

Thursday, June 16, 2011

REQUEST NUMBER: 11-2668

**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: 11-2668  
Per Agreement Number: 63641-001-10  
Project Cost Code: MR8R032NFM00

Please analyse the enclosed samples  
according to the schedule indicated:

**SHIP DATE: 6/16/2011**

**TURNAROUND/REPORT DUE: 7/16/2011**

**TURNAROUND REQ'D: 30 Days**

**RAD SCREENING: Yes, Below Background**

**LAB REQUEST COMMENTS:**

LANL ER SMO CONTACT:

Signature: 

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-14524	GAS	6/15/2011	
		1	MD21-11-14525	GAS	6/15/2011	
		1	MD21-11-14526	GAS	6/15/2011	
		1	MD21-11-14527	GAS	6/15/2011	
		1	MD21-11-14528	GAS	6/15/2011	
		1	MD21-11-14529	GAS	6/15/2011	
		1	MD21-11-14530	GAS	6/15/2011	
		1	MD21-11-14531	GAS	6/15/2011	
		1	MD21-11-14532	GAS	6/15/2011	
		1	MD21-11-14533	GAS	6/15/2011	

Thursday, June 16, 2011

REQUEST NUMBER: 11-2668

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-14534	GAS	6/15/2011	

Final Page of REQUEST NUMBER 11-2668

Thursday, June 16, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-2668C

LOS ALAMOS  
NATIONAL LABORATORY

REQUEST NUMBER: 11-2668

ATTN: Danny Coleman

TURNAROUND/REPORT DUE: 7/16/2011

American Radiation Services - Primary

TURNAROUND REQ'D: 30

1726 Wooddale Court

Baton Rouge, LA 70806

LAB REQUEST COMMENTS:

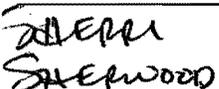
SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
MD21-11-14527	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14524	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14531	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14525	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14534	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14532	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14526	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14529	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14533	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14528	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-14530	1	SILICA GEL TUBE	H3	None	GAS

Relinquished By:

Date Time

Received By:

Date Time

 Signature  
 Signature  
 6/16/11 3pm

Signature

Signature

Signature

Signature

Signature

Received for DISPOSAL By:

Date Time

Remarks:

Signature



# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14525

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		1020	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:	122.5	ok	SAMPLE USAGE:	INV
BOTTOM DEPTH:	127.5	ok	SCREEN/PORT DESC:	part 2
FIELD MATRIX:	GAS	ok	EXCAVATED: YES/NO	(NA)
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	NA
			WATER FLOWING: YES/NO	(NA)
BOREHOLE: <input checked="" type="checkbox"/> YES / <input type="checkbox"/> NO / <input type="checkbox"/> 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	N	not collected for 6/15/11

**SAMPLE DESC:**  
 column # 15  
 initial wt = 596.13g  
 silica = 147.14g  
 Final wt 619.30g  
 Vapor wt 23.17g

**SAMPLE COMMENTS:**  
 weather @ 1010 T = 73°F RH = 12% BP = 30.23 in

**LOCATION DESC:**  
 NA

**FIELD SCREENING/MEASUREMENT RESULTS:**  
 atm O<sub>2</sub> 20.9%      CO<sub>2</sub> 420 ppm  
 Sab atm O<sub>2</sub> 19.9%      CO<sub>2</sub> 4220 ppm

COLLECTED BY (PRINT) R. Onstott M. Giorgio      REVIEWED BY (PRINT) allw boxpr

RELINQUISHED BY (Printed Name) <u>allw boxpr</u> (Signature) <u>[Signature]</u>	Date/Time 6/15/11 1445	RECEIVED BY (Printed Name) <u>JV Aldoz</u> (Signature) <u>[Signature]</u>	Date/Time 6/15/11 1445
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14526

WORK ORDER:

	AS PLANNED	AS COLLECTED	AS PLANNED	AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA: NA	ok
TIME COLLECTED (HH:MM)		1020	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:	part 3
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO <input checked="" type="checkbox"/> NA	
COMPOSITE TYPE: NA		ok	COMPOSITE TIME INTERVAL: NA	WATER FLOWING: YES/NO <input checked="" type="checkbox"/> NA
BOREHOLE: <input checked="" type="checkbox"/> YES / NO / NA			BOREHOLE DECLINATION: NA	BOREHOLE DIRECTION: <del>20</del> 90°

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

SAMPLE DESC: column # 1B  
 initial wt = 603.21g      Final wt 606.15g  
 silica wt = 148.90g      Vapor wt 21.74g

SAMPLE COMMENTS: weather @ 1010 T = 73°F RH = 12% BP = 30.23 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 340 ppm  
 sub atm O<sub>2</sub> 19.9% CO<sub>2</sub> 4440 ppm

COLLECTED BY (PRINT) Ernesto M. Giorgi      REVIEWED BY (PRINT) all Borgin

RELINQUISHED BY (Printed Name) <i>all Borgin</i> (Signature) <i>all Borgin</i>	Date/Time 6/15/11 1445	RECEIVED BY (Printed Name) <i>J. Valdez</i> (Signature) <i>J. Valdez</i>	Date/Time 6/15/11 1445
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14527

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA: NA	ok
TIME COLLECTED (HH:MM)		1020	SUB-MEDIA: OTHER	
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE: VOST	
LOCATION ID: 21-2424W		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:	part 4
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO <input checked="" type="checkbox"/> NO	
COMPOSITE TYPE: <u>NA</u>			COMPOSITE TIME INTERVAL: <u>NA</u>	WATER FLOWING: YES/NO <input checked="" type="checkbox"/> NA
BOREHOLE: <input checked="" type="radio"/> 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
1		TO15	6 LITER SUMMA CANISTER	None	N	Not sampled for

SAMPLE DESC: column # 26 initial wt 596.83g final wt 614.28g  
 silica wt 148.48g vapor wt 17.45g

SAMPLE COMMENTS: weather @ 1010 T=73°F RH=12% BP=30.23in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 310 ppm  
 sub atm O<sub>2</sub> 20.2% CO<sub>2</sub> 4660 ppm

COLLECTED BY (PRINT) Konstantin Morigin REVIEWED BY (PRINT) allvborgr

<b>RELINQUISHED BY</b> (Printed Name) <u>allvborgr</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/15/11</u> <u>1425</u>	<b>RECEIVED BY</b> (Printed Name) <u>J Valdez</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/15/11</u> <u>1425</u>
<b>RELINQUISHED BY</b> (Printed Name) (Signature)	Date/Time	<b>RECEIVED BY</b> (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14528

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA: NA	ok
TIME COLLECTED (HH:MM)		1020	SUB-MEDIA: OTHER	
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE: VOST	
LOCATION ID: 21-24324W		ok	FIELD QC TYPE: NA	
LOCATION TYPE: BH		ok	FIELD PREP: NA	
TOP DEPTH: 300		ok	SAMPLE USAGE: INV	
BOTTOM DEPTH: 305		ok	SCREEN/PORT DESC:	
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO/NA	part 5
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: 6/15/11 NA	
BOREHOLE: YES/NO/NA			WATER FLOWING: 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	N	not sampled for re 6/15/11

SAMPLE DESC: column # 7 initial wt 563.14g Final wt 603.23g  
 silica wt 147.41g vapor wt 20.09g

SAMPLE COMMENTS: weather @ 1010 T=73°F RH=12% BP=30.23in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 340 ppm  
 sub atm O<sub>2</sub> 20.1% CO<sub>2</sub> 4500 ppm

COLLECTED BY (PRINT) R Onst H M Giorgi, REVIEWED BY (PRINT) M Borgpr

RELINQUISHED BY (Printed Name) M Borgpr (Signature) <i>M Borgpr</i>	Date/Time 6/15/11 1445	RECEIVED BY (Printed Name) J Valdez (Signature) <i>J Valdez</i>	Date/Time 6/15/11 1445
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14529

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA: NA	ok
TIME COLLECTED (HH:MM)		1020	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: 327.5		ok	SAMPLE USAGE: INV	
BOTTOM DEPTH: 332.5		ok	SCREEN/PORT DESC:	
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO/NA <span style="margin-left: 20px;">part 6</span>	
COMPOSITE TYPE: NA		NA	COMPOSITE TIME INTERVAL: NA	
BOREHOLE: YES/NO/NA		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	N	not sampled for

SAMPLE DESC: column #7  
 Initial wt 585.07g Final wt 607.32g  
 Silica wt 145.23g vapor wt 22.25g

SAMPLE COMMENTS: weather @ 1010 T = 73°F RH = 12% BP = 30.23 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 340 ppm  
 sub O<sub>2</sub> 20.1% CO<sub>2</sub> 4160 ppm

COLLECTED BY (PRINT) *Orsted M Borgui* REVIEWED BY (PRINT) *ell/Boyer*

RELINQUISHED BY (Printed Name)		Date/Time 6/15/11	RECEIVED BY (Printed Name)	Date/Time 6/15/11
(Signature)		14 25	<i>[Signature]</i>	14 25
RELINQUISHED BY (Printed Name)			RECEIVED BY (Printed Name)	Date/Time
(Signature)			<i>[Signature]</i>	

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14530

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA: NA	26
TIME COLLECTED (HH:MM)		1020	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: NA			COMPOSITE TIME INTERVAL: NA	
BOREHOLE: YES/NO/NA			WATER FLOWING: 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	N	not sampled for

SAMPLE DESC: column #14 initial wt 604.88g Final wt 624.73g  
 silica wt 150.21g vapor wt 19.85g

SAMPLE COMMENTS: weather @ 1010 T=73°F RH=12% BP=30.23 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 340 ppm  
 sub atm O<sub>2</sub> 20.3% CO<sub>2</sub> 3610 ppm

COLLECTED BY (PRINT) Konstantin Moring REVIEWED BY (PRINT) J. Valdez

RELINQUISHED BY (Printed Name) J. Valdez (Signature) <i>J. Valdez</i>	Date/Time 6/15/11 1445	RECEIVED BY (Printed Name) J. Valdez (Signature) <i>J. Valdez</i>	Date/Time 6/15/11 1445
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14531

WORK ORDER:

	AS PLANNED	AS COLLECTED	AS PLANNED	AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA: NA	
TIME COLLECTED (HH:MM)		1020	SUB-MEDIA: OTHER	OK
PRS ID: 21-018(a)-99		OK	SAMPLE TECH CODE: VOST	<div style="font-size: 2em;">I</div>
LOCATION ID: 21-2424S		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:	
FIELD MATRIX: GAS		OK	EXCAVATED: YES/NO/NA	
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: NA	
BOREHOLE: 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	N	Not sampled for

**SAMPLE DESC:** Column # 9  
 initial wt = 581.31g Final wt 599.34g  
 silica wt 147.99g  
 weather @ 1010 T = 73°F RH = 12% BP = 30.23 in  
 so 6/15/11 so 4 vapor wt 18.03 so 6/15/11

**LOCATION DESC:** NA

**FIELD SCREENING/MEASUREMENT RESULTS:**  
 atm O<sub>2</sub> 20.9%  
 sub atm O<sub>2</sub> 20.5%  
 CO<sub>2</sub> 340 ppm  
 CO<sub>2</sub> 2350 ppm

COLLECTED BY (PRINT) Konstantin M. G. REVIEWED BY (PRINT) M. G.

<b>RELINQUISHED BY</b> (Printed Name) M. G. (Signature) M. G.	Date/Time 6/15/11 1445	<b>RECEIVED BY</b> (Printed Name) J. V. Lopez (Signature) J. V. Lopez	Date/Time 6/15/11 1445
<b>RELINQUISHED BY</b> (Printed Name) (Signature)	Date/Time	<b>RECEIVED BY</b> (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14532

WORK ORDER:

	AS PLANNED	AS COLLECTED	AS PLANNED	AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA: NA	OK
TIME COLLECTED (HH:MM)		1020	SUB-MEDIA: OTHER	
PRS ID: 21-018(a)-99		OK	SAMPLE TECH CODE: VOST	
LOCATION ID: 21-24524S		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:	part 11
FIELD MATRIX: GAS		OK	EXCAVATED: YES/NO <input checked="" type="checkbox"/> NA	
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: NA	WATER FLOWING: YES/NO <input checked="" type="checkbox"/> NA
BOREHOLE: <input checked="" type="checkbox"/> 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	Y	not sampled for TO15

SAMPLE DESC: Column # 10 initial wt 585.89g Final wt 604.10g  
 silica wt 147.02g vapor wt 18.21g

SAMPLE COMMENTS: weather data @ 1010 T = 73°F RH = 12% BP = 30.28 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9% CO<sub>2</sub> 340 ppm  
 sub atm O<sub>2</sub> 20.6% CO<sub>2</sub> 1520 ppm

COLLECTED BY (PRINT) Konstantin Morigin REVIEWED BY (PRINT) J. Valdez

RELINQUISHED BY (Printed Name) J. Valdez (Signature) <i>J. Valdez</i>	Date/Time 6/15/11 1445	RECEIVED BY (Printed Name) J. Valdez (Signature) <i>J. Valdez</i>	Date/Time 6/15/11 1445
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14533

WORK ORDER:

	AS PLANNED	AS COLLECTED	AS PLANNED	AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA: NA	ok
TIME COLLECTED (HH:MM)		1020	SUB-MEDIA: OTHER	
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE: VOST	
LOCATION ID: 21-24524		ok	FIELD QC TYPE: ED	
LOCATION TYPE: BH		ok	FIELD PREP: NA	
TOP DEPTH: 0		300	SAMPLE USAGE: QC	
BOTTOM DEPTH: 0		305	SCREEN/PORT DESC:	port 5 FD
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO (NA)	
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: NA	
			WATER FLOWING: YES/NO (NA)	
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
1		TO15	6 LITER SUMMA CANISTER	None	N	not sampled for

SAMPLE DESC: QC Sample of MD21-11-14528  
 Column # 1  
 initial wt 585.22g      Final wt 604.75g  
 silica wt 145.38g      vapor wt 19.53g

SAMPLE COMMENTS:  
 weather @ 1010 T = 73°F RH = 12% BP = 30.23 in

LOCATION DESC:  
 NA

FIELD SCREENING/MEASUREMENT RESULTS:  
 atm O<sub>2</sub> 20.9%      CO<sub>2</sub> 340 ppm  
 sub atm O<sub>2</sub> 20.1%      CO<sub>2</sub> 4500 ppm

COLLECTED BY (PRINT) R Onstott Mborgji      REVIEWED BY (PRINT) clw brogr

RELINQUISHED BY (Printed Name) <i>clw brogr</i> (Signature) <i>clw brogr</i>	Date/Time 6/15/11 1445	RECEIVED BY (Printed Name) <i>J Valdez</i> (Signature) <i>J Valdez</i>	Date/Time 6/15/11 1445
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3515

