

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

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:11-1296

Per Agreement Number:63641-001-10

Project Cost Code: MR8R032NFB00

Please analyse the enclosed samples
according to the schedule indicated:

SHIP DATE: 2/8/2011**TURNAROUND/REPORT DUE: 3/10/2011****TURNAROUND REQ'D: 30 Days****RAD SCREENING: Not Required****LAB REQUEST COMMENTS:**

LANL ER SMO CONTACT:

Signature: 

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-4738	GAS	2/8/2011	
		1	MD21-11-4739	GAS	2/8/2011	
		1	MD21-11-4740	GAS	2/8/2011	
		1	MD21-11-4741	GAS	2/8/2011	
		1	MD21-11-4742	GAS	2/8/2011	
		1	MD21-11-4743	GAS	2/8/2011	
		1	MD21-11-4744	GAS	2/8/2011	
		1	MD21-11-4745	GAS	2/8/2011	
	MD21-11-4746	1	MD21-11-4746	GAS	2/8/2011	

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-4748	GAS	2/8/2011	

Final Page of REQUEST NUMBER 11-1296

Tuesday, February 08, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-1296C

LOS ALAMOS

REQUEST NUMBER: 11-1296

NATIONAL LABORATORY

ATTN: Danny Coleman

TURNAROUND/REPORT DUE: 3/10/2011

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
MD21-11-4742	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4740	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4746	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4747	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4741	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4738	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4748	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4739	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4743	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4745	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4744	1	SILICA GEL TUBE	H3	None	GAS

Relinquished By:

Date

Time

Received By:

Date

Time

Signature
[Signature] 2/8/11 1400
Signature

Signature

Signature

Signature

Signature

Received for DISPOSAL By:

Date

Time

Remarks:

Signature

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4738

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/8/11		MEDIA:	NA		OK
TIME COLLECTED (HH:MM)		940		SUB-MEDIA:	OTHER		
PRS ID:	21-018(a)-99	OK		SAMPLE TECH CODE:	YOST		
LOCATION ID:	21-602059 21-4738	21-24524W		FIELD QC TYPE:	FB		
LOCATION TYPE:	BH	OK		FIELD PREP:	NA		
TOP DEPTH:	0	300' bgs		SAMPLE USAGE:	QC		
BOTTOM DEPTH:	0	305' bgs		SCREEN/PORT DESC:			
FIELD MATRIX:	GAS	OK		EXCAVATED: YES / NO / <input checked="" type="radio"/>			part 5 FB
COMPOSITE TYPE:	NA			COMPOSITE TIME INTERVAL:	NA		
BOREHOLE: <input checked="" type="radio"/> YES / NO / NA				BOREHOLE DECLINATION:	NA		
				BOREHOLE DIRECTION:	90°		

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC: QC Sample of MD21-11-4738
column # 12
initial wt = 591.95g
silica wt 150.20g
final wt = 597.33g
vapor wt = 5.36g
SAMPLE COMMENTS:
weather data @ 13102/7/11 T=34°F RH=44% BP=30.06 in
@ 930 2/8/11 T=32°F RH 87% BP=29.7 in

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS: mult Rn 1A
atm O₂ 20.9% CO₂ 580 ppm
sub atm O₂ 20.9% CO₂ 3550 ppm

COLLECTED BY (PRINT) R Onstott M Rains REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) Megan Rains (Signature)	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) Miss Matri (Signature)	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4739

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/8/11		MEDIA:	NA		86
TIME COLLECTED (HH:MM)		940		SUB-MEDIA:	OTHER		
PRS ID:	21-018(a)-99	ok		SAMPLE TECH CODE:	VOST		
LOCATION ID:	21-603039	21-24524W		FIELD QC TYPE:	ED		
LOCATION TYPE:	BH	ok		FIELD PREP:	NA		
TOP DEPTH:	0	300' bgs		SAMPLE USAGE:	QC		
BOTTOM DEPTH:	0	305' bgs		SCREEN/PORT DESC:			part 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	MA

SAMPLE DESC: QC Sample of MD21-11-4744 initial wt = 611.16g Final wt = 621.84g
column # 6 2/8/11 silica wt 156.79 vapor wt 10.38g

SAMPLE COMMENTS:

weather data MD21-11-4744

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:

see MD21-11-4744

COLLECTED BY (PRINT) R Onst H M Rain REVIEWED BY (PRINT) m. Rains

RELINQUISHED BY (Printed Name) Megan Rains (Signature)	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) Melissa Montoya (Signature)	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4740

WORK ORDER:

AS PLANNED		AS COLLECTED	AS PLANNED		AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA	ok
TIME COLLECTED (HH:MM)		940	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:	± 4.5	42.5' bgs	SAMPLE USAGE:	INV	
BOTTOM DEPTH:	0	47.5' bgs	SCREEN/PORT DESC:		port #1
FIELD MATRIX:	GAS	ok	EXCAVATED: YES/NO	NA	
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	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

SAMPLE DESC:

column # 1

initial wt = 589.45g
silica wt = 151.65gFinal wt = 606.06g
vapor wt = 16.61g

SAMPLE COMMENTS:

weather data @ 930 2/8/11 T = 32°F RH = 87% BP = 29.71 in
@ 1320 2/7/11 T = 34°F RH = 44% BP = 30.06 in

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:

multiRae IR

604/01 NA atm O₂ 20.9% CO₂ 490 ppm
Sub atm O₂ 15.9% CO₂ 1.56%

COLLECTED BY (PRINT) R. Dushoff M. Rains

REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) Megan Rains (Signature)	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) Miss Monty (Signature)	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4741

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/8/11		MEDIA:		NA	
TIME COLLECTED (HH:MM)		940		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: 0-12.5' to 21.3m		122.5' bgs		SAMPLE USAGE:		INV	
BOTTOM DEPTH: 0		127.5' bgs		SCREEN/PORT DESC:		port #2	
FIELD MATRIX: GAS		ok		EXCAVATED: YES/NO/NA		NA	
COMPOSITE TYPE: NA		COMPOSITE TIME INTERVAL:		WATER FLOWING: YES/NO/NA		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

SAMPLE DESC:

column #
2initial wt 593.62g
final wt = 152.75g
silicafinal silicant 614.93g
vapour wt 21.31g

SAMPLE COMMENTS:

weather data @ 1310 2/7/11 T = 34°F RH 44% BP = 3006 in
@ 930 2/8/11 T = 32°F RH = 87% BP = 29.71 in

LOCATION DESC:


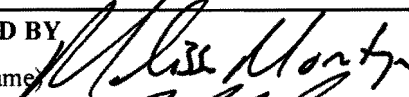

NA

FIELD SCREENING/MEASUREMENT RESULTS: multi RAE 1R

atm O₂ 20.9% CO₂ 520ppm
Subatm O₂ 20.9% CO₂ 3150ppm

COLLECTED BY (PRINT) R Onstott M Rains

REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) Megan Rains (Signature) 	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name)  (Signature) 	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4742

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/8/11		MEDIA:	NA		ok
TIME COLLECTED (HH:MM)		940		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:	± 175' to 211'	172.5' bgs		SAMPLE USAGE:	INV		
BOTTOM DEPTH:	0	177.5' bgs		SCREEN/PORT DESC:		port 3	
FIELD MATRIX:	GAS	ok		EXCAVATED: YES/NO/NA	NA		
COMPOSITE TYPE:	NA			COMPOSITE TIME INTERVAL:	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		NA

SAMPLE DESC:

column #
3initial wt = 588.53g
silica wt = 151.02gFinal wt = 607.4g
vapor wt = 18.91g

SAMPLE COMMENTS:

weather data @ 1310 2/8/11 T=34°F RH=44% BR=30.06 in
@ 930 2/8/11 T=32°F RH 87% BP=29.71 in

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:

multi Rae
atm O₂ 20.9% CO₂ 500ppm
Sub atm O₂ 20.6% CO₂ 4560ppm

COLLECTED BY (PRINT)

L Onstott

REVIEWED BY (PRINT)

M. Rains

RELINQUISHED BY (Printed Name) <i>Morgan Rains</i> (Signature) <i>[Signature]</i>	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) <i>Mike Monty</i> (Signature) <i>[Signature]</i>	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4743

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/8/11 940		MEDIA: NA		OK	
TIME COLLECTED (HH:MM)		940		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: 260		257.5' bgs		SAMPLE USAGE: INV			
BOTTOM DEPTH: 0		262.5' bgs		SCREEN/PORT DESC:		port # 4	
FIELD MATRIX: GAS		OK		EXCAVATED: YES/NO/NA			
COMPOSITE TYPE: NA		NA		WATER FLOWING: YES/NO/NA		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

SAMPLE DESC:

column #
4initial wt = 594.84g
silica wt = 147.98gFinal wt = 608.65g
vapor wt = 13.81g

SAMPLE COMMENTS:

weather data @ 1310 2/7/11 T=34°F RH=44% BP=30.06in
@ 930 2/8/11 T=32°F RH 87% BP=29.71in


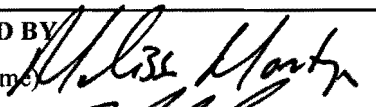

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:

mult Rave 1R
atm O₂ 20.9% CO₂ 520ppm
subatm O₂ 20.9% CO₂ 3700ppm

COLLECTED BY (PRINT) L Onstott M Rains REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) Megan Rains (Signature) 	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name)  (Signature) 	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4744

WORK ORDER:

AS PLANNED	AS COLLECTED	AS PLANNED	AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):	2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)	940	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: 302.5	300' bgs	SAMPLE USAGE: INV	
BOTTOM DEPTH: 0	305' bgs	SCREEN/PORT DESC:	port 5
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

SAMPLE DESC:

column #
5initial wt
silica wtFinal wt
vapor wt

SAMPLE COMMENTS:

weather data @ 1310 2/7/11 T=34°F RH=44% BP=30.06 in
@ 930 2/8/11 T=32°F RH 87% BP=29.71 in

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:

multi Rae
atm O₂ 20.9% CO₂ 580 ppm
sub atm O₂ 20.9% CO₂ 3550 ppm

COLLECTED BY (PRINT) R. Onstott M. Rains

REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) Megan Rains (Signature) [Signature]	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) [Signature] (Signature) [Signature]	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4745

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/8/11		MEDIA:	NA		OK
TIME COLLECTED (HH:MM)		940		SUB-MEDIA:	OTHER		
PRS ID:	21-018(a)-99	OK		SAMPLE TECH CODE:	YOST		
LOCATION ID:	21-24524W	OK		FIELD QC TYPE:	NA		
LOCATION TYPE:	BH	OK		FIELD PREP:	NA		
TOP DEPTH:	2230 20 2/7/11	327.5' bgs		SAMPLE USAGE:	INV		
BOTTOM DEPTH:	0	332.5' bgs		SCREEN/PORT DESC:		port 6	
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

SAMPLE DESC:

column #
7

Initial wt: 590.22g

Silica wt: 158.93g

Final wt: 610.13g
Vapor wt: 19.91g

SAMPLE COMMENTS:

weather data

@ 1310 2/7/11 T=34°F RH 44% BP=30.06 in
@ 930 2/8/11 T=32°F RH 87% BP 29.7 in

LOCATION DESC:

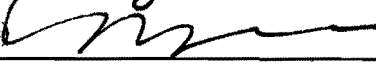
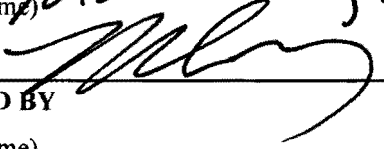
NA

FIELD SCREENING/MEASUREMENT RESULTS:

multi RAE

atm O₂ 20.9% CO₂ 500ppm
Sub atm O₂ 20.9% CO₂ 3950ppm

COLLECTED BY (PRINT) R Onstath M Rains REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) Megan Rains (Signature) 	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) Melissa Montoya (Signature) 	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4746

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/8/11		MEDIA:		NA	
TIME COLLECTED (HH:MM)		940		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: 380		377.5' bgs		SAMPLE USAGE:		INV	
BOTTOM DEPTH: 0		382.5' bgs		SCREEN/PORT DESC:		port 7	
FIELD MATRIX: GAS				EXCAVATED: YES/NO/NA		NA	
COMPOSITE TYPE: NA		COMPOSITE TIME INTERVAL: NA		WATER FLOWING: YES/NO/NA		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

SAMPLE DESC:

column # 8

initial wt 611.33g
silica wt 150.42gFinal wt 621.21g
Vapour wt 9.88g

SAMPLE COMMENTS:

weather data @ 1310 2/7/11 T=34°F RH=44% BP=30.06in
@ 930 2/8/11 T=32°F RH 87% BP=29.71in

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:

multi Rae
atm O₂ 20.9% CO₂ 530 ppm
sub atm O₂ 20.9% CO₂ 3400 ppm

COLLECTED BY (PRINT) R. Drachoff M. Krins REVIEWED BY (PRINT) m. Paris

RELINQUISHED BY (Printed Name) Megan Racis (Signature)	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) Melissa Harts (Signature)	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4747

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/8/11		MEDIA:		NA	
TIME COLLECTED (HH:MM)		9:40		SUB-MEDIA:		OTHER	
PRS ID: 21-018(a)-99		OK		SAMPLE TECH CODE:		VOST	
LOCATION ID: 21-245245		21-245245		FIELD QC TYPE:		NA	
LOCATION TYPE: BH		OK		FIELD PREP:		NA	
TOP DEPTH: 0-680		677.5' bs		SAMPLE USAGE:		INV	
BOTTOM DEPTH: 0		682.5' bs		SCREEN/PORT DESC:		part 10	
FIELD MATRIX: GAS				EXCAVATED: YES/NO/NA		NA	
COMPOSITE TYPE: NA				COMPOSITE TIME INTERVAL: NA		WATER FLOWING: YES/NO/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

SAMPLE DESC:

column #9 initial wt 591.24g final wt 601.59g
silica wt 155.78g vapor wt 10.35g

SAMPLE COMMENTS:

weather data @ 1310 2/7/11 T=34°F RH=44% BP=30.06in
@ 930 2/8/11 T=32°F RH=87% BP=29.71in

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:



mult RAE
atm O₂ 20.9% CO₂ 500 ppm
sub atm O₂ 20.9% CO₂ 3000 ppm

COLLECTED BY (PRINT)

Konst/H M Pains

REVIEWED BY (PRINT)

m. Pains

RELINQUISHED BY (Printed Name) m. Pains (Signature) 	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) Melissa Montez (Signature) 	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4748

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		2/8/11		MEDIA:	NA		ok
TIME COLLECTED (HH:MM)		940		SUB-MEDIA:	OTHER		
PRS ID:	21-018(a)-99	ok		SAMPLE TECH CODE:	VOST		
LOCATION ID:	21-24524W	21-245245		FIELD QC TYPE:	NA		
LOCATION TYPE:	BH	ok		FIELD PREP:	NA		
TOP DEPTH:	0	712.5' bgs		SAMPLE USAGE:	INV		
BOTTOM DEPTH:	0	717.5' bgs		SCREEN/PORT DESC:			
FIELD MATRIX:	GAS	ok		EXCAVATED: YES/NO/NA	NA		
COMPOSITE TYPE:	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

SAMPLE DESC:

column #
10initial wt 593.91g
silica wt = 153.38gFinal wt 607.75g
vapor wt 13.84g

SAMPLE COMMENTS:

weather data @ 1310 T = 34°F RH = 44% BP = 30.06 in
@ 930 2/8/11 T = 32°F RH 87% BP = 29.71 in

LOCATION DESC:


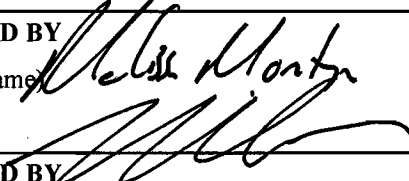
NA

FIELD SCREENING/MEASUREMENT RESULTS:

Mult Rac
atm O₂ 20.9% CO₂ 580 ppm
sub atm O₂ 20.9% CO₂ 2870 ppm

COLLECTED BY (PRINT) K Onst/H M Rain

REVIEWED BY (PRINT) m. Pairs

RELINQUISHED BY (Printed Name) Megan Pairs (Signature) 	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) Melissa Montoya (Signature) 	Date/Time 2/8/11 1300
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: 11-1296 VALIDATION DATE: 03/30/11 LAB CODE: ARS

CONTRACT LABORATORY NAME: American Radiation Services, Inc.

