	(BKG)	2.6	NET WEIGHT	(W3)		0.0940
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		6.17
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.884				
SOLID	SAMPLE COUNT RATE	(Rs)	2.40	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.97	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T392	SEPARATION TIME	(ST)	03:00	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/14/95	DETECTION LIMIT	(Ld)		2.03
WB27811	TIME OF COUNT	(TOC)	09:10	Sr-89/90 CONC in µCi/g			1.3626E-03
Analyst	DATE OF COUNT	(DOC)	01/14/95				
RWK							
Date							
01/17/95							
Time							
11:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.36E-03	µCi/g
RELATIVE COUNTING ERROR =	71.2%	
PERCENT CARRIER RECOVERY =	94.0%	

DETECTION LEVEL

1.15E-03 µCi/g

Data Entry by:	MC BIERMAN		Date:	17-Jan-95
Approved by:	SL FITZGERALD		Date:	1-18-95

Form WB Rev. 2.1 220-10n_WB

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

WHC-SD-WM-DP-103, REV. 1

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
STANDARD	TOTAL COUNTS	(TC)	10069	GROSS WEIGHT	(W2)		7.0605
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9653
407	BACKGROUND in cpm	(BKG)	2.6	NET WEIGHT	(W3)		0.0952
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		7.33
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1004.30	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.97	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
51B52	SEPARATION TIME	(ST)	03:00	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/14/95	DETECTION LIMIT	(Ld)		2.03
WB2781.1	TIME OF COUNT	(TOC)	10:20	Sr-89/90 CONC. in µCi/L =			1.0479E+00
Analyst	DATE OF COUNT	(DOC)	01/14/95				
RWK							
Date							
01/17/95							
Time							
11:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.05E-03	µCi/mL
RELATIVE COUNTING ERROR =	2.0%	
PERCENT CARRIER RECOVERY =	95.2%	

DETECTION LEVEL
2.12E-06 µCi/L

Data Entry by:	MC BIERMAN	MC Bierman	Date:	17-Jan-95
Approved by:	SL FITZGERALD	[signature]	Date:	1-18-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	5415	GROSS WEIGHT	(W2)		7.0530
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9596
407	BACKGROUND in cpm	(BKG)	2.6	NET WEIGHT	(W3)		0.0934
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		7.67
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.884				
SOLID	SAMPLE COUNT RATE	(Rs)	538.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.97	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T392	SEPARATION TIME	(ST)	03:00	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/14/95	DETECTION LIMIT	(Ld)		2.03
WB27811	TIME OF COUNT	(TOC)	10:40	Sr-89/90 CONC in µCi/g			3.0318E-01
Analyst	DATE OF COUNT	(DOC)	01/14/95				
RWK							
Date							
01/17/95							
Time							
11:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	3.03E-01	µCi/g
RELATIVE COUNTING ERROR =	2.7%	
PERCENT CARRIER RECOVERY =	93.4%	

DETECTION LEVEL

1.14E-03 µCi/g

Data Entry by:	MC BIERMAN		Date:	17-Jan-95
Approved by:	SL FITZGERALD		Date:	1-18-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
DUPLICATE	TOTAL COUNTS	(TC)	5171	GROSS WEIGHT	(W2)		6.9677
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8750
407	BACKGROUND in cpm	(BKG)	2.6	NET WEIGHT	(W3)		0.0927
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		7.87
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.884				
SOLID	SAMPLE COUNT RATE	(Rs)	514.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.97	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T392	SEPARATION TIME	(ST)	03:00	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/14/95	DETECTION LIMIT	(Ld)		2.03
WB27811	TIME OF COUNT	(TOC)	10:52	Sr-89/90 CONC in µCi/g			2.9104E-01
Analyst	DATE OF COUNT	(DOC)	01/14/95				
RWK							
Date							
01/17/95							
Time							
11:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	2.91E-01	µCi/g
RELATIVE COUNTING ERROR	=	2.7%	
PERCENT CARRIER RECOVERY	=	92.7%	

DETECTION LEVEL

1.15E-03 µCi/g

Data Entry by:	MC BIERMAN		Date:	17-Jan-95
Approved by:	SL FITZGERALD		Date:	1-18-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		SAMPLE 1.000
SAMPLE	TOTAL COUNTS	(TC)	1779	GROSS WEIGHT	(W2)		7.1018
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0080
407	BACKGROUND in cpm	(BKG)	2.6	NET WEIGHT	(W3)		0.0938
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		8.17
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1.94				
SOLID	SAMPLE COUNT RATE	(Rs)	175.30	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.97	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T393	SEPARATION TIME	(ST)	03:10	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/14/95	DETECTION LIMIT	(Ld)		2.03
WB27811	TIME OF COUNT	(TOC)	11:20	Sr-89/90 CONC in µCi/g			9.4885E-01
Analyst	DATE OF COUNT	(DOC)	01/14/95				
RWK							
Date							
01/17/95							
Time							
11:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	9.49E-01	µCi/g
RELATIVE COUNTING ERROR =	4.8%	
PERCENT CARRIER RECOVERY =	93.8%	

DETECTION LEVEL

1.10E-02 µCi/g

Data Entry by:	MC BIERMAN		Date:	17-Jan-95
Approved by:	SL FITZGERALD		Date:	1-18-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
DUPLICATE	TOTAL COUNTS	(TC)	1946	GROSS WEIGHT	(W2)		7.1327
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0404
407	BACKGROUND in cpm	(BKG)	2.6	NET WEIGHT	(W3)		0.0923
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		8.42
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	(Dg/L)	1.936				
SOLID	SAMPLE COUNT RATE	(Rs)	192.00	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.97	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T393	SEPARATION TIME	(ST)	03:10	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/14/95	DETECTION LIMIT	(Ld)		2.03
WB27811	TIME OF COUNT	(TOC)	11:35	Sr-89/90 CONC in µCi/g			1.0557E+00
Analyst	DATE OF COUNT	(DOC)	01/14/95				
RWK							
Date							
01/17/95							
Time							
11:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	1.06E+00	µCi/g
RELATIVE COUNTING ERROR	=	4.5%	
PERCENT CARRIER RECOVERY	=	92.3%	

DETECTION LEVEL
1.12E-02 µCi/g

Data Entry by:	MC BIERMAN		Date:	17-Jan-95
Approved by:	SL FITZGERALD		Date:	1-18-95

Form WB Rev. 2.1 220-10n_WB

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
WHC-SD-WM-DP-103, REV. 1

RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-SOLIDS
ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	RWK	BATCH ID:	0
		ANALYSIS DATE:	January 17, 1995

UNITS: µCi/g

SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *									
BLANK									
SAMPLE 1	S94T394	Sr-90	1.82E-01	1.88E-01	1.85E-01	2.9%		1.09E-03	3.4%
DUPLICATE 1	S94T394	Sr-90						1.05E-03	3.3%
SAMPLE 2					N/A	N/A			
STANDARD END									
	STD ID:	STD VOL.:							

NARRATIVE:

Analyst Comments:

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	01/17/95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-18-95

Revision 2.1

LAB LEADER INFO:	
Method:	LA-220-101(D-1)
Test Code	@SR90-01
Matrix:	SOLID
Work List #	407
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/17/95
Time Complete:	11:30
Chemist:	SL FITZGERALD
Analyst:	RWK
Analysis Date:	01/14/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	
BLANK	
SAMPLE 1	S94T394
DUPLICATE 1	S94T394
SAMPLE 2	
DUPLICATE 2	
ST-END	

PRINT

TECH INFO:

Liquids Standard Run		Solid-Blank Run:		Solid-Sample Run 2:		Solid-Duplicate Run 2:	
INPUT		**INPUT**		**INPUT**		**INPUT**	
TOTAL COUNTS		TOTAL COUNTS		TOTAL COUNTS		TOTAL COUNTS	
COUNT TIME in MINUTES		COUNT TIME in MINUTES		COUNT TIME in MINUTES		COUNT TIME in MINUTES	
BACKGROUND in cpm		BACKGROUND in cpm		BACKGROUND in cpm		BACKGROUND in cpm	
SAMPLE VOLUME in mL		SAMPLE VOLUME in mL		SAMPLE VOLUME in mL		SAMPLE VOLUME in mL	
DILUTION FACTOR		DILUTION FACTOR		DILUTION FACTOR		DILUTION FACTOR	
DIGEST DILUTION FACTOR		DIGEST FACTOR (g/L)		DIGEST FACTOR (g/L)		DIGEST FACTOR (g/L)	
SEPARATION TIME		SEPARATION TIME		SEPARATION TIME		SEPARATION TIME	
SEPARATION DATE		SEPARATION DATE		SEPARATION DATE		SEPARATION DATE	
TIME OF COUNT		TIME OF COUNT		TIME OF COUNT		TIME OF COUNT	
DATE OF COUNT		DATE OF COUNT		DATE OF COUNT		DATE OF COUNT	
CARRIER ADDED in mL		CARRIER ADDED in mL		CARRIER ADDED in mL		CARRIER ADDED in mL	
GROSS WEIGHT		GROSS WEIGHT		GROSS WEIGHT		GROSS WEIGHT	
TARE WEIGHT		TARE WEIGHT		TARE WEIGHT		TARE WEIGHT	
STANDARD VALUE							
RESULT		**RESULT**		**RESULT**		**RESULT**	
SAMPLE COUNT RATE		SAMPLE COUNT RATE		SAMPLE COUNT RATE		SAMPLE COUNT RATE	
CRITICAL LEVEL		CRITICAL LEVEL		CRITICAL LEVEL		CRITICAL LEVEL	
NET WEIGHT		NET WEIGHT		NET WEIGHT		NET WEIGHT	
DELTA TIME (hours)		DELTA TIME (hours)		DELTA TIME (hours)		DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR		SR-90 EFFICIENCY FACTOR		SR-90 EFFICIENCY FACTOR		SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR		Y-90 EFFICIENCY FACTOR		Y-90 EFFICIENCY FACTOR		Y-90 EFFICIENCY FACTOR	
Rmax		Rmax		Rmax		Rmax	
DETECTION LIMIT		DETECTION LIMIT		DETECTION LIMIT		DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL		Sr-89/90 CONC in µCi/g		Sr-89/90 CONC in µCi/g		Sr-89/90 CONC in µCi/g	
Relative Counting Error		Relative Counting Error		Relative Counting Error		Relative Counting Error	
Percent Carrier Recovery		Percent Carrier Recovery		Percent Carrier Recovery		Percent Carrier Recovery	

Solid-Sample Run:		Solid-Duplicate Run:		Liquids Standard End	
INPUT		**INPUT**		**INPUT**	
TOTAL COUNTS	3435	TOTAL COUNTS	3646	TOTAL COUNTS	
COUNT TIME in MINUTES	10	COUNT TIME in MINUTES	10	COUNT TIME in MINUTES	
BACKGROUND in cpm	3	BACKGROUND in cpm	3	BACKGROUND in cpm	
SAMPLE VOLUME in mL	1	SAMPLE VOLUME in mL	1	SAMPLE VOLUME in mL	
DILUTION FACTOR	1	DILUTION FACTOR	1	DILUTION FACTOR	
DIGEST FACTOR (g/L)	1.96	DIGEST FACTOR (g/L)	1.964	DIGEST DILUTION FACTOR	
SEPARATION TIME	03:10	SEPARATION TIME	03:10	SEPARATION TIME	
SEPARATION DATE	01/14/95	SEPARATION DATE	01/14/95	SEPARATION DATE	
TIME OF COUNT	13:20	TIME OF COUNT	13:40	TIME OF COUNT	
DATE OF COUNT	01/14/95	DATE OF COUNT	01/14/95	DATE OF COUNT	
CARRIER ADDED in mL	1	CARRIER ADDED in mL	1	CARRIER ADDED in mL	
GROSS WEIGHT	7.0405	GROSS WEIGHT	6.905	GROSS WEIGHT	
TARE WEIGHT	6.9483	TARE WEIGHT	6.8104	TARE WEIGHT	
				STANDARD VALUE	
RESULT		**RESULT**		**RESULT**	
SAMPLE COUNT RATE	3.41E+02	SAMPLE COUNT RATE	3.62E+02	SAMPLE COUNT RATE	
CRITICAL LEVEL	9.71E-01	CRITICAL LEVEL	9.71E-01	CRITICAL LEVEL	
NET WEIGHT	0.0922	NET WEIGHT	0.0946	NET WEIGHT	
DELTA TIME (hours)	10.17	DELTA TIME (hours)	10.50	DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	0.42	SR-90 EFFICIENCY FACTOR	0.42	SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	0.47	Y-90 EFFICIENCY FACTOR	0.47	Y-90 EFFICIENCY FACTOR	
Rmax	N/A	Rmax	N/A	Rmax	
DETECTION LIMIT	2.03	DETECTION LIMIT	2.03	DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	1.82E-01	Sr-89/90 CONC in µCi/g	1.88E-01	Sr-89/90 CONC in µCi/mL	
Relative Counting Error	3.4%	Relative Counting Error	3.3%	Relative Counting Error	
Percent Carrier Recovery	92.2%	Percent Carrier Recovery	94.6%	Percent Carrier Recovery	

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	17-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-18-95

Revision 2.1

2686

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
SAMPLE	TOTAL COUNTS	(TC)	3435	GROSS WEIGHT	(W2)		7.0405
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9483
407	BACKGROUND in cpm	(BKG)	2.6	NET WEIGHT	(W3)		0.0922
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		10.17
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.96				
SOLID	SAMPLE COUNT RATE	(Rs)	340.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.97	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T394	SEPARATION TIME	(ST)	03:10	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/14/95	DETECTION LIMIT	(Ld)		2.03
WB27811	TIME OF COUNT	(TOC)	13:20	Sr-89/90 CONC in µCi/g			1.8217E-01
Analyst	DATE OF COUNT	(DOC)	01/14/95				
RWK							
Date							
01/17/95							
Time							
11:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.82E-01	µCi/g
RELATIVE COUNTING ERROR =	3.4%	
PERCENT CARRIER RECOVERY =	92.2%	

DETECTION LEVEL

1.09E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	17-Jan-95
Approved by:	SL FITZGERALD	Date:	1-18-95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		DUPLICATE 1.000
DUPLICATE	TOTAL COUNTS	(TC)	3646	GROSS WEIGHT	(W2)		6.9050
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8104
407	BACKGROUND in cpm	(BKG)	2.6	NET WEIGHT	(W3)		0.0946
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		10.50
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.964				
SOLID	SAMPLE COUNT RATE	(Rs)	362.00	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.97	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T394	SEPARATION TIME	(ST)	03:10	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/14/95	DETECTION LIMIT	(Ld)		2.03
WB27811	TIME OF COUNT	(TOC)	13:40	Sr-89/90 CONC in µCi/g			1.8756E-01
Analyst	DATE OF COUNT	(DOC)	01/14/95				
RWK							
Date							
01/17/95							
Time							
11:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.88E-01	µCi/g
RELATIVE COUNTING ERROR =	3.3%	
PERCENT CARRIER RECOVERY =	94.6%	

DETECTION LEVEL

1.05E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	17-Jan-95
Approved by:	SL FITZGERALD	Date:	1-18-95

Form WB Rev. 2.1 220-10n_WB

By104

LABCORE Data Entry Template for Worklist# 471

Analyst: RAC **Instrument:** AB00 _____ **Method:** LA-220-101 D-1

Worklist Comment: Use .100-10-.100mL ~~100 mL~~ sample size. SLF SLF 1-28-95

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01	SR90-01	LIQUID			N/A	uCi/m
1	BLNK-PREP				@SR90-01	SR90-01C	LIQUID			N/A	% Rec
1	BLNK-PREP				@SR90-01	SR90-01E	LIQUID			N/A	% Ct.
2	STD 57B52				@SR90-01	SR90-01	LIQUID			N/A	uCi/m
2	STD				@SR90-01	SR90-01C	LIQUID			N/A	% Rec
2	STD				@SR90-01	SR90-01E	LIQUID			N/A	% Ct.
3	SAMPLE	S94T000355	0		@SR90-01	SR90-01	LIQUID	N/A			uCi/m
3	SAMPLE	S94T000355	0		@SR90-01	SR90-01C	LIQUID	N/A			% Rec
3	SAMPLE	S94T000355	0		@SR90-01	SR90-01E	LIQUID	N/A			% Ct.
4	DUP	S94T000355	0		@SR90-01	SR90-01	LIQUID			N/A	uCi/m
4	DUP	S94T000355	0		@SR90-01	SR90-01C	LIQUID			N/A	% Rec
4	DUP	S94T000355	0		@SR90-01	SR90-01E	LIQUID			N/A	% Ct.
5	SAMPLE	S94T000371	0		@SR90-01	SR90-01	LIQUID	N/A			uCi/m
5	SAMPLE	S94T000371	0		@SR90-01	SR90-01C	LIQUID	N/A			% Rec
5	SAMPLE	S94T000371	0		@SR90-01	SR90-01E	LIQUID	N/A			% Ct.
6	DUP	S94T000371	0		@SR90-01	SR90-01	LIQUID			N/A	uCi/m
6	DUP	S94T000371	0		@SR90-01	SR90-01C	LIQUID			N/A	% Rec
6	DUP	S94T000371	0		@SR90-01	SR90-01E	LIQUID			N/A	% Ct.
7	SAMPLE	S95T000004	0		@SR90-01	SR90-01	LIQUID	N/A			uCi/m
7	SAMPLE	S95T000004	0		@SR90-01	SR90-01C	LIQUID	N/A			% Rec

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 471

Analyst: _____ **Instrument:** AB00 _____ **Method:** LA-220-101

Worklist Comment: Use .100 mL sample size. SLF

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
7	SAMPLE	S95T000004	0		@SR90-01	SR90-01E	LIQUID	N/A			% Ct.
8	DUP	S95T000004	0		@SR90-01	SR90-01	LIQUID			N/A	uCi/m
8	DUP	S95T000004	0		@SR90-01	SR90-01C	LIQUID			N/A	% Rec
8	DUP	S95T000004	0		@SR90-01	SR90-01E	LIQUID			N/A	% Ct.

Final page for worklist # 471

Rae Ann Green
Analyst Signature

January 28, 1995
Date

M G Brown

1-30-95

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
WHC-SD-WM-DP-103, REV. 1

RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-LIQUIDS
ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	RAG	BATCH ID:	0
		ANALYSIS DATE:	January 30, 1995

	UNITS:	µCi/mL							
SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *	61B52	Sr-90	1.05E-03				94.2%	2.63E-06	2.0%
BLANK	S94T355	Sr-90	8.41E-03					2.54E-03	30.1%
SAMPLE 1	S94T355	Sr-90	2.07E-02	1.72E-02	1.89E-02	18.8%		2.59E-03	16.4%
DUPLICATE 1	S94T355	Sr-90						2.70E-03	19.1%
SAMPLE 2	S94T371	Sr-90	3.95E-02	3.70E-02	3.83E-02	6.6%		2.66E-03	11.2%
DUPLICATE 2	S94T371	Sr-90						2.75E-03	11.9%
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE:

Analyst Comments:

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:		Date:	01/30/95
Chemist Approval:	SL FITZGERALD	Signature:		Date:	1/30/95

Revision 2.1

LAB LEADER INFO:	
Method:	LA220-101(D-1)
Test Code	@SR90-01
Matrix:	LIQUID
Work List #	471
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/30/95
Time Complete:	11:00
Chemist:	SL FITZGERALD
Analyst:	RAG
Analysis Date:	01/28/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	51B52
BLANK	S94T355
SAMPLE 1	S94T355
DUPLICATE 1	S94T355
SAMPLE 2	S94T371
DUPLICATE 2	S94T371
ST-END	

PRINT

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	9984
COUNT TIME in MINUTES	10
BACKGROUND in cpm	4
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	04:15
SEPARATION DATE	01/28/95
TIME OF COUNT	11:05
DATE OF COUNT	01/28/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.9696
TARE WEIGHT	7.8746
STANDARD VALUE	1.1098

RESULT	
SAMPLE COUNT RATE	9.94E+02
CRITICAL LEVEL	1.20E+00
NET WEIGHT	0.0950
DELTA TIME (hours)	6.83
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.50
Sr-89/90 CONC in µCi/mL	1.05E-03
Relative Counting Error	2.0%
Percent Carrier Recovery	95.0%

Liquids Blank Run

INPUT	
TOTAL COUNTS	123
COUNT TIME in MINUTES	10
BACKGROUND in cpm	4
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	101
DIGEST DILUTION FACTOR	1
SEPARATION TIME	04:35
SEPARATION DATE	01/28/95
TIME OF COUNT	11:35
DATE OF COUNT	01/28/95
CARRIER ADDED in mL	1
GROSS WEIGHT	6.9795
TARE WEIGHT	6.8802

RESULT	
SAMPLE COUNT RATE	8.30E+00
CRITICAL LEVEL	1.20E+00
NET WEIGHT	0.0993
DELTA TIME (hours)	7.00
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.50
Sr-89/90 CONC in µCi/mL	8.41E-03
Relative Counting Error	30.1%
Percent Carrier Recovery	99.3%

Liquids Sample Run 2

INPUT	
TOTAL COUNTS	412
COUNT TIME in MINUTES	10
BACKGROUND in cpm	4
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	101
DIGEST DILUTION FACTOR	1
SEPARATION TIME	04:15
SEPARATION DATE	01/28/95
TIME OF COUNT	12:40
DATE OF COUNT	01/28/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.9829
TARE WEIGHT	7.8895

RESULT	
SAMPLE COUNT RATE	3.72E+01
CRITICAL LEVEL	1.20E+00
NET WEIGHT	0.0934
DELTA TIME (hours)	8.42
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.50
Sr-89/90 CONC in µCi/mL	3.95E-02
Relative Counting Error	11.2%
Percent Carrier Recovery	93.4%

Liquids Duplicate Run 2

INPUT	
TOTAL COUNTS	377
COUNT TIME in MINUTES	10
BACKGROUND in cpm	4
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	101
DIGEST DILUTION FACTOR	1
SEPARATION TIME	04:35
SEPARATION DATE	01/28/95
TIME OF COUNT	13:05
DATE OF COUNT	01/28/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.109
TARE WEIGHT	7.0187

RESULT	
SAMPLE COUNT RATE	3.37E+01
CRITICAL LEVEL	1.20E+00
NET WEIGHT	0.0903
DELTA TIME (hours)	8.50
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.50
Sr-89/90 CONC in µCi/mL	3.70E-02
Relative Counting Error	11.9%
Percent Carrier Recovery	90.3%

Liquids Sample Run

INPUT	
TOTAL COUNTS	240
COUNT TIME in MINUTES	10
BACKGROUND in cpm	4
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	101
DIGEST DILUTION FACTOR	1
SEPARATION TIME	04:15
SEPARATION DATE	01/28/95
TIME OF COUNT	12:15
DATE OF COUNT	01/28/95
CARRIER ADDED in mL	1
GROSS WEIGHT	8.0718
TARE WEIGHT	7.9756

RESULT	
SAMPLE COUNT RATE	2.00E+01
CRITICAL LEVEL	1.20E+00
NET WEIGHT	0.0962
DELTA TIME (hours)	8.00
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.50
Sr-89/90 CONC in µCi/mL	2.07E-02
Relative Counting Error	16.4%
Percent Carrier Recovery	96.2%

Liquids Duplicate Run

INPUT	
TOTAL COUNTS	199
COUNT TIME in MINUTES	10
BACKGROUND in cpm	4
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	101
DIGEST DILUTION FACTOR	1
SEPARATION TIME	04:35
SEPARATION DATE	01/28/95
TIME OF COUNT	12:30
DATE OF COUNT	01/28/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1786
TARE WEIGHT	7.0862

RESULT	
SAMPLE COUNT RATE	1.59E+01
CRITICAL LEVEL	1.20E+00
NET WEIGHT	0.0924
DELTA TIME (hours)	7.92
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.50
Sr-89/90 CONC in µCi/mL	1.72E-02
Relative Counting Error	19.1%
Percent Carrier Recovery	92.4%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	30-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-30-95

Revision 2.1

20592

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	BLANK 1.000
BLANK	TOTAL COUNTS	(TC)	123	GROSS WEIGHT	(W2)	6.9795
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.8802
471	BACKGROUND in cpm	(BKG)	4	NET WEIGHT	(W3)	0.0993
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	7.00
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	DDF	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	8.30	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
S94T355	SEPARATION TIME	(ST)	04:35	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	01/28/95	DETECTION LIMIT	(Ld)	2.50
WB27811	TIME OF COUNT	(TOC)	11:35	Sr-89/90 CONC in µCi/L		8.4146E+00
Analyst	DATE OF COUNT	(DOC)	01/28/95			
RAG						
Date						
01/30/95						
Time						
11:00						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with
RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	8.41E-03	µCi/mL
RELATIVE COUNTING ERROR =	30.1%	
PERCENT CARRIER RECOVERY =	99.3%	

DETECTION LEVEL
2.54E-03 µCi/mL

Data Entry by:	MC BIERMAN		
Approved by:	SL FITZGERALD	Date:	30-Jan-95
		Date:	1/30/95

Form WB Rev. 2.1 220-10n_WB

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
STANDARD	TOTAL COUNTS	(TC)	9984	GROSS WEIGHT	(W2)		7.9696
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.8746
471	BACKGROUND in cpm	(BKG)	4	NET WEIGHT	(W3)		0.0950
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		6.83
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	994.40	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
51B52	SEPARATION TIME	(ST)	04:15	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/28/95	DETECTION LIMIT	(Ld)		2.50
WB2781.1	TIME OF COUNT	(TOC)	11:05	Sr-89/90 CONC. in µCi/L =			1.0451E+00
Analyst	DATE OF COUNT	(DOC)	01/28/95				
RAG							
Date							
01/30/95							
Time							
11:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.05E-03	µCi/mL
RELATIVE COUNTING ERROR =	2.0%	
PERCENT CARRIER RECOVERY =	95.0%	

DETECTION LEVEL
2.63E-06 µCi/L

Data Entry by:	MC BIERMAN		Date:	30-Jan-95
Approved by:	SL FITZGERALD		Date:	1/30/95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	240	GROSS WEIGHT	(W2)		8.0718
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9756
471	BACKGROUND in cpm	(BKG)	4	NET WEIGHT	(W3)		0.0962
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		8.00
@SR90-01	DILUTION FACTOR	(DF)	101				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	20.00	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T355	SEPARATION TIME	(ST)	04:15	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/28/95	DETECTION LIMIT	(Ld)		2.50
WB27811	TIME OF COUNT	(TOC)	12:15	Sr-89/90 CONC in µCi/L			2.0717E+01
Analyst	DATE OF COUNT	(DOC)	01/28/95				
RAG							
Date							
01/30/95							
Time							
11:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	2.07E-02	µCi/mL
RELATIVE COUNTING ERROR =	16.4%	
PERCENT CARRIER RECOVERY =	96.2%	

DETECTION LEVEL

2.59E-03 µCi/mL

Data Entry by:	MC BIERMAN		Date:	30-Jan-95
Approved by:	SL FITZGERALD		Date:	1/30/95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
DUPLICATE	TOTAL COUNTS	(TC)	199	GROSS WEIGHT	(W2)		7.1786
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0862
471	BACKGROUND in cpm	(BKG)	4	NET WEIGHT	(W3)		0.0924
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		7.92
@SR90-01	DILUTION FACTOR	(DF)	101				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	15.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S941355	SEPARATION TIME	(ST)	04:35	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/28/95	DETECTION LIMIT	(Ld)		2.50
WB27811	TIME OF COUNT	(TOC)	12:30	Sr-89/90 CONC in µCi/L			1.7162E+01
Analyst	DATE OF COUNT	(DOC)	01/28/95				
RAG							
Date							
01/30/95							
Time							
11:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.72E-02	µCi/mL
RELATIVE COUNTING ERROR =	19.1%	
PERCENT CARRIER RECOVERY =	92.4%	

DETECTION LEVEL

2.70E-03 µCi/mL

Data Entry by:	MC BIERMAN		Date:	30-Jan-95
Approved by:	SL FITZGERALD		Date:	1/30/95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	412	GROSS WEIGHT	(W2)		7.9829
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.8895
471	BACKGROUND in cpm	(BKG)	4	NET WEIGHT	(W3)		0.0934
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		8.42
@SR90-01	DILUTION FACTOR	(DF)	101				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	37.20	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S941371	SEPARATION TIME	(ST)	04:15	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/28/95	DETECTION LIMIT	(Ld)		2.50
WB27811	TIME OF COUNT	(TOC)	12:40	Sr-89/90 CONC in µCi/L			3.9523E+01
Analyst	DATE OF COUNT	(DOC)	01/28/95				
RAG							
Date							
01/30/95							
Time							
11:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	3.95E-02	µCi/mL
RELATIVE COUNTING ERROR	=	11.2%	
PERCENT CARRIER RECOVERY	=	93.4%	

DETECTION LEVEL

2.66E-03 µCi/mL

Data Entry by:	MC BIERMAN		Date:	30-Jan-95
Approved by:	SL FITZGERALD		Date:	1/30/95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA	DUPLICATE 1.000
DUPLICATE	TOTAL COUNTS	(TC)	377	GROSS WEIGHT	(W2)	7.1090
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0187
471	BACKGROUND in cpm	(BKG)	4	NET WEIGHT	(W3)	0.0903
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	8.50
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(Dg/L)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	33.70	SR-90 EFFICIENCY FACTO	(C1)	0.4180
Sample #	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
S94T371	SEPARATION TIME	(ST)	04:35	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	01/28/95	DETECTION LIMIT	(Ld)	2.50
WB27811	TIME OF COUNT	(TOC)	13:05	Sr-89/90 CONC in µCi/L		3.7002E+01
Analyst	DATE OF COUNT	(DOC)	01/28/95			
RAG						
Date						
01/30/95						
Time						
11:00						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	3.70E-02	µCi/mL
RELATIVE COUNTING ERROR =	11.9%	
PERCENT CARRIER RECOVERY =	90.3%	

DETECTION LEVEL
2.75E-03 µCi/mL

Data Entry by:	MC BIERMAN		
Approved by:	SL FITZGERALD	Date:	30-Jan-95
		Date:	1/30/95

Form WB Rev. 2.1 220-10n_WB

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-LIQUIDS

WHC-SD-WM-DP-103, REV. 1

ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	RAG	BATCH ID:	0
		ANALYSIS DATE:	January 30, 1995

UNITS: µCi/mL

SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *									
BLANK									
SAMPLE 1	S95T4	Sr-90	6.10E-02	5.07E-02	5.59E-02	18.3%		2.72E-03	8.8%
DUPLICATE 1	S95T4	Sr-90						2.52E-03	9.4%
SAMPLE 2					N/A	N/A			
STANDARD END									
	STD ID:	STD VOL.:							

NARRATIVE:

Analyst Comments:

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:		Date:	01/30/95
Chemist Approval:	SL FITZGERALD	Signature:		Date:	1/30/95

Revision 2.1

LAB LEADER INFO:	
Method:	LA-220-101(D-1)
Test Code	@SR90-01
Matrix:	LIQUID
Work List #	471
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/30/95
Time Complete:	11:00
Chemist:	SL FITZGERALD
Analyst:	RAG
Analysis Date:	01/28/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	
BLANK	
SAMPLE 1	S95T4
DUPLICATE 1	S95T4
SAMPLE 2	
DUPLICATE 2	
ST-END	

PRINT

TECH INFO:

Liquids Standard Run		Liquids Blank Run		Liquids Sample Run 2		Liquids Duplicate Run 2	
INPUT		**INPUT**		**INPUT**		**INPUT**	
TOTAL COUNTS		TOTAL COUNTS		TOTAL COUNTS		TOTAL COUNTS	
COUNT TIME in MINUTES		COUNT TIME in MINUTES		COUNT TIME in MINUTES		COUNT TIME in MINUTES	
BACKGROUND in cpm		BACKGROUND in cpm		BACKGROUND in cpm		BACKGROUND in cpm	
SAMPLE VOLUME in mL		SAMPLE VOLUME in mL		SAMPLE VOLUME in mL		SAMPLE VOLUME in mL	
DILUTION FACTOR		DILUTION FACTOR		DILUTION FACTOR		DILUTION FACTOR	
DIGEST DILUTION FACTOR		DIGEST DILUTION FACTOR		DIGEST DILUTION FACTOR		DIGEST DILUTION FACTOR	
SEPARATION TIME		SEPARATION TIME		SEPARATION TIME		SEPARATION TIME	
SEPARATION DATE		SEPARATION DATE		SEPARATION DATE		SEPARATION DATE	
TIME OF COUNT		TIME OF COUNT		TIME OF COUNT		TIME OF COUNT	
DATE OF COUNT		DATE OF COUNT		DATE OF COUNT		DATE OF COUNT	
CARRIER ADDED in mL		CARRIER ADDED in mL		CARRIER ADDED in mL		CARRIER ADDED in mL	
GROSS WEIGHT		GROSS WEIGHT		GROSS WEIGHT		GROSS WEIGHT	
TARE WEIGHT		TARE WEIGHT		TARE WEIGHT		TARE WEIGHT	
STANDARD VALUE							
RESULT		**RESULT**		**RESULT**		**RESULT**	
SAMPLE COUNT RATE		SAMPLE COUNT RATE		SAMPLE COUNT RATE		SAMPLE COUNT RATE	
CRITICAL LEVEL		CRITICAL LEVEL		CRITICAL LEVEL		CRITICAL LEVEL	
NET WEIGHT		NET WEIGHT		NET WEIGHT		NET WEIGHT	
DELTA TIME (hours)		DELTA TIME (hours)		DELTA TIME (hours)		DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR		SR-90 EFFICIENCY FACTOR		SR-90 EFFICIENCY FACTOR		SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR		Y-90 EFFICIENCY FACTOR		Y-90 EFFICIENCY FACTOR		Y-90 EFFICIENCY FACTOR	
Rmax		Rmax		Rmax		Rmax	
DETECTION LIMIT		DETECTION LIMIT		DETECTION LIMIT		DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL		Sr-89/90 CONC in µCi/mL		Sr-89/90 CONC in µCi/mL		Sr-89/90 CONC in µCi/mL	
Relative Counting Error		Relative Counting Error		Relative Counting Error		Relative Counting Error	
Percent Carrier Recovery		Percent Carrier Recovery		Percent Carrier Recovery		Percent Carrier Recovery	

Liquids Sample Run		Liquids Duplicate Run		Liquids Standard End	
INPUT		**INPUT**		**INPUT**	
TOTAL COUNTS	601	TOTAL COUNTS	543	TOTAL COUNTS	
COUNT TIME in MINUTES	10	COUNT TIME in MINUTES	10	COUNT TIME in MINUTES	
BACKGROUND in cpm	4	BACKGROUND in cpm	4	BACKGROUND in cpm	
SAMPLE VOLUME in mL	0.1	SAMPLE VOLUME in mL	0.1	SAMPLE VOLUME in mL	
DILUTION FACTOR	101	DILUTION FACTOR	101	DILUTION FACTOR	
DIGEST DILUTION FACTOR	1	DIGEST DILUTION FACTOR	1	DIGEST DILUTION FACTOR	
SEPARATION TIME	04:15	SEPARATION TIME	04:35	SEPARATION TIME	
SEPARATION DATE	01/28/95	SEPARATION DATE	01/28/95	SEPARATION DATE	
TIME OF COUNT	13:20	TIME OF COUNT	13:30	TIME OF COUNT	
DATE OF COUNT	01/28/95	DATE OF COUNT	01/28/95	DATE OF COUNT	
CARRIER ADDED in mL	1	CARRIER ADDED in mL	1	CARRIER ADDED in mL	
GROSS WEIGHT	8.0557	GROSS WEIGHT	7.0019	GROSS WEIGHT	
TARE WEIGHT	7.965	TARE WEIGHT	6.904	TARE WEIGHT	
				STANDARD VALUE	
RESULT		**RESULT**		**RESULT**	
SAMPLE COUNT RATE	5.61E+01	SAMPLE COUNT RATE	5.03E+01	SAMPLE COUNT RATE	
CRITICAL LEVEL	1.20E+00	CRITICAL LEVEL	1.20E+00	CRITICAL LEVEL	
NET WEIGHT	0.0907	NET WEIGHT	0.0979	NET WEIGHT	
DELTA TIME (hours)	9.08	DELTA TIME (hours)	8.92	DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	0.42	SR-90 EFFICIENCY FACTOR	0.42	SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	0.47	Y-90 EFFICIENCY FACTOR	0.47	Y-90 EFFICIENCY FACTOR	
Rmax	N/A	Rmax	N/A	Rmax	
DETECTION LIMIT	2.50	DETECTION LIMIT	2.50	DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	6.10E-02	Sr-89/90 CONC in µCi/mL	5.07E-02	Sr-89/90 CONC in µCi/mL	
Relative Counting Error	8.8%	Relative Counting Error	9.4%	Relative Counting Error	
Percent Carrier Recovery	90.7%	Percent Carrier Recovery	97.9%	Percent Carrier Recovery	

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	30-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1/30/95

Revision 2.1

2/00

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	SAMPLE 1.000
SAMPLE	TOTAL COUNTS	(TC)	601	GROSS WEIGHT	(W2)	8.0557
Work List 471	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9650
Test Code @SR90-01	BACKGROUND in cpm	(BKG)	4	NET WEIGHT	(W3)	0.0907
Matrix	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	9.08
LIQUID	DILUTION FACTOR	(DF)	101			
Sample #	DIGEST DILUTION FACTOR	DDF	1			
S95T4	SAMPLE COUNT RATE	(Rs)	56.10	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Instrument Code WB27811	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
Analyst RAG	SEPARATION TIME	(ST)	04:15	Rmax		N/A
Date 01/30/95	SEPARATION DATE	(SD)	01/28/95	DETECTION LIMIT	(Ld)	2.50
Time 11:00	TIME OF COUNT	(TOC)	13:20	Sr-89/90 CONC in µCi/L		6.0971E+01
	DATE OF COUNT	(DOC)	01/28/95			

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	6.10E-02	µCi/mL
RELATIVE COUNTING ERROR =	8.8%	
PERCENT CARRIER RECOVERY =	90.7%	

DETECTION LEVEL
2.72E-03 µCi/mL

Data Entry by:	MC BIERMAN		
Approved by:	SL FITZGERALD	Date:	30-Jan-95
		Date:	1/30/95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		DUPLICATE 1.000
DUPLICATE	TOTAL COUNTS	(TC)	543	GROSS WEIGHT	(W2)		7.0019
Work List 471	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9040
Test Code @SR90-01	BACKGROUND in cpm	(BKG)	4	NET WEIGHT	(W3)		0.0979
Matrix	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		8.92
LIQUID	DILUTION FACTOR	(DF)	101				
Sample # 595T4	DIGEST DILUTION FACTOR	DDF	1				
Instrument Code WB27811	SAMPLE COUNT RATE	(Rs)	50.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Analyst RAG	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
Date 01/30/95	SEPARATION TIME	(ST)	04:35	Rmax			N/A
Time 11:00	SEPARATION DATE	(SD)	01/28/95	DETECTION LIMIT	(Ld)		2.50
	TIME OF COUNT	(TOC)	13:30	Sr-89/90 CONC in µCi/L			5.0731E+01
	DATE OF COUNT	(DOC)	01/28/95				

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	5.07E-02	µCi/mL
RELATIVE COUNTING ERROR =	9.4%	
PERCENT CARRIER RECOVERY =	97.9%	

DETECTION LEVEL 2.52E-03 µCi/mL

Data Entry by:	MC BIERMAN		
Approved by:	SL FITZGERALD	Date:	30-Jan-95
		Date:	1/30/95

Form WB Rev. 2.1 220-10n_WB

LABCORE Data Entry Template for Worklist# 1142

Analyst: S.C.L **Instrument:** AB00 #10 UD 26870 **Book #** 51BV2

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: Determine sample size using Ludlum. SLF

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				@SR90-01 SR90-01	SOLID			N/A	uCi/g
		1	STD				@SR90-01 SR90-01C	SOLID			N/A	% Recovery
		1	STD				@SR90-01 SR90-01E	SOLID			N/A	% Ct. Error
		2	BLNK-PREP				@SR90-01 SR90-01	SOLID			N/A	uCi/g
		2	BLNK-PREP				@SR90-01 SR90-01C	SOLID			N/A	% Recovery
		2	BLNK-PREP				@SR90-01 SR90-01E	SOLID			N/A	% Ct. Error
		3	BLNK/BKG	1.09			@SR90-01 SR90-01	SOLID			N/A	uCi/g
95000007	BY-106	4	SAMPLE	S95T000101	0		@SR90-01 SR90-01	SOLID	N/A			uCi/g
95000007	BY-106	4	SAMPLE	S95T000101	0		@SR90-01 SR90-01C	SOLID	N/A			% Recovery
95000007	BY-106	4	SAMPLE	S95T000101	0		@SR90-01 SR90-01E	SOLID	N/A			% Ct. Error
95000007	BY-106	5	DUP	S95T000101	0		@SR90-01 SR90-01	SOLID			N/A	uCi/g
95000007	BY-106	5	DUP	S95T000101	0		@SR90-01 SR90-01C	SOLID			N/A	% Recovery
95000007	BY-106	5	DUP	S95T000101	0		@SR90-01 SR90-01E	SOLID			N/A	% Ct. Error

Final page for worklist # 1142

Sue Lai 4-18-95
Analyst Signature **Date**

Sharon L Walker 4-19-95
Analyst Signature **Date**

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

WHC-SD-WM-DP-103, REV. 1

RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-SOLIDS

ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB26870	SAMPLE PREP:	0
ANALYST:	SCL	BATCH ID:	0
		ANALYSIS DATE:	April 19, 1995

		UNITS:	µCi/g						
SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *	WRKLST 1142	Sr-90	8.85E-04				80.2%	3.82E-06	2.0%
BLANK	S95T101	Sr-90	< 1.90E+00					2.49E+00	282.3%
SAMPLE 1	S95T101	Sr-90	7.83E+02	7.43E+02	7.63E+02	5.3%		2.47E+00	1.7%
DUPLICATE 1	S95T101	Sr-90						2.43E+00	1.7%
SAMPLE 2					N/A	N/A			
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	51B52	1.000							

NARRATIVE:

Analyst Comments:

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	SLH	Signature:	[signature]	Date:	04/19/95
Chemist Approval:	SLF	Signature:	[signature]	Date:	4/19/95

Revision 2.1

LAB LEADER INFO:	
Method:	LA220-101(D-1)
Test Code	@SR90-01
Matrix:	SOLID
Work List #	1142
Batch #	
Prepared By:	SLH
Date Complete:	04/19/95
Time Complete:	09:00
Chemist:	SLF
Analyst:	SCL
Analysis Date:	04/18/95
Detector Number:	10
Instrument Code:	WB26870
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	51B52

Sample Type	Sample #
STANDARD	WRKLST 1142
BLANK	S95T101
SAMPLE 1	S95T101
DUPLICATE 1	S95T101
SAMPLE 2	
DUPLICATE 2	
ST-END	

PRINT

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	9999
COUNT TIME in MINUTES	10
BACKGROUND in cpm	12
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	14:10
SEPARATION DATE	04/18/95
TIME OF COUNT	21:25
DATE OF COUNT	04/18/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.7965
TARE WEIGHT	7.682
STANDARD VALUE	1.104

RESULT	
SAMPLE COUNT RATE	9.88E+02
CRITICAL LEVEL	2.09E+00
NET WEIGHT	0.1145
DELTA TIME (hours)	7.25
SR-90 EFFICIENCY FACTOR	0.41
Y-90 EFFICIENCY FACTOR	0.45
Rmax	N/A
DETECTION LIMIT	4.26
Sr-89/90 CONC in µCi/mL	8.85E-04
Relative Counting Error	2.0%
Percent Carrier Recovery	114.5%

Solid-Blank Run:

INPUT	
TOTAL COUNTS	131
COUNT TIME in MINUTES	10
BACKGROUND in cpm	12
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	101
DIGEST FACTOR (g/L)	1.904
SEPARATION TIME	14:10
SEPARATION DATE	04/18/95
TIME OF COUNT	21:50
DATE OF COUNT	04/18/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.8584
TARE WEIGHT	7.7654

RESULT	
SAMPLE COUNT RATE	1.10E+00
CRITICAL LEVEL	2.09E+00
NET WEIGHT	0.0930
DELTA TIME (hours)	7.67
SR-90 EFFICIENCY FACTOR	0.41
Y-90 EFFICIENCY FACTOR	0.45
Rmax	3.26
DETECTION LIMIT	4.26
Sr-89/90 CONC in µCi/g	< 1.90E+00
Relative Counting Error	282.3%
Percent Carrier Recovery	93.0%

Solid-Sample Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Duplicate Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Sample Run:

INPUT	
TOTAL COUNTS	13647
COUNT TIME in MINUTES	10
BACKGROUND in cpm	12
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	101
DIGEST FACTOR (g/L)	1.904
SEPARATION TIME	14:10
SEPARATION DATE	04/18/95
TIME OF COUNT	22:07
DATE OF COUNT	04/18/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.9102
TARE WEIGHT	7.8168

RESULT	
SAMPLE COUNT RATE	1.35E+03
CRITICAL LEVEL	2.09E+00
NET WEIGHT	0.0934
DELTA TIME (hours)	7.95
SR-90 EFFICIENCY FACTOR	0.41
Y-90 EFFICIENCY FACTOR	0.45
Rmax	N/A
DETECTION LIMIT	4.26
Sr-89/90 CONC in µCi/g	7.83E+02
Relative Counting Error	1.7%
Percent Carrier Recovery	93.4%

Solid-Duplicate Run:

INPUT	
TOTAL COUNTS	13176
COUNT TIME in MINUTES	10
BACKGROUND in cpm	12
SAMPLE VOLUME in mL	0.1
DILUTION FACTOR	101
DIGEST FACTOR (g/L)	1.926
SEPARATION TIME	14:10
SEPARATION DATE	04/18/95
TIME OF COUNT	22:35
DATE OF COUNT	04/18/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.7595
TARE WEIGHT	7.666

RESULT	
SAMPLE COUNT RATE	1.31E+03
CRITICAL LEVEL	2.09E+00
NET WEIGHT	0.0935
DELTA TIME (hours)	8.42
SR-90 EFFICIENCY FACTOR	0.41
Y-90 EFFICIENCY FACTOR	0.45
Rmax	N/A
DETECTION LIMIT	4.26
Sr-89/90 CONC in µCi/g	7.43E+02
Relative Counting Error	1.7%
Percent Carrier Recovery	93.5%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

Form Completed By:	SLH	Signature:	Sharon L Hall	Date:	19-Apr-95
Chemist Approval:	SLF	Signature:	[illegible]	Date:	4/19/95

Revision 2.1

2705

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS WHC-SD-WM-DP-103, REV. 1

							STANDARD
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA		1.000
STANDARD	TOTAL COUNTS	(TC)	9999	GROSS WEIGHT	(W2)		7.7965
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.6820
1142	BACKGROUND in cpm	(BKG)	12	NET WEIGHT	(W3)		0.1145
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		7.25
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	987.90	SR-90 EFFICIENCY FACTO	(C1)		0.4051
Sample #	CRITICAL LEVEL	(Lc)	2.09	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
WRKLST 1142	SEPARATION TIME	(ST)	14.10	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	04/18/95	DETECTION LIMIT	(Ld)		4.26
WB26870	TIME OF COUNT	(TOC)	21:25	Sr-89/90 CONC. in µCi/L =			8.8529E-01
Analyst	DATE OF COUNT	(DOC)	04/18/95				
SCL							
Date							
04/19/95							
Time							
09:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	8.85E-04	µCi/mL
RELATIVE COUNTING ERROR =	2.0%	
PERCENT CARRIER RECOVERY =	114.5%	

DETECTION LEVEL
3.82E-06 µCi/L

Data Entry by:	SLH		Date:	19-Apr-95
Approved by:	SLF		Date:	4/19/95

Form WB Rev. 2.1 220-10n_WB

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)**

							BLANK
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA		1.000
BLANK	TOTAL COUNTS	(TC)	131	GROSS WEIGHT	(W2)		7.8584
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.7654
1142	BACKGROUND in cpm	(BKG)	12	NET WEIGHT	(W3)		0.0930
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		7.67
@SR90-01	DILUTION FACTOR	(DF)	101				
Matrix	DIGEST FACTOR (g/L)	DDF	1.904				
SOLID	SAMPLE COUNT RATE	(Rs)	1.10	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Sample #	CRITICAL LEVEL	(Lc)	2.09	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
S95T101	SEPARATION TIME	(ST)	14:10	Rmax			3.26
Instrument Code	SEPARATION DATE	(SD)	04/18/95	DETECTION LIMIT	(Ld)		4.26
WB26870	TIME OF COUNT	(TOC)	21:50	Sr-89/90 CONC in µCi/g		<	1.8985E+00
Analyst	DATE OF COUNT	(DOC)	04/18/95				
SCL							
Date							
04/19/95							
Time							
09:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	< 1.90E+00	µCi/g
LESS THAN Value was Determined from Rmax.		
RELATIVE COUNTING ERROR =	282.3%	
PERCENT CARRIER RECOVERY =	93.0%	

DETECTION LEVEL

2.49E+00 µCi/g

Data Entry by:	SLH	Sharon L Hulden	Date:	19-Apr-95
Approved by:	SLF	SLF	Date:	4/19/95

Form WB Rev. 2.1 220-10n_WB Page 1 of 1

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)**

Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA		SAMPLE 1.000
SAMPLE	TOTAL COUNTS	(TC)	13647	GROSS WEIGHT	(W2)		7.9102
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.8168
1142	BACKGROUND in cpm	(BKG)	12	NET WEIGHT	(W3)		0.0934
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		7.95
@SR90-01	DILUTION FACTOR	(DF)	101				
Matrix	DIGEST FACTOR (g/L)	DDF	1.904				
SOLID	SAMPLE COUNT RATE	(Rs)	1352.70	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Sample #	CRITICAL LEVEL	(Lc)	2.09	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
S95T101	SEPARATION TIME	(ST)	14:10	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	04/18/95	DETECTION LIMIT	(Ld)		4.26
WB26870	TIME OF COUNT	(TOC)	22:07	Sr-89/90 CONC in µCi/g			7.8270E+02
Analyst	DATE OF COUNT	(DOC)	04/18/95				
SCL							
Date							
04/19/95							
time							
09:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	7.83E+02	µCi/g
RELATIVE COUNTING ERROR =	1.7%	
PERCENT CARRIER RECOVERY =	93.4%	

DETECTION LEVEL

2.47E+00 µCi/g

Data Entry by:	SLH	Sharon L Hulsey	Date:	19-Apr-95
Approved by:	SLF		Date:	4/19/95

Form WB Rev. 2.1 220-10n_WB Page 1 of 1

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)**

							DUPLICATE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUPLICATE	TOTAL COUNTS	(TC)	13176	GROSS WEIGHT	(W2)		7.7595
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.6660
1142	BACKGROUND in cpm	(BKG)	12	NET WEIGHT	(W3)		0.0935
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		8.42
@SR90-01	DILUTION FACTOR	(DF)	101				
Matrix	DIGEST FACTOR (g/L)	DDF	1.926				
SOLID	SAMPLE COUNT RATE	(Rs)	1305.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Sample #	CRITICAL LEVEL	(Lc)	2.09	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
S95T101	SEPARATION TIME	(ST)	14:10	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	04/18/95	DETECTION LIMIT	(Ld)		4.26
WB26870	TIME OF COUNT	(TOC)	22:35	Sr-89/90 CONC in µCi/g			7.4253E+02
Analyst	DATE OF COUNT	(DOC)	04/18/95				
SCL							
Date							
04/19/95							
Time							
09:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	7.43E+02	µCi/g	
RELATIVE COUNTING ERROR =	1.7%		
PERCENT CARRIER RECOVERY =	93.5%		

DETECTION LEVEL

2.43E+00 µCi/g

Data Entry by:	SLH	Sharon L Hahn	Date:	19-Apr-95
Approved by:	SLF	SLF	Date:	4/19/95

Form WB Rev. 2.1 220-10n_WB

LABCORE Data Entry Template for Worklist# 5348

Analyst: RY **Instrument:** AB00 #10 **Book#** 9856

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: SR90 DETERMINE SS USING LUDLUM. NEW

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T004179	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S95T004179	0	Z	@SR90-01	SOLID		
6	SAMPLE	S95T004180	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S95T004180	0	Z	@SR90-01	SOLID		
8	SAMPLE	S95T004181	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
9	DUP	S95T004181	0	Z	@SR90-01	SOLID		
10	SAMPLE	S95T004182	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
11	DUP	S95T004182	0	Z	@SR90-01	SOLID		

Final page for worklist # 5348

Rae Ann Green 2-1-96
Analyst Signature **Date**

[illegible] 2/2/96
Analyst Signature **Date**

C.J. Opinen 2/2/96

Data Entry Comments:

The RPD for sample 4180 is out of the control limits. Sample will be re-run.

[illegible] 2/9/96

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 5348

Analyst: rag **Instrument:** AB10 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: SR90 DETERMINE SS USING LUDLUM. NEW

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01 SR90-01	SOLID	1.24E-03	1.27E-3	102.420	% Recovery
1	STD		0		@SR90-01 SR90-01C	SOLID	100	8.35E+01	83.500	% Recovery
1	STD		0		@SR90-01 SR90-01E	SOLID	1.00	1.93E+00	1.930	% Ct. Error
2	BLNK-PREP		0		@SR90-01 SR90-01	SOLID	1	1.10E-2	1.000e-002	uCi/g
2	BLNK-PREP		0		@SR90-01 SR90-01C	SOLID	100	7.97E+01	79.700	% Recovery
2	BLNK-PREP		0		@SR90-01 SR90-01E	SOLID	1.00	6.81E+01	68.100	% Ct. Error
3	BLNK/BKG		0		@SR90-01 SR90-01	SOLID	1	1.48E+00	1.480	uCi/g
4	SAMPLE	S95T004179	0	Z	@SR90-01 SR90-01	SOLID	N/A	9.41E-01	9.630e-003	uCi/g
4	SAMPLE	S95T004179	0	Z	@SR90-01 SR90-01C	SOLID	N/A	7.82E+01	1.000e-004	% Recovery
4	SAMPLE	S95T004179	0	Z	@SR90-01 SR90-01E	SOLID	N/A	3.34E+00	0.000	% Ct. Error
5	DUP	S95T004179	0	Z	@SR90-01 SR90-01	SOLID	9.41E-1	9.81E-1	4.160	RPD
5	DUP	S95T004179	0	Z	@SR90-01 SR90-01C	SOLID	100	8.26E+01	82.600	% Recovery
5	DUP	S95T004179	0	Z	@SR90-01 SR90-01E	SOLID	1.00	3.19E+00	3.190	% Ct. Error
6	SAMPLE	S95T004180	0	Z	@SR90-01 SR90-01	SOLID	N/A	8.08E+00	7.840e-003	uCi/g
6	SAMPLE	S95T004180	0	Z	@SR90-01 SR90-01C	SOLID	N/A	8.49E+01	1.000e-004	% Recovery
6	SAMPLE	S95T004180	0	Z	@SR90-01 SR90-01E	SOLID	N/A	1.01E+00	0.000	% Ct. Error
7	DUP	S95T004180	0	Z	@SR90-01 SR90-01	SOLID	8.08E+0	6.31E+0	24.600	RPD
7	DUP	S95T004180	0	Z	@SR90-01 SR90-01C	SOLID	100	8.60E+01	86.000	% Recovery
7	DUP	S95T004180	0	Z	@SR90-01 SR90-01E	SOLID	1.00	1.18E+00	1.180	% Ct. Error
8	SAMPLE	S95T004181	0	Z	@SR90-01 SR90-01	SOLID	N/A	6.02E+00	9.100e-003	uCi/g
8	SAMPLE	S95T004181	0	Z	@SR90-01 SR90-01C	SOLID	N/A	7.74E+01	1.000e-004	% Recovery
8	SAMPLE	S95T004181	0	Z	@SR90-01 SR90-01E	SOLID	N/A	1.26E+00	0.000	% Ct. Error
9	DUP	S95T004181	0	Z	@SR90-01 SR90-01	SOLID	6.02E+0	5.91E+0	1.840	RPD
9	DUP	S95T004181	0	Z	@SR90-01 SR90-01C	SOLID	100	8.82E+01	88.200	% Recovery
9	DUP	S95T004181	0	Z	@SR90-01 SR90-01E	SOLID	1.00	1.18E+00	1.180	% Ct. Error
10	SAMPLE	S95T004182	0	Z	@SR90-01 SR90-01	SOLID	N/A	7.52E+00	9.110e-003	uCi/g
10	SAMPLE	S95T004182	0	Z	@SR90-01 SR90-01C	SOLID	N/A	8.24E+01	1.000e-004	% Recovery
10	SAMPLE	S95T004182	0	Z	@SR90-01 SR90-01E	SOLID	N/A	1.12E+00	0.000	% Ct. Error
11	DUP	S95T004182	0	Z	@SR90-01 SR90-01	SOLID	7.52E+0	7.39E+0	1.740	RPD
11	DUP	S95T004182	0	Z	@SR90-01 SR90-01C	SOLID	100	7.80E+01	78.000	% Recovery
11	DUP	S95T004182	0	Z	@SR90-01 SR90-01E	SOLID	1.00	1.15E+00	1.150	% Ct. Error

Final page for worklist# 5348

Analyst Signature **Date** **Analyst Signature** **Date**

2/9/96

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Completed Worklist Report for Worklist# 5348

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit

Units shown for QC (BLK/BKG) may not reflect the actual units.