EVENT NAME: FY11 - MDA T - CU 21-018(a)-99 - Pore Gas Sampling

SAMPLE ID: MD21-11-14534

WORK ORDER:

	AS PLANNED	AS COLLECTED	AS PLANNED	AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		6/15/11	MEDIA: NA	ok
TIME COLLECTED (HH:MM)		1200	SUB-MEDIA: OTHER	
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE: VOST	
LOCATION ID: 21-24524		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:	FB
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO/NA	
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: NA	WATER FLOWING: YES/NO/NA
BOREHOLE: YES/NO/NA			BOREHOLE DECLINATION: NA	BOREHOLE DIRECTION: NA

#	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>N</del>	<del>Not sampled for 6/15/11</del>

SAMPLE DESC: QC Sample of MD21-11-1452B  
 column # 23  
 Initial wt = 595.09g  
 Silica wt = 148.78g  
 Final = 600.78g  
 DI wt = 5.66g

SAMPLE COMMENTS: weather @ 6/15/11 1150 T = 77°F RH = 11% BP = 30.21 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS: NA

COLLECTED BY (PRINT) Ronald M Giorgi REVIEWED BY (PRINT) allv Gory

RELINQUISHED BY (Printed Name) <u>allv Gory</u> (Signature) <u>[Signature]</u>	Date/Time 6/15/11 1445	RECEIVED BY (Printed Name) <u>J Valdez</u> (Signature) <u>[Signature]</u>	Date/Time 6/15/11 1445
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: 11-2668      VALIDATION DATE: 8/4/11      LAB CODE: ARS

 CONTRACT LABORATORY NAME: American Radiation Services

 VALIDATOR: Allison Felix      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 PESTICIDES/POLYCHLORINATED BIPHENYLS |
| <input type="checkbox"/> GENERAL CHEMISTRY                     | <input checked="" type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH 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 results were qualified.
2. An LCSD was analyzed instead of a sample duplicate. Acceptance criteria were met and, thus, no sample results were qualified. 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:** 08/04/11

 VALIDATOR'S SIGNATURE: Allison Felix      DATE: 8/4/11

## 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: ARS1-11-01342  
Client Sample ID: MD21-11-14527  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-001  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	32753.119	1726.401	208.440	102.378		pCi/L	ARS-054/EPA 906.0	07/03/11 22:30	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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ARS Sample Delivery Group: ARS1-11-01342  
Client Sample ID: MD21-11-14524  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-002  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	41926.866	2205.599	206.040	101.199		pCi/L	ARS-054/EPA 906.0	07/04/11 01:40	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14531  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-003  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	160.897	64.279	207.627	101.979	U	pCi/L	ARS-054/EPA 906.0	07/04/11 04:49	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-01342  
Client Sample ID: MD21-11-14525  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-004  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	11794.262	632.551	208.577	102.445		pCi/L	ARS-054/EPA 906.0	07/04/11 07:58	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-01342  
Client Sample ID: MD21-11-14534  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-005  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	-51.944	62.390	210.666	103.471	U	pCi/L	ARS-054/EPA 906.0	07/04/11 11:08	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14532  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-006  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	49.086	62.998	209.029	102.667	U	pCi/L	ARS-054/EPA 906.0	07/04/11 14:17	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-01342  
Client Sample ID: MD21-11-14526  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-007  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	13441.997	718.485	210.217	103.251		pCi/L	ARS-054/EPA 906.0	07/04/11 17:27	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-01342  
Client Sample ID: MD21-11-14529  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-008  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	9413.044	508.886	209.650	102.972		pCi/L	ARS-054/EPA 906.0	07/04/11 20:36	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-01342  
Client Sample ID: MD21-11-14533  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-009  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	47952.511	2520.727	209.086	102.695		pCi/L	ARS-054/EPA 906.0	07/04/11 23:45	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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NELAP Certificate # E87558



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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14528  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-010  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	48532.938	2551.217	211.314	103.789		pCi/L	ARS-054/EPA 906.0	07/05/11 02:55	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:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14530  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-011  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	6328.974	349.679	212.469	104.356		pCi/L	ARS-054/EPA 906.0	07/05/11 06:04	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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LELAP Certificate# 01949

NELAP Certificate # E87558

Thursday, June 16, 2011

REQUEST NUMBER: 11-2668

**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: 11-2668  
Per Agreement Number: 63641-001-10  
Project Cost Code: MR8R032NFM00

Please analyse the enclosed samples  
according to the schedule indicated:

**SHIP DATE: 6/16/2011**  
**TURNAROUND/REPORT DUE: 7/16/2011**  
**TURNAROUND REQ'D: 30 Days**

**RAD SCREENING: Yes, Below Background**

**LAB REQUEST COMMENTS:**

LANL ER SMO CONTACT:

Signature: 

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-14524	GAS	6/15/2011	
		1	MD21-11-14525	GAS	6/15/2011	
		1	MD21-11-14526	GAS	6/15/2011	
		1	MD21-11-14527	GAS	6/15/2011	
		1	MD21-11-14528	GAS	6/15/2011	
		1	MD21-11-14529	GAS	6/15/2011	
		1	MD21-11-14530	GAS	6/15/2011	
		1	MD21-11-14531	GAS	6/15/2011	
		1	MD21-11-14532	GAS	6/15/2011	
		1	MD21-11-14533	GAS	6/15/2011	

Thursday, June 16, 2011

REQUEST NUMBER: 11-2668

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-14534	GAS	6/15/2011	

Final Page of REQUEST NUMBER 11-2668

Thursday, June 16, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-2668C

LOS ALAMOS NATIONAL LABORATORY

REQUEST NUMBER: 11-2668

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

TURNAROUND/REPORT DUE: 7/16/2011
TURNAROUND REQ'D: 30

LAB REQUEST COMMENTS:

Table with 6 columns: SAMPLE ID, CTNR, CTNR DESC, ORDER, PRESERV, MATRIX. Contains 12 rows of sample data.

Relinquished By: Date Time Received By: Date Time

Handwritten signatures and dates for Relinquished By and Received By.

Signature

Signature

Received for DISPOSAL By: Date Time Remarks:

Signature



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: 11-2668**



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: 11-2668**

# **Original COC**

Thursday, June 16, 2011

REQUEST NUMBER: 11-2668

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

ATTN: Danny Coleman

These Samples are on:

American Radiation Services - Primary  
1726 Wooddale Court  
Baton Rouge, LA 70806

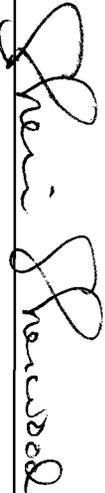
LANL Request Number: 11-2668  
Per Agreement Number: 63641-001-10  
Project Cost Code: MR8R032NFM00

Please analyse the enclosed samples according to the schedule indicated:

SHIP DATE: 6/16/2011  
TURNAROUND/REPORT DUE: 7/16/2011  
TURNAROUND REQ'D: 30 Days

**RAD SCREENING: Yes, Below Background**  
**LAB REQUEST COMMENTS:**

LANL ER SMO CONTACT:

Signature: 

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-14524	GAS	6/15/2011	
		1	MD21-11-14525	GAS	6/15/2011	
		1	MD21-11-14526	GAS	6/15/2011	
		1	MD21-11-14527	GAS	6/15/2011	
		1	MD21-11-14528	GAS	6/15/2011	
		1	MD21-11-14529	GAS	6/15/2011	
		1	MD21-11-14530	GAS	6/15/2011	
		1	MD21-11-14531	GAS	6/15/2011	
		1	MD21-11-14532	GAS	6/15/2011	
		1	MD21-11-14533	GAS	6/15/2011	

Thursday, June 16, 2011

REQUEST NUMBER: 11-2668

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

EPA:906.0		1	MD21-11-14534	GAS	6/15/2011	
-----------	--	---	---------------	-----	-----------	--

Final Page of REQUEST NUMBER 11-2668

Thursday, June 16, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-2668C

LOS ALAMOS NATIONAL LABORATORY

REQUEST NUMBER: 11-2668

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

TURNAROUND/REPORT DUE: 7/16/2011
TURNAROUND REQ'D: 30

LAB REQUEST COMMENTS:

Table with 6 columns: SAMPLE ID, CTNR, CTNR DESC, ORDER, PRESERV, MATRIX. Contains 12 rows of sample data.

Relinquished By: Date Time Received By: Date Time

Handwritten signatures and dates for Relinquished By and Received By.

Signature

Signature

Received for DISPOSAL By: Date Time Remarks:

Signature



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: 11-2668**

# **Case Narrative**



2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

July 11, 2011

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

Request Number: **11-2668**

LANL Sample ID: **MD21-11-14527; MD21-11-14524; MD21-11-14531; MD21-11-14525; MD21-11-14534;  
MD21-11-14532; MD21-11-14526; MD21-11-14529; MD21-11-14533; MD21-11-14528; MD21-11-14530.**

Dear Mr. Greene;

On June 17, 2011, ARS International received eleven (11) 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 Mullen'.

Laboratory Management  
**ARS International**



**COVER PAGE**

**PROJECT SAMPLE IDENTIFICATION  
CROSS-REFERENCE  
TO ARS SAMPLE LABORATORY ID<sub>s</sub>  
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>
11-2668	MD21-11-14527	ARS1-11-01342-001
11-2668	MD21-11-14524	ARS1-11-01342-002
11-2668	MD21-11-14531	ARS1-11-01342-003
11-2668	MD21-11-14525	ARS1-11-01342-004
11-2668	MD21-11-14534	ARS1-11-01342-005
11-2668	MD21-11-14532	ARS1-11-01342-006
11-2668	MD21-11-14526	ARS1-11-01342-007
11-2668	MD21-11-14529	ARS1-11-01342-008
11-2668	MD21-11-14533	ARS1-11-01342-009
11-2668	MD21-11-14528	ARS1-11-01342-010
11-2668	MD21-11-14530	ARS1-11-01342-011

**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.

**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."*



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*"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."*

*Jurgens Mullen*  
Signature

Laboratory Management, ARS International  
Title

7-15-11  
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:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14527  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-001  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	32753.119	1726.401	208.440	102.378		pCi/L	ARS-054/EPA 906.0	07/03/11 22:30	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:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14524  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-002  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	41926.866	2205.599	206.040	101.199		pCi/L	ARS-054/EPA 906.0	07/04/11 01:40	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14531  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-003  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	160.897	64.279	207.627	101.979	U	pCi/L	ARS-054/EPA 906.0	07/04/11 04:49	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14525  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-004  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	11794.262	632.551	208.577	102.445		pCi/L	ARS-054/EPA 906.0	07/04/11 07:58	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14534  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-005  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	-51.944	62.390	210.666	103.471	U	pCi/L	ARS-054/EPA 906.0	07/04/11 11:08	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14532  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-006  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	49.086	62.998	209.029	102.667	U	pCi/L	ARS-054/EPA 906.0	07/04/11 14:17	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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ARS Sample Delivery Group: ARS1-11-01342  
Client Sample ID: MD21-11-14526  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-007  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	13441.997	718.485	210.217	103.251		pCi/L	ARS-054/EPA 906.0	07/04/11 17:27	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14529  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-008  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	9413.044	508.886	209.650	102.972		pCi/L	ARS-054/EPA 906.0	07/04/11 20:36	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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

**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14533  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-009  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	47952.511	2520.727	209.086	102.695		pCi/L	ARS-054/EPA 906.0	07/04/11 23:45	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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NELAP Certificate # E87558



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

**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14528  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-010  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	48532.938	2551.217	211.314	103.789		pCi/L	ARS-054/EPA 906.0	07/05/11 02:55	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:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14530  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-011  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	6328.974	349.679	212.469	104.356		pCi/L	ARS-054/EPA 906.0	07/05/11 06:04	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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**QC Results per Analytical Batch**

Analytical Batch	<b>ARS1-B11-02481</b>
SDG	<b>ARS1-11-01342</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	07/03/11 03:35	Analysis Technician	BSTEFFENS	
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	Expected Value	LCS Rec (%)	MDC
ARS1-B11-02481-01	LCS	H-3	2170	140	2426	89	210

Duplicate RER/DER/RPD			Analysis Date	07/03/11 06:44	Analysis Technician	BSTEFFENS	
Analyte	Result LCS	CSU LCS (1s)	Results LCSD	CSU LCSD (1s)	RER	DER	RPD
H-3	2170	140	2390	150	0.39	1.07	9.6

Method Blank			Analysis Date	07/03/11 09:53	Analysis Technician	BSTEFFENS	
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	MDC	Qual	
ARS1-B11-02481-03	MBL	H-3	-14	61	200	U	

*Susan Leese*

Susan Leese

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 client.

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NELAP Certificate # E87558



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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

\\PACK003170\_NEW\Results\ARS\H-3 Normal Lvl 3

Batch Sample ID				Non-BKG Samples Transferred				Samples Eligible To Save				LSC 2			
LIMS Batch Sample ID	LSC PE	LSC PTD	LSC S#	SMP ID	LSC Count Date	LSC CPM	LSC LSTE	LSC EFF	LSC Count Dur	Analysis Batch	LIMS SDG	LIMS Run			
ARS1-B11-02481 23															
BKG	50		1												
ARS1-B11-02481-01	50		2	BACKGROUND	07/03/11 00:27	5.82	405.05	36.5700	180.00	ARS1-B11-02481					
ARS1-B11-02481-02	50		3	B11-02481-01	07/03/11 03:35	14.81	409.02	36.7600	180.00	ARS1-B11-02481					
ARS1-B11-02481-03	50		4	B11-02481-02	07/03/11 06:44	15.86	422.26	37.3700	180.00	ARS1-B11-02481					
ARS1-B11-02481-04	50		5	B11-02481-03	07/03/11 09:53	5.76	415.46	37.0500	180.00	ARS1-B11-02481					
ARS1-B11-02481-05	50		6	B11-02481-04	07/03/11 13:02	9.23	389.23	35.8400	180.00	ARS1-B11-02481					
ARS1-B11-02481-06	50		7	B11-02481-05	07/03/11 16:11	8.88	385.19	35.6500	180.00	ARS1-B11-02481					
ARS1-B11-02481-07	50		8	B11-02481-06	07/03/11 19:20	8.58	388.11	35.7800	180.00	ARS1-B11-02481					
ARS1-B11-02481-08	50		9	B11-02481-07	07/03/11 22:30	139.65	406.43	36.6300	180.00	ARS1-B11-02481					
ARS1-B11-02481-09	50		10	B11-02481-08	07/04/11 01:39	179.13	411.26	36.8600	180.00	ARS1-B11-02481					
ARS1-B11-02481-10	50		11	B11-02481-09	07/04/11 04:49	6.48	404.71	36.5500	180.00	ARS1-B11-02481					
ARS1-B11-02481-11	50		12	B11-02481-10	07/04/11 07:58	53.98	400.68	36.3700	180.00	ARS1-B11-02481					
ARS1-B11-02481-12	50		13	B11-02481-11	07/04/11 11:07	5.61	393.00	36.0100	180.00	ARS1-B11-02481					
ARS1-B11-02481-13	50		14	B11-02481-12	07/04/11 14:17	6.02	396.16	36.2500	180.00	ARS1-B11-02481					
ARS1-B11-02481-14	50		15	B11-02481-13	07/04/11 17:26	60.28	396.39	36.2600	180.00	ARS1-B11-02481					
ARS1-B11-02481-15	50		16	B11-02481-14	07/04/11 20:35	44.06	402.58	36.4600	180.00	ARS1-B11-02481					
ARS1-B11-02481-16	50		17	B11-02481-15	07/04/11 23:45	201.15	401.32	36.4000	180.00	ARS1-B11-02481					
ARS1-B11-02481-17	50		18	B11-02481-16	07/05/11 02:54	201.43	396.14	36.1600	180.00	ARS1-B11-02481					
ARS1-B11-02481-18	50		19	B11-02481-17	07/05/11 06:04	31.19	390.72	35.9000	180.00	ARS1-B11-02481					
ARS1-B11-02481-19	50		20	B11-02481-18	07/05/11 09:13	6.56	385.73	35.6700	180.00	ARS1-B11-02481					
ARS1-B11-02481-20	50		21	B11-02481-19	07/05/11 12:22	12.81	387.98	35.7800	180.00	ARS1-B11-02481					
ARS1-B11-02481-21	50		22	B11-02481-20	07/05/11 15:32	6.08	381.23	35.4600	180.00	ARS1-B11-02481					
ARS1-B11-02481-22	50		23	B11-02481-21	07/05/11 21:50	5.38	404.97	36.5700	180.00	ARS1-B11-02481					
ARS1-B11-02481-23	50		24	B11-02481-22	07/06/11 00:58	5.59	372.68	35.0700	180.00	ARS1-B11-02481					

