RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
24462-WES-1367 (923-3418)

9413275.0513

MEMORANDUM

FEB 1994 RECEIVED TQO

TO: 200 UP-2 Project QA Record

February 10, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE 24462-WES-1367 (923-3418)

INTRODUCTION

This memo presents the results of data validation on data package 24462-WES-1367 consisting of one soil sample for radiochemistry analysis. The sample was analyzed by the Teledyne Isotopes laboratory under contract to Weston Analytics using WHC approved methods. The sample validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA*	ANALYSIS
B09314	8/22/93	GS	SEE NOTE 1

NOTES:

* GS indicates the media type is soil.

1. Indicates the samples were analyzed for gross alpha, gross beta, strontium-90, technetium-99, isotopic plutonium, uranium, curium-244, and americium-241 by alpha spectroscopy, and selected isotopes by gamma spectroscopy.

RECEIVED FEB 1 - 1994 VALIDATION DOCUMENTATION SDLA

9413225.0514

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met except for the blank spike sample recovery for uranium-235 as discussed under "Minor Deficiencies" below.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were acceptable for all sample results.

MEMORANDUM

TO: 200-UP-2 Project QA Record February 10, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE 24462-WES-1367 (923-E418, 24462R.UP2)

INTRODUCTION

This memo presents the results of data validation on data package 24462 WES-1367 consisting of one soil samples for radiochemistry analysis. The samples was analyzed by the Teledyne Isotopes laboratory under contract to Weston Analytics using WHC approved methods. The sample validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA *	ANALYSIS
B09314	8/22/93	GS	SEE NOTE 1

NOTES:

* GS indicates the media type is soil.

1. Indiates the sample was analyzed for gross alpha, gross beta, strontium-90, technetium-99, isotopic plutonium, uranium, curium-244, and americium 241 by alpha spectroscopy, and selected isotopes by gamma spectroscopy.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met except for the blank spike sample recovery for uranium-235 as discussed under "Minor Deficiencies" below.

Sample Result Verification. All sample results were supported in the raw data with the exception of the gross alpha results. Recalculated results for gross alpha did not match the reported values therefore the results have been changed on the report form.

Detection Limits. Detection limit goals were met for all sample results.

revised 3/23/94

9413225.0515

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of 35 determinations reported, all of which were determined to be valid. This results in a completeness of 100 percent, which statisfies the 90% objective of the work plan.

QUALIFIED DATA

Major Deficiencies

No major deficiencies were identified during data validation which required qualification of data as unusable.

Minor Deficiencies

The following minor deficiencies were identified during data validation which required qualification of data.

Laboratory Blanks

- For gamma spectrometry analysis the laboratory blank was analyzed in a different geometry and aliquot size than the associated samples, therefore the sample results have been qualified as estimated (J for detects, UJ for non-detects).

Laboratory Control Samples

- The uranium-235 result for sample "Distilled Spiked H2O" was below the control limit of 70% recovery, therefore sample B09314 has been qualified as estimated (UJ).

Data format presentation has been adjusted as follows:

- Sample results reported as less than (L.T.) by the laboratory have been qualified as undetected (U) on the sample result forms (see Attachment 3).

- Secondary results reported by the laboratory have been crossed out on the sample result forms for clarification purposes.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M0/3750. Westinghouse Hanford Company, Richland, Washington.

WHC 1993b, Data Validation Procedures for Radiochemical Analyses, WHC SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

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3/23/94

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9413225.0517

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9417225.0518

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

9413225.0519

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 24462-WES-1367	REVIEWER: T. STAPP	DATE: 2/10/94	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
ALL SECONDARY RESULTS	NONE	ALL	VALUES HAVE BEEN LINED OUT TO CLARIFY REPORTING OF DATA
ALL LESS THAN (L.T.) RESULTS	U	ALL	QUALIFIER APPLIED TO BE CONSISTENT WITH NORMAL REPORTING PRACTICE
URANIUM-235	UJ	B09314	LABORATORY CONTROL SAMPLE RECOVERY BELOW 70%.
All gamma detects	J	B09314	Blank sample analyzed in different geometry and aliquot size than sample
All gamma non-detects	UJ	B09314	
			[illegible] 3/22/94