VALIDATOR: David Schwent 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/POLYCHLORINA
TED BIPHENYLS |
| <input type="checkbox"/> GENERAL CHEMISTRY | <input checked="" type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH
EXPLOSIVES | |
| <input type="checkbox"/> OTHER (DESCRIBE): Tritium only | | | |

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):

- In the MB, tritium was detected. The associated results of samples MD21-11-4742, -4747, -4741, -4748, and -4745 were detects >5X but ≤50X the MB concentration and, thus, was qualified J,R4a. The associated results of samples -4746 and -4738 were NDs and, thus, were not qualified. All other associated sample results were detects >50X the MB concentration and, thus, were not qualified, based on professional judgment.
- It should be noted that no duplicate or MS samples were analyzed. However, an LCS and LCSD were analyzed and met acceptance criteria and, thus, no sample data were qualified.
- It should also be noted that the LCS/LCSD RER was hand-calculated using the 2-sigma TPU values and was found to be within specifications. No sample data were qualified as a result.
- It should also be noted that the tritium analysis for sample -4747 was not listed on the Analytical Request form associated with the COC. No sample data were qualified as a result.

DATA VALIDATION COVER SHEET

5119-1

Data Validation Cover Sheet

Records Use only

**Reviewed by:** Susan Ball**Level:** I**Date:** 03/30/11

VALIDATOR'S SIGNATURE:

A handwritten signature in black ink, appearing to read "David Schwent", written over a horizontal line.

DATE: 03/30/11

Form 5119-1, Revision 0.0

LOS ALAMOS

Environmental Restoration Project

RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

Rad Analytical Data Validation Checklist

Records Use only



Yes	No	N/A		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 checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input 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				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				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: ARS1-11-00256
Client Sample ID: MD21-11-4742
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-001
Date Received: 02/09/11
Report Date: 03/18/11

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 J,R4a	11316.852	608.411	212.519	104.332		pCi/L	ARS-054/EPA 906.0	03/15/11 19:25	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4740
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-002
Date Received: 02/09/11
Report Date: 03/18/11

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	30698.165	1619.537	210.569	103.374		pCi/L	ARS-054/EPA 906.0	03/15/11 22:32	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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NELAP Certificate # E87558



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ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4746
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-003
Date Received: 02/09/11
Report Date: 03/18/11

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	152.031	64.923	210.270	103.228	U	pCi/L	ARS-054/EPA 906.0	03/16/11 01:39	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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: ARS1-11-00256
Client Sample ID: MD21-11-4747
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-004
Date Received: 02/09/11
Report Date: 03/18/11

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 J.R4a	3477.138	204.807	211.390	103.778		pCi/L	ARS-054/EPA 906.0	03/16/11 04:46	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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NELAP Certificate # EB7558



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

ARS Sample Delivery Group: ARS1-11-00256

Client Sample ID: MD21-11-4741

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-005

Date Received: 02/09/11

Report Date: 03/18/11

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 J,R4a	9799.779	529.351	210.245	103.215		pCi/L	ARS-054/EPA 906.0	03/16/11 07:53	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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: ARS1-11-00256

Client Sample ID: MD21-11-4738

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-006

Date Received: 02/09/11

Report Date: 03/18/11

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	111.103	64.033	209.542	102.870	U	pCi/L	ARS-054/EPA 906.0	03/16/11 11:00	AB	NA
NOTES: Project Cost Code MR8R032NFB00										

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: ARS1-11-00256

Client Sample ID: MD21-11-4748

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-007

Date Received: 02/09/11

Report Date: 03/18/11

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 J,R4a	2304.098	147.128	209.424	102.812		pCi/L	ARS-054/EPA 906.0	03/16/11 14:07	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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: ARS1-11-00256

Client Sample ID: MD21-11-4739

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-008

Date Received: 02/09/11

Report Date: 03/18/11

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	26870.401	1419.539	209.945	103.068		pCi/L	ARS-054/EPA 906.0	03/16/11 17:14	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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LELAP Certificate# 01949

NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256

Client Sample ID: MD21-11-4743

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-009

Date Received: 02/09/11

Report Date: 03/18/11

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	24399.350	1290.720	212.954	104.545		pCi/L	ARS-054/EPA 906.0	03/16/11 20:21	AB	NA
NOTES: Project Cost Code MR8R032NFB00										

SD

Project Manager Review

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

LELAP Certificate# 01949

NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4745
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-010
Date Received: 02/09/11
Report Date: 03/18/11

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 J,R4a	7396.100	405.078	212.889	104.513		pCi/L	ARS-054/EPA 906.0	03/16/11 23:28	AB	NA

NOTES: Project Cost Code MR8R032NFB00

SED

Project Manager Review

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

LELAP Certificate# 01949

NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4744
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-011
Date Received: 02/09/11
Report Date: 03/18/11

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	25452.475	1345.529	210.542	103.361		pCi/L	ARS-054/EPA 906.0	03/17/11 02:35	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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LELAP Certificate# 01949

NELAP Certificate # E87558

Tuesday, February 08, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-12960

LOS ALAMOS
NATIONAL LABORATORY

REQUEST NUMBER: 11-1296

ATTN: Danny Coleman

TURNAROUND/REPORT DUE: 3/10/2011

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
MD21-11-4742	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4740	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4746	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4747	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4741	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4738	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4748	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4739	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4743	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4745	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4744	1	SILICA GEL TUBE	H3	None	GAS

Relinquished By:

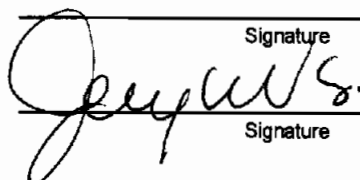
Date

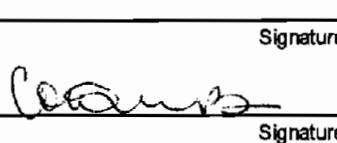
Time

Received By:

Date

Time

Signature
 2/8/11 1400
 Signature

Signature
 2-9-11/09:50
 Signature

Signature

Signature

Received for DISPOSAL By:

Date

Time

Remarks:

Signature

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

LOS ALAMOS**NATIONAL LABORATORY**

ATTN: Danny Coleman

These Samples are on:

American Radiation Services - Primary

LANL Request Number: 11-1296

1726 Wooddale Court

Per Agreement Number: 63641-001-10

Baton Rouge, LA 70806

Project Cost Code: MR8R032NFB00

Please analyse the enclosed samples
according to the schedule indicated:

SHIP DATE: 2/8/2011

TURNAROUND/REPORT DUE: 3/10/2011

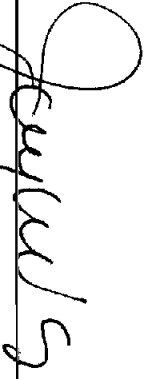
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Not Required

LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature:



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

EPA906.0	1	MD21-11-4738	GAS	2/8/2011	
----------	---	--------------	-----	----------	--

1	MD21-11-4739	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4740	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4741	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4742	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4743	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4744	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4745	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4746	GAS	2/8/2011	
---	--------------	-----	----------	--

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
EPA:906.0		1	MD21-11-4748	GAS	2/8/2011	

Final Page of REQUEST NUMBER 11-1296



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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Request Number: 11-1296



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American Radiation Services Analytical Reports

for

**Los Alamos National Laboratory
Request Number: 11-1296**

Original COC

Tuesday, February 08, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-12960

**LOS ALAMOS
NATIONAL LABORATORY**

REQUEST NUMBER: 11-1296

ATTN: Danny Coleman

TURNAROUND/REPORT DUE: 3/10/2011

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
MD21-11-4742	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4740	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4746	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4747	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4741	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4738	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4748	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4739	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4743	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4745	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4744	1	SILICA GEL TUBE	H3	None	GAS

Relinquished By:

Date

Time

Received By:

Date

Time

Signature

Signature

Signature

Signature

Signature

Signature

Received for DISPOSAL By: Date

Time

Remarks:

Signature

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

LOS ALAMOS**NATIONAL LABORATORY**

ATTN: Danny Coleman

These Samples are on:

American Radiation Services - Primary

LANL Request Number: 11-1296

1726 Wooddale Court

Per Agreement Number: 63641-001-10

Baton Rouge, LA 70806

Project Cost Code: MR8R032NFB00

Please analyse the enclosed samples
according to the schedule indicated:

SHIP DATE: 2/8/2011

TURNAROUND/REPORT DUE: 3/10/2011

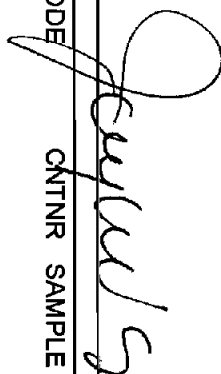
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Not Required

LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature:



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

EPA906.0	1	MD21-11-4738	GAS	2/8/2011	
----------	---	--------------	-----	----------	--

1	MD21-11-4739	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4740	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4741	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4742	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4743	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4744	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4745	GAS	2/8/2011	
---	--------------	-----	----------	--

1	MD21-11-4746	GAS	2/8/2011	
---	--------------	-----	----------	--

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
EPA:906.0		1	MD21-11-4748	GAS	2/8/2011	

Final Page of REQUEST NUMBER 11-1296



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American Radiation Services Analytical Reports

for

**Los Alamos National Laboratory
Request Number: 11-1296**

Case Narrative



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March 18, 2011

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

Request Number: 11-1296

LANL Sample ID: MD21-11-4742; MD21-11-4740; MD21-11-4746; MD21-11-4747; MD21-11-4741;
MD21-11-4738; MD21-11-4748; MD21-11-4739; MD21-11-4743; MD21-11-4745; MD21-11-4744.

Dear Mr. Greene;

On February 9, 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.

Sincerely,

A handwritten signature in cursive script that reads 'Virginia Mulligan'.

Laboratory Management
ARS International

**COVER PAGE**

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

Request Number	LANL PROJECT SAMPLE ID NUMBER	American Radiation Services SAMPLE ID NUMBER(S)
11-1296	MD21-11-4742	ARS1-11-00256-001
11-1296	MD21-11-4740	ARS1-11-00256-002
11-1296	MD21-11-4746	ARS1-11-00256-003
11-1296	MD21-11-4747	ARS1-11-00256-004
11-1296	MD21-11-4741	ARS1-11-00256-005
11-1296	MD21-11-4738	ARS1-11-00256-006
11-1296	MD21-11-4748	ARS1-11-00256-007
11-1296	MD21-11-4739	ARS1-11-00256-008
11-1296	MD21-11-4743	ARS1-11-00256-009
11-1296	MD21-11-4745	ARS1-11-00256-010
11-1296	MD21-11-4744	ARS1-11-00256-011

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."

Dwayne Mulligan
Signature

Laboratory Management, ARS International
Title

3-18-11
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: ARS1-11-00256
Client Sample ID: MD21-11-4742
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-001
Date Received: 02/09/11
Report Date: 03/18/11

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	11316.852	608.411	212.519	104.332		pCi/L	ARS-054/EPA 906.0	03/15/11 19:25	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4740
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-002
Date Received: 02/09/11
Report Date: 03/18/11

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	30698.165	1619.537	210.569	103.374		pCi/L	ARS-054/EPA 906.0	03/15/11 22:32	AB	NA

NOTES: Project Cost Code MR8R032NFB00

SDH

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: ARS1-11-00256
Client Sample ID: MD21-11-4746
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-003
Date Received: 02/09/11
Report Date: 03/18/11

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	152.031	64.923	210.270	103.228	U	pCi/L	ARS-054/EPA 906.0	03/16/11 01:39	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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: ARS1-11-00256
Client Sample ID: MD21-11-4747
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-004
Date Received: 02/09/11
Report Date: 03/18/11

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	3477.138	204.807	211.390	103.778		pCi/L	ARS-054/EPA 906.0	03/16/11 04:46	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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LELAP Certificate# 01949

NELAP Certificate # EB7558



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

ARS Sample Delivery Group: ARS1-11-00256

Client Sample ID: MD21-11-4741

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-005

Date Received: 02/09/11

Report Date: 03/18/11

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	9799.779	529.351	210.245	103.215		pCi/L	ARS-054/EPA 906.0	03/16/11 07:53	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4738
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-006
Date Received: 02/09/11
Report Date: 03/18/11

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	111.103	64.033	209.542	102.870	U	pCi/L	ARS-054/EPA 906.0	03/16/11 11:00	AB	NA
NOTES: Project Cost Code MR8R032NFB00										

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: ARS1-11-00256

Client Sample ID: MD21-11-4748

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-007

Date Received: 02/09/11

Report Date: 03/18/11

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	2304.098	147.128	209.424	102.812		pCi/L	ARS-054/EPA 906.0	03/16/11 14:07	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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

ARS Sample Delivery Group: ARS1-11-00256

Client Sample ID: MD21-11-4739

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-008

Date Received: 02/09/11

Report Date: 03/18/11

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	26870.401	1419.539	209.945	103.068		pCi/L	ARS-054/EPA 906.0	03/16/11 17:14	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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LELAP Certificate# 01949

NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256

Client Sample ID: MD21-11-4743

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-009

Date Received: 02/09/11

Report Date: 03/18/11

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	24399.350	1290.720	212.954	104.545		pCi/L	ARS-054/EPA 906.0	03/16/11 20:21	AB	NA
NOTES: Project Cost Code MR8R032NFB00										

SD

Project Manager Review

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LELAP Certificate# 01949

NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4745
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-010
Date Received: 02/09/11
Report Date: 03/18/11

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	7396.100	405.078	212.889	104.513		pCi/L	ARS-054/EPA 906.0	03/16/11 23:28	AB	NA

NOTES: Project Cost Code MR8R032NFB00

SED

Project Manager Review

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4744
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-011
Date Received: 02/09/11
Report Date: 03/18/11

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	25452.475	1345.529	210.542	103.361		pCi/L	ARS-054/EPA 906.0	03/17/11 02:35	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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LELAP Certificate# 01949

NELAP Certificate # E87558



QC Results per Analytical Batch

Analytical Batch	ARS1-B11-00807
SDG	ARS1-11-00256
Analysis	Tritium (Aqueous)
Analysis Test Method	ARS-054/Liquid Scintillation Counter
Analysis Code	LSC-A-001
Report Units	pCi/L

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	03/15/11 10:04	Analysis Technician	BSTEFFENS	
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	Expected Value	LCS Rec (%)	MDC	
ARS1-B11-00807-01	LCS	H-3	2670	160	2467	108	210	

Duplicate RER/DER/RPD				Analysis Date	03/15/11 13:11	Analysis Technician	BSTEFFENS	
Analyte	Result LCS	CSU LCS (1s)	Results LCSD	CSU LCSD (1s)	RER	DER	RPD	
H-3	2670	165	2640	163	0.05	0.13	1.1	

Method Blank		Analysis Date	03/15/11 16:18	Analysis Technician	BSTEFFENS	
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	MDC	Qual
ARS1-B11-00807-03	MBL	H-3	276	66	210	

