

Wednesday, March 09, 2011

REQUEST NUMBER: 11-1587

**LOS ALAMOS  
NATIONAL LABORATORY**

ATTN: Danny Coleman  
American Radiation Services - Primary  
1726 Wooddale Court  
Baton Rouge, LA 70806

These Samples are on:  
LANL Request Number:11-1587  
Per Agreement Number:63641-001-10  
Project Cost Code: MR8R032NFM00

Please analyse the enclosed samples  
according to the schedule indicated:

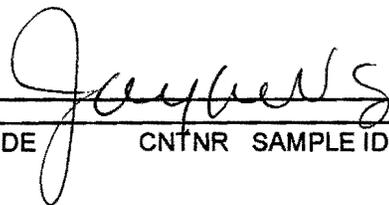
**SHIP DATE: 3/9/2011**  
**TURNAROUND/REPORT DUE: 4/8/2011**  
**TURNAROUND REQ'D: 30 Days**

**RAD SCREENING: Not Required**

**LAB REQUEST COMMENTS:**

LANL ER SMO CONTACT:

Signature:



PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-5600	GAS	3/9/2011	
		1	MD21-11-5601	GAS	3/9/2011	
		1	MD21-11-5602	GAS	3/9/2011	
		1	MD21-11-5603	GAS	3/9/2011	
		1	MD21-11-5605	GAS	3/9/2011	
		1	MD21-11-5606	GAS	3/9/2011	
		1	MD21-11-5607	GAS	3/9/2011	
		1	MD21-11-5608	GAS	3/9/2011	
CAS1	121523011-5610	GAS1	121523011-5610	GAS	3/9/2011	

Wednesday, March 09, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-1587C

LOS ALAMOS  
NATIONAL LABORATORY

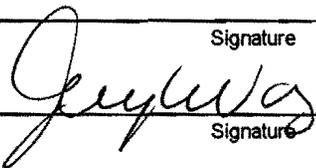
REQUEST NUMBER: 11-1587

ATTN: Danny Coleman  
American Radiation Services - Primary  
1726 Wooddale Court  
Baton Rouge, LA 70806  
LAB REQUEST COMMENTS:

TURNAROUND/REPORT DUE: 4/8/2011  
TURNAROUND REQ'D: 30

MD21-11-5610  
1 of 1  
C

SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
MD21-11-5610	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-5607	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-5605	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-5608	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-5600	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-5602	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-5603	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-5606	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-5601	1	SILICA GEL TUBE	H3	None	GAS

Relinquished By:	Date	Time	Received By:	Date	Time
	3/9/11	1400			
Signature			Signature		
Signature			Signature		
Signature			Signature		

Received for DISPOSAL By: \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ Remarks: \_\_\_\_\_

Signature \_\_\_\_\_

1 of 1  
C

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3396

EVENT NAME: Pore Gas Sampling - MDA T - CU 21-016(a)-99

SAMPLE ID: MD21-11-5600

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		3/9/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		950	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	VOST
LOCATION ID: 21-24524W		ok	FIELD QC TYPE:	NA
LOCATION TYPE: BH		ok	FIELD PREP:	NA
TOP DEPTH: 42.5		ok	SAMPLE USAGE:	INV
BOTTOM DEPTH: 47.5		ok	SCREEN/PORT DESC:	port #1
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO/NA	NA
COMPOSITE TYPE: MA			COMPOSITE TIME INTERVAL: MA	
			WATER FLOWING: YES/NO/NA	NA
BOREHOLE: <input checked="" type="radio"/> YES / NO / NA			BOREHOLE DECLINATION: MA	
			BOREHOLE DIRECTION: 90°	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA
<del>1</del>		<del>T015</del>	<del>6 LITER SUMMA CANISTER</del>	<del>None</del>	<del>Not collected 10/9/11</del>	

SAMPLE DESC: column # 17 initial wt = 598.23g Final wt = 611.03g  
 silica wt = 153.52g vapor wt = 12.8g

SAMPLE COMMENTS: weather data @ 950 T=36°F RH=56% BP 30.36 in

LOCATION DESC: MA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 360 ppm  
 sub atm O<sub>2</sub> 15.9% CO<sub>2</sub> 2.90%

COLLECTED BY (PRINT) R. Jankl M. Giorgi REVIEWED BY (PRINT) M. Giorgi

RELINQUISHED BY (Printed Name) M. Giorgi (Signature) <i>MVG</i>	Date/Time 3/9/11 1345	RECEIVED BY (Printed Name) M. Giorgi (Signature) <i>MVG</i>	Date/Time 3/9/11 1345
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3396

EVENT NAME: Pore Gas Sampling - MDA T - CU 21-016(a)-99

SAMPLE ID: MD21-11-5601

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		3/9/11	MEDIA: NA	ok
TIME COLLECTED (HH:MM)		950	SUB-MEDIA: OTHER	ok
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE: VOST	ok
LOCATION ID: 21-24524W		ok	FIELD QC TYPE: NA	ok
LOCATION TYPE: BH		ok	FIELD PREP: NA	ok
TOP DEPTH: 122.5		ok	SAMPLE USAGE: INV	ok
BOTTOM DEPTH: 127.5		ok	SCREEN/PORT DESC:	ok
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO <input checked="" type="checkbox"/> NA	ok
COMPOSITE TYPE: <u>NA</u>			COMPOSITE TIME INTERVAL: <u>NA</u>	
			WATER FLOWING: YES/NO <input checked="" type="checkbox"/> NA	
BOREHOLE: <input checked="" type="checkbox"/> YES/NO/NA			BOREHOLE DECLINATION: <u>NA</u>	
			BOREHOLE DIRECTION: <u>90°</u>	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA
<del>1</del>		<del>TO15</del>	<del>6 LITER SUMMA CANISTER</del>	<del>None</del>		<del>Not collected Not sampled</del>

SAMPLE DESC: Column # 18 initial wt = 587.04g  
 silica wt 149.92g  
 Final wt 605.20g for  
 Vapor wt = 18.16g

SAMPLE COMMENTS: weather data @ 950 T = 36°F RH = 56% BP = 30.36 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 380 ppm  
 sub atm O<sub>2</sub> 20.2% CO<sub>2</sub> 4500 ppm

COLLECTED BY (PRINT) K. Ernst M. Giorgi REVIEWED BY (PRINT) M. Giorgi

RELINQUISHED BY (Printed Name) <u>M. Giorgi</u> (Signature) <u>M. Giorgi</u>	Date/Time 3/9/11 1345	RECEIVED BY (Printed Name) <u>M. Giorgi</u> (Signature) <u>M. Giorgi</u>	Date/Time 3/9/11 1345
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3396

EVENT NAME: Pore Gas Sampling - MDA T - CU 21-016(a)-99

SAMPLE ID: MD21-11-5602

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		3/9/11	MEDIA: NA	OK
TIME COLLECTED (HH:MM)		950	SUB-MEDIA: OTHER	           
PRS ID: 21-018(a)-99		OK	SAMPLE TECH CODE: VOST	
LOCATION ID: 21-24524W		OK	FIELD QC TYPE: NA	
LOCATION TYPE: BH		OK	FIELD PREP: NA	
TOP DEPTH: 172.5		OK	SAMPLE USAGE: INV	
BOTTOM DEPTH: 177.5		OK	SCREEN/PORT DESC:	
FIELD MATRIX: GAS		OK	EXCAVATED: YES/NO/NA <span style="margin-left: 20px;">port # 3</span>	
COMPOSITE TYPE: <u>NA</u>			COMPOSITE TIME INTERVAL: <u>NA</u>	WATER FLOWING: YES/NO/NA <u>NA</u>
BOREHOLE: <u>YES</u> /NO/NA			BOREHOLE DECLINATION: <u>NA</u>	BOREHOLE DIRECTION: <u>90°</u>

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA
1		TO15	6 LITER SUMMA CANISTER	None	N	<del>NOT COLLECTED</del>

SAMPLE DESC: column # 19      initial wt = 593.90g      Final wt = 605.17g  
 silica wt = 167.75g      vapor wt = 11.27g

SAMPLE COMMENTS: weather @ 950 T = 36°F RH = 56% BP = 30.36 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9%      CO<sub>2</sub> 420 ppm  
 sub atm O<sub>2</sub> 20.4%      CO<sub>2</sub> 4000 ppm

COLLECTED BY (PRINT) L. Orsini M61 org ii      REVIEWED BY (PRINT) MLV Giorgio

RELINQUISHED BY (Printed Name) <u>MLV Giorgio</u>	Date/Time <u>3/9/11</u> <u>1345</u>	RECEIVED BY (Printed Name) <u>Whitney</u>	Date/Time <u>3/9/11</u> <u>1345</u>
RELINQUISHED BY (Printed Name)	Date/Time	RECEIVED BY (Printed Name)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3396

EVENT NAME: Pore Gas Sampling - MDA T - CU 21-016(a)-99

SAMPLE ID: MD21-11-5603

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		3/9/11	MEDIA: NA	ok
TIME COLLECTED (HH:MM)		950	SUB-MEDIA: OTHER	
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE: VOST	
LOCATION ID: 21-24524W		ok	FIELD QC TYPE: NA	
LOCATION TYPE: BH		ok	FIELD PREP: NA	
TOP DEPTH: 257.5		ok	SAMPLE USAGE: INV	
BOTTOM DEPTH: 262.5		ok	SCREEN/PORT DESC:	port #4
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO/NA	
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: M	
BOREHOLE: YES/NO/NA			BOREHOLE DECLINATION: NA	
			BOREHOLE DIRECTION: 90°	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA
<del>1</del>		<del>TQ15</del>	<del>6 LITER SUMMA CANISTER</del>	<del>None</del>		<del>to 3/9/11 not collected</del>

SAMPLE DESC: column # 20  
 initial wt = 603.29g  
 silica wt = 150.99g  
 Final wt = 616.56g  
 vapor wt = 13.27g

SAMPLE COMMENTS: weather @ 950 T=36°F RH 56% BP 30.36 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 440ppm  
 sub atm O<sub>2</sub> 20.5% CO<sub>2</sub> 4350ppm

COLLECTED BY (PRINT) R. Onstott M Giorgii REVIEWED BY (PRINT) all V. Burge

RELINQUISHED BY (Printed Name) <i>all V. Burge</i> (Signature) <i>[Signature]</i>	Date/Time 3/9/11 1345	RECEIVED BY (Printed Name) <i>all V. Burge</i> (Signature) <i>[Signature]</i>	Date/Time 3/9/11 1345
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3396

EVENT NAME: Pore Gas Sampling - MDA T - CU 21-016(a)-99

SAMPLE ID: MD21-11-5605

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		3/9/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		950	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		OK	SAMPLE TECH CODE: VOST	OK
LOCATION ID: 21-24524W		OK	FIELD QC TYPE: NA	
LOCATION TYPE: BH		OK	FIELD PREP: NA	
TOP DEPTH: 327.5		OK	SAMPLE USAGE: INV	
BOTTOM DEPTH: 332.5		OK	SCREEN/PORT DESC:	
FIELD MATRIX: GAS		OK	EXCAVATED: YES/NO <input checked="" type="radio"/> NA	
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: NA	
BOREHOLE: <input checked="" type="radio"/> YES / NO / NA			BOREHOLE DECLINATION: NA	90°
			BOREHOLE DIRECTION:	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA
1		TO15	6 LITER SUMMA CANISTER	None		no 3/9/11 not collected

SAMPLE DESC: Column # 23 initial wt = 591.84g Final wt = 605.58g  
 silica wt = 150.67g vapor wt = 13.74g

SAMPLE COMMENTS: weather @ 950 T=36°F RH=56% BP 30.36in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 420ppm  
 sub atm O<sub>2</sub> 20.9% CO<sub>2</sub> 3700ppm

COLLECTED BY (PRINT) Konstantin M Giorgi REVIEWED BY (PRINT) MW Bergin

RELINQUISHED BY (Printed Name) <u>MW Bergin</u> (Signature) <u>MW Bergin</u>	Date/Time 3/9/11 1345	RECEIVED BY (Printed Name) <u>Melissa M. ...</u> (Signature) <u>Melissa M. ...</u>	Date/Time 3/9/11 1345
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3396

EVENT NAME: Pore Gas Sampling - MDA T - CU 21-016(a)-99

SAMPLE ID: MD21-11-5606

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		3/9/11	MEDIA:	NA	ok
TIME COLLECTED (HH:MM)		950	SUB-MEDIA:	OTHER	
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	VOST	
LOCATION ID: 21-24524W		ok	FIELD QC TYPE:	NA	
LOCATION TYPE: BH		ok	FIELD PREP:	NA	
TOP DEPTH: 377.5		ok	SAMPLE USAGE:	INV	
BOTTOM DEPTH: 382.5		ok	SCREEN/PORT DESC:		port # 7
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO/NA		

COMPOSITE TYPE: MA COMPOSITE TIME INTERVAL: \_\_\_\_\_ WATER FLOWING: YES/NO/NA NA  
 BOREHOLE: ES/NO/NA BOREHOLE DECLINATION: NA BOREHOLE DIRECTION: 90°

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	MA
1		TO15	6 LITER SUMMA CANISTER	None	Y	MA

SAMPLE DESC: column # 24 initial wt = 600.01g Anal wt = 613.48g  
 silica wt = 151.65g vapor wt = 13.47g  
 to 3/9/11 VOST collected

SAMPLE COMMENTS: weather @ 950 T = 36°F RH = 56% BP = 30.36 in

LOCATION DESC: MA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 440 ppm  
 sub atm O<sub>2</sub> 20.9% CO<sub>2</sub> 3300 ppm

COLLECTED BY (PRINT) R Onstott M Giorgi REVIEWED BY (PRINT) WV Bergner

RELINQUISHED BY (Printed Name) <u>WV Bergner</u> (Signature) <u>WV Bergner</u>	Date/Time <u>3/9/11</u> <u>1345</u>	RECEIVED BY (Printed Name) <u>WV Bergner</u> (Signature) <u>WV Bergner</u>	Date/Time <u>3/9/11</u> <u>1345</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3396

EVENT NAME: Pore Gas Sampling - MDA T - CU 21-016(a)-99

SAMPLE ID: MD21-11-5607

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		3/9/11	MEDIA:	NA	OK
TIME COLLECTED (HH:MM)		950	SUB-MEDIA:	OTHER	
PRS ID:	21-018(a)-99	OK	SAMPLE TECH CODE:	VOST	
LOCATION ID:	21-24524X <sup>no 344</sup> S	OK	FIELD QC TYPE:	NA	
LOCATION TYPE:	BH	OK	FIELD PREP:	NA	
TOP DEPTH:	677.5	OK	SAMPLE USAGE:	INV	
BOTTOM DEPTH:	682.5	OK	SCREEN/PORT-DESC:		port # 10
FIELD MATRIX:	GAS	OK	EXCAVATED: YES/NO/NA		
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	NA	WATER FLOWING: YES/NO/NA
BOREHOLE: <input checked="" type="radio"/> YES / NO / NA			BOREHOLE DECLINATION:	NA	BOREHOLE DIRECTION: 90°

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA
1		TO15	6 LITER SUMMA CANISTER	None	NO 3/9/11	NA collected

SAMPLE DESC: column # 25      initial wt = 595.54 g      Final wt = 603.06g  
 silical wt = 146.75g      vapor wt = 7.52g

SAMPLE COMMENTS: weather @ 950 T = 36°F RH = 56% BP = 30.36 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 440 ppm  
 sub atm O<sub>2</sub> 20.9% CO<sub>2</sub> 1800 ppm

COLLECTED BY (PRINT) R. on staff M Giorgi      REVIEWED BY (PRINT) MV Birge

RELINQUISHED BY (Printed Name) <u>MV Birge</u> (Signature) <u>MVB</u>	Date/Time 3/9/11 1345	RECEIVED BY (Printed Name) <u>Melissa Monty</u> (Signature) <u>[Signature]</u>	Date/Time 3/9/11 1345
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3396

EVENT NAME: Pore Gas Sampling - MDA T - CU 21-016(a)-99

SAMPLE ID: MD21-11-5608

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		3/9/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		950	SUB-MEDIA:	OTHER
PRS ID:	21-018(a)-99	ok	SAMPLE TECH CODE:	VOST
LOCATION ID:	21-24524 <sup>to 21/11</sup>	ok	FIELD QC TYPE:	NA
LOCATION TYPE:	BH	ok	FIELD PREP:	NA
TOP DEPTH:	712.5	ok	SAMPLE USAGE:	INV
BOTTOM DEPTH:	717.5	ok	SCREEN/PORT DESC:	port # 11
FIELD MATRIX:	GAS	ok	EXCAVATED: YES/NO/NA	NA
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	
BOREHOLE: <input checked="" type="checkbox"/> YES / NO / NA			BOREHOLE DECLINATION: NA	BOREHOLE DIRECTION: 90°
WATER FLOWING: YES/NO/NA <input checked="" type="checkbox"/>				

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	p	NA
1		TO15	6 LITER SUMMA CANISTER	None	ok 3/9/11	Not collected

SAMPLE DESC: Column # 26  
 initial wt 582.13g  
 silica wt 148.10g  
 Final wt = 595.86g  
 vapor wt = 13.73g

SAMPLE COMMENTS: weather data @ 950 T=36°F RH=56% BP=30.36in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 440 ppm  
 sub atm O<sub>2</sub> 20.9% CO<sub>2</sub> 2290 ppm

COLLECTED BY (PRINT) K Onstott M Giorgi REVIEWED BY (PRINT) M V Borgis

RELINQUISHED BY (Printed Name) M V Borgis (Signature) <i>MVB</i>	Date/Time 3/9/11 1345	RECEIVED BY (Printed Name) Melissa Martinez (Signature) <i>M Martinez</i>	Date/Time 3/9/11 1345
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3396

EVENT NAME: Pore Gas Sampling - MDA T - CU 21-016(a)-99

SAMPLE ID: MD21-11-5610

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		3/9/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		950	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	VOST
LOCATION ID: 21-24524W		ok	FIELD QC TYPE:	FB
LOCATION TYPE: BH		ok	FIELD PREP:	NA
TOP DEPTH: 0		ok	SAMPLE USAGE:	QC
BOTTOM DEPTH: 0		ok	SCREEN/PORT DESC:	Prt 5 FB
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO	NA
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL:	
BOREHOLE: YES/NO NA			BOREHOLE DECLINATION:	
			BOREHOLE DIRECTION:	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA
<del>1</del>		<del>TO15</del>	<del>6 LITER SUMMA CANISTER</del>	<del>None</del>	<del>RO 3/9/11</del>	<del>not collected</del>

SAMPLE DESC: QC Sample of MD 21-11-5604  
 column # 27  
 initial wt = 593.25g  
 silica wt = 148.20g  
 Final wt 599.41g  
 DE wt = 6.26.16g  
 to 3/9/11

SAMPLE COMMENTS:

NA

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:

NA

COLLECTED BY (PRINT) R. Onstott M6109gii REVIEWED BY (PRINT) M. W. Binger

RELINQUISHED BY (Printed Name) <u>M. W. Binger</u> (Signature) <u>MWB</u>	Date/Time 3/5/11 1345	RECEIVED BY (Printed Name) <u>Miss Matye</u> (Signature) <u>[Signature]</u>	Date/Time 3/9/11 1345
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

## DATA VALIDATION COVER SHEET

5119-1

### Data Validation Cover Sheet

Records Use only



#### Section I.

 REQUEST NUMBER: 11-1587      VALIDATION DATE: 05/17/2011      LAB CODE: ARS

 CONTRACT LABORATORY NAME: American Radiation Services

 VALIDATOR: Janis Kardatzke      ORGANIZATION: Analytical Quality Associates, Inc.