Procedure		ARS-054	Isotope				H-3			
Variable	Value		Calculated Value	Excel	VBA	V/V				
Gross Count Rate	14.810000		ACT	2165.130670	2165.130670	OK				
Sample Count Minus	180.000000		C	81.833818	81.833818	OK				
BKG Count Rate	5.820000		TPU	139.500135	139.500135	OK				
BKG Count Minus	180.000000		MDA	205.119220	205.119220	OK				
Instrument Efficiency	0.367600		DL	100.746637	100.746637	OK				
Sample Aliquot	5.068000		Net Count Rate	8.990000	8.990000	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)	7/3/11 3:35 AM		Sys Err	0.052280	0.052280	OK				
Count Date (t2)	7/3/11 3:35 AM		K	0.004152	0.004152	OK				
Activity Units = pCi --- UCF =	2.2200		K MDA	0.747391	0.747391	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	0.000000									
TPUF_Decay Ingrowth Factor	0.025000									
TPUF_Analysis Factor	0.000000									
TPUF_Unassigned Factor	0.000000									
Activity Units	pCi									
Aliquot Units	L									
			<b>Batch Identifiers and Other Related Information</b>							
			Batch	ARS1-B11-02481						
			Batch L	ARS1-B11-02481-01						
			Analysis Code							
			SDU	QC Sample						
			Fraction	N/A QC Sample						
			Run Number							
			Client	QC Sample						
			Client Profile							
			Client ID	N/A QC Sample						
			Instr File Name	76						
			Instr Detector	P-50-S-2						
			Instr Key							
			Version/Date	1.0 -- 11/18/2005						
<b>0</b>	<b>Variables Intact Test</b>	<b>OK</b>								

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Value	Excel	VBA	V/V
Gross Count Rate	15.860000	ACT	2386.514239	2386.514239	OK
Sample Count Mins	180.000000	C	161.658739	161.658739	OK
BKG Count Rate	5.820000	TP	293.162078	293.162078	OK
BKG Count Mins	180.000000	MD	202.447423	202.447423	OK
Instrument Efficiency	0.373700	D	99.434354	99.434354	OK
Sample Aliquot	5.071000	Net Count Rate	10.040000	10.040000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	0.000000	0.000000	OK
Aliquot Conversion Factor	0.001000	C	1.000000	1.000000	OK
Sample Collection Date (t1)	7/3/11 6:44 AM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	7/3/11 6:44 AM	K	0.004207	0.004207	OK
Activity Units = pCi --- UCF =	2.2200	K MDA	0.757255	0.757255	OK
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-B11-02481		
		Batch Y	ARS1-B11-02481-02		
		Analysis Cod			
		SD	QC Sample		
		Fraction	N/A QC Sample		
		Run Number			
		Client	QC Sample		
		Client Profile			
		Client ID	N/A QC Sample		
		Instr File Name	76		
		Instr Detector	P-50-S-3		
		Instr ke			
		Version/Date	1.0 -- 11/18/2005		
<b>0</b>	<b>Variables Intact Test</b>				<b>OK</b>

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Reviewed By: SOD

Date: 7-8-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Value	Excel	VBA	V/V
Gross Count Rate	5.760000	AC	-14.413642	-14.413642	OK
Sample Count Mins	180.000000	C	119.425364	119.425364	OK
BKG Count Rate	5.820000	TPU	119.434497	119.434497	OK
BKG Count Mins	180.000000	MD	204.599426	204.599426	OK
Instrument Efficiency	0.370500	D	100.491335	100.491335	OK
Sample Aliquot	5.061000	Net Count Rate	-0.060000	-0.060000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	0.000000	0.000000	OK
Aliquot Conversion Factor	0.001000	D	1.000000	1.000000	OK
Sample Collection Date (t1)	7/3/11 9:53 AM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	7/3/11 9:53 AM	K MDA	0.004163	0.004163	OK
Activity Units = pCi --- UCF =	2.2200		0.749290	0.749290	OK
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-B11-02481		
		Batch I	ARS1-B11-02481-03		
		Analysis Cod			
		SD	QC Sample		
		Fractio	N/A QC Sample		
		Run Number			
		Client	QC Sample		
		Client Profil			
		Client ID	N/A QC Sample		
		Instr File Nam	76		
		Instr Detecto	P-50-S-4		
		Instr ke			
		Version/Date	1.0 -- 11/18/2005		
<b>0</b>	<b>Variables Intact Test</b>				<b>OK</b>

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	139.650000	ACT	32753.119376	32753.119371	OK
Sample Count Mins	180.000000	CD	226.013666	226.013666	OK
BKG Count Rate	5.820000	TPU	1726.400575	1726.400575	OK
BKG Count Mins	180.000000	MDA	288.440030	288.440030	OK
Instrument Efficiency	0.366300	DL	102.377691	102.377691	OK
Sample Aliquot	5.039000	Net Count Rate	133.830000	133.830000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	18.437500	18.437500	OK
Aliquot Conversion Factor	0.001000	DI	0.997164	0.997164	OK
Sample Collection Date (t1)	6/15/11 12:00 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	7/3/11 10:30 PM	K	0.004086	0.004086	OK
Activity Units = pCi --- UCF =	2.2200	K MDA	0.735484	0.735484	OK
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-B11-02481		
		Batch ID	ARS1-B11-02481-07		
		Analysis Code	LSC-A-001		
		SD	ARS1-11-01342		
		Fraction	001		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-14527		
		Instr File Name	76		
		Instr Detector	P-50-S-8		
		Instr Key			
		Version/Date	1.0 -- 11/18/2005		
<b>0 Variables Intact Test</b>	<b>OK</b>				

Reviewed by: SDH

Date: 7-8-11



Procedure		ARS-054			
Variable	Value	Isotope		H-3	
		Calculated Values	Excel	VBA	V/V
Gross Count Rate	6.480000	ACT	160.896527	160.896527	OK
Sample Count Mins	180.000000	CP	63.726349	63.726349	OK
BKG Count Rate	5.820000	TPU	64.279102	64.279102	OK
BKG Count Mins	180.000000	MDA	207.627402	207.627402	OK
Instrument Efficiency	0.365500	DL	101.978560	101.978560	OK
Sample Aliquot	5.070000	Net Count Rate	0.660000	0.660000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	18.700694	18.700694	OK
Aliquot Conversion Factor	0.001000	DF	0.997123	0.997123	OK
Sample Collection Date (t1)	6/15/11 12:00 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	7/4/11 4:49 AM	K	0.004102	0.004102	OK
Activity Units = pCi --- UCF =	2.2200	K MDA	0.738363	0.738363	OK
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-B11-02481		
		Batch ID	ARS1-B11-02481-09		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-01342		
		Fraction	003		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-14531		
		Instr File Name	76		
		Instr Detector	P-50-S-10		
		Instr Key			
		Version/Date	1.0 -- 11/18/2005		
<b>0</b>	<b>Variables Intact Test</b>				<b>OK</b>

Reviewed By: *SPK*

Date: *7-8-11*

Procedure		ARS-054			
Variable	Value				
Gross Count Rate	53.980000				
Sample Count Mins	180.000000				
BKG Count Rate	5.820000				
BKG Count Mins	180.000000				
Instrument Efficiency	0.363700				
Sample Aliquot	5.072000				
Dilution Factor	1.000000				
Aliquot Conversion Factor	0.001000				
Sample Collection Date (t1)	6/15/11 12:00 PM				
Count Date (t2)	7/4/11 7:58 AM				
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				
Aliquot Units	L				
<b>Variables Intact Test</b>		<b>OK</b>			

Isotope		H-3		
Calculated Values	Excel	VBA	V/V	
ACT	11794.262439	11794.262437	OK	
CF	141.155774	141.155774	OK	
TPU	632.551493	632.551493	OK	
MDA	208.576918	208.576918	OK	
DL	102.444925	102.444925	OK	
Net Count Rate	48.160000	48.160000	OK	
D t 1 (t2 - t1)	18.831944	18.831944	OK	
DF	0.997103	0.997103	OK	
Sys Err	0.052280	0.052280	OK	
K	0.004083	0.004083	OK	
K MDA	0.735001	0.735001	OK	
<b>Batch Identifiers and Other Related Information</b>				
Batch	ARS1-B11-02481			
Batch I	ARS1-B11-02481-10			
Analysis Code	LSC-A-001			
SDP	ARS1-11-01342			
Fraction	004			
Run Number	1			
Client	Los Alamos National Laboratory			
Client Profile	Keith Greene			
Chart ID	MD21-11-14525			
Instr File Name	76			
Instr Detector	P-50-S-11			
Instr keV				
Version/Date	1.0 -- 11/18/2005			

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	5.610000	ACT	-51.943668	-51.943668	OK
Sample Count Mins	180.000000	CU	62.389566	62.389566	OK
BKG Count Rate	5.820000	TPU	62.389566	62.389566	OK
BKG Count Mins	180.000000	MDA	210.666389	210.666389	OK
Instrument Efficiency	0.360100	DL	103.471193	103.471193	OK
Sample Aliquot	5.072000	Net Count Rate	-0.210000	-0.210000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	18.963889	18.963889	OK
Aliquot Conversion Factor	0.001000	DF	0.997083	0.997083	OK
Sample Collection Date (t1)	6/15/11 12:00 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	7/4/11 11:08 AM	K	0.004043	0.004043	OK
Activity Units = pCi --- UCF =	2.2200	K MDA	0.727711	0.727711	OK
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-B11-02481		
		Batch ID	ARS1-B11-02481-11		
		Analysis Code	LSC-A-001		
		SDS	ARS1-11-01342		
		Fraction	005		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-14534		
		Instr File Name	76		
		Instr Detector	P-50-S-12		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>Variables Intact Test</b>	<b>OK</b>				

Reviewed By: SDA

Date: 7-8-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	6.020000	ACT	49.085560	49.085560	OK
Sample Count Mins	180.000000	CU	62.948307	62.948307	OK
BKG Count Rate	5.820000	TPU	62.997594	62.997594	OK
BKG Count Mins	180.000000	MDA	209.028590	209.028590	OK
Instrument Efficiency	0.362500	DL	102.666769	102.666769	OK
Sample Aliquot	5.078000	Net Count Rate	0.208000	0.208000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	19.095139	19.095139	OK
Aliquot Conversion Factor	0.001000	DF	0.997063	0.997063	OK
Sample Collection Date (t1)	6/15/11 12:00 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	7/4/11 2:17 PM	K	0.004075	0.004075	OK
Activity Units = pCi --- UCF =	2.2200	K MDA	0.733413	0.733413	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	0.000000				
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-B11-02481		
		Batch ID	ARS1-B11-02481-12		
		Analysis Code	LSC-A-001		
		SDC	ARS1-11-01342		
		Fraction	006		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-14532		
		Instr File Name	76		
		Instr Detector	P-50-S-13		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>0</b>	<b>Variables Intact Test</b>		<b>OK</b>		

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	60.280000	ACT	13441.996566	13441.996564	OK
Sample Count Mins	180.000000	CU	149.572110	149.572110	OK
BKG Count Rate	5.820000	TPU	718.484967	718.484967	OK
BKG Count Mins	180.000000	MDA	210.217119	210.217119	OK
Instrument Efficiency	0.362600	DL	103.250528	103.250528	OK
Sample Aliquot	5.048000	Net Count Rate	54.468000	54.468000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	19.227083	19.227083	OK
Aliquot Conversion Factor	0.001000	DF	0.997043	0.997043	OK
Sample Collection Date (t1)	6/15/11 12:00 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	7/4/11 5:27 PM	K	0.004051	0.004051	OK
Activity Units = pCi -- UCF =	2.2200	K MDA	0.729267	0.729267	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	0.000000				
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-B11-02481		
		Batch ID	ARS1-B11-02481-13		
		Analysis Code	LSC-A-001		
		SDC	ARS1-11-01342		
		Fraction	007		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-14526		
		Instr File Name	76		
		Instr Detector	P-50-S-14		
		Instr ke			
		Version/Date	1.0 -- 11/18/2005		
<b>0 Variables Intact Test</b>	<b>OK</b>				

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	44.060000	ACT	9413.043759	9413.043757	OK
Sample Count Mins	180.000000	CU	129.580385	129.580385	OK
BKG Count Rate	5.820000	TPU	508.885618	508.885618	OK
BKG Count Mins	180.000000	MDA	209.649644	209.649644	OK
Instrument Efficiency	0.364600	DL	102.971807	102.971807	OK
Sample Aliquot	5.034000	Net Count Rate	38.240000	38.240000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	19.358333	19.358333	OK
Aliquot Conversion Factor	0.001000	DF	0.997022	0.997022	OK
Sample Collection Date (t1)	6/15/11 12:00 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	7/4/11 8:36 PM	J	0.004062	0.004062	OK
Activity Units = pCi --- UCF =	2.2200	K MDA	0.731241	0.731241	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	0.000000				
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-B11-02481		
		Batch ID	ARS1-B11-02481-14		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-01342		
		Fraction	008		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-14529		
		Instr File Name	76		
		Instr Detector	P-50-S-15		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>0: Variables Intact Test</b>	<b>OK</b>				