Susan Leese

Susan Leese

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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Tritium

by

Low Level Liquid Scintillation Counting

Samples



LSC Instrument Data Transfer Report

\\PACARD03\20_NEW\Bouaziz\ARS\11-3 Normal.Lvt

Batch Sample ID										Non-BKG Samples Transferred										Samples Eligible To Save																			
ARS1-B11-00807										22										22										LSC 2									
LIMS Batch Sample ID	LSC P/D	LSC PID	LSC SW	LSC SPL ID	LSC Count Date	LSC CPM	LSC BKG	LSC EFF	LSC Count Dur	Analysis Batch	LIMS SQC	LIMS Run																											
BKG	44		1	BACKGROUND	03/15/11 06:57	5.52	410.50	35.3500	180.00	ARS1-B11-00807																													
ARS1-B11-00807-01	44		2	B11-00807-01	03/15/11 10:04	16.11	414.33	35.5500	180.00	ARS1-B11-00807																													
ARS1-B11-00807-02	44		3	B11-00807-02	03/15/11 13:11	16.15	426.45	36.0800	180.00	ARS1-B11-00807																													
ARS1-B11-00807-03	44		4	B11-00807-03	03/15/11 16:16	6.63	414.68	35.5600	180.00	ARS1-B11-00807																													
ARS1-B11-00807-04	44		5	B11-00807-04	03/15/11 19:25	49.71	405.93	35.0200	180.00	ARS1-B11-00807																													
ARS1-B11-00807-05	44		6	B11-00807-05	03/15/11 22:32	126.50	410.94	35.3800	180.00	ARS1-B11-00807																													
ARS1-B11-00807-06	44		7	B11-00807-06	03/16/11 01:39	6.12	411.36	35.4100	180.00	ARS1-B11-00807																													
ARS1-B11-00807-07	44		8	B11-00807-07	03/16/11 04:46	19.17	408.76	35.2300	180.00	ARS1-B11-00807																													
ARS1-B11-00807-08	44		9	B11-00807-08	03/16/11 07:53	44.20	413.36	35.5000	180.00	ARS1-B11-00807																													
ARS1-B11-00807-09	44		10	B11-00807-09	03/16/11 11:00	5.96	413.28	35.5000	180.00	ARS1-B11-00807																													
ARS1-B11-00807-10	44		11	B11-00807-10	03/16/11 14:07	14.65	414.87	35.5700	180.00	ARS1-B11-00807																													
ARS1-B11-00807-11	44		12	B11-00807-11	03/16/11 17:14	111.73	414.53	35.5600	180.00	ARS1-B11-00807																													
ARS1-B11-00807-12	44		13	B11-00807-12	03/16/11 20:21	100.60	407.94	35.1700	180.00	ARS1-B11-00807																													
ARS1-B11-00807-13	44		14	B11-00807-13	03/16/11 23:28	34.35	405.60	35.0000	180.00	ARS1-B11-00807																													
ARS1-B11-00807-14	44		15	B11-00807-14	03/17/11 02:35	105.84	409.73	35.3000	180.00	ARS1-B11-00807																													
ARS1-B11-00807-15	44		16	B11-00807-15	03/17/11 05:42	13.00	397.32	34.4000	180.00	ARS1-B11-00807																													
ARS1-B11-00807-16	44		17	B11-00807-16	03/17/11 08:51	113.86	405.78	35.0100	180.00	ARS1-B11-00807																													
ARS1-B11-00807-17	44		18	B11-00807-17	03/17/11 11:58	11.66	402.60	34.7800	180.00	ARS1-B11-00807																													
ARS1-B11-00807-18	44		19	B11-00807-18	03/17/11 15:05	12.12	381.91	33.2900	180.00	ARS1-B11-00807																													
ARS1-B11-00807-19	44		20	B11-00807-19	03/17/11 18:15	37.63	410.47	35.3500	180.00	ARS1-B11-00807																													
ARS1-B11-00807-20	44		21	B11-00807-20	03/17/11 21:22	7.57	382.91	33.3600	180.00	ARS1-B11-00807																													
ARS1-B11-00807-21	44		22	B11-00807-21	03/18/11 00:31	13.41	405.48	34.9900	180.00	ARS1-B11-00807																													
ARS1-B11-00807-22	44		23	B11-00807-22	03/18/11 03:41	7.66	412.72	35.4800	180.00	ARS1-B11-00807																													

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	16.110000	ACT	2668.751347	2668.751347	OK
Sample Count Mins	180.000000	CU	87.358297	87.358297	OK
BKG Count Rate	5.520000	TPU	164.613911	164.613911	OK
BKG Count Mins	180.000000	MDA	209.125958	209.125958	OK
Instrument Efficiency	0.355500	DL	102.665928	102.665928	OK
Sample Aliquot	5.028000	Net Count Rate	10.590000	10.590000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	0.000000	0.000000	OK
Aliquot Conversion Factor	0.001000	DF	1.000000	1.000000	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/15/11 10:04 AM	K	0.003968	0.003968	OK
Count Date (t2)	3/15/11 10:04 AM	K MDA	0.714267	0.714267	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	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-01		
		Analysis Code			
		SDG	QC Sample		
		Fraction	N/A QC Sample		
		Run Number			
		Client	QC Sample		
		Client Profile			
		Client ID	N/A QC Sample		
		Instr File Name	73		
		Instr Detector	P-44-S-2		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK				

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Procedure		ARS-054	Isotope		H-3	
Variable	Value		Calculated Values	Excel	VBA	V/V
Gross Count Rate	16.150000		ACT	2639.480709	2639.480709	OK
Sample Count Mins	180.000000		CD	168.863001	168.863001	OK
BKG Count Rate	5.520000		TPU	318.849379	318.849379	OK
BKG Count Mins	180.000000		MDA	206.053986	206.053986	OK
Instrument Efficiency	0.360800		DL	101.157809	101.157809	OK
Sample Aliquot	5.020000		Net Count Rate	10.630000	10.630000	OK
Dilution Factor	1.000000		D t 1 (t2 - t1)	0.000000	0.000000	OK
Aliquot Conversion Factor	0.001800		DF	1.000000	1.000000	OK
			Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/15/11 1:11 PM		K	0.004027	0.004027	OK
Count Date (t2)	3/15/11 1:11 PM		K MDA	0.724915	0.724915	OK
Activity Units = pCi -- UCF =	2.2200					
CF	1.9600					
Nuclide Abundance	1.000000					
Half-life Days 1 - Result Isotope	4499.800000					
TPUF_Calibration Factor	0.041330					
TPUF_Aliquoting Factor	0.020000					
TPUF_Yield Factor	0.000000					
TPUF_Decay Ingrowth Factor	0.025000					
TPUF_Analysis Factor	0.000000					
TPUF_Unassigned Factor	0.000000					
Activity Units	pCi		Batch Identifiers and Other Related Information			
Aliquot Units	L		Batch	ARS1-B11-00807		
			Batch ID	ARS1-B11-00807-02		
			Analysis Code			
			SDG	QC Sample		
			Fraction	N/A QC Sample		
			Run Number			
			Client	QC Sample		
			Client Profile			
			Client ID	N/A QC Sample		
			Instr File Name	73		
			Instr Detector	P-44-S-3		
			Instr keV			
			Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK					

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Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	6.630000	ACT	275.700832	275.700832	OK
Sample Count Min	180.000000	CU	126.480349	126.480349	OK
BKG Count Rate	5.520000	TPU	129.596967	129.596967	OK
BKG Count Min	180.000000	MDA	206.115612	206.115612	OK
Instrument Efficiency	0.355600	DL	101.188063	101.188063	OK
Sample Aliquot	9.100000	Net Count Rate	1.110000	1.110000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	0.000000	0.000000	OK
Aliquot Conversion Factor	0.001000	DF	1.000000	1.000000	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/15/11 4:18 PM	K	0.004026	0.004026	OK
Count Date (t2)	3/15/11 4:18 PM	K MDA	0.724699	0.724699	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.9600				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-03		
		Analysis Code			
		SDG	QC Sample		
		Fraction	N/A QC Sample		
		Run Number			
		Client	QC Sample		
		Client Profile			
		Client ID	N/A QC Sample		
		Instr File Name	73		
		Instr Detector	P-44-S-4		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK				

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[illegible]

Procedure		ARS-054	
Variable	Value		
Gross Count Rate	126.500000		
Sample Count Mins	180.000000		
BKG Count Rate	5.520000		
BKG Count Mins	180.000000		
Instrument Efficiency	0.353800		
Sample Aliquot	5.045000		
Dilution Factor	1.000000		
Aliquot Conversion Factor	0.001000		
Sample Collection Date (t1)	2/8/11 12:00 PM		
Count Date (t2)	3/15/11 10:32 PM		
Activity Units = pCi --- UCF =	1.2200		
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		
Variables Intact Test		OK	

Isotope		H-3	
Calculated Values	Excel	VBA	V/V
ACT	30698.165001	30698.164990	OK
CU	217.311369	217.311369	OK
TPU	1619.537173	1619.537172	OK
MDA	210.569093	210.569093	OK
DL	103.374405	103.374405	OK
Net Count Rate	120.980000	120.980000	OK
D t 1 (t2 - t1)	35.438889	35.438889	OK
DF	0.994556	0.994556	OK
Sys Err	0.052280	0.052280	OK
K	0.003941	0.003941	OK
K MDA	0.709371	0.709371	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-00807		
Batch ID	ARS1-B11-00807-05		
Analysis Code	LSC-A-001		
SDG	ARS1-11-00256		
Fraction	002		
Run Number	1		
Client	Los Alamos National Laboratory		
Client Profile	Keith Greene		
Client ID	ND21-11-4740		
Instr File Name	73		
Instr Detector	P-44-S-6		
Instr keV			
Version/Date	1.0 -- 11/18/2005		

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Procedure		ARS-054	
Variable	Value		
Gross Count Rate	6.120000		
Sample Count Mins	180.000000		
BKG Count Rate	5.520000		
BKG Count Mins	180.000000		
Instrument Efficiency	0.354100		
Sample Aliquot	5.048000		
Dilution Factor	1.000000		
Aliquot Conversion Factor	0.001000		
Sample Collection Date (t1)	2/8/11 12:00 PM		
Count Date (t2)	3/16/11 1:39 AM		
Activity Units = pCi --- UCF =	2.2200		
CF	1.0000		
Nuclide Abundance	1.000000		
Half-life Days - 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		
Variables Intact Test			
		OK	

Isotope		H-3	
Calculated Values	Excel	VBA	V/V
ACT	152.031122	152.031122	OK
CU	64.434949	64.434949	OK
TPU	64.923306	64.923306	OK
MDA	210.269868	210.269867	OK
DL	103.227506	103.227506	OK
Net Count Rate	0.600000	0.600000	OK
D t 1 (t2 - t1)	35.568750	35.568750	OK
DF	0.994536	0.994536	OK
Sys Err	0.052280	0.052280	OK
K	0.003947	0.003947	OK
K MDA	0.710381	0.710381	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-00807		
Batch ID	ARS1-B11-00807-06		
Analysis Code	LSC-A-001		
SDG	ARS1-11-00256		
Fraction	003		
Run Number	1		
Client	Los Alamos National Laboratory		
Client Profile	Keith Greene		
Client ID	MD21-11-4746		
Instr File Name	73		
Instr Detector	P-44-S-7		
Instr keV			
Version/Date	1.0 -- 11/18/2005		

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Procedure		ARS-054	
Variable	Value		
Gross Count Rate	19.170000		
Sample Count Mins	180.000000		
BKG Count Rate	5.520000		
BKG Count Mins	180.000000		
Instrument Efficiency	0.352300		
Sample Aliquot	5.047000		
Dilution Factor	1.000000		
Aliquot Conversion Factor	0.001000		
Sample Collection Date (t1)	2/8/11 12:00 PM		
Count Date (t2)	3/16/11 4:46 AM		
Activity Units = pCi -- UCF =	2.7200		
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		
Variables Intact Test		OK	

Isotope		H-3	
Calculated Values	Excel	VBA	V/V
ACT	3477.137890	3477.137889	OK
CU	04.343841	04.343841	OK
TPU	204.807485	204.807485	OK
MDA	211.390299	211.390299	OK
DL	103.777558	103.777558	OK
Net Count Rate	13.650000	13.650000	OK
D t 1 (t2 - t1)	35.698611	35.698611	OK
DF	0.994516	0.994516	OK
Sys Err	0.052280	0.052280	OK
K	0.003926	0.003926	OK
K MDA	0.706616	0.706616	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-00807		
Batch ID	ARS1-B11-00807-07		
Analysis Code	LSC-A-001		
SDG	ARS1-11-00256		
Fraction	004		
Run Number	1		
Client	Los Alamos National Laboratory		
Client Profile	Keith Greene		
Client ID	MD21-11-4747		
Instr File Name	73		
Instr Detector	P-44-S-8		
Instr keV			
Version/Date	1.0 -- 11/18/2005		

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3-18-11

Procedure		ARS-054	
Variable	Value		
Gross Count Rate	44.200000		
Sample Count Min	180.000000		
BKG Count Rate	5.520000		
BKG Count Min	180.000000		
Instrument Efficiency	0.355000		
Sample Aliquot	5.036000		
Dilution Factor	1.000000		
Aliquot Conversion Factor	0.001000		
Sample Collection Date (t1)	2/9/11 12:00 PM		
Count Date (t2)	3/16/11 7:53 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		
Variables Intact Test		OK	

Isotope		H-3	
Calculated Values	Excel	VBA	V/V
ACT	9799.779152	9799.779148	OK
CU	139.158506	139.158506	OK
TPU	529.350639	529.350639	OK
MDA	210.244970	210.244970	OK
DL	103.215283	103.215283	OK
Net Count Rate	38.680000	38.680000	OK
D t 1 (t2 - t1)	35.828472	35.828472	OK
DF	0.994496	0.994496	OK
Sys Err	0.052280	0.052280	OK
K	0.003947	0.003947	OK
K MDA	0.710465	0.710465	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-00807		
Batch ID	ARS1-B11-00807-08		
Analysis Code	LSC-A-001		
SDG	ARS1-11-00256		
Fraction	005		
Run Number	1		
Client	Los Alamos National Laboratory		
Client Profile	Keith Greene		
Client ID	MD21-11-4741		
Instr File Name	73		
Instr Detector	P-44 S-9		
Instr keV			
Version/Date	1.0 -- 11/18/2005		

Procedure		ARS-054	
Variable	Value		
Gross Count Rate	5.960000		
Sample Count Mins	180.000000		
BKG Count Rate	5.520000		
BKG Count Mins	180.000000		
Instrument Efficiency	0.355000		
Sample Aliquot	5.053000		
Dilution Factor	1.000000		
Aliquot Conversion Factor	0.001000		
Sample Collection Date (t1)	2/8/11 12:00 PM		
Count Date (t2)	3/16/11 11:00 AM		
Activity Units = pCi -- UCF =	2.2280		
CF	1.0000		
Nuclide Abundance	1.000000		
Half-life Days 1 - Result Isotope	4499.800000		
TPUF_Calibration Factor	0.041330		
TPUF_Aliquoting Factor	0.020000		
TPUF_Yield Factor	0.080000		
TPUF_Decay Ingrowth Factor	0.025000		
TPUF_Analysis Factor	0.000000		
TPUF_Unassigned Factor	0.000000		
Activity Units	pCi		
Aliquot Units	L		
Variables Intact Test		OK	

Isotope		H-3	
Calculated Values	Excel	VBA	V/V
ACT	111.103467	111.103467	OK
CF	63.769003	63.769003	OK
TPU	64.032991	64.032991	OK
MDA	209.541827	209.541827	OK
DL	102.870090	102.870090	OK
Net Count Rate	0.440000	0.440000	OK
D t 1 (t2 - t1)	35.958333	35.958333	OK
DF	0.994476	0.994476	OK
Sys Err	0.052280	0.052280	OK
K	0.003960	0.003960	OK
K MDA	0.712849	0.712849	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-00807		
Batch ID	ARS1-B11-00807-09		
Analysis Code	LSC-A-001		
SDG	ARS1-11-00256		
Fraction	006		
Run Number	1		
Client	Los Alamos National Laboratory		
Client Profile	Keith Greene		
Client ID	MD21-11-4738		
Instr File Name	73		
Instr Detector	P-44 S-10		
Instr keV			
Version/Date	1.0 -- 11/18/2005		

Procedure		ARS-054	
Variable	Value		
Gross Count Rate	14.650000		
Sample Count Mins	160.000000		
BKG Count Rate	5.520000		
BKG Count Mins	160.000000		
Instrument Efficiency	0.355700		
Sample Aliquot	5.046000		
Dilution Factor	1.000000		
Aliquot Conversion Factor	0.001000		
Sample Collection Date (t1)	2/8/11 12:00 PM		
Count Date (t2)	3/16/11 2:07 PM		
Activity Units = pCi --- UCF =	2.2200		
CF	1.0000		
Nuclide Abundance	1.000000		
Halflife Days 1 - Result Isotope	4499.800000		
TPUF_Calibration Factor	0.041330		
TPUF_Aliquoting Factor	0.020000		
TPUF_Yield Factor	0.000000		
TPUF_Decay Ingrowth Factor	0.025000		
TPUF_Analysis Factor	0.000000		
TPUF_Unassigned Factor	0.000000		
Activity Units	pCi		
Aliquot Units	L		
Variables Intact Test		OK	