ANALYTICAL SUITE (CHECK ALL THAT APPLY):

- |  |  |  |   |
|--|--|--|---|
| <input type="checkbox"/> TPH-GRO                               | <input type="checkbox"/> HIGH EXPLOSIVES           | <input type="checkbox"/> DIOXIN FURANS             | <input type="checkbox"/> LCMSMS PERCHLORATES  |
| <input type="checkbox"/> TPH-DRO                               | <input type="checkbox"/> METALS                    | <input type="checkbox"/> PCB CONGENERS             | <input type="checkbox"/> ORGANOCHLORINE<br>PESTICIDES/POLYCHLORINA<br>TED BIPHENYLS |
| <input type="checkbox"/> GENERAL CHEMISTRY                     | <input checked="" type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH<br>EXPLOSIVES |   |
| <input type="checkbox"/> OTHER (DESCRIBE): <u>tritium only</u> |  |  |   |

#### Section II.      Completeness Check

YES	NO	N/A	(CHECK ONE)	YES	NO	N/A	(CHECK ONE)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. CHAIN-OF-CUSTODY FORM(S)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. RAW/BSS DATA
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. CASE NARRATIVE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. QUALITY CONTROL FORMS
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. SAMPLE RESULT FORMS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. QUANTITATION REPORTS
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. SAMPLE CHROMATOGRAMS	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. TICS FORMS
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5. STANDARD CHROMATOGRAMS	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10. TICS MASS SPECTRA

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact):

1. An MS was not analyzed for tritium. However, an LCS was analyzed and met acceptance criteria, thus, no sample data were qualified.
2. A sample duplicate was not analyzed for tritium. However, an LCSD was analyzed and met the acceptance criteria, thus, no sample data were qualified.
3. It should be noted that the LCS/LCSD RER was hand-calculated using the 2-sigma TPU values and was found to be within specifications. No sample data were qualified.

 Reviewed by: Mary Donovan      Level: I      Date: 05/17/11

 VALIDATOR'S SIGNATURE:       DATE: 05/17/2011

## RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

### Rad Analytical Data Validation Checklist

Records Use only



Yes No N/A  (Check One)				Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. The holding time was >1 and ≤2 times the applicable holding time requirement.	UJ, R9	J-, R9
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. The holding time was >2 times the applicable holding time requirement.	R, R9a	J-, R9a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3. The results for the affected analytes are considered not detected (U) because the associated sample concentration was less than or equal to the MDC.	U, R5	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. The analyte should be regarded as rejected because spectral interferences prevent positive identification of the analytes.	R, R5a	R, R5a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. The MDC and/or TPU documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R5b	J-, R5b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	6. The results for the affected analytes should be regarded as not detected (U) because the associated sample concentration was less than 3X the 1 sigma TPU.	U, R11	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. The sample result is ≤5X the concentration of the related analyte in the method blank.	U, R4	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5X.	N/A	J, R4a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. The sample result is ≤5X the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.	U, R4d	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. Required method blank information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R4e	R, R4e
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11. The tracer is <10%R. Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	R, R3	R, R3

## RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

### Rad Analytical Data Validation Checklist

Records Use only



Yes No N/A  (Check One)				Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12. The tracer is < the Lower Acceptance Level (LAL) but $\geq 10\%R$ . Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	UJ, R3a	J-, R3a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13. The Tracer%R value is > the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	N/A	J+, R3b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14. Required tracer information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. Tracer%R is not applicable for Gamma Spectroscopy.	R, R3d	R, R3d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. The LCS percent recovery was <10%. Follow the external laboratory limits located within the associated data package.	R, R12	R, R12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	16. The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.	UJ, R12a	J-, R12a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17. The LCS percent recovery was > the UAL. Follow the external laboratory limits located within the associated data package.	N/A	J+, R12b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18. The LCS documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R12c	R, R12c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	19. Associated duplicate sample has DER or RER > the analytical laboratory's acceptance limits.	R, R10	J, J10
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20. The duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons. The duplicate information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R6	R, R6

## RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

### Rad Analytical Data Validation Checklist

Records Use only



Yes No N/A  (Check One)				Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	21. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	R, R6	R, R6
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	22. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	UJ, R6a	J-, R6a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	23. The associated matrix spike recovery was above the UAL. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	UJ, R6b	J+, R6b
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24. Required matrix spike information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. If LCS information is present, do not Reject. Qualify data based on LCS information. MS/MSD is not applicable to Gamma Spectroscopy.	R, R6c	R, R6c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25. Duplicate, dilution, or reanalysis.	UJ, R88	J, R88
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	26. The LANL project chemist identified quality deficiencies in the reported data that require further qualification. This code can ONLY be used and/or under advisement by the LANL project chemist.	UJ, R, R19	J, R, R19
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. Quantification of data via data validation did not occur based on Quality Control requirements in this procedure. Adhere to the external laboratory qualifiers found within the Form I analytical data summary sheets generated by the external laboratory.	U, U_LAB	J, J_LAB NQ, NQ



2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5600  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-001  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	18312.003	972.668	220.598	108.432		pCi/L	ARS-054/EPA 906.0	05/03/11 04:39	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.

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1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5601  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-002  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	8321.930	452.722	219.105	107.698		pCi/L	ARS-054/EPA 906.0	05/03/11 07:49	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5602  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-003  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	8685.194	471.606	219.884	108.081		pCi/L	ARS-054/EPA 906.0	05/03/11 10:58	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5603  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-004  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	22232.079	1177.212	220.301	108.286		pCi/L	ARS-054/EPA 906.0	05/03/11 14:08	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5605  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-005  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	5524.951	308.825	220.414	108.342		pCi/L	ARS-054/EPA 906.0	05/03/11 17:17	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-00491  
**Client Sample ID:** MD21-11-5606  
**Sample Collection Date:** 03/09/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-1587  
**ARS Sample ID:** ARS1-11-00491-006  
**Date Received:** 03/10/11  
**Report Date:** 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	4340.263	248.407	219.018	107.656		pCi/L	ARS-054/EPA 906.0	05/03/11 20:27	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

**Notes:** American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.

LELAP Certificate# 01949

NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5607  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-007  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	101.103	66.810	219.380	107.834	U	pCi/L	ARS-054/EPA 906.0	05/03/11 23:36	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5608  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-008  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	268.997	69.788	219.551	107.918		pCi/L	ARS-054/EPA 906.0	05/04/11 02:45	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5610  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-009  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	2.479	65.923	220.534	108.401	U	pCi/L	ARS-054/EPA 906.0	05/04/11 05:55	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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LELAP Certificate# 01949

NELAP Certificate # E87558

Wednesday, March 09, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-15870

LOS ALAMOS NATIONAL LABORATORY

REQUEST NUMBER: 11-1587

ATTN: Danny Coleman
American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge, LA 70806
LAB REQUEST COMMENTS:

TURNAROUND/REPORT DUE: 4/8/2011
TURNAROUND REQ'D: 30

Vertical stamp on the right side of the page containing the number 11-15870 and other markings.

Table with 6 columns: SAMPLE ID, CTNR, CTNR DESC, ORDER, PRESERV, MATRIX. It lists 9 rows of silica gel tubes with sample IDs ranging from MD21-11-5610 to MD21-11-5601.

Relinquished By: [Signature] Date: 3/9/11 Time: 14:00 Received By: [Signature] Date: 3/10/11 Time: 10:45

Received for DISPOSAL By: [Signature] Date: [ ] Time: [ ] Remarks: [ ]

Wednesday, March 09, 2011

REQUEST NUMBER: 11-1587

**LOS ALAMOS  
NATIONAL LABORATORY**

ATTN: Danny Coleman  
American Radiation Services - Primary  
1726 Wooddale Court  
Baton Rouge, LA 70806

These Samples are on:  
LANL Request Number:11-1587  
Per Agreement Number:63641-001-10  
Project Cost Code: MR8R032NFM00

Please analyse the enclosed samples  
according to the schedule indicated:

**SHIP DATE: 3/9/2011**

**TURNAROUND/REPORT DUE: 4/8/2011**

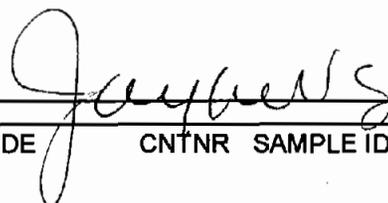
**TURNAROUND REQ'D: 30 Days**

**RAD SCREENING: Not Required**

**LAB REQUEST COMMENTS:**

LANL ER SMO CONTACT:

Signature:



PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-5600	GAS	3/9/2011	
		1	MD21-11-5601	GAS	3/9/2011	
		1	MD21-11-5602	GAS	3/9/2011	
		1	MD21-11-5603	GAS	3/9/2011	
		1	MD21-11-5605	GAS	3/9/2011	
		1	MD21-11-5606	GAS	3/9/2011	
		1	MD21-11-5607	GAS	3/9/2011	
		1	MD21-11-5608	GAS	3/9/2011	
CAS1	13132291-5310	GAS1	131322911-5310	GAS	3/9/2011	



2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# **American Radiation Services Analytical Reports**

for

## **Los Alamos National Laboratory**

# **Request Number: 11-1587**



2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# **American Radiation Services Analytical Reports**

**for**

**Los Alamos National Laboratory  
Request Number: 11-1587**

# **Original COC**

Wednesday, March 09, 2011

REQUEST NUMBER: 11-1587

**LOS ALAMOS**  
**NATIONAL LABORATORY**

ATTN: Danny Coleman

These Samples are on:

American Radiation Services - Primary

LANL Request Number: 11-1587

1726 Wooddale Court

Per Agreement Number: 63641-001-10

Baton Rouge, LA 70806

Project Cost Code: MR8R032NFM00

Please analyse the enclosed samples according to the schedule indicated:

SHIP DATE: 3/9/2011

TURNAROUND/REPORT DUE: 4/8/2011

TURNAROUND REQ'D: 30 Days

RAD SCREENING: Not Required

LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature:



PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
----------	-------------	-------	-----------	---------------	--------------	----------------------

EPA:906.0 1 MD21-11-5600 GAS 3/9/2011

1 MD21-11-5601 GAS 3/9/2011

1 MD21-11-5602 GAS 3/9/2011

1 MD21-11-5603 GAS 3/9/2011

1 MD21-11-5605 GAS 3/9/2011

1 MD21-11-5606 GAS 3/9/2011

1 MD21-11-5607 GAS 3/9/2011

1 MD21-11-5608 GAS 3/9/2011

GAS1 11-1587-5610 GAS1 11-1587-5610 GAS1 11-1587-5610 3/9/2011

Wednesday, March 09, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-15870

LOS ALAMOS NATIONAL LABORATORY

REQUEST NUMBER: 11-1587

ATTN: Danny Coleman
American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge, LA 70806
LAB REQUEST COMMENTS:

TURNAROUND/REPORT DUE: 4/8/2011
TURNAROUND REQ'D: 30

Vertical stamp on the right side of the page containing the number 11-15870 and other markings.

Table with 6 columns: SAMPLE ID, CTNR, CTNR DESC, ORDER, PRESERV, MATRIX. It lists 9 rows of sample data, all with CTNR 1 and CTNR DESC SILICA GEL TUBE.

Relinquished By: [Signature] Date: 3/9/11 Time: 14:00 Received By: [Signature] Date: 3/10/11 Time: 10:45

Received for DISPOSAL By: [Signature] Date: [ ] Time: [ ] Remarks: [ ]



2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

# **American Radiation Services Analytical Reports**

for

**Los Alamos National Laboratory  
Request Number: 11-1587**

# **Case Narrative**



2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

May 6, 2011

LANL  
Keith Greene  
PO Box 1663 MS M992  
Los Alamos, NM 87545

Request Number: **11-1587**

LANL Sample ID: **MD21-11-5600; MD21-11-5601; MD21-11-5602; MD21-11-5603; MD21-11-5605;  
MD21-11-5606; MD21-11-5607; MD21-11-5608; MD21-11-5610.**

Dear Mr. Greene;

On March 10, 2011, ARS International received nine (9) Silica Gel samples to be analyzed for Tritium.

The samples were received in good condition. They were processed and counted using the appropriate counting equipment and QA/QC for this type of analysis. Results of the analysis and QA/QC are attached in the data package.

The client and QA/QC samples were counted with a count time sufficient to meet quality control parameters for counting equipment and were within acceptance criteria and statistical sound detection limits.

If you have any questions please do not hesitate to call at 225.381.2991 or email [LANL@amrad.com](mailto:LANL@amrad.com).

Sincerely,

A handwritten signature in black ink that reads 'Eugene Mulligan'.

Laboratory Management  
ARS International



**COVER PAGE**

**PROJECT SAMPLE IDENTIFICATION  
CROSS-REFERENCE  
TO ARS SAMPLE LABORATORY IDs**  
Subcontract (LANL Agreement Number) 63641-001-10

<b>Request Number</b>	<b>LANL PROJECT SAMPLE ID NUMBER</b>	<b>American Radiation Services SAMPLE ID NUMBER(S)</b>
11-1587	MD21-11-5600	ARS1-11-00491-001
11-1587	MD21-11-5601	ARS1-11-00491-002
11-1587	MD21-11-5602	ARS1-11-00491-003
11-1587	MD21-11-5603	ARS1-11-00491-004
11-1587	MD21-11-5605	ARS1-11-00491-005
11-1587	MD21-11-5606	ARS1-11-00491-006
11-1587	MD21-11-5607	ARS1-11-00491-007
11-1587	MD21-11-5608	ARS1-11-00491-008
11-1587	MD21-11-5610	ARS1-11-00491-009

**ANALYTICAL METHODS**

Tritium analyses were performed using EPA 906.0.

**ANALYTICAL RESULTS**

The result data that are flagged with "U" indicate that the activity is below the MDC.



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**American Radiation Services Project Manager/Laboratory Director's Comments:**

*"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."*

*"I certify that this electronic image and all hardcopies produced from this image accurately represent the data and is in compliance with the LANL specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager/Technical Director or the Manager's designee."*

*Dixene Mulligan*  
Signature

Laboratory Management, ARS International

Title

*5-6-11*  
Date



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# **American Radiation Services Analytical Reports**

for

## **Los Alamos National Laboratory**

### **Tritium**

by

### **Low Level Liquid Scintillation Counting**



2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5600  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-001  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	18312.003	972.668	220.598	108.432		pCi/L	ARS-054/EPA 906.0	05/03/11 04:39	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.