Reviewed by: SDK

Date: 7-8-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	201.150000	ACT	47952.510723	47952.510714	OK
Sample Count Mins	180.000000	CC	265.244829	263.244829	OK
BKG Count Rate	5.820000	TPU	2520.727021	2520.727020	OK
BKG Count Mins	180.000000	MDA	209.085703	209.085703	OK
Instrument Efficiency	0.364000	DL	102.694821	102.694821	OK
Sample Aliquot	5.056000	Net Count Rate	195.330000	195.330000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	19.489583	19.489583	OK
Aliquot Conversion Factor	0.001000	DF	0.997002	0.997002	OK
Sample Collection Date (t1)	6/15/11 12:00 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	7/4/11 11:45 PM	K	0.004073	0.004073	OK
Activity Units = pCi --- UCF =	2.2200	K MDA	0.733213	0.733213	OK
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-B11-02481		
		Batch ID	ARS1-B11-02481-15		
		Analysis Code	LSC-A-001		
		SDN	ARS1-11-01342		
		Fraction	009		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-14533		
		Instr File Name	76		
		Instr Detector	P-50-S-16		
		Instr ke'			
		Version/Date	1.0 -- 11/18/2005		
<b>Variables Intact Test</b>	<b>OK</b>				

Reviewed by: SDN

Date: 7-8-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	201.430000	ACT	48532.938454	48532.938444	OK
Sample Count Mins	180.000000	CF	266.229729	266.229729	OK
BKG Count Rate	5.820000	TPU	2551.217422	2551.217422	OK
BKG Count Mins	180.000000	MDA	211.313610	211.313610	OK
Instrument Efficiency	0.361600	DL	103.789083	103.789083	OK
Sample Aliquot	5.036000	Net Count Rate	195.610000	195.610000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	19.621528	19.621528	OK
Aliquot Conversion Factor	0.001000	DF	0.996982	0.996982	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	6/15/11 12:00 PM	K	0.004030	0.004030	OK
Count Date (t2)	7/5/11 2:55 AM	K MDA	0.725483	0.725483	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-B11-02481		
		Batch ID	ARS1-B11-02481-16		
		Analysis Code	LSC-A-001		
		SDE	ARS1-11-01342		
		Fraction	010		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-14528		
		Instr File Name	76		
		Instr Detector	P-50-5-17		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
<b>0</b>	<b>Variables Intact Test</b>				<b>OK</b>

*SAC*

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	31.190000	ACT	6328.973910	6328.973909	OK
Sample Count Mins	160.000000	GU	113.119149	113.119149	OK
BKG Count Rate	5.820000	TPU	349.679155	349.679155	OK
BKG Count Mins	150.000000	MDA	212.468609	212.468609	OK
Instrument Efficiency	0.359000	DL	104.356373	104.356373	OK
Sample Aliquot	5.045000	Net Count Rate	25.370000	25.370000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	19.752778	19.752778	OK
Aliquot Conversion Factor	0.001000	DF	0.996962	0.996962	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	6/15/11 12:00 PM	K	0.004009	0.004009	OK
Count Date (t2)	7/5/11 6:04 AM	K MDA	0.721539	0.721539	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-B11-02481		
		Batch ID	ARS1-B11-02481-17		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-01342		
		Fraction	011		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-14530		
		Instr File Name	76		
		Instr Detector	P-50-S-1B		
		Instr Key			
		Version/Date	1.0 -- 11/18/2005		
<b>Variables Intact Test</b>	<b>OK</b>				

Reviewed by: SPD

Date: 7-8-11



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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-B11-02481**

Method **ARS-054** Description **Tritium (Aqueous)** Analysis **LSC-A-001** Matrix **SI**

Batch Sample ID	Type	Blind Iso1	Blind Iso2	Blind Iso3	SDG	FR	Run	Client ID	Isotope Group	Lab Deadline
ARS1-B11-02481-01	LCS	B-11976								
ARS1-B11-02481-02	LCSD	B-11977								
ARS1-B11-02481-03	MBL									
ARS1-B11-02481-04	TRG				ARS1-11-01310	001	1	MD54-11-7522	STD	07/11/11
ARS1-B11-02481-05	TRG				ARS1-11-01310	002	1	MD54-11-7521	STD	07/11/11
ARS1-B11-02481-06	TRG				ARS1-11-01310	003	1	MD54-11-7602	STD	07/11/11
ARS1-B11-02481-07	TRG				ARS1-11-01342	001	1	MD21-11-14527	STD	07/12/11
ARS1-B11-02481-08	TRG				ARS1-11-01342	002	1	MD21-11-14524	STD	07/12/11
ARS1-B11-02481-09	TRG				ARS1-11-01342	003	1	MD21-11-14531	STD	07/12/11
ARS1-B11-02481-10	TRG				ARS1-11-01342	004	1	MD21-11-14525	STD	07/12/11
ARS1-B11-02481-11	TRG				ARS1-11-01342	005	1	MD21-11-14534	STD	07/12/11
ARS1-B11-02481-12	TRG				ARS1-11-01342	006	1	MD21-11-14532	STD	07/12/11
ARS1-B11-02481-13	TRG				ARS1-11-01342	007	1	MD21-11-14526	STD	07/12/11
ARS1-B11-02481-14	TRG				ARS1-11-01342	008	1	MD21-11-14529	STD	07/12/11
ARS1-B11-02481-15	TRG				ARS1-11-01342	009	1	MD21-11-14533	STD	07/12/11
ARS1-B11-02481-16	TRG				ARS1-11-01342	010	1	MD21-11-14528	STD	07/12/11
ARS1-B11-02481-17	TRG				ARS1-11-01342	011	1	MD21-11-14530	STD	07/12/11
ARS1-B11-02481-18	TRG				ARS1-11-01343	001	1	MD54-11-7605	STD	07/12/11
ARS1-B11-02481-19	TRG				ARS1-11-01343	002	1	MD54-11-7520	STD	07/12/11
ARS1-B11-02481-20	TRG				ARS1-11-01343	003	1	MD54-11-7612	STD	07/12/11
ARS1-B11-02481-21	TRG				ARS1-11-01343	004	1	MD54-11-7519	STD	07/12/11
ARS1-B11-02481-22	TRG				ARS1-11-01343	005	1	MD54-11-7539	STD	07/12/11
ARS1-B11-02481-23	TRG				ARS1-11-01343	006	1	MD54-11-7620	STD	07/12/11

90230 90231 90232 90233 90234 90235 90236 90237 90238  
 11-01310-001-1 11-01310-002-1 11-01310-003-1 11-01342-001-1 11-01342-002-1 11-01342-003-1 11-01342-004-1 11-01342-005-1 11-01342-006-1  
 WRAD WRAD WRAD WRAD WRAD WRAD WRAD WRAD WRAD

90239 90240 90241 90242 90243 90244 90245 90246 90247  
 11-01342-007-1 11-01342-008-1 11-01342-009-1 11-01342-010-1 11-01342-011-1 11-01343-001-1 11-01343-002-1 11-01343-003-1 11-01343-004-1  
 WRAD WRAD WRAD WRAD WRAD WRAD WRAD WRAD WRAD

90248 90249  
 11-01343-005-1 11-01343-006-1  
 WRAD WRAD

LCS Report  
Analytical Batch: ARS1-B11-02481

BlindID	ASatch	AbatchSampleID	BlindGroup	StdID	Isotope	ExpectedAddition	ExpectedValue	EmptyWT	GrossWT	NetWT	UserID	ModDate	ExpectedValue_CT	MidPointCountDate	KnownValue
B-11976	ARS1-B11-02481	ARS1-B11-02481-01	B-H3	S-0247	H-3	5	2.428209486	0	1	1	1BSTEFFENS	6/27/2011	2.425966282	7/3/2011	2.425966282
B-11977	ARS1-B11-02481	ARS1-B11-02481-02	B-H3	S-0247	H-3	5	2.428209486	0	1	1	1BSTEFFENS	6/27/2011	2.425966282	7/3/2011	2.425966282

ARS-054

ID_31001_054	ABatch	ABatchSampleID	ClientID	Aliquot1	AliquotUnits1	IC_ID1	Aliquot2	AliquotUnits2	IC_ID2	UserID	ModDate
9198	ARSI-B11-02481	ARSI-B11-02481-01					5.088 g			BSTEFFENS	07/01/2011 15:49:21
9199	ARSI-B11-02481	ARSI-B11-02481-02					5.071 g			BSTEFFENS	07/01/2011 15:49:21
9200	ARSI-B11-02481	ARSI-B11-02481-03					5.061 g			BSTEFFENS	07/01/2011 15:49:21
9201	ARSI-B11-02481	ARSI-B11-02481-04	MD54-11-7522				5.044 g		90230	BSTEFFENS	07/01/2011 15:49:21
9202	ARSI-B11-02481	ARSI-B11-02481-05	MD54-11-7521				5.054 g		90231	BSTEFFENS	07/01/2011 15:49:21
9203	ARSI-B11-02481	ARSI-B11-02481-06	MD54-11-7602				5.046 g		90232	BSTEFFENS	07/01/2011 15:49:21
9204	ARSI-B11-02481	ARSI-B11-02481-07	MD21-11-14527				5.039 g		90233	BSTEFFENS	07/01/2011 15:49:21
9205	ARSI-B11-02481	ARSI-B11-02481-08	MD21-11-14524				5.066 g		90234	BSTEFFENS	07/01/2011 15:49:21
9206	ARSI-B11-02481	ARSI-B11-02481-09	MD21-11-14531				5.07 g		90235	BSTEFFENS	07/01/2011 15:49:21
9207	ARSI-B11-02481	ARSI-B11-02481-10	MD21-11-14525				5.072 g		90236	BSTEFFENS	07/01/2011 15:49:21
9208	ARSI-B11-02481	ARSI-B11-02481-11	MD21-11-14534				5.072 g		90237	BSTEFFENS	07/01/2011 15:49:22
9209	ARSI-B11-02481	ARSI-B11-02481-12	MD21-11-14532				5.078 g		90238	BSTEFFENS	07/01/2011 15:49:22
9210	ARSI-B11-02481	ARSI-B11-02481-13	MD21-11-14526				5.048 g		90239	BSTEFFENS	07/01/2011 15:49:22
9211	ARSI-B11-02481	ARSI-B11-02481-14	MD21-11-14529				5.034 g		90240	BSTEFFENS	07/01/2011 15:49:22
9212	ARSI-B11-02481	ARSI-B11-02481-15	MD21-11-14533				5.056 g		90241	BSTEFFENS	07/01/2011 15:49:22
9213	ARSI-B11-02481	ARSI-B11-02481-16	MD21-11-14528				5.036 g		90242	BSTEFFENS	07/01/2011 15:49:22
9214	ARSI-B11-02481	ARSI-B11-02481-17	MD21-11-14530				5.045 g		90243	BSTEFFENS	07/01/2011 15:49:22
9215	ARSI-B11-02481	ARSI-B11-02481-18	MD54-11-7605				5.045 g		90244	BSTEFFENS	07/01/2011 15:49:22
9216	ARSI-B11-02481	ARSI-B11-02481-19	MD54-11-7520				5.024 g		90245	BSTEFFENS	07/01/2011 15:49:22
9217	ARSI-B11-02481	ARSI-B11-02481-20	MD54-11-7612				5.044 g		90246	BSTEFFENS	07/01/2011 15:49:22
9218	ARSI-B11-02481	ARSI-B11-02481-21	MD54-11-7519				5.029 g		90247	BSTEFFENS	07/01/2011 15:49:22
9219	ARSI-B11-02481	ARSI-B11-02481-22	MD54-11-7539				5.033 g		90248	BSTEFFENS	07/01/2011 15:49:22
9220	ARSI-B11-02481	ARSI-B11-02481-23	MD54-11-7620				5.048 g		90249	BSTEFFENS	07/01/2011 15:49:23

Batch Result Verification Report

AbateSampleID	SDG	Fraction	ClientID	Run	Isotope	ACT	TPU	TPUs1	TPUs2	MDA	DL	CU	CU1s	CU2s	ActivityReportUnits
ARS1-B11-02481-01				1	H-3	2165.13067	139.5001348	139.5001348	273.4202642	205.1192199	100.7466375	81.5381838	81.5381838	159.806884	PCI
ARS1-B11-02481-02				1	H-3	2386.514239	293.1620784	149.572489	293.1620784	202.4474231	99.4343541	161.6887393	82.49425476	161.6887393	PCI
ARS1-B11-02481-03				1	H-3	-14.41364184	119.4344966	60.93596764	119.4344966	204.5994265	100.491335	119.4253642	60.93130827	119.4253642	PCI
ARS1-B11-02481-04				1	H-3	852.7070861	84.94437177	84.94437177	166.4909687	212.9744126	104.6048047	72.30652505	72.30652505	141.7207891	PCI
ARS1-B11-02481-05				1	H-3	767.7574751	82.17116267	82.17116267	161.0554788	213.6901791	104.9563616	71.70097179	71.70097179	140.5339047	PCI
ARS1-B11-02481-06				1	H-3	691.0789726	79.5046165	79.5046165	155.8290483	213.2556435	104.7429344	70.82125041	70.82125041	138.8096508	PCI
ARS1-B11-02481-07				1	H-3	32753.11937	1726.400575	1726.400575	3883.745127	208.4400296	102.3776909	220.0136657	220.0136657	431.2267847	PCI
ARS1-B11-02481-08				1	H-3	41926.86595	2205.599214	2205.599214	4322.974459	206.0396074	101.1986963	245.2221484	245.2221484	480.6354108	PCI
ARS1-B11-02481-09				1	H-3	160.8965268	64.27910219	64.27910219	125.9870403	207.627402	101.9785596	63.72634889	63.72634889	124.9036438	PCI
ARS1-B11-02481-10				1	H-3	11794.26244	632.5514931	632.5514931	122.3895624	208.5769175	102.444925	141.1557742	141.1557742	276.6653174	PCI
ARS1-B11-02481-11				1	H-3	-51.94366754	62.38956624	62.38956624	122.2835498	210.6668992	103.4711927	62.33043791	62.33043791	122.1676583	PCI
ARS1-B11-02481-12				1	H-3	49.08556003	62.9975944	62.9975944	123.475285	209.0285898	102.666769	62.94530661	62.94530661	123.372801	PCI
ARS1-B11-02481-13				1	H-3	13441.99656	718.4849668	718.4849668	1408.230535	210.2171186	103.2505284	149.57211	149.57211	293.1613356	PCI
ARS1-B11-02481-14				1	H-3	9413.043757	508.885618	508.885618	997.4158112	209.6496443	102.971807	129.5803545	129.5803545	253.9779949	PCI
ARS1-B11-02481-15				1	H-3	47952.51071	2520.72702	2520.72702	4940.62496	209.0857028	102.6948207	263.2448286	263.2448286	515.959864	PCI
ARS1-B11-02481-16				1	H-3	48532.93844	2551.217422	2551.217422	5000.386147	211.3136101	103.7890827	266.2297293	266.2297293	521.8102695	PCI
ARS1-B11-02481-17				1	H-3	6328.973909	349.6791548	349.6791548	685.3711434	212.4686087	104.3563734	113.1191487	113.1191487	221.7135314	PCI
ARS1-B11-02481-18				1	H-3	185.8281811	66.57000938	66.57000938	130.4772184	213.8758715	105.0475665	65.85730067	65.85730067	129.0803093	PCI
ARS1-B11-02481-19				1	H-3	1756.735489	122.3609049	122.3609049	239.8273737	214.0479807	105.1320999	80.8536023	80.8536023	158.4730605	PCI
ARS1-B11-02481-20				1	H-3	65.6730952	65.03653355	65.03653355	127.4716058	215.1275708	105.6623529	64.94584406	64.94584406	127.2938544	PCI
ARS1-B11-02481-21				1	H-3	640.0534105	78.93943766	78.93943766	154.7212978	217.1823012	106.6715571	71.496644729	71.496644729	140.1330367	PCI
ARS1-B11-02481-22				1	H-3	-108.0056163	61.49010678	61.49010678	120.5206093	209.0622399	102.6832966	61.23030487	61.23030487	120.0113975	PCI
ARS1-B11-02481-23				1	H-3	-58.63524201	64.25873709	64.25873709	125.9471247	217.1264951	106.6441472	64.18557788	64.18557788	125.8037326	PCI