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	10607	GROSS WEIGHT	(W2)		7.2674
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1839
5348	BACKGROUND in cpm	(BKG)	9.0	NET WEIGHT	(W3)		0.0835
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		8.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1051.70	SR-90 EFFICIENCY FACTO	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.81	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000890	TIME OF SEPARATION	(ST)	01:20	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		3.71
0	TIME OF COUNT	(TOC)	10:05	Sr-89/90 CONC. in µCi/L			1.2730E+00
Sample Prep	DATE OF COUNT	(DOC)	02/01/96				
N/A	STANDARD BOOK #		9B56				
Sample #	STANDARD VALUE in µCi/mL		1.2353E-03				
WL5338							
Instrument Code							
WB26870							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/02/96							
Analysis Date							
02/01/96							
Analysis Time							
01:20 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.27E-03	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	1.9%		4.49E-06 µCi/L
PERCENT CARRIER RECOVERY	83.5%		

Analyst:	RAG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/9/96

STANDARD.WB1 REV 1.2 22010NML

2713

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							BLNK-PREP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
BLNK-PREP	TOTAL COUNTS	(TC)	133	GROSS WEIGHT	(W2)		7.2710
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1913
5348	BACKGROUND in cpm	(BKG)	9.0	NET WEIGHT	(W3)		0.0797
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		9.55
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L)	1.9692				
SOLID	SAMPLE COUNT RATE	(Rs)	4.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.81	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000890	TIME OF SEPARATION	(ST)	01:20	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		3.71
0	TIME OF COUNT	(TOC)	10:53	Sr-89/90 CONC in µCi/g			1.0989E-02
Sample Prep	DATE OF COUNT	(DOC)	02/01/96				
N/A							
Sample #							
WL5348							

Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
WB26870	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
Analyst	NOTE: Expected weight = CVA * 0.1
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
02/02/96	
Analysis Date	
02/01/96	
Analysis Time	
01:20 AM	
Sample Point	
BY-106	

Sr-89/90 CONCENTRATION	1.10E-02	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	68.1%		9.47E-03 µCi/g
PERCENT CARRIER RECOVERY	79.7%		

Analyst:	RAG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/9/96

BLANK.WB1 REV 1.2 22010NML

2714

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	3709	GROSS WEIGHT	(W2)		7.3003
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.2221
5348	BACKGROUND in cpm	(BKG)	9.0	NET WEIGHT	(W3)		0.0782
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		9.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9692				
SOLID	SAMPLE COUNT RATE	(Rs)	361.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.81	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000890	TIME OF SEPARATION	(ST)	01:20	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		3.71
0	TIME OF COUNT	(TOC)	11:05	Sr-89/90 CONC in µCi/g			9.4080E-01
Sample Prep	DATE OF COUNT	(DOC)	02/01/96				
FUS-ZR01							
Sample #							
S95T004179							

Instrument Code: WB26870

Prepared By: MCB

Chemist: SLF

Analyst: RAG

Date Complete: 02/02/96

Analysis Date: 02/01/96

Analysis Time: 01:20 AM

Sample Point: BY-106

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	9.41E-01	µCi/g
RELATIVE COUNTING ERROR	3.3%	
PERCENT CARRIER RECOVERY	78.2%	

DETECTION LEVEL 9.63E-03 µCi/g

Analyst:	RAG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/7/96

SAMPLE.WB1 REV 1.2 22010NML

2715

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	4039	GROSS WEIGHT	(W2)		7.2912
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.2086
5348	BACKGROUND in cpm	(BKG)	9.0	NET WEIGHT	(W3)		0.0826
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		9.97
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9476				
SOLID	SAMPLE COUNT RATE	(Rs)	394.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.81	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000890	TIME OF SEPARATION	(ST)	01:20	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		3.71
0	TIME OF COUNT	(TOC)	11:18	Sr-89/90 CONC in µCi/g			9.8062E-01
Sample Prep	DATE OF COUNT	(DOC)	02/01/96				
FUS-ZR01							
Sample #							
S95T004179							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB26870	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/02/96							
Analysis Date							DETECTION LEVEL
02/01/96	Sr-89/90 CONCENTRATION		9.81E-01		µCi/g		
Analysis Time							
01:20 AM	RELATIVE COUNTING ERROR		3.2%				9.20E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY		82.6%				

Analyst:		RAG	Date:	02-Feb-96
Signature of Chemist:		SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

WHC-SD-WM-DP-103, REV. 1

WORKBOOK PAGE: SAM8

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						SAMPLE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	24621	GROSS WEIGHT	(W2)	7.3057
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.2283
5348	BACKGROUND in cpm	(BKG)	9.0	NET WEIGHT	(W3)	0.0774
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	10.83
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.0852			
SOLID	SAMPLE COUNT RATE	(Rs)	2453.10	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.81	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
96000890	TIME OF SEPARATION	(ST)	01:25	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)	3.71
0	TIME OF COUNT	(TOC)	12:15	Sr-89/90 CONC in µCi/g		6.0215E+00
Sample Prep	DATE OF COUNT	(DOC)	02/01/96			
FUS-ZR01						
Sample #						
S95T004181						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Instrument Code				
WB26870				
Prepared By				
MCB				
Chemist				
SLF				
Analyst				
RAG				
Date Complete				
02/02/96				
Analysis Date				DETECTION LEVEL
02/01/96	Sr-89/90 CONCENTRATION	6.02E+00	µCi/g	
Analysis Time				
01:20 AM	RELATIVE COUNTING ERROR	1.3%		9.10E-03 µCi/g
Sample Point				
BY-106	PERCENT CARRIER RECOVERY	77.4%		

Analyst:	RAG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

2717

WORKBOOK PAGE: DUP9

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	27882	GROSS WEIGHT	(W2)		7.2847
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1965
5348	BACKGROUND in cpm	(BKG)	9.0	NET WEIGHT	(W3)		0.0882
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		11.63
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.098				
SOLID	SAMPLE COUNT RATE	(Rs)	2779.20	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.81	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000890	TIME OF SEPARATION	(ST)	01:25	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		3.71
0	TIME OF COUNT	(TOC)	13:03	Sr-89/90 CONC in µCi/g			5.9054E+00
Sample Prep	DATE OF COUNT	(DOC)	02/01/96				
FUS-ZR01							
Sample #							
S95T004181							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB26870	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/02/96							
Analysis Date							DETECTION LEVEL
02/01/96	Sr-89/90 CONCENTRATION			5.91E+00	µCi/g		
Analysis Time							
01:20 AM	RELATIVE COUNTING ERROR			1.2%			7.87E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			88.2%			

Analyst:		RAG	Date:	02-Feb-96
Signature of Chemist:		SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

2718

WORKBOOK PAGE: SAM10

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	30697	GROSS WEIGHT	(W2)		7.2830
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.2006
5348	BACKGROUND in cpm	(BKG)	9.0	NET WEIGHT	(W3)		0.0824
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		12.92
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.918				
SOLID	SAMPLE COUNT RATE	(Rs)	3060.70	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.81	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000890	TIME OF SEPARATION	(ST)	01:25	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		3.71
0	TIME OF COUNT	(TOC)	14:20	Sr-89/90 CONC in µCi/g			7.5249E+00
Sample Prep	DATE OF COUNT	(DOC)	02/01/96				
FUS-ZR01							
Sample #							
S95T004182							

Instrument Code: WB26870

Prepared By: MCB

Chemist: SLF

Analyst: RAG

Date Complete: 02/02/96

Analysis Date: 02/01/96

Analysis Time: 01:20 AM

Sample Point: BY-106

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	7.52E+00	µCi/g
RELATIVE COUNTING ERROR	1.1%	
PERCENT CARRIER RECOVERY	82.4%	

DETECTION LEVEL 9.11E-03 µCi/g

Analyst:		RAG	Date:	02-Feb-96
Signature of Chemist:		SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP11

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	29148	GROSS WEIGHT	(W2)		7.2988
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.2208
5348	BACKGROUND in cpm	(BKG)	9.0	NET WEIGHT	(W3)		0.0780
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		14.17
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.938				
SOLID	SAMPLE COUNT RATE	(Rs)	2905.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.81	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000890	TIME OF SEPARATION	(ST)	01:25	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		3.71
0	TIME OF COUNT	(TOC)	15:35	Sr-89/90 CONC in µCi/g			7.3856E+00
Sample Prep	DATE OF COUNT	(DOC)	02/01/96				
FUS-ZR01							
Sample #							
S95T004182							
Instrument Code							
WB26870							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/02/96							
Analysis Date							
02/01/96							
Analysis Time							
01:20 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

				DETECTION LEVEL
Sr-89/90 CONCENTRATION	7.39E+00	µCi/g		9.42E-03 µCi/g
RELATIVE COUNTING ERROR	1.2%			
PERCENT CARRIER RECOVERY	78.0%			

Analyst:	RAG	Date:	02-Feb-96	
Signature of Chemist:	SLF	Date:	2/9/96	

SAMPLE.WB1 REV 1.2 22010NML

2720

LAD 4-1-96
~~WHC-SD-WM-DP-103, REV. 1~~

LABCORE Data Entry Template for Worklist# 5355

Analyst: RJS **Instrument:** AB00 12 **Book#** 9B56

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: SR90 DETERMINE SS USING LUDLUM. NEW

WHC-SD-WM-DP-103, REV. 1

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T004183	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S95T004183	0	Z	@SR90-01	SOLID		
6	SAMPLE	S95T004184	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S95T004184	0	Z	@SR90-01	SOLID		
8	SAMPLE	S95T004185	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
9	DUP	S95T004185	0	Z	@SR90-01	SOLID		
10	SAMPLE	S95T004186	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
11	DUP	S95T004186	0	Z	@SR90-01	SOLID		

Final page for worklist # 5355

Rae Ann Green 2-8-96
~~Rae Ann Green 2-8-96~~ RJS 2-8-96
Analyst Signature **Date**

[illegible] 2/9/96
Analyst Signature **Date**

C.J. Green 2/9/96

Data Entry Comments:

DATA NOT USED IN PACKAGE

[illegible] 2/17/96

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 5355

Analyst: rag **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____ WHC-SD-WM-DP-103, REV. 1

Worklist Comment: SR90 DETERMINE SS USING LUDLUM. NEW

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
1	STD			0	@SR90-01	SR90-01	SOLID	1.23E-03	1.18E-3	95.930	% Recovery
1	STD			0	@SR90-01	SR90-01C	SOLID	100	9.69E+01	96.900	% Recovery
1	STD			0	@SR90-01	SR90-01E	SOLID	1.00	1.74E+00	1.740	% Ct. Error
2	BLNK-PREP			0	@SR90-01	SR90-01	SOLID	1	2.01E-2	2.000e-002	uCi/g
2	BLNK-PREP			0	@SR90-01	SR90-01C	SOLID	100	8.31E+01	83.100	% Recovery
2	BLNK-PREP			0	@SR90-01	SR90-01E	SOLID	1.00	2.70E+01	27.000	% Ct. Error
3	BLNK/BKG			0	@SR90-01	SR90-01	SOLID	1	3.10E+00	3.100	uCi/g
4	SAMPLE	S95T004183	0	Z	@SR90-01	SR90-01	SOLID	N/A	6.49E+00	5.510e-003	uCi/g
4	SAMPLE	S95T004183	0	Z	@SR90-01	SR90-01C	SOLID	N/A	8.09E+01	1.000e-004	% Recovery
4	SAMPLE	S95T004183	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.09E+00	0.000	% Ct. Error
5	DUP	S95T004183	0	Z	@SR90-01	SR90-01	SOLID	6.49E+0	6.91E+0	6.270	RPD
5	DUP	S95T004183	0	Z	@SR90-01	SR90-01C	SOLID	100	8.42E+01	84.200	% Recovery
5	DUP	S95T004183	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.06E+00	1.060	% Ct. Error
6	SAMPLE	S95T004184	0	Z	@SR90-01	SR90-01	SOLID	N/A	8.82E+00	5.600e-003	uCi/g
6	SAMPLE	S95T004184	0	Z	@SR90-01	SR90-01C	SOLID	N/A	8.28E+01	1.000e-004	% Recovery
6	SAMPLE	S95T004184	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.41E-01	0.000	% Ct. Error
7	DUP	S95T004184	0	Z	@SR90-01	SR90-01	SOLID	8.82E+0	1.02E+1	14.510	RPD
7	DUP	S95T004184	0	Z	@SR90-01	SR90-01C	SOLID	100	8.05E+01	80.500	% Recovery
7	DUP	S95T004184	0	Z	@SR90-01	SR90-01E	SOLID	1.00	8.68E-01	0.870	% Ct. Error
8	SAMPLE	S95T004185	0	Z	@SR90-01	SR90-01	SOLID	N/A	9.13E+00	5.600e-003	uCi/g
8	SAMPLE	S95T004185	0	Z	@SR90-01	SR90-01C	SOLID	N/A	7.44E+01	1.000e-004	% Recovery
8	SAMPLE	S95T004185	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.25E-01	0.000	% Ct. Error
9	DUP	S95T004185	0	Z	@SR90-01	SR90-01	SOLID	9.13E+0	9.53E+0	4.290	RPD
9	DUP	S95T004185	0	Z	@SR90-01	SR90-01C	SOLID	100	7.47E+01	74.700	% Recovery
9	DUP	S95T004185	0	Z	@SR90-01	SR90-01E	SOLID	1.00	9.27E-01	0.930	% Ct. Error
10	SAMPLE	S95T004186	0	Z	@SR90-01	SR90-01	SOLID	N/A	6.50E+00	6.810e-003	uCi/g
10	SAMPLE	S95T004186	0	Z	@SR90-01	SR90-01C	SOLID	N/A	7.09E+01	1.000e-004	% Recovery
10	SAMPLE	S95T004186	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.21E+00	0.000	% Ct. Error
11	DUP	S95T004186	0	Z	@SR90-01	SR90-01	SOLID	6.50E+0	5.67E+0	13.640	RPD
11	DUP	S95T004186	0	Z	@SR90-01	SR90-01C	SOLID	100	7.28E+01	72.800	% Recovery
11	DUP	S95T004186	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.29E+00	1.290	% Ct. Error

Final page for worklist# 5355

Analyst Signature **Date** **Analyst Signature** **Date**

2/13/96
Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

DATA NOT USED IN PACKAGE
in error 4/1/96

LABCORE Completed Worklist Report for Worklist# 5355

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit

WHC-SD-WM-DP-103, REV. 1

Units shown for QC (BLK/BKG) may not reflect the actual units.

DATA NOT USED IN PACKAGE

WHC-SD-WM-DP-103, REV. 1

~~WHC-SD-WM-DP-103, REV. 1~~ LAD 4-1-96

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	STANDARD	
STD	TOTAL COUNTS	(TC)	12896	GROSS WEIGHT	(W2)	7.0468	
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.9499	
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)	0.0969	
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	19.67	
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1284.70	SR-90 EFFICIENCY FACTO	(C1)	0.4180	
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)	0.4660	
96000891	TIME OF SEPARATION	(ST)	09:20	Rmax		N/A	
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)	2.76	
0	TIME OF COUNT	(TOC)	05:00	Sr-89/90 CONC. in µCi/L		1.1776E+00	
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
N/A	STANDARD BOOK #		9B56				
Sample #	STANDARD VALUE in µCi/mL		1.2347E-03				
WL5355							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/09/96							
Analysis Date							
02/08/96							
Analysis Time							
09:20 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.18E-03	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	1.7%		2.53E-06 µCi/L
PERCENT CARRIER RECOVERY	96.9%		

Analyst:	RAG	Date:	09-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

STANDARD.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

in error PW 4/17/96

2724

I:\22010N\OUT\SR5355.WB1 02/09/96

~~WHC-SD-WM-DP-103, REV. 1~~ LAD 4-1-96

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							BLNK-PREP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLNK-PREP	TOTAL COUNTS	(TC)	152	GROSS WEIGHT	(W2)		7.0583
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9752
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)		0.0831
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		19.67
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L)	2.1932				
SOLID	SAMPLE COUNT RATE	(Rs)	10.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000891	TIME OF SEPARATION	(ST)	09:30	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)		2.76
0	TIME OF COUNT	(TOC)	05:10	Sr-89/90 CONC in µCi/g			2.0078E-02
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
N/A							
Sample #							
WL5355							

Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
Analyst	NOTE: Expected weight = CVA * 0.1
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
02/09/96	
Analysis Date	
02/08/96	
Analysis Time	
09:20 AM	
Sample Point	
BY-106	

Sr-89/90 CONCENTRATION	2.01E-02	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	27.0%		5.38E-03 µCi/g
PERCENT CARRIER RECOVERY	83.1%		

Analyst:	RAG	Date:	09-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

BLANK.WB1 REV 1.2 22010NML

2725

DATA NOT USED IN PACKAGE

inerm 4/17/96

WHC-SD-WM-DP-103, REV. 1 LAD 4/1/96 ~~WHC-SD-WM-DP-103, REV. 1~~

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	32534	GROSS WEIGHT	(W2)		6.9764
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8955
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)		0.0809
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		19.92
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1932				
SOLID	SAMPLE COUNT RATE	(Rs)	3248.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000891	TIME OF SEPARATION	(ST)	09:30	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)		2.76
0	TIME OF COUNT	(TOC)	05:25	Sr-89/90 CONC in µCi/g			6.4917E+00
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
FUS-ZR01							
Sample #							
S95T004183							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/09/96							
Analysis Date							DETECTION LEVEL
02/08/96	Sr-89/90 CONCENTRATION			6.49E+00		µCi/g	
Analysis Time							
09:20 AM	RELATIVE COUNTING ERROR			1.1%			5.51E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			80.9%			

Analyst:	RAG	Date:	09-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

in emb 4/17/96

2726

I:\22010N\OUT\SR5355.WB1 02/09/96

WHC-SD-WM-DP-103, REV. 1

~~WHC-SD-WM-DP-103, REV. 1~~
LAD 4-1-96

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	34274	GROSS WEIGHT	(W2)		7.0161
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9319
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)		0.0842
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		20.10
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.082				
SOLID	SAMPLE COUNT RATE	(Rs)	3422.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000891	TIME OF SEPARATION	(ST)	09:30	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)		2.76
0	TIME OF COUNT	(TOC)	05:36	Sr-89/90 CONC in µCi/g			6.9122E+00
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
FUS-ZR01							
Sample #							
S95T004183							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/09/96							
Analysis Date							DETECTION LEVEL
02/08/96	Sr-89/90 CONCENTRATION			6.91E+00	µCi/g		
Analysis Time							
09:20 AM	RELATIVE COUNTING ERROR			1.1%			5.57E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			84.2%			

Analyst:		RAG	Date:	09-Feb-96
Signature of Chemist:		SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

2'727

DATA NOT USED IN PACKAGE

in error 4/1/96

4-1-96 LAD

WHC-SD-WM-DP-103, REV. 1 ~~WHC-SD-WM-DP-103, REV. 1~~

WORKBOOK PAGE: SAM6

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	43516	GROSS WEIGHT	(W2)		7.0399
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9571
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)		0.0828
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		20.30
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1028				
SOLID	SAMPLE COUNT RATE	(Rs)	4346.70	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000891	TIME OF SEPARATION	(ST)	09:30	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)		2.76
0	TIME OF COUNT	(TOC)	05:48	Sr-89/90 CONC in µCi/g			8.8249E+00
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
FUS-ZR01							
Sample #							
S95T004184							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/09/96							
Analysis Date							
02/08/96							
Analysis Time							
09:20 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	8.82E+00	µCi/g	5.60E-03 µCi/g
RELATIVE COUNTING ERROR	0.9%		
PERCENT CARRIER RECOVERY	82.8%		

Analyst:		RAG	Date:	09-Feb-96
Signature of Chemist:		SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

2728

DATA NOT USED IN PACKAGE

in error 4/13/96

WHC-SD-WM-DP-103, REV. 1 ~~WHC-SD-WM-DP-103, REV. 1~~

4-1-96 L AD

WORKBOOK PAGE: DUP7

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	51183	GROSS WEIGHT	(W2)		7.0108
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9303
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)		0.0805
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		21.03
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1808				
SOLID	SAMPLE COUNT RATE	(Rs)	5113.40	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000891	TIME OF SEPARATION	(ST)	09:30	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)		2.76
0	TIME OF COUNT	(TOC)	06:32	Sr-89/90 CONC in µCi/g			1.0237E+01
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
FUS-ZR01							
Sample #							
S95T004184							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/09/96							
Analysis Date							DETECTION LEVEL
02/08/96	Sr-89/90 CONCENTRATION			1.02E+01	µCi/g		
Analysis Time							
09:20 AM	RELATIVE COUNTING ERROR			0.9%			5.52E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			80.5%			

Analyst:	RAG	Date:	09-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

2729

DATA NOT USED IN PACKAGE

in error 4/17/96

WHC-SD-WM-DP-103, REV. 1

~~WHC-SD-WM-DP-103, REV. 1~~ LAD 4-1-96

WORKBOOK PAGE: SAM8

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	45000	GROSS WEIGHT	(W2)		7.0191
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9447
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)		0.0744
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		21.17
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.3232				
SOLID	SAMPLE COUNT RATE	(Rs)	4495.10	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000891	TIME OF SEPARATION	(ST)	09:35	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)		2.76
0	TIME OF COUNT	(TOC)	06:45	Sr-89/90 CONC in µCi/g			9.1306E+00
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
FUS-ZR01							
Sample #							
S95T004185							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/09/96							
Analysis Date							
02/08/96							
Analysis Time							
09:20 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	9.13E+00	µCi/g	
RELATIVE COUNTING ERROR	0.9%		5.60E-03 µCi/g
PERCENT CARRIER RECOVERY	74.4%		

Analyst:	RAG	Date:	09-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE in error 4/17/96

2730

I:\22010N\OUT\SR5355.WB1 02/09/96

~~WHC-SD-WM-DP-103, REV. 1~~ LRD 4-1-96

WORKBOOK PAGE: DUP9

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	44879	GROSS WEIGHT	(W2)		7.0003
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9256
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)		0.0747
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		21.35
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.2072				
SOLID	SAMPLE COUNT RATE	(Rs)	4483.00	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000891	TIME OF SEPARATION	(ST)	09:35	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)		2.76
0	TIME OF COUNT	(TOC)	06:56	Sr-89/90 CONC in µCi/g			9.5325E+00
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
FUS-ZR01							
Sample #							
S95T004185							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/09/96							
Analysis Date							
02/08/96							
Analysis Time							
09:20 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	9.53E+00	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.9%		5.86E-03 µCi/g
PERCENT CARRIER RECOVERY	74.7%		

Analyst:	RAG	Date:	09-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

2731

DATA NOT USED IN PACKAGE

in error 4/17/96

WHC-SD-WM-DP-103, REV. 1 ~~WHC-SD-WM-DP-103, REV. 1~~ LAD 4-1-96

WORKBOOK PAGE: SAM10

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	26364	GROSS WEIGHT	(W2)		6.9909
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9200
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)		0.0709
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		21.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9956				
SOLID	SAMPLE COUNT RATE	(Rs)	2631.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000891	TIME OF SEPARATION	(ST)	09:35	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)		2.76
0	TIME OF COUNT	(TOC)	07:20	Sr-89/90 CONC in µCi/g			6.5003E+00
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
FUS-ZR01							
Sample #							
S95T004186							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/09/96							
Analysis Date							
02/08/96							
Analysis Time							
09:20 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

				DETECTION LEVEL
Sr-89/90 CONCENTRATION	6.50E+00	µCi/g		
RELATIVE COUNTING ERROR	1.2%			6.81E-03 µCi/g
PERCENT CARRIER RECOVERY	70.9%			

Analyst:	RAG	Date:	09-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

2732

DATA NOT USED IN PACKAGE in error 4/17/96

I:\22010N\OUT\SR5355.WB1 02/09/96

LAD 4-1-96

~~WHC-SD-WM-DP-103, REV. 1~~

WORKBOOK PAGE: DUP11

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	23196	GROSS WEIGHT	(W2)		7.0293
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9565
5355	BACKGROUND in cpm	(BKG)	4.9	NET WEIGHT	(W3)		0.0728
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		21.98
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9556				
SOLID	SAMPLE COUNT RATE	(Rs)	2314.70	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.33	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000891	TIME OF SEPARATION	(ST)	09:35	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/08/96	DETECTION LIMIT	(Ld)		2.76
0	TIME OF COUNT	(TOC)	07:34	Sr-89/90 CONC in µCi/g			5.6723E+00
Sample Prep	DATE OF COUNT	(DOC)	02/09/96				
FUS-ZR01							
Sample #							
S95T004186							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/09/96							
Analysis Date							
02/08/96							
Analysis Time							
09:20 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

				DETECTION LEVEL
Sr-89/90 CONCENTRATION	5.67E+00	µCi/g		
RELATIVE COUNTING ERROR	1.3%			6.76E-03 µCi/g
PERCENT CARRIER RECOVERY	72.8%			

Analyst:	RAG	Date:	09-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

in error 4/17/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

PREPARATION OF SAMPLE MOUNTS FOR GAMMA ENERGY ANALYSIS : LA-548-121 (D-1)

3 < Choose Sample Units: 1=µCi/Sample, 2=µCi/g, 3=µCi/L

4 < Choose Report Units: 1=µCi/L, 2=pCi/L, 3=µCi/mL, 4=µCi/g

2.4676 < Enter SAMPLE g/L 2.4796 < Enter DUPLICATE g/L

Type	ANALYTE	? <	SAMPLE µCi/L	REPORT µCi/g	COUNTING ERROR %	? <	DUPLICATE µCi/L	REPORT µCi/g	COUNTING ERROR %	AVERAGE µCi/g	RPD
SAMPLE	CS137	<	0.0644	2.62E-02			531.3000	2.14E+02	0.33	2.14E+02	NA
Work List				0.00E+00				0.00E+00		0.00E+00	ERR
286				0.00E+00				0.00E+00			
Test Code				0.00E+00				0.00E+00			
@GEA-01				0.00E+00				0.00E+00			
Matrix				0.00E+00				0.00E+00			
SOLID				0.00E+00				0.00E+00			
Sample #				0.00E+00				0.00E+00			
S94T314				0.00E+00				0.00E+00			
				0.00E+00				0.00E+00			
Digest DF				0.00E+00				0.00E+00			
1				0.00E+00				0.00E+00			
				0.00E+00				0.00E+00			
DUP's Digest DF				0.00E+00				0.00E+00			
1				0.00E+00				0.00E+00			
				0.00E+00				0.00E+00			
Instrument Code				0.00E+00				0.00E+00			
WC38931				0.00E+00				0.00E+00			
Analyst				0.00E+00				0.00E+00			
KGH				0.00E+00				0.00E+00			
Date											
12/23/94											
Time											
10:45 AM											

REPORT (µCi/g) = SAMPLE (µCi/L) / (g/L) * DF

AVERAGE = (SAMPLE + DUPLICATE) / 2

RPD = |(SAMPLE - DUPLICATE)| / AVERAGE * 100

DATA NOT USED IN PACKAGE in error 4/17/96

Data Entry by: [signature] Date: 12/27/94

Approved by: [signature] Date: 12/27/94

Form 548121_1 Rev. 2.2

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

PREPARATION OF SAMPLE MOUNTS FOR GAMMA ENERGY ANALYSIS : LA-548-121 (D-1)

3 < Choose Sample Units: 1=µCi/Sample, 2=µCi/g, 3=µCi/L

4 < Choose Report Units: 1=µCi/L, 2=pCi/L, 3=µCi/mL, 4=µCi/g

2.4676 < Enter SAMPLE g/L < Enter DUPLICATE g/L

Type	ANALYTE	? <	SAMPLE µCi/L	REPORT µCi/g	COUNTING ERROR %	? <	DUPLICATE µCi/L	REPORT µCi/g	COUNTING ERROR %	AVERAGE µCi/g	RPD
BLANK	CS137	<	0.0724	2.95E-02				ERR		ERR	NA
Work List				0.00E+00				ERR		ERR	ERR
268				0.00E+00				ERR			
Test Code				0.00E+00				ERR			
@GEA-01				0.00E+00				ERR			
Matrix				0.00E+00				ERR			
SOLID				0.00E+00				ERR			
Sample #				0.00E+00				ERR			
S94T314				0.00E+00				ERR			
				0.00E+00				ERR			
Digest DF				0.00E+00				ERR			
1				0.00E+00				ERR			
				0.00E+00				ERR			
DUP's Digest DF				0.00E+00				ERR			
1				0.00E+00				ERR			
				0.00E+00				ERR			
Instrument Code				0.00E+00				ERR			
WC38931				0.00E+00				ERR			
Analyst				0.00E+00				ERR			
KGH				0.00E+00				ERR			
Date											
12/23/94											
Time											
10:45 AM											

REPORT (µCi/g) = SAMPLE (µCi/L) / (g/L) * DF

AVERAGE = (SAMPLE + DUPLICATE) / 2

RPD = |(SAMPLE - DUPLICATE)| / AVERAGE * 100

DATA NOT USED in error IN PACKAGE 4/17/96

Data Entry by: [signature] Date: 12/27/94

Approved by: [signature] Date: 12/27/94

Form 548121_1 Rev. 2.2

LABCORE Completed Worklist Report for Worklist# 5359

Analyst: rag **Instrument:** AB10 **Book#** _____

Method: LA-220-121 Rev/Mod D-1

Worklist Comment: SR90. DETERMINE SS USING LUDLUM. new

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01	SR90-01	SOLID	1.23E-03	1.30E-3	105.690	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	8.43E+01	84.300	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.88E+00	1.880	% Ct. Error
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	2.54E-2	3.000e-002	uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	8.64E+01	86.400	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	2.79E+01	27.900	% Ct. Error
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	2.46E+00	2.460	uCi/g
4	REJECT	S95T004187	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.30E+00		uCi/g
4	REJECT	S95T004187	0	Z	@SR90-01	SR90-01C	SOLID	N/A	8.10E+01		% Recovery
4	REJECT	S95T004187	0	Z	@SR90-01	SR90-01E	SOLID	N/A	2.65E+00		% Ct. Error
5	DUP	S95T004187	0	Z	@SR90-01	SR90-01	SOLID	1.30E+0	6.20E+0	130.670	RPD
5	DUP	S95T004187	0	Z	@SR90-01	SR90-01C	SOLID	100	8.27E+01	82.700	% Recovery
5	DUP	S95T004187	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.19E+00	1.190	% Ct. Error
6	SAMPLE	S95T004188	0	Z	@SR90-01	SR90-01	SOLID	N/A	8.95E+00	7.170e-003	uCi/g
6	SAMPLE	S95T004188	0	Z	@SR90-01	SR90-01C	SOLID	N/A	8.19E+01	1.000e-004	% Recovery
6	SAMPLE	S95T004188	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.40E-01	0.000	% Ct. Error
7	DUP	S95T004188	0	Z	@SR90-01	SR90-01	SOLID	8.95E+0	9.75E+0	8.560	RPD
7	DUP	S95T004188	0	Z	@SR90-01	SR90-01C	SOLID	100	7.54E+01	75.400	% Recovery
7	DUP	S95T004188	0	Z	@SR90-01	SR90-01E	SOLID	1.00	9.79E-01	0.980	% Ct. Error
8	REJECT	S95T004189	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.01E+01		uCi/g
8	REJECT	S95T004189	0	Z	@SR90-01	SR90-01C	SOLID	N/A	8.63E+01		% Recovery
8	REJECT	S95T004189	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.44E-01		% Ct. Error
9	DUP	S95T004189	0	Z	@SR90-01	SR90-01	SOLID	1.01E+1	8.00E+0	23.200	RPD
9	DUP	S95T004189	0	Z	@SR90-01	SR90-01C	SOLID	100	8.41E+01	84.100	% Recovery
9	DUP	S95T004189	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.11E+00	1.110	% Ct. Error
10	SAMPLE	S95T004190	0	Z	@SR90-01	SR90-01	SOLID	N/A	9.46E+00	9.130e-003	uCi/g
10	SAMPLE	S95T004190	0	Z	@SR90-01	SR90-01C	SOLID	N/A	8.25E+01	1.000e-004	% Recovery
10	SAMPLE	S95T004190	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.03E+00	0.000	% Ct. Error
11	DUP	S95T004190	0	Z	@SR90-01	SR90-01	SOLID	9.46E+0	8.68E+0	8.600	RPD
11	DUP	S95T004190	0	Z	@SR90-01	SR90-01C	SOLID	100	8.43E+01	84.300	% Recovery
11	DUP	S95T004190	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.03E+00	1.030	% Ct. Error

Final page for worklist# 5359

Analyst Signature **Date** **Analyst Signature** **Date**

2/12/96

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Completed Worklist Report for Worklist# 5359

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit

Units shown for QC (BLK/BKG) may not reflect the actual units.

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	11098	GROSS WEIGHT	(W2)		7.0272
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9429
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)		0.0843
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		10.32
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1101.80	SR-90 EFFICIENCY FACTO	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000893	TIME OF SEPARATION	(ST)	15:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)		3.50
0	TIME OF COUNT	(TOC)	02:04	Sr-89/90 CONC. in µCi/L			1.3009E+00
Sample Prep	DATE OF COUNT	(DOC)	02/06/96				
N/A	STANDARD BOOK #		9B56				
Sample #	STANDARD VALUE in µCi/mL		1.2349E-03				
WL#5359							
Instrument Code							
WB26870							
Prepared By							
CJO							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/06/96							
Analysis Date							
02/05/96							
Analysis Time							
03:45 PM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.30E-03	µCi/mL
RELATIVE COUNTING ERROR	1.9%	
PERCENT CARRIER RECOVERY	84.3%	

DETECTION LEVEL

4.13E-06 µCi/L

Analyst:	RAG	Date:	06-Feb-96
Signature of Chemist:	SLF	Date:	2/9/96

STANDARD.WB1 REV 1.2 22010NML

2738

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						BLNK-PREP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	197	GROSS WEIGHT	(W2)	7.0061
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.9197
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)	0.0864
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	10.52
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L)	2.1196			
SOLID	SAMPLE COUNT RATE	(Rs)	11.70	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
96000893	TIME OF SEPARATION	(ST)	15:45	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)	3.50
0	TIME OF COUNT	(TOC)	02:16	Sr-89/90 CONC in µCi/g		2.5387E-02
Sample Prep	DATE OF COUNT	(DOC)	02/06/96			
N/A						
Sample #						
WL#5359						
Instrument Code						
WB26870						
Prepared By						
CJO						
Chemist						
SLF						
Analyst						
RAG						
Date Complete						
02/06/96						
Analysis Date						
02/05/96						
Analysis Time						
03:45 PM						
Sample Point						
BY-106						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	2.54E-02	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	27.9%		7.59E-03 µCi/g
PERCENT CARRIER RECOVERY	86.4%		

Analyst:	RAG	Date:	06-Feb-96
Signature of Chemist:	SLF	Date:	2/9/96

BLANK.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM6

WHC-SD-WM-DP-103, REV. 1

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	43751	GROSS WEIGHT	(W2)		6.9792
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8973
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)		0.0819
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		11.08
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.3536				
SOLID	SAMPLE COUNT RATE	(Rs)	4367.10	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000893	TIME OF SEPARATION	(ST)	15:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)		3.50
0	TIME OF COUNT	(TOC)	02:50	Sr-89/90 CONC in µCi/g			8.9542E+00
Sample Prep	DATE OF COUNT	(DOC)	02/05/96				
FUS-ZR01							
Sample #							
S95T004188							

Instrument Code: WB26870

Prepared By: CJO

Chemist: SLF

Analyst: RAG

Date Complete: 02/06/96

Analysis Date: 02/05/96

Analysis Time: 03:45 PM

Sample Point: BY-106

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	8.95E+00	µCi/g	7.17E-03 µCi/g
RELATIVE COUNTING ERROR	0.9%		
PERCENT CARRIER RECOVERY	81.9%		

Analyst:		RAG	Date:	06-Feb-96
Signature of Chemist:		SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP7

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	40326	GROSS WEIGHT	(W2)		7.0212
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9458
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)		0.0754
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		11.13
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1628				
SOLID	SAMPLE COUNT RATE	(Rs)	4024.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000893	TIME OF SEPARATION	(ST)	16:00	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)		3.50
0	TIME OF COUNT	(TOC)	03:08	Sr-89/90 CONC in µCi/g			9.7495E+00
Sample Prep	DATE OF COUNT	(DOC)	02/06/96				
FUS-ZR01							
Sample #							
S95T004188							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB26870	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/06/96							
Analysis Date							DETECTION LEVEL
02/05/96	Sr-89/90 CONCENTRATION			9.75E+00		µCi/g	
Analysis Time							
03:45 PM	RELATIVE COUNTING ERROR			1.0%			8.48E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			75.4%			

Analyst:		RAG	Date:	06-Feb-96
Signature of Chemist:		SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

2741

WORKBOOK PAGE: SAM10

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	36328	GROSS WEIGHT	(W2)		7.0058
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9233
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)		0.0825
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		12.38
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.8144				
SOLID	SAMPLE COUNT RATE	(Rs)	3624.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000893	TIME OF SEPARATION	(ST)	16:00	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)		3.50
0	TIME OF COUNT	(TOC)	04:23	Sr-89/90 CONC in µCi/g			9.4553E+00
Sample Prep	DATE OF COUNT	(DOC)	02/05/96				
FUS-ZR01							
Sample #							
S95T004190							
Instrument Code							
WB26870							
Prepared By							
CJO							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/06/96							
Analysis Date							
02/05/96							
Analysis Time							
03:45 PM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	9.46E+00	µCi/g	
RELATIVE COUNTING ERROR	1.0%		9.13E-03 µCi/g
PERCENT CARRIER RECOVERY	82.5%		

Analyst:	RAG	Date:	06-Feb-96
Signature of Chemist:	SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

2742

WORKBOOK PAGE: DUP11

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	36102	GROSS WEIGHT	(W2)		7.0708
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9865
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)		0.0843
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		12.55
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9196				
SOLID	SAMPLE COUNT RATE	(Rs)	3602.20	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000893	TIME OF SEPARATION	(ST)	16:00	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)		3.50
0	TIME OF COUNT	(TOC)	04:33	Sr-89/90 CONC in µCi/g			8.6785E+00
Sample Prep	DATE OF COUNT	(DOC)	02/06/96				
FUS-ZR01							
Sample #							
S95T004190							
Instrument Code							
WB26870							
Prepared By							
CJO							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
02/06/96							
Analysis Date							
02/05/96							
Analysis Time							
03:45 PM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	8.68E+00	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	1.0%		8.43E-03 µCi/g
PERCENT CARRIER RECOVERY	84.3%		

Analyst:	RAG	Date:	06-Feb-96
Signature of Chemist:	SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

2743

LABCORE Data Entry Template for Worklist# 5360

Analyst: DBS **Instrument:** AB00 12 **Book#** 9B56

Method: LA-220-101 Rev/Mod D1

Worklist Comment: SR90. DETERMINE SS USING LUDLUM. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S96T000106	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S96T000106	0	Z	@SR90-01	SOLID		
6	SAMPLE	S96T000107	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S96T000107	0	Z	@SR90-01	SOLID		
8	SAMPLE	S96T000250	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
9	DUP	S96T000250	0	Z	@SR90-01	SOLID		
10	SAMPLE	S96T000251	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
11	DUP	S96T000251	0	Z	@SR90-01	SOLID		

Final page for worklist # 5360

DB Sullen 2-1-96 1163 **Analyst Signature** **Date**

[illegible] 2/2/96 **Analyst Signature** **Date**

SE Morgan 2/2/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

worklistdata Version 0.0 05/16/95
02/02/96 15:28

~~WHC-SD-WM-DP-103, REV. 1~~ 2AD 4-1-96

LABCORE Completed Worklist Report for Worklist# 5360

Analyst: dgg **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: SR90. DETERMINE SS USING LUDLUM. new

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01 SR90-01	SOLID	1.24E-03	1.24E-3	100.000	% Recovery
1	STD		0		@SR90-01 SR90-01C	SOLID	100	9.01E+01	90.100	% Recovery
1	STD		0		@SR90-01 SR90-01E	SOLID	1.00	1.73E+00	1.730	% Ct. Error
2	BLNK-PREP		0		@SR90-01 SR90-01	SOLID	1	2.00E-3	0.000	uCi/g
2	BLNK-PREP		0		@SR90-01 SR90-01C	SOLID	100	9.08E+01	90.800	% Recovery
2	BLNK-PREP		0		@SR90-01 SR90-01E	SOLID	1.00	9.80E+01	98.000	% Ct. Error
3	BLNK/BKG		0		@SR90-01 SR90-01	SOLID	1	1.50E+00	1.500	uCi/g
4	SAMPLE	S96T000106	0	Z	@SR90-01 SR90-01	SOLID	N/A	2.61E+00	2.550e-003	uCi/g
4	SAMPLE	S96T000106	0	Z	@SR90-01 SR90-01C	SOLID	N/A	8.90E+01	1.000e-004	% Recovery
4	SAMPLE	S96T000106	0	Z	@SR90-01 SR90-01E	SOLID	N/A	1.23E+00	0.000	% Ct. Error
5	DUP	S96T000106	0	Z	@SR90-01 SR90-01	SOLID	2.61E+0	3.04E+0	15.220	RPD
5	DUP	S96T000106	0	Z	@SR90-01 SR90-01C	SOLID	100	8.80E+01	88.000	% Recovery
5	DUP	S96T000106	0	Z	@SR90-01 SR90-01E	SOLID	1.00	1.19E+00	1.190	% Ct. Error
6	SAMPLE	S96T000107	0	Z	@SR90-01 SR90-01	SOLID	N/A	1.30E+01	2.620e-003	uCi/g
6	SAMPLE	S96T000107	0	Z	@SR90-01 SR90-01C	SOLID	N/A	8.81E+01	1.000e-004	% Recovery
6	SAMPLE	S96T000107	0	Z	@SR90-01 SR90-01E	SOLID	N/A	5.57E-01	0.000	% Ct. Error
7	DUP	S96T000107	0	Z	@SR90-01 SR90-01	SOLID	1.30E+1	1.23E+1	5.530	RPD
7	DUP	S96T000107	0	Z	@SR90-01 SR90-01C	SOLID	100	8.88E+01	88.800	% Recovery
7	DUP	S96T000107	0	Z	@SR90-01 SR90-01E	SOLID	1.00	5.61E-01	0.560	% Ct. Error
8	SAMPLE	S96T000250	0	Z	@SR90-01 SR90-01	SOLID	N/A	6.67E-01	2.130e-003	uCi/g
8	SAMPLE	S96T000250	0	Z	@SR90-01 SR90-01C	SOLID	N/A	8.96E+01	1.000e-004	% Recovery
8	SAMPLE	S96T000250	0	Z	@SR90-01 SR90-01E	SOLID	N/A	2.22E+00	0.000	% Ct. Error
9	DUP	S96T000250	0	Z	@SR90-01 SR90-01	SOLID	6.67E-1	6.73E-1	0.900	RPD
9	DUP	S96T000250	0	Z	@SR90-01 SR90-01C	SOLID	100	8.86E+01	88.600	% Recovery
9	DUP	S96T000250	0	Z	@SR90-01 SR90-01E	SOLID	1.00	2.17E+00	2.170	% Ct. Error
10	SAMPLE	S96T000251	0	Z	@SR90-01 SR90-01	SOLID	N/A	2.22E+00	2.760e-003	uCi/g
10	SAMPLE	S96T000251	0	Z	@SR90-01 SR90-01C	SOLID	N/A	8.81E+01	1.000e-004	% Recovery
10	SAMPLE	S96T000251	0	Z	@SR90-01 SR90-01E	SOLID	N/A	1.39E+00	0.000	% Ct. Error
11	DUP	S96T000251	0	Z	@SR90-01 SR90-01	SOLID	2.22E+0	2.35E+0	5.690	RPD
11	DUP	S96T000251	0	Z	@SR90-01 SR90-01C	SOLID	100	8.91E+01	89.100	% Recovery
11	DUP	S96T000251	0	Z	@SR90-01 SR90-01E	SOLID	1.00	1.36E+00	1.360	% Ct. Error

Final page for worklist# 5360

Analyst Signature **Date** **Analyst Signature** **Date**

2/6/96

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

~~WHC-SD-WM-DP-103, REV. 1~~
4-1-96 LAD

LABCORE Completed Worklist Report for Worklist# 5360

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit

Units shown for QC (BLK/BKG) may not reflect the actual units.

WHC-SD-WM-DP-103, REV. 1

~~WHC-SD-WM-DP-103, REV. 1~~ LAD 4-1-96

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	12883	GROSS WEIGHT	(W2)		7.2229
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1328
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0901
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		22.08
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1284.30	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	08:50	Sr-89/90 CONC. in µCi/L			1.2423E+00
Sample Prep	DATE OF COUNT	(DOC)	02/02/96				
N/A	STANDARD BOOK #		9B56				
Sample #	STANDARD VALUE in µCi/mL		1.2353E-03				
WL5360							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
DGG							
Date Complete							
02/02/96							
Analysis Date							
02/01/96							
Analysis Time							
10:45 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	1.24E-03	µCi/mL	2.42E-06 µCi/L
RELATIVE COUNTING ERROR	1.7%		
PERCENT CARRIER RECOVERY	90.1%		

Analyst:	DGG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/6/96

STANDARD.WB1 REV 1.2 22010NML

2747

WHC-SD-WM-DP-103, REV. 1
~~WHC-SD-WM-DP-103, REV. 1~~
LAD 4-1-96

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) BLNK-PREP

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	60	GROSS WEIGHT	(W2)	7.1690
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0782
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0908
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)	22.42
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L)	1.9128			
SOLID	SAMPLE COUNT RATE	(Rs)	2.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	09:10	Sr-89/90 CONC in µCi/g		2.0021E-03
Sample Prep	DATE OF COUNT	(DOC)	02/02/96			
N/A						
Sample #						
WL5360						

Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
Analyst	NOTE: Expected weight = CVA * 0.1
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
02/02/96	
Analysis Date	
02/01/96	
Analysis Time	
10:45 AM	
Sample Point	
BY-106	

Sr-89/90 CONCENTRATION	2.00E-03	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	98.0%		2.50E-03 µCi/g
PERCENT CARRIER RECOVERY	90.8%		

Analyst:	DGG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/6/96

BLANK.WB1 REV 1.2 22010NML

2748

I:\22010N\OUT\SR5360.WB1 02/02/96

WHC-SD-WM-DP-103, REV. 1
~~WHC-SD-WM-DP-103, REV. 1~~
LAD 4-1-96

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	25664	GROSS WEIGHT	(W2)		7.1180
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0290
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0890
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		22.58
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9128				
SOLID	SAMPLE COUNT RATE	(Rs)	2562.40	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	09:20	Sr-89/90 CONC in µCi/g			2.6136E+00
Sample Prep	DATE OF COUNT	(DOC)	02/02/96				
FUS-ZR01							
Sample #							
S96T000106							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/02/96							
Analysis Date							DETECTION LEVEL
02/01/96	Sr-89/90 CONCENTRATION			2.61E+00	µCi/g		
Analysis Time							
10:45 AM	RELATIVE COUNTING ERROR			1.2%			2.55E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			89.0%			

Analyst:	DGG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/6/96

SAMPLE.WB1 REV 1.2 22010NML

2149

WHC-SD-WM-DP-103, REV. 1
~~WHC-SD-WM-DP-103, REV. 1~~
LAD 4-1-96

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	27098	GROSS WEIGHT	(W2)		7.2773
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1893
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0880
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		22.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.7552				
SOLID	SAMPLE COUNT RATE	(Rs)	2705.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	09:30	Sr-89/90 CONC in µCi/g			3.0380E+00
Sample Prep	DATE OF COUNT	(DOC)	02/02/96				
FUS-ZR01							
Sample #							
S96T000106							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/02/96							
Analysis Date							DETECTION LEVEL
02/01/96	Sr-89/90 CONCENTRATION			3.04E+00		µCi/g	
Analysis Time							
10:45 AM	RELATIVE COUNTING ERROR			1.2%			2.81E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			88.0%			

Analyst:	DGG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/6/96

SAMPLE.WB1 REV 1.2 22010NML

2750

LAD 4-19

~~WHC-SD-WM-DP-103, REV. 1~~

WORKBOOK PAGE: SAM6

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	123883	GROSS WEIGHT	(W2)		7.1371
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0490
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0881
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		22.92
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.876				
SOLID	SAMPLE COUNT RATE	(Rs)	12384.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	09:40	Sr-89/90 CONC in µCi/g			1.2978E+01
Sample Prep	DATE OF COUNT	(DOC)	02/02/96				
FUS-ZR01							
Sample #							
S96T000107							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/02/96							
Analysis Date							DETECTION LEVEL
02/01/96	Sr-89/90 CONCENTRATION			1.30E+01		µCi/g	
Analysis Time							
10:45 AM	RELATIVE COUNTING ERROR			0.6%			2.62E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			88.1%			

Analyst:		DGG	Date:	02-Feb-96
Signature of Chemist:		SLF	Date:	2/6/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP7

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	122099	GROSS WEIGHT	(W2)		7.1999
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1111
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0888
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		23.58
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.922				
SOLID	SAMPLE COUNT RATE	(Rs)	12205.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	10:20	Sr-89/90 CONC in µCi/g			1.2325E+01
Sample Prep	DATE OF COUNT	(DOC)	02/02/96				
FUS-ZR01							
Sample #							
S96T000107							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/02/96							
Analysis Date							DETECTION LEVEL
02/01/96	Sr-89/90 CONCENTRATION			1.23E+01	µCi/g		
Analysis Time							
10:45 AM	RELATIVE COUNTING ERROR			0.6%			2.53E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			88.8%			

Analyst:	DGG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/6/96

SAMPLE.WB1 REV 1.2 22010NML

2752

WORKBOOK PAGE: SAM8

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	7889	GROSS WEIGHT	(W2)		7.2452
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1556
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0896
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		23.92
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.2568				
SOLID	SAMPLE COUNT RATE	(Rs)	784.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	10:40	Sr-89/90 CONC in µCi/g			6.6729E-01
Sample Prep	DATE OF COUNT	(DOC)	02/02/96				
FUS-ZR01							
Sample #							
S96T000250							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/02/96							
Analysis Date							DETECTION LEVEL
02/01/96	Sr-89/90 CONCENTRATION			6.67E-01	µCi/g		
Analysis Time							
10:45 AM	RELATIVE COUNTING ERROR			2.2%			2.13E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			89.6%			

Analyst:	DGG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/6/96

SAMPLE.WB1 REV 1.2 22010NML

2753

~~WHC-SD-WM-DP-103, REV. 1~~
LAD 4-1-96

WORKBOOK PAGE: DUP9

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	8299	GROSS WEIGHT	(W2)		7.2399
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1513
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0886
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		24.17
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.3764				
SOLID	SAMPLE COUNT RATE	(Rs)	825.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	10:55	Sr-89/90 CONC in µCi/g			6.7309E-01
Sample Prep	DATE OF COUNT	(DOC)	02/02/96				
FUS-ZR01							
Sample #							
S96T000250							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
DGG							
Date Complete							
02/02/96							
Analysis Date							
02/01/96							
Analysis Time							
10:45 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	6.73E-01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	2.2%		2.04E-03 µCi/g
PERCENT CARRIER RECOVERY	88.6%		

Analyst:	DGG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/6/96

SAMPLE.WB1 REV 1.2 22010NML

2754

LAD 4-1-96
~~WHC-SD-WM-DP-103, REV. 1~~

WORKBOOK PAGE: SAM10

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	20103	GROSS WEIGHT	(W2)		7.1836
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0955
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0881
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		24.50
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.758				
SOLID	SAMPLE COUNT RATE	(Rs)	2006.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	11:15	Sr-89/90 CONC in µCi/g			2.2174E+00
Sample Prep	DATE OF COUNT	(DOC)	02/02/96				
FUS-ZR01							
Sample #							
S96T000251							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
DGG							
Date Complete							
02/02/96							
Analysis Date							
02/01/96							
Analysis Time							
10:45 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

				DETECTION LEVEL
Sr-89/90 CONCENTRATION	2.22E+00	µCi/g		
RELATIVE COUNTING ERROR	1.4%			2.76E-03 µCi/g
PERCENT CARRIER RECOVERY	88.1%			

Analyst:	DGG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/6/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP11

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	21028	GROSS WEIGHT	(W2)		7.2559
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1668
5360	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0891
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		24.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.7112				
SOLID	SAMPLE COUNT RATE	(Rs)	2098.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000894	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/01/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	11:30	Sr-89/90 CONC in µCi/g			2.3520E+00
Sample Prep	DATE OF COUNT	(DOC)	02/02/96				
FUS-ZR01							
Sample #							
S96T000251							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/02/96							
Analysis Date							DETECTION LEVEL
02/01/96	Sr-89/90 CONCENTRATION			2.35E+00		µCi/g	
Analysis Time							
10:45 AM	RELATIVE COUNTING ERROR			1.4%			2.80E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			89.1%			

Analyst:	DGG	Date:	02-Feb-96
Signature of Chemist:	SLF	Date:	2/6/96

SAMPLE.WB1 REV 1.2 22010NML

WHC-SD-WM-DP-103, REV. 1

LABCORE Data Entry Template for Worklist# 5630

Analyst: DBB **Instrument:** AB00 12 **Book#** 9B56

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: Use .250 mL sample size. Rerun #1. SLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T004187	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S95T004187	0	Z	@SR90-01	SOLID		
6	SAMPLE	S95T004189	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S95T004189	0	Z	@SR90-01	SOLID		

Final page for worklist # 5630

D B Buffin 2-11-96/ 2340
Analyst Signature Date

Sylvia Z Cochran 2/12/96
Analyst Signature Date

SE Hogan 2/12/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 5630

Analyst: dgg **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: Use .250 mL sample size. Rerun #1. SLF

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01	SR90-01	SOLID	1.23E-03	1.22E-3	99.190	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	9.01E+01	90.100	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.86E+00	1.860	% Ct. Error
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	1.14E-3	0.000	uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	8.98E+01	89.800	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	9.43E+01	94.300	% Ct. Error
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	1.49E+00	1.490	uCi/g
4	SAMPLE	S95T004187	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.21E+00	1.350e-003	uCi/g
4	SAMPLE	S95T004187	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.07E+01	1.000e-004	% Recovery
4	SAMPLE	S95T004187	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.28E+00	0.000	% Ct. Error
5	DUP	S95T004187	0	Z	@SR90-01	SR90-01	SOLID	1.21E+0	5.95E+0	132.400	RPD
5	DUP	S95T004187	0	Z	@SR90-01	SR90-01C	SOLID	100	9.10E+01	91.000	% Recovery
5	DUP	S95T004187	0	Z	@SR90-01	SR90-01E	SOLID	1.00	5.73E-01	0.570	% Ct. Error
6	SAMPLE	S95T004189	0	Z	@SR90-01	SR90-01	SOLID	N/A	9.91E+00	2.890e-003	uCi/g
6	SAMPLE	S95T004189	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.15E+01	1.000e-004	% Recovery
6	SAMPLE	S95T004189	0	Z	@SR90-01	SR90-01E	SOLID	N/A	6.51E-01	0.000	% Ct. Error
7	DUP	S95T004189	0	Z	@SR90-01	SR90-01	SOLID	9.91E+0	9.32E+0	6.140	RPD
7	DUP	S95T004189	0	Z	@SR90-01	SR90-01C	SOLID	100	9.11E+01	91.100	% Recovery
7	DUP	S95T004189	0	Z	@SR90-01	SR90-01E	SOLID	1.00	6.97E-01	0.700	% Ct. Error

Final page for worklist# 5630

Analyst Signature **Date** **Analyst Signature** **Date**

2/13/96

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	11205	GROSS WEIGHT	(W2)		7.2518
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1617
5630	BACKGROUND in cpm	(BKG)	4.5	NET WEIGHT	(W3)		0.0901
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		8.00
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1116.00	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.28	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001191	TIME OF SEPARATION	(ST)	22:00	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/11/96	DETECTION LIMIT	(Ld)		2.65
0	TIME OF COUNT	(TOC)	06:00	Sr-89/90 CONC. in µCi/L			1.2220E+00
Sample Prep	DATE OF COUNT	(DOC)	02/12/96				
N/A	STANDARD BOOK #		9B56				
Sample #	STANDARD VALUE in µCi/mL		1.2345E-03				
WL5630							
Instrument Code							
WB27811							
Prepared By							
SZC							
Chemist							
SLF							
Analyst							
DGG							
Date Complete							
02/12/96							
Analysis Date							
02/11/96							
Analysis Time							
11:40 PM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.22E-03	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	1.9%		2.90E-06 µCi/L
PERCENT CARRIER RECOVERY	90.1%		

Analyst:	DGG	Date:	12-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

STANDARD.WB1 REV 1.2 22010NML

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							BLNK-PREP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLNK-PREP	TOTAL COUNTS	(TC)	67	GROSS WEIGHT	(W2)		7.0013
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9115
5630	BACKGROUND in cpm	(BKG)	4.5	NET WEIGHT	(W3)		0.0898
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		8.25
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L)	2.1196				
SOLID	SAMPLE COUNT RATE	(Rs)	2.20	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.28	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001191	TIME OF SEPARATION	(ST)	22:00	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/11/96	DETECTION LIMIT	(Ld)		2.65
0	TIME OF COUNT	(TOC)	06:15	Sr-89/90 CONC in µCi/g			1.1375E-03
Sample Prep	DATE OF COUNT	(DOC)	02/12/96				
N/A							
Sample #							

Instrument Code: WB27811

Prepared By: SZC

Chemist: SLF

Analyst: DGG

Date Complete: 02/12/96

Analysis Date: 02/11/96

Analysis Time: 11:40 PM

Sample Point: BY-106

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	1.14E-03	µCi/g	1.37E-03 µCi/g
RELATIVE COUNTING ERROR	94.3%		
PERCENT CARRIER RECOVERY	89.8%		

Analyst:		DGG	Date:	12-Feb-96
Signature of Chemist:	[signature]	SLF	Date:	2/13/96

BLANK.WB1 REV 1.2 22010NML

2760

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	23721	GROSS WEIGHT	(W2)	6.9796
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.8889
5630	BACKGROUND in cpm	(BKG)	4.5	NET WEIGHT	(W3)	0.0907
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	8.50
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1196			
SOLID	SAMPLE COUNT RATE	(Rs)	2367.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.28	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96001191	TIME OF SEPARATION	(ST)	22:00	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	02/11/96	DETECTION LIMIT	(Ld)	2.65
1	TIME OF COUNT	(TOC)	06:30	Sr-89/90 CONC in µCi/g		1.2090E+00
Sample Prep	DATE OF COUNT	(DOC)	02/12/96			
FUS-ZR01						
Sample #						
S95T004187						
Instrument Code						
WB27811						
Prepared By						
SZC						
Chemist						
SLF						
Analyst						
DGG						
Date Complete						
02/12/96						
Analysis Date						
02/11/96						
Analysis Time						
11:40 PM						
Sample Point						
BY-106						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	1.21E+00	µCi/g	
RELATIVE COUNTING ERROR	1.3%		1.35E-03 µCi/g
PERCENT CARRIER RECOVERY	90.7%		

Analyst:	DGG	Date:	12-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

2761

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	117088	GROSS WEIGHT	(W2)		7.0830
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9920
5630	BACKGROUND in cpm	(BKG)	4.5	NET WEIGHT	(W3)		0.0910
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		8.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.116				
SOLID	SAMPLE COUNT RATE	(Rs)	11704.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.28	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001191	TIME OF SEPARATION	(ST)	22:00	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/11/96	DETECTION LIMIT	(Ld)		2.65
1	TIME OF COUNT	(TOC)	06:45	Sr-89/90 CONC in µCi/g			5.9521E+00
Sample Prep	DATE OF COUNT	(DOC)	02/12/96				
FUS-ZR01							
Sample #							
S95T004187							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
SZC	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/12/96							
Analysis Date							DETECTION LEVEL
02/11/96	Sr-89/90 CONCENTRATION			5.95E+00		µCi/g	
Analysis Time							
11:40 PM	RELATIVE COUNTING ERROR			0.6%			1.35E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			91.0%			

Analyst:	DGG	Date:	12-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

2762

WORKBOOK PAGE: SAM6

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	SAMPLE 1.000
SAMPLE	TOTAL COUNTS	(TC)	90661	GROSS WEIGHT	(W2)	6.9835
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.8920
5630	BACKGROUND in cpm	(BKG)	4.5	NET WEIGHT	(W3)	0.0915
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)	9.00
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9528			
SOLID	SAMPLE COUNT RATE	(Rs)	9061.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.28	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96001191	TIME OF SEPARATION	(ST)	22:00	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	02/11/96	DETECTION LIMIT	(Ld)	2.65
1	TIME OF COUNT	(TOC)	07:00	Sr-89/90 CONC in µCi/g		9.9074E+00
Sample Prep	DATE OF COUNT	(DOC)	02/12/96			
FUS-ZR01						
Sample #						
S95T004189						
Instrument Code						
WB27811						
Prepared By						
SZC						
Chemist						
SLF						
Analyst						
DGG						
Date Complete						
02/12/96						
Analysis Date						
02/11/96						
Analysis Time						
11:40 PM						
Sample Point						
BY-106						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	9.91E+00	µCi/g	2.89E-03 µCi/g
RELATIVE COUNTING ERROR	0.7%		
PERCENT CARRIER RECOVERY	91.5%		

Analyst:	DGG	Date:	12-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP7

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	79251	GROSS WEIGHT	(W2)		7.0301
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9390
5630	BACKGROUND in cpm	(BKG)	4.5	NET WEIGHT	(W3)		0.0911
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		9.25
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.8188				
SOLID	SAMPLE COUNT RATE	(Rs)	7920.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.28	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001191	TIME OF SEPARATION	(ST)	22:00	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/11/96	DETECTION LIMIT	(Ld)		2.65
1	TIME OF COUNT	(TOC)	07:15	Sr-89/90 CONC in µCi/g			9.3157E+00
Sample Prep	DATE OF COUNT	(DOC)	02/12/96				
FUS-ZR01							
Sample #							
S95T004189							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
SZC	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/12/96							
Analysis Date							DETECTION LEVEL
02/11/96	Sr-89/90 CONCENTRATION			9.32E+00	µCi/g		
Analysis Time							
11:40 PM	RELATIVE COUNTING ERROR			0.7%			3.11E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			91.1%			