Isotope		H-3	
Calculated Values	Excel	VBA	V/V
ACT	2304.097957	2304.097956	OK
CD	84.478629	84.478629	OK
TPU	147.128074	147.128074	OK
MDA	209.423760	209.423760	OK
DL	102.812128	102.812128	OK
Net Count Rate	9.130000	9.130000	OK
D t 1 (t2 - t1)	36.088194	36.088194	OK
DF	0.994456	0.994456	OK
Sys Err	0.052280	0.052280	OK
K	0.003963	0.003963	OK
K MDA	0.713251	0.713251	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-00807		
Batch ID	ARS1-B11-00807-10		
Analysis Code	LSC-A-001		
SDG	ARS1-11-00256		
Fraction	007		
Run Number	1		
Client	Los Alamos National Laboratory		
Client Profile	Keith Greene		
Client ID	MD21-11-4748		
Instr File Name	73		
Instr Detector	P-44-S-11		
Instr keV			
Version/Date	1.0 -- 11/18/2005		

Procedure		ARS-054	
Variable	Value		
Gross Count Rate	111.730000		
Sample Count Mins	180.000000		
BKG Count Rate	5.520000		
BKG Count Mins	180.000000		
Instrument Efficiency	0.355600		
Sample Aliquot	5.035000		
Dilution Factor	1.000000		
Aliquot Conversion Factor	0.001000		
Sample Collection Date (t1)	2/8/11 12:00 PM		
Count Date (t2)	3/16/11 5:14 PM		
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		
Variables Intact Test			
		OK	

Isotope		H-3	
Calculated Values	Excel	VBA	V/V
ACT	26870.400637	26870.400627	OK
CU	204.187384	204.187384	OK
TPU	1419.538942	1419.538941	OK
MDA	209.944511	209.944511	OK
DL	103.067779	103.067779	OK
Net Count Rate	106.210000	106.210000	OK
D t 1 (t2 - t1)	36.218056	36.218056	OK
DF	0.994437	0.994437	OK
Sys Err	0.052280	0.052280	OK
K	0.003953	0.003953	OK
K MDA	0.711482	0.711482	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-00807		
Batch ID	ARS1-B11-00807-11		
Analysis Code	LSC-A-001		
SDG	ARS1-11-00256		
Fraction	008		
Run Number	1		
Client	Los Alamos National Laboratory		
Client Profile	Keith Greene		
Client ID	MD21-11-4739		
Instr File Name	73		
Instr Detector	P-44-S-12		
Instr keV			
Version/Date	1.0 -- 11/18/2005		

Reviewed by: SDH

Date: 3-18-11

Procedure		ARS-054	
Variable	Value		
Gross Count Rate	100.600000		
Sample Count Mins	180.000000		
BKG Count Rate	5.520000		
BKG Count Mins	180.000000		
Instrument Efficiency	0.351700		
Sample Aliquot	5.019000		
Dilution Factor	1.000000		
Aliquot Conversion Factor	0.001000		
Sample Collection Date (t1)	2/8/11 12:00 PM		
Count Date (t2)	3/16/11 8:21 PM		
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		
Variables Intact Test		OK	

Isotope		H-3	
Calculated Values	Excel	VBA	V/V
ACT	24399.349992	24399.349983	OK
CU	197.038663	197.038663	OK
TPU	1290.719557	1290.719557	OK
MDA	212.053546	212.053546	OK
DL	104.545001	104.545001	OK
Net Count Rate	95.080000	95.080000	OK
D t 1 (t2 - t1)	36.347917	36.347917	OK
DF	0.994417	0.994417	OK
Sys Err	0.052280	0.052280	OK
K	0.003897	0.003897	OK
K MDA	0.701429	0.701429	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-00807		
Batch ID	ARS1-B11-00807-12		
Analysis Code	LSC-A-001		
SDS	ARS1-11-00256		
Fraction	009		
Run Number	1		
Client	Los Alamos National Laboratory		
Client Profile	Keith Greene		
Client ID	MD21-11-4743		
Instr File Name	73		
Instr Detector	P-44-S-13		
Instr keV			
Version/Date	1.0 -- 11/18/2005		

Procedure		ARS-054	
Variable	Value		
Gross Count Rate	34.350000		
Sample Count Mins	180.000000		
BKG Count Rate	5.520000		
BKG Count Mins	180.000000		
Instrument Efficiency	0.350000		
Sample Aliquot	5.045000		
Dilution Factor	1.000000		
Aliquot Conversion Factor	0.001000		
Sample Collection Date (t1)	2/8/11 12:00 PM		
Count Date (t2)	3/16/11 11:28 PM		
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		
Variables Intact Test		OK	

Isotope		H-3	
Calculated Values	Excel	VBA	V/V
ACT	7396.099799	7396.099796	OK
CD	120.738280	120.738280	OK
TPU	405.078185	405.078185	OK
MDA	212.899338	212.899338	OK
DL	104.513480	104.513479	OK
Net Count Rate	28.830000	28.830000	OK
D t 1 (t2 - t1)	36.477778	36.477778	OK
DF	0.994397	0.994397	OK
Sys Err	0.052280	0.052280	OK
K	0.003898	0.003898	OK
K MDA	0.701640	0.701640	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-00807		
Batch ID	ARS1-B11-00807-13		
Analysis Code	LSC-A-001		
SDG	ARS1-11-00256		
Fraction	010		
Run Number	1		
Client	Los Alamos National Laboratory		
Client Profile	Keith Greene		
Client ID	MD21-11-4745		
Instr File Name	73		
Instr Detector	P-44-S-14		
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	105.840000	ACT	25452.474780	25452.474771	OK
Sample Count Min	180.000000	CU	100.000000	100.000000	OK
BKG Count Rate	5.520000	TPU	1345.529019	1345.529019	OK
BKG Count Min	180.000000	MDA	110.541777	110.541777	OK
Instrument Efficiency	0.353000	DL	103.360994	103.360994	OK
Sample Aliquot	5.058000	Net Count Rate	100.320000	100.320000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	36.607639	36.607639	OK
Aliquot Conversion Factor	0.001000	DF	0.994377	0.994377	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	K	0.003941	0.003941	OK
Count Date (t2)	3/17/11 2:35 AM	K MDA	0.709463	0.709463	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	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-14		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	011		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4744		
		Instr File Name	73		
		Instr Detector	P-44-S-15		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK				

Reviewed by: SOL

Date: 3-18-11



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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-B11-00807

Method ARS-054 Tritium (Aqueous)

Analysis

LSC-A-001

Matrix SI

Batch Sample ID	Type	Blind 1s01	Blind 1s02	Blind 1s03	SDG	FR	Run	Client ID	Isotope Group	Lab Deadline
ARS1-B11-00807-01	LCS	B-11376								
ARS1-B11-00807-02	LCS	B-11377								
ARS1-B11-00807-03	MBL									
ARS1-B11-00807-04	TRG				ARS1-11-00256	001	1	MD21-11-4742	STD	03/08/11
ARS1-B11-00807-05	TRG				ARS1-11-00256	002	1	MD21-11-4740	STD	03/08/11
ARS1-B11-00807-06	TRG				ARS1-11-00256	003	1	MD21-11-4746	STD	03/08/11
ARS1-B11-00807-07	TRG				ARS1-11-00256	004	1	MD21-11-4747	STD	03/08/11
ARS1-B11-00807-08	TRG				ARS1-11-00256	005	1	MD21-11-4741	STD	03/08/11
ARS1-B11-00807-09	TRG				ARS1-11-00256	006	1	MD21-11-4738	STD	03/08/11
ARS1-B11-00807-10	TRG				ARS1-11-00256	007	1	MD21-11-4748	STD	03/08/11
ARS1-B11-00807-11	TRG				ARS1-11-00256	008	1	MD21-11-4739	STD	03/08/11
ARS1-B11-00807-12	TRG				ARS1-11-00256	009	1	MD21-11-4743	STD	03/08/11
ARS1-B11-00807-13	TRG				ARS1-11-00256	010	1	MD21-11-4745	STD	03/08/11
ARS1-B11-00807-14	TRG				ARS1-11-00256	011	1	MD21-11-4744	STD	03/08/11
ARS1-B11-00807-15	TRG				ARS1-11-00267	001	1	MD50-11-3974	STD	03/08/11
ARS1-B11-00807-16	TRG				ARS1-11-00267	002	1	MD50-11-3963	STD	03/08/11
ARS1-B11-00807-17	TRG				ARS1-11-00267	003	1	MD50-11-3975	STD	03/08/11
ARS1-B11-00807-18	TRG				ARS1-11-00267	004	1	MD50-11-3973	STD	03/08/11
ARS1-B11-00807-19	TRG				ARS1-11-00267	005	1	MD50-11-4164	STD	03/08/11
ARS1-B11-00807-20	TRG				ARS1-11-00268	001	1	MD50-11-3979	STD	03/08/11
ARS1-B11-00807-21	TRG				ARS1-11-00268	002	1	MD50-11-3978	STD	03/08/11
ARS1-B11-00807-22	TRG				ARS1-11-00268	003	1	MD50-11-3977	STD	03/08/11

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11-00256-003-1

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11-00256-011-1

11-00267-001-1

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11-00267-003-1

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LCS Report
Analytical Batch: ARS1-B11-00807

BlindID	Abatch	BatchSampleID	BlindGroup	StdID	Isotope	ExpectedAddition	ExpectedValue	Empyrv	GrossWt	NetWt	UserID	ModDate	ExpectedValue CT	MidPointConcIDate	KnownValue
B-11376	ARS1-B11-00807	ARS1-B11-00807-01	B-H3	S-0247	H-3	5	2.475798889	0	1	1	BSTEFFENS	2/21/2011	2.467422931	3/15/2011	2.467422931
B-11377	ARS1-B11-00807	ARS1-B11-00807-02	B-H3	S-0247	H-3	5	2.475798889	0	1	1	BSTEFFENS	2/21/2011	2.467422931	3/15/2011	2.467422931

ID_31001_054	ABatch	ABatchSampleID	ClientID	Aliquot1	AliquotUnits1	IC_ID1	Aliquot2	AliquotUnits2	IC_ID2	UserID	ModDate
7871	ARS1-B11-00807	ARS1-B11-00807-01					5.028 g			BSTEFFENS	03/01/2011 14:15
7872	ARS1-B11-00807	ARS1-B11-00807-02					5.028 g			BSTEFFENS	03/01/2011 14:15
7873	ARS1-B11-00807	ARS1-B11-00807-03					5.1 g			BSTEFFENS	03/01/2011 14:15
7874	ARS1-B11-00807	ARS1-B11-00807-04					5.05 g			81305 BSTEFFENS	03/01/2011 14:15
7875	ARS1-B11-00807	ARS1-B11-00807-05					5.045 g			81306 BSTEFFENS	03/01/2011 14:15
7876	ARS1-B11-00807	ARS1-B11-00807-06					5.048 g			81307 BSTEFFENS	03/01/2011 14:15
7877	ARS1-B11-00807	ARS1-B11-00807-07					5.047 g			81308 BSTEFFENS	03/01/2011 14:15
7878	ARS1-B11-00807	ARS1-B11-00807-08					5.036 g			81309 BSTEFFENS	03/01/2011 14:15
7879	ARS1-B11-00807	ARS1-B11-00807-09					5.053 g			81310 BSTEFFENS	03/01/2011 14:15
7880	ARS1-B11-00807	ARS1-B11-00807-10					5.046 g			81311 BSTEFFENS	03/01/2011 14:15
7881	ARS1-B11-00807	ARS1-B11-00807-11					5.035 g			81312 BSTEFFENS	03/01/2011 14:15
7882	ARS1-B11-00807	ARS1-B11-00807-12					5.019 g			81313 BSTEFFENS	03/01/2011 14:15
7883	ARS1-B11-00807	ARS1-B11-00807-13					5.045 g			81314 BSTEFFENS	03/01/2011 14:15
7884	ARS1-B11-00807	ARS1-B11-00807-14					5.058 g			81315 BSTEFFENS	03/01/2011 14:15
7885	ARS1-B11-00807	ARS1-B11-00807-15					5.073 g			81316 BSTEFFENS	03/01/2011 14:15
7886	ARS1-B11-00807	ARS1-B11-00807-16					5.06 g			81317 BSTEFFENS	03/01/2011 14:15
7887	ARS1-B11-00807	ARS1-B11-00807-17					5.061 g			81318 BSTEFFENS	03/01/2011 14:15
7888	ARS1-B11-00807	ARS1-B11-00807-18					5.067 g			81319 BSTEFFENS	03/01/2011 14:15
7889	ARS1-B11-00807	ARS1-B11-00807-19					5.024 g			81320 BSTEFFENS	03/01/2011 14:15
7890	ARS1-B11-00807	ARS1-B11-00807-20					5.052 g			81321 BSTEFFENS	03/01/2011 14:15
7891	ARS1-B11-00807	ARS1-B11-00807-21					5.06 g			81322 BSTEFFENS	03/01/2011 14:15
7892	ARS1-B11-00807	ARS1-B11-00807-22					5.071 g			81323 BSTEFFENS	03/01/2011 14:15

Batch Result Verification Report

BatchSampleID	SDG	Fraction	ClientID	Run	Isotope	ACT	TPU	TPUs	TPUs	MDA	DL	CU	CUts	CUts	ActivityReportUnits
ARSI-B11-00807-01					1 H-3	2668.751347	164.6139114	164.6139114	322.6432664	209.1259578	102.6659282	87.3582969	87.3582969	171.2222619	PC
ARSI-B11-00807-02					1 H-3	2639.480709	318.8493788	162.6782545	318.8493788	206.0539856	101.157809	168.8630006	86.15459213	168.8630006	PC
ARSI-B11-00807-03					1 H-3	275.7008315	129.5969675	66.12090177	129.5969675	206.1156123	101.1880633	126.4803489	64.53079025	126.4803489	PC
ARSI-B11-00807-04	ARSI-11-00256	001	MD21-11-4742		1 H-3	11316.85181	608.4107563	608.4107563	1192.485082	212.5188314	104.3315871	141.8576943	141.8576943	278.0410807	PC
ARSI-B11-00807-05	ARSI-11-00256	002	MD21-11-4740		1 H-3	30698.16499	1619.537172	1619.537172	3174.292857	210.5690934	103.3744048	217.3113688	217.3113688	425.9302829	PC
ARSI-B11-00807-06	ARSI-11-00256	003	MD21-11-4746		1 H-3	152.0311217	64.92330559	64.92330559	127.2496789	210.2698675	103.2275062	94.34384118	94.34384118	126.2924984	PC
ARSI-B11-00807-07	ARSI-11-00256	004	MD21-11-4747		1 H-3	3477.137889	204.8074849	204.8074849	401.4226705	211.3902993	103.7775583	133.1555063	133.1555063	260.9847924	PC
ARSI-B11-00807-08	ARSI-11-00256	005	MD21-11-4741		1 H-3	9799.779148	529.3506391	529.3506391	1037.527253	210.2449701	103.2132634	133.1555063	133.1555063	260.9847924	PC
ARSI-B11-00807-09	ARSI-11-00256	006	MD21-11-4738		1 H-3	111.1034667	64.03299065	64.03299065	125.504617	209.5418265	102.8700901	63.76900272	63.76900272	124.9872453	PC
ARSI-B11-00807-10	ARSI-11-00256	007	MD21-11-4748		1 H-3	2304.097956	147.1280735	147.1280735	288.3710241	209.42376	102.8121278	84.47862911	84.47862911	165.5781131	PC
ARSI-B11-00807-11	ARSI-11-00256	008	MD21-11-4739		1 H-3	26870.40063	1419.538941	1419.538941	2782.286325	209.944511	103.0677794	204.1873844	204.1873844	400.2072734	PC
ARSI-B11-00807-12	ARSI-11-00256	009	MD21-11-4743		1 H-3	24399.34998	1290.719557	1290.719557	2529.810331	212.9533455	104.5450007	197.0386628	197.0386628	386.1957792	PC
ARSI-B11-00807-13	ARSI-11-00256	010	MD21-11-4745		1 H-3	7396.099796	405.0781851	405.0781851	793.9532429	212.8893381	104.5134795	120.7382802	120.7382802	236.6470292	PC
ARSI-B11-00807-14	ARSI-11-00256	011	MD21-11-4744		1 H-3	25452.47477	1345.529019	1345.529019	2637.236877	210.5417768	103.3609943	199.5587848	199.5587848	391.1352183	PC
ARSI-B11-00807-15	ARSI-11-00267	001	MD50-11-3974		1 H-3	1942.003023	131.3130009	131.3130009	257.3724818	212.2431094	105.7699965	83.27843254	83.27843254	163.2257278	PC
ARSI-B11-00807-16	ARSI-11-00267	002	MD50-11-3983		1 H-3	27709.36919	1463.535642	1463.535642	2868.529858	212.4488078	104.1962273	208.2894833	208.2894833	408.2473872	PC
ARSI-B11-00807-17	ARSI-11-00267	003	MD50-11-3975		1 H-3	1585.637544	114.9056052	114.9056052	225.2149662	213.6087308	104.86665	79.57033361	79.57033361	155.9578539	PC
ARSI-B11-00807-18	ARSI-11-00267	004	MD50-11-3973		1 H-3	1772.870635	125.146828	125.146828	245.2877829	222.9096668	109.4327461	84.09034783	84.09034783	164.8170818	PC
ARSI-B11-00807-19	ARSI-11-00267	005	MD50-11-4164		1 H-3	8192.337726	446.1381524	446.1381524	874.4307787	211.7207061	103.9397645	124.9170414	124.9170414	244.8374011	PC
ARSI-B11-00807-20	ARSI-11-00268	001	MD50-11-3979		1 H-3	551.0777254	78.00754538	78.00754538	152.8947889	223.0769961	109.5148928	72.4924148	72.4924148	142.085133	PC
ARSI-B11-00807-21	ARSI-11-00268	002	MD50-11-3978		1 H-3	2019.015954	134.2689067	134.2689067	263.1670571	212.3530676	104.2502089	82.98542106	82.98542106	162.6514253	PC
ARSI-B11-00807-22	ARSI-11-00268	003	MD50-11-3977		1 H-3	538.8929957	73.73574629	73.73574629	144.5220627	208.9702956	102.5895092	68.14126914	68.14126914	133.5568875	PC