Batch Result Verification Report

BatchSampleID	SDG	Fraction	AliquotReportUnits	ChemRecovery	TracerRecovery	SampleCounts	SampleCountHins	BKG_Counts	BKG_CountHins	EFF	ALIQ	SampleCollDate	MidpointCountDate	BP_DL
ARSI-B11-02481-01			L			0.082277778	180	0.032333333	180	0.3676	5.088	7/6/2011	7/3/2011	
ARSI-B11-02481-02			L			0.088111111	180	0.032333333	180	0.3737	5.071	7/6/2011	7/3/2011	
ARSI-B11-02481-03			L			0.032	180	0.032333333	180	0.3705	5.061	7/6/2011	7/3/2011	
ARSI-B11-02481-04			L			0.051277778	180	0.032333333	180	0.3584	5.044	6/10/2011	7/3/2011	
ARSI-B11-02481-05			L			0.049333333	180	0.032333333	180	0.3565	5.054	6/10/2011	7/3/2011	
ARSI-B11-02481-06			L			0.047666667	180	0.032333333	180	0.3578	5.046	6/10/2011	7/3/2011	
ARSI-B11-02481-07			L			0.775833333	180	0.032333333	180	0.3668	5.039	6/15/2011	7/4/2011	
ARSI-B11-02481-08			L			0.995166667	180	0.032333333	180	0.3655	5.07	6/15/2011	7/4/2011	
ARSI-B11-02481-09			L			0.036	180	0.032333333	180	0.3637	5.072	6/15/2011	7/4/2011	
ARSI-B11-02481-10			L			0.299888889	180	0.032333333	180	0.3601	5.072	6/15/2011	7/4/2011	
ARSI-B11-02481-11			L			0.031166667	180	0.032333333	180	0.3625	5.078	6/15/2011	7/4/2011	
ARSI-B11-02481-12			L			0.033444444	180	0.032333333	180	0.3626	5.048	6/15/2011	7/4/2011	
ARSI-B11-02481-13			L			0.334888889	180	0.032333333	180	0.3646	5.034	6/15/2011	7/4/2011	
ARSI-B11-02481-14			L			0.244777778	180	0.032333333	180	0.3646	5.034	6/15/2011	7/4/2011	
ARSI-B11-02481-15			L			1.1175	180	0.032333333	180	0.364	5.056	6/15/2011	7/4/2011	
ARSI-B11-02481-16			L			1.119055556	180	0.032333333	180	0.3616	5.036	6/15/2011	7/5/2011	
ARSI-B11-02481-17			L			0.173277778	180	0.032333333	180	0.359	5.045	6/15/2011	7/5/2011	
ARSI-B11-02481-18			L			0.036444444	180	0.032333333	180	0.3567	5.045	6/14/2011	7/5/2011	
ARSI-B11-02481-19			L			0.071166667	180	0.032333333	180	0.3578	5.024	6/16/2011	7/5/2011	
ARSI-B11-02481-20			L			0.033777778	180	0.032333333	180	0.3546	5.044	6/16/2011	7/5/2011	
ARSI-B11-02481-21			L			0.046277778	180	0.032333333	180	0.3523	5.029	6/16/2011	7/5/2011	
ARSI-B11-02481-22			L			0.029888889	180	0.032333333	180	0.3657	5.033	6/16/2011	7/5/2011	
ARSI-B11-02481-23			L			0.031055556	180	0.032333333	180	0.3507	5.048	6/23/2011	7/6/2011	

Batch Result Verification Report

Batch/SampleID	SDG	Fraction	BP	MDA	Sp	Val	UCF	CF	GrossCountRate	BKGCountRate	NetCountRate	PlatingRecovery	InstFileName	DetectorID	InstrumentKey	NuclideAbd	TracerMeasACT
ARSI-B11-02481-01							2.22	1	14.81	5.82	8.99		76	P-50-S-2			
ARSI-B11-02481-02							2.22	1.96	15.86	5.82	10.04		76	P-50-S-3			
ARSI-B11-02481-03							2.22	1.96	5.76	5.82	-0.06		76	P-50-S-4			
ARSI-B11-02481-04	ARSI-11-01310	001					2.22	1	9.23	5.82	3.41		76	P-50-S-5			
ARSI-B11-02481-05	ARSI-11-01310	002					2.22	1	8.88	5.82	3.06		76	P-50-S-6			
ARSI-B11-02481-06	ARSI-11-01310	003					2.22	1	8.58	5.82	2.76		76	P-50-S-7			
ARSI-B11-02481-07	ARSI-11-01342	001					2.22	1	139.65	5.82	133.83		76	P-50-S-8			
ARSI-B11-02481-08	ARSI-11-01342	002					2.22	1	179.13	5.82	173.31		76	P-50-S-9			
ARSI-B11-02481-09	ARSI-11-01342	003					2.22	1	6.48	5.82	0.66		76	P-50-S-10			
ARSI-B11-02481-10	ARSI-11-01342	004					2.22	1	53.98	5.82	48.16		76	P-50-S-11			
ARSI-B11-02481-11	ARSI-11-01342	005					2.22	1	5.61	5.82	-0.21		76	P-50-S-12			
ARSI-B11-02481-12	ARSI-11-01342	006					2.22	1	6.02	5.82	0.2		76	P-50-S-13			
ARSI-B11-02481-13	ARSI-11-01342	007					2.22	1	60.28	5.82	54.46		76	P-50-S-14			
ARSI-B11-02481-14	ARSI-11-01342	008					2.22	1	44.06	5.82	38.24		76	P-50-S-15			
ARSI-B11-02481-15	ARSI-11-01342	009					2.22	1	201.15	5.82	195.33		76	P-50-S-16			
ARSI-B11-02481-16	ARSI-11-01342	010					2.22	1	201.43	5.82	195.61		76	P-50-S-17			
ARSI-B11-02481-17	ARSI-11-01342	011					2.22	1	31.19	5.82	25.37		76	P-50-S-18			
ARSI-B11-02481-18	ARSI-11-01343	001					2.22	1	6.56	5.82	0.74		76	P-50-S-19			
ARSI-B11-02481-19	ARSI-11-01343	002					2.22	1	12.81	5.82	6.99		76	P-50-S-20			
ARSI-B11-02481-20	ARSI-11-01343	003					2.22	1	6.08	5.82	0.26		76	P-50-S-21			
ARSI-B11-02481-21	ARSI-11-01343	004					2.22	1	8.33	5.82	2.51		76	P-50-S-22			
ARSI-B11-02481-22	ARSI-11-01343	005					2.22	1	5.38	5.82	-0.44		76	P-50-S-23			
ARSI-B11-02481-23	ARSI-11-01343	006					2.22	1	5.59	5.82	-0.23		76	P-50-S-24			

Batch Result Verification Report

BatchSampleID	SDG	Fraction	TracerKnownACT	TracerIsotope	TracerRefDate	TracerRefACT	TracerKnown	Halfife1	Halfife2	Halfife3	TPUF_1	TPUF_2	TPUF_3	TPUF_4	TPUF_5	TPUF_6	DeltaT1	DeltaT2
ARSI-B11-02481-01								4499.8			0.04133	0.02	0	0.025	0	0	0	0
ARSI-B11-02481-02								4499.8			0.04133	0.02	0	0.025	0	0	0	0
ARSI-B11-02481-03								4499.8			0.04133	0.02	0	0.025	0	0	0	0
ARSI-B11-02481-04	ARSI-11-01310	001						4499.8			0.04133	0.02	0	0.025	0	0	23.04305556	0
ARSI-B11-02481-05	ARSI-11-01310	002						4499.8			0.04133	0.02	0	0.025	0	0	23.175	23.30625
ARSI-B11-02481-06	ARSI-11-01310	003						4499.8			0.04133	0.02	0	0.025	0	0	18.4375	18.56944444
ARSI-B11-02481-07	ARSI-11-01342	001						4499.8			0.04133	0.02	0	0.025	0	0	18.70069444	18.83194444
ARSI-B11-02481-08	ARSI-11-01342	002						4499.8			0.04133	0.02	0	0.025	0	0	18.96388889	19.09513889
ARSI-B11-02481-09	ARSI-11-01342	003						4499.8			0.04133	0.02	0	0.025	0	0	19.22708333	19.35833333
ARSI-B11-02481-10	ARSI-11-01342	004						4499.8			0.04133	0.02	0	0.025	0	0	19.62152778	19.75277778
ARSI-B11-02481-11	ARSI-11-01342	005						4499.8			0.04133	0.02	0	0.025	0	0	19.88402778	20.01527222
ARSI-B11-02481-12	ARSI-11-01342	006						4499.8			0.04133	0.02	0	0.025	0	0	19.14722222	19.27916667
ARSI-B11-02481-13	ARSI-11-01342	007						4499.8			0.04133	0.02	0	0.025	0	0	19.41041667	12.54097222
ARSI-B11-02481-14	ARSI-11-01342	008						4499.8			0.04133	0.02	0	0.025	0	0		
ARSI-B11-02481-15	ARSI-11-01342	009						4499.8			0.04133	0.02	0	0.025	0	0		
ARSI-B11-02481-16	ARSI-11-01342	010						4499.8			0.04133	0.02	0	0.025	0	0		
ARSI-B11-02481-17	ARSI-11-01342	011						4499.8			0.04133	0.02	0	0.025	0	0		
ARSI-B11-02481-18	ARSI-11-01343	001						4499.8			0.04133	0.02	0	0.025	0	0		
ARSI-B11-02481-19	ARSI-11-01343	002						4499.8			0.04133	0.02	0	0.025	0	0		
ARSI-B11-02481-20	ARSI-11-01343	003						4499.8			0.04133	0.02	0	0.025	0	0		
ARSI-B11-02481-21	ARSI-11-01343	004						4499.8			0.04133	0.02	0	0.025	0	0		
ARSI-B11-02481-22	ARSI-11-01343	005						4499.8			0.04133	0.02	0	0.025	0	0		
ARSI-B11-02481-23	ARSI-11-01343	006						4499.8			0.04133	0.02	0	0.025	0	0		

Batch Result Verification Report

BatchSampleID	SDG	Fraction	DeltaT3	DeltaT4	DeltaT5	DeltaT6	DF1	DF2	DF3	IF1	IF2	System	K_Val	K_MDA	AnalysisCode	UserID	ModDate
ARSI-B11-02481-01							1					0.0522279718	0.004152174	0.74739138	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-02							1					0.0522279718	0.004206973	0.757255067	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-03												0.0522279718	0.004162723	0.74929016	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-04							0.99645675					0.0522279718	0.003985634	0.71741405	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-05							0.996436498					0.0522279718	0.003999029	0.719825143	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-06							0.997163925					0.0522279718	0.003993755	0.718875873	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-07							0.997143658					0.0522279718	0.004086023	0.735484145	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-08							0.997103339					0.0522279718	0.004133626	0.744052752	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-09							0.997123499					0.0522279718	0.004102015	0.738362738	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-10							0.997103339					0.0522279718	0.004083341	0.735001451	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-11							0.997083074					0.0522279718	0.004042841	0.727711419	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-12							0.997062915					0.0522279718	0.004074518	0.733413248	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-13							0.997042655					0.0522279718	0.004051481	0.729266665	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-14							0.997022493					0.0522279718	0.004062448	0.731240625	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-15							0.997002335					0.0522279718	0.004073405	0.733212812	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-16							0.996982072					0.0522279718	0.004030459	0.725482551	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-17							0.996961915					0.0522279718	0.004008549	0.721538762	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-18							0.996788203					0.0522279718	0.003982173	0.716791174	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-19							0.997075074					0.0522279718	0.003978971	0.716214825	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-20							0.997054916					0.0522279718	0.003959003	0.712620592	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-21							0.997034651					0.0522279718	0.003921548	0.705878592	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-22							0.997014494					0.0522279718	0.004073862	0.7332952	LSC-A-001	BSTEFFENS	7/6/2011
ARSI-B11-02481-23							0.9968070059					0.0522279718	0.003922556	0.706060018	LSC-A-001	BSTEFFENS	7/6/2011

Assay Definition-

Assay Description:  
H-3 Normal Level Assay

Assay Type: DPM (Single)

Report Name: Report1  
Output Data Path: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl 3\20110703\_0022\20110703\_0022.results  
Raw Results Path: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl 3\20110703\_0022\H-3 Results.rtf  
RTF File Name: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl 3\20110703\_0022\H-3 Results.rtf  
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl 3\20110703\_0022\H-3 Results.csv  
Assay File Name: C:\Packard\Tricarb\Assays\H-3 Normal Lvl 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-

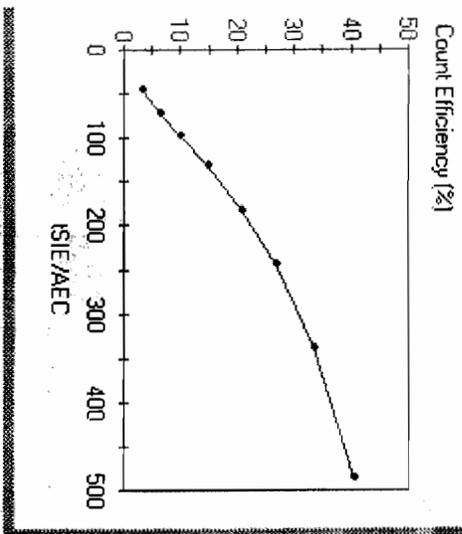
Static Controller: On  
Colored Samples: Off  
Coincidence Time (nsec): 18  
Half Life-  
Luminescence Correction: Off  
Heterogeneity Monitor: Off  
Delay Before Burst (nsec): 75