Analyst:	DGG	Date:	12-Feb-96
Signature of Chemist:	SLF	Date:	2/13/96

SAMPLE.WB1 REV 1.2 22010NML

LABCORE Data Entry Template for Worklist# 5631

Analyst: DPB **Instrument:** AB00 12 **Book#** 9B56

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: Use .250 mL sample size. Rerun #1. SLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T004180	0	Z	@SR90-01	SOLID	95000229	BY-106
		Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
5	DUP	S95T004180	0	Z	@SR90-01	SOLID		

Final page for worklist # 5631

Daniel P. Bromley 2/15/96 0430
Analyst Signature Date

SE Hogan 2/15/96
Analyst Signature Date

B/B Bierman 2/15/96

Data Entry Comments:

RPD For 4180 is consistent with 1st run, ~~Batch~~ SLF 2/15/96

No rerun requested. [illegible] 2/15/96

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 5631

Analyst: dpb **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: Use .250 mL sample size. Rerun #1. SLF

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01 SR90-01	SOLID	1.23E-03	1.25E-3	101.630	% Recovery
1	STD		0		@SR90-01 SR90-01C	SOLID	100	8.81E+01	88.100	% Recovery
1	STD		0		@SR90-01 SR90-01E	SOLID	1.00	1.87E+00	1.870	% Ct. Error
2	BLNK-PREP		0		@SR90-01 SR90-01	SOLID	1	3.92E-3	0.000	uCi/g
2	BLNK-PREP		0		@SR90-01 SR90-01C	SOLID	100	8.74E+01	87.400	% Recovery
2	BLNK-PREP		0		@SR90-01 SR90-01E	SOLID	1.00	1.07E+02	107.000	% Ct. Error
3	BLNK/BKG		0		@SR90-01 SR90-01	SOLID	1	1.43E+00	1.430	uCi/g
4	SAMPLE	S95T004180	0	Z	@SR90-01 SR90-01	SOLID	N/A	5.95E+00	5.410e-003	uCi/g
4	SAMPLE	S95T004180	0	Z	@SR90-01 SR90-01C	SOLID	N/A	8.70E+01	1.000e-004	% Recovery
4	SAMPLE	S95T004180	0	Z	@SR90-01 SR90-01E	SOLID	N/A	1.16E+00	0.000	% Ct. Error
5	DUP	S95T004180	0	Z	@SR90-01 SR90-01	SOLID	5.95E+0	8.84E+0	39.080	RPD
5	DUP	S95T004180	0	Z	@SR90-01 SR90-01C	SOLID	100	8.82E+01	88.200	% Recovery
5	DUP	S95T004180	0	Z	@SR90-01 SR90-01E	SOLID	1.00	9.86E-01	0.990	% Ct. Error

Final page for worklist# 5631

Analyst Signature **Date** **Analyst Signature** **Date**

2/15/96

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	11070	GROSS WEIGHT	(W2)		6.9620
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8739
5631	BACKGROUND in cpm	(BKG)	4.4	NET WEIGHT	(W3)		0.0881
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		6.50
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1102.60	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.26	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001192	TIME OF SEPARATION	(ST)	23:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/14/96	DETECTION LIMIT	(Ld)		2.62
0	TIME OF COUNT	(TOC)	06:15	Sr-89/90 CONC. in µCi/L			1.2539E+00
Sample Prep	DATE OF COUNT	(DOC)	02/15/96				
N/A	STANDARD BOOK #		9B56				
Sample #	STANDARD VALUE in µCi/mL		1.2342E-03				
WL#5631							
Instrument Code							
WB27811							
Prepared By							
SEH							
Chemist							
SLF							
Analyst							
DPB							
Date Complete							
02/15/96							
Analysis Date							
02/14/96							
Analysis Time							
11:45 PM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.25E-03	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	1.9%		2.98E-06 µCi/L
PERCENT CARRIER RECOVERY	88.1%		

Analyst:	DPB	Date:	15-Feb-96
Signature of Chemist:	SLF	Date:	2/15/96

STANDARD.WB1 REV 1.2 22010NML

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							BLNK-PREP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLNK-PREP	TOTAL COUNTS	(TC)	63	GROSS WEIGHT	(W2)		7.0213
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9339
5631	BACKGROUND in cpm	(BKG)	4.4	NET WEIGHT	(W3)		0.0874
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		6.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L)	2.2188				
SOLID	SAMPLE COUNT RATE	(Rs)	1.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.26	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001192	TIME OF SEPARATION	(ST)	23:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/14/96	DETECTION LIMIT	(Ld)		2.62
0	TIME OF COUNT	(TOC)	06:30	Sr-89/90 CONC in µCi/g			3.9164E-03
Sample Prep	DATE OF COUNT	(DOC)	02/15/96				
N/A							
Sample #							
WL#5631							
Instrument Code							
WB27811							
Prepared By							
SEH							
Chemist							
SLF							
Analyst							
DPB							
Date Complete							
02/15/96							
Analysis Date							
02/14/96							
Analysis Time							
11:45 PM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	3.92E-03	µCi/g	5.40E-03 µCi/g
RELATIVE COUNTING ERROR	106.7%		
PERCENT CARRIER RECOVERY	87.4%		

Analyst:	DPB	Date:	15-Feb-96
Signature of Chemist:	SLF	Date:	2/15/96

BLANK.WB1 REV 1.2 22010NML

2768

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	28830	GROSS WEIGHT	(W2)		7.1968
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1098
5631	BACKGROUND in cpm	(BKG)	4.4	NET WEIGHT	(W3)		0.0870
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		7.00
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.2188				
SOLID	SAMPLE COUNT RATE	(Rs)	2878.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.26	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001192	TIME OF SEPARATION	(ST)	23:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/14/96	DETECTION LIMIT	(Ld)		2.62
1	TIME OF COUNT	(TOC)	06:45	Sr-89/90 CONC in µCi/g			5.9455E+00
Sample Prep	DATE OF COUNT	(DOC)	02/15/96				
FUS-ZR01							
Sample #							
S95T004180							

Instrument Code: WB27811

Prepared By: SEH

Chemist: SLF

Analyst: DPB

Date Complete: 02/15/96

Analysis Date: 02/14/96

Analysis Time: 11:45 PM

Sample Point: BY-106

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	5.95E+00	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	1.2%		5.41E-03 µCi/g
PERCENT CARRIER RECOVERY	87.0%		

Analyst:		DPB	Date:	15-Feb-96
Signature of Chemist:		SLF	Date:	2/15/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	39646	GROSS WEIGHT	(W2)		7.2941
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.2059
5631	BACKGROUND in cpm	(BKG)	4.4	NET WEIGHT	(W3)		0.0882
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		7.25
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.0208				
SOLID	SAMPLE COUNT RATE	(Rs)	3960.20	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.26	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001192	TIME OF SEPARATION	(ST)	23:45	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/14/96	DETECTION LIMIT	(Ld)		2.62
1	TIME OF COUNT	(TOC)	07:00	Sr-89/90 CONC in µCi/g			8.8359E+00
Sample Prep	DATE OF COUNT	(DOC)	02/15/96				
FUS-ZR01							
Sample #							
S95T004180							
Instrument Code							
WB27811							
Prepared By							
SEH							
Chemist							
SLF							
Analyst							
DPB							
Date Complete							
02/15/96							
Analysis Date							
02/14/96							
Analysis Time							
11:45 PM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	8.84E+00	µCi/g	5.84E-03 µCi/g
RELATIVE COUNTING ERROR	1.0%		
PERCENT CARRIER RECOVERY	88.2%		

Analyst:		DPB	Date:	15-Feb-96
Signature of Chemist:		SLF	Date:	2/15/96

SAMPLE.WB1 REV 1.2 22010NML

2770

LABCORE Data Entry Template for Worklist# 5766

Analyst: KT **Instrument:** AB00 12 **Book#** 9B56

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: Determine Sample Size Using Ludlum. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S96T000379	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S96T000379	0	Z	@SR90-01	SOLID		
6	SAMPLE	S96T000374	0	F	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S96T000374	0	F	@SR90-01	SOLID		

Final page for worklist # 5766

Kim Thomas 2-26-96
Analyst Signature **Date**

C.B. Ovrien 2/27/96
Analyst Signature **Date**
M.L. Brelsford 2/27/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 5766

Analyst: knt **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine Sample Size Using Ludlum. new

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01 SR90-01	SOLID	1.23E-03	1.22E-3	99.190	% Recovery
1	STD		0		@SR90-01 SR90-01C	SOLID	100	8.86E+01	88.600	% Recovery
1	STD		0		@SR90-01 SR90-01E	SOLID	1.00	1.92E+00	1.920	% Ct. Error
2	BLNK-PREP		0		@SR90-01 SR90-01	SOLID	1	<5.35E-3		uCi/g
2	BLNK-PREP		0		@SR90-01 SR90-01C	SOLID	100	8.89E+01	88.900	% Recovery
2	BLNK-PREP		0		@SR90-01 SR90-01E	SOLID	1.00	2.35E+02	235.000	% Ct. Error
3	BLNK/BKG		0		@SR90-01 SR90-01	SOLID	1	1.19E+00	1.190	uCi/g
4	SAMPLE	S96T000379	0	Z	@SR90-01 SR90-01	SOLID	N/A	6.42E+00	6.340e-003	uCi/g
4	SAMPLE	S96T000379	0	Z	@SR90-01 SR90-01C	SOLID	N/A	9.00E+01	1.000e-004	% Recovery
4	SAMPLE	S96T000379	0	Z	@SR90-01 SR90-01E	SOLID	N/A	1.22E+00	0.000	% Ct. Error
5	DUP	S96T000379	0	Z	@SR90-01 SR90-01	SOLID	6.42E+0	6.16E+0	4.130	RPD
5	DUP	S96T000379	0	Z	@SR90-01 SR90-01C	SOLID	100	9.01E+01	90.100	% Recovery
5	DUP	S96T000379	0	Z	@SR90-01 SR90-01E	SOLID	1.00	1.28E+00	1.280	% Ct. Error
6	SAMPLE	S96T000374	0	Z	@SR90-01 SR90-01	SOLID	N/A	3.47E+01	1.540e-002	uCi/g
6	SAMPLE	S96T000374	0	Z	@SR90-01 SR90-01C	SOLID	N/A	9.06E+01	1.000e-004	% Recovery
6	SAMPLE	S96T000374	0	Z	@SR90-01 SR90-01E	SOLID	N/A	8.17E-01	0.000	% Ct. Error
7	DUP	S96T000374	0	Z	@SR90-01 SR90-01	SOLID	3.47E+1	3.86E+1	10.640	RPD
7	DUP	S96T000374	0	Z	@SR90-01 SR90-01C	SOLID	100	9.12E+01	91.200	% Recovery
7	DUP	S96T000374	0	Z	@SR90-01 SR90-01E	SOLID	1.00	7.45E-01	0.750	% Ct. Error

Final page for worklist# 5766

Analyst Signature Date

Analyst Signature Date

Reviewer Signature 2/28/96 Date

Units shown for QC (BLK/BKG) may not reflect the actual units. 2772

WHC-SD-WM-DP-103, REV. 1

~~WHC-SD-WM-DP-153, REV. 1~~ JW 3/04/96

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

						STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
STD	TOTAL COUNTS	(TC)	10573	GROSS WEIGHT	(W2)	7.1829
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0943
5766	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)	0.0886
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	4.08
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST DILUTION FACTOR	DDF	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	1053.10	SR-90 EFFICIENCY FACTO	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96001348	TIME OF SEPARATION	(ST)	02:55	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	02/27/96	DETECTION LIMIT	(Ld)	2.56
0	TIME OF COUNT	(TOC)	07:00	Sr-89/90 CONC. in µCi/L		1.2221E+00
Sample Prep	DATE OF COUNT	(DOC)	02/27/96			
N/A	STANDARD BOOK #		9B56			
Sample #	STANDARD VALUE in µCi/mL		1.2332E-03			
WL#5766						
Instrument Code						
WB27811						
Prepared By						
CJO						
Chemist						
SLF						
Analyst						
KNT						
Date Complete						
02/27/96						
Analysis Date						
02/27/96						
Analysis Time						
02:55 AM						
Sample Point						
BY-106						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	1.22E-03	µCi/mL	2.97E-06 µCi/L
RELATIVE COUNTING ERROR	1.9%		
PERCENT CARRIER RECOVERY	88.6%		

Analyst:	KNT	Date:	27-Feb-96
Signature of Chemist:	SLF	Date:	2/28/96

STANDARD.WB1 REV 1.2 22010NML

2773

I:\22010N\OUT\SR5766.WB1 02/27/96

~~WHC-SD-WM-DP-153, REV. 1~~ 3/25/96

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							BLNK-PREP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLNK-PREP	TOTAL COUNTS	(TC)	50	GROSS WEIGHT	(W2)		7.1892
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1003
5766	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)		0.0889
Test Code	SAMPLE VOLUME in mL	(SS)	0.200	DELTA TIME (HOURS)	(DT)		4.33
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L)	2.2848				
SOLID	SAMPLE COUNT RATE	(Rs)	0.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001348	TIME OF SEPARATION	(ST)	02:56	Rmax			2.12
Rerun	DATE OF SEPARATION	(SD)	02/27/96	DETECTION LIMIT	(Ld)		2.56
0	TIME OF COUNT	(TOC)	07:15	Sr-89/90 CONC in µCi/g		<	5.3511E-03
Sample Prep	DATE OF COUNT	(DOC)	02/27/96				
N/A							
Sample #							
WL#5766							
Instrument Code							
WB27811							
Prepared By							
CJO							
Chemist							
SLF							
Analyst							
KNT							
Date Complete							
02/27/96							
Analysis Date							
02/27/96							
Analysis Time							
02:55 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	< 5.35E-03	µCi/g	DETECTION LEVEL
LESS THAN Value was Determined from Rmax.			
RELATIVE COUNTING ERROR	235.0%		6.46E-03 µCi/g
PERCENT CARRIER RECOVERY	88.9%		

Analyst:	KNT	Date:	27-Feb-96
Signature of Chemist:	SLF	Date:	2/28/96

BLANK.WB1 REV 1.2 22010NML

~~WHC-SD-WM-DP-153, REV. 1~~ JW 3/25/96

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	25941	GROSS WEIGHT	(W2)		7.2203
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1303
5766	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)		0.0900
Test Code	SAMPLE VOLUME in mL	(SS)	0.200	DELTA TIME (HOURS)	(DT)		4.92
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.2848				
SOLID	SAMPLE COUNT RATE	(Rs)	2589.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001348	TIME OF SEPARATION	(ST)	02:55	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/27/96	DETECTION LIMIT	(Ld)		2.56
0	TIME OF COUNT	(TOC)	07:50	Sr-89/90 CONC in µCi/g			6.4165E+00
Sample Prep	DATE OF COUNT	(DOC)	02/27/96				
FUS-ZR01							
Sample #							
S96T000379							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/27/96							
Analysis Date							DETECTION LEVEL
02/27/96	Sr-89/90 CONCENTRATION			6.42E+00		µCi/g	
Analysis Time							
02:55 AM	RELATIVE COUNTING ERROR			1.2%			6.34E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			90.0%			

Analyst:		KNT	Date:	27-Feb-96
Signature of Chemist:		SLF	Date:	

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	23734	GROSS WEIGHT	(W2)	7.2214
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1313
5766	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)	0.0901
Test Code	SAMPLE VOLUME in mL	(SS)	0.200	DELTA TIME (HOURS)	(DT)	7.08
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1244			
SOLID	SAMPLE COUNT RATE	(Rs)	2369.20	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96001348	TIME OF SEPARATION	(ST)	02:55	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	02/27/96	DETECTION LIMIT	(Ld)	2.56
0	TIME OF COUNT	(TOC)	10:00	Sr-89/90 CONC in µCi/g		6.1634E+00
Sample Prep	DATE OF COUNT	(DOC)	02/27/96			
FUS-ZR01						
Sample #						
S96T000379						
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0					
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)					
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))					
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)					
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100					
Analyst	NOTE: Expected weight = CVA * 0.1					
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.					
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100					
02/27/96						
Analysis Date						DETECTION LEVEL
02/27/96	Sr-89/90 CONCENTRATION		6.16E+00		µCi/g	
Analysis Time						
02:55 AM	RELATIVE COUNTING ERROR		1.3%			6.66E-03 µCi/g
Sample Point						
BY-106	PERCENT CARRIER RECOVERY		90.1%			

Analyst:		KNT	Date:	27-Feb-96
Signature of Chemist:		SLF	Date:	2/28/96

SAMPLE.WB1 REV 1.2 22010NML

LABCORE Data Entry Template for Worklist# 7287

Analyst: DBB **Instrument:** AB00 12 **Book#** 9B56

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: Determine sample size using ludlum. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S96T001378	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S96T001378	0	Z	@SR90-01	SOLID		
6	SAMPLE	S96T001415	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S96T001415	0	Z	@SR90-01	SOLID		

Final page for worklist # 7287

D B Griffin 4-8-96
Analyst Signature **Date**

J. Opines 4/9/96
Analyst Signature **Date**

Sue Hogan 4/9/96

Data Entry Comments: RPD for 1378 accepted by Project Coordinator.

4/11/96

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 7287

Analyst: dgg **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine sample size using ludlum. new

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01 SR90-01	SOLID	1.23E-03	1.13E-3	91.870	% Recovery
1	STD		0		@SR90-01 SR90-01C	SOLID	100	9.31E+01	93.100	% Recovery
1	STD		0		@SR90-01 SR90-01E	SOLID	1.00	1.87E+00	1.870	% Ct. Error
2	BLNK-PREP		0		@SR90-01 SR90-01	SOLID	1	4.66E-3	0.000	uCi/g
2	BLNK-PREP		0		@SR90-01 SR90-01C	SOLID	100	9.20E+01	92.000	% Recovery
2	BLNK-PREP		0		@SR90-01 SR90-01E	SOLID	1.00	2.95E+01	29.500	% Ct. Error
3	BLNK/BKG		0		@SR90-01 SR90-01	SOLID	1	1.02E+00	1.020	uCi/g
4	SAMPLE	S96T001378	0	Z	@SR90-01 SR90-01	SOLID	N/A	5.12E+00	1.360e-003	uCi/g
4	SAMPLE	S96T001378	0	Z	@SR90-01 SR90-01C	SOLID	N/A	9.22E+01	1.000e-004	% Recovery
4	SAMPLE	S96T001378	0	Z	@SR90-01 SR90-01E	SOLID	N/A	6.32E-01	0.000	% Ct. Error
5	DUP	S96T001378	0	Z	@SR90-01 SR90-01	SOLID	5.12E+0	5.74E+0	11.420	RPD
5	DUP	S96T001378	0	Z	@SR90-01 SR90-01C	SOLID	100	8.84E+01	88.400	% Recovery
5	DUP	S96T001378	0	Z	@SR90-01 SR90-01E	SOLID	1.00	5.83E-01	0.580	% Ct. Error
6	SAMPLE	S96T001415	0	Z	@SR90-01 SR90-01	SOLID	N/A	9.31E+00	1.540e-003	uCi/g
6	SAMPLE	S96T001415	0	Z	@SR90-01 SR90-01C	SOLID	N/A	8.85E+01	1.000e-004	% Recovery
6	SAMPLE	S96T001415	0	Z	@SR90-01 SR90-01E	SOLID	N/A	4.98E-01	0.000	% Ct. Error
7	DUP	S96T001415	0	Z	@SR90-01 SR90-01	SOLID	9.31E+0	8.80E+0	5.630	RPD
7	DUP	S96T001415	0	Z	@SR90-01 SR90-01C	SOLID	100	9.05E+01	90.500	% Recovery
7	DUP	S96T001415	0	Z	@SR90-01 SR90-01E	SOLID	1.00	5.02E-01	0.500	% Ct. Error

Final page for worklist# 7287

Analyst Signature **Date** **Analyst Signature** **Date**

Reviewer Signature 4/11/96 **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

WORKBOOK PAGE: STD1

WHC-SD-WM-DP-103, REV. 1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

						STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
STD	TOTAL COUNTS	(TC)	11094	GROSS WEIGHT	(W2)	7.8734
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7803
7287	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)	0.0931
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	11.67
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST DILUTION FACTOR	DDF	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	1105.20	SR-90 EFFICIENCY FACTO	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96003004	TIME OF SEPARATION	(ST)	22:35	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	04/08/96	DETECTION LIMIT	(Ld)	2.56
0	TIME OF COUNT	(TOC)	10:15	Sr-89/90 CONC. in µCi/L		1.1302E+00
Sample Prep	DATE OF COUNT	(DOC)	04/09/96			
N/A	STANDARD BOOK #		9B56			
Sample #	STANDARD VALUE in µCi/mL		1.2299E-03			
WL7287						
Instrument Code						
WB27811						
Prepared By						
CJO						
Chemist						
SLF						
Analyst						
DGG						
Date Complete						
04/09/96						
Analysis Date						
04/08/96						
Analysis Time						
10:35 PM						
Sample Point						
BY-106						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.13E-03	µCi/mL
RELATIVE COUNTING ERROR	1.9%	
PERCENT CARRIER RECOVERY	93.1%	

DETECTION LEVEL

2.62E-06 µCi/L

Analyst:	DGG	Date:	09-Apr-96
Signature of Chemist:	SLF	Date:	4/11/96

STANDARD.WB1 REV 1.2 22010NML

WORKBOOK PAGE: BLANK2

WHC-SD-WM-DP-103, REV. 1

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						BLNK-PREP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	129	GROSS WEIGHT	(W2)	7.8217
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7297
7287	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)	0.0920
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	12.08
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9264			
SOLID	SAMPLE COUNT RATE	(Rs)	8.70	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96003004	TIME OF SEPARATION	(ST)	22:35	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	04/08/96	DETECTION LIMIT	(Ld)	2.56
0	TIME OF COUNT	(TOC)	10:40	Sr-89/90 CONC in µCi/g		4.6552E-03
Sample Prep	DATE OF COUNT	(DOC)	04/09/96			
N/A						
Sample #						
WL#7287						
Instrument Code						
WB27811						
Prepared By						
CJO						
Chemist						
SLF						
Analyst						
DGG						
Date Complete						
04/09/96						
Analysis Date						
04/08/96						
Analysis Time						
10:35 PM						
Sample Point						
BY-106						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	4.66E-03	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	29.5%		1.37E-03 µCi/g
PERCENT CARRIER RECOVERY	92.0%		

Analyst:	DGG	Date:	09-Apr-96
Signature of Chemist:	SLF	Date:	4/11/96

BLANK.WB1 REV 1.2 22010NML

2780

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	96177	GROSS WEIGHT	(W2)		7.8952
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.8030
7287	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)		0.0922
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		12.25
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9264				
SOLID	SAMPLE COUNT RATE	(Rs)	9613.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96003004	TIME OF SEPARATION	(ST)	22:35	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	04/08/96	DETECTION LIMIT	(Ld)		2.56
0	TIME OF COUNT	(TOC)	10:50	Sr-89/90 CONC in µCi/g			5.1250E+00
Sample Prep	DATE OF COUNT	(DOC)	04/09/96				
FUS-ZR01							
Sample #							
S96T001378							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
04/09/96							
Analysis Date							DETECTION LEVEL
04/08/96	Sr-89/90 CONCENTRATION			5.12E+00		µCi/g	
Analysis Time							
10:35 PM	RELATIVE COUNTING ERROR			0.6%			1.36E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			92.2%			

Analyst:	DGG	Date:	09-Apr-96
Signature of Chemist:	SLF	Date:	4/11/96

SAMPLE.WB1 REV 1.2 22010NML

2781

WHC-SD-WM-DP-103, REV. 1

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	113102	GROSS WEIGHT	(W2)		7.8180
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.7296
7287	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)		0.0884
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		12.50
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1064				
SOLID	SAMPLE COUNT RATE	(Rs)	11306.00	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96003004	TIME OF SEPARATION	(ST)	22:35	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	04/08/96	DETECTION LIMIT	(Ld)		2.56
0	TIME OF COUNT	(TOC)	11:05	Sr-89/90 CONC in µCi/g			5.7359E+00
Sample Prep	DATE OF COUNT	(DOC)	04/09/96				
FUS-ZR01							
Sample #							
S96T001378							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
04/09/96							
Analysis Date							DETECTION LEVEL
04/08/96	Sr-89/90 CONCENTRATION			5.74E+00		µCi/g	
Analysis Time							
10:35 PM	RELATIVE COUNTING ERROR			0.6%			1.30E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			88.4%			

Analyst:	DGG	Date:	09-Apr-96
Signature of Chemist:	SLF	Date:	4/11/96

SAMPLE.WB1 REV 1.2 22010NML

2782

WORKBOOK PAGE: SAM6

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	155092	GROSS WEIGHT	(W2)		7.8667
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.7782
7287	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)		0.0885
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		12.75
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.7744				
SOLID	SAMPLE COUNT RATE	(Rs)	15505.00	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96003004	TIME OF SEPARATION	(ST)	22:35	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	04/08/96	DETECTION LIMIT	(Ld)		2.56
0	TIME OF COUNT	(TOC)	11:20	Sr-89/90 CONC in µCi/g			9.3059E+00
Sample Prep	DATE OF COUNT	(DOC)	04/09/96				
FUS-ZR01							
Sample #							
S96T001415							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
04/09/96							
Analysis Date							DETECTION LEVEL
04/08/96	Sr-89/90 CONCENTRATION			9.31E+00		µCi/g	
Analysis Time							
10:35 PM	RELATIVE COUNTING ERROR			0.5%			1.54E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			88.5%			

Analyst:	DGG	Date:	09-Apr-96
Signature of Chemist:	SLF	Date:	4/11/96

SAMPLE.WB1 REV 1.2 22010NML

2783

WORKBOOK PAGE: DUP7

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	152610	GROSS WEIGHT	(W2)	7.8594
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7689
7287	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)	0.0905
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	13.17
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.7996			
SOLID	SAMPLE COUNT RATE	(Rs)	15256.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96003004	TIME OF SEPARATION	(ST)	22:35	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	04/08/96	DETECTION LIMIT	(Ld)	2.56
0	TIME OF COUNT	(TOC)	11:45	Sr-89/90 CONC in µCi/g		8.7957E+00
Sample Prep	DATE OF COUNT	(DOC)	04/09/96			
FUS-ZR01						
Sample #						
S96T001415						

Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
Analyst	NOTE: Expected weight = CVA * 0.1
DGG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
04/09/96	
Analysis Date	
04/08/96	
Analysis Time	
10:35 PM	
Sample Point	
BY-106	

Sr-89/90 CONCENTRATION	8.80E+00	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.5%		1.48E-03 µCi/g
PERCENT CARRIER RECOVERY	90.5%		

Analyst:	DGG	Date:	09-Apr-96
Signature of Chemist:	SLF	Date:	4/11/96

SAMPLE.WB1 REV 1.2 22010NML

THE FOLLOWING ANALYSES WERE RERUN AND INCLUDED IN THE DATA PACKAGE, BUT THE RESULTS HAVE NOT BEEN REPORTED IN THE FINAL SUMMARY REPORTS.

THIS PAGE WAS INTENTIONALLY LEFT BLANK

LABCORE Data Entry Template for Worklist# 5359

Analyst: RS **Instrument:** AB00 10 **Book#** 9B56

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: SR90. DETERMINE SS USING LUDLUM. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T004187	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S95T004187	0	Z	@SR90-01	SOLID		
6	SAMPLE	S95T004188	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S95T004188	0	Z	@SR90-01	SOLID		
8	SAMPLE	S95T004189	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
9	DUP	S95T004189	0	Z	@SR90-01	SOLID		
10	SAMPLE	S95T004190	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
11	DUP	S95T004190	0	Z	@SR90-01	SOLID		

Final page for worklist # 5359

Raelynn Green 2-5-96 2000
Analyst Signature **Date**

C.J. Owen 2/6/96
Analyst Signature **Date**

Data Entry Comments: The RPDs for 4187 and 4189 are out of control limits. Samples will be rerun. 2/9/96

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						SAMPLE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	5693	GROSS WEIGHT	(W2)	7.0406
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.9596
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)	0.0810
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	10.70
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1196			
SOLID	SAMPLE COUNT RATE	(Rs)	561.30	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
96000893	TIME OF SEPARATION	(ST)	15:45	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)	3.50
0	TIME OF COUNT	(TOC)	02:27	Sr-89/90 CONC in µCi/g		1.2968E+00
Sample Prep	DATE OF COUNT	(DOC)	02/06/96			
FUS-ZR01						
Sample #						
S95T004187						
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
WB26870	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0					
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)					
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))					
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)					
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100					
Analyst	NOTE: Expected weight = CVA * 0.1					
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.					
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100					
02/06/96						
Analysis Date						DETECTION LEVEL
02/05/96	Sr-89/90 CONCENTRATION		1.30E+00	µCi/g		
Analysis Time						
03:45 PM	RELATIVE COUNTING ERROR		2.7%			8.08E-03 µCi/g
Sample Point						
BY-106	PERCENT CARRIER RECOVERY		81.0%			

Analyst:		RAG	Date:	06-Feb-96
Signature of Chemist:		SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						DUP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	27466	GROSS WEIGHT	(W2)	7.0548
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.9721
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)	0.0827
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	10.87
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.116			
SOLID	SAMPLE COUNT RATE	(Rs)	2738.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
96000893	TIME OF SEPARATION	(ST)	15:45	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)	3.50
0	TIME OF COUNT	(TOC)	02:37	Sr-89/90 CONC in µCi/g		6.1980E+00
Sample Prep	DATE OF COUNT	(DOC)	02/06/96			
FUS-ZR01						
Sample #						
S95T004187						
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
WB26870	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0					
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)					
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))					
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)					
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100					
Analyst	NOTE: Expected weight = CVA * 0.1					
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.					
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100					
02/06/96						
Analysis Date						DETECTION LEVEL
02/05/96	Sr-89/90 CONCENTRATION		6.20E+00		µCi/g	
Analysis Time						
03:45 PM	RELATIVE COUNTING ERROR		1.2%			7.92E-03 µCi/g
Sample Point						
BY-106	PERCENT CARRIER RECOVERY		82.7%			

Analyst:	RAG	Date:	06-Feb-96
Signature of Chemist:	SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: SAM8

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	43329	GROSS WEIGHT	(W2)		6.9644
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8781
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)		0.0863
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		12.00
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.9528				
SOLID	SAMPLE COUNT RATE	(Rs)	4324.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000893	TIME OF SEPARATION	(ST)	16:00	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)		3.50
0	TIME OF COUNT	(TOC)	04:00	Sr-89/90 CONC in µCi/g			1.0056E+01
Sample Prep	DATE OF COUNT	(DOC)	02/06/96				
FUS-ZR01							
Sample #							
S95T004189							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB26870	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/06/96							
Analysis Date							DETECTION LEVEL
02/05/96	Sr-89/90 CONCENTRATION			1.01E+01		µCi/g	
Analysis Time							
03:45 PM	RELATIVE COUNTING ERROR			0.9%			8.14E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY			86.3%			

Analyst:		RAG	Date:	06-Feb-96
Signature of Chemist:		SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NM1

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: DUP9

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	31385	GROSS WEIGHT	(W2)		7.0371
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9530
5359	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)		0.0841
Test Code	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		12.20
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	1.8188				
SOLID	SAMPLE COUNT RATE	(Rs)	3130.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
96000893	TIME OF SEPARATION	(ST)	16:00	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/05/96	DETECTION LIMIT	(Ld)		3.50
0	TIME OF COUNT	(TOC)	04:12	Sr-89/90 CONC in µCi/g			8.0047E+00
Sample Prep	DATE OF COUNT	(DOC)	02/06/96				
FUS-ZR01							
Sample #							
S95T004189							

Instrument Code: WB26870

Prepared By: CJO

Chemist: SLF

Analyst: RAG

Date Complete: 02/06/96

Analysis Date: 02/05/96

Analysis Time: 03:45 PM

Sample Point: BY-106

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	8.00E+00	µCi/g	8.95E-03 µCi/g
RELATIVE COUNTING ERROR	1.1%		
PERCENT CARRIER RECOVERY	84.1%		

Analyst:		RAG	Date:	06-Feb-96
Signature of Chemist:		SLF	Date:	2/9/96

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

2791

By/Date

LABCORE Data Entry Template for Worklist# 386

Analyst: AKL **Instrument:** AB00 12 **Method:** LA-220-101 A-1

Worklist Comment: See Scot Fitzgerald for sample size. WHC-SD-WM-DP-103, REV. 1

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/g
1	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Rec
1	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
2	STD 51852				@SR90-01	SR90-01	SOLID			N/A	uCi/g
2	STD				@SR90-01	SR90-01C	SOLID			N/A	% Rec
2	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
3	SAMPLE	S94T000374	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
3	SAMPLE	S94T000374	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
3	SAMPLE	S94T000374	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
4	DUP	S94T000374	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
4	DUP	S94T000374	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
4	DUP	S94T000374	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.
5	SAMPLE	S94T000375	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/g
5	SAMPLE	S94T000375	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Rec
5	SAMPLE	S94T000375	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
6	DUP	S94T000375	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
6	DUP	S94T000375	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Rec
6	DUP	S94T000375	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.

DATA NOT USED IN PACKAGE

Data Entry Comments: Sample 375 will be rerun due to high RPD.

Units shown for QC (SPK) may not reflect the actual units.

2792

LABCORE Data Entry Template for Worklist# 386

Analyst: ARL **Instrument:** AB00 12 **Method:** LA-220-101 D-1

Worklist Comment: See Scot Fitzgerald for sample size.

Seg	Type	Sample#	Rep Al	Test	Matrix	Actual	Found	DL	Unit

Final page for worklist # 386

Alita Lewis
Analyst Signature

1-10-95
Date

M G Brennan

1-11-95

DATA NOT USED IN PACKAGE

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-SOLIDS ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	AKL	BATCH ID:	0
		ANALYSIS DATE:	January 11, 1995

	UNITS:	µCi/g							
SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *	51B62	Sr-90	1.01E-03				91.3%	2.19E-06	2.0%
BLANK	S94T374	Sr-90	1.25E-03					2.17E-03	132.7%
SAMPLE 1	S94T374	Sr-90	6.92E-01	6.72E-01	6.82E-01	2.9%		2.16E-03	2.4%
DUPLICATE 1	S94T374	Sr-90						2.12E-03	2.4%
SAMPLE 2	S94T375	Sr-90	1.78E-01	2.54E-01	2.16E-01	35.2%		1.99E-03	4.6%
DUPLICATE 2	S94T375	Sr-90						2.03E-03	3.9%
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE: **Analyst Comments:**

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:		Date:	01/11/95
Chemist Approval:	SL FITZGERALD	Signature:		Date:	1/11/95

Revision 2.1

DATA NOT USED IN PACKAGE

LAB LEADER INFO:	
Method:	LA-220-101(0-1)
Test Code	@SR90-01
Matrix:	SOLID
Work List #	386
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/11/95
Time Complete:	09:30
Chemist:	SL FITZGERALD
Analyst:	AKL
Analysis Date:	01/10/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	51B52
BLANK	594T374
SAMPLE 1	594T374
DUPLICATE 1	594T374
SAMPLE 2	594T375
DUPLICATE 2	594T375
ST-END	

PRINT

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	9614
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	12:12
SEPARATION DATE	01/10/95
TIME OF COUNT	17:10
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1237
TARE WEIGHT	7.0275
STANDARD VALUE	1.1112

RESULT	
SAMPLE COUNT RATE	9.59E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0962
DELTA TIME (hours)	4.97
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/mL	1.01E-03
Relative Counting Error	2.0%
Percent Carrier Recovery	96.2%

Solid-Blank Run:

INPUT	
TOTAL COUNTS	39
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.032
SEPARATION TIME	12:12
SEPARATION DATE	01/10/95
TIME OF COUNT	17:30
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1248
TARE WEIGHT	7.0293

RESULT	
SAMPLE COUNT RATE	1.20E+00
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0955
DELTA TIME (hours)	5.30
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	1.25E-03
Relative Counting Error	132.7%
Percent Carrier Recovery	95.5%

Solid-Sample Run 2:

INPUT	
TOTAL COUNTS	1884
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.1472
SEPARATION TIME	12:17
SEPARATION DATE	01/10/95
TIME OF COUNT	18:20
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1185
TARE WEIGHT	7.0208

RESULT	
SAMPLE COUNT RATE	1.86E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0977
DELTA TIME (hours)	6.05
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	1.78E-01
Relative Counting Error	4.6%
Percent Carrier Recovery	97.7%

Solid-Duplicate Run 2:

INPUT	
TOTAL COUNTS	2623
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.146
SEPARATION TIME	12:17
SEPARATION DATE	01/10/95
TIME OF COUNT	18:30
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0278
TARE WEIGHT	6.9322

RESULT	
SAMPLE COUNT RATE	2.60E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0956
DELTA TIME (hours)	6.22
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	2.54E-01
Relative Counting Error	3.9%
Percent Carrier Recovery	95.6%

Solid-Sample Run:

INPUT	
TOTAL COUNTS	6676
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.032
SEPARATION TIME	12:12
SEPARATION DATE	01/10/95
TIME OF COUNT	17:45
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0231
TARE WEIGHT	6.9274

RESULT	
SAMPLE COUNT RATE	6.65E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0957
DELTA TIME (hours)	5.55
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	6.92E-01
Relative Counting Error	2.4%
Percent Carrier Recovery	95.7%

Solid-Duplicate Run:

INPUT	
TOTAL COUNTS	6578
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.0372
SEPARATION TIME	12:12
SEPARATION DATE	01/10/95
TIME OF COUNT	18:00
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0702
TARE WEIGHT	6.9736

RESULT	
SAMPLE COUNT RATE	6.55E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0966
DELTA TIME (hours)	5.80
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	6.72E-01
Relative Counting Error	2.4%
Percent Carrier Recovery	96.6%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

2795

DATA NOT USED IN PACKAGE

WHC-SD-WM-DP-103, REV. 1

Form Completed By:	MC BIERMAN	Signature:	MC Bierman	Date:	11-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	SL Fitzgerald	Date:	1-11-95

Revision 2.1

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STANDARD	TOTAL COUNTS	(TC)	9614	GROSS WEIGHT	(W2)		7.1237
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0275
386	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0962
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		4.97
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	958.70	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
51852	SEPARATION TIME	(ST)	12:12	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/10/95	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	17:10	Sr-89/90 CONC. in µCi/L =			1.0149E+00
Analyst	DATE OF COUNT	(DOC)	01/10/95				
AKE							
Date							
01/11/95							
Time							
08:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.01E-03	µCi/mL
RELATIVE COUNTING ERROR =	2.0%	
PERCENT CARRIER RECOVERY =	96.2%	

DETECTION LEVEL
2.19E-06 µCi/L

Data Entry by:	MC BIERMAN	MC Bierman	Date:	11-Jan-95
Approved by:	SL FITZGERALD	SL Fitzgerald	Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		BLANK 1.000
BLANK	TOTAL COUNTS	(TC)	39	GROSS WEIGHT	(W2)		7.1248
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0293
386	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0955
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		5.30
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	2.032				
SOLID	SAMPLE COUNT RATE	(Rs)	1.20	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T374	SEPARATION TIME	(ST)	12:12	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/10/95	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	17:30	Sr-89/90 CONC in µCi/g			1.2550E-03
Analyst	DATE OF COUNT	(DOC)	01/10/95				
AKL							
Date							
01/11/95							
Time							
08:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.25E-03	µCi/g
RELATIVE COUNTING ERROR =	132.7%	
PERCENT CARRIER RECOVERY =	95.5%	

DETECTION LEVEL

2.17E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	11-Jan-95
Approved by:	SL FITZGERALD	Date:	1-11-95

DATA NOT USED IN PACKAGE

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		SAMPLE
SAMPLE	TOTAL COUNTS	(TC)	6676	GROSS WEIGHT	(W2)		7.0231
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9274
386	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0957
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		5.55
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	2.032				
SOLID	SAMPLE COUNT RATE	(Rs)	664.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T374	SEPARATION TIME	(ST)	12:12	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/10/95	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	17:45	Sr-89/90 CONC in µCi/g			6.9205E-01
Analyst	DATE OF COUNT	(DOC)	01/10/95				
AKI							
Date							
01/11/95							
Time							
08:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	6.92E-01	µCi/g
RELATIVE COUNTING ERROR =	2.4%	
PERCENT CARRIER RECOVERY =	95.7%	

DETECTION LEVEL

2.16E-03 µCi/g

Data Entry by:	MC BIERMAN		Date:	11-Jan-95
Approved by:	SL FITZGERALD		Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	DUPLICATE 1.000
DUPLICATE	TOTAL COUNTS	(TC)	6578	GROSS WEIGHT	(W2)	7.0702
Work List 386	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.9736
Test Code @SR90-01	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)	0.0966
Matrix	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)	5.80
SOLID	DILUTION FACTOR	(DF)	1			
Sample # S941374	DIGEST FACTOR (g/L)	DDF	2.0372			
Instrument Code WB27811	SAMPLE COUNT RATE	(Rs)	655.10	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Analyst AKL	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
Date 01/11/95	SEPARATION TIME	(ST)	12:12	Rmax		N/A
Time 08:30	SEPARATION DATE	(SD)	01/10/95	DETECTION LIMIT	(Ld)	2.07
	TIME OF COUNT	(TOC)	18:00	Sr-89/90 CONC in µCi/g		6.7199E-01
	DATE OF COUNT	(DOC)	01/10/95			

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	6.72E-01	µCi/g
RELATIVE COUNTING ERROR	=	2.4%	
PERCENT CARRIER RECOVERY	=	96.6%	

DETECTION LEVEL
2.12E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	11-Jan-95
Approved by:	SL FITZGERALD	Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
SAMPLE	TOTAL COUNTS	(TC)	1884	GROSS WEIGHT	(W2)		7.1185
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0208
386	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0977
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		6.05
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	2.1472				
SOLID	SAMPLE COUNT RATE	(Rs)	185.70	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T375	SEPARATION TIME	(ST)	12:17	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/10/95	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	18:20	Sr-89/90 CONC in µCi/g			1.7822E-01
Analyst	DATE OF COUNT	(DOC)	01/10/95				
AKL							
Date							
01/11/95							
Time							
08:30							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	1.78E-01	µCi/g
RELATIVE COUNTING ERROR	=	4.6%	
PERCENT CARRIER RECOVERY	=	97.7%	

DETECTION LEVEL

1.99E-03 µCi/g

Data Entry by:	MC BIERMAN		Date:	11-Jan-95
Approved by:	SL FITZGERALD		Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB Page 1 of 1

DATA NOT USED IN PACKAGE

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA	1.000
DUPLICATE	TOTAL COUNTS	(TC)	2623	GROSS WEIGHT	(W2)	7.0278
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	6.9322
386	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)	0.0956
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)	6.22
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST DILUTION FACTOR	(Dg/L)	2.146			
SOLID	SAMPLE COUNT RATE	(Rs)	259.60	SR-90 EFFICIENCY FACTO	(C1)	0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
S94T375	SEPARATION TIME	(ST)	12:17	Rmax		N/A
Instrument Code	SEPARATION DATE	(SD)	01/10/95	DETECTION LIMIT	(Ld)	2.07
WB27811	TIME OF COUNT	(TOC)	18:30	Sr-89/90 CONC in µCi/g		2.5432E-01
Analyst	DATE OF COUNT	(DOC)	01/10/95			
AKL						
Date						
01/11/95						
Time						
08:30						

DUPLICATE

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	2.54E-01	µCi/g
RELATIVE COUNTING ERROR	=	3.9%	
PERCENT CARRIER RECOVERY	=	95.6%	

DETECTION LEVEL

2.03E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	11-Jan-95
Approved by:	SL FITZGERALD	Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

WESTINGHOUSE HANFORD COMPANY WHC-SD-WM-DP-103, REV. 1
222-S LABORATORY
RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-SOLIDS ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	DCD	BATCH ID:	0
		ANALYSIS DATE:	January 6, 1995

		UNITS:	uCi/g						
SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *	51B52	Sr-90	1.02E-03				91.9%	1.62E-06	2.0%
BLANK	S94T349	Sr-90	1.90E-03					8.77E-04	46.1%
SAMPLE 1	S94T349	Sr-90	8.81E-01	6.53E-01	7.67E-01	29.8%		8.73E-04	1.6%
DUPLICATE 1	S94T349	Sr-90						8.78E-04	1.8%
SAMPLE 2					N/A	N/A			
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE: **Analyst Comments:**

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:		Date:	01/06/95
Chemist Approval:	SL FITZGERALD	Signature:		Date:	1/9/95

Revision 2.1

DATA NOT USED IN PACKAGE

LAB LEADER INFO:	
Method:	LA-220-101(D-1)
Test Code	DSR90-01
Matrix:	SOLID
Work List #	334
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/06/95
Time Complete:	08:00
Chemist:	SL FITZGERALD
Analyst:	DCD
Analysis Date:	01/05/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	21852
BLANK	894T349
SAMPLE 1	894T349
DUPLICATE 1	894T349
SAMPLE 2	
DUPLICATE 2	
ST-END	

PRINT

2803

DATA NOT USED IN PACKAGE

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	9889
COUNT TIME in MINUTES	10
BACKGROUND in cpm	2
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	11:20
SEPARATION DATE	01/05/95
TIME OF COUNT	17:00
DATE OF COUNT	01/05/95
CARRIER ADDED in mL	1
GROSS WEIGHT	6.9704
TARE WEIGHT	6.8729
STANDARD VALUE	1.1116

RESULT	
SAMPLE COUNT RATE	9.85E+02
CRITICAL LEVEL	7.38E-01
NET WEIGHT	0.0975
DELTA TIME (hours)	5.67
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	1.57
Sr-89/90 CONC in µCi/mL	1.02E-03
Relative Counting Error	2.0%
Percent Carrier Recovery	97.5%

Solid-Blank Run:

INPUT	
TOTAL COUNTS	49
COUNT TIME in MINUTES	10
BACKGROUND in cpm	2
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.86
SEPARATION TIME	11:20
SEPARATION DATE	01/05/95
TIME OF COUNT	17:10
DATE OF COUNT	01/05/95
CARRIER ADDED in mL	1
GROSS WEIGHT	6.9743
TARE WEIGHT	6.8774

RESULT	
SAMPLE COUNT RATE	3.40E+00
CRITICAL LEVEL	7.38E-01
NET WEIGHT	0.0969
DELTA TIME (hours)	5.83
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	1.57
Sr-89/90 CONC in µCi/g	1.90E-03
Relative Counting Error	46.1%
Percent Carrier Recovery	96.9%

Solid-Sample Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Duplicate Run 2:

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST FACTOR (g/L)	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/g	
Relative Counting Error	
Percent Carrier Recovery	

Solid-Sample Run:

INPUT	
TOTAL COUNTS	15830
COUNT TIME in MINUTES	10
BACKGROUND in cpm	2
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.88
SEPARATION TIME	11:20
SEPARATION DATE	01/05/95
TIME OF COUNT	17:35
DATE OF COUNT	01/05/95
CARRIER ADDED in mL	1
GROSS WEIGHT	6.9769
TARE WEIGHT	6.88

RESULT	
SAMPLE COUNT RATE	1.58E+03
CRITICAL LEVEL	7.38E-01
NET WEIGHT	0.0969
DELTA TIME (hours)	6.25
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	1.57
Sr-89/90 CONC in µCi/g	8.81E-01
Relative Counting Error	1.6%
Percent Carrier Recovery	96.9%

Solid-Duplicate Run:

INPUT	
TOTAL COUNTS	11664
COUNT TIME in MINUTES	10
BACKGROUND in cpm	2
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	1.89
SEPARATION TIME	11:20
SEPARATION DATE	01/05/95
TIME OF COUNT	17:55
DATE OF COUNT	01/05/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1985
TARE WEIGHT	7.014

RESULT	
SAMPLE COUNT RATE	1.16E+03
CRITICAL LEVEL	7.38E-01
NET WEIGHT	0.0945
DELTA TIME (hours)	6.58
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	1.57
Sr-89/90 CONC in µCi/g	6.53E-01
Relative Counting Error	1.8%
Percent Carrier Recovery	94.5%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

Form Completed By:	MC BIERMAN	Signature:	[signature]	Date:	06-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:	[signature]	Date:	1-9-95

Revision 2.1

WHC-SD-WM-DP-103, REV. 1

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							BLANK
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
BLANK	TOTAL COUNTS	(TC)	49	GROSS WEIGHT	(W2)		6.9743
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8774
334	BACKGROUND in cpm	(BKG)	1.5	NET WEIGHT	(W3)		0.0969
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		5.83
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.86				
SOLID	SAMPLE COUNT RATE	(Rs)	3.40	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.74	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T349	SEPARATION TIME	(ST)	11:20	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/05/95	DETECTION LIMIT	(Ld)		1.57
WB27811	TIME OF COUNT	(TOC)	17:10	Sr-89/90 CONC in µCi/g			1.9034E-03
Analyst	DATE OF COUNT	(DOC)	01/05/95				
DCD							
Date							
01/06/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	1.90E-03	µCi/g
RELATIVE COUNTING ERROR =	46.1%	
PERCENT CARRIER RECOVERY =	96.9%	

DETECTION LEVEL

8.77E-04 µCi/g

Data Entry by:	MC BIERMAN		Date:	06-Jan-95
Approved by:	SL FITZGERALD		Date:	1-9-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	15830	GROSS WEIGHT	(W2)		6.9769
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8800
334	BACKGROUND in cpm	(BKG)	1.5	NET WEIGHT	(W3)		0.0969
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		6.25
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.86				
SOLID	SAMPLE COUNT RATE	(Rs)	1581.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.74	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
594T349	SEPARATION TIME	(ST)	11:20	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/05/95	DETECTION LIMIT	(Ld)		1.57
WB27811	TIME OF COUNT	(TOC)	17:35	Sr-89/90 CONC in µCi/g			8.8147E-01
Analyst	DATE OF COUNT	(DOC)	01/05/95				
DCD							
Date							
01/06/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION =	8.81E-01	µCi/g
RELATIVE COUNTING ERROR =	1.6%	
PERCENT CARRIER RECOVERY =	96.9%	

DETECTION LEVEL

8.73E-04 µCi/g

Data Entry by:	MC BIERMAN		Date:	06-Jan-95
Approved by:	SL FITZGERALD		Date:	1-9-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
DUPLICATE	TOTAL COUNTS	(TC)	11664	GROSS WEIGHT	(W2)		7.1085
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0140
334	BACKGROUND in cpm	(BKG)	1.5	NET WEIGHT	(W3)		0.0945
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		6.58
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	DDF	1.89				
SOLID	SAMPLE COUNT RATE	(Rs)	1164.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.74	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T349	SEPARATION TIME	(ST)	11:20	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/05/95	DETECTION LIMIT	(Ld)		1.57
WB27811	TIME OF COUNT	(TOC)	17:55	Sr-89/90 CONC in µCi/g			6.5291E-01
Analyst	DATE OF COUNT	(DOC)	01/05/95				
DCD							
Date							
01/06/95							
Time							
08:00							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	6.53E-01	µCi/g
RELATIVE COUNTING ERROR	=	1.8%	
PERCENT CARRIER RECOVERY	=	94.5%	

DETECTION LEVEL

8.78E-04 µCi/g

Data Entry by:	MC BIERMAN		Date:	06-Jan-95
Approved by:	SL FITZGERALD		Date:	1-9-95

Form WB Rev. 2.1 220-10n_WB

DATA NOT USED IN PACKAGE

By LLC

LABCORE Data Entry Template for Worklist# 345

Analyst: ARL **Instrument:** AM01 _____ **Method:** LA-953-103 A-1

Worklist Comment: See chemist for sample size. --LLF WHC-SD-WM-DP-103, REV. 1

Seg	Type	Sample#	Rep	Al	Test	Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@AM24101 AM24101	LIQUID			N/A	uCi/r
1	BLNK-PREP				@AM24101 AM24101E	LIQUID			N/A	% Ct.
1	BLNK-PREP				@AM24101 AM24101T	LIQUID			N/A	% Rec
2	STD 83B43				@AM24101 AM24101	LIQUID			N/A	uCi/r
2	STD				@AM24101 AM24101E	LIQUID			N/A	% Ct.
2	STD				@AM24101 AM24101T	LIQUID			N/A	% Rec
3	SAMPLE	S94T000389	0		@AM24101 AM24101	LIQUID	N/A			uCi/r
3	SAMPLE	S94T000389	0		@AM24101 AM24101E	LIQUID	N/A			% Ct.
3	SAMPLE	S94T000389	0		@AM24101 AM24101T	LIQUID	N/A			% Rec
4	DUP	S94T000389	0		@AM24101 AM24101	LIQUID			N/A	uCi/r
4	DUP	S94T000389	0		@AM24101 AM24101E	LIQUID			N/A	% Ct.
4	DUP	S94T000389	0		@AM24101 AM24101T	LIQUID			N/A	% Rec

Final page for worklist # 345

Alita Lewis
Analyst Signature

1-4-95
Date

M Brown

1-9-95

Data Entry Comments: The standard started to leak 10 minutes into electro plating. I changed vials and rinsed old one into new. This changed liquid light yellow. It did not change to clear again.

Units shown for QC (SPK) may not reflect the actual units.

Page: 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-103, REV. 1

Am-241 : LA-953-103(A-1) LIQUID

			BLANK
Type	Spike (Tracer) Book Number		87B43
BLANK	Activity of Am243 Tracer in dpm/mL	(SPKA)	9140
Work List	Spike (Tracer) Volume in mL	(SPKV)	0.100
#345	Volume of Sample in mL	(SS)	1.000
Test Code	Dilution Factor	(DF)	1
@AM241-01	Digest Dilution Factor	(DDF)	1
Matrix	Am-241 Area Peak Height from AEA	(C241)	12
LIQUID	Am-243 Area Peak Height from AEA	(C243)	7454
Sample #	Cm-243/244 Area Peak Height from AEA	(CM)	2
S94T389	Total AT Count	(ATOT)	9798
Instrument Code	AT Count Time in Minutes	(MIN CT'd)	30
WC38931	Background in CPM	(BKG)	4
Analyst	Am 241 µCi/L	= <	2.9209E-02
AKL			
Date			
01/04/95			
Time			
01:30 PM			

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 2.92E-05	
Cm 243/244 µCi/mL	=	< 2.92E-05	
Relative counting error (Am-241)	=	56.6%	
Relative counting error (Cm-243/244)	=	138.6%	
Am-243 Tracer Recovery	=	70.5%	2.92E-05

Data Entry by: [signature] Date: 01/09/95
Approved by: [signature] Date: 10 Jan 95

Form 953103WB Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-103, REV. 1

Am-241 : LA-953-103(A-1) LIQUID

			STANDARD
Type: STANDARD	Spike (Tracer) Book Number		87B43
Work List: #345	Activity of Am243 Tracer in dpm/mL	(SPKA)	9140
Test Code: @AM241-01	Spike (Tracer) Volume in mL	(SPKV)	0.100
Matrix: LIQUID	Volume of Sample in mL	(SS)	1.000
Sample #: S94T389	Dilution Factor	(DF)	101
Instrument Code: WC38931	Digest Dilution Factor	(DDF)	1
Analyst: AKL	Am-241 Area Peak Height from AEA	(C241)	432
Date: 01/04/95	Am-243 Area Peak Height from AEA	(C243)	819
Time: 01:30 PM	Cm-243/244 Area Peak Height from AEA	(CM)	2
	Total AT Count	(ATOT)	6872
	AT Count Time in Minutes	(MIN CT'd)	30
	Background in CPM	(BKG)	4
	Am 241 µCi/L	=	2.1934E+01

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	2.19E-02	
Cm 243/244 µCi/mL	=	< 6.45E-03	
Relative counting error (Am-241)	=	11.7%	
Relative counting error (Cm-243/244)	=	138.8%	
Am-243 Tracer Recovery	=	32.2%	6.45E-03

Data Entry by: [signature] Date: 01/09/95
Approved by: [signature] Date: 10 Jan 95

Form 953103WB Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-103, REV. 1

Am-241 : LA-953-103(A-1) LIQUID

				SAMPLE
Type	Spike (Tracer) Book Number			87B43
SAMPLE	Activity of Am243 Tracer in dpm/mL		(SPKA)	9140
Work List	Spike (Tracer) Volume in mL		(SPKV)	0.100
#345	Volume of Sample in mL		(SS)	1.000
Test Code	Dilution Factor		(DF)	1
@AM241-01	Digest Dilution Factor		(DDF)	1
Matrix	Am-241 Area Peak Height from AEA		(C241)	13
LIQUID	Am-243 Area Peak Height from AEA		(C243)	5769
Sample #	Cm-243/244 Area Peak Height from AEA		(CM)	2
S94T389	Total AT Count		(ATOT)	9591
Instrument Code	AT Count Time in Minutes		(MIN CT'd)	30
WC38931	Background in CPM		(BKG)	4
Analyst	Am 241 µCi/L	=	<	2.9866E-02
AKL				
Date				
01/04/95				
Time				
01:30 PM				

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 2.99E-05	
Cm 243/244 µCi/mL	=	< 2.99E-05	
Relative counting error (Am-241)	=	54.4%	
Relative counting error (Cm-243/244)	=	138.6%	
Am-243 Tracer Recovery	=	68.9%	2.99E-05

Data Entry by:	M Bruiman	Date:	01/09/95
Approved by:	[illegible]	Date:	10 Jan 95

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-103, REV. 1

Am-241 : LA-953-103(A-1) LIQUID

			DUPLICATE
Type	Spike (Tracer) Book Number		87B43
DUPLICATE	Activity of Am243 Tracer in dpm/mL	(SPKA)	9140
Work List	Spike (Tracer) Volume in mL	(SPKV)	0.100
#345	Volume of Sample in mL	(SS)	1.000
Test Code	Dilution Factor	(DF)	1
@AM241-01	Digest Dilution Factor	(DDF)	1
Matrix	Am-241 Area Peak Height from AEA	(C241)	19
LIQUID	Am-243 Area Peak Height from AEA	(C243)	7407
Sample #	Cm-243/244 Area Peak Height from AEA	(CM)	5
S94T389	Total AT Count	(ATOT)	10462
Instrument Code	AT Count Time in Minutes	(MIN CT'd)	30
WC38931	Background in CPM	(BKG)	5
Analyst	Am 241 µCi/L	= <	2.7439E-02
AKL			
Date			
01/04/95			
Time			
01:30 PM			

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 2.74E-05	
Cm 243/244 µCi/mL	=	< 2.74E-05	
Relative counting error (Am-241)	=	45.0%	
Relative counting error (Cm-243/244)	=	87.7%	
Am-243 Tracer Recovery	=	75.0%	2.74E-05

Data Entry by:	[signature]	Date:	01/09/95
Approved by:	[signature]	Date:	10 Jan 95

Em Barela
1-6-95

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-103, REV. 1

SAMPLE
S94T000389STD
File ID: 10a2097.CNF

Counted on: 1/ 6/95 @11:13
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	416.6	416.6	299.261	299.261	26.000	12.042	13.000	0.643
2	580.3	580.3	252.502	252.057	18.000	9.823	9.000	0.995

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	Am241	0.653	5.480	5.477	0.003	0.06	65.64	1.1	550.7	0.248E-03
	Pu238		5.499	5.477	0.022				719.0	0.324E-03
2	Am243	0.526	5.276	5.260	0.016	0.05	52.84	1.6	421.0	0.190E-03
Totals:		1.179	<--valid peaks only-->				118.48			

DETECTOR CALIBRATION
Energy(MEV) = 4.101 + (0.0046)*Channel
Energy range (MeV): 4.101 TO 6.456
Efficiency = 0.1268 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	48232.0	100.000
Smoothed	48232.0	100.000
Composite fit	56874.6	117.919
Residuals	-8642.6	-17.919

Analyzed by: _____
DM

Spectrum 10a2097.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 6169.9


```
1
1
1
1
1
1
 1
 1
21
21
2 1
 21
.2 1
. 21
.. 21
... 2
.....12
......1 2
.......1..2
........1....2..
.........1......2.....
..........1..........2........
...........1............2..............
..............1.................2.................
...............1.......................2....................
.................1.............................2.....................
....................21.....................
2......................1
....................... 1
............................1.
...............................1..
................................1.
.............1
1.
```

Raw Data Dump for AEA Spectrum: 10a2097.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
21	1.	0.	0.	1.	1.	0.	0.	0.	0.	0.
31	2.	0.	0.	1.	1.	0.	1.	2.	0.	0.
41	0.	1.	1.	2.	0.	1.	2.	0.	2.	1.
51	3.	1.	0.	1.	1.	0.	2.	2.	0.	2.
61	1.	1.	1.	0.	2.	0.	0.	1.	2.	2.
71	1.	0.	1.	0.	0.	1.	0.	0.	1.	1.
81	0.	1.	1.	3.	1.	0.	1.	0.	2.	0.
91	0.	1.	1.	2.	0.	1.	0.	0.	0.	1.
101	5.	1.	5.	1.	1.	2.	4.	4.	2.	2.
111	3.	2.	5.	1.	3.	5.	3.	7.	4.	3.
121	4.	6.	5.	2.	7.	7.	6.	4.	3.	6.
131	3.	9.	5.	8.	4.	4.	10.	5.	5.	4.
141	7.	6.	16.	12.	11.	13.	12.	9.	10.	16.
151	13.	12.	16.	18.	16.	18.	19.	17.	29.	22.
161	29.	27.	23.	30.	29.	33.	19.	33.	33.	33.
171	35.	46.	39.	33.	54.	39.	53.	45.	52.	56.
181	59.	64.	79.	88.	74.	83.	74.	63.	106.	103.
191	106.	109.	126.	115.	102.	137.	138.	128.	148.	140.
201	150.	164.	167.	161.	187.	206.	218.	224.	230.	231.
211	238.	260.	267.	269.	290.	298.	329.	311.	333.	353.
221	343.	368.	371.	411.	375.	431.	459.	466.	479.	485.
231	528.	518.	552.	512.	609.	561.	591.	585.	640.	652.
241	716.	717.	739.	661.	737.	758.	735.	819.	788.	769.
251	757.	819.	796.	804.	747.	763.	725.	581.	486.	402.
261	322.	265.	252.	223.	250.	238.	245.	270.	282.	265.
271	228.	268.	275.	266.	258.	280.	286.	312.	308.	308.
281	306.	334.	323.	345.	369.	361.	379.	370.	392.	408.
291	414.	418.	420.	418.	432.	426.	371.	418.	426.	418.
301	422.	412.	364.	353.	271.	185.	145.	101.	86.	54.
311	62.	48.	32.	22.	17.	14.	5.	2.	1.	0.
321	1.	1.	0.	1.	0.	1.	0.	0.	1.	1.
331	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
341	0.	1.	0.	0.	0.	1.	3.	5.	2.	3.
351	1.	3.	1.	2.	0.	0.	0.	1.	0.	0.
361	0.	0.	0.	1.	1.	2.	0.	0.	0.	0.
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.	1.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
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.	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.								

