Appendix I: ALS Analytical Reports

Gross Alpha/Beta

Case Narrative

Tidewater, Inc.

Phase 1 RI OU2 Great Kills Park – 2016-007

Work Order Number: 1810475

1. This report consists of the analytical results and supporting documentation for six water samples received by ALS on 10/20/2018.

2. These samples were prepared according to the current revision of SOP 702.

3. The samples were analyzed for gross alpha and beta activity by gas flow proportional counting according to the current revision of SOP 724. The analyses were completed on 11/21/2018. Gross alpha results are referenced to ^{241}Am. Gross beta results are referenced to ^{90}Sr/Y.

4. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.

5. The requested MDC for gross alpha and/or beta for samples 1810475-1, -2, and -6 was not achieved. These samples were counted for a maximum count time of 1000 minutes and results are reported without further qualification. The results are flagged with an “M” and/or “M3” qualifier on the final reports. The reported activity with an “M3” qualifier exceeds the achieved MDC.

6. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Pik Yee Yuen — 12/5/18

Pik Yee Yuen — Date

Radiochemistry Primary Data Reviewer

12/6/18

Radiochemistry Final Data Reviewer — Date

1

Section 1

CHAIN OF CUSTODY

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1810475
Client Name: Tidewater, Inc.
Client Project Name: Phase 1 RI OU2 Great Kills Park
Client Project Number: 2016-007
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
OU2-1-SW001	1810475-1		WATER	18-Oct-18	10:10
OU2-1-SW003	1810475-2		WATER	18-Oct-18	11:40
OU2-1-SW004	1810475-3		WATER	18-Oct-18	13:55
REF-1-SW001	1810475-4		WATER	18-Oct-18	15:40
OU1-1-SW005	1810475-5		WATER	19-Oct-18	9:10
OU2-1-SW002	1810475-6		WATER	19-Oct-18	12:50

ALS Environmental

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

Chain-of-Custody

Turnaround time for samples received after 2 p.m. will be calculated beginning from the next business day.
Turnaround time for samples received Saturday will be calculated beginning from the next business day.

ALS WORKORDER # 1810475

TURNAROUND TIME		SAMPLER	John C Schroeder	PAGE	1 of 1
SITE ID				DISPOSAL	BY LAB or RETURN
EDD FORMAT	contact Ryan Wensink				
PURCHASE ORDER					
BILL TO COMPANY	Tidewater				
INVOICE ATTN TO	Ryan Wensink				
ADDRESS	3761 Attucks Drive				
CITY / STATE / ZIP	Powell, OH 43065				
PHONE	614-389-6251				
FAX					
E-MAIL	ryan.wensink@ ~~tidewater~~ tideh2o.net				

PROJECT NAME	Phase I RI OU2 Great Kills Park
PROJECT No.	2016-007
COMPANY NAME	Tidewater
SEND REPORT TO	Ryan Wensink (Tidewater)
ADDRESS	Devon Chicoine (AECOM)
CITY / STATE / ZIP	devon.chicoine@aecom.com
PHONE	(703) 966-5484
FAX	Collen Scott
E-MAIL	colleen.scott@aecom.com

PARAMETER/METHOD REQUEST FOR ANALYSIS

A	Radium 226/228	EPA 903/904
B	Gross Alpha + Beta	EPA 900
C	Total Uranium	EPA 200.8
D		
E		
F		
G		
H		
I		
J		

LAB ID	FIELD ID	MATRIX	SAMPLE DATE	SAMPLE TIME	# OF BOTTLES	PRESERVATIVE	QC	A	B	C	D	E	F	G	H	I	J	SEE NOTES SECTION
1	OU2-1-SW001	W	101818	1010	5	HNO_3		X	X	X								
2	OU2-1-SW003	W	101818	1140	5	HNO_3		X	X	X								
3	OU2-1-SW004	W	101818	1355	5	HNO_3		X	X	X								
4	REF-1-SW001	W	~~101818~~ 101818	1540	5	HNO_3		X	X	X								
5	OU1-1-SW005	W	101918	0910	5	HNO_3		X	X	X								
6	OU2-1-SW002	W	101918	1250	5	HNO_3		X	X	X								

10/19/18

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

NOTES	REPORT LEVEL / QC REQUIRED
	Summary (Standard QC)
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw

PRESERVATION KEY: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaOH/ZnAcetate 6-NaHSO4 7-4°C 8-Other

Form 202r9

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY		John C Schroeder	10/19/18	1900
RECEIVED BY	Fed Ex	Fed Ex	10/19/18	1900
RELINQUISHED BY	FED EX			
RECEIVED BY	C Trimble	C Trimble	10-20-18	0930
RELINQUISHED BY				
RECEIVED BY				

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Tidewater Workorder No: 1810475

Project Manager: LS Initials: CDT Date: 10-20-18

1.	Are airbills / shipping documents present and/or removable?	DROP OFF	YES	NO
2.	Are custody seals on **shipping** containers intact?	NONE	YES	NO
3.	Are custody seals on **sample** containers intact?	NONE	YES	NO
4.	Is there a COC (chain-of-custody) present?		YES	NO
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		YES	NO
6.	Are short-hold samples present?		YES	NO
7.	Are all samples within holding times for the requested analyses?		YES	NO
8.	Were all sample containers received intact? (not broken or leaking)		YES	NO
9.	Is there sufficient sample for the requested analyses?		YES	NO
10.	Are all samples in the proper containers for the requested analyses?		YES	NO
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)	N/A	YES	NO
12.	Are all aqueous non-preserved samples pH 4-9?	N/A	YES	NO
13.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	N/A	YES	NO
14.	Were the samples shipped on ice?		YES	NO
15.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #1 #3 #4	RAD ONLY	YES	NO

Cooler #:	1	2						
Temperature (°C):	Amb	Amb						
No. of custody seals on cooler:	1	1						
DOT Survey/ Acceptance Information — External µR/hr reading:	12	11						
Background µR/hr reading:	11							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

Additional Information: **Please provide details here for any NO responses to gray-shaded boxes above, or any other issues noted:**

All client bottle ID's vs ALS lab ID's double-checked by: CAT

If applicable, was the client contacted? **YES / NO / NA** Contact: _____ Date/Time: _____

Project Manager Signature / Date: 10/20/18

Form 201r26.xls
(06/29/2018)

*IR Gun #1, VWR SN 170560549
*IR Gun #3, VWR SN 170647571
*IR Gun #4, Oakton, SN 2372220101-0002

1810475

SAMPLES RECEIVING
ALS ENVIRONMENTAL
225 COMMERCE DR

FORT COLLINS CO 80524

FedEx

1 of 2

7833 4373 4828

MASTER

XO FTCA

SATURDAY 12:00P
PRIORITY OVERNIGHT
AHS
80524
CO - US DEN

1810470

ORIGIN ID:LDJA (614) 389-6251
TIDEWATER
6625 SELNICK DR STE A

ELKRIDGE, MD 21075
UNITED STATES US

SHIP DATE: 19OCT18
ACTWGT: 36.40 LB
CAD: 6991560/SSF0192
DIMS: 24x13x13 IN

BILL THIRD PARTY

TO SAMPLES RECEIVING
ALS ENVIRONMENTAL
225 COMMERCE DR

FORT COLLINS CO 80524
(999) 999-9999
INV:
PO:
REF:
DEPT:

FedEx

2 of 2
MPS# 0263 7833 4373 4839
Mstr# 7833 4373 4828
XO FTCA

0201

SATURDAY 12:00
PRIORITY OVERNIGHT
AH
80524
CO-US DEN

Section 2

2

SAMPLE RESULTS SUMMARY

Gross Alpha/Beta by GFPC Sample Results Summary

Client Name: Tidewater, Inc.
Client Project Name: Phase 1 RI OU2 Great Kills Park
Client Project Number: 2016-007
Laboratory Name: **ALS -- Fort Collins**
PAI Work Order: 1810475

Reported on: Wednesday, December 05, 2018
9:47:45 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	DL	Units	Matrix	Prep Batch	Date Analyze	Flags
1810475-1	OU2-1-SW001	Sample	GROSS ALPHA	2.1 +/- 2.3	3.7	NA	pCi/l	WATER	AB181117-1	11/20/2018	U,M
1810475-1	OU2-1-SW001	Sample	GROSS BETA	8.5 +/- 2.5	3.3	NA	pCi/l	WATER	AB181117-1	11/20/2018	
1810475-2	OU2-1-SW003	Sample	GROSS ALPHA	10.2 +/- 4.8	6.8	NA	pCi/l	WATER	AB181117-1	11/20/2018	M3
1810475-2	OU2-1-SW003	Sample	GROSS BETA	21.3 +/- 5.7	6.9	NA	pCi/l	WATER	AB181117-1	11/20/2018	M3
1810475-3	OU2-1-SW004	Sample	GROSS ALPHA	1.17 +/- 0.75	1.14	NA	pCi/l	WATER	AB181117-1	11/20/2018	LT
1810475-3	OU2-1-SW004	Sample	GROSS BETA	7.3 +/- 1.4	1.1	NA	pCi/l	WATER	AB181117-1	11/20/2018	
1810475-4	REF-1-SW001	Sample	GROSS ALPHA	3.4 +/- 1.5	2.0	NA	pCi/l	WATER	AB181117-1	11/20/2018	
1810475-4	REF-1-SW001	Sample	GROSS BETA	4.9 +/- 1.5	1.9	NA	pCi/l	WATER	AB181117-1	11/20/2018	
1810475-5	OU1-1-SW005	Sample	GROSS ALPHA	0.6 +/- 1.5	2.6	NA	pCi/l	WATER	AB181117-1	11/20/2018	U

Comments:

Data Package ID: *AB1810475-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

Gross Alpha/Beta by GFPC Sample Results Summary

Client Name: Tidewater, Inc.
Client Project Name: Phase 1 RI OU2 Great Kills Park
Client Project Number: 2016-007
Laboratory Name: **ALS -- Fort Collins**
PAI Work Order: 1810475

Reported on: Wednesday, December 05, 2018
9:47:45 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	DL	Units	Matrix	Prep Batch	Date Analyze	Flags
1810475-5	OU1-1-SW005	Sample	GROSS BETA	5.1 +/- 1.7	2.4	NA	pCi/l	WATER	AB181117-1	11/20/2018	
1810475-6	OU2-1-SW002	Sample	GROSS ALPHA	3.5 +/- 2.1	3.1	NA	pCi/l	WATER	AB181117-1	11/20/2018	M3
1810475-6	OU2-1-SW002	Sample	GROSS BETA	5.8 +/- 1.9	2.5	NA	pCi/l	WATER	AB181117-1	11/20/2018	

Comments:

Data Package ID: *AB1810475-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

Section 3

QC RESULTS SUMMARY ❸

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Method Blank Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Lab ID: AB181117-1MB

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 21
Date Collected: 17-Nov-18
Date Prepared: 17-Nov-18
Date Analyzed: 21-Nov-18

Prep Batch: AB181117-1
QCBatchID: AB181117-1-1
Run ID: AB181117-1A
Count Time: 1000 minutes

Final Aliquot: 200 ml
Result Units: pCi/l
File Name: ABC1121

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	0.59 +/- 0.48	0.76	3	NA	U
12587-47-2	GROSS BETA	-0.03 +/- 0.64	1.07	4	NA	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: *AB1810475-1*

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Laboratory Control Sample(s)

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Lab ID: AB181117-1LCS

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 21
Date Collected: 17-Nov-18
Date Prepared: 17-Nov-18
Date Analyzed: 20-Nov-18

Prep Batch: AB181117-1
QCBatchID: AB181117-1-1
Run ID: AB181117-1A
Count Time: 30 minutes

Final Aliquot: 200 ml
Result Units: pCi/l
File Name: ABC1120A

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
12587-46-1	GROSS ALPHA	277 +/- 50	7	232.9	119	72 - 130	P,M3
12587-47-2	GROSS BETA	208 +/- 36	13	211.8	98.4	86 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS Recovery within control limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration

Data Package ID: *AB1810475-1*

Section 4

INDIVIDUAL SAMPLE RESULTS

4

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Field ID: OU2-1-SW001
Lab ID: 1810475-1

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 21
Date Collected: 18-Oct-18
Date Prepared: 17-Nov-18
Date Analyzed: 20-Nov-18

Prep Batch: AB181117-1
QCBatchID: AB181117-1-1
Run ID: AB181117-1A
Count Time: 1000 minutes
Report Basis: Unfiltered

Final Aliquot: 60.0 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC1120C

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	2.1 +/- 2.3	3.7	3	NA	U,M
12587-47-2	GROSS BETA	8.5 +/- 2.5	3.3	4	NA	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *AB1810475-1*

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Field ID: OU2-1-SW003
Lab ID: 1810475-2

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 21
Date Collected: 18-Oct-18
Date Prepared: 17-Nov-18
Date Analyzed: 20-Nov-18

Prep Batch: AB181117-1
QCBatchID: AB181117-1-1
Run ID: AB181117-1A
Count Time: 1000 minutes
Report Basis: Unfiltered

Final Aliquot: 30.0 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC1120C

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	10.2 +/- 4.8	6.8	3	NA	M3
12587-47-2	GROSS BETA	21.3 +/- 5.7	6.9	4	NA	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *AB1810475-1*

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Field ID: OU2-1-SW004
Lab ID: 1810475-3

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 21
Date Collected: 18-Oct-18
Date Prepared: 17-Nov-18
Date Analyzed: 20-Nov-18

Prep Batch: AB181117-1
QCBatchID: AB181117-1-1
Run ID: AB181117-1A
Count Time: 1000 minutes
Report Basis: Unfiltered

Final Aliquot: 200 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC1120C

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	1.17 +/- 0.75	1.14	3	NA	LT
12587-47-2	GROSS BETA	7.3 +/- 1.4	1.1	4	NA	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *AB1810475-1*

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Field ID: REF-1-SW001
Lab ID: 1810475-4

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 21
Date Collected: 18-Oct-18
Date Prepared: 17-Nov-18
Date Analyzed: 20-Nov-18

Prep Batch: AB181117-1
QCBatchID: AB181117-1-1
Run ID: AB181117-1A
Count Time: 1000 minutes
Report Basis: Unfiltered

Final Aliquot: 120 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC1120C

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	3.4 +/- 1.5	2.0	3	NA	
12587-47-2	GROSS BETA	4.9 +/- 1.5	1.9	4	NA	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *AB1810475-1*

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Field ID: OU1-1-SW005
Lab ID: 1810475-5

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 21
Date Collected: 19-Oct-18
Date Prepared: 17-Nov-18
Date Analyzed: 20-Nov-18

Prep Batch: AB181117-1
QCBatchID: AB181117-1-1
Run ID: AB181117-1A
Count Time: 1000 minutes
Report Basis: Unfiltered

Final Aliquot: 90.0 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC1120C

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	0.6 +/- 1.5	2.6	3	NA	U
12587-47-2	GROSS BETA	5.1 +/- 1.7	2.4	4	NA	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *AB1810475-1*

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Field ID: OU2-1-SW002
Lab ID: 1810475-6

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 21
Date Collected: 19-Oct-18
Date Prepared: 17-Nov-18
Date Analyzed: 20-Nov-18

Prep Batch: AB181117-1
QCBatchID: AB181117-1-1
Run ID: AB181117-1A
Count Time: 1000 minutes
Report Basis: Unfiltered

Final Aliquot: 90.0 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC1120C

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	3.5 +/- 2.1	3.1	3	NA	M3
12587-47-2	GROSS BETA	5.8 +/- 1.9	2.5	4	NA	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *AB1810475-1*

Section 5

RAW DATA

5

Gross Alpha/Beta by GFPC Raw Data Report

Laboratory Name: ALS -- Fort Collins
PAI Work Order: 1810475

Prep SOP: PAI 702
Analytical SOP: PAI 724

Reported on: Tuesday, November 27, 2018
9:24:54 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Alq Analy Alq	Inst ID Det ID	AnRunID File Name	Count Date/Time	GrossCPM BkgCPM	BaseEff ProgEff	CntDur(min) Yield	Activity +/- 2 s TPU	MDC DecLev	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
1810475-1	GROSS ALPHA	10/18/2018	AB181117-1	NA	NA	WATER	60 ml	LB4100-C	AB181117-1A	11/20/2018	0.172	21.01%	1000	2.1	3.7	pCi/l	NA	
SMP	Trg. Analyte	10:10:00 AM	AB181117-1-1	NA	NA	NA	60 ml	A3	ABC1120C	2:16 PM	0.138	NA	NA	2.3		Unfiltered	NA	U,M
1810475-1	GROSS BETA	10/18/2018	AB181117-1	NA	NA	WATER	60 ml	LB4100-C	AB181117-1A	11/20/2018	1.982	44.40%	1000	8.5	3.3	pCi/l	NA	
SMP	Trg. Analyte	10:10:00 AM	AB181117-1-1	NA	NA	NA	60 ml	A3	ABC1120C	2:16 PM	1.500	NA	NA	2.5		Unfiltered	NA	
1810475-2	GROSS ALPHA	10/18/2018	AB181117-1	NA	NA	WATER	30 ml	LB4100-C	AB181117-1A	11/20/2018	0.188	20.68%	1000	10.2	6.8	pCi/l	NA	
SMP	Trg. Analyte	11:40:00 AM	AB181117-1-1	NA	NA	NA	30 ml	A4	ABC1120C	2:16 PM	0.109	NA	NA	4.8		Unfiltered	NA	M3
1810475-2	GROSS BETA	10/18/2018	AB181117-1	NA	NA	WATER	30 ml	LB4100-C	AB181117-1A	11/20/2018	2.121	42.84%	1000	21.3	6.9	pCi/l	NA	
SMP	Trg. Analyte	11:40:00 AM	AB181117-1-1	NA	NA	NA	30 ml	A4	ABC1120C	2:16 PM	1.530	NA	NA	5.7		Unfiltered	NA	M3
1810475-3	GROSS ALPHA	10/18/2018	AB181117-1	NA	NA	WATER	200 ml	LB4100-C	AB181117-1A	11/20/2018	0.225	19.65%	1000	1.17	1.14	pCi/l	NA	
SMP	Trg. Analyte	1:55:00 PM	AB181117-1-1	NA	NA	NA	200 ml	B1	ABC1120C	2:16 PM	0.158	NA	NA	0.75		Unfiltered	NA	LT
1810475-3	GROSS BETA	10/18/2018	AB181117-1	NA	NA	WATER	200 ml	LB4100-C	AB181117-1A	11/20/2018	2.982	42.52%	1000	7.3	1.1	pCi/l	NA	
SMP	Trg. Analyte	1:55:00 PM	AB181117-1-1	NA	NA	NA	200 ml	B1	ABC1120C	2:16 PM	1.669	NA	NA	1.4		Unfiltered	NA	
1810475-4	GROSS ALPHA	10/18/2018	AB181117-1	NA	NA	WATER	120 ml	LB4100-C	AB181117-1A	11/20/2018	0.258	21.92%	1000	3.4	2.0	pCi/l	NA	
SMP	Trg. Analyte	3:40:00 PM	AB181117-1-1	NA	NA	NA	120 ml	B2	ABC1120C	2:16 PM	0.155	NA	NA	1.5		Unfiltered	NA	
1810475-4	GROSS BETA	10/18/2018	AB181117-1	NA	NA	WATER	120 ml	LB4100-C	AB181117-1A	11/20/2018	2.231	41.22%	1000	4.9	1.9	pCi/l	NA	
SMP	Trg. Analyte	3:40:00 PM	AB181117-1-1	NA	NA	NA	120 ml	B2	ABC1120C	2:16 PM	1.699	NA	NA	1.5		Unfiltered	NA	
1810475-5	GROSS ALPHA	10/19/2018	AB181117-1	NA	NA	WATER	90 ml	LB4100-C	AB181117-1A	11/20/2018	0.155	20.40%	1000	0.6	2.6	pCi/l	NA	
SMP	Trg. Analyte	9:10:00 AM	AB181117-1-1	NA	NA	NA	90 ml	B3	ABC1120C	2:16 PM	0.141	NA	NA	1.5		Unfiltered	NA	U
1810475-5	GROSS BETA	10/19/2018	AB181117-1	NA	NA	WATER	90 ml	LB4100-C	AB181117-1A	11/20/2018	2.050	42.89%	1000	5.1	2.4	pCi/l	NA	
SMP	Trg. Analyte	9:10:00 AM	AB181117-1-1	NA	NA	NA	90 ml	B3	ABC1120C	2:16 PM	1.636	NA	NA	1.7		Unfiltered	NA	
1810475-6	GROSS ALPHA	10/19/2018	AB181117-1	NA	NA	WATER	90 ml	LB4100-C	AB181117-1A	11/20/2018	0.253	20.08%	1000	3.5	3.1	pCi/l	NA	
SMP	Trg. Analyte	12:50:00 PM	AB181117-1-1	NA	NA	NA	90 ml	B4	ABC1120C	2:16 PM	0.178	NA	NA	2.1		Unfiltered	NA	M3

Comments:

Data Package ID: *AB1810475-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
+ - Duplicate RPD not within limits.
LT - Result is less than Request MDC, greater than sample specific MDC
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'
# - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits
NC - Not Calculated for duplicate results less than 5 times MDC
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).
2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
DER - Duplicate Error Ratio
BDL - Below Detection Limit

Gross Alpha/Beta by GFPC Raw Data Report

Laboratory Name: ALS -- Fort Collins
PAI Work Order: 1810475

Prep SOP: PAI 702
Analytical SOP: PAI 724

Reported on: Tuesday, November 27, 2018
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Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Alq Analy Alq	Inst ID Det ID	AnRunID File Name	Count Date/Time	GrossCPM BkgCPM	BaseEff ProgEff	CntDur(min) Yield	Activity +/- 2 s TPU	MDC DecLev	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
1810475-6	GROSS BETA	10/19/2018	AB181117-1	NA	NA	WATER	90 ml	LB4100-C	AB181117-1A	11/20/2018	2.205	41.95%	1000	5.8	2.5	pCi/l	NA	
SMP	Trg. Analyte	12:50:00 PM	AB181117-1-1	NA	NA	NA	90 ml	B4	ABC1120C	2:16 PM	1.728	NA	NA	1.9		Unfiltered	NA	
AB181117-1	GROSS ALPHA	11/17/2018	AB181117-1	NA	NA	WATER	200 ml	LB4100-C	AB181117-1A	11/21/2018	0.210	22.32%	1000	0.59	0.76	pCi/l	NA	
MB	Trg. Analyte	2:31:58 PM	AB181117-1-1	NA	NA	NA	200 ml	C2	ABC1121	1:20 PM	0.162	NA	NA	0.48		Unfiltered	NA	U
AB181117-1	GROSS BETA	11/17/2018	AB181117-1	NA	NA	WATER	200 ml	LB4100-C	AB181117-1A	11/21/2018	1.734	43.39%	1000	-0.03	1.07	pCi/l	NA	
MB	Trg. Analyte	2:31:58 PM	AB181117-1-1	NA	NA	NA	200 ml	C2	ABC1121	1:20 PM	1.728	NA	NA	0.64		Unfiltered	NA	U
AB181117-1	GROSS ALPHA	11/17/2018	AB181117-1	NA	NA	WATER	200 ml	LB4100-C	AB181117-1A	11/20/2018	20.433	19.96%	30	277	7	pCi/l	NA	119
LCS	Trg. Analyte	2:31:58 PM	AB181117-1-1	NA	NA	NA	200 ml	D4	ABC1120A	12:15 PM	0.126	NA	NA	50		Unfiltered	NA	P,M3
AB181117-1	GROSS BETA	11/17/2018	AB181117-1	NA	NA	WATER	200 ml	LB4100-C	AB181117-1A	11/20/2018	44.033	42.14%	30	208	13	pCi/l	NA	98.4
LCS	Trg. Analyte	2:31:58 PM	AB181117-1-1	NA	NA	NA	200 ml	D4	ABC1120A	12:15 PM	1.664	NA	NA	36		Unfiltered	NA	P,M3

Comments:

Data Package ID: *AB1810475-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
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W - DER is greater than Warning Limit of 1.42
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Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).
2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
DER - Duplicate Error Ratio
BDL - Below Detection Limit

ALS - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC1120A
Batch ID: AB1811185-4, 1117-1
Count Preset (m): 30
Batch Ended: 11/20/2018 12:46

Background logfile: BKGABW
Date of Bkg. Cal: 11/16/2018
Alpha efficiency logfile: Am241R-06/17 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0610, 0611 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr90R-06/17 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	0.89490	Beta b=	0.9681
m=	0.99140	m=	0.9996
a=	0.9119	a=	0.9174
x0=	21.4480	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2414	b ->a xtalk b=	1.12E-05
a ->b xtalk m=	0.9990	b ->a xtalk m=	0.0018

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
C3	1810637-1MS	11/20/2018 12:46	30.00	110.5	7.167	0.135	0.108	0.2134	0.444	n/a	n/a	37.167	1.704	1.8959	0.4278	0.930	n/a	n/a
C4	1810646-1MS	11/20/2018 12:46	30.00	79.5	11.633	0.171	0.107	0.2042	0.567	n/a	n/a	41.700	1.925	2.9961	0.4285	0.940	n/a	n/a
D1	AB1811185-4LCS	11/20/2018 12:46	30.00	24.9	18.800	0.127	0.087	0.1946	0.871	n/a	n/a	43.500	1.692	4.6214	0.4099	0.959	n/a	n/a
D3	1810637-2MS	11/20/2018 12:46	30.00	110.1	5.967	0.144	0.099	0.2056	0.445	n/a	n/a	34.400	1.581	1.5693	0.4196	0.930	n/a	n/a
D4	AB181117-1LCS	11/20/2018 12:46	30.00	32.0	20.433	0.126	0.091	0.1996	0.824	n/a	n/a	44.033	1.664	5.0617	0.4214	0.957	n/a	n/a

JM 11/28/18
NP 11/27/18

ALS - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC1120C
Batch ID: AB181115-1, 1117-1
Count Preset (m): 1000
Batch Ended: 11/21/2018 7:01

Background logfile: BKGABW
Date of Bkg. Cal: 11/16/2018
Alpha efficiency logfile: Am241R-06/17 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0610, 0611 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr90R-06/17 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	0.89490	Beta b=	0.9681
m=	0.99140	m=	0.9996
a=	0.9119	a=	0.9174
x0=	21.4480	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2414	b ->a xtalk b=	1.12E-05
a ->b xtalk m=	0.9990	b ->a xtalk m=	0.0018

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A2	1809293-25D	11/21/2018 6:59	1000.00	28.8	0.364	0.152	0.002	0.2221	0.845	n/a	n/a	2.395	1.511	0.0527	0.4238	0.958	n/a	n/a
A3	1810475-1	11/21/2018 6:59	1000.00	83.1	0.172	0.138	0.001	0.2101	0.551	n/a	n/a	1.982	1.500	0.0089	0.4440	0.939	n/a	n/a
A4	1810475-2	11/21/2018 6:59	1000.00	82.6	0.188	0.109	0.002	0.2068	0.553	n/a	n/a	2.121	1.530	0.0207	0.4284	0.939	n/a	n/a
C2	1810637-1	11/21/2018 7:00	1000.00	106.7	0.234	0.162	0.004	0.2232	0.457	n/a	n/a	3.229	1.728	0.0193	0.4339	0.931	n/a	n/a
C3	1810637-1D	11/21/2018 7:00	1000.00	103.8	0.210	0.135	0.004	0.2134	0.468	n/a	n/a	3.185	1.704	0.0201	0.4278	0.932	n/a	n/a
C4	1810637-2	11/21/2018 7:00	1000.00	105.4	0.229	0.171	0.005	0.2042	0.462	n/a	n/a	3.593	1.925	0.0156	0.4285	0.931	n/a	n/a
B1	1810475-3	11/21/2018 7:00	1000.00	67.6	0.225	0.158	0.003	0.1965	0.622	n/a	n/a	2.982	1.669	0.0173	0.4252	0.944	n/a	n/a
B2	1810475-4	11/21/2018 7:00	1000.00	92.6	0.258	0.155	0.002	0.2192	0.511	n/a	n/a	2.231	1.699	0.0273	0.4122	0.936	n/a	n/a
B3	1810475-5	11/21/2018 7:00	1000.00	82.1	0.155	0.141	0.001	0.2040	0.555	n/a	n/a	2.050	1.636	0.0037	0.4289	0.939	n/a	n/a
B4	1810475-6	11/21/2018 7:00	1000.00	89.3	0.253	0.178	0.001	0.2008	0.524	n/a	n/a	2.205	1.728	0.0198	0.4195	0.937	n/a	n/a
D1	1810637-2D	11/21/2018 7:01	1000.00	111.2	0.201	0.127	0.005	0.1946	0.441	n/a	n/a	3.173	1.692	0.0200	0.4099	0.929	n/a	n/a
D3	1810637-3	11/21/2018 7:01	1000.00	50.0	0.172	0.144	0.000	0.2056	0.715	n/a	n/a	1.587	1.581	0.0071	0.4196	0.950	n/a	n/a
D4	1811039-1	11/21/2018 7:01	1000.00	85.7	0.194	0.126	0.004	0.1996	0.540	n/a	n/a	2.951	1.664	0.0179	0.4214	0.938	n/a	n/a

JP 11/28/18
NP 11/27/18

Date 11/20/18

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	NP	P			NP	(LB)	NP	(LB)	OL
2						P			P
3									
4									
5									
6									
7									
8									
9									OL
10									P
11									
12									
13									
14		(Lα, β)							OL
15		P							P
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKC1115W			
Dr B				
Dr C	1116W			
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	1100	Dr A	10
		Dr B	
Tank 2	1250	Dr C	
		Dr D	

Comments:

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Reviewed By / Date NP 11/20/18

Date 11/20/18

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily EFF	—	—	10	06:53	NP	EFC1120	NP
1-16	Daily BKg	—	—	60	07:03		BKC1120	
15	RA181115-11LCS	RA181115-11	Ra228	30	08:08		RAC1120	NP
16	-11LCSD							
1	Daily BKg	—	—	60	08:13		BKC1120A	
2	1809293-10	RA181115-11	Ra228	150	08:39		RAC1120A	
3	-11							
4	-12							
5	-13							
6	-14							
7	-15							
8	-16							
10	-17							
11	-18							
12	-19							
13	-20							
15	RA181115-11MB							
16	AB181115-3LCS	AB181115-3	αβ	30	09:07		ABC1120	NP
2	1809293-32	RA181115-12	Ra228	150	11:26	NP	RAC1120B	
3	-33							
4	-34							
5	-35							
6	-36							
7	-37							
8	1810910-1							
10	RA181115-12LCS MB							NP 11/20/18
11	-12LCS			30			RAC1120C	
12	-12LCSD							
11	1810637-1MS	AB181117-1	αβ		12:16	NP	ABC1120A	
15	-2MS							
16	AB181117-1LCS							
17	1810646-1MS	AB181185-4						
13	AB181185-4LCS							
11	1811315-1	AB181116-12		10	13:07		ABC1120B	
12	-4D							
13	-5							
15	-23	-13						
16	-24							
2	1809293-25D	AB181115-1		1000	14:18		ABC1120C	
3	1810975-1	AB181117-1						
4	-2							
5	-3							
6	-4							
7	-5							
8	-6							
10	1810637-1							
11	-1D							

Comments:

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(cont. from page N/A B)

Form 780r8.doc (6/23/06)

Reviewed By / Date NP 11/21/18

Date 11/20/18

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
12	1810677-2	AB181117-1	αβ	1000	14:18	NP	ABC1120C	NP
13	-20	|	|	|	|	|	|	|
15	-3	|	|	|	|	|	|	|
16	1811039-1	|	|	|	|	|	|	|

NP 11/21/18

Comments:

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Reviewed By / Date NP 11/21/18

ALS - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC1121
Batch ID: AB181117-1, 11185-4
Count Preset (m): 1000
Batch Ended: 11/22/2018 5:58

Background logfile: BKGABW
Date of Bkg. Cal: 11/16/2018
Alpha efficiency logfile: Am241R-06/17 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0610, 061 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr90R-06/17 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	0.89490	Beta b=	0.9681
m=	0.99140	m=	0.9996
a=	0.9119	a=	0.9174
x0=	21.4480	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2414	b ->a xtalk b=	1.12E-05
a ->b xtalk m=	0.9990	b ->a xtalk m=	0.0018

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1811039-2	11/22/2018 5:57	1000.00	80.6	0.175	0.138	0.002	0.2015	0.562	n/a	n/a	3.612	2.690	0.0097	0.4236	0.940	n/a	n/a
A2	1811039-3	11/22/2018 5:57	1000.00	79.8	0.200	0.152	0.002	0.2221	0.565	n/a	n/a	2.343	1.511	0.0126	0.4238	0.940	n/a	n/a
A3	1811039-4	11/22/2018 5:57	1000.00	78.5	0.249	0.138	0.002	0.2101	0.571	n/a	n/a	2.395	1.500	0.0290	0.4440	0.941	n/a	n/a
A4	1811039-5	11/22/2018 5:57	1000.00	109.6	0.268	0.109	0.004	0.2068	0.447	n/a	n/a	2.740	1.530	0.0428	0.4284	0.930	n/a	n/a
C2	AB181117-1MB	11/22/2018 5:57	1000.00	32.5	0.210	0.162	0.000	0.2232	0.820	n/a	n/a	1.734	1.728	0.0120	0.4339	0.957	n/a	n/a
C3	1810585-2	11/22/2018 5:57	1000.00	145.8	0.290	0.135	0.002	0.2134	0.336	n/a	n/a	2.364	1.704	0.0433	0.4278	0.918	n/a	n/a
B1	1811039-6	11/22/2018 5:58	1000.00	70.2	0.271	0.158	0.002	0.1965	0.610	n/a	n/a	2.312	1.669	0.0293	0.4252	0.943	n/a	n/a
B2	1811039-7	11/22/2018 5:58	1000.00	88.4	0.230	0.155	0.002	0.2192	0.528	n/a	n/a	2.476	1.699	0.0198	0.4122	0.937	n/a	n/a
B3	1811039-8	11/22/2018 5:58	1000.00	64.3	0.281	0.141	0.002	0.2040	0.639	n/a	n/a	2.530	1.636	0.0360	0.4289	0.946	n/a	n/a
B4	1811039-10	11/22/2018 5:58	1000.00	65.0	0.759	0.178	0.005	0.2008	0.635	n/a	n/a	3.648	1.728	0.1497	0.4195	0.945	n/a	n/a
D3	1810585-3	11/22/2018 5:58	1000.00	122.1	0.395	0.144	0.002	0.2056	0.405	n/a	n/a	2.303	1.581	0.0685	0.4196	0.926	n/a	n/a
D4	1810585-4	11/22/2018 5:58	1000.00	131.6	0.418	0.126	0.003	0.1996	0.376	n/a	n/a	2.497	1.664	0.0804	0.4214	0.922	n/a	n/a

JR 11/28/18
NC 11/27/18

Date 11/21/18 SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	NP	P			P				P
2									
3									
4					(Hα)	NP	P		
5					P				
6					(Hβ)	NP	P		
7					P				
8									
9					P				OL
10									P
11									
12									
13					(Hα)	NP	P		
14		(Lα,β)							OL
15		P			P				P
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKC1115W			
Dr B				
Dr C	1116W			
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	600	Dr A	10
		Dr B	
Tank 2	1250	Dr C	
		Dr D	

Comments:

Page No.: 480856 A Form 780r8.doc (6 23 06) Reviewed By / Date NP 11/21/18

Date 11/21/18

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily EFF	—	—	10	07:13	NP	EFC1121	NP
1-16	Daily BKg	—	—	60	07:26		BKC1121	
4,6,13		—	—	1	08:42		BKC1121A	
1	1810499-5	RA181119-01	Ra228	150	10:23	NP	RAC1121	JP
2	-6							
3	-7							
4	-8							
5	-9							
6	-10							
7	-11							
8	-12							
10	-13							
11	RA181119-01MB							
12	-01LCS			30			RAC1121A	
13	-01LCSD			1			1	
12	1810475-6	RA181119-02		180	12:25		RAC1121B	
13	RA181119-02MB			1			1	
15	-02LCS			30			RAC1121C	
16	-02LCSD			1			1	
1	1811039-2	AB181117-1	αβ	1000	13:13	NP	ABC1121	
2	-3							
3	-4							
4	-5							
5	-6							
6	-7							
7	-8							
8	-10							
10	AB181117-1MB							
11	1810585-2	AB181118-4						
15	-3							
16	-4							

JP 11/23/18

Comments:

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(cont. from page N/A B)

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Reviewed By / Date JP 11/23/18

Section 6

QUALITY ASSURANCE SUMMARY REPORTS

6

No *NON-CONFORMANCE REPORTS* or *QUALITY ASSURANCE SUMMARY SHEETS* are included in this data package.

Section 7

LABORATORY BENCH SHEETS

7

Radiochemistry Instrument Worksheet

ALS -- Fort Collins

Prep Batch: AB181117-1

Prep Procedure: GAB

Analytical QASS / NCR? Y / N N/A

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
11/20 1	1810475-1	SMP	60	60	ml	PCI/L	83.1	ABC1120C3		NP							
1	1810475-2	SMP	30	30	ml	PCI/L	82.6		4								
1	1810475-3	SMP	200	200	ml	PCI/L	67.6		5								
1	1810475-4	SMP	120	120	ml	PCI/L	92.6		6								
1	1810475-5	SMP	90	90	ml	PCI/L	82.1		7								
1	1810475-6	SMP	90	90	ml	PCI/L	89.3		8								
11/30 1	1810637-1	SMP	90	90	ml	PCI/L	106.7		10								
1	1810637-1	DUP	90	90	ml	PCI/L	103.8		11								
1	1810637-1	MS	90	90	ml	PCI/L	110.5	ABC1120A	11	NP							
1	1810637-2	SMP	90	90	ml	PCI/L	105.4	ABC1120C	12	NP							
1	1810637-2	DUP	90	90	ml	PCI/L	111.2		13								
1	1810637-2	MS	90	90	ml	PCI/L	110.1	ABC1120A	15	NP							
1	1810637-3	SMP	200	200	ml	PCI/L	50	ABC1120C	15	NP							
12/03 1	1811039-1	SMP	50	50	ml	PCI/L	85.7		16								
1	1811039-2	SMP	50	50	ml	PCI/L	80.6	ABC1121	1	JP							
1	1811039-3	SMP	50	50	ml	PCI/L	79.8		2								
1	1811039-4	SMP	50	50	ml	PCI/L	78.5		3								
1	1811039-5	SMP	70	70	ml	PCI/L	109.6		4								
1	1811039-6	SMP	40	40	ml	PCI/L	70.2		5								
1	1811039-7	SMP	150	150	ml	PCI/L	88.4		6								
1	1811039-8	SMP	200	200	ml	PCI/L	64.3		7								
1	1811039-10	SMP	40	40	ml	PCI/L	65		8								
1	AB181117-1	MB	200	200	ml	PCI/L	32.5		10								
1	AB181117-1	LCS	200	200	ml	PCI/L	32	ABC1120A	16	NP							

NP 11/27/18

Spike Solution Information

Soln #	Nuclide	SolnID	Exp Date	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	931.4243.13	12/1/18	47.031	DPM/ml	11/17/18	1	ml	RS-033
S2	Am-241	956.4243.11	9/25/19	103.391	DPM/ml	11/17/18	1	ml	RS-033

Radiochemistry Instrument Worksheet

ALS -- Fort Collins

Prep Batch: AB181117-1

Prep Procedure: GAB

Analytical QASS / NCR? Y / N N/A

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes

Sample Barcodes

1810475-1 AB181117-1PS1	1810475-2 AB181117-1PS2	1810475-3 AB181117-1PS3
1810475-4 AB181117-1PS4	1810475-5 AB181117-1PS5	1810475-6 AB181117-1PS6
1810637-1 AB181117-1PS7	1810637-1DUP AB181117-1PS8	1810637-1MS AB181117-1PS9
1810637-2 AB181117-1PS10	1810637-2DUP AB181117-1PS11	1810637-2MS AB181117-1PS12
1810637-3 AB181117-1PS13	1811039-1 AB181117-1PS14	1811039-2 AB181117-1PS15
1811039-3 AB181117-1PS16	1811039-4 AB181117-1PS17	1811039-5 AB181117-1PS18
1811039-6 AB181117-1PS19	1811039-7 AB181117-1PS20	1811039-8 AB181117-1PS21
1811039-10 AB181117-1PS22	AB181117-1MB AB181117-1PS23	AB181117-1LCS AB181117-1PS24

Reporting Units

LabID:	TstGrpName:	RptUnits:
1811039-1	GrossAlpha/Beta	PCI/L
1810637-1	GrossAlpha/Beta	PCI/L
1810475-1	GrossAlpha/Beta	PCI/L
1810475-2	GrossAlpha/Beta	PCI/L
1810637-2	GrossAlpha/Beta	PCI/L
1811039-2	GrossAlpha/Beta	PCI/L
1811039-3	GrossAlpha/Beta	PCI/L
1810475-3	GrossAlpha/Beta	PCI/L
1810637-3	GrossAlpha/Beta	PCI/L
1811039-4	GrossAlpha/Beta	PCI/L
1810475-4	GrossAlpha/Beta	PCI/L
1811039-5	GrossAlpha/Beta	PCI/L
1810475-5	GrossAlpha/Beta	PCI/L
1811039-6	GrossAlpha/Beta	PCI/L
1810475-6	GrossAlpha/Beta	PCI/L
1811039-7	GrossAlpha/Beta	PCI/L
1811039-8	GrossAlpha/Beta	PCI/L
1811039-10	GrossAlpha/Beta	PCI/L

Radiochemistry Prep Worksheet

ALS -- Fort Collins

Prep Batch: AB181117-1

Prep Procedure: GAB

Reviewed By: rgs RMS **Review Date:** 11/19/2018

Non-Routine Pre-Treatment? Y (N) **Batch:** MS **Re-Prep? Y** (N) **Batch:** MS **Prep QASS / NCR? Y** (N) MS

Prep SOP: PAI 702 **Rev:** 21
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Reilly G. Stockton RMS
Prep Date: 11/17/2018
Prep Dept: RS

Balance: 13
Balance: 13

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1810475-1	SMP	MS	60	60	Unfiltered	MS	
2	1	1810475-2	SMP		30	30	Unfiltered		
3	1	1810475-3	SMP		200	200	Unfiltered		
4	1	1810475-4	SMP		120	120	Unfiltered		
5	1	1810475-5	SMP		90	90	Unfiltered		
6	1	1810475-6	SMP		90	90	Unfiltered		
7	1	1810637-1	SMP		90	90	Unfiltered		
8	1	1810637-1	DUP		90	90	Unfiltered		
9	1	1810637-1	MS		90	90	Unfiltered	S1,S2	
10	1	1810637-2	SMP		90	90	Unfiltered	MS	
11	1	1810637-2	DUP		90	90	Unfiltered		
12	1	1810637-2	MS		90	90	Unfiltered	S1,S2	
13	1	1810637-3	SMP		200	200	Unfiltered	MS	
14	1	1811039-1	SMP		50	50	Unfiltered		
15	1	1811039-2	SMP		50	50	Unfiltered		
16	1	1811039-3	SMP		50	50	Unfiltered		
17	1	1811039-4	SMP		50	50	Unfiltered		
18	1	1811039-5	SMP		70	70	Unfiltered		
19	1	1811039-6	SMP		40	40	Unfiltered		
20	1	1811039-7	SMP		150	150	Unfiltered		
21	1	1811039-8	SMP		200	200	Unfiltered		
22	1	1811039-10	SMP		40	40	Unfiltered		
23	1	AB181117-1	MB		200	200	Unfiltered		
24	1	AB181117-1	LCS		200	200	Unfiltered	S1,S2	

RMS 11/19/18

Radiochemistry Prep Worksheet

ALS -- Fort Collins

Prep Batch: AB181117-1

Prep Procedure: GAB

Reviewed By: rgs **Review Date:** 11/19/2018

Non-Routine Pre-Treatment? Y / N **Batch:** **Re-Prep?** Y / N **Batch:** **Prep QASS / NCR?** Y / N

Prep SOP: PAI 702 **Rev:** 21
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Reilly G. Stockton
Prep Date: 11/17/2018
Prep Dept: RS

Balance: 13
Balance: 13

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes

Comments

Spiked By: Reilly G. Stockton **Date:** 11/18/2018

Witnessed By: Steven D. White **Date:** 11/18/2018

Spike Solution Information

Soln #	Nuclide	SolnID	Exp Date	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	931.4243.13	12/1/18	47.031	DPM/ml	11/17/18	1	ml	RS-033
S2	Am-241	956.4243.11	9/25/19	103.391	DPM/ml	11/17/18	1	ml	RS-033

ALS -- Fort Collins

Radiochemistry Prep Worksheet

Prep Batch: AB181117-1

Prep Procedure: GAB

Prep Batch Not Validated!!!

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N **Batch:** _____ **Re-Prep? Y / N** **Batch:** _____ **Prep QASS / NCR? Y / N** _____

Prep SOP: PAI 702 **Rev:** 21
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Reilly G. Stockton RGS
Prep Date: 11/17/2018
Prep Dept: RS

Balance:
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1810475-1	SMP		0	0	Unfiltered		
2	1	1810475-2	SMP		0	0	Unfiltered		
3	1	1810475-3	SMP		0	0	Unfiltered		
4	1	1810475-4	SMP		0	0	Unfiltered		
5	1	1810475-5	SMP		0	0	Unfiltered		
6	1	1810475-6	SMP		0	0	Unfiltered		
7	1	1810637-1	SMP		0	0	Unfiltered		
8	1	1810637-1	DUP		0	0	Unfiltered		
9	1	1810637-1	MS		0	0	Unfiltered	S1,S2	
10	1	1810637-2	SMP		0	0	Unfiltered		
11	1	1810637-2	DUP		0	0	Unfiltered		
12	1	1810637-2	MS		0	0	Unfiltered	S1,S2	
13	1	1810637-3	SMP		0	0	Unfiltered		
14	1	1811039-1	SMP		0	0	Unfiltered		
15	1	1811039-2	SMP		0	0	Unfiltered		
16	1	1811039-3	SMP		0	0	Unfiltered		
17	1	1811039-4	SMP		0	0	Unfiltered		
18	1	1811039-5	SMP		0	0	Unfiltered		
19	1	1811039-6	SMP		0	0	Unfiltered		
20	1	1811039-7	SMP		0	0	Unfiltered		
21	1	1811039-8	SMP		0	0	Unfiltered		
22	1	1811039-10	SMP		0	0	Unfiltered		
23	1	AB181117-1	MB		0	0	Unfiltered		
24	1	AB181117-1	LCS		0	0	Unfiltered	S1,S2	

ALS -- Fort Collins

Radiochemistry Prep Worksheet

Prep Batch: AB181117-1

Prep Procedure: GAB

Prep Batch Not Validated!!!