Half Life Correction: Off  
Regions Half Life Units Reference Date Reference Time

A  
B  
C

Cycle 1 Results  
Quench Curve Block Data

UG STD H-3 in A



Date Acquired: 06/15/2011  
Date Modified:  
UG STD H-3 in A

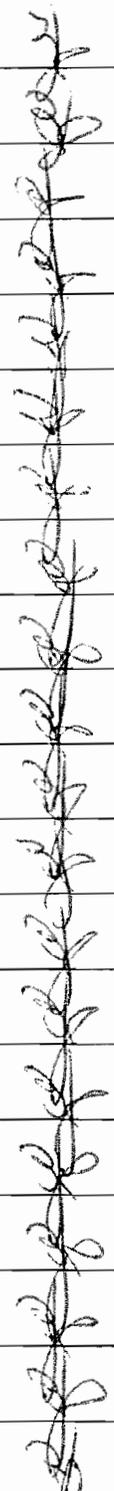
tSIE/AEC	Count Efficiency (%)
487.53	40.41
339.12	33.51
243.83	26.83
182.60	20.93
130.85	14.63
96.86	9.97
71.30	6.34
46.31	3.09

P#	S#	SAMPL_ID	CPMA	DPMI	tSITE	Eff Nucl	In A	Count	Time	MESSAGES
50	1	BACKGROUN	5.82	15.91	405.05		36.57	180.00	7/3/2011 12:27:51 AM	
50	2	B11-02481-01	14.81	40.29	409.02		36.76	180.00	7/3/2011 3:35:13 AM	
50	3	B11-02481-02	15.86	42.43	422.26		37.37	180.00	7/3/2011 6:44:08 AM	
50	4	B11-02481-03	5.76	15.54	415.46		37.05	180.00	7/3/2011 9:53:13 AM	
50	5	B11-02481-04	9.23	25.75	389.23		35.84	180.00	7/3/2011 1:02:13 PM	
50	6	B11-02481-05	8.88	24.92	385.19		35.65	180.00	7/3/2011 4:11:35 PM	
50	7	B11-02481-06	8.58	23.98	388.11		35.78	180.00	7/3/2011 7:20:58 PM	
50	8	B11-02481-07	139.65	381.20	406.43		36.63	180.00	7/3/2011 10:30:19 PM	
50	9	B11-02481-08	179.13	485.98	411.26		36.86	180.00	7/4/2011 1:39:41 AM	
50	10	B11-02481-09	6.48	17.73	404.71		36.55	180.00	7/4/2011 4:49:02 AM	
50	11	B11-02481-10	53.98	148.43	400.68		36.37	180.00	7/4/2011 7:58:22 AM	
50	12	B11-02481-11	5.61	15.58	393.00		36.01	180.00	7/4/2011 11:07:42 AM	
50	13	B11-02481-12	6.02	16.60	398.16		36.25	180.00	7/4/2011 2:17:09 PM	
50	14	B11-02481-13	60.28	166.25	398.39		36.26	180.00	7/4/2011 5:26:30 PM	
50	15	B11-02481-14	44.06	120.85	402.58		36.46	180.00	7/4/2011 8:35:52 PM	
50	16	B11-02481-15	201.15	552.64	401.32		36.40	180.00	7/4/2011 11:45:14 PM	
50	17	B11-02481-16	201.43	557.10	396.14		36.16	180.00	7/5/2011 2:54:36 AM	
50	18	B11-02481-17	31.19	86.86	390.72		35.90	180.00	7/5/2011 6:04:02 AM	
50	19	B11-02481-18	6.56	18.39	385.73		35.67	180.00	7/5/2011 9:13:22 AM	
50	20	B11-02481-19	12.81	35.81	387.98		35.78	180.00	7/5/2011 12:22:49 PM	
50	21	B11-02481-20	6.08	17.16	381.23		35.46	180.00	7/5/2011 3:32:15 PM	
50	22	B11-02481-21	8.33	23.65	376.30		35.23	180.00	7/5/2011 6:41:36 PM	
50	23	B11-02481-22	5.38	14.70	404.97		36.57	180.00	7/5/2011 9:50:59 PM	
50	24	B11-02481-23	5.59	15.93	372.68		35.07	180.00	7/6/2011 12:58:31 AM	

## Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
6-29-11	1321	B11-02472-12	B11-02472	1413	JDR
↓	↓	B11-02472-13	↓	↓	JDR
↓	↓	B11-02472-14	↓	↓	JDR
↓	↓	B11-02472-15	↓	↓	JDR
↓	↓	B11-02472-16	↓	↓	JDR
↓	↓	B11-02472-17	↓	↓	JDR
↓	↓	B11-02472-18	↓	↓	JDR
↓	↓	B11-02472-19	↓	↓	JDR
↓	↓	B11-02472-20	↓	↓	JDR
↓	↓	B11-02472-21	↓	↓	JDR
↓	↓	B11-02472-22	↓	↓	JDR
↓	↓	B11-02472-23	↓	↓	JDR
7-1-11	1156	Background	UK Fe-55	1226	JDR
↓	↓	LCS	↓	↓	JDR
↓	↓	LCSD	↓	↓	JDR
↓	↓	MBL	↓	↓	JDR
↓	↓	11-01338-001	↓	↓	JDR
↓	↓	11-01338-002	↓	↓	JDR
↓	↓	Yield Spk	↓	↓	JDR
7-1-11	1508	SNC 117	QA	QA	JDR

## Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
7-1-11	1508	Background	B11-02481	0022	
L	L	B11-02481-01	L	L	
L	L	B11-02481-02	L	L	
L	L	B11-02481-03	L	L	
L	L	B11-02481-04	L	L	
L	L	B11-02481-05	L	L	
L	L	B11-02481-06	L	L	
L	L	B11-02481-07	L	L	
L	L	B11-02481-09	L	L	
L	L	B11-02481-10	L	L	
L	L	B11-02481-11	L	L	
L	L	B11-02481-12	L	L	
L	L	B11-02481-13	L	L	
L	L	B11-02481-14	L	L	
L	L	B11-02481-15	L	L	
L	L	B11-02481-16	L	L	
L	L	B11-02481-17	L	L	
L	L	B11-02481-18	L	L	
L	L	B11-02481-19	L	L	
L	L	B11-02481-20	L	L	





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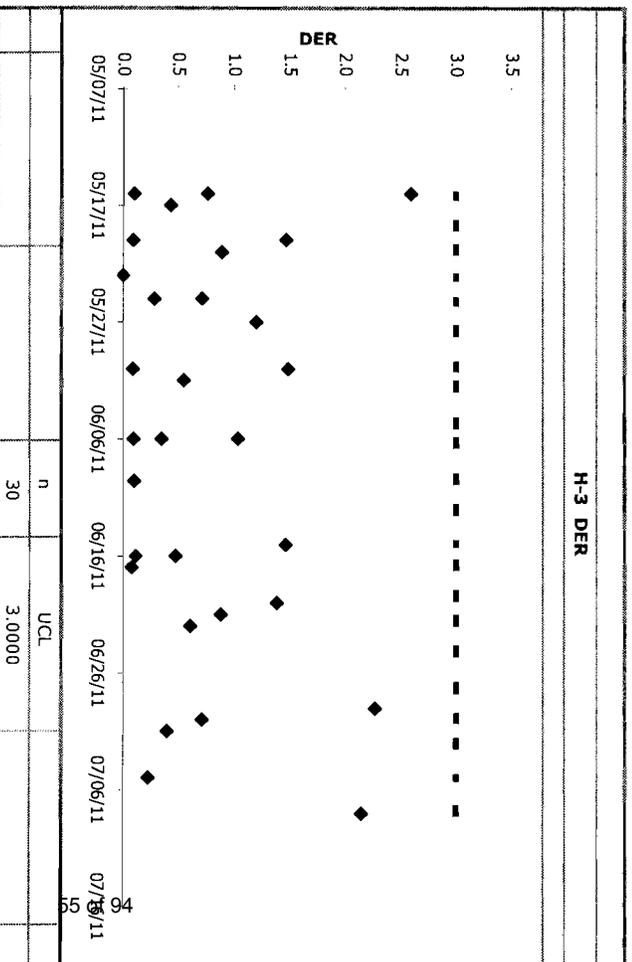
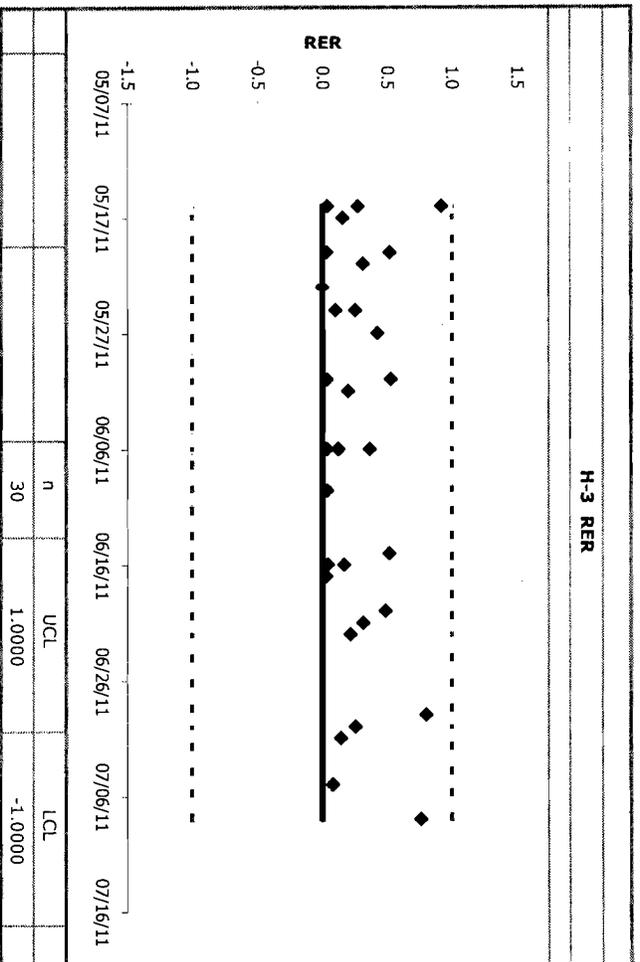
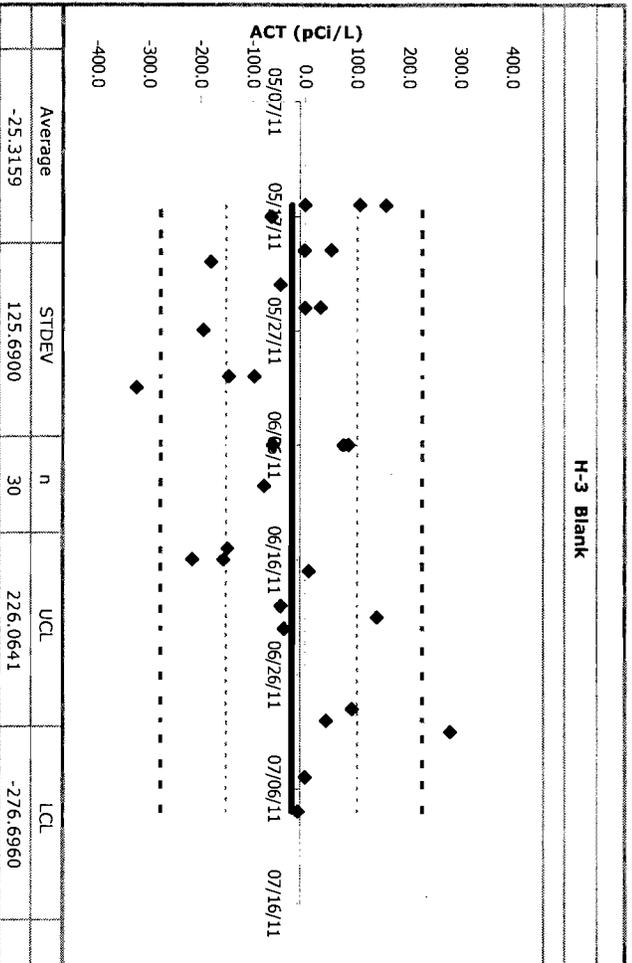
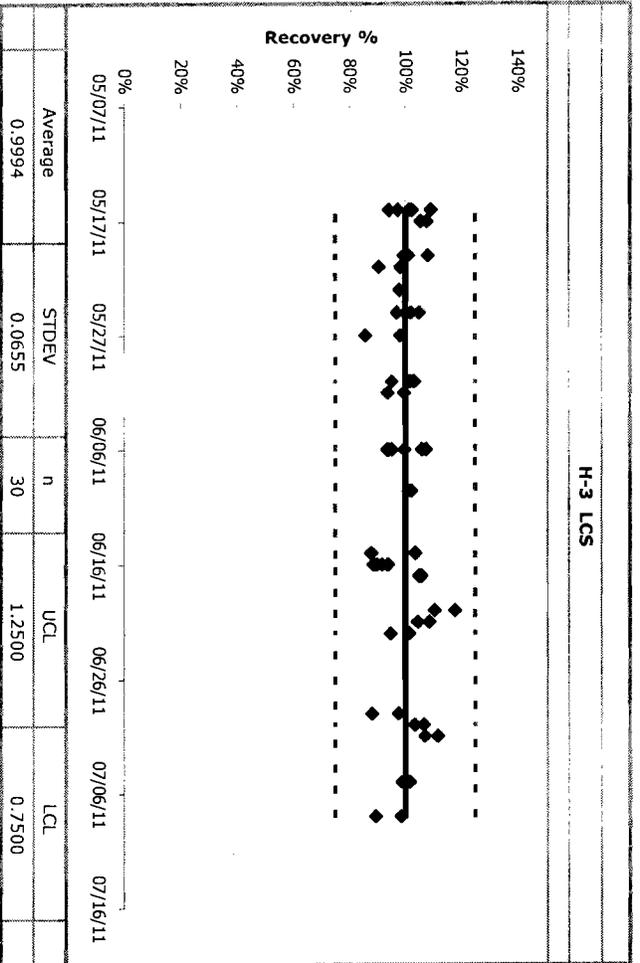
for