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NELAP Certificate # E87558



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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5601  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-002  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	8321.930	452.722	219.105	107.698		pCi/L	ARS-054/EPA 906.0	05/03/11 07:49	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-00491  
**Client Sample ID:** MD21-11-5602  
**Sample Collection Date:** 03/09/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-1587  
**ARS Sample ID:** ARS1-11-00491-003  
**Date Received:** 03/10/11  
**Report Date:** 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	8685.194	471.606	219.884	108.081		pCi/L	ARS-054/EPA 906.0	05/03/11 10:58	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5603  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-004  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	22232.079	1177.212	220.301	108.286		pCi/L	ARS-054/EPA 906.0	05/03/11 14:08	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5605  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-005  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	5524.951	308.825	220.414	108.342		pCi/L	ARS-054/EPA 906.0	05/03/11 17:17	BS	NA

NOTES: Project Cost Code MR8R032NFM00

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**ARS Sample Delivery Group:** ARS1-11-00491  
**Client Sample ID:** MD21-11-5606  
**Sample Collection Date:** 03/09/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-1587  
**ARS Sample ID:** ARS1-11-00491-006  
**Date Received:** 03/10/11  
**Report Date:** 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	4340.263	248.407	219.018	107.656		pCi/L	ARS-054/EPA 906.0	05/03/11 20:27	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5607  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-007  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	101.103	66.810	219.380	107.834	U	pCi/L	ARS-054/EPA 906.0	05/03/11 23:36	BS	NA

NOTES: Project Cost Code MR8R032NFM00

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**ARS Sample Delivery Group:** ARS1-11-00491  
**Client Sample ID:** MD21-11-5608  
**Sample Collection Date:** 03/09/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-1587  
**ARS Sample ID:** ARS1-11-00491-008  
**Date Received:** 03/10/11  
**Report Date:** 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	268.997	69.788	219.551	107.918		pCi/L	ARS-054/EPA 906.0	05/04/11 02:45	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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**ARS Sample Delivery Group:** ARS1-11-00491  
**Client Sample ID:** MD21-11-5610  
**Sample Collection Date:** 03/09/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-1587  
**ARS Sample ID:** ARS1-11-00491-009  
**Date Received:** 03/10/11  
**Report Date:** 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	2.479	65.923	220.534	108.401	U	pCi/L	ARS-054/EPA 906.0	05/04/11 05:55	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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### QC Results per Analytical Batch

Analytical Batch	<b>ARS1-B11-01640</b>
SDG	<b>ARS1-11-00491</b>
Analysis	<b>Tritium (Aqueous)</b>
Analysis Test Method	<b>ARS-054/Liquid Scintillation Counter</b>
Analysis Code	<b>LSC-A-001</b>
Report Units	<b>pCi/L</b>

### Acceptable QC Performance Ranges

QC Sample Type	Performance Items and Ranges		
Laboratory Control Sample	Recovery (%):	> 80	< 120
Matrix Spike	Recovery (%):	> 75	< 125
Duplicate	Replicate Error Ratio (RER):	< 1	
	Duplicate Error Ratio (DER):	< 3	
	Relative Percent Difference (RPD %):	≤ 25	

Laboratory Control Sample			Analysis Date	05/02/11 19:14	Analysis Technician	BSTEFFENS	
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	Expected Value	LCS Rec (%)	MDC
ARS1-B11-01640-01	LCS	H-3	2460	160	2449	100	220

Duplicate RER/DER/RPD			Analysis Date	05/02/11 22:23	Analysis Technician	BSTEFFENS		
Analyte	Result LCS	CSU LCS (1s)	Results LCSD	CSU LCSD (1s)	RER	DER	RPD	
H-3	2460	155	2440	155	0.03	0.09	0.8	

Method Blank			Analysis Date	05/03/11 01:31	Analysis Technician	BSTEFFENS	
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	MDC	Qual	
ARS1-B11-01640-03	MBL	H-3	-110	64	220	U	

*Susan Leese*

Susan Leese

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# **American Radiation Services Analytical Reports**

for

## **Los Alamos National Laboratory**

### **Tritium**

by

### **Low Level Liquid Scintillation Counting**

# **Samples**



# LSC Instrument Data Transfer Report

\\PACARD03170\_NEW\results\ARSN-3 Normal 3\

Batch Sample ID				New Data Samples Transferred				Samples Eligible to Save				
LIMS Batch Sample ID	LSC P#	LSC P#D	LSC S#	LSC S#P1 ID	LSC Count Date	LSC CPMA	LSC KSE	LSC BFF	LSC Count Dur	Analysis Batch	LIMS SDC	LIMS Run
ARSI-B11-01640-01	54		1	BACKGROUND	05/02/11 16:07	6.36	422.88	35.9200	180.00	ARSI-B11-01640		
ARSI-B11-01640-02	54		2	B11-01640-01	05/02/11 19:13	16.38	435.48	36.4800	180.00	ARSI-B11-01640		
ARSI-B11-01640-03	54		3	B11-01640-02	05/02/11 22:23	16.31	435.50	36.4800	180.00	ARSI-B11-01640		
ARSI-B11-01640-04	54		4	B11-01640-03	05/03/11 01:31	5.91	437.63	36.5700	180.00	ARSI-B11-01640		
ARSI-B11-01640-05	54		5	B11-01640-04	05/03/11 04:39	80.21	436.54	36.5300	180.00	ARSI-B11-01640		
ARSI-B11-01640-06	54		6	B11-01640-05	05/03/11 07:48	40.15	439.73	36.6700	180.00	ARSI-B11-01640		
ARSI-B11-01640-07	54		7	B11-01640-06	05/03/11 10:39	41.50	435.59	36.4900	180.00	ARSI-B11-01640		
ARSI-B11-01640-08	54		8	B11-01640-07	05/03/11 14:07	96.14	433.67	36.4000	180.00	ARSI-B11-01640		
ARSI-B11-01640-09	54		9	B11-01640-08	05/03/11 17:17	28.66	431.65	36.3100	180.00	ARSI-B11-01640		
ARSI-B11-01640-10	54		10	B11-01640-09	05/03/11 20:36	23.99	435.20	36.4700	180.00	ARSI-B11-01640		
ARSI-B11-01640-11	54		11	B11-01640-10	05/03/11 23:36	6.77	430.55	36.2600	180.00	ARSI-B11-01640		
ARSI-B11-01640-12	54		12	B11-01640-11	05/04/11 02:45	7.45	427.76	36.1400	180.00	ARSI-B11-01640		
ARSI-B11-01640-13	54		13	B11-01640-12	05/04/11 05:55	6.37	429.04	36.2000	180.00	ARSI-B11-01640		
ARSI-B11-01640-14	54		14	B11-01640-13	05/04/11 09:04	6.20	424.17	35.9800	180.00	ARSI-B11-01640		
ARSI-B11-01640-15	54		15	B11-01640-14	05/04/11 12:12	6.24	423.99	35.9700	180.00	ARSI-B11-01640		
ARSI-B11-01640-16	54		16	B11-01640-15	05/04/11 15:20	6.82	418.05	35.7100	180.00	ARSI-B11-01640		
ARSI-B11-01640-17	54		17	B11-01640-16	05/04/11 18:29	6.57	424.88	36.0100	180.00	ARSI-B11-01640		
ARSI-B11-01640-18	54		18	B11-01640-17	05/04/11 21:39	6.80	434.42	36.4300	180.00	ARSI-B11-01640		
ARSI-B11-01640-19	54		19	B11-01640-18	05/05/11 00:48	6.97	428.92	36.1900	180.00	ARSI-B11-01640		
ARSI-B11-01640-20	54		20	B11-01640-19	05/05/11 03:58	7.28	406.85	35.0900	180.00	ARSI-B11-01640		
ARSI-B11-01640-21	54		21	B11-01640-20	05/05/11 07:07	8.06	416.46	35.6400	180.00	ARSI-B11-01640		
ARSI-B11-01640-22	54		22	B11-01640-21	05/05/11 10:16	7.01	400.48	34.6300	180.00	ARSI-B11-01640		
ARSI-B11-01640-23	54		23	B11-01640-22	05/05/11 13:26	137.77	423.60	35.9600	180.00	ARSI-B11-01640		
ARSI-B11-01640-24	54		24	B11-01640-23	05/05/11 16:35	156.32	419.18	35.7600	180.00	ARSI-B11-01640		

Procedure		ARS-054		Isotope		H-3	
Variable	Value	Calculated Values	Excel	VBA	V/V		
Gross Count Rate	16.380000	ACT	2456.337093	2456.337093	OK		
Sample Count Mins	180.000000	CU	87.132309	87.132309	OK		
BKG Count Rate	6.360000	TPU	155.186549	155.186549	OK		
BKG Count Mins	180.000000	MDA	218.090311	218.090311	OK		
Instrument Efficiency	0.364800	DL	107.199670	107.199670	OK		
Sample Aliquot	5.037000	Net Count Rate	10.020000	10.020000	OK		
Dilution Factor	1.000000	D t 1 (t2 - t1)	0.000000	0.000000	OK		
Aliquot Conversion Factor	0.001000	DF	1.000000	1.000000	OK		
Sample Collection Date (t1)	5/2/11 7:14 PM	Sys Err	0.052280	0.052280	OK		
Count Date (t2)	5/2/11 7:14 PM	K	0.004079	0.004079	OK		
Activity Units = pCi → UCP =	2.2200	K MDA	0.734264	0.734264	OK		
CF	1.0000						
Nuclide Abundance	1.000000						
Half-life Days 1 - Result Isotope	4499.800000						
TPUF_Calibration Factor	0.041330						
TPUF_Aliquoting Factor	0.020000						
TPUF_Field Factor	0.000000						
TPUF_Decay Ingrowth Factor	0.025000						
TPUF_Analysis Factor	0.000000						
TPUF_Unassigned Factor	0.000000						
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>					
Aliquot Units	L	Batch	ARS1-B11-01640				
		Batch ID	ARS1-B11-01640-01				
		Analysis Code					
		SDG	QC Sample				
		Fraction	N/A QC Sample				
		Run Number					
		Client	QC Sample				
		Client Profile					
		Client ID	N/A QC Sample				
		Instr File Name	71				
		Instr Detector	P-54-S-2				
		Instr keV					
		Version/Date	1.0 -- 11/18/2005				
<b>0</b>	<b>Variables Intact Test</b>	<b>OK</b>					

Reviewed by: SDH Date: 5-6-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	16.310000	ACT	2444.029206	2444.029206	OK
Sample Count Mins	180.000000	GU	170.855471	170.855471	OK
BKG Count Rate	6.360000	TPU	303.165756	303.165756	OK
BKG Count Mins	180.000000	MDA	218.523849	218.523849	OK
Instrument Efficiency	0.364800	DL	107.412918	107.412918	OK
Sample Aliquot	5.027000	Net Count Rate	9.950000	9.950000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	0.000000	0.000000	OK
Aliquot Conversion Factor	0.001000	DF	1.000000	1.000000	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	5/2/11 10:23 PM	K	0.004071	0.004071	OK
Count Date (t2)	5/2/11 10:23 PM	K MDA	0.732806	0.732806	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.9600				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>			
Aliquot Units	L	Batch	ARS1-B11-01640		
		Batch ID	ARS1-B11-01640-02		
		Analysis Code			
		SDG	QC Sample		
		Fraction	N/A QC Sample		
		Run Number			
		Client	QC Sample		
		Client Profile			
		Client ID	N/A QC Sample		
		Instr File Name	71		
		Instr Detector	P-54-S-3		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>0</b>	<b>Variables Intact Test</b>	<b>OK</b>			

Reviewed by: SDH Date: 5-6-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	5.910000	ACT	-109.890336	-109.890336	OK
Sample Count Mins	180.000000	CU	124.965200	124.965200	OK
BKG Count Rate	6.360000	TPU	125.471490	125.471490	OK
BKG Count Mins	180.000000	MDA	217.251468	217.251468	OK
Instrument Efficiency	0.365700	DL	106.787444	106.787444	OK
Sample Aliquot	5.044000	Net Count Rate	-0.450000	-0.450000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	0.000000	0.000000	OK
Aliquot Conversion Factor	6.001000	DF	1.000000	1.000000	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	5/3/11 1:31 AM	K	0.004095	0.004095	OK
Count Date (t2)	5/3/11 1:31 AM	K MDA	0.737098	0.737098	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.9600				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>			
Aliquot Units	L	Batch	ARS1-B11-01640		
		Batch ID	ARS1-B11-01640-03		
		Analysis Code			
		SDG	QC Sample		
		Fraction	N/A QC Sample		
		Run Number			
		Client	QC Sample		
		Client Profile			
		Client ID	N/A QC Sample		
		Instr File Name	71		
		Instr Detector	P-54-S-4		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>0 Variables Intact Test</b>	<b>OK</b>				

Reviewed by: SDH Date: 5-6-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	80.210000	ACT	18312.002839	18312.002829	OK
Sample Count Mins	180.000000	CD	171.962125	171.962125	OK
BKG Count Rate	6.360000	TPU	972.667976	972.667975	OK
BKG Count Mins	180.000000	MDA	220.597748	220.597748	OK
Instrument Efficiency	0.365300	DL	108.432271	108.432271	OK
Sample Aliquot	5.015000	Net Count Rate	73.850000	73.850000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	54.693750	54.693750	OK
Aliquot Conversion Factor	0.001000	DF	0.991610	0.991610	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/9/11 12:00 PM	K	0.004033	0.004033	OK
Count Date (t2)	5/3/11 4:39 AM	K MDA	0.725917	0.725917	OK
Activity Units - pCi --> UCF =	2.2280				
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.030000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>			
Aliquot Units	L	Batch	ARS1-B11-01640		
		Batch ID	ARS1-B11-01640-04		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00491		
		Fraction	001		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	ND21-11-5600		
		Instr File Name	71		
		Instr Detector	P-54-5-5		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>0 Variables Intact Test</b>	<b>OK</b>				

Reviewed by: SDR Date: 5-6-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	40.150000	ACT	8321.930425	8321.930420	OK
Sample Count Mins	180.000000	CD	125.190913	125.190913	OK
BKG Count Rate	6.360000	TPU	452.721859	452.721858	OK
BKG Count Mins	150.000000	MDA	219.104662	219.104662	OK
Instrument Efficiency	0.366700	OL	107.698361	107.698361	OK
Sample Aliquot	5.030000	Net Count Rate	33.790000	33.790000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	54.825694	54.825694	OK
Aliquot Conversion Factor	0.001000	DF	0.991590	0.991590	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/9/11 12:00 PM	K	0.004060	0.004060	OK
Count Date (t2)	5/3/11 7:49 AM	K MDA	0.730864	0.730864	OK
Activity Units = pCi --- UCF =	7.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>			
Aliquot Units	L	Batch	ARS1-B11-01640		
		Batch ID	ARS1-B11-01640-05		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00491		
		Fraction	002		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	ND21-11-5601		
		Instr File Name	71		
		Instr Detector	P-54-S-6		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>Variables Intact Test</b>	<b>OK</b>				

Reviewed by: SDK Date: 5-6-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	41.500000	ACT	8685.193670	8685.193665	OK
Sample Count Mins	180.000000	CG	127.446480	127.446480	OK
BKG Count Rate	6.360000	TPU	471.606416	471.606416	OK
BKG Count Mins	180.000000	MDA	219.883924	219.883924	OK
Instrument Efficiency	0.364900	DL	108.081398	108.081398	OK
Sample Aliquot	5.037000	Net Count Rate	35.140000	35.140000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	54.956944	54.956944	OK
Aliquot Conversion Factor	0.001000	DF	0.991570	0.991570	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/9/11 12:00 PM	K	0.004046	0.004046	OK
Count Date (t2)	5/3/11 10:58 AM	K MDA	0.728274	0.728274	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Halflife Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>			
Aliquot Units	L	Batch	ARS1-B11-01640		
		Batch ID	ARS1-B11-01640-06		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00491		
		Fraction	003		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-5682		
		Instr File Name	71		
		Instr Detector	P-54 5-7		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>Variables Intact Test</b>	<b>OK</b>				

Reviewed by:                           Date: 5-6-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	96.140000	ACT	22232.078748	22232.078736	OK
Sample Count Mins	180.000000	CD	180.000000	180.000000	OK
BKG Count Rate	6.360000	TPU	1177.212323	1177.212322	OK
BKG Count Mins	180.000000	MDA	220.300000	220.300000	OK
Instrument Efficiency	0.364000	DL	108.286340	108.286340	OK
Sample Aliquot	5.040000	Net Count Rate	89.780000	89.780000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	55.088889	55.088889	OK
Aliquot Conversion Factor	0.001000	DF	0.991550	0.991550	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/9/11 12:00 PM	K	0.004038	0.004038	OK
Count Date (t2)	5/3/11 2:08 PM	K MDA	0.726896	0.726896	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>			
Aliquot Units	L	Batch	ARS1-B11-01640		
		Batch ID	ARS1-B11-01640-07		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00491		
		Fraction	004		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	ND21-11-5603		
		Instr File Name	71		
		Instr Detector	P-54-S-8		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>0</b>	<b>Variables Intact Test</b>				<b>OK</b>

Reviewed by: SDR Date: 5-6-11

Procedure		ARS-054		Isotope		H-3	
Variable	Value	Calculated Values	Excel	VBA	V/V		
Gross Count Rate	28.660000	ACT	5524.950706	5524.950703	OK		
Sample Count Mins	169.000000	CD	169.281177	169.281177	OK		
BKG Count Rate	6.360000	TPU	308.824506	308.824506	OK		
BKG Count Mins	150.000000	MDA	220.414050	220.414049	OK		
Instrument Efficiency	0.363100	DL	108.341975	108.341975	OK		
Sample Aliquot	5.050000	Net Count Rate	22.300000	22.300000	OK		
Dilution Factor	1.000000	D t 1 (t2 - t1)	55.220139	55.220139	OK		
Aliquot Conversion Factor	0.001000	DF	0.991530	0.991530	OK		
Sample Collection Date (t1)	3/9/11 12:00 PM	Sys Err	0.052280	0.052280	OK		
Count Date (t2)	5/3/11 5:17 PM	K	0.004036	0.004036	OK		
Activity Units = pCi --- UCF =	2.2200	K MDA	0.726522	0.726522	OK		
CF	1.0000						
Nuclide Abundance	1.000000						
Half-life Days 1 - Result Isotope	4499.800000						
TPUF_Calibration Factor	0.041330						
TPUF_Aliquoting Factor	0.020000						
TPUF_Yield Factor	0.000690						
TPUF_Decay Ingrowth Factor	0.025000						
TPUF_Analysis Factor	0.000000						
TPUF_Unassigned Factor	0.000000						
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>					
Aliquot Units	L	Batch	ARS1-B11-01640				
		Batch ID	ARS1-B11-01640-08				
		Analysis Code	LSC-A-001				
		SDG	ARS1-11-00491				
		Fraction	005				
		Run Number	1				
		Client	Los Alamos National Laboratory				
		Client Profile	Keith Greene				
		Client ID	ND21-11-5605				
		Instr File Name	71				
		Instr Detector	P-54-S-9				
		Instr keV					
		Version/Date	1.0 -- 11/18/2005				
<b>0</b>	<b>Variables Intact Test</b>	<b>OK</b>					