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3/24/94 [illegible]

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

9113225.0521

Validated Data Summary, Data Package: 24462-WES-1367

Parameter	Sample Date Units	B09314 4-22-93 Result:	Q
TECHNETIUM-99	pCi/g	1.100	
GROSS ALPHA	pCi/g	5.500	
GROSS BETA	pCi/g	65.000	
STRONTIUM-90	pCi/g	16.000	
BERYLLIUM-7	pCi/g	0.200	UJ
SODIUM-22	pCi/g	0.020	UJ
POTASSIUM-40	pCi/g	12.100	J
MANGANESE-54	pCi/g	0.020	U
COBALT-58	pCi/g	0.020	U
IRON-59	pCi/g	0.050	UJ
COBALT-60	pCi/g	0.020	UJ
ZINC-65	pCi/g	0.050	UJ
ZIRCONIUM-95	pCi/g	0.020	UJ
RUTHENIUM-103	pCi/g	0.030	UJ
RUTHENIUM-106	pCi/g	0.200	UJ
IODINE-131	pCi/g	0.080	UJ
CESIUM-134	pCi/g	0.030	UJ
CESIUM-137	pCi/g	1.780	J
BARIUM-140	pCi/g	0.030	UJ
CERIUM-141	pCi/g	0.040	UJ
CERIUM-144	pCi/g	0.100	UJ
EUROPIUM-152	pCi/g	0.070	UJ
EUROPIUM-154	pCi/g	0.060	UJ
EUROPIUM-155	pCi/g	0.080	UJ
RADIUM-226	pCi/g	1.080	J
THORIUM-228	pCi/g	0.631	J
THORIUM-234	pCi/g	0.500	J
PLUTONIUM-238	pCi/g	0.007	J
URANIUM-234	pCi/g	0.160	
PLUTONIUM-239	pCi/g	0.007	U
URANIUM-235	pCi/g	0.006	UJ
URANIUM-238	pCi/g	0.160	
AMERICIUM-241	pCi/g	0.020	U
CURIUM-244	pCi/g	0.020	U
NEPTUNIUM-237	pCi/g	0.020	U

Verified 3/22/94

3/23/94

94/3225.0523

2-10-94

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/19/93

	WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 1
MRS JOSIE EDWARDS WESTON/WESTINGHOUSE/HANFORD 208 WELSH POOL ROAD PICKERING CREEK INDUSTRIAL PARK LIONVILLE PA 19341-1313	4-3478	LL-1140-F4	08/30/93	10/02/93	

SOIL

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/N *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
24462	9308L675-001	809314	08/22				TC-99	1.1 +-0.6 E 00	3/22/94	09/19			3
							GR-A	5.5 ~~4.2~~ +-1.5 E 00		10/08			3
							GR-B	8.5 +-0.4 E 01		09/04			3
							SR-90	1.6 +-0.1 E 01		09/09			3
							~~GR-A~~	~~L.T. 4. E-00~~		~~10/08~~			3
							~~GR-B~~	~~L.T. 2. E-00~~		~~09/04~~			3
							~~SR-90~~	~~L.T. 5. E-02~~		~~09/09~~			3
							~~TC-99~~	~~L.T. 7. E-01~~		~~09/19~~			3
							BE-7	L.T. 2. E-01		09/07	UJ		4
							~~BE-7~~	~~7.1 +-13.0E-02~~		~~09/07~~			4
							NA-22	L.T. 2. E-02		09/07	UJ		4
							~~NA-22~~	~~7.5 +-13.0E-03~~		~~09/07~~			4
							K-40	~~1.21 +-6.12E-01~~	12.1 ± 0.47 E00	09/07	J		4
							~~K-40~~	~~L.T. 1. E-00~~		~~09/07~~			4
							MN-54	L.T. 2. E-02		09/07	UJ		4
							~~MN-54~~	~~4.5 +-12.7E-03~~		~~09/07~~			4
							CO-58	L.T. 2. E-02		09/07	UJ		4
							~~CO-58~~	~~3.3 +-13.0E-03~~		~~09/07~~			4
							FE-59	L.T. 5. E-02		09/07	UJ		4
							~~FE-59~~	~~5.3 +-30.4E-03~~		~~09/07~~			4
							CO-60	L.T. 2. E-02		09/07	UJ		4
							~~CO-60~~	~~0.0 +-1.2E-02~~		~~09/07~~			4
							ZN-65	L.T. 5. E-02		09/07	UJ		4
							~~ZN-65~~	~~9.1 +-27.1E-02~~		~~09/07~~			4
							ZR-95	L.T. 2. E-02		09/07	UJ		4
							~~ZR-95~~	~~4.1 +-14.7E-03~~		~~09/07~~			4
							RU-103	L.T. 3. E-02		09/07	UJ		4
							~~RU-103~~	~~0.0 +-1.6E-02~~		~~09/07~~			4
							RU-106	L.T. 2. E-01		09/07	UJ		4
							~~RU-106~~	~~7.1 +-12.4E-02~~		~~09/07~~			4
							I-131	L.T. 8. E-02		09/07	UJ		4
							~~I-131~~	~~1.4 +-5.0E-02~~		~~09/07~~			4