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N **Batch:** _____ **Re-Prep? Y / N** **Batch:** _____ **Prep QASS / NCR? Y / N** _____

Prep SOP: PAI 702 **Rev:** 21
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Reilly G. Stockton RGS
Prep Date: 11/17/2018
Prep Dept: RS

Balance:
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes

Comments

Spiked By: Reilly Stockton **Date:** 11/18/18
Witnessed By: [illegible] **Date:** 11-18-18

Spike Solution Information

Soln #	Nuclide	SolnID	Exp Date	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	931.4243.13	12/1/18	47.031	DPM/ml	11/17/18	1	ml	RS-033
S2	Am-241	956.4243.11	9/25/19	103.391	DPM/ml	11/17/18	1	ml	RS-033

Radiochemistry Gravimetric Worksheet

ALS -- Fort Collins

Prep Batch: AB181117-1

Prep Procedure: **GAB**

Reviewed By: rgs

Review Date: **11/19/2018**

Prep Num	Planc. Num	LabID	QC Type	Test Alq (ml)	Tare Mass (g)	Initial Gross Mass (g)	Initial Net Mass (mg)	Suggested Alq (ml)	Samp Vol Available (ml)	Samp Vol Taken (ml)	Fin Gross Mass (g)	Final Net Mass (mg)	Salt Sol. Added (ml)	Flag
1	1	1810475-1	SMP	10	9.3522	9.3650	12.8	59	200	60	9.4353	83.1	0	
1	2	1810475-2	SMP	10	9.3022	9.3276	25.4	30	200	30	9.3848	82.6	0	
1	3	1810475-3	SMP	10	9.3165	9.3194	2.9	200	200	200	9.3841	67.6	0	
1	4	1810475-4	SMP	10	9.3114	9.3181	6.7	112	200	120	9.4040	92.6	0	
1	5	1810475-5	SMP	10	9.3024	9.3111	8.7	86	200	90	9.3845	82.1	0	
1	6	1810475-6	SMP	10	9.2968	9.3055	8.7	86	200	90	9.3861	89.3	0	
1	7	1810637-1	SMP	10	9.3110	9.3205	9.5	79	200	90	9.4177	106.7	0	
1	8	1810637-1	DUP	10	9.2857	9.2941	8.4	89	200	90	9.3895	103.8	0	
1	9	1810637-1	MS	10	9.2587	9.2693	10.6	71	200	90	9.3692	110.5	0	
1	10	1810637-2	SMP	10	9.3228	9.3328	10	75	200	90	9.4282	105.4	0	
1	11	1810637-2	DUP	10	9.3291	9.3391	10	75	200	90	9.4403	111.2	0	
1	12	1810637-2	MS	10	9.2469	9.2572	10.3	73	200	90	9.3570	110.1	0	
1	13	1810637-3	SMP	10	9.2780	9.2779	-0.1	200	200	200	9.3280	50	1	
1	14	1811039-1	SMP	10	9.3425	9.3591	16.6	45	200	50	9.4282	85.7	0	
1	15	1811039-2	SMP	10	9.2470	9.2633	16.3	46	200	50	9.3276	80.6	0	
1	16	1811039-3	SMP	10	9.2722	9.2886	16.4	46	200	50	9.3520	79.8	0	
1	17	1811039-4	SMP	10	9.2463	9.2627	16.4	46	200	50	9.3248	78.5	0	
1	18	1811039-5	SMP	10	9.2989	9.3104	11.5	65	200	70	9.4085	109.6	0	
1	19	1811039-6	SMP	10	9.2365	9.2541	17.6	43	200	40	9.3067	70.2	0	
1	20	1811039-7	SMP	10	9.3001	9.3052	5.1	147	200	150	9.3885	88.4	0	
1	21	1811039-8	SMP	10	9.2433	9.2466	3.3	200	200	200	9.3076	64.3	0	
1	22	1811039-10	SMP	10	9.2649	9.2833	18.4	41	200	40	9.3299	65	0	
1	23	AB181117-1	MB	10	9.2642	0.0000	0	200	200	200	9.2967	32.5	1	
1	24	AB181117-1	LCS	10	9.3500	0.0000	0	200	200	200	9.3820	32	1	

Sample Condition Form (Liquid)

Analyst: Keilly Stockton

Analysis Date: 11/18/18

Method: Gross Alpha Beta

Work Order	Sample ID	pH	Color	Remarks
		Sample Condition (Visual Appearance of Analysis Aliquot at Time of Prep)		
1810475	1	<2	clear	none
	2		↓	↓
	3		brown	organic sediment throughout
	4		clear	none
	5			~~sg~~ some organic sediment
	6			none
1810637	1			
	2			
	3			
1811039	1		brown	sediment throughout
	2		clear	none
	3			
	4			
	5			
	6			
	7			
	8			
	10		dark brown	thick sediment throughout
				11/18/18

Section 8

STANDARDS TRACEABILITY DOCUMENTS

8

TE 1/17/17

Prepare a working dilution of 931.4095.11

1. Density of 0.1M HCl, lot # 0000132881
   Mass of 100mL vol. flask: 68.5633g Balance # 12
   Mass of flask & 100mL acid: 168.3994g Balance# 12
   Net Mass: 99.8361g
   Density: 0.9984g/mL

TE 1/17/17

2. Mass of 931.4095.11 transferred:
   Mass of open empty nalgene: 74.2481 Balance# 12
   Mass of nalgene & standard: 75.9096 Balance# 12
   Net mass of standard transferred: 1.6615g

TE 1/17/17

3. Dilute to final volume:
   Mass of nalgene, standard, & diluent: 1071.8g Balance# 26
   Mass of empty nalgene (from above): 74.2481g Balance# 12
   Net mass of new dilution: 997.5519g

4. Final activity calculation:

$$33{,}966.93\,dpm/g\,(0.9984\,g/mL)\left(\frac{1.6615\,g}{997.5519\,g}\right)=56.48\,dpm/mL$$

TE 1/17/17

JP 12/14/17

Stnd ID: 931.4243.13

Description: Sr-90
Expiration: 12/1/2018
Activity: 56.48 dpm/ml

2s Uncertainty: 1.02 dpm/ml
Ref. Date: 4/11/2011
Ref Time: N/A
Prep Date: 1/17/2017 Prep by: TE
Matrix/Comp. 0.1 M HCl
Half Life (y): 2.88E+01

Reverification Log

Analysis Date	Initials	Expiration Date
11/24/16	JP	11/24/2019

JP 12/14/17

Continued on Page

TEWA 1/17/17
Signed Date

Read and Understood By
Signed 12/14/17
Date

Project 931.4095.11 Sr-90 Intermediate Standard

Continued from Page

11

MEL 12/14/11

Prepare an intermediate dilution of 931 Sr-90

1. Density of 0.1 M HCl, lot # K30039
   Mass of 100mL vol. flask: 66.4305 g Balance # 12
   Mass of flask & 100mL acid: 166.2718 g Balance# 12
   Net Mass: 99.8413 g
   Density: 0.9984 g/mL

2. Mass of 931 transferred:
   Mass of open empty 40mL Voa vial: 21.7293 g Balance# 12
   Mass of Voa vial and standard: 27.0645 g Balance# 12
   Net mass of standard transferred: 5.3352 g

MEL 12/14/11

3. Dilute to final volume:
   Mass of open empty 40mL Voa vial: 21.7293 g Balance# 12
   Mass of vial, standard, & diluent: 56.1105 g Balance# 12
   Net mass of new dilution: 34.3812 g

4. Final activity calculation:

$$1.967\times10^{4}\,Bq\left(\frac{5.3352\,g}{5.39174\,g}\right)\left(\frac{60\,dpm}{1\,Bq}\right)\left(\frac{0.9984\,g/mL}{34.3812\,g}\right)=\cancel{33{,}966.93}\ dpm/g$$

33,966.93 dpm/g
JP 6/20/12

33,912.59 dpm/mL

MEL 12/14/11

JP 6/20/12

Stnd ID: 931.4095.11

Description: Sr-90
Expiration: 1/19/2013
Activity: 33912.59 dpm/mL
2s Uncertainty: 610.43 dpm/mL
Ref. Date: 4/11/2011
Ref Time: N/A
Prep Date: 12/14/2011 Prep by: ML TE JP 6/20/12
Matrix/Comp. 0.1 M HCl
Half Life (y): 2.88E+01

JP 6/20/12

Reverification Log

Analysis Date	Initials	Expiration Date

JP 6/20/12

JP 6/20/12

Continued on Page

Megan Lee 12/14/11
Signature Date

Read and Understood By
T Elliott 12/14/11
Signature Date

Eckert & Ziegler Analytics

rec 4-5-11 RSO# 931

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

84379-307

5 mL Liquid in Flame Sealed Vial

Customer: ALS Laboratory Group/Fort Collins, CO
P.O. No.: 73625, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Sr-90	1.052E+04	1.967E+04	0.1	0.9	1.8	04/11/2011

*Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities < 0.1 %. 5.39174 grams 0.1M HCl solution with approximately 30 μg/g each of Sr and Y carriers.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared by: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 3/31/11
J. D. McCorvey, QA Manager Alternate

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1958

Single Isotope Certificate, Rev 1 9/28/2009

ANA Form005 Rev. —

Prepare a working dilution of 956.4095.60 TE 1/17/17

1. Density of 1M HCl, lot # 0000132881
   Mass of 100mL vol. flask: 68.5633g Balance # 12
   Mass of flask & 100mL acid: 170.0263g Balance# 12
   Net Mass: 101.4630g
   Density: 1.0146 g/ml

2. Mass of 956.4095.60 transferred:
   Mass of open empty nalgene: 74.3480 Balance# 12
   Mass of nalgene & standard: 77.2801 Balance# 12
   Net mass of standard transferred: 2.9321g

TE 1/17/17 TE 1/17/17

3. Dilute to final volume:
   Mass of nalgene, standard, & diluent: 997.3g Balance# 26
   Mass of empty nalgene (from above): 74.3480g Balance# 12
   Net mass of new dilution: 922.9520g

4. Final activity calculation:

$$32{,}428.06\,dpm/g\left(\frac{2.9321g}{\cancel{997.3g}\ 922.9520g}\right)(1.0146\,g/ml) = 104.52\,dpm/ml$$

TE 1/17/17

TE 1/17/17

JP 10/02/17

Stnd ID: 956.4243.11

Description:	Am-241	
Expiration:	9/21/2018	
Activity:	104.52	dpm/ml
2s Uncertainty:	1.88	dpm/ml
Ref. Date:	1/30/2012	
Ref Time:	N/A	
Prep Date:	1/17/2017	Prep by: TE
Matrix/Comp.	1.0 M HCl	
Half Life (y):	4.32E+02	

Reverification Log

Analysis Date	Initials	Expiration Date
9/25/2018	JP	9/25/2019

JP 10/02/17

Continued on Page

T Elus 1/17/17
Signed Date

Read and Understood By 10/2/2017
Signed Date

Project Am-241 Intermediate Standard 956.4095.60

Continued from Page

TE 11/5/14

Prepare an intermediate dilution of RSO # 956

1. Density of 1M HCl, lot # 0000079759
   Mass of 100mL vol. flask: 68.5657g Balance # 12
   Mass of flask & 100mL acid: 169.9213g Balance# 12
   Net Mass: 101.3556g
   Density: 1.0136g/mL

2. Mass of RSO #956 transferred:
   Mass of open empty 40mL Voa vial: 26.7005g Balance# 12
   Mass of Voa vial and standard: 31.8113g Balance# 12
   Net mass of standard transferred: 5.1108g

TE 11/5/14

TE 11/5/14

3. Dilute to final volume:
   Mass of open empty 40mL Voa vial: 26.7005g Balance# 12
   Mass of vial, standard, & diluent: 62.8691g Balance# 12
   Net mass of new dilution: 36.1686g

4. Final activity calculation:

$$19630\,Bq\left(\frac{60\,dpm}{1\,Bq}\right)\left(\frac{5.1108\,g}{5.13225\,g}\right)\left(\frac{1}{36.1686\,g}\right)=32{,}428.06\,dpm/g$$

TE 11/5/14

TE 11/5/14

Continued on Page

T Ellet 11/5/14
Signed Date

Read and Understood By
Signed Date 11-5-14

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

rec 2-2-2012 PO 956

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

90167
Am-241 5 mL Liquid in Flame Sealed Vial

Customer: ALS Laboratory Group / Fort Collins, CO
P.O. No.: 73625, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Am-241	1.580E+05	1.963E+04	0.1	0.9	1.8	01/30/2012

*Uncertainty: U - Relative expanded uncertainty, k = 2.326 NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities<0.1%, α-impurities<0.1%. 5.13225 g 1M HCl solution, carrier free.

Source Prepared by: MITaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: L. McC
J.D. McCorvey, Counting Room Manager

Date: 26 Jan 12

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY

Single Isotope Certificate, Rev 2 04-08-2010

Section 9

ADDITIONAL SUPPORTING DOCUMENTATION

Gas Proportional Counter

Instrument Calibration

Background Calibration

LB4100-C
Long Instrument Background Calibration
Background Determination

Detector ID	Alpha CPM	Alpha LCL	Alpha UCL	Alpha Flag	Beta CPM	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	0.138	0.0538	0.1713	PASS	2.690	0.717	2.732	PASS	A1 (01)
A2 (02)	0.152	0.0500	0.1751	PASS	1.511	1.255	1.718	PASS	A2 (02)
A3 (03)	0.138	0.0237	0.2204	PASS	1.500	1.374	1.711	PASS	A3 (03)
A4 (04)	0.109	0.0640	0.1738	PASS	1.530	1.378	1.635	PASS	A4 (04)
B1 (05)	0.158	0.0868	0.1681	PASS	1.669	1.429	1.742	PASS	B1 (05)
B2 (06)	0.155	0.0532	0.1998	PASS	1.699	1.538	1.811	PASS	B2 (06)
B3 (07)	0.141	0.0424	0.2040	PASS	1.636	1.473	1.931	PASS	B3 (07)
B4 (08)	0.178	0.0528	0.2226	PASS	1.728	1.439	1.904	PASS	B4 (08)
C1 (09)	0.189	0.0759	0.1706	FLAG-HIGH	1.665	1.025	2.424	PASS	C1 (09) Δ
C2 (10)	0.162	0.0800	0.2190	PASS	1.728	1.596	1.913	PASS	C2 (10)
C3 (11)	0.135	0.0515	0.1805	PASS	1.704	1.526	1.723	PASS	C3 (11)
C4 (12)	0.171	0.0785	0.2262	PASS	1.925	1.349	3.194	PASS	C4 (12)
D1 (13)	0.127	0.0608	0.1655	PASS	1.692	1.530	1.841	PASS	D1 (13)
D2 (14)	0.064	0.0054	0.1582	PASS	1.395	1.223	1.767	PASS	D2 (14)
D3 (15)	0.144	0.0413	0.2190	PASS	1.581	1.411	1.714	PASS	D3 (15)
D4 (16)	0.126	0.0797	0.1625	PASS	1.664	1.029	2.545	PASS	D4 (16)

Reviewed by: _____ Date: 11/16/18

Historical Control Limits set to be +/- 3 Std Dev Of 15 Data Points (07/04/17-->01/24/18)
JP 01/25/18

Δ: Recount to BKC1116W

LB4100-C
Long Instrument Background Calibration
Background Determination

Detector ID	Alpha CPM	Alpha LCL	Alpha UCL	Alpha Flag	Beta CPM	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	#REF!	0.0538	0.1713	#REF!	#REF!	0.717	2.732	#REF!	A1 (01)
A2 (02)	#REF!	0.0500	0.1751	#REF!	#REF!	1.255	1.718	#REF!	A2 (02)
A3 (03)	#REF!	0.0237	0.2204	#REF!	#REF!	1.374	1.711	#REF!	A3 (03)
A4 (04)	#REF!	0.0640	0.1738	#REF!	#REF!	1.378	1.635	#REF!	A4 (04)
B1 (05)	#REF!	0.0868	0.1681	#REF!	#REF!	1.429	1.742	#REF!	B1 (05)
B2 (06)	#REF!	0.0532	0.1998	#REF!	#REF!	1.538	1.811	#REF!	B2 (06)
B3 (07)	#REF!	0.0424	0.2040	#REF!	#REF!	1.473	1.931	#REF!	B3 (07)
B4 (08)	#REF!	0.0528	0.2226	#REF!	#REF!	1.439	1.904	#REF!	B4 (08)
C1 (09)	0.179	0.0759	0.1706	FLAG-HIGH	1.683	1.025	2.424	PASS	C1 (09) Δ
C2 (10)	#REF!	0.0800	0.2190	#REF!	#REF!	1.596	1.913	#REF!	C2 (10)
C3 (11)	#REF!	0.0515	0.1805	#REF!	#REF!	1.526	1.723	#REF!	C3 (11)
C4 (12)	#REF!	0.0785	0.2262	#REF!	#REF!	1.349	3.194	#REF!	C4 (12)
D1 (13)	#REF!	0.0608	0.1655	#REF!	#REF!	1.530	1.841	#REF!	D1 (13)
D2 (14)	#REF!	0.0054	0.1582	#REF!	#REF!	1.223	1.767	#REF!	D2 (14)
D3 (15)	#REF!	0.0413	0.2190	#REF!	#REF!	1.411	1.714	#REF!	D3 (15)
D4 (16)	#REF!	0.0797	0.1625	#REF!	#REF!	1.029	2.545	#REF!	D4 (16)

Δ: detector offline

Reviewed by: _____ Date: 11/17/18

Historical Control Limits set to be +/- 3 Std Dev Of 15 Data Points (07/04/17-->01/24/18)
JP 01/25/18

Gas Proportional Counter

Quality Control Data

Daily Instrument Performance Checks

LB4100-C
Daily Instrument Performance Check-Efficiency Determination

Detector ID	Alpha Eff.	Alpha LCL	Alpha UCL	Alpha Flag	Beta Eff.	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	0.1939	0.1843	0.2142	PASS	0.3728	0.3620	0.4207	PASS	A1 (01)
A2 (02)	0.2063	0.1938	0.2252	PASS	0.3758	0.3690	0.4288	PASS	A2 (02)
A3 (03)	0.2126	0.1992	0.2315	PASS	0.3784	0.3711	0.4313	PASS	A3 (03)
A4 (04)	0.2025	0.1947	0.2262	PASS	0.3780	0.3719	0.4323	PASS	A4 (04)
B1 (05)	0.2288	0.2145	0.2493	PASS	0.4080	0.3869	0.4496	PASS	B1 (05)
B2 (06)	0.1921	0.1855	0.2156	PASS	0.3648	0.3499	0.4067	PASS	B2 (06)
B3 (07)	0.2121	0.2036	0.2367	PASS	0.3881	0.3710	0.4312	PASS	B3 (07)
B4 (08)	0.2120	0.2010	0.2336	PASS	0.3854	0.3728	0.4332	PASS	B4 (08)
C1 (09)	0.2062	0.1947	0.2263	PASS	0.3799	0.3723	0.4327	PASS	C1 (09)
C2 (10)	0.2187	0.2037	0.2367	PASS	0.3896	0.3806	0.4423	PASS	C2 (10)
C3 (11)	0.2094	0.1949	0.2265	PASS	0.3797	0.3700	0.4300	PASS	C3 (11)
C4 (12)	0.2159	0.2051	0.2384	PASS	0.3994	0.3832	0.4453	PASS	C4 (12)
D1 (13)	0.2161	0.2002	0.2327	PASS	0.3829	0.3656	0.4249	PASS	D1 (13)
D2 (14)	0.1722	0.1786	0.2076	FLAG-LOW	0.3337	0.3369	0.3916	FLAG-LOW	D2 (14) Δ
D3 (15)	0.2205	0.2045	0.2377	PASS	0.3678	0.3550	0.4126	PASS	D3 (15)
D4 (16)	0.2265	0.2069	0.2405	PASS	0.3775	0.3591	0.4174	PASS	D4 (16)

Δ: Detector offline

Reviewed by: _____ Date: 11/20/18

Historical Control Limits Established based on 30 Data Points
Established 01/22/18 JP

EFC1120.XLD

Printed 11/20/2018 7:00 AM

LB4100-C

Daily Instrument Performance Checks

Background Checks

Detector ID	Alpha CPM	Alpha LCL	Alpha UCL	Alpha Flag	Beta CPM	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	0.117	-0.006	0.282	PASS	1.967	2.055	3.325	FLAG-LOW	A1 (01) A
A2 (02)	0.217	0.001	0.303	PASS	1.650	1.035	1.987	PASS	A2 (02)
A3 (03)	0.117	-0.006	0.282	PASS	1.533	1.026	1.974	PASS	A3 (03)
A4 (04)	0.183	-0.019	0.237	PASS	1.517	1.051	2.009	PASS	A4 (04)
B1 (05)	0.217	0.004	0.312	PASS	1.583	1.169	2.169	PASS	B1 (05)
B2 (06)	0.150	0.003	0.307	PASS	2.033	1.194	2.204	PASS	B2 (06)
B3 (07)	0.250	-0.004	0.286	PASS	1.467	1.141	2.131	PASS	B3 (07)
B4 (08)	0.300	0.015	0.341	PASS	1.883	1.219	2.237	PASS	B4 (08)
C1 (09)	0.317	0.015	0.343	PASS	1.833	1.181	2.185	PASS	C1 (09)
C2 (10)	0.183	0.006	0.318	PASS	1.683	1.219	2.237	PASS	C2 (10)
C3 (11)	0.150	-0.007	0.277	PASS	1.483	1.198	2.210	PASS	C3 (11)
C4 (12)	0.150	0.011	0.331	PASS	2.433	1.388	2.462	PASS	C4 (12)
D1 (13)	0.150	-0.011	0.265	PASS	1.783	1.188	2.196	PASS	D1 (13)
D2 (14)	0.150	-0.034	0.162	PASS	1.617	0.938	1.852	PASS	D2 (14)
D3 (15)	0.183	-0.003	0.291	PASS	1.817	1.094	2.068	PASS	D3 (15)
D4 (16)	0.200	-0.011	0.263	PASS	1.633	1.164	2.164	PASS	D4 (16)

Reviewed by: _____ Date: 11/20/18

Control Limits established from previous weekly background determinations.

Weekly Background File:	Date:	Analyst:
BKC1115W	11/15/2018	JP
BKC1116W	11/16/2018	JP
		JP

A: Recount to BKC1120A

LB4100-C

Daily Instrument Performance Checks

Background Checks

Detector ID	Alpha CPM	Alpha LCL	Alpha UCL	Alpha Flag	Beta CPM	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	0.267	-0.006	0.282	PASS	1.783	2.055	3.325	FLAG-LOW	A1 (01) Δ
A2 (02)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A2 (02)
A3 (03)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A3 (03)
A4 (04)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A4 (04)
B1 (05)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B1 (05)
B2 (06)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B2 (06)
B3 (07)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B3 (07)
B4 (08)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B4 (08)
C1 (09)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C1 (09)
C2 (10)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C2 (10)
C3 (11)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C3 (11)
C4 (12)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C4 (12)
D1 (13)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D1 (13)
D2 (14)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D2 (14)
D3 (15)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D3 (15)
D4 (16)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D4 (16)

Δ: Detector offline

Reviewed by: _____ Date: 11/20/18

Control Limits established from previous weekly background determinations.

Weekly Background File:	BKC1115W	Date: 11/15/2018	Analyst: JP
	BKC1116W	11/16/2018	JP
			JP

LB4100-C
Daily Instrument Performance Check-Efficiency Determination

Detector ID	Alpha Eff.	Alpha LCL	Alpha UCL	Alpha Flag	Beta Eff.	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	0.1988	0.1843	0.2142	PASS	0.3720	0.3620	0.4207	PASS	A1 (01)
A2 (02)	0.2050	0.1938	0.2252	PASS	0.3740	0.3690	0.4288	PASS	A2 (02)
A3 (03)	0.2118	0.1992	0.2315	PASS	0.3805	0.3711	0.4313	PASS	A3 (03)
A4 (04)	0.2033	0.1947	0.2262	PASS	0.3751	0.3719	0.4323	PASS	A4 (04)
B1 (05)	0.2253	0.2145	0.2493	PASS	0.4047	0.3869	0.4496	PASS	B1 (05)
B2 (06)	0.1972	0.1855	0.2156	PASS	0.3591	0.3499	0.4067	PASS	B2 (06)
B3 (07)	0.2142	0.2036	0.2367	PASS	0.3851	0.3710	0.4312	PASS	B3 (07)
B4 (08)	0.2179	0.2010	0.2336	PASS	0.3867	0.3728	0.4332	PASS	B4 (08)
C1 (09)	0.2118	0.1947	0.2263	PASS	0.3819	0.3723	0.4327	PASS	C1 (09)
C2 (10)	0.2217	0.2037	0.2367	PASS	0.4006	0.3806	0.4423	PASS	C2 (10)
C3 (11)	0.2133	0.1949	0.2265	PASS	0.3833	0.3700	0.4300	PASS	C3 (11)
C4 (12)	0.2228	0.2051	0.2384	PASS	0.3931	0.3832	0.4453	PASS	C4 (12)
D1 (13)	0.2137	0.2002	0.2327	PASS	0.3698	0.3656	0.4249	PASS	D1 (13)
D2 (14)	0.1613	0.1786	0.2076	FLAG-LOW	0.3243	0.3369	0.3916	FLAG-LOW	D2 (14) Δ
D3 (15)	0.2197	0.2045	0.2377	PASS	0.3713	0.3550	0.4126	PASS	D3 (15)
D4 (16)	0.2245	0.2069	0.2405	PASS	0.3799	0.3591	0.4174	PASS	D4 (16)

Δ: Detector offline

Reviewed by: _____ Date: 11/21/18

Historical Control Limits Established based on 30 Data Points
Established 01/22/18 JP

LB4100-C
Daily Instrument Performance Checks
Background Checks

Detector ID	Alpha CPM	Alpha LCL	Alpha UCL	Alpha Flag	Beta CPM	Beta LCL	Beta UCL	Beta Flag	Detector ID	
A1 (01)	0.150	-0.006	0.282	PASS	2.117	2.055	3.325	PASS	A1 (01)	
A2 (02)	0.300	0.001	0.303	PASS	1.917	1.035	1.987	PASS	A2 (02)	
A3 (03)	0.217	-0.006	0.282	PASS	1.550	1.026	1.974	PASS	A3 (03)	
A4 (04)	0.267	-0.019	0.237	FLAG-HIGH	1.733	1.051	2.009	PASS	A4 (04)	Δ
B1 (05)	0.133	0.004	0.312	PASS	1.750	1.169	2.169	PASS	B1 (05)	
B2 (06)	0.233	0.003	0.307	PASS	2.267	1.194	2.204	FLAG-HIGH	B2 (06)	Δ
B3 (07)	0.217	-0.004	0.286	PASS	1.933	1.141	2.131	PASS	B3 (07)	
B4 (08)	0.233	0.015	0.341	PASS	1.767	1.219	2.237	PASS	B4 (08)	
C1 (09)	0.317	0.015	0.343	PASS	1.583	1.181	2.185	PASS	C1 (09)	
C2 (10)	0.250	0.006	0.318	PASS	1.867	1.219	2.237	PASS	C2 (10)	
C3 (11)	0.217	-0.007	0.277	PASS	1.817	1.198	2.210	PASS	C3 (11)	
C4 (12)	0.167	0.011	0.331	PASS	2.300	1.388	2.462	PASS	C4 (12)	
D1 (13)	0.300	-0.011	0.265	FLAG-HIGH	2.100	1.188	2.196	PASS	D1 (13)	Δ
D2 (14)	0.183	-0.034	0.162	FLAG-HIGH	1.783	0.938	1.852	PASS	D2 (14)	¥
D3 (15)	0.200	-0.003	0.291	PASS	1.983	1.094	2.068	PASS	D3 (15)	
D4 (16)	0.133	-0.011	0.263	PASS	1.917	1.164	2.164	PASS	D4 (16)	

¥: Detector offline

Reviewed by: _____ Date: 11/21/18

Control Limits established from previous weekly background determinations.

Weekly Background File:	BKC1115W	Date: 11/15/2018	Analyst: JP
	BKC1116W	11/16/2018	JP
			JP

Δ: Recount to BKC1121A

BKC1121.XLD

Printed 11/21/2018 8:36 AM

LB4100-C
Daily Instrument Performance Checks
Background Checks

Detector ID	Alpha CPM	Alpha LCL	Alpha UCL	Alpha Flag	Beta CPM	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A1 (01)
A2 (02)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A2 (02)
A3 (03)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A3 (03)
A4 (04)	0.217	-0.019	0.237	PASS	1.683	1.051	2.009	PASS	A4 (04)
B1 (05)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B1 (05)
B2 (06)	0.167	0.003	0.307	PASS	1.950	1.194	2.204	PASS	B2 (06)
B3 (07)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B3 (07)
B4 (08)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B4 (08)
C1 (09)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C1 (09)
C2 (10)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C2 (10)
C3 (11)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C3 (11)
C4 (12)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C4 (12)
D1 (13)	0.183	-0.011	0.265	PASS	1.683	1.188	2.196	PASS	D1 (13)
D2 (14)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D2 (14)
D3 (15)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D3 (15)
D4 (16)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D4 (16)

Reviewed by: _____ Date: 11/21/18

Control Limits established from previous weekly background determinations.

Weekly Background File:	BKC1115W	Date: 11/15/2018	Analyst: JP
	BKC1116W	11/16/2018	JP
			JP

LB4100-C

Daily Instrument Performance Check-Efficiency Determination

Detector ID	Alpha Eff.	Alpha LCL	Alpha UCL	Alpha Flag	Beta Eff.	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	0.1906	0.1843	0.2142	PASS	0.3719	0.3620	0.4207	PASS	A1 (01)
A2 (02)	0.2031	0.1938	0.2252	PASS	0.3756	0.3690	0.4288	PASS	A2 (02)
A3 (03)	0.2142	0.1992	0.2315	PASS	0.3762	0.3711	0.4313	PASS	A3 (03)
A4 (04)	0.2048	0.1947	0.2262	PASS	0.3726	0.3719	0.4323	PASS	A4 (04)
B1 (05)	0.2316	0.2145	0.2493	PASS	0.4104	0.3869	0.4496	PASS	B1 (05)
B2 (06)	0.1969	0.1855	0.2156	PASS	0.3605	0.3499	0.4067	PASS	B2 (06)
B3 (07)	0.2148	0.2036	0.2367	PASS	0.3907	0.3710	0.4312	PASS	B3 (07)
B4 (08)	0.2213	0.2010	0.2336	PASS	0.3859	0.3728	0.4332	PASS	B4 (08)
C1 (09)	0.2110	0.1947	0.2263	PASS	0.3860	0.3723	0.4327	PASS	C1 (09)
C2 (10)	0.2192	0.2037	0.2367	PASS	0.3960	0.3806	0.4423	PASS	C2 (10)
C3 (11)	0.2119	0.1949	0.2265	PASS	0.3812	0.3700	0.4300	PASS	C3 (11)
C4 (12)	0.2259	0.2051	0.2384	PASS	0.4013	0.3832	0.4453	PASS	C4 (12)
D1 (13)	0.2199	0.2002	0.2327	PASS	0.3738	0.3656	0.4249	PASS	D1 (13)
D2 (14)	0.1801	0.1786	0.2076	PASS	0.3433	0.3369	0.3916	PASS	D2 (14)
D3 (15)	0.2204	0.2045	0.2377	PASS	0.3613	0.3550	0.4126	PASS	D3 (15)
D4 (16)	0.2272	0.2069	0.2405	PASS	0.3690	0.3591	0.4174	PASS	D4 (16)

Reviewed by: JP Date: 11/23/18

Historical Control Limits Established based on 30 Data Points
Established 01/22/18 JP

EFC1123.XLD

Printed 11/23/2018 8:08 AM

LB4100-C

Daily Instrument Performance Checks

Background Checks

Detector ID	Alpha CPM	Alpha LCL	Alpha UCL	Alpha Flag	Beta CPM	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	0.167	-0.006	0.282	PASS	2.450	2.055	3.325	PASS	A1 (01)
A2 (02)	0.183	0.001	0.303	PASS	1.267	1.035	1.987	PASS	A2 (02)
A3 (03)	0.100	-0.006	0.282	PASS	1.200	1.026	1.974	PASS	A3 (03)
A4 (04)	0.100	-0.019	0.237	PASS	1.633	1.051	2.009	PASS	A4 (04)
B1 (05)	0.083	0.004	0.312	PASS	1.667	1.169	2.169	PASS	B1 (05)
B2 (06)	0.200	0.003	0.307	PASS	1.867	1.194	2.204	PASS	B2 (06)
B3 (07)	0.117	-0.004	0.286	PASS	1.683	1.141	2.131	PASS	B3 (07)
B4 (08)	0.150	0.015	0.341	PASS	1.700	1.219	2.237	PASS	B4 (08)
C1 (09)	0.200	0.015	0.343	PASS	1.700	1.181	2.185	PASS	C1 (09)
C2 (10)	0.167	0.006	0.318	PASS	1.667	1.219	2.237	PASS	C2 (10)
C3 (11)	0.200	-0.007	0.277	PASS	1.683	1.198	2.210	PASS	C3 (11)
C4 (12)	0.233	0.011	0.331	PASS	4.233	1.388	2.462	FLAG-HIGH	C4 (12) Δ
D1 (13)	0.067	-0.011	0.265	PASS	1.850	1.188	2.196	PASS	D1 (13)
D2 (14)	0.150	-0.034	0.162	PASS	1.717	0.938	1.852	PASS	D2 (14)
D3 (15)	0.117	-0.003	0.291	PASS	1.483	1.094	2.068	PASS	D3 (15)
D4 (16)	0.183	-0.011	0.263	PASS	1.683	1.164	2.164	PASS	D4 (16)

ΔRecount in file BKC1123A

Reviewed by: JP Date: 11/23/18

Control Limits established from previous weekly background determinations.

Weekly Background File: BKC1115W Date: 11/15/2018 Analyst: JP

BKC1116W 11/16/2018 JP

JP

LB4100-C
Daily Instrument Performance Checks
Background Checks

Detector ID	Alpha CPM	Alpha LCL	Alpha UCL	Alpha Flag	Beta CPM	Beta LCL	Beta UCL	Beta Flag	Detector ID
A1 (01)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A1 (01)
A2 (02)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A2 (02)
A3 (03)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A3 (03)
A4 (04)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A4 (04)
B1 (05)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B1 (05)
B2 (06)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B2 (06)
B3 (07)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B3 (07)
B4 (08)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B4 (08)
C1 (09)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C1 (09)
C2 (10)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C2 (10)
C3 (11)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C3 (11)
C4 (12)	0.250	0.011	0.331	PASS	7.417	1.388	2.462	FLAG-HIGH	C4 (12)
D1 (13)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D1 (13)
D2 (14)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D2 (14)
D3 (15)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D3 (15)
D4 (16)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D4 (16)

Δ

Doffm Today

Reviewed by: JP Date: 11/23/18

Control Limits established from previous weekly background determinations.

Weekly Background File:	BKC1115W	Date: 11/15/2018	Analyst: JP
	BKC1116W	11/16/2018	JP
			JP

Gas Proportional Counter

Instrument Calibration

Initial Efficiency Calibration Standards Traceability

Instrument: LB4100-C

Calibration: Gross Alpha (Am-241) - ringed planchet
Gross Beta (Sr-90/Y-90) - ringed planchet

Date of Calibration: Gross Alpha 06/09/2017
Gross Beta 06/09/2017

Efficiency Log Files: **Am241R-06/17**
Sr90R-06/17

Efficiency Instrument Files: EAM0609A-D
ESR0609A-D

Source ID's: Am-241→955.4095.10
Sr-90/Y-90 →777.3020.11

ICV ID's: Am-241→616.4095.13)
(Sr-90/Y-90→931.4095.33)

JP 6/7/18 ~~Stan~~ Calibration Re-Verified
06/04/2018
New Exp Date 06/05/2019
JP 6/7/18

ALS

QUALITY ASSURANCE SUMMARY SHEET

ALS W.O. # / BATCH Inst C Calibration
TEST Various
METHOD GFPC
SOP/REV (PREP) Various
SOP/REV (ANAL) 724

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics. JP 6/6/18

JP 6/6/18

ALS Fort Collins SOP 724 requires an efficiency calibration for each Gas Flow test to be performed annually for each instrument. Per Technical Manager, the efficiency calibrations performed in 2017 for Instrument C will be acceptable for another year providing the following acceptance criteria was met: 1) Plateau checks were performed and were within acceptance criteria (The beta slope at the beta voltage and the alpha slope at the beta voltage had a slope of less than 3.5%). 2) CCV's and CCB's were performed for each calibration and were within the acceptance criteria. These results for the plateau checks and the CCV's/CCB's can be found in the "Addendum" section in the back of the calibration.

JP 6/6/18

The instrument will be monitored with daily efficiency checks, daily background checks, and long background calibrations every two weeks, as well as quarterly plateau checks as required per SOP 724. If any detectors fail any of these checks, the specific detector will be taken offline for the day and not be used to count client samples. If a detector fails its quarterly plateau check, the detector will be taken off-line until the instrument is re-calibrated for Voltage Plateaus, ROI's, and efficiency calibrations.

JP 6/6/18

JP 6/6/18

TECHNICIAN/ANALYST _____ DATE _____

DEPARTMENT MANAGER _____ DATE 6/6/18

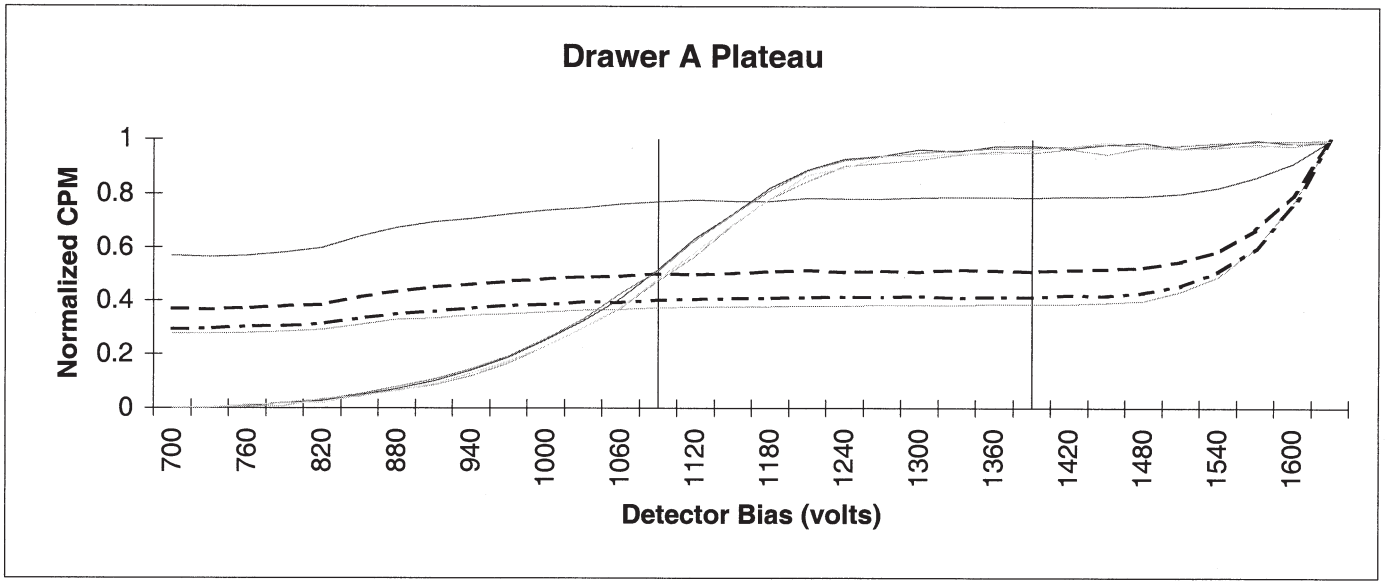
FORM 302r6.doc (4/22/04)

452915

Instrument Plateaus

Unit Type: LB4100/W
Date Performed: 6/6/17 08:23
FileName: PTC0606A
Batch ID: DRAWER A PLATEAU

Unit Id: Magenta
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1402.5

Optimum alpha only operating voltage: 1087.5

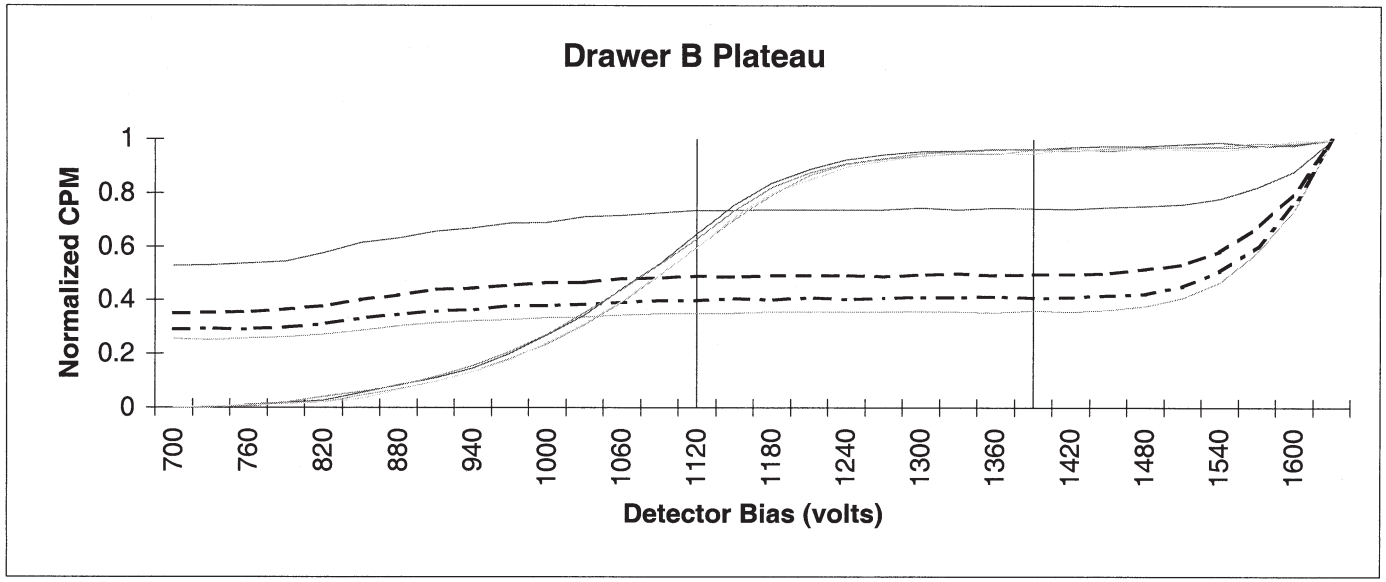
	A1	A2	A3	A4
Beta slope at beta voltage	1.47%	1.71%	0.53%	3.64%
Alpha slope at beta voltage	0.19%	0.63%	1.60%	1.64%
Alpha slope at alpha voltage	3.18%	2.44%	3.36%	3.18%

OK JP 6/9/17

Printed 6/6/2017 2:14 PM

Unit Type: LB4100/W
Date Performed: 6/6/17 08:23
FileName: PTC0606B
Batch ID: DRAWER B PLATEAU

Unit Id: Magenta
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1402.5

Optimum alpha only operating voltage: 1120

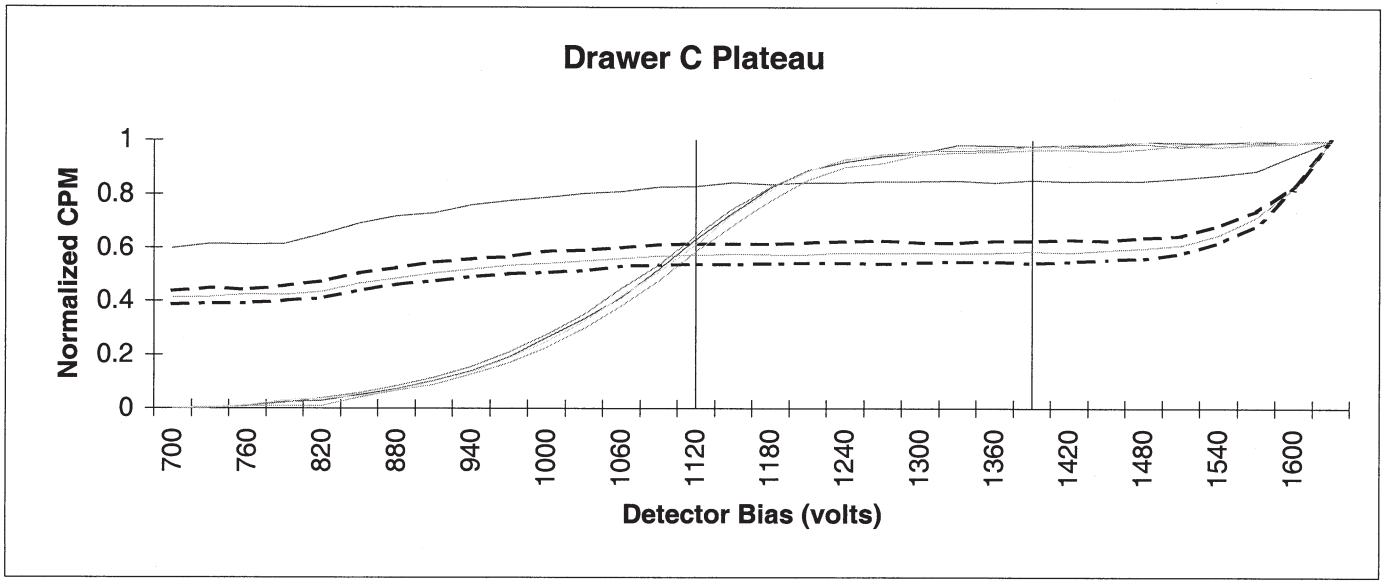
	B1	B2	B3	B4
Beta slope at beta voltage	1.46%	0.21%	1.67%	1.02%
Alpha slope at beta voltage	0.74%	0.41%	1.47%	0.77%
Alpha slope at alpha voltage	2.44%	2.07%	2.12%	2.16%

OK JP 6/9/17

Printed 6/6/2017 2:16 PM

Unit Type: LB4100/W
Date Performed: 6/5/17 16:24
FileName: PTC0605C
Batch ID: DRAWER C PLATEAU

Unit Id: Magenta
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1402.5

Optimum alpha only operating voltage: 1120

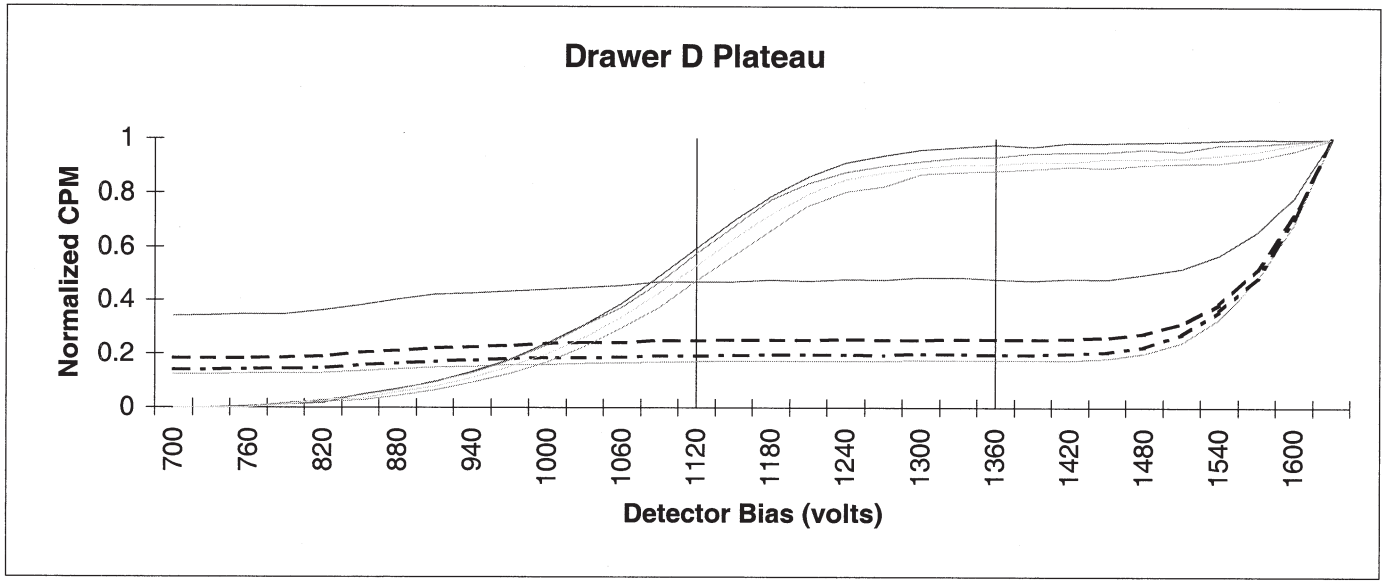
	C1	C2	C3	C4
Beta slope at beta voltage	0.01%	1.81%	0.66%	1.49%
Alpha slope at beta voltage	0.09%	0.91%	1.33%	0.91%
Alpha slope at alpha voltage	2.85%	1.52%	2.04%	1.53%