Em Barela 1-6-95

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
S94T000389BLK
File ID: 9a1254.CNF

Counted on: 1/ 6/95 @11:12
Detector: AEA9
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	6025.9	6025.9	255.091	255.091	12.000	4.417	6.000	3.695

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	Am243	0.942	5.276	5.279	-.0030	0.02	138.97	0.8	1032.1	0.465E-03
Totals:		0.942	<--valid peaks only-->				138.97			

DETECTOR CALIBRATION
Energy(MEV) = 4.106 + (0.0046)*Channel
Energy range (MeV): 4.106 TO 6.461
Efficiency = 0.1360 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	70797.0	100.000
Smoothed	70797.0	100.000
Composite fit	66710.9	94.228
Residuals	4086.1	5.772

Analyzed by: _____
DM

Spectrum 9a1254.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 35037.0


```
.1
..............1.
.................................................................... 1
.......................................1
1.......
.
```

Raw Data Dump for AEA Spectrum: 9a1254.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.	1.	0.	0.	1.	0.	0.	0.	1.	0.
31	0.	0.	0.	1.	0.	0.	0.	1.	2.	0.
41	0.	1.	0.	1.	1.	0.	0.	1.	0.	0.
51	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
61	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
71	1.	1.	0.	0.	0.	0.	2.	1.	0.	0.
81	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
91	1.	0.	0.	1.	0.	1.	1.	1.	0.	2.
101	0.	2.	0.	0.	0.	1.	1.	2.	1.	0.
111	1.	0.	0.	1.	1.	0.	1.	0.	1.	0.
121	0.	1.	1.	3.	2.	3.	0.	0.	3.	2.
131	0.	1.	0.	1.	2.	0.	0.	3.	1.	1.
141	1.	2.	0.	1.	1.	2.	0.	0.	2.	2.
151	0.	0.	0.	1.	0.	0.	1.	2.	1.	1.
161	1.	2.	0.	1.	5.	0.	2.	1.	1.	2.
171	1.	1.	3.	0.	1.	1.	1.	1.	5.	4.
181	2.	2.	2.	2.	1.	5.	1.	3.	2.	2.
191	5.	3.	2.	3.	2.	2.	2.	0.	3.	4.
201	4.	4.	4.	3.	6.	5.	4.	2.	6.	9.
211	8.	3.	9.	6.	11.	16.	14.	9.	11.	17.
221	6.	15.	14.	16.	21.	22.	17.	25.	41.	45.
231	58.	71.	104.	116.	135.	130.	174.	198.	253.	288.
241	403.	530.	671.	851.	1060.	1398.	1490.	1912.	2300.	2941.
251	3604.	4719.	5768.	6949.	7454.	6817.	5667.	4121.	2444.	1501.
261	947.	692.	600.	557.	520.	511.	526.	422.	368.	308.
271	205.	129.	87.	56.	25.	6.	3.	4.	0.	2.
281	1.	1.	2.	1.	1.	2.	0.	3.	2.	3.
291	2.	4.	3.	5.	9.	7.	7.	11.	9.	8.
301	12.	9.	12.	9.	1.	5.	6.	3.	6.	3.
311	2.	0.	3.	1.	0.	0.	0.	1.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
341	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.
351	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
361	0.	2.	0.	0.	2.	0.	1.	1.	0.	0.
371	2.	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	1.	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.	0.	0.	0.
481	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Em Bauer

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
S94T000389SAM
File ID: 11a3112.CNF

Counted on: 1/ 6/95 @11:14
Detector: AEA11
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	10.1	10.1	303.946	303.946	12.000	5.331	6.000	0.332
2	4916.2	4916.2	257.158	257.158	12.000	5.278	6.000	3.972

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	Pu238	0.010	5.499	5.496	0.003	0.02	1.34	7.7	15.2	0.687E-05
	Am241		5.480	5.496	-.016				11.7	0.526E-05
2	Am243	0.955	5.276	5.281	-.005	0.02	124.49	0.8	1033.2	0.465E-03
Totals:		0.966	<--valid peaks only-->				125.82			

DETECTOR CALIBRATION
Energy(MEV) = 4.098 + (0.0046)*Channel
Energy range (MeV): 4.098 TO 6.453
Efficiency = 0.1217 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	62542.0	100.000
Smoothed	62542.0	100.000
Composite fit	60398.3	96.572
Residuals	2143.7	3.428

Analyzed by: _____
DM

Spectrum 11a3112.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 26747.7


```
1
1
1
1
1
1
12
1..........2
1.............................................................2
1................................................................ 2
1....2.......
1.
1
1
1
1
```

Raw Data Dump for AEA Spectrum: 11a3112.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	1.	1.	0.	2.	1.	0.	2.	1.	0.	0.
31	1.	0.	0.	1.	0.	0.	0.	0.	1.	1.
41	2.	0.	0.	0.	0.	0.	0.	0.	0.	1.
51	0.	0.	1.	1.	0.	1.	3.	1.	0.	0.
61	1.	0.	0.	0.	0.	1.	0.	1.	2.	0.
71	0.	0.	0.	1.	1.	1.	0.	0.	0.	0.
81	0.	1.	1.	1.	0.	0.	3.	0.	0.	0.
91	0.	0.	0.	1.	0.	0.	0.	3.	0.	0.
101	0.	1.	1.	1.	1.	0.	1.	0.	0.	1.
111	0.	0.	0.	2.	0.	1.	1.	0.	0.	0.
121	1.	0.	1.	0.	1.	1.	1.	1.	1.	1.
131	1.	0.	2.	0.	1.	2.	0.	0.	0.	0.
141	2.	0.	3.	1.	1.	0.	0.	1.	0.	0.
151	1.	1.	0.	0.	0.	0.	2.	0.	0.	1.
161	0.	1.	1.	1.	1.	0.	0.	1.	2.	0.
171	1.	2.	0.	1.	0.	1.	1.	0.	2.	2.
181	0.	1.	0.	0.	1.	0.	1.	0.	3.	2.
191	3.	1.	1.	2.	4.	1.	4.	1.	0.	2.
201	6.	1.	1.	1.	1.	1.	2.	4.	2.	2.
211	9.	3.	6.	5.	4.	5.	6.	11.	8.	8.
221	11.	18.	15.	10.	12.	17.	15.	24.	24.	29.
231	48.	48.	77.	73.	107.	131.	119.	134.	146.	210.
241	283.	296.	398.	521.	661.	784.	1076.	1268.	1519.	1852.
251	2170.	2794.	3415.	4249.	4809.	5643.	5769.	5533.	4793.	3830.
261	2632.	1540.	983.	673.	501.	462.	456.	354.	341.	313.
271	290.	225.	165.	111.	86.	61.	31.	13.	6.	4.
281	0.	0.	0.	2.	3.	1.	0.	0.	1.	3.
291	1.	1.	3.	3.	4.	6.	4.	7.	6.	9.
301	7.	7.	10.	13.	13.	6.	6.	5.	5.	1.
311	1.	1.	2.	2.	1.	1.	0.	1.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
341	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
351	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
361	0.	2.	0.	2.	1.	0.	1.	2.	1.	0.
371	1.	0.	0.	1.	3.	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.	1.	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.	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.	0.	0.	0.
481	0.	0.	0.	1.	0.	1.	1.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Em Barabe
1-6-95

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-103, REV. 1

SAMPLE
S94T000389DUP
File ID: 12a4910.CNF

Counted on: 1/ 6/95 @11:15
Detector: AEA12
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?	14.4	14.4	302.498	302.498	12.000	4.671	6.000	0.628
2	6202.8	6202.8	255.556	255.556	10.000	4.383	5.000	3.177

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		????		5.506			0.97	9.1		
2	Am243	0.944	5.276	5.290	-.0140	.02	148.62	0.7	1267.9	0.571E-03
Totals:		0.944	<--valid peaks only-->				148.62			

DETECTOR CALIBRATION
Energy(MEV) = 4.114 + (0.0046)*Channel
Energy range (MeV): 4.114 TO 6.469
Efficiency = 0.1184 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	75542.0	100.000
Smoothed	75542.0	100.000
Composite fit	71807.1	95.056
Residuals	3734.9	4.944

Analyzed by: _____
DM

Spectrum 12a4910.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 35239.1


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

Raw Data Dump for AEA Spectrum: 12a4910.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
21	0.	0.	0.	1.	0.	0.	1.	1.	0.	0.
31	1.	0.	0.	0.	1.	1.	0.	0.	0.	0.
41	1.	0.	0.	0.	0.	0.	0.	1.	0.	2.
51	0.	0.	0.	0.	0.	1.	0.	1.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	1.	0.	1.	1.	0.	0.	0.	0.	0.
81	1.	0.	0.	1.	0.	1.	0.	0.	0.	0.
91	1.	1.	0.	0.	0.	0.	0.	0.	1.	0.
101	0.	0.	1.	0.	1.	1.	1.	1.	0.	2.
111	0.	0.	0.	1.	0.	0.	0.	0.	2.	0.
121	1.	0.	0.	1.	0.	0.	0.	1.	1.	0.
131	0.	2.	1.	0.	0.	0.	0.	0.	0.	0.
141	1.	2.	0.	0.	0.	0.	0.	0.	1.	0.
151	0.	0.	0.	1.	2.	0.	2.	2.	3.	3.
161	1.	0.	0.	0.	0.	1.	3.	0.	2.	0.
171	3.	2.	1.	0.	1.	0.	0.	5.	1.	0.
181	1.	3.	1.	1.	3.	2.	0.	4.	1.	1.
191	3.	3.	3.	1.	0.	0.	1.	3.	3.	3.
201	3.	3.	2.	2.	4.	3.	2.	3.	4.	10.
211	6.	7.	9.	1.	3.	14.	9.	7.	10.	14.
221	8.	23.	28.	18.	16.	29.	40.	42.	50.	71.
231	77.	101.	133.	142.	177.	176.	235.	254.	332.	377.
241	478.	621.	723.	954.	1265.	1421.	1837.	2133.	2375.	2876.
251	3631.	4411.	5494.	6605.	7407.	7390.	6804.	4985.	3241.	1793.
261	1025.	757.	622.	547.	552.	521.	516.	457.	375.	294.
271	246.	150.	120.	68.	30.	11.	5.	2.	2.	0.
281	1.	0.	0.	1.	1.	1.	3.	1.	2.	1.
291	2.	3.	2.	1.	4.	7.	8.	8.	10.	10.
301	15.	18.	19.	13.	13.	3.	6.	2.	5.	2.
311	1.	2.	1.	2.	0.	1.	0.	2.	1.	0.
321	1.	1.	1.	0.	0.	0.	1.	0.	0.	0.
331	0.	0.	0.	1.	1.	2.	3.	1.	0.	0.
341	2.	0.	0.	1.	2.	3.	0.	0.	0.	5.
351	2.	1.	5.	1.	0.	4.	3.	2.	2.	1.
361	2.	1.	2.	2.	1.	1.	2.	0.	3.	1.
371	2.	1.	1.	1.	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.	0.	0.	0.
421	0.	1.	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.	0.	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.								

By106

LABCORE Data Entry Template for Worklist# 456

Analyst: AKL **Instrument:** AM01 **Method:** LA-953-103 A-1 WHC-SD-WM-DP-103, REV. 1

Worklist Comment: See chemist for sample size. --LLF WHC-SD-WM-DP-103, REV. 1

	Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
(1)	1	BLNK-PREP				@AM24101	AM24101	LIQUID			N/A	uCi/m
	1	BLNK-PREP				@AM24101	AM24101E	LIQUID			N/A	% Ct.
	1	BLNK-PREP				@AM24101	AM24101T	LIQUID			N/A	% Rec
(2)	2	STD 83 BLB				@AM24101	AM24101	LIQUID			N/A	uCi/m
	2	STD				@AM24101	AM24101E	LIQUID			N/A	% Ct.
	2	STD				@AM24101	AM24101T	LIQUID			N/A	% Rec
(3)	3	SAMPLE	S94T000371	0		@AM24101	AM24101	LIQUID	N/A			uCi/m
	3	SAMPLE	S94T000371	0		@AM24101	AM24101E	LIQUID	N/A			% Ct.
	3	SAMPLE	S94T000371	0		@AM24101	AM24101T	LIQUID	N/A			% Rec
(4)	4	DUP	S94T000371	0		@AM24101	AM24101	LIQUID			N/A	uCi/m
	4	DUP	S94T000371	0		@AM24101	AM24101E	LIQUID			N/A	% Ct.
	4	DUP	S94T000371	0		@AM24101	AM24101T	LIQUID			N/A	% Rec
(5)	5	SAMPLE	S94T000355	0		@AM24101	AM24101	LIQUID	N/A			uCi/m
	5	SAMPLE	S94T000355	0		@AM24101	AM24101E	LIQUID	N/A			% Ct.
	5	SAMPLE	S94T000355	0		@AM24101	AM24101T	LIQUID	N/A			% Rec
(6)	6	DUP	S94T000355	0		@AM24101	AM24101	LIQUID			N/A	uCi/m
	6	DUP	S94T000355	0		@AM24101	AM24101E	LIQUID			N/A	% Ct.
	6	DUP	S94T000355	0		@AM24101	AM24101T	LIQUID			N/A	% Rec
(7)	7	SAMPLE	S95T000004	0		@AM24101	AM24101	LIQUID	N/A			uCi/m
	7	SAMPLE	S95T000004	0		@AM24101	AM24101E	LIQUID	N/A			% Ct.

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 456

Analyst: AVL **Instrument:** AM01 _____ **Method:** LA-953-103 A-1

Worklist Comment: See chemist for sample size. --LLF

Seg Type	Sample#	Rep Al	Test	Matrix	Actual	Found	DL	Unit
7 SAMPLE	S95T000004	0	@AM24101 AM24101T	LIQUID	N/A			% Rec
(6) 8 DUP	S95T000004	0	@AM24101 AM24101	LIQUID			N/A	uCi/m
8 DUP	S95T000004	0	@AM24101 AM24101E	LIQUID			N/A	% Ct.
8 DUP	S95T000004	0	@AM24101 AM24101T	LIQUID			N/A	% Rec

Final page for worklist # 456

Alita Luis
Analyst Signature

1-26-95
Date

M Bielan

1-30-95

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Am-241 : LA-953-103(A-1) LIQUID

			BLANK
Type	Spike (Tracer) Book Number		101B43
BLANK	Activity of Am243 Tracer in dpm/mL	(SPKA)	9427
Work List	Spike (Tracer) Volume in mL	(SPKV)	0.100
456	Volume of Sample in mL	(SS)	0.500
Test Code	Dilution Factor	(DF)	1
@AM241-01	Digest Dilution Factor	(DDF)	1
Matrix	Am-241 Area Peak Height from AEA	(C241)	20
LIQUID	Am-243 Area Peak Height from AEA	(C243)	7680
Sample #	Cm-243/244 Area Peak Height from AEA	(CM)	3
S94T371	Total AT Count	(ATOT)	13643
Instrument Code	AT Count Time in Minutes	(MIN CT'd)	30
WC38931	Background in CPM	(BKG)	5
Analyst	Am 241 µCi/L	= <	4.4618E-02
AKL			
Date			
01/26/95			
Time			
03:00 PM			

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 4.46E-05	
Cm 243/244 µCi/mL	=	< 4.46E-05	
Relative counting error (Am-241)	=	43.9%	
Relative counting error (Cm-243/244)	=	113.2%	
Am-243 Tracer Recovery	=	95.2%	4.46E-05

Data Entry by:	[signature]	Date:	01/30/95
Approved by:	[signature]	Date:	31 Jan 95

Form 953103WB Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Am-241 : LA-953-103(A-1) LIQUID

			STANDARD
Type	Spike (Tracer) Book Number		101B43
STANDARD	Activity of Am243 Tracer in dpm/mL	(SPKA)	9427
Work List	Spike (Tracer) Volume in mL	(SPKV)	0.100
456	Volume of Sample in mL	(SS)	1.000
Test Code	Dilution Factor	(DF)	101
@AM241-01	Digest Dilution Factor	(DDF)	1
Matrix	Am-241 Area Peak Height from AEA	(C241)	1843
LIQUID	Am-243 Area Peak Height from AEA	(C243)	3587
Sample #	Cm-243/244 Area Peak Height from AEA	(CM)	3
WORKLIST#456	Total AT Count	(ATOT)	18810
Instrument Code	AT Count Time in Minutes	(MIN CT'd)	30
WC38931	Background in CPM	(BKG)	5
Analyst	Am 241 µCi/L	=	2.2036E+01
AKL			
Date			
01/26/95			
Time			
03:00 PM			

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	2.20E-02	
Cm 243/244 µCi/mL	=	< 2.46E-03	
Relative counting error (Am-241)	=	5.6%	
Relative counting error (Cm-243/244)	=	113.2%	
Am-243 Tracer Recovery	=	87.2%	2.46E-03

Data Entry by:	[illegible]	Date:	01/30/95
Approved by:	[illegible]	Date:	31 Jan 95

Form 953103WB Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Am-241 : LA-953-103(A-1) LIQUID

				SAMPLE
Type	Spike (Tracer) Book Number			101B43
SAMPLE	Activity of Am243 Tracer in dpm/mL		(SPKA)	9427
Work List	Spike (Tracer) Volume in mL		(SPKV)	0.100
456	Volume of Sample in mL		(SS)	0.500
Test Code	Dilution Factor		(DF)	1
@AM241-01	Digest Dilution Factor		(DDF)	1
Matrix	Am-241 Area Peak Height from AEA		(C241)	15
LIQUID	Am-243 Area Peak Height from AEA		(C243)	5406
Sample #	Cm-243/244 Area Peak Height from AEA		(CM)	7
S94T371	Total AT Count		(ATOT)	13898
Instrument Code	AT Count Time in Minutes		(MIN CT'd)	30
WC38931	Background in CPM		(BKG)	5
Analyst	Am 241 µCi/L	=	<	4.3797E-02
AKL				
Date				
01/26/95				
Time				
03:00 PM				

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 4.38E-05	
Cm 243/244 µCi/mL	=	< 4.38E-05	
Relative counting error (Am-241)	=	50.7%	
Relative counting error (Cm-243/244)	=	74.1%	
Am-243 Tracer Recovery	=	97.0%	4.38E-05

Data Entry by:	[signature]	Date:	01/30/95
Approved by:	[signature]	Date:	31 Jan 95

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Am-241 : LA-953-103(A-1) LIQUID

			DUPLICATE
Type	Spike (Tracer) Book Number		101B43
DUPLICATE	Activity of Am243 Tracer in dpm/mL	(SPKA)	9427
Work List	Spike (Tracer) Volume in mL	(SPKV)	0.100
456	Volume of Sample in mL	(SS)	0.500
Test Code	Dilution Factor	(DF)	1
@AM241-01	Digest Dilution Factor	(DDF)	1
Matrix	Am-241 Area Peak Height from AEA	(C241)	15
LIQUID	Am-243 Area Peak Height from AEA	(C243)	4057
Sample #	Cm-243/244 Area Peak Height from AEA	(CM)	4
S94T371	Total AT Count	(ATOT)	12841
Instrument Code	AT Count Time in Minutes	(MIN CT'd)	30
WC38931	Background in CPM	(BKG)	5
Analyst	Am 241 µCi/L	= <	4.7489E-02
AKL			
Date			
01/26/95			
Time			
03:00 PM			

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 4.75E-05	
Cm 243/244 µCi/mL	=	< 4.75E-05	
Relative counting error (Am-241)	=	50.7%	
Relative counting error (Cm-243/244)	=	98.0%	
Am-243 Tracer Recovery	=	89.4%	4.75E-05

Data Entry by:	[illegible]	Date:	01/30/95
Approved by:	[illegible]	Date:	31 Jan 95

Form 953103WB Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Am-241 : LA-953-103(A-1) LIQUID

				SAMPLE
Type	Spike (Tracer) Book Number			101B43
SAMPLE	Activity of Am243 Tracer in dpm/mL	(SPKA)		9427
Work List	Spike (Tracer) Volume in mL	(SPKV)		0.100
456	Volume of Sample in mL	(SS)		0.500
Test Code	Dilution Factor	(DF)		1
@AM241-01	Digest Dilution Factor	(DDF)		1
Matrix	Am-241 Area Peak Height from AEA	(C241)		24
LIQUID	Am-243 Area Peak Height from AEA	(C243)		6454
Sample #	Cm-243/244 Area Peak Height from AEA	(CM)		3
S94T355	Total AT Count	(ATOT)		12533
Instrument Code	AT Count Time in Minutes	(MIN CT'd)		30
WC38931	Background in CPM	(BKG)		5
Analyst	Am 241 µCi/L	=	<	4.8671E-02
AKL				
Date				
01/26/95				
Time				
03:00 PM				

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 4.87E-05	
Cm 243/244 µCi/mL	=	< 4.87E-05	
Relative counting error (Am-241)	=	40.1%	
Relative counting error (Cm-243/244)	=	113.2%	
Am-243 Tracer Recovery	=	87.2%	4.87E-05

Data Entry by: [signature] Date: 01/30/95
Approved by: [signature] Date: 31 Jan 95

Form 953103WB Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Am-241 : LA-953-103(A-1) LIQUID

				DUPLICATE
Type	Spike (Tracer) Book Number			101B43
DUPLICATE	Activity of Am243 Tracer in dpm/mL	(SPKA)		9427
Work List	Spike (Tracer) Volume in mL	(SPKV)		0.100
456	Volume of Sample in mL	(SS)		0.500
Test Code	Dilution Factor	(DF)		1
@AM241-01	Digest Dilution Factor	(DDF)		1
Matrix	Am-241 Area Peak Height from AEA	(C241)		18
LIQUID	Am-243 Area Peak Height from AEA	(C243)		4062
Sample #	Cm-243/244 Area Peak Height from AEA	(CM)		4
S94T355	Total AT Count	(ATOT)		13530
Instrument Code	AT Count Time in Minutes	(MIN CT'd)		30
WC38931	Background in CPM	(BKG)		5
Analyst	Am 241 µCi/L	=	<	4.5076E-02
AKL				
Date				
01/26/95				
Time				
03:00 PM				

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 4.51E-05	
Cm 243/244 µCi/mL	=	< 4.51E-05	
Relative counting error (Am-241)	=	46.3%	
Relative counting error (Cm-243/244)	=	98.0%	
Am-243 Tracer Recovery	=	94.2%	4.51E-05

Data Entry by:	[signature]	Date:	01/30/95
Approved by:	[signature]	Date:	31 Jan 95

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Am-241 : LA-953-103(A-1) LIQUID

			SAMPLE
Spike (Tracer) Book Number			101B43
Activity of Am243 Tracer in dpm/mL	(SPKA)		9427
Spike (Tracer) Volume in mL	(SPKV)		0.100
Volume of Sample in mL	(SS)		0.500
Dilution Factor	(DF)		1
Digest Dilution Factor	(DDF)		1
Am-241 Area Peak Height from AEA	(C241)		17
Am-243 Area Peak Height from AEA	(C243)		6673
Cm-243/244 Area Peak Height from AEA	(CM)		3
Total AT Count	(ATOT)		13080
AT Count Time in Minutes	(MIN CT'd)		30
Background in CPM	(BKG)		5
Am 241 µCi/L	=	<	4.6558E-02

Type
SAMPLE
Work List
456
Test Code
@AM241-01
Matrix
LIQUID
Sample #
S95T4
Instrument Code
WC38931
Analyst
AKL
Date
01/26/95
Time
03:00 PM

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 4.66E-05	
Cm 243/244 µCi/mL	=	< 4.66E-05	
Relative counting error (Am-241)	=	47.6%	
Relative counting error (Cm-243/244)	=	113.2%	
Am-243 Tracer Recovery	=	91.2%	4.66E-05

Data Entry by: M Brown Date: 01/30/95
Approved by: [illegible] Date: 31 Jan 95

Form 953103WB Rev. 1.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Am-241 : LA-953-103(A-1) LIQUID

				DUPLICATE
Type	Spike (Tracer) Book Number			101B43
DUPLICATE	Activity of Am243 Tracer in dpm/mL		(SPKA)	9427
Work List	Spike (Tracer) Volume in mL		(SPKV)	0.100
456	Volume of Sample in mL		(SS)	0.500
Test Code	Dilution Factor		(DF)	1
@AM241-01	Digest Dilution Factor		(DDF)	1
Matrix	Am-241 Area Peak Height from AEA		(C241)	22
LIQUID	Am-243 Area Peak Height from AEA		(C243)	9739
Sample #	Cm-243/244 Area Peak Height from AEA		(CM)	3
S95T4	Total AT Count		(ATOT)	12510
Instrument Code	AT Count Time in Minutes		(MIN CT'd)	30
WC38931	Background in CPM		(BKG)	5
Analyst	Am 241 µCi/L	=	<	4.8691E-02
AKL				
Date				
01/26/95				
Time				
03:00 PM				

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100
NOTE: Am 241 Result is a LESS THAN Value

Print

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 4.87E-05	
Cm 243/244 µCi/mL	=	< 4.87E-05	
Relative counting error (Am-241)	=	41.8%	
Relative counting error (Cm-243/244)	=	113.2%	
Am-243 Tracer Recovery	=	87.2%	4.87E-05

Data Entry by: [signature] Date: 01/30/95
Approved by: [signature] Date: 31 Jan 95

Form 953103WB Rev. 1.0

Raymond 1.28.95

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
S94T000371-BLK
File ID: 3a3563.CNF

Counted on: 1/27/95 @18:50
Detector: AEA3
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	13.3	13.3	300.731	300.731	12.000	6.777	6.000	0.339
2	6713.9	6713.9	254.587	254.586	14.000	6.768	7.000	4.500

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	Am241	0.011	5.480	5.485	-.0050	.03	2.15	6.1	17.5	0.789E-05
	Pu238		5.499	5.485	0.014				22.9	0.103E-04
2	Am243	0.948	5.276	5.273	0.0030	.03	192.48	0.6	1491.0	0.672E-03
Totals:		0.959	<--valid peaks only-->				194.63			

DETECTOR CALIBRATION
Energy(MEV) = 4.102 + (0.0046)*Channel
Energy range (MeV): 4.102 TO 6.457
Efficiency = 0.1304 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	97427.0	100.000
Smoothed	97427.0	100.000
Composite fit	93429.7	95.897
Residuals	3997.3	4.103

Analyzed by: _____
ALJ

Spectrum 3a3563.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 44719.6


```
1
1
1
1
1
1
1
1
1
2
1...2
1....................2
1.......................................................................2
1.......................................2
12......
1
1
1
1
1
```

Raw Data Dump for AEA Spectrum: 3a3563.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.
21	2.	2.	1.	1.	2.	0.	1.	0.	0.	0.
31	1.	0.	1.	1.	1.	2.	0.	1.	0.	0.
41	0.	2.	0.	0.	4.	0.	0.	0.	1.	0.
51	1.	1.	2.	2.	1.	1.	2.	1.	0.	0.
61	1.	0.	2.	1.	2.	2.	1.	1.	3.	1.
71	6.	0.	3.	5.	3.	1.	0.	0.	3.	2.
81	1.	1.	3.	3.	2.	1.	1.	1.	1.	5.
91	5.	2.	3.	5.	1.	1.	2.	2.	1.	0.
101	2.	3.	4.	3.	1.	3.	3.	1.	4.	1.
111	2.	2.	2.	2.	2.	3.	2.	2.	2.	3.
121	4.	3.	1.	2.	5.	4.	1.	2.	1.	4.
131	3.	4.	3.	5.	2.	2.	5.	9.	4.	4.
141	4.	3.	6.	3.	3.	1.	6.	2.	7.	5.
151	3.	4.	3.	8.	4.	10.	3.	6.	5.	10.
161	8.	1.	6.	6.	9.	9.	6.	3.	6.	2.
171	7.	5.	8.	6.	7.	8.	7.	7.	6.	8.
181	11.	12.	10.	11.	7.	11.	7.	15.	10.	18.
191	10.	14.	27.	14.	14.	12.	26.	12.	16.	14.
201	15.	19.	26.	31.	18.	21.	25.	24.	29.	28.
211	36.	39.	39.	33.	46.	56.	64.	65.	68.	72.
221	50.	85.	81.	87.	105.	110.	130.	133.	164.	179.
231	207.	237.	311.	284.	328.	402.	408.	514.	549.	741.
241	910.	1119.	1352.	1598.	1939.	2247.	2672.	3294.	4002.	4697.
251	5561.	6466.	7312.	7680.	7660.	6946.	6056.	4747.	3554.	2501.
261	1729.	1229.	888.	741.	685.	591.	559.	458.	446.	277.
271	234.	177.	134.	84.	44.	25.	7.	4.	2.	4.
281	1.	1.	2.	2.	0.	3.	2.	2.	1.	4.
291	1.	2.	8.	1.	5.	12.	6.	10.	20.	11.
301	17.	12.	14.	10.	4.	2.	3.	3.	5.	3.
311	2.	3.	1.	0.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
341	0.	1.	2.	0.	2.	1.	0.	3.	0.	1.
351	0.	1.	0.	1.	3.	2.	2.	1.	1.	2.
361	0.	0.	1.	1.	1.	0.	0.	0.	2.	0.
371	0.	2.	2.	0.	0.	0.	1.	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.	1.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
441	1.	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.	0.
471	0.	0.	0.	1.	0.	0.	2.	0.	0.	0.
481	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond
1.28.95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S94T000371-STD
File ID: 2a2829.CNF

Counted on: 1/27/95 @18:51
Detector: AEA2
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	1681.8	1681.8	301.805	301.805	22.000	18.361	11.000	6.412
2	3349.1	3349.1	255.594	255.545	20.000	16.812	10.000	5.993
3?	19.3	19.3	157.375	157.315	116.000	1.000	58.000	0.100
4?	4.5	4.5	132.453	132.027	6.000	1.342	3.000	0.244
5?	5.3	5.3	105.151	104.710	16.000	4.328	8.000	3.187

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	Am241	0.334	5.480	5.498	-.0180	08	82.85	1.0	789.8	0.356E-03
	Pu238		5.499	5.498	0.001				1031.1	0.464E-03
2	Am243	0.641	5.276	5.285	-.0090	08	159.10	0.7	1440.0	0.649E-03
	Pu240		5.144	5.285	-.141				1425.6	0.642E-03
3		????		4.833			1.54	7.2		
4		????		4.717			0.21	43.6		
5		????		4.591			0.13	58.7		
Totals:		0.975	<--valid peaks only-->				241.95			

DETECTOR CALIBRATION

Energy(MEV) = 4.109 + (0.0046)*Channel
Energy range (MeV): 4.109 TO 6.465
Efficiency = 0.1116 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	119138.0	100.000
Smoothed	119138.0	100.000
Composite fit	117042.3	98.241
Residuals	2095.7	1.759

Analyzed by: _____
ALJ

Spectrum 2a2829.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 24410.0


```
3
5
5
5
4
4
4
3
3
3

.
2.
..2
......2
................2
.................................2..
.......................................................................2..
1.............................................................2
.1..................2..
.2.1...
..........1
....................1.
.................................1
...........................1
.......1
1
```

Raw Data Dump for AEA Spectrum: 2a2829.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	9.	2.	3.
21	9.	2.	1.	4.	0.	5.	3.	4.	5.	4.
31	2.	2.	8.	2.	5.	7.	6.	5.	3.	2.
41	14.	2.	3.	11.	7.	2.	5.	2.	3.	4.
51	3.	6.	3.	5.	9.	10.	6.	7.	7.	5.
61	6.	6.	5.	6.	7.	10.	8.	9.	5.	4.
71	9.	7.	7.	6.	11.	7.	8.	8.	7.	5.
81	6.	7.	9.	8.	10.	11.	13.	9.	14.	5.
91	14.	10.	7.	5.	13.	6.	9.	10.	7.	8.
101	17.	6.	6.	7.	17.	8.	10.	6.	10.	4.
111	9.	14.	11.	4.	11.	7.	9.	15.	6.	11.
121	13.	7.	10.	12.	14.	10.	13.	11.	14.	6.
131	12.	17.	20.	8.	9.	18.	8.	13.	9.	10.
141	21.	19.	15.	9.	12.	17.	18.	22.	20.	19.
151	21.	11.	15.	19.	15.	12.	21.	25.	11.	19.
161	11.	15.	14.	19.	20.	14.	24.	19.	28.	16.
171	15.	24.	25.	34.	23.	29.	33.	31.	25.	23.
181	37.	29.	36.	27.	24.	36.	28.	43.	28.	40.
191	37.	37.	40.	38.	30.	33.	57.	45.	54.	56.
201	61.	69.	59.	80.	68.	59.	79.	85.	94.	98.
211	85.	90.	109.	117.	127.	112.	126.	135.	143.	165.
221	170.	176.	241.	202.	240.	244.	298.	292.	329.	345.
231	403.	404.	449.	539.	575.	676.	727.	842.	898.	1057.
241	1154.	1342.	1403.	1596.	1858.	2044.	2242.	2506.	2746.	2874.
251	3105.	3246.	3432.	3587.	3546.	3490.	3463.	3291.	3043.	2809.
261	2516.	2165.	1796.	1649.	1344.	1095.	862.	760.	574.	522.
271	420.	406.	307.	313.	303.	250.	243.	279.	271.	286.
281	299.	349.	381.	368.	476.	473.	574.	598.	684.	785.
291	903.	991.	1099.	1192.	1321.	1421.	1521.	1576.	1658.	1783.
301	1699.	1843.	1625.	1667.	1509.	1507.	1394.	1190.	1028.	899.
311	733.	593.	501.	402.	339.	276.	167.	136.	136.	85.
321	60.	43.	35.	24.	17.	11.	7.	4.	1.	0.
331	0.	1.	1.	1.	0.	0.	0.	0.	2.	1.
341	0.	0.	0.	1.	2.	0.	0.	2.	0.	1.
351	1.	2.	0.	2.	1.	0.	2.	3.	0.	1.
361	1.	1.	0.	2.	1.	0.	0.	0.	3.	2.
371	0.	2.	0.	0.	1.	1.	0.	0.	1.	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.	1.	0.	0.	0.
421	0.	0.	0.	0.	0.	1.	0.	1.	0.	1.
431	0.	0.	1.	0.	1.	0.	2.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	2.	0.	0.	0.	1.	0.	0.	0.
461	0.	0.	0.	1.	0.	1.	0.	0.	0.	0.
471	0.	0.	0.	1.	0.	0.	1.	0.	0.	1.
481	2.	0.	0.	0.	0.	1.	0.	0.	0.	0.
491	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond 1-28-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S94T000371-SAM
File ID: 4a4028.CNF

Counted on: 1/27/95 @18:49
Detector: AEA4
Geometry number: 1
Count time: 28800. 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?	11.2	11.2	301.560	301.560	16.000	6.555	8.000	0.667
2	4521.6	4521.6	256.575	256.574	12.000	4.732	6.000	2.666

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		????		5.499			0.98	9.0		
2	Am243	0.943	5.276	5.287	-.011	0.02	121.61	0.8	1399.1	0.630E-03
Totals:		0.943	<--valid peaks only-->				121.61			

DETECTOR CALIBRATION
Energy(MEV) = 4.082 + (0.0047)*Channel
Energy range (MeV): 4.082 TO 6.488
Efficiency = 0.0878 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	61903.0	100.000
Smoothed	61903.0	100.000
Composite fit	58847.4	95.064
Residuals	3055.6	4.936

Analyzed by: _____
ALJ

Spectrum 4a4028.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 23577.5


```
.
2..
1....2..
1...................2.
1.......................................................................... 2
1.......................................................................2
1.2......
1
1
1
1
1
```

Raw Data Dump for AEA Spectrum: 4a4028.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	2.	0.
21	0.	0.	0.	1.	0.	1.	0.	1.	0.	0.
31	0.	0.	1.	0.	1.	0.	1.	0.	0.	0.
41	0.	0.	2.	0.	1.	0.	1.	1.	1.	0.
51	1.	0.	0.	1.	1.	1.	0.	1.	0.	1.
61	1.	0.	0.	0.	1.	0.	0.	0.	1.	1.
71	0.	0.	1.	1.	3.	0.	0.	2.	0.	0.
81	0.	0.	2.	0.	0.	0.	2.	0.	0.	0.
91	2.	1.	2.	1.	1.	0.	0.	1.	1.	1.
101	1.	2.	2.	1.	0.	0.	0.	0.	0.	0.
111	0.	1.	0.	0.	0.	1.	0.	0.	0.	1.
121	2.	0.	0.	0.	1.	0.	5.	1.	2.	2.
131	1.	2.	0.	2.	1.	0.	0.	2.	1.	1.
141	0.	1.	1.	1.	2.	1.	0.	1.	2.	0.
151	1.	2.	0.	0.	2.	2.	2.	3.	0.	1.
161	0.	2.	1.	1.	1.	4.	1.	3.	0.	2.
171	2.	1.	1.	3.	3.	6.	2.	2.	2.	1.
181	4.	0.	4.	2.	1.	2.	5.	1.	1.	2.
191	1.	5.	4.	6.	3.	7.	5.	3.	4.	8.
201	6.	6.	10.	8.	13.	11.	26.	15.	11.	21.
211	19.	25.	22.	20.	34.	38.	33.	38.	49.	52.
221	56.	58.	89.	83.	104.	99.	135.	139.	171.	157.
231	190.	225.	223.	293.	345.	333.	404.	389.	468.	488.
241	538.	634.	756.	878.	1023.	1236.	1442.	1582.	1745.	2036.
251	2160.	2706.	3380.	4080.	4821.	5272.	5406.	4740.	3822.	2694.
261	1751.	1037.	528.	410.	315.	273.	270.	226.	180.	167.
271	134.	115.	70.	59.	40.	16.	11.	6.	1.	0.
281	1.	1.	0.	0.	1.	1.	1.	1.	3.	3.
291	4.	3.	8.	2.	3.	3.	11.	5.	9.	11.
301	15.	14.	9.	9.	8.	8.	8.	3.	0.	0.
311	0.	0.	1.	2.	0.	0.	2.	0.	0.	0.
321	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
331	0.	2.	0.	0.	1.	0.	0.	1.	1.	1.
341	1.	0.	1.	0.	0.	0.	1.	0.	1.	4.
351	2.	4.	0.	4.	4.	6.	3.	3.	2.	3.
361	4.	7.	6.	5.	3.	1.	0.	1.	1.	0.
371	0.	1.	0.	0.	0.	1.	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.	2.	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.	1.	0.	0.	0.	0.	0.	0.	0.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond 1.28.95.

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
S94T000371-DUP
File ID: 5a5955.CNF

Counted on: 1/27/95 @18:47
Detector: AEA5
Geometry number: 1
Count time: 28800. 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	12.3	12.3	305.546	305.546	22.000	17.596	11.000	0.880
2	3893.9	3893.9	258.325	258.323	24.000	20.428	12.000	8.149
3?	11.1	11.1	200.576	200.576	14.000	0.456	7.000	0.080

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	Am241	0.011	5.480	5.509	-.029	0.08	2.10	6.2	15.7	0.705E-05
	Pu238		5.499	5.509	-.010				20.4	0.921E-05
2	Am243	0.985	5.276	5.287	-.011	0.10	191.94	0.6	1356.7	0.611E-03
	Pu240		5.144	5.287	-.143				1343.2	0.605E-03
3		????		5.016			0.52	19.8		
Totals:		0.996	<--valid peaks only-->				194.04			

DETECTOR CALIBRATION
Energy(MEV) = 4.073 + (0.0047)*Channel
Energy range (MeV): 4.073 TO 6.480
Efficiency = 0.1429 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	93513.0	100.000
Smoothed	93512.8	100.000
Composite fit	93387.6	99.866
Residuals	125.4	0.134

Analyzed by: ALJ

Spectrum 5a5955.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 29146.5


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

Raw Data Dump for AEA Spectrum: 5a5955.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	3.	1.	3.	3.
21	1.	2.	5.	6.	5.	2.	1.	6.	3.	0.
31	2.	1.	3.	4.	3.	2.	1.	3.	3.	6.
41	2.	2.	3.	1.	1.	2.	1.	3.	5.	3.
51	1.	3.	1.	5.	5.	4.	3.	5.	4.	3.
61	4.	2.	6.	4.	7.	1.	6.	6.	2.	2.
71	7.	4.	1.	0.	3.	4.	5.	3.	2.	3.
81	0.	3.	4.	3.	3.	3.	1.	1.	4.	2.
91	2.	2.	4.	5.	7.	2.	6.	1.	4.	3.
101	1.	5.	4.	4.	1.	4.	2.	3.	6.	5.
111	2.	1.	6.	7.	4.	5.	4.	6.	10.	3.
121	4.	5.	4.	5.	6.	7.	9.	1.	8.	5.
131	5.	3.	7.	6.	4.	3.	5.	2.	5.	6.
141	7.	11.	3.	5.	4.	10.	6.	4.	3.	7.
151	4.	6.	6.	7.	8.	4.	4.	5.	4.	12.
161	6.	6.	10.	3.	7.	9.	7.	9.	6.	10.
171	6.	4.	8.	6.	8.	4.	10.	9.	8.	1.
181	5.	6.	7.	4.	8.	8.	14.	15.	16.	15.
191	15.	11.	17.	20.	19.	23.	24.	20.	15.	26.
201	25.	19.	21.	15.	18.	32.	22.	34.	37.	31.
211	32.	43.	39.	33.	50.	47.	50.	57.	60.	73.
221	67.	75.	89.	98.	133.	125.	139.	176.	173.	224.
231	274.	304.	337.	394.	436.	488.	578.	644.	742.	892.
241	1042.	1142.	1356.	1469.	1670.	1872.	2167.	2232.	2634.	2837.
251	2968.	3234.	3600.	3705.	3943.	4048.	4025.	4057.	4015.	3927.
261	3771.	3533.	3245.	2818.	2629.	2374.	1947.	1664.	1383.	1183.
271	990.	735.	645.	523.	390.	313.	239.	168.	132.	130.
281	79.	61.	42.	38.	28.	19.	11.	10.	13.	4.
291	13.	10.	11.	5.	9.	12.	6.	9.	14.	14.
301	15.	9.	6.	12.	14.	14.	13.	8.	11.	12.
311	13.	6.	5.	6.	2.	5.	7.	1.	2.	2.
321	2.	1.	0.	2.	0.	0.	2.	0.	0.	0.
331	0.	0.	0.	1.	0.	0.	0.	0.	2.	1.
341	0.	0.	1.	1.	0.	1.	1.	2.	1.	0.
351	3.	4.	0.	1.	3.	0.	0.	0.	2.	1.
361	0.	2.	3.	1.	0.	0.	3.	3.	3.	1.
371	0.	0.	0.	1.	1.	0.	1.	1.	1.	0.
381	1.	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.	1.	0.	0.	1.	0.	1.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	2.	0.	0.
471	0.	0.	1.	1.	0.	0.	0.	1.	0.	0.
481	2.	0.	0.	0.	0.	0.	1.	1.	2.	0.
491	0.	1.	1.	0.	0.	0.	2.	0.	0.	0.
511	0.	0.								

Raymond 1-28-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S94T000355-SAM
File ID: 6a6776.CNF

Counted on: 1/27/95 @18:46
Detector: AEA6
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	18.8	18.8	301.645	301.645	20.000	14.058	10.000	0.703
2	5677.8	5677.8	256.380	256.379	16.000	7.377	8.000	4.884
3?	14.7	14.7	172.827	172.713	110.000	1.000	55.000	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	Am241	0.018	5.480	5.489	-.009	0.06	3.16	5.0	28.4	0.128E-04
	Pu238		5.499	5.489	0.010				37.1	0.167E-04
2	Am243	0.938	5.276	5.281	-.005	0.03	168.28	0.7	1435.6	0.647E-03
3		????		4.896			1.18	9.8		
Totals:		0.955	<--valid peaks only-->				171.44			

DETECTOR CALIBRATION
Energy(MEV) = 4.102 + (0.0046)*Channel
Energy range (MeV): 4.102 TO 6.457
Efficiency = 0.1184 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	86150.0	100.000
Smoothed	86149.9	100.000
Composite fit	82860.3	96.181
Residuals	3289.7	3.819

Analyzed by: _____
ALJ

Spectrum 6a6776.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 32970.2


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

Raw Data Dump for AEA Spectrum: 6a6776.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
21	1.	3.	0.	3.	2.	4.	2.	1.	0.	3.
31	2.	2.	4.	3.	1.	2.	1.	1.	0.	0.
41	1.	4.	1.	0.	1.	1.	2.	1.	1.	2.
51	4.	1.	1.	0.	1.	3.	1.	2.	2.	2.
61	1.	4.	2.	1.	1.	2.	1.	1.	1.	2.
71	2.	1.	2.	3.	3.	3.	1.	2.	3.	0.
81	2.	2.	4.	0.	1.	2.	3.	2.	3.	1.
91	0.	0.	2.	1.	3.	4.	4.	5.	1.	4.
101	6.	3.	3.	4.	2.	4.	7.	8.	2.	6.
111	3.	2.	1.	2.	5.	5.	9.	6.	3.	4.
121	5.	6.	5.	3.	4.	5.	7.	4.	2.	4.
131	4.	2.	5.	6.	3.	5.	6.	7.	5.	5.
141	7.	11.	6.	5.	6.	6.	7.	7.	12.	6.
151	6.	6.	10.	11.	10.	9.	8.	12.	11.	8.
161	13.	8.	13.	7.	10.	12.	10.	21.	10.	13.
171	18.	12.	21.	14.	16.	12.	10.	12.	14.	14.
181	21.	22.	20.	14.	25.	23.	14.	20.	21.	23.
191	23.	23.	30.	22.	22.	36.	24.	19.	38.	31.
201	33.	32.	27.	34.	36.	39.	32.	49.	28.	59.
211	42.	48.	54.	50.	62.	52.	57.	51.	57.	65.
221	61.	84.	65.	95.	89.	92.	105.	109.	112.	119.
231	146.	156.	181.	188.	229.	229.	280.	328.	394.	431.
241	529.	668.	810.	997.	1211.	1479.	1799.	2137.	2549.	3061.
251	3593.	4379.	4984.	5658.	6350.	6454.	6290.	5807.	5002.	3910.
261	3056.	2180.	1479.	1059.	852.	694.	585.	511.	472.	387.
271	348.	262.	214.	150.	110.	79.	57.	27.	9.	4.
281	2.	1.	2.	1.	1.	3.	2.	3.	1.	2.
291	4.	3.	8.	6.	9.	11.	11.	16.	12.	23.
301	21.	24.	17.	17.	12.	14.	16.	13.	9.	10.
311	6.	4.	3.	4.	0.	1.	1.	2.	1.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	1.	0.	1.	0.	0.
341	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
351	2.	0.	0.	0.	0.	0.	1.	2.	0.	2.
361	0.	1.	0.	0.	3.	0.	0.	1.	0.	1.
371	0.	0.	0.	0.	1.	0.	0.	0.	1.	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.	1.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	1.	0.	1.	0.	0.	0.	1.
431	0.	0.	0.	2.	0.	1.	1.	1.	1.	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.	0.
471	0.	0.	0.	0.	0.	0.	0.	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.								

Kaymon 1.28.95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S94T000355-DUP
File ID: 7a7380.CNF

Counted on: 1/27/95 @18:45
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	12.3	12.3	300.626	300.626	12.000	9.347	6.000	0.467
2	3741.4	3741.4	255.659	255.658	16.000	9.069	8.000	2.877
3	29.4	29.4	151.716	151.591	134.000	1.000	67.000	0.100
4?	0.0	0.1	139.626	139.626	0.000	0.100	0.000	0.100
5?	0.7	0.1	118.372	117.570	4.000	0.100	2.000	0.100
6?	4.9	4.9	105.099	105.099	6.000	0.188	3.000	0.069
7?	3.0	3.0	93.267	92.453	6.000	0.958	3.000	0.371

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	Am241	0.012	5.480	5.493	-.013	0.04	2.03	6.3	20.0	0.900E-05
	Pu238		5.499	5.493	0.006				26.1	0.118E-04
2	Am243	0.924	5.276	5.281	-.005	0.04	155.98	0.7	1461.6	0.658E-03
3	Np237	0.014	4.781	4.792	-.011	0.00	2.34	6.2	24.9	0.112E-04
4		????		4.736			0.00	*****		
5		????		4.632			0.00	9865.		
6		????		4.574			0.11	73.8		
7		????		4.514			0.07	101.		
Totals:		0.950	<--valid peaks only-->				160.34			

DETECTOR CALIBRATION

Energy(MEV) = 4.080 + (0.0047)*Channel
Energy range (MeV): 4.080 TO 6.486
Efficiency = 0.1078 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	81004.0	100.000
Smoothed	81004.1	100.000
Composite fit	77062.9	95.135
Residuals	3941.1	4.865

ANALYZED By: _____
ALJ

Spectrum 7a7380.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 25562.8


```
7
7
7
6
6
5
3
4
4
3
3
1
1
1
1
1
2.
12.
1..2.
1......2
1................2
1.................................2.
1.......................................................................2.
1.................................................2
1......2...
1
1
1
1
1
```

Raw Data Dump for AEA Spectrum: 7a7380.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	4.	4.	6.
21	5.	4.	3.	2.	5.	5.	5.	4.	5.	2.
31	5.	5.	7.	6.	5.	10.	6.	6.	2.	8.
41	4.	7.	2.	7.	5.	2.	2.	6.	7.	9.
51	7.	6.	8.	4.	9.	5.	9.	4.	3.	6.
61	4.	4.	8.	4.	4.	2.	9.	6.	6.	7.
71	5.	7.	5.	11.	6.	8.	5.	10.	7.	14.
81	5.	4.	7.	7.	5.	13.	4.	10.	10.	6.
91	12.	9.	14.	11.	10.	11.	5.	9.	7.	16.
101	17.	14.	11.	5.	13.	14.	11.	9.	6.	5.
111	16.	9.	15.	10.	13.	10.	14.	14.	16.	10.
121	12.	16.	6.	10.	16.	16.	15.	13.	19.	22.
131	13.	19.	6.	23.	16.	17.	19.	23.	24.	19.
141	20.	25.	12.	16.	29.	24.	23.	16.	21.	19.
151	29.	23.	23.	23.	19.	18.	17.	15.	30.	38.
161	45.	30.	23.	24.	26.	38.	33.	35.	36.	48.
171	38.	51.	53.	48.	40.	31.	30.	43.	45.	46.
181	46.	46.	54.	52.	46.	74.	73.	69.	79.	70.
191	61.	59.	90.	85.	76.	79.	81.	81.	88.	103.
201	76.	86.	95.	111.	91.	121.	123.	134.	120.	134.
211	154.	150.	185.	184.	188.	193.	197.	222.	231.	240.
221	277.	253.	319.	324.	335.	355.	381.	380.	428.	483.
231	473.	586.	573.	672.	761.	759.	826.	932.	963.	1168.
241	1223.	1298.	1450.	1705.	1769.	2086.	2175.	2401.	2645.	2807.
251	3033.	3376.	3716.	3845.	4039.	4062.	3895.	3558.	3072.	2358.
261	1956.	1547.	1085.	791.	565.	458.	346.	299.	263.	228.
271	179.	145.	103.	78.	74.	27.	25.	22.	9.	8.
281	6.	1.	1.	4.	3.	5.	4.	9.	10.	9.
291	7.	8.	9.	10.	13.	8.	10.	8.	13.	15.
301	8.	18.	9.	9.	2.	8.	3.	7.	5.	1.
311	4.	1.	2.	1.	0.	1.	3.	1.	0.	0.
321	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.
331	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
341	1.	1.	2.	0.	1.	0.	0.	2.	2.	3.
351	2.	2.	3.	2.	0.	2.	3.	0.	0.	1.
361	0.	4.	0.	0.	1.	0.	3.	2.	1.	1.
371	0.	1.	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	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	1.	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.	1.	2.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
491	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	6.	0.								

Kaymore 1.28.95.

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
S95T000004-SAM
File ID: 8a8550.CNF

Counted on: 1/27/95 @18:44
Detector: AEA8
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	13.6	13.6	303.090	303.090	14.000	8.251	7.000	0.413
2	5876.4	5876.4	258.312	258.311	16.000	7.504	8.000	5.217

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	Am241	0.012	5.480	5.496	-.016	0.04	2.22	6.0	18.0	0.812E-05
	Pu238		5.499	5.496	0.003				23.5	0.106E-04
2	Am243	0.962	5.276	5.285	-.009	0.04	173.30	0.7	1336.2	0.602E-03
Totals:		0.974	<--valid peaks only-->				175.52			

DETECTOR CALIBRATION
Energy(MEV) = 4.071 + (0.0047)*Channel
Energy range (MeV): 4.071 TO 6.478
Efficiency = 0.1310 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	86494.0	100.000
Smoothed	86494.0	100.000
Composite fit	84259.9	97.417
Residuals	2234.1	2.583

Analyzed by: _____
ALJ

Spectrum 8a8550.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 38962.0


```
1
1
1
1
1
1
1
1
1
1
12
1........2
1.............................................2
1.............................................................................2
1..............2...
1..
1
1
1
1
```

Raw Data Dump for AEA Spectrum: 8a8550.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.	1.	1.	0.	0.	0.	0.	2.	0.	0.
31	1.	0.	1.	0.	1.	1.	1.	0.	0.	0.
41	0.	0.	0.	1.	2.	2.	0.	2.	1.	0.
51	1.	1.	0.	0.	1.	1.	1.	3.	1.	0.
61	2.	0.	2.	0.	0.	0.	2.	0.	0.	0.
71	1.	1.	0.	1.	0.	1.	1.	1.	0.	0.
81	1.	1.	0.	0.	0.	2.	0.	0.	1.	3.
91	0.	1.	1.	1.	0.	1.	2.	0.	2.	1.
101	0.	1.	0.	2.	1.	1.	0.	0.	1.	0.
111	0.	0.	1.	1.	0.	3.	2.	0.	1.	0.
121	0.	1.	1.	0.	0.	1.	2.	0.	0.	2.
131	0.	3.	2.	0.	1.	0.	1.	1.	3.	1.
141	0.	1.	1.	1.	0.	0.	2.	1.	1.	2.
151	0.	1.	0.	1.	3.	1.	0.	0.	1.	1.
161	0.	1.	0.	1.	2.	2.	2.	0.	1.	0.
171	3.	1.	2.	3.	4.	3.	2.	1.	4.	3.
181	2.	1.	4.	0.	3.	2.	2.	6.	3.	2.
191	3.	3.	5.	3.	3.	7.	5.	3.	4.	3.
201	6.	4.	10.	3.	6.	8.	9.	11.	10.	9.
211	12.	13.	13.	9.	17.	17.	24.	18.	25.	18.
221	24.	30.	40.	31.	46.	43.	46.	68.	55.	80.
231	113.	116.	131.	159.	185.	197.	200.	239.	308.	332.
241	388.	448.	538.	688.	832.	932.	1239.	1467.	1778.	2085.
251	2573.	3138.	3843.	4505.	5373.	6109.	6360.	6673.	6488.	5916.
261	5040.	4186.	3019.	2217.	1640.	1211.	885.	720.	592.	529.
271	444.	385.	312.	285.	179.	154.	94.	61.	33.	13.
281	17.	1.	3.	2.	3.	2.	1.	0.	1.	1.
291	3.	4.	5.	4.	5.	4.	5.	8.	12.	11.
301	12.	13.	17.	17.	9.	10.	11.	6.	3.	6.
311	5.	3.	1.	0.	3.	0.	0.	2.	2.	0.
321	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
341	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
351	0.	0.	3.	0.	1.	0.	1.	0.	1.	2.
361	1.	1.	0.	0.	0.	1.	2.	2.	1.	0.
371	0.	0.	1.	0.	0.	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.	1.	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.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Kaymore 1.28.95

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
S95000004-DUP
File ID: 9a1307.CNF

Counted on: 1/27/95 @18:43
Detector: AEA9
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?	17.5	17.5	299.527	299.527	10.000	4.303	5.000	1.891
2	7744.2	7744.2	253.311	253.311	12.000	3.700	6.000	3.033

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		????		5.488			0.51	12.5		
2	Am243	0.924	5.276	5.275	0.001	0.02	168.47	0.7	3022.6	0.136E-02
Totals:		0.924	<--valid peaks only-->				168.47			

DETECTOR CALIBRATION
Energy(MEV) = 4.110 + (0.0046)*Channel
Energy range (MeV): 4.110 TO 6.465
Efficiency = 0.0563 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	87581.0	100.000
Smoothed	87581.0	100.000
Composite fit	81128.9	92.633
Residuals	6452.1	7.367

Analyzed by: _____
ALJ

Spectrum 9a1307.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 49176.6


```
.
..2.
...................2
.......................................................................... 2
...................2....
....

1
1
1
1
```

Raw Data Dump for AEA Spectrum: 9a1307.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	1.	3.	0.
21	0.	0.	1.	0.	1.	0.	0.	0.	0.	1.
31	0.	0.	1.	0.	1.	1.	0.	0.	0.	1.
41	1.	1.	0.	0.	1.	1.	0.	1.	0.	0.
51	1.	0.	1.	1.	0.	0.	0.	0.	1.	0.
61	0.	0.	1.	0.	1.	1.	0.	3.	0.	0.
71	3.	1.	0.	0.	3.	1.	0.	0.	1.	2.
81	0.	0.	2.	0.	0.	2.	1.	0.	2.	1.
91	0.	1.	0.	0.	3.	0.	1.	0.	0.	0.
101	0.	1.	0.	0.	1.	2.	0.	0.	1.	2.
111	1.	0.	0.	0.	1.	0.	5.	2.	0.	1.
121	1.	2.	1.	3.	3.	0.	2.	2.	0.	3.
131	0.	1.	0.	3.	1.	2.	3.	1.	1.	2.
141	2.	2.	1.	1.	1.	1.	0.	1.	2.	0.
151	1.	2.	0.	2.	2.	1.	3.	1.	0.	2.
161	0.	2.	2.	3.	1.	3.	0.	0.	0.	3.
171	3.	4.	5.	2.	2.	1.	1.	2.	3.	4.
181	2.	2.	1.	4.	4.	1.	3.	4.	1.	2.
191	1.	4.	5.	3.	6.	1.	2.	5.	5.	6.
201	7.	7.	5.	9.	10.	8.	7.	9.	10.	9.
211	9.	15.	10.	8.	21.	27.	17.	33.	22.	32.
221	40.	33.	48.	57.	63.	67.	86.	108.	126.	129.
231	163.	242.	224.	253.	296.	310.	360.	425.	546.	682.
241	893.	1152.	1453.	1692.	2013.	2101.	2382.	2979.	3799.	5176.
251	6879.	8602.	9739.	9549.	7695.	5126.	2935.	1630.	980.	732.
261	661.	644.	623.	599.	587.	574.	415.	338.	252.	187.
271	99.	69.	28.	5.	3.	0.	2.	1.	0.	1.
281	2.	1.	4.	2.	1.	0.	4.	2.	6.	5.
291	8.	3.	7.	3.	8.	9.	19.	19.	19.	22.
301	19.	13.	9.	3.	5.	3.	3.	4.	0.	2.
311	1.	1.	0.	1.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
341	0.	0.	0.	0.	1.	0.	0.	1.	1.	1.
351	1.	1.	0.	1.	0.	1.	0.	1.	3.	1.
361	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
371	0.	1.	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.	1.	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.	0.	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.								