Verified: 2-10-94

3/22/94

3/22/94

009

SENT BY:SEATTLE : 3-23-94 : 5:23PM : GOLDER ASSOCIATES→ 509 372 2106:# 9/10

9413225.0524

RS 2-10-94

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/18/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE 2
4-3478	LL-1140-F4	08/30/93	10/02/93	

MRS JOSIE EDWARDS
WESTON/WESTINGHOUSE/HANFORD
208 WELSH POOL ROAD
PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

SOIL

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	TIME	STOP DATE	TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
24462	9308L675-001	309314	08/22				CS-134	L.T. 3. E-02		09/07	UJ		4
							~~CS-134~~	~~2.4 +- 1.5E-02~~		~~09/07~~			4
							CS-137	1.78+-0.18E 00	1.78± 0.047 Ecc	09/07	J		4
							~~CS-137~~	~~L.T. 1. E-01~~		~~09/07~~			4
							BA-140	L.T. 3. E-02		09/07	UJ		4
							~~BA-140~~	~~2.8 +- 2.4E-02~~		~~09/07~~			4
							CE-141	L.T. 4. E-02		09/07	UJ		4
							~~CE-141~~	~~1.6 +- 2.4E-02~~		~~09/07~~			4
							CE-144	L.T. 1. E-01		09/07	UJ		4
							~~CE-144~~	~~7.1 +- 8.3E-02~~		~~09/07~~			4
							EU-152	L.T. 7. E-02		09/07	UJ		4
							~~EU-152~~	~~3.7 +- 0.5E-01~~		~~09/07~~			4
							EU-154	L.T. 6. E-02		09/07	UJ		4
							~~EU-154~~	~~2.3 +- 4.1E-02~~		~~09/07~~			4
							EU-155	L.T. 8. E-02		09/07	UJ		4
							~~EU-155~~	~~9.3 +- 46.9E-03~~		~~09/07~~			4
							RA-226	1.08+-0.27E 00		09/07	J		4
							~~RA-226~~	~~L.T. 5. E-01~~		~~09/07~~			4
							TH-228	~~6.31+-0.63E-01~~	6.31± 0.28 E-01	09/07	J		4
							~~TH-228~~	~~L.T. 7. E-02~~		~~09/07~~			4
							TH-234	L.T. 5. E-01		09/07	UJ		4
							~~TH-234~~	~~3.5 +- 2.8E-01~~		~~09/07~~			4
							PU-238	L.T. 7. E-03		10/01	U		6
							U-234	1.6 +-0.3 E-01		09/14			6
							PU-239	L.T. 7. E-03		10/01	U		6
							U-235	L.T. 6. E-03		09/14	UJ		6
							U-238	1.6 +-0.3 E-01		09/14			6
							AM-241	L.T. 2. E-02		09/14	U		6
							CM-244	L.T. 2. E-02		09/04	U		6
							NP-237	L.T. 2. E-02		11/16	U		6
							~~AM-241~~	~~1.4 +- 14.3E-03~~		~~09/14~~			6
							~~PU-238~~	~~4.2 +- 42.3E-04~~		~~10/01~~			6