OK JP 6/9/17

Printed 6/6/2017 8:08 AM

Unit Type: LB4100/W
Date Performed: 6/5/17 16:24
FileName: PTC0605D
Batch ID: DRAWER D PLATEAU

Unit Id: Magenta
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1372.5

Optimum alpha only operating voltage: 1120

	D1	D2	D3	D4
Beta slope at beta voltage	1.86%	2.83%	2.42%	2.14%
Alpha slope at beta voltage	-1.26%	0.56%	0.63%	0.33%
Alpha slope at alpha voltage	3.38%	3.01%	3.50%	3.06%

OK JP 6/9/17

Printed 6/9/2017 2:54 PM

Date 6/5/17

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	JCB	P			JCB	P			P
2									
3									
4									
5									
6									
7									
8									
9						H β	JCB	P	
10						P			
11									
12						H β			OL
13						P			P
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	~~BKC0523~~ BKC0520W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1		Dr A	10
		Dr B	
Tank 2		Dr C	
		Dr D	

Comments:

Date 6/5/17

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily Eff	—	—	30	820	JKB	EFC0605	JKB
1-16	Daily Bkgd	—	—	60	833	JKB	BKC0605	
9	↓	—	—	60	945	JKB	BKC0605A	
1-4	Alpha/Beta	Drawer A Plat.	Plateau	5 min/step	1009		PTC0605A	
5-8	Beta/Alpha	Drawer B Plateau					PTC0605B	
9-12	Alpha/Beta	Drawer C Plateau			1630		PTC0605C	
13-16	Beta/alpha	Drawer D Plateau			↓		PTC0605D	

JKB 6/11/17

Comments:

Page No.: 471486 B

(cont. from page N/A B)

Form 780r8.doc (6/23/06)

Reviewed By / Date JKB 6/11/17

4/4/17 Drawers A+B removal from Instrument and sent back to Canberra to fix guard detector/Slide tray connection so the 3 guard pins holding the two together dont become loose over time due to opening and closing the drawers resulting in ↑ beta cpm, ↓ guard cpm

5/1/17 Drawers A+B received back from Canberra. Drawers re-installed in the instrument, daily performance check run after allowing time for the gas to purge. ~~Weekly~~ Long Background calibration performed. Drawers A+B are now back on line. JR 5/1/17

6/5/17 Voltage Plateau
~~Plateau Check~~ run for drawers A-D
JR 6/11/17

α sources used		detectors	β sources used	
410	Am-241	A1 B1 C1 D1	406	Sr 90/Y90
411	17800 dpm	A2 B2 C2 D2	407	29600 dpm
412	2/16/95	A3 B3 C3 D3	408	9/15/95
413		A4 B4 C4 D4	409	

Parameters:
β: Starting voltage 700 — Count preset 40000 — Filenames:
Ending voltage 1650 — Time btwn steps 0.1 — PTC060SA
30V/step — Weak check tries 0.1 — PTC060SB
5min/step — Weak check limits 20

6/7/17
ROIs set for all drawers using Sr/Y-90 sources
Sources → 406, 407, 408, + 409: over 40,000 counts achieved for each detector. α lower limit + β upper limit set to 50% to start. Both lower limit + β upper limit moved to achieve β→α x-talk of 2.5%. α lower limit moved to achieve α→β x-talk of 0.10%
All ROIs archived

Continued on Page

Read and Understood By

Signed 6/11/17 Date — Signed 6/13/17 Date

Instrument ROIs

LB4100 -C Water Sample Counting Parameters

Certainty requirement for MDA and flags	95%
Maximum count time (min)	360.00
Typical Residual Mass (mg)	50.00
Typical Sample Volume (l)	0.10

	α
Action level for flags (pCi/l)	1.200E+02
Activity Multiplier	1.000E+00
Mass Error (%)	1.00%
Volume Error (%)	1.00%

	Alpha			Beta		
	eff.	bkg.	MDA (pCi/l)	eff.	bkg.	MDA (pCi/l)
A1	15.92%	0.078	1.812E+00	37.98%	1.436	3.017E+00
A2	16.59%	0.094	1.889E+00	37.36%	1.336	2.958E+00
A3	16.06%	0.096	1.971E+00	37.67%	1.51	3.120E+00
A4	16.20%	0.083	1.831E+00	38.95%	1.532	3.039E+00

Batch Specific:

	Event	Recycle
Magenta	1	0

Drawer Specific:

	Date/Time	Official	Bias	Step
A	6-6-17 8:23	TRUE	1402.5	0
B	6-6-17 8:23	TRUE	1402.5	0
C	6-5-17 16:24	TRUE	1402.5	0
D	6-5-17 16:24	TRUE	1372.5	0

Detector Specific:

	Date/Time	Official	Threshold	bLL	bUL	aLL	aUL
A1	6-7-17 0:00	TRUE	0.1	0	40.07	80.17	100
A2	6-7-17 0:00	TRUE	0.1	0	38.87	77.48	100
A3	6-7-17 0:00	TRUE	0.1	0	36.33	74.84	100
A4	6-7-17 0:00	TRUE	0.1	0	35.53	72.18	100
B1	6-7-17 0:00	TRUE	0.1	0	39.75	79.58	100
B2	6-7-17 0:00	TRUE	0.1	0	40.63	77.85	100
B3	6-7-17 0:00	TRUE	0.1	0	36.99	75.53	100
B4	6-7-17 0:00	TRUE	0.1	0	36.53	74.87	100
C1	6-7-17 0:00	TRUE	0.1	0	36.53	73.52	100
C2	6-7-17 0:00	TRUE	0.1	0	37.82	75.5	100
C3	6-7-17 0:00	TRUE	0.1	0	33.33	70.13	100
C4	6-7-17 0:00	TRUE	0.1	0	35.45	72.25	100
D1	6-7-17 0:00	TRUE	0.1	0	25.76	53.3	100
D2	6-7-17 0:00	TRUE	0.1	0	24.2	46.69	100
D3	6-7-17 0:00	TRUE	0.1	0	18.87	40.7	100
D4	6-7-17 0:00	TRUE	0.1	0	22.24	47.03	100

OK JP 6/17

4/4/17 Drawers A+B removal from Instrument and sent back to Canberra to fix guard detector/Slide tray connection so the 3 guard pins holding the two together dont become loose over time due to opening and closing the drawers resulting in ↑ beta cpm, ↓ guard cpm

5/1/17 Drawers A+B received back from Canberra. Drawers re-installed in the instrument, daily performance check run after allowing time for the gas to purge. ~~Weekly~~ Long Background calibration performed. Drawers A+B are now back on line. JP 5/1/17

6/5/17 Voltage Plateau
~~Plateau Check~~ run for drawers A-D

JP 6/11/17

α sources used		detectors		β sources used	
410	Am-241	A1 B1 C1 D1		406	Sr 90/Y90
411	17800 dpm	A2 B2 C2 D2		407	29660 dpm
412	2/16/95	A3 B3 C3 D3		408	9/15/95
413		A4 B4 C4 D4		409	

Parameters:

Starting voltage 700	Count preset 40000	Filenames:	
Ending voltage 1650	Time btwn steps 0.1	PTC0605A	
30V/step	Weak check times 0.1	PTC0605B	
5min/step	Weak check limits 20		

6/7/17
ROIs set for all drawers using Sr/Y-90 sources
Sources → 406, 407, 408, + 409: over 40,000 counts achieved for each detector. α lower limit + β upper limit set to 50% to start. Both α lower limit + β upper limit moved to achieve β→α walk of 2.5%. α lower limit moved to achieve α→β walk of 0.10%
All ROIs archived

Continued on Page

Read and Understood By

Signed 6/11/17 Date

Signed 6/13/17 Date

Calibration Efficiencies

Source Database for OSUM

Number of sources in table: 137

Application Revision:

Control ID	Isotope	Type	Half-Life	DPM	Std dev	Date	Status	Alpha/Beta Archive File
1076	Sr-90	Beta	10519.2	9993.46	199.86	2-Dec-04	ALS	Sr90R-06/17
1077	Am-241	Alpha	158153.25	5516.133	99.29	25-Oct-11	ALS	Am241R-06/17

Am-241 Ringed Planchet Efficiency Calibration
LB4100-C
Date: 6/9/2017
Source ID: 1077

Det ID	A1	A2	A3	A4	B1	B2	B3	B4
File Name	EAM0609A	EAM0609A	EAM0609A	EAM0609A	EAM0609B	EAM0609B	EAM0609B	EAM0609B
Cnt Time	9.08	8.24	8.71	8.85	9.32	8.35	8.97	9.12
Tot Cnts	10002	10005	10007	10005	10012	10007	10003	10010
Bkg CPM	0.078	0.094	0.096	0.083	0.091	0.117	0.084	0.100
CPM	1101.464	1214.105	1148.813	1130.425	1074.158	1198.326	1115.078	1097.488
Alpha Efficiency	0.201487	0.222092	0.210148	0.206784	0.196492	0.219205	0.203977	0.200759
Beta Efficiency	0.054817	0.054922	0.055946	0.056003	0.052699	0.055912	0.056737	0.051418
Efficiency	**0.2015**	**0.2221**	**0.2101**	**0.2068**	**0.1965**	**0.2192**	**0.2040**	**0.2008**

Det ID	C1	C2	C3	C4	D1	D2	D3	D4
File Name	EAM0609C	EAM0609C	EAM0609C	EAM0609C	EAM0609D	EAM0609D	EAM0609D	EAM0609D
Cnt Time	8.91	8.2	8.58	8.96	9.41	8.45	8.9	9.17
Tot Cnts	10007	10008	10009	10003	10009	10005	10007	10009
Bkg CPM	0.110	0.112	0.096	0.141	0.095	0.087	0.171	0.101
CPM	1123.010	1220.376	1166.454	1116.265	1063.561	1183.937	1124.211	1091.393
Alpha Efficiency	0.205428	0.223239	0.213375	0.204194	0.194553	0.216573	0.205648	0.199644
Beta Efficiency	0.056054	0.061847	0.054620	0.056022	0.051258	0.055320	0.053710	0.051651
Efficiency	**0.2054**	**0.2232**	**0.2134**	**0.2042**	**0.1946**	**0.2166**	**0.2056**	**0.1996**

Am241 Eff

		A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	offset	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
	NumRecs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	total time	9.08	8.24	8.71	8.85	9.32	8.35	8.97	9.12	8.91	8.2	8.58	8.96	9.41	8.45	8.9	9.17
Alpha	total counts	10002	10005	10007	10005	10012	10007	10003	10010	10007	10008	10009	10003	10009	10005	10007	10009
	reduced chi-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	chi-square	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	CPM	1101.464	1214.105	1148.813	1130.425	1074.158	1198.326	1115.078	1097.488	1123.01	1220.376	1166.454	1116.265	1063.561	1183.937	1124.211	1091.393
	CPM var	242.6547	294.7823	263.9063	255.5461	230.6639	287.1528	248.6799	240.8195	252.1916	297.7991	272.0456	249.2353	226.171	280.3124	252.7587	238.1648
	Efficiency	0.201487	0.222092	0.210148	0.206784	0.196492	0.219205	0.203977	0.200759	0.205428	0.223239	0.213375	0.204194	0.194553	0.216573	0.205648	0.199644
	archived STI	0.004612	0.005084	0.00481	0.004733	0.004498	0.005018	0.004669	0.004595	0.004702	0.00511	0.004884	0.004674	0.004453	0.004957	0.004707	0.00457
	predicted ST	0.002015	0.00222	0.002101	0.002067	0.001964	0.002191	0.00204	0.002007	0.002054	0.002232	0.002133	0.002042	0.001945	0.002165	0.002056	0.001996
	actual STDE	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Beta	total counts	2734	2485	2677	2723	2700	2566	2796	2578	2744	2786	2576	2770	2652	2569	2628	2604
	reduced chi-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	chi-square	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	CPM	299.6653	300.2417	305.8379	306.1516	288.0866	305.6554	310.1607	281.0844	306.4286	338.0971	298.5931	306.2548	280.2138	302.4167	293.6159	282.3625
	CPM var	42.22858	45.69548	44.73456	44.23496	39.47784	46.24835	44.46739	38.98725	44.05038	52.97875	44.00783	44.06393	37.89413	45.22378	41.89838	39.0327
	Efficiency	0.054817	0.054922	0.055946	0.056003	0.052699	0.055912	0.056737	0.051418	0.056054	0.061847	0.05462	0.056022	0.051258	0.05532	0.05371	0.051651
	archived STI	0.001545	0.001583	0.001585	0.00158	0.00149	0.0016	0.001591	0.00147	0.001579	0.001736	0.001562	0.001578	0.001456	0.001583	0.001529	0.001473
	predicted ST	0.001051	0.001104	0.001084	0.001076	0.001017	0.001107	0.001076	0.001016	0.001073	0.001175	0.001079	0.001069	0.000998	0.001094	0.001051	0.001015
	actual STDE	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Sr-90 Ringed Planchet Efficiency Calibration
LB4100-C
Date: 6/9/2017
Source ID: 1076

Det ID	A1	A2	A3	A4	B1	B2	B3	B4
File Name	ESR0609A	ESR0609A	ESR0609A	ESR0609A	ESR0609B	ESR0609B	ESR0609B	ESR0609B
Cnt Time	3.20	3.20	3.06	3.17	3.19	3.29	3.16	3.23
Tot Cnts	10028	10031	10049	10045	10033	10032	10026	10023
Bkg CPM	1.436	1.336	1.510	1.532	1.613	1.650	1.545	1.591
CPM	3132.314	3133.352	3282.477	3167.238	3143.528	3047.590	3171.240	3101.505
Alpha Efficiency	0.000750	0.001171	0.001180	0.001311	0.001344	0.001094	0.000802	0.001117
Beta Efficiency	0.423645	0.423785	0.443955	0.428369	0.425162	0.412186	0.428910	0.419478
Efficiency	**0.4236**	**0.4238**	**0.4440**	**0.4284**	**0.4252**	**0.4122**	**0.4289**	**0.4195**

Det ID	C1	C2	C3	C4	D1	D2	D3	D4
File Name	ESR0609C	ESR0609C	ESR0609C	ESR0609C	ESR0609D	ESR0609D	ESR0609D	ESR0609D
Cnt Time	3.22	3.13	3.17	3.16	3.31	3.3	3.23	3.22
Tot Cnts	10037	10046	10033	10021	10037	10026	10027	10038
Bkg CPM	1.540	1.659	1.640	2.897	1.614	1.607	1.665	1.607
CPM	3115.541	3207.926	3163.344	3168.306	3030.712	3036.575	3102.669	3115.784
Alpha Efficiency	0.001245	0.000892	0.001139	0.000837	0.000723	0.000767	0.000312	0.000658
Beta Efficiency	0.421376	0.433871	0.427842	0.428513	0.409903	0.410696	0.419635	0.421409
Efficiency	**0.4214**	**0.4339**	**0.4278**	**0.4285**	**0.4099**	**0.4107**	**0.4196**	**0.4214**

Sr 90 Gross Beta Eff

		A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	offset	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
	NumRecs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	total time	3.2	3.2	3.06	3.17	3.19	3.29	3.16	3.23	3.22	3.13	3.17	3.16	3.31	3.3	3.23	3.22
Alpha	total counts	18	28	27	31	32	27	19	27	30	21	27	20	18	19	8	16
	reduced ch	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	chi-square	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	CPM	5.547	8.656	8.727529	9.69618	9.940348	8.089687	5.928658	8.259133	9.20677	6.597265	8.42135	6.188114	5.343066	5.670576	2.30578	4.867944
	CPM var	1.761055	2.742125	2.891388	3.094561	3.154777	2.501286	1.906439	2.595054	2.902197	2.148149	2.694212	2.007031	1.645973	1.748122	0.767589	1.54572
	Efficiency	0.00075	0.001171	0.00118	0.001311	0.001344	0.001094	0.000802	0.001117	0.001245	0.000892	0.001139	0.000837	0.000723	0.000767	0.000312	0.000658
	archived S	0.00018	0.000225	0.000231	0.000239	0.000242	0.000215	0.000187	0.000219	0.000232	0.000199	0.000223	0.000192	0.000174	0.000179	0.000119	0.000169
	predicted S	0.000178	0.000222	0.000228	0.000237	0.000239	0.000212	0.000185	0.000216	0.000229	0.000196	0.00022	0.000189	0.000172	0.000177	0.000114	0.000166
	actual STD	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Beta	total counts	10028	10031	10049	10045	10033	10032	10026	10023	10037	10046	10033	10021	10037	10026	10027	10038
	reduced ch	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	chi-square	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	CPM	3132.314	3133.352	3282.477	3167.238	3143.528	3047.59	3171.24	3101.505	3115.541	3207.926	3163.344	3168.306	3030.712	3036.575	3102.669	3115.784
	CPM var	1961.337	1962.218	2151.657	2003.724	1975.13	1856.609	2010.704	1923.633	1939.658	2055.571	2000.132	2009.201	1835.613	1843.718	1924.785	1939.948
	Efficiency	0.423645	0.423785	0.443955	0.428369	0.425162	0.412186	0.42891	0.419478	0.421376	0.433871	0.427842	0.428513	0.409903	0.410696	0.419635	0.421409
	archived S	0.010376	0.010379	0.010872	0.01049	0.010413	0.010095	0.010505	0.010275	0.01032	0.010625	0.010479	0.010497	0.010039	0.010059	0.010278	0.010321
	predicted S	0.004232	0.004232	0.00443	0.004275	0.004246	0.004116	0.004285	0.004191	0.004207	0.00433	0.004272	0.004283	0.004093	0.004103	0.004192	0.004207
	actual STD	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

6/8/17

Sr90 flat Efficiency Calibration
Benchsheet: SR160216-1 Source ID: 1075
Logfile SrA0F - 6/17

Sources		detectors	Filenames	
1613011-	2	A1 B1 C1 D1	ESF0608	A
	3	A2 B2 C2 D2		B
	4	A3 B3 C3 D3		C
	5	A4 B4 C4 D4		D

6/9/17 Gross Alpha

Am-241 Eff. Calibration
Benchsheet: AB121109-1 Source ID ⇒ 1077
Logfile: Am241R-06/17

Sources		Detector	Filenames	
1223001-	20	A1 B1 C1 D1	EAM0609	A
	22	A2 B2 C2 D2		B
	23	A3 B3 C3 D3		C
	24	A4 B4 C4 D4		D

6/9/17 Gross beta

Sr-90 ringed planchet calibration
Benchsheet: AB110616-3 Source ID ⇒ 1076
Logfile SrA0R ⇒ 06/17

Sources		Detector	Filename	
1118005-	2	A1 B1 C1 D1	ESR0609	A
	3	A2 B2 C2 D2		B
	4	A3 B3 C3 D3		C
	5	A4 B4 C4 D4		D

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Read and Understood By

Signed	Date	Signed	Date
	6/13/17		6/13/17

Date 6/9/17 SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	JCB	P			JCB				P
2						H α	JCB	P	
3									
4									
5									
6		H α	JCB	P					
7		P							
8									
9						H β	JCB	P	
10									
11									
12									
13									
14									
15									
16						H β	JCB	(H β)	JCB

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKC0607W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	500	Dr A	10
		Dr B	
Tank 2	2000	Dr C	
		Dr D	

Comments:

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Date 6/9/17

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily Eff	—	—	30	914	JWB	EFC0609	JWB
6	↓	—	—	30	929	JWB	EFC0609A	↓
1-16	Daily Bkgd	—	—	60	944	JWB	BKC0609	↓
2,3,9,16	↓	—	—	60	1107	↓	BKC0609A	
1-4	1077	AB121109-1	Am 241	30	1213	JWB	EAM0609A	JP
5-8	↓	↓	eff cal	↓	1228	↓	EAM0609B	↓
9-12	↓	↓	↓	↓	1239	↓	EAM0609C	↓
13-16	↓	↓	↓	↓	1253	↓	EAM0609D	↓
13-16	1076	AB110616-3	Sr90 Rig	↓	1214	↓	ESR0609D	↓
9-12	↓	↓	eff cal	↓	1229	↓	ESR0609C	↓
5-8	↓	↓	↓	↓	1239	↓	ESR0609B	↓
1-4	↓	↓	↓	↓	1229	↓	ESR0609A	↓
1-4	1078	AB150603-5	Th230	30	13:54	JP	ETH0609A	↓
5-8	↓	↓	EFF Cal	↓	14:10	JP	B	↓
9-12	↓	↓	↓	↓	14:21	JP	C	↓
13-16	↓	↓	↓	↓	14:45	JP	D	↓
13-16	1079	AB150310-2	Cs137	↓	13:54	JP	ECS0609D	↓
9-12	↓	↓	EFF Cal	↓	14:10	JP	C	↓
5-8	↓	↓	↓	↓	14:21	JP	B	↓
1-4	↓	↓	↓	↓	14:45	JP	A	↓

JWB 6/9/17

JP 6/10/17

Comments:

Page No.: 471491 B

(cont. from page NA B)

Form 780r8.doc (6/23/06)

Reviewed By / Date JP 6/10/17

Date 6/10/17

SOP 724r 12

ALS
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Daily Response Check Status	Daily Response Check Start 2	Daily Response Check Status	Background Check Start 1	Background Check Status	Background Check Start 2	Background Check Status	Det. Status
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15						(HB)			(HB)
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKC0607W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	0	Dr A	10
		Dr B	
Tank 2	2000	Dr C	
		Dr D	

Comments:

Reviewed By / Date JP 6/30/17

Radiochemistry Instrument Worksheet

Prep Batch: AB121109-1

ALS Environmental -- FC

Gross Alpha!!

Eff. & ATTN calibration.

Efficiency

Prep Procedure: GAB

Analytical QASS / NCR? Y / N NA

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	1223001-1	SMP	200	200	ml	PCI/L	23.3										
1	1223001-2	SMP	200	200	ml	PCI/L	22.1										
1	1223001-3	SMP	200	200	ml	PCI/L	21										
1	1223001-4	SMP	200	200	ml	PCI/L	22.8										
1	1223001-5	SMP	200	200	ml	PCI/L	22.7										
1	1223001-6	SMP	200	200	ml	PCI/L	48.5										
1	1223001-7	SMP	200	200	ml	PCI/L	47.5										
1	1223001-8	SMP	200	200	ml	PCI/L	43.7										
1	1223001-9	SMP	200	200	ml	PCI/L	46.1										
1	1223001-10	SMP	200	200	ml	PCI/L	63.5										
1	1223001-11	SMP	200	200	ml	PCI/L	81.1										
1	1223001-12	SMP	200	200	ml	PCI/L	93.6										
1	1223001-13	SMP	200	200	ml	PCI/L	95.2										
1	1223001-14	SMP	200	200	ml	PCI/L	116.1										
1	1223001-15	SMP	200	200	ml	PCI/L	90.7										
1	1223001-16	SMP	200	200	ml	PCI/L	134.2										
1	1223001-17	SMP	200	200	ml	PCI/L	134.3										
1	1223001-18	SMP	200	200	ml	PCI/L	151.6										
1	1223001-19	SMP	200	200	ml	PCI/L	156										
1	1223001-20	SMP	200	200	ml	PCI/L	21.3										
1	1223001-21	SMP	200	200	ml	PCI/L	21.8										
1	1223001-22	SMP	200	200	ml	PCI/L	19.7										
1	1223001-23	SMP	200	200	ml	PCI/L	20.5										
1	1223001-24	SMP	200	200	ml	PCI/L	21.2										
1	1223001-25	SMP	200	200	ml	PCI/L	21.1										
1	1223001-26	SMP	200	200	ml	PCI/L	21.5										
1	1223001-27	SMP	200	200	ml	PCI/L	20.7										

don't use

outlier - don't use

don't use

JP 6/13/17

ABA1118 | MK

A | OUTLIER don't use

B |

C | JP

ABA1119 | MK

A |

B |

C |

See Maintenance Log 3710 pg 82

JP 6/13/17

Eff. for use calibration

Supersedes: NA

Radiochemistry Instrument Worksheet

Prep Batch: AB121109-1

ALS Environmental -- FC

Prep Procedure: GAB

Analytical QASS / NCR? Y / N NA

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Am-241	955.4095.10	55,069.251	DPM/ml	11/08/12	0.1	ml	RS-008

Sample Barcodes

1223001-1 AB121109-1PS1	1223001-2 AB121109-1PS2	1223001-3 AB121109-1PS3
1223001-4 AB121109-1PS4	1223001-5 AB121109-1PS5	1223001-6 AB121109-1PS6
1223001-7 AB121109-1PS7	1223001-8 AB121109-1PS8	1223001-9 AB121109-1PS9
1223001-10 AB121109-1PS10	1223001-11 AB121109-1PS11	1223001-12 AB121109-1PS12
1223001-13 AB121109-1PS13	1223001-14 AB121109-1PS14	1223001-15 AB121109-1PS15
1223001-16 AB121109-1PS16	1223001-17 AB121109-1PS17	1223001-18 AB121109-1PS18
1223001-19 AB121109-1PS19	1223001-20 AB121109-1PS20	1223001-21 AB121109-1PS21
1223001-22 AB121109-1PS22	1223001-23 AB121109-1PS23	1223001-24 AB121109-1PS24
1223001-25 AB121109-1PS25	1223001-26 AB121109-1PS26	1223001-27 AB121109-1PS27

Supersedes: NA

Radiochemistry Instrument Worksheet

Prep Batch: AB121109-1

Reporting Units

LabID:	TstGrpName:	RptUnits:
1223001-1	GrossAlpha/Beta	PCI/L
1223001-2	GrossAlpha/Beta	PCI/L
1223001-3	GrossAlpha/Beta	PCI/L
1223001-4	GrossAlpha/Beta	PCI/L
1223001-5	GrossAlpha/Beta	PCI/L
1223001-6	GrossAlpha/Beta	PCI/L
1223001-7	GrossAlpha/Beta	PCI/L
1223001-8	GrossAlpha/Beta	PCI/L
1223001-9	GrossAlpha/Beta	PCI/L
1223001-10	GrossAlpha/Beta	PCI/L
1223001-11	GrossAlpha/Beta	PCI/L
1223001-12	GrossAlpha/Beta	PCI/L
1223001-13	GrossAlpha/Beta	PCI/L
1223001-14	GrossAlpha/Beta	PCI/L
1223001-15	GrossAlpha/Beta	PCI/L
1223001-16	GrossAlpha/Beta	PCI/L
1223001-17	GrossAlpha/Beta	PCI/L
1223001-18	GrossAlpha/Beta	PCI/L
1223001-19	GrossAlpha/Beta	PCI/L
1223001-20	GrossAlpha/Beta	PCI/L
1223001-21	GrossAlpha/Beta	PCI/L
1223001-22	GrossAlpha/Beta	PCI/L
1223001-23	GrossAlpha/Beta	PCI/L
1223001-24	GrossAlpha/Beta	PCI/L
1223001-25	GrossAlpha/Beta	PCI/L
1223001-26	GrossAlpha/Beta	PCI/L
1223001-27	GrossAlpha/Beta	PCI/L

Supersedes: NR

Radiochemistry Prep Worksheet

ALS Environmental -- FC

Prep Batch: AB121109-1

Prep Procedure: GAB

Reviewed By: jtl JM **Review Date:** 11/15/2012

Non-Routine Pre-Treatment? Y / (N) **Batch:** N/A **Re-Prep?** Y / (N) **Batch:** N/A **Prep QASS / NCR?** Y / (N) N/A

Prep SOP: PAI 702 **Rev:** 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Steve Workman
Prep Date: 11/8/2012
Prep Dept: RS

Balance: 10
Balance: 13

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1223001-1	SMP		200	200	Unfiltered	S1	
2	1	1223001-2	SMP		200	200	Unfiltered	S1	
3	1	1223001-3	SMP		200	200	Unfiltered	S1	
4	1	1223001-4	SMP		200	200	Unfiltered	S1	
5	1	1223001-5	SMP		200	200	Unfiltered	S1	
6	1	1223001-6	SMP		200	200	Unfiltered	S1	
7	1	1223001-7	SMP		200	200	Unfiltered	S1	
8	1	1223001-8	SMP		200	200	Unfiltered	S1	
9	1	1223001-9	SMP		200	200	Unfiltered	S1	
10	1	1223001-10	SMP		200	200	Unfiltered	S1	
11	1	1223001-11	SMP		200	200	Unfiltered	S1	
12	1	1223001-12	SMP		200	200	Unfiltered	S1	
13	1	1223001-13	SMP		200	200	Unfiltered	S1	
14	1	1223001-14	SMP		200	200	Unfiltered	S1	
15	1	1223001-15	SMP		200	200	Unfiltered	S1	
16	1	1223001-16	SMP		200	200	Unfiltered	S1	
17	1	1223001-17	SMP		200	200	Unfiltered	S1	
18	1	1223001-18	SMP		200	200	Unfiltered	S1	
19	1	1223001-19	SMP		200	200	Unfiltered	S1	
20	1	1223001-20	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
21	1	1223001-21	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
22	1	1223001-22	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
23	1	1223001-23	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
24	1	1223001-24	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
25	1	1223001-25	SMP		200	200	Unfiltered		0.05 mL of 10 mg/mL natural Uranium
26	1	1223001-26	SMP		200	200	Unfiltered		0.05 mL of 10 mg/mL natural Uranium
27	1	1223001-27	SMP		200	200	Unfiltered		0.05 mL of 10 mg/mL natural Uranium

JM 11/15/12

Supersedes: NA

Radiochemistry Prep Worksheet

ALS Environmental -- FC

Prep Batch: AB121109-1

Prep Procedure: GAB

Reviewed By: jtl **Review Date:** 11/15/2012

Non-Routine Pre-Treatment? Y / N **Batch:** _____ **Re-Prep?** Y / N **Batch:** _____ **Prep QASS / NCR?** Y / N _____

Prep SOP: PAI 702 **Rev:** 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Steve Workman
Prep Date: 11/8/2012
Prep Dept: RS

Balance: 10
Balance: 13

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes

Comments

Calibration planchets and mass attenuation curve.

Spiked By: Steve Workman **Date:** 11/8/2012

Witnessed By: N/A **Date:** N/A

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Am-241	955.4095.10	55,069.251	DPM/ml	11/08/12	0.1	ml	RS-008

Reagent Solution IDs*

J12036

*Except where otherwise noted, all reagents were applied in accordance with the specifications of the preparation methods associated with this batch.

Supersedes: _____

Radiochemistry Gravimetric Worksheet

ALS Environmental -- FC

Prep Batch: AB121109-1

Prep Procedure: **GAB**

Reviewed By: jtl

Review Date: 11/15/2012

Prep Num	Planc. Num	LabID	QC Type	Test Alq (ml)	Tare Mass (g)	Initial Gross Mass (g)	Initial Net Mass (mg)	Suggested Alq (ml)	Samp Vol Available (ml)	Samp Vol Taken (ml)	Fin Gross Mass (g)	Final Net Mass (mg)	Salt Sol. Added (ml)	Flag
1	1	1223001-1	SMP	10	9.1050	0.0000	0	200	200	200	9.1283	23.3	0.5	
1	2	1223001-2	SMP	10	9.0995	0.0000	0	200	200	200	9.1216	22.1	0.5	
1	3	1223001-3	SMP	10	9.0872	0.0000	0	200	200	200	9.1082	21	0.5	
1	4	1223001-4	SMP	10	9.1198	0.0000	0	200	200	200	9.1426	22.8	0.5	
1	5	1223001-5	SMP	10	9.1442	0.0000	0	200	200	200	9.1669	22.7	0.5	
1	6	1223001-6	SMP	10	9.1142	0.0000	0	200	200	200	9.1627	48.5	1	
1	7	1223001-7	SMP	10	9.1346	0.0000	0	200	200	200	9.1821	47.5	1	
1	8	1223001-8	SMP	10	9.0877	0.0000	0	200	200	200	9.1314	43.7	1.5	
1	9	1223001-9	SMP	10	9.0922	0.0000	0	200	200	200	9.1383	46.1	1.5	
1	10	1223001-10	SMP	10	9.0712	0.0000	0	200	200	200	9.1347	63.5	2	
1	11	1223001-11	SMP	10	9.1302	0.0000	0	200	200	200	9.2113	81.1	2	
1	12	1223001-12	SMP	10	9.1044	0.0000	0	200	200	200	9.1980	93.6	2.5	
1	13	1223001-13	SMP	10	9.1418	0.0000	0	200	200	200	9.2370	95.2	2.5	
1	14	1223001-14	SMP	10	9.1031	0.0000	0	200	200	200	9.2192	116.1	3	
1	15	1223001-15	SMP	10	9.1182	0.0000	0	200	200	200	9.2089	90.7	3	
1	16	1223001-16	SMP	10	9.1173	0.0000	0	200	200	200	9.2515	134.2	3.5	
1	17	1223001-17	SMP	10	9.0956	0.0000	0	200	200	200	9.2298	134.2	3.5	
1	18	1223001-18	SMP	10	9.1276	0.0000	0	200	200	200	9.2792	151.6	4	
1	19	1223001-19	SMP	10	9.1131	0.0000	0	200	200	200	9.2691	156	4	
1	20	1223001-20	SMP	10	9.0751	0.0000	0	200	200	200	9.0964	21.3	0.5	
1	21	1223001-21	SMP	10	9.1113	0.0000	0	200	200	200	9.1331	21.8	0.5	
1	22	1223001-22	SMP	10	9.0713	0.0000	0	200	200	200	9.0910	19.7	0.5	
1	23	1223001-23	SMP	10	9.1326	0.0000	0	200	200	200	9.1531	20.5	0.5	
1	24	1223001-24	SMP	10	9.1320	0.0000	0	200	200	200	9.1532	21.2	0.5	
1	25	1223001-25	SMP	10	9.1188	0.0000	0	200	200	200	9.1399	21.1	0.5	
1	26	1223001-26	SMP	10	9.0872	0.0000	0	200	200	200	9.1087	21.5	0.5	
1	27	1223001-27	SMP	10	9.1133	0.0000	0	200	200	200	9.1340	20.7	0.5	

Supersedes: 11/15/12 12:19

Gross α standards

mg mass		Std				
21.3	1	20mg R1	0.5ml salt,	0.1ml 955, 4095.10	.0751	.0964
1.8	2	R2			.1113	.1331
9.7	3	R3			.0713	.0910
20.5	4	R4			.1326	.1531
21.2	5	R5			.1320	.1532
21.1	6	20mg + U		0.05ml of 10mg/ml nat. U	.1188	.1399
21.5	7				.0872	.1087
20.7	8				.1133	.134

OUTLIER TEST

FILE	DET	SAMPLE ID	Alpha CPM	Relative % diff. from mean	Within acceptability range	Outlier?
ABA1118	A1(1)	1223001-20	1163.818	0.71%	YES	NO
ABA1118A	A1(1)	1223001-21	1074.100	8.36%	YES	OUTLIER!
ABA1118B	A1(1)	1223001-22	1248.300	6.50%	YES	NO
ABA1118C	A1(1)	1223001-23	1203.900	2.71%	YES	NO
ABA1119	A1(1)	1223001-24	1170.500	0.14%	YES	NO

Mean of all five planchets:			Acceptability range	elative range
Average=	1172.12	Upper	1300.55	+/- 10.96%
Std dev=	64.21220433	Lower	1043.70	
2 Std Dev=	128.42			**10.96%**

Sample 1223001-21 rejected as outlier.

Criteria: Potential outliers fall outside acceptability range; which is the mean of all five measurements +/- 2 std dev per the Grubbs statistical test.

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1118
Batch ID: OUTLIER TEST
Count Preset (m): 11
Batch Ended: 11/18/12 16:44

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		Beta to Alpha X-talk y = b*mass + m	
a ->b xtalk b=	0.2550	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1223001-20	11/18/12 16:44	11.00	21.3	1163.818	0.114	0.060	0.2633	0.890	n/a	n/a	300.818	1.998	296.6420	0.3879	0.992	n/a	n/a

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1118A
Batch ID: OUTLIER TEST
Count Preset (m): 10
Batch Ended: 11/18/12 17:02

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		Beta to Alpha X-talk y = b*mass + m	
a ->b xtalk b=	0.2560	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1223001-21	11/18/12 17:02	10.00	21.8	1074.100	0.114	0.056	0.2633	0.887	n/a	n/a	280.100	1.998	273.7444	0.3879	0.992	n/a	n/a

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1118B
Batch ID: OUTLIER TEST
Count Preset (m): 10
Batch Ended: 11/18/12 17:13

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		Beta to Alpha X-talk y = b*mass + m	
a ->b xtalk b=	0.2560	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1223001-22	11/18/12 17:13	10.00	19.7	1248.300	0.114	0.070	0.2633	0.899	n/a	n/a	350.400	1.998	318.2792	0.3879	0.993	n/a	n/a

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1118C
Batch ID: OUTLIER TEST
Count Preset (m): 10
Batch Ended: 11/18/12 17:37

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		Beta to Alpha X-talk y = b*mass + m	
a ->b xtalk b=	0.2560	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1223001-23	11/18/12 17:37	10.00	20.5	1203.900	0.114	0.066	0.2633	0.895	n/a	n/a	332.000	1.998	306.9084	0.3879	0.992	n/a	n/a

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1119
Batch ID: OUTLIER TEST
Count Preset (m): 10
Batch Ended: 11/19/12 9:42

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		Beta to Alpha X-talk y = b*mass + m	
a ->b xtalk b=	0.2560	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1223001-24	11/19/12 9:42	10.00	21.2	1170.500	0.114	0.066	0.2633	0.890	n/a	n/a	331.600	1.998	298.3512	0.3879	0.992	n/a	n/a

Radiochemistry Instrument Worksheet

Prep Batch: AB110616-3

ALS Environmental -- FC

Prep Procedure: GAB EFF CAL SET Drinking H2O / Sr-90

Analytical QASS / NCR? Y / N

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	1118005-1	SMP	200	200	ml	PCI/L											OUTLIER
1	1118005-2	SMP	200	200	ml	PCI/L											
1	1118005-3	SMP	200	200	ml	PCI/L											
1	1118005-4	SMP	200	200	ml	PCI/L											
1	1118005-5	SMP	200	200	ml	PCI/L											
1	1118005-6	SMP	200	200	ml	PCI/L											
1	1118005-7	SMP	200	200	ml	PCI/L											OUTLIER JP 6/13/11
1	1118005-8	SMP	200	200	ml	PCI/L											
1	1118005-9	SMP	200	200	ml	PCI/L											
1	1118005-10	SMP	200	200	ml	PCI/L											

Sr-90

See Maintenance Log 3710 pg 82

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	777.3020.11	4,268.831	DPM/ml	06/16/11	1	ml	RS-005
S2	Th-230	853.3020.89	1,166.342	DPM/ml	06/16/11	5	ml	RS-009

Sample Barcodes

1118005-1 AB110616-3PS1	1118005-2 AB110616-3PS2	1118005-3 AB110616-3PS3
1118005-4 AB110616-3PS4	1118005-5 AB110616-3PS5	1118005-6 AB110616-3PS6
1118005-7 AB110616-3PS7	1118005-8 AB110616-3PS8	1118005-9 AB110616-3PS9
1118005-10 AB110616-3PS10		

Radiochemistry Instrument Worksheet

Prep Batch: AB110616-3

Reporting Units

LabID:	TstGrpName:	RptUnits:
1118005-1	GrossAlpha/Beta	PCI/L
1118005-2	GrossAlpha/Beta	PCI/L
1118005-3	GrossAlpha/Beta	PCI/L
1118005-4	GrossAlpha/Beta	PCI/L
1118005-5	GrossAlpha/Beta	PCI/L
1118005-6	GrossAlpha/Beta	PCI/L
1118005-7	GrossAlpha/Beta	PCI/L
1118005-8	GrossAlpha/Beta	PCI/L
1118005-9	GrossAlpha/Beta	PCI/L
1118005-10	GrossAlpha/Beta	PCI/L

Radiochemistry Instrument Worksheet

Prep Batch: AB110616-3

ALS Environmental -- FC

Prep Procedure: GAB Calib. SET (GROSS B GROSS α DRY H2O) OUTLIER TEST **Analytical QASS / NCR? Y / N** _____

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	1118005-1	SMP	200	200	ml	PCI/L	X	ABC0621	F 11	δ	X						OUTLIER
1	1118005-2	SMP	200	200	ml	PCI/L			G 11	δ							
1	1118005-3	SMP	200	200	ml	PCI/L			H 11	δ							
1	1118005-4	SMP	200	200	ml	PCI/L			I 11	δ							
1	1118005-5	SMP	200	200	ml	PCI/L			J 11	δ							
1	1118005-6	SMP	200	200	ml	PCI/L		ABC0621	A 26	δ							
1	1118005-7	SMP	200	200	ml	PCI/L	X		B 6	δ	X						OUTLIER
1	1118005-8	SMP	200	200	ml	PCI/L			C 6	δ							
1	1118005-9	SMP	200	200	ml	PCI/L			D 6	δ							
1	1118005-10	SMP	200	200	ml	PCI/L			E 6	δ							

X Rejected as OUTLIER
δ 6/21/11

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	777.3020.11	4,268.831	DPM/ml	06/16/11	1	ml	RS-005
S2	Th-230	853.3020.89	1,166.342	DPM/ml	06/16/11	5	ml	RS-009

Sample Barcodes

1118005-1 AB110616-3PS1	1118005-2 AB110616-3PS2	1118005-3 AB110616-3PS3
1118005-4 AB110616-3PS4	1118005-5 AB110616-3PS5	1118005-6 AB110616-3PS6
1118005-7 AB110616-3PS7	1118005-8 AB110616-3PS8	1118005-9 AB110616-3PS9
1118005-10 AB110616-3PS10		

Radiochemistry Instrument Worksheet

Prep Batch: AB110616-3

Reporting Units

LabID:	TstGrpName:	RptUnits:
1118005-1	GrossAlpha/Beta	PCI/L
1118005-2	GrossAlpha/Beta	PCI/L
1118005-3	GrossAlpha/Beta	PCI/L
1118005-4	GrossAlpha/Beta	PCI/L
1118005-5	GrossAlpha/Beta	PCI/L
1118005-6	GrossAlpha/Beta	PCI/L
1118005-7	GrossAlpha/Beta	PCI/L
1118005-8	GrossAlpha/Beta	PCI/L
1118005-9	GrossAlpha/Beta	PCI/L
1118005-10	GrossAlpha/Beta	PCI/L

Radiochemistry Prep Worksheet

Prep Batch: AB110616-3

ALS Environmental -- FC

Prep Procedure: GAB

Reviewed By: gdw GDW **Review Date:** 6/20/2011

Non-Routine Pre-Treatment? Y / (N) **Batch:** N/A **Re-Prep?** Y / (N) **Batch:** N/A **Prep QASS / NCR?** Y (N) N/A

Prep SOP: PAI 702 **Rev:** 20 **Prep Analyst:** Gabriel D. Wagner GDW **Balance:**

Prep SOP: NONE **Prep Date:** 6/16/2011 **Balance:**

Matrix Class: liquid **Prep Dept:** RS

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1118005-1	SMP		200	200	Unfiltered	S1	
2	1	1118005-2	SMP		200	200	Unfiltered	S1	
3	1	1118005-3	SMP		200	200	Unfiltered	S1	
4	1	1118005-4	SMP		200	200	Unfiltered	S1	
5	1	1118005-5	SMP		200	200	Unfiltered	S1	
6	1	1118005-6	SMP		200	200	Unfiltered	S2	
7	1	1118005-7	SMP		200	200	Unfiltered	S2	
8	1	1118005-8	SMP		200	200	Unfiltered	S2	
9	1	1118005-9	SMP		200	200	Unfiltered	S2	
10	1	1118005-10	SMP		200	200	Unfiltered	S2	

GDW 06-20-11

GDW 06-20-11

Comments

Gross alpha and beta zero mass efficiency. Direct spike onto planchet along with concentrated HNO3. (Into desiccator on 6/20/11 @ 13:00 gdw 06/20/11)

Spiked By: Gabriel D. Wagner GDW **Date:** 6/20/2011

Witnessed By: Justin D. Anderson **Date:** 6/20/2011

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	777.3020.11	4,268.831	DPM/ml	06/16/11	1	ml	RS-005
S2	Th-230	853.3020.89	1,166.342	DPM/ml	06/16/11	5	ml	RS-009

Reagent Solution IDs*

J12036

*Except where otherwise noted, all reagents were applied in accordance with the specifications of the preparation methods associated with this batch.

Supersedes: 6/16/11 15:50

Radiochemistry Prep Worksheet

Prep Batch: AB110616-3

ALS Environmental -- FC

Prep Procedure: GAB

Prep Batch Not Validated!!!

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N **Batch:** _____ **Re-Prep? Y / N** **Batch:** _____ **Prep QASS / NCR? Y / N** _____

Prep SOP: PAI 702 **Rev:** 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Gabriel D. Wagner GDW
Prep Date: 6/16/2011
Prep Dept: RS

Balance:
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1118005-1	SMP		200	200	Unfiltered	S1	
2	1	1118005-2	SMP		200	200	Unfiltered	S1	
3	1	1118005-3	SMP		200	200	Unfiltered	S1	
4	1	1118005-4	SMP		200	200	Unfiltered	S1	
5	1	1118005-5	SMP		200	200	Unfiltered	S1	
6	1	1118005-6	SMP		200	200	Unfiltered	S2	
7	1	1118005-7	SMP		200	200	Unfiltered	S2	
8	1	1118005-8	SMP		200	200	Unfiltered	S2	
9	1	1118005-9	SMP		200	200	Unfiltered	S2	
10	1	1118005-10	SMP		200	200	Unfiltered	S2	

TRAY#3 DESIGNATED on 06/20/11 @ 13:00

Comments
Gross alpha and beta zero mass efficiency. Direct spike onto planchet along with concentrated HNO3.

Spiked By: GDW **Date:** 06/20/11
Witnessed By: JMA **Date:** 6/20/11

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	777.3020.11	4,268.831	DPM/ml	06/16/11	1	ml	RS-005
S2	Th-230	853.3020.89	1,166.342	DPM/ml	06/16/11	5	ml	RS-009

EXP. 4/1/12
EXP. 11/19/11

Reagent Solution IDs*

J12036

*Except where otherwise noted, all reagents were applied in accordance with the specifications of the preparation methods associated with this batch.

Supersedes: N/A

OUTLIER TEST

FILE	DET	SAMPLE ID	Beta CPM	Relative % diff. from mean	Within acceptability range	Outlier?
ABC0621F	C3(11)	1118005-1	3650.0	1.94%	YES	OUTLIER!
ABC0621G	C3(11)	1118005-2	3736	0.37%	YES	NO
ABC0621H	C3(11)	1118005-3	3676.67	1.22%	YES	NO
ABC0621I	C3(11)	1118005-4	3757.67	0.95%	YES	NO
ABC0621J	C3(11)	1118005-5	3790.67	1.84%	YES	NO

Mean of all five planchets:

Average= 3722.20

Std dev= 57.927

2 Std Dev= 115.85

	Acceptability range	Relative range
Upper	3838.05	+/- 3.11%
Lower	3606.35	

3.11%

Sample 1118005-1 rejected as outlier.

Criteria: Potential outliers fall outside acceptability range; which is the mean of all five measurements +/- 2 std dev per the Grubbs statistical test.