By/04

LABCORE Data Entry Template for Worklist# 344

Analyst: JMV **Instrument:** PU01 **Method:** LA-503-156 D-1

Worklist Comment: See chemist for sample size. --LLF

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@PU23901	PU23901	LIQUID			N/A	uCi/m
1	BLNK-PREP				@PU23901	PU23901T	LIQUID			N/A	% Rec
1	BLNK-PREP				@PU23901	PU23901E	LIQUID			N/A	% Ct.
2	STD	83843			@PU23901	PU23901	LIQUID			N/A	uCi/m
2	STD				@PU23901	PU23901E	LIQUID			N/A	% Ct.
2	STD				@PU23901	PU23901T	LIQUID			N/A	% Rec
3	SAMPLE	S94T000389	0		@PU23901	PU23901	LIQUID	N/A			uCi/m
3	SAMPLE	S94T000389	0		@PU23901	PU23901T	LIQUID	N/A			% Rec
3	SAMPLE	S94T000389	0		@PU23901	PU23901E	LIQUID	N/A			% Ct.
4	DUP	S94T000389	0		@PU23901	PU23901	LIQUID			N/A	uCi/m
4	DUP	S94T000389	0		@PU23901	PU23901T	LIQUID			N/A	% Rec
4	DUP	S94T000389	0		@PU23901	PU23901E	LIQUID			N/A	% Ct.

Final page for worklist # 344

Analyst Signature

Date 01-05-95

1-5-95

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
PLUTONIUM LIQUIDS LA-503-156 / D-1

TEST CODE:	@PU239-01	SAMPLE POINT:	0
INSTRUMENT:	WC38931	SAMPLE PREP:	0
ANALYST:	JMV	BATCH ID:	0
		ANALYSIS DATE:	January 5, 1995

Pu 239/240

	UNITS:	µCi/mL					
SAMPLE TYPE	SAMPLE ID	Pu 239/240	% REC	DET LIM	%CT ER	AVERAGE	RPD%
STANDARD	83B43	1.75E-01	123.0%	2.22E-02	2.3%		
BLANK	S94T389	< 5.62E-06	52.3%	5.62E-06	100.0%		
SAMPLE 1	S94T389	< 7.66E-06	40.8%	7.66E-06	100.0%	N/A	N/A
DUPLICATE 1	S94T389	< 7.03E-06	46.7%	7.03E-06	100.0%		
SPIKE						N/A	N/A
SAMPLE 2						N/A	N/A
SPIKE 2		0.00E+00				N/A	N/A
		0.00E+00					
STANDARD END							

Pu 238

	UNITS:	µCi/mL					
SAMPLE TYPE	SAMPLE ID	Pu 238	% REC	DET LIM	%CT ER	AVERAGE	RPD%
BLANK	S94T389	< 5.62E-06	52.3%	5.62E-06	100.0%		
SAMPLE 1	S94T389	< 7.66E-06	40.8%	7.66E-06	100.0%	N/A	N/A
DUPLICATE 1	S94T389	< 7.03E-06	46.7%	7.03E-06	100.0%		
SAMPLE 2						N/A	N/A

NARRATIVE: **Analyst Comments:**

Chemist Comments:

Form Completed By:	MC BIERMAN	Signature:	MC Bierman	Date:	01/05/95
Chemist Approval:	LL FRITTS	Signature:	LL Fritts	Date:	5 Jan 95

LAB LEADER INFO:

Method:	LA-503-156 / D-4
Test Code	[illegible]
Matrix:	LIQUID
Work List #	[illegible]
Batch #	
Prepared By:	MC BHERMAN
Date Complete:	[illegible]
Time Complete:	[illegible]
Chemist:	LL PRITTS
Analyst:	[illegible]
Analysis Date:	[illegible]
Instrument Code:	[illegible]
Rerun:	
Sample Prep:	
Sample Point:	

Sample Type	Sample #
STANDARD	[illegible]
BLANK	[illegible]
SAMPLE 1	[illegible]
DUPLICATE 1	[illegible]
SPIKE 1	
SPIKE DUPLICATE 1	
SAMPLE 2	
DUPLICATE 2	
SPIKE 2	
SPIKE DUPLICATE 2	
ST-BND	

PRINT

TECH INFO:

Standard Run

INPUT

DATE COUNTED	[illegible]
SAMPLE VOLUME in mL	[illegible]
SAMPLE DILUTION FACTOR	[illegible]
TRACER VOLUME in mL	[illegible]
DIGEST DILUTION FACTOR	[illegible]
TRACER BOOK NO.	[illegible]
PU 236 AEA FRAC.	[illegible]
PU 238 AEA FRAC.	[illegible]
PU 239 AEA FRAC.	[illegible]
TOTAL AT COUNTS	[illegible]
AT COUNT TIME (MIN)	[illegible]
BACKGROUND in cpm	[illegible]
PU 236 cpm	[illegible]
PU 238 cpm	[illegible]
PU 239 cpm	[illegible]
AEA COUNT TIME	[illegible]
STANDARD VALUE in µCi/mL	[illegible]

RESULT

TRACER PREPARATION DATE	[illegible]
PU 236 PREPARATION VALUE	[illegible]
PU-236 DECAY CORR'D VALUE	[illegible]
PU-236 TRACER VALUE	[illegible]
PU 239/240:	
DETECTION LEVEL	[illegible]
CONC in µCi/mL	[illegible]
RELATIVE COUNTING ERROR	[illegible]
PU 236 TRACER RECOVERY	[illegible]

Liquid Blank Run

INPUT

DATE COUNTED	[illegible]
SAMPLE VOLUME in mL	[illegible]
SAMPLE DILUTION FACTOR	[illegible]
TRACER VOLUME in mL	[illegible]
DIGEST DILUTION FACTOR	[illegible]
TRACER BOOK NO.	[illegible]
PU 236 AEA FRAC.	[illegible]
PU 238 AEA FRAC.	[illegible]
PU 239 AEA FRAC.	[illegible]
TOTAL AT COUNTS	[illegible]
AT COUNT TIME (MIN)	[illegible]
BACKGROUND in cpm	[illegible]
PU 236 cpm	[illegible]
PU 238 cpm	[illegible]
PU 239 cpm	[illegible]
AEA COUNT TIME	[illegible]

RESULT

TRACER PREPARATION DATE	[illegible]
PU 236 PREPARATION VALUE	[illegible]
PU-236 DECAY CORR'D VALUE	[illegible]
PU-236 TRACER VALUE	[illegible]
PU 239/240:	
DETECTION LEVEL	[illegible]
CONC in µCi/mL	[illegible]
RELATIVE COUNTING ERROR	[illegible]
PU 236:	
DETECTION LEVEL	[illegible]
CONC in µCi/mL	[illegible]
RELATIVE COUNTING ERROR	[illegible]
PU 236 TRACER RECOVERY	[illegible]

Standard End

INPUT

DATE COUNTED	
SAMPLE VOLUME in mL	
SAMPLE DILUTION FACTOR	
TRACER VOLUME in mL	
DIGEST DILUTION FACTOR	
TRACER BOOK NO.	
PU 236 AEA FRAC.	
PU 238 AEA FRAC.	
PU 239 AEA FRAC.	
TOTAL AT COUNTS	
AT COUNT TIME (MIN)	
BACKGROUND in cpm	
PU 236 cpm	
PU 238 cpm	
PU 239 cpm	
AEA COUNT TIME	
STANDARD VALUE in µCi/mL	

RESULT

TRACER PREPARATION DATE	
PU 236 PREPARATION VALUE	
PU-236 DECAY CORR'D VALUE	
PU-236 TRACER VALUE	
PU 239/240:	
DETECTION LEVEL	
CONC in µCi/mL	
RELATIVE COUNTING ERROR	
PU 236 TRACER RECOVERY	

Liquid Sample Run

INPUT

DATE COUNTED	[illegible]
SAMPLE VOLUME in mL	[illegible]
SAMPLE DILUTION FACTOR	[illegible]
TRACER VOLUME in mL	[illegible]
DIGEST DILUTION FACTOR	[illegible]
TRACER BOOK NO.	[illegible]
PU 236 AEA FRAC.	[illegible]
PU 238 AEA FRAC.	[illegible]
PU 239 AEA FRAC.	[illegible]
TOTAL AT COUNTS	[illegible]
AT COUNT TIME (MIN)	[illegible]
BACKGROUND in cpm	[illegible]
PU 236 cpm	[illegible]
PU 238 cpm	[illegible]
PU 239 cpm	[illegible]
AEA COUNT TIME	[illegible]

RESULT

TRACER PREPARATION DATE	[illegible]
PU 236 PREPARATION VALUE	[illegible]
PU-236 DECAY CORR'D VALUE	[illegible]
PU-236 TRACER VALUE	[illegible]
PU 239/240:	
DETECTION LEVEL	[illegible]
CONC in µCi/mL	[illegible]
RELATIVE COUNTING ERROR	[illegible]
PU 236:	
DETECTION LEVEL	[illegible]
CONC in µCi/mL	[illegible]
RELATIVE COUNTING ERROR	[illegible]
PU 236 TRACER RECOVERY	[illegible]

Liquid Duplicate Run

INPUT

DATE COUNTED	[illegible]
SAMPLE VOLUME in mL	[illegible]
SAMPLE DILUTION FACTOR	[illegible]
TRACER VOLUME in mL	[illegible]
DIGEST DILUTION FACTOR	[illegible]
TRACER BOOK NO.	[illegible]
PU 236 AEA FRAC.	[illegible]
PU 238 AEA FRAC.	[illegible]
PU 239 AEA FRAC.	[illegible]
TOTAL AT COUNTS	[illegible]
AT COUNT TIME (MIN)	[illegible]
BACKGROUND in cpm	[illegible]
PU 236 cpm	[illegible]
PU 238 cpm	[illegible]
PU 239 cpm	[illegible]
AEA COUNT TIME	[illegible]

RESULT

TRACER PREPARATION DATE	[illegible]
PU 236 PREPARATION VALUE	[illegible]
PU-236 DECAY CORR'D VALUE	[illegible]
PU-236 TRACER VALUE	[illegible]
PU 239/240:	
DETECTION LEVEL	[illegible]
CONC in µCi/mL	[illegible]
RELATIVE COUNTING ERROR	[illegible]
PU 236:	
DETECTION LEVEL	[illegible]
CONC in µCi/mL	[illegible]
RELATIVE COUNTING ERROR	[illegible]
PU 236 TRACER RECOVERY	[illegible]

Liquid Spike Run

INPUT

DATE COUNTED	
SAMPLE VOLUME in mL	
SAMPLE DILUTION FACTOR	
TRACER VOLUME in mL	
DIGEST DILUTION FACTOR	
TRACER BOOK NO.	
SPIKE (MATRIX) VOLUME IN mL	
SPIKE (MATRIX) DILUTION FACTOR	
SPIKE (MATRIX) VALUE IN µCi/L	
PU 236 AEA FRAC.	
PU 239 AEA FRAC.	
Pu 239/240 µCi/mL FROM SAMPLE FORM	

RESULT

TRACER PREPARATION DATE	
PU 236 PREPARATION VALUE	
PU-236 DECAY CORR'D VALUE	
Pu 239/240 µCi/mL in SPIKED SAMPLE	0.0000E+00
PERCENT SPIKE RECOVERY	

Liquid Spike Duplicate Run

INPUT

DATE COUNTED	
SAMPLE VOLUME in mL	
SAMPLE DILUTION FACTOR	
TRACER VOLUME in mL	
DIGEST DILUTION FACTOR	
TRACER BOOK NO.	
SPIKE (MATRIX) VOLUME IN mL	
SPIKE (MATRIX) DILUTION FACTOR	
SPIKE (MATRIX) VALUE IN µCi/L	
PU 236 AEA FRAC.	
PU 239 AEA FRAC.	
Pu 239/240 µCi/mL FROM SAMPLE FORM	

RESULT

TRACER PREPARATION DATE	
PU 236 PREPARATION VALUE	
PU-236 DECAY CORR'D VALUE	
Pu 239/240 µCi/mL in SPIKED SAMPLE	0.0000E+00
PERCENT SPIKE RECOVERY	

Liquid Sample Run 2

INPUT

DATE COUNTED	
SAMPLE VOLUME in mL	
SAMPLE DILUTION FACTOR	
TRACER VOLUME in mL	
DIGEST DILUTION FACTOR	
TRACER BOOK NO.	
PU 236 AEA FRAC.	
PU 238 AEA FRAC.	
PU 239 AEA FRAC.	
TOTAL AT COUNTS	
AT COUNT TIME (MIN)	
BACKGROUND in cpm	
PU 236 cpm	
PU 238 cpm	
PU 239 cpm	
AEA COUNT TIME	

RESULT

TRACER PREPARATION DATE	
PU 236 PREPARATION VALUE	
PU-236 DECAY CORR'D VALUE	
PU-236 TRACER VALUE	
PU 239/240:	
DETECTION LEVEL	
CONC in µCi/mL	
RELATIVE COUNTING ERROR	
PU 236:	
DETECTION LEVEL	
CONC in µCi/mL	
RELATIVE COUNTING ERROR	
PU 236 TRACER RECOVERY	

Liquid Duplicate Run 2

INPUT

DATE COUNTED	
SAMPLE VOLUME in mL	
SAMPLE DILUTION FACTOR	
TRACER VOLUME in mL	
DIGEST DILUTION FACTOR	
TRACER BOOK NO.	
PU 236 AEA FRAC.	
PU 238 AEA FRAC.	
PU 239 AEA FRAC.	
TOTAL AT COUNTS	
AT COUNT TIME (MIN)	
BACKGROUND in cpm	
PU 236 cpm	
PU 238 cpm	
PU 239 cpm	
AEA COUNT TIME	

RESULT

TRACER PREPARATION DATE	
PU 236 PREPARATION VALUE	
PU-236 DECAY CORR'D VALUE	
PU-236 TRACER VALUE	
PU 239/240:	
DETECTION LEVEL	
CONC in µCi/mL	
RELATIVE COUNTING ERROR	
PU 236:	
DETECTION LEVEL	
CONC in µCi/mL	
RELATIVE COUNTING ERROR	
PU 236 TRACER RECOVERY	

Liquid Spike Run 2

INPUT

DATE COUNTED	
SAMPLE VOLUME in mL	
SAMPLE DILUTION FACTOR	
TRACER VOLUME in mL	
DIGEST DILUTION FACTOR	
TRACER BOOK NO.	
SPIKE (MATRIX) VOLUME IN mL	
SPIKE (MATRIX) DILUTION FACTOR	
SPIKE (MATRIX) VALUE IN µCi/L	
PU 236 AEA FRAC.	
PU 239 AEA FRAC.	
Pu 239/240 µCi/mL FROM SAMPLE FORM	

RESULT

TRACER PREPARATION DATE	
PU 236 PREPARATION VALUE	
PU-236 DECAY CORR'D VALUE	
Pu 239/240 µCi/mL in SPIKED SAMPLE	0.0000E+00
PERCENT SPIKE RECOVERY	

Liquid Spike Duplicate Run 2

INPUT

DATE COUNTED	
SAMPLE VOLUME in mL	
SAMPLE DILUTION FACTOR	
TRACER VOLUME in mL	
DIGEST DILUTION FACTOR	
TRACER BOOK NO.	
SPIKE (MATRIX) VOLUME IN mL	
SPIKE (MATRIX) DILUTION FACTOR	
SPIKE (MATRIX) VALUE IN µCi/L	
PU 236 AEA FRAC.	
PU 239 AEA FRAC.	
Pu 239/240 µCi/mL FROM SAMPLE FORM	

RESULT

TRACER PREPARATION DATE	
PU 236 PREPARATION VALUE	
PU-236 DECAY CORR'D VALUE	
Pu 239/240 µCi/mL in SPIKED SAMPLE	0.0000E+00
PERCENT SPIKE RECOVERY	

Form Completed By:	MC BHERMAN	Signature:	Date: 01/05/95
Chemist Approval:	LL PRITTS	Signature:	Date: 1/5/95

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

							BLANK
Type	DATE COUNTED		JAN-04-95	PU 236 AEA FRAC.		(C236)	0.943
BLANK	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC.		(C238)	
Work List	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC.		(C239)	
344	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS			1925
Test Code	DIGEST DILUTION FACTOR	DDF	1.000	AT COUNT TIME (MIN)			30
@PU239-01	TRACER BOOK NO.		92B43	BACKGROUND in cpm		(Bkg)	4
Matrix	TRACER PREPARATION DATE		09/02/94	PU 236 cpm			22.460
LIQUID	TRACER PREPARATION VALUE (dpm/mL		2226.00	PU 238 cpm			
Sample #	PU-236 DECAY CORR'D VALUE (dpm/m		2049.58	PU 239 cpm			
S94T389	PU-238 TRACER VALUE (dpm/		0.00	AEA COUNT TIME			480
Instrument Code				Pu 239/240 µCi/L =		<	5.6162E-03
WC38931							
Analyst							
JMV							
Date							
1/5/94							
Time							
10:30							

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/g = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]
Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 2 * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)
Pu 238 µCi/g = [(Pu 238 dpm)(DF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]
Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

v RESULTS v

Pu 239/240	µCi/mL	=	< 5.62E-06	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	100.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 5.62E-06
Pu 238	µCi/mL	=	< 5.62E-06	
Relative Counting Error		=	100.0%	Pu 238 5.62E-06
Pu 236 Tracer Recovery		=	52.3%	

Data Entry by:	[signature]	Date:	05-Jan-95
Approved by:	[signature]	Date:	5 Jan 95

Form WB Rev. 1.0

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

Type	DATE COUNTED		01/04/95	PU 236 AEA FRAC.	(C236)	STANDARD 0.268
STANDARD	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC.	(C238)	0.066
Work List	SAMPLE DILUTION FACTOR	DF	101.0	PU 239 AEA FRAC.	(C239)	0.502
344	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		5573
Test Code	DIGEST DILUTION FACTOR	DDF	1.0	AT COUNT TIME (MIN)		30
@PU239-01	TRACER BOOK NO.		92B43	BACKGROUND in cpm	(Bkg)	6
Matrix	TRACER PREPARATION DATE		09/02/94	PU 236 cpm		22.270
LIQUID	TRACER PREPARATION VALUE (dpm/mL		2226.00	PU 238 cpm		5.490
Sample #	PU-236 DECAY CORR'D VALUE (dpm/m		2049.58	PU 239 cpm		41.780
83B43	PU-238 TRACER VALUE (dpm/		0.00	AEA COUNT TIME		480
Instrument Code				Pu 239/240 µCi/L		1.7466E+02
WC38931						
Analyst						
JMV						
Date						
1/5/94						
Time						
10:30						

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/g = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]
Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 2 * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)
Pu 238 µCi/g = [(Pu 238 dpm)(DF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]
Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

v RESULTS v

Pu 239/240	µCi/mL	=	1.75E-01	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	2.3%	
				Pu 239/240 2.22E-02
Pu 238	µCi/mL	=	2.30E-02	
Relative Counting Error		=	4.3%	
Pu 236 Tracer Recovery		=	47.0%	

Data Entry by: [signature] Date: 05-Jan-95
Approved by: [signature] Date: 5 Jan 95
FormWB Rev. 1.0

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						SAMPLE
Type	DATE COUNTED		JAN-04-95	PU 236 AEA FRAC.	(C236)	0.885
SAMPLE	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC.	(C238)	
Work List	SAMPLE DILUTION FACTOR	DF	1.0	PU 239 AEA FRAC.	(C239)	
344	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		1569
Test Code	DIGEST DILUTION FACTOR	DDF	1.0	AT COUNT TIME (MIN)		30
@PU238-01	TRACER BOOK NO.		92B43	BACKGROUND in cpm	(Bkg)	6
Matrix	TRACER PREPARATION DATE		09/02/94	PU 236 cpm		15.800
LIQUID	TRACER PREPARATION VALUE (dpm/m		2226.00	PU 238 cpm		
Sample #	PU-236 DECAY CORR'D VALUE (dpm/m		2049.58	PU 239 cpm		
S94T389	PU-238 TRACER VALUE (dpm/		0.00	AEA COUNT TIME		480
Instrument Code				Pu 239/240 µCi/L =	<	7.6617E-03
WC38931						
Analyst						
JMV						
Date						
1/5/94						
Time						
10:30						

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/g = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]
Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 2 * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)
Pu 238 µCi/g = [(Pu 238 dpm)(DF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]
Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

v RESULTS v

Pu 239/240	µCi/mL	=	< 7.66E-06
Relative Counting Error		=	100.0%
NOTE: Pu 238 Result is a LESS THAN Value.			
Pu 238	µCi/mL	=	< 7.66E-06
Relative Counting Error		=	100.0%
Pu 236 Tracer Recovery		=	40.8%

DETECTION LEVELS in µCi/mL
Pu 239/240 7.66E-06
Pu 238 7.66E-06

Data Entry by: [signature] Date: 05-Jan-95
Approved by: [signature] Date: 5 Jan 95
Form WB Rev 1.0

Pu 238 and 239/240 : LA-503-156 (D-1)

LIQUID / SOLID

							DUPLICATE
Type	DATE COUNTED		JAN-04-95	PU 236 AEA FRAC.		(C236)	0.843
DUPLICATE	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC.		(C238)	
Work List	SAMPLE DILUTION FACTOR	DF	1.0	PU 239 AEA FRAC.		(C239)	
344	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS			1854
Test Code	DIGEST DILUTION FACTOR	DDF	1.0	AT COUNT TIME (MIN)			30
@PU239-01	TRACER BOOK NO.		92B43	BACKGROUND in cpm		(Bkg)	5
Matrix	TRACER PREPARATION DATE		09/02/94	PU 236 cpm			21.950
LIQUID	TRACER PREPARATION VALUE (dpm/m		2226.00	PU 238 cpm			
Sample #	PU-236 DECAY CORR'D VALUE (dpm/		2049.58	PU 239 cpm			
S94T389	PU-238 TRACER VALUE (dp		0.00	AEA COUNT TIME			480
Instrument Code				Pu 239/240 µCi/L =		<	7.0318E-03
WC38931							
Analyst							
JMV							
Date							
1/5/94							
Time							
10:30							

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/g = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]
Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 2 * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)
Pu 238 µCi/g = [(Pu 238 dpm)(DF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]
Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

v RESULTS v

Pu 239/240	µCi/mL	=	< 7.03E-06	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	100.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 7.03E-06
Pu 238	µCi/mL	=	< 7.03E-06	
Relative Counting Error		=	100.0%	Pu 238 7.03E-06
Pu 236 Tracer Recovery		=	46.7%	

Data Entry by: [signature] Date: 05-Jan-95
Approved by: [signature] Date: 5 Jan 95
Form WB Rev 1.0

Raymond 1.5.95

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-103, REV. 1

SAMPLE
S94T000389-BLK
File ID: 9a1250.CNF

Counted on: 1/ 4/95 @18:39
Detector: AEA9
Geometry number: 1
Count time: 28800. 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	867.3	867.3	363.344	363.344	12.000	3.098	6.000	1.497

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	0.943	5.756	5.775	-.019	0.01	22.46	1.9	164.7	0.742E-04
	Cm243		5.786	5.775	0.011				221.1	0.996E-04
Totals:		0.943	<--valid peaks only-->				22.46			

DETECTOR CALIBRATION
Energy(MEV) = 4.104 + (0.0046)*Channel
Energy range (MeV): 4.104 TO 6.459
Efficiency = 0.1392 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	11429.0	100.000
Smoothed	11429.0	100.000
Composite fit	10783.0	94.347
Residuals	646.0	5.653

Analyzed by: _____
ALJ

```
1 Legend:  Raw = ....  Modeled Peaks = 1,2,.., etc     Display Max.:     5310.9

.
1.
....1
.............1
.......................................1
.............................................................................1
....1...
```

Raw Data Dump for AEA Spectrum: 9a1250.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.	1.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
51	1.	0.	0.	1.	0.	0.	0.	0.	0.	1.
61	1.	0.	0.	0.	1.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	1.	0.	0.	1.	0.	0.	0.	1.	0.
91	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
101	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
111	0.	1.	0.	2.	0.	0.	1.	0.	0.	0.
121	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
131	1.	0.	1.	0.	0.	0.	0.	0.	0.	2.
141	1.	1.	0.	0.	1.	1.	0.	1.	1.	2.
151	1.	0.	1.	1.	0.	1.	0.	1.	0.	0.
161	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
171	2.	0.	0.	0.	0.	2.	0.	0.	0.	3.
181	1.	0.	0.	0.	1.	2.	0.	0.	0.	0.
191	0.	1.	2.	1.	3.	1.	2.	0.	0.	2.
201	1.	0.	1.	1.	2.	1.	1.	0.	3.	1.
211	1.	1.	3.	2.	3.	1.	2.	1.	1.	0.
221	1.	4.	1.	0.	2.	3.	3.	6.	5.	3.
231	2.	5.	3.	1.	2.	0.	0.	0.	3.	4.
241	1.	2.	1.	2.	3.	3.	1.	1.	2.	0.
251	1.	2.	2.	1.	0.	3.	3.	7.	1.	2.
261	2.	1.	0.	3.	3.	4.	4.	1.	1.	1.
271	4.	3.	3.	0.	1.	4.	3.	1.	2.	3.
281	3.	2.	4.	6.	0.	4.	6.	1.	6.	6.
291	7.	6.	3.	6.	3.	4.	5.	12.	5.	4.
301	6.	6.	6.	10.	13.	5.	8.	7.	9.	9.
311	6.	4.	9.	9.	6.	11.	8.	10.	8.	8.
321	11.	18.	13.	13.	11.	11.	22.	14.	19.	8.
331	27.	21.	26.	20.	31.	39.	34.	31.	32.	21.
341	43.	52.	67.	61.	63.	70.	91.	119.	129.	39.
351	236.	276.	363.	391.	386.	407.	411.	421.	458.	183.
361	735.	866.	1062.	1116.	869.	570.	308.	133.	40.	560.
371	1.	0.	0.	0.	0.	0.	0.	0.	0.	10.
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.	1.	0.
441	0.	0.	0.	0.	0.	0.	1.	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.	0.	0.	0.
481	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.			0.	0.	0.	0.	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

SAMPLE
S94T000389-STD
File ID: 10a2093.CNF

Counted on: 1/ 4/95 @18:38
Detector: AEA10
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	501.8	501.8	364.066	364.066	12.000	3.970	6.000	0.893
2	50.4	50.4	305.318	304.823	48.000	80.463	24.000	11.494
3	1044.4	1044.4	229.966	229.964	12.000	4.365	6.000	1.159
4	36.8	36.8	125.673	125.549	166.000	1.000	83.000	0.100
5?	8.4	8.4	96.778	95.782	10.000	1.435	5.000	1.506
6	8.2	8.2	86.214	86.214	16.000	0.957	8.000	0.041
7?	2.2	2.2	58.930	58.177	10.000	1.280	5.000	0.892
8?	5.6	5.6	40.298	39.864	8.000	0.348	4.000	0.776
9?	5.7	5.7	28.433	28.003	14.000	3.511	7.000	1.299

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	0.268	5.756	5.775	-.019	0.02	22.27	1.9	179.7	0.809E-04
	Cm243		5.786	5.775	0.011				241.2	0.109E-03
2	Am241	0.066	5.480	5.502	-.022	0.37	5.49	6.7	46.2	0.208E-04
	Pu238		5.499	5.502	-.003				60.3	0.272E-04
3	Pu239	0.502	5.143	5.158	-.015	0.02	41.78	1.4	330.2	0.149E-03
	Pu240		5.144	5.158	-.014				330.2	0.149E-03
4	Np237	0.034	4.640	4.678	-.038	0.00	2.87	5.3	378.0	0.170E-03
5		????		4.541			0.12	90.6		
6		0.011		4.497		0.00	0.94	13.4	7.4	0.335E-05
7		????		4.368			0.04	243.		
8		????		4.283			0.04	173.		
9		????		4.229			0.17	42.7		
Totals:		0.881	<--valid peaks only-->				73.35			

DETECTOR CALIBRATION
Energy(MEV) = 4.100 + (0.0046)*Channel
Energy range (MeV): 4.100 TO 6.455
Efficiency = 0.1265 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	39955.0	100.000
Smoothed	39955.0	100.000
Composite fit	35391.6	88.579
Residuals	4563.4	11.421

Analyzed by: _____
ALJ

Spectrum 10a2093.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 7197.6

```
6
9
9
9
8
6
7
7
6
6
6
5
5
4
.4
.4
..
...
...
....
.....
3.....
.3......
...3......
......3.......
.............3.....
.......................3..
..................................... 3
.......................................................................3
.........................3
..
2
2
2
2
.2
..2
..2.
1.2.
.12.
.21..
2...1..
........1.
...............1
.........................1
...............................1
....1.
```

Raw Data Dump for AEA Spectrum: 10a2093.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	6.	13.	8.	12.	14.
21	9.	12.	10.	8.	10.	11.	16.	12.	8.	17.
31	9.	11.	11.	7.	6.	5.	9.	11.	13.	10.
41	16.	9.	9.	11.	7.	7.	11.	12.	12.	5.
51	9.	15.	12.	14.	12.	9.	16.	15.	12.	15.
61	13.	14.	12.	9.	17.	11.	15.	9.	14.	13.
71	14.	21.	22.	16.	13.	21.	13.	15.	16.	16.
81	18.	23.	20.	22.	12.	26.	20.	18.	22.	9.
91	21.	14.	18.	23.	22.	23.	28.	20.	19.	25.
101	17.	19.	23.	21.	22.	21.	22.	22.	28.	20.
111	26.	22.	19.	34.	24.	25.	24.	28.	28.	23.
121	34.	33.	30.	37.	33.	38.	31.	28.	38.	39.
131	39.	47.	24.	35.	39.	35.	33.	41.	36.	36.
141	51.	41.	43.	58.	44.	40.	37.	57.	56.	52.
151	51.	60.	47.	53.	57.	59.	57.	62.	63.	62.
161	54.	63.	73.	76.	60.	85.	71.	80.	73.	80.
171	96.	83.	85.	88.	85.	88.	99.	103.	105.	98.
181	123.	118.	129.	108.	130.	118.	129.	120.	161.	175.
191	156.	141.	189.	156.	191.	181.	197.	196.	202.	223.
201	194.	235.	218.	240.	256.	282.	242.	257.	292.	321.
211	356.	310.	308.	395.	353.	359.	432.	458.	488.	507.
221	555.	626.	649.	635.	745.	760.	888.	987.	1114.	1234.
231	1136.	999.	745.	491.	282.	134.	57.	30.	15.	9.
241	15.	16.	8.	15.	17.	8.	11.	13.	13.	16.
251	13.	22.	14.	15.	27.	13.	11.	18.	21.	17.
261	14.	23.	16.	21.	21.	28.	14.	20.	23.	20.
271	22.	23.	22.	31.	25.	18.	20.	23.	24.	29.
281	23.	28.	29.	24.	30.	37.	27.	35.	39.	30.
291	36.	28.	53.	27.	40.	66.	49.	47.	49.	49.
301	55.	59.	57.	52.	76.	71.	54.	50.	58.	50.
311	54.	46.	47.	39.	59.	64.	70.	53.	52.	75.
321	67.	74.	77.	71.	74.	89.	87.	67.	78.	90.
331	94.	95.	81.	95.	105.	125.	100.	121.	126.	139.
341	145.	142.	149.	142.	147.	184.	172.	192.	226.	204.
351	219.	271.	277.	316.	350.	362.	345.	336.	353.	410.
361	385.	437.	540.	574.	562.	508.	338.	243.	108.	30.
371	13.	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.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
471	0.	0.	1.	0.	0.	0.	1.	0.	0.	0.
481	0.	0.	0.	1.	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

SAMPLE
S94T000389-SAM
File ID: 11a3108.CNF

Counted on: 1/ 4/95 @18:37
Detector: AEA11
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	355.7	355.7	365.861	365.861	12.000	4.134	6.000	0.936
2	11.0	11.0	291.443	291.056	30.000	109.164	15.000	8.969

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	0.885	5.796	5.783	0.013	0.02	15.80	2.3	143.6	0.647E-04
	Cm243		5.786	5.783	0.003				196.7	0.886E-04
2	Th228	0.094	5.430	5.439	-.009	0.50	1.69	14.0	21.6	0.972E-05
	Am241		5.480	5.439	0.041				16.3	0.734E-05
Totals:		0.979	<--valid peaks only-->				17.48			

DETECTOR CALIBRATION
Energy(MEV) = 4.100 + (0.0046)*Channel
Energy range (MeV): 4.100 TO 6.456
Efficiency = 0.1100 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	8571.0	100.000
Smoothed	8571.0	100.000
Composite fit	8392.0	97.912
Residuals	179.0	2.088

Analyzed by: ALJ

Spectrum 11a3108.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 2521.0


```
2
2
2
2
2
2
2
2
2
2
2.
.2
.2
12.
21..
2.1.
2....1.
.........1
...............1
.........................1
.........................................1...
.......................................................1
.....................1
.
```

Raw Data Dump for AEA Spectrum: 11a3108.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	0.	1.	0.
21	0.	0.	0.	0.	2.	1.	0.	0.	2.	0.
31	0.	3.	0.	0.	0.	0.	0.	1.	0.	0.
41	0.	1.	0.	1.	2.	0.	0.	1.	0.	0.
51	1.	1.	0.	1.	0.	1.	2.	1.	1.	1.
61	0.	0.	1.	1.	0.	0.	4.	1.	3.	0.
71	1.	1.	0.	0.	0.	2.	1.	1.	1.	2.
81	2.	0.	1.	0.	0.	1.	0.	1.	0.	0.
91	0.	0.	2.	2.	1.	3.	0.	1.	1.	0.
101	0.	0.	1.	0.	0.	1.	1.	0.	0.	1.
111	1.	0.	1.	2.	1.	1.	2.	1.	2.	0.
121	2.	4.	0.	3.	0.	4.	1.	0.	0.	1.
131	1.	1.	1.	0.	4.	1.	2.	0.	1.	0.
141	0.	2.	1.	4.	0.	2.	1.	1.	1.	1.
151	3.	0.	1.	2.	0.	2.	3.	4.	1.	3.
161	2.	3.	2.	2.	3.	2.	1.	1.	2.	3.
171	4.	1.	3.	1.	1.	2.	1.	4.	3.	2.
181	3.	2.	3.	4.	1.	2.	3.	2.	2.	9.
191	0.	3.	2.	4.	2.	4.	1.	1.	2.	0.
201	5.	5.	4.	2.	3.	3.	3.	3.	3.	0.
211	1.	4.	2.	3.	6.	5.	3.	7.	3.	3.
221	3.	5.	3.	3.	7.	5.	3.	5.	5.	4.
231	2.	4.	4.	4.	5.	4.	7.	2.	1.	4.
241	5.	7.	9.	5.	3.	4.	6.	8.	7.	4.
251	5.	7.	6.	5.	0.	8.	5.	4.	15.	3.
261	5.	5.	8.	2.	6.	10.	5.	9.	11.	7.
271	9.	3.	8.	6.	9.	9.	10.	10.	16.	10.
281	8.	12.	6.	14.	13.	11.	11.	19.	10.	11.
291	18.	14.	14.	13.	8.	10.	15.	21.	19.	12.
301	18.	20.	18.	10.	17.	21.	25.	15.	16.	24.
311	18.	14.	19.	20.	21.	19.	24.	28.	28.	19.
321	33.	24.	31.	33.	28.	33.	45.	39.	46.	43.
331	46.	37.	49.	50.	51.	58.	56.	56.	65.	65.
341	80.	69.	83.	90.	104.	104.	111.	107.	138.	132.
351	149.	160.	185.	189.	220.	239.	254.	255.	294.	228.
361	254.	301.	306.	337.	363.	400.	393.	356.	223.	149.
371	71.	29.	4.	2.	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.	1.	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.	1.
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.	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.								

Raymond 1.5.95

Westinghouse Hanford Co. WHC-SD-WM-DP-103, REV. 1

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
S94T000389-DUP
File ID: 12a4906.CNF

Counted on: 1/ 4/95 @18:36
Detector: AEA12
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	504.0	504.0	362.952	362.952	12.000	4.148	6.000	0.965
2	15.0	15.0	268.363	268.212	102.000	1.000	51.000	0.100
3?	3.0	3.0	258.723	257.253	10.000	0.049	5.000	0.005

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	0.843	5.796	5.781	0.015	0.02	21.95	1.9	157.8	0.711E-04
	Cm243		5.786	5.781	0.005				216.2	0.974E-04
2		0.046		5.346		0.00	1.21	8.3	8.7	0.391E-05
3		????		5.295			0.23	41.3		
Totals:		0.889	<--valid peaks only-->				23.16			

DETECTOR CALIBRATION
Energy(MEV) = 4.112 + (0.0046)*Channel
Energy range (MeV): 4.112 TO 6.467
Efficiency = 0.1391 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	12507.0	100.000
Smoothed	12507.0	100.000
Composite fit	11228.9	89.781
Residuals	1278.1	10.219

Analyzed by: _____
ALJ

Spectrum 12a4906.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: *3212.8*


```
3
3
3
3
3
3
3
3
3
32
2.
..
...
....
1...
.1...
...1..
......1..
...........1..
..................... 1
...................................1
...........................................................1..
.................................................................1
.......1.
```

Raw Data Dump for AEA Spectrum: 12a4906.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	1.	3.
21	0.	0.	2.	0.	2.	1.	0.	2.	0.	2.
31	1.	1.	1.	1.	1.	0.	0.	0.	1.	1.
41	1.	0.	1.	0.	1.	3.	2.	0.	2.	3.
51	1.	0.	5.	3.	0.	2.	3.	0.	1.	0.
61	0.	2.	1.	2.	1.	0.	0.	3.	0.	0.
71	0.	0.	1.	2.	2.	3.	1.	5.	1.	3.
81	2.	1.	0.	0.	1.	3.	1.	4.	0.	1.
91	2.	2.	1.	0.	2.	1.	0.	1.	2.	1.
101	6.	1.	2.	1.	0.	2.	0.	1.	1.	3.
111	4.	2.	3.	3.	1.	2.	2.	3.	3.	1.
121	0.	3.	1.	1.	3.	1.	3.	3.	2.	4.
131	2.	0.	3.	2.	2.	2.	2.	1.	1.	3.
141	3.	3.	1.	2.	1.	3.	2.	0.	3.	1.
151	3.	2.	1.	3.	1.	4.	4.	2.	2.	1.
161	0.	2.	5.	5.	3.	3.	3.	3.	2.	3.
171	6.	5.	2.	3.	7.	3.	2.	1.	6.	2.
181	2.	0.	7.	1.	2.	3.	8.	7.	7.	6.
191	4.	5.	8.	0.	5.	5.	2.	7.	6.	2.
201	4.	9.	5.	5.	3.	7.	7.	5.	6.	6.
211	7.	3.	2.	12.	8.	5.	7.	13.	4.	9.
221	3.	3.	8.	8.	4.	11.	13.	4.	5.	6.
231	6.	9.	4.	9.	5.	16.	11.	5.	11.	6.
241	12.	9.	8.	17.	11.	8.	12.	15.	10.	11.
251	13.	7.	15.	10.	8.	14.	18.	11.	11.	20.
261	11.	10.	11.	9.	12.	11.	12.	18.	16.	12.
271	10.	13.	12.	17.	13.	13.	11.	21.	19.	22.
281	16.	23.	18.	11.	21.	23.	15.	28.	21.	30.
291	22.	20.	19.	30.	26.	18.	29.	22.	28.	28.
301	33.	30.	36.	22.	36.	30.	35.	21.	27.	37.
311	41.	28.	34.	27.	39.	46.	36.	41.	56.	48.
321	56.	54.	55.	48.	70.	62.	59.	61.	66.	64.
331	82.	87.	88.	106.	91.	93.	107.	107.	98.	111.
341	114.	125.	118.	126.	167.	182.	179.	229.	210.	255.
351	258.	308.	317.	377.	373.	371.	373.	396.	394.	429.
361	448.	501.	594.	542.	478.	356.	249.	99.	40.	5.
371	1.	1.	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.	0.	0.	0.	1.	1.	0.	0.	0.
441	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	1.	0.	0.	1.	0.	1.	1.	0.	0.	0.
461	0.	0.	1.	0.	1.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	1.	0.	2.	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.								

LABCORE Data Entry Template for Worklist# 455

Analyst: dmv **Instrument:** PU01 **Method:** LA-503-156 D-1

Worklist Comment: See chemist for sample size. --LLF

WHC-SD-WM-DP-103, REV. 1

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@PU23901	PU23901	LIQUID			N/A	uCi/m
1	BLNK-PREP				@PU23901	PU23901T	LIQUID			N/A	% Rec
1	BLNK-PREP				@PU23901	PU23901E	LIQUID			N/A	% Ct.
2	STD	83B43			@PU23901	PU23901	LIQUID			N/A	uCi/m
2	STD				@PU23901	PU23901E	LIQUID			N/A	% Ct.
2	STD				@PU23901	PU23901T	LIQUID			N/A	% Rec
3	SAMPLE	S94T000371	0		@PU23901	PU23901	LIQUID	N/A			uCi/m
3	SAMPLE	S94T000371	0		@PU23901	PU23901T	LIQUID	N/A			% Rec
3	SAMPLE	S94T000371	0		@PU23901	PU23901E	LIQUID	N/A			% Ct.
4	DUP	S94T000371	0		@PU23901	PU23901	LIQUID			N/A	uCi/m
4	DUP	S94T000371	0		@PU23901	PU23901T	LIQUID			N/A	% Rec
4	DUP	S94T000371	0		@PU23901	PU23901E	LIQUID			N/A	% Ct.
5	SAMPLE	S94T000355	0		@PU23901	PU23901	LIQUID	N/A			uCi/m
5	SAMPLE	S94T000355	0		@PU23901	PU23901T	LIQUID	N/A			% Rec
5	SAMPLE	S94T000355	0		@PU23901	PU23901E	LIQUID	N/A			% Ct.
6	DUP	S94T000355	0		@PU23901	PU23901	LIQUID			N/A	uCi/m
6	DUP	S94T000355	0		@PU23901	PU23901T	LIQUID			N/A	% Rec
6	DUP	S94T000355	0		@PU23901	PU23901E	LIQUID			N/A	% Ct.
7	SAMPLE	S95T000004	0		@PU23901	PU23901	LIQUID	N/A			uCi/m
7	SAMPLE	S95T000004	0		@PU23901	PU23901T	LIQUID	N/A			% Rec

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

2878

LABCORE Data Entry Template for Worklist# 455

Analyst: JMV **Instrument:** PU01 _____ **Method:** LA-503-156 D-1

Worklist Comment: See chemist for sample size. --LLF

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
7	SAMPLE	S95T000004	0		@PU23901	PU23901E	LIQUID	N/A			% Ct.
8	DUP	S95T000004	0		@PU23901	PU23901	LIQUID			N/A	uCi/m
8	DUP	S95T000004	0		@PU23901	PU23901T	LIQUID			N/A	% Rec
8	DUP	S95T000004	0		@PU23901	PU23901E	LIQUID			N/A	% Ct.

Final page for worklist # 455

Joel M Umbarger
Analyst Signature

1-25-95
Date

MG Bizel
1-30-95

Data Entry Comments:

Units shown for QC (SPK) may not reflect the actual units.

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						STANDARD
Type	Date Counted		01/26/95	Pu 236 AEA Frac.	(C236)	0.379
STANDARD	Sample Volume in mL	(SS)	0.100	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.624
455	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		4034
Test Code	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		92B43	Background in cpm	(Bkg)	7
Matrix	Tracer Preparation Date		09/02/94	Pu 236 cpm		13.47
LIQUID	Pu-236 Preparation Value	(dpm/mL)	2226	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	2019.78	Pu 239 cpm		22.16
WORKLIST#455	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/L		1.5129E+02
WC38931						
Analyst						
JMV						
Date						
01/25/95						
Time						
04:00 PM						

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

Pu 239/240	µCi/mL	=	1.51E-01	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	3.1%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238	µCi/mL	=	< 1.52E-02	1.52E-02
Relative Counting Error		=	100.0%	Pu 238
Pu 236 Tracer Recovery		=	47.8%	1.62E-02

Data Entry by: [signature] Date: 01/30/95

Approved by: [signature] Date: 30 Jan 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						SAMPLE
Type	Date Counted		01/26/95	Pu 236 AEA Frac.	(C236)	0.95
SAMPLE	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0.026
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.017
455	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		2878
Test Code	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		92B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		09/02/94	Pu 236 cpm		41.18
LIQUID	Pu-236 Preparation Value	(dpm/mL)	2226	Pu 238 cpm		1.12
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	2019.78	Pu 239 cpm		0.75
S94T371	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/L =	<	6.7175E-03
WC38931						

Decay Time = Date Counted - Tracer Preparation Date

Analyst: JMV

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

Date: 01/25/95

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)

Time: 04:00 PM

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	=	< 6.72E-06	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	10.4%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 6.72E-06
Pu 238	µCi/mL	=	< 6.72E-06	
Relative Counting Error		=	8.6%	Pu 238 6.72E-06
Pu 236 Tracer Recovery		=	85.5%	

Data Entry by:	[signature]	Date:	01/30/95
Approved by:	[signature]	Date:	30 Jan 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						BLANK
Type	Date Counted		01/26/95	Pu 236 AEA Frac.	(C236)	0.951
BLANK	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.02
456	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		2046
Test Code	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		92B43	Background in cpm	(Bkg)	7
Matrix	Tracer Preparation Date		09/02/94	Pu 236 cpm		26
LIQUID	Pu-236 Preparation Value	(dpm/mL)	2226	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	2019.78	Pu 239 cpm		0.54
S94T371	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/L =	<	9.9601E-03
WC38931						
Analyst						
JMV						
Date						
01/25/95						
Time						
04:00 PM						

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.

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	< 9.96E-06	
Relative Counting Error		=	12.3%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238	µCi/mL	=	< 9.96E-06	9.96E-06
Relative Counting Error		=	100.0%	Pu 238
Pu 236 Tracer Recovery		=	57.6%	9.96E-06

Data Entry by: [signature] Date: 01/30/95

Approved by: [signature] Date: 30 Jan 95

Form 503156PC Rev. 2.0

2882

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						DUPLICATE
Type	Date Counted		01/26/95	Pu 236 AEA Frac.	(C236)	0.975
DUPLICATE	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.025
455	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		2670
Test Code	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		92B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		09/02/94	Pu 236 cpm		35.56
LIQUID	Pu-236 Preparation Value	(dpm/mL)	2226	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	2019.78	Pu 239 cpm		0.91
S94T371	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/L =	<	6.9038E-03
WC38931						
Analyst						
JMV						
Date						
01/26/95						
Time						
04:00 PM						

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	=	< 6.90E-06	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	9.5%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238	µCi/mL	=	< 6.90E-06	6.90E-06
Relative Counting Error		=	100.0%	Pu 238
Pu 236 Tracer Recovery		=	81.1%	6.90E-06

Data Entry by:	[signature]	Date:	01/30/95
Approved by:	[signature]	Date:	30 Jan 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

Type						SAMPLE
SAMPLE	Date Counted		01/26/95	Pu 236 AEA Frac.	(C236)	0.893
Work List	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0.051
455	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.043
Test Code	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		2306
@PU239-01	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
Matrix	Tracer Book No.		92B43	Background in cpm	(Bkg)	5
LIQUID	Tracer Preparation Date		09/02/94	Pu 236 cpm		24.3
Sample #	Pu-236 Preparation Value	(dpm/mL)	2226	Pu 238 cpm		1.38
S94T356	Pu-236 Decay Corr'd value	(dpm/mL)	2019.78	Pu 239 cpm		1.18
Instrument Code	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
WC38931				Pu 239/240 µCi/L =	<	9.6193E-03
Analyst						
JMV						
Date						
01/25/95						
Time						
04:00 PM						

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.

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	< 9.62E-06	Pu 239/240 9.62E-06
Relative Counting Error	=		8.4%	
Pu 238	µCi/mL	=	1.04E-05	Pu 238 9.62E-06
Relative Counting Error	=		7.8%	
Pu 236 Tracer Recovery	=		63.5%	

Data Entry by: [signature] Date: 01/30/95

Approved by: [signature] Date: 30 Jan 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						DUPLICATE
Type	Date Counted		01/26/95	Pu 236 AEA Frac.	(C236)	0.918
DUPLICATE	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0
455	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		2581
Test Code	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		92B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		09/02/94	Pu 236 cpm		31.16
LIQUID	Pu-236 Preparation Value	(dpm/mL)	2226	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	2019.78	Pu 239 cpm		0
S94T355	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/L =	<	8.0728E-03
WC38931						
Analyst						
JMV						
Date						
01/25/95						
Time						
04:00 PM						

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.

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	< 8.07E-06	
Relative Counting Error		=	100.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 8.07E-06
Pu 238	µCi/mL	=	< 8.07E-06	
Relative Counting Error		=	100.0%	Pu 238 8.07E-06
Pu 236 Tracer Recovery		=	73.7%	

Data Entry by: [signature] Date: 01/30/95

Approved by: [signature] Date: 30 Jan 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

							SAMPLE
Type	Date Counted		01/26/95	Pu 236 AEA Frac.	(C236)		0.973
SAMPLE	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)		0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)		0.027
455	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts			2706
Test Code	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)		30
@PU239-01	Tracer Book No.		92B43	Background in cpm	(Bkg)		7
Matrix	Tracer Preparation Date		09/02/94	Pu 236 cpm			33.65
LIQUID	Pu-236 Preparation Value	(dpm/mL)	2226	Pu 238 cpm			0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	2019.78	Pu 239 cpm			0.95
S95T4	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)		480
Instrument Code				Pu 239/240 µCi/L =		<	6.9989E-03
WC38931							

Analyst: JMV

Date: 01/25/95

Time: 04:00 PM

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.