Reviewed by: SDH Date: 5-6-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	23.990000	ACT	4340.262840	4340.262838	OK
Sample Count Mins	180.000000	CU	101.069678	101.069678	OK
BKG Count Rate	6.360000	TPU	248.407397	248.407397	OK
BKG Count Mins	180.000000	MDA	219.017818	219.017818	OK
Instrument Efficiency	0.364700	DL	107.655674	107.655674	OK
Sample Aliquot	5.060000	Net Count Rate	17.630000	17.630000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	55.352083	55.352083	OK
Aliquot Conversion Factor	0.091800	DF	0.991510	0.991510	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/9/11 12:00 PM	K	0.004062	0.004062	OK
Count Date (t2)	5/3/11 8:27 PM	K MDA	0.731154	0.731154	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Halflife Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>			
Aliquot Units	L	Batch	ARS1-B11-01640		
		Batch ID	ARS1-B11-01640-09		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00491		
		Fraction	006		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-5606		
		Instr File Name	71		
		Instr Detector	P-54-5-10		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>0</b>	<b>Variables Intact Test</b>	<b>OK</b>			

Reviewed by: SDH Date: 5-6-11

Procedure		ARS-054		Isotope		H-3	
Variable	Value	Calculated Values	Excel	V&A	V/V		
Gross Count Rate	6.770000	ACT	101.103372	101.103372	OK		
Sample Count Mins	180.000000	CD	66.608952	66.608952	OK		
BKG Count Rate	6.360000	TPU	66.809977	66.809977	OK		
BKG Count Mins	180.000000	MDA	219.380243	219.380243	OK		
Instrument Efficiency	0.362600	DL	107.833820	107.833820	OK		
Sample Aliquot	5.081000	Net Count Rate	0.410000	0.410000	OK		
Dilution Factor	1.000000	D t 1 (t2 - t1)	55.483333	55.483333	OK		
Aliquot Conversion Factor	0.001000	DF	0.991490	0.991490	OK		
		Sys Err	0.052280	0.052280	OK		
Sample Collection Date (t1)	3/9/11 12:00 PM	K	0.004055	0.004055	OK		
Count Date (t2)	5/3/11 11:36 PM	K MDA	0.729946	0.729946	OK		
Activity Units - pCi --- UCF =	2.2280						
CF	1.0000						
Nuclide Abundance	1.000000						
Halflife Days 1 - Result Isotope	4499.800000						
TPUF_Calibration Factor	0.041330						
TPUF_Aliquoting Factor	0.020000						
TPUF_Yield Factor	0.000000						
TPUF_Decay Ingrowth Factor	0.025000						
TPUF_Analysis Factor	0.000000						
TPUF_Unassigned Factor	0.000000						
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>					
Aliquot Units	L	Batch	ARS1-B11-01640				
		Batch ID	ARS1-B11-01640-10				
		Analysis Code	LSC-A-001				
		SDG	ARS1-11-00491				
		Fraction	007				
		Run Number	1				
		Client	Los Alamos National Laboratory				
		Client Profile	Keith Greene				
		Client ID	MD21-11-5607				
		Instr File Name	71				
		Instr Detector	P-54-5-11				
		Instr keV					
		Version/Date	1.0 -- 11/18/2005				
<b>0</b>	<b>Variables Intact Test</b>	<b>OK</b>					

Reviewed by: SDA

Date: 5-6-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	7.450000	ACT	268.996710	268.996710	OK
Sample Count Mins	180.000000	CJ	68.386695	68.386695	OK
BKG Count Rate	6.360000	TPU	69.788307	69.788307	OK
BKG Count Mins	180.000000	MDA	219.551394	219.551394	OK
Instrument Efficiency	0.361400	DL	107.917947	107.917947	OK
Sample Aliquot	5.094000	Net Count Rate	1.090000	1.090000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	55.614583	55.614583	OK
Aliquot Conversion Factor	0.001000	DF	0.991470	0.991470	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/9/11 12:00 PM	K	0.004052	0.004052	OK
Count Date (t2)	5/4/11 2:45 AM	K MDA	0.729377	0.729377	OK
Activity Units = pCi -- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	<b>Batch Identifiers and Other Related Information</b>			
Aliquot Units	L	Batch	ARS1-B11-01640		
		Batch ID	ARS1-B11-01640-11		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00491		
		Fraction	008		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-5608		
		Instr File Name	71		
		Instr Detector	P-54-S-12		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>0</b>	<b>Variables Intact Test</b>	<b>OK</b>			

Reviewed by: SDH Date: 5-6-11

Procedure		ARS-054	Isotope				H-3
Variable	Value		Calculated Values	Excel	VBA	V/V	
Gross Count Rate	6.370000		ACT	2.478905	2.478905	OK	
Sample Count Mins	180.000000		CU	65.923260	65.923260	OK	
BKG Count Rate	6.360000		TPU	65.923260	65.923260	OK	
BKG Count Mins	180.000000		MDA	220.534032	220.534032	OK	
Instrument Efficiency	0.362000		DL	108.400951	108.400951	OK	
Sample Aliquot	5.063000		Net Count Rate	0.010000	0.010000	OK	
Dilution Factor	1.000000		D t 1 (t2 - t1)	55.746528	55.746528	OK	
Aliquot Conversion Factor	0.001000		DF	0.991450	0.991450	OK	
			Sys Err	0.052280	0.052280	OK	
Sample Collection Date (t1)	3/9/11 12:00 PM		K	0.004034	0.004034	OK	
Count Date (t2)	5/4/11 5:55 AM		K MDA	0.726127	0.726127	OK	
Activity Units = pCi -- UCF =	2.2200						
CF	1.0000						
Nuclide Abundance	1.000000						
Half-life Days 1 - Result Isotope	4499.800000						
TPUF_Calibration Factor	0.041330						
TPUF_Aliquoting Factor	0.020000						
TPUF_Field Factor	0.000000						
TPUF_Decay Ingrowth Factor	0.025000						
TPUF_Analysis Factor	0.000000						
TPUF_Unassigned Factor	0.000000						
Activity Units	pCi		<b>Batch Identifiers and Other Related Information</b>				
Aliquot Units	L		Batch	ARS1-B11-01640			
			Batch ID	ARS1-B11-01640-12			
			Analysis Code	LSC-A-001			
			SDG	ARS1-11-00491			
			Fraction	009			
			Run Number	1			
			Client	Los Alamos National Laboratory			
			Client Profile	Keith Greene			
			Client ID	MD21-11-5618			
			Instr File Name	71			
			Instr Detector	P-54-S-13			
			Instr keV				
			Version/Date	1.0 -- 11/18/2005			
<b>Variables Intact Test</b>		<b>OK</b>					

Reviewed by: SDN

Date: 5-6-11



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**American Radiation Services  
Analytical Reports**

for

**Los Alamos National Laboratory**

**Tritium**  
by  
**Low Level Liquid  
Scintillation Counting  
Laboratory  
Records**

Analysis Batch Report



Analysis Batch ID ARS1-B11-01640

Method ARS-054

Analysis LSC-A-001

Matrix SI

Batch Sample ID	Type	Blind Iso1	Blind Iso2	Blind Iso3	Description	SDG	FR	Run	Client ID	Isotope Group	Lab Deadline
ARS1-B11-01640-01	LCS	B-11644									
ARS1-B11-01640-02	LCSD	B-11645									
ARS1-B11-01640-03	MBL										
ARS1-B11-01640-04	TRG										
ARS1-B11-01640-05	TRG										
ARS1-B11-01640-06	TRG										
ARS1-B11-01640-07	TRG										
ARS1-B11-01640-08	TRG										
ARS1-B11-01640-09	TRG										
ARS1-B11-01640-10	TRG										
ARS1-B11-01640-11	TRG										
ARS1-B11-01640-12	TRG										
ARS1-B11-01640-13	TRG										
ARS1-B11-01640-14	TRG										
ARS1-B11-01640-15	TRG										
ARS1-B11-01640-16	TRG										
ARS1-B11-01640-17	TRG										
ARS1-B11-01640-18	TRG										
ARS1-B11-01640-19	TRG										
ARS1-B11-01640-20	TRG										
ARS1-B11-01640-21	TRG										
ARS1-B11-01640-22	TRG										
ARS1-B11-01640-23	TRG										

85817  
 85818  
 85819  
 85820  
 85821  
 85822  
 85823  
 85824  
 85825  
 WRAD 11-00491-001-1  
 WRAD 11-00491-002-1  
 WRAD 11-00491-003-1  
 WRAD 11-00491-004-1  
 WRAD 11-00491-005-1  
 WRAD 11-00491-006-1  
 WRAD 11-00491-007-1  
 WRAD 11-00491-008-1  
 WRAD 11-00491-009-1

85826  
 85827  
 85828  
 85829  
 85830  
 85831  
 85832  
 85833  
 85834  
 WRAD 11-00622-001-1  
 WRAD 11-00622-002-1  
 WRAD 11-00622-003-1  
 WRAD 11-00622-004-1  
 WRAD 11-00622-005-1  
 WRAD 11-00622-006-1  
 WRAD 11-00526-001-1  
 WRAD 11-00526-002-1  
 WRAD 11-00526-003-1

85835  
 85836  
 WRAD 11-00527-001-1  
 WRAD 11-00527-002-1

LCS Report  
 Analytical Batch: ARS1-B11-01640

BlindID	Batch	BatchSampleID	BlindGroup	StatID	Isotope	ExpectedRadition	ExpectedValue	EmpYrWt	GrossWt	NetWt	UserID	ModDate	ExpectedValue_CT	MidPointCountDate	Know/Value
B-11644	ARS1-B11-01640	ARS1-B11-01640-01	B-H3	S-0247	H-3	5	2.454533971	0	1	1	BSTEFFENS	4/18/2011	2.449246341	5/2/2011	2.449246341
B-11645	ARS1-B11-01640	ARS1-B11-01640-02	B-H3	S-0247	H-3	5	2.454533971	0	1	1	BSTEFFENS	4/18/2011	2.449246341	5/2/2011	2.449246341

ARS-054

ID_31001_054	ABatch	ABatchSampleID	ClientID	Alliquot1	AlliquotUnits1	IC_ID1	Alliquot2	AlliquotUnits2	IC_ID2	UserID	Moddate
8443	ARSI-B11-01640	ARSI-B11-01640-01					5.037 g			BSTEFFENS	05/03/2011 10:19:34
8444	ARSI-B11-01640	ARSI-B11-01640-02					5.027 g			BSTEFFENS	05/03/2011 10:19:34
8445	ARSI-B11-01640	ARSI-B11-01640-03					5.044 g			BSTEFFENS	05/03/2011 10:19:34
8446	ARSI-B11-01640	ARSI-B11-01640-04					5.015 g			85817 BSTEFFENS	05/03/2011 10:19:34
8447	ARSI-B11-01640	ARSI-B11-01640-05					5.03 g			85818 BSTEFFENS	05/03/2011 10:19:34
8448	ARSI-B11-01640	ARSI-B11-01640-06					5.037 g			85819 BSTEFFENS	05/03/2011 10:19:34
8449	ARSI-B11-01640	ARSI-B11-01640-07					5.04 g			85820 BSTEFFENS	05/03/2011 10:19:34
8450	ARSI-B11-01640	ARSI-B11-01640-08					5.05 g			85821 BSTEFFENS	05/03/2011 10:19:34
8451	ARSI-B11-01640	ARSI-B11-01640-09					5.06 g			85822 BSTEFFENS	05/03/2011 10:19:35
8452	ARSI-B11-01640	ARSI-B11-01640-10					5.081 g			85823 BSTEFFENS	05/03/2011 10:19:35
8453	ARSI-B11-01640	ARSI-B11-01640-11					5.094 g			85824 BSTEFFENS	05/03/2011 10:19:35
8454	ARSI-B11-01640	ARSI-B11-01640-12					5.063 g			85825 BSTEFFENS	05/03/2011 10:19:35
8455	ARSI-B11-01640	ARSI-B11-01640-13					5.03 g			85826 BSTEFFENS	05/03/2011 10:19:35
8456	ARSI-B11-01640	ARSI-B11-01640-14					5.075 g			85827 BSTEFFENS	05/03/2011 10:19:35
8457	ARSI-B11-01640	ARSI-B11-01640-15					5.054 g			85828 BSTEFFENS	05/03/2011 10:19:35
8458	ARSI-B11-01640	ARSI-B11-01640-16					5.051 g			85829 BSTEFFENS	05/03/2011 10:19:35
8459	ARSI-B11-01640	ARSI-B11-01640-17					5.069 g			85830 BSTEFFENS	05/03/2011 10:19:35
8460	ARSI-B11-01640	ARSI-B11-01640-18					5.05 g			85831 BSTEFFENS	05/03/2011 10:19:35
8461	ARSI-B11-01640	ARSI-B11-01640-19					5.033 g			85832 BSTEFFENS	05/03/2011 10:19:35
8462	ARSI-B11-01640	ARSI-B11-01640-20					5.028 g			85833 BSTEFFENS	05/03/2011 10:19:35
8463	ARSI-B11-01640	ARSI-B11-01640-21					5.007 g			85834 BSTEFFENS	05/03/2011 10:19:35
8464	ARSI-B11-01640	ARSI-B11-01640-22					5.076 g			85835 BSTEFFENS	05/03/2011 10:19:36
8465	ARSI-B11-01640	ARSI-B11-01640-23					5.055 g			85836 BSTEFFENS	05/03/2011 10:19:36

Batch Result Verification Report

AbatchSampleID	SDG	Fraction	ClientID	Run	Isotope	ACT	TPU	TPUs	TPUs2	MDA	DL	CU	CU1s	CU2s	ActivityReportUnits
ARSI-B11-01640-01					1-H-3	2456.337093	155.1865492	155.1865492	304.1655363	218.0901114	107.1996705	87.13230894	87.13230894	170.7792325	pci
ARSI-B11-01640-02					1-H-3	2444.029206	303.1657561	154.6764062	303.1657561	218.5239489	107.4129183	170.8554708	87.17115858	170.8554708	pci
ARSI-B11-01640-03					1-H-3	-109.890336	125.471449	64.01606635	125.471449	217.2514664	106.7874443	124.9651997	63.75775494	124.9651997	pci
ARSI-B11-01640-04	ARSI-11-00491	001	MD21-11-5600		1-H-3	18312.00283	972.6679752	972.6679752	1906.429231	220.5977489	108.4322707	171.962125	171.962125	337.0457651	pci
ARSI-B11-01640-05	ARSI-11-00491	002	MD21-11-5601		1-H-3	8321.93042	452.7218584	452.7218584	887.3468424	219.1046617	107.698361	125.1909127	125.1909127	245.3741889	pci
ARSI-B11-01640-06	ARSI-11-00491	003	MD21-11-5602		1-H-3	8685.193665	471.6064159	924.3485752	924.3485752	219.8839242	108.0813984	127.4464798	127.4464798	249.7951004	pci
ARSI-B11-01640-07	ARSI-11-00491	004	MD21-11-5603		1-H-3	2223.07874	1177.212322	1177.212322	2307.336151	220.3008638	108.2863403	186.8642194	186.8642194	366.25387	pci
ARSI-B11-01640-08	ARSI-11-00491	005	MD21-11-5605		1-H-3	5524.950703	308.8245062	308.8245062	605.2960322	220.4140495	108.3419754	109.2811767	109.2811767	214.1911063	pci
ARSI-B11-01640-09	ARSI-11-00491	006	MD21-11-5606		1-H-3	4340.262838	248.407397	248.407397	486.878498	219.0178177	107.6556738	101.089678	101.089678	198.1357689	pci
ARSI-B11-01640-10	ARSI-11-00491	007	MD21-11-5607		1-H-3	101.1033721	66.809977	66.809977	130.9475549	219.380243	107.8338198	66.60056208	66.60056208	130.5371017	pci
ARSI-B11-01640-11	ARSI-11-00491	008	MD21-11-5608		1-H-3	268.9967099	69.78830671	69.78830671	136.7850812	219.5513943	107.9179472	68.35669504	68.35669504	133.9791223	pci
ARSI-B11-01640-12	ARSI-11-00491	009	MD21-11-5610		1-H-3	2.478905026	65.92326012	65.92326012	129.2095898	220.5340318	108.4009513	65.92313274	65.92313274	129.2093402	pci
ARSI-B11-01640-13	ARSI-11-00622	001	MD50-11-5957		1-H-3	40.08725551	66.21593903	66.21593903	129.7833405	222.8958953	109.5618979	66.18276521	66.18276521	129.7182198	pci
ARSI-B11-01640-14	ARSI-11-00622	002	MD50-11-5958		1-H-3	-29.80773851	65.738359	65.738359	128.8471836	220.9853639	108.6227984	65.71988603	65.71988603	128.8109766	pci
ARSI-B11-01640-15	ARSI-11-00622	003	MD50-11-5959		1-H-3	115.5754778	68.25550695	68.25550695	133.7807936	223.5237089	109.8704925	67.98753859	67.98753859	133.2555756	pci
ARSI-B11-01640-16	ARSI-11-00622	004	MD50-11-5960		1-H-3	52.3552919	66.87570253	66.87570253	131.076377	221.7976906	109.0220881	66.81566599	66.81566599	130.9665453	pci
ARSI-B11-01640-17	ARSI-11-00622	005	MD50-11-5961		1-H-3	108.0492545	66.6387333	66.6387333	130.6119173	218.4664883	107.3846742	66.3988856	66.3988856	130.1418158	pci
ARSI-B11-01640-18	ARSI-11-00526	001	MD50-11-5962		1-H-3	151.3593526	67.98680895	67.98680895	133.2527354	220.7471757	108.5057197	67.5240136	67.5240136	132.3470667	pci
ARSI-B11-01640-19	ARSI-11-00526	001	MD54-11-3767		1-H-3	236.672871	71.88884579	71.88884579	140.9021377	228.8634188	112.4851651	70.81603134	70.81603134	138.7994214	pci
ARSI-B11-01640-20	ARSI-11-00526	002	MD54-11-3766		1-H-3	431.0182784	75.21642731	75.21642731	147.4241975	225.5602129	110.8715124	71.76177035	71.76177035	140.6530699	pci
ARSI-B11-01640-21	ARSI-11-00526	003	MD54-11-3768		1-H-3	170.3224249	71.96773679	71.96773679	141.0567641	233.1171388	114.5860319	71.41475094	71.41475094	139.9729118	pci
ARSI-B11-01640-22	ARSI-11-00527	001	MD21-11-5604		1-H-3	32710.29471	1724.529924	1724.529924	3380.078652	221.4480044	108.850204	222.7393677	222.7393677	436.5691607	pci
ARSI-B11-01640-23	ARSI-11-00527	002	MD21-11-5609		1-H-3	38195.80284	2011.29211	2011.29211	3942.132535	223.6161801	109.9159456	240.4205572	240.4205572	471.2243706	pci