PAI - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC0621F
Batch ID: SR90 OUTLIER TEST
Count Preset (m): 3
Batch Ended: 6/21/2011 9:59

Background logfile: BKGABW
Date of Bkg. Cal: 6/16/2011
Alpha efficiency logfile: Am-241R-06/10 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0611/12/14 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr-89-06/11 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0610/0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	1.14100	Beta b=	1.0680
m=	0.99380	m=	0.9990
a=	0.9950	a=	0.9920
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2779	b ->a xtalk b=	-1.05E-05
a ->b xtalk m=	1.0004	b ->a xtalk m=	0.0023

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity							Beta Activity						
					Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.
C3	1118005-1	6/21/2011 9:59	3.00	0.0	2.667	0.064	8.391	0.2180	1.141	n/a	n/a	3650.000	1.727	0.7233	0.4712	1.068	n/a	n/a

6/27/11

PAI - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC0621G
Batch ID: SR90 OUTLIER TEST
Count Preset (m): 3
Batch Ended: 6/21/2011 10:03

Background logfile: BKGABW
Date of Bkg. Cal: 6/16/2011
Alpha efficiency logfile: Am-241R-06/10 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0611/12/14 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr-89-06/11 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0610/0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	1.14100	Beta b=	1.0680
m=	0.99380	m=	0.9990
a=	0.9950	a=	0.9920
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2779	b ->a xtalk b=	-1.05E-05
a ->b xtalk m=	1.0004	b ->a xtalk m=	0.0023

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity							Beta Activity						
					Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.
C3	1118005-2	6/21/2011 10:03	3.00	0.0	4.333	0.064	8.589	0.2180	1.141	n/a	n/a	3736.000	1.727	1.1864	0.4712	1.068	n/a	n/a

6/27/11

PAI - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC0621H
Batch ID: SR90 OUTLIER TEST
Count Preset (m): 3
Batch Ended: 6/21/2011 10:07

Background logfile: BKGABW
Date of Bkg. Cal: 6/16/2011
Alpha efficiency logfile: Am-241R-06/10 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0611/12/14 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr-89-06/11 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0610/0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	1.14100	Beta b=	1.0680
m=	0.99380	m=	0.9990
a=	0.9950	a=	0.9920
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2779	b ->a xtalk b=	-1.05E-05
a ->b xtalk m=	1.0004	b ->a xtalk m=	0.0023

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity							Beta Activity						
					Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.
C3	1118005-3	6/21/2011 10:07	3.00	0.0	2.667	0.064	8.452	0.2180	1.141	n/a	n/a	3676.667	1.727	0.7233	0.4712	1.068	n/a	n/a

6/27/11

PAI - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC0621I
Batch ID: SR90 OUTLIER TEST
Count Preset (m): 3
Batch Ended: 6/21/2011 10:11

Background logfile: BKGABW
Date of Bkg. Cal: 6/16/2011
Alpha efficiency logfile: Am-241R-06/10 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0611/12/14 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr-89-06/11 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0610/0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	1.14100	Beta b=	1.0680
m=	0.99380	m=	0.9990
a=	0.9950	a=	0.9920
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2779	b ->a xtalk b=	-1.05E-05
a ->b xtalk m=	1.0004	b ->a xtalk m=	0.0023

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity							Beta Activity						
					Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.
C3	1118005-4	6/21/2011 10:11	3.00	0.0	2.000	0.064	8.639	0.2180	1.141	n/a	n/a	3757.667	1.727	0.5380	0.4712	1.068	n/a	n/a

6/27/11

PAI - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC0621J
Batch ID: SR90 OUTLIER TEST
Count Preset (m): 3
Batch Ended: 6/21/2011 10:15

Background logfile: BKGABW
Date of Bkg. Cal: 6/16/2011
Alpha efficiency logfile: Am-241R-06/10 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0611/12/14 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr-89-06/11 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0610/0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	1.14100	Beta b=	1.0680
m=	0.99380	m=	0.9990
a=	0.9950	a=	0.9920
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2779	b ->a xtalk b=	-1.05E-05
a ->b xtalk m=	1.0004	b ->a xtalk m=	0.0023

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity							Beta Activity						
					Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.
C3	1118005-5	6/21/2011 10:15	3.00	0.0	2.667	0.064	8.715	0.2180	1.141	n/a	n/a	3790.667	1.727	0.7233	0.4712	1.068	n/a	n/a

S 6/27/11

Project 955, 4095.10 Am-241 ~~Intermediate~~ Working Standard MEL 11/8/11

Continued from Page

MEL 11/8/11

Prepare a working dilution of 955, Am-241

1. Density of 1 M HCl, lot # K22032
   - Mass of 100mL vol. flask: 66.4295g — Balance # 12
   - Mass of flask & 100mL acid: 167.9701g — Balance# 12
   - Net Mass: 101.5406g
   - Density: 1.0154g/mL

2. Mass of 955 transferred:
   - Mass of empty voa vial: 21.3568g — Balance# 12
   - Mass of voa vial & standard: 26.4318g — Balance# 12
   - Net mass of standard transferred: 5.0750g

MEL 11/8/11 MEL 11/8/11

3. Dilute to final volume:
   - Mass of vial, standard, & diluent: 42.8085g — Balance# 12
   - Mass of empty voa vial: 21.3568g — Balance# 12
   - Net mass of new dilution: 21.4517g

4. Final activity calculation:

$$\left(1.965\times10^{4}\,Bq\right)\left(\frac{60\,dpm}{1\,Bq}\right)\left(\frac{5.0750\,g}{5.1344\,g}\right)\left(\frac{1.0154\,g/mL}{21.4517\,g}\right) = \cancel{55,161.32}\ 55,161.33\ dpm/mL$$

MEL 11/8/11 MEL 11/8/11

MEL 11/8/11

RG 11/29/11

Stnd ID: 955.4095.10

RG 11/29/11

Description: Am-241
Expiration: 11/11/2012
Activity: 55161.33 dpm/mL

2s Uncertainty: 992.90 dpm/mL
Ref. Date: 10/25/2011
Ref Time: N/A
Prep Date: 11/8/2011 Prep by: MEL
Matrix/Comp. 3M HCl
Half Life (y): 4.33E+02

RG 11/29/11

Reverification Log		
Analysis Date	Initials	Expiration Date

RG 11/29/11

Continued on Page

Signed: Meyer Lons — Date: 11/8/11

Read and Understood By — Signed: [illegible] — Date: 11/29/11

Eckert & Ziegler
Analytics

RSO#955
Rec 10-31-11

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

85983-307

Am-241 5 mL Liquid in Flame Sealed Vial

Customer: ALS Laboratory Group / Fort Collins
P.O. No.: 73625, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Am-241	1.580E+05	1.965E+04	0.1	0.9	1.8	10/25/2011

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities < 0.1 %, α-impurities < 0.1 %. 5.13441 g 1M HCl solution, carrier free.

Source Prepared by: MITaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 26 Oct 11
J. D. McCorvey, QA Manager Alternate

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

ANA Form005 Rev. —

Single Isotope Certificate, Rev 1 9/28/2009

Prepare a primary dilution of RSO #777 (Analytics #69573-307) in 0.1M HCl to a final volume of approx. 500mL

1) Prepare 0.1M HCl by diluting 8.3 mL HCl (12M) (Fisher Scientific Lot # 055784) to a final volume of 1L.

2) Determine the density of 0.1M HCl

Weight of empty volumetric flask (100mL) — Bal 26 — 68.54g
Mass of flask + 100mL 0.1M HCl — 168.31g
Mass of 100mL of 0.1M HCl — 99.77g
÷ 100mL = density = — 0.9977

3) Transfer #777 to a 500mL

Mass of bottle — Bal 12 — 47.9687
Mass of bottle + std. — 52.9160
Mass of std. — 4.9473

4) Dilute to volume w/ 0.1M HCl

Mass of bottle + std. + soln — Bal 26 — 494.52g
Mass of bottle (from above) — -47.9487g
mass of soln — ~~446.31g~~ HB 2/8/06 446.55g

5) Final activity (dpm/mL)

$$\frac{(3812 \times 10^4 \text{ dps})(60\text{sec}/1\text{min})(4.9473\text{g})}{(5.0516\text{g})(\cancel{446.31}\ 446.55\text{g})} = \cancel{5010.94}\ 5008.25 \text{ dpm/g}$$

HB 2/8/06

RG 5/9/06 HB 2/8/06 ~~5010.94~~ dpm × 0.9977g / 5008.25 g = ~~4999.42~~ 4996.73 dpm/mL

Stnd ID: 777.3020.11
Description: Sr-90
Expiration: 2/27/07
Activity: 4996.73 dpm/mL
2s Uncertainty: 99.93 dpm/mL
Ref. Date: 12/2/04
Ref Time: N/A
Prep Date: 2/8/06 Prep by: HB
Matrix/Comp. 0.1 M HCl
Half Life (y): 2.88E+01

ANALYSIS DATE = 06/8/10
NEW EXP. = DATE 07/06/07/11

Reverification Log		
Analysis Date	Initials	Expiration Date
7/7/10	RG	7/7/11
4/1/11	RG	4/1/12

Reverification Log		
Analysis Date	Initials	Expiration Date
11/8/06	RG	11/8/07
8/3/07	DHS	8/3/08
2/28/08	MBC	2/25/09
1/30/09	RG	1/30/2010
7/17/09	RG	7/17/2010

Read and Understood:

Signed: Courtney Barker — Date: 2/8/06
Signed: [signature] — Date: 2/8/06

ANALYTICS

RSO #777
Rec'd 12/9/04 JCB

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

69573-307

Sr-90 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Sr-90
ACTIVITY (dps):	3.812 E4
HALF-LIFE:	28.79 years
CALIBRATION DATE:	December 2, 2004 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	2.0%

Impurities: γ-impurities <0.1%

5.05960 grams in 0.1M HCl solution with 30 μg/g Sr carrier.

This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

P O NUMBER 71069, Item 1

SOURCE PREPARED BY: M Dimitrova
M. Dimitrova, Radiochemist

Q A APPROVED: 12-6-04

Mass Attenuation Curves

LB4100C Alpha Attenuation Curve -- Am-241

WO #	1223001	
Mass Range		
Low	21.0	mg
High	156.0	mg

Spike Information		
Std. ID	955.4095.10	
Ref. Date	10/25/2011	
Halflife	433	yrs
Activity	55161.33	dpm/mL
Vol.	0.1	mL
Act. Added	5516.13	dpm

Attenuation Equation	y=b*m^(a*(x-x0)
b =	0.8949
m =	0.9914
a =	0.9119
xo	21.448
% Diff Max. =	14.9%

Cross-Talk Equation	y=b*m^-x
b =	0.2414
m =	0.9990
% Diff Max. =	16.0%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Alpha CPM	Beta CPM	Base Alpha Eff.	Decay Corr. Act. added dpm/mL	Alpha EFF Actual	Alpha Att. Fitted EFF	Actual/Fit Ratio	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	α > β X Tlk Actual	α > β X Tlk Fitted	% Diff.
AAM0606	A1	1223001-3	21	6/11/2017 8:18	10011	2845	8.75	1144.0363	323.7069	0.2015	5466.64	0.2093	0.1810	0.8647	1.0386	0.8980	13.5%	0.2830	0.2463	13.0%
AAM0611	A2	1223001-3	21	6/11/2017 8:48	10012	2643	8.65	1157.3626	304.2131	0.2221	5466.64	0.2117	0.1995	0.9421	0.9532	0.8980	5.8%	0.2629	0.2463	6.3%
AAM0610	A3	1223001-3	21	6/10/2017 10:19	10012	2671	8.61	1162.7379	308.7107	0.2101	5466.66	0.2127	0.1887	0.8871	1.0124	0.8980	11.3%	0.2655	0.2463	7.2%
AAM0610	A4	1223001-3	21	6/10/2017 10:49	10004	2690	8.58	1165.8844	311.9878	0.2068	5466.66	0.2133	0.1857	0.8708	1.0313	0.8980	12.9%	0.2676	0.2463	8.0%
AAM0610	B1	1223001-3	21	6/10/2017 11:17	10016	2665	8.89	1106.5682	298.1620	0.1965	5466.66	0.2024	0.1765	0.8718	1.0301	0.8980	12.8%	0.2694	0.2463	8.6%
AAM0610	B2	1223001-3	21	6/10/2017 11:47	10011	2699	8.87	1128.5189	302.6341	0.2192	5466.66	0.2064	0.1968	0.9535	0.9418	0.8980	4.6%	0.2682	0.2463	8.2%
AAM0610	B3	1223001-3	21	6/10/2017 12:15	10003	2830	8.85	1130.1985	318.2290	0.2040	5466.66	0.2067	0.1832	0.8861	1.0134	0.8980	11.4%	0.2816	0.2463	12.5%
AAM0610	B4	1223001-3	21	6/10/2017 12:47	10009	2817	8.94	1119.4749	313.5097	0.2008	5466.66	0.2048	0.1803	0.8806	1.0198	0.8980	11.9%	0.2801	0.2463	12.1%
AAM0610	C1	1223001-3	21	6/10/2017 13:15	10012	2882	8.83	1133.7518	324.8473	0.2054	5466.66	0.2074	0.1845	0.8894	1.0097	0.8980	11.1%	0.2865	0.2463	14.0%
AAM0610	C2	1223001-3	21	6/10/2017 13:45	10012	2724	8.67	1154.6746	312.5279	0.2232	5466.66	0.2112	0.2004	0.9490	0.9463	0.8980	5.1%	0.2707	0.2463	9.0%
AAM0610	C3	1223001-3	21	6/10/2017 14:14	10007	2821	8.82	1134.4845	318.2013	0.2134	5466.66	0.2075	0.1916	0.9234	0.9725	0.8980	7.7%	0.2805	0.2463	12.2%
AAM0610	C4	1223001-3	21	6/10/2017 14:42	10012	2622	8.62	1121.3439	301.2793	0.2042	5466.66	0.2051	0.1834	0.8940	1.0045	0.8980	10.6%	0.2687	0.2463	8.3%
AAM0610	D1	1223001-3	21	6/10/2017 15:12	10012	2751	9.08	1102.5482	301.3596	0.1946	5466.66	0.2017	0.1748	0.8665	1.0364	0.8980	13.4%	0.2733	0.2463	9.9%
AAM0610	D2	1223001-3	21	6/10/2017 15:40	10006	2724	8.96	1116.6541	302.4109	0.2166	5466.66	0.2043	0.1945	0.9522	0.9431	0.8980	4.8%	0.2708	0.2463	9.1%
AAM0611	D3	1223001-3	21	6/11/2017 7:21	10014	2651	8.89	1126.2632	296.5352	0.2056	5466.64	0.2060	0.1846	0.8962	1.0021	0.8980	10.4%	0.2633	0.2463	6.5%
AAM0611	D4	1223001-3	21	6/11/2017 7:49	10010	2611	8.75	1113.8990	296.7930	0.1996	5466.64	0.2038	0.1792	0.8797	1.0209	0.8980	12.0%	0.2664	0.2463	7.6%
AAM0611	A1	1223001-2	22.1	6/11/17 8:48	10005	2949	9.30	1075.7285	315.6608	0.2015	5466.64	0.1968	0.1794	0.9117	0.9766	0.8903	8.8%	0.2934	0.2465	16.0%
AAM0610	A2	1223001-2	22.1	6/10/2017 10:20	10011	2646	9.4	1064.9060	280.1534	0.2221	5466.66	0.1948	0.1977	1.0151	0.8771	0.8903	-1.5%	0.2631	0.2465	6.3%
AAM0610	A3	1223001-2	22.1	6/10/2017 10:50	10010	2806	9.32	1073.9383	299.5630	0.2101	5466.66	0.1965	0.1871	0.9522	0.9350	0.8903	4.8%	0.2789	0.2465	11.6%
AAM0610	A4	1223001-2	22.1	6/10/2017 11:18	10006	2746	9.25	1081.6467	295.3329	0.2068	5466.66	0.1979	0.1841	0.9305	0.9568	0.8903	6.9%	0.2730	0.2465	9.7%
AAM0610	B1	1223001-2	22.1	6/10/2017 11:47	10010	2636	9.33	1072.7922	280.9165	0.1965	5466.66	0.1962	0.1749	0.8915	0.9987	0.8903	10.9%	0.2619	0.2465	5.8%
AAM0610	B2	1223001-2	22.1	6/10/2017 12:16	10015	2861	9.74	1028.1171	292.0872	0.2192	5466.66	0.1881	0.1952	1.0377	0.8580	0.8903	-3.8%	0.2841	0.2465	13.2%
AAM0610	B3	1223001-2	22.1	6/10/2017 12:48	10015	2791	9.70	1032.3902	286.1870	0.2040	5466.66	0.1889	0.1816	0.9617	0.9257	0.8903	3.8%	0.2772	0.2465	11.1%
AAM0610	B4	1223001-2	22.1	6/10/2017 13:16	10010	2876	9.68	1033.9909	295.5164	0.2008	5466.66	0.1891	0.1788	0.9452	0.9420	0.8903	5.5%	0.2858	0.2465	13.7%
AAM0610	C1	1223001-2	22.1	6/10/2017 13:45	10006	2702	9.18	1089.8682	292.7955	0.2054	5466.66	0.1994	0.1829	0.9173	0.9706	0.8903	8.3%	0.2687	0.2465	8.2%
AAM0610	C2	1223001-2	22.1	6/10/2017 14:14	10006	2799	9.28	1078.1208	299.9574	0.2232	5466.66	0.1972	0.1987	1.0076	0.8836	0.8903	-0.8%	0.2782	0.2465	11.4%
AAM0610	C3	1223001-2	22.1	6/10/2017 14:43	10005	2730	9.30	1075.7105	291.9084	0.2134	5466.66	0.1968	0.1900	0.9655	0.9221	0.8903	3.4%	0.2714	0.2465	9.1%
AAM0610	C4	1223001-2	22.1	6/10/2017 15:12	10003	2871	9.51	1051.6992	298.9957	0.2042	5466.66	0.1924	0.1818	0.9450	0.9421	0.8903	5.5%	0.2843	0.2465	13.3%
AAM0610	D1	1223001-2	22.1	6/10/2017 15:41	10015	2849	9.62	1040.9653	294.5398	0.1946	5466.66	0.1904	0.1733	0.9099	0.9785	0.8903	9.0%	0.2829	0.2465	12.9%
AAM0611	D2	1223001-2	22.1	6/11/2017 7:21	10018	2715	9.57	1046.7260	282.0921	0.2166	5466.64	0.1915	0.1928	1.0071	0.8840	0.8903	-0.7%	0.2695	0.2465	8.5%
AAM0611	D3	1223001-2	22.1	6/11/2017 7:50	10007	2667	9.43	1061.0167	281.1558	0.2056	5466.64	0.1941	0.1830	0.9431	0.9440	0.8903	5.7%	0.2650	0.2465	7.0%
AAM0611	D4	1223001-2	22.1	6/11/2017 8:19	10015	2640	9.44	1060.8100	278.0540	0.1996	5466.64	0.1941	0.1777	0.9158	0.9722	0.8903	8.4%	0.2621	0.2465	5.9%
AAM0610	A1	1223001-1	23.3	6/10/2017 10:21	10002	2654	10.60	943.5069	248.9414	0.2015	5466.66	0.1726	0.1777	1.0297	0.8565	0.8820	-3.0%	0.2638	0.2468	6.4%
AAM0610	A2	1223001-1	23.3	6/10/17 10:51 AM	10011	2636	10.64	940.78946	246.4084	0.2221	5466.66	0.1721	0.1959	1.1383	0.7749	0.8820	-13.8%	0.2619	0.2468	5.8%
AAM0610	A3	1223001-1	23.3	6/10/2017 11:19	10005	2838	10.81	925.4359	261.0247	0.2101	5466.66	0.1693	0.1853	1.0946	0.8057	0.8820	-9.5%	0.2821	0.2468	12.5%
AAM0610	A4	1223001-1	23.3	6/10/2017 11:48	10011	2832	10.47	956.0775	268.9551	0.2068	5466.66	0.1749	0.1824	1.0429	0.8457	0.8820	-4.3%	0.2813	0.2468	12.3%
AAM0610	B1	1223001-1	23.3	6/10/2017 12:18	10000	2784	10.99	909.8271	251.7082	0.1965	5466.66	0.1664	0.1733	1.0413	0.8470	0.8820	-4.1%	0.2767	0.2468	10.8%
AAM0610	B2	1223001-1	23.3	6/10/2017 12:49	10006	2895	11.14	928.0877	258.2243	0.2192	5466.66	0.1698	0.1933	1.1388	0.7745	0.8820	-13.9%	0.2782	0.2468	11.3%
AAM0610	B3	1223001-1	23.3	6/10/2017 13:17	10010	2836	10.89	919.1079	258.8774	0.2040	5466.66	0.1681	0.1799	1.0702	0.8242	0.8820	-7.0%	0.2817	0.2468	12.4%
AAM0610	B4	1223001-1	23.3	6/10/2017 13:47	10014	2885	10.89	919.4592	263.3309	0.2008	5466.66	0.1682	0.1771	1.0530	0.8376	0.8820	-5.3%	0.2864	0.2468	13.8%
AAM0610	C1	1223001-1	23.3	6/10/2017 14:15	9999	2813	10.41	960.4087	268.6809	0.2054	5466.66	0.1757	0.1812	1.0312	0.8553	0.8820	-3.1%	0.2798	0.2468	11.8%
AAM0610	C2	1223001-1	23.3	6/10/2017 14:44	10004	2876	10.68	936.5921	267.6294	0.2232	5466.66	0.1713	0.1969	1.1490	0.7676	0.8820	-14.9%	0.2857	0.2468	13.6%
AAM0610	C3	1223001-1	23.3	6/10/2017 15:13	10003	2818	10.75	930.4156	260.4995	0.2134	5466.66	0.1702	0.1882	1.1059	0.7976	0.8820	-10.6%	0.2800	0.2468	11.8%
AAM0610	C4	1223001-1	23.3	6/10/2017 15:42	10011	2874	10.93	915.7785	260.0490	0.2042	5466.66	0.1675	0.1801	1.0751	0.8204	0.8820	-7.5%	0.2840	0.2468	13.1%
AAM0611	D1	1223001-1	23.3	6/11/2017 7:23	10003	2691	10.92	915.9306	244.8146	0.1946	5466.64	0.1675	0.1716	1.0244	0.8610	0.8820	-2.4%	0.2673	0.2468	7.7%
AAM0611	D2	1223001-1	23.3	6/11/2017 7:51	10000	2655	10.76	929.2810	245.1402	0.2166	5466.64	0.1700	0.1910	1.1238	0.7848	0.8820	-12.4%	0.2638	0.2468	6.4%
AAM0611	D3	1223001-1	23.3	6/11/2017 8:20	10003	2648	10.68	936.4395	246.2751	0.2056	5466.64	0.1713	0.1813	1.0586	0.8332	0.8820	-5.9%	0.2630	0.2468	6.1%
AAM0611	D4	1223001-1	23.3	6/11/2017 8:50	10020	2739	10.89	920.0092	249.9082	0.1996	5466.64	0.1683	0.1760	1.0460	0.8432	0.8820	-4.6%	0.2716	0.2468	9.1%

LB4100C Alpha Attenuation Curve -- Am-241

WO #	1223001	
Mass Range		
Low	21.0	mg
High	156.0	mg

Spike Information		
Std. ID	955.4095.10	
Ref. Date	10/25/2011	
Halflife	433	yrs
Activity	55161.33	dpm/mL
Vol.	0.1	mL
Act. Added	5516.13	dpm

Attenuation Equation	y=b*m^(a*(x-x0)
b =	0.8949
m =	0.9914
a =	0.9119
xo	21.448
% Diff Max. =	14.9%

Cross-Talk Equation	y=b*m^-x
b =	0.2414
m =	0.9990
% Diff Max. =	16.0%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Alpha CPM	Beta CPM	Base Alpha Eff.	Decay Corr. Act. added dpm/mL	Alpha EFF Actual	Alpha Att. Fitted EFF	Actual/Fit Ratio	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	α > β X Tlk Actual	α > β X Tlk Fitted	% Diff.
AAM0610	A1	1223001-9	46.1	6/10/2017 15:14	10002	2574	11.46	872.6969	223.1713	0.2015	5466.66	0.1596	0.1487	0.9312	0.7923	0.7377	6.9%	0.2557	0.2523	1.3%
AAM0610	A2	1223001-9	46.1	6/10/17 3:43 PM	10007	2535	11.55	866.31293	218.1445	0.2221	5466.66	0.1585	0.1638	1.0339	0.7135	0.7377	-3.4%	0.2518	0.2523	-0.2%
AAM0611	A3	1223001-9	46.1	6/11/2017 7:23	10013	2549	11.38	879.7810	222.4795	0.2101	5466.64	0.1609	0.1550	0.9631	0.7660	0.7377	3.7%	0.2529	0.2523	0.2%
AAM0611	A4	1223001-9	46.1	6/11/2017 7:51	10006	2477	11.03	907.0793	223.0374	0.2068	5466.64	0.1659	0.1526	0.9194	0.8024	0.7377	8.1%	0.2459	0.2523	-2.6%
AAM0611	B1	1223001-9	46.1	6/11/2017 8:21	10002	2626	11.67	856.9784	223.4084	0.1965	5466.64	0.1568	0.1450	0.9247	0.7978	0.7377	7.5%	0.2607	0.2523	3.2%
AAM0611	B2	1223001-9	46.1	6/11/2017 8:50	10016	2493	11.51	870.0828	214.9443	0.2192	5466.64	0.1592	0.1617	1.0160	0.7261	0.7377	-1.6%	0.2470	0.2523	-2.1%
AAM0610	B3	1223001-9	46.1	6/10/2017 10:22	10001	2716	11.70	854.7023	230.5918	0.2040	5466.66	0.1563	0.1505	0.9626	0.7664	0.7377	3.7%	0.2698	0.2523	6.5%
AAM0610	B4	1223001-9	46.1	6/10/2017 10:52	10002	2657	11.82	846.0929	223.1975	0.2008	5466.66	0.1548	0.1481	0.9571	0.7708	0.7377	4.3%	0.2638	0.2523	4.4%
AAM0610	C1	1223001-9	46.1	6/10/2017 11:20	10005	2594	11.43	875.2181	225.4066	0.2054	5466.66	0.1601	0.1515	0.9465	0.7795	0.7377	5.4%	0.2575	0.2523	2.0%
AAM0610	C2	1223001-9	46.1	6/10/2017 11:49	10007	2687	11.53	867.7978	231.3852	0.2232	5466.66	0.1587	0.1647	1.0373	0.7112	0.7377	-3.7%	0.2666	0.2523	5.4%
AAM0610	C3	1223001-9	46.1	6/10/2017 12:18	10011	2478	11.52	868.9144	213.4642	0.2134	5466.66	0.1589	0.1574	0.9905	0.7448	0.7377	1.0%	0.2457	0.2523	-2.7%
AAM0610	C4	1223001-9	46.1	6/10/2017 12:49	10007	2592	11.53	867.7688	221.9079	0.2042	5466.66	0.1587	0.1506	0.9490	0.7774	0.7377	5.1%	0.2557	0.2523	1.3%
AAM0610	D1	1223001-9	46.1	6/10/2017 13:18	10007	2559	11.92	839.4184	213.0672	0.1946	5466.66	0.1536	0.1436	0.9349	0.7891	0.7377	6.5%	0.2538	0.2523	0.6%
AAM0610	D2	1223001-9	46.1	6/10/2017 13:48	10004	2573	11.70	854.9557	218.3075	0.2166	5466.66	0.1564	0.1598	1.0217	0.7220	0.7377	-2.2%	0.2553	0.2523	1.2%
AAM0610	D3	1223001-9	46.1	6/10/2017 14:17	10002	2741	11.74	851.7881	231.8103	0.2056	5466.66	0.1558	0.1517	0.9734	0.7579	0.7377	2.7%	0.2721	0.2523	7.3%
AAM0610	D4	1223001-9	46.1	6/10/2017 14:46	10014	2557	11.79	849.2629	215.2717	0.1996	5466.66	0.1554	0.1473	0.9478	0.7783	0.7377	5.2%	0.2535	0.2523	0.5%
AAM0610	A1	1223001-10	63.5	6/10/2017 14:47	9999	2584	12.92	773.8384	198.5640	0.2015	5466.66	0.1416	0.1297	0.9163	0.7025	0.6437	8.4%	0.2566	0.2565	0.0%
AAM0610	A2	1223001-10	63.5	6/10/17 3:16 PM	10006	2500	13.12	762.55844	189.2128	0.2221	5466.66	0.1395	0.1430	1.0249	0.6281	0.6437	-2.5%	0.2481	0.2565	-3.4%
AAM0610	A3	1223001-10	63.5	6/10/2017 15:44	10009	2685	12.92	774.5944	206.3073	0.2101	5466.66	0.1417	0.1352	0.9545	0.6744	0.6437	4.6%	0.2663	0.2565	3.7%
AAM0611	A4	1223001-10	63.5	6/11/2017 7:24	10011	2570	12.63	792.5536	201.9518	0.2068	5466.64	0.1450	0.1331	0.9182	0.7011	0.6437	8.2%	0.2548	0.2565	-0.7%
AAM0611	B1	1223001-10	63.5	6/11/2017 7:53	10001	2555	13.04	766.8569	194.3226	0.1965	5466.64	0.1403	0.1265	0.9017	0.7139	0.6437	9.8%	0.2534	0.2565	-1.2%
AAM0611	B2	1223001-10	63.5	6/11/2017 8:22	10000	2496	13.15	760.3393	188.1599	0.2192	5466.64	0.1391	0.1411	1.0145	0.6345	0.6437	-1.5%	0.2475	0.2565	-3.7%
AAM0611	B3	1223001-10	63.5	6/11/2017 8:52	10002	2504	12.85	778.2818	193.3188	0.2040	5466.64	0.1424	0.1313	0.9224	0.6979	0.6437	7.8%	0.2484	0.2565	-3.3%
AAM0610	B4	1223001-10	63.5	6/10/2017 10:24	10003	2575	13.13	761.7431	194.5248	0.2008	5466.66	0.1393	0.1293	0.9276	0.6939	0.6437	7.2%	0.2554	0.2565	-0.5%
AAM0610	C1	1223001-10	63.5	6/10/2017 10:53	10005	2676	12.96	771.8807	204.9415	0.2054	5466.66	0.1412	0.1322	0.9364	0.6874	0.6437	6.4%	0.2655	0.2565	3.4%
AAM0610	C2	1223001-10	63.5	6/10/2017 11:21	10005	2579	12.74	785.2098	200.7743	0.2232	5466.66	0.1436	0.1437	1.0003	0.6435	0.6437	0.0%	0.2557	0.2565	-0.3%
AAM0610	C3	1223001-10	63.5	6/10/2017 11:51	10002	2671	13.12	762.2516	201.9423	0.2134	5466.66	0.1394	0.1374	0.9852	0.6534	0.6437	1.5%	0.2649	0.2565	3.2%
AAM0610	C4	1223001-10	63.5	6/10/2017 12:20	10003	2549	13.01	768.7291	193.0292	0.2042	5466.66	0.1406	0.1314	0.9348	0.6886	0.6437	6.5%	0.2511	0.2565	-2.2%
AAM0610	D1	1223001-10	63.5	6/10/2017 12:51	10003	2604	13.26	754.2791	194.7661	0.1946	5466.66	0.1380	0.1253	0.9079	0.7090	0.6437	9.2%	0.2582	0.2565	0.7%
AAM0610	D2	1223001-10	63.5	6/10/2017 13:20	10003	2565	13.36	748.6405	190.3840	0.2166	5466.66	0.1369	0.1394	1.0181	0.6323	0.6437	-1.8%	0.2543	0.2565	-0.9%
AAM0610	D3	1223001-10	63.5	6/10/2017 13:49	10000	2755	13.36	748.3320	204.5476	0.2056	5466.66	0.1369	0.1323	0.9668	0.6658	0.6437	3.3%	0.2733	0.2565	6.1%
AAM0610	D4	1223001-10	63.5	6/10/2017 14:18	9999	2543	13.29	752.2692	189.7399	0.1996	5466.66	0.1376	0.1285	0.9337	0.6894	0.6437	6.6%	0.2522	0.2565	-1.7%
AAM0610	A1	1223001-12	93.6	6/10/2017 13:52	10009	2373	15.97	626.6596	147.1551	0.2015	5466.66	0.1146	0.1025	0.8938	0.5689	0.5085	10.6%	0.2348	0.2640	-12.4%
AAM0610	A2	1223001-12	93.6	6/10/2017 14:21	10003	2318	15.93	627.8407	144.1756	0.2221	5466.66	0.1148	0.1129	0.9834	0.5171	0.5085	1.7%	0.2296	0.2640	-15.0%
AAM0610	A3	1223001-12	93.6	6/10/17 2:50 PM	10008	2500	15.9	629.33796	155.7227	0.2101	5466.66	0.1151	0.1068	0.9280	0.5479	0.5085	7.2%	0.2474	0.2640	-6.7%
AAM0610	A4	1223001-12	93.6	6/10/2017 15:18	10002	2510	15.79	633.3559	157.4294	0.2068	5466.66	0.1159	0.1052	0.9077	0.5602	0.5085	9.2%	0.2486	0.2640	-6.2%
AAM0610	B1	1223001-12	93.6	6/10/2017 15:48	10011	2431	16.31	613.7042	147.4367	0.1965	5466.66	0.1123	0.0999	0.8901	0.5713	0.5085	11.0%	0.2402	0.2640	-9.9%
AAM0611	B2	1223001-12	93.6	6/11/2017 7:28	10003	2473	16.26	615.0737	150.4410	0.2192	5466.64	0.1125	0.1115	0.9907	0.5133	0.5085	0.9%	0.2446	0.2640	-8.0%
AAM0611	B3	1223001-12	93.6	6/11/2017 7:56	10000	2500	16.16	618.7279	153.1580	0.2040	5466.64	0.1132	0.1037	0.9165	0.5548	0.5085	8.3%	0.2475	0.2640	-6.7%
AAM0611	B4	1223001-12	93.6	6/11/2017 8:26	10007	2534	16.47	607.4896	152.2645	0.2008	5466.64	0.1111	0.1021	0.9188	0.5534	0.5085	8.1%	0.2506	0.2640	-5.3%
AAM0611	C1	1223001-12	93.6	6/11/2017 8:55	10001	2603	16.01	624.5621	161.0459	0.2054	5466.64	0.1142	0.1044	0.9142	0.5562	0.5085	8.6%	0.2579	0.2640	-2.4%
AAM0610	C2	1223001-12	93.6	6/10/2017 10:26	10005	2468	15.97	626.3752	152.8808	0.2232	5466.66	0.1146	0.1135	0.9906	0.5134	0.5085	0.9%	0.2441	0.2640	-8.2%
AAM0610	C3	1223001-12	93.6	6/10/2017 10:56	10003	2398	16.08	621.9811	147.4894	0.2134	5466.66	0.1138	0.1085	0.9538	0.5332	0.5085	4.6%	0.2371	0.2640	-11.4%
AAM0610	C4	1223001-12	93.6	6/10/2017 11:24	10001	2469	15.99	625.3124	151.5120	0.2042	5466.66	0.1144	0.1038	0.9078	0.5602	0.5085	9.2%	0.2423	0.2640	-9.0%
AAM0610	D1	1223001-12	93.6	6/10/2017 11:55	10002	2494	16.71	598.4687	147.6379	0.1946	5466.66	0.1095	0.0990	0.9039	0.5626	0.5085	9.6%	0.2467	0.2640	-7.0%
AAM0610	D2	1223001-12	93.6	6/10/2017 12:24	10000	2570	16.97	589.1882	149.8367	0.2166	5466.66	0.1078	0.1101	1.0219	0.4976	0.5085	-2.2%	0.2543	0.2640	-3.8%
AAM0610	D3	1223001-12	93.6	6/10/2017 12:55	10001	2677	16.75	596.9036	158.1559	0.2056	5466.66	0.1092	0.1045	0.9575	0.5311	0.5085	4.2%	0.2650	0.2640	0.3%
AAM0610	D4	1223001-12	93.6	6/10/2017 13:23	10003	2356	16.31	613.2037	142.8443	0.1996	5466.66	0.1122	0.1015	0.9048	0.5620	0.5085	9.5%	0.2329	0.2640	-13.3%

LB4100C Alpha Attenuation Curve -- Am-241

WO #	1223001	
Mass Range		
Low	21.0	mg
High	156.0	mg

Spike Information		
Std. ID	955.4095.10	
Ref. Date	10/25/2011	
Halflife	433	yrs
Activity	55161.33	dpm/mL
Vol.	0.1	mL
Act. Added	5516.13	dpm

Attenuation Equation	y=b*m^(a*(x-x0))
b =	0.8949
m =	0.9914
a =	0.9119
xo	21.448
% Diff Max. =	14.9%

Cross-Talk Equation	y=b*m^-x
b =	0.2414
m =	0.9990
% Diff Max. =	16.0%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Alpha CPM	Beta CPM	Base Alpha Eff.	Decay Corr. Act. added dpm/mL	Alpha EFF Actual	Alpha Att. Fitted EFF	Actual/Fit Ratio	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	α > β X Tlk Actual	α > β X Tlk Fitted	% Diff.
AAM0610	A1	1223001-13	95.2	6/10/2017 13:23	10008	2609	16.96	590.0163	152.3965	0.2015	5466.66	0.1079	0.1012	0.9375	0.5356	0.5022	6.2%	0.2583	0.2644	-2.4%
AAM0610	A2	1223001-13	95.2	6/10/2017 13:53	10012	2579	17.04	587.4647	150.0138	0.2221	5466.66	0.1075	0.1115	1.0379	0.4839	0.5022	-3.8%	0.2554	0.2644	-3.6%
AAM0610	A3	1223001-13	95.2	6/10/17 2:22 PM	10004	2607	16.8	595.38019	153.6686	0.2101	5466.66	0.1089	0.1055	0.9687	0.5184	0.5022	3.1%	0.2581	0.2644	-2.5%
AAM0610	A4	1223001-13	95.2	6/10/2017 14:51	10000	2655	16.81	594.8010	156.4097	0.2068	5466.66	0.1088	0.1038	0.9545	0.5261	0.5022	4.6%	0.2630	0.2644	-0.6%
AAM0610	B1	1223001-13	95.2	6/10/2017 15:20	10005	2616	17.09	585.3391	151.4590	0.1965	5466.66	0.1071	0.0987	0.9216	0.5449	0.5022	7.8%	0.2588	0.2644	-2.2%
AAM0610	B2	1223001-13	95.2	6/10/2017 15:49	10001	2780	17.76	563.0024	154.8815	0.2192	5466.66	0.1030	0.1101	1.0688	0.4698	0.5022	-6.9%	0.2751	0.2644	3.9%
AAM0611	B3	1223001-13	95.2	6/11/2017 7:29	10001	2696	17.19	581.7077	155.2904	0.2040	5466.64	0.1064	0.1024	0.9627	0.5216	0.5022	3.7%	0.2670	0.2644	0.9%
AAM0611	B4	1223001-13	95.2	6/11/2017 7:58	10007	2700	17.34	577.0050	154.1183	0.2008	5466.64	0.1056	0.1008	0.9553	0.5256	0.5022	4.5%	0.2671	0.2644	1.0%
AAM0611	C1	1223001-13	95.2	6/11/2017 8:26	10002	2721	16.67	599.8900	161.6874	0.2054	5466.64	0.1097	0.1031	0.9399	0.5343	0.5022	6.0%	0.2695	0.2644	1.9%
AAM0611	C2	1223001-13	95.2	6/11/2017 8:56	10003	2635	16.79	595.6593	155.2797	0.2232	5466.64	0.1090	0.1121	1.0287	0.4882	0.5022	-2.9%	0.2607	0.2644	-1.4%
AAM0610	C3	1223001-13	95.2	6/10/2017 10:28	10005	2598	17.32	577.5599	148.3600	0.2134	5466.66	0.1057	0.1072	1.0143	0.4951	0.5022	-1.4%	0.2569	0.2644	-2.9%
AAM0610	C4	1223001-13	95.2	6/10/2017 10:57	10007	2727	17.07	586.0922	156.8570	0.2042	5466.66	0.1072	0.1025	0.9565	0.5250	0.5022	4.4%	0.2676	0.2644	1.2%
AAM0610	D1	1223001-13	95.2	6/10/2017 11:26	10003	2595	17.68	565.6855	145.1620	0.1946	5466.66	0.1035	0.0977	0.9444	0.5318	0.5022	5.6%	0.2566	0.2644	-3.1%
AAM0610	D2	1223001-13	95.2	6/10/2017 11:55	10006	2507	17.33	577.2933	143.0554	0.2166	5466.66	0.1056	0.1088	1.0300	0.4875	0.5022	-3.0%	0.2478	0.2644	-6.7%
AAM0610	D3	1223001-13	95.2	6/10/2017 12:24	10001	2756	17.26	579.2612	158.0106	0.2056	5466.66	0.1060	0.1032	0.9744	0.5154	0.5022	2.6%	0.2728	0.2644	3.1%
AAM0610	D4	1223001-13	95.2	6/10/2017 12:55	10003	2691	17.25	579.7831	154.3930	0.1996	5466.66	0.1061	0.1002	0.9451	0.5314	0.5022	5.5%	0.2663	0.2644	0.7%
AAM0610	A1	1223001-14	116.1	6/10/2017 12:57	10002	2612	18.71	504.5024	138.1685	0.2015	5466.66	0.0923	0.0859	0.9309	0.4580	0.4263	6.9%	0.2739	0.2698	1.5%
AAM0610	A2	1223001-14	116.1	6/10/2017 13:25	10011	2655	18.99	527.0782	138.4744	0.2221	5466.66	0.0964	0.0947	0.9821	0.4341	0.4263	1.8%	0.2627	0.2698	-2.7%
AAM0610	A3	1223001-14	116.1	6/10/17 1:55 PM	10001	2611	18.82	531.30676	137.2254	0.2101	5466.66	0.0972	0.0896	0.9216	0.4626	0.4263	7.8%	0.2583	0.2698	-4.5%
AAM0610	A4	1223001-14	116.1	6/10/2017 14:24	10001	2709	18.61	537.3162	144.0349	0.2068	5466.66	0.0983	0.0882	0.8970	0.4753	0.4263	10.3%	0.2681	0.2698	-0.6%
AAM0610	B1	1223001-14	116.1	6/10/2017 14:53	10002	2676	19.47	503.6224	135.8292	0.1965	5466.66	0.0921	0.0838	0.9094	0.4688	0.4263	9.1%	0.2697	0.2698	0.0%
AAM0610	B2	1223001-14	116.1	6/10/2017 15:22	10004	2675	19.45	514.2275	135.8821	0.2192	5466.66	0.0941	0.0935	0.9935	0.4291	0.4263	0.7%	0.2642	0.2698	-2.1%
AAM0610	B3	1223001-14	116.1	6/10/2017 15:51	10001	2726	19.22	520.2594	140.2864	0.2040	5466.66	0.0952	0.0870	0.9139	0.4665	0.4263	8.6%	0.2696	0.2698	-0.1%
AAM0611	B4	1223001-14	116.1	6/11/2017 7:31	9999	2737	19.13	522.5869	141.4827	0.2008	5466.64	0.0956	0.0856	0.8955	0.4761	0.4263	10.4%	0.2707	0.2698	0.3%
AAM0611	C1	1223001-14	116.1	6/11/17 7:59 AM	10003	2777	18.41	513.23601	149.3019	0.2054	5466.64	0.0939	0.0876	0.9327	0.4571	0.4263	6.7%	0.2909	0.2698	7.3%
AAM0611	C2	1223001-14	116.1	6/11/2017 8:28	10005	2749	18.74	533.7727	145.0326	0.2232	5466.64	0.0976	0.0952	0.9746	0.4375	0.4263	2.5%	0.2717	0.2698	0.7%
AAM0611	C3	1223001-14	116.1	6/11/2017 8:58	10001	2677	18.59	537.8814	142.3622	0.2134	5466.64	0.0984	0.0910	0.9247	0.4611	0.4263	7.5%	0.2647	0.2698	-1.9%
AAM0610	C4	1223001-14	116.1	6/10/2017 10:30	10003	2757	19.00	526.3327	142.2083	0.2042	5466.66	0.0963	0.0871	0.9042	0.4715	0.4263	9.6%	0.2702	0.2698	0.1%
AAM0610	D1	1223001-14	116.1	6/10/2017 11:00	10000	2689	19.81	504.7006	134.1255	0.1946	5466.66	0.0923	0.0830	0.8986	0.4744	0.4263	10.1%	0.2658	0.2698	-1.5%
AAM0610	D2	1223001-14	116.1	6/10/2017 11:28	10002	2665	19.63	509.4392	134.1546	0.2166	5466.66	0.0932	0.0923	0.9909	0.4302	0.4263	0.9%	0.2633	0.2698	-2.5%
AAM0610	D3	1223001-14	116.1	6/10/2017 11:57	10002	2861	19.46	513.8064	145.3545	0.2056	5466.66	0.0940	0.0877	0.9326	0.4571	0.4263	6.7%	0.2829	0.2698	4.6%
AAM0610	D4	1223001-14	116.1	6/10/2017 12:26	10006	2675	19.38	516.2045	136.4219	0.1996	5466.66	0.0944	0.0851	0.9012	0.4731	0.4263	9.9%	0.2643	0.2698	-2.1%
AAM0610	A1	1223001-16	134.2	6/10/2017 12:31	10001	2902	24.23	412.6748	118.3329	0.2015	5466.66	0.0755	0.0746	0.9876	0.3746	0.3700	1.2%	0.2867	0.2745	4.3%
AAM0610	A2	1223001-16	134.2	6/10/2017 13:03	10004	2990	25.18	397.2054	117.4090	0.2221	5466.66	0.0727	0.0822	1.1309	0.3271	0.3700	-13.1%	0.2956	0.2745	7.1%
AAM0610	A3	1223001-16	134.2	6/10/2017 13:31	10005	2997	24.25	412.4813	122.0776	0.2101	5466.66	0.0755	0.0777	1.0302	0.3591	0.3700	-3.0%	0.2960	0.2745	7.2%
AAM0610	A4	1223001-16	134.2	6/10/2017 14:00	10000	2983	23.88	418.6775	123.3842	0.2068	5466.66	0.0766	0.0765	0.9990	0.3703	0.3700	0.1%	0.2947	0.2745	6.8%
AAM0610	B1	1223001-16	134.2	6/10/2017 14:30	10000	2959	24.65	405.5885	118.4276	0.1965	5466.66	0.0742	0.0727	0.9799	0.3776	0.3700	2.0%	0.2920	0.2745	6.0%
AAM0610	B2	1223001-16	134.2	6/10/2017 14:59	10001	3107	25.49	392.2329	120.2409	0.2192	5466.66	0.0718	0.0811	1.1303	0.3273	0.3700	-13.0%	0.3066	0.2745	10.4%
AAM0610	B3	1223001-16	134.2	6/10/2017 15:27	10002	3169	24.85	402.4110	125.9802	0.2040	5466.66	0.0736	0.0755	1.0253	0.3608	0.3700	-2.5%	0.3131	0.2745	12.3%
AAM0610	B4	1223001-16	134.2	6/10/2017 15:57	10003	3144	25.08	398.7437	123.7679	0.2008	5466.66	0.0729	0.0743	1.0185	0.3633	0.3700	-1.9%	0.3104	0.2745	11.6%
AAM0611	C1	1223001-16	134.2	6/11/17 7:36 AM	10004	2990	23.88	418.81797	123.6694	0.2054	5466.64	0.0766	0.0760	0.9919	0.3730	0.3700	0.8%	0.2953	0.2745	7.0%
AAM0611	C2	1223001-16	134.2	6/11/2017 8:04	10005	3103	24.11	414.8610	127.0428	0.2232	5466.64	0.0759	0.0826	1.0881	0.3400	0.3700	-8.8%	0.3062	0.2745	10.4%
AAM0611	C3	1223001-16	134.2	6/11/2017 8:34	9999	3039	24.50	408.0264	122.4008	0.2134	5466.64	0.0746	0.0790	1.0578	0.3498	0.3700	-5.8%	0.3000	0.2745	8.5%
AAM0611	C4	1223001-16	134.2	6/11/2017 9:04	9999	2993	24.55	407.1502	119.0175	0.2042	5466.64	0.0745	0.0755	1.0144	0.3647	0.3700	-1.4%	0.2923	0.2745	6.1%
AAM0610	D1	1223001-16	134.2	6/10/2017 10:36	10002	3047	25.54	391.5260	117.6891	0.1946	5466.66	0.0716	0.0720	1.0053	0.3680	0.3700	-0.5%	0.3006	0.2745	8.7%
AAM0610	D2	1223001-16	134.2	6/10/2017 11:06	10003	2996	25.67	389.5897	115.1051	0.2166	5466.66	0.0713	0.0801	1.1245	0.3290	0.3700	-12.4%	0.2955	0.2745	7.1%
AAM0610	D3	1223001-16	134.2	6/10/2017 11:34	10001	3170	25.32	394.8132	123.5325	0.2056	5466.66	0.0722	0.0761	1.0532	0.3513	0.3700	-5.3%	0.3129	0.2745	12.3%
AAM0610	D4	1223001-16	134.2	6/10/2017 12:03	10005	2988	24.88	402.0292	118.4895	0.1996	5466.66	0.0735	0.0738	1.0042	0.3684	0.3700	-0.4%	0.2947	0.2745	6.9%