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	< 7.00E-06	
Relative Counting Error		=	9.3%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 7.00E-06
Pu 238	µCi/mL	=	< 7.00E-06	
Relative Counting Error		=	100.0%	Pu 238 7.00E-06
Pu 236 Tracer Recovery		=	80.2%	

Data Entry by: [signature] Date: 01/30/95

Approved by: [signature] Date: 30 Jan 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						DUPLICATE
Type	Date Counted		01/31/95	Pu 236 AEA Frac.	(C236)	0.966
DUPLICATE	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.026
455	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		1946
Test Code	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		92B43	Background in cpm	(Bkg)	6
Matrix	Tracer Preparation Date		09/02/94	Pu 236 cpm		22.06
LIQUID	Pu-236 Preparation Value	(dpm/mL)	2226	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	2013.07	Pu 239 cpm		0.58
S95T4	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/L =	<	9.9692E-03
WC38931	Decay Time = Date Counted - Tracer Preparation Date					
Analyst	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * [e to the power of {(-ln2 * Decay Time) / 1040.95 }]					
JMV	Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV					
Date	Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))					
01/25/95	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 2 * C238] - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)					
Time	Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / [(Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS]					
04:00 PM	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	=	< 9.97E-06
Relative Counting Error		=	11.9%

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238	µCi/mL	=	< 9.97E-06
Relative Counting Error		=	100.0%
Pu 236 Tracer Recovery		=	56.5%

DETECTION LEVELS in µCi/mL
Pu 239/240
9.97E-06
Pu 238
9.97E-06

Data Entry by:	M G Brunner	Date:	01/31/95
Approved by:	[illegible]	Date:	1 Feb 95

Form 503156PC Rev. 2.0

Em Barker
1-26-95

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-103, REV. 1

SAMPLE
WORKLIST455-STD
File ID: 4a4023.CNF

Counted on: 1/26/95 @ 0:37
Detector: AEA4
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	417.3	417.3	361.846	361.846	12.000	4.936	6.000	1.934
2?	9.5	9.5	305.243	305.074	16.000	2.338	8.000	0.713
3	786.1	786.1	230.655	230.655	12.000	5.104	6.000	2.707

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	0.379	5.796	5.784	0.012	0.02	13.47	2.4	153.6	0.692E-04
	Cm243		5.786	5.784	0.002				210.4	0.948E-04
2		????		5.517			0.31	17.3		
3	Pu239	0.624	5.143	5.167	-.024	0.02	22.16	1.9	252.7	0.114E-03
	Pu240		5.144	5.167	-.023				252.7	0.114E-03
Totals:		1.004	<--valid peaks only-->				35.63			

DETECTOR CALIBRATION
Energy(MEV) = 4.083 + (0.0047)*Channel
Energy range (MeV): 4.083 TO 6.489
Efficiency = 0.0877 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	17045.0	100.000
Smoothed	17045.0	100.000
Composite fit	17255.4	101.235
Residuals	-210.4	-1.235

Analyzed by: _____
DM

Spectrum 4a4023.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 5275.2


```
.3
..... 3
.......................3.
.......................................................................3..
.................................3
3.


2
2
2
2


 1
..  1
..........1.
............................1..
...............................1
..1
```

Raw Data Dump for AEA Spectrum: 4a4023.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.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	1.	0.	0.	0.	0.	1.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
91	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
111	0.	0.	1.	0.	0.	0.	0.	0.	0.	1.
121	0.	0.	0.	0.	0.	0.	1.	0.	2.	1.
131	0.	0.	0.	1.	0.	0.	0.	0.	0.	1.
141	1.	1.	0.	1.	0.	0.	0.	1.	1.	0.
151	0.	1.	0.	1.	0.	1.	0.	0.	0.	0.
161	1.	0.	0.	0.	0.	1.	0.	1.	1.	0.
171	0.	1.	0.	2.	3.	4.	2.	1.	2.	0.
181	1.	2.	2.	2.	6.	4.	2.	1.	3.	1.
191	3.	6.	0.	3.	5.	6.	2.	6.	7.	5.
201	5.	10.	10.	6.	9.	18.	12.	20.	24.	29.
211	43.	43.	48.	73.	86.	100.	126.	156.	197.	207.
221	274.	348.	357.	439.	461.	602.	655.	747.	800.	870.
231	894.	841.	719.	523.	355.	229.	100.	55.	13.	7.
241	2.	0.	1.	4.	0.	1.	0.	0.	0.	0.
251	1.	0.	0.	0.	1.	0.	0.	1.	1.	0.
261	0.	0.	2.	3.	0.	0.	1.	1.	0.	1.
271	0.	4.	1.	0.	0.	1.	2.	0.	0.	2.
281	0.	0.	1.	1.	0.	0.	3.	1.	4.	1.
291	1.	1.	2.	9.	7.	8.	11.	6.	11.	9.
301	6.	15.	9.	7.	9.	14.	11.	6.	4.	2.
311	0.	0.	1.	0.	0.	1.	2.	3.	0.	1.
321	2.	1.	5.	2.	1.	4.	4.	3.	3.	2.
331	5.	7.	7.	6.	4.	9.	13.	11.	12.	13.
341	18.	23.	23.	57.	67.	77.	80.	106.	123.	183.
351	199.	227.	244.	272.	258.	267.	291.	319.	352.	438.
361	430.	477.	458.	399.	280.	221.	120.	62.	27.	7.
371	4.	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.	1.	1.	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.	1.	0.	1.	0.	0.	0.	0.	0.	0.
481	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Em Barlow
1-26-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
WORKLIST455-BLK
File ID: 3a3558.CNF

Counted on: 1/26/95 @ 0:36
Detector: AEA3
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	735.3	735.3	362.133	362.133	14.000	6.566	7.000	2.463
2	17.6	17.6	229.949	229.949	10.000	4.743	5.000	2.037

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	0.951	5.756	5.775	-.019	0.03	26.00	1.8	215.6	0.971E-04
	Cm243		5.786	5.775	0.011				289.4	0.130E-03
2	Pu239	0.020	5.143	5.167	-.024	0.02	0.54	12.2	4.4	0.197E-05
	Pu240		5.144	5.167	-.023				4.4	0.197E-05
Totals:		0.970	<--valid peaks only-->				26.54			

DETECTOR CALIBRATION

Energy(MEV) = 4.109 + (0.0046)*Channel
Energy range (MeV): 4.109 TO 6.464
Efficiency = 0.1231 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	13131.0	100.000
Smoothed	13131.0	100.000
Composite fit	12742.4	97.040
Residuals	388.6	2.960

Analyzed by: _____
DM

Spectrum 3a3558.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 4797.9


```
2
2
2
2

.
.
.
.1
...1
.......  1
.......................1
.......................................................1....
.............................................................1
...........1
```

Raw Data Dump for AEA Spectrum: 3a3558.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.	1.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	2.	0.	0.
91	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
101	0.	1.	0.	0.	0.	0.	1.	0.	0.	0.
111	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
121	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
131	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
141	0.	1.	0.	0.	0.	0.	1.	0.	0.	0.
151	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
161	0.	2.	2.	0.	0.	1.	0.	1.	0.	0.
171	2.	0.	1.	1.	0.	0.	0.	0.	1.	0.
181	1.	0.	0.	0.	1.	1.	0.	1.	0.	0.
191	0.	0.	0.	1.	2.	1.	0.	1.	1.	0.
201	0.	0.	3.	2.	1.	3.	1.	1.	1.	2.
211	3.	2.	2.	4.	8.	2.	5.	5.	4.	4.
221	10.	8.	6.	16.	19.	7.	16.	15.	20.	13.
231	27.	14.	8.	7.	8.	3.	2.	2.	0.	1.
241	2.	2.	1.	0.	1.	2.	1.	1.	5.	1.
251	4.	3.	1.	4.	3.	1.	5.	3.	4.	6.
261	5.	6.	4.	10.	5.	0.	3.	5.	4.	3.
271	4.	1.	2.	3.	5.	2.	5.	2.	3.	4.
281	0.	3.	8.	4.	5.	6.	8.	3.	8.	7.
291	5.	7.	7.	4.	5.	9.	4.	8.	15.	15.
301	7.	13.	6.	7.	16.	7.	7.	16.	8.	14.
311	11.	11.	12.	13.	10.	12.	17.	13.	13.	16.
321	16.	16.	12.	16.	19.	20.	15.	22.	23.	32.
331	32.	24.	33.	32.	42.	44.	50.	39.	55.	57.
341	85.	55.	88.	89.	125.	146.	173.	208.	233.	276.
351	328.	374.	422.	462.	465.	484.	566.	619.	645.	768.
361	781.	795.	809.	737.	641.	475.	378.	215.	155.	86.
371	36.	20.	6.	3.	0.	0.	0.	0.	1.	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.	1.	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.	0.	0.	0.	0.
481	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Em Bueler
1-26-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S94T371-SAM
File ID: 5a5950.CNF

Counted on: 1/26/95 @ 0:38
Detector: AEA5
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	828.4	828.4	362.811	362.811	20.000	20.772	10.000	8.209
2	9.9	9.9	310.113	310.113	32.000	4.036	16.000	0.294
3	17.5	17.5	232.622	232.478	22.000	14.047	11.000	5.610

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	0.950	5.786	5.777	0.009	0.10	41.18	1.4	386.9	0.174E-03
	Cm244		5.796	5.777	0.019				282.4	0.127E-03
2	Pu238	0.026	5.499	5.529	-.030	0.02	1.12	9.5	10.7	0.481E-05
3	Pu239	0.017	5.143	5.164	-.021	0.07	0.75	12.4	5.2	0.232E-05
	Pu240		5.144	5.164	-.020				5.2	0.232E-05
Totals:		0.994	<--valid peaks only-->				43.05			

DETECTOR CALIBRATION
Energy(MEV) = 4.072 + (0.0047)*Channel
Energy range (MeV): 4.072 TO 6.478
Efficiency = 0.1458 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	20801.0	100.000
Smoothed	20800.8	99.999
Composite fit	20668.4	99.362
Residuals	132.6	0.638

Analyzed by: _____
DM

```
                    Spectrum 5a5950.CNF
1 Legend:  Raw = ....  Modeled Peaks = 1,2,.., etc     Display Max.:    6374.7

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

Raw Data Dump for AEA Spectrum: 5a5950.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
21	0.	1.	0.	1.	3.	2.	0.	1.	3.	1.
31	0.	2.	0.	1.	2.	0.	1.	1.	1.	0.
41	0.	2.	0.	1.	0.	0.	2.	0.	1.	0.
51	0.	0.	0.	1.	1.	0.	1.	1.	1.	1.
61	1.	1.	0.	0.	0.	1.	0.	1.	0.	0.
71	4.	0.	0.	2.	1.	0.	0.	1.	0.	0.
81	0.	1.	1.	0.	1.	1.	0.	1.	0.	0.
91	0.	0.	0.	1.	2.	0.	0.	0.	1.	0.
101	3.	3.	2.	0.	1.	0.	1.	0.	1.	0.
111	2.	0.	0.	0.	1.	1.	1.	0.	0.	2.
121	0.	2.	3.	3.	0.	1.	0.	0.	0.	1.
131	0.	1.	0.	1.	1.	1.	0.	0.	0.	0.
141	0.	2.	2.	1.	2.	1.	3.	2.	1.	4.
151	0.	2.	1.	4.	1.	3.	3.	1.	1.	3.
161	1.	1.	5.	1.	3.	0.	3.	1.	3.	1.
171	2.	2.	3.	1.	1.	2.	0.	4.	0.	0.
181	1.	1.	2.	5.	0.	1.	1.	2.	1.	1.
191	0.	4.	0.	1.	1.	1.	2.	8.	0.	0.
201	1.	1.	3.	4.	2.	3.	1.	2.	1.	3.
211	7.	3.	5.	3.	8.	6.	4.	4.	6.	7.
221	12.	12.	14.	12.	10.	17.	20.	20.	12.	23.
231	19.	22.	18.	22.	21.	10.	19.	20.	13.	9.
241	10.	9.	5.	7.	2.	5.	2.	3.	4.	1.
251	2.	0.	6.	2.	2.	6.	2.	4.	5.	3.
261	7.	4.	3.	0.	3.	4.	3.	5.	4.	5.
271	4.	4.	6.	7.	4.	1.	6.	1.	4.	4.
281	5.	6.	7.	10.	7.	8.	9.	7.	8.	10.
291	6.	6.	7.	7.	10.	5.	14.	9.	9.	13.
301	14.	9.	11.	6.	13.	18.	9.	10.	15.	14.
311	11.	16.	7.	14.	8.	10.	11.	12.	17.	14.
321	12.	18.	12.	13.	22.	21.	21.	32.	27.	29.
331	37.	40.	43.	53.	47.	64.	63.	79.	87.	101.
341	121.	134.	171.	174.	201.	223.	252.	289.	315.	388.
351	427.	489.	505.	607.	624.	667.	740.	749.	838.	868.
361	887.	841.	824.	876.	795.	799.	782.	710.	610.	518.
371	489.	369.	356.	279.	236.	183.	144.	92.	67.	58.
381	30.	31.	15.	10.	2.	6.	4.	2.	2.	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.	1.	0.
441	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
451	0.	0.	1.	1.	1.	1.	0.	0.	0.	0.
461	0.	0.	0.	0.	1.	0.	1.	0.	0.	0.
471	1.	0.	1.	2.	2.	0.	0.	0.	2.	0.
481	0.	0.	1.	0.	1.	1.	0.	2.	0.	1.
491	0.	0.	0.	0.	1.	1.	1.	2.	1.	0.
511	0.	0.			1.	0.	0.	1.	0.	0.

Em Barker
1-26-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S94T371-DUP
File ID: 6a6771.CNF

Counted on: 1/26/95 @ 0:39
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	1049.8	1049.8	362.578	362.578	14.000	7.281	7.000	3.186
2	30.1	30.1	229.701	229.701	12.000	6.686	6.000	3.680

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	0.975	5.756	5.764	-.008	0.03	35.56	1.5	292.9	0.132E-03
	Cm243		5.786	5.764	0.022				393.2	0.177E-03
2	Pu239	0.025	5.143	5.152	-.009	0.03	0.91	9.4	7.3	0.331E-05
	Pu240		5.144	5.152	-.008				7.3	0.331E-05
Totals:		1.000	<--valid peaks only-->				36.47			

DETECTOR CALIBRATION
Energy(MEV) = 4.096 + (0.0046)*Channel
Energy range (MeV): 4.096 TO 6.451
Efficiency = 0.1239 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	17504.0	100.000
Smoothed	17504.9	100.005
Composite fit	17509.3	100.031
Residuals	-5.3	-0.031

Analyzed by: _____
DM

Spectrum 6a6771.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 7232.0


```
2
.2
2

1
 1
...   1
..................1
.................................................1....
.............................................................1.
...............1
```

Raw Data Dump for AEA Spectrum: 6a6771.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.	0.	0.	1.	0.	1.	0.	0.	0.	0.
31	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
91	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
101	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
111	0.	0.	1.	0.	0.	1.	0.	0.	0.	1.
121	0.	0.	0.	0.	1.	0.	0.	1.	0.	0.
131	2.	1.	1.	2.	0.	0.	0.	2.	0.	2.
141	1.	1.	2.	3.	1.	2.	2.	2.	3.	3.
151	2.	2.	3.	2.	3.	11.	9.	3.	5.	3.
161	3.	0.	4.	0.	0.	1.	0.	0.	0.	0.
171	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
181	0.	0.	0.	0.	0.	2.	0.	0.	0.	0.
191	0.	0.	0.	1.	1.	0.	0.	0.	1.	1.
201	2.	0.	0.	2.	1.	2.	1.	2.	0.	2.
211	3.	1.	2.	6.	4.	3.	6.	7.	8.	7.
221	14.	18.	13.	23.	24.	29.	29.	28.	35.	28.
231	41.	21.	23.	17.	10.	12.	1.	4.	1.	5.
241	0.	1.	0.	1.	1.	3.	0.	3.	0.	4.
251	0.	1.	5.	1.	1.	2.	7.	6.	2.	9.
261	5.	4.	7.	7.	8.	2.	5.	2.	3.	6.
271	2.	2.	2.	1.	1.	2.	3.	4.	2.	0.
281	2.	1.	6.	1.	4.	8.	6.	8.	4.	3.
291	5.	4.	6.	4.	7.	2.	2.	7.	2.	7.
301	4.	5.	3.	2.	5.	6.	5.	5.	4.	2.
311	3.	3.	1.	1.	0.	3.	2.	1.	3.	1.
321	1.	2.	6.	0.	6.	6.	1.	5.	8.	7.
331	4.	5.	5.	8.	14.	19.	17.	21.	24.	32.
341	44.	46.	73.	91.	127.	140.	196.	243.	279.	352.
351	356.	465.	510.	572.	642.	694.	750.	871.	938.	934.
361	1159.	1145.	1157.	1078.	968.	836.	685.	480.	299.	177.
371	94.	47.	21.	14.	5.	3.	0.	1.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	1.	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.	0.	0.	0.	1.	1.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	1.	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.	0.	0.	0.	0.	1.	0.	0.
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.								

Em Burke
1-26-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S94T355-SAM
File ID: 7a7375.CNF

Counted on: 1/26/95 @ 0:40
Detector: AEA7
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	591.0	591.0	361.499	361.499	14.000	8.236	7.000	2.566
2	13.3	13.3	298.267	297.704	42.000	66.956	21.000	9.466
3	27.6	27.6	228.971	228.942	16.000	10.860	8.000	3.598

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	0.893	5.786	5.753	0.033	0.04	24.30	1.8	329.9	0.149E-03
	Pu236		5.756	5.753	0.003				245.7	0.111E-03
2	Th228	0.051	5.430	5.459	-.029	0.31	1.38	15.1	19.2	0.867E-05
	Am241		5.480	5.459	0.021				14.5	0.655E-05
3	Pu239	0.043	5.143	5.143	0.000	0.05	1.18	8.7	11.7	0.528E-05
	Pu240		5.144	5.143	0.001				11.7	0.528E-05
		---					---			
Totals:		0.987	<--valid peaks only-->				26.86			

DETECTOR CALIBRATION

Energy(MEV) = 4.090 + (0.0046)*Channel
Energy range (MeV): 4.090 TO 6.445
Efficiency = 0.1009 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	13069.0	100.000
Smoothed	13069.0	100.000
Composite fit	12893.7	98.659
Residuals	175.3	1.341

Analyzed by: _____
DM

Spectrum 7a7375.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3823.5


```
3
3
.3
..3
.3
2
2
2
2
2
2
2
2.
2.
21
2..1
.......1
..............  1
...............................1.
.......................................................................1....
.........................................................................1
..............1
```

Raw Data Dump for AEA Spectrum: 7a7375.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
21	1.	1.	0.	1.	3.	0.	0.	0.	1.	0.
31	0.	0.	1.	2.	0.	2.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.
51	1.	2.	0.	0.	0.	0.	0.	0.	0.	0.
61	1.	1.	1.	2.	0.	0.	1.	0.	0.	2.
71	1.	0.	2.	0.	0.	1.	0.	0.	1.	0.
81	0.	0.	1.	1.	0.	0.	0.	0.	1.	0.
91	2.	0.	1.	1.	0.	2.	1.	1.	2.	0.
101	0.	0.	0.	1.	0.	1.	0.	0.	1.	0.
111	0.	0.	0.	0.	0.	1.	0.	1.	0.	0.
121	0.	1.	1.	0.	0.	0.	1.	1.	0.	2.
131	1.	1.	2.	0.	1.	0.	1.	2.	1.	1.
141	1.	2.	0.	0.	3.	2.	1.	0.	0.	1.
151	0.	3.	2.	3.	0.	1.	2.	1.	3.	1.
161	2.	1.	2.	2.	0.	0.	0.	2.	1.	3.
171	1.	3.	3.	1.	0.	1.	3.	3.	2.	3.
181	2.	2.	0.	3.	4.	2.	4.	2.	3.	4.
191	2.	2.	1.	1.	0.	5.	4.	2.	3.	3.
201	7.	7.	1.	3.	4.	4.	5.	4.	6.	9.
211	6.	7.	8.	9.	7.	10.	15.	14.	16.	21.
221	12.	18.	25.	19.	29.	17.	30.	32.	30.	36.
231	24.	21.	28.	18.	19.	17.	7.	6.	5.	9.
241	5.	4.	2.	1.	6.	2.	4.	0.	5.	4.
251	2.	5.	1.	3.	1.	1.	5.	8.	3.	11.
261	7.	11.	1.	4.	7.	8.	5.	0.	7.	9.
271	6.	7.	5.	2.	10.	12.	4.	5.	8.	6.
281	6.	13.	9.	12.	12.	14.	12.	10.	8.	15.
291	11.	11.	12.	14.	11.	18.	14.	21.	12.	21.
301	8.	16.	14.	13.	7.	19.	16.	17.	19.	21.
311	17.	16.	17.	21.	15.	24.	28.	19.	20.	23.
321	20.	35.	32.	39.	45.	32.	38.	36.	46.	39.
331	35.	61.	47.	65.	50.	56.	67.	65.	89.	86.
341	98.	98.	117.	120.	170.	194.	182.	257.	258.	267.
351	326.	372.	369.	407.	407.	526.	482.	550.	574.	626.
361	634.	629.	609.	570.	464.	385.	275.	204.	174.	91.
371	43.	25.	13.	6.	1.	0.	1.	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.	1.	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.	1.	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.	1.	0.	0.	0.	0.	0.	0.
471	1.	0.	0.	0.	0.	2.	0.	3.	0.	0.
481	0.	0.	0.	1.	1.	0.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	8.	0.								

Em Baiter
1-26-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S94T355DUP
File ID: 2a2824.CNF

Counted on: 1/26/95 @ 0:35
Detector: AEA2
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	561.0	561.0	359.324	359.324	22.000	19.201	11.000	5.061

PEAK RESULTS

Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Peak Centroid Obs.	Peak Centroid Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.918	5.786	5.748	0.038	0.09	31.15	1.6	360.1	0.162E-03
	Pu236		5.756	5.748	0.008				268.2	0.121E-03
Totals:		0.918	<--valid peaks only-->				31.15			

DETECTOR CALIBRATION

Energy(MEV) = 4.095 + (0.0046)*Channel
Energy range (MeV): 4.095 TO 6.450
Efficiency = 0.1185 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	16293.0	100.000
Smoothed	16293.0	100.000
Composite fit	14952.7	91.774
Residuals	1340.3	8.226

Analyzed by: _____
DM

Spectrum 2a2824.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 4155.0


```
.
..
...
.


.
.
.
.
..
1.
.1
...1
......1
........... 1
.......................1
.........................................1....
.......................................................................1.
.......................................................1.
.......................1
..1
```

Raw Data Dump for AEA Spectrum: 2a2824.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.	1.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	1.	0.	0.	1.	0.	0.	0.	0.	0.
51	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
61	0.	1.	0.	0.	1.	0.	0.	0.	0.	1.
71	0.	2.	1.	1.	0.	1.	2.	1.	0.	0.
81	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
91	0.	1.	0.	1.	0.	0.	0.	0.	0.	2.
101	1.	1.	0.	0.	2.	0.	1.	1.	0.	3.
111	0.	1.	0.	2.	0.	1.	1.	0.	2.	0.
121	4.	0.	0.	2.	3.	0.	1.	1.	1.	0.
131	0.	2.	2.	0.	1.	0.	1.	2.	1.	3.
141	3.	1.	4.	4.	1.	3.	3.	3.	1.	2.
151	2.	0.	2.	5.	4.	2.	3.	4.	1.	2.
161	1.	4.	0.	0.	3.	1.	3.	3.	2.	4.
171	2.	1.	4.	2.	2.	2.	3.	4.	1.	7.
181	2.	6.	3.	1.	4.	2.	2.	2.	1.	3.
191	5.	2.	3.	5.	4.	2.	5.	6.	5.	4.
201	6.	10.	2.	7.	5.	6.	9.	9.	10.	10.
211	10.	13.	13.	6.	10.	13.	19.	8.	14.	15.
221	19.	22.	25.	20.	31.	31.	17.	28.	22.	21.
231	23.	21.	15.	13.	15.	12.	10.	12.	13.	10.
241	7.	6.	5.	7.	9.	2.	7.	2.	5.	3.
251	10.	12.	5.	10.	5.	10.	5.	5.	10.	7.
261	8.	11.	12.	5.	6.	10.	11.	7.	11.	7.
271	10.	8.	13.	7.	8.	11.	4.	9.	14.	9.
281	10.	12.	13.	13.	13.	10.	14.	15.	19.	14.
291	12.	13.	17.	15.	11.	22.	20.	16.	11.	17.
301	20.	22.	15.	17.	15.	20.	19.	16.	17.	24.
311	27.	18.	30.	31.	25.	21.	33.	28.	34.	35.
321	35.	39.	53.	59.	65.	53.	59.	66.	85.	78.
331	81.	80.	100.	93.	97.	116.	132.	131.	177.	174.
341	172.	189.	226.	231.	287.	275.	331.	345.	401.	354.
351	435.	435.	495.	488.	531.	536.	564.	604.	573.	587.
361	555.	556.	482.	481.	454.	391.	326.	297.	243.	202.
371	140.	134.	100.	72.	32.	41.	18.	17.	11.	2.
381	8.	0.	2.	2.	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.	1.	0.	0.	0.	1.	0.	1.	0.
421	0.	0.	1.	0.	0.	0.	0.	0.	0.	1.
431	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	1.	0.	0.	0.	0.	0.	1.	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	1.	0.	0.	2.	0.	2.	0.	1.	0.	0.
481	0.	0.	0.	1.	0.	1.	0.	0.	2.	0.
491	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Em Barlow
1-26-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S95T4-SAM
File ID: 8a8545.CNF

Counted on: 1/26/95 @ 0:40
Detector: AEA8
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	1015.5	1015.5	363.173	363.173	16.000	7.730	8.000	3.748
2	29.5	29.5	231.864	231.864	18.000	8.310	9.000	4.774

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	0.973	5.796	5.787	0.009	0.04	33.65	1.5	307.6	0.139E-03
	Cm243		5.786	5.787	-.001				421.4	0.190E-03
2	Pu239	0.027	5.143	5.170	-.027	0.04	0.95	9.2	8.7	0.390E-05
	Pu240		5.144	5.170	-.026				8.7	0.390E-05
Totals:		1.001	<--valid peaks only-->				34.60			

DETECTOR CALIBRATION
Energy(MEV) = 4.080 + (0.0047)*Channel
Energy range (MeV): 4.080 TO 6.486
Efficiency = 0.1094 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	16596.0	100.000
Smoothed	16596.0	100.000
Composite fit	16608.0	100.072
Residuals	-12.0	-0.072

Analyzed by: _____
DM

Spectrum 8a8545.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 7281.3


```
2
2
2

1
.   1
.............1
.........................................1...
.......................................................................1.
..................1
.
```

Raw Data Dump for AEA Spectrum: 8a8545.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.	1.	0.	1.	0.	0.	0.	1.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
41	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
71	0.	0.	0.	1.	0.	1.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
91	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
101	0.	0.	0.	1.	0.	1.	0.	1.	0.	1.
111	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
121	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
131	0.	1.	0.	0.	0.	2.	0.	0.	0.	0.
141	0.	0.	2.	0.	0.	1.	0.	0.	1.	1.
151	0.	0.	1.	1.	0.	0.	2.	1.	1.	0.
161	1.	0.	1.	0.	0.	0.	0.	1.	0.	2.
171	1.	1.	0.	0.	1.	0.	0.	0.	0.	0.
181	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
191	0.	0.	1.	0.	0.	0.	2.	0.	0.	1.
201	2.	0.	0.	1.	0.	2.	1.	0.	0.	0.
211	4.	2.	1.	6.	2.	4.	2.	6.	6.	7.
221	13.	7.	9.	15.	13.	22.	22.	24.	28.	33.
231	35.	30.	32.	29.	26.	20.	12.	14.	9.	5.
241	4.	3.	2.	0.	2.	2.	1.	1.	0.	1.
251	8.	1.	1.	1.	1.	2.	1.	3.	1.	3.
261	2.	2.	1.	3.	5.	2.	0.	4.	5.	5.
271	7.	1.	3.	3.	1.	0.	1.	1.	1.	3.
281	2.	0.	1.	1.	5.	4.	6.	2.	8.	2.
291	9.	4.	7.	3.	2.	4.	2.	4.	5.	3.
301	2.	5.	8.	3.	8.	1.	6.	8.	0.	5.
311	2.	3.	1.	1.	1.	0.	1.	4.	1.	1.
321	1.	4.	2.	1.	1.	2.	2.	4.	10.	3.
331	7.	4.	8.	11.	3.	12.	5.	11.	13.	16.
341	30.	35.	35.	56.	65.	83.	133.	167.	209.	263.
351	298.	394.	423.	476.	618.	630.	638.	793.	805.	909.
361	1065.	1148.	1100.	1081.	1030.	924.	720.	587.	443.	255.
371	158.	106.	39.	26.	11.	3.	2.	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.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	1.	0.	0.	0.	1.	0.	0.
481	0.	0.	0.	3.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
511	0.	0.								

A. Johnson 1-31-95

Westinghouse Hanford Co. WHC-SD-WM-DP-103, REV. 1

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
S95T4-DUP
File ID: 7a7389.CNF

Counted on: 1/31/95 @ 8:34
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	700.4	700.4	361.926	361.926	14.000	7.265	7.000	3.840
2	19.5	19.5	228.298	228.298	18.000	8.270	9.000	6.671

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	0.966	5.796	5.782	0.014	0.03	22.06	1.9	153.4	0.691E-04
	Cm243		5.786	5.782	0.004				210.2	0.947E-04
2	Pu239	0.026	5.143	5.154	-.011	0.04	0.58	11.7	4.0	0.182E-05
	Pu240		5.144	5.154	-.010				4.0	0.182E-05
Totals:		0.992	<--valid peaks only-->				22.64			

DETECTOR CALIBRATION
Energy(MEV) = 4.081 + (0.0047)*Channel
Energy range (MeV): 4.081 TO 6.488
Efficiency = 0.1438 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	10960.0	100.000
Smoothed	10960.0	100.000
Composite fit	10869.5	99.174
Residuals	90.5	0.826

Analyzed by: _____
MB

Spectrum 7a7389.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 4571.9


```
2
.2
2

1
..  1
...............1.
...................................................1..
.......................................................................1
............1
```

Raw Data Dump for AEA Spectrum: 7a7389.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.	1.	0.	0.	1.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	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.	0.
71	0.	0.	0.	1.	0.	0.	0.	0.	0.	1.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111	1.	0.	1.	0.	1.	0.	1.	0.	0.	0.
121	0.	1.	0.	0.	0.	0.	0.	1.	1.	0.
131	0.	1.	0.	1.	0.	0.	1.	0.	2.	0.
141	1.	0.	2.	1.	0.	0.	0.	1.	0.	1.
151	2.	0.	0.	2.	1.	0.	1.	0.	1.	0.
161	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.
171	1.	0.	0.	0.	0.	1.	0.	0.	1.	0.
181	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
191	0.	0.	1.	1.	1.	0.	0.	0.	0.	1.
201	0.	1.	0.	2.	0.	1.	1.	1.	1.	2.
211	3.	2.	2.	2.	2.	2.	4.	4.	4.	6.
221	4.	8.	8.	10.	11.	23.	24.	22.	23.	20.
231	16.	8.	17.	6.	10.	9.	13.	5.	3.	0.
241	1.	1.	0.	1.	0.	0.	0.	1.	1.	1.
251	0.	1.	1.	4.	4.	0.	1.	1.	5.	2.
261	1.	0.	3.	3.	2.	5.	3.	3.	3.	3.
271	1.	0.	3.	3.	2.	1.	1.	0.	2.	1.
281	4.	2.	1.	2.	3.	1.	1.	4.	3.	4.
291	3.	2.	1.	3.	1.	5.	1.	7.	4.	4.
301	5.	7.	1.	5.	6.	1.	1.	0.	2.	5.
311	2.	1.	3.	1.	1.	1.	2.	2.	1.	2.
321	2.	1.	4.	1.	3.	5.	6.	7.	5.	7.
331	6.	5.	11.	6.	13.	8.	7.	8.	14.	16.
341	16.	22.	30.	40.	58.	75.	124.	132.	172.	192.
351	240.	252.	354.	357.	346.	470.	481.	604.	639.	721.
361	774.	785.	751.	660.	562.	466.	400.	262.	145.	95.
371	43.	25.	7.	2.	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.	1.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	1.	0.	0.	0.	1.	0.	1.
441	1.	0.	0.	1.	0.	0.	0.	0.	1.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	1.	0.	2.	0.	2.	2.	2.	1.	2.	0.
481	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	14.	0.								

LABCORE Data Entry Template for Worklist# 1180

Analyst: JMV **Instrument:** PU01 **Book #** 104843

Method: LA-503-156 Rev/Mod D-Z1
LAD 3/15/96

Worklist Comment: Use a 0.5 mL sample size. --LLF

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------		MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				@PU23901	PU23901	SOLID			N/A	uCi/g
		1	STD				@PU23901	PU23901T	SOLID			N/A	% Recovery
		1	STD				@PU23901	PU23901E	SOLID			N/A	% Ct. Error
		2	BLNK-PREP				@PU23901	PU23901	SOLID			N/A	uCi/g
		2	BLNK-PREP				@PU23901	PU23901T	SOLID			N/A	% Recovery
		2	BLNK-PREP				@PU23901	PU23901E	SOLID			N/A	% Ct. Error
95000007	BY-106	3	SAMPLE	S95T000101	0		@PU23901	PU23901	SOLID	N/A			uCi/g
95000007	BY-106	3	SAMPLE	S95T000101	0		@PU23901	PU23901T	SOLID	N/A			% Recovery
95000007	BY-106	3	SAMPLE	S95T000101	0		@PU23901	PU23901E	SOLID	N/A			% Ct. Error
95000007	BY-106	4	DUP	S95T000101	0		@PU23901	PU23901	SOLID			N/A	uCi/g
95000007	BY-106	4	DUP	S95T000101	0		@PU23901	PU23901T	SOLID			N/A	% Recovery
95000007	BY-106	4	DUP	S95T000101	0		@PU23901	PU23901E	SOLID			N/A	% Ct. Error

Final page for worklist # 1180

Joel M Umbarger 4-20-95
Analyst Signature **Date**

[illegible] 4-21-95
Analyst Signature **Date**

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						STANDARD
Type	Date Counted		04/20/95	Pu 236 AEA Frac.	(C236)	0.404
STANDARD	Sample Volume in mL	(SS)	0.100	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.602
1180	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		5570
Test Code	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
@PU239.01	Tracer Book No.		110B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		04/03/95	Pu 236 cpm		35.58
LIQUID	Pu-236 Preparation Value	(dpm/mL)	1889	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	1867.74	Pu 239 cpm		53.04
WORKLIST#1180	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/L		1.2662E+02
WC38931						
Analyst						
JMV						
Date						
04/20/95						
Time						
12:30 PM						

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	=	1.27E-01	
Relative Counting Error		=	1.9%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 8.07E-03
Pu 238	µCi/mL	=	< 8.07E-03	
Relative Counting Error		=	100.0%	Pu 238 8.07E-03
Pu 236 Tracer Recovery		=	78.2%	

Data Entry by: [signature] Date: 04/21/95

Approved by: [signature] Date: 24 Apr 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						BLANK
Type	Date Counted		04/20/95	Pu 236 AEA Frac.	(C236)	0.854
BLANK	Sample Volume in mL	(SS)	1.000	Pu 238 AEA Frac.	(C238)	0.066
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.089
1180	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		2738
Test Code	Digest Grams of Solids/L	(Dg/L)	1.904	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		110B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		04/03/95	Pu 236 cpm		33.62
SOLID	Pu-236 Preparation Value	(dpm/mL)	1889	Pu 238 cpm		2.6
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	1867.74	Pu 239 cpm		3.49
S95T101	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/g		4.6050E-03
WC38931	Decay Time = Date Counted - Tracer Preparation Date					
Analyst	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * [e to the power of {(-ln2 * Decay Time) / 1040.95 }]					
JMV	Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV					
Date	Pu 239/240 µCi/g = (C239) (Pu 236 Decay Corr'd Value) (SPKV) (1000mL/L) (DF) / [(C236) (SS) (D g/L) (2220000dpm/µCi)]					
04/20/95	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 2 * C238] - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)					
Time	Pu 238 µCi/g = [(Pu 238 dpm) (DF) (1000mL/L)] / [(Pu-236 Tracer Recovery / 100) (2220000dpm/µCi) (D g/L) (SS)]					
12:30 PM	Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100					

Pu 239/240	µCi/g	=	4.60E-03	DETECTION LEVELS in µCi/g
Relative Counting Error		=	5.0%	
				Pu 239/240 1.97E-03
Pu 238	µCi/g	=	3.41E-03	
Relative Counting Error		=	5.8%	Pu 238 1.97E-03
Pu 236 Tracer Recovery		=	78.9%	

Data Entry by:	[signature]	Date:	04/21/95
Approved by:	[signature]	Date:	24 Apr 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						SAMPLE
Type	Date Counted		04/20/95	Pu 236 AEA Frac.	(C236)	0.264
SAMPLE	Sample Volume in mL	(SS)	1.000	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.628
1180	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		8981
Test Code	Digest Grams of Solids/L	(Dg/L)	1.904	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		110B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		04/03/95	Pu 236 cpm		30.3
SOLID	Pu-236 Preparation Value	(dpm/mL)	1889	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	1867.74	Pu 239 cpm		71.95
S95T101	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/g		1.0511E-01
WC38931						
Analyst						
JMV						
Date						
04/20/95						
Time						
12:30 PM						

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/g = (C239) (Pu 236 Decay Corr'd Value) (SPKV) (1000mL/L) (DF) / [(C236) (SS) (D g/L) (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/g = [(Pu 238 dpm) (DF) (1000mL/L)] / [(Pu-236 Tracer Recovery / 100) (2220000dpm/µCi) (D g/L) (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/g
Pu 239/240	µCi/g	=	1.05E-01	
Relative Counting Error		=	1.9%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238	µCi/g	=	< 6.03E-03	6.03E-03
Relative Counting Error		=	100.0%	Pu 238
Pu 236 Tracer Recovery		=	83.2%	6.03E-03

Data Entry by:	[signature]	Date:	04/21/95
Approved by:	[signature]	Date:	24 Apr 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						DUPLICATE
Type	Date Counted		04/20/95	Pu 236 AEA Frac.	(C236)	0.389
DUPLICATE	Sample Volume in mL	(SS)	1.000	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.84
1180	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		8159
Test Code	Digest Grams of Solids/L	(Dg/L)	1.926	AT Count Time (min)	(TC)	30
@PU239.01	Tracer Book No.		110B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		04/03/95	Pu 236 cpm		44.43
SOLID	Pu-236 Preparation Value	(dpm/mL)	1889	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	1867.74	Pu 239 cpm		96.07
S95T101	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/g		9.4327E-02
WC38931						
Analyst						
JMV						
Date						
04/20/95						
Time						
12:30 PM						

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/g = (C239) (Pu 236 Decay Corr'd Value) (SPKV) (1000mL/L) (DF) / [(C236) (SS) (D g/L) (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/g = [(Pu 238 dpm) (DF) (1000mL/L)] / [(Pu-236 Tracer Recovery / 100) (2220000dpm/µCi) (D g/L) (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/g
Pu 239/240	µCi/g	=	9.43E-02	
Relative Counting Error		=	1.6%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238	µCi/g	=	< 3.37E-03	3.37E-03
Relative Counting Error		=	100.0%	Pu 238
Pu 236 Tracer Recovery		=	111.2%	3.37E-03

Data Entry by:	[signature]	Date:	04/21/95
Approved by:	[signature]	Date:	24 Apr 95

Form 503156PC Rev. 2.0

D. H. Malicia
4-21-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S95T000101-STD
File ID: 5a5178.CNF

Counted on: 4/20/95 @17:58
Detector: AEA5
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	288.3	288.3	355.283	355.283	32.000	34.255	16.000	2.828
2	432.0	432.0	228.012	227.843	22.000	18.882	11.000	1.415
3?	0.0	0.1	115.679	115.679	0.000	0.100	0.000	0.100
4?	4.4	4.4	47.951	47.320	6.000	0.000	3.000	0.115

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	0.404	5.786	5.744	0.042	0.16	35.58	1.5	195.0	0.879E-04
	Pu236		5.756	5.744	0.012				145.3	0.654E-04
2	Pu239	0.602	5.143	5.145	-.002	0.09	53.04	1.3	212.2	0.956E-04
	Pu240		5.144	5.145	-.001				212.2	0.956E-04
3		????		4.618			0.00	*****		
4		????		4.297			0.00	1000.		
Totals:		1.007	<--valid peaks only-->				88.62			

DETECTOR CALIBRATION

Energy(MEV) = 4.075 + (0.0047)*Channel
Energy range (MeV): 4.075 TO 6.481
Efficiency = 0.2499 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	42268.0	100.000
Smoothed	42268.0	100.000
Composite fit	42544.4	100.654
Residuals	-276.4	-0.654

Analyzed by: _____
ALJ

Spectrum 5a5178.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3482.6


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

Raw Data Dump for AEA Spectrum: 5a5178.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	8.	9.	10.	9.
21	8.	8.	13.	10.	6.	10.	11.	12.	5.	12.
31	7.	10.	11.	12.	13.	12.	12.	14.	11.	9.
41	13.	9.	19.	10.	9.	11.	6.	15.	12.	14.
51	2.	7.	13.	10.	20.	15.	23.	20.	13.	10.
61	18.	21.	14.	10.	20.	18.	15.	15.	23.	28.
71	16.	19.	25.	20.	14.	22.	17.	19.	20.	28.
81	21.	17.	23.	24.	35.	30.	18.	38.	21.	26.
91	19.	32.	27.	25.	21.	24.	31.	33.	39.	22.
101	29.	31.	46.	24.	32.	35.	25.	27.	43.	40.
111	35.	38.	39.	31.	49.	46.	43.	36.	29.	35.
121	49.	53.	45.	39.	49.	51.	49.	43.	59.	57.
131	48.	49.	60.	64.	71.	60.	66.	73.	55.	76.
141	73.	76.	91.	71.	80.	72.	89.	88.	88.	79.
151	94.	92.	106.	79.	96.	91.	90.	103.	114.	132.
161	105.	157.	108.	128.	124.	123.	123.	136.	133.	150.
171	136.	141.	147.	158.	146.	153.	145.	176.	174.	173.
181	203.	191.	180.	216.	204.	178.	198.	189.	192.	212.
191	249.	216.	230.	228.	237.	233.	232.	241.	256.	232.
201	280.	274.	277.	239.	307.	288.	304.	322.	305.	328.
211	314.	348.	366.	334.	353.	374.	364.	364.	376.	404.
221	414.	427.	435.	414.	469.	426.	456.	477.	435.	432.
231	459.	409.	348.	329.	275.	243.	204.	196.	150.	150.
241	121.	95.	84.	66.	57.	55.	52.	27.	26.	32.
251	46.	28.	36.	30.	23.	23.	33.	39.	30.	43.
261	38.	33.	43.	39.	40.	43.	35.	38.	52.	43.
271	39.	47.	49.	54.	50.	49.	52.	60.	51.	56.
281	59.	40.	54.	62.	65.	63.	75.	82.	80.	82.
291	60.	62.	72.	69.	82.	77.	104.	113.	84.	94.
301	72.	83.	115.	102.	100.	90.	114.	110.	94.	133.
311	116.	118.	135.	114.	137.	117.	143.	137.	114.	139.
321	152.	144.	152.	162.	166.	164.	156.	149.	160.	160.
331	185.	166.	155.	156.	190.	190.	199.	185.	167.	190.
341	200.	199.	240.	206.	207.	235.	248.	257.	259.	287.
351	268.	297.	269.	269.	327.	269.	285.	262.	277.	282.
361	268.	239.	241.	242.	205.	170.	174.	133.	135.	108.
371	87.	63.	62.	49.	33.	26.	12.	13.	9.	7.
381	5.	2.	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.	1.	0.	0.
421	0.	0.	1.	0.	0.	0.	0.	1.	0.	0.
431	0.	1.	0.	0.	0.	0.	0.	0.	1.	0.
441	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
461	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
471	0.	0.	0.	0.	0.	1.	2.	0.	0.	0.
481	0.	0.	1.	1.	0.	0.	1.	1.	0.	0.
491	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
511	0.	0.								

D. H. Milliken
4-21-95

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
S95T000101-BLK
File ID: 6a6998.CNF

Counted on: 4/20/95 @17:59
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	498.3	498.3	358.976	358.976	22.000	13.128	11.000	2.094
2	30.3	30.3	297.807	296.567	38.000	73.368	19.000	28.264
3	21.8	21.8	263.342	262.646	24.000	21.370	12.000	1.165
4?	2.5	2.5	198.494	197.979	12.000	0.000	6.000	5.529
5?	2.8	2.8	186.428	185.961	8.000	0.744	4.000	0.795

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	0.854	5.786	5.747	0.039	0.06	33.62	1.5	152.2	0.685E-04
	Pu236		5.756	5.747	0.009				113.3	0.511E-04
2	Th228	0.066	5.430	5.460	-.030	0.34	2.60	14.4	12.1	0.546E-05
	Am241		5.480	5.460	0.020				9.1	0.412E-05
3	Am243	0.089	5.276	5.304	-.028	0.10	3.49	6.1	11.6	0.524E-05
	Pu240		5.144	5.304	-.160				11.5	0.519E-05
4		????		5.007			0.00	1000.		
5		????		4.951			0.03	268.		
Totals:		1.009	<--valid peaks only-->				39.71			

DETECTOR CALIBRATION
Energy(MEV) = 4.096 + (0.0046)*Channel
Energy range (MeV): 4.096 TO 6.451
Efficiency = 0.3027 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	18902.0	100.000
Smoothed	18902.6	100.003
Composite fit	19080.6	100.945
Residuals	-178.6	-0.945

ANALYZED By: _____
ALJ

Spectrum 6a6998.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3702.5


```
3
3
3
3
3
3
3
5
5
3
3
3
3
3.
.3
.3.
.3.
1.3.
23..
32...
.12...
...2....
...2.1...
..2....1...
.2.........1..
2................1.
.......................1
.............................  1
.............................................1
.......................................................................1.
.................................................1...
.......... 1
```

Raw Data Dump for AEA Spectrum: 6a6998.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	2.	1.
21	4.	1.	0.	1.	1.	0.	0.	2.	4.	0.
31	1.	1.	0.	1.	1.	3.	0.	1.	3.	0.
41	1.	0.	1.	1.	0.	3.	1.	2.	0.	2.
51	1.	2.	2.	0.	0.	3.	1.	3.	0.	3.
61	1.	3.	1.	0.	1.	2.	3.	0.	2.	0.
71	3.	3.	2.	0.	1.	3.	1.	3.	2.	1.
81	2.	1.	2.	1.	3.	3.	3.	5.	3.	1.
91	1.	2.	1.	4.	4.	1.	2.	2.	2.	3.
101	7.	2.	1.	4.	1.	0.	6.	1.	2.	1.
111	2.	3.	3.	4.	7.	3.	1.	3.	7.	2.
121	5.	2.	3.	1.	3.	3.	3.	5.	3.	9.
131	3.	3.	4.	4.	3.	2.	1.	3.	3.	2.
141	4.	3.	4.	3.	3.	1.	6.	3.	5.	4.
151	3.	6.	6.	5.	12.	5.	1.	1.	5.	2.
161	4.	9.	5.	4.	5.	5.	6.	1.	5.	7.
171	7.	3.	4.	4.	7.	3.	8.	7.	8.	6.
181	12.	7.	6.	10.	6.	15.	8.	9.	8.	11.
191	2.	5.	7.	7.	10.	6.	7.	17.	12.	4.
201	12.	8.	6.	12.	14.	11.	10.	15.	14.	13.
211	13.	14.	9.	14.	13.	10.	14.	12.	12.	12.
221	7.	10.	17.	7.	16.	18.	13.	17.	20.	18.
231	16.	17.	12.	19.	18.	23.	22.	21.	18.	18.
241	21.	18.	21.	24.	23.	22.	12.	23.	24.	13.
251	31.	28.	20.	22.	20.	25.	20.	31.	20.	24.
261	35.	31.	39.	37.	32.	22.	33.	33.	30.	27.
271	34.	43.	34.	31.	34.	44.	36.	29.	34.	36.
281	45.	40.	50.	43.	44.	37.	49.	49.	53.	51.
291	53.	53.	60.	51.	51.	73.	69.	65.	60.	66.
301	60.	52.	66.	74.	83.	65.	78.	77.	84.	84.
311	79.	93.	111.	76.	79.	96.	119.	100.	102.	122.
321	113.	111.	116.	127.	138.	121.	127.	143.	149.	142.
331	152.	161.	165.	159.	189.	189.	184.	214.	180.	224.
341	217.	246.	255.	277.	278.	314.	309.	343.	315.	406.
351	420.	413.	465.	419.	440.	461.	502.	548.	526.	492.
361	495.	475.	434.	420.	349.	301.	225.	154.	105.	59.
371	32.	20.	5.	5.	0.	0.	0.	0.	1.	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.	0.	0.	0.	0.	0.	1.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
511	0.	0.								

D. H. Milicia
4-21-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A WHC-SD-WM-DP-103, REV. 1
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T000101-SAM
File ID: 7a7598.CNF

Counted on: 4/20/95 @18: 0
Detector: AEA7
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	445.6	445.6	356.704	356.704	24.000	13.158	12.000	2.076
2	1180.1	1180.1	225.752	225.748	16.000	9.971	8.000	1.730
3?	21.7	21.7	20.227	20.224	20.000	5.051	10.000	10.134

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	Ra224	0.264	5.680	5.728	-.048	0.06	30.30	1.6	687.3	0.310E-03
	Pu236		5.756	5.728	0.028				659.2	0.297E-03
2	Pu239	0.628	5.143	5.126	0.017	0.05	71.95	1.1	1534.1	0.691E-03
	Pu240		5.144	5.126	0.018				1534.1	0.691E-03
3		????		4.181			0.49	12.9		
Totals:		0.892	<--valid peaks only-->				102.25			

DETECTOR CALIBRATION
Energy(MEV) = 4.088 + (0.0046)*Channel
Energy range (MeV): 4.088 TO 6.443
Efficiency = 0.0469 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	55042.0	100.000
Smoothed	55041.7	100.000
Composite fit	49321.4	89.607
Residuals	5720.6	10.393

Analyzed by: _____
ALJ

Spectrum 7a7598.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 8090.6


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

Raw Data Dump for AEA Spectrum: 7a7598.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	11.	27.	38.	20.
21	26.	25.	12.	13.	20.	12.	9.	11.	3.	6.
31	10.	5.	8.	8.	5.	3.	7.	5.	8.	7.
41	8.	16.	7.	8.	7.	9.	7.	6.	9.	9.
51	9.	9.	4.	13.	6.	4.	12.	10.	8.	12.
61	10.	11.	10.	9.	9.	8.	14.	9.	16.	8.
71	18.	14.	11.	16.	15.	12.	11.	16.	17.	16.
81	23.	18.	19.	19.	12.	12.	23.	25.	12.	19.
91	22.	21.	24.	18.	21.	19.	28.	23.	22.	28.
101	30.	30.	19.	22.	31.	28.	25.	23.	33.	41.
111	28.	33.	26.	26.	44.	50.	36.	45.	44.	38.
121	31.	41.	50.	45.	48.	51.	46.	49.	54.	64.
131	65.	66.	51.	77.	60.	73.	72.	82.	71.	79.
141	64.	71.	76.	89.	75.	71.	76.	68.	76.	83.
151	83.	81.	78.	87.	88.	84.	95.	92.	91.	95.
161	95.	100.	101.	94.	120.	95.	112.	135.	107.	137.
171	141.	144.	154.	149.	154.	176.	177.	163.	193.	178.
181	194.	189.	205.	218.	228.	239.	242.	272.	223.	262.
191	283.	293.	303.	287.	310.	325.	332.	312.	334.	405.
201	383.	420.	430.	445.	473.	472.	488.	495.	523.	546.
211	577.	620.	705.	753.	787.	831.	905.	953.	1002.	1005.
221	1090.	1099.	1182.	1202.	1164.	1258.	1218.	1146.	1049.	912.
231	754.	534.	432.	332.	216.	127.	94.	65.	30.	24.
241	14.	9.	9.	7.	8.	8.	14.	23.	16.	18.
251	9.	15.	17.	12.	12.	12.	23.	23.	12.	16.
261	18.	21.	18.	17.	17.	24.	18.	27.	29.	16.
271	22.	31.	22.	23.	25.	15.	27.	37.	32.	29.
281	29.	30.	37.	38.	42.	39.	44.	39.	38.	53.
291	52.	45.	51.	44.	41.	62.	52.	37.	67.	86.
301	69.	61.	65.	56.	67.	74.	77.	67.	89.	100.
311	62.	86.	90.	83.	71.	90.	93.	92.	90.	81.
321	120.	101.	106.	136.	136.	133.	131.	137.	124.	149.
331	134.	142.	158.	143.	186.	181.	212.	197.	190.	226.
341	231.	236.	253.	255.	278.	290.	369.	370.	376.	437.
351	427.	454.	402.	412.	501.	446.	427.	462.	458.	415.
361	394.	318.	294.	241.	200.	132.	74.	39.	31.	19.
371	10.	1.	1.	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.	0.	0.	0.	0.	0.	1.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	1.	0.	0.	0.	0.	2.	0.	0.	0.	1.
481	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	3.	0.								

D. Hamilton
4-21-95

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S95T000101-DUP
File ID: 8a8761.CNF

Counted on: 4/20/95 @18: 0
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	324.5	324.5	354.788	354.788	22.000	17.566	11.000	1.152
2	713.7	713.7	224.800	224.740	18.000	11.372	9.000	0.718
3?	0.0	0.1	21.329	21.329	0.000	0.100	0.000	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	Ra224	0.389	5.680	5.719	-.039	0.08	44.43	1.3	209.9	0.945E-04
	Pu236		5.756	5.719	0.037				201.3	0.907E-04
2	Pu239	0.840	5.143	5.121	0.022	0.05	96.07	0.9	426.6	0.192E-03
	Pu240		5.144	5.121	0.023				426.6	0.192E-03
3		????		4.185			0.00	9143.		
Totals:		1.229	<--valid peaks only-->				140.50			

DETECTOR CALIBRATION
Energy(MEV) = 4.087 + (0.0046)*Channel
Energy range (MeV): 4.087 TO 6.442
Efficiency = 0.2252 CPM/DPM

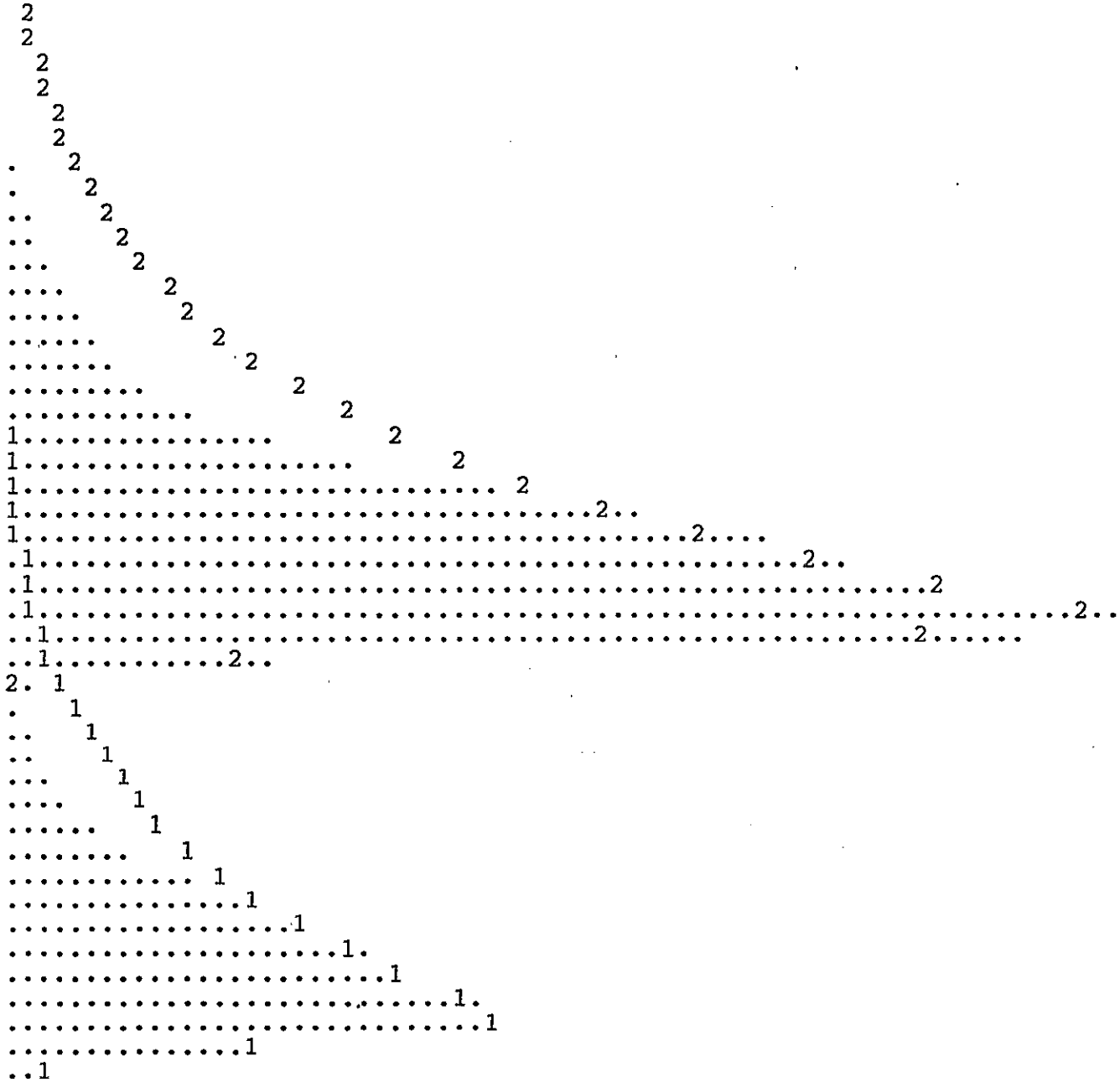
TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	54879.0	100.000
Smoothed	54879.0	100.000
Composite fit	67449.6	122.906
Residuals	-12570.6	-22.906

Analyzed by: _____
ALJ

Spectrum 8a8761.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 5494.2



Raw Data Dump for AEA Spectrum: 8a8761.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	8.	14.	12.	22.
21	14.	15.	13.	12.	10.	10.	7.	12.	6.	5.
31	7.	5.	11.	6.	6.	8.	6.	4.	4.	6.
41	4.	4.	8.	9.	7.	11.	11.	5.	4.	10.
51	7.	8.	7.	3.	6.	4.	8.	10.	8.	6.
61	5.	9.	12.	4.	10.	14.	5.	11.	14.	8.
71	6.	9.	19.	15.	16.	18.	11.	18.	16.	14.
81	14.	16.	21.	22.	16.	16.	21.	24.	17.	19.
91	19.	26.	16.	24.	28.	24.	24.	27.	23.	21.
101	28.	30.	27.	26.	31.	23.	27.	42.	33.	35.
111	39.	35.	35.	40.	43.	37.	29.	50.	41.	45.
121	49.	43.	47.	54.	58.	55.	59.	53.	59.	65.
131	54.	82.	75.	54.	62.	62.	66.	75.	75.	75.
141	87.	100.	89.	82.	89.	90.	91.	107.	91.	104.
151	112.	100.	120.	126.	119.	135.	121.	119.	130.	155.
161	163.	150.	185.	166.	159.	175.	206.	205.	174.	215.
171	193.	231.	226.	272.	271.	273.	291.	281.	301.	305.
181	292.	338.	366.	350.	344.	424.	410.	405.	416.	440.
191	406.	467.	454.	468.	498.	491.	457.	470.	541.	548.
201	522.	492.	528.	535.	557.	491.	517.	546.	534.	558.
211	580.	552.	542.	584.	653.	594.	663.	640.	680.	684.
221	729.	716.	764.	775.	754.	781.	718.	719.	665.	547.
231	471.	365.	299.	177.	158.	90.	51.	37.	19.	17.
241	13.	14.	8.	15.	16.	13.	19.	16.	8.	13.
251	16.	17.	18.	21.	13.	18.	18.	27.	18.	15.
261	34.	22.	24.	29.	25.	22.	26.	36.	30.	30.
271	22.	33.	36.	30.	28.	30.	35.	39.	39.	35.
281	45.	46.	43.	54.	55.	59.	40.	54.	53.	65.
291	50.	67.	64.	64.	78.	96.	71.	77.	79.	82.
301	82.	81.	104.	100.	105.	114.	116.	117.	131.	134.
311	129.	134.	141.	156.	138.	149.	154.	181.	195.	201.
321	185.	183.	196.	200.	196.	209.	214.	190.	243.	234.
331	214.	222.	245.	234.	255.	265.	212.	242.	257.	262.
341	264.	286.	232.	269.	275.	322.	263.	300.	294.	335.
351	330.	300.	319.	323.	345.	325.	296.	336.	294.	299.
361	261.	218.	181.	143.	134.	86.	51.	40.	18.	9.
371	8.	2.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
391	0.	0.	0.	0.	1.	0.	0.	0.	0.	1.
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.	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.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

THE FOLLOWING ANALYSES WERE RERUN AND INCLUDED IN THE DATA PACKAGE, BUT THE RESULTS HAVE NOT BEEN REPORTED IN THE FINAL SUMMARY REPORTS.

worklistrpt Version 2.0 02/21/95
04/14/95 06:37

LABCORE Data Entry Template for Worklist# 1132

Analyst: JMV **Instrument:** PU01 _____ **Book #** 104843

Method: LA-503-156 Rev/Mod D-21
HAD 3/15/96

Worklist Comment: See chemist for sample size. --LLF

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD				@PU23901 PU23901	SOLID			N/A	uCi/g
		1 STD				@PU23901 PU23901T	SOLID			N/A	% Recovery
		1 STD				@PU23901 PU23901E	SOLID			N/A	% Ct. Error
		2 BLNK-PREP				@PU23901 PU23901	SOLID			N/A	uCi/g
		2 BLNK-PREP				@PU23901 PU23901T	SOLID			N/A	% Recovery
		2 BLNK-PREP				@PU23901 PU23901E	SOLID			N/A	% Ct. Error
95000007	BY-106	3 SAMPLE	S95T000101	0		@PU23901 PU23901	SOLID	N/A			uCi/g
95000007	BY-106	3 SAMPLE	S95T000101	0		@PU23901 PU23901T	SOLID	N/A			% Recovery
95000007	BY-106	3 SAMPLE	S95T000101	0		@PU23901 PU23901E	SOLID	N/A			% Ct. Error
95000007	BY-106	4 DUP	S95T000101	0		@PU23901 PU23901	SOLID			N/A	uCi/g
95000007	BY-106	4 DUP	S95T000101	0		@PU23901 PU23901T	SOLID			N/A	% Recovery
95000007	BY-106	4 DUP	S95T000101	0		@PU23901 PU23901E	SOLID			N/A	% Ct. Error

Final page for worklist # 1132

Joel M Van Sant 4-17-95
Analyst Signature **Date**

M C Sizlan 4-18-95
Analyst Signature **Date**

Data Entry Comments:

DATA NOT USED IN PACKAGE

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						STANDARD
Type	Date Counted		04/18/95	Pu 236 AEA Frac.	(C236)	0.388
STANDARD	Sample Volume in mL	(SS)	0.100	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.584
1132	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		968
Test Code	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		110B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		04/03/95	Pu 236 cpm		4.68
LIQUID	Pu-236 Preparation Value	(dpm/mL)	1889	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	1870.23	Pu 239 cpm		7.05
WORKLIST#1132	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/L		1.2807E+02
WC38931						
Analyst						
JMV						
Date						
04/17/95						
Time						
04:30 PM						

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	=	1.28E-01	
Relative Counting Error		=	5.3%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238	µCi/mL	=	< 5.82E-02	5.82E-02
Relative Counting Error		=	100.0%	Pu 238
Pu 236 Tracer Recovery		=	11.3%	5.82E-02

DATA NOT USED IN PACKAGE

Data Entry by:	[signature]	Date:	04/19/95
Approved by:	[signature]	Date:	19 Apr 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						BLANK
Type	Date Counted		04/18/95	Pu 236 AEA Frac.	(C236)	0.785
BLANK	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0
1132	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		333
Test Code	Digest Grams of Solids/L	(Dg/L)	1.904	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		110B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		04/03/95	Pu 236 cpm		1.51
SOLID	Pu-236 Preparation Value	(dpm/mL)	1889	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	1870.23	Pu 239 cpm		0
S95T101	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/g =	<	3.3819E-02
WC38931						
Analyst						
JMV						
Date						
04/17/95						
Time						
04:30 PM						

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/g = (C239) (Pu 236 Decay Corr'd Value) (SPKV) (1000mL/L) (DF) / [(C236) (SS) (D g/L) (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/g = [(Pu 238 dpm) (DF) (1000mL/L)] / [(Pu-236 Tracer Recovery / 100) (2220000dpm/µCi) (D g/L) (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/g	=	< 3.38E-02	DETECTION LEVELS in µCi/g
Relative Counting Error		=	100.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238	µCi/g	=	< 3.38E-02	3.38E-02
Relative Counting Error		=	100.0%	Pu 238
Pu 236 Tracer Recovery		=	5.1%	3.38E-02

DATA NOT USED IN PACKAGE

Data Entry by:	[signature]	Date:	04/19/95
Approved by:	[signature]	Date:	19 Apr 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						SAMPLE
Type	Date Counted		04/18/95	Pu 236 AEA Frac.	(C236)	0.192
SAMPLE	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.594
1132	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		3276
Test Code	Digest Grams of Solids/L	(Dg/L)	1.904	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		110B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		04/03/95	Pu 236 cpm		7.41
SOLID	Pu-236 Preparation Value	(dpm/mL)	1889	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	1870.23	Pu 239 cpm		22.87
S95T101	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/g		2.7377E-01
WC38931						
Analyst						
JMV						
Date						
04/17/95						
Time						
04:30 PM						

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/g = (C239) (Pu 236 Decay Corr'd Value) (SPKV) (1000mL/L) (DF) / [(C236) (SS) (D g/L) (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/g = [(Pu 238 dpm) (DF) (1000mL/L)] / [(Pu-236 Tracer Recovery / 100) (2220000dpm/µCi) (D g/L) (SS)]

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

Pu 239/240	µCi/g	=	2.74E-01	DETECTION LEVELS in µCi/g
Relative Counting Error		=	3.8%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238	µCi/g	=	< 6.46E-02	6.46E-02
Relative Counting Error		=	100.0%	Pu 238
Pu 236 Tracer Recovery		=	21.4%	6.46E-02

DATA NOT USED IN PACKAGE

Data Entry by:	M Bu...	Date:	04/19/95
Approved by:	[illegible]	Date:	19 Apr 95

Form 503156PC Rev. 2.0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Pu 238 and 239/240 : LA-503-156 (D-1) LIQUID / SOLID

						DUPLICATE
Type	Date Counted		04/18/95	Pu 236 AEA Frac.	(C236)	0.284
DUPLICATE	Sample Volume in mL	(SS)	0.500	Pu 238 AEA Frac.	(C238)	0
Work List	Sample D.F.	(DF)	1	Pu 239 AEA Frac.	(C239)	0.616
1132	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		1528
Test Code	Digest Grams of Solids/L	(Dg/L)	1.926	AT Count Time (min)	(TC)	30
@PU239-01	Tracer Book No.		110B43	Background in cpm	(Bkg)	5
Matrix	Tracer Preparation Date		04/03/95	Pu 236 cpm		4.64
SOLID	Pu-236 Preparation Value	(dpm/mL)	1889	Pu 238 cpm		0
Sample #	Pu-236 Decay Corr'd value	(dpm/mL)	1870.23	Pu 239 cpm		10.84
S95T101	Pu-238 Tracer Value	(dpm/mL)	0	AEA Count Time	(min)	480
Instrument Code				Pu 239/240 µCi/g		2.0412E-01
WC38931	Decay Time = Date Counted - Tracer Preparation Date					
Analyst	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * [e to the power of {(-ln2 * Decay Time) / 1040.95 }]					
JMV	Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV					
Date	Pu 239/240 µCi/g = (C239) (Pu 236 Decay Corr'd Value) (SPKV) (1000mL/L) (DF) / [(C236) (SS) (D g/L) (2220000dpm/µCi)]					
04/17/95	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 2 * C238] - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)					
Time	Pu 238 µCi/g = [(Pu 238 dpm) (DF) (1000mL/L)] / [(Pu-236 Tracer Recovery / 100) (2220000dpm/µCi) (D g/L) (SS)]					
04:30 PM	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/g
Pu 239/240	µCi/g	=	2.04E-01	
Relative Counting Error		=	5.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 7.67E-02
Pu 238	µCi/g	=	< 7.67E-02	
Relative Counting Error		=	100.0%	Pu 238 7.67E-02
Pu 236 Tracer Recovery		=	13.0%	

DATA NOT USED IN PACKAGE

Data Entry by:	[signature]	Date:	04/19/95
Approved by:	[signature]	Date:	19 Apr 95

Form 503156PC Rev. 2.0

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

SAMPLE
WORKLIST1132-STD
File ID: 5a5173.CNF

Counted on: 4/18/95 @ 1: 6
Detector: AEA5
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	98.4	98.4	362.190	362.190	22.000	17.194	11.000	6.242
2	143.7	143.7	231.871	231.871	20.000	15.513	10.000	4.749

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	0.388	5.786	5.741	0.045	0.08	4.68	4.1	45.3	0.204E-04
	Pu236		5.756	5.741	0.015				33.7	0.152E-04
2	Pu239	0.584	5.143	5.142	0.001	0.07	7.05	3.4	49.8	0.224E-04
	Pu240		5.144	5.142	0.002				49.8	0.224E-04
Totals:		0.972	<--valid peaks only-->				11.73			

DETECTOR CALIBRATION
Energy(MEV) = 4.075 + (0.0046)*Channel
Energy range (MeV): 4.075 TO 6.430
Efficiency = 0.1416 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	5791.0	100.000
Smoothed	5791.0	100.000
Composite fit	5629.4	97.210
Residuals	161.6	2.790

DATA NOT USED IN PACKAGE

Analyzed by: DM 4-18-95

Spectrum 5a5173.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 1038.4

```
2
.2
.. 2
......  2
................2
...................................2.......
.......................................................................2...
.......................................................................2
.................. 2
.2.
..
...
.
.