Batch Result Verification Report

AbatchSampleID	SDG	Fraction	AllquotReportUnits	ChemRecovery	TracerRecovery	SampleCounts	SampleCountPctns	BKG_Counts	BKG_CountPctns	EFF	Aliq	SampleCollDate	MidPointCountDate	BP_DL
ARS1-B11-01640-01		L				0.091	180	0.0353333333	180	0.3648	5.037	5/6/2011	5/2/2011	
ARS1-B11-01640-02		L				0.090611111	180	0.0353333333	180	0.3648	5.027	5/6/2011	5/2/2011	
ARS1-B11-01640-03		L				0.032833333	180	0.0353333333	180	0.3657	5.044	5/6/2011	5/3/2011	
ARS1-B11-01640-04	ARS1-11-00491	L				0.445611111	180	0.0353333333	180	0.3653	5.015	3/9/2011	5/3/2011	
ARS1-B11-01640-05	ARS1-11-00491	L				0.223055556	180	0.0353333333	180	0.3667	5.03	3/9/2011	5/3/2011	
ARS1-B11-01640-06	ARS1-11-00491	L				0.230555556	180	0.0353333333	180	0.3649	5.037	3/9/2011	5/3/2011	
ARS1-B11-01640-07	ARS1-11-00491	L				0.534111111	180	0.0353333333	180	0.364	5.04	3/9/2011	5/3/2011	
ARS1-B11-01640-08	ARS1-11-00491	L				0.159222222	180	0.0353333333	180	0.3631	5.05	3/9/2011	5/3/2011	
ARS1-B11-01640-09	ARS1-11-00491	L				0.133277778	180	0.0353333333	180	0.3647	5.06	3/9/2011	5/3/2011	
ARS1-B11-01640-10	ARS1-11-00491	L				0.037611111	180	0.0353333333	180	0.3626	5.081	3/9/2011	5/3/2011	
ARS1-B11-01640-11	ARS1-11-00491	L				0.041388889	180	0.0353333333	180	0.3614	5.094	3/9/2011	5/4/2011	
ARS1-B11-01640-12	ARS1-11-00491	L				0.035388889	180	0.0353333333	180	0.362	5.063	3/9/2011	5/4/2011	
ARS1-B11-01640-13	ARS1-11-00622	L				0.034444444	180	0.0353333333	180	0.3598	5.03	3/22/2011	5/4/2011	
ARS1-B11-01640-14	ARS1-11-00622	L				0.034666667	180	0.0353333333	180	0.3597	5.075	3/22/2011	5/4/2011	
ARS1-B11-01640-15	ARS1-11-00622	L				0.037888889	180	0.0353333333	180	0.3571	5.054	3/22/2011	5/4/2011	
ARS1-B11-01640-16	ARS1-11-00622	L				0.0365	180	0.0353333333	180	0.3601	5.051	3/22/2011	5/4/2011	
ARS1-B11-01640-17	ARS1-11-00622	L				0.037777778	180	0.0353333333	180	0.3643	5.069	3/22/2011	5/4/2011	
ARS1-B11-01640-18	ARS1-11-00622	L				0.038722222	180	0.0353333333	180	0.3619	5.05	3/22/2011	5/5/2011	
ARS1-B11-01640-19	ARS1-11-00526	L				0.040444444	180	0.0353333333	180	0.3509	5.033	3/10/2011	5/5/2011	
ARS1-B11-01640-20	ARS1-11-00526	L				0.044777778	180	0.0353333333	180	0.3564	5.028	3/10/2011	5/5/2011	
ARS1-B11-01640-21	ARS1-11-00526	L				0.038944444	180	0.0353333333	180	0.3463	5.007	3/10/2011	5/5/2011	
ARS1-B11-01640-22	ARS1-11-00527	L				0.076388889	180	0.0353333333	180	0.3596	5.076	3/10/2011	5/5/2011	
ARS1-B11-01640-23	ARS1-11-00527	L				0.075555556	180	0.0353333333	180	0.3576	5.055	3/10/2011	5/5/2011	

Batch Result Verification Report

BatchSampleID	SDG	Fraction	BP	MDA	Sb	Yal	UCF	CF	GrossCountRate	BKCountRate	NetCountRate	PlatingRecovery	InstrFile	DetectorID	Instrument	Nuclide	Tracer	MeasACT
ARSI-B11-01640-01							2.22	1	16.38	6.36	10.02		71	P-54-S-2				
ARSI-B11-01640-02							2.22	1.96	16.31	6.36	9.95		71	P-54-S-3				
ARSI-B11-01640-03							2.22	1.96	5.91	6.36	-0.45		71	P-54-S-4				
ARSI-B11-01640-04	ARSI-11-00491	001					2.22	1	80.21	6.36	73.85		71	P-54-S-5				
ARSI-B11-01640-05	ARSI-11-00491	002					2.22	1	40.15	6.36	33.79		71	P-54-S-6				
ARSI-B11-01640-06	ARSI-11-00491	003					2.22	1	41.5	6.36	35.14		71	P-54-S-7				
ARSI-B11-01640-07	ARSI-11-00491	004					2.22	1	96.14	6.36	89.78		71	P-54-S-8				
ARSI-B11-01640-08	ARSI-11-00491	005					2.22	1	28.66	6.36	22.3		71	P-54-S-9				
ARSI-B11-01640-09	ARSI-11-00491	006					2.22	1	23.99	6.36	17.63		71	P-54-S-10				
ARSI-B11-01640-10	ARSI-11-00491	007					2.22	1	6.77	6.36	0.41		71	P-54-S-11				
ARSI-B11-01640-11	ARSI-11-00491	008					2.22	1	7.45	6.36	1.09		71	P-54-S-12				
ARSI-B11-01640-12	ARSI-11-00491	009					2.22	1	6.37	6.36	0.01		71	P-54-S-13				
ARSI-B11-01640-13	ARSI-11-00622	001					2.22	1	6.2	6.36	-0.16		71	P-54-S-14				
ARSI-B11-01640-14	ARSI-11-00622	002					2.22	1	6.24	6.36	-0.12		71	P-54-S-15				
ARSI-B11-01640-15	ARSI-11-00622	003					2.22	1	6.82	6.36	0.46		71	P-54-S-16				
ARSI-B11-01640-16	ARSI-11-00622	004					2.22	1	6.57	6.36	0.21		71	P-54-S-17				
ARSI-B11-01640-17	ARSI-11-00622	005					2.22	1	6.8	6.36	0.44		71	P-54-S-18				
ARSI-B11-01640-18	ARSI-11-00622	006					2.22	1	6.97	6.36	0.61		71	P-54-S-19				
ARSI-B11-01640-19	ARSI-11-00526	001					2.22	1	7.28	6.36	0.92		71	P-54-S-20				
ARSI-B11-01640-20	ARSI-11-00526	002					2.22	1	8.06	6.36	1.7		71	P-54-S-21				
ARSI-B11-01640-21	ARSI-11-00526	003					2.22	1	7.01	6.36	0.65		71	P-54-S-22				
ARSI-B11-01640-22	ARSI-11-00527	001					2.22	1	137.77	6.36	131.41		71	P-54-S-23				
ARSI-B11-01640-23	ARSI-11-00527	002					2.22	1	156.32	6.36	151.96		71	P-54-S-24				

Batch Result Verification Report

ABatchSampleID	SDG	Fraction	TracerKnown	TracerKnownACT	TracerIsotope	TracerRefDate	TracerRefACT	TracerKnown	HalfLife1	HalfLife2	HalfLife3	TPUF_1	TPUF_2	TPUF_3	TPUF_4	TPUF_5	TPUF_6	DeltaT1	DeltaT2
ARSI-811-01640-01								4499.8				0.04133	0.02	0	0.025	0	0	0	0
ARSI-811-01640-02								4499.8				0.04133	0.02	0	0.025	0	0	0	0
ARSI-811-01640-03								4499.8				0.04133	0.02	0	0.025	0	0	0	0
ARSI-811-01640-04								4499.8				0.04133	0.02	0	0.025	0	0	54.69375	0
ARSI-811-01640-05								4499.8				0.04133	0.02	0	0.025	0	0	54.82569444	0
ARSI-811-01640-06								4499.8				0.04133	0.02	0	0.025	0	0	55.08888889	0
ARSI-811-01640-07								4499.8				0.04133	0.02	0	0.025	0	0	55.95594444	0
ARSI-811-01640-08								4499.8				0.04133	0.02	0	0.025	0	0	55.08888889	0
ARSI-811-01640-09								4499.8				0.04133	0.02	0	0.025	0	0	55.22013889	0
ARSI-811-01640-10								4499.8				0.04133	0.02	0	0.025	0	0	55.35208333	0
ARSI-811-01640-11								4499.8				0.04133	0.02	0	0.025	0	0	55.48333333	0
ARSI-811-01640-12								4499.8				0.04133	0.02	0	0.025	0	0	55.61458333	0
ARSI-811-01640-13								4499.8				0.04133	0.02	0	0.025	0	0	55.74652778	0
ARSI-811-01640-14								4499.8				0.04133	0.02	0	0.025	0	0	42.87777778	0
ARSI-811-01640-15								4499.8				0.04133	0.02	0	0.025	0	0	43.00902778	0
ARSI-811-01640-16								4499.8				0.04133	0.02	0	0.025	0	0	43.13888889	0
ARSI-811-01640-17								4499.8				0.04133	0.02	0	0.025	0	0	43.27083333	0
ARSI-811-01640-18								4499.8				0.04133	0.02	0	0.025	0	0	43.40263333	0
ARSI-811-01640-19								4499.8				0.04133	0.02	0	0.025	0	0	43.53402778	0
ARSI-811-01640-20								4499.8				0.04133	0.02	0	0.025	0	0	55.66527778	0
ARSI-811-01640-21								4499.8				0.04133	0.02	0	0.025	0	0	55.79652778	0
ARSI-811-01640-22								4499.8				0.04133	0.02	0	0.025	0	0	55.92847222	0
ARSI-811-01640-23								4499.8				0.04133	0.02	0	0.025	0	0	56.05972222	0
ARSI-811-01640-23								4499.8				0.04133	0.02	0	0.025	0	0	56.19166667	0

Batch Result Verification Report

AbatchSampleID	SDG	Fraction	DeltaT3	DeltaT4	DeltaT5	DeltaT6	DF1	DF2	DF3	IF1	IF2	SysErr	K_Val	K_MDA	AnalysisCode	UserID	ModDate
ARSI-811-01640-01							1					0.052279718	0.004079245	0.73426401		BSTEFFENS	5/6/2011
ARSI-811-01640-02							1					0.052279718	0.004071146	0.7328063		BSTEFFENS	5/6/2011
ARSI-811-01640-03												0.052279718	0.004094992	0.737098484		BSTEFFENS	5/6/2011
ARSI-811-01640-04	ARSI-11-00491	001					0.991610391					0.052279718	0.004032874	0.725917319	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-05	ARSI-11-00491	002					0.991580237					0.052279718	0.004060356	0.730864078	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-06	ARSI-11-00491	003					0.991570189					0.052279718	0.004045966	0.728273916	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-07	ARSI-11-00491	004					0.991550036					0.052279718	0.004038309	0.72689559	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-08	ARSI-11-00491	005					0.991529989					0.052279718	0.004036235	0.72852232	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-09	ARSI-11-00491	006					0.991509837					0.052279718	0.004061966	0.731153877	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-10	ARSI-11-00491	007					0.991489791					0.052279718	0.004055255	0.72994598	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-11	ARSI-11-00491	008					0.991469746					0.052279718	0.004052094	0.729376951	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-12	ARSI-11-00491	009					0.991449595					0.052279718	0.004034039	0.726127052	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-13	ARSI-11-00622	001					0.993416891					0.052279718	0.003991293	0.71843282	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-14	ARSI-11-00622	002					0.993396807					0.052279718	0.0040258	0.724644038	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-15	ARSI-11-00622	003					0.993376935					0.052279718	0.003980083	0.716414949	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-16	ARSI-11-00622	004					0.993356745					0.052279718	0.004011056	0.721990054	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-17	ARSI-11-00622	005					0.993336662					0.052279718	0.004072217	0.732998041	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-18	ARSI-11-00526	006					0.993316473					0.052279718	0.004030144	0.725425936	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-19	ARSI-11-00526	001					0.991462004					0.052279718	0.003887222	0.699669967	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-20	ARSI-11-00526	002					0.991441959					0.052279718	0.003944148	0.70994669	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-21	ARSI-11-00526	003					0.991421808					0.052279718	0.003816291	0.688693246	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-22	ARSI-11-00527	001					0.991401764					0.052279718	0.00401739	0.72313014	LSC-A-001	BSTEFFENS	5/6/2011
ARSI-811-01640-23	ARSI-11-00527	002					0.991381614					0.052279718	0.003978437	0.716118693	LSC-A-001	BSTEFFENS	5/6/2011

Assay Definition-

Assay Description:  
H3 Normal LV1

Assay Type: DPM (Single)

Report Name: Report1  
Output Data Path: C:\Packard\Tricarb\Results\ARS\H-3 Normal 3\20110502\_1602  
Raw Results Path: C:\Packard\Tricarb\Results\ARS\H-3 Normal 3\20110502\_1602\20110502\_1602.results  
RTF File Name: C:\Packard\Tricarb\Results\ARS\H-3 Normal 3\20110502\_1602\H3 Results.rtf  
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\H-3 Normal 3\20110502\_1602\H3 Results.csv  
Assay File Name: C:\Packard\Tricarb\Assays\H-3 Normal 3.1sa

Count Conditions-

Nuclide: H-3 Normal

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Set:

Low Energy: UG STD H-3

Count Time (min): 180.00

Count Mode: Normal

Assay Count Cycles: 1

#Vials/Sample: 1

Repeat Sample Count: 1

Calculate & Reference: Off

Background Subtract: Off

Low CPM Threshold: Off

2 Sigma & Terminator: On - Any Region

Regions	LL	UL	2Sigma & Terminator
A	2.0	18.6	0.50
B	0.0	2000.0	0.00
C	0.0	2000.0	0.00

Count Corrections-

Static Controller: On

Colored Samples: Off

Coincidence Time (nsec): 18

Luminescence Correction: Off

Heterogeneity Monitor: Off

Delay Before Burst (nsec): 75

Half Life-

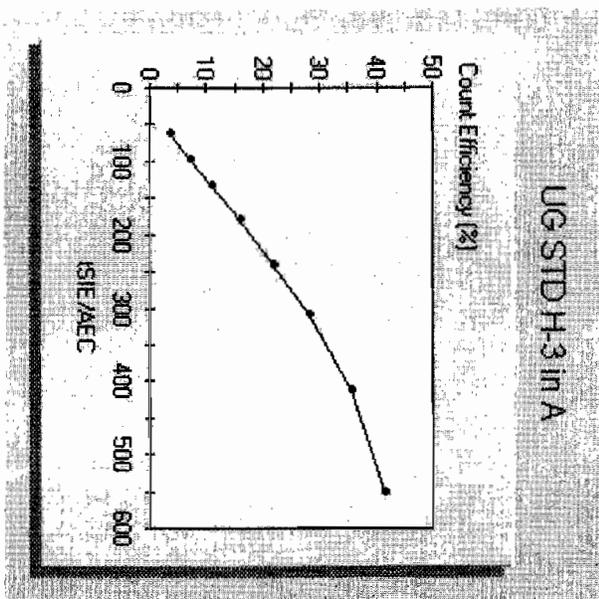
Half Life Correction: Off  
Regions Half Life

Units Reference Date

Reference Time

A  
B  
C

Cycle 1 Results  
Quench Curve Block Data



Date Acquired: 06/30/2010  
Date Modified:  
UG STD H-3 in A

tSIE/AEC	Count Efficiency (%)
551.03	41.58
411.38	35.42
310.08	28.09
241.32	21.90
178.11	15.75
132.72	11.03
96.52	6.92
63.58	3.36