LB4100C Alpha Attenuation Curve -- Am-241

WO #	1223001	
Mass Range		
Low	21.0	mg
High	156.0	mg

Spike Information		
Std. ID	955.4095.10	
Ref. Date	10/25/2011	
Halflife	433	yrs
Activity	55161.33	dpm/mL
Vol.	0.1	mL
Act. Added	5516.13	dpm

Attenuation Equation y=b*m^(a*(x-x0)	
b =	0.8949
m =	0.9914
a =	0.9119
xo	21.448
% Diff Max. =	14.9%

Cross-Talk Equation	y=b*m^-x
b =	0.2414
m =	0.9990
% Diff Max. =	16.0%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Alpha CPM	Beta CPM	Base Alpha Eff.	Decay Corr. Act. added dpm/mL	Alpha EFF Actual	Alpha Att. Fitted EFF	Actual/Fit Ratio	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	α > β X Tlk Actual	α > β X Tlk Fitted	% Diff.
AAM0610	A1	1223001-17	134.3	6/10/2017 12:00	10004	2789	21.71	460.7235	127.0301	0.2015	5466.66	0.0843	0.0745	0.8839	0.4183	0.3697	11.6%	0.2757	0.2746	0.4%
AAM0610	A2	1223001-17	134.3	6/10/2017 12:29	10003	2763	22.11	452.3257	123.6301	0.2221	5466.66	0.0827	0.0821	0.9923	0.3725	0.3697	0.8%	0.2733	0.2746	-0.5%
AAM0610	A3	1223001-17	134.3	6/10/2017 13:00	10005	2764	21.42	466.9908	127.5283	0.2101	5466.66	0.0854	0.0777	0.9092	0.4066	0.3697	9.1%	0.2731	0.2746	-0.5%
AAM0610	A4	1223001-17	134.3	6/10/17 1:28 PM	10001	2850	21.15	472.77752	133.2198	0.2068	5466.66	0.0865	0.0765	0.8840	0.4182	0.3697	11.6%	0.2818	0.2746	2.6%
AAM0610	B1	1223001-17	134.3	6/10/2017 13:59	10005	2958	22.74	439.8826	128.4662	0.1965	5466.66	0.0805	0.0726	0.9028	0.4095	0.3697	9.7%	0.2920	0.2746	6.0%
AAM0610	B2	1223001-17	134.3	6/10/2017 14:28	10002	2953	22.51	444.2189	129.5361	0.2192	5466.66	0.0813	0.0810	0.9972	0.3707	0.3697	0.3%	0.2916	0.2746	5.8%
AAM0610	B3	1223001-17	134.3	6/10/2017 14:56	10002	2909	22.11	452.2905	130.0244	0.2040	5466.66	0.0827	0.0754	0.9115	0.4056	0.3697	8.8%	0.2875	0.2746	4.5%
AAM0610	B4	1223001-17	134.3	6/10/2017 15:25	10003	3002	22.64	441.7286	131.0062	0.2008	5466.66	0.0808	0.0742	0.9187	0.4024	0.3697	8.1%	0.2966	0.2746	7.4%
AAM0610	C1	1223001-17	134.3	6/10/2017 15:53	10001	2871	21.41	467.0082	132.5562	0.2054	5466.66	0.0854	0.0759	0.8889	0.4159	0.3697	11.1%	0.2838	0.2746	3.3%
AAM0611	C2	1223001-17	134.3	6/11/2017 7:33	10003	2870	21.65	461.9203	130.9045	0.2232	5466.64	0.0845	0.0825	0.9765	0.3786	0.3697	2.3%	0.2834	0.2746	3.1%
AAM0611	C3	1223001-17	134.3	6/11/2017 8:02	10002	2812	21.80	458.7113	127.3508	0.2134	5466.64	0.0839	0.0789	0.9402	0.3932	0.3697	6.0%	0.2776	0.2746	1.1%
AAM0611	C4	1223001-17	134.3	6/11/2017 8:31	10000	2918	21.79	458.7851	131.0176	0.2042	5466.64	0.0839	0.0755	0.8995	0.4110	0.3697	10.0%	0.2856	0.2746	3.9%
AAM0611	D1	1223001-17	134.3	6/11/2017 9:02	10003	2832	22.71	440.3718	123.0888	0.1946	5466.64	0.0806	0.0719	0.8931	0.4140	0.3697	10.7%	0.2795	0.2746	1.8%
AAM0610	D2	1223001-17	134.3	6/10/2017 10:33	10001	2720	22.34	447.5853	120.1477	0.2166	5466.66	0.0819	0.0801	0.9780	0.3780	0.3697	2.2%	0.2684	0.2746	-2.3%
AAM0610	D3	1223001-17	134.3	6/10/2017 11:03	9999	3049	22.16	451.0474	135.9253	0.2056	5466.66	0.0825	0.0760	0.9212	0.4013	0.3697	7.9%	0.3014	0.2746	8.9%
AAM0610	D4	1223001-17	134.3	6/10/17 11:31 AM	10003	2828	22.08	452.93342	126.4727	0.1996	5466.66	0.0829	0.0738	0.8906	0.4151	0.3697	10.9%	0.2792	0.2746	1.7%
AAM0610	A1	1223001-19	156	6/10/2017 11:06	10002	2918	25.89	366.2488	111.2716	0.2015	5466.66	0.0670	0.0628	0.9381	0.3325	0.3119	6.2%	0.3038	0.2803	7.7%
AAM0610	A2	1223001-19	156	6/10/2017 11:35	10001	2822	26.16	382.2072	106.5386	0.2221	5466.66	0.0699	0.0693	0.9908	0.3148	0.3119	0.9%	0.2787	0.2803	-0.6%
AAM0610	A3	1223001-19	156	6/10/2017 12:04	9999	2904	26.06	383.5955	109.9251	0.2101	5466.66	0.0702	0.0655	0.9339	0.3340	0.3119	6.6%	0.2866	0.2803	2.2%
AAM0610	A4	1223001-19	156	6/10/17 12:33 PM	10002	3072	26.17	382.11035	115.8543	0.2068	5466.66	0.0699	0.0645	0.9228	0.3380	0.3119	7.7%	0.3032	0.2803	7.5%
AAM0610	B1	1223001-19	156	6/10/2017 13:04	10001	2973	26.27	350.6094	111.5579	0.1965	5466.66	0.0641	0.0613	0.9556	0.3264	0.3119	4.4%	0.3182	0.2803	11.9%
AAM0610	B2	1223001-19	156	6/10/2017 13:33	10000	2972	26.98	370.5279	108.5057	0.2192	5466.66	0.0678	0.0684	1.0087	0.3092	0.3119	-0.9%	0.2928	0.2803	4.3%
AAM0610	B3	1223001-19	156	6/10/2017 14:03	10002	2998	26.78	373.4037	110.4042	0.2040	5466.66	0.0683	0.0636	0.9315	0.3348	0.3119	6.8%	0.2957	0.2803	5.2%
AAM0610	B4	1223001-19	156	6/10/2017 14:32	10001	3006	26.59	376.0188	111.4590	0.2008	5466.66	0.0688	0.0626	0.9105	0.3425	0.3119	8.9%	0.2964	0.2803	5.4%
AAM0610	C1	1223001-19	156	6/10/2017 15:00	10002	3048	25.78	387.8652	116.6912	0.2054	5466.66	0.0710	0.0641	0.9029	0.3454	0.3119	9.7%	0.3009	0.2803	6.8%
AAM0610	C2	1223001-19	156	6/10/2017 15:28	10001	2890	25.85	386.7739	110.1398	0.2232	5466.66	0.0708	0.0696	0.9839	0.3170	0.3119	1.6%	0.2848	0.2803	1.6%
AAM0610	C3	1223001-19	156	6/10/2017 15:58	10000	3007	26.59	375.9852	111.4476	0.2134	5466.66	0.0688	0.0666	0.9677	0.3223	0.3119	3.2%	0.2964	0.2803	5.4%
AAM0611	C4	1223001-19	156	6/11/2017 7:38	10004	3000	26.33	379.8058	111.0415	0.2042	5466.64	0.0695	0.0637	0.9167	0.3402	0.3119	8.3%	0.2924	0.2803	4.1%
AAM0611	D1	1223001-19	156	6/11/2017 8:07	9999	2909	26.77	353.4201	107.0524	0.1946	5466.64	0.0647	0.0607	0.9388	0.3322	0.3119	6.1%	0.3029	0.2803	7.5%
AAM0611	D2	1223001-19	156	6/11/2017 8:36	10001	2987	26.84	372.5285	109.6821	0.2166	5466.64	0.0681	0.0676	0.9914	0.3146	0.3119	0.9%	0.2944	0.2803	4.8%
AAM0611	D3	1223001-19	156	6/11/2017 9:06	10002	3081	27.08	369.1791	112.1090	0.2056	5466.64	0.0675	0.0641	0.9495	0.3285	0.3119	5.0%	0.3037	0.2803	7.7%
AAM0610	D4	1223001-19	156	6/10/17 10:37 AM	10001	2973	26.37	359.15573	111.1348	0.1996	5466.66	0.0657	0.0623	0.9476	0.3292	0.3119	5.2%	0.3094	0.2803	9.4%

LB4100C Alpha Attenuation Curve -- Am-241

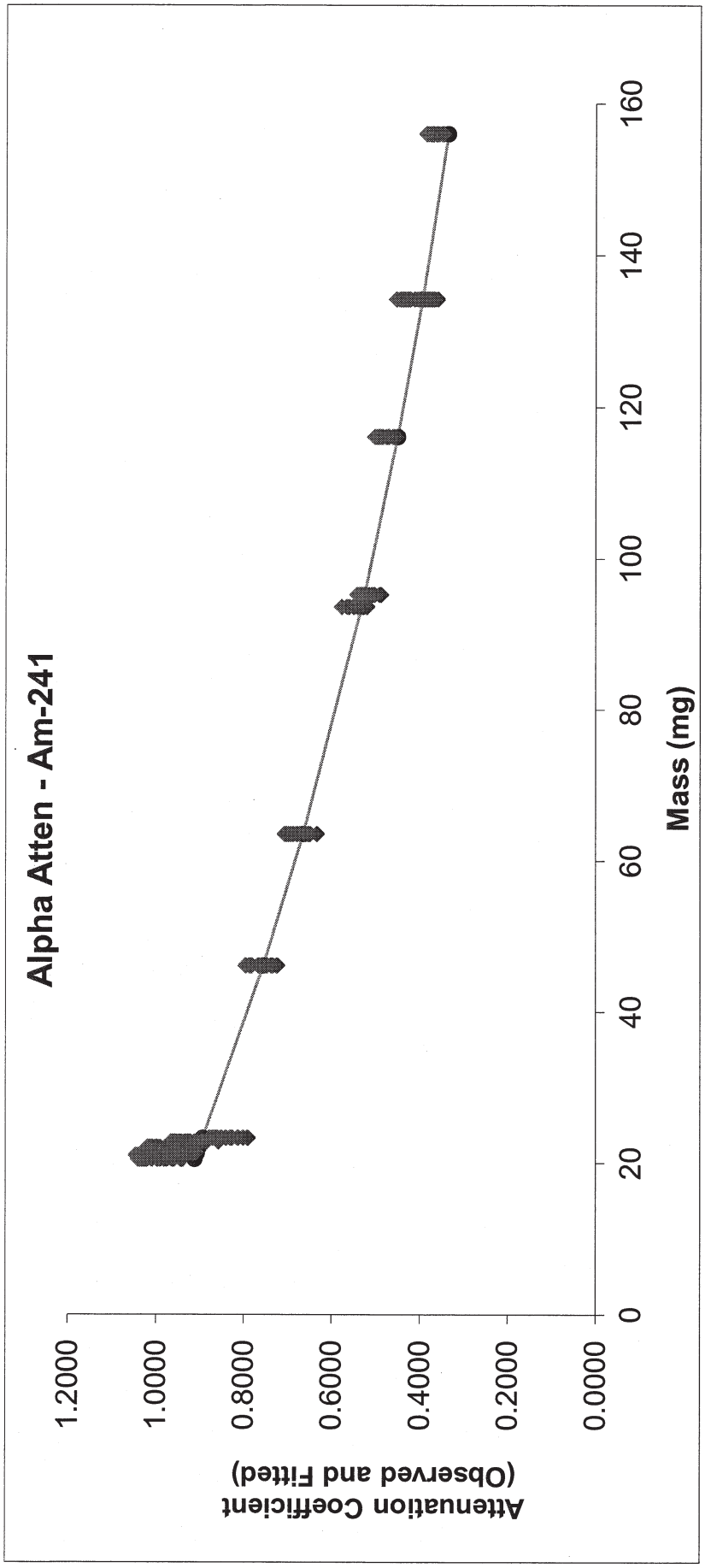
WO #	1223001	
Mass Range		
Low	21.0	mg
High	156.0	mg

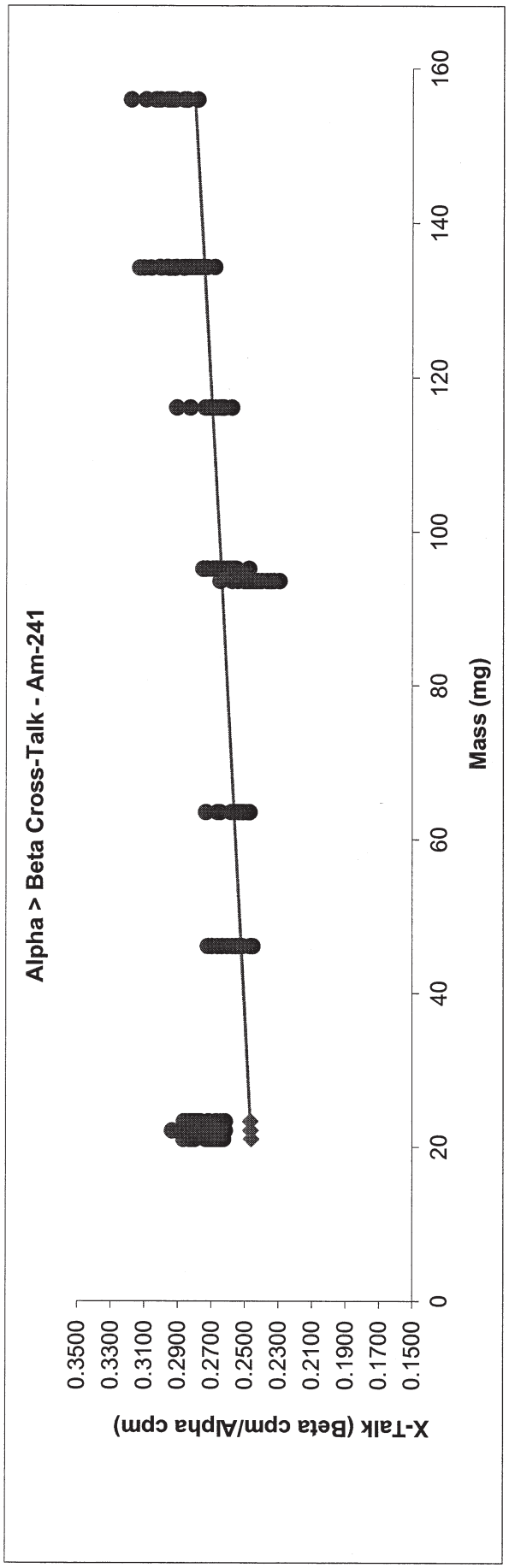
Spike Information		
Std. ID	955.4095.10	
Ref. Date	10/25/2011	
Halflife	433	yrs
Activity	55161.33	dpm/mL
Vol.	0.1	mL
Act. Added	5516.13	dpm

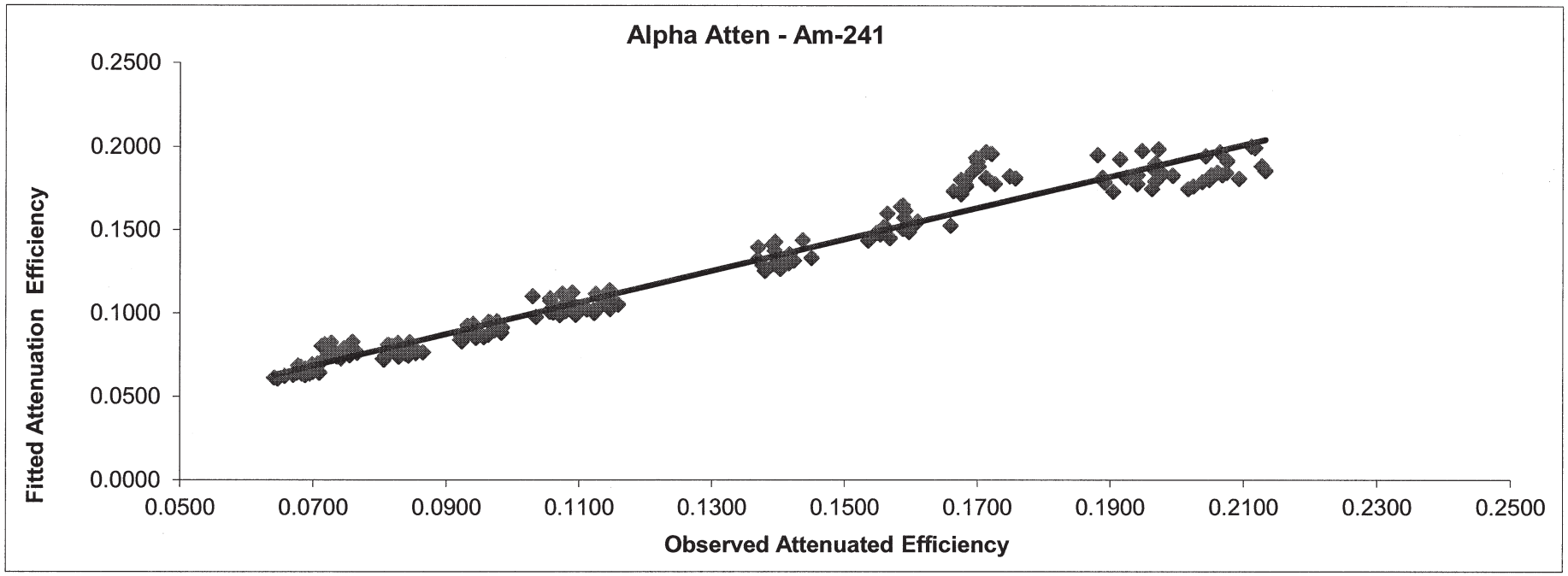
Attenuation Equation y=b*m^(a*(x-x0))	
b =	0.8949
m =	0.9914
a =	0.9119
xo	21.448
% Diff Max. =	14.9%

Cross-Talk Equation	y=b*m^-x
b =	0.2414
m =	0.9990
% Diff Max. =	16.0%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Alpha CPM	Beta CPM	Base Alpha Eff.	Decay Corr. Act. added dpm/mL	Alpha EFF Actual	Alpha Att. Fitted EFF	Actual/Fit Ratio	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	α > β X Tlk Actual	α > β X Tlk Fitted	% Diff.
OUTLIERS																				
AAM0611	A1	1223001-7	47.5	6/11/17 7:30	10002	3074	18.13	551.60429	168.1172	0.2015	5466.66	0.1009	0.1470	1.4571	0.5008	0.7297	-45.7%	0.3048	0.2526	17.1%
AAM0611	A2	1223001-7	47.5	6/11/2017 7:59	10001	2908	18.38	544.0300	156.8795	0.2221	5466.64	0.0995	0.1621	1.6285	0.4481	0.7297	-62.8%	0.2884	0.2526	12.4%
AAM0611	A3	1223001-7	47.5	6/11/2017 8:27	10001	3025	18.3	546.4067	163.7905	0.2101	5466.64	0.1000	0.1533	1.5338	0.4757	0.7297	-53.4%	0.2998	0.2526	15.7%
AAM0611	A4	1223001-7	47.5	6/11/2017 8:57	10002	3027	17.92	558.0643	167.3854	0.2068	5466.64	0.1021	0.1509	1.4782	0.4936	0.7297	-47.8%	0.2999	0.2526	15.8%
AAM0610	B1	1223001-7	47.5	6/10/2017 10:29	10004	3012	18.80	532.0367	158.5998	0.1965	5466.66	0.0973	0.1434	1.4733	0.4953	0.7297	-47.3%	0.2981	0.2526	15.3%
AAM0610	B2	1223001-7	47.5	6/10/2017 11:00	10001	2973	19.1	523.4956	154.0045	0.2192	5466.66	0.0958	0.1599	1.6703	0.4369	0.7297	-67.0%	0.2942	0.2526	14.1%
AAM0610	B3	1223001-7	47.5	6/10/2017 11:27	10003	3141	18.60	537.7117	167.3260	0.2040	5466.66	0.0984	0.1489	1.5133	0.4822	0.7297	-51.3%	0.3112	0.2526	18.8%
AAM0610	B4	1223001-7	47.5	6/10/2017 11:57	10002	3046	18.69	535.0525	161.3839	0.2008	5466.66	0.0979	0.1465	1.4970	0.4874	0.7297	-49.7%	0.3016	0.2526	16.2%
AAM0610	C1	1223001-7	47.5	6/10/2017 12:25	10002	3067	18.29	546.7462	166.1473	0.2054	5466.66	0.1000	0.1499	1.4985	0.4869	0.7297	-49.9%	0.3039	0.2526	16.9%
AAM0610	C2	1223001-7	47.5	6/10/2017 12:56	10004	3014	18.31	546.2561	162.9505	0.2232	5466.66	0.0999	0.1629	1.6299	0.4477	0.7297	-63.0%	0.2983	0.2526	15.3%
AAM0610	C3	1223001-7	47.5	6/10/2017 13:25	10000	2955	18.44	542.2033	158.6095	0.2134	5466.66	0.0992	0.1557	1.5700	0.4648	0.7297	-57.0%	0.2925	0.2526	13.6%
AAM0610	C4	1223001-7	47.5	6/10/2017 13:55	10003	3054	18.57	538.5235	161.5618	0.2042	5466.66	0.0985	0.1490	1.5125	0.4824	0.7297	-51.3%	0.3000	0.2526	15.8%
AAM0610	D1	1223001-7	47.5	6/10/2017 14:24	9999	2970	18.78	532.3331	156.5330	0.1946	5466.66	0.0974	0.1420	1.4582	0.5004	0.7297	-45.8%	0.2941	0.2526	14.1%
AAM0610	D2	1223001-7	47.5	6/10/2017 14:52	10001	3108	18.58	538.1800	165.6696	0.2166	5466.66	0.0984	0.1580	1.6054	0.4545	0.7297	-60.5%	0.3078	0.2526	17.9%
AAM0610	D3	1223001-7	47.5	6/10/2017 15:22	10002	3187	18.92	528.4759	166.7811	0.2056	5466.66	0.0967	0.1500	1.5519	0.4702	0.7297	-55.2%	0.3156	0.2526	20.0%
AAM0610	D4	1223001-7	47.5	6/10/2017 15:51	10001	3111	19.22	520.2424	160.2556	0.1996	5466.66	0.0952	0.1456	1.5304	0.4768	0.7297	-53.0%	0.3080	0.2526	18.0%
AAM0611	A1	1223001-6	48.5	6/11/17 7:55	10000	2861	14.80	675.59768	191.8748	0.2015	5466.64	0.1236	0.1459	1.1804	0.6133	0.7240	-18.0%	0.2840	0.2529	11.0%
AAM0611	A2	1223001-6	48.5	6/11/2017 8:24	10004	2885	15.04	665.0656	190.4858	0.2221	5466.64	0.1217	0.1608	1.3217	0.5478	0.7240	-32.2%	0.2864	0.2529	11.7%
AAM0611	A3	1223001-6	48.5	6/11/2017 8:54	9999	2811	14.68	681.0348	189.9750	0.2101	5466.64	0.1246	0.1521	1.2210	0.5930	0.7240	-22.1%	0.2790	0.2529	9.3%
AAM0610	A4	1223001-6	48.5	6/10/2017 10:25	10006	2898	14.90	671.4606	192.9646	0.2068	5466.66	0.1228	0.1497	1.2189	0.5939	0.7240	-21.9%	0.2874	0.2529	12.0%
AAM0610	B1	1223001-6	48.5	6/10/2017 10:55	10007	2818	14.97	668.3793	186.6302	0.1965	5466.66	0.1223	0.1423	1.1636	0.6222	0.7240	-16.4%	0.2792	0.2529	9.4%
AAM0610	B2	1223001-6	48.5	6/10/2017 11:24	10007	2933	15.48	646.3300	187.8203	0.2192	5466.66	0.1182	0.1587	1.3423	0.5394	0.7240	-34.2%	0.2906	0.2529	13.0%
AAM0610	B3	1223001-6	48.5	6/10/2017 11:53	10004	3079	15.27	655.0568	200.0922	0.2040	5466.66	0.1198	0.1477	1.2326	0.5874	0.7240	-23.3%	0.3055	0.2529	17.2%
AAM0610	B4	1223001-6	48.5	6/10/2017 12:22	10005	2912	15.31	653.3944	188.6115	0.2008	5466.66	0.1195	0.1454	1.2163	0.5952	0.7240	-21.6%	0.2887	0.2529	12.4%
AAM0610	C1	1223001-6	48.5	6/10/2017 12:53	10008	2909	14.73	679.3197	195.9481	0.2054	5466.66	0.1243	0.1487	1.1967	0.6050	0.7240	-19.7%	0.2884	0.2529	12.3%
AAM0610	C2	1223001-6	48.5	6/10/2017 13:21	10000	2902	14.97	667.8907	192.1954	0.2232	5466.66	0.1222	0.1616	1.3226	0.5474	0.7240	-32.3%	0.2878	0.2529	12.1%
AAM0610	C3	1223001-6	48.5	6/10/2017 13:51	10003	2928	14.97	668.1071	193.9512	0.2134	5466.66	0.1222	0.1545	1.2642	0.5727	0.7240	-26.4%	0.2903	0.2529	12.9%
AAM0610	C4	1223001-6	48.5	6/10/2017 14:20	10003	2750	15.05	664.5102	179.8273	0.2042	5466.66	0.1216	0.1478	1.2162	0.5953	0.7240	-21.6%	0.2706	0.2529	6.6%
AAM0610	D1	1223001-6	48.5	6/10/2017 14:49	10006	2822	15.51	645.0372	180.3331	0.1946	5466.66	0.1180	0.1409	1.1940	0.6063	0.7240	-19.4%	0.2796	0.2529	9.6%
AAM0610	D2	1223001-6	48.5	6/10/2017 15:18	10002	2980	15.39	649.8155	192.0252	0.2166	5466.66	0.1189	0.1568	1.3192	0.5488	0.7240	-31.9%	0.2955	0.2529	14.4%
AAM0610	D3	1223001-6	48.5	6/10/2017 15:47	10012	2983	15.21	658.0802	194.4560	0.2056	5466.66	0.1204	0.1489	1.2365	0.5855	0.7240	-23.7%	0.2955	0.2529	14.4%
AAM0611	D4	1223001-6	48.5	6/11/2017 7:27	10004	2672	15.04	665.0586	176.0526	0.1996	5466.64	0.1217	0.1445	1.1878	0.6095	0.7240	-18.8%	0.2647	0.2529	4.5%
AAM0610	A1	1223001-11	81.1	6/10/2017 14:16	10020	2487	11.28	888.2199	219.0427	0.2015	5466.66	0.1625	0.1130	0.6955	0.8063	0.5608	30.4%	0.2466	0.2609	-5.8%
AAM0610	A2	1223001-11	81.1	6/10/2017 14:45	10009	2356	11.28	887.2287	207.5292	0.2221	5466.66	0.1623	0.1246	0.7675	0.7307	0.5608	23.3%	0.2339	0.2609	-11.5%
AAM0610	A3	1223001-11	81.1	6/10/2017 15:14	10002	2477	11.02	907.5265	223.2631	0.2101	5466.66	0.1660	0.1178	0.7098	0.7902	0.5608	29.0%	0.2460	0.2609	-6.1%
AAM0610	A4	1223001-11	81.1	6/10/2017 15:43	10002	2494	11.12	899.3774	222.7486	0.2068	5466.66	0.1645	0.1160	0.7049	0.7956	0.5608	29.5%	0.2477	0.2609	-5.3%
AAM0611	B1	1223001-11	81.1	6/11/17 7:23 AM	10008	2565	11.50	870.16987	221.4305	0.1965	5466.64	0.1592	0.1102	0.6923	0.8101	0.5608	30.8%	0.2545	0.2609	-2.5%
AAM0611	B2	1223001-11	81.1	6/11/2017 7:52	10006	2568	11.73	852.9094	217.2758	0.2192	5466.64	0.1560	0.1229	0.7879	0.7118	0.5608	21.2%	0.2547	0.2609	-2.4%
AAM0611	B3	1223001-11	81.1	6/11/2017 8:21	10000	2512	11.53	867.2187	216.3214	0.2040	5466.64	0.1586	0.1144	0.7212	0.7776	0.5608	27.9%	0.2494	0.2609	-4.6%
AAM0611	B4	1223001-11	81.1	6/11/2017 8:51	10007	2617	11.68	856.6637	222.4672	0.2008	5466.64	0.1567	0.1126	0.7186	0.7804	0.5608	28.1%	0.2597	0.2609	-0.5%
AAM0610	C1	1223001-11	81.1	6/10/2017 10:22	10010	2588	11.27	888.0888	228.0962	0.2054	5466.66	0.1625	0.1152	0.7091	0.7909	0.5608	29.1%	0.2568	0.2609	-1.6%
AAM0610	C2	1223001-11	81.1	6/10/2017 10:51	10007	2533	11.10	901.4195	226.5392	0.2232	5466.66	0.1649	0.1252	0.7591	0.7388	0.5608	24.1%	0.2513	0.2609	-3.8%
AAM0610	C3	1223001-11	81.1	6/10/2017 11:20	10003	2600	11.47	872.0051	225.0383	0.2134	5466.66	0.1595	0.1197	0.7503	0.7475	0.5608	25.0%	0.2581	0.2609	-1.1%
AAM0610	C4	1223001-11	81.1	6/10/2017 11:49	10014	2550	11.48	872.1587	219.2284	0.2042	5466.66	0.1595	0.1145	0.7178	0.7813	0.5608	28.2%	0.2514	0.2609	-3.8%
AAM0610	D1	1223001-11	81.1	6/10/2017 12:18	10002	2645	11.77	849.6926	223.1099	0.1946	5466.66	0.1554	0.1091	0.7021	0.7987	0.5608	29.8%	0.2626	0.2609	0.6%
AAM0610	D2	1223001-11	81.1	6/10/2017 12:50	10010	2622	11.76	851.1035	221.3522	0.2166	5466.66	0.1557	0.1215	0.7802	0.7188	0.5608	22.0%	0.2601	0.2609	-0.3%
AAM0610	D3	1223001-11	81.1	6/10/2017 13:18	10002	2669	11.58	863.5596	228.8186	0.2056	5466.66	0.1580	0.1153	0.7299	0.7683	0.5608	27.0%	0.2650	0.2609	1.5%
AAM0610	D4	1223001-11	81.1	6/10/2017 13:48	10004	2590	11.65	858.6114	220.7108	0.1996	5466.66	0.1571	0.1119	0.7127	0.7869	0.5608	28.7%	0.2571	0.2609	-1.5%
AAM0610	A1	1223001-18	151.6	6/10/2017 11:32	9999	2851	23.11	432.5918	121.9305	0.2015	5466.66	0.0791	0.0651	0.8221	0.3927	0.3228	17.8%	0.2819	0.2791	1.0%
AAM0610	A2	1223001-18	151.6	6/10/2017 12:01	10003	2818	23.28	429.5881	119.7121	0.2221	5466.66	0.0786	0.0717	0.9124	0.3538	0.3228	8.8%	0.2787	0.2791	-0.2%
AAM0610	A3	1223001-18	151.6	6/10/2017 12:30	10004	2844	22.95	435.8081	122.4116	0.2101	5466.66	0.0797	0.0678	0.8508	0.3794	0.3228	14.9%	0.2809	0.2791	0.6%
AAM0610	A4	1223001-18	151.6	6/10/17 1:01 PM	10003	2813	22.69	440.772	122.4433	0.2068	5466.66	0.0806	0.0668	0.8280	0.3899	0.3228	17.2%	0.2778	0.2791	-0.5%
AAM0610	B1	1223001-18	151.6	6/10/2017 13:30	10006	2732	23.35	428.4315	115.3891	0.1965	5466.66	0.0784	0.0634	0.8094	0.3988	0.3228	19.1%	0.2693	0.2791	-3.6%
AAM0610	B2	1223001-18	151.6	6/10/2017 14:00	10002	2963	24.07	415.4210	121.4493	0.2192	5466.66	0.0760	0.0708	0.9312	0.3467	0.3228	6.9%	0.2924	0.2791	4.5%
AAM0610	B3	1223001-18	151.6	6/10/2017 14:28	10000	2918	23.34	428.3650	123.4764	0.2040	5466.66	0.0784	0.0659	0.8405	0.3841	0.3228	16.0%	0.2883	0.2791	3.2%
AAM0610	B4	1223001-18	151.6	6/10/2017 14:57	10003	2945	23.23	430.5070	125.1847	0.2008	5466.66	0.0788	0.0648	0.8232	0.3922	0.3228	17.7%	0.2908	0.2791	4.0%
AAM0610	C1	1223001-18	151.6	6/10/2017 15:26	10001	2874	23.24	430.2256	122.1261	0.2054	5466.66	0.0787	0.0663	0.8426	0.3832	0.3228	15.7%	0.2839	0.2791	1.7%
AAM0610	C2	1223001-18	151.6	6/10/2017 15:55	10001	2934	23.35	428.1964	123.9941	0.2232	5466.66	0.0783	0.0721	0.9199	0.3509	0.3228	8.0%	0.2896	0.2791	3.6%
AAM0611	C3	1223001-18	151.6	6/11/2017 7:35	10000	2846	23.22	430.5672	120.9268	0.2134	5466.64	0.0788	0.0689	0.8747	0.3691	0.3228	12.5%	0.2809	0.2791	0.6%
AAM0611	C4	1223001-18	151.6	6/11/2017 8:04	10001	2902	23.68	422.1985	119.6537	0.2042	5466.64	0.0772	0.0659	0.8536	0.3782	0.3228	14.6%	0.2834	0.2791	1.5%
AAM0611	D1	1223001-18	151.6	6/11/2017 8:33	10000	2724	23.65	422.7380	113.5657	0.1946	5466.64	0.0773	0.0628	0.8124	0.3974	0.3228	18.8%	0.2686	0.2791	-3.9%
AAM0611	D2	1223001-18	151.6	6/11/2017 9:03	10007	2805	23.91	418.4408	115.7079	0.2166	5466.64	0.0765	0.0699	0.9135	0.3534	0.3228	8.6%	0.2765	0.2791	-0.9%
AAM0610	D3	1223001-18	151.6	6/10/2017 10:35	10002	3092	24.10	414.8497	126.6338	0.2056	5466.66	0.0759	0.0664	0.8746	0.3691	0.3228	12.5%	0.3053	0.2791	8.6%
AAM0610	D4	1223001-18	151.6	6/10/17 11:04 AM	10006	3006	23.9	418.56009	124.1671	0.1996	5466.66	0.0766	0.0644	0.8416	0.3836	0.3228	15.8%	0.2967	0.2791	5.9%
AAM0610	A1	1223001-8	43.7	6/10/2017 15:44	10000	2613	12.97	770.9320	200.0289	0.2015	5466.66	0.1410	0.1515	1.0741	0.6999	0.7517	-7.4%	0.2595	0.2517	3.0%
AAM0611	A2	1223001-8	43.7	6/11/2017 7:24	10006	2617	12.73	785.9233	204.2414	0.2221	5466.64	0.1438	0.1670	1.1613	0.6473	0.7517	-16.1%	0.2599	0.2517	3.1%
AAM0611	A3	1223001-8	43.7	6/11/2017 7:53	10011	2634	12.81	781.4028	204.1106	0.2101	5466.64	0.1429	0.1579	1.1049	0.6803	0.7517	-10.5%	0.2612	0.2517	3.8%
AAM0611	A4	1223001-8	43.7	6/11/2017 8:22	10004	2717	12.66	790.1224	213.0810	0.2068	5466.64	0.1445	0.1555	1.0756	0.6989	0.7517	-7.6%	0.2697	0.2517	6.7%
AAM0611	B1	1223001-8	43.7	6/11/2017 8:52	10006	2576	12.65	790.8971	202.0234	0.1965	5466.64	0.1447	0.1477	1.0210	0.7363	0.7517	-2.1%	0.2554	0.2517	1.5%
AAM0610	B2	1223001-8	43.7	6/10/2017 10:24	10006	2699	13.5	741.0682	198.2759	0.2192	5466.66	0.1356	0.1648	1.2155	0.6184	0.7517	-21.6%	0.2676	0.2517	5.9%
AAM0610	B3	1223001-8	43.7	6/10/2017 10:54	10006	2811	13.43	744.9644	207.7625	0.2040	5466.66	0.1363	0.1534	1.1253	0.6680	0.7517	-12.5%	0.2789	0.2517	9.7%
AAM0610	B4	1223001-8	43.7	6/10/2017 11:22	10005	2765	13.13	761.8954	208.9954	0.2008	5466.66	0.1394	0.1509	1.0831	0.6941	0.7517	-8.3%	0.2743	0.2517	8.2%
AAM0610	C1	1223001-8	43.7	6/10/2017 11:51	10010	2653	12.72	786.8397	207.0292	0.2054	5466.66	0.1439	0.1544	1.0727	0.7008	0.7517	-7.3%	0.2631	0.2517	4.3%
AAM0610	C2	1223001-8	43.7	6/10/2017 12:20	10009	2671	12.93	773.9793	204.9149	0.2232	5466.66	0.1416	0.1678	1.1851	0.6343	0.7517	-18.5%	0.2648	0.2517	4.9%
AAM0610	C3	1223001-8	43.7	6/10/2017 12:51	10002	2622	13.02	768.1068	199.7425	0.2134	5466.66	0.1405	0.1604	1.1417	0.6584	0.7517	-14.2%	0.2600	0.2517	3.2%
AAM0610	C4	1223001-8	43.7	6/10/2017 13:19	10004	2568	12.75	784.4865	198.5148	0.2042	5466.66	0.1435	0.1535	1.0697	0.7028	0.7517	-7.0%	0.2531	0.2517	0.5%
AAM0610	D1	1223001-8	43.7	6/10/2017 13:49	10001	2595	13.29	752.4257	193.6456	0.1946	5466.66	0.1376	0.1463	1.0628	0.7073	0.7517	-6.3%	0.2574	0.2517	2.2%
AAM0610	D2	1223001-8	43.7	6/10/2017 14:18	10004	2689	13.38	747.5961	199.3646	0.2166	5466.66	0.1368	0.1628	1.1906	0.6314	0.7517	-19.1%	0.2667	0.2517	5.6%
AAM0610	D3	1223001-8	43.7	6/10/2017 14:47	10019	2784	13.35	750.3159	206.8743	0.2056	5466.66	0.1373	0.1546	1.1261	0.6676	0.7517	-12.6%	0.2757	0.2517	8.7%
AAM0610	D4	1223001-8	43.7	6/10/2017 15:16	10002	2828	13.17	759.3523	213.1234	0.1996	5466.66	0.1389	0.1500	1.0802	0.6959	0.7517	-8.0%	0.2807	0.2517	10.3%


Alpha Atten - Am-241
Attenuation Coefficient
(Observed and Fitted)
1.2000
1.0000
0.8000
0.6000
0.4000
0.2000
0.0000
0
20
40
60
80
100
120
140
160
Mass (mg)


Alpha > Beta Cross-Talk - Am-241
X-Talk (Beta cpm/Alpha cpm)
0.3500
0.3300
0.3100
0.2900
0.2700
0.2500
0.2300
0.2100
0.1900
0.1700
0.1500
0
20
40
60
80
100
120
140
160
Mass (mg)


Alpha Atten - Am-241
Fitted Attenuation Efficiency
0.2500
0.2000
0.1500
0.1000
0.0500
0.0000
0.0500
0.0700
0.0900
0.1100
0.1300
0.1500
0.1700
0.1900
0.2100
0.2300
0.2500
Observed Attenuated Efficiency

LB4100C Beta Attenuation Curve -- Sr-90

WO #:	1118007

Nuclide:	Sr-90	
Std. ID:	777.3020.11	
Ref. Date:	02/08/06	
Halflife:	28.5	yrs
Activity:	4996.73	dpm/mL
Vol.:	2	mL

Calibrated Mass Range		
Low	7.7	mg
High	158.6	mg

Attenuation Equation	y=b*m^(a*x)
b =	0.9681
m =	0.9996
a =	0.9174
% Diff Max. =	5.9%

Cross-Talk Equation	y=b*x+m
b =	1.1183E-05
m =	0.0018
% Diff Max. =	83.2%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Base Beta Eff.	Alpha CPM	Beta CPM	Decay Corr. Act. added dpm/mL	Beta Obs. Atten. Eff.	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	β > α XTLK Observed	β > α XTLK Fitted	% Diff.
ASR0611	A1	1118007-2	7.7	6/11/2017 11:24	12	10029	3.11	0.4236	3.78	3223.32	7584.92	0.4250	1.0032	0.9654	3.9%	0.0012	0.0019	-37.8%
ASR0611	A2	1118007-2	7.7	6/11/2017 9:13	25	10008	3.13	0.4238	7.89	3196.11	7584.96	0.4214	0.9943	0.9654	3.0%	0.0025	0.0019	30.9%
ASR0611	A3	1118007-2	7.7	6/11/2017 9:19	18	10018	3.13	0.4440	5.65	3199.13	7584.96	0.4218	0.9499	0.9654	-1.6%	0.0018	0.0019	-6.3%
ASR0611	A4	1118007-2	7.7	6/11/2017 9:31	27	10045	3.1	0.4284	8.63	3238.79	7584.96	0.4270	0.9967	0.9654	3.2%	0.0027	0.0019	41.2%
ASR0611	B1	1118007-2	7.7	6/11/2017 9:40	30	10050	3.23	0.4252	9.20	3109.84	7584.96	0.4100	0.9643	0.9654	-0.1%	0.0030	0.0019	56.8%
ASR0611	B2	1118007-2	7.7	6/11/2017 9:48	24	10037	3.18	0.4122	7.43	3154.64	7584.95	0.4159	1.0090	0.9654	4.5%	0.0024	0.0019	24.9%
ASR0611	B3	1118007-2	7.7	6/11/2017 9:53	22	10023	3.23	0.4289	6.73	3101.55	7584.95	0.4089	0.9534	0.9654	-1.2%	0.0022	0.0019	15.0%
ASR0611	B4	1118007-2	7.7	6/11/2017 10:02	18	10025	3.23	0.4195	5.47	3102.12	7584.95	0.4090	0.9749	0.9654	1.0%	0.0018	0.0019	-6.5%
ASR0611	C1	1118007-2	7.7	6/11/2017 10:09	13	10029	3.16	0.4214	4.00	3172.19	7584.94	0.4182	0.9925	0.9654	2.8%	0.0013	0.0019	-33.1%
ASR0611	C2	1118007-2	7.7	6/11/2017 10:19	19	10038	3.18	0.4339	5.86	3154.94	7584.94	0.4159	0.9586	0.9654	-0.7%	0.0019	0.0019	-1.5%
ASR0611	C3	1118007-2	7.7	6/11/2017 10:24	20	10016	3.15	0.4278	6.25	3178.04	7584.94	0.4190	0.9794	0.9654	1.5%	0.0020	0.0019	4.3%
ASR0611	C4	1118007-2	7.7	6/11/2017 10:33	20	10016	3.17	0.4285	6.17	3156.72	7584.94	0.4162	0.9713	0.9654	0.6%	0.0020	0.0019	3.6%
ASR0611	D1	1118007-2	7.7	6/11/2017 10:42	19	10008	3.27	0.4099	5.72	3058.94	7584.93	0.4033	0.9839	0.9654	1.9%	0.0019	0.0019	-0.9%
ASR0611	D2	1118007-2	7.7	6/11/2017 10:54	16	10041	3.22	0.4107	4.88	3116.72	7584.93	0.4109	1.0005	0.9654	3.6%	0.0016	0.0019	-17.0%
ASR0611	D3	1118007-2	7.7	6/11/2017 11:04	10	10039	3.25	0.4196	2.91	3087.26	7584.93	0.4070	0.9700	0.9654	0.5%	0.0009	0.0019	-50.1%
ASR0611	D4	1118007-2	7.7	6/11/2017 11:16	13	10007	3.23	0.4214	3.92	3096.54	7584.92	0.4082	0.9688	0.9654	0.4%	0.0013	0.0019	-32.8%
ASR0611	A1	1118007-1	8.1	6/11/2017 9:13	29	10039	3.13	0.4236	9.19	3205.91	7584.96	0.4227	0.9978	0.9652	3.4%	0.0029	0.0019	51.6%
ASR0611	A2	1118007-1	8.1	6/11/2017 9:19	30	10014	3.11	0.4238	9.55	3218.60	7584.96	0.4243	1.0013	0.9652	3.7%	0.0030	0.0019	57.0%
ASR0611	A3	1118007-1	8.1	6/11/2017 9:31	27	10024	3.11	0.4440	8.59	3221.64	7584.96	0.4247	0.9566	0.9652	-0.9%	0.0027	0.0019	41.0%
ASR0611	A4	1118007-1	8.1	6/11/2017 9:40	28	10041	3.09	0.4284	8.98	3247.98	7584.96	0.4282	0.9996	0.9652	3.6%	0.0028	0.0019	46.2%
ASR0611	B1	1118007-1	8.1	6/11/2017 9:48	27	10021	3.11	0.4252	8.59	3220.57	7584.95	0.4246	0.9986	0.9652	3.5%	0.0027	0.0019	41.1%
ASR0611	B2	1118007-1	8.1	6/11/2017 9:53	23	10039	3.21	0.4122	7.05	3125.76	7584.95	0.4121	0.9998	0.9652	3.6%	0.0023	0.0019	19.3%
ASR0611	B3	1118007-1	8.1	6/11/2017 10:02	19	10041	3.15	0.4289	5.95	3186.07	7584.95	0.4201	0.9794	0.9652	1.5%	0.0019	0.0019	-1.3%
ASR0611	B4	1118007-1	8.1	6/11/2017 10:09	21	10016	3.19	0.4195	6.48	3138.22	7584.94	0.4137	0.9863	0.9652	2.2%	0.0021	0.0019	9.3%
ASR0611	C1	1118007-1	8.1	6/11/2017 10:18	22	10007	3.11	0.4214	6.96	3216.14	7584.94	0.4240	1.0062	0.9652	4.2%	0.0022	0.0019	14.5%
ASR0611	C2	1118007-1	8.1	6/11/2017 10:24	21	10034	3.08	0.4339	6.71	3256.13	7584.94	0.4293	0.9894	0.9652	2.5%	0.0021	0.0019	8.9%
ASR0611	C3	1118007-1	8.1	6/11/2017 10:33	20	10029	3.2	0.4278	6.15	3132.42	7584.94	0.4130	0.9654	0.9652	0.0%	0.0020	0.0019	3.9%
ASR0611	C4	1118007-1	8.1	6/11/2017 10:42	30	10043	3.16	0.4285	9.35	3175.27	7584.93	0.4186	0.9770	0.9652	1.2%	0.0029	0.0019	55.8%
ASR0611	D1	1118007-1	8.1	6/11/2017 10:54	17	10043	3.27	0.4099	5.10	3069.64	7584.93	0.4047	0.9873	0.9652	2.3%	0.0017	0.0019	-12.1%
ASR0611	D2	1118007-1	8.1	6/11/2017 11:04	30	10057	3.2	0.4107	9.29	3141.21	7584.93	0.4141	1.0084	0.9652	4.5%	0.0030	0.0019	56.4%
ASR0611	D3	1118007-1	8.1	6/11/2017 11:16	14	10030	3.17	0.4196	4.25	3162.37	7584.92	0.4169	0.9936	0.9652	2.9%	0.0013	0.0019	-29.0%
ASR0611	D4	1118007-1	8.1	6/11/2017 11:24	15	10033	3.23	0.4214	4.54	3104.58	7584.92	0.4093	0.9713	0.9652	0.6%	0.0015	0.0019	-22.6%
ASR0611	A1	1118007-4	19	6/11/2017 11:04	30	10005	3.14	0.4236	9.48	3184.87	7584.93	0.4199	0.9913	0.9614	3.1%	0.0030	0.0020	47.8%
ASR0611	A2	1118007-4	19	6/11/2017 11:16	28	10076	3.19	0.4238	8.68	3157.28	7584.92	0.4163	0.9822	0.9614	2.2%	0.0028	0.0020	36.7%
ASR0611	A3	1118007-4	19	6/11/2017 11:24	16	10022	3.17	0.4440	4.95	3160.00	7584.92	0.4166	0.9383	0.9614	-2.4%	0.0016	0.0020	-22.1%
ASR0611	A4	1118007-4	19	6/11/2017 9:13	24	10020	3.14	0.4284	7.56	3189.55	7584.96	0.4205	0.9816	0.9614	2.1%	0.0024	0.0020	17.8%
ASR0611	B1	1118007-4	19	6/11/2017 9:19	21	10006	3.2	0.4252	6.47	3125.26	7584.96	0.4120	0.9690	0.9614	0.8%	0.0021	0.0020	2.9%
ASR0611	B2	1118007-4	19	6/11/2017 9:31	30	10004	3.26	0.4122	9.09	3067.06	7584.96	0.4044	0.9810	0.9614	2.0%	0.0030	0.0020	47.2%
ASR0611	B3	1118007-4	19	6/11/2017 9:40	18	10027	3.18	0.4289	5.58	3151.60	7584.96	0.4155	0.9688	0.9614	0.8%	0.0018	0.0020	-12.1%
ASR0611	B4	1118007-4	19	6/11/2017 9:48	23	10032	3.19	0.4195	7.11	3143.24	7584.95	0.4144	0.9879	0.9614	2.8%	0.0023	0.0020	12.4%
ASR0611	C1	1118007-4	19	6/11/2017 9:53	21	10036	3.2	0.4214	6.45	3134.71	7584.95	0.4133	0.9807	0.9614	2.0%	0.0021	0.0020	2.3%
ASR0611	C2	1118007-4	19	6/11/2017 10:02	16	10047	3.17	0.4339	4.94	3167.74	7584.95	0.4176	0.9625	0.9614	0.1%	0.0016	0.0020	-22.6%
ASR0611	C3	1118007-4	19	6/11/2017 10:09	17	10018	3.2	0.4278	5.22	3128.99	7584.94	0.4125	0.9643	0.9614	0.3%	0.0017	0.0020	-17.2%
ASR0611	C4	1118007-4	19	6/11/2017 10:19	20	10066	3.18	0.4285	6.15	3162.51	7584.94	0.4169	0.9730	0.9614	1.2%	0.0019	0.0020	-3.4%
ASR0611	D1	1118007-4	19	6/11/2017 10:24	14	10014	3.21	0.4099	4.27	3118.01	7584.94	0.4111	1.0029	0.9614	4.3%	0.0014	0.0020	-32.0%
ASR0611	D2	1118007-4	19	6/11/2017 10:34	25	10016	3.22	0.4107	7.68	3108.95	7584.94	0.4099	0.9980	0.9614	3.8%	0.0025	0.0020	22.7%
ASR0611	D3	1118007-4	19	6/11/2017 10:42	10	10021	3.22	0.4196	2.93	3110.45	7584.93	0.4101	0.9773	0.9614	1.7%	0.0009	0.0020	-53.1%
ASR0611	D4	1118007-4	19	6/11/2017 10:54	12	10043	3.22	0.4214	3.63	3117.34	7584.93	0.4110	0.9753	0.9614	1.4%	0.0012	0.0020	-42.2%