**Los Alamos National Laboratory**

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

**Control Charts**

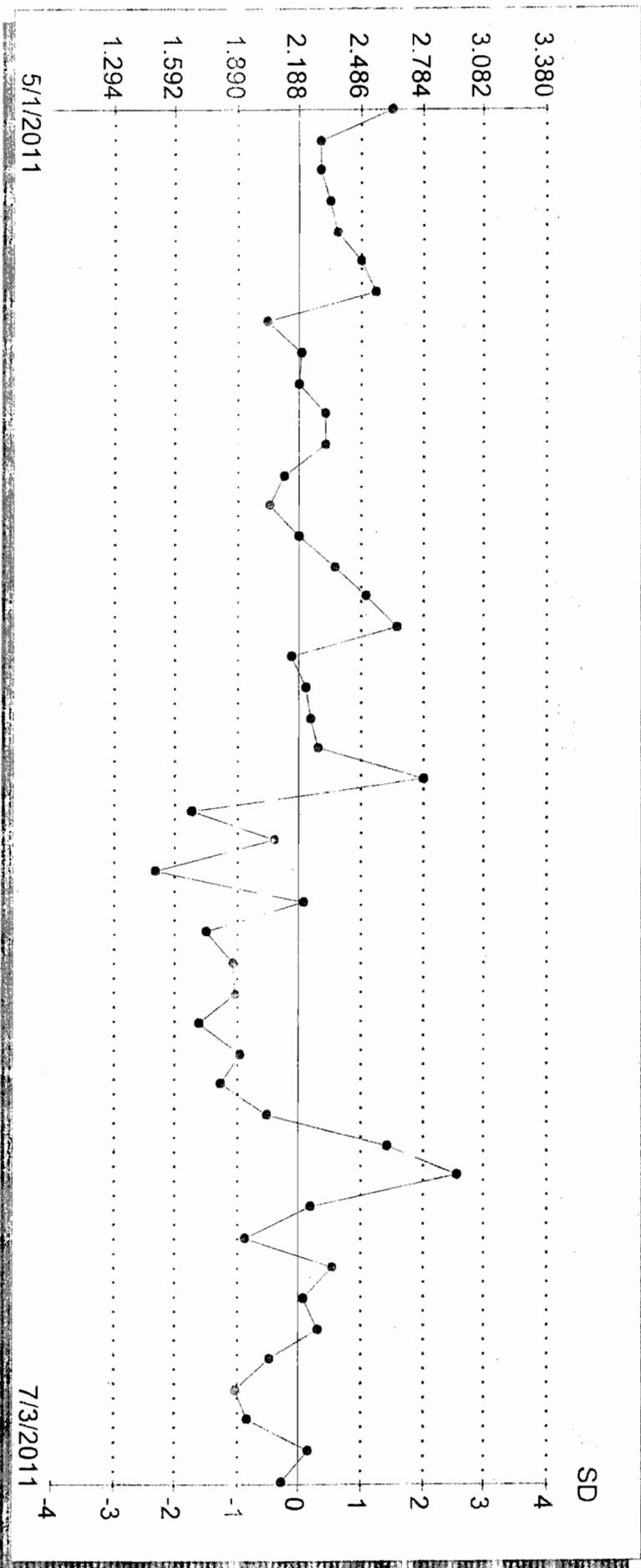
# QC Chart



3H Background  
 Total # pts : 1592  
 Valid # pts : 46  
 Mean : 2.19  
 SD : 0.30

Date	Value	Valid Pt
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
May 09, 2011	2.24	X
May 16, 2011	2.27	X
May 21, 2011	2.79	X
Jun 02, 2011	1.67	X
Jun 02, 2011	2.07	X
Jun 02, 2011	1.50	X
Jun 02, 2011	2.21	X
Jun 02, 2011	1.74	X
Jun 03, 2011	1.87	X
Jun 03, 2011	1.88	X
Jun 03, 2011	1.70	X
Jun 03, 2011	1.91	X
Jun 03, 2011	1.81	X
Jun 03, 2011	2.03	X
Jun 06, 2011	2.62	X
Jun 09, 2011	2.95	X
Jun 13, 2011	2.24	X
Jun 15, 2011	1.93	X
Jun 16, 2011	2.35	X
Jun 21, 2011	2.21	X
Jun 24, 2011	2.28	X
Jun 28, 2011	2.04	X
Jun 29, 2011	1.89	X
Jun 29, 2011	1.94	X
Jun 29, 2011	2.23	X
Jul 03, 2011	2.10	X

3H Background : 1592  
Total # pts : 46  
Valid # pts : 2.19  
Mean : 0.30  
SD



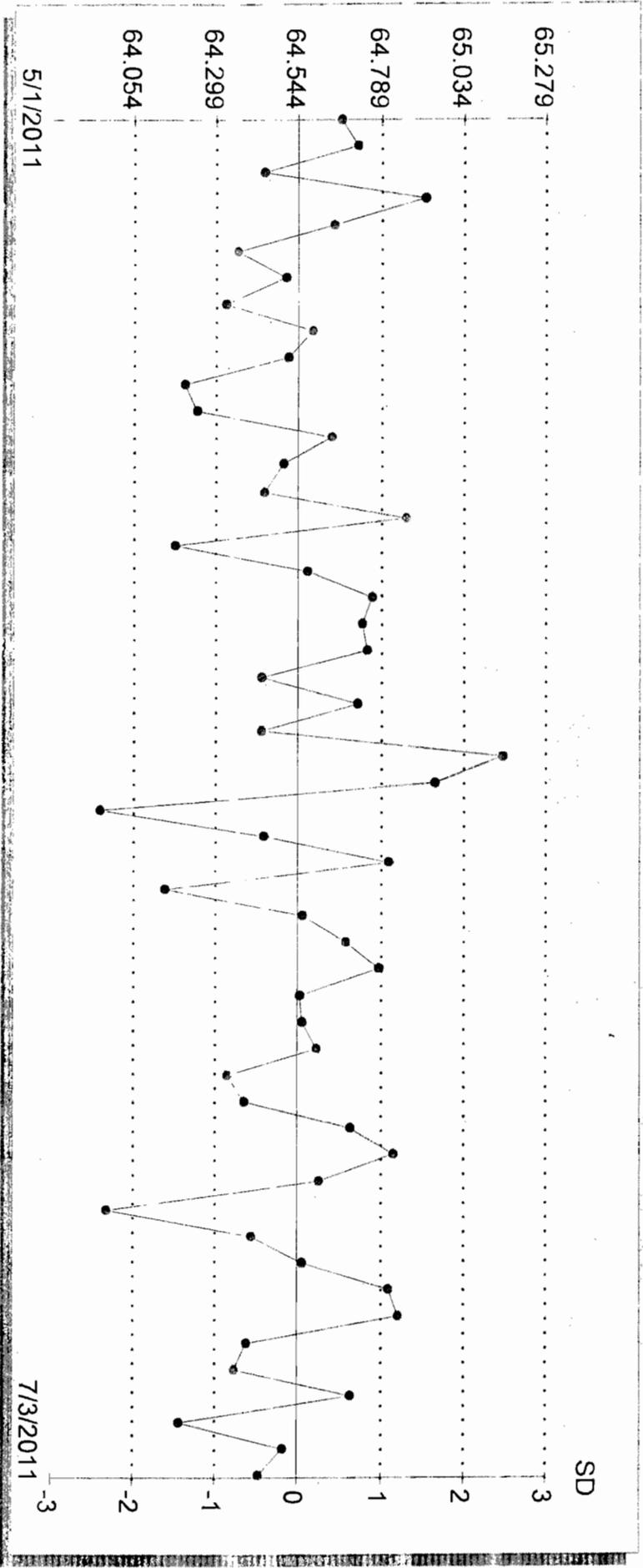
3H Efficiency

Total # pts : 1636  
 Valid # pts : 52  
 Mean : 64.54  
 SD : 0.24

Date	Value	Valid Pt
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
May 09, 2011	64.44	X
May 16, 2011	64.72	X
May 21, 2011	64.43	X
May 26, 2011	65.15	X
Jun 02, 2011	64.95	X
Jun 02, 2011	63.95	X
Jun 02, 2011	64.44	X
Jun 02, 2011	64.81	X
Jun 02, 2011	64.15	X
Jun 02, 2011	64.56	X
Jun 02, 2011	64.68	X
Jun 02, 2011	64.78	X
Jun 03, 2011	64.55	X
Jun 03, 2011	64.60	X
Jun 03, 2011	64.33	X
Jun 03, 2011	64.39	X
Jun 03, 2011	64.70	X
Jun 03, 2011	64.83	X
Jun 06, 2011	64.60	X
Jun 09, 2011	63.97	X
Jun 13, 2011	64.40	X
Jun 15, 2011	64.56	X
Jun 16, 2011	64.81	X
Jun 21, 2011	64.84	X
Jun 24, 2011	64.70	X

Jun 28, 2011	64.35	X
Jun 29, 2011	64.70	X
Jun 29, 2011	64.19	X
Jun 29, 2011	64.50	X
Jul 03, 2011	64.43	X

3H Efficiency : 1636  
 Total # pts : 52  
 Valid # pts : 64.54  
 Mean : 0.24  
 SD : 0.24





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for

## **Los Alamos National Laboratory**

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

# **Calibration Information**

STD ID: S-0247

		Add/Edit Secondary Stds		Parent Standard Data			
<b>Planning</b>		Parent Solution Reference #		<b>NIST SRM 4927F</b>			
Planning Comments		Create an H-3 LCS standard		Parent Solution #		<b>S-0237</b>	
Target dpm/g (on dil. date)	<b>5.56</b>	Parent Principal Radionuclide		<b>H-3</b>	Half Life (Days)	<b>4499.6000000</b>	
Target Final volume mL	<b>2000</b>	Parent Reference Date		<b>03/22/2010 10:10</b>			
Appx mass g of Parent Sol'n	<b>3.274623294</b>	Parent Certified Act		<b>3503.682716</b>	Certi Act/Vol Units	dpm	g
Appx vol ml of Parent Sol'n	<b>3.260528244</b>	Parent Cert Act Uncert 1 Sigma		<b>0.0036</b>			
Expected Addition for Analysis g	<b>5</b>	Parent Sp. Gravity G/ML		<b>0.9982</b>			
<b>Standards Preparation / Dilution</b>		Parent Supplier		<b>NIST SRM 4927F</b>			
Secondary Solution #	<b>S-0247</b>	Parent Date Recvd		<b>01/02/00</b>			
Dilution Date (New Ref Date)	<b>10/11/2010 10:30</b>	Parent Received By		<b>Unknown</b>			
Ampoule, Empty (g)		Parent Cert Exp Date					
Ampoule /Solution Gross (g)		Parent Matrix		<b>H2O</b>			
Net Wt Removed (g)		Certified dpm/g At Ref Date		<b>3503.682716</b>			
Transfer Container, empty (g)	<b>1.7</b>	Certified dpm/g on 10/11/2010 10:30		<b>3395.81045</b>			
Container Plus Solution (g)	<b>4.994</b>	Parent Comments		<b>Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. -BJS 3/22/10</b>			
Net Wt Transferred (g)	<b>3.294</b>						
DPM Xferred on 10/11/2010 10:30	<b>11185.79962</b>						
Diluent/matrix	<b>DI H2O</b>	Parent Tech		<b>Unknown</b>			
Diluent Density Cont, empty (g)		Is_Primary		<b>FALSE</b>			
Test Mass of 5 ml of Diluent (g)		Is_LCS		<b>TRUE</b>			
Diluent Density Test - (g/mL)		Is_Tracer		<b>FALSE</b>			
Dilution Empty Container Mass (g)	<b>473.96</b>	Is_Calib		<b>FALSE</b>			
Dilution Full Cont g (if measured)	<b>2467.85</b>						
Dilution Final Volume ml (if measured)	<b>2000</b>						
Final Dilution Density (g/mL)	<b>0.996945</b>						
Final Dilution Measured Mass g	<b>1993.89</b>						
Comments	<b>Stock H-3 LCS standard. Dilution performed as stated above by B Steffens. -BJS 10/11/10</b>						
Final Dilution dpm/g	<b>5.610038479</b>						
Final Dil New Ref Date/Time	<b>10/11/2010 10:30</b>						

<b>S-0247</b>			
<b>H-3</b>	Verified	10/13/10	
<b>SL</b>	Expires	<b>10/13/11</b>	
<b>Manufacturer</b>	<b>NIST SRM 4927F</b>		
<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)	4499.600000	
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	Cert 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 G/ML	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 Container, empty (g)	0	Certified dpm/g on 10/18/2005 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	Parent Tech	Unknown			
Diluent Density Cont, empty (g)		Is_Primary	FALSE			
Test Mass of 5 ml of Diluent (g)		Is_LCS	TRUE			
Diluent Density Test - (g/mL)		Is_Tracer	FALSE			
Dilution Empty Container Mass (g)	1	Is_Calib	FALSE			
Dilution Full Cont g (if measured)	200.64					
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 - 4/19/2005 RTS					
Final Dilution dpm/g	607764.9486					
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/MI	<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. Unterwiesing 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**

<b>Solution density</b>	$(0.998 \pm 0.002) \text{ g} \cdot \text{mL}^{-1}$ at 20.0 °C [b]*
<b>Radionuclide</b>	Hydrogen-3
<b>Reference time</b>	1200 EST, 3 September 1998   100 CST
<b>Massic activity of the solution [c]</b>	$634.7 \text{ kBq} \cdot \text{g}^{-1}$
<b>Relative expanded uncertainty (k=2)</b>	0.72% [d] [e]

**Uncertified values**

<b>Physical Properties:</b>			
<b>Source description</b>	Liquid in flame-sealed NIST borosilicate-glass ampoule		
<b>Ampoule specifications</b>	Body outside diameter	(16.5 ± 0.5) mm	
	Wall Thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
<b>Solution mass</b>	Approximately 5.0 g		
<b>Chemical Properties:</b>			
<b>Solution composition</b>	<b>Chemical Formula</b>	<b>Concentration (mol·L<sup>-1</sup>)</b>	<b>Mass Fraction (g·g<sup>-1</sup>)</b>
	H <sub>2</sub> O <sup>3</sup> HHO	55 $6 \times 10^{-7}$	1.00 $1 \times 10^{-8}$
<b>Radiological Properties:</b>			
<b>Radionuclidic impurities</b>	None detected [f]		
<b>Half lives used</b>	Hydrogen-3: (4500 ± 8) d [g]		
<b>Calibration method and measuring instrument(s)</b>	4πβ gas counting of SRM 4927E using the NIST length-compensated internal gas proportional counters and intercomparison of SRMs 4927E/4927F using two 4πβ 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  $y$ ,  $u_i(y) = |\partial y / \partial x_i| \cdot u(x_i)$ , 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  $y \pm U$  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:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14527  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-001  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	12.080	NA	NA	NA		%	Percent Moisture	07/03/11 22:30	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

*SAL*

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14524  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-002  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	13.880	NA	NA	NA		%	Percent Moisture	07/04/11 01:40	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