.


1
..1
.......1
................1..
.....................................1
.............................................. 1
....................1
...1.
```

DATA
NOT USED
IN PACKAGE

Raw Data Dump for AEA Spectrum: 5a5173.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	1.	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.	1.	0.	0.	0.	0.	0.
61	0.	0.	2.	0.	0.	0.	1.	0.	0.	0.
71	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.
81	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
91	0.	1.	1.	2.	0.	0.	0.	0.	0.	1.
101	0.	1.	0.	0.	0.	1.	0.	1.	0.	1.
111	2.	1.	2.	1.	0.	1.	2.	1.	0.	0.
121	3.	1.	1.	1.	1.	1.	1.	2.	0.	1.
131	1.	0.	0.	1.	1.	2.	1.	0.	2.	1.
141	1.	0.	3.	0.	0.	1.	1.	0.	0.	1.
151	0.	1.	1.	1.	0.	3.	0.	3.	0.	1.
161	2.	1.	0.	1.	2.	2.	3.	0.	1.	2.
171	0.	2.	0.	1.	3.	0.	1.	0.	4.	2.
181	3.	2.	3.	3.	3.	0.	1.	1.	5.	1.
191	4.	6.	7.	6.	2.	5.	4.	8.	6.	9.
201	7.	6.	11.	15.	11.	10.	13.	25.	22.	25.
211	27.	32.	27.	40.	50.	55.	50.	58.	68.	86.
221	103.	102.	103.	118.	137.	119.	122.	134.	141.	132.
231	156.	151.	158.	122.	140.	119.	108.	92.	82.	72.
241	40.	30.	26.	22.	21.	21.	7.	13.	5.	2.
251	6.	4.	3.	2.	3.	4.	4.	4.	5.	3.
261	7.	9.	6.	2.	4.	8.	13.	13.	5.	4.
271	3.	1.	4.	3.	2.	2.	2.	4.	1.	2.
281	1.	0.	3.	2.	3.	4.	1.	1.	3.	0.
291	0.	1.	0.	3.	3.	0.	2.	3.	1.	3.
301	2.	1.	2.	4.	1.	2.	1.	1.	2.	3.
311	0.	1.	3.	3.	0.	1.	2.	2.	3.	2.
321	1.	2.	2.	1.	5.	2.	2.	0.	4.	4.
331	7.	4.	6.	8.	8.	7.	6.	8.	11.	12.
341	11.	13.	26.	29.	23.	30.	30.	44.	42.	52.
351	53.	59.	68.	71.	61.	67.	73.	103.	82.	86.
361	109.	108.	109.	92.	85.	76.	71.	57.	51.	47.
371	55.	46.	42.	26.	25.	13.	14.	7.	3.	1.
381	2.	1.	0.	0.	1.	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.	1.	0.	0.	0.	0.	0.	0.	0.	1.
431	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
441	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
481	1.	0.	1.	1.	0.	1.	1.	0.	1.	0.
491	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.
511	0.	0.								

DATA NOT USED IN PACKAGE

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

WHC-SD-WM-DP-103, REV. 1

DATA REDUCTION REPORT

SAMPLE
S95T101-BLANK
File ID: 2a2054.CNF

Counted on: 4/18/95 @11:35
Detector: AEA2
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	32.7	32.7	362.996	360.744	22.000	13.422	11.000	4.290
2	3.6	3.6	268.577	267.944	14.000	15.858	7.000	3.427

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	0.785	5.786	5.752	0.034	0.06	1.51	7.3	13.0	0.587E-05
	Pu236		5.756	5.752	0.004				9.7	0.437E-05
2	Am243	0.109	5.276	5.325	-.049	0.07	0.21	19.7	1.3	0.600E-06
Totals:		0.894	<--valid peaks only-->				1.72			

DETECTOR CALIBRATION

Energy(MEV) = 4.092 + (0.0046)*Channel
Energy range (MeV): 4.092 TO 6.447
Efficiency = 0.1584 CPM/DPM

TOTAL COUNT DATA:

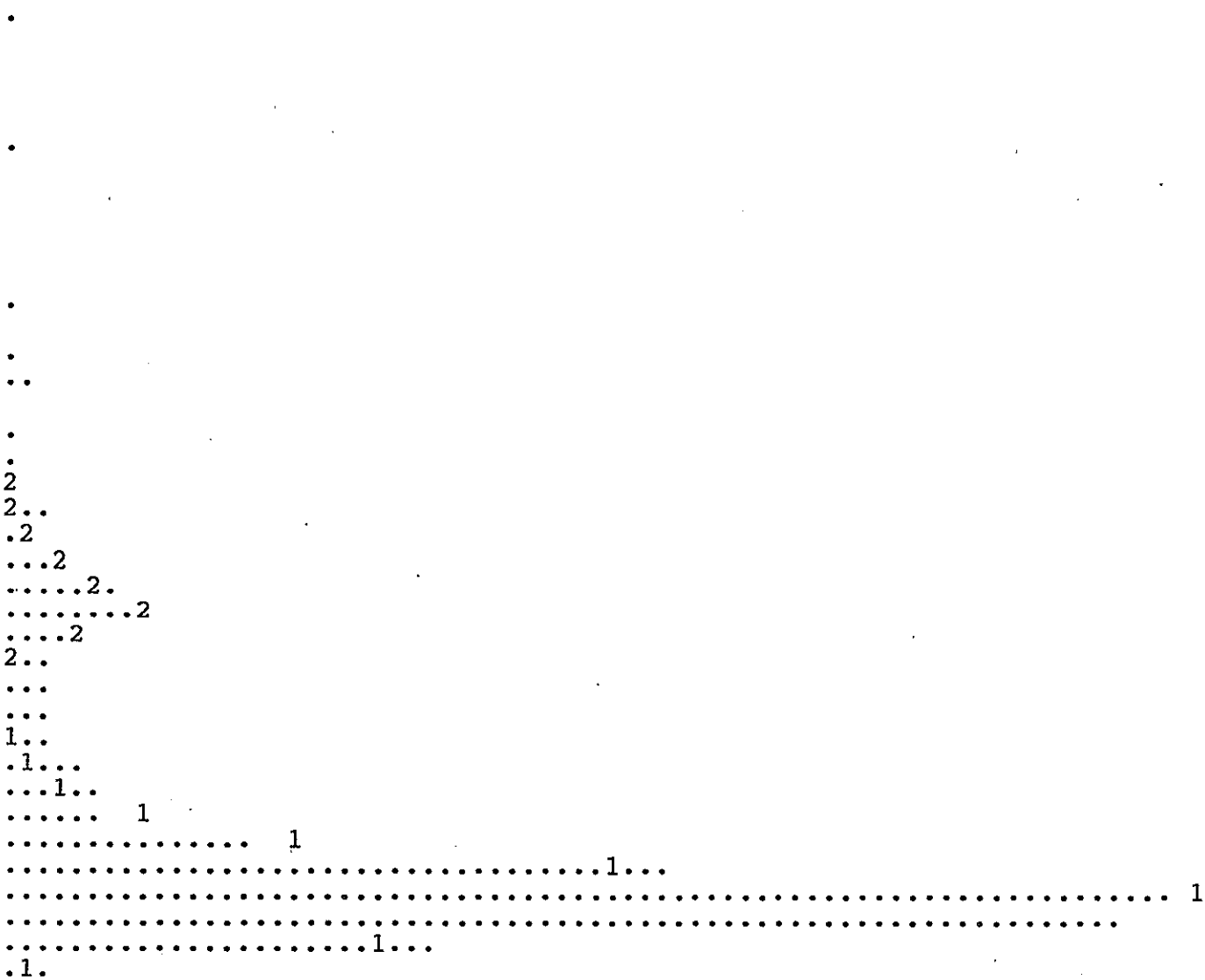
Item	Total	% Recovery
Raw spectrum	922.0	100.000
Smoothed	921.9	99.991
Composite fit	823.9	89.361
Residuals	98.1	10.639

Analyzed by: _____
MB

DATA
NOT USED
IN PACKAGE

Spectrum 2a2054.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 205.9



DATA
NOT USED
IN PACKAGE

Raw Data Dump for AEA Spectrum: 2a2054.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
41	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	1.	0.	0.	2.	0.
71	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
81	1.	1.	0.	0.	1.	0.	1.	0.	0.	1.
91	0.	0.	0.	0.	0.	1.	0.	1.	0.	1.
101	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111	0.	0.	2.	0.	0.	0.	0.	1.	0.	0.
121	0.	1.	1.	0.	1.	0.	0.	1.	0.	1.
131	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
141	1.	0.	0.	1.	1.	0.	0.	0.	1.	0.
151	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
161	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
171	0.	1.	2.	0.	0.	0.	0.	0.	0.	0.
181	1.	0.	0.	0.	0.	2.	0.	0.	2.	0.
191	1.	0.	2.	2.	0.	0.	1.	1.	0.	2.
201	0.	0.	0.	0.	0.	0.	0.	1.	0.	2.
211	0.	0.	0.	0.	0.	2.	0.	0.	1.	2.
221	1.	0.	0.	0.	0.	1.	0.	1.	0.	1.
231	0.	0.	2.	1.	3.	1.	1.	2.	0.	1.
241	0.	0.	1.	0.	0.	1.	0.	2.	2.	2.
251	5.	0.	1.	1.	2.	3.	2.	3.	3.	3.
261	5.	1.	3.	4.	1.	3.	6.	2.	3.	4.
271	4.	2.	0.	1.	2.	1.	3.	2.	1.	2.
281	1.	0.	0.	1.	1.	1.	4.	1.	1.	2.
291	1.	0.	1.	1.	2.	4.	0.	1.	2.	1.
301	0.	1.	1.	5.	0.	1.	1.	0.	4.	3.
311	0.	0.	3.	2.	3.	2.	2.	4.	0.	1.
321	1.	2.	1.	3.	4.	5.	2.	3.	4.	2.
331	1.	2.	3.	3.	0.	5.	3.	6.	5.	3.
341	6.	7.	10.	10.	7.	13.	18.	8.	14.	20.
351	22.	28.	23.	24.	29.	18.	23.	36.	20.	43.
361	35.	30.	25.	31.	24.	21.	14.	11.	18.	13.
371	6.	10.	8.	5.	2.	3.	0.	0.	1.	1.
381	0.	2.	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	1.	0.	0.	0.	1.	1.	0.	0.	0.	0.
431	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
461	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	1.	0.	0.	1.	0.	0.	1.	0.	1.	0.
481	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

DATA
NOT USED
IN PACKAGE

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
S95T101-SAM
File ID: 7a7592.CNF

Counted on: 4/18/95 @ 1: 7
Detector: AEA7
Geometry number: 1
Count time: 28800. 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	198.4	198.4	359.553	359.553	16.000	8.365	8.000	3.203
2	12.8	12.8	264.405	264.400	14.000	6.222	7.000	1.146
3	704.2	704.2	227.792	227.788	14.000	7.486	7.000	3.730
4	99.4	99.4	145.372	145.370	16.000	11.374	8.000	3.857
5	90.3	90.3	22.797	22.797	14.000	5.662	7.000	12.732

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	0.192	5.796	5.783	0.013	0.04	7.41	3.3	36.0	0.162E-04
	Cm243		5.786	5.783	0.003				49.3	0.222E-04
2		0.018		5.336		0.03	0.70	10.7	3.4	0.152E-05
3	Pu239	0.594	5.143	5.164	-.021	0.04	22.87	1.9	111.0	0.500E-04
	Pu240		5.144	5.164	-.020				111.0	0.500E-04
4	Np237	0.111	4.781	4.776	0.005	0.05	4.27	4.3	23.8	0.107E-04
5	U 238	0.056	4.200	4.200	0.000	0.03	2.14	6.1	13.5	0.607E-05
Totals:		0.971	<--valid peaks only-->				37.38			

DETECTOR CALIBRATION
Energy(MEV) = 4.093 + (0.0047)*Channel
Energy range (MeV): 4.093 TO 6.500
Efficiency = 0.2060 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	18471.0	100.000
Smoothed	18471.0	100.000
Composite fit	17941.1	97.131
Residuals	529.9	2.869

DATA NOT USED IN PACKAGE

Analyzed by: [signature] 4-18-95 DM

Spectrum 7a7592.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 5081.8


```
5
......5.
...5.

4
...4
.......4
........4
.4

.
3.
...3
...........3
.................................3.
2.............................................................3
2.....................3
2
2
2
2

1
..1
.......1.
................1
.............1
1
```

DATA
NOT USED
IN PACKAGE

Raw Data Dump for AEA Spectrum: 7a7592.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	44.	83.	99.	91.
21	89.	104.	104.	93.	84.	65.	63.	37.	30.	15.
31	19.	9.	5.	2.	1.	2.	3.	2.	2.	2.
41	2.	0.	1.	2.	2.	1.	1.	1.	3.	1.
51	3.	3.	1.	3.	6.	4.	2.	3.	4.	7.
61	4.	6.	5.	5.	4.	7.	4.	4.	3.	2.
71	1.	4.	7.	2.	2.	3.	4.	1.	4.	3.
81	2.	2.	4.	1.	4.	3.	4.	3.	3.	2.
91	1.	3.	2.	3.	2.	7.	2.	4.	4.	5.
101	5.	2.	2.	5.	3.	5.	6.	5.	5.	5.
111	7.	7.	11.	3.	4.	6.	9.	4.	10.	14.
121	11.	6.	12.	14.	13.	15.	18.	19.	22.	39.
131	37.	43.	47.	50.	52.	61.	62.	69.	77.	78.
141	79.	101.	87.	114.	102.	113.	91.	96.	83.	74.
151	49.	32.	36.	23.	24.	17.	14.	18.	11.	10.
161	7.	8.	7.	3.	2.	4.	4.	3.	6.	7.
171	6.	9.	10.	2.	9.	7.	4.	8.	6.	9.
181	13.	6.	13.	8.	6.	8.	11.	20.	12.	10.
191	16.	16.	11.	18.	14.	21.	21.	22.	23.	21.
201	31.	39.	36.	32.	37.	46.	43.	70.	69.	69.
211	82.	95.	124.	151.	174.	200.	213.	251.	312.	388.
221	411.	438.	546.	590.	685.	743.	750.	808.	725.	652.
231	569.	497.	356.	245.	174.	113.	69.	27.	18.	6.
241	3.	5.	1.	2.	2.	6.	1.	6.	6.	7.
251	6.	4.	6.	3.	6.	9.	7.	2.	6.	8.
261	17.	15.	9.	18.	9.	12.	17.	4.	4.	4.
271	2.	2.	1.	1.	4.	4.	2.	4.	2.	0.
281	1.	2.	3.	5.	4.	1.	6.	3.	2.	6.
291	4.	3.	2.	7.	8.	5.	6.	5.	10.	6.
301	9.	12.	3.	3.	8.	4.	6.	5.	7.	3.
311	7.	2.	2.	3.	1.	3.	5.	5.	4.	5.
321	6.	3.	6.	3.	4.	6.	6.	4.	9.	10.
331	5.	14.	16.	8.	9.	11.	12.	20.	18.	26.
341	28.	38.	28.	42.	59.	72.	82.	86.	90.	107.
351	118.	112.	142.	148.	164.	168.	201.	192.	236.	196.
361	212.	172.	163.	153.	106.	76.	46.	26.	20.	7.
371	2.	1.	1.	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.	1.	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.	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	1.	0.								

DATA NOT USED IN PACKAGE

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
S95T101-DUP
File ID: 8a8755.CNF

Counted on: 4/18/95 @ 1: 8
Detector: AEA8
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	130.6	130.6	360.880	360.880	14.000	6.939	7.000	2.651
2	345.3	345.3	228.041	228.041	16.000	7.735	8.000	4.413
3	31.2	31.2	146.491	146.491	18.000	11.089	9.000	4.924
4	24.4	24.4	24.295	24.295	12.000	5.150	6.000	13.119

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	0.264	5.796	5.785	0.011	0.03	4.64	4.2	16.4	0.740E-05
	Cm243		5.786	5.785	0.001				22.5	0.101E-04
2	Pu239	0.616	5.143	5.161	-.018	0.04	10.84	2.7	38.3	0.173E-04
	Pu240		5.144	5.161	-.017				38.3	0.173E-04
3	Np237	0.068	4.781	4.777	0.004	0.05	1.20	8.2	4.9	0.220E-05
4	U 238	0.031	4.200	4.203	-.003	0.02	0.55	12.1	2.5	0.114E-05
Totals:		0.980	<--valid peaks only-->				17.24			

DETECTOR CALIBRATION
Energy(MEV) = 4.089 + (0.0047)*Channel
Energy range (MeV): 4.089 TO 6.495
Efficiency = 0.2828 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	8443.0	100.000
Smoothed	8443.0	100.000
Composite fit	8274.0	97.998
Residuals	169.0	2.002

Analyzed by: DM 4-18-95

DATA NOT USED IN PACKAGE

Spectrum 8a8755.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 2520.6

```
..4
..4

3
...3
.....3
.3

.2
.........2
.................................2
.......................................................................2.
.......................2
2

1
.  1
........1
....................1..
....................1
.1
```

DATA
NOT USED
IN PACKAGE

Raw Data Dump for AEA Spectrum: 8a8755.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	3.	18.	16.	22.
21	19.	23.	27.	24.	31.	24.	19.	10.	8.	9.
31	5.	2.	0.	0.	0.	1.	0.	0.	0.	1.
41	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
51	2.	0.	0.	0.	0.	0.	1.	0.	1.	2.
61	1.	0.	1.	0.	1.	2.	3.	0.	0.	0.
71	0.	0.	4.	0.	0.	0.	0.	0.	1.	1.
81	1.	2.	1.	1.	1.	0.	0.	2.	0.	0.
91	2.	2.	1.	0.	0.	0.	0.	1.	0.	2.
101	0.	0.	1.	0.	0.	0.	1.	0.	1.	3.
111	1.	0.	2.	0.	3.	4.	4.	1.	0.	0.
121	3.	2.	4.	4.	4.	8.	7.	6.	4.	2.
131	6.	10.	10.	7.	18.	13.	7.	12.	15.	15.
141	16.	26.	28.	23.	32.	36.	42.	25.	24.	25.
151	25.	13.	20.	18.	8.	6.	5.	9.	3.	4.
161	5.	3.	1.	2.	3.	4.	3.	2.	1.	1.
171	2.	1.	3.	2.	0.	2.	1.	2.	2.	3.
181	1.	2.	2.	1.	2.	2.	3.	1.	3.	2.
191	2.	3.	1.	5.	2.	2.	5.	7.	6.	3.
201	8.	6.	9.	9.	16.	9.	5.	15.	33.	29.
211	31.	38.	45.	49.	67.	82.	109.	115.	153.	155.
221	167.	201.	242.	277.	331.	359.	390.	382.	376.	320.
231	306.	250.	211.	152.	88.	61.	28.	19.	10.	3.
241	2.	2.	1.	0.	0.	0.	0.	1.	2.	1.
251	2.	1.	4.	1.	2.	2.	4.	2.	4.	2.
261	0.	2.	6.	1.	1.	2.	1.	1.	1.	0.
271	1.	2.	0.	1.	0.	0.	1.	0.	2.	2.
281	2.	1.	1.	0.	1.	1.	2.	1.	3.	1.
291	2.	1.	2.	0.	4.	2.	6.	1.	6.	6.
301	3.	10.	2.	6.	4.	3.	2.	1.	3.	0.
311	1.	3.	0.	1.	0.	1.	1.	1.	1.	1.
321	0.	0.	1.	0.	1.	3.	2.	1.	2.	1.
331	3.	5.	5.	1.	3.	6.	3.	5.	5.	1.
341	9.	15.	13.	24.	24.	29.	30.	55.	58.	51.
351	58.	88.	105.	86.	105.	118.	126.	127.	143.	128.
361	136.	138.	138.	108.	84.	52.	36.	27.	10.	6.
371	3.	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.	1.	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.	0.	0.	0.
481	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

DATA
NOT USED
IN PACKAGE

worklistdata Version 0.0 05/16/95
02/12/96 10:32

LABCORE Completed Worklist Report for Worklist# 5378

Analyst: knt **Instrument:** U01 **Book#** 22856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: BY-106 FOR URANIUM: SS= 1-10ML (USE .1ML SPIKE) RTS!

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		U-02	SOLID	6.38E-02	6.33E-02	99.220	% Recovery
2	BLNK-PREP		0		U-02	SOLID	1	6.40E-01	0.640	ug/g
3	SAMPLE	S95T004179	0	Z	U-02	SOLID	N/A	1.27E+01	2.070	ug/g
4	DUP	S95T004179	0	Z	U-02	SOLID	1.27E+01	1.19E+01	6.500	RPD
5	SAMPLE	S95T004180	0	Z	U-02	SOLID	N/A	1.32E+02	0.167	ug/g
6	DUP	S95T004180	0	Z	U-02	SOLID	1.32E+02	1.10E+02	18.180	RPD
7	SAMPLE	S95T004181	0	Z	U-02	SOLID	N/A	1.42E+02	0.177	ug/g
8	DUP	S95T004181	0	Z	U-02	SOLID	1.42E+02	1.38E+02	2.860	RPD
9	SAMPLE	S95T004182	0	Z	U-02	SOLID	N/A	1.13E+02	0.193	ug/g
10	SPK	S95T004182	0	Z	U-02	SOLID	5.69E+01	6.17E+01	108.440	% Recovery
11	DUP	S95T004182	0	Z	U-02	SOLID	1.13E+02	1.25E+02	10.080	RPD

Final page for worklist# 5378

Analyst Signature **Date** **Analyst Signature** **Date**

2/12/96
Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 5378

Analyst: KNT **Instrument:** U01 _____ **Book#** 22B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: BY-106 FOR URANIUM: SS= 1-10ML (USE .1ML SPIKE) RTS!

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				U-02	SOLID		
2	BLNK-PREP				U-02	SOLID		
3	SAMPLE	S95T004179	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
4	DUP	S95T004179	0	Z	U-02	SOLID		
5	SAMPLE	S95T004180	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
6	DUP	S95T004180	0	Z	U-02	SOLID		
7	SAMPLE	S95T004181	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
8	DUP	S95T004181	0	Z	U-02	SOLID		
9	SAMPLE	S95T004182	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
10	SPK	S95T004182	0	Z	U-02	SOLID		
11	DUP	S95T004182	0	Z	U-02	SOLID		

Final page for worklist # 5378

Kim Thomas 2-6-96
Analyst Signature **Date**

D G Griffin 2-9-96/2330
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

URANIUM ANALYSIS

Sample ID S95T004182
Description BY-106
Ref. Ratio 1.062
Laser Pulses 500
Lifetime 201 + 1.33 us
R2 .9981
Integrated 666753
Range: LOW

Date/Time 02/09/96/23:23:57
Cal Y=4.99E+09X-4.88E-04
Intensity 47105 (t= 169 us)
Conc 2.17E-05 + 4.36E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.17E-05 + 4.36E-07 g/L

Sample ID S95T004182-DUP
Description BY-106
Ref. Ratio 1.052
Laser Pulses 500
Lifetime 220 + 1.029 us
R2 .9991
Integrated 762263
Range: LOW

Date/Time 02/09/96/23:27:05
Cal Y=4.99E+09X-4.88E-04
Intensity 48596 (t= 195 us)
Conc 2.42E-05 + 3.90E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.42E-05 + 3.90E-07 g/L

Sample ID S95T004182-SPK
Description BY-106
Ref. Ratio 1.056
Laser Pulses 500
Lifetime 194 + 1.309 us
R2 .998
Integrated 498426
Range: HIGH

Date/Time 02/09/96/23:31:23
Cal Y=6.91E+07X+41.434
Intensity 37154 (t= 39 us)
Conc 6.39E-04 + 2.19E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.39E-04 + 2.19E-05 g/L

URANIUM ANALYSIS

Sample ID 22B56
Description LMCS STD.
Ref. Ratio 1.033
Laser Pulses 500
Lifetime 272 + 1.741 us
R2 .9983
Integrated 68965
Range: HIGH

Date/Time 02/09/96/20:31:35
Cal Y=6.91E+07X+41.434
Intensity 3955 (t= 39 us)
Conc 6.33E-05 + 2.07E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.33E-05 + 2.07E-06 g/L

Sample ID PREP-BLANK
Description BY-106
Ref. Ratio 1.051
Laser Pulses 500
Lifetime + us
R2
Integrated 23
~~Range: HIGH~~
Sample <= Blank

Date/Time 02/09/96/23:41:58
Cal Y=6.91E+07X+41.434
Intensity 11 (t= 39 us)
Conc -6.00E-07 + 1.89E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT -6.00E-07 + 1.89E-08 g/L

Sample ID PREP-BLANK
Description BY-106
Ref. Ratio 1.068
Laser Pulses 500
Lifetime 90 + 6.548 us
R2 .9262
Integrated 2330
Range: LOW

Date/Time 02/09/96/23:42:40
Cal Y=4.99E+09X-4.88E-04
Intensity 232 (t= 39 us)
Conc 1.26E-07 + 1.73E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.26E-07 + 1.73E-08 g/L

Sample ID S95T004179
Description BY-106
Ref. Ratio 1.03
Laser Pulses 500
Lifetime 172 + 4.08 us
R2 .9795
Integrated 10655
Range: LOW

Dilution 1-10

Date/Time 02/09/96/22:49:11
Cal Y=4.99E+09X-4.88E-04
Intensity 726 (t= 39 us)
Conc 2.28E-07 + 1.08E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.28E-07 + 1.08E-08 g/L

Sample ID S95T004179-DUP
Description BY-106
Ref. Ratio 1.03
Laser Pulses 500
Lifetime 211 + .574 us
R2 .9997
Integrated 140748
Range: LOW

Date/Time 02/09/96/22:56:03
Cal Y=4.99E+09X-4.88E-04
Intensity 8930 (t= 39 us)
Conc 2.31E-06 + 2.93E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.31E-06 + 2.93E-08 g/L

Sample ID S95T004180
Description BY-106
Ref. Ratio 1.025
Laser Pulses 500
Lifetime 227 + 1.233 us
R2 .9987
Integrated 814832
Range: LOW

Date/Time 02/09/96/23:04:23
Cal Y=4.99E+09X-4.88E-04
Intensity 50629 (t= 234 us)
Conc 2.92E-05 + 5.23E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.92E-05 + 5.23E-07 g/L

Sample ID S95T004180-DUP
Description BY-106
Ref. Ratio 1.044
Laser Pulses 500
Lifetime 201 + 1.057 us
R2 .9988
Integrated 680755
Range: LOW

Date/Time 02/09/96/23:08:40
Cal Y=4.99E+09X-4.88E-04
Intensity 47708 (t= 169 us)
Conc 2.23E-05 + 3.91E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.23E-05 + 3.91E-07 g/L

Sample ID S95T004181
Description BY-106
Ref. Ratio 1.044
Laser Pulses 500
Lifetime 208 + 1.09 us
R2 .9988
Integrated 743279
Range: LOW

Date/Time 02/09/96/23:14:55
Cal Y=4.99E+09X-4.88E-04
Intensity 49769 (t= 221 us)
Conc 2.96E-05 + 5.33E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.96E-05 + 5.33E-07 g/L

Sample ID S95T004181-DUP
Description BY-106
Ref. Ratio 1.052
Laser Pulses 500
Lifetime 193 + .867 us
R2 .9991
Integrated 670624
Range: LOW

Date/Time 02/09/96/23:18:19
Cal Y=4.99E+09X-4.88E-04
Intensity 47901 (t= 208 us)
Conc 2.89E-05 + 4.93E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.89E-05 + 4.93E-07 g/L

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		22B56
5378	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		272.00
LIQUID	R2 VALUE		0.9983
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000907	INSTRUMENT UNCERTAINTY	(IU)	2.07E-06
Rerun	INSTRUMENT RESULT	(IR)	6.33E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		6.33E-02
Sample #	VALUE OF STANDARD		6.38E-02
STD	%RECOVERY		99.22
Instrument Code	RELATIVE % UNCERTAINTY		3.3
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	KNT	Date:	10-Feb-96
Signature of Chemist: Jennifer J. Sleeper	JLS	Date:	2/12/96

STANDARD.WB1 REV 1.2 925009ML

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9692
Matrix	LIFETIME IN MICROSECONDS		90.00
SOLID	R2 VALUE		0.9262
Batch Number	RANGE (HIGH OR LOW)		LOW
96000907	INSTRUMENT UNCERTAINTY	(IU)	1.73E-08
Rerun	INSTRUMENT RESULT	(IR)	1.26E-07
0	DETECTION LEVEL µg/g		1.88E-01
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		1.26E-06
Sample #	RESULT (µg/g)		6.40E-01
BLNK	RELATIVE % UNCERTAINTY		13.7
Instrument Code			
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		KNT	Date:	10-Feb-96
Signature of Chemist:	Jennifer L. Sherpen	JLS	Date:	2/10/96

BLANK.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE	(DF)	11.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9692
Matrix	LIFETIME IN MICROSECONDS		172.00
SOLID	R2 VALUE		0.9795
Batch Number	RANGE (HIGH OR LOW)		LOW
96000907	INSTRUMENT UNCERTAINTY	(IU)	1.08E-08
Rerun	INSTRUMENT RESULT	(IR)	2.28E-07
0	DETECTION LEVEL µg/g		2.07E+00
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.51E-05
Sample #	RESULT (µg/g)		1.27E+01
S95T004179	RELATIVE % UNCERTAINTY		4.7
Instrument Code			
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	10-Feb-96
Signature of Chemist:	JLS	Date:	2/10/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9476
Matrix	LIFETIME IN MICROSECONDS		211.00
SOLID	R2 VALUE		0.9997
Batch Number	RANGE (HIGH OR LOW)		LOW
96000907	INSTRUMENT UNCERTAINTY	(IU)	2.93E-08
Rerun	INSTRUMENT RESULT	(IR)	2.31E-06
0	DETECTION LEVEL µg/g		1.90E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.31E-05
Sample #	RESULT (µg/g)		1.19E+01
S95T004179	RELATIVE % UNCERTAINTY		1.3
Instrument Code			
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	10-Feb-96
Signature of Chemist:	JLS	Date:	2/12/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.2188
Matrix	LIFETIME IN MICROSECONDS		227.00
SOLID	R2 VALUE		0.9987
Batch Number	RANGE (HIGH OR LOW)		LOW
96000907	INSTRUMENT UNCERTAINTY	(IU)	5.23E-07
Rerun	INSTRUMENT RESULT	(IR)	2.92E-05
0	DETECTION LEVEL µg/g		1.67E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.92E-04
Sample #	RESULT (µg/g)		1.32E+02
S95T004180	RELATIVE % UNCERTAINTY		1.8
Instrument Code			
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	10-Feb-96
Signature of Chemist: Jennifer L. Sleppe	JLS	Date:	2/12/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP6

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.0208
Matrix	LIFETIME IN MICROSECONDS		201.00
SOLID	R2 VALUE		0.9988
Batch Number	RANGE (HIGH OR LOW)		LOW
96000907	INSTRUMENT UNCERTAINTY	(IU)	3.91E-07
Rerun	INSTRUMENT RESULT	(IR)	2.23E-05
0	DETECTION LEVEL µg/g		1.83E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.23E-04
Sample #	RESULT (µg/g)		1.10E+02
S95T004180	RELATIVE % UNCERTAINTY		1.8
Instrument Code			
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	10-Feb-96
Signature of Chemist:	JLS	Date:	2/12/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM7

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.0852
Matrix	LIFETIME IN MICROSECONDS		208.00
SOLID	R2 VALUE		0.9988
Batch Number	RANGE (HIGH OR LOW)		LOW
96000907	INSTRUMENT UNCERTAINTY	(IU)	5.33E-07
Rerun	INSTRUMENT RESULT	(IR)	2.96E-05
0	DETECTION LEVEL µg/g		1.77E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.96E-04
Sample #	RESULT (µg/g)		1.42E+02
S95T004181	RELATIVE % UNCERTAINTY		1.8
Instrument Code			
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	10-Feb-96
Signature of Chemist:	JLS	Date:	2/12/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP8

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.0980
Matrix	LIFETIME IN MICROSECONDS		193.00
SOLID	R2 VALUE		0.9991
Batch Number	RANGE (HIGH OR LOW)		LOW
96000907	INSTRUMENT UNCERTAINTY	(IU)	4.93E-07
Rerun	INSTRUMENT RESULT	(IR)	2.89E-05
0	DETECTION LEVEL µg/g		1.76E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.89E-04
Sample #	RESULT (µg/g)		1.38E+02
S95T004181	RELATIVE % UNCERTAINTY		1.7
Instrument Code			
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	10-Feb-96
Signature of Chemist: Jennifer L. Sperper	JLS	Date:	2/12/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM9

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9180
Matrix	LIFETIME IN MICROSECONDS		201.00
SOLID	R2 VALUE		0.9981
Batch Number	RANGE (HIGH OR LOW)		LOW
96000907	INSTRUMENT UNCERTAINTY	(IU)	4.36E-07
Rerun	INSTRUMENT RESULT	(IR)	2.17E-05
0	DETECTION LEVEL µg/g		1.93E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.17E-04
Sample #	RESULT (µg/g)		1.13E+02
S95T004182	RELATIVE % UNCERTAINTY		2.0
Instrument Code			
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	10-Feb-96
Signature of Chemist: Jennifer L. Schroeder	JLS	Date:	2/12/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP11

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9380
Matrix	LIFETIME IN MICROSECONDS		220.00
SOLID	R2 VALUE		0.9991
Batch Number	RANGE (HIGH OR LOW)		LOW
96000907	INSTRUMENT UNCERTAINTY	(IU)	3.90E-07
Rerun	INSTRUMENT RESULT	(IR)	2.42E-05
0	DETECTION LEVEL µg/g		1.91E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.42E-04
Sample #	RESULT (µg/g)		1.25E+02
S95T004182	RELATIVE % UNCERTAINTY		1.6
Instrument Code			
UO1			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/10/96			
Analysis Date			
02/09/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		KNT	Date:	10-Feb-96
Signature of Chemist:	Jennifer L. Schroeder	JLS	Date:	2/12/96

SAMPLE.WB1 REV 1.2 925009ML

2960

WORKBOOK PAGE: SPIKE10

WHC-SD-WM-DP-103, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SPIKE
SPK	SPIKE BOOK #		22B55
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
5378	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
	DIGEST FACTOR OF SAMPLE	(DDF)	1.9180
Matrix	LIFETIME IN MICROSECONDS		194.00
SOLID	R2 VALUE		0.9980
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000907	INSTRUMENT RESULT	(IR)	6.39E-04
Rerun	CONCENTRATION IN SOLUTION (g/L)	(CONC)	6.39E-03
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
Sample Number	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FO	(SR)	2.17E-04
S95T004182			
Instrument Code			
UO1	Concentration = IR * DF * PF		
Prepared By			
GJH	QC Actual (µg/mL) = SV (g/L) * 1000		
Chemist			
JLS	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
Analyst			
KNT	% Recovery = QC FOUND / QC ACTUAL		
Date Complete			
02/10/96			
Analysis Date			
02/09/96	QC ACTUAL	=	5.69E+01 µg/mL
Analysis Time	QC FOUND	=	6.17E+01 µg/mL
11:30 PM	% SPIKE RECOVERY	=	108.5%
Sample Point			
BY-106			

Analyst:	KNT	Date:	10-Feb-96
Signature of Chemist:	JLS	Date:	2/12/96

SPIKE.WB1 REV 1.2 925009ML

LABCORE Completed Worklist Report for Worklist# 5379

Analyst: knt **Instrument:** U01 **Book#** 22856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: BY-106 FOR URANIUM: SS= 1-10ML (USE .1ML SPIKE) RTS!

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		U-02	SOLID	6.38E-02	5.98E-02	93.730	% Recovery
2	BLNK-PREP		0		U-02	SOLID	1	1.29E+00	1.290	ug/g
3	SAMPLE	S95T004183	0	Z	U-02	SOLID	N/A	1.68E+02	0.169	ug/g
4	DUP	S95T004183	0	Z	U-02	SOLID	1.68E+02	1.69E+02	0.590	RPD
5	SAMPLE	S95T004184	0	Z	U-02	SOLID	N/A	3.03E+02	0.176	ug/g
6	DUP	S95T004184	0	Z	U-02	SOLID	3.03E+02	3.16E+02	4.200	RPD
7	SAMPLE	S95T004185	0	Z	U-02	SOLID	N/A	2.71E+02	0.159	ug/g
8	DUP	S95T004185	0	Z	U-02	SOLID	2.71E+02	3.39E+02	22.300	RPD
9	SAMPLE	S95T004186	0	Z	U-02	SOLID	N/A	1.79E+02	0.185	ug/g
10	SPK	S95T004186	0	Z	U-02	SOLID	5.69E+01	6.54E+01	114.940	% Recovery
11	DUP	S95T004186	0	Z	U-02	SOLID	1.79E+2	2.06E+2	14.030	RPD

Final page for worklist# 5379

Analyst Signature **Date** **Analyst Signature** **Date**

Reviewer Signature **Date** 2/16/96

Units shown for QC (BLK/BKG) may not reflect the actual units.

02/01/96 11:31
A-0004-1

LABCORE Data Entry Template for Worklist# 5379

Analyst: KT **Instrument:** UA01 **Book#** 22B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: BY-106 FOR URANIUM: SS= 1-10ML (USE .1ML SPIKE) RTS!

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				U-02	SOLID		
2	BLNK-PREP				U-02	SOLID		
3	SAMPLE	S95T004183	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
4	DUP	S95T004183	0	Z	U-02	SOLID		
5	SAMPLE	S95T004184	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
6	DUP	S95T004184	0	Z	U-02	SOLID		
7	SAMPLE	S95T004185	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
8	DUP	S95T004185	0	Z	U-02	SOLID		
9	SAMPLE	S95T004186	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
10	SPK	S95T004186	0	Z	U-02	SOLID		
11	DUP	S95T004186	0	Z	U-02	SOLID		

Final page for worklist # 5379

Kim Thomas 2-12-96
Analyst Signature **Date**

[illegible] 2-14-96
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Sample ID 22856 Date/Time 02/13/96/13:46:52
Description STD Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.018 Intensity 3732 (t= 39 us)
Laser Pulses 500 Conc 5.98E-05 + 1.97E-06 g/L
Lifetime 282 + 1.791 us Dilution Factor 1 mL/mL
R2 .9983
Integrated 66010 FINAL RESULT 5.98E-05 + 1.97E-06 g/L
Range: HIGH

Sample ID BLNK-PREP Date/Time 02/13/96/13:51:30
Description Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.028 Intensity 14 (t= 39 us)
Laser Pulses 500 Conc 1.83E-06 + 5.82E-08 g/L
Lifetime + us Dilution Factor 1 mL/mL
R2
Integrated 30 FINAL RESULT 1.83E-06 + 5.82E-08 g/L
Range: HIGH

RJ 2-14-96

Sample ID BLNK-PREP Date/Time 02/13/96/13:52:11
Description Cal Y=4.81E+09X+4.88E-04
Ref. Ratio 1.042 Intensity 1158 (t= 39 us)
Laser Pulses 500 Conc 2.82E-07 + 5.83E-09 g/L
Lifetime 292 + 3.643 us Dilution Factor 1 mL/mL
R2 .9934
Integrated 22563 FINAL RESULT 2.82E-07 + 5.83E-09 g/L
Range: LOW

Sample ID S95T004183 Date/Time 02/13/96/13:54:29
Description SAM Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.04 Intensity 2064 (t= 39 us)
Laser Pulses 500 Conc 3.80E-05 + 1.26E-06 g/L
Lifetime 205 + .991 us Dilution Factor 1 mL/mL
R2 .999
Integrated 30463 FINAL RESULT 3.80E-05 + 1.26E-06 g/L
Range: HIGH

JR 2/14/96

Sample ID S95T004183 Date/Time 02/13/96/13:55:09
Description SAM Cal Y=4.81E+09X+4.88E-04
Ref. Ratio 1.044 Intensity 48650 (t= 273 us)
Laser Pulses 500 Conc 3.69E-05 + 6.31E-07 g/L
Lifetime 217 + .877 us Dilution Factor 1 mL/mL
R2 .9993
Integrated 757669 FINAL RESULT 3.69E-05 + 6.31E-07 g/L
Range: LOW

URANIUM ANALYSIS

Sample ID S95T004183 Date/Time 02/13/96/13:59:04
Description DUP Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.037 Intensity 2021 (t= 39 us)
Laser Pulses 500 Conc 3.71E-05 + 1.23E-06 g/L
Lifetime 219 + 1.172 us Dilution Factor 1 mL/mL
R2 .9988
Integrated 31769 FINAL RESULT 3.71E-05 + 1.23E-06 g/L
Range: HIGH

gf 2/14/96

Sample ID S95T004183 Date/Time 02/13/96/13:59:45
Description DUP Cal Y=4.81E+09X+4.88E-04
Ref. Ratio 1.054 Intensity 49103 (t= 286 us)
Laser Pulses 500 Conc 3.52E-05 + 6.14E-07 g/L
Lifetime 237 + 1.057 us Dilution Factor 1 mL/mL
R2 .9991
Integrated 822464 FINAL RESULT 3.52E-05 + 6.14E-07 g/L
Range: LOW

OK gf 2/14/96

Sample ID S95T004184 Date/Time 02/13/96/14:01:45
Description SAM Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.039 Intensity 3110 (t= 39 us)
Laser Pulses 500 Conc 6.38E-05 + 2.12E-06 g/L
Lifetime 148 + .531 us Dilution Factor 1 mL/mL
R2 .9994
Integrated 35515 FINAL RESULT 6.38E-05 + 2.12E-06 g/L
Range: HIGH

Sample ID S95T004184 Date/Time 02/13/96/14:05:00
Description DUP Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.042 Intensity 3661 (t= 39 us)
Laser Pulses 500 Conc 6.89E-05 + 2.33E-06 g/L
Lifetime 149 + .658 us Dilution Factor 1 mL/mL
R2 .9992
Integrated 39477 FINAL RESULT 6.89E-05 + 2.33E-06 g/L
Range: HIGH

Sample ID S95T004185 Date/Time 02/13/96/14:08:20
Description SAM Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.059 Intensity 3479 (t= 39 us)
Laser Pulses 500 Conc 6.30E-05 + 2.04E-06 g/L
Lifetime 205 + .686 us Dilution Factor 1 mL/mL
R2 .9995
Integrated 51254 FINAL RESULT 6.30E-05 + 2.04E-06 g/L
Range: HIGH

Sample ID S95T004185 Date/Time 02/13/96/14:10:46
Description DUP Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.042 Intensity 2661 (t= 39 us)
Laser Pulses 500 Conc 6.26E-05 + 2.70E-06 g/L
Lifetime 90 + .679 us Dilution Factor 1 mL/mL
R2 .9978
Integrated 18354 FINAL RESULT 6.26E-05 + 2.70E-06 g/L
Range: HIGH

OK 2/14/95

Sample ID S95T004186 Date/Time 02/13/96/14:13:49
Description SAM Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.047 Intensity 2123 (t= 39 us)
Laser Pulses 500 Conc 3.90E-05 + 1.29E-06 g/L
Lifetime 228 + 1.222 us Dilution Factor 1 mL/mL
R2 .9988
Integrated 34738 FINAL RESULT 3.90E-05 + 1.29E-06 g/L
Range: HIGH

JK 2/14/96

Sample ID S95T004186 Date/Time 02/13/96/14:14:30
Description SAM Cal Y=4.81E+09X+4.88E-04
Ref. Ratio 1.07 Intensity 47605 (t= 312 us)
Laser Pulses 500 Conc 3.57E-05 + 6.11E-07 g/L
Lifetime 249 + 1.074 us Dilution Factor 1 mL/mL
R2 .9992
Integrated 829608 FINAL RESULT 3.57E-05 + 6.11E-07 g/L
Range: LOW

Sample ID S95T004185 Date/Time 02/13/96/14:31:38
Description DUP Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.044 Intensity 331 (t= 39 us)
Laser Pulses 500 Conc 7.82E-06 + 2.90E-07 g/L
Lifetime 218 + 2.396 us Dilution Factor 1 mL/mL
R2 .9948
Integrated 5367 FINAL RESULT 7.82E-06 + 2.90E-07 g/L
Range: HIGH

JK 2/14/95

Sample ID S95T004185 Date/Time 02/13/96/14:32:19
Description DUP Cal Y=4.81E+09X+4.88E-04
Ref. Ratio 1.052 Intensity 27258 (t= 39 us)
Laser Pulses 500 Conc 6.80E-06 + 1.01E-07 g/L
Lifetime 222 + .938 us Dilution Factor 1 mL/mL
R2 .9992
Integrated 422448 FINAL RESULT 6.80E-06 + 1.01E-07 g/L
Range: LOW

Sample ID S95T004186 Date/Time 02/13/96/14:36:12
Description SPK Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.051 Intensity 40572 (t= 39 us)
Laser Pulses 500 Conc 6.90E-04 + 2.27E-05 g/L
Lifetime 218 + 1.029 us Dilution Factor 1 mL/mL
R2 .9991
Integrated 617249 FINAL RESULT 6.90E-04 + 2.27E-05 g/L
Range: HIGH

Sample ID S95T004186 Date/Time 02/13/96/14:38:52
Description DUP Cal Y=7.06E+07X-1.29E+02
Ref. Ratio 1.056 Intensity 2296 (t= 39 us)
Laser Pulses 500 Conc 4.12E-05 + 1.36E-06 g/L
Lifetime 218 + 1.019 us Dilution Factor 1 mL/mL
R2 .9991
Integrated 35235 FINAL RESULT 4.12E-05 + 1.36E-06 g/L
Range: HIGH

Sample ID S95T004186 Date/Time 02/13/96/14:39:33
Description DUP Cal Y=4.81E+09X+4.88E-04
Ref. Ratio 1.074 Intensity 47704 (t= 312 us)
Laser Pulses 500 Conc 4.02E-05 + 6.59E-07 g/L
Lifetime 230 + .826 us Dilution Factor 1 mL/mL
R2 .9994
Integrated 784235 FINAL RESULT 4.02E-05 + 6.59E-07 g/L
Range: LOW

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		22B56
5379	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		282.00
LIQUID	R2 VALUE		0.9983
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000908	INSTRUMENT UNCERTAINTY	(IU)	1.97E-06
Rerun	INSTRUMENT RESULT	(IR)	5.98E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		5.98E-02
Sample #	VALUE OF STANDARD		6.38E-02
22B56	%RECOVERY		93.73
Instrument Code	RELATIVE % UNCERTAINTY		3.3
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	KNT	Date:	14-Feb-96
Signature of Chemist: Jennifer L. Slippen	JLS	Date:	2/14/96

STANDARD.WB1 REV 1.2 925009ML

2968

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.1932
Matrix	LIFETIME IN MICROSECONDS		292.00
SOLID	R2 VALUE		0.9934
Batch Number	RANGE (HIGH OR LOW)		LOW
96000908	INSTRUMENT UNCERTAINTY	(IU)	5.83E-09
Rerun	INSTRUMENT RESULT	(IR)	2.82E-07
0	DETECTION LEVEL µg/g		1.69E-01
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		2.82E-06
Sample #	RESULT (µg/g)		1.29E+00
BLANK	RELATIVE % UNCERTAINTY		2.1
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	14-Feb-96
Signature of Chemist:	JLS	Date:	2/16/96

BLANK.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.1932
Matrix	LIFETIME IN MICROSECONDS		217.00
SOLID	R2 VALUE		0.9993
Batch Number	RANGE (HIGH OR LOW)		LOW
96000908	INSTRUMENT UNCERTAINTY	(IU)	6.31E-07
Rerun	INSTRUMENT RESULT	(IR)	3.69E-05
0	DETECTION LEVEL µg/g		1.69E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		3.69E-04
Sample #	RESULT (µg/g)		1.68E+02
S95T004183	RELATIVE % UNCERTAINTY		1.7
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	14-Feb-96
Signature of Chemist:	JLS	Date:	2/14/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.0820
Matrix	LIFETIME IN MICROSECONDS		237.00
SOLID	R2 VALUE		0.9991
Batch Number	RANGE (HIGH OR LOW)		LOW
96000908	INSTRUMENT UNCERTAINTY	(IU)	6.14E-07
Rerun	INSTRUMENT RESULT	(IR)	3.52E-05
0	DETECTION LEVEL µg/g		1.78E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		3.52E-04
Sample #	RESULT (µg/g)		1.69E+02
S95T004183	RELATIVE % UNCERTAINTY		1.7
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		KNT	Date:	14-Feb-96
Signature of Chemist:		JLS	Date:	2/16/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.1028
Matrix	LIFETIME IN MICROSECONDS		146.00
SOLID	R2 VALUE		0.9994
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000908	INSTRUMENT UNCERTAINTY	(IU)	2.12E-06
Rerun	INSTRUMENT RESULT	(IR)	6.38E-05
0	DETECTION LEVEL µg/g		1.76E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		6.38E-04
Sample #	RESULT (µg/g)		3.03E+02
S95T004184	RELATIVE % UNCERTAINTY		3.3

Instrument Code
U-02
Prepared By
RCJ
Chemist
JLS
Analyst
KNT
Date Complete
02/14/96
Analysis Date
02/13/96
Analysis Time
01:45 PM
Sample Point
BY-106

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	14-Feb-96
Signature of Chemist:	JLS	Date:	2/14/96

SAMPLE.WB1 REV 1.2 925009ML

2972

WORKBOOK PAGE: DUP6

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.1808
Matrix	LIFETIME IN MICROSECONDS		149.00
SOLID	R2 VALUE		0.9992
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000908	INSTRUMENT UNCERTAINTY	(IU)	2.33E-06
Rerun	INSTRUMENT RESULT	(IR)	6.89E-05
0	DETECTION LEVEL µg/g		1.70E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		6.89E-04
Sample #	RESULT (µg/g)		3.16E+02
S95T004184	RELATIVE % UNCERTAINTY		3.4
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	14-Feb-96
Signature of Chemist:	JLS	Date:	2/16/96

SAMPLE.WB1 REV 1.2 925009ML

2973

WORKBOOK PAGE: SAM7

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.3232
Matrix	LIFETIME IN MICROSECONDS		205.00
SOLID	R2 VALUE		0.9995
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000908	INSTRUMENT UNCERTAINTY	(IU)	2.04E-06
Rerun	INSTRUMENT RESULT	(IR)	6.30E-05
0	DETECTION LEVEL µg/g		1.59E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		6.30E-04
Sample #	RESULT (µg/g)		2.71E+02
S95T004185	RELATIVE % UNCERTAINTY		3.2
Instrument Code			
U-02			
Prepared By	Result = Conc. in Solution (g/L) * 1000000 / Dg/L		
RCJ			
Chemist	Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF		
JLS			
Analyst	Relative % Uncertainty = IU / IR * 100		
KNT			
Date Complete	Concentration in Solution (g/L) = IR * DF * PF		
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Analyst:	KNT	Date:	14-Feb-96
Signature of Chemist:	JLS	Date:	2/16/96

SAMPLE.WB1 REV 1.2 925009ML

2974

WORKBOOK PAGE: DUP8

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE	(DF)	11.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.2072
Matrix	LIFETIME IN MICROSECONDS		222.00
SOLID	R2 VALUE		0.9992
Batch Number	RANGE (HIGH OR LOW)		LOW
96000908	INSTRUMENT UNCERTAINTY	(IU)	1.01E-07
Rerun	INSTRUMENT RESULT	(IR)	6.80E-06
0	DETECTION LEVEL µg/g		1.84E+00
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		7.48E-04
Sample #	RESULT (µg/g)		3.39E+02
S95T004185	RELATIVE % UNCERTAINTY		1.5
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	14-Feb-96
Signature of Chemist:	JLS	Date:	2/16/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM9

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9956
Matrix	LIFETIME IN MICROSECONDS		249.00
SOLID	R2 VALUE		0.9992
Batch Number	RANGE (HIGH OR LOW)		LOW
96000908	INSTRUMENT UNCERTAINTY	(IU)	6.11E-07
Rerun	INSTRUMENT RESULT	(IR)	3.57E-05
0	DETECTION LEVEL µg/g		1.85E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		3.57E-04
Sample #	RESULT (µg/g)		1.79E+02
S95T004186	RELATIVE % UNCERTAINTY		1.7
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		KNT	Date:	14-Feb-96
Signature of Chemist:	J L Lupeau	JLS	Date:	2/14/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SPIKE10

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SPIKE
SPK	SPIKE BOOK #		22B55
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
	DIGEST FACTOR OF SAMPLE	(DDF)	1.9956
Matrix	LIFETIME IN MICROSECONDS		218.00
SOLID	R2 VALUE		0.9991
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000908	INSTRUMENT RESULT	(IR)	6.90E-04
Rerun	CONCENTRATION IN SOLUTION (g/L)	(CONC)	6.90E-03
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
Sample Number	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FO	(SR)	3.57E-04
S95T004186			
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Concentration = IR * DF * PF

QC Actual (µg/mL) = SV (g/L) * 1000

QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000

% Recovery = QC FOUND / QC ACTUAL

QC ACTUAL	=	5.69E+01	µg/mL
QC FOUND	=	6.54E+01	µg/mL
% SPIKE RECOVERY	=	115.0%	

Analyst:	KNT	Date:	14-Feb-96
Signature of Chemist:	JLS	Date:	2/16/96

SPIKE.WB1 REV 1.2 925009ML

2977

WORKBOOK PAGE: DUP11

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5379	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9556
Matrix	LIFETIME IN MICROSECONDS		230.00
SOLID	R2 VALUE		0.9994
Batch Number	RANGE (HIGH OR LOW)		LOW
96000908	INSTRUMENT UNCERTAINTY	(IU)	6.59E-07
Rerun	INSTRUMENT RESULT	(IR)	4.02E-05
0	DETECTION LEVEL µg/g		1.89E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		4.02E-04
Sample #	RESULT (µg/g)		2.06E+02
S95T004186	RELATIVE % UNCERTAINTY		1.6
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/14/96			
Analysis Date			
02/13/96			
Analysis Time			
01:45 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	14-Feb-96
Signature of Chemist:	JLS	Date:	2/16/96

SAMPLE.WB1 REV 1.2 925009ML

2978

LABCORE Completed Worklist Report for Worklist# 5382

Analyst: dgg **Instrument:** U01 **Book#** 22856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: BY-106 FOR URANIUM: SS= 1-10ML (USE .1ML SPIKE) RTS!

	Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD			0		U-02	SOLID	6.38E-02	6.38E-02	100.000	% Recovery
2	BLNK-PREP			0		U-02	SOLID	1	<1.75e-1	0.000	ug/g
3	SAMPLE		S95T004187	0	Z	U-02	SOLID	N/A	5.14E+01	0.175	ug/g
4	DUP		S95T004187	0	Z	U-02	SOLID	5.14E+01	1.99E+02	117.890	RPD
5	SAMPLE		S95T004188	0	Z	U-02	SOLID	N/A	2.38E+02	0.157	ug/g
6	DUP		S95T004188	0	Z	U-02	SOLID	2.38E+02	2.53E+02	6.110	RPD
7	SAMPLE		S95T004189	0	Z	U-02	SOLID	N/A	3.40E+02	0.189	ug/g
8	DUP		S95T004189	0	Z	U-02	SOLID	3.40E+02	3.27E+02	3.900	RPD
9	SAMPLE		S95T004190	0	Z	U-02	SOLID	N/A	2.34E+02	0.204	ug/g
10	SPK		S95T004190	0	Z	U-02	SOLID	5.69E+01	6.11E+01	107.380	% Recovery
11	DUP		S95T004190	0	Z	U-02	SOLID	2.34e+2	2.35E+02	0.430	RPD

Final page for worklist# 5382

Analyst Signature Date

Analyst Signature Date

Reviewer Signature Date 2/14/96

Sample S95T004187 will be rerun due to high RPD between sample and duplicate.

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 5382

Analyst: ABS **Instrument:** UA01 _____ **Book#** 22 B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: BY-106 FOR URANIUM: SS= 1-10ML (USE .1ML SPIKE) RTS!

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				U-02	SOLID		
2	BLNK-PREP				U-02	SOLID		
3	SAMPLE	S95T004187	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
4	DUP	S95T004187	0	Z	U-02	SOLID		
5	SAMPLE	S95T004188	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
6	DUP	S95T004188	0	Z	U-02	SOLID		
7	SAMPLE	S95T004189	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
8	DUP	S95T004189	0	Z	U-02	SOLID		
9	SAMPLE	S95T004190	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
10	SPK	S95T004190	0	Z	U-02	SOLID		
11	DUP	S95T004190	0	Z	U-02	SOLID		

Final page for worklist # 5382

ABS 2-12-96 / 0500
Analyst Signature **Date**

[illegible] 2-13-96
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

URANIUM ANALYSIS

Sample ID S95T004189
Description BY-106
Ref. Ratio 1.06
Laser Pulses 500
Lifetime 235 + 1.399 us
R2 .9985
Integrated 58837
Range: HIGH

Date/Time 02/12/96/04:40:54
Cal Y=6.87E+07X-2.55E+02
Intensity 3628 (t= 39 us)
Conc 6.64E-05 + 2.20E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.64E-05 + 2.20E-06 g/L

Sample ID S95T004189-DUP
Description BY-106
Ref. Ratio 1.068
Laser Pulses 500
Lifetime 225 + 1.4 us
R2 .9983
Integrated 50289
Range: HIGH

Date/Time 02/12/96/04:42:51
Cal Y=6.87E+07X-2.55E+02
Intensity 3146 (t= 39 us)
Conc 5.95E-05 + 1.99E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 5.95E-05 + 1.99E-06 g/L

Sample ID S95T004190
Description BY-106
Ref. Ratio 1.087
Laser Pulses 500
Lifetime 260 + .911 us
R2 .9995
Integrated 856678
Range: LOW

Date/Time 02/12/96/04:47:36
Cal Y=4.71E+09X+4.88E-04
Intensity 47321 (t= 364 us)
Conc 4.24E-05 + 6.24E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 4.24E-05 + 6.24E-07 g/L

Sample ID S95T004190-DUP
Description BY-106
Ref. Ratio 1.091
Laser Pulses 500
Lifetime 246 + .704 us
R2 .9997
Integrated 808133
Range: LOW

Date/Time 02/12/96/04:50:34
Cal Y=4.71E+09X+4.88E-04
Intensity 46245 (t= 364 us)
Conc 4.51E-05 + 6.41E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 4.51E-05 + 6.41E-07 g/L

Sample ID S95T004190-SPK
Description BY-106
Ref. Ratio 1.081
Laser Pulses 500
Lifetime 238 + 1.246 us
R2 .9988
Integrated 616433
Range: HIGH

Date/Time 02/12/96/04:53:56
Cal Y=6.87E+07X-2.55E+02
Intensity 37865 (t= 39 us)
Conc 6.53E-04 + 2.14E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.53E-04 + 2.14E-05 g/L

URANIUM ANALYSIS

Sample ID 22B56
Description LMCS STD.
Ref. Ratio 1.043
Laser Pulses 500
Lifetime 288 + 1.697 us
R2 .9985
Integrated 67759
Range: HIGH

Date/Time 02/12/96/04:09:46
Cal Y=6.87E+07X-2.55E+02
Intensity 3567 (t= 39 us)
Conc 6.38E-05 + 2.08E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.38E-05 + 2.08E-06 g/L

Sample ID PREP-BLANK
Description BY-106
Ref. Ratio 1.042
Laser Pulses 500
Lifetime + us
R2
Integrated 0
Range: LOW
Sample <= Blank

Date/Time 02/12/96/04:16:52
Cal Y=4.71E+09X+4.88E-04
Intensity -153 (t= 39 us)
Conc + g/L
Dilution Factor 1 mL/mL

FINAL RESULT

Sample ID S95T004187
Description BY-106
Ref. Ratio 1.072
Laser Pulses 500
Lifetime 239 + .878 us
R2 .9994
Integrated 713562
Range: LOW

Date/Time 02/12/96/04:25:57
Cal Y=4.71E+09X+4.88E-04
Intensity 43509 (t= 39 us)
Conc 1.09E-05 + 1.43E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.09E-05 + 1.43E-07 g/L

Sample ID S95T004187-DUP
Description BY-106
Ref. Ratio 1.068
Laser Pulses 500
Lifetime 251 + .84 us
R2 .9995
Integrated 876110
Range: LOW

Date/Time 02/12/96/04:29:17
Cal Y=4.71E+09X+4.88E-04
Intensity 49014 (t= 338 us)
Conc 4.21E-05 + 6.20E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 4.21E-05 + 6.20E-07 g/L

Sample ID S95T004188
Description BY-106
Ref. Ratio 1.049
Laser Pulses 500
Lifetime 199 + .715 us
R2 .9994
Integrated 41400
Range: HIGH

Date/Time 02/12/96/04:34:39
Cal Y=6.87E+07X-2.55E+02
Intensity 2811 (t= 39 us)
Conc 5.60E-05 + 1.81E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 5.60E-05 + 1.81E-06 g/L

Sample ID S95T004188-DUP
Description BY-106
Ref. Ratio 1.065
Laser Pulses 500
Lifetime 214 + .997 us
R2 .9991
Integrated 43729
Range: HIGH

Date/Time 02/12/96/04:37:18
Cal Y=6.87E+07X-2.55E+02
Intensity 2940 (t= 39 us)
Conc 5.48E-05 + 1.79E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 5.48E-05 + 1.79E-06 g/L

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		22B56
5382	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		288.00
LIQUID	R2 VALUE		0.9985
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000911	INSTRUMENT UNCERTAINTY	(IU)	2.08E-06
Rerun	INSTRUMENT RESULT	(IR)	6.38E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		6.38E-02
Sample #	VALUE OF STANDARD		6.38E-02
22B55	%RECOVERY		100.00
Instrument Code	RELATIVE % UNCERTAINTY		3.3
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/13/96			
Analysis Date			
02/12/96			
Analysis Time			
04:09 AM			
Sample Point			
BY-106			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	DGG	Date:	13-Feb-96
Signature of Chemist: Jennifer L. Sleppen	JLS	Date:	2/14/96

STANDARD.WB1 REV 1.2 925009ML

2983

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5382	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.1196
Matrix	LIFETIME IN MICROSECONDS		0.00
SOLID	R2 VALUE		0.0000
Batch Number	RANGE (HIGH OR LOW)		LOW
96000911	INSTRUMENT UNCERTAINTY	(IU)	0.00E+00
Rerun	INSTRUMENT RESULT	(IR)	0.00E+00
0	DETECTION LEVEL µg/g		1.75E-01
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		0.00E+00
Sample #	RESULT (µg/g)		0.00E+00
BLANK	RELATIVE % UNCERTAINTY		
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/13/96			
Analysis Date			
02/12/96			
Analysis Time			
04:09 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Blank result is less than the detection level.

Result = < 1.75E-1 µg/g

Analyst:	DGG	Date:	13-Feb-96
Signature of Chemist:	JLS	Date:	2/14/96

BLANK.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5382	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.3536
Matrix	LIFETIME IN MICROSECONDS		199.00
SOLID	R2 VALUE		0.9994
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000911	INSTRUMENT UNCERTAINTY	(IU)	1.81E-06
Rerun	INSTRUMENT RESULT	(IR)	5.60E-05
0	DETECTION LEVEL µg/g		1.57E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		5.60E-04
Sample #	RESULT (µg/g)		2.38E+02
S95T004188	RELATIVE % UNCERTAINTY		3.2
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/13/96			
Analysis Date			
02/12/96			
Analysis Time			
04:09 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	13-Feb-96
Signature of Chemist:	JLS	Date:	2/14/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP6

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5382	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.1628
Matrix	LIFETIME IN MICROSECONDS		214.00
SOLID	R2 VALUE		0.9991
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000911	INSTRUMENT UNCERTAINTY	(IU)	1.79E-06
Rerun	INSTRUMENT RESULT	(IR)	5.48E-05
0	DETECTION LEVEL µg/g		1.71E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		5.48E-04
Sample #	RESULT (µg/g)		2.53E+02
S95T004188	RELATIVE % UNCERTAINTY		3.3
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/13/96			
Analysis Date			
02/12/96			
Analysis Time			
04:09 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	13-Feb-96
Signature of Chemist:	JLS	Date:	2/14/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM7

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5382	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9528
Matrix	LIFETIME IN MICROSECONDS		235.00
SOLID	R2 VALUE		0.9985
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000911	INSTRUMENT UNCERTAINTY	(IU)	2.20E-06
Rerun	INSTRUMENT RESULT	(IR)	6.64E-05
0	DETECTION LEVEL µg/g		1.89E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		6.64E-04
Sample #	RESULT (µg/g)		3.40E+02
S95T004189	RELATIVE % UNCERTAINTY		3.3
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/13/96			
Analysis Date			
02/12/96			
Analysis Time			
04:09 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	13-Feb-96
Signature of Chemist:	JLS	Date:	2/14/96

SAMPLE.WB1 REV 1.2 925009ML

2987

WORKBOOK PAGE: DUP8

WHC-SD-WM-DP-103, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5382	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.8188
Matrix	LIFETIME IN MICROSECONDS		225.00
SOLID	R2 VALUE		0.9983
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000911	INSTRUMENT UNCERTAINTY	(IU)	1.99E-06
Rerun	INSTRUMENT RESULT	(IR)	5.95E-05
0	DETECTION LEVEL µg/g		2.03E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		5.95E-04
Sample #	RESULT (µg/g)		3.27E+02
S95T004189	RELATIVE % UNCERTAINTY		3.3
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/13/96			
Analysis Date			
02/12/96			
Analysis Time			
04:09 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	13-Feb-96
Signature of Chemist:	JLS	Date:	2/14/96

SAMPLE.WB1 REV 1.2 925009ML

2988

WORKBOOK PAGE: SAM9

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5382	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.8144
Matrix	LIFETIME IN MICROSECONDS		260.00
SOLID	R2 VALUE		0.9995
Batch Number	RANGE (HIGH OR LOW)		LOW
96000911	INSTRUMENT UNCERTAINTY	(IU)	6.24E-07
Rerun	INSTRUMENT RESULT	(IR)	4.24E-05
0	DETECTION LEVEL µg/g		2.04E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		4.24E-04
Sample #	RESULT (µg/g)		2.34E+02
S95T004190	RELATIVE % UNCERTAINTY		1.5
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/13/96			
Analysis Date			
02/12/96			
Analysis Time			
04:09 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	13-Feb-96
Signature of Chemist:	JLS	Date:	2/19/96

SAMPLE.WB1 REV 1.2 925009ML

2989

WORKBOOK PAGE: SPIKE10

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SPIKE
SPK	SPIKE BOOK #		22B55
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
5382	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
	DIGEST FACTOR OF SAMPLE	(DDF)	1.8144
Matrix	LIFETIME IN MICROSECONDS		238.00
SOLID	R2 VALUE		0.9988
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000911	INSTRUMENT RESULT	(IR)	6.53E-04
Rerun	CONCENTRATION IN SOLUTION (g/L)	(CONC)	6.53E-03
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
Sample Number	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FO	(SR)	4.24E-04
S95T004190			
Instrument Code			
U-02			
Prepared By			
RCJ			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/13/96			
Analysis Date			
02/12/96			
Analysis Time			
04:09 AM			
Sample Point			
BY-106			

Concentration = IR * DF * PF

QC Actual (µg/mL) = SV (g/L) * 1000

QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000

% Recovery = QC FOUND / QC ACTUAL

QC ACTUAL	=	5.69E+01	µg/mL
QC FOUND	=	6.11E+01	µg/mL
% SPIKE RECOVERY	=	107.3%	

Analyst:	DGG	Date:	13-Feb-96
Signature of Chemist:	JLS	Date:	2/14/96

SPIKE.WB1 REV 1.2 925009ML

2990

WORKBOOK PAGE: DUP11

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5382	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9196
Matrix	LIFETIME IN MICROSECONDS		246.00
SOLID	R2 VALUE		0.9997
Batch Number	RANGE (HIGH OR LOW)		LOW
96000911	INSTRUMENT UNCERTAINTY	(IU)	6.41E-07
Rerun	INSTRUMENT RESULT	(IR)	4.51E-05
0	DETECTION LEVEL µg/g		1.93E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		4.51E-04
Sample #	RESULT (µg/g)		2.35E+02
S95T004190	RELATIVE % UNCERTAINTY		1.4
Instrument Code			
U-02			
Prepared By	Result = Conc. in Solution (g/L) * 1000000 / Dg/L		
RCJ			
Chemist	Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF		
JLS			
Analyst	Relative % Uncertainty = IU / IR * 100		
DGG			
Date Complete	Concentration in Solution (g/L) = IR * DF * PF		
02/13/96			
Analysis Date			
02/12/96			
Analysis Time			
04:09 AM			
Sample Point			
BY-106			

Analyst:	DGG	Date:	13-Feb-96
Signature of Chemist:	JLS	Date:	2/14/96

SAMPLE.WB1 REV 1.2 925009ML

LABCORE Completed Worklist Report for Worklist# 5383

Analyst: dgg **Instrument:** U01 **Book#** 22856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: BY-106 FOR URANIUM SS= 1-10ML (USE .1ML SPIKE) RTS!

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		U-02	SOLID	6.38e-2	6.07e-2	95.140	% Recovery
2	BLNK-PREP		0		U-02	SOLID	1	<1.93e-1		ug/g
3	SAMPLE	S96T000106	0	Z	U-02	SOLID	N/A	6.48e+1	0.193	ug/g
4	DUP	S96T000106	0	Z	U-02	SOLID	6.48e+1	7.18e+1	10.250	RPD
5	SPK	S96T000106	0	Z	U-02	SOLID	100	92.7	92.700	% Recovery
6	SAMPLE	S96T000107	0	Z	U-02	SOLID	N/A	1.27e+2	0.197	ug/g
7	DUP	S96T000107	0	Z	U-02	SOLID	1.27e+2	1.14e+2	10.790	RPD
8	SAMPLE	S96T000250	0	Z	U-02	SOLID	N/A	2.01e+1	0.164	ug/g
9	DUP	S96T000250	0	Z	U-02	SOLID	2.01e+1	1.91e+1	5.100	RPD
10	SAMPLE	S96T000251	0	Z	U-02	SOLID	N/A	6.66e+1	0.210	ug/g
11	DUP	S96T000251	0	Z	U-02	SOLID	6.66e+1	6.08e+1	9.110	RPD

Final page for worklist# 5383

Analyst Signature **Date** **Analyst Signature** **Date**

2/29/96

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 5383

Analyst: DBB **Instrument:** UA01 _____ **Book#** 22B56

Method: LA-925-009 Rev/Mod A-1 Spk # 22B55

Worklist Comment: BY-106 FOR URANIUM: SS= 1-10ML (USE .1ML SPIKE) RTS!

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				U-02	SOLID		
2	BLNK-PREP				U-02	SOLID		
3	SAMPLE	S96T000106	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
4	DUP	S96T000106	0	Z	U-02	SOLID		
5	SPK	S96T000106	0	Z	U-02	SOLID		
6	SAMPLE	S96T000107	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
7	DUP	S96T000107	0	Z	U-02	SOLID		
8	SAMPLE	S96T000250	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
9	DUP	S96T000250	0	Z	U-02	SOLID		
10	SAMPLE	S96T000251	0	Z	U-02	SOLID	95000229	BY-106
	Analytes Requested: U-02							
11	DUP	S96T000251	0	Z	U-02	SOLID		

Final page for worklist # 5383

Kim Thomas 2-15-96 / Donald B Duffy 2-22-96

Analyst Signature **Date** **Analyst Signature** **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Sample ID S96T000251-DUP
Description BY-106
Ref. Ratio 1.086
Laser Pulses 500
Lifetime 219 + .66 us
R2 .9996
Integrated 729814

Date/Time 02/22/96/23:30:46
Cal Y=5.52E+09X+4.88E-04
Intensity 45980 (t= 39 us)
Conc 1.04E-05 + 1.21E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.04E-05 + 1.21E-07 g/L

Range: LOW

URANIUM ANALYSIS