P#	S#	SMPLE_ID	CPMA	DPML	TSIE	Eff Nucl	In A	Count Time	DATE	TIME	MESSAGES
54	1	BACKGROUND	6.36	17.71	422.88		35.92	180.00	5/2/2011	4:07:03 PM	
54	2	B11-01640-01	16.38	44.91	435.49		36.48	180.00	5/2/2011	7:13:59 PM	
54	3	B11-01640-02	16.31	44.72	435.50		36.48	180.00	5/2/2011	10:23:14 PM	
54	4	B11-01640-03	5.91	16.16	437.63		36.57	180.00	5/3/2011	1:31:18 AM	
54	5	B11-01640-04	80.21	219.60	436.54		36.53	180.00	5/3/2011	4:39:00 AM	
54	6	B11-01640-05	40.15	109.48	439.73		36.67	180.00	5/3/2011	7:48:32 AM	
54	7	B11-01640-06	41.50	113.75	435.59		36.49	180.00	5/3/2011	10:58:02 AM	
54	8	B11-01640-07	96.14	264.11	433.67		36.40	180.00	5/3/2011	2:07:33 PM	
54	9	B11-01640-08	28.66	78.93	431.65		36.31	180.00	5/3/2011	5:17:04 PM	
54	10	B11-01640-09	23.99	65.80	435.20		36.47	180.00	5/3/2011	8:26:32 PM	
54	11	B11-01640-10	6.77	18.67	430.55		36.26	180.00	5/3/2011	11:36:00 PM	
54	12	B11-01640-11	7.45	20.62	427.76		36.14	180.00	5/4/2011	2:45:27 AM	
54	13	B11-01640-12	6.37	17.59	429.04		36.20	180.00	5/4/2011	5:55:02 AM	
54	14	B11-01640-13	6.20	17.23	424.17		35.98	180.00	5/4/2011	9:04:28 AM	
54	15	B11-01640-14	6.24	17.34	423.99		35.97	180.00	5/4/2011	12:12:40 PM	
54	16	B11-01640-15	6.82	19.09	418.05		35.71	180.00	5/4/2011	3:20:13 PM	
54	17	B11-01640-16	6.57	18.25	424.88		36.01	180.00	5/4/2011	6:29:40 PM	
54	18	B11-01640-17	6.80	18.68	434.42		36.43	180.00	5/4/2011	9:39:08 PM	
54	19	B11-01640-18	6.97	19.27	428.92		36.19	180.00	5/5/2011	12:48:36 AM	
54	20	B11-01640-19	7.28	20.74	406.85		35.09	180.00	5/5/2011	3:58:02 AM	
54	21	B11-01640-20	8.06	22.61	416.46		35.64	180.00	5/5/2011	7:07:29 AM	
54	22	B11-01640-21	7.01	20.25	400.48		34.63	180.00	5/5/2011	10:16:58 AM	
54	23	B11-01640-22	137.77	383.16	423.60		35.96	180.00	5/5/2011	1:26:27 PM	
54	24	B11-01640-23	158.32	442.71	419.18		35.76	180.00	5/5/2011	4:35:56 PM	

# Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials	
4-21-11	1623	B11-01513-03	B11-01513	2132	<del>Handwritten initials</del>	
↓	↓	B11-01513-04	↓	↓		
↓	↓	B11-01513-05	↓	↓		
↓	↓	B11-01513-06	↓	↓		
↓	↓	B11-01513-07	↓	↓		
↓	↓	B11-01513-08	↓	↓		
↓	↓	B11-01513-09	↓	↓		
↓	↓	B11-01513-10	↓	↓		
↓	↓	B11-01513-11	↓	↓		
↓	↓	B11-01513-12	↓	↓		
↓	↓	B11-01513-13	↓	↓		
↓	↓	B11-01513-14	↓	↓		
↓	↓	B11-01513-15	↓	↓		
↓	↓	B11-01513-16	↓	↓		
↓	↓	B11-01513-17	↓	↓		
↓	↓	B11-01513-18	↓	↓		
↓	↓	B11-01513-19	↓	↓		
↓	↓	B11-01513-20	↓	↓		
4-2-11	1421	SNC 117	QA	QA		Handwritten initials
↓	1506	Background	B11-01646	1602		Handwritten initials

## Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
5-2-11	1504	B11-01640-01	B11-01640	1602	<del>LSW</del>
L	L	B11-01640-02	L	L	<del>LSW</del>
L	L	B11-01640-03	L	L	<del>LSW</del>
L	L	B11-01640-04	L	L	<del>LSW</del>
L	L	B11-01640-05	L	L	<del>LSW</del>
L	L	B11-01640-06	L	L	<del>LSW</del>
L	L	B11-01640-07	L	L	<del>LSW</del>
L	L	B11-01640-08	L	L	<del>LSW</del>
L	L	B11-01640-09	L	L	<del>LSW</del>
L	L	B11-01640-10	L	L	<del>LSW</del>
L	L	B11-01640-11	L	L	<del>LSW</del>
L	L	B11-01640-12	L	L	<del>LSW</del>
L	L	B11-01640-13	L	L	<del>LSW</del>
L	L	B11-01640-14	L	L	<del>LSW</del>
L	L	B11-01640-15	L	L	<del>LSW</del>
L	L	B11-01640-16	L	L	<del>LSW</del>
L	L	B11-01640-17	L	L	<del>LSW</del>
L	L	B11-01640-18	L	L	<del>LSW</del>
L	L	B11-01640-19	L	L	<del>LSW</del>
L	L	B11-01640-20	L	L	<del>LSW</del>

# Beta Liquid Scintillation Counter Log Book

*LSW*  
5/2/11

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
5-2-11	1506	B11-01640-21	B11-01640	1602	<i>LSW</i>
↓	L	B11-01640-22	L	L	
↓	L	B11-01640-23	L	L	
5-4-11	1632	Background	B11-01659	1941	<i>LSW</i>
↓	L	B11-01659-01	L	L	
↓	L	B11-01659-02	L	L	
↓	L	B11-01659-03	L	L	
↓	L	B11-01659-04	L	L	
↓	L	B11-01659-05	L	L	
↓	L	B11-01659-06	L	L	
↓	L	B11-01659-07	L	L	
↓	L	B11-01659-08	L	L	
↓	L	B11-01659-09	L	L	
↓	L	B11-01659-10	L	L	
↓	L	B11-01659-11	L	L	
↓	L	B11-01659-12	L	L	
↓	L	B11-01659-13	L	L	
↓	L	B11-01659-14	L	L	
↓	L	B11-01659-15	L	L	
↓	L	B11-01659-16	L	L	



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**American Radiation Services  
Analytical Reports**

for

**Los Alamos National Laboratory**

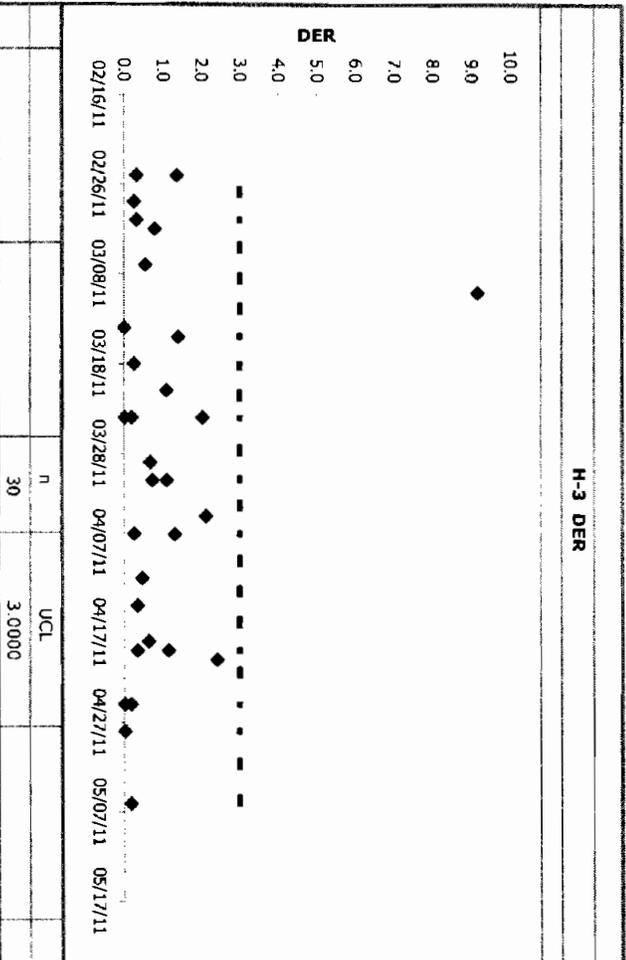
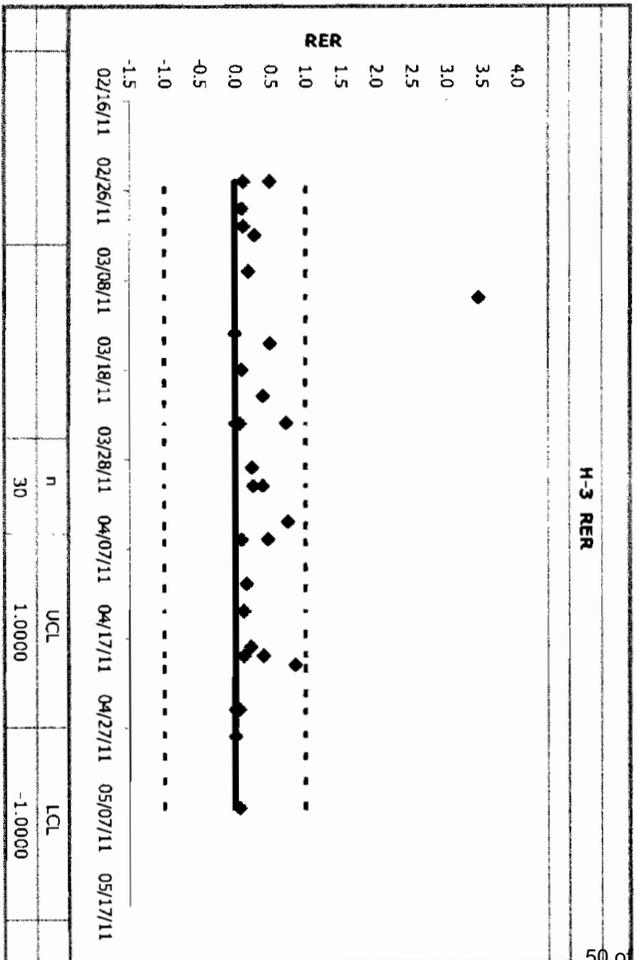
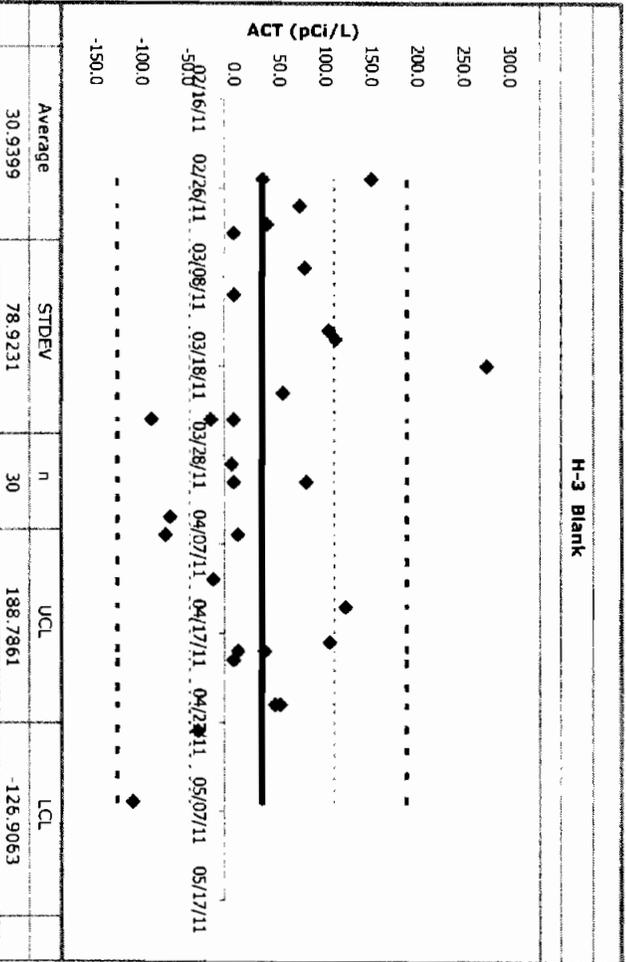
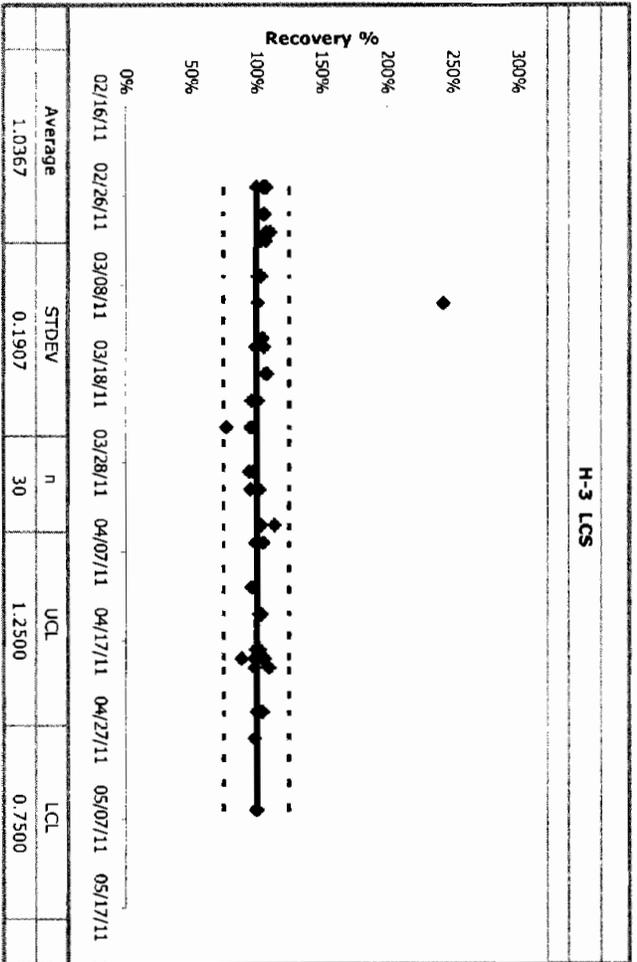
**Tritium**

by

**Low Level Liquid  
Scintillation Counting**

**Control Charts**

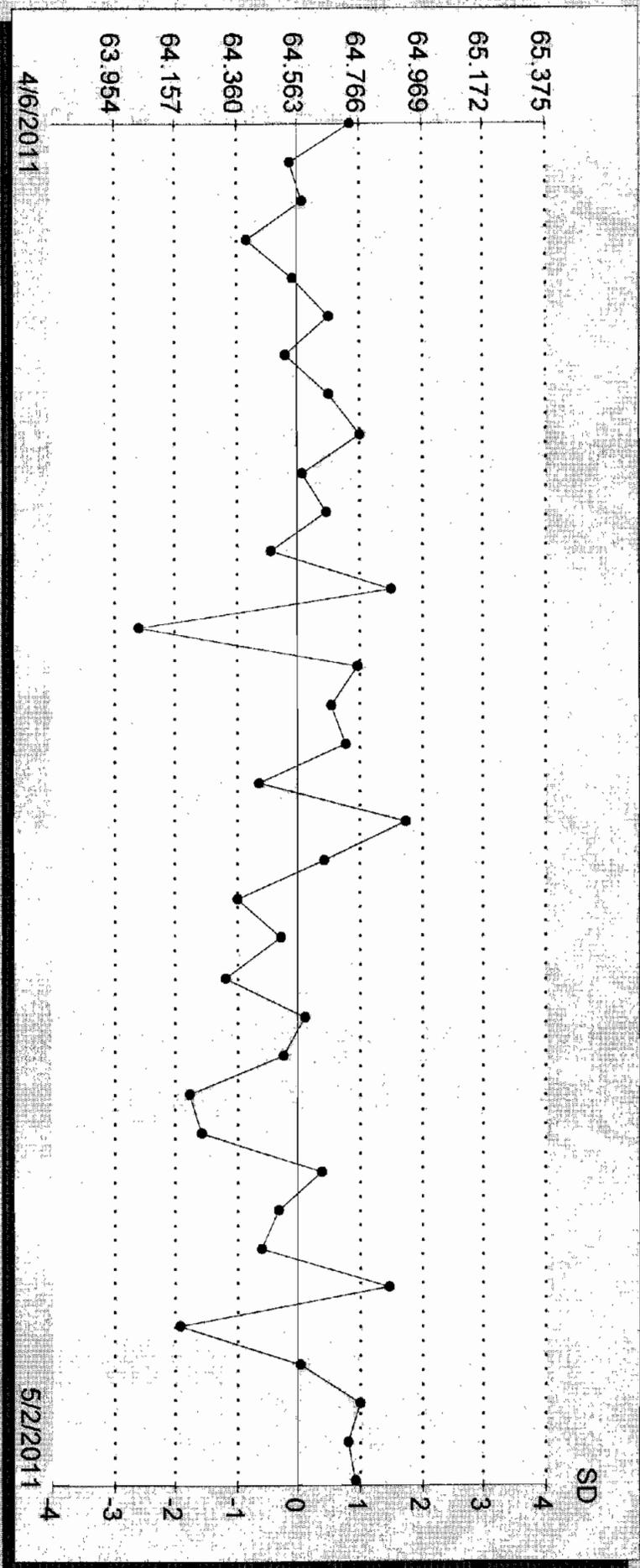
# QC Chart



3H Efficiency  
Total # pts : 1605  
Valid # pts : 36  
Mean : 64.56  
SD : 0.20

Date	Value	Valid Pt
Apr 06, 2011	64.74	X
Apr 10, 2011	64.54	X
Apr 16, 2011	64.58	X
Apr 19, 2011	64.39	X
Apr 25, 2011	64.54	X
Apr 30, 2011	64.67	X
Apr 30, 2011	64.52	X
Apr 30, 2011	64.66	X
Apr 30, 2011	64.76	X
Apr 30, 2011	64.58	X
Apr 30, 2011	64.66	X
Apr 30, 2011	64.87	X
Apr 30, 2011	64.47	X
Apr 30, 2011	64.03	X
Apr 30, 2011	64.76	X
May 01, 2011	64.67	X
May 01, 2011	64.72	X
May 01, 2011	64.44	X
May 01, 2011	64.92	X
May 01, 2011	64.65	X
May 01, 2011	64.36	X
May 01, 2011	64.50	X
May 01, 2011	64.32	X
May 01, 2011	64.58	X
May 01, 2011	64.51	X
May 01, 2011	64.20	X
May 01, 2011	64.24	X
May 01, 2011	64.64	X
May 01, 2011	64.50	X
May 02, 2011	64.44	X
May 02, 2011	64.86	X
May 02, 2011	64.17	X
May 02, 2011	64.57	X
May 02, 2011	64.76	X
May 02, 2011	64.73	X
May 02, 2011	64.75	X