Verified : RS 2-10-94
[signature] 2/22/94

3/23/94
[signature]

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TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 11/18/93

PAGE 3

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE
4-3478	LL-1140-F4	08/30/93	10/02/93

MRS JOSIE EDWARDS
WESTON/WESTINGHOUSE/HANFORD
208 WELSH POOL ROAD
PICKERING CREEK INDUSTRIAL PARK
LIONVILLE PA 19341-1313

S O I L

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/GM DRY)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
24462	9308L675-001	B09314	08/22				~~PU-239~~	~~3.8 +-6.4 E-03~~		~~10/01~~			6
							~~U-234~~	~~L.T. 6. E-03~~		~~09/14~~			6
							~~U-235~~	~~6.5 +-7.3 E-03~~		~~09/14~~			6
							~~U-238~~	~~L.T. 6. E-03~~		~~09/14~~			6
							~~NP-237~~	~~4.7 +-13.3E-03~~		~~11/16~~			6
							~~EM-244~~	~~1.4 +-14.3E-03~~		~~09/04~~			6
24633	9308L675-001DUPB09314		08/22				TC-99	L.T. 8. E-01		09/19			3
							GR-A	4.6 +-3.6 E 00		10/08			3
							GR-B	8.4 +-0.4 E 01		09/04			3
							SR-90	1.5 +-0.1 E 01		09/11			3
							GR-A	L.T. 4. E 00		10/08			3
							GR-B	L.T. 2. E 00		09/04			3
							SR-90	L.T. 9. E-02		09/11			3
							TC-99	1.3 +-5.32E-01		09/19			3
							BE-7	L.T. 2. E-01		09/08			4
							BE-7	5.1 +-14.7E-02		09/08			4
							NA-22	L.T. 3. E-02		09/08			4
							NA-22 -	1.3 +- 1.7E-02		09/08			4
							K-40	1.23+-0.12E 01		09/08			4
							K-40	L.T. 1. E 00		09/08			4
							MN-54	L.T. 2. E-02		09/08			4
							MN-54	1.3 +- 1.4E-02		09/08			4
							CO-58	L.T. 2. E-02		09/08			4
							CO-58 -	3.8 +-13.7E-03		09/08			4
							FE-59	L.T. 5. E-02		09/08			4
							FE-59 -	1.4 +- 3.1E-02		09/08			4
							CO-60	L.T. 2. E-02		09/08			4
							CO-60	5.7 +-11.9E-03		09/08			4
							ZN-65	L.T. 5. E-02		09/08			4
							ZN-65	1.6 +-28.8E-03		09/08			4
							ZR-95	L.T. 3. E-02		09/08			4

Verified 2-10-94

011

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9413225.0526

TELEDYNE ISOTOPES
50 VAN BUREN AVENUE
PO BOX 1235
WESTWOOD NJ 07675-1235
(201) 664-7070

WESTON/WESTINGHOUSE/HANFORD

Case Narrative/Cover Sheet for Reports of Analysis and Lab Data

Date 11/22/93

TI #'s 24462, 24633, 24567 - 24568

WO # 4-3478

NOV 1993
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SDLA

RECORD COPY

Comments:

There were no unusual occurances with the analysis of these samples.