Batch Result Verification Report

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Page 2 of 5

AbatchSampleID	SDG	Fraction	AliquotReportUnits	ChemRecovery	TracerRecovery	SampleCounts	SampleCountRate	BKG_Counts	BKG_CountRate	EFF	ALIQ	SampleCalDate	MidPointCountDate	BP_DL
ARSI-B11-00807-01			L			0.0895	180	0.030666667	180	0.3555	5.028	3/18/2011	3/15/2011	
ARSI-B11-00807-02			L			0.089722222	180	0.030666667	180	0.3608	5.028	3/18/2011	3/15/2011	
ARSI-B11-00807-03			L			0.036833333	180	0.030666667	180	0.3556	5.1	3/18/2011	3/15/2011	
ARSI-B11-00807-04	ARSI-11-00256	001	L			0.276166667	180	0.030666667	180	0.3502	5.05	2/8/2011	3/15/2011	
ARSI-B11-00807-05	ARSI-11-00256	002	L			0.702777778	180	0.030666667	180	0.3538	5.045	2/8/2011	3/15/2011	
ARSI-B11-00807-06	ARSI-11-00256	003	L			0.034	180	0.030666667	180	0.3541	5.048	2/8/2011	3/16/2011	
ARSI-B11-00807-07	ARSI-11-00256	004	L			0.1065	180	0.030666667	180	0.3523	5.047	2/8/2011	3/16/2011	
ARSI-B11-00807-08	ARSI-11-00256	005	L			0.245555556	180	0.030666667	180	0.355	5.036	2/8/2011	3/16/2011	
ARSI-B11-00807-09	ARSI-11-00256	006	L			0.033111111	180	0.030666667	180	0.355	5.053	2/8/2011	3/16/2011	
ARSI-B11-00807-10	ARSI-11-00256	007	L			0.081388889	180	0.030666667	180	0.3557	5.046	2/8/2011	3/16/2011	
ARSI-B11-00807-11	ARSI-11-00256	008	L			0.620722222	180	0.030666667	180	0.3556	5.035	2/8/2011	3/16/2011	
ARSI-B11-00807-12	ARSI-11-00256	009	L			0.558888889	180	0.030666667	180	0.3517	5.019	2/8/2011	3/16/2011	
ARSI-B11-00807-13	ARSI-11-00256	010	L			0.190833333	180	0.030666667	180	0.35	5.045	2/8/2011	3/16/2011	
ARSI-B11-00807-14	ARSI-11-00256	011	L			0.588	180	0.030666667	180	0.344	5.073	2/7/2011	3/17/2011	
ARSI-B11-00807-15	ARSI-11-00267	001	L			0.072222222	180	0.030666667	180	0.3501	5.06	2/7/2011	3/17/2011	
ARSI-B11-00807-16	ARSI-11-00267	002	L			0.632555556	180	0.030666667	180	0.3478	5.061	2/7/2011	3/17/2011	
ARSI-B11-00807-17	ARSI-11-00267	003	L			0.064888889	180	0.030666667	180	0.3329	5.067	2/7/2011	3/17/2011	
ARSI-B11-00807-18	ARSI-11-00267	004	L			0.067333333	180	0.030666667	180	0.3336	5.024	2/7/2011	3/17/2011	
ARSI-B11-00807-19	ARSI-11-00267	005	L			0.209055556	180	0.030666667	180	0.3336	5.052	2/8/2011	3/18/2011	
ARSI-B11-00807-20	ARSI-11-00268	001	L			0.042055556	180	0.030666667	180	0.3499	5.06	2/8/2011	3/18/2011	
ARSI-B11-00807-21	ARSI-11-00268	002	L			0.0745	180	0.030666667	180	0.3548	5.071	2/8/2011	3/18/2011	
ARSI-B11-00807-22	ARSI-11-00268	003	L			0.042555556	180	0.030666667	180	0.3548	5.071	2/8/2011	3/18/2011	

Batch Result Verification Report

AssaySampleID	SDG	Fraction	BP_MDA	SP_Val	UCF	CF	GrossCountRate	BKGCountRate	NetCountRate	PlatingRecovery	InstFile	DetectorID	InstrumentKey	NuclideAbd	TracerMessAct
ARSI-B11-00807-01					2.22	1	16.11	5.52	10.59		73	P-44-S-2			
ARSI-B11-00807-02					2.22	1.96	16.15	5.52	10.63		73	P-44-S-3			
ARSI-B11-00807-03					2.22	1.96	6.63	5.52	1.11		73	P-44-S-4			
ARSI-B11-00807-04	ARSI-11-00256	001			2.22	1	49.71	5.52	44.19		73	P-44-S-5			
ARSI-B11-00807-05	ARSI-11-00256	002			2.22	1	126.5	5.52	120.98		73	P-44-S-6			
ARSI-B11-00807-06	ARSI-11-00256	003			2.22	1	6.12	5.52	0.6		73	P-44-S-7			
ARSI-B11-00807-07	ARSI-11-00256	004			2.22	1	19.17	5.52	13.65		73	P-44-S-8			
ARSI-B11-00807-08	ARSI-11-00256	005			2.22	1	44.2	5.52	38.68		73	P-44-S-9			
ARSI-B11-00807-09	ARSI-11-00256	006			2.22	1	5.96	5.52	0.44		73	P-44-S-10			
ARSI-B11-00807-10	ARSI-11-00256	007			2.22	1	14.65	5.52	9.13		73	P-44-S-11			
ARSI-B11-00807-11	ARSI-11-00256	008			2.22	1	111.73	5.52	106.21		73	P-44-S-12			
ARSI-B11-00807-12	ARSI-11-00256	009			2.22	1	100.6	5.52	95.08		73	P-44-S-13			
ARSI-B11-00807-13	ARSI-11-00256	010			2.22	1	34.35	5.52	28.83		73	P-44-S-14			
ARSI-B11-00807-14	ARSI-11-00256	011			2.22	1	105.84	5.52	100.32		73	P-44-S-15			
ARSI-B11-00807-15	ARSI-11-00267	001			2.22	1	13	5.52	7.48		73	P-44-S-16			
ARSI-B11-00807-16	ARSI-11-00267	002			2.22	1	113.86	5.52	108.34		73	P-44-S-17			
ARSI-B11-00807-17	ARSI-11-00267	003			2.22	1	11.68	5.52	6.16		73	P-44-S-18			
ARSI-B11-00807-18	ARSI-11-00267	004			2.22	1	12.12	5.52	6.6		73	P-44-S-19			
ARSI-B11-00807-19	ARSI-11-00267	005			2.22	1	37.63	5.52	32.11		73	P-44-S-20			
ARSI-B11-00807-20	ARSI-11-00268	001			2.22	1	7.57	5.52	2.05		73	P-44-S-21			
ARSI-B11-00807-21	ARSI-11-00268	002			2.22	1	13.41	5.52	7.89		73	P-44-S-22			
ARSI-B11-00807-22	ARSI-11-00268	003			2.22	1	7.66	5.52	2.14		73	P-44-S-23			

Batch Result Verification Report

AbatchSampleID	SDG	Fraction	TracerKnownACT	TracerIsotope	TracerRefDate	TracerRefACT	TracerKnown	HalfLife1	HalfLife2	HalfLife3	TPUF_1	TPUF_2	TPUF_3	TPUF_4	TPUF_5	TPUF_6	DeltaT1	DeltaT2
ARSI-B11-00807-01								4499.8			0.04133	0.02	0	0.025	0	0	0	
ARSI-B11-00807-02								4499.8			0.04133	0.02	0	0.025	0	0	0	
ARSI-B11-00807-03								4499.8			0.04133	0.02	0	0.025	0	0	0	
ARSI-B11-00807-04	ARSI-11-00256	.001						4499.8			0.04133	0.02	0	0.025	0	0	35.30902778	0
ARSI-B11-00807-05	ARSI-11-00256	.002						4499.8			0.04133	0.02	0	0.025	0	0	35.43888889	0
ARSI-B11-00807-06	ARSI-11-00256	.003						4499.8			0.04133	0.02	0	0.025	0	0	35.56875	0
ARSI-B11-00807-07	ARSI-11-00256	.004						4499.8			0.04133	0.02	0	0.025	0	0	35.69861111	0
ARSI-B11-00807-08	ARSI-11-00256	.005						4499.8			0.04133	0.02	0	0.025	0	0	35.82847222	0
ARSI-B11-00807-09	ARSI-11-00256	.006						4499.8			0.04133	0.02	0	0.025	0	0	35.95833333	0
ARSI-B11-00807-10	ARSI-11-00256	.007						4499.8			0.04133	0.02	0	0.025	0	0	36.08819444	0
ARSI-B11-00807-11	ARSI-11-00256	.008						4499.8			0.04133	0.02	0	0.025	0	0	36.21805556	0
ARSI-B11-00807-12	ARSI-11-00256	.009						4499.8			0.04133	0.02	0	0.025	0	0	36.34791667	0
ARSI-B11-00807-13	ARSI-11-00256	.010						4499.8			0.04133	0.02	0	0.025	0	0	36.47777778	0
ARSI-B11-00807-14	ARSI-11-00256	.011						4499.8			0.04133	0.02	0	0.025	0	0	36.60763889	0
ARSI-B11-00807-15	ARSI-11-00267	.001						4499.8			0.04133	0.02	0	0.025	0	0	37.7375	0
ARSI-B11-00807-16	ARSI-11-00267	.002						4499.8			0.04133	0.02	0	0.025	0	0	37.86944444	0
ARSI-B11-00807-17	ARSI-11-00267	.003						4499.8			0.04133	0.02	0	0.025	0	0	37.99930556	0
ARSI-B11-00807-18	ARSI-11-00267	.004						4499.8			0.04133	0.02	0	0.025	0	0	38.12916667	0
ARSI-B11-00807-19	ARSI-11-00267	.005						4499.8			0.04133	0.02	0	0.025	0	0	38.26041667	0
ARSI-B11-00807-20	ARSI-11-00268	.001						4499.8			0.04133	0.02	0	0.025	0	0	37.39027778	0
ARSI-B11-00807-21	ARSI-11-00268	.002						4499.8			0.04133	0.02	0	0.025	0	0	37.52222222	0
ARSI-B11-00807-22	ARSI-11-00268	.003						4499.8			0.04133	0.02	0	0.025	0	0	37.65347222	0

Batch Result Verification Report

AbatchSampleID	S06	Fraction	DeltaT3	DeltaT4	DeltaT5	DeltaT6	DF1	DF2	DF3	IF1	IF2	SysErr	K_val	K_MDA	AnalysisCode	UserID	ModDate
ARSI-B11-00807-01							1					0.052279718	0.003968148	0.714266518		BSTEFFENS	3/18/2011
ARSI-B11-00807-02							1					0.052279718	0.004027307	0.724915319		BSTEFFENS	3/18/2011
ARSI-B11-00807-03							1					0.052279718	0.004026103	0.724698576		BSTEFFENS	3/18/2011
ARSI-B11-00807-04	ARSI-11-00256	.001										0.052279718	0.003904796	0.702863317	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-05	ARSI-11-00256	.002										0.052279718	0.003940952	0.709371391	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-06	ARSI-11-00256	.003										0.052279718	0.00394656	0.710380867	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-07	ARSI-11-00256	.004										0.052279718	0.003925642	0.706615636	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-08	ARSI-11-00256	.005										0.052279718	0.003947028	0.710464991	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-09	ARSI-11-00256	.006										0.052279718	0.003960272	0.712849044	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-10	ARSI-11-00256	.007										0.052279718	0.003962505	0.713250926	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-11	ARSI-11-00256	.008										0.052279718	0.003952676	0.711481763	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-12	ARSI-11-00256	.009										0.052279718	0.003896825	0.701428522	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-13	ARSI-11-00256	.010										0.052279718	0.003898	0.701640073	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-14	ARSI-11-00256	.011										0.052279718	0.003941463	0.709463428	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-15	ARSI-11-00267	.001										0.052279718	0.003851693	0.693304791	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-16	ARSI-11-00267	.002										0.052279718	0.003909869	0.703776397	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-17	ARSI-11-00267	.003										0.052279718	0.003919516	0.705512906	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-18	ARSI-11-00267	.004										0.052279718	0.003722776	0.670099655	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-19	ARSI-11-00267	.005										0.052279718	0.003919516	0.705512906	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-20	ARSI-11-00268	.001										0.052279718	0.003719983	0.669597015	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-21	ARSI-11-00268	.002										0.052279718	0.003907844	0.703411975	LSC-A-.001	BSTEFFENS	3/18/2011
ARSI-B11-00807-22	ARSI-11-00268	.003										0.052279718	0.003971104	0.714798676	LSC-A-.001	BSTEFFENS	3/18/2011

Assay Definition-

Assay Description:
H3 Normal Lvl

Assay Type: DPM (Single)

Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl\20110315_0652
Raw Results Path: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl\20110315_0652\H3 Results.results
RTF File Name: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl\20110315_0652\H3 Results.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl\20110315_0652\H3 Results.csv
Assay File Name: C:\Packard\Tricarb\Assays\H-3 Normal Lvl.1sa

Count Conditions-

Nuclide: H-3 Normal
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: UG STD H-3
Count Time (min): 180.00
Count Mode: Normal
Assay Count Cycles: 1
#Vials/Sample: 1
Repeat Sample Count: 1
Calculate & Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma & Terminator: On - Any Region

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

Count Corrections-

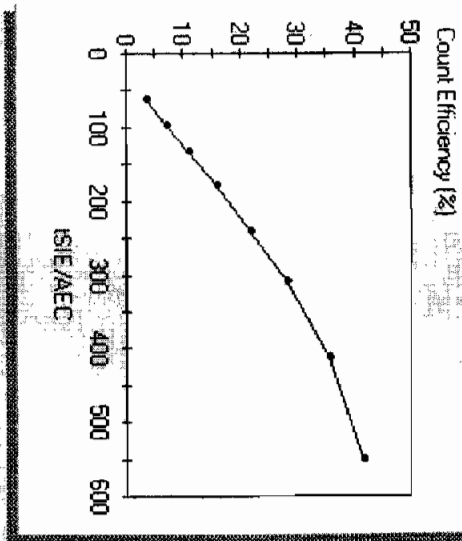
Static Controller: On
Colored Samples: Off
Coincidence Time (nsec): 18
Luminescence Correction: Off
Heterogeneity Monitor: Off
Delay Before Burst (nsec): 75

