RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
32249-WES-1405 (923-E418, Filename 32249RAD.UP2)

9413225.0488

RECEIVED
MEMORANDUM 2 5 1994

TO: 200-UP-2 Project QA Record February 23, 1994

FR: Susan Winter, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: 32249-WES-1405 (923-E418, Filename 32249RAD.UP2)

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INTRODUCTION

This memo presents the results of data validation on data package 32249-WES-1405 prepared by the Teledyne Isotopes laboratory under contract to the Weston Analytics laboratory. Information concerning the sample validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B09900*	10/22/93	SOIL	SEE NOTE 1

*Indicates sample which received 100% data validation.
Note 1. The sample was analyzed for gross beta, technetium-99, and alpha spectroscopy (uranium-234, 235, and 238) using WHC approved methods.

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.

Sample Result Verification. All sample results were supported in the raw data with the exception of uranium-235 in samples B09900 and B09900 duplicate and uranium-238 for the laboratory blank sample. Attachments 3 and 5 provide a summary of the corrected sample results and supporting documentation.

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

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 5 determinations reported, all of

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which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

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 Blank

- Uranium-238 was detected in the laboratory blank, therefore, the associated sample results have been qualified as estimated (J).

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 M073750. 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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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

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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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

9413225.0493

DATA QUALIFICATION SUMMARY

32249-WE5-1405

SDG:	VALIDATOR:	DATE: 2/22/94	PAGE 1 OF 1
COMMENTS: Radio Chemistry			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Uranium-238	J	B09900	Detected in Blank
↓	↓	B09900 Dup	↓
↓	↓	Blank spike	↓

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

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Validated Data Summary, Data Package: 32249-WES-1405

	Samp#	B09900	
	Date	10-22-93	
	Location	---	
	Depth	---	
	Type	---	
	Comments	---	
Parameter	Units	Result	Q
TECHNETIUM-99	pCi/g	0.700	U
GROSS BETA	pCi/g	40.000	
URANIUM-234	pCi/g	0.250	
URANIUM-235	pCi/g	0.0078	
URANIUM-238	pCi/g	0.160	J

Verified
2/23/94

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SDG 32249-WES-1405

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 12/15/93

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE	PAGE
4-4781	LL-1140-F4	11/04/93	12/07/93	1/2

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

S O I L

Q

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	TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
32249	9310L453-001	B09900	10/22				TC-99	L.T. 7.	E-01	11/26	4		3
							GR-B	4.0 +-0.3	E 01	12/20			3
							~~GR-B~~	~~L.T. 2.~~	~~E-00~~	~~12/20~~			3
							~~TC-99~~	~~1.2 +-4.3~~	~~E-01~~	~~11/26~~			3
							U-234	2.5 +-0.4	E-01	12/03			6
							~~U-235~~	~~L.T. 6.~~	~~E-03~~	~~12/03~~			6
							U-238	1.6 +-0.3	E-01	12/03	S		6
							~~U-234~~	~~L.T. 6.~~	~~E-03~~	~~12/03~~			6
							U-235	7.8 ~~6.3~~ +-7.0	E-03	12/03	R	2/22/94	6
							~~U-238~~	~~L.T. 6.~~	~~E-03~~	~~12/03~~			6
32250	9310L453-001DUP	B09900	10/22				TC-99	L.T. 5.	E-01	11/26	4		3
							GR-B	4.5 +-0.3	E 01	12/20			3
							~~GR-B~~	~~L.T. 2.~~	~~E-00~~	~~12/20~~			3
							~~TC-99~~	~~9.0 +-32.1~~	~~E-02~~	~~11/26~~			3
							U-234	3.1 +-0.4	E-01	12/03			6
							~~U-235~~	~~L.T. 5.~~	~~E-03~~	~~12/03~~			6
							U-238	1.6 +-0.3	E-01	12/03	S		6
							~~U-234~~	~~L.T. 5.~~	~~E-03~~	~~12/03~~			6
							U-235	7.1 ~~5.8~~ +-6.4	E-03	12/03	R	2/22/94	6
							~~U-238~~	~~L.T. 8.~~	~~E-03~~	~~12/03~~			6

Verified: 2/22/94

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9413225.0498

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

DEC 1993
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SDLA

Date 12/22/93

TI #'s 32249 - 32252

WO # 4-4781

Comments:

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

Contents:

	Procedure #'s	Bench & Work Sheet Pages	Calibration Pages	Tracers/ Carrier Pages
Reports of Analysis		2		
Gross Alpha	PRO-032-1	-	-	
Gross Beta		3	18	
Tc-99	PRO-032-78	5	29	1
U-234-235-238	PRO-062-110	12	18	6
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