Contents:

	Procedure #'s	Bench & Work Sheet Pages	Calibration Pages	Tracers/ Carrier Pages
Reports of Analysis		10		
Gross Alpha	PRO-032-1	3	18	
Gross Beta		-	-	
Sr-90	PRO-032-38	5	25	2
Gamma	PRO-042-5	11	10	
Tc-99	PRO-032-78	5	54	1
Pu-238,239/240	PRO-062-114	42	40	22
U-235-235-238	PRO-062-110	-	-	-
Am-241	PRO-062-111	-	-	-
Cm-244	PRO-062-111	-	-	-
C-O-C		1		
Other		-		

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature." A. J. Hogan

013
12-10-94
1

EasyLink 62877198 • • • FAX (201) 664-5586

9413225.0527

TELEDYNE ISOTOPES

Spike Activity for TI #24567

Nuclide	Activity pCi/l	Acceptable Range
Technetium-99	98.5	79. - 118.
Gross Alpha	11.2	6. - 17.
Gross Beta	22.	17. - 28.
Strontium-90	40.	34. - 46.
Cobalt-60	2.5 E 04	1.7 - 3.2 E 04
Cesium-137	2.16 E 04	1.51 - 2.81 E 04
Plutonium-239	1.09	0.9 - 1.3
Uranium-234	2.1	1.8 - 2.4
Uranium-235	0.095	0.08 - 0.11
Uranium-238	2.1	1.8 - 2.4
Americium-241	1.9	1.6 - 2.2
Neptunium-237	1.7	1.4 - 2.0

9413225.0528

KS 2-10-94 2

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 8/22/93

Ice Chest No.

Field Logbook No. EFL-1091

Bill of Lading/Airbill No.

Offsite Property No.

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to ~~WESTON TMA~~ Weston

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE 9308L675-C

Sample Identification

B09314 Temp. = 5.6°

1)

1,500ml P:CLP;TAL Metals,Hg,Ti
1,125ml Gs:VOA CLP
1,500ml aG:Semi-VOA CLP
1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
1,250ml G:Cyanide CLP
1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

2)

1,500ml P:CLP;TAL Metals,Hg,Ti
1,125ml Gs:VOA CLP
1,500ml aG:Semi-VOA CLP
1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
1,250ml G:Cyanide CLP
1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

JCR 8/22/93

3)

1,500ml P:CLP;TAL Metals,Hg,Ti
1,125ml Gs:VOA CLP
1,500ml aG:Semi-VOA CLP
1,250ml G:Anions F,Cl,SO4 (EPA 300.0)
1,125ml P/G:Anions NO2,NO3 (EPA 353.1)
1,250ml G:Cyanide CLP
1,1000ml P/G:Gross alpha/beta (PRO-032-15), Gamma Spec to include,Cs-134,Cs-137,Co-60,Eu-152, Eu-154,Eu-155,K-40,Ru-106,Na-22 (PRO-042-5), U-235,U-234,U-238 (PRO-052-32) Np-237,(PRO-042-5) Pu-238,Pu-239/240 (PRO-052-32) Sr-90 (PRO-032-38,PRO-032-25) Tc-99 (PRO-032-78) Am-241,Cm-244 (PRO-052-32 or PRO-062-109) Se-79

[] Field Transfer of Custody

Chain of Possession (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
8/22/93 [signature] 1131	Helani Lyers [signature]	8/22/93 1133
8/23/93 Helani Lyers 0915		
[signature]	B. Burnett	8-24-93 09:00

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

RS 2-11-94 ~~0010~~

~~0016~~

9413225.0529

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9413225.0530

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT:	200 UP-2	DATA PACKAGE:	24462-WES-1367
VALIDATOR:	T. Stapp	LAB: WESTON	DATE: 2-9-94
CASE:		SDG:	

ANALYSES PERFORMED

☑ Gross Alpha/Beta	☑ Strontium-90	☑ Technetium-99	☑ Alpha Spectroscopy	☑ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☐		

SAMPLES/MATRIX B09314 / SOIL

9413225.0531

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments:

2. Initial Calibration . . . . . ☐ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . (Yes) No N/A

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments:

~~A1~~ FC 2-10-94

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis?	Yes	No	N/A
Calibration check acceptable?	Yes	No	N/A
Calibration check standards NIST traceable?	Yes	No	N/A
Calibration check standards expired?	Yes	No	N/A

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed?	Yes	No	N/A
Method blank results acceptable?	Yes	No	N/A
Analytes detected in method blank?	Yes	No	N/A
Field blank(s) analyzed?	Yes	No	N/A
Field blank results acceptable?	Yes	No	N/A
Analytes detected in field blank(s)?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments: Method blank not analyzed in same geometry/Aliquot size as samples, qualify gamma results as estimated (J/UJ).