Half Life-

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

A
 B
 C

Cycle 1 Results
 Quench Curve Block Data



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

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

P#	S#	SMPD_ID	CPMA	DPM1	CSIE	Eff Nucl In A	Count Time	DATE	TIME	MESSAGES
44	1	BACKGROUND	5.52	15.63	410.50	35.35	180.00	3/15/2011	6:57:09 AM	
44	2	B11-00807-01	16.11	45.33	414.33	35.55	180.00	3/15/2011	10:04:03 AM	
44	3	B11-00807-02	16.15	44.77	426.45	36.08	180.00	3/15/2011	1:11:06 PM	
44	4	B11-00807-03	6.63	18.64	414.68	35.56	180.00	3/15/2011	4:18:12 PM	
44	5	B11-00807-04	49.71	141.93	405.93	35.02	180.00	3/15/2011	7:25:20 PM	
44	6	B11-00807-05	126.50	357.52	410.94	35.38	180.00	3/15/2011	10:32:21 PM	
44	7	B11-00807-06	6.12	17.29	411.36	35.41	180.00	3/16/2011	1:39:25 AM	
44	8	B11-00807-07	19.17	54.43	408.76	35.23	180.00	3/16/2011	4:46:20 AM	
44	9	B11-00807-08	44.20	124.50	413.36	35.50	180.00	3/16/2011	7:53:17 AM	
44	10	B11-00807-09	5.96	16.80	413.28	35.50	180.00	3/16/2011	11:00:18 AM	
44	11	B11-00807-10	14.65	41.19	414.87	35.57	180.00	3/16/2011	2:07:11 PM	
44	12	B11-00807-11	111.73	314.25	414.53	35.56	180.00	3/16/2011	5:14:06 PM	
44	13	B11-00807-12	100.60	286.06	407.94	35.17	180.00	3/16/2011	8:21:11 PM	
44	14	B11-00807-13	34.35	98.14	405.60	35.00	180.00	3/16/2011	11:28:12 PM	
44	15	B11-00807-14	105.84	299.85	409.73	35.30	180.00	3/17/2011	2:35:13 AM	
44	16	B11-00807-15	13.00	37.80	397.32	34.40	180.00	3/17/2011	5:42:17 AM	
44	17	B11-00807-16	113.86	325.22	405.78	35.01	180.00	3/17/2011	8:51:44 AM	
44	18	B11-00807-17	11.68	33.57	402.60	34.78	180.00	3/17/2011	11:58:45 AM	
44	19	B11-00807-18	12.12	36.40	381.91	33.29	180.00	3/17/2011	3:05:57 PM	
44	20	B11-00807-19	37.63	106.44	410.47	35.35	180.00	3/17/2011	6:15:25 PM	
44	21	B11-00807-20	7.57	22.68	382.91	33.36	180.00	3/17/2011	9:22:25 PM	
44	22	B11-00807-21	13.41	38.32	405.48	34.99	180.00	3/18/2011	12:31:35 AM	
44	23	B11-00807-22	7.66	21.60	412.72	35.48	180.00	3/18/2011	3:41:04 AM	

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
2-24-11	1318	B11-00704-16	B11-00704	0250	J
↓	↓	B11-00704-17	↓	↓	↓
↓	↓	B11-00704-18	↓	↓	↓
↓	↓	B11-00704-19	↓	↓	↓
↓	↓	B11-00704-20	↓	↓	↓
2-25-11	1114	SNC 117	QA	QA	*
↓	↓	Background	B11-00826	0213	↓
↓	↓	B11-00826-01	↓	↓	↓
↓	↓	B11-00826-02	↓	↓	↓
↓	↓	B11-00826-03	↓	↓	↓
↓	↓	B11-00826-04	↓	↓	↓
↓	↓	B11-00826-05	↓	↓	↓
↓	↓	B11-00826-06	↓	↓	↓
↓	↓	B11-00826-07	↓	↓	↓
↓	↓	B11-00826-08	↓	↓	↓
↓	↓	B11-00826-09	↓	↓	↓
↓	↓	B11-00826-10	↓	↓	↓
↓	↓	B11-00826-11	↓	↓	↓
3-7-11	1446	SNC 117	QA	QA	↓
3-7-11	1446	Background	B11-00807	0652	*

YSW
3-1-11

3-1-11

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
3-1-11	1446	B11-00807-01	B11-00807	0652	<i>[Signature]</i>
L	L	B11-00807-02	L	L	<i>[Signature]</i>
L	L	B11-00807-03	L	L	<i>[Signature]</i>
L	L	B11-00807-04	L	L	<i>[Signature]</i>
L	L	B11-00807-05	L	L	<i>[Signature]</i>
L	L	B11-00807-06	L	L	<i>[Signature]</i>
L	L	B11-00807-07	L	L	<i>[Signature]</i>
L	L	B11-00807-08	L	L	<i>[Signature]</i>
L	L	B11-00807-08	L	L	<i>[Signature]</i>
L	L	B11-00807-09	L	L	<i>[Signature]</i>
L	L	B11-00807-10	L	L	<i>[Signature]</i>
L	L	B11-00807-11	L	L	<i>[Signature]</i>
L	L	B11-00807-12	L	L	<i>[Signature]</i>
L	L	B11-00807-13	L	L	<i>[Signature]</i>
L	L	B11-00807-14	L	L	<i>[Signature]</i>
L	L	B11-00807-15	L	L	<i>[Signature]</i>
L	L	B11-00807-16	L	L	<i>[Signature]</i>
L	L	B11-00807-17	L	L	<i>[Signature]</i>
L	L	B11-00807-18	L	L	<i>[Signature]</i>
L	L	B11-00807-19	L	L	<i>[Signature]</i>

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
3-1-11	1446	B11-00807-20	B11-00807	0652	JDR
↓	↓	B11-00807-21	↓	↓	JDR
↓	↓	B11-00807-22	↓	↓	JDR
3-2-11	1646	Background	B11-00882	2333	JDR
↓	↓	^{JDR 3-2-11} B11-00882-04	↓	↓	JDR
↓	↓	B11-00882-05	↓	↓	JDR
↓	↓	B11-00882-06	↓	↓	JDR
↓	↓	B11-00882-07	↓	↓	JDR
↓	↓	B11-00882-08	↓	↓	JDR
↓	↓	B11-00882-09	↓	↓	JDR
↓	↓	B11-00882-10	↓	↓	JDR
↓	↓	B11-00882-11	↓	↓	JDR
↓	↓	B11-00882-12	↓	↓	JDR
↓	↓	B11-00882-13	↓	↓	JDR
↓	↓	B11-00882-14	↓	↓	JDR
↓	↓	B11-00882-15	↓	↓	JDR
↓	↓	B11-00882-16	↓	↓	JDR
↓	↓	B11-00882-17	↓	↓	JDR
↓	↓	B11-00882-18	↓	↓	JDR
↓	↓	B11-00882-19	↓	↓	JDR



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

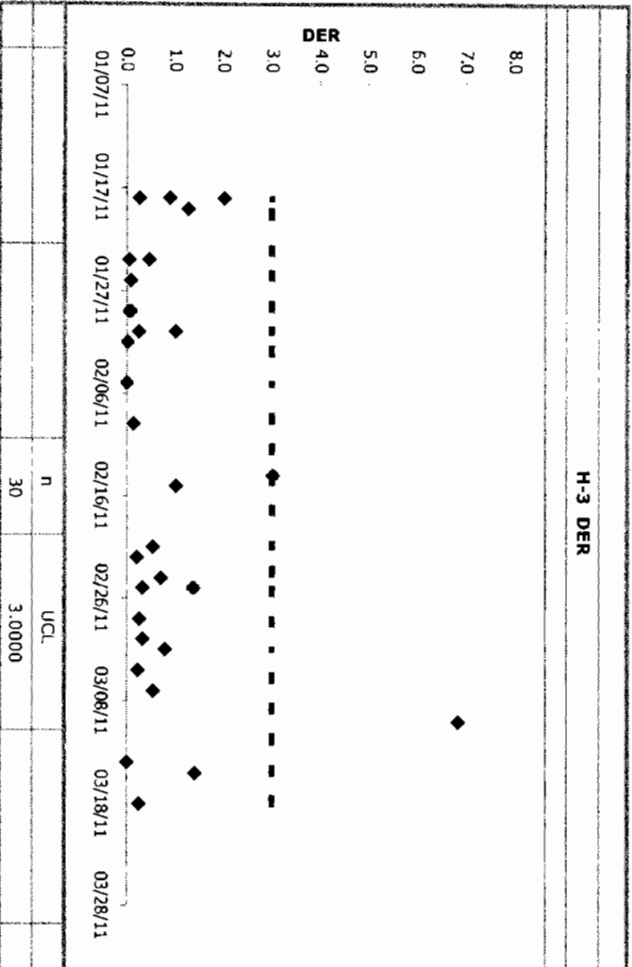
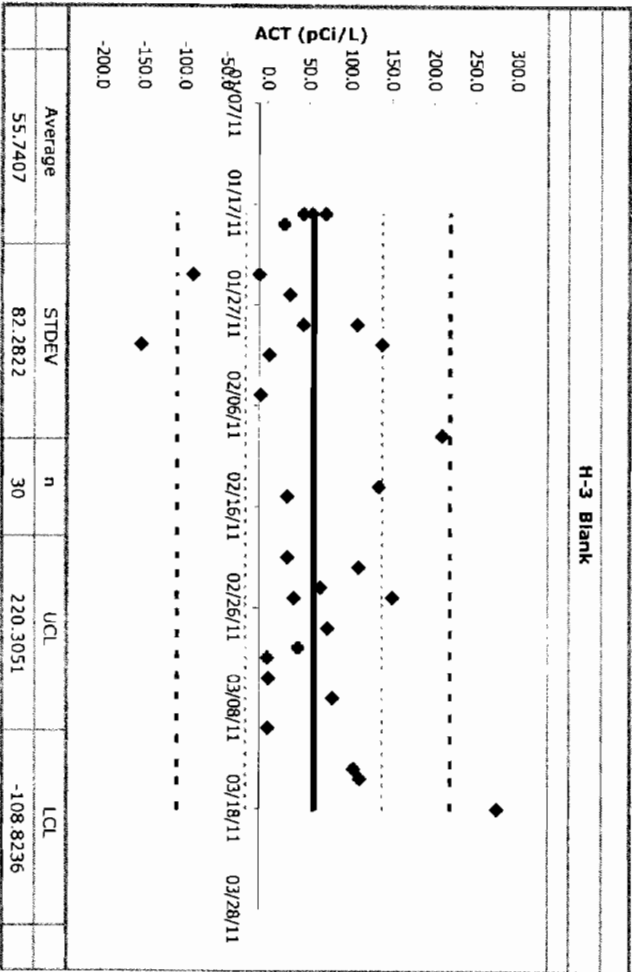
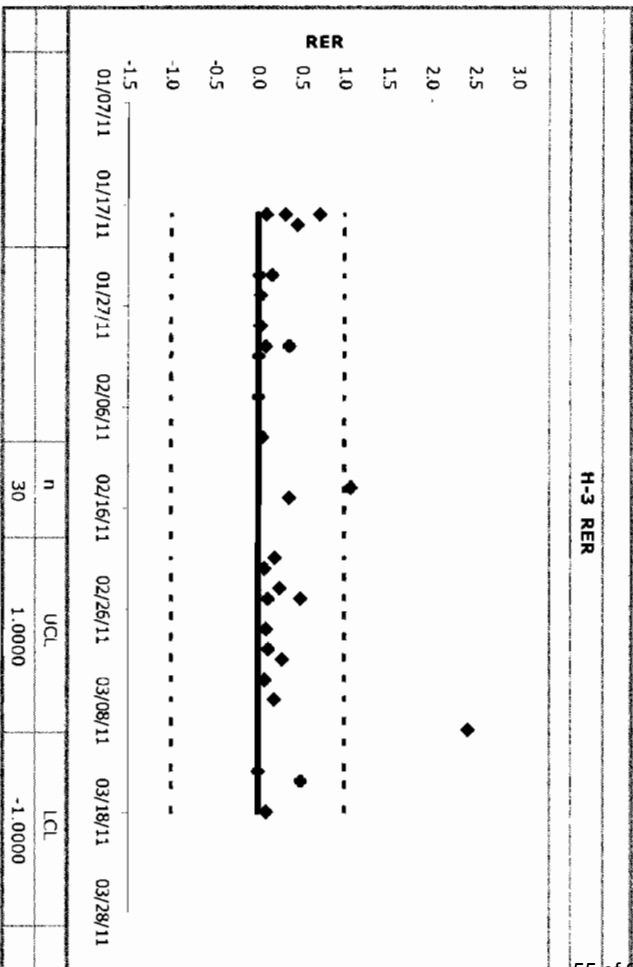
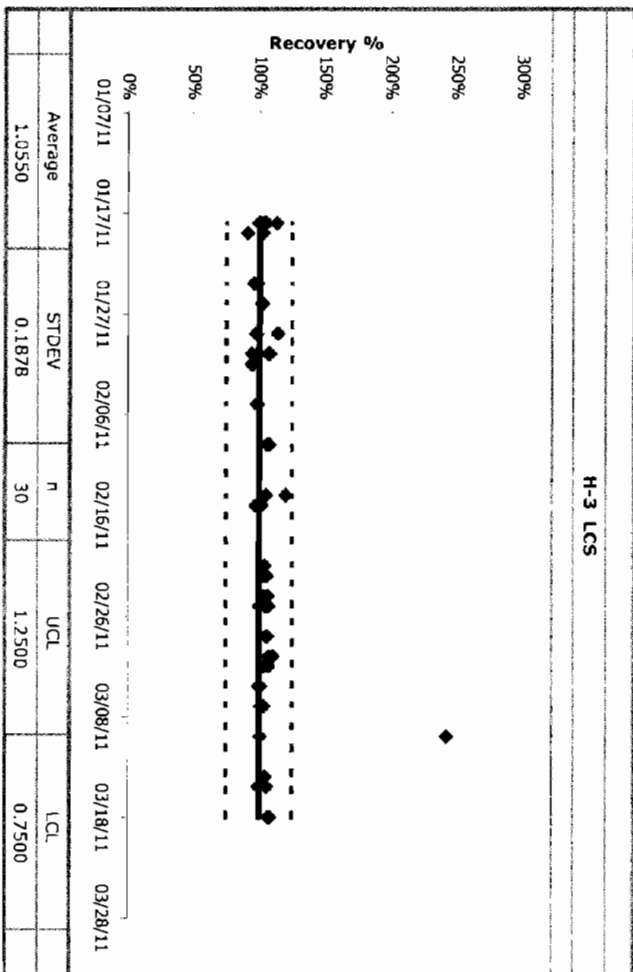
Tritium

by

**Low Level Liquid
Scintillation Counting**

Control Charts

QC Chart



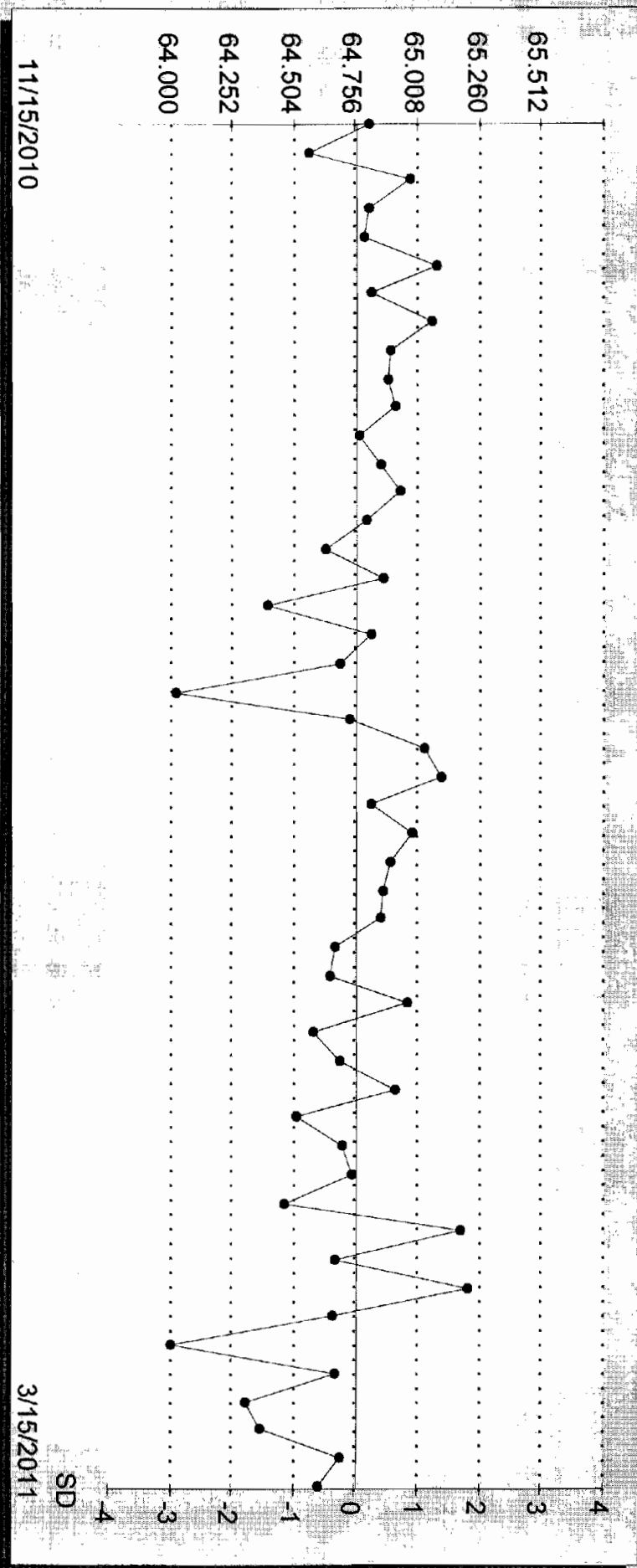
3H Efficiency
Total # pts : 1566
Valid # pts : 49
Mean : 64.76
SD : 0.25