3H Efficiency : 1605  
Total # pts : 36  
Valid # pts : 64.56  
Mean : 0.20  
SD

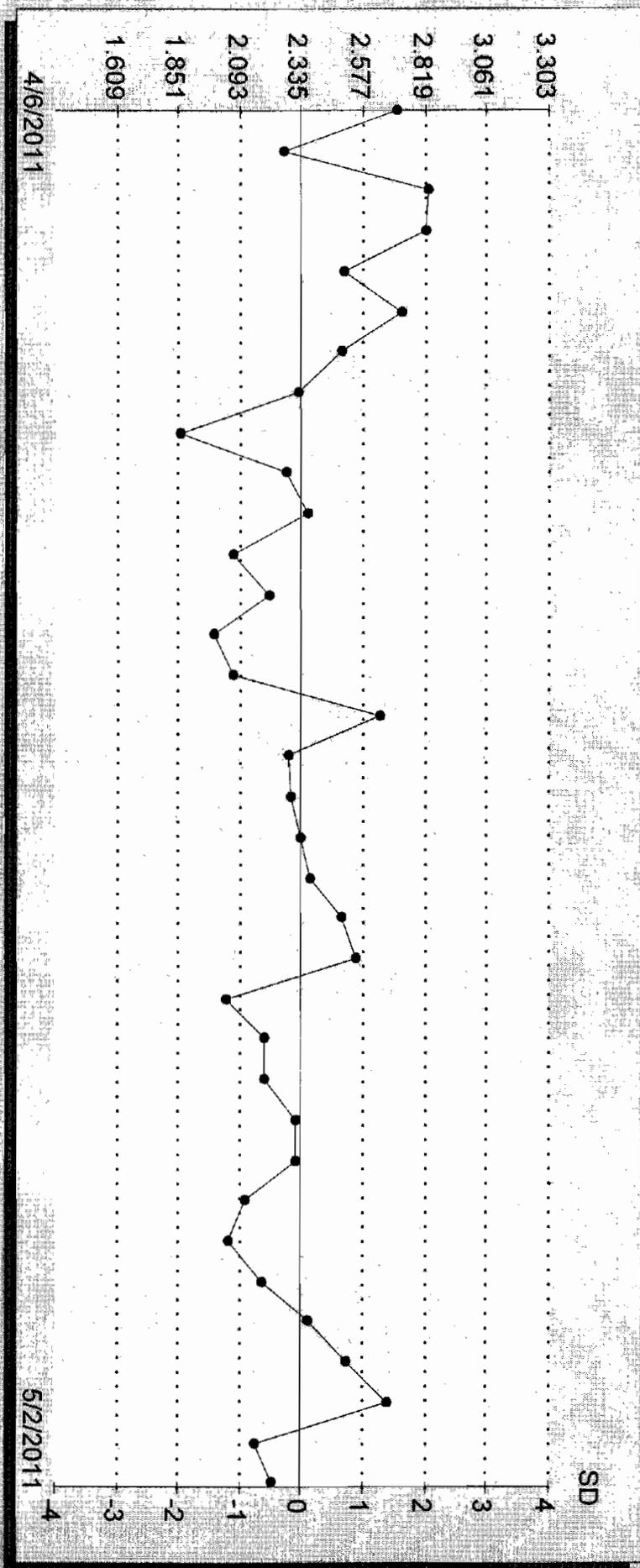


3H Background

Total # pts : 1566  
 Valid # pts : 35  
 Mean : 2.34  
 SD : 0.24

Date	Value	Valid pt
Apr 06, 2011	2.70	X
Apr 10, 2011	2.27	X
Apr 16, 2011	2.84	X
Apr 19, 2011	2.82	X
Apr 25, 2011	2.50	X
Apr 30, 2011	2.73	X
Apr 30, 2011	2.49	X
Apr 30, 2011	2.32	X
Apr 30, 2011	1.86	X
Apr 30, 2011	2.27	X
Apr 30, 2011	2.36	X
Apr 30, 2011	2.07	X
Apr 30, 2011	2.20	X
Apr 30, 2011	1.99	X
Apr 30, 2011	2.07	X
May 01, 2011	2.64	X
May 01, 2011	2.29	X
May 01, 2011	2.29	X
May 01, 2011	2.34	X
May 01, 2011	2.37	X
May 01, 2011	2.49	X
May 01, 2011	2.55	X
May 01, 2011	2.04	X
May 01, 2011	2.19	X
May 01, 2011	2.19	X
May 01, 2011	2.31	X
May 01, 2011	2.32	X
May 01, 2011	2.12	X
May 01, 2011	2.05	X
May 02, 2011	2.18	X
May 02, 2011	2.36	X
May 02, 2011	2.51	X
May 02, 2011	2.67	X
May 02, 2011	2.15	X
May 02, 2011	2.22	X

3H Background : 1566  
Total # pts : 35  
Valid # pts : 2.34  
Mean : 0.24  
SD





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**American Radiation Services  
Analytical Reports**

for

**Los Alamos National Laboratory**

**Low Level Liquid  
Scintillation Counting**

**Calibration  
Information**

STD ID: S-0247

ARS INTERNATIONAL		Add/Edit Secondary Stds	Parent Standard Data			
Planning		Parent Solution Reference #	NIST SRM 4927F			
Planning Comments	Create an H-3 LCS standard	Parent Solution #	S-0237			
Target dpm/g (on dll. date)	5.56	Parent Principal Radionuclide	H-3	Half Life (Days)	4499.6000000	
Target Final volume mL	2000	Parent Reference Date	03/22/2010 10:10			
Appx mass g of Parent Sol'n	3.274623294	Parent Certified Act	3503.682716	Certf Act/Vol Units	dpm	g
Appx vol ml of Parent Sol'n	3.280528244	Parent Cert Act Uncert 1 Sigma	0.0036			
Expected Addition for Analysis g	5	Parent Sp. Gravity G/Ml	0.9982			
Standards Preparation / Dilution		Parent Supplier	NIST SRM 4927F			
Secondary Solution #	S-0247	Parent Date Recvd	01/02/00			
Dilution Date (New Ref Date)	10/11/2010 10:30	Parent Received By	Unknown			
Ampoule, Empty (g)		Parent Cert Exp Date				
Ampoule /Solution Gross (g)		Parent Matrix	H2O			
Net Wt Removed (g)		Certified dpm/g At Ref Date	3503.682716			
Transfer Container, empty (g)	1.7	Certified dpm/g on 10/11/2010 10:30	3385.81045			
Container Plus Solution (g)	4.994	Parent Comments	Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. -BJS 3/22/10			
Net Wt Transferred (g)	3.294					
DPM Xferred on 10/11/2010 10:30	11185.79962					
Diluent/matrix	D1 H2O					
Diluent Density Cont, empty (g)		Parent Tech	Unknown			
Test Mass of 5 ml of Diluent (g)		Is_Primary	FALSE			
Diluent Density Test - (g/mL)		Is_LCS	TRUE			
Dilution Empty Container Mass (g)	473.96	Is_Tracer	FALSE			
Dilution Full Cont g (if measured)	2467.85	Is_Calib	FALSE			
Dilution Final Volume ml (if measured)	2000					
Final Dilution Density (g/mL)	0.999948					
Final Dilution Measured Mass g	1993.89					
Comments	Stock H-3 LCS standard. Dilution performed as stated above by B Steffens. -BJS 10/11/10					
Final Dilution dpm/g	5.610038479					
Final Dll New Ref Date/Time	10/11/2010 10:30					

<b>S-0247</b>			
<b>H-3</b>	Verified	10/13/10	
<b>SL</b>	<b>Expires</b>	<b>10/13/11</b>	
<b>Manufacturer</b>	NIST SRM 4927F		
<b>Sol Matrix</b>	H2O		
<b>Ref No</b>	NIST SRM 4927F		
<b>Tech</b>	Unknown		
<b>Parent ID</b>	S-0237		
<b>RADIOACTIVE STANDARDS - BATON ROUGE LABORATORY</b>			





STD ID: S-0031

ARS INTERNATIONAL		Add/Edit Secondary Stds	Parent Standard Data			
Planning		Parent Solution Reference #	NIST SRM 4927F			
Planning Comments	Dilute Intermediate level solution from SRM 4927F	Parent Solution #	S-0107			
Target dpm/g (on dil. date)	267000	Parent Principal Radionuclide	H-3	Half Life (Days)	4499.8000000	
Target Final volume mL	200	Parent Reference Date	09/03/1998 11:00			
Appx mass g of Parent Sol'n	2.093763934	Parent Certified Act	38082000	Certs Act/Vol Units	dpm	g
Appx vol ml of Parent Sol'n	2.097539505	Parent Cert Act Uncert 1 Sigma	0.0036			
Expected Addition for Analysis g		Parent Sp. Gravity GMI	0.9982			
Standards Preparation / Dilution		Parent Supplier	NIST SRM 4927F			
Secondary Solution #	S-0031	Parent Date Recvd	01/02/00			
Dilution Date (New Ref Date)	10/19/2005 00:00	Parent Received By	Unknown			
Ampoule, Empty (g)		Parent Cert Exp Date				
Ampoule /Solution Gross (g)		Parent Matrix	H2O			
Net Wt Removed (g)		Certified dpm/g At Ref Date	38082000			
Transfer Containers, empty (g)	0	Certified dpm/g on 10/19/2005 00:00	25504307.89			
Container Plus Solution (g)	4.7574	Parent Comments	Primary for S-0029 - Information entered from dilution records - 4/18/2006 RTS			
Net Wt Transferred (g)	4.7574					
DPM Xferred on 10/19/2005 00:00	121334194.3					
Diluent/matrix	H2O					
Diluent Density Cont, empty (g)		Parent Tech	Unknown			
Test Mass of 5 ml of Diluent (g)		Is_Primary	FALSE			
Diluent Density Test - (g/mL)		Is_LCS	TRUE			
Dilution Empty Container Mass (g)	1	Is_Trcer	FALSE			
Dilution Full Cont g (if measured)	200.64	Is_Calib	FALSE			
Dilution Final Volume ml (if measured)	200					
Final Dilution Density (g/mL)	0.9982					
Final Dilution Measured Mass g	199.64					
Comments	S-0031 Intermediate dilution - Information entered from dilution records - 4/19/2006 RTS					
Final Dilution dpm/g	607764.9488					
Final Dil New Ref Date/Time	10/19/2005 00:00					



## Add / Edit *Primary* Standards

Solution Reference #	<b>NIST SRM 4927F</b>		
Solution #	<b>S-0107</b>		
Principal Radionuclide	<b>H-3</b>	Half Life (Days)	<b>4499.8000</b>
Reference Date	<b>09/03/98 11:00</b>		
Certified Act	<b>634700.0000</b>	Cert. Act/Vol Units	<b>Bq</b> <b>g</b>
Cert Act Uncert 1 Sigma (fractional .03=3%)	<b>0.0036</b>		
Sp. Gravity G/ML	<b>0.9982</b>		
Supplier	<b>NIST SRM 4927F</b>		
Date Recvd	<b>01/02/00</b>		
Received By	<b>Unknown</b>		
Cert Exp Date			
Matrix	<b>H2O</b>		
Certified dpm/g At Reference Date	<b>38082000</b>		
Certified dpm/g On 10/15/2010 15:48	<b>19261068.03</b>		
Comments	Primary for S-0029 - Information entered from dilution records - 4/18/2006 RTS		
Primary Tech	<b>Unknown</b>		
Is_Primary	<b>TRUE</b>		
Is_LCS	<b>TRUE</b>		
Is_Tracer	<b>FALSE</b>		
Is_Calib	<b>FALSE</b>		

5-0031



# National Institute of Standards & Technology

## Certificate

### Standard Reference Material 4927F Hydrogen-3 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive hydrogen-3, as water, in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of beta-particle counting instruments and for the monitoring of radiochemical procedures.

#### Radiological Hazard

The SRM ampoule contains hydrogen-3 with a total activity of approximately 3.2 MBq. Hydrogen-3 decays by beta-particle emission. None of the beta particles escape from the SRM ampoule. During the decay process no photons are emitted. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]\*. There is no detectable external radiation. The SRM should be used only by persons qualified to handle radioactive material.

#### Chemical Hazard

The SRM ampoule contains only distilled water. There is no chemical hazard. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2.

#### Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least September 2008.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) because of the radioactivity.

#### Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, L.R. Karam, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas and M.P. Unterwieser of the Radioactivity Group.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by J.W.L. Thomas.

Bert M. Coursey, Chief  
Ionizing Radiation Division

Nancy M. Trahey, Chief  
Standard Reference Materials Program

Gaithersburg, Maryland 20899  
June 1999  
Half-life and text revised October 2000

PROPERTIES OF SRM 4927F

Certified values

Solution density	$(0.996 \pm 0.002) \text{ g} \cdot \text{mL}^{-1}$ at 20.0 °C [b]*
Radionuclide	Hydrogen-3
Reference time	1200 EST, 3 September 1998   100 CST
Massic activity of the solution [c]	$634.7 \text{ kBq} \cdot \text{g}^{-1}$
Relative expanded uncertainty ( $k=2$ )	0.72% [d] [e]

Uncertified values

Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	$(16.5 \pm 0.5) \text{ mm}$	
	Wall thickness	$(0.60 \pm 0.04) \text{ mm}$	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Solution mass	Approximately 5.0 g		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration ( $\text{mol} \cdot \text{L}^{-1}$ )	Mass Fraction ( $\text{g} \cdot \text{g}^{-1}$ )
	H <sub>2</sub> O <sup>3</sup> HHO	55 $6 \times 10^{-7}$	1.00 $1 \times 10^{-8}$
Radiological Properties:			
Radionuclidic impurities	None detected [f]		
Half lives used	Hydrogen-3: $(4500 \pm 8) \text{ d}$ [g]		
Calibration method and measuring instrument(s)	4πB gas counting of SRM 4927E using the NIST length-compensated internal gas proportional counters and intercomparison of SRMs 4927E/4927F using two 4πB liquid-scintillation counting systems [h]		

## NOTES

- [a] The Sievert is the SI unit for dose equivalent. See reference [1]. One  $\mu\text{Sv}$  is equal to 0.1 mrem.  
 Distance from Ampoule (cm): 1 30 100  
 Approximate Dose Rate ( $\mu\text{Sv/h}$ ): <0.1 (Not detectable)
- [b] The stated uncertainty is two times the standard uncertainty.
- [c] Massic activity is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].
- [d] The reported value,  $y$ , of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as  $y = f(x_1, x_2, x_3, \dots, x_n)$ , where  $f$  is a mathematical function derived from the assumed model of the measurement process.
- The value,  $x_i$ , used for each input quantity  $i$  has a standard uncertainty,  $u(x_i)$ , that generates a corresponding uncertainty in  $y$ ,  $u(y) = |\partial y / \partial x_i| \cdot u(x_i)$ , called a component of combined standard uncertainty of  $y$ .
- The combined standard uncertainty of  $y$ ,  $u_c(y)$ , is the positive square root of the sum of the squares of the components of combined standard uncertainty.
- The combined standard uncertainty is multiplied by a coverage factor of  $k = 2$  to obtain  $U$ , the expanded uncertainty of  $y$ .
- Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation  $u_c(y)$ , the unknown value of the massic activity is believed to lie in the interval  $\pm U$  with a level of confidence of approximately 95 percent.
- For further information on the expression of uncertainties, see references [2] and [3].
- [e] The value of each standard uncertainty component, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the massic response is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval  $U/2$  to  $2U$  (i.e., within a factor of 2 of the estimated value).
- [f] The estimated limit of detection for radionuclides impurities is  $300 \text{ Bq} \cdot \text{g}^{-1}$ .
- [g] The stated uncertainty is the standard uncertainty. See reference [5].
- [h] Extensive gas-counting measurements were made on the SRM 4927E solution during 1998 and 1999. The SRM 4927F solution was intercompared with the SRM 4927E solution using liquid-scintillation counting.
- [i] Relative standard uncertainty of the input quantity  $x_i$ .