3/22/94

5. Matrix Spikes . . . . . ☑ N/A

Matrix spike analyzed?	Yes	No	N/A
Spike recoveries acceptable?	Yes	No	N/A
Spike source traceable?	Yes	No	N/A
Spike source expired?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments:

2-10-94

3/23/94

9413225.0532

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . as. BSS (Blank Spike Sample) . . . Yes No N/A

LCS recoveries acceptable? . . . . . Yes- No N/A Note ①

LCS traceable? . . . . . Yes No N/A

Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: ① U235 recovery @ 47% qualifies this isotope J/UJ for B09314.

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? α Spec., Sr90 . . Tc99, NP-237 . . Yes No N/A

Chemical recovery acceptable? . . . . . Yes No N/A

Chemical carrier traceable? . . . . . Yes No N/A

Chemical carrier expired? . . . . . Yes No N/A

Transcription/Calculation errors? . . . . . Yes No N/A

Comments:

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . Yes No N/A

RPD Values Acceptable? . . . . . Yes No N/A

Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:

~~A3~~ XS 2-10-94

9413225.0533

9. Field QC Samples . . . . . ☒ N/A

Field duplicate sample(s) analyzed? . . . . . Yes No N/A
Field duplicate RPD values acceptable? . . . . . Yes No N/A
Field split sample(s) analyzed? . . . . . Yes No N/A
Field split RPD values acceptable? . . . . . Yes No N/A
Performance audit sample(s) analyzed? . . . . . Yes No N/A
Performance audit sample results acceptable? . . . . . Yes No N/A

Comments:

10. Holding Times

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

Sample	Collected	Grs α/β	Gamma Spec	Sr90	Tc99
B09314	8-22-93	✓	✓	✓	✓

✓-Indicates analysis within 180 days. No qualifier.

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . (Yes) No N/A
Results supported in raw data? . . . . . (Yes) No N/A
Results Acceptable? . . . . . Yes (No) N/A Note 1
Transcription/Calculation errors? . . . . . (Yes) No N/A Note 2
MDA's meet required detection limits? . . . . . (Yes) No N/A
Transcription/calculation errors? . . . . . Yes (No) N/A

Comments: 1 Gross α result cannot be confirmed by recalculation. No qualif.
2 Gamma spec error amounts for K-40, Cs137, and Th-228 are not supported in raw data and have been changed on Lab Report Forms.

~~A-1~~ FS 2-10-94

9413225.0534

Comments: For sample result qualification summary, see attachment #2.

2-10-94

A-5

9413225.0535

WESTINGHOUSE/HANFORD RADIOCHEMISTRY 10-Feb-94 SDG 24462-WES-1367

TECHNETIUM-99 RESULTS

SDG	HEIS	Lab No.	Date Analyzed	Det. ID	Spl Amt.	Yield	Gross cnts	Count Time	Bkg. cpm	Det. Eff.	Tc99 Result Calc.	Result Rptd	MDA Calc.	MDA Rptd.
24462	B09314	24462	9/19/93	B4	1	0.522	46	100	0.17	0.235	1.1	1.10	0.71	<0.7
	B09314 DUP	24633	9/19/93	B5	1	0.441	21	100	0.18	0.24	0.1	<0.8	0.84	<0.8
	BLANK SPIKE	24567	9/19/93	D2	0.2	0.581	548	100	0.18	0.23	89.3	89	3.33	<3
	BLANK	24568	9/19/93	D3	0.2	0.559	15	100	0.17	0.232	-0.3	<3	3.34	<3