Date	Value	Valid Pt
Nov 15, 2010	64.81	X
Nov 16, 2010	64.56	X
Nov 17, 2010	64.97	X
Nov 17, 2010	64.81	X
Nov 17, 2010	64.79	X
Nov 17, 2010	65.08	X
Nov 17, 2010	64.82	X
Nov 22, 2010	65.07	X
Nov 25, 2010	64.90	X
Nov 28, 2010	64.89	X
Nov 28, 2010	64.92	X
Nov 28, 2010	64.77	X
Nov 28, 2010	64.86	X
Nov 28, 2010	64.94	X
Nov 28, 2010	64.80	X
Nov 29, 2010	64.63	X
Nov 29, 2010	64.87	X
Nov 29, 2010	64.40	X
Nov 29, 2010	64.82	X
Nov 29, 2010	64.69	X
Nov 29, 2010	64.02	X
Nov 30, 2010	64.73	X
Nov 30, 2010	65.03	X
Nov 30, 2010	65.11	X
Nov 30, 2010	64.82	X
Dec 02, 2010	64.99	X
Dec 05, 2010	64.90	X
Dec 08, 2010	64.87	X
Dec 13, 2010	64.86	X
Dec 17, 2010	64.68	X
Dec 28, 2010	64.65	X
Jan 01, 2011	64.97	X
Jan 06, 2011	64.58	X
Jan 10, 2011	64.70	X
Jan 13, 2011	64.92	X
Jan 18, 2011	64.51	X
Jan 24, 2011	64.70	X
Jan 29, 2011	64.74	X
Jan 31, 2011	64.46	X
Feb 05, 2011	65.19	X
Feb 11, 2011	64.68	X
Feb 15, 2011	65.22	X
Feb 19, 2011	64.66	X
Feb 23, 2011	64.01	X
Feb 25, 2011	64.68	X
Mar 01, 2011	64.31	X
Mar 04, 2011	64.27	X

Mar 09, 2011 64.70
Mar 15, 2011 64.61

X
X

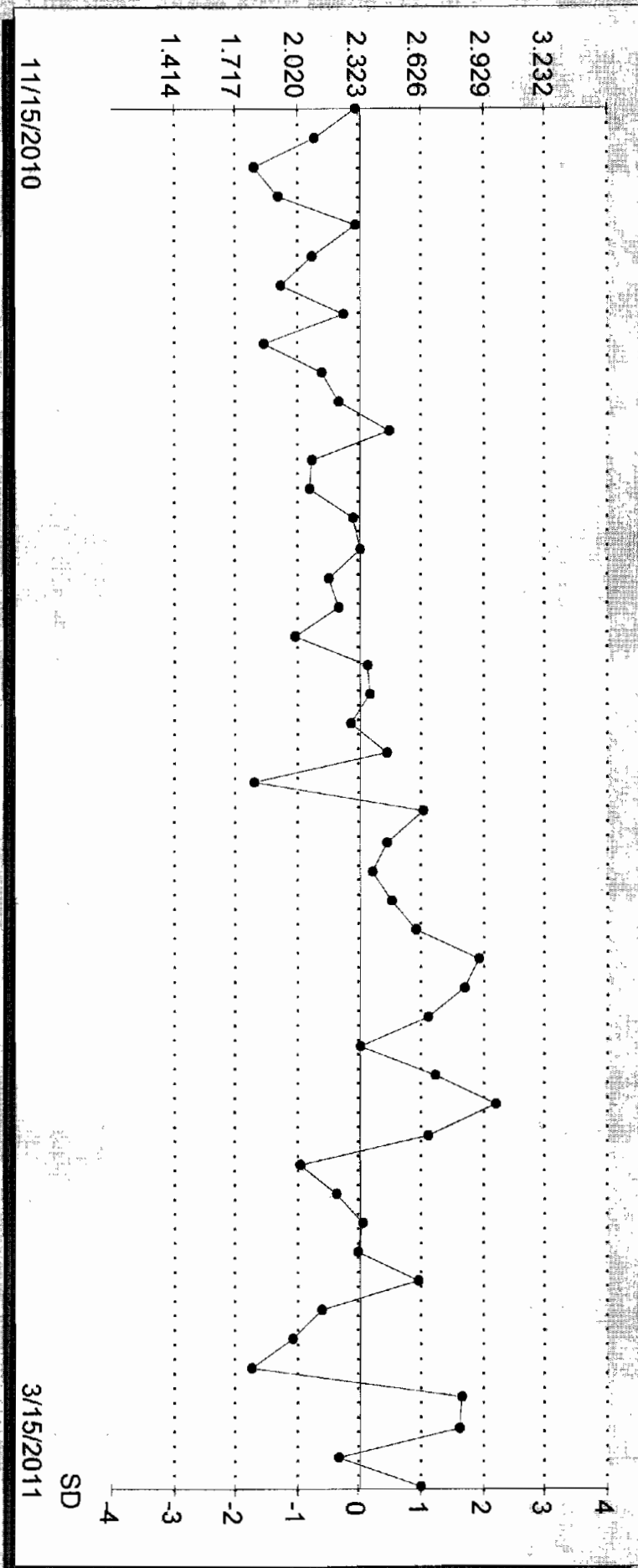
3H Efficiency : 1566
 Total # pts : 49
 Valid # pts : 64.76
 Mean : 0.25
 SD : 0.25



3H Background
Total # pts : 1528
Valid # pts : 48
Mean : 2.32
SD : 0.30

Date	Value	Valid Pt
Nov 15, 2010	2.31	X
Nov 16, 2010	2.10	X
Nov 17, 2010	1.80	X
Nov 17, 2010	1.93	X
Nov 17, 2010	2.30	X
Nov 17, 2010	2.09	X
Nov 17, 2010	1.94	X
Nov 22, 2010	2.25	X
Nov 25, 2010	1.85	X
Nov 28, 2010	2.14	X
Nov 28, 2010	2.23	X
Nov 28, 2010	2.47	X
Nov 28, 2010	2.09	X
Nov 28, 2010	2.08	X
Nov 28, 2010	2.29	X
Nov 29, 2010	2.33	X
Nov 29, 2010	2.18	X
Nov 29, 2010	2.22	X
Nov 29, 2010	2.01	X
Nov 29, 2010	2.36	X
Nov 29, 2010	2.38	X
Nov 30, 2010	2.28	X
Nov 30, 2010	2.45	X
Nov 30, 2010	1.81	X
Dec 02, 2010	2.63	X
Dec 05, 2010	2.46	X
Dec 08, 2010	2.39	X
Dec 13, 2010	2.48	X
Dec 17, 2010	2.60	X
Dec 28, 2010	2.90	X
Jan 01, 2011	2.84	X
Jan 06, 2011	2.66	X
Jan 10, 2011	2.33	X
Jan 13, 2011	2.69	X
Jan 18, 2011	2.99	X
Jan 24, 2011	2.65	X
Jan 29, 2011	2.04	X
Jan 31, 2011	2.21	X
Feb 05, 2011	2.34	X
Feb 11, 2011	2.31	X
Feb 15, 2011	2.61	X
Feb 19, 2011	2.14	X
Feb 23, 2011	2.00	X
Feb 25, 2011	1.80	X
Mar 01, 2011	2.83	X
Mar 04, 2011	2.81	X
Mar 04, 2011	2.73	X

3H Background : 1528
Total # pts : 48
Valid # pts : 2.32
Mean : 0.30
SD : 0.30





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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Low Level Liquid Scintillation Counting

Calibration Information

STD ID: S-0247

ARS INTERNATIONAL		Add/Edit Secondary Stds	Parent Standard Data			
Planning		Parent Solution Reference #	NIST SRM 4927F			
Planning Comments	Create an H-3 LCS standard	Parent Solution #	S-0237			
Target dpm/g (on dil. date)	5.96	Parent Principal Radionuclide	H-3	Half Life (Days)	4499.6000000	
Target Final volume ml	2000	Parent Reference Date	03/22/2010 10:10			
Appx mass g of Parent Sol'n	3.274623294	Parent Certified Act	3503.682716	Cert Act/Vol Units	dpm	g
Appx vol ml of Parent Sol'n	3.280528244	Parent Cert Act Uncert 1 Sigma	0.0036			
Expected Addition for Analysis g	5	Parent Sp. Gravity G/ml	0.9982			
Standards Preparation / Dilution		Parent Supplier	NIST SRM 4927F			
Secondary Solution #	S-0247	Parent Date Recvd	01/02/00			
Dilution Date (New Ref Date)	10/11/2010 10:30	Parent Received By	Unknown			
Ampoule, Empty (g)		Parent Cert Exp Date				
Ampoule /Solution Gross (g)		Parent Matrix	H2O			
Net Wt Removed (g)		Certified dpm/g At Ref Date	3503.682716			
Transfer Container, empty (g)	1.7	Certified dpm/g on 10/11/2010 10:30	3395.61045			
Container Plus Solution (g)	4.994	Parent Comments	Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. -BJS 3/22/10			
Net Wt Transferred (g)	3.294					
DPM Xferred on 10/11/2010 10:30	11165.79962					
Diluent/matrix	DI H2O					
Diluent Density Cont, empty (g)		Parent Tech	Unknown			
Test Mass of 5 ml of Diluent (g)		Is_Primary	FALSE			
Diluent Density Test - (g/ml)		Is_LCS	TRUE			
Dilution Empty Container Mass (g)	473.96	Is_Tracer	FALSE			
Dilution Full Cont g (if measured)	2467.85	Is_Calib	FALSE			
Dilution Final Volume ml (if measured)	2000					
Final Dilution Density (g/ml)	0.998945					
Final Dilution Measured Mass g	1993.89					
Comments	Stock H-3 LCS standard. Dilution performed as stated above by B Steffens. -BJS 10/11/10					
Final Dilution dpm/g	6.610038479					
Final Dil New Ref Date/Time	10/11/2010 10:30					

S-0247



H-3

Verified

10/13/10

SL

Expires

10/13/11

Manufacturer

NIST SRM 4927F

Sol Matrix

H2O

Ref No

NIST SRM 4927F

Tech

Unknown

Parent ID

S-0237



RADIOACTIVE STANDARDS -- BATON ROUGE LABORATORY



QUALITY CONTROL PROGRAM
AMERICAN RADIATION SERVICES
RADIOACTIVE REFERENCE SOLUTIONS
ANNUAL ACTIVITY VERIFICATION

VERIFICATION DATE **10/13/2010 20:18** date counted
 STANDARD REFERENCE # **S-0247**

Principal Radionuclide

H-3

ENTER →

Half Life, Years

1.232E+01

OR →

Half Life, Days

4.4998E+03**4.4998E+03**Radionuclide **H-3**Dilution Reference Date **10/11/2010 10:30**Dilution Activity **2.53** pCi per gram ==> dpm/g**5.61**Verif. Date Decay Corrected **2.53** pCi per gram ==> dpm/g**5.61**

Minimum of 3 Required

Trial ID	Sample Counts	Count Time (min)	Detector	Efficiency	Bkg. (cpm)	Net Weight	Decay Corrected Activity Result (dpm/g)	Decay Corrected Activity Result (pCi/g)
S-0247-V1	16.99	1	LSC	0.3440	6.86	5.017	5.87	2.64
S-0247-V2	16.76	1	LSC	0.3484	6.86	4.979	5.70	2.57
S-0247-V3	16.97	1	LSC	0.3465	6.86	4.972	5.87	2.64
S-0247-V4	16.76	1	LSC	0.3449	6.86	4.982	5.76	2.60
S-0247-V5	16.88	1	LSC	0.3433	6.86	4.980	5.86	2.64

10% Max**PASS**

Standard Deviation percent of known concentration

5% Max**PASS**

Target Activity

% Diff

Average

Two Sigma Uncertainty

5.81**2.62****0.15****0.07****1.35%****1.35%****5.61****2.53****3.66%****3.66%**Verification Expiration Date: **October 13, 2011**Prepared & Counted By *B. J. Self*Date: **10/13/2010 20:18**Verified & Approved By *D. Eugene Mulligan*Date: **10-14-10 / 12:24**QC Approval *[Signature]*Date: **10-14-10 / 12:30**

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)	167000	Parent Principal Radionuclide		H-3	Half Life (Days)	4499.6000000	
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		38082800	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		38082800			
Transfer Container, empty (g)	0	Certified dpm/g on 10/18/2003 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)	4.7674						
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 - 4/19/2006 RTS						
Final Dilution dpm/g	607764.9485						
Final Dil New Ref Date/Time	10/19/2005 00:00						



Add / Edit *Primary* Standards

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

5-0031



National Institute of Standards & Technology

Certificate

Standard Reference Material 4927F Hydrogen-3 Radioactivity Standard

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

Radiological Hazard

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

Chemical Hazard

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

Storage and Handling

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

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

Preparation

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

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

Bert M. Coursey, Chief
Ionizing Radiation Division

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

Nancy M. Trahey, Chief
Standard Reference Materials Program

PROPERTIES OF SRM 4927F

Certified values

Solution density	$(0.998 \pm 0.002) \text{ g} \cdot \text{mL}^{-1}$ at 20.0 °C [b]*
Radionuclide	Hydrogen-3
Reference time	1200 EST, 3 September 1998 1100 CST
Massic activity of the solution [c]	$634.7 \text{ kBq} \cdot \text{g}^{-1}$
Relative expanded uncertainty ($k=2$)	0.72% [d] [e]

Uncertified values

Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 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	
Solution mass	Approximately 5.0 g		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L ⁻¹)	Mass Fraction (g·g ⁻¹)
	H ₂ O 3HHO	55 6 × 10 ⁻⁷	1.00 1 × 10 ⁻⁸
Radiological Properties:			
Radionuclidic impurities	None detected [f]		
Half lives used	Hydrogen-3: (4500 ± 8) d [g]		
Calibration method and measuring instrument(s)	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 μSv is equal to 0.1 mrem.
 Distance from Ampoule (cm): 1 30 100
 Approximate Dose Rate ($\mu\text{Sv/h}$): <0.1 (Not detectable)
- [b] The stated uncertainty is two times the standard uncertainty.
- [c] Massic activity is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].
- [d] The reported value, y , of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as $y = f(x_1, x_2, x_3, \dots, x_n)$, where f is a mathematical function derived from the assumed model of the measurement process.
- The value, x_i , used for each input quantity i has a standard uncertainty, $u(x_i)$, that generates a corresponding uncertainty in y , $u(y) = |\partial y / \partial x_i| \cdot u(x_i)$, called a component of combined standard uncertainty of y .
- The combined standard uncertainty of y , $u_c(y)$, is the positive square root of the sum of the squares of the components of combined standard uncertainty.
- The combined standard uncertainty is multiplied by a coverage factor of $k = 2$ to obtain U , the expanded uncertainty of y .
- Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation $u_c(y)$, the unknown value of the massic activity is believed to lie in the interval $y \pm U$ 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 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