LB4100C Beta Attenuation Curve -- Sr-90

WO #:	1118007

Nuclide:	Sr-90	
Std. ID:	777.3020.11	
Ref. Date:	02/08/06	
Halflife:	28.5	yrs
Activity:	4996.73	dpm/mL
Vol.:	2	mL

Calibrated Mass Range		
Low	7.7	mg
High	158.6	mg

Attenuation Equation	y=b*m^(a*x)
b =	0.9681
m =	0.9996
a =	0.9174
% Diff Max. =	5.9%

Cross-Talk Equation	y=b*x+m
b =	1.1183E-05
m =	0.0018
% Diff Max. =	83.2%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Base Beta Eff.	Alpha CPM	Beta CPM	Decay Corr. Act. added dpm/mL	Beta Obs. Atten. Eff.	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	β > α XTLK Observed	β > α XTLK Fitted	% Diff.
ASR0611	A1	1118007-3	19.8	6/11/2017 11:16	25	10034	3.26	0.4236	7.59	3076.48	7584.92	0.4056	0.9575	0.9611	-0.4%	0.0025	0.0020	22.1%
ASR0611	A2	1118007-3	19.8	6/11/2017 11:24	30	10031	3.22	0.4238	9.22	3113.88	7584.92	0.4105	0.9687	0.9611	0.8%	0.0030	0.0020	46.5%
ASR0611	A3	1118007-3	19.8	6/11/2017 9:13	23	10014	3.19	0.4440	7.11	3137.67	7584.96	0.4137	0.9317	0.9611	-3.1%	0.0023	0.0020	12.2%
ASR0611	A4	1118007-3	19.8	6/11/2017 9:19	37	10016	3.18	0.4284	11.55	3148.15	7584.96	0.4151	0.9688	0.9611	0.8%	0.0037	0.0020	81.5%
ASR0611	B1	1118007-3	19.8	6/11/2017 9:31	19	10041	3.31	0.4252	5.65	3031.92	7584.96	0.3997	0.9401	0.9611	-2.2%	0.0019	0.0020	-7.8%
ASR0611	B2	1118007-3	19.8	6/11/2017 9:40	23	10026	3.33	0.4122	6.79	3009.16	7584.96	0.3967	0.9625	0.9611	0.1%	0.0023	0.0020	11.6%
ASR0611	B3	1118007-3	19.8	6/11/2017 9:48	22	10014	3.29	0.4289	6.60	3042.22	7584.95	0.4011	0.9352	0.9611	-2.7%	0.0022	0.0020	7.4%
ASR0611	B4	1118007-3	19.8	6/11/2017 9:54	26	10027	3.39	0.4195	7.57	2956.23	7584.95	0.3897	0.9291	0.9611	-3.3%	0.0026	0.0020	26.7%
ASR0611	C1	1118007-3	19.8	6/11/2017 10:02	12	10028	3.17	0.4214	3.68	3161.87	7584.95	0.4169	0.9892	0.9611	2.9%	0.0012	0.0020	-42.5%
ASR0611	C2	1118007-3	19.8	6/11/2017 10:09	18	10018	3.18	0.4339	5.55	3148.66	7584.94	0.4151	0.9567	0.9611	-0.5%	0.0018	0.0020	-12.8%
ASR0611	C3	1118007-3	19.8	6/11/2017 10:19	21	10016	3.25	0.4278	6.37	3080.21	7584.94	0.4061	0.9493	0.9611	-1.2%	0.0021	0.0020	2.2%
ASR0611	C4	1118007-3	19.8	6/11/2017 10:24	22	10031	3.26	0.4285	6.61	3074.10	7584.94	0.4053	0.9458	0.9611	-1.6%	0.0021	0.0020	6.3%
ASR0611	D1	1118007-3	19.8	6/11/2017 10:34	25	10022	3.32	0.4099	7.44	3017.06	7584.94	0.3978	0.9704	0.9611	1.0%	0.0025	0.0020	21.9%
ASR0611	D2	1118007-3	19.8	6/11/2017 10:42	29	10029	3.29	0.4107	8.73	3046.72	7584.93	0.4017	0.9780	0.9611	1.8%	0.0029	0.0020	41.7%
ASR0611	D3	1118007-3	19.8	6/11/2017 10:54	16	10015	3.32	0.4196	4.65	3014.90	7584.93	0.3975	0.9473	0.9611	-1.4%	0.0015	0.0020	-23.7%
ASR0611	D4	1118007-3	19.8	6/11/2017 11:04	25	10042	3.28	0.4214	7.52	3059.98	7584.93	0.4034	0.9574	0.9611	-0.4%	0.0025	0.0020	21.6%
ASR0611	A1	1118007-5	39.9	6/11/2017 10:54	20	10036	3.32	0.4236	5.95	3021.46	7584.93	0.3983	0.9404	0.9540	-1.4%	0.0020	0.0022	-12.4%
ASR0611	A2	1118007-5	39.9	6/11/2017 11:04	22	10009	3.25	0.4238	6.68	3078.36	7584.93	0.4059	0.9576	0.9540	0.4%	0.0022	0.0022	-3.5%
ASR0611	A3	1118007-5	39.9	6/11/2017 11:16	18	10020	3.28	0.4440	5.39	3053.37	7584.92	0.4026	0.9067	0.9540	-5.0%	0.0018	0.0022	-21.4%
ASR0611	A4	1118007-5	39.9	6/11/2017 11:24	31	10015	3.27	0.4284	9.40	3061.16	7584.92	0.4036	0.9421	0.9540	-1.3%	0.0031	0.0022	36.7%
ASR0611	B1	1118007-5	39.9	6/11/2017 9:14	22	10021	3.41	0.4252	6.36	2937.10	7584.96	0.3872	0.9107	0.9540	-4.5%	0.0022	0.0022	-3.6%
ASR0611	B2	1118007-5	39.9	6/11/2017 9:19	25	10034	3.39	0.4122	7.26	2958.23	7584.96	0.3900	0.9462	0.9540	-0.8%	0.0025	0.0022	9.2%
ASR0611	B3	1118007-5	39.9	6/11/2017 9:31	21	10013	3.26	0.4289	6.36	3069.93	7584.96	0.4047	0.9437	0.9540	-1.1%	0.0021	0.0022	-7.8%
ASR0611	B4	1118007-5	39.9	6/11/2017 9:40	19	10012	3.35	0.4195	5.57	2987.07	7584.96	0.3938	0.9388	0.9540	-1.6%	0.0019	0.0022	-17.0%
ASR0611	C1	1118007-5	39.9	6/11/2017 9:48	20	10036	3.34	0.4214	5.88	3003.25	7584.95	0.3959	0.9396	0.9540	-1.5%	0.0020	0.0022	-12.9%
ASR0611	C2	1118007-5	39.9	6/11/2017 9:53	17	10013	3.24	0.4339	5.13	3088.77	7584.95	0.4072	0.9385	0.9540	-1.6%	0.0017	0.0022	-26.0%
ASR0611	C3	1118007-5	39.9	6/11/2017 10:02	13	10025	3.33	0.4278	3.81	3008.87	7584.95	0.3967	0.9273	0.9540	-2.8%	0.0013	0.0022	-43.7%
ASR0611	C4	1118007-5	39.9	6/11/2017 10:09	25	10032	3.31	0.4285	7.41	3027.92	7584.94	0.3992	0.9316	0.9540	-2.3%	0.0024	0.0022	9.0%
ASR0611	D1	1118007-5	39.9	6/11/2017 10:19	18	10010	3.37	0.4099	5.25	2968.71	7584.94	0.3914	0.9549	0.9540	0.1%	0.0018	0.0022	-21.3%
ASR0611	D2	1118007-5	39.9	6/11/2017 10:25	14	10011	3.37	0.4107	4.07	2969.02	7584.94	0.3914	0.9531	0.9540	-0.1%	0.0014	0.0022	-39.0%
ASR0611	D3	1118007-5	39.9	6/11/2017 10:34	9	10022	3.44	0.4196	2.45	2911.71	7584.94	0.3839	0.9149	0.9540	-4.1%	0.0008	0.0022	-62.6%
ASR0611	D4	1118007-5	39.9	6/11/2017 10:42	18	10026	3.31	0.4214	5.34	3027.40	7584.93	0.3991	0.9472	0.9540	-0.7%	0.0018	0.0022	-21.5%
ASR0611	A1	1118007-6	40.4	6/11/2017 10:42	18	10026	3.29	0.4236	5.39	3045.98	7584.93	0.4016	0.9480	0.9539	-0.6%	0.0018	0.0023	-21.4%
ASR0611	A2	1118007-6	40.4	6/11/2017 10:54	21	10027	3.31	0.4238	6.25	3027.97	7584.93	0.3992	0.9420	0.9539	-1.2%	0.0021	0.0023	-8.3%
ASR0611	A3	1118007-6	40.4	6/11/2017 11:04	12	10010	3.28	0.4440	3.56	3050.32	7584.93	0.4022	0.9058	0.9539	-5.0%	0.0012	0.0023	-48.1%
ASR0611	A4	1118007-6	40.4	6/11/2017 11:16	24	10017	3.27	0.4284	7.26	3061.77	7584.92	0.4037	0.9423	0.9539	-1.2%	0.0024	0.0023	5.3%
ASR0611	B1	1118007-6	40.4	6/11/2017 11:24	25	10041	3.34	0.4252	7.39	3004.67	7584.92	0.3961	0.9317	0.9539	-2.3%	0.0025	0.0023	9.3%
ASR0611	B2	1118007-6	40.4	6/11/2017 9:14	19	10025	3.37	0.4122	5.52	2973.13	7584.96	0.3920	0.9509	0.9539	-0.3%	0.0019	0.0023	-17.5%
ASR0611	B3	1118007-6	40.4	6/11/2017 9:19	20	10014	3.39	0.4289	5.82	2952.44	7584.96	0.3892	0.9076	0.9539	-4.9%	0.0020	0.0023	-12.5%
ASR0611	B4	1118007-6	40.4	6/11/2017 9:31	24	10050	3.34	0.4195	7.09	3007.39	7584.96	0.3965	0.9452	0.9539	-0.9%	0.0024	0.0023	4.6%
ASR0611	C1	1118007-6	40.4	6/11/2017 9:40	25	10029	3.3	0.4214	7.47	3037.55	7584.96	0.4005	0.9503	0.9539	-0.4%	0.0025	0.0023	9.1%
ASR0611	C2	1118007-6	40.4	6/11/2017 9:48	16	10019	3.32	0.4339	4.71	3016.11	7584.95	0.3976	0.9164	0.9539	-3.9%	0.0016	0.0023	-30.7%
ASR0611	C3	1118007-6	40.4	6/11/2017 9:54	15	10022	3.33	0.4278	4.41	3007.97	7584.95	0.3966	0.9270	0.9539	-2.8%	0.0015	0.0023	-34.9%
ASR0611	C4	1118007-6	40.4	6/11/2017 10:02	27	10030	3.4	0.4285	7.80	2947.10	7584.95	0.3885	0.9068	0.9539	-4.9%	0.0026	0.0023	17.5%
ASR0611	D1	1118007-6	40.4	6/11/2017 10:09	20	10023	3.42	0.4099	5.75	2929.09	7584.94	0.3862	0.9421	0.9539	-1.2%	0.0020	0.0023	-12.8%
ASR0611	D2	1118007-6	40.4	6/11/2017 10:19	28	10021	3.43	0.4107	8.08	2919.97	7584.94	0.3850	0.9373	0.9539	-1.7%	0.0028	0.0023	22.8%
ASR0611	D3	1118007-6	40.4	6/11/2017 10:25	10	10027	3.42	0.4196	2.75	2930.21	7584.94	0.3863	0.9207	0.9539	-3.5%	0.0009	0.0023	-58.3%
ASR0611	D4	1118007-6	40.4	6/11/2017 10:34	15	10020	3.37	0.4214	4.35	2971.69	7584.94	0.3918	0.9297	0.9539	-2.5%	0.0015	0.0023	-35.0%

LB4100C Beta Attenuation Curve -- Sr-90

WO #:	1118007

Nuclide:	Sr-90	
Std. ID:	777.3020.11	
Ref. Date:	02/08/06	
Halflife:	28.5	yrs
Activity:	4996.73	dpm/mL
Vol.:	2	mL

Calibrated Mass Range		
Low	7.7	mg
High	158.6	mg

Attenuation Equation	y=b*m^(a*x)
b =	0.9681
m =	0.9996
a =	0.9174
% Diff Max. =	5.9%

Cross-Talk Equation	y=b*x+m
b =	1.1183E-05
m =	0.0018
% Diff Max. =	83.2%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Base Beta Eff.	Alpha CPM	Beta CPM	Decay Corr. Act. added dpm/mL	Beta Obs. Atten. Eff.	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	β > α XTLK Observed	β > α XTLK Fitted	% Diff.
ASR0611	A1	1118007-7	61.5	6/11/2017 10:34	26	10040	3.27	0.4236	7.87	3068.90	7584.94	0.4046	0.9552	0.9465	0.9%	0.0026	0.0025	3.1%
ASR0611	A2	1118007-7	61.5	6/11/2017 10:42	27	10010	3.31	0.4238	8.06	3022.83	7584.93	0.3985	0.9404	0.9465	-0.6%	0.0027	0.0025	7.2%
ASR0611	A3	1118007-7	61.5	6/11/2017 10:54	17	10052	3.27	0.4440	5.10	3072.50	7584.93	0.4051	0.9123	0.9465	-3.6%	0.0017	0.0025	-33.2%
ASR0611	A4	1118007-7	61.5	6/11/2017 11:04	14	10014	3.26	0.4284	4.21	3070.25	7584.93	0.4048	0.9449	0.9465	-0.2%	0.0014	0.0025	-44.9%
ASR0611	B1	1118007-7	61.5	6/11/2017 11:16	24	10006	3.31	0.4252	7.16	3021.35	7584.92	0.3983	0.9368	0.9465	-1.0%	0.0024	0.0025	-4.7%
ASR0611	B2	1118007-7	61.5	6/11/2017 11:24	23	10023	3.38	0.4122	6.69	2963.73	7584.92	0.3907	0.9479	0.9465	0.2%	0.0023	0.0025	-9.3%
ASR0611	B3	1118007-7	61.5	6/11/2017 9:13	18	10005	3.24	0.4289	5.47	3086.42	7584.96	0.4069	0.9487	0.9465	0.2%	0.0018	0.0025	-28.7%
ASR0611	B4	1118007-7	61.5	6/11/2017 9:19	18	10035	3.34	0.4195	5.29	3002.90	7584.96	0.3959	0.9437	0.9465	-0.3%	0.0018	0.0025	-29.2%
ASR0611	C1	1118007-7	61.5	6/11/2017 9:31	17	10024	3.31	0.4214	5.03	3026.86	7584.96	0.3991	0.9470	0.9465	0.1%	0.0017	0.0025	-33.3%
ASR0611	C2	1118007-7	61.5	6/11/2017 9:40	17	10019	3.25	0.4339	5.12	3081.11	7584.96	0.4062	0.9362	0.9465	-1.1%	0.0017	0.0025	-33.2%
ASR0611	C3	1118007-7	61.5	6/11/2017 9:48	15	10036	3.35	0.4278	4.38	2994.18	7584.95	0.3948	0.9228	0.9465	-2.5%	0.0015	0.0025	-41.2%
ASR0611	C4	1118007-7	61.5	6/11/2017 9:53	27	10026	3.26	0.4285	8.14	3072.56	7584.95	0.4051	0.9454	0.9465	-0.1%	0.0026	0.0025	6.5%
ASR0611	D1	1118007-7	61.5	6/11/2017 10:02	17	10023	3.39	0.4099	4.92	2955.02	7584.95	0.3896	0.9505	0.9465	0.4%	0.0017	0.0025	-33.1%
ASR0611	D2	1118007-7	61.5	6/11/2017 10:09	16	10028	3.4	0.4107	4.62	2947.80	7584.94	0.3886	0.9463	0.9465	0.0%	0.0016	0.0025	-37.0%
ASR0611	D3	1118007-7	61.5	6/11/2017 10:19	10	10037	3.32	0.4196	2.84	3021.53	7584.94	0.3984	0.9494	0.9465	0.3%	0.0009	0.0025	-62.2%
ASR0611	D4	1118007-7	61.5	6/11/2017 10:25	13	10000	3.32	0.4214	3.81	3010.44	7584.94	0.3969	0.9419	0.9465	-0.5%	0.0013	0.0025	-49.1%
ASR0611	A1	1118007-8	61.6	6/11/2017 10:24	18	10040	3.27	0.4236	5.43	3068.90	7584.94	0.4046	0.9552	0.9465	0.9%	0.0018	0.0025	-29.0%
ASR0611	A2	1118007-8	61.6	6/11/2017 10:34	17	10037	3.34	0.4238	5.00	3003.75	7584.94	0.3960	0.9344	0.9465	-1.3%	0.0017	0.0025	-33.2%
ASR0611	A3	1118007-8	61.6	6/11/2017 10:42	23	10009	3.3	0.4440	6.87	3031.52	7584.93	0.3997	0.9002	0.9465	-4.9%	0.0023	0.0025	-8.9%
ASR0611	A4	1118007-8	61.6	6/11/2017 10:54	24	10012	3.27	0.4284	7.26	3060.24	7584.93	0.4035	0.9418	0.9465	-0.5%	0.0024	0.0025	-4.7%
ASR0611	B1	1118007-8	61.6	6/11/2017 11:04	20	10024	3.38	0.4252	5.83	2964.07	7584.93	0.3908	0.9191	0.9465	-2.9%	0.0020	0.0025	-21.0%
ASR0611	B2	1118007-8	61.6	6/11/2017 11:17	27	10031	3.38	0.4122	7.87	2966.10	7584.92	0.3911	0.9487	0.9465	0.2%	0.0027	0.0025	6.6%
ASR0611	B3	1118007-8	61.6	6/11/2017 11:24	23	10030	3.36	0.4289	6.76	2983.57	7584.92	0.3934	0.9171	0.9465	-3.1%	0.0023	0.0025	-8.9%
ASR0611	B4	1118007-8	61.6	6/11/2017 9:14	27	10000	3.39	0.4195	7.86	2948.26	7584.96	0.3887	0.9266	0.9465	-2.1%	0.0027	0.0025	7.2%
ASR0611	C1	1118007-8	61.6	6/11/2017 9:19	15	10036	3.34	0.4214	4.38	3003.25	7584.96	0.3959	0.9396	0.9465	-0.7%	0.0015	0.0025	-41.4%
ASR0611	C2	1118007-8	61.6	6/11/2017 9:31	13	10012	3.31	0.4339	3.82	3023.11	7584.96	0.3986	0.9186	0.9465	-2.9%	0.0013	0.0025	-49.3%
ASR0611	C3	1118007-8	61.6	6/11/2017 9:40	17	10014	3.34	0.4278	4.99	2996.56	7584.96	0.3951	0.9235	0.9465	-2.4%	0.0017	0.0025	-33.0%
ASR0611	C4	1118007-8	61.6	6/11/2017 9:48	26	10040	3.34	0.4285	7.64	3003.09	7584.95	0.3959	0.9240	0.9465	-2.4%	0.0025	0.0025	2.3%
ASR0611	D1	1118007-8	61.6	6/11/2017 9:54	15	10021	3.4	0.4099	4.32	2945.74	7584.95	0.3884	0.9475	0.9465	0.1%	0.0015	0.0025	-41.1%
ASR0611	D2	1118007-8	61.6	6/11/2017 10:02	19	10024	3.36	0.4107	5.57	2981.73	7584.95	0.3931	0.9572	0.9465	1.1%	0.0019	0.0025	-25.0%
ASR0611	D3	1118007-8	61.6	6/11/2017 10:09	9	10027	3.32	0.4196	2.54	3018.52	7584.94	0.3980	0.9484	0.9465	0.2%	0.0008	0.0025	-66.2%
ASR0611	D4	1118007-8	61.6	6/11/2017 10:19	18	10021	3.38	0.4214	5.22	2963.19	7584.94	0.3907	0.9271	0.9465	-2.0%	0.0018	0.0025	-29.2%
ASR0611	A1	1118007-9	83.7	6/11/2017 10:19	17	10037	3.28	0.4236	5.10	3058.62	7584.94	0.4032	0.9520	0.9388	1.4%	0.0017	0.0027	-39.0%
ASR0611	A2	1118007-9	83.7	6/11/2017 10:24	12	10013	3.25	0.4238	3.60	3079.59	7584.94	0.4060	0.9580	0.9388	2.0%	0.0012	0.0027	-57.3%
ASR0611	A3	1118007-9	83.7	6/11/2017 10:34	22	10029	3.29	0.4440	6.59	3046.82	7584.94	0.4017	0.9047	0.9388	-3.6%	0.0022	0.0027	-20.9%
ASR0611	A4	1118007-9	83.7	6/11/2017 10:42	25	10033	3.26	0.4284	7.59	3076.08	7584.93	0.4056	0.9467	0.9388	0.8%	0.0025	0.0027	-9.9%
ASR0611	B1	1118007-9	83.7	6/11/2017 10:54	24	10007	3.37	0.4252	7.03	2967.82	7584.93	0.3913	0.9202	0.9388	-2.0%	0.0024	0.0027	-13.4%
ASR0611	B2	1118007-9	83.7	6/11/2017 11:04	16	10021	3.32	0.4122	4.70	3016.72	7584.93	0.3977	0.9649	0.9388	2.8%	0.0016	0.0027	-43.0%
ASR0611	B3	1118007-9	83.7	6/11/2017 11:16	19	10013	3.28	0.4289	5.71	3051.20	7584.92	0.4023	0.9379	0.9388	-0.1%	0.0019	0.0027	-31.6%
ASR0611	B4	1118007-9	83.7	6/11/2017 11:24	20	10007	3.39	0.4195	5.80	2950.33	7584.92	0.3890	0.9272	0.9388	-1.2%	0.0020	0.0027	-28.2%
ASR0611	C1	1118007-9	83.7	6/11/2017 9:13	12	10038	3.27	0.4214	3.56	3068.18	7584.96	0.4045	0.9599	0.9388	2.2%	0.0012	0.0027	-57.6%
ASR0611	C2	1118007-9	83.7	6/11/2017 9:19	14	10031	3.25	0.4339	4.20	3084.80	7584.96	0.4067	0.9373	0.9388	-0.2%	0.0014	0.0027	-50.3%
ASR0611	C3	1118007-9	83.7	6/11/2017 9:31	15	10015	3.35	0.4278	4.38	2987.91	7584.96	0.3939	0.9208	0.9388	-1.9%	0.0015	0.0027	-46.4%
ASR0611	C4	1118007-9	83.7	6/11/2017 9:40	31	10049	3.28	0.4285	9.31	3060.82	7584.96	0.4035	0.9417	0.9388	0.3%	0.0030	0.0027	11.2%
ASR0611	D1	1118007-9	83.7	6/11/2017 9:48	15	10020	3.41	0.4099	4.30	2936.80	7584.95	0.3872	0.9446	0.9388	0.6%	0.0015	0.0027	-46.4%
ASR0611	D2	1118007-9	83.7	6/11/2017 9:54	16	10041	3.35	0.4107	4.69	2995.71	7584.95	0.3950	0.9617	0.9388	2.4%	0.0016	0.0027	-42.8%
ASR0611	D3	1118007-9	83.7	6/11/2017 10:02	10	10027	3.29	0.4196	2.87	3046.06	7584.95	0.4016	0.9571	0.9388	1.9%	0.0009	0.0027	-65.6%
ASR0611	D4	1118007-9	83.7	6/11/2017 10:09	11	10030	3.35	0.4214	3.18	2992.42	7584.94	0.3945	0.9362	0.9388	-0.3%	0.0011	0.0027	-61.1%

LB4100C Beta Attenuation Curve -- Sr-90

WO #:	1118007

Nuclide:	Sr-90	
Std. ID:	777.3020.11	
Ref. Date:	02/08/06	
Halflife:	28.5	yrs
Activity:	4996.73	dpm/mL
Vol.:	2	mL

Calibrated Mass Range		
Low	7.7	mg
High	158.6	mg

Attenuation Equation	y=b*m^(a*x)
b =	0.9681
m =	0.9996
a =	0.9174
% Diff Max. =	5.9%

Cross-Talk Equation	y=b*x+m
b =	1.1183E-05
m =	0.0018
% Diff Max. =	83.2%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Base Beta Eff.	Alpha CPM	Beta CPM	Decay Corr. Act. added dpm/mL	Beta Obs. Atten. Eff.	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	β > α XTLK Observed	β > α XTLK Fitted	% Diff.
ASR0611	A1	1118007-10	84.3	6/11/2017 10:09	25	10021	3.3	0.4236	7.50	3035.23	7584.94	0.4002	0.9447	0.9386	0.6%	0.0025	0.0027	-9.9%
ASR0611	A2	1118007-10	84.3	6/11/2017 10:19	25	10013	3.36	0.4238	7.35	2978.72	7584.94	0.3927	0.9267	0.9386	-1.3%	0.0025	0.0027	-10.1%
ASR0611	A3	1118007-10	84.3	6/11/2017 10:25	13	10044	3.36	0.4440	3.77	2987.78	7584.94	0.3939	0.8872	0.9386	-5.5%	0.0013	0.0027	-54.0%
ASR0611	A4	1118007-10	84.3	6/11/2017 10:34	29	10055	3.34	0.4284	8.60	3008.95	7584.94	0.3967	0.9260	0.9386	-1.3%	0.0029	0.0027	4.2%
ASR0611	B1	1118007-10	84.3	6/11/2017 10:42	22	10023	3.39	0.4252	6.40	2955.02	7584.93	0.3896	0.9163	0.9386	-2.4%	0.0022	0.0027	-21.1%
ASR0611	B2	1118007-10	84.3	6/11/2017 10:54	19	10015	3.39	0.4122	5.49	2952.63	7584.93	0.3893	0.9444	0.9386	0.6%	0.0019	0.0027	-32.2%
ASR0611	B3	1118007-10	84.3	6/11/2017 11:04	15	10008	3.32	0.4289	4.43	3012.91	7584.93	0.3972	0.9261	0.9386	-1.3%	0.0015	0.0027	-46.3%
ASR0611	B4	1118007-10	84.3	6/11/2017 11:17	10	10003	3.41	0.4195	2.83	2931.84	7584.92	0.3865	0.9214	0.9386	-1.8%	0.0010	0.0027	-64.8%
ASR0611	C1	1118007-10	84.3	6/11/2017 11:24	20	10025	3.34	0.4214	5.88	2999.96	7584.92	0.3955	0.9386	0.9386	0.0%	0.0020	0.0027	-28.6%
ASR0611	C2	1118007-10	84.3	6/11/2017 9:13	21	10038	3.32	0.4339	6.21	3021.83	7584.96	0.3984	0.9182	0.9386	-2.2%	0.0021	0.0027	-25.0%
ASR0611	C3	1118007-10	84.3	6/11/2017 9:19	18	10021	3.36	0.4278	5.26	2980.80	7584.96	0.3930	0.9186	0.9386	-2.1%	0.0018	0.0027	-35.6%
ASR0611	C4	1118007-10	84.3	6/11/2017 9:31	21	10033	3.32	0.4285	6.18	3019.09	7584.96	0.3980	0.9289	0.9386	-1.0%	0.0020	0.0027	-25.3%
ASR0611	D1	1118007-10	84.3	6/11/2017 9:40	14	10022	3.38	0.4099	4.05	2963.47	7584.96	0.3907	0.9532	0.9386	1.6%	0.0014	0.0027	-50.2%
ASR0611	D2	1118007-10	84.3	6/11/2017 9:48	20	10032	3.43	0.4107	5.74	2923.17	7584.95	0.3854	0.9384	0.9386	0.0%	0.0020	0.0027	-28.4%
ASR0611	D3	1118007-10	84.3	6/11/2017 9:54	11	10027	3.33	0.4196	3.13	3009.45	7584.95	0.3968	0.9456	0.9386	0.7%	0.0010	0.0027	-62.1%
ASR0611	D4	1118007-10	84.3	6/11/2017 10:02	15	10035	3.36	0.4214	4.36	2985.00	7584.95	0.3935	0.9339	0.9386	-0.5%	0.0015	0.0027	-46.7%
ASR0611	A1	1118007-11	106.2	6/11/2017 10:02	14	10038	3.29	0.4236	4.18	3049.63	7584.95	0.4021	0.9492	0.9311	1.9%	0.0014	0.0030	-54.2%
ASR0611	A2	1118007-11	106.2	6/11/2017 10:09	24	10032	3.36	0.4238	7.05	2984.38	7584.94	0.3935	0.9284	0.9311	-0.3%	0.0024	0.0030	-20.9%
ASR0611	A3	1118007-11	106.2	6/11/2017 10:19	12	10031	3.3	0.4440	3.54	3038.19	7584.94	0.4006	0.9022	0.9311	-3.1%	0.0012	0.0030	-61.0%
ASR0611	A4	1118007-11	106.2	6/11/2017 10:24	17	10032	3.33	0.4284	5.02	3011.08	7584.94	0.3970	0.9267	0.9311	-0.5%	0.0017	0.0030	-44.2%
ASR0611	B1	1118007-11	106.2	6/11/2017 10:34	24	10009	3.37	0.4252	7.03	2968.42	7584.94	0.3914	0.9204	0.9311	-1.1%	0.0024	0.0030	-20.7%
ASR0611	B2	1118007-11	106.2	6/11/2017 10:42	25	10026	3.46	0.4122	7.11	2896.04	7584.93	0.3818	0.9263	0.9311	-0.5%	0.0025	0.0030	-17.8%
ASR0611	B3	1118007-11	106.2	6/11/2017 10:54	14	10028	3.39	0.4289	4.05	2956.57	7584.93	0.3898	0.9088	0.9311	-2.4%	0.0014	0.0030	-54.2%
ASR0611	B4	1118007-11	106.2	6/11/2017 11:04	17	10026	3.35	0.4195	4.97	2991.24	7584.93	0.3944	0.9401	0.9311	1.0%	0.0017	0.0030	-44.3%
ASR0611	C1	1118007-11	106.2	6/11/2017 11:17	15	10037	3.36	0.4214	4.35	2985.66	7584.92	0.3936	0.9341	0.9311	0.3%	0.0015	0.0030	-51.2%
ASR0611	C2	1118007-11	106.2	6/11/2017 11:24	13	10032	3.3	0.4339	3.83	3038.34	7584.92	0.4006	0.9232	0.9311	-0.8%	0.0013	0.0030	-57.8%
ASR0611	C3	1118007-11	106.2	6/11/2017 9:13	15	10030	3.33	0.4278	4.41	3010.37	7584.96	0.3969	0.9277	0.9311	-0.4%	0.0015	0.0030	-51.0%
ASR0611	C4	1118007-11	106.2	6/11/2017 9:19	21	10020	3.28	0.4285	6.26	3051.98	7584.96	0.4024	0.9390	0.9311	0.9%	0.0021	0.0030	-31.3%
ASR0611	D1	1118007-11	106.2	6/11/2017 9:31	15	10006	3.4	0.4099	4.32	2941.33	7584.96	0.3878	0.9460	0.9311	1.6%	0.0015	0.0030	-50.9%
ASR0611	D2	1118007-11	106.2	6/11/2017 9:40	24	10023	3.36	0.4107	7.06	2981.43	7584.96	0.3931	0.9571	0.9311	2.8%	0.0024	0.0030	-20.8%
ASR0611	D3	1118007-11	106.2	6/11/2017 9:48	8	10018	3.41	0.4196	2.18	2936.16	7584.95	0.3871	0.9226	0.9311	-0.9%	0.0007	0.0030	-75.2%
ASR0611	D4	1118007-11	106.2	6/11/2017 9:54	15	10010	3.35	0.4214	4.38	2986.45	7584.95	0.3937	0.9343	0.9311	0.3%	0.0015	0.0030	-50.9%
ASR0611	A1	1118007-12	106.8	6/11/2017 9:54	18	10045	3.36	0.4236	5.28	2988.15	7584.95	0.3940	0.9300	0.9309	-0.1%	0.0018	0.0030	-41.0%
ASR0611	A2	1118007-12	106.8	6/11/2017 10:02	18	10031	3.33	0.4238	5.31	3010.98	7584.95	0.3970	0.9367	0.9309	0.6%	0.0018	0.0030	-41.1%
ASR0611	A3	1118007-12	106.8	6/11/2017 10:09	21	10039	3.32	0.4440	6.23	3022.29	7584.94	0.3985	0.8974	0.9309	-3.6%	0.0021	0.0030	-31.2%
ASR0611	A4	1118007-12	106.8	6/11/2017 10:19	19	10025	3.32	0.4284	5.64	3018.05	7584.94	0.3979	0.9288	0.9309	-0.2%	0.0019	0.0030	-37.6%
ASR0611	B1	1118007-12	106.8	6/11/2017 10:25	20	10028	3.4	0.4252	5.79	2947.80	7584.94	0.3886	0.9140	0.9309	-1.8%	0.0020	0.0030	-34.4%
ASR0611	B2	1118007-12	106.8	6/11/2017 10:34	22	10004	3.38	0.4122	6.39	2958.11	7584.94	0.3900	0.9461	0.9309	1.6%	0.0022	0.0030	-27.8%
ASR0611	B3	1118007-12	106.8	6/11/2017 10:42	12	10048	3.38	0.4289	3.47	2971.24	7584.93	0.3917	0.9133	0.9309	-1.9%	0.0012	0.0030	-61.0%
ASR0611	B4	1118007-12	106.8	6/11/2017 10:54	15	10003	3.42	0.4195	4.29	2923.26	7584.93	0.3854	0.9187	0.9309	-1.3%	0.0015	0.0030	-51.0%
ASR0611	C1	1118007-12	106.8	6/11/2017 11:04	16	10009	3.33	0.4214	4.69	3004.17	7584.93	0.3961	0.9399	0.9309	1.0%	0.0016	0.0030	-47.8%
ASR0611	C2	1118007-12	106.8	6/11/2017 11:17	14	10055	3.38	0.4339	4.03	2973.19	7584.92	0.3920	0.9034	0.9309	-3.0%	0.0014	0.0030	-54.7%
ASR0611	C3	1118007-12	106.8	6/11/2017 11:24	17	10051	3.33	0.4278	5.01	3016.68	7584.92	0.3977	0.9297	0.9309	-0.1%	0.0017	0.0030	-44.5%
ASR0611	C4	1118007-12	106.8	6/11/2017 9:14	23	10051	3.42	0.4285	6.58	2935.99	7584.96	0.3871	0.9033	0.9309	-3.0%	0.0022	0.0030	-25.1%
ASR0611	D1	1118007-12	106.8	6/11/2017 9:19	16	10021	3.36	0.4099	4.67	2980.83	7584.96	0.3930	0.9587	0.9309	3.0%	0.0016	0.0030	-47.7%
ASR0611	D2	1118007-12	106.8	6/11/2017 9:31	19	10026	3.43	0.4107	5.45	2921.43	7584.96	0.3852	0.9378	0.9309	0.7%	0.0019	0.0030	-37.7%
ASR0611	D3	1118007-12	106.8	6/11/2017 9:40	17	10010	3.42	0.4196	4.80	2925.24	7584.96	0.3857	0.9191	0.9309	-1.3%	0.0016	0.0030	-45.2%
ASR0611	D4	1118007-12	106.8	6/11/2017 9:48	12	10029	3.39	0.4214	3.44	2956.80	7584.95	0.3898	0.9251	0.9309	-0.6%	0.0012	0.0030	-61.2%

LB4100C Beta Attenuation Curve -- Sr-90

WO #:	1118007

Nuclide:	Sr-90	
Std. ID:	777.3020.11	
Ref. Date:	02/08/06	
Halflife:	28.5	yrs
Activity:	4996.73	dpm/mL
Vol.:	2	mL

Calibrated Mass Range		
Low	7.7	mg
High	158.6	mg

Attenuation Equation	y=b*m^(a*x)
b =	0.9681
m =	0.9996
a =	0.9174
% Diff Max. =	5.9%

Cross-Talk Equation	y=b*x+m
b =	1.1183E-05
m =	0.0018
% Diff Max. =	83.2%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Base Beta Eff.	Alpha CPM	Beta CPM	Decay Corr. Act. added dpm/mL	Beta Obs. Atten. Eff.	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	β > α XTLK Observed	β > α XTLK Fitted	% Diff.
ASR0611	A1	1118007-13	126.6	6/11/2017 9:48	16	10034	3.34	0.4236	4.71	3002.76	7584.95	0.3959	0.9346	0.9241	1.1%	0.0016	0.0032	-51.2%
ASR0611	A2	1118007-13	126.6	6/11/2017 9:54	20	10028	3.43	0.4238	5.74	2922.28	7584.95	0.3853	0.9091	0.9241	-1.6%	0.0020	0.0032	-39.0%
ASR0611	A3	1118007-13	126.6	6/11/2017 10:02	16	10012	3.37	0.4440	4.65	2969.41	7584.95	0.3915	0.8817	0.9241	-4.6%	0.0016	0.0032	-51.3%
ASR0611	A4	1118007-13	126.6	6/11/2017 10:09	23	10026	3.33	0.4284	6.82	3009.28	7584.94	0.3967	0.9261	0.9241	0.2%	0.0023	0.0032	-29.5%
ASR0611	B1	1118007-13	126.6	6/11/2017 10:19	26	10030	3.43	0.4252	7.49	2922.59	7584.94	0.3853	0.9062	0.9241	-1.9%	0.0026	0.0032	-20.3%
ASR0611	B2	1118007-13	126.6	6/11/2017 10:25	17	10023	3.49	0.4122	4.75	2870.27	7584.94	0.3784	0.9180	0.9241	-0.7%	0.0017	0.0032	-48.5%
ASR0611	B3	1118007-13	126.6	6/11/2017 10:34	13	10036	3.43	0.4289	3.71	2924.40	7584.94	0.3856	0.8989	0.9241	-2.7%	0.0013	0.0032	-60.6%
ASR0611	B4	1118007-13	126.6	6/11/2017 10:42	16	10020	3.34	0.4195	4.69	2998.41	7584.93	0.3953	0.9423	0.9241	2.0%	0.0016	0.0032	-51.4%
ASR0611	C1	1118007-13	126.6	6/11/2017 10:54	26	10028	3.34	0.4214	7.67	3000.86	7584.93	0.3956	0.9389	0.9241	1.6%	0.0026	0.0032	-20.5%
ASR0611	C2	1118007-13	126.6	6/11/2017 11:04	18	10017	3.36	0.4339	5.25	2979.59	7584.93	0.3928	0.9053	0.9241	-2.0%	0.0018	0.0032	-45.3%
ASR0611	C3	1118007-13	126.6	6/11/2017 11:17	12	10025	3.37	0.4278	3.46	2973.14	7584.92	0.3920	0.9163	0.9241	-0.9%	0.0012	0.0032	-63.8%
ASR0611	C4	1118007-13	126.6	6/11/2017 11:24	21	10040	3.31	0.4285	6.20	3030.34	7584.92	0.3995	0.9324	0.9241	0.9%	0.0020	0.0032	-36.3%
ASR0611	D1	1118007-13	126.6	6/11/2017 9:14	9	10037	3.4	0.4099	2.55	2950.44	7584.96	0.3890	0.9490	0.9241	2.7%	0.0009	0.0032	-73.1%
ASR0611	D2	1118007-13	126.6	6/11/2017 9:19	12	10022	3.38	0.4107	3.46	2963.48	7584.96	0.3907	0.9513	0.9241	2.9%	0.0012	0.0032	-63.7%
ASR0611	D3	1118007-13	126.6	6/11/2017 9:31	6	10011	3.4	0.4196	1.59	2942.75	7584.96	0.3880	0.9246	0.9241	0.1%	0.0005	0.0032	-83.2%
ASR0611	D4	1118007-13	126.6	6/11/2017 9:40	14	10018	3.38	0.4214	4.04	2962.30	7584.96	0.3905	0.9268	0.9241	0.3%	0.0014	0.0032	-57.6%
ASR0611	A1	1118007-14	127.4	6/11/2017 9:40	13	10025	3.29	0.4236	3.87	3045.68	7584.96	0.4015	0.9479	0.9239	2.6%	0.0013	0.0032	-60.6%
ASR0611	A2	1118007-14	127.4	6/11/2017 9:48	18	10029	3.35	0.4238	5.28	2992.40	7584.95	0.3945	0.9309	0.9239	0.8%	0.0018	0.0032	-45.3%
ASR0611	A3	1118007-14	127.4	6/11/2017 9:53	13	10014	3.31	0.4440	3.83	3023.87	7584.95	0.3987	0.8979	0.9239	-2.8%	0.0013	0.0032	-60.7%
ASR0611	A4	1118007-14	127.4	6/11/2017 10:02	20	10027	3.31	0.4284	5.96	3027.77	7584.95	0.3992	0.9318	0.9239	0.9%	0.0020	0.0032	-39.0%
ASR0611	B1	1118007-14	127.4	6/11/2017 10:09	18	10022	3.38	0.4252	5.23	2963.48	7584.94	0.3907	0.9189	0.9239	-0.5%	0.0018	0.0032	-45.2%
ASR0611	B2	1118007-14	127.4	6/11/2017 10:19	28	10018	3.45	0.4122	8.00	2902.12	7584.94	0.3826	0.9282	0.9239	0.5%	0.0028	0.0032	-14.5%
ASR0611	B3	1118007-14	127.4	6/11/2017 10:25	17	10024	3.44	0.4289	4.86	2912.41	7584.94	0.3840	0.8952	0.9239	-3.1%	0.0017	0.0032	-48.3%
ASR0611	B4	1118007-14	127.4	6/11/2017 10:34	20	10047	3.33	0.4195	5.91	3015.53	7584.94	0.3976	0.9477	0.9239	2.6%	0.0020	0.0032	-39.3%
ASR0611	C1	1118007-14	127.4	6/11/2017 10:42	17	10023	3.34	0.4214	4.98	2999.36	7584.93	0.3954	0.9384	0.9239	1.6%	0.0017	0.0032	-48.5%
ASR0611	C2	1118007-14	127.4	6/11/2017 10:54	18	10024	3.35	0.4339	5.26	2990.58	7584.93	0.3943	0.9087	0.9239	-1.6%	0.0018	0.0032	-45.4%
ASR0611	C3	1118007-14	127.4	6/11/2017 11:04	11	10036	3.36	0.4278	3.18	2985.26	7584.93	0.3936	0.9200	0.9239	-0.4%	0.0011	0.0032	-67.0%
ASR0611	C4	1118007-14	127.4	6/11/2017 11:16	20	10018	3.32	0.4285	5.88	3014.57	7584.92	0.3974	0.9275	0.9239	0.4%	0.0020	0.0032	-39.5%
ASR0611	D1	1118007-14	127.4	6/11/2017 11:24	17	10021	3.34	0.4099	4.99	2998.69	7584.92	0.3953	0.9645	0.9239	4.4%	0.0017	0.0032	-48.3%
ASR0611	D2	1118007-14	127.4	6/11/2017 9:14	13	10019	3.44	0.4107	3.69	2910.89	7584.96	0.3838	0.9344	0.9239	1.1%	0.0013	0.0032	-60.7%
ASR0611	D3	1118007-14	127.4	6/11/2017 9:19	7	10027	3.36	0.4196	1.91	2982.56	7584.96	0.3932	0.9371	0.9239	1.4%	0.0006	0.0032	-80.1%
ASR0611	D4	1118007-14	127.4	6/11/2017 9:31	16	10035	3.38	0.4214	4.63	2967.33	7584.96	0.3912	0.9284	0.9239	0.5%	0.0016	0.0032	-51.6%
ASR0611	A1	1118007-16	148	6/11/2017 9:19	21	10029	3.41	0.4236	6.08	2939.62	7584.96	0.3876	0.9149	0.9169	-0.2%	0.0021	0.0035	-40.1%
ASR0611	A2	1118007-16	148	6/11/2017 9:31	14	10036	3.46	0.4238	3.95	2899.24	7584.96	0.3822	0.9019	0.9169	-1.6%	0.0014	0.0035	-60.5%
ASR0611	A3	1118007-16	148	6/11/2017 9:40	16	10003	3.44	0.4440	4.56	2906.34	7584.96	0.3832	0.8630	0.9169	-5.9%	0.0016	0.0035	-54.6%
ASR0611	A4	1118007-16	148	6/11/2017 9:48	19	10039	3.42	0.4284	5.47	2933.85	7584.95	0.3868	0.9029	0.9169	-1.5%	0.0019	0.0035	-46.0%
ASR0611	B1	1118007-16	148	6/11/2017 9:54	24	10017	3.57	0.4252	6.63	2804.27	7584.95	0.3697	0.8695	0.9169	-5.2%	0.0024	0.0035	-31.6%
ASR0611	B2	1118007-16	148	6/11/2017 10:02	19	10007	3.51	0.4122	5.30	2849.35	7584.95	0.3757	0.9113	0.9169	-0.6%	0.0019	0.0035	-46.2%
ASR0611	B3	1118007-16	148	6/11/2017 10:09	14	10024	3.46	0.4289	3.96	2895.56	7584.94	0.3818	0.8901	0.9169	-2.9%	0.0014	0.0035	-60.4%
ASR0611	B4	1118007-16	148	6/11/2017 10:19	24	10034	3.42	0.4195	6.92	2932.33	7584.94	0.3866	0.9216	0.9169	0.5%	0.0024	0.0035	-31.7%
ASR0611	C1	1118007-16	148	6/11/2017 10:25	20	10001	3.51	0.4214	5.59	2847.75	7584.94	0.3754	0.8910	0.9169	-2.8%	0.0020	0.0035	-43.2%
ASR0611	C2	1118007-16	148	6/11/2017 10:34	19	10027	3.4	0.4339	5.48	2947.46	7584.94	0.3886	0.8956	0.9169	-2.3%	0.0019	0.0035	-46.2%
ASR0611	C3	1118007-16	148	6/11/2017 10:42	11	10018	3.44	0.4278	3.10	2910.57	7584.93	0.3837	0.8970	0.9169	-2.2%	0.0011	0.0035	-69.2%
ASR0611	C4	1118007-16	148	6/11/2017 10:55	20	10017	3.49	0.4285	5.59	2867.30	7584.93	0.3780	0.8822	0.9169	-3.8%	0.0019	0.0035	-43.6%
ASR0611	D1	1118007-16	148	6/11/2017 11:04	15	10027	3.54	0.4099	4.14	2830.87	7584.93	0.3732	0.9105	0.9169	-0.7%	0.0015	0.0035	-57.6%
ASR0611	D2	1118007-16	148	6/11/2017 11:17	29	10013	3.57	0.4107	8.04	2803.15	7584.92	0.3696	0.8999	0.9169	-1.9%	0.0029	0.0035	-17.0%
ASR0611	D3	1118007-16	148	6/11/2017 11:24	15	10039	3.57	0.4196	4.03	2810.38	7584.92	0.3705	0.8830	0.9169	-3.7%	0.0014	0.0035	-58.5%
ASR0611	D4	1118007-16	148	6/11/2017 9:14	8	10039	3.53	0.4214	2.17	2842.30	7584.96	0.3747	0.8892	0.9169	-3.0%	0.0008	0.0035	-78.0%