Verified RS 2-10-94

GROSS ALPHA RESULTS

SDG	HEIS#	Lab No.	Det.	Spl. Amt.	Date Alpha Counted	GROSS ALPHA Gross Counts	Count Time	Bkg. cpm	Eff.	Result Calc	Result Rptd	MDA Calc	MDA Rptd
24462	B09314	24462	T3	1	10/08/93	16	50	0.04	0.023	5.48	4.2	2.6	<4
	B09314 DUP	24633	T3	1	10/08/93	17	50	0.04	0.023	5.88	4.6	2.6	<4
	BLANK SPIKE	24567	T3	1	9/04/93	236	50	0.04	0.153	13.78	14	0.4	<0.4
	BLANK	24568	T3	1	9/04/93	7	50	0.04	0.152	0.30	<0.4	0.4	<0.4

Verified RZ-10-94

GROSS BETA RESULTS

SDG	HEIS#	Lab No.	Det.	Date Beta Counted	GROSS BETA Gross Counts	Count Time	Bkg. cpm	Eff.	Spl. Amt.	Result Calc	Result Rptd	MDA Calc	MDA Rptd
24462	B09314	24462	T3	9/04/93	1600	50	0.9	0.164	1	85.42	85	1.72	<2
	B09314 DUP	24633	T3	9/04/93	1576	50	0.9	0.164	1	84.10	84	1.72	<2
	BLANK SPIKE	24567	T3	9/04/93	1061	50	0.9	0.373	1	24.54	25	0.76	<0.8
	BLANK	24568	T3	9/04/93	59	50	0.9	0.372	1	0.34	0.34	0.76	<0.8

Verified [illegible] 2-10-94

9413225.0539

STRONTIUM-90 RESULTS

SDG	HEIS	Lab No.	Det. ID	Spl Amt.	Yield	Ingrowth	Decay	Gross cnts	Count Time	Bkg. cpm	Det. Eff.	Sr90 Result Calc.	Result Rptd	MDA Calc.	MDA Rptd.
24462	B09314	24462	D7	10	0.715	1	0.623	6442	100	0.16	0.4	1.6E+01	16	0.05	<0.05
	B09314 DUP	24633	D8	10	0.821	1	0.623	7014	100	0.28	0.41	1.5E+01	15	0.05	<0.05
	BLANK SPIKE	24567	D4	1	0.703	1	0.623	1584	100	0.15	0.39	4.1E+01	41	0.48	<0.5
	BLANK	24568	D5	1	0.628	1	0.623	33	100	0.19	0.4	4.0E-01	<0.6	0.58	<0.6

Verified RS 2-10-94

WESTINGHOUSE/HANFORD RADIOCHEMISTRY 10-Feb-94 SDG 24462-WES-1367

Pu 239/238 RESULTS

SDG	HEIS No.	Lab No.	Spl. Amt.	Date Analyzed	Det.	Eff.	Pu239 Cnts	Pu238 Cnts	Time Secs	Spike Cnts	Spike Act.	Bkg Pu239	Bkg Pu238	Time secs	Spike %R
24462	B09314	24462	2	10/01/93	46	0.1845	3	1	60000	1192	4.03	1	1	80000	0.722
	B09314 DUP	24633													
	BLANK SPIKE	24567													
	BLANK	24568													

Pu 239/238 RESULTS

SDG	HEIS No.	Lab No.	Pu239 Calc.	Pu239 Rptd	Pu239 MDA Calc	Pu239 MDA Rptd	Pu238 Calc.	Pu238 Rptd.	Pu238 MDA Calc	Pu238 MDA Rptd
24462	B09314	24462	0.0038	<0.007	0.007	<0.007	0.0004	<0.007	0.007	<0.007
	B09314 DUP	24633								
	BLANK SPIKE	24567								
	BLANK	24568								

Verified RS 2-10-94

U 238/235 RESULTS

SDG	HEIS No.	Lab No.	Spl. Amt.	Date Analyzed	Det.	Eff.	U238 Cnts	U235 Cnts	Time Secs	Spike Cnts	Spike Act.	Bkg U238	Bkg U235	Time secs	Spike %R
24462	B09314	24462	2	9/14/93	16	0.1977	102	5	60000	1045	3.2	1	1	80000	0.742
	B09314 DUP	24633													
	BLANK SPIKE	24567													
	BLANK	24568													