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ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4742
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-001
Date Received: 02/09/11
Report Date: 03/18/11

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	12.240	NA	NA	NA		%	Percent Moisture	03/15/11 19:25	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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: ARS1-11-00256

Client Sample ID: MD21-11-4740

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-002

Date Received: 02/09/11

Report Date: 03/18/11

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	10.069	NA	NA	NA		%	Percent Moisture	03/15/11 22:32	AB	NA
NOTES: Project Cost Code MR8R032NFB00										

SOH

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4746
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-003
Date Received: 02/09/11
Report Date: 03/18/11

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	7.796	NA	NA	NA	U	%	Percent Moisture	03/16/11 01:39	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4747
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-004
Date Received: 02/09/11
Report Date: 03/18/11

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	7.977	NA	NA	NA		%	Percent Moisture	03/16/11 04:46	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4741
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-005
Date Received: 02/09/11
Report Date: 03/18/11

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	12.709	NA	NA	NA		%	Percent Moisture	03/16/11 07:53	AB	NA

NOTES: Project Cost Code MR8R032NFB00

SDH

Project Manager Review

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ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4738
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-006
Date Received: 02/09/11
Report Date: 03/18/11

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	4.937	NA	NA	NA	U	%	Percent Moisture	03/16/11 11:00	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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NELAP Certificate # E87558



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ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4748
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-007
Date Received: 02/09/11
Report Date: 03/18/11

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	9.360	NA	NA	NA		%	Percent Moisture	03/16/11 14:07	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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

LELAP Certificate# 01949

NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4739
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-008
Date Received: 02/09/11
Report Date: 03/18/11

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	7.465	NA	NA	NA		%	Percent Moisture	03/16/11 17:14	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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

LELAP Certificate# 01949

NELAP Certificate # E87558



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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4743
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-009
Date Received: 02/09/11
Report Date: 03/18/11

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	10.253	NA	NA	NA		%	Percent Moisture	03/16/11 20:21	AB	NA
NOTES: Project Cost Code MR8R032NFB00										

Project Manager Review

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

LELAP Certificate# 01949

NELAP Certificate # E87558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256

Client Sample ID: MD21-11-4745

Sample Collection Date: 02/08/11

Sample Matrix: Silica

Request or PO Number: 11-1296

ARS Sample ID: ARS1-11-00256-010

Date Received: 02/09/11

Report Date: 03/18/11

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	12.163	NA	NA	NA		%	Percent Moisture	03/16/11 23:28	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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

LELAP Certificate# 01949

NELAP Certificate # E87558



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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4744
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-011
Date Received: 02/09/11
Report Date: 03/18/11

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	8.158	NA	NA	NA		%	Percent Moisture	03/17/11 02:35	AB	NA

NOTES: Project Cost Code MR8R032NFB00

Project Manager Review

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

LELAP Certificate# 01949

NELAP Certificate # E87558



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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 ARS1-11-00256, 00267, 00268
 Client LANL

LANL ID	ARS ID	weight of cylinder with gel (g)	weight of empty cylinder (g)	Weight of gel (g)	amount of liquid collected (ml)	amount of liquid tested (ml)	% moisture
MD21-11-4742	ARS1-11-00256-001	609	439	170	20.808	5.05	12.24
MD21-11-4740	ARS1-11-00256-002	607	439	167	16.816	5.045	10.0694611
MD21-11-4746	ARS1-11-00256-003	603	437	166	12.941	5.048	7.79578313
MD21-11-4747	ARS1-11-00256-004	622	463	160	12.763	5.047	7.976875
MD21-11-4741	ARS1-11-00256-005	617	442	174	22.113	5.036	12.7086207
MD21-11-4738	ARS1-11-00256-006	599	443	155	7.653	5.053	4.93741935
MD21-11-4748	ARS1-11-00256-007	609	442	167	15.631	5.046	9.35988024
MD21-11-4739	ARS1-11-00256-008	623	456	167	12.466	5.035	7.46467066
MD21-11-4743	ARS1-11-00256-009	610	448	161	16.507	5.019	10.252795
MD21-11-4745	ARS1-11-00256-010	611	433	179	21.771	5.045	12.1625698
MD21-11-4744	ARS1-11-00256-011	599	439	159	12.971	5.058	8.15786164
MD50-11-3974	ARS1-11-00267-001	593	437	156	6.055	5.073	3.88141026
MD50-11-3983	ARS1-11-00267-002	604	441	163	14.801	5.06	9.0803681
MD50-11-3975	ARS1-11-00267-003	603	441	162	10.615	5.061	6.55246914
MD50-11-3973	ARS1-11-00267-004	596	439	155	6.568	5.067	4.23741935

MD50-11-4164	ARS1-11-00267-005	619	437	181	31.773	5.024	17.5541436
MD50-11-3979	ARS1-11-00268-001	611	443	168	15.132	5.052	9.00714286
MD50-11-3978	ARS1-11-00268-002	608	441	167	18.422	5.06	11.0311377
MD50-11-3977	ARS1-11-00268-003	602	438	162	12.006	5.071	7.41111111

Balance ID: 0102/H1331122173560P

Pipettor ID: FJ40469

Signature



Date

3-17-11

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

SDG Number ARS1-11-00256, 00267, 00268
 Client LANL

LANL ID	ARS ID	weight of cylinder with gel (g)	weight of empty cylinder (g)	Weight of gel (g)	amount of liquid collected (ml)	amount of liquid tested (ml)	% moisture
MD21-11-4742	ARS1-11-00256-001	609	439	170	20.808	5.050	#DIV/0!
MD21-11-4740	ARS1-11-00256-002	607	439	167	16.816	5.045	#DIV/0!
MD21-11-4746	ARS1-11-00256-003	603	437	166	12.941	5.048	#DIV/0!
MD21-11-4747	ARS1-11-00256-004	622	463	160	12.763	5.047	#DIV/0!
MD21-11-4741	ARS1-11-00256-005	617	442	174	22.113	5.036	#DIV/0!
MD21-11-4738	ARS1-11-00256-006	599	443	155	7.653	5.053	#DIV/0!
MD21-11-4748	ARS1-11-00256-007	609	442	167	15.631	5.046	#DIV/0!
MD21-11-4739	ARS1-11-00256-008	623	456	167	12.466	5.035	#DIV/0!
MD21-11-4743	ARS1-11-00256-009	610	448	161	16.507	5.019	#DIV/0!
MD21-11-4745	ARS1-11-00256-010	611	433	179	21.771	5.046	#DIV/0!
MD21-11-4744	ARS1-11-00256-011	599	439	159	12.971	5.058	#DIV/0!
MD50-11-3974	ARS1-11-00267-001	593	437	156	6.055	5.073	#DIV/0!
MD50-11-3983	ARS1-11-00267-002	604	441	163	14.801	5.066	#DIV/0!
MD50-11-3975	ARS1-11-00267-003	603	441	162	10.615	5.061	#DIV/0!
MD50-11-3973	ARS1-11-00267-004	596	439	155	6.568	5.067	#DIV/0!

LC5-5.028
 LC5D-5.028
 BIK-5.100

MD50-11-4164	AR51-11-00267-005	619	437	181	31,778	5,024	#DIV/0!
MD50-11-3979	AR51-11-00268-001	611	443	168	15,132	5,052	#DIV/0!
MD50-11-3978	AR51-11-00268-002	608	441	167	18,422	5,060	#DIV/0!
MD50-11-3977	AR51-11-00268-003	602	438	162	12,006	5,071	#DIV/0!

Balance ID: 0102/H1331122173560P
Pipettor ID: FJ40469

Signature



Date

3-1-11



2609 North River Road • Port Allen, Louisiana 70767

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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Folder Duplicate



Report Compilation Checklist

ARS SDG: 11-00256 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?	Yes	No	<input checked="" type="checkbox"/> N/A	
24) Other:	Yes	No	N/A	

Jurana Heese 3-18-11
Report Generator Signature Date

Uym 3-18-11
Management Review Signature Date



LSC Technical Review Checklist

ARS SDG 11-00256

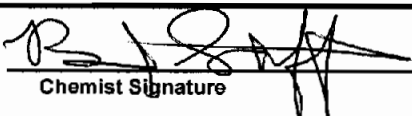
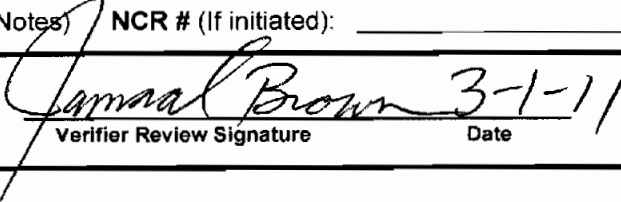
Sample Matrix: SI Aliquot (Circle One): Dry As Received ☒ Filtered Other: _____

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

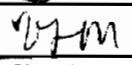

ARS A. Batch ID(s): Batch A: B11-00807 Batch B: N/A Batch C: N/A

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="checkbox"/> Yes No N/A	<input checked="" type="checkbox"/> Yes No N/A
2) 100% of Manual Calculations Verified?	Yes No <input checked="" type="checkbox"/> N/A	Yes No <input checked="" type="checkbox"/> N/A
3) Blank Composition/Configuration Matches Calibration?	<input checked="" type="checkbox"/> Yes No N/A	<input checked="" type="checkbox"/> Yes No N/A
4) Deviations from procedure are documented and verified?	Yes No <input checked="" type="checkbox"/> N/A	Yes No <input checked="" type="checkbox"/> N/A
5) Appropriate Cocktail Selected?	<input checked="" type="checkbox"/> Yes No N/A	<input checked="" type="checkbox"/> 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>3-1-11</u> Date	 Verifier Review Signature

B. ANALYSIS REVIEW

	Analyst Review	QA Officer Review
1) Calibrations Valid and Current?	<input checked="" type="checkbox"/> Yes No N/A	<input checked="" type="checkbox"/> Yes No N/A
2) Backgrounds Valid and Current?	<input checked="" type="checkbox"/> Yes No N/A	<input checked="" type="checkbox"/> Yes No N/A
3) Source Checks Completed and Acceptable?	<input checked="" type="checkbox"/> Yes No N/A	<input checked="" type="checkbox"/> Yes No N/A
 QA Officer Signature		<u>3-18-11</u> Date
	Analyst Review	Technical Review
4) Background Checks Complete and Acceptable?	<input checked="" type="checkbox"/> Yes No N/A	<input checked="" type="checkbox"/> Yes No N/A
5) 100% of Manually Entered Parameters Verified Accurate?	<input checked="" type="checkbox"/> Yes No N/A	<input checked="" type="checkbox"/> Yes No N/A
6) Appropriate QC samples initiated at required frequency?	<input checked="" type="checkbox"/> Yes No N/A	<input checked="" type="checkbox"/> 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="checkbox"/> Yes No N/A	Yes No N/A
b) Spectra show no Evidence of Interferences?	<input checked="" type="checkbox"/> Yes No N/A	Yes No N/A
c) Sample Quench for All Samples within Range of Quench Curve?	<input checked="" type="checkbox"/> Yes No N/A	Yes No N/A
7) Analysis Anomaly? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (See Comments) NCR # (If initiated): _____		
 Analyst Signature	<u>3-18-11</u> Date	<u>N/A</u> Technical Reviewer Signature



C. BATCH QC VALIDATION

	Proj. Mgr. Review			QA Officer Review			
1) Activity + 3xCSU a Negative Number?	Yes	No	N/A	Yes	No	N/A	
2) RDL Criteria are Met?	Yes	No	N/A	Yes	No	N/A	
3) Method Blank Criterion Met?	Yes	No	N/A	Yes	No	N/A	
4) LCS/LCD Criteria Met?	Yes	No	N/A	Yes	No	N/A	
5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met?	Yes	No	N/A	Yes	No	N/A	
6) MS/MSD Criteria Met?	Yes	No	N/A	Yes	No	N/A	
7) Batch QC Anomaly? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (See Tech Notes) NCR # (If initiated): _____							
<u>Susan Heere</u> Project Manager Signature		<u>3-18-11</u> Date		<u>UHM</u> QA Officer Signature		<u>3-18-11</u> Date	

GENERAL COMMENTS

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

Analysis Code	Group	Isotope	Activity Units	Aliquot Units	Procedure No.	ROL	LCS_LL	LCS_UL	MS_LL	MS_UL	RadY_LL	RadY_UL	GravY_LL	GravY_UL	RER	RPD	DilutionReq	RoughPrepReq	BlankCorrectionMDA	BlankCorrectionAL	CountTimeReq	AliquotReq
LSC-A-001	STL	H-3	PC1	L	ARS-054	2.50E-02	80	120	75	125	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		

SDG Report - Samples and Containers

SDG		SDG Specific Data		TAT Days		Project Type	
Sample Count	ARS1-11-00256	Rpt Level	4	Date Received	2/9/2011	COC Number	Environmental
Client	Los Alamos National Laboratory	Client Deadline	3/11/2011	PO Number	63641-001-10		
Client Code	114	Internal Deadline	3/10/2011	Job Number	MRBR032NFB00		
Profile Number	PN-00094	Lab Deadline	3/8/2011	Job Location			
Comments							

FR		ClientID	Matrix	SampleStartDate	SampleEndDate	Samples and Containers (→) Checked In This Far																Comments
						Disp	Hold	Arch	Storage	X	Units	Y	Units	Z	Units							
001	→	MD21-11-4742	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79865	1		1.00			30	13		N	N/A										
002	→	MD21-11-4740	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79866	1		1.00			30	12		N	N/A										
003	→	MD21-11-4746	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79867	1		1.00			30	12		N	N/A										
004	→	MD21-11-4747	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79868	1		1.00			35	13		N	N/A										
005	→	MD21-11-4741	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79869	1		1.00			25	12		N	N/A										
006	→	MD21-11-4738	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79870	1		1.00			30	12		N	N/A										
007	→	MD21-11-4748	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79871	1		1.00			25	12		N	N/A										
008	→	MD21-11-4739	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79872	1		1.00			35	13		N	N/A										
009	→	MD21-11-4743	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79873	1		1.00			30	12		N	N/A										
010	→	MD21-11-4745	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79874	1		1.00			30	12		N	N/A										
011	→	MD21-11-4744	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6													
		IC_ID	Cnt	Volume_mL	WL 9	PH_Orig	PH_Final	CPM	UR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol						
		79875	1		1.00			30	12		N	N/A										

SDG Report - Analysis Assignments

Temp SDG	ARS1-11-00256	Sample Count	
Client	Los Alamos National Laboratory	Analysis Count	1-11

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

ARS FILE TRACKING SHEET

SDG: ARS1-11-00256

Task	Date / Time	Initials
Date & Time Samples Received	02-09-11/09:58	CWB
ICOC Initiated / Storage Location: <u>Q6</u>	02-09-11/11:56	CWB
Technical Checks Performed	See Batch	_____
Report Written / EDD Generated: <u>3-18-11 / 1120</u> <div style="text-align: right; font-size: small;">Date/Time Initials</div>	3-18-11 / 1115	SDH
Quality Assurance Checks Performed on Report	3-18-11 1347	THM
Management Check Performed on Report		
Preliminary Report Sent		
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 ^{see notes} Mgmt. Approval: _____		✓

NOTES:

SDG: ARS MI-00256

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

COC ☒ Yes ☐ No

Good Condition ☒ Yes ☐ No
 Sec. Seals ☐ Yes ☒ No
 Seal Intact ☐ Yes ☐ No ☒ N/A
 Radioactive ☐ Yes ☒ No

Marked Radioactive

Samples Rcv

Matrix

[AF , AQ , BI , FE , LT , (SI) , SO , UR , VG]

[illegible]

Surveyors' Name: Camp

Date/Time Surveyed: 2-9-11 / 10:42