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# **American Radiation Services Analytical Reports**

for

## **Los Alamos National Laboratory**

# **Percent Moisture**



2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

**ARS Sample Delivery Group:** ARS1-11-00491  
**Client Sample ID:** MD21-11-5600  
**Sample Collection Date:** 03/09/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-1587  
**ARS Sample ID:** ARS1-11-00491-001  
**Date Received:** 03/10/11  
**Report Date:** 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	9.148	NA	NA	NA		%	Percent Moisture	05/03/11 04:39	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

*Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

LELAP Certificate# 01949

NELAP Certificate # E87558



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**ARS Sample Delivery Group:** ARS1-11-00491  
**Client Sample ID:** MD21-11-5601  
**Sample Collection Date:** 03/09/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-1587  
**ARS Sample ID:** ARS1-11-00491-002  
**Date Received:** 03/10/11  
**Report Date:** 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	11.705	NA	NA	NA		%	Percent Moisture	05/03/11 07:49	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5602  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-003  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	8.491	NA	NA	NA		%	Percent Moisture	05/03/11 10:58	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00491  
 Client Sample ID: MD21-11-5603  
 Sample Collection Date: 03/09/11  
 Sample Matrix: Silica

Request or PO Number: 11-1587  
 ARS Sample ID: ARS1-11-00491-004  
 Date Received: 03/10/11  
 Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	9.899	NA	NA	NA		%	Percent Moisture	05/03/11 14:08	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-00491  
**Client Sample ID:** MD21-11-5605  
**Sample Collection Date:** 03/09/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-1587  
**ARS Sample ID:** ARS1-11-00491-005  
**Date Received:** 03/10/11  
**Report Date:** 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	9.926	NA	NA	NA		%	Percent Moisture	05/03/11 17:17	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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LELAP Certificate# 01949

NELAP Certificate # E8755B



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ARS Sample Delivery Group: ARS1-11-00491  
Client Sample ID: MD21-11-5606  
Sample Collection Date: 03/09/11  
Sample Matrix: Silica

Request or PO Number: 11-1587  
ARS Sample ID: ARS1-11-00491-006  
Date Received: 03/10/11  
Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	9.653	NA	NA	NA		%	Percent Moisture	05/03/11 20:27	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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LELAP Certificate# 01949

NELAP Certificate # E87558



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**ARS Sample Delivery Group:** ARS1-11-00491  
**Client Sample ID:** MD21-11-5607  
**Sample Collection Date:** 03/09/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-1597  
**ARS Sample ID:** ARS1-11-00491-007  
**Date Received:** 03/10/11  
**Report Date:** 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	7.114	NA	NA	NA	U	%	Percent Moisture	05/03/11 23:36	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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NELAP Certificate # E97558



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ARS Sample Delivery Group: ARS1-11-00491  
 Client Sample ID: MD21-11-5608  
 Sample Collection Date: 03/09/11  
 Sample Matrix: Silica

Request or PO Number: 11-1587  
 ARS Sample ID: ARS1-11-00491-008  
 Date Received: 03/10/11  
 Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	9.189	NA	NA	NA		%	Percent Moisture	05/04/11 02:45	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00491  
 Client Sample ID: MD21-11-5610  
 Sample Collection Date: 03/09/11  
 Sample Matrix: Silica

Request or PO Number: 11-1587  
 ARS Sample ID: ARS1-11-00491-009  
 Date Received: 03/10/11  
 Report Date: 05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 1s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	5.521	NA	NA	NA	U	%	Percent Moisture	05/04/11 05:55	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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# **American Radiation Services Analytical Reports**

**for**

**Los Alamos National Laboratory**

# **Percent Moisture Laboratory Records**

**AMERICAN RADIATION SERVICES**  
 Port Allen, LA  
**PERCENT MOISTURE DETERMINATION IN SOILS**

SDG Number ARS1-11-00491, 00622, 00526, 00527  
 Client LANL

LANL ID	ARS ID	weight of cylinder with gel (g)	weight of empty cylinder (g)	Weight of gel (g)	amount of liquid collected (ml)	amount of liquid tested (ml)	% moisture
MD21-11-5600	ARS1-11-00491-001	612	446	166	15.186	5.015	9.14819277
MD21-11-5601	ARS1-11-00491-002	606	438	167	19.547	5.03	11.7047904
MD21-11-5602	ARS1-11-00491-003	607	428	179	15.199	5.037	8.49106145
MD21-11-5603	ARS1-11-00491-004	617	454	165	16.333	5.04	9.89878788
MD21-11-5605	ARS1-11-00491-005	607	443	165	16.378	5.05	9.92606061
MD21-11-5606	ARS1-11-00491-006	615	450	165	15.928	5.06	9.65333333
MD21-11-5607	ARS1-11-00491-007	605	450	154	10.955	5.081	7.11363636
MD21-11-5608	ARS1-11-00491-008	598	436	162	14.886	5.094	9.18888889
MD21-11-5610	ARS1-11-00491-009	601	447	154	8.502	5.063	5.52077922
MD50-11-5957	ARS1-11-00622-001	604	443	161	13.697	5.03	8.50745342
MD50-11-5958	ARS1-11-00622-002	601	443	157	10.123	5.075	6.44777707
MD50-11-5959	ARS1-11-00622-003	598	440	159	9.564	5.054	6.01509434
MD50-11-5960	ARS1-11-00622-004	606	442	164	18.137	5.051	11.0591463
MD50-11-5961	ARS1-11-00622-005	610	444	165	16.472	5.069	9.9830303
MD50-11-5962	ARS1-11-00622-006	602	441	161	15.059	5.05	9.35341615

MD54-11-3767	ARS1-11-00526-001	611	455	156	11,189	5,033	7,172,359
MD54-11-3766	ARS1-11-00526-002	628	455	172	21,497	5,028	12,498,258
MD54-11-3768	ARS1-11-00526-003	599	438	159	16,892	5,007	10,623,894
MD21-11-5604	ARS1-11-00527-001	629	461	168	18,983	5,076	11,299,404
MD21-11-5605	ARS1-11-00527-002	604	435	169	19,375	5,055	11,464,497

Balance ID: 0102/H1331122173560P

Pipefector ID: FJ40469

Signature

*Ray S. [Signature]*

Date

*5-6-11*

**AMERICAN RADIATION SERVICES**  
 Port Allen, LA  
**PERCENT MOISTURE DETERMINATION IN SOILS**

SDG Number ARS1-11-00491, 00622, 00526, 00527  
 Client LANL

LANL ID	ARS ID	weight of cylinder with gel (g)	weight of empty cylinder (g)	Weight of gel (g)	amount of liquid collected (ml)	amount of liquid tested (ml)	% moisture
MD21-11-5600	ARS1-11-00491-001	612	446	166	15.186	5.015	#DIV/0!
MD21-11-5601	ARS1-11-00491-002	686	438	167	19.547	5.036	#DIV/0!
MD21-11-5602	ARS1-11-00491-003	607	428	179	15.199	5.037	#DIV/0!
MD21-11-5603	ARS1-11-00491-004	617	454	165	16.333	5.040	#DIV/0!
MD21-11-5605	ARS1-11-00491-005	607	443	165	16.378	5.050	#DIV/0!
MD21-11-5606	ARS1-11-00491-006	615	450	165	15.928	5.060	#DIV/0!
MD21-11-5607	ARS1-11-00491-007	605	450	154	10.955	5.081	#DIV/0!
MD21-11-5608	ARS1-11-00491-008	598	436	162	14.886	5.094	#DIV/0!
MD21-11-5610	ARS1-11-00491-009	601	447	154	8.502	5.063	#DIV/0!
MD50-11-5957	ARS1-11-00622-001	604	443	161	13.697	5.030	#DIV/0!
MD50-11-5958	ARS1-11-00622-002	601	443	157	10.123	5.075	#DIV/0!
MD50-11-5959	ARS1-11-00622-003	598	440	159	9.564	5.054	#DIV/0!
MD50-11-5960	ARS1-11-00622-004	606	442	164	18.137	5.051	#DIV/0!
MD50-11-5961	ARS1-11-00622-005	610	444	165	16.472	5.069	#DIV/0!
MD50-11-5962	ARS1-11-00622-006	602	441	161	15.059	5.050	#DIV/0!

LCS - 5.037  
 LCSB - 5.027  
 BLK - 5.044

MD54-11-3767	ARS1-11-00526-001	611	455	156	11.189	5.033	#DIV/0!
MD54-11-3766	ARS1-11-00526-002	628	455	172	21.497	5.028	#DIV/0!
MD54-11-3768	ARS1-11-00526-003	599	438	159	16.892	5.007	#DIV/0!
MD21-11-5604	ARS1-11-00527-001	629	461	168	18.983	5.076	#DIV/0!
MD21-11-5605	ARS1-11-00527-002	604	435	169	19.375	5.055	#DIV/0!

Balance ID: 0102/H1331122173560P

Pipettor ID: FJ40469

Signature



Date

5-3-11



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# **American Radiation Services Analytical Reports**

**for**

## **Los Alamos National Laboratory**

# **Folder Duplicate**



## Report Compilation Checklist

ARS SDG:	<u>11-00491</u>	Client Name:	<u>LANL</u>	Sample Matrix:	<u>SI</u>
----------	-----------------	--------------	-------------	----------------	-----------

LEVEL 1 COMPONENTS	1st Reviewer		
1) Cover Page Complete and Accurate (see ARS-059)?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
2) Technical Review Checklist(s) Complete and Accurate?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
3) Case Narrative Complete and Accurate (see ARS-059)?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
4) Form 1s Present for all Samples and Tests?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
5) Client Specific Components are Present and Complete?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

LEVEL 2 COMPONENTS	1st Reviewer		
6) Batch Quality Control Report is Present and Accurate?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
7) DQO Report is Present and Accurate?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
8) Client Specific Batch QC Components are Present and Complete?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

LEVEL 3 COMPONENTS	1st Reviewer		
9) Efficiencies are Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
10) Calibrations are Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
11) Backgrounds are Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
12) Spectrum Analysis is Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
13) Spectral Plots are Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
14) Plateaus are Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
15) Control Charts are Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
16) Other:	Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A

LEVEL 4 COMPONENTS	1st Reviewer		
17) Preparation Raw Data Present, Signed and Complete?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
18) Instrument Raw Data Present and Complete?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
19) Calibration Certificates Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
20) Copies of Log Book Pages Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
21) Sample Receiving Documentation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
22) LIMS Reports Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
23) Applicable Correspondence Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
24) Other:	Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A

*Sumaheese*                      5-6-11  
 Report Generator Signature                      Date

*MM*                                      5-6-11  
 Management Review Signature                      Date



## LSC Technical Review Checklist

ARS SDG 11-00491

Sample Matrix: SI Aliquot (Circle One): Dry As Received Filtered Other: \_\_\_\_\_

Required QC Samples (Mark all that apply): Blank  LOS  LQSD  Sample Dup MS MSD

ARS A. Batch ID(s): Batch A: B11-01640 Batch B: N/A Batch C: N/A

Test Method(s): LSC-A-001 N/A N/A

### A. RADIOCHEMICAL PREPARATION REVIEW

	Chemist Review	Verifier Review
1) 100% of Manual Transcriptions Verified?	<input checked="" type="radio"/> Yes No N/A	<input checked="" type="radio"/> Yes No N/A
2) 100% of Manual Calculations Verified?	Yes No <input checked="" type="radio"/> N/A	Yes No <input checked="" type="radio"/> N/A
3) Blank Composition/Configuration Matches Calibration?	<input checked="" type="radio"/> Yes No N/A	<input checked="" type="radio"/> Yes No N/A
4) Deviations from procedure are documented and verified?	Yes No <input checked="" type="radio"/> N/A	Yes No <input checked="" type="radio"/> N/A
5) Appropriate Cocktail Selected?	<input checked="" type="radio"/> Yes No N/A	<input checked="" type="radio"/> Yes No N/A
6) Sample Prep Anomaly? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (See Tech Notes) NCR # (If initiated): _____		
 Chemist Signature	<u>5-3-11</u> Date	 Verifier Review Signature
<u>5-3-11</u> Date		

### B. ANALYSIS REVIEW

	Analyst Review	QA Officer Review
1) Calibrations Valid and Current?	<input checked="" type="radio"/> Yes No N/A	<input checked="" type="radio"/> Yes No N/A
2) Backgrounds Valid and Current?	<input checked="" type="radio"/> Yes No N/A	<input checked="" type="radio"/> Yes No N/A
3) Source Checks Completed and Acceptable?	<input checked="" type="radio"/> Yes No N/A	<input checked="" type="radio"/> Yes No N/A
 QA Officer Signature		<u>5-6-11</u> Date
	Analyst Review	Technical Review
4) Background Checks Complete and Acceptable?	<input checked="" type="radio"/> Yes No N/A	<input checked="" type="radio"/> Yes No N/A
5) 100% of Manually Entered Parameters Verified Accurate?	<input checked="" type="radio"/> Yes No N/A	<input checked="" type="radio"/> Yes No N/A
6) Appropriate QC samples initiated at required frequency?	<input checked="" type="radio"/> Yes No N/A	<input checked="" type="radio"/> Yes No N/A
6) Test/Sample Specific Parameters (See ARS-059 for details)		
a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable?	<input checked="" type="radio"/> Yes No N/A	Yes No <input checked="" type="radio"/> N/A
b) Spectra show no Evidence of Interferences?	<input checked="" type="radio"/> Yes No N/A	Yes No <input checked="" type="radio"/> N/A
c) Sample Quench for All Samples within Range of Quench Curve?	<input checked="" type="radio"/> Yes No N/A	Yes No <input checked="" type="radio"/> N/A
7) Analysis Anomaly? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (See Comments) NCR # (If initiated): _____		
 Analyst Signature	<u>5-6-11</u> Date	<u>N/A</u> Technical Reviewer Signature
Date		



SDG Report - Samples and Containers

SDG		Rpt Level		TAT Days		Project Type	
ARS1-11-00491	4	29	3/10/2011	Environmental			
Sample Count	Los Alamos National Laboratory	Date Received	4/8/2011	COC Number	11-1587		
Client	114	Client Deadline	4/7/2011	PG Number	63641-001-10		
Client Code	PN-00094	Internal Deadline	4/5/2011	Job Number	MR2R03ZNF00		
Profile Number		Lab Deadline		Job Location			
Comments							

FR	ClientID	Matrix	SampleStartDate	SampleEndDate	Disp	Hold	Arch	Storage	X	Units	Y	Units	Z	Units	Comments
→	001	MD21-11-5600	SI	03/09/11 12:00 PM	03/09/11 12:00 PM	H	90	5	Q6		N	N/A			
		82005	1					1.00		45	18	Q6			
→	002	MD21-11-5601	SI	03/09/11 12:00 PM	03/09/11 12:00 PM	H	90	5	Q6		N	N/A			
		82006	1					1.00		45	18	Q6			
→	003	MD21-11-5602	SI	03/09/11 12:00 PM	03/09/11 12:00 PM	H	90	5	Q6		N	N/A			
		82007	1					1.00		45	18	Q6			
→	004	MD21-11-5603	SI	03/09/11 12:00 PM	03/09/11 12:00 PM	H	90	5	Q6		N	N/A			
		82008	1					1.00		45	18	Q6			
→	005	MD21-11-5605	SI	03/09/11 12:00 PM	03/09/11 12:00 PM	H	90	5	Q6		N	N/A			
		82009	1					1.00		45	18	Q6			
→	006	MD21-11-5606	SI	03/09/11 12:00 PM	03/09/11 12:00 PM	H	90	5	Q6		N	N/A			
		82010	1					1.00		45	18	Q6			
→	007	MD21-11-5607	SI	03/09/11 12:00 PM	03/09/11 12:00 PM	H	90	5	Q6		N	N/A			
		82011	1					1.00		45	18	Q6			
→	008	MD21-11-5608	SI	03/09/11 12:00 PM	03/09/11 12:00 PM	H	90	5	Q6		N	N/A			
		82012	1					1.00		45	18	Q6			
→	009	MD21-11-5610	SI	03/09/11 12:00 PM	03/09/11 12:00 PM	H	90	5	Q6		N	N/A			
		82013	1					1.00		45	18	Q6			

### SDG Report - Analysis Assignments

<b>Temp SDG</b>	<b>ARS1-11-00491</b>	<b>Sample Count</b>
<b>Client</b>	<b>Los Alamos National Laboratory</b>	<b>Analysis Count</b> <b>1-9</b>

Samples Count Totals per Analysis		
Analysis Code	Analysis Description	Samples Count
LSC-A-001	Tritium in (Water [Aqueous, AQ, SI])	9

Analyses Assigned Per Fraction		
Fraction	Analysis Code	X = Assigned
001	LSC-A-001	X
002	LSC-A-001	X
003	LSC-A-001	X
004	LSC-A-001	X
005	LSC-A-001	X
006	LSC-A-001	X
007	LSC-A-001	X
008	LSC-A-001	X
009	LSC-A-001	X

**DQO Report for SDG**  
ARS1-11-00491

Analysis Code	Group	Isotope	Activity	Units	Aliquot Units	Procedure No.	ROD	CS LL	CS UL	MS LL	MS UL	Ready LL	Ready UL	Grav LL	Grav UL	REN RPD	CRITERIA	Repaired	Blank Correction	Blank Correction	Count	Time	Aliquot
LSC-A-001	STC	H-3	PCI		L	ARS-054	2.50E+02	80	120	75	125	30	110	40	110	1.00	25	FALSE	FALSE	FALSE			

# ARS FILE TRACKING SHEET

SDG: ARS1-11-00491

Task	Date / Time	Initials
Date & Time Samples Received	3/10/2011/10:45	SW
ICOC Initiated / Storage Location: <u>Q6</u>	3/10/2011/11:55	SW
Technical Checks Performed	See Batch	---
Report Written / EDD Generated: <u>5-6-11/10:12</u>   <u>SDH</u>	<small>Date/Time</small>   <small>Initials</small>	
	5-6-11/10:16	SDH
Quality Assurance Checks Performed on Report	<del>5-6-11/10:22</del>	<del>WJM</del>
Management Check Performed on Report	<del>5-6-11/10:22</del>	<del>WJM</del>
<i>Preliminary Report Sent</i>		
Report E-mailed		
Report Faxed		
Report Reviewed		
Report Mailed		
Invoice Completed      Invoice #: _____		
Report Imaged		

### SPECIAL REQUIREMENTS

Requirement	Yes	No
3 Hour Rush		✓
24 Hour Rush		✓
48 Hour Rush		✓
Special Invoicing <sup>see notes</sup> Mgmt. Approval: _____		✓

**NOTES:**