U 234 RESULTS

SDG	HEIS No.	Lab No.	Spl. Amt.	Date Analyzed	Det.	Eff.	U234 Cnts	U235 Cnts	Time Secs	Spike Cnts	Spike Act.	Bkg U234	Bkg U235	Time secs	Spike %R
24462	B09314	24462	2	9/14/93	16	0.1977	108	N/A	60000	1045	3.2	3	N/A	80000	0.742
	B09314 DUP	24633													
	BLANK SPIKE	24567													
	BLANK	24568													

U 238/235 RESULTS

SDG	HEIS No.	Lab No.	U238 Calc.	U238 Rptd	U238 MDA Calc	U238 MDA Rptd	U235 Calc.	U235 Rptd.	U235 MDA Calc	U235 MDA Rptd
24462	B09314	24462	0.1555	0.16	0.006	<0.006	0.0065	<0.006	0.006	<0.006
	B09314 DUP	24633								
	BLANK SPIKE	24567								
	BLANK	24568								

U 234 RESULTS

SDG	HEIS No.	Lab No.	U234 Calc.	U234 Rptd	U234 MDA Calc	U234 MDA Rptd	U235 Calc.	U235 Rptd.	U235 MDA Calc	U235 MDA Rptd
24462	B09314	24462	0.1624	0.16	0.011	<0.006	N/A	N/A	N/A	N/A
	B09314 DUP	24633								
	BLANK SPIKE	24567								
	BLANK	24568								

Verified: [illegible] 2-10-94

NEPTUNIUM-237

SDG	HEIS	Lab No.	Date Analyzed	Det. ID	Spl Amt.	Yield	Gross cnts	Count Time	Bkg. cpm	Det. Eff.	NP-237 Result Calc.	NP-237 Result Rptd	MDA Calc.	MDA Rptd.
24462	B09314	24462	11/16/93	2	2	0.365	3	1000	0.0015	0.1974	0.0047	<0.02	0.02	<0.02
	B09314 DUP	24633	11/12/93	2	2	0.385	2	1000	0.0015	0.1974	0.0015	<0.02	0.02	<0.02
	BLANK SPIKE	24567	11/01/93	33	0.3	0.558	1074	1000	0.0015	0.1802	16.0153	16	0.09	<0.09
	BLANK	24568	11/01/93	34	0.15	0.443	2	1000	0.0015	0.1858	0.0182	<0.2	0.21	<0.2

Verified RS 2-10-94

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CM 244 RESULTS

SDG	HEIS No.	Lab No.	Spl. Amt.	Date Analyzed	Det.	Eff.	CM244 Cnts	U235 Cnts	Time Secs	Spike Cnts	Spike Act.	Bkg CM244	Bkg U235	Time secs	Spike %R
24462	B09314	24462	2	9/4/93	47	0.1908	1	N/A	60000	352	4.02	1	N/A	80000	0.21
	B09314 DUP	24633													
	BLANK SPIKE	24567													
	BLANK	24568													

AM 241 RESULTS

SDG	HEIS No.	Lab No.	Spl. Amt.	Date Analyzed	Det.	Eff.	AM241 Cnts	U235 Cnts	Time Secs	Spike Cnts	Spike Act.	Bkg AM241	Bkg U235	Time secs	Spike %R
24462	B09314	24462	2	9/4/93	47	0.1908	1	N/A	60000	352	4.02	1	N/A	80000	0.21
	B09314 DUP	24633													
	BLANK SPIKE	24567													
	BLANK	24568													

CM 244 RESULTS

SDG	HEIS No.	Lab No.	CM244 Calc.	CM244 Rptd	CM244 MDA Calc	MDA Rptd
24462	B09314	24462	0.0014	<0.02	0.023	<0.02
	B09314 DUP	24633				
	BLANK SPIKE	24567				
	BLANK	24568				

AM 241 RESULTS

SDG	HEIS No.	Lab No.	AM241 Calc.	AM241 Rptd	AM241 MDA Calc	MDA Rptd
24462	B09314	24462	0.0014	<0.02	0.023	<0.02
	B09314 DUP	24633				
	BLANK SPIKE	24567				
	BLANK	24568				

Verified 2-10-94