*SDH*

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-01342  
Client Sample ID: MD21-11-14531  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-003  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	12.724	NA	NA	NA	U	%	Percent Moisture	07/04/11 04:49	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14525  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-004  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	14.430	NA	NA	NA		%	Percent Moisture	07/04/11 07:58	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-01342  
Client Sample ID: MD21-11-14534  
Sample Collection Date: 06/15/11  
Sample Matrix: Silica

Request or PO Number: 11-2668  
ARS Sample ID: ARS1-11-01342-005  
Date Received: 06/17/11  
Report Date: 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	4.790	NA	NA	NA	U	%	Percent Moisture	07/04/11 11:08	BS	NA

NOTES: Project Cost Code MR8R032NFM00

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14532  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-006  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	12.389	NA	NA	NA	U	%	Percent Moisture	07/04/11 14:17	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14526  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-007  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	13.116	NA	NA	NA		%	Percent Moisture	07/04/11 17:27	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14529  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-008  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	14.556	NA	NA	NA		%	Percent Moisture	07/04/11 20:36	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14533  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-009  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	13.007	NA	NA	NA		%	Percent Moisture	07/04/11 23:45	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

*SDL*

Project Manager Review

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14528  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-010  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	12.154	NA	NA	NA		%	Percent Moisture	07/05/11 02:55	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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**ARS Sample Delivery Group:** ARS1-11-01342  
**Client Sample ID:** MD21-11-14530  
**Sample Collection Date:** 06/15/11  
**Sample Matrix:** Silica

**Request or PO Number:** 11-2668  
**ARS Sample ID:** ARS1-11-01342-011  
**Date Received:** 06/17/11  
**Report Date:** 07/11/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	10.874	NA	NA	NA		%	Percent Moisture	07/05/11 06:04	BS	NA

**NOTES: Project Cost Code MR8R032NFM00**

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**American Radiation Services  
Analytical Reports**

**for**

**Los Alamos National Laboratory**

**Percent Moisture  
Laboratory  
Records**

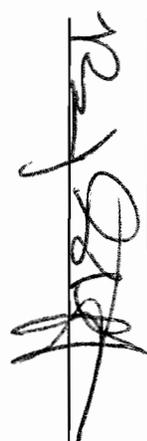
**AMERICAN RADIATION SERVICES**  
 Port Allen, LA  
**PERCENT MOISTURE DETERMINATION IN SOILS**

SDG Number **ARS1-11-01310.01342.01343**  
 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
MD54-11-7522	ARS1-11-01310-001	603	444	158	15.519	5.044	9.8221519
MD54-11-7521	ARS1-11-01310-002	589	441	148	8.394	5.054	5.67162162
MD54-11-7602	ARS1-11-01310-003	599	437	162	15.011	5.046	9.26604938
MD21-11-14527	ARS1-11-01342-001	616	450	166	20.052	5.039	12.0795181
MD21-11-14524	ARS1-11-01342-002	610	447	163	22.624	5.066	13.8797546
MD21-11-14531	ARS1-11-01342-003	602	435	166	21.122	5.07	12.7240964
MD21-11-14525	ARS1-11-01342-004	607	436	171	24.676	5.072	14.4304094
MD21-11-14534	ARS1-11-01342-005	603	448	155	7.425	5.072	4.79032258
MD21-11-14532	ARS1-11-01342-006	605	440	166	20.566	5.078	12.3891566
MD21-11-14526	ARS1-11-01342-007	627	457	171	22.429	5.048	13.1163743
MD21-11-14529	ARS1-11-01342-008	609	441	168	24.454	5.034	14.5559524
MD21-11-14533	ARS1-11-01342-009	606	441	165	21.462	5.056	13.0072727
MD21-11-14528	ARS1-11-01342-010	605	437	168	20.419	5.036	12.1541667
MD21-11-14530	ARS1-11-01342-011	626	456	170	18.486	5.045	10.8741176
MD54-11-7605	ARS1-11-01343-001	606	449	157	10.643	5.045	6.77898089

MD54-11-7520	ARS1-11-01343-002	621	454	167	19.114	5.024	11.445509
MD54-11-7612	ARS1-11-01343-003	588	439	149	9.978	5.044	6.6966443
MD54-11-7519	ARS1-11-01343-004	619	456	162	15.972	5.029	9.85925926
MD54-11-7539	ARS1-11-01343-005	611	438	172	22.836	5.033	13.2767442
MD54-11-7620	ARS1-11-01343-006	583	437	146	9.718	5.048	6.65616438
Balance ID:	0102/H133122173560P						
Pipettor ID:	FJ40469						

Signature



Date

7-6-11

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

SDG Number ARS1-11-01310.01342.01343  
 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
MD54-11-7522	ARS1-11-01310-001	603	444	158	15.519	5.044	#DIV/0!
MD54-11-7521	ARS1-11-01310-002	589	441	148	8.394	5.054	#DIV/0!
MD54-11-7602	ARS1-11-01310-003	599	437	162	15.011	5.046	#DIV/0!
MD21-11-14527	ARS1-11-01342-001	616	450	166	20.052	5.039	#DIV/0!
MD21-11-14524	ARS1-11-01342-002	610	447	163	22.624	5.066	#DIV/0!
MD21-11-14531	ARS1-11-01342-003	602	435	166	21.122	5.070	#DIV/0!
MD21-11-14525	ARS1-11-01342-004	607	436	171	24.676	5.072	#DIV/0!
MD21-11-14534	ARS1-11-01342-005	603	448	155	7.425	5.072	#DIV/0!
MD21-11-14532	ARS1-11-01342-006	605	440	166	20.566	5.078	#DIV/0!
MD21-11-14526	ARS1-11-01342-007	627	457	171	22.429	5.048	#DIV/0!
MD21-11-14529	ARS1-11-01342-008	609	441	168	24.954	5.034	#DIV/0!
MD21-11-14533	ARS1-11-01342-009	606	441	165	21.462	5.066	#DIV/0!
MD21-11-14528	ARS1-11-01342-010	605	437	168	20.419	5.036	#DIV/0!
MD21-11-14530	ARS1-11-01342-011	626	456	170	18.486	5.045	#DIV/0!
MD54-11-7605	ARS1-11-01343-001	606	449	157	10.643	5.045	#DIV/0!

LCS- 5.088  
 LCSD-5.071  
 BIK-5.061

MD54-11-7520	AR51-11-01343-002	621	454	167	19.114	5.024	#DIV/0!
MD54-11-7612	AR51-11-01343-003	588	439	149	9.578	5.044	#DIV/0!
MD54-11-7519	AR51-11-01343-004	619	456	162	15.972	5.029	#DIV/0!
MD54-11-7539	AR51-11-01343-005	611	438	172	22.536	5.033	#DIV/0!
MD54-11-7620	AR51-11-01343-006	583	437	146	9.718	5.048	#DIV/0!

Balance ID: 0102/H1331122173560P  
 Pipettor ID: FJ40469

Signature



Date

7-1-11



2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

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# **American Radiation Services Analytical Reports**

**for**

## **Los Alamos National Laboratory**

# **Folder Duplicate**



## Report Compilation Checklist

ARS SDG: 11-01342 Client Name: LANL Sample Matrix: SI

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

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

LEVEL 3 COMPONENTS	1st Reviewer		
9) Efficiencies are Present?	<input checked="" type="checkbox"/> Yes	No	N/A
10) Calibrations are Present?	<input checked="" type="checkbox"/> Yes	No	N/A
11) Backgrounds are Present?	<input checked="" type="checkbox"/> Yes	No	N/A
12) Spectrum Analysis is Present?	<input checked="" type="checkbox"/> Yes	No	N/A
13) Spectral Plots are Present?	<input checked="" type="checkbox"/> Yes	No	N/A
14) Plateaus are Present?	<input checked="" type="checkbox"/> Yes	No	N/A
15) Control Charts are Present?	<input checked="" type="checkbox"/> Yes	No	N/A
16) Other:	Yes	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	No	N/A
18) Instrument Raw Data Present and Complete?	<input checked="" type="checkbox"/> Yes	No	N/A
19) Calibration Certificates Present?	<input checked="" type="checkbox"/> Yes	No	N/A
20) Copies of Log Book Pages Present?	<input checked="" type="checkbox"/> Yes	No	N/A
21) Sample Receiving Documentation Present?	<input checked="" type="checkbox"/> Yes	No	N/A
22) LIMS Reports Present?	<input checked="" type="checkbox"/> Yes	No	N/A
23) Applicable Correspondence Present?	<input checked="" type="checkbox"/> Yes	No	N/A
24) Other:	Yes	No	<input checked="" type="checkbox"/> N/A

Gusman Heere 7-11-11  
Report Generator Signature Date

JHM 7-15-11  
Management Review Signature Date



## LSC Technical Review Checklist

ARS SDG 11-01342

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

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

ARS A. Batch ID(s): Batch A: B11-02481 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>7-1-11</u> Date	 Verifier Review Signature
<u>7-1-11</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>7-15-11</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>7-6-11</u> Date	<u>N/A</u> Technical Reviewer Signature
Date		



SDG Report - Samples and Containers

SDG		Rpt Level		TAT Days		Project Type	
Sample Count	ARS1-11-01342	4		30	6/17/2011	Environmental	
Client	Los Alamos National Laboratory			Date Received	7/16/2011	COC Number	11-2668
Client Code	114			Client Deadline	7/14/2011	PO Number	63641-001-10
Profile Number	PN-00094			Internal Deadline	7/12/2011	Job Number	MR8R032NFM00
Comments				Lab Deadline		Job Location	

Samples and Containers (→) Checked In Thus Far															
FR	ClientID	Matrix	SampleStartDate	SampleEndDate	Disp	Hold	Arch	Storage	X	Units	Y	Units	Z	Units	Comments
→	001	MD21-11-14527	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	13	Q6	20	13	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89305	1		1.00			20	13		N	N/A			
→	002	MD21-11-14524	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	13	Q6	20	13	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89306	1		1.00			20	13		N	N/A			
→	003	MD21-11-14531	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	14	Q6	20	14	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89307	1		1.00			20	14		N	N/A			
→	004	MD21-11-14525	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	13	Q6	20	13	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89308	1		1.00			25	13		N	N/A			
→	005	MD21-11-14534	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	14	Q6	20	14	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89309	1		1.00			20	14		N	N/A			
→	006	MD21-11-14532	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	14	Q6	20	14	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89310	1		1.00			25	14		N	N/A			
→	007	MD21-11-14526	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	14	Q6	20	14	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89311	1		1.00			20	14		N	N/A			
→	008	MD21-11-14529	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	14	Q6	20	14	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89312	1		1.00			20	14		N	N/A			
→	009	MD21-11-14533	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	13	Q6	20	13	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89313	1		1.00			20	13		N	N/A			
→	010	MD21-11-14528	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	13	Q6	20	13	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89314	1		1.00			20	13		N	N/A			
→	011	MD21-11-14530	SI	06/15/11 12:00 PM	06/15/11 12:00 PM	H	90	5	Q6	20	13	Q6	20	13	
		IC_ID	Cnt	Volume_mL	WL_g	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp.	AF Units	AF Rate	AF Mins
		89315	1		1.00			20	13		N	N/A			

**SDG Report - Analysis Assignments**

Temp SDG	<b>ARS1-11-01342</b>	Sample Count	
Client	<b>Los Alamos National Laboratory</b>	Analysis Count	<b>1-11</b>

Samples Count Totals per Analysis		
Analysis Code	Analysis Description	Samples Count
LSC-A-001	Tritium in (Water [Aqueous, AQ, SI])	11

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
010	LSC-A-001	X
011	LSC-A-001	X

**DQO Report for SDG**  
 ARSI-11-01342

Analysis Code	Group	Isotope	Activity Units	Aliquot Units	Procedure	RDL	LCS_LL	LCS_UL	MS_LL	MS_UL	Ready_LL	Ready_UL	Grav_LL	Grav_UL	RER	RPD	DilutionReq	RoughPrepReq	BlankCorrectionMDA	BlankCorrectionAll	CountTimeReq	AliquotRequired
LSCA-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	FALSE		FALSE

# ARS FILE TRACKING SHEET

SDG: ARS1-11-01342

Task	Date / Time	Initials
Date & Time Samples Received	06-17-11/10:09	WLB
ICOC Initiated / Storage Location: <u>Q6</u>	06-17-11/15:06	WLB
Technical Checks Performed	See Batch	—
Report Written / EDD Generated: <u>7-11-11/1705</u> <u>SDC</u>	<small>Date/Time</small> <u>7-11-11/1701</u> <small>Initials</small> <u>SDC</u>	<u>SDC</u>
Quality Assurance Checks Performed on Report	<del>7-15-11 1115</del>	<del>WLB</del>
Management Check Performed on Report		
<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:**

COMPANY NAME: Los Alamos Neutron Lab

SDG: APSH101312

**External and Internal Surveys**

**SHIPPING CONTAINER**

Good Condition  Yes  No  
 Radioactive  Yes  No  
 UN2910  Yes  No  
 Sec. Seals  Yes  No  
 Seals Intact  Yes  No  N/A  
 Air Bill  Yes  No

Exposure Rate Meter: <u>M3 242801</u>	Serial No.: <u>m44-2 PR242801</u>	Calibration Due Date: <u>4-2012</u>
Count Rate Meter: <u>m2 154859</u>	Serial No.: <u>m44-9 PR184359</u>	Calibration Due Date: <u>4-2012</u>
Background Exposure Rate (µR/hr) <u>20</u>	Max. Exposure Rate on Shipping Containers Externals (Plus Bkgd) <u>10</u> µR/hr	
Background Count Rate (cpm) <u>70</u>	Max. Removable Count Rate on Shipping Containers Externals (Plus Bkgd) <u>20</u> cpm	
	Max. Removable Count Rate on Shipping Containers Internals (Plus Bkgd) <u>20</u> cpm	

**COC PRESENT WITH SAMPLES**

COC  Yes  No

**SAMPLE CONTAINER(S)**

Good Condition  Yes  No  
 Sec. Seals  Yes  No  
 Seal Intact  Yes  No  N/A  
 Marked Radioactive  Yes  No  
 # Samples Rcv 11  
 Matrix [ AF , AQ , BI , FE , LT , (SI) , SO , UR , VG ]

Acceptance Limits	
<500 µR/hr	<100 cpm/cm²

Sample Label/Comments/Notes	pH ≤ 2 is Acceptable		Mark if Preserve	Acid Lot #	Weight(g) / Volume(mL)	Acceptance Limits	
	pH Orig	pH Final				µR/hr	cpm
MD21-11-14527					1 sample	13	20
↓ 14524					↓	13	20
↓ 14531					↓	14	20
↓ 14525					↓	13	25
↓ 14534					↓	14	20
↓ 14532					↓	14	25
↓ 14526					↓	14	20
↓ 14529					↓	14	20
↓ 14533					↓	13	20
↓ 14528					↓	13	20
↓ 14530					↓	13	20

Surveyors' Name: [Signature]

Date/Time Surveyed: 6-17-11/11:28