Spike Activity for TI #32251

Nuclide	Activity pCi/l	Acceptable Range
Technetium-99	98.5	79. - 118.
Gross Beta	22.	17. - 28.
Uranium-234	2.1	1.8 - 2.4
Uranium-235	0.095	0.08 - 0.11
Uranium-238	2.1	1.8 - 2.4

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

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: 10-22-93

Ice Chest No.: SML-122 — Field Logbook No.: EFL-1091

Bill of Lading/Airbill No.: — Offsite Property No.:

Method of Shipment: OVERNIGHT AIR SERVICE

Shipped to: WESTON

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

1) B09900

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

2)

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

LER 10-27-93

3)

1,120ml P/G:Anions NO2,NO3 (EPA 353.1)
1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: 10-28-93 Karen E Hogan 0920	Received by:	Date/Time:
Relinquished by: Emery	Received by: Brian E Shaffer	Date/Time: 10/29/93 1300
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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

012 ~~013~~

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9413225.0501

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: 32249-WES-1405		
VALIDATOR: [signature]		LAB: Weston Teledyne		DATE: 02/21/94	
CASE:			SDG: 32249-WES-1405		
ANALYSES PERFORMED					
☒ Gross ~~Alpha/Beta~~ Beta	☐ Strontium-90	☒ Technetium-99	☒ Alpha Spectroscopy (Uranium)	☐ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☐		
SAMPLES/MATRIX B09900					

2/21/94

9413225.0502

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:

014

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: Uranium-238 was detected in the lab blank, the reported result was corrected from 0.094 pCi/g to 0.12 pCi/g. Asbestos results were qualified as estimated (J).

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:

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

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

LCS recoveries acceptable? . . . . . Yes ~~Yes~~ No N/A 2/22/94

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

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

Comments: ~~Uranium-235 results were qualified as unusable (R) since the LCS & R = -22%~~ 2/22/94

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . 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:

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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: _____

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
Transcription/Calculation errors? . . . . . (Yes) No N/A
MDA's meet required detection limits? . . . . . (Yes) No N/A
Transcription/calculation errors? . . . . . Yes (No) N/A

Comments: Sample results for Uranium-235 were corrected for R09900 and R09900Dup.

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TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 12/15/93

PAGE 1

WORK ORDER NUMBER	CUSTOMER P.O. NUMBER	DATE RECEIVED	DELIVERY DATE
4-4781	LL-1140-F4	11/04/93	12/07/93

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

WATER

Q

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE START DATE	START TIME	STOP DATE	STOP TIME	NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME DATE	MID-COUNT TIME TIME	VOLUME - UNITS ASH-WGHT-% *	LAB.
32251	DISTILLED SPIKED H2O		/				TC-99	1.1 +-0.1 E 02		11/26			3
							GR-B	2.1 +-0.1 E 01		11/18			3
							~~GR-B~~	~~L.T. 8. E-01~~		~~11/18~~			3
							~~TC-99~~	~~L.T. 3. E 00~~		~~11/26~~			3
							U-234	2.3 +-0.4 E 00		12/03			6
							U-235	9.9 +-7.4 E-02		12/03			6
							U-238	2.5 +-0.4 E 00		12/03	R J		6
							~~U-234~~	~~L.T. 5. E-02~~		~~12/03~~			6
							~~U-235~~	~~L.T. 5. E-02~~		~~12/03~~			6
							~~U-238~~	~~L.T. 5. E-02~~		~~12/03~~			6
32252	DISTILLED BLANK H2O		/				TC-99	L.T. 3. E 00		11/26	U		3
							GR-B	L.T. 8. E-01		11/18	U		3
							~~GR-B~~	~~9.5 +-48.5E-02~~		~~11/18~~			3
							~~TC-99~~	~~5.3 +-21.3E-01~~		~~11/26~~			3
							U-234	L.T. 2. E-01		12/03	U		6
							U-235	L.T. 9. E-02		12/03	U		6
							~~U-238~~	~~L.T. 9. E-02~~		~~12/03~~			6
							~~U-234~~	~~1.7 +-10.7E-02~~		~~12/03~~			6
							~~U-235~~	~~5.5 +-55.4E-03~~		~~12/03~~			6
							~~U-238~~	~~9.4 +-10.5E-02~~		~~12/03~~			6
							U-238	1.2 ± 1.05E-01		12/03	R		