```
Sample ID  S96T000106-SPK            Date/Time  02/22/96/22:51:46
Description  BY-106                 Cal Y=7.74E+07X+284.578
Ref. Ratio 1.051                    Intensity 32715     (t=  39     us)
Laser Pulses 500                    Conc 5.40E-04 + 1.72E-05 g/L
Lifetime 171 + .688 us              Dilution Factor 1 mL/mL
R2 .9993
Integrated 412947          FINAL RESULT  5.40E-04 + 1.72E-05 g/L
Range: HIGH

Sample ID  S96T000107               Date/Time  02/22/96/22:54:54
Description  BY-106                 Cal Y=5.52E+09X+4.88E-04
Ref. Ratio 1.056                    Intensity 48102     (t= 182     us)
Laser Pulses 500                    Conc 2.39E-05 + 1.01E-06 g/L
Lifetime 161 + 2.092 us             Dilution Factor 1 mL/mL
R2 .9928
Integrated 510733          FINAL RESULT  2.39E-05 + 1.01E-06 g/L
Range: LOW

Sample ID  S96T000107-DUP           Date/Time  02/22/96/22:58:42
Description  BY-106                 Cal Y=5.52E+09X+4.88E-04
Ref. Ratio 1.073                    Intensity 46066     (t= 182     us)
Laser Pulses 500                    Conc 2.20E-05 + 9.48E-07 g/L
Lifetime 165 + 2.228 us             Dilution Factor 1 mL/mL
R2 .9922
Integrated 496393          FINAL RESULT  2.20E-05 + 9.48E-07 g/L
Range: LOW

Sample ID  S96T000250               Date/Time  02/22/96/23:19:54
Description  BY-106                 Cal Y=5.52E+09X+4.88E-04
Ref. Ratio 1.051                    Intensity 19818     (t=  39     us)
Laser Pulses 500                    Conc 4.54E-06 + 4.81E-08 g/L
Lifetime 218 + .244 us              Dilution Factor 1 mL/mL
R2 .9999
Integrated 316754          FINAL RESULT  4.54E-06 + 4.81E-08 g/L
Range: LOW

Sample ID  S96T000250-DUP           Date/Time  02/22/96/23:23:51
Description  BY-106                 Cal Y=5.52E+09X+4.88E-04
Ref. Ratio 1.067                    Intensity 19062     (t=  39     us)
Laser Pulses 500                    Conc 4.55E-06 + 5.02E-08 g/L
Lifetime 205 + .404 us              Dilution Factor 1 mL/mL
R2 .9998
Integrated 298667          FINAL RESULT  4.55E-06 + 5.02E-08 g/L
Range: LOW

Sample ID  S96T000251               Date/Time  02/22/96/23:26:49
Description  BY-106                 Cal Y=5.52E+09X+4.88E-04
Ref. Ratio 1.081                    Intensity 45975     (t=  65     us)
Laser Pulses 500                    Conc 1.17E-05 + 1.48E-07 g/L
Lifetime 208 + .775 us              Dilution Factor 1 mL/mL
R2 .9994
Integrated 691106          FINAL RESULT  1.17E-05 + 1.48E-07 g/L
Range: LOW
```

URANIUM ANALYSIS

```
Sample ID  22B56                    Date/Time  02/22/96/22:30:25
Description  LMCS STD.              Cal Y=7.74E+07X+284.578
Ref. Ratio 1.009                    Intensity 4143      (t=  39     us)
Laser Pulses 500                    Conc 6.07E-05 + 1.86E-06 g/L
Lifetime 282 + .439 us              Dilution Factor 1 mL/mL
R2 .9999
Integrated 80214          FINAL RESULT  6.07E-05 + 1.86E-06 g/L
Range: HIGH
```

```
Sample ID  PREP-BLK                 Date/Time  02/22/96/22:38:10
Description  BY-106                 Cal Y=7.74E+07X+284.578
Ref. Ratio 1.04                     Intensity -1        (t=  39     us)
Laser Pulses 500                    Conc -3.68E-06 + 1.12E-07 g/L
Lifetime  +  us                     Dilution Factor 1 mL/mL
R2
Integrated 0              FINAL RESULT  -3.68E-06 + 1.12E-07 g/L
Range: HIGH
Sample <= Blank
```

SB 2/26/96

```
Sample ID  PREP-BLK                 Date/Time  02/22/96/22:38:51
Description  BY-106                 Cal Y=5.52E-09X+4.88E-04
Ref. Ratio 1.042                    Intensity -24       (t=  39     us)
Laser Pulses 500                    Conc  +  g/L
Lifetime  +  us                     Dilution Factor 1 mL/mL
R2
Integrated 0              FINAL RESULT
Range: LOW
Sample <= Blank
```

```
Sample ID  S96T000106               Date/Time  02/22/96/22:43:38
Description  BY-106                 Cal Y=5.52E+09X+4.88E-04
Ref. Ratio 1.052                    Intensity 52084     (t=  39     us)
Laser Pulses 500                    Conc 1.24E-05 + 1.83E-07 g/L
Lifetime 170 + .801 us              Dilution Factor 1 mL/mL
R2 .9991
Integrated 670852         FINAL RESULT  1.24E-05 + 1.83E-07 g/L
Range: LOW
```

```
Sample ID  S96T000106-DUP           Date/Time  02/22/96/22:48:13
Description  BY-106                 Cal Y=5.52E+09X+4.88E-04
Ref. Ratio 1.052                    Intensity 47405     (t=  65     us)
Laser Pulses 500                    Conc 1.26E-05 + 1.85E-07 g/L
Lifetime 179 + .819 us              Dilution Factor 1 mL/mL
R2 .9991
Integrated 624390         FINAL RESULT  1.26E-05 + 1.85E-07 g/L
Range: LOW
```

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		22B56
5383	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		282.00
LIQUID	R2 VALUE		0.9999
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000916	INSTRUMENT UNCERTAINTY	(IU)	1.86E-06
Rerun	INSTRUMENT RESULT	(IR)	6.07E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		6.07E-02
Sample #	VALUE OF STANDARD		6.38E-02
22B56	%RECOVERY		95.14
Instrument Code	RELATIVE % UNCERTAINTY		3.1
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	KNT	Date:	24-Feb-96
Signature of Chemist: Jennifer L. Sherrow	JLS	Date:	2/26/96

STANDARD.WB1 REV 1.2 925009ML

2997

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9128
Matrix	LIFETIME IN MICROSECONDS		0.00
SOLID	R2 VALUE		0.0000
Batch Number	RANGE (HIGH OR LOW)		LOW
96000916	INSTRUMENT UNCERTAINTY	(IU)	0.00E+00
Rerun	INSTRUMENT RESULT	(IR)	0.00E+00
0	DETECTION LEVEL µg/g		1.93E-01
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		0.00E+00
Sample #	RESULT (µg/g)		<1.93E-01
BLANK	RELATIVE % UNCERTAINTY		N/A
Instrument Code			
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Feb-96
Signature of Chemist: Jennifer L. Blecker	JLS	Date:	2/26/96

BLANK.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9128
Matrix	LIFETIME IN MICROSECONDS		170.00
SOLID	R2 VALUE		0.9991
Batch Number	RANGE (HIGH OR LOW)		LOW
96000916	INSTRUMENT UNCERTAINTY	(IU)	1.83E-07
Rerun	INSTRUMENT RESULT	(IR)	1.24E-05
0	DETECTION LEVEL µg/g		1.93E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.24E-04
Sample #	RESULT (µg/g)		6.48E+01
S96T000106	RELATIVE % UNCERTAINTY		1.5
Instrument Code			
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Feb-96
Signature of Chemist:	JLS	Date:	2/26/96

SAMPLE.WB1 REV 1.2 925009ML

2999

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.7552
Matrix	LIFETIME IN MICROSECONDS		179.00
SOLID	R2 VALUE		0.9991
Batch Number	RANGE (HIGH OR LOW)		LOW
96000916	INSTRUMENT UNCERTAINTY	(IU)	1.85E-07
Rerun	INSTRUMENT RESULT	(IR)	1.26E-05
0	DETECTION LEVEL µg/g		2.11E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.26E-04
Sample #	RESULT (µg/g)		7.18E+01
S96T000106	RELATIVE % UNCERTAINTY		1.5
Instrument Code			
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Feb-96
Signature of Chemist: Jennifer L. Schepper	JLS	Date:	2/26/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SPIKE5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SPIKE
SPK	SPIKE BOOK #		22B55
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
	DIGEST FACTOR OF SAMPLE	(DDF)	1.9128
Matrix	LIFETIME IN MICROSECONDS		171.00
SOLID	R2 VALUE		0.9993
Batch Number	RANGE (HIGH OR LOW)		HIGH
96000916	INSTRUMENT RESULT	(IR)	5.40E-04
Rerun	CONCENTRATION IN SOLUTION (g/L)	(CONC)	5.40E-03
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
Sample Number	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FO	(SR)	1.24E-04
S96T000106			
Instrument Code			
UA01	Concentration = IR * DF * PF		
Prepared By			
LC	QC Actual (µg/mL) = SV (g/L) * 1000		
Chemist			
JLS	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
Analyst			
KNT	% Recovery = QC FOUND / QC ACTUAL		
Date Complete			
02/24/96			
Analysis Date			
02/15/96	QC ACTUAL	=	5.69E+01 µg/mL
Analysis Time	QC FOUND	=	5.28E+01 µg/mL
11:30 PM	% SPIKE RECOVERY	=	92.7%
Sample Point			
BY-106			

Analyst:	KNT	Date:	24-Feb-96
Signature of Chemist: Jennifer L. Silvopes	JLS	Date:	2/26/96

SPIKE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM6

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.8760
Matrix	LIFETIME IN MICROSECONDS		161.00
SOLID	R2 VALUE		0.9928
Batch Number	RANGE (HIGH OR LOW)		LOW
96000916	INSTRUMENT UNCERTAINTY	(IU)	1.01E-06
Rerun	INSTRUMENT RESULT	(IR)	2.39E-05
0	DETECTION LEVEL µg/g		1.97E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.39E-04
Sample #	RESULT (µg/g)		1.27E+02
S96T000107	RELATIVE % UNCERTAINTY		4.2
Instrument Code			
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Feb-96
Signature of Chemist:	JLS	Date:	2/26/96

SAMPLE.WB1 REV 1.2 925009ML

3002

WORKBOOK PAGE: DUP7

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.9220
Matrix	LIFETIME IN MICROSECONDS		165.00
SOLID	R2 VALUE		0.9922
Batch Number	RANGE (HIGH OR LOW)		LOW
96000916	INSTRUMENT UNCERTAINTY	(IU)	9.48E-07
Rerun	INSTRUMENT RESULT	(IR)	2.20E-05
0	DETECTION LEVEL µg/g		1.93E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.20E-04
Sample #	RESULT (µg/g)		1.14E+02
S96T000107	RELATIVE % UNCERTAINTY		4.3
Instrument Code			
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		KNT	Date:	24-Feb-96
Signature of Chemist:	Jennifer L. Berrier	JLS	Date:	2/26/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM8

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.2568
Matrix	LIFETIME IN MICROSECONDS		218.00
SOLID	R2 VALUE		0.9999
Batch Number	RANGE (HIGH OR LOW)		LOW
96000916	INSTRUMENT UNCERTAINTY	(IU)	4.81E-08
Rerun	INSTRUMENT RESULT	(IR)	4.54E-06
0	DETECTION LEVEL µg/g		1.64E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		4.54E-05
Sample #	RESULT (µg/g)		2.01E+01
S96T000250	RELATIVE % UNCERTAINTY		1.1
Instrument Code			
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		KNT	Date:	24-Feb-96
Signature of Chemist:	Jennifer L Shuppert	JLS	Date:	2/24/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP9

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	2.3764
Matrix	LIFETIME IN MICROSECONDS		205.00
SOLID	R2 VALUE		0.9998
Batch Number	RANGE (HIGH OR LOW)		LOW
96000916	INSTRUMENT UNCERTAINTY	(IU)	5.02E-08
Rerun	INSTRUMENT RESULT	(IR)	4.55E-06
0	DETECTION LEVEL µg/g		1.56E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		4.55E-05
Sample #	RESULT (µg/g)		1.91E+01
S96T000250	RELATIVE % UNCERTAINTY		1.1
Instrument Code			
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Feb-96
Signature of Chemist:	JLS	Date:	2/26/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM10

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.7580
Matrix	LIFETIME IN MICROSECONDS		208.00
SOLID	R2 VALUE		0.9994
Batch Number	RANGE (HIGH OR LOW)		LOW
96000916	INSTRUMENT UNCERTAINTY	(IU)	1.48E-07
Rerun	INSTRUMENT RESULT	(IR)	1.17E-05
0	DETECTION LEVEL µg/g		2.10E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.17E-04
Sample #	RESULT (µg/g)		6.66E+01
S96T000251	RELATIVE % UNCERTAINTY		1.3
Instrument Code			
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		KNT	Date:	24-Feb-96
Signature of Chemist:	Jennifer L Simpson	JLS	Date:	2/26/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP11

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5383	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
	DIGEST FACTOR	(Dg/L)	1.7112
Matrix	LIFETIME IN MICROSECONDS		219.00
SOLID	R2 VALUE		0.9996
Batch Number	RANGE (HIGH OR LOW)		LOW
96000916	INSTRUMENT UNCERTAINTY	(IU)	1.21E-07
Rerun	INSTRUMENT RESULT	(IR)	1.04E-05
0	DETECTION LEVEL µg/g		2.16E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.04E-04
Sample #	RESULT (µg/g)		6.08E+01
S96T000251	RELATIVE % UNCERTAINTY		1.2
Instrument Code			
UA01			
Prepared By			
LC			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
02/24/96			
Analysis Date			
02/15/96			
Analysis Time			
11:30 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Feb-96
Signature of Chemist:	JLS	Date:	2/26/96

SAMPLE.WB1 REV 1.2 925009ML

LABCORE Completed Worklist Report for Worklist# 5695

Analyst: wgb **Instrument:** U01 **Book#** 22856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: Rerun 1 / 1-10 mL sample prep / jls

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		U-02	SOLID	0.0638	6.84e-02	107.210	% Recovery
2	BLNK-PREP		0		U-02	SOLID	1	4.95e-2	2.000e-002	ug/g
3	SAMPLE	S95T004187	0	Z	U-02	SOLID	N/A	4.42e+1	1.750e-002	ug/g
4	DUP	S95T004187	0	Z	U-02	SOLID	4.42e+1	1.73e+2	74.450	RPD

Final page for worklist# 5695

Analyst Signature **Date** **Analyst Signature** **Date**

[signature] 2/29/96

Reviewer Signature **Date**

High RPD between sample and duplicate consistent with original analysis.

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 5695

Analyst: WGB **Instrument:** U01 _____ **Book#** 22B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: Rerun 1 / 1-10 mL sample prep / jls

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				U-02	SOLID		
2	BLNK-PREP				U-02	SOLID		
3	SAMPLE	S95T004187	0	Z	U-02	SOLID	95000229	BY-106
		Analytes Requested: U-02						
4	DUP	S95T004187	0	Z	U-02	SOLID		

Final page for worklist # 5695

Wayne N. Burchault 2-17-96
Analyst Signature **Date**

J. Sleppen 2/29/96
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Wayne L Buzhardt
2-17-96

Sample ID 22856 Date/Time 02/17/96/01:31:10
Description STANDARD Cal Y=6.57E+07X-9.77E-04
Ref. Ratio .949 Intensity 3872 (t= 39 us)
Laser Pulses 500 Conc 6.84E-05 + 2.24E-06 ug/L
Lifetime 226 + 1.458 us Dilution Factor 1 mL/mL
R2 .9982
Integrated 59224 FINAL RESULT 6.84E-05 + 2.24E-06 ~~u~~g/L WB 2-17-96
Range: HIGH

Sample ID BLANK-PREP Date/Time 02/17/96/01:49:49
Description S95T004187 Cal Y=4.60E+09X-4.88E-04
Ref. Ratio .985 Intensity 606 (t= 39 us)
Laser Pulses 500 Conc 1.05E-07 + 4.85E-09 ug/L
Lifetime 316 + 11.696 us Dilution Factor 1 mL/mL
R2 .9445
Integrated 8779 FINAL RESULT 1.05E-07 + 4.85E-09 ~~u~~g/L WB 2-17-96
Range: LOW

Sample ID SAMPLE Date/Time 02/17/96/02:00:30
Description S95T004187 Cal Y=6.57E+07X-9.77E-04
Ref. Ratio .969 Intensity 5243 (t= 39 us)
Laser Pulses 500 Conc 9.37E-05 + 3.29E-06 ug/L
Lifetime 196 + 1.661 us Dilution Factor 1 mL/mL
R2 .9969
Integrated 70479 FINAL RESULT 9.37E-05 + 3.29E-06 ~~u~~g/L WB 2-17-96
Range: HIGH

Sample ID DUP. Date/Time 02/17/96/02:15:55
Description S95T004187 Cal Y=6.57E+07X-9.77E-04
Ref. Ratio .974 Intensity 20146 (t= 39 us)
Laser Pulses 500 Conc 3.66E-04 + 1.25E-05 ug/L
Lifetime 194 + 1.47 us Dilution Factor 1 mL/mL
R2 .9975
Integrated 272667 FINAL RESULT 3.66E-04 + 1.25E-05 ~~u~~g/L WB 2-17-96
Range: HIGH

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		22B56
5695	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
U-02	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		226.00
LIQUID	R2 VALUE		0.9982
Batch Number	RANGE (HIGH OR LOW)		HIGH
96001269	INSTRUMENT UNCERTAINTY	(IU)	2.24E-06
Rerun	INSTRUMENT RESULT	(IR)	6.84E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		6.84E-02
Sample #	VALUE OF STANDARD		6.38E-02
STD	%RECOVERY		107.21
Instrument Code	RELATIVE % UNCERTAINTY		3.3
UO1			
Prepared By			
DLH			
Chemist			
JLS			
Analyst			
WGB			
Date Complete			
02/20/96			
Analysis Date			
02/17/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	WGB	Date:	20-Feb-96
Signature of Chemist:	JLS	Date:	

STANDARD.WB1 REV 1.2 925009ML

3011

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5695	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
U-02	DIGEST FACTOR	(Dg/L)	2.1196
Matrix	LIFETIME IN MICROSECONDS		316.00
SOLID	R2 VALUE		0.9445
Batch Number	RANGE (HIGH OR LOW)		LOW
96001269	INSTRUMENT UNCERTAINTY	(IU)	4.85E-09
Rerun	INSTRUMENT RESULT	(IR)	1.05E-07
0	DETECTION LEVEL µg/g		1.75E-02
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		1.05E-07
Sample #	RESULT (µg/g)		4.95E-02
PREP-BLANK	RELATIVE % UNCERTAINTY		4.6
Instrument Code			
UO1			
Prepared By			
DLH			
Chemist			
JLS			
Analyst			
WGB			
Date Complete			
02/20/96			
Analysis Date			
02/17/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	WGB	Date:	20-Feb-96
Signature of Chemist:	JLS	Date:	

BLANK.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5695	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
U-02	DIGEST FACTOR	(Dg/L)	2.1196
Matrix	LIFETIME IN MICROSECONDS		196.00
SOLID	R2 VALUE		0.9969
Batch Number	RANGE (HIGH OR LOW)		HIGH
96001269	INSTRUMENT UNCERTAINTY	(IU)	3.29E-06
Rerun	INSTRUMENT RESULT	(IR)	9.37E-05
1	DETECTION LEVEL µg/g		1.75E-02
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		9.37E-05
Sample #	RESULT (µg/g)		4.42E+01
S95T004187	RELATIVE % UNCERTAINTY		3.5
Instrument Code			
UO1			
Prepared By	Result = Conc. in Solution (g/L) * 1000000 / Dg/L		
DLH			
Chemist	Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF		
JLS			
Analyst	Relative % Uncertainty = IU / IR * 100		
WGB			
Date Complete	Concentration in Solution (g/L) = IR * DF * PF		
02/20/96			
Analysis Date			
02/17/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Analyst:	WGB	Date:	20-Feb-96
Signature of Chemist:	JLS	Date:	

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5695	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
	DIGEST FACTOR	(Dg/L)	2.1160
Matrix	LIFETIME IN MICROSECONDS		194.00
SOLID	R2 VALUE		0.9975
Batch Number	RANGE (HIGH OR LOW)		HIGH
96001269	INSTRUMENT UNCERTAINTY	(IU)	1.25E-05
Rerun	INSTRUMENT RESULT	(IR)	3.66E-04
1	DETECTION LEVEL µg/g		1.75E-02
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		3.66E-04
Sample #	RESULT (µg/g)		1.73E+02
S95T004187	RELATIVE % UNCERTAINTY		3.4
Instrument Code			
UO1			
Prepared By	Result = Conc. in Solution (g/L) * 1000000 / Dg/L		
DLH			
Chemist	Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF		
JLS			
Analyst	Relative % Uncertainty = IU / IR * 100		
WGB			
Date Complete	Concentration in Solution (g/L) = IR * DF * PF		
02/20/96			
Analysis Date			
02/17/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Analyst:	WGB	Date:	20-Feb-96
Signature of Chemist:	JLS	Date:	

SAMPLE.WB1 REV 1.2 925009ML

LABCORE Completed Worklist Report for Worklist# 5771

Analyst: dgg **Instrument:** U01 **Book#** 22856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10 ML SAMPLE PREP. USE 0.1ML SPIKE.

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		aU-01	U-02	SOLID	6.38E-02	6.32E-02	99.060	% Recovery
2	BLNK-PREP		0		aU-01	U-02	SOLID	1	7.92E-01	0.790	ug/g
3	SAMPLE	S96T000379	0	Z	aU-01	U-02	SOLID	N/A	1.67E+02	0.162	ug/g
3	SAMPLE	S96T000379	0	Z	aU-01	U-02E	SOLID	N/A	1.73E+00	1.730	ug/g
4	DUP	S96T000379	0	Z	aU-01	U-02	SOLID	1.67E+02	1.83E+02	9.140	RPD
5	SPK	S96T000379	0	Z	aU-01	U-02	SOLID	5.69E+01	6.07E+01	106.680	% Recovery

Final page for worklist# 5771

Analyst Signature	Date	Analyst Signature	Date

2/29/96

Reviewer Signature Date

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 5771

Analyst: DBB **Instrument:** U01 _____ **Book#** 22B56

Method: LA-925-009 Rev/Mod A-1 Spk # 22B55

Worklist Comment: 1-10 ML SAMPLE PREP. USE 0.1ML SPIKE.

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				U-02	SOLID		
2	BLNK-PREP				U-02	SOLID		
3	SAMPLE	S96T000379	0	Z	U-02	SOLID	95000229	BY-106
		Analytes Requested: U-02						
4	DUP	S96T000379	0	Z	U-02	SOLID		
5	SPK	S96T000379	0	Z	U-02	SOLID		

Final page for worklist # 5771

D B Buffum 2-17-96 / 1415
Analyst Signature **Date**

[illegible] 2-19-96
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

URANIUM ANALYSIS

Sample ID 22B56
Description LMCS STD.
Ref. Ratio 1.004
Laser Pulses 500
Lifetime 258 + 1.906 us
R2 .9977
Integrated 62100
Range: HIGH

Date/Time 02/17/96/11:02:52
Cal Y=6.57E+07X-9.77E-04
Intensity 3597 (t= 39 us)
Conc 6.32E-05 + 2.07E-06 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.32E-05 + 2.07E-06 ~~ug/L~~ 088 g/L

Sample ID PREP-BLANK
Description BY-106
Ref. Ratio 1.075
Laser Pulses 500
Lifetime 355 + 9.765 us
R2 .9685
Integrated 16307
Range: LOW

Date/Time 02/17/96/13:02:47
Cal Y=4.60E+09X-4.88E-04
Intensity 928 (t= 39 us)
Conc 1.81E-07 + 5.83E-09 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.81E-07 + 5.83E-09 ~~ug/L~~ 088 g/L

Sample ID S96T000379
Description BY-106
Ref. Ratio 1.038
Laser Pulses 500
Lifetime 234 + .991 us
R2 .9992
Integrated 829871
Range: LOW

Date/Time 02/17/96/11:10:05
Cal Y=4.60E+09X-4.88E-04
Intensity 49830 (t= 286 us)
Conc 3.81E-05 + 6.58E-07 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.81E-05 + 6.58E-07 ug/L

Sample ID S96T000379-DUP
Description BY-106
Ref. Ratio 1.042
Laser Pulses 500
Lifetime 244 + .944 us
R2 .9994
Integrated 824509
Range: LOW

Date/Time 02/17/96/15:05:04
Cal Y=4.60E+09X-4.88E-04
Intensity 48305 (t= 312 us)
Conc 3.88E-05 + 6.46E-07 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.88E-05 + 6.46E-07 ug/L

Sample ID S96T000379-SPK
Description BY-106
Ref. Ratio 1.037
Laser Pulses 500
Lifetime 213 + 1.134 us
R2 .9988
Integrated 525131
Range: HIGH

Date/Time 02/17/96/11:16:51
Cal Y=6.57E+07X-9.77E-04
Intensity 35985 (t= 39 us)
Conc 6.45E-04 + 2.09E-05 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.45E-04 + 2.09E-05 ug/L
DH 2/14/96

BEST AVAILABLE COPY

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		22B56
5771	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
@U-01	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		258.00
LIQUID	R2 VALUE		0.9977
Batch Number	RANGE (HIGH OR LOW)		HIGH
96001355	INSTRUMENT UNCERTAINTY	(IU)	2.07E-06
Rerun	INSTRUMENT RESULT	(IR)	6.32E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		6.32E-02
Sample #	VALUE OF STANDARD		6.38E-02
STD	%RECOVERY		99.06
Instrument Code	RELATIVE % UNCERTAINTY		3.3
U01			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/19/96			
Analysis Date			
02/17/96			
Analysis Time			
02:15 PM			
Sample Point			
BY-106			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	DGG	Date:	19-Feb-96
Signature of Chemist: Jennifer L. Schlipsen	JLS	Date:	2/20/96

STANDARD.WB1 REV 1.2 925009ML

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5771	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.2848
Matrix	LIFETIME IN MICROSECONDS		355.00
SOLID	R2 VALUE		0.9685
Batch Number	RANGE (HIGH OR LOW)		LOW
96001355	INSTRUMENT UNCERTAINTY	(IU)	5.83E-09
Rerun	INSTRUMENT RESULT	(IR)	1.81E-07
0	DETECTION LEVEL µg/g		1.62E-01
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		1.81E-06
Sample #	RESULT (µg/g)		7.92E-01
PREP-BLANK	RELATIVE % UNCERTAINTY		3.2
Instrument Code			
U01			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/19/96			
Analysis Date			
02/17/96			
Analysis Time			
02:15 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	19-Feb-96
Signature of Chemist:	JLS	Date:	2/20/96

BLANK.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM3

WHC-SD-WM-DP-103, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5771	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.2848
Matrix	LIFETIME IN MICROSECONDS		234.00
SOLID	R2 VALUE		0.9992
Batch Number	RANGE (HIGH OR LOW)		LOW
96001355	INSTRUMENT UNCERTAINTY	(IU)	6.58E-07
Rerun	INSTRUMENT RESULT	(IR)	3.81E-05
0	DETECTION LEVEL µg/g		1.62E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		3.81E-04
Sample #	RESULT (µg/g)		1.67E+02
S96T000379	RELATIVE % UNCERTAINTY		1.7
Instrument Code			
U01			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/19/96			
Analysis Date			
02/17/96			
Analysis Time			
02:15 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	19-Feb-96
Signature of Chemist: Jennifer L. Sleppen	JLS	Date:	2/20/96

SAMPLE.WB1 REV 1.2 925009ML

3020

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
5771	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.1244
Matrix	LIFETIME IN MICROSECONDS		244.00
SOLID	R2 VALUE		0.9994
Batch Number	RANGE (HIGH OR LOW)		LOW
96001355	INSTRUMENT UNCERTAINTY	(IU)	6.46E-07
Rerun	INSTRUMENT RESULT	(IR)	3.88E-05
0	DETECTION LEVEL µg/g		1.74E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		3.88E-04
Sample #	RESULT (µg/g)		1.83E+02
S96T000379	RELATIVE % UNCERTAINTY		1.7
Instrument Code			
U01			
Prepared By			
GJH			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/19/96			
Analysis Date			
02/17/96			
Analysis Time			
02:15 PM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		DGG	Date:	19-Feb-96
Signature of Chemist:	Jennifer J. Johnson	JLS	Date:	2/20/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SPIKE5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SPIKE
SPK	SPIKE BOOK #		22B55
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
5771	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
@U-01	DIGEST FACTOR OF SAMPLE	(DDF)	2.2848
Matrix	LIFETIME IN MICROSECONDS		213.00
SOLID	R2 VALUE		0.9988
Batch Number	RANGE (HIGH OR LOW)		HIGH
96001355	INSTRUMENT RESULT	(IR)	6.45E-04
Rerun	CONCENTRATION IN SOLUTION (g/L)	(CONC)	6.45E-03
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
Sample Number	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FOR	(SR)	3.81E-04
S96T000379			
Instrument Code			
U01	Concentration = IR * DF * PF		
Prepared By			
GJH	QC Actual (µg/mL) = SV (g/L) * 1000		
Chemist			
JLS	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
Analyst			
DGG	% Recovery = QC FOUND / QC ACTUAL		
Date Complete			
02/19/96			
Analysis Date			
02/17/96	QC ACTUAL	=	5.69E+01 µg/mL
Analysis Time	QC FOUND	=	6.07E+01 µg/mL
02:15 PM	% SPIKE RECOVERY	=	106.7%
Sample Point			
BY-106			

Analyst:		DGG	Date:	19-Feb-96
Signature of Chemist:	Jennifer L. Sleppern	JLS	Date:	2/20/96

SPIKE.WB1 REV 1.2 925009ML

LABCORE Completed RadChem Report for Worklist#: 7355

Analyst: knt **Instrument:** U01 **Book#** 45854

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep.For spike use: 0.1ml spk. new

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0	@U-01	U-02	SOLID	0.0639	7.22e-2	112.990	% Recovery
1	STD		0	@U-01	U-02E	SOLID	1	3.3	3.300	% Inst Error
2	BLNK-PREP		0	@U-01	U-02	SOLID	1	5.64	5.640	ug/g
2	BLNK-PREP		0	@U-01	U-02E	SOLID	1	3.1	3.100	% Inst Error
3	SAMPLE	S96T001378	0 Z	@U-01	U-02	SOLID	N/A	2.18e+2	211.0e-002	ug/g
3	SAMPLE	S96T001378	0 Z	@U-01	U-02E	SOLID	N/A	1.4	0.0e+000	% Inst Error
4	DUP	S96T001378	0 Z	@U-01	U-02	SOLID	2.18e+2	1.96e+2	10.630	RPD
4	DUP	S96T001378	0 Z	@U-01	U-02E	SOLID	1	1.6	1.600	% Inst Error
5	SPK	S96T001378	0 Z	@U-01	U-02	SOLID	100	119	119.000	% Recovery
6	SAMPLE	S96T001415	0 Z	@U-01	U-02	SOLID	N/A	1.85e+2	209.0e-003	ug/g
6	SAMPLE	S96T001415	0 Z	@U-01	U-02E	SOLID	N/A	1.5	0.0e+000	% Inst Error
7	DUP	S96T001415	0 Z	@U-01	U-02	SOLID	1.85e+2	1.89e+2	2.140	RPD
7	DUP	S96T001415	0 Z	@U-01	U-02E	SOLID	1	1.7	1.700	% Inst Error

Final page for worklist# 7355

Analyst Signature **Date** **Analyst Signature** **Date**

Jennifer L. Skeppen 4/25/96
Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 7355

Analyst: KNT **Instrument:** U01 _____ **Book#** 45B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep.For spike use: 0.1ml spk. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S96T001378	0	Z	@U-01	SOLID	95000229	BY-106
		Analytes Requested:			U-02	, U-02E		
4	DUP	S96T001378	0	Z	@U-01	SOLID		
5	SPK	S96T001378	0	Z	@U-01	SOLID		
6	SAMPLE	S96T001415	0	Z	@U-01	SOLID	95000229	BY-106
		Analytes Requested:			U-02	, U-02E		
7	DUP	S96T001415	0	Z	@U-01	SOLID		

Final page for worklist # 7355

Kim Thomas 4-21-96
Analyst Signature **Date**

Sharon L Hale 4-24-96
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Background Report

Background for LOW Range
Laser Pulses 500

First Time Gate Used (sample) 4
Date/Time 04/20/96/21:19:24

Reference	Sample
Intensity 8128	Intensity 1158
Lifetime 342.51 + 2.2 us	
R2 .99826	
Intercept 8957.73	

Background Report

Background for HIGH Range
Laser Pulses 500

First Time Gate Used (sample) 4
Date/Time 04/20/96/21:21:00

Reference	Sample
Intensity 8147	Intensity 21
Lifetime 345.17 + 2.18 us	
R2 .99829	
Intercept 9001.63	

Standard Report

Standard for HIGH Range - 9.90E-04 g/L
Laser Pulses 500

Date/Time 04/20/96/22:06:51

Reference	Standard
Intensity 8164	Intensity 49533
Lifetime 337.35 + 1.36 us	Lifetime 227.5 + 1.09 us
R2 .99907	R2 .999
Intercept 9172.44	Intercept 59513.35 - 2.44E+02

BEST AVAILABLE COPY

Standard Report

Standard for HIGH Range - 4.98E-04 g/L
Laser Pulses 500 Date/Time 04/20/96/22:10:16

Reference	Standard
Intensity 8293	Intensity 26637
Lifetime 338.38 + 2.09 us	Lifetime 349.69 + 2.3 us
R2 .99834	R2 .9982
Intercept 9167.17	Intercept 29049.21 + 1.70E+02

Standard Report

Standard for LOW Range - 2.43E-06 g/L
Laser Pulses 500 Date/Time 04/20/96/22:14:02

Reference	Standard
Intensity 8142	Intensity 9545
Lifetime 335.61 + 1.25 us	Lifetime 332.61 + 2.27 us
R2 .99937	R2 .998
Intercept 9211.82	Intercept 10439.77 - 1.02E+02

Sample ID 45856 Date/Time 04/21/96/00:12:16
Description STD Cal Y=6.01E+07X-2.94E+02
Ref. Ratio 1.022 Intensity 3598 (t= 39 us)
Laser Pulses 500 Conc 7.22E-05 + 2.36E-06 g/L
Lifetime 291 + 1.723 us Dilution Factor 1 mL/mL
R2 .9935
Integrated 67125 FINAL RESULT 7.22E-05 + 2.36E-06 g/L
Range: HIGH

Sample ID BLNK-PREP Date/Time 04/21/96/00:15:50
Description Cal Y=6.01E+07X-2.94E+02
Ref. Ratio 1.022 Intensity -3 (t= 39 us)
Laser Pulses 500 Conc 4.93E-06 + 1.36E-07 g/L
Lifetime + us Dilution Factor 1 mL/mL
R2
Integrated 0 FINAL RESULT 4.93E-06 + 1.36E-07 g/L
Range: HIGH

BEST AVAILABLE COPY

Sample ID BLNK-PREP
Description
Ref. Ratio 1.032
Laser Pulses 500
Lifetime 395 ± 11.597 us
R2 .9643
Integrated 8782
Range: LOW

Date/Time 04/21/96/00:16:31
Cal Y=4.22E+09X0
Intensity 412 (t= 39 us)
Conc 9.87E-08 ± 3.04E-09 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 9.87E-08 ± 3.04E-09 g/L

Sample ID 896T001378
Description SAM
Ref. Ratio 1.038
Laser Pulses 500
Lifetime 233 ± .643 us
R2 .9994
Integrated 217609
Range: LOW

Date/Time 04/21/96/00:33:12
Cal Y=4.22E+09X0
Intensity 13247 (t= 39 us)
Conc 3.81E-06 ± 5.30E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.81E-06 ± 5.30E-08 g/L

Sample ID 896T001378
Description DUP
Ref. Ratio 1.056
Laser Pulses 500
Lifetime 262 ± 1.056 us
R2 .9993
Integrated 883919
Range: LOW

Date/Time 04/21/96/00:35:59
Cal Y=4.22E+09X0
Intensity 48571 (t= 325 us)
Conc 4.12E-05 ± 6.66E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 4.12E-05 ± 6.66E-07 g/L

Sample ID 896T001378
Description SPK
Ref. Ratio 1.054
Laser Pulses 500
Lifetime 236 ± 1.251 us
R2 .9987
Integrated 587687
Range: HIGH

Date/Time 04/21/96/00:38:35
Cal Y=6.01E+07X-2.94E+02
Intensity 36627 (t= 39 us)
Conc 7.18E-04 ± 2.37E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 7.18E-04 ± 2.37E-05 g/L

Sample ID 896T001415
Description DUP
Ref. Ratio 1.062
Laser Pulses 500
Lifetime 268 ± 1.368 us
R2 .9989
Integrated 884474
Range: LOW

Date/Time 04/21/96/00:45:05
Cal Y=4.22E+09X0
Intensity 48072 (t= 266 us)
Conc 3.40E-05 ± 5.84E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.40E-05 ± 5.84E-07 g/L

BEST AVAILABLE COPY

```
Sample ID  S96T001415                Date/Time  04/21/96/01:46:33
Description  SAM                     Cal Y=4.22E+09X0
Ref. Ratio 1.039                     Intensity 50361     (t= 273     us)
Laser Pulses 500                     Conc 3.29E-05 + 5.05E-07 g/L
Lifetime 278 + 1.112 us              Dilution Factor 1 mL/mL
R2 .9993
Integrated 954068          FINAL RESULT  3.29E-05 + 5.05E-07 g/L
Range: LOW
-------------------------------------------------------------------------------
```

BEST AVAILABLE COPY

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		45B56
7355	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
@U-01	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		291.00
LIQUID	R2 VALUE		0.9985
Batch Number	RANGE (HIGH OR LOW)		HIGH
96003105	INSTRUMENT UNCERTAINTY	(IU)	2.36E-06
Rerun	INSTRUMENT RESULT	(IR)	7.22E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		7.22E-02
Sample #	VALUE OF STANDARD		6.39E-02
WL7355	%RECOVERY		112.99
Instrument Code	RELATIVE % UNCERTAINTY		3.3
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/24/96			
Analysis Date			
04/21/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	KNT	Date:	24-Apr-96
Signature of Chemist:	JLS	Date:	

STANDARD.WB1 REV 2.0 925009ML

WORKBOOK PAGE: BLANK2

WHC-SD-WM-DP-103, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7355	DILUTION FACTOR OF SAMPLE	(DF)	11.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	1.9264
Matrix	LIFETIME IN MICROSECONDS		395.00
SOLID	R2 VALUE		0.9643
Batch Number	RANGE (HIGH OR LOW)		LOW
96003105	INSTRUMENT UNCERTAINTY	(IU)	3.04E-09
Rerun	INSTRUMENT RESULT	(IR)	9.87E-08
0	DETECTION LEVEL µg/g		2.11E+00
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		1.09E-05
Sample #	RESULT (µg/g)		5.64E+00
WL7355	RELATIVE % UNCERTAINTY		3.1
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/24/96			
Analysis Date			
04/21/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Apr-96 .
Signature of Chemist:	JLS	Date:	

BLANK.WB1 REV 2.0 925009ML

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7355	DILUTION FACTOR OF SAMPLE	(DF)	11.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	1.9264
Matrix	LIFETIME IN MICROSECONDS		233.00
SOLID	R2 VALUE		0.9994
Batch Number	RANGE (HIGH OR LOW)		LOW
96003105	INSTRUMENT UNCERTAINTY	(IU)	5.30E-08
Rerun	INSTRUMENT RESULT	(IR)	3.81E-06
0	DETECTION LEVEL µg/g		2.11E+00
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		4.19E-04
Sample #	RESULT (µg/g)		2.18E+02
S96T001378	RELATIVE % UNCERTAINTY		1.4
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/24/96			
Analysis Date			
04/21/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Apr-96
Signature of Chemist:	JLS	Date:	

SAMPLE.WB1 REV 2.0 925009ML

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			DUP
DUP	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work List	DILUTION FACTOR OF SAMPLE	(DF)	1.00
7355	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
Test Code	DIGEST FACTOR	(Dg/L)	2.1064
@U-01	LIFETIME IN MICROSECONDS		262.00
Matrix	R2 VALUE		0.9993
SOLID	RANGE (HIGH OR LOW)		LOW
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	6.66E-07
96003105	INSTRUMENT RESULT	(IR)	4.12E-05
Rerun	DETECTION LEVEL µg/g		1.76E-01
0			
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		4.12E-04
Sample #	RESULT (µg/g)		1.96E+02
S96T001378	RELATIVE % UNCERTAINTY		1.6
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/24/96			
Analysis Date			
04/21/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Apr-96
Signature of Chemist:	JLS	Date:	

SAMPLE.WB1 REV 2.0 925009ML

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SPIKE
SPIKE	SPIKE BOOK #		22B55
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
7355	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
@U-01	DIGEST FACTOR OF SAMPLE	(DDF)	1.9264
Matrix	LIFETIME IN MICROSECONDS		236.00
SOLID	R2 VALUE		0.9987
Batch Number	RANGE (HIGH OR LOW)		HIGH
96003105	INSTRUMENT RESULT	(IR)	7.18E-04
Rerun	CONCENTRATION IN SOLUTION (g/L)	(CONC)	7.18E-03
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
Sample #	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FO	(SR)	0.0004
S96T001378			
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/24/96			
Analysis Date			
04/21/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Concentration = IR * DF * PF

QC Actual (µg/mL) = SV (g/L) * 1000

QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000

% Recovery = QC FOUND / QC ACTUAL

QC ACTUAL	=	5.69E+01	µg/mL
QC FOUND	=	6.76E+01	µg/mL
% SPIKE RECOVERY	=	118.8%	

Analyst:	KNT	Date: 24-Apr-96
Signature of Chemist:	JLS	Date:

WORKBOOK PAGE: SAM6

WHC-SD-WM-DP-103, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7355	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	1.7744
Matrix	LIFETIME IN MICROSECONDS		278.00
SOLID	R2 VALUE		0.9993
Batch Number	RANGE (HIGH OR LOW)		LOW
96003105	INSTRUMENT UNCERTAINTY	(IU)	5.05E-07
Rerun	INSTRUMENT RESULT	(IR)	3.29E-05
0	DETECTION LEVEL µg/g		2.09E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		3.29E-04
Sample #	RESULT (µg/g)		1.85E+02
S96T001415	RELATIVE % UNCERTAINTY		1.5
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/24/96			
Analysis Date			
04/21/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Apr-96
Signature of Chemist:	JLS	Date:	

SAMPLE.WB1 REV 2.0 925009ML

WORKBOOK PAGE: DUP7

WHC-SD-WM-DP-103, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7355	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	1.7996
Matrix	LIFETIME IN MICROSECONDS		268.00
SOLID	R2 VALUE		0.9989
Batch Number	RANGE (HIGH OR LOW)		LOW
96003105	INSTRUMENT UNCERTAINTY	(IU)	5.84E-07
Rerun	INSTRUMENT RESULT	(IR)	3.40E-05
0	DETECTION LEVEL µg/g		2.06E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		3.40E-04
Sample #	RESULT (µg/g)		1.89E+02
S96T001415	RELATIVE % UNCERTAINTY		1.7
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/24/96			
Analysis Date			
04/21/96			
Analysis Time			
01:40 AM			
Sample Point			
BY-106			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	24-Apr-96
Signature of Chemist:	JLS	Date:	

SAMPLE.WB1 REV 2.0 925009ML

P:\QPRO\METHODS\925009ML.WB1 04/24/96 14:40:24