LB4100C Beta Attenuation Curve -- Sr-90

WO #:	1118007

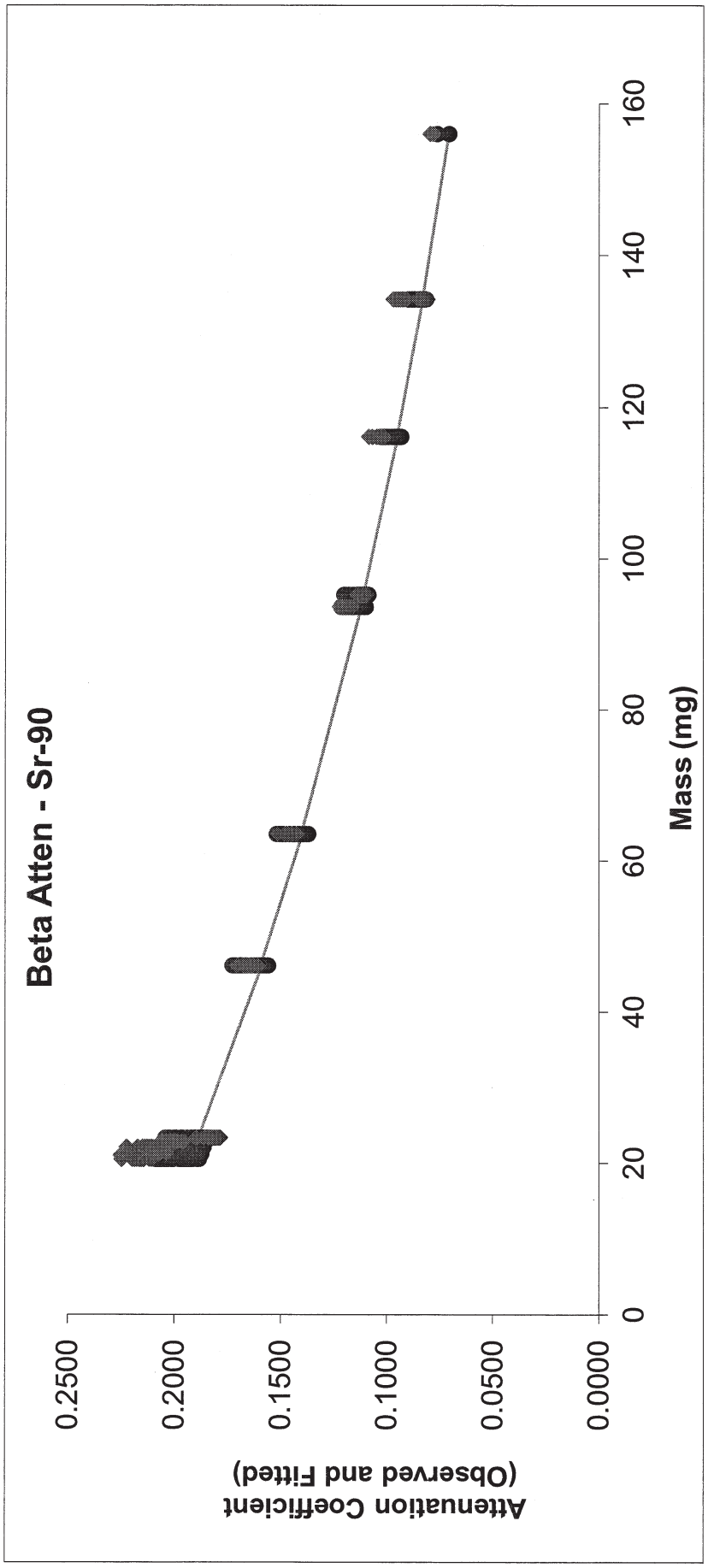
Nuclide:	Sr-90	
Std. ID:	777.3020.11	
Ref. Date:	02/08/06	
Halflife:	28.5	yrs
Activity:	4996.73	dpm/mL
Vol.:	2	mL

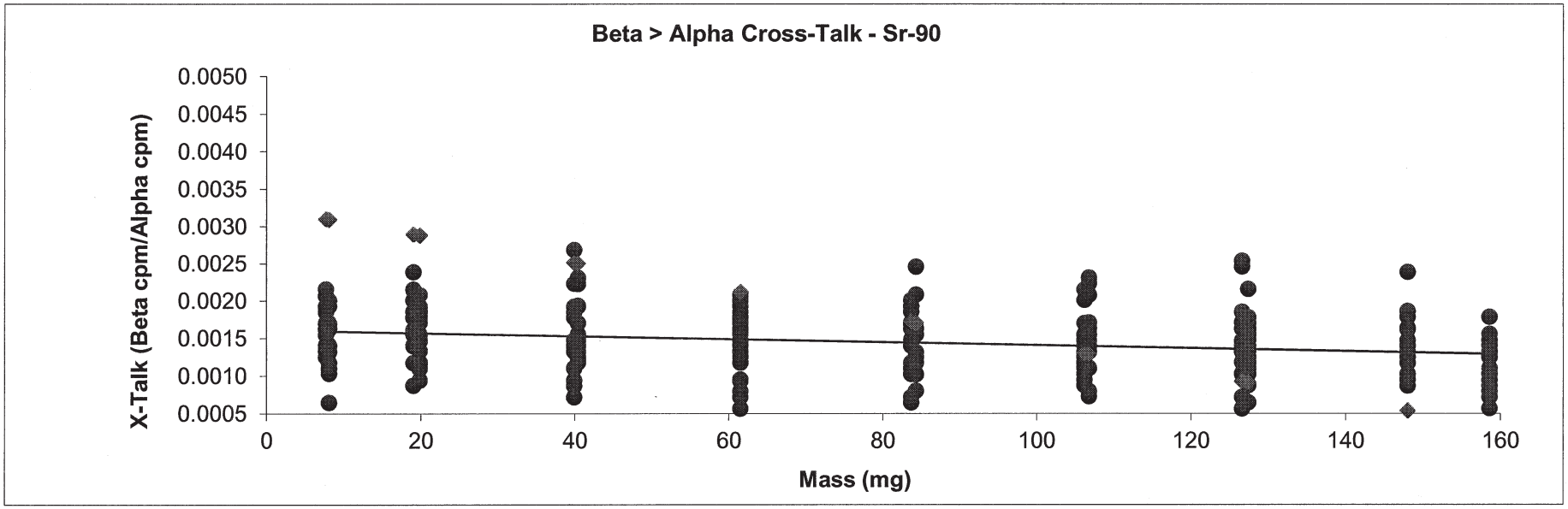
Calibrated Mass Range		
Low	7.7	mg
High	158.6	mg

Attenuation Equation	y=b*m^(a*x)
b =	0.9681
m =	0.9996
a =	0.9174
% Diff Max. =	5.9%

Cross-Talk Equation	y=b*x+m
b =	1.1183E-05
m =	0.0018
% Diff Max. =	83.2%

File ID	Detector ID	Sample ID	Mass (mg)	Count Date	Alpha Counts	Beta Counts	Count Time	Base Beta Eff.	Alpha CPM	Beta CPM	Decay Corr. Act. added dpm/mL	Beta Obs. Atten. Eff.	Obs Atten Fact.	Fitted Atten Fact.	% Diff.	β > α XTLK Observed	β > α XTLK Fitted	% Diff.
ASR0611	A1	1118007-15	158.6	6/11/2017 9:31	21	10010	3.38	0.4236	6.14	2960.10	7584.96	0.3903	0.9213	0.9134	0.9%	0.0021	0.0036	-42.0%
ASR0611	A2	1118007-15	158.6	6/11/2017 9:40	24	10036	3.39	0.4238	6.99	2959.14	7584.96	0.3901	0.9206	0.9134	0.8%	0.0024	0.0036	-33.9%
ASR0611	A3	1118007-15	158.6	6/11/2017 9:48	14	10014	3.38	0.4440	4.05	2961.21	7584.95	0.3904	0.8793	0.9134	-3.7%	0.0014	0.0036	-61.8%
ASR0611	A4	1118007-15	158.6	6/11/2017 9:54	18	10027	3.44	0.4284	5.15	2913.29	7584.95	0.3841	0.8966	0.9134	-1.8%	0.0018	0.0036	-50.5%
ASR0611	B1	1118007-15	158.6	6/11/2017 10:02	17	10021	3.44	0.4252	4.85	2911.47	7584.95	0.3838	0.9027	0.9134	-1.2%	0.0017	0.0036	-53.4%
ASR0611	B2	1118007-15	158.6	6/11/2017 10:09	19	10034	3.49	0.4122	5.33	2873.42	7584.94	0.3788	0.9190	0.9134	0.6%	0.0019	0.0036	-48.1%
ASR0611	B3	1118007-15	158.6	6/11/2017 10:19	17	10027	3.43	0.4289	4.87	2921.78	7584.94	0.3852	0.8981	0.9134	-1.7%	0.0017	0.0036	-53.3%
ASR0611	B4	1118007-15	158.6	6/11/2017 10:25	11	10004	3.47	0.4195	3.07	2881.41	7584.94	0.3799	0.9056	0.9134	-0.9%	0.0011	0.0036	-70.2%
ASR0611	C1	1118007-15	158.6	6/11/2017 10:34	15	10029	3.39	0.4214	4.31	2956.87	7584.94	0.3898	0.9251	0.9134	1.3%	0.0015	0.0036	-59.2%
ASR0611	C2	1118007-15	158.6	6/11/2017 10:42	15	10011	3.42	0.4339	4.27	2925.53	7584.93	0.3857	0.8889	0.9134	-2.7%	0.0015	0.0036	-59.1%
ASR0611	C3	1118007-15	158.6	6/11/2017 10:54	20	10029	3.41	0.4278	5.77	2939.42	7584.93	0.3875	0.9059	0.9134	-0.8%	0.0020	0.0036	-45.1%
ASR0611	C4	1118007-15	158.6	6/11/2017 11:04	27	10036	3.38	0.4285	7.85	2966.33	7584.93	0.3911	0.9127	0.9134	-0.1%	0.0026	0.0036	-26.0%
ASR0611	D1	1118007-15	158.6	6/11/2017 11:17	16	10018	3.48	0.4099	4.50	2877.12	7584.92	0.3793	0.9254	0.9134	1.3%	0.0016	0.0036	-56.2%
ASR0611	D2	1118007-15	158.6	6/11/2017 11:24	14	10006	3.44	0.4107	3.98	2907.11	7584.92	0.3833	0.9332	0.9134	2.2%	0.0014	0.0036	-61.7%
ASR0611	D3	1118007-15	158.6	6/11/2017 9:14	9	10035	3.45	0.4196	2.44	2907.03	7584.96	0.3833	0.9134	0.9134	0.0%	0.0008	0.0036	-76.5%
ASR0611	D4	1118007-15	158.6	6/11/2017 9:19	7	10011	3.47	0.4214	1.92	2883.41	7584.96	0.3801	0.9021	0.9134	-1.2%	0.0007	0.0036	-81.4%


Beta Atten - Sr-90
Attenuation Coefficient
(Observed and Fitted)
0.2500
0.2000
0.1500
0.1000
0.0500
0.0000
0
20
40
60
80
100
120
140
160
Mass (mg)


Beta > Alpha Cross-Talk - Sr-90
X-Talk (Beta cpm/Alpha cpm)
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
0.0005
0
20
40
60
80
100
120
140
160
Mass (mg)

Detector ID	Sample ID	Alpha	Beta	Guard	Count Time	TOD	ALPHA CPM	BETA CPM
A1	23.3	10002	2654	7406	10.6	6/10/2017 10:21	943.5069	248.9414
A1	43.7	10000	2613	8885	12.97	6/10/2017 15:44	770.932	200.0289
A1	46.1	10002	2574	7898	11.46	6/10/2017 15:14	872.6969	223.1713
A1	63.5	9999	2584	9151	12.92	6/10/2017 14:47	773.8384	198.564
A1	81.1	10020	2487	7790	11.28	6/10/2017 14:16	888.2199	219.0427
A1	93.6	10009	2373	11094	15.97	6/10/2017 13:52	626.6596	147.1551
A1	95.2	10008	2609	11819	16.96	6/10/2017 13:23	590.0163	152.3965
A1	116.1	10002	2612	13186	18.71	6/10/2017 12:57	534.5024	138.1685
A1	134.2	10001	2902	17075	24.23	6/10/2017 12:31	412.6748	118.3329
A1	134.3	10004	2789	15271	21.71	6/10/2017 12:00	460.7235	127.0301
A1	151.6	9999	2851	16367	23.11	6/10/2017 11:32	432.5918	121.9305
A1	156	10002	2918	18142	25.89	6/10/2017 11:06	386.2488	111.2716
A2	22.1	10011	2646	6595	9.4	6/10/2017 10:20	1064.906	280.1534
A2	23.3	10011	2636	7609	10.64	6/10/2017 10:51	940.7895	246.4084
A2	46.1	10007	2535	7934	11.55	6/10/2017 15:43	866.3129	218.1445
A2	63.5	10006	2500	9094	13.12	6/10/2017 15:16	762.5584	189.2128
A2	81.1	10009	2356	7986	11.28	6/10/2017 14:45	887.2287	207.5292
A2	93.6	10003	2318	11007	15.93	6/10/2017 14:21	627.8407	144.1756
A2	95.2	10012	2579	11870	17.04	6/10/2017 13:53	587.4647	150.0138
A2	116.1	10011	2655	13262	18.99	6/10/2017 13:25	527.0782	138.4744
A2	134.2	10004	2990	17715	25.18	6/10/2017 13:03	397.2054	117.409
A2	134.3	10003	2763	15595	22.11	6/10/2017 12:29	452.3257	123.6301
A2	151.6	10003	2818	16361	23.28	6/10/2017 12:01	429.5881	119.7121
A2	156	10001	2822	18457	26.16	6/10/2017 11:35	382.2072	106.5386
A3	21	10012	2671	6066	8.61	6/10/2017 10:19	1162.738	308.7107
A3	22.1	10010	2806	6703	9.32	6/10/2017 10:50	1073.938	299.563
A3	23.3	10005	2838	7514	10.81	6/10/2017 11:19	925.4359	261.0247
A3	63.5	10009	2685	8856	12.92	6/10/2017 15:44	774.5944	206.3073
A3	81.1	10002	2477	7603	11.02	6/10/2017 15:14	907.5265	223.2631
A3	93.6	10008	2500	11269	15.9	6/10/2017 14:50	629.338	155.7227
A3	95.2	10004	2607	11650	16.8	6/10/2017 14:22	595.3802	153.6686
A3	116.1	10001	2611	13179	18.82	6/10/2017 13:55	531.3068	137.2254
A3	134.2	10005	2997	16878	24.25	6/10/2017 13:31	412.4813	122.0776
A3	134.3	10005	2764	15102	21.42	6/10/2017 13:00	466.9908	127.5283
A3	151.6	10004	2844	16176	22.95	6/10/2017 12:30	435.8081	122.4116
A3	156	9999	2904	18286	26.06	6/10/2017 12:04	383.5955	109.9251
A4	21	10004	2690	6173	8.58	6/10/2017 10:49	1165.884	311.9878
A4	22.1	10006	2746	6454	9.25	6/10/2017 11:18	1081.647	295.3329
A4	23.3	10011	2832	7457	10.47	6/10/2017 11:48	956.0775	268.9551
A4	48.5	10006	2898	10358	14.9	6/10/2017 10:25	671.4606	192.9646
A4	81.1	10002	2494	7658	11.12	6/10/2017 15:43	899.3774	222.7486
A4	93.6	10002	2510	11033	15.79	6/10/2017 15:18	633.3559	157.4294
A4	95.2	10000	2655	11909	16.81	6/10/2017 14:51	594.801	156.4097
A4	116.1	10001	2709	12944	18.61	6/10/2017 14:24	537.3162	144.0349
A4	134.2	10000	2983	16717	23.88	6/10/2017 14:00	418.6775	123.3842
A4	134.3	10001	2850	14745	21.15	6/10/2017 13:28	472.7775	133.2198
A4	151.6	10003	2813	15978	22.69	6/10/2017 13:01	440.772	122.4433
A4	156	10002	3072	18458	26.17	6/10/2017 12:33	382.1104	115.8543
B1	21	10016	2665	6317	8.89	6/10/2017 11:17	1126.568	298.162
B1	22.1	10010	2636	6772	9.33	6/10/2017 11:47	1072.792	280.9165

B1	23.3	10000	2784	8006	10.99	6/10/2017 12:18	909.8271	251.7082
B1	47.5	10004	3012	13364	18.8	6/10/2017 10:29	532.0367	158.5998
B1	48.5	10007	2818	10722	14.97	6/10/2017 10:55	668.3793	186.6302
B1	93.6	10011	2431	11611	16.31	6/10/2017 15:48	613.7042	147.4367
B1	95.2	10005	2616	12000	17.09	6/10/2017 15:20	585.3391	151.459
B1	116.1	10002	2676	13864	19.47	6/10/2017 14:53	513.6224	135.8292
B1	134.2	10000	2959	17625	24.65	6/10/2017 14:30	405.5885	118.4276
B1	134.3	10005	2958	16108	22.74	6/10/2017 13:59	439.8826	128.4662
B1	151.6	10006	2732	16525	23.35	6/10/2017 13:30	428.4315	115.3891
B1	156	10001	2973	18646	26.27	6/10/2017 13:04	380.6094	111.5579
B2	21	10011	2699	6451	8.87	6/10/2017 11:47	1128.519	302.6341
B2	22.1	10015	2861	7137	9.74	6/10/2017 12:16	1028.117	292.0872
B2	23.3	10006	2895	7900	11.14	6/10/2017 12:49	898.0877	258.2243
B2	43.7	10006	2699	9551	13.5	6/10/2017 10:24	741.0682	198.2759
B2	47.5	10001	2973	13557	19.1	6/10/2017 11:00	523.4956	154.0045
B2	48.5	10007	2933	11045	15.48	6/10/2017 11:24	646.33	187.8203
B2	95.2	10001	2780	12620	17.76	6/10/2017 15:49	563.0024	154.8815
B2	116.1	10004	2675	13717	19.45	6/10/2017 15:22	514.2275	135.8821
B2	134.2	10001	3107	18077	25.49	6/10/2017 14:59	392.2329	120.2409
B2	134.3	10002	2953	16192	22.51	6/10/2017 14:28	444.2189	129.5361
B2	151.6	10002	2963	17070	24.07	6/10/2017 14:00	415.421	121.4493
B2	156	10000	2972	19055	26.98	6/10/2017 13:33	370.5279	108.5057
B3	21	10003	2830	6473	8.85	6/10/2017 12:15	1130.198	318.229
B3	22.1	10015	2791	6866	9.7	6/10/2017 12:48	1032.39	286.187
B3	23.3	10010	2836	7679	10.89	6/10/2017 13:17	919.1079	258.8774
B3	43.7	10006	2811	9628	13.43	6/10/2017 10:54	744.9644	207.7625
B3	46.1	10001	2716	8244	11.7	6/10/2017 10:22	854.7023	230.5918
B3	47.5	10003	3141	13327	18.6	6/10/2017 11:27	537.7117	167.326
B3	48.5	10004	3079	11025	15.27	6/10/2017 11:53	655.0568	200.0922
B3	116.1	10001	2726	13670	19.22	6/10/2017 15:51	520.2594	140.2864
B3	134.2	10002	3169	17537	24.85	6/10/2017 15:27	402.411	125.9802
B3	134.3	10002	2909	15708	22.11	6/10/2017 14:56	452.2905	130.0244
B3	151.6	10000	2918	16758	23.34	6/10/2017 14:28	428.365	123.4764
B3	156	10002	2998	19002	26.78	6/10/2017 14:03	373.4037	110.4042
B4	21	10009	2817	6320	8.94	6/10/2017 12:47	1119.475	313.5097
B4	22.1	10010	2876	6834	9.68	6/10/2017 13:16	1033.991	295.5164
B4	23.3	10014	2885	7650	10.89	6/10/2017 13:47	919.4592	263.3309
B4	43.7	10005	2765	9398	13.13	6/10/2017 11:22	761.8954	208.9954
B4	46.1	10002	2657	8495	11.82	6/10/2017 10:52	846.0929	223.1975
B4	47.5	10002	3046	13505	18.69	6/10/2017 11:57	535.0525	161.3839
B4	48.5	10005	2912	11066	15.31	6/10/2017 12:22	653.3944	188.6115
B4	63.5	10003	2575	9268	13.13	6/10/2017 10:24	761.7431	194.5248
B4	134.2	10003	3144	17876	25.08	6/10/2017 15:57	398.7437	123.7679
B4	134.3	10003	3002	15951	22.64	6/10/2017 15:25	441.7286	131.0062
B4	151.6	10003	2945	16489	23.23	6/10/2017 14:57	430.507	125.1847
B4	156	10001	3006	18966	26.59	6/10/2017 14:32	376.0188	111.459
C1	21	10012	2882	6401	8.83	6/10/2017 13:15	1133.752	324.8473
C1	22.1	10006	2702	6527	9.18	6/10/2017 13:45	1089.868	292.7955
C1	23.3	9999	2813	7534	10.41	6/10/2017 14:15	960.4087	268.6809
C1	43.7	10010	2653	9354	12.72	6/10/2017 11:51	786.8397	207.0292
C1	46.1	10005	2594	8270	11.43	6/10/2017 11:20	875.2181	225.4066
C1	47.5	10002	3067	13299	18.29	6/10/2017 12:25	546.7462	166.1473

C1	48.5	10008	2909	10618	14.73	6/10/2017 12:53	679.3197	195.9481
C1	63.5	10005	2676	9493	12.96	6/10/2017 10:53	771.8807	204.9415
C1	81.1	10010	2588	8050	11.27	6/10/2017 10:22	888.0888	228.0962
C1	134.3	10001	2871	15485	21.41	6/10/2017 15:53	467.0082	132.5562
C1	151.6	10001	2874	16729	23.24	6/10/2017 15:26	430.2256	122.1261
C1	156	10002	3048	18560	25.78	6/10/2017 15:00	387.8652	116.6912
C2	21	10012	2724	6160	8.67	6/10/2017 13:45	1154.675	312.5279
C2	22.1	10006	2799	6749	9.28	6/10/2017 14:14	1078.121	299.9574
C2	23.3	10004	2876	7687	10.68	6/10/2017 14:44	936.5921	267.6294
C2	43.7	10009	2671	9453	12.93	6/10/2017 12:20	773.9793	204.9149
C2	46.1	10007	2687	8469	11.53	6/10/2017 11:49	867.7978	231.3852
C2	47.5	10004	3014	13231	18.31	6/10/2017 12:56	546.2561	162.9505
C2	48.5	10000	2902	10881	14.97	6/10/2017 13:21	667.8907	192.1954
C2	63.5	10005	2579	9239	12.74	6/10/2017 11:21	785.2098	200.7743
C2	81.1	10007	2533	8182	11.1	6/10/2017 10:51	901.4195	226.5392
C2	93.6	10005	2468	11486	15.97	6/10/2017 10:26	626.3752	152.8808
C2	151.6	10001	2934	16860	23.35	6/10/2017 15:55	428.1964	123.9941
C2	156	10001	2890	18630	25.85	6/10/2017 15:28	386.7739	110.1398
C3	21	10007	2821	6408	8.82	6/10/2017 14:14	1134.484	318.2013
C3	22.1	10005	2730	6665	9.3	6/10/2017 14:43	1075.71	291.9084
C3	23.3	10003	2818	7655	10.75	6/10/2017 15:13	930.4156	260.4995
C3	43.7	10002	2622	9451	13.02	6/10/2017 12:51	768.1068	199.7425
C3	46.1	10011	2478	8413	11.52	6/10/2017 12:18	868.9144	213.4642
C3	47.5	10000	2955	13463	18.44	6/10/2017 13:25	542.2033	158.6095
C3	48.5	10003	2928	10764	14.97	6/10/2017 13:51	668.1071	193.9512
C3	63.6	10002	2671	9648	13.12	6/10/2017 11:51	762.2516	201.9423
C3	81.1	10003	2600	8299	11.47	6/10/2017 11:20	872.0051	225.0383
C3	93.6	10003	2398	11706	16.08	6/10/2017 10:56	621.9811	147.4894
C3	95.2	10005	2598	12450	17.32	6/10/2017 10:28	577.5599	148.36
C3	156	10000	3007	19206	26.59	6/10/2017 15:58	375.9852	111.4476
C4	21	10012	2622	6177	8.62	6/10/2017 14:42	1161.344	301.2793
C4	22.1	10003	2871	6734	9.51	6/10/2017 15:12	1051.699	298.9957
C4	23.3	10011	2874	7988	10.93	6/10/2017 15:42	915.7785	260.049
C4	43.7	10004	2568	9238	12.75	6/10/2017 13:19	784.4865	198.5148
C4	46.1	10007	2592	8385	11.53	6/10/2017 12:49	867.7688	221.9079
C4	47.5	10003	3054	13427	18.57	6/10/2017 13:55	538.5235	161.5618
C4	48.5	10003	2750	10934	15.05	6/10/2017 14:20	664.5102	179.8273
C4	63.5	10003	2549	9517	13.01	6/10/2017 12:20	768.7291	193.0292
C4	81.1	10014	2550	8438	11.48	6/10/2017 11:49	872.1587	219.2284
C4	93.6	10001	2469	11614	15.99	6/10/2017 11:24	625.3124	151.512
C4	95.2	10007	2727	12414	17.07	6/10/2017 10:57	586.0922	156.857
C4	116.1	10003	2757	13734	19	6/10/2017 10:30	526.3327	142.2083
D1	21	10012	2751	6589	9.08	6/10/2017 15:12	1102.548	301.3596
D1	22.1	10015	2849	6949	9.62	6/10/2017 15:41	1040.965	294.5398
D1	43.7	10001	2595	9657	13.29	6/10/2017 13:49	752.4257	193.6456
D1	46.1	10007	2559	8836	11.92	6/10/2017 13:18	839.4184	213.0672
D1	47.5	9999	2970	13852	18.78	6/10/2017 14:24	532.3331	156.533
D1	48.5	10006	2822	11263	15.51	6/10/2017 14:49	645.0372	180.3331
D1	63.5	10003	2604	9724	13.26	6/10/2017 12:51	754.2791	194.7661
D1	81.1	10002	2645	8550	11.77	6/10/2017 12:18	849.6926	223.1099
D1	93.6	10002	2494	12447	16.71	6/10/2017 11:55	598.4687	147.6379
D1	95.2	10003	2595	13050	17.68	6/10/2017 11:26	565.6855	145.162

D1	116.1	10000	2689	14417	19.81	6/10/2017 11:00	504.7006	134.1255
D1	134.2	10002	3047	18644	25.54	6/10/2017 10:36	391.526	117.6891
D2	21	10006	2724	6467	8.96	6/10/2017 15:40	1116.654	302.4109
D2	43.7	10004	2689	9847	13.38	6/10/2017 14:18	747.5961	199.3646
D2	46.1	10004	2573	8469	11.7	6/10/2017 13:48	854.9557	218.3075
D2	47.5	10001	3108	13588	18.58	6/10/2017 14:52	538.18	165.6696
D2	48.5	10002	2980	11159	15.39	6/10/2017 15:18	649.8155	192.0252
D2	63.5	10003	2565	9872	13.36	6/10/2017 13:20	748.6405	190.384
D2	81.1	10010	2622	8634	11.76	6/10/2017 12:50	851.1035	221.3522
D2	93.6	10000	2570	12441	16.97	6/10/2017 12:24	589.1882	149.8367
D2	95.2	10006	2507	12877	17.33	6/10/2017 11:55	577.2933	143.0554
D2	116.1	10002	2665	14461	19.63	6/10/2017 11:28	509.4392	134.1546
D2	134.2	10003	2996	18625	25.67	6/10/2017 11:06	389.5897	115.1051
D2	134.3	10001	2720	16375	22.34	6/10/2017 10:33	447.5853	120.1477
D3	43.7	10019	2784	9676	13.35	6/10/2017 14:47	750.3159	206.8743
D3	46.1	10002	2741	8685	11.74	6/10/2017 14:17	851.7881	231.8103
D3	47.5	10002	3187	13821	18.92	6/10/2017 15:22	528.4759	166.7811
D3	48.5	10012	2983	10970	15.21	6/10/2017 15:47	658.0802	194.456
D3	63.5	10000	2755	9715	13.36	6/10/2017 13:49	748.332	204.5476
D3	81.1	10002	2669	8584	11.58	6/10/2017 13:18	863.5596	228.8186
D3	93.6	10001	2677	12205	16.75	6/10/2017 12:55	596.9036	158.1559
D3	95.2	10001	2756	12624	17.26	6/10/2017 12:24	579.2612	158.0106
D3	116.1	10002	2861	14462	19.46	6/10/2017 11:57	513.8064	145.3545
D3	134.2	10001	3170	18459	25.32	6/10/2017 11:34	394.8132	123.5325
D3	134.3	9999	3049	16122	22.16	6/10/2017 11:03	451.0474	135.9253
D3	151.6	10002	3092	17649	24.1	6/10/2017 10:35	414.8497	126.6338
D4	43.7	10002	2828	9550	13.17	6/10/2017 15:16	759.3523	213.1234
D4	46.1	10014	2557	8553	11.79	6/10/2017 14:46	849.2629	215.2717
D4	47.5	10001	3111	13892	19.22	6/10/2017 15:51	520.2424	160.2556
D4	63.5	9999	2543	9776	13.29	6/10/2017 14:18	752.2692	189.7399
D4	81.1	10004	2590	8436	11.65	6/10/2017 13:48	858.6114	220.7106
D4	93.6	10003	2356	12057	16.31	6/10/2017 13:23	613.2037	142.8443
D4	95.2	10003	2691	12576	17.25	6/10/2017 12:55	579.7831	154.393
D4	116.1	10006	2675	14206	19.38	6/10/2017 12:26	516.2045	136.4219
D4	134.2	10005	2988	18358	24.88	6/10/2017 12:03	402.0292	118.4895
D4	134.3	10003	2828	16148	22.08	6/10/2017 11:31	452.9334	126.4727
D4	151.6	10006	3006	17360	23.9	6/10/2017 11:04	418.5601	124.1671
D4	156	10001	2973	19249	26.37	6/10/2017 10:37	379.1557	111.1348
A1	21	10011	2845	5988	8.75	6/11/2017 8:18	1144.036	323.7069
A1	22.1	10005	2949	6557	9.3	6/11/2017 8:48	1075.728	315.6608
A1	47.5	10002	3074	12634	18.13	6/11/2017 7:30	551.6043	168.1172
A1	48.5	10000	2861	10320	14.8	6/11/2017 7:55	675.5977	191.8748
A2	21	10012	2643	6087	8.65	6/11/2017 8:48	1157.363	304.2131
A2	43.7	10006	2617	8923	12.73	6/11/2017 7:24	785.9233	204.2414
A2	47.5	10001	2908	12772	18.38	6/11/2017 7:59	544.03	156.8795
A2	48.5	10004	2885	10355	15.04	6/11/2017 8:24	665.0656	190.4858
A3	43.7	10011	2634	8907	12.81	6/11/2017 7:53	781.4028	204.1106
A3	46.1	10013	2549	8024	11.38	6/11/2017 7:23	879.781	222.4795
A3	47.5	10001	3025	12651	18.3	6/11/2017 8:27	546.4067	163.7905
A3	48.5	9999	2811	10307	14.68	6/11/2017 8:54	681.0348	189.975
A4	43.7	10004	2717	8691	12.66	6/11/2017 8:22	790.1224	213.081
A4	46.1	10006	2477	7653	11.03	6/11/2017 7:51	907.0793	223.0374

A4	47.5	10002	3027	12548	17.92	6/11/2017 8:57	558.0643	167.3854
A4	63.5	10011	2570	8856	12.63	6/11/2017 7:24	792.5536	201.9518
B1	43.7	10006	2576	9018	12.65	6/11/2017 8:52	790.8971	202.0234
B1	46.1	10002	2626	8203	11.67	6/11/2017 8:21	856.9784	223.4084
B1	63.5	10001	2555	9221	13.04	6/11/2017 7:53	766.8569	194.3226
B1	81.1	10008	2565	8288	11.5	6/11/2017 7:23	870.1699	221.4305
B2	46.1	10016	2493	8221	11.51	6/11/2017 8:50	870.0828	214.9443
B2	63.5	10000	2496	9253	13.15	6/11/2017 8:22	760.3393	188.1599
B2	81.1	10006	2568	8316	11.73	6/11/2017 7:52	852.9094	217.2758
B2	93.6	10003	2473	11549	16.26	6/11/2017 7:28	615.0737	150.441
B3	63.5	10002	2504	9148	12.85	6/11/2017 8:52	778.2818	193.3188
B3	81.1	10000	2512	8113	11.53	6/11/2017 8:21	867.2187	216.3214
B3	93.6	10000	2500	11422	16.16	6/11/2017 7:56	618.7279	153.158
B3	95.2	10001	2696	12261	17.19	6/11/2017 7:29	581.7077	155.2904
B4	81.1	10007	2617	8361	11.68	6/11/2017 8:51	856.6637	222.4672
B4	93.6	10007	2534	11619	16.47	6/11/2017 8:26	607.4896	152.2645
B4	95.2	10007	2700	12247	17.34	6/11/2017 7:58	577.005	154.1183
B4	116.1	9999	2737	13670	19.13	6/11/2017 7:31	522.5869	141.4827
C1	93.6	10001	2603	11548	16.01	6/11/2017 8:55	624.5621	161.0459
C1	95.2	10002	2721	12144	16.67	6/11/2017 8:26	599.89	161.6874
C1	116.1	10003	2777	13365	18.41	6/11/2017 7:59	543.236	149.3019
C1	134.2	10004	2990	17392	23.88	6/11/2017 7:36	418.818	123.6694
C2	95.2	10003	2635	12086	16.79	6/11/2017 8:56	595.6593	155.2797
C2	116.1	10005	2749	13669	18.74	6/11/2017 8:28	533.7727	145.0326
C2	134.2	10005	3103	17609	24.11	6/11/2017 8:04	414.861	127.0428
C2	134.3	10003	2870	15827	21.65	6/11/2017 7:33	461.9203	130.9045
C3	116.1	10001	2677	13423	18.59	6/11/2017 8:58	537.8814	142.3622
C3	134.2	9999	3039	17878	24.5	6/11/2017 8:34	408.0264	122.4008
C3	134.3	10002	2812	15879	21.8	6/11/2017 8:02	458.7113	127.3508
C3	151.6	10000	2846	16948	23.22	6/11/2017 7:35	430.5672	120.9268
C4	134.2	9999	2993	17794	24.55	6/11/2017 9:04	407.1502	119.0175
C4	134.3	10000	2918	15870	21.79	6/11/2017 8:31	458.7851	131.0176
C4	151.6	10001	2902	17326	23.68	6/11/2017 8:04	422.1985	119.6537
C4	156	10004	3000	19186	26.33	6/11/2017 7:38	379.8058	111.0415
D1	23.3	10003	2691	8136	10.92	6/11/2017 7:23	915.9306	244.8146
D1	134.3	10003	2832	16505	22.71	6/11/2017 9:02	440.3718	123.0888
D1	151.6	10000	2724	17413	23.65	6/11/2017 8:33	422.738	113.5657
D1	156	9999	2909	19704	26.77	6/11/2017 8:07	373.4201	107.0524
D2	22.1	10018	2715	7144	9.57	6/11/2017 7:21	1046.726	282.0921
D2	23.3	10000	2655	7864	10.76	6/11/2017 7:51	929.281	245.1402
D2	151.6	10007	2805	17385	23.91	6/11/2017 9:03	418.4408	115.7079
D2	156	10001	2987	19810	26.84	6/11/2017 8:36	372.5285	109.6821
D3	21	10014	2651	6666	8.89	6/11/2017 7:21	1126.263	296.5352
D3	22.1	10007	2667	6829	9.43	6/11/2017 7:50	1061.017	281.1558
D3	23.3	10003	2648	7847	10.68	6/11/2017 8:20	936.4395	246.2751
D3	156	10002	3081	19624	27.08	6/11/2017 9:06	369.1791	112.109
D4	21	10010	2611	6340	8.75	6/11/2017 7:49	1143.899	296.793
D4	22.1	10015	2640	6896	9.44	6/11/2017 8:19	1060.81	278.054
D4	23.3	10020	2739	7831	10.89	6/11/2017 8:50	920.0092	249.9082
D4	48.5	10004	2672	11077	15.04	6/11/2017 7:27	665.0586	176.0526

Detector ID	Sample ID	Alpha	Beta	Guard	Count Time	TOD	ALPHA CPM	BETA CPM
A1	7.7	12	10029	2111	3.11	6/11/2017 11:24	3.780521	3223.323
A1	8.1	29	10039	2184	3.13	6/11/2017 9:13	9.187176	3205.912
A1	19	30	10005	2183	3.14	6/11/2017 11:04	9.47614	3184.87
A1	19.8	25	10034	2262	3.26	6/11/2017 11:16	7.590712	3076.478
A1	39.9	20	10036	2242	3.32	6/11/2017 10:54	5.946096	3021.456
A1	40.4	18	10026	2319	3.29	6/11/2017 10:42	5.393125	3045.98
A1	61.5	26	10040	2342	3.27	6/11/2017 10:34	7.87307	3068.9
A1	61.6	18	10040	2331	3.27	6/11/2017 10:24	5.426587	3068.9
A1	83.7	17	10037	2331	3.28	6/11/2017 10:19	5.104927	3058.625
A1	84.3	25	10021	2319	3.3	6/11/2017 10:09	7.497758	3035.231
A1	106.2	14	10038	2326	3.29	6/11/2017 10:02	4.177319	3049.628
A1	106.8	18	10045	2326	3.36	6/11/2017 9:54	5.279143	2988.147
A1	126.6	16	10034	2283	3.34	6/11/2017 9:48	4.712419	3002.756
A1	127.4	13	10025	2285	3.29	6/11/2017 9:40	3.873368	3045.676
A1	148	21	10029	2471	3.41	6/11/2017 9:19	6.080358	2939.62
A1	158.6	21	10010	2353	3.38	6/11/2017 9:31	6.135018	2960.102
A2	7.7	25	10008	2186	3.13	6/11/2017 9:13	7.89322	3196.108
A2	8.1	30	10014	2241	3.11	6/11/2017 9:19	9.552302	3218.6
A2	19	28	10076	2216	3.19	6/11/2017 11:16	8.683429	3157.285
A2	19.8	30	10031	2198	3.22	6/11/2017 11:24	9.22277	3113.881
A2	39.9	22	10009	2272	3.25	6/11/2017 11:04	6.675231	3078.356
A2	40.4	21	10027	2239	3.31	6/11/2017 10:54	6.250411	3027.969
A2	61.5	27	10010	2338	3.31	6/11/2017 10:42	8.0631	3022.833
A2	61.6	17	10037	2378	3.34	6/11/2017 10:34	4.99582	3003.754
A2	83.7	12	10013	2320	3.25	6/11/2017 10:24	3.598308	3079.587
A2	84.3	25	10013	2392	3.36	6/11/2017 10:19	7.346476	2978.724
A2	106.2	24	10032	2340	3.36	6/11/2017 10:09	7.048857	2984.378
A2	106.8	18	10031	2364	3.33	6/11/2017 10:02	5.311405	3010.976
A2	126.6	20	10028	2379	3.43	6/11/2017 9:54	5.736904	2922.279
A2	127.4	18	10029	2289	3.35	6/11/2017 9:48	5.279134	2992.395
A2	148	14	10036	2422	3.46	6/11/2017 9:31	3.952243	2899.242
A2	158.6	24	10036	2352	3.39	6/11/2017 9:40	6.985646	2959.136
A3	7.7	18	10018	2255	3.13	6/11/2017 9:19	5.654799	3199.129
A3	8.1	27	10024	2168	3.11	6/11/2017 9:31	8.585672	3221.641
A3	19	16	10022	2158	3.17	6/11/2017 11:24	4.951319	3160.004
A3	19.8	23	10014	2229	3.19	6/11/2017 9:13	7.114031	3137.675
A3	39.9	18	10020	2276	3.28	6/11/2017 11:16	5.391805	3053.368
A3	40.4	12	10010	2296	3.28	6/11/2017 11:04	3.562537	3050.319
A3	61.5	17	10052	2213	3.27	6/11/2017 10:54	5.102777	3072.496
A3	61.6	23	10009	2332	3.3	6/11/2017 10:42	6.873697	3031.52
A3	83.7	22	10029	2347	3.29	6/11/2017 10:34	6.59093	3046.818
A3	84.3	13	10044	2383	3.36	6/11/2017 10:25	3.773048	2987.776
A3	106.2	12	10031	2349	3.3	6/11/2017 10:19	3.540364	3038.187
A3	106.8	21	10039	2322	3.32	6/11/2017 10:09	6.229301	3022.285
A3	126.6	16	10012	2385	3.37	6/11/2017 10:02	4.651774	2969.41
A3	127.4	13	10014	2301	3.31	6/11/2017 9:53	3.831492	3023.868
A3	148	16	10003	2385	3.44	6/11/2017 9:40	4.555163	2906.339
A3	158.6	14	10014	2307	3.38	6/11/2017 9:48	4.046012	2961.212
A4	7.7	27	10045	2163	3.1	6/11/2017 9:31	8.626677	3238.791
A4	8.1	28	10041	2161	3.09	6/11/2017 9:40	8.978489	3247.983

A4	19	24	10020	2199	3.14	6/11/2017 9:13	7.560312	3189.551
A4	19.8	37	10016	2298	3.18	6/11/2017 9:19	11.55222	3148.154
A4	39.9	31	10015	2235	3.27	6/11/2017 11:24	9.397122	3061.159
A4	40.4	24	10017	2271	3.27	6/11/2017 11:16	7.25645	3061.771
A4	61.5	14	10014	2287	3.26	6/11/2017 11:04	4.211479	3070.247
A4	61.6	24	10012	2213	3.27	6/11/2017 10:54	7.25645	3060.242
A4	83.7	25	10033	2302	3.26	6/11/2017 10:42	7.585712	3076.075
A4	84.3	29	10055	2373	3.34	6/11/2017 10:34	8.599635	3008.947
A4	106.2	17	10032	2362	3.33	6/11/2017 10:24	5.022105	3011.081
A4	106.8	19	10025	2372	3.32	6/11/2017 10:19	5.639892	3018.046
A4	126.6	23	10026	2325	3.33	6/11/2017 10:09	6.823907	3009.279
A4	127.4	20	10027	2351	3.31	6/11/2017 10:02	5.959296	3027.773
A4	148	19	10039	2333	3.42	6/11/2017 9:48	5.472556	2933.848
A4	158.6	18	10027	2387	3.44	6/11/2017 9:54	5.149558	2913.294
B1	7.7	30	10050	2283	3.23	6/11/2017 9:40	9.196926	3109.842
B1	8.1	27	10021	2233	3.11	6/11/2017 9:48	8.590672	3220.573
B1	19	21	10006	2290	3.2	6/11/2017 9:19	6.4715	3125.262
B1	19.8	19	10041	2363	3.31	6/11/2017 9:31	5.649181	3031.922
B1	39.9	22	10021	2488	3.41	6/11/2017 9:14	6.360613	2937.097
B1	40.4	25	10041	2289	3.34	6/11/2017 11:24	7.39403	3004.674
B1	61.5	24	10006	2355	3.31	6/11/2017 11:16	7.159755	3021.348
B1	61.6	20	10024	2394	3.38	6/11/2017 11:04	5.82616	2964.067
B1	83.7	24	10007	2300	3.37	6/11/2017 10:54	7.030662	2967.823
B1	84.3	22	10023	2410	3.39	6/11/2017 10:42	6.398676	2955.024
B1	106.2	24	10009	2354	3.37	6/11/2017 10:34	7.030662	2968.417
B1	106.8	20	10028	2382	3.4	6/11/2017 10:25	5.791353	2947.799
B1	126.6	26	10030	2399	3.43	6/11/2017 10:19	7.489175	2922.585
B1	127.4	18	10022	2400	3.38	6/11/2017 10:09	5.234444	2963.476
B1	148	24	10017	2430	3.57	6/11/2017 9:54	6.631689	2804.269
B1	158.6	17	10021	2479	3.44	6/11/2017 10:02	4.85086	2911.468
B2	7.7	24	10037	2274	3.18	6/11/2017 9:48	7.43017	3154.639
B2	8.1	23	10039	2185	3.21	6/11/2017 9:53	7.048109	3125.764
B2	19	30	10004	2326	3.26	6/11/2017 9:31	9.085454	3067.062
B2	19.8	23	10026	2351	3.33	6/11/2017 9:40	6.789907	3009.161
B2	39.9	25	10034	2441	3.39	6/11/2017 9:19	7.257631	2958.232
B2	40.4	19	10025	2452	3.37	6/11/2017 9:14	5.520982	2973.127
B2	61.5	23	10023	2316	3.38	6/11/2017 11:24	6.687734	2963.735
B2	61.6	27	10031	2414	3.38	6/11/2017 11:17	7.871166	2966.101
B2	83.7	16	10021	2356	3.32	6/11/2017 11:04	4.702277	3016.723
B2	84.3	19	10015	2313	3.39	6/11/2017 10:54	5.48772	2952.627
B2	106.2	25	10026	2455	3.46	6/11/2017 10:42	7.108434	2896.038
B2	106.8	22	10004	2359	3.38	6/11/2017 10:34	6.391876	2958.113
B2	126.6	17	10023	2443	3.49	6/11/2017 10:25	4.75406	2870.27
B2	127.4	28	10018	2409	3.45	6/11/2017 10:19	7.998942	2902.118
B2	148	19	10007	2538	3.51	6/11/2017 10:02	5.296105	2849.347
B2	158.6	19	10034	2476	3.49	6/11/2017 10:09	5.327126	2873.422
B3	7.7	22	10023	2205	3.23	6/11/2017 9:53	6.727146	3101.551
B3	8.1	19	10041	2280	3.15	6/11/2017 10:02	5.947746	3186.074
B3	19	18	10027	2252	3.18	6/11/2017 9:40	5.576377	3151.6
B3	19.8	22	10014	2345	3.29	6/11/2017 9:48	6.60293	3042.224
B3	39.9	21	10013	2326	3.26	6/11/2017 9:31	6.357718	3069.927
B3	40.4	20	10014	2441	3.39	6/11/2017 9:19	5.815705	2952.437