LAST PAGE OF REPORT

J Guenther
APPROVED BY J. GUENTHER 12/15/93

SEND 1 COPIES TO WE884S MRS JOSIE EDWARDS

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

Allinton 2/22/94

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LABORATORY DUPLICATE PRECISION CALCULATION WORKSHEET 22-Feb-94

FILENAME: 32249-LD.WK1

SDG NO.: 32249-WES-1405

SAMPLE ID: B09900
DUPLICATE SAMPLE ID: B09900 DUP

PARAMETER	SAMPLE RESULT	DUPLICATE RESULT	RPD	QUALIFIER APPLIED
GROSS BETA	40	45	12	NONE
URANIUM-234	0.25	0.31	21	NONE
URANIUM-238	0.16	0.16	0	NONE
URANIUM-235	0.0078	0.0071	9	NONE

ACCURACY CALCULATION WORKSHEET 22-Feb-94

FILENAME: 32249-QC.WK1

SDG NO.: 32249-WES-1405

SAMPLE: LABORATORY BLANK (TI# 32252)
SPIKE SAMPLE: LABORATORY BLANK SPIKE SAMPLE (TI# 32251)

PARAMETER	SPIKED AMOUNT	BLANK SAMPLE	SPIKE SAMPLE	%R	QUALIFIER APPLIED
TECHNETIUM-99	98.5	0	110	112	NONE
GROSS BETA	22	0	21	95	NONE
URANIUM-234	2.1	0	2.3	110	NONE
URANIUM-235	0.095	0	0.099	104	NONE
URANIUM-238	2.1	0.12	2.5	113	NONE

GROSS BETA RESULT VERIFICATION 22-Feb-94 SDG 32249-WES-1405 PAGE: 1

FILENAME: UP2-GRB.WK1

SDG	HEIS#	Lab No.	Det.	Date Beta Counted	Gross Counts	Count Time	Bkg. cpm	Eff.	Spl. Amt.	Result Calc	Result Rptd	MDA Calc	MDA Rptd
32249	B09900	32249	T3	11/17/93	781	50	0.98	0.164	1	40	40	2	2
	B09900 DUP	32250	T3	11/17/93	862	50	0.98	0.164	1	45	45	2	2
	BLANK SPIKE	32251	T3	11/18/93	933	50	1.08	0.38	1	21	21	0.8	0.8
	BLANK	32252	T3	11/18/93	50	50	1.08	0.379	1	-0.095	-0.095	0.8	0.8

TECHNETIUM 99 RESULT VERIFICATION 22-Feb-94 SDG 32249-WES-1405 PAGE 1

FILENAME: UP2-TC.WK1

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.
32249	B09900	32249	11/26/93	B1	1	0.639	26	100	0.22	0.226	0.12	0.12	0.7	0.7
	B09900 DUP	32250	11/26/93	B2	1	0.677	16	100	0.13	0.223	0.09	0.09	0.5	0.5
	BLANK SPIKE	32251	11/26/93	B8	0.2	0.511	604	100	0.15	0.247	105.10	110.00	3.2	3
	BLANK	32252	11/26/93	B9	0.2	0.522	20	100	0.17	0.246	0.53	0.53	3.4	3

ISOTOPIC URANIUM RESULT VERIFICATION 23-Feb-94 SDG 32249-WES-1405 PAGE 1

FILENAME: UP2-U.WK1

SDG	HEIS No.	Lab No.	Spl. Amt.	Date Analyzed	Det.	Eff.	U238 Cnts	U235 Cnts	U234 Cnts	Time Secs	Tracer Cnts	Tracer Act.	Bkg U238	Bkg U235	Bkg U234	Time secs	Tracer %R
32249	B09900	32249	2	12/03/93	5	0.194	105	6	167	60000	1079	3.2	1	1	1	80000	0.7824
	B09900 DUP	32250	2	12/03/93	6	0.2005	118	6	229	60000	1186	3.2	2	1	1	80000	0.8316
	BLANK SPIKE	32251	0.3	12/03/93	8	0.1853	207	9	195	60000	894	3.2	1	1	1	80000	0.6786
	BLANK	32252	0.15	12/03/93	13	0.2096	6	1	3	60000	964	3.2	1	1	5	80000	0.6469

ISOTOPIC URANIUM RESULT VERIFICATION 23-Feb-94 SDG 32249-WES-1405 PAGE 2

FILENAME: UP2-U.WK1														
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	U234 Calc.	U234 Rptd.	U234 MDA Calc	U234 MDA Rptd
32249	B09900	32249	0.15	0.16	0.006	0.006	0.0078	0.0063	0.006	0.006	0.25	0.25	0.006	0.006
	B09900 DUP	32250	0.16	0.16	0.008	0.008	0.0071	0.0058	0.005	0.005	0.31	0.31	0.005	0.005
	BLANK SPIKE	32251	2.46	2.5	0.048	0.05	0.0985	0.099	0.05	0.05	2.3	2.3	0.05	0.05
	BLANK	32252	0.12	0.094	0.089	0.09	0.0055	0.0055	0.09	0.09	-0.017	-0.017	0.2	0.2