B3	61.5	18	10005	2354	3.24	6/11/2017 9:13	5.471556	3086.418
B3	61.6	23	10030	2301	3.36	6/11/2017 11:24	6.761238	2983.574
B3	83.7	19	10013	2326	3.28	6/11/2017 11:16	5.708683	3051.199
B3	84.3	15	10008	2356	3.32	6/11/2017 11:04	4.434072	3012.913
B3	106.2	14	10028	2314	3.39	6/11/2017 10:54	4.045794	2956.567
B3	106.8	12	10048	2407	3.38	6/11/2017 10:42	3.466296	2971.236
B3	126.6	13	10036	2390	3.43	6/11/2017 10:34	3.706087	2924.403
B3	127.4	17	10024	2407	3.44	6/11/2017 10:25	4.85786	2912.408
B3	148	14	10024	2448	3.46	6/11/2017 10:09	3.962243	2895.565
B3	158.6	17	10027	2399	3.43	6/11/2017 10:19	4.872268	2921.779
B4	7.7	18	10025	2329	3.23	6/11/2017 10:02	5.472755	3102.124
B4	8.1	21	10016	2269	3.19	6/11/2017 10:09	6.483072	3138.221
B4	19	23	10032	2270	3.19	6/11/2017 9:48	7.110031	3143.237
B4	19.8	26	10027	2295	3.39	6/11/2017 9:54	7.569617	2956.226
B4	39.9	19	10012	2363	3.35	6/11/2017 9:40	5.571642	2987.066
B4	40.4	24	10050	2381	3.34	6/11/2017 9:31	7.085629	3007.391
B4	61.5	18	10035	2404	3.34	6/11/2017 9:19	5.289222	3002.9
B4	61.6	27	10000	2471	3.39	6/11/2017 9:14	7.864602	2948.262
B4	83.7	20	10007	2328	3.39	6/11/2017 11:24	5.799705	2950.326
B4	84.3	10	10003	2440	3.41	6/11/2017 11:17	2.832551	2931.84
B4	106.2	17	10026	2384	3.35	6/11/2017 11:04	4.974627	2991.245
B4	106.8	15	10003	2345	3.42	6/11/2017 10:54	4.285965	2923.263
B4	126.6	16	10020	2387	3.34	6/11/2017 10:42	4.690419	2998.409
B4	127.4	20	10047	2325	3.33	6/11/2017 10:34	5.906006	3015.526
B4	148	24	10034	2388	3.42	6/11/2017 10:19	6.917544	2932.327
B4	158.6	11	10004	2427	3.47	6/11/2017 10:25	3.070029	2881.406
C1	7.7	13	10029	2277	3.16	6/11/2017 10:09	4.003924	3172.194
C1	8.1	22	10007	2212	3.11	6/11/2017 10:18	6.963955	3216.145
C1	19	21	10036	2293	3.2	6/11/2017 9:53	6.4525	3134.71
C1	19.8	12	10028	2290	3.17	6/11/2017 10:02	3.675489	3161.867
C1	39.9	20	10036	2426	3.34	6/11/2017 9:48	5.878024	3003.25
C1	40.4	25	10029	2448	3.3	6/11/2017 9:40	7.465758	3037.551
C1	61.5	17	10024	2432	3.31	6/11/2017 9:31	5.025952	3026.859
C1	61.6	15	10036	2367	3.34	6/11/2017 9:19	4.381018	3003.25
C1	83.7	12	10038	2416	3.27	6/11/2017 9:13	3.559725	3068.185
C1	84.3	20	10025	2227	3.34	6/11/2017 11:24	5.878024	2999.957
C1	106.2	15	10037	2405	3.36	6/11/2017 11:17	4.354286	2985.662
C1	106.8	16	10009	2425	3.33	6/11/2017 11:04	4.694805	3004.166
C1	126.6	26	10028	2339	3.34	6/11/2017 10:54	7.674431	3000.855
C1	127.4	17	10023	2419	3.34	6/11/2017 10:42	4.97982	2999.358
C1	148	20	10001	2484	3.51	6/11/2017 10:25	5.588006	2847.748
C1	158.6	15	10029	2445	3.39	6/11/2017 10:34	4.314779	2956.867
C2	7.7	19	10038	2252	3.18	6/11/2017 10:19	5.862843	3154.945
C2	8.1	21	10034	2172	3.08	6/11/2017 10:24	6.706182	3256.133
C2	19	16	10047	2288	3.17	6/11/2017 10:02	4.935319	3167.742
C2	19.8	18	10018	2287	3.18	6/11/2017 10:09	5.548377	3148.655
C2	39.9	17	10013	2329	3.24	6/11/2017 9:53	5.134914	3088.773
C2	40.4	16	10019	2405	3.32	6/11/2017 9:48	4.707277	3016.112
C2	61.5	17	10019	2402	3.25	6/11/2017 9:40	5.118769	3081.11
C2	61.6	13	10012	2430	3.31	6/11/2017 9:31	3.815492	3023.114
C2	83.7	14	10031	2294	3.25	6/11/2017 9:19	4.195692	3084.803
C2	84.3	21	10038	2458	3.32	6/11/2017 9:13	6.213301	3021.835

C2	106.2	13	10032	2209	3.3	6/11/2017 11:24	3.827394	3038.341
C2	106.8	14	10055	2423	3.38	6/11/2017 11:17	4.030012	2973.193
C2	126.6	18	10017	2459	3.36	6/11/2017 11:04	5.245143	2979.591
C2	127.4	18	10024	2345	3.35	6/11/2017 10:54	5.261134	2990.58
C2	148	19	10027	2456	3.4	6/11/2017 10:34	5.476235	2947.459
C2	158.6	15	10011	2468	3.42	6/11/2017 10:42	4.273965	2925.534
C3	7.7	20	10016	2239	3.15	6/11/2017 10:24	6.253206	3178.043
C3	8.1	20	10029	2302	3.2	6/11/2017 10:33	6.154	3132.423
C3	19	17	10018	2295	3.2	6/11/2017 10:09	5.2165	3128.985
C3	19.8	21	10016	2301	3.25	6/11/2017 10:19	6.365538	3080.206
C3	39.9	13	10025	2404	3.33	6/11/2017 10:02	3.807904	3008.871
C3	40.4	15	10022	2395	3.33	6/11/2017 9:54	4.408505	3007.97
C3	61.5	15	10036	2436	3.35	6/11/2017 9:48	4.381612	2994.181
C3	61.6	17	10014	2463	3.34	6/11/2017 9:40	4.99382	2996.564
C3	83.7	15	10015	2462	3.35	6/11/2017 9:31	4.381612	2987.912
C3	84.3	18	10021	2384	3.36	6/11/2017 9:19	5.261143	2980.8
C3	106.2	15	10030	2464	3.33	6/11/2017 9:13	4.408505	3010.372
C3	106.8	17	10051	2219	3.33	6/11/2017 11:24	5.009105	3016.678
C3	126.6	12	10025	2422	3.37	6/11/2017 11:17	3.464831	2973.137
C3	127.4	11	10036	2458	3.36	6/11/2017 11:04	3.17781	2985.265
C3	148	11	10018	2480	3.44	6/11/2017 10:42	3.101674	2910.569
C3	158.6	20	10029	2386	3.41	6/11/2017 10:54	5.769103	2939.416
C4	7.7	20	10016	2286	3.17	6/11/2017 10:33	6.168148	3156.724
C4	8.1	30	10043	2276	3.16	6/11/2017 10:42	9.352671	3175.268
C4	19	20	10066	2251	3.18	6/11/2017 10:19	6.148308	3162.512
C4	19.8	22	10031	2325	3.26	6/11/2017 10:24	6.607466	3074.097
C4	39.9	25	10032	2359	3.31	6/11/2017 10:09	7.41187	3027.919
C4	40.4	27	10030	2445	3.4	6/11/2017 10:02	7.800176	2947.103
C4	61.5	27	10026	2347	3.26	6/11/2017 9:53	8.141209	3072.563
C4	61.6	26	10040	2430	3.34	6/11/2017 9:48	7.643431	3003.091
C4	83.7	31	10049	2432	3.28	6/11/2017 9:40	9.31022	3060.823
C4	84.3	21	10033	2439	3.32	6/11/2017 9:31	6.184301	3019.091
C4	106.2	21	10020	2318	3.28	6/11/2017 9:19	6.261439	3051.981
C4	106.8	23	10051	2532	3.42	6/11/2017 9:14	6.584146	2935.992
C4	126.6	21	10040	2204	3.31	6/11/2017 11:24	6.203411	3030.336
C4	127.4	20	10018	2378	3.32	6/11/2017 11:16	5.883096	3014.573
C4	148	20	10017	2461	3.49	6/11/2017 10:55	5.589659	2867.304
C4	158.6	27	10036	2467	3.38	6/11/2017 11:04	7.847166	2966.334
D1	7.7	19	10008	2257	3.27	6/11/2017 10:42	5.715398	3058.936
D1	8.1	17	10043	2277	3.27	6/11/2017 10:54	5.103777	3069.64
D1	19	14	10014	2377	3.21	6/11/2017 10:24	4.266371	3118.012
D1	19.8	25	10022	2440	3.32	6/11/2017 10:34	7.43512	3017.061
D1	39.9	18	10010	2404	3.37	6/11/2017 10:19	5.246246	2968.712
D1	40.4	20	10023	2539	3.42	6/11/2017 10:09	5.752953	2929.088
D1	61.5	17	10023	2451	3.39	6/11/2017 10:02	4.919749	2955.023
D1	61.6	15	10021	2516	3.4	6/11/2017 9:54	4.316765	2945.739
D1	83.7	15	10020	2524	3.41	6/11/2017 9:48	4.303827	2936.802
D1	84.3	14	10022	2583	3.38	6/11/2017 9:40	4.047012	2963.475
D1	106.2	15	10006	2514	3.4	6/11/2017 9:31	4.316765	2941.327
D1	106.8	16	10021	2397	3.36	6/11/2017 9:19	4.666905	2980.826
D1	126.6	9	10037	2584	3.4	6/11/2017 9:14	2.552059	2950.445
D1	127.4	17	10021	2292	3.34	6/11/2017 11:24	4.99482	2998.685

D1	148	15	10027	2637	3.54	6/11/2017 11:04	4.142288	2830.872
D1	158.6	16	10018	2532	3.48	6/11/2017 11:17	4.502701	2877.122
D2	7.7	16	10041	2241	3.22	6/11/2017 10:54	4.881944	3116.716
D2	8.1	30	10057	2383	3.2	6/11/2017 11:04	9.288	3141.206
D2	19	25	10016	2360	3.22	6/11/2017 10:34	7.676975	3108.952
D2	19.8	29	10029	2277	3.29	6/11/2017 10:42	8.72759	3046.721
D2	39.9	14	10011	2479	3.37	6/11/2017 10:25	4.067303	2969.016
D2	40.4	28	10021	2449	3.43	6/11/2017 10:19	8.076265	2919.967
D2	61.5	16	10028	2529	3.4	6/11/2017 10:09	4.618882	2947.805
D2	61.6	19	10024	2435	3.36	6/11/2017 10:02	5.567762	2981.726
D2	83.7	16	10041	2477	3.35	6/11/2017 9:54	4.689119	2995.706
D2	84.3	20	10032	2533	3.43	6/11/2017 9:48	5.743904	2923.174
D2	106.2	24	10023	2565	3.36	6/11/2017 9:40	7.055857	2981.429
D2	106.8	19	10026	2537	3.43	6/11/2017 9:31	5.452359	2921.425
D2	126.6	12	10022	2414	3.38	6/11/2017 9:19	3.463296	2963.482
D2	127.4	13	10019	2623	3.44	6/11/2017 9:14	3.69207	2910.893
D2	148	29	10013	2608	3.57	6/11/2017 11:17	8.036249	2803.155
D2	158.6	14	10006	2357	3.44	6/11/2017 11:24	3.982767	2907.114
D3	7.7	10	10039	2425	3.25	6/11/2017 11:04	2.905923	3087.258
D3	8.1	14	10030	2295	3.17	6/11/2017 11:16	4.245404	3162.373
D3	19	10	10021	2225	3.22	6/11/2017 10:42	2.93459	3110.447
D3	19.8	16	10015	2307	3.32	6/11/2017 10:54	4.648277	3014.901
D3	39.9	9	10022	2527	3.44	6/11/2017 10:34	2.445279	2911.707
D3	40.4	10	10027	2507	3.42	6/11/2017 10:25	2.752977	2930.206
D3	61.5	10	10037	2369	3.32	6/11/2017 10:19	2.841048	3021.528
D3	61.6	9	10027	2469	3.32	6/11/2017 10:09	2.539843	3018.516
D3	83.7	10	10027	2387	3.29	6/11/2017 10:02	2.868514	3046.055
D3	84.3	11	10027	2460	3.33	6/11/2017 9:54	3.132303	3009.446
D3	106.2	8	10018	2519	3.41	6/11/2017 9:48	2.175041	2936.165
D3	106.8	17	10010	2602	3.42	6/11/2017 9:40	4.79976	2925.236
D3	126.6	6	10011	2518	3.4	6/11/2017 9:31	1.593706	2942.747
D3	127.4	7	10027	2403	3.36	6/11/2017 9:19	1.912333	2982.561
D3	148	15	10039	2456	3.57	6/11/2017 11:24	4.030681	2810.38
D3	158.6	9	10035	2635	3.45	6/11/2017 9:14	2.437696	2907.031
D4	7.7	13	10007	2335	3.23	6/11/2017 11:16	3.923768	3096.535
D4	8.1	15	10033	2215	3.23	6/11/2017 11:24	4.542963	3104.585
D4	19	12	10043	2243	3.22	6/11/2017 10:54	3.625708	3117.337
D4	19.8	25	10042	2449	3.28	6/11/2017 11:04	7.520951	3059.978
D4	39.9	18	10026	2292	3.31	6/11/2017 10:42	5.337066	3027.396
D4	40.4	15	10020	2478	3.37	6/11/2017 10:34	4.350039	2971.687
D4	61.5	13	10000	2440	3.32	6/11/2017 10:25	3.814663	3010.441
D4	61.6	18	10021	2416	3.38	6/11/2017 10:19	5.224444	2963.186
D4	83.7	11	10030	2497	3.35	6/11/2017 10:09	3.182582	2992.423
D4	84.3	15	10035	2434	3.36	6/11/2017 10:02	4.363286	2985
D4	106.2	15	10010	2477	3.35	6/11/2017 9:54	4.376612	2986.453
D4	106.8	12	10029	2503	3.39	6/11/2017 9:48	3.438823	2956.8
D4	126.6	14	10018	2579	3.38	6/11/2017 9:40	4.041012	2962.298
D4	127.4	16	10035	2502	3.38	6/11/2017 9:31	4.632728	2967.328
D4	148	8	10039	2703	3.53	6/11/2017 9:14	2.165289	2842.302
D4	158.6	7	10011	2480	3.47	6/11/2017 9:19	1.916291	2883.407

6/10/2017 Gross Alpha Mass Attenuation Curve
Benchsheet: AB121109-1 Sources: 1223001 1-3, 6-14, 16-19
Calibration Range: 21mg → 156mg Filenames: AAM0610
AAM0611

Det	10:10	10:40	11:08	11:37	12:06	12:38	13:06	13:36	14:08	14:33	15:02	15:31	7:11	7:40	8:09	8:39
A1	1	19	18	17	16	14	13	12	11	10	9	8	7	6	3	2
A2	2	1	19	18	17	16	14	13	12	11	10	9	8	7	6	3
A3	3	2	1	19	18	17	16	14	13	12	11	10	9	8	7	6
A4	6	3	2	1	19	18	17	16	14	13	12	11	10	9	8	7
B1	7	6	3	2	1	19	18	17	16	14	13	12	11	10	9	8
B2	8	7	6	3	2	1	19	18	17	16	14	13	12	11	10	9
B3	9	8	7	6	3	2	1	19	18	17	16	14	13	12	11	10
B4	10	9	8	7	6	3	2	1	19	18	17	16	14	13	12	11
C1	11	10	9	8	7	6	3	2	1	19	18	17	16	14	13	12
C2	12	11	10	9	8	7	6	3	2	1	19	18	17	16	14	13
C3	13	12	11	10	9	8	7	6	3	2	1	19	18	17	16	14
C4	14	13	12	11	10	9	8	7	6	3	2	1	19	18	17	16
D1	16	14	13	12	11	10	9	8	7	6	3	2	1	19	18	17
D2	17	16	14	13	12	11	10	9	8	7	6	3	2	1	19	18
D3	18	17	16	14	13	12	11	10	9	8	7	6	3	2	1	19
D4	19	18	17	16	14	13	12	11	10	9	8	7	6	3	2	1

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6/11/2017 Gross Beta Mass Attenuation
Benchsheet: AB110619-4 Sources: 1118007-1→16
Calibration Range: 7.7→1586 mg Filename: ASR0611

Det	9:10	9:16	9:27	9:36	9:44	9:50	9:58	10:06	10:15	10:21	10:30	10:38	10:51	11:00	11:13	11:20
A1	1	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
A2	2	1	16	15	14	13	12	11	10	9	8	7	6	5	4	3
A3	3	2	1	16	15	14	13	12	11	10	9	8	7	6	5	4
A4	4	3	2	1	16	15	14	13	12	11	10	9	8	7	6	5
B1	5	4	3	2	1	16	15	14	13	12	11	10	9	8	7	6
B2	6	5	4	3	2	1	16	15	14	13	12	11	10	9	8	7
B3	7	6	5	4	3	2	1	16	15	14	13	12	11	10	9	8
B4	8	7	6	5	4	3	2	1	16	15	14	13	12	11	10	9
C1	9	8	7	6	5	4	3	2	1	16	15	14	13	12	11	10
C2	10	9	8	7	6	5	4	3	2	1	16	15	14	13	12	11
C3	11	10	9	8	7	6	5	4	3	2	1	16	15	14	13	12
C4	12	11	16	9	8	7	6	5	4	3	2	1	16	15	14	13
D1	13	12	11	10	9	8	7	6	5	4	3	2	1	16	15	14
D2	14	13	12	11	10	9	8	7	6	5	4	3	2	1	16	15
D3	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	16
D4	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

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Date 6/10/17

SOP 724r 12

ALS
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16							(HB)		(HB)

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKC0607W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	0	Dr A	10
		Dr B	
Tank 2	2000	Dr C	
		Dr D	

Comments:

Reviewed By / Date JP 6/10/17

Batch No.: 471492 A

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Date 6/10/17

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily EF	—	—	30	9:18	JP	EF00610	JP
1-16	Daily Bks	—	—	~~60~~ 30	9:25	JP	BKC0610	JP
1-16	1223001-1-3,6-14	AB121109-1	Am241	30	10:10	JP	AAM0610	JP
↓	1223001-16-19	↓	Attn	↓	↓	↓	↓	↓

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Comments:

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Date 6/11/17

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16						(HB)			(HB)

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKC0607W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	2200	Dr A	10
		Dr B	
Tank 2	1800	Dr C	
		Dr D	

Comments:

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Reviewed By / Date JP 6/11/17

Date 6/11/17

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily EFF	—	—	30	6:20	JP	EFC0611	JP
1-16	Daily BKg	—	—	~~60~~ 30	6:28	JP	BKC0611	JP 6/11/17
1-16	1223001-1-3,6-14	AB12109-1	Am241	30	7:11	JP	AAM0611	JP
	→ 16-19		Alpha					
1-16	1118007-1-16	AB10619-4	Sr90 Alpha	30	9:10	JP	ASR0611	
2	1224001-1	AB12120-3	2B	~~2B~~	11:48	JP	ABC0611	JP
7	-2		ICVs/	360				JP 6/11/17
9	-3		ICBs	360				
14	-4							
4	AB12120-3AMB							
6	BMB							
11	CMB							
15	EMB							

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Comments:

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Reviewed By / Date JP 6/12/17

Date 6/12/17 SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7						Hα	JCB	P	
8						P			
9						Hβ	JCB	P	
10						P			
11									
12									
13									
14									
15						Hα	JCB	P	
16						Hβ	JCB	Hβ	Hβ

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKC0607W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	1900	Dr A	10
		Dr B	
Tank 2	1800	Dr C	
		Dr D	

Comments:

Page No.: 471494 A Form 780r8.doc (6/23/06) Reviewed By / Date JP 6/13/17

Radiochemistry Instrument Worksheet

Prep Batch: AB121109-1

ALS Environmental -- FC

Gross Alpha!!

Eff. & ATTN calibration.

Prep Procedure: GAB

Mass Attenuation

Analytical QASS / NCR? Y (N) WK

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	1223001-1	SMP	200	200	ml	PCI/L	23.3										
1	1223001-2	SMP	200	200	ml	PCI/L	22.1										
1	1223001-3	SMP	200	200	ml	PCI/L	21										
1	1223001-4	SMP	200	200	ml	PCI/L	22.8	don't use									
1	1223001-5	SMP	200	200	ml	PCI/L	22.7	outlier - don't use									
1	1223001-6	SMP	200	200	ml	PCI/L	48.5										
1	1223001-7	SMP	200	200	ml	PCI/L	47.5										
1	1223001-8	SMP	200	200	ml	PCI/L	43.7										
1	1223001-9	SMP	200	200	ml	PCI/L	46.1										
1	1223001-10	SMP	200	200	ml	PCI/L	63.5										
1	1223001-11	SMP	200	200	ml	PCI/L	81.1										
1	1223001-12	SMP	200	200	ml	PCI/L	93.6										
1	1223001-13	SMP	200	200	ml	PCI/L	95.2										
1	1223001-14	SMP	200	200	ml	PCI/L	116.1										
1	1223001-15	SMP	200	200	ml	PCI/L	90.7	don't use									
1	1223001-16	SMP	200	200	ml	PCI/L	134.2										
1	1223001-17	SMP	200	200	ml	PCI/L	134.2										
1	1223001-18	SMP	200	200	ml	PCI/L	151.6										
1	1223001-19	SMP	200	200	ml	PCI/L	156										
1	1223001-20	SMP	200	200	ml	PCI/L	21.3	AB111B	1	WK							
1	1223001-21	SMP	200	200	ml	PCI/L	21.8	A	1								OUTLIER don't use
1	1223001-22	SMP	200	200	ml	PCI/L	19.7	B	1								
1	1223001-23	SMP	200	200	ml	PCI/L	20.5	C	1	JP							
1	1223001-24	SMP	200	200	ml	PCI/L	21.2	AB111C	1	WK							
1	1223001-25	SMP	200	200	ml	PCI/L	21.1	A	1								
1	1223001-26	SMP	200	200	ml	PCI/L	21.5	B	1								
1	1223001-27	SMP	200	200	ml	PCI/L	20.7	C	1								

See Maintenance Log 3710 pg 85

use for Eff. calibration

JP 6/13/17

N/A

Supersedes:

Radiochemistry Instrument Worksheet

Prep Batch: AB121109-1

ALS Environmental -- FC

Prep Procedure: GAB

Analytical QASS / NCR? Y N NA

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Am-241	955.4095.10	55,069.251	DPM/ml	11/08/12	0.1	ml	RS-008

Sample Barcodes

1223001-1 AB121109-1PS1	1223001-2 AB121109-1PS2	1223001-3 AB121109-1PS3
1223001-4 AB121109-1PS4	1223001-5 AB121109-1PS5	1223001-6 AB121109-1PS6
1223001-7 AB121109-1PS7	1223001-8 AB121109-1PS8	1223001-9 AB121109-1PS9
1223001-10 AB121109-1PS10	1223001-11 AB121109-1PS11	1223001-12 AB121109-1PS12
1223001-13 AB121109-1PS13	1223001-14 AB121109-1PS14	1223001-15 AB121109-1PS15
1223001-16 AB121109-1PS16	1223001-17 AB121109-1PS17	1223001-18 AB121109-1PS18
1223001-19 AB121109-1PS19	1223001-20 AB121109-1PS20	1223001-21 AB121109-1PS21
1223001-22 AB121109-1PS22	1223001-23 AB121109-1PS23	1223001-24 AB121109-1PS24
1223001-25 AB121109-1PS25	1223001-26 AB121109-1PS26	1223001-27 AB121109-1PS27

Radiochemistry Instrument Worksheet

Prep Batch: AB121109-1

Reporting Units

LabID:	TstGrpName:	RptUnits:
1223001-1	GrossAlpha/Beta	PCI/L
1223001-2	GrossAlpha/Beta	PCI/L
1223001-3	GrossAlpha/Beta	PCI/L
1223001-4	GrossAlpha/Beta	PCI/L
1223001-5	GrossAlpha/Beta	PCI/L
1223001-6	GrossAlpha/Beta	PCI/L
1223001-7	GrossAlpha/Beta	PCI/L
1223001-8	GrossAlpha/Beta	PCI/L
1223001-9	GrossAlpha/Beta	PCI/L
1223001-10	GrossAlpha/Beta	PCI/L
1223001-11	GrossAlpha/Beta	PCI/L
1223001-12	GrossAlpha/Beta	PCI/L
1223001-13	GrossAlpha/Beta	PCI/L
1223001-14	GrossAlpha/Beta	PCI/L
1223001-15	GrossAlpha/Beta	PCI/L
1223001-16	GrossAlpha/Beta	PCI/L
1223001-17	GrossAlpha/Beta	PCI/L
1223001-18	GrossAlpha/Beta	PCI/L
1223001-19	GrossAlpha/Beta	PCI/L
1223001-20	GrossAlpha/Beta	PCI/L
1223001-21	GrossAlpha/Beta	PCI/L
1223001-22	GrossAlpha/Beta	PCI/L
1223001-23	GrossAlpha/Beta	PCI/L
1223001-24	GrossAlpha/Beta	PCI/L
1223001-25	GrossAlpha/Beta	PCI/L
1223001-26	GrossAlpha/Beta	PCI/L
1223001-27	GrossAlpha/Beta	PCI/L

Supersedes: NA

Radiochemistry Prep Worksheet

Prep Batch: AB121109-1

ALS Environmental -- FC

Prep Procedure: GAB

Reviewed By: jtl JM **Review Date:** 11/15/2012

Non-Routine Pre-Treatment? Y / (N) **Batch:** N/A **Re-Prep?** Y / (N) **Batch:** N/A **Prep QASS / NCR?** Y (N) N/A

Prep SOP: PAI 702 **Rev:** 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Steve Workman
Prep Date: 11/8/2012
Prep Dept: RS

Balance: 10
Balance: 13

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1223001-1	SMP		200	200	Unfiltered	S1	
2	1	1223001-2	SMP		200	200	Unfiltered	S1	
3	1	1223001-3	SMP		200	200	Unfiltered	S1	
4	1	1223001-4	SMP		200	200	Unfiltered	S1	
5	1	1223001-5	SMP		200	200	Unfiltered	S1	
6	1	1223001-6	SMP		200	200	Unfiltered	S1	
7	1	1223001-7	SMP		200	200	Unfiltered	S1	
8	1	1223001-8	SMP		200	200	Unfiltered	S1	
9	1	1223001-9	SMP		200	200	Unfiltered	S1	
10	1	1223001-10	SMP		200	200	Unfiltered	S1	
11	1	1223001-11	SMP		200	200	Unfiltered	S1	
12	1	1223001-12	SMP		200	200	Unfiltered	S1	
13	1	1223001-13	SMP		200	200	Unfiltered	S1	
14	1	1223001-14	SMP		200	200	Unfiltered	S1	
15	1	1223001-15	SMP		200	200	Unfiltered	S1	
16	1	1223001-16	SMP		200	200	Unfiltered	S1	
17	1	1223001-17	SMP		200	200	Unfiltered	S1	
18	1	1223001-18	SMP		200	200	Unfiltered	S1	
19	1	1223001-19	SMP		200	200	Unfiltered	S1	
20	1	1223001-20	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
21	1	1223001-21	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
22	1	1223001-22	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
23	1	1223001-23	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
24	1	1223001-24	SMP		200	200	Unfiltered	S1	Spiked on 11/14 by SW
25	1	1223001-25	SMP		200	200	Unfiltered		0.05 mL of 10 mg/mL natural Uranium
26	1	1223001-26	SMP		200	200	Unfiltered		0.05 mL of 10 mg/mL natural Uranium
27	1	1223001-27	SMP		200	200	Unfiltered		0.05 mL of 10 mg/mL natural Uranium

JM 11/15/12

Supersedes: N/A

Radiochemistry Prep Worksheet

Prep Batch: AB121109-1

ALS Environmental -- FC

Prep Procedure: GAB

Reviewed By: jtl **Review Date:** 11/15/2012

Non-Routine Pre-Treatment? Y / N **Batch:** _____ **Re-Prep?** Y / N **Batch:** _____ **Prep QASS / NCR?** Y / N _____

Prep SOP: PAI 702 **Rev:** 20 **Prep Analyst:** Steve Workman **Balance:** 10

Prep SOP: NONE **Prep Date:** 11/8/2012 **Balance:** 13

Matrix Class: liquid **Prep Dept:** RS

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes

Comments

Calibration planchets and mass attenuation curve.

Spiked By: Steve Workman **Date:** 11/8/2012

Witnessed By: N/A **Date:** N/A

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Am-241	955.4095.10	55,069.251	DPM/ml	11/08/12	0.1	ml	RS-008

Reagent Solution IDs*

J12036

*Except where otherwise noted, all reagents were applied in accordance with the specifications of the preparation methods associated with this batch.

Supersedes: _____

Radiochemistry Gravimetric Worksheet

Prep Batch: AB121109-1

ALS Environmental -- FC

Prep Procedure: **GAB**

Reviewed By: jtl

Review Date: 11/15/2012

Prep Num	Planc. Num	LabID	QC Type	Test Alq (ml)	Tare Mass (g)	Initial Gross Mass (g)	Initial Net Mass (mg)	Suggested Alq (ml)	Samp Vol Available (ml)	Samp Vol Taken (ml)	Fin Gross Mass (g)	Final Net Mass (mg)	Salt Sol. Added (ml)	Flag
1	1	1223001-1	SMP	10	9.1050	0.0000	0	200	200	200	9.1283	23.3	0.5	
1	2	1223001-2	SMP	10	9.0995	0.0000	0	200	200	200	9.1216	22.1	0.5	
1	3	1223001-3	SMP	10	9.0872	0.0000	0	200	200	200	9.1082	21	0.5	
1	4	1223001-4	SMP	10	9.1198	0.0000	0	200	200	200	9.1426	22.8	0.5	
1	5	1223001-5	SMP	10	9.1442	0.0000	0	200	200	200	9.1669	22.7	0.5	
1	6	1223001-6	SMP	10	9.1142	0.0000	0	200	200	200	9.1627	48.5	1	
1	7	1223001-7	SMP	10	9.1346	0.0000	0	200	200	200	9.1821	47.5	1	
1	8	1223001-8	SMP	10	9.0877	0.0000	0	200	200	200	9.1314	43.7	1.5	
1	9	1223001-9	SMP	10	9.0922	0.0000	0	200	200	200	9.1383	46.1	1.5	
1	10	1223001-10	SMP	10	9.0712	0.0000	0	200	200	200	9.1347	63.5	2	
1	11	1223001-11	SMP	10	9.1302	0.0000	0	200	200	200	9.2113	81.1	2	
1	12	1223001-12	SMP	10	9.1044	0.0000	0	200	200	200	9.1980	93.6	2.5	
1	13	1223001-13	SMP	10	9.1418	0.0000	0	200	200	200	9.2370	95.2	2.5	
1	14	1223001-14	SMP	10	9.1031	0.0000	0	200	200	200	9.2192	116.1	3	
1	15	1223001-15	SMP	10	9.1182	0.0000	0	200	200	200	9.2089	90.7	3	
1	16	1223001-16	SMP	10	9.1173	0.0000	0	200	200	200	9.2515	134.2	3.5	
1	17	1223001-17	SMP	10	9.0956	0.0000	0	200	200	200	9.2298	134.2	3.5	
1	18	1223001-18	SMP	10	9.1276	0.0000	0	200	200	200	9.2792	151.6	4	
1	19	1223001-19	SMP	10	9.1131	0.0000	0	200	200	200	9.2691	156	4	
1	20	1223001-20	SMP	10	9.0751	0.0000	0	200	200	200	9.0964	21.3	0.5	
1	21	1223001-21	SMP	10	9.1113	0.0000	0	200	200	200	9.1331	21.8	0.5	
1	22	1223001-22	SMP	10	9.0713	0.0000	0	200	200	200	9.0910	19.7	0.5	
1	23	1223001-23	SMP	10	9.1326	0.0000	0	200	200	200	9.1531	20.5	0.5	
1	24	1223001-24	SMP	10	9.1320	0.0000	0	200	200	200	9.1532	21.2	0.5	
1	25	1223001-25	SMP	10	9.1188	0.0000	0	200	200	200	9.1399	21.1	0.5	
1	26	1223001-26	SMP	10	9.0872	0.0000	0	200	200	200	9.1087	21.5	0.5	
1	27	1223001-27	SMP	10	9.1133	0.0000	0	200	200	200	9.1340	20.7	0.5	

Supersedes: 11/15/12 12:19

Gross α standards

mg mass		Std				
21.3	1	20mg R1	0.5ml salt,	0.1ml 955, 4095.10	.0751	.0964
1.8	2	R2			.1113	.1331
9.7	3	R3			.0713	.0910
20.5	4	R4			.1326	.1531
21.2	5	R5			.1320	.1532
21.1	6	20mg + U		0.05ml of 10mg/ml nat. U	.1188	.1399
21.5	7				.0872	.1087
20.7	8				.1133	.134

OUTLIER TEST

FILE	DET	SAMPLE ID	Alpha CPM	Relative % diff. from mean	Within acceptability range	Outlier?
ABA1118	A1(1)	1223001-20	1163.818	0.71%	YES	NO
ABA1118A	A1(1)	1223001-21	1074.100	8.36%	YES	OUTLIER!
ABA1118B	A1(1)	1223001-22	1248.300	6.50%	YES	NO
ABA1118C	A1(1)	1223001-23	1203.900	2.71%	YES	NO
ABA1119	A1(1)	1223001-24	1170.500	0.14%	YES	NO

Mean of all five planchets:

			Acceptability range	elative range
Average=	1172.12	Upper	1300.55	+/- 10.96%
Std dev=	64.21220433	Lower	1043.70	
2 Std Dev=	128.42			**10.96%**

Sample 1223001-21 rejected as outlier.

Criteria: Potential outliers fall outside acceptability range; which is the mean of all five measurements +/- 2 std dev per the Grubbs statistical test.

I:\Oprtns\RAD\INST\GFP\Calibration\Outliers and ICVs\1223001_AM241_OUTLIER_11.18.12

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1118
Batch ID: OUTLIER TEST
Count Preset (m): 11
Batch Ended: 11/18/12 16:44

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		Beta to Alpha X-talk y = b*mass + m	
a ->b xtalk b=	0.2560	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1223001-20	11/18/12 16:44	11.00	21.3	1163.818	0.114	0.060	0.2633	0.890	n/a	n/a	300.818	1.998	296.6420	0.3879	0.992	n/a	n/a

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1118A
Batch ID: OUTLIER TEST
Count Preset (m): 10
Batch Ended: 11/18/12 17:02

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		Beta to Alpha X-talk y = b*mass + m	
a ->b xtalk b=	0.2560	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1223001-21	11/18/12 17:02	10.00	21.8	1074.100	0.114	0.056	0.2633	0.887	n/a	n/a	280.100	1.998	273.7444	0.3879	0.992	n/a	n/a

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1118B
Batch ID: OUTLIER TEST
Count Preset (m): 10
Batch Ended: 11/18/12 17:13

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		Beta to Alpha X-talk y = b*mass + m	
a ->b xtalk b=	0.2560	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

					Alpha Activity							Beta Activity						
Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.
A1	1223001-22	11/18/12 17:13	10.00	19.7	1248.300	0.114	0.070	0.2633	0.899	n/a	n/a	350.400	1.998	318.2792	0.3879	0.993	n/a	n/a

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1118C
Batch ID: OUTLIER TEST
Count Preset (m): 10
Batch Ended: 11/18/12 17:37

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		**Beta to Alpha X-talk y = b*mass + m**	
a ->b xtalk b=	0.2560	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1223001-23	11/18/12 17:37	10.00	20.5	1203.900	0.114	0.066	0.2633	0.895	n/a	n/a	332.000	1.998	306.9084	0.3879	0.992	n/a	n/a

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: ABA1119
Batch ID: OUTLIER TEST
Count Preset (m): 10
Batch Ended: 11/19/12 9:42

Background logfile: BKGAB
Date of Bkg. Cal: 11/14/12
Alpha efficiency logfile: Am241R-12/11
Alpha attenuation calibration: AAM0108
Beta efficiency logfile: Sr90F-10/12
Beta attenuation calibration: ASR1123

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration y = b*m^(a*(mass-x0))		Beta Attenuation Calibration y = b*m^(a*(mass-x0))	
Alpha b=	1.02810	Beta b=	1.0002
m=	0.99320	m=	0.9995
a=	0.9951	a=	0.7685
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk y = b*m^-x		Beta to Alpha X-talk y = b*mass + m	
a ->b xtalk b=	0.2560	b ->a xtalk b=	-5.900E-09
a ->b xtalk m=	1.0002	b ->a xtalk m=	0.0002

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A1	1223001-24	11/19/12 9:42	10.00	21.2	1170.500	0.114	0.066	0.2633	0.890	n/a	n/a	331.600	1.998	298.3512	0.3879	0.992	n/a	n/a

Radiochemistry Instrument Worksheet

ALS Environmental -- FC

Prep Batch: AB110619-4

Prep Procedure: GROSS_BETA MASS ATTEN. CALIB.

Analytical QASS / NCR? Y (N) NA

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	1118007-1	SMP	200	200	ml	pCi/l	8.1	See Maintenance log 3710 pg 86									
1	1118007-2	SMP	200	200	ml	pCi/l	7.7										
1	1118007-3	SMP	200	200	ml	pCi/l	19.8										
1	1118007-4	SMP	200	200	ml	pCi/l	19										
1	1118007-5	SMP	200	200	ml	pCi/l	39.9										
1	1118007-6	SMP	200	200	ml	pCi/l	40.4										
1	1118007-7	SMP	200	200	ml	pCi/l	61.5										
1	1118007-8	SMP	200	200	ml	pCi/l	61.6										
1	1118007-9	SMP	200	200	ml	pCi/l	83.7										
1	1118007-10	SMP	200	200	ml	pCi/l	84.3										
1	1118007-11	SMP	200	200	ml	pCi/l	106.2										
1	1118007-12	SMP	200	200	ml	pCi/l	106.8										
1	1118007-13	SMP	200	200	ml	pCi/l	126.6										
1	1118007-14	SMP	200	200	ml	pCi/l	127.4										
1	1118007-15	SMP	200	200	ml	pCi/l	158.6										
1	1118007-16	SMP	200	200	ml	pCi/l	148										

JP 6/13/11

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	777.3020.11	4,268.018	DPM/ml	06/19/11	1	ml	RS-005

Sample Barcodes

1118007-1 AB110619-4PS1	1118007-2 AB110619-4PS2	1118007-3 AB110619-4PS3
1118007-4 AB110619-4PS4	1118007-5 AB110619-4PS5	1118007-6 AB110619-4PS6
1118007-7 AB110619-4PS7	1118007-8 AB110619-4PS8	1118007-9 AB110619-4PS9
1118007-10 AB110619-4PS10	1118007-11 AB110619-4PS11	1118007-12 AB110619-4PS12

Supersedes: NA

Radiochemistry Instrument Worksheet

ALS Environmental -- FC

Prep Batch: AB110619-4

Prep Procedure: GROSS_BETA

Analytical QASS / NCR? Y N

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes

1118007-13
AB110619-4PS13

1118007-14
AB110619-4PS14

1118007-15
AB110619-4PS15

1118007-16
AB110619-4PS16

Reporting Units

LabID:	TstGrpName:	RptUnits:
1118007-1	GrossBeta	pCi/l
1118007-2	GrossBeta	pCi/l
1118007-3	GrossBeta	pCi/l
1118007-4	GrossBeta	pCi/l
1118007-5	GrossBeta	pCi/l
1118007-6	GrossBeta	pCi/l
1118007-7	GrossBeta	pCi/l
1118007-8	GrossBeta	pCi/l
1118007-9	GrossBeta	pCi/l
1118007-10	GrossBeta	pCi/l
1118007-11	GrossBeta	pCi/l
1118007-12	GrossBeta	pCi/l
1118007-13	GrossBeta	pCi/l
1118007-14	GrossBeta	pCi/l
1118007-15	GrossBeta	pCi/l
1118007-16	GrossBeta	pCi/l

Radiochemistry Prep Worksheet

ALS Environmental -- FC

Prep Batch: AB110619-4

Prep Procedure: GROSS_BETA

Reviewed By: gdw GDW **Review Date:** 6/20/2011

Non-Routine Pre-Treatment? Y / N **Batch:** N/A **Re-Prep?** Y / N **Batch:** N/A **Prep QASS / NCR?** Y / N

Prep SOP: PAI 702 **Rev:** 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Gabriel D. Wagner GDW
Prep Date: 6/19/2011
Prep Dept: RS

Balance: 13
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1118007-1	SMP		200	200	Unfiltered	S1	
2	1	1118007-2	SMP		200	200	Unfiltered	S1	
3	1	1118007-3	SMP		200	200	Unfiltered	S1	
4	1	1118007-4	SMP		200	200	Unfiltered	S1	
5	1	1118007-5	SMP		200	200	Unfiltered	S1	
6	1	1118007-6	SMP		200	200	Unfiltered	S1	
7	1	1118007-7	SMP		200	200	Unfiltered	S1	
8	1	1118007-8	SMP		200	200	Unfiltered	S1	
9	1	1118007-9	SMP		200	200	Unfiltered	S1	
10	1	1118007-10	SMP		200	200	Unfiltered	S1	
11	1	1118007-11	SMP		200	200	Unfiltered	S1	
12	1	1118007-12	SMP		200	200	Unfiltered	S1	
13	1	1118007-13	SMP		200	200	Unfiltered	S1	
14	1	1118007-14	SMP		200	200	Unfiltered	S1	
15	1	1118007-15	SMP		200	200	Unfiltered	S1	
16	1	1118007-16	SMP		200	200	Unfiltered	S1	

GDW 06-20-11

GDW 06-20-11

Comments

Gross beta mass attenuation curve. All samples desiccated on 06/19/2011 @ 14:48.

Spiked By: Gabriel D. Wagner GDW **Date:** 6/19/2011

Witnessed By: Justin D. Anderson **Date:** 6/19/2011

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	777.3020.11	4,268.018	DPM/ml	06/19/11	1	ml	RS-005

ALS Environmental -- FC

Radiochemistry Prep Worksheet

Prep Batch: AB110619-4

Prep Procedure: GROSS_BETA

Prep Batch Not Validated!!!

Reviewed By: **Review Date:**

Non-Routine Pre-Treatment? Y / N **Batch:** _____ **Re-Prep?** Y / N **Batch:** _____ **Prep QASS / NCR?** Y / N _____

Prep SOP: PAI 702 **Rev:** 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Gabriel D. Wagner GDW
Prep Date: 6/19/2011
Prep Dept: RS

Balance: 13
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1118007-1	SMP		0	0	Unfiltered	S1	
2	1	1118007-2	SMP		0	0	Unfiltered	S1	
3	1	1118007-3	SMP		0	0	Unfiltered	S1	
4	1	1118007-4	SMP		0	0	Unfiltered	S1	
5	1	1118007-5	SMP		0	0	Unfiltered	S1	
6	1	1118007-6	SMP		0	0	Unfiltered	S1	
7	1	1118007-7	SMP		0	0	Unfiltered	S1	
8	1	1118007-8	SMP		0	0	Unfiltered	S1	
9	1	1118007-9	SMP		0	0	Unfiltered	S1	
10	1	1118007-10	SMP		0	0	Unfiltered	S1	
11	1	1118007-11	SMP		0	0	Unfiltered	S1	
12	1	1118007-12	SMP		0	0	Unfiltered	S1	
13	1	1118007-13	SMP		0	0	Unfiltered	S1	
14	1	1118007-14	SMP		0	0	Unfiltered	S1	
15	1	1118007-15	SMP		0	0	Unfiltered	S1	
16	1	1118007-16	SMP		0	0	Unfiltered	S1	

Comments

TRAY#3

Gross beta mass attenuation curve. All samples desiccated on 06/19/11 @ 14:48.

Spiked By: Gabriel D. Wagner GDW **Date:** 06/19/11

Witnessed By: JCA **Date:** 6/19/11

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-90	777.3020.11	4,268.018	DPM/ml	06/19/11	1	ml	RS-005

Exp: 4/1/12

Radiochemistry Gravimetric Worksheet

ALS Environmental -- FC

Prep Batch: AB110619-4

Prep Procedure: **GROSS_BETA**

Reviewed By: gdw GDW

Review Date: **6/20/2011**

Prep Num	Planc. Num	LabID	QC Type	Test Alq (ml)	Tare Mass (g)	Initial Gross Mass (g)	Initial Net Mass (mg)	Suggested Alq (ml)	Samp Vol Available (ml)	Samp Vol Taken (ml)	Fin Gross Mass (g)	Final Net Mass (mg)	Salt Sol. Added (ml)	Flag
1	1	1118007-1	SMP	10	9.1792	0.0000	0	200	200	200	9.1873	8.1	0.25	
1	2	1118007-2	SMP	10	9.1459	0.0000	0	200	200	200	9.1536	7.7	0.25	
1	3	1118007-3	SMP	10	9.1322	0.0000	0	200	200	200	9.1520	19.8	0.5	
1	4	1118007-4	SMP	10	9.1795	0.0000	0	200	200	200	9.1985	19	0.5	
1	5	1118007-5	SMP	10	9.1387	0.0000	0	200	200	200	9.1786	39.9	1	
1	6	1118007-6	SMP	10	9.1305	0.0000	0	200	200	200	9.1709	40.4	1	
1	7	1118007-7	SMP	10	9.1189	0.0000	0	200	200	200	9.1804	61.5	1.5	
1	8	1118007-8	SMP	10	9.1427	0.0000	0	200	200	200	9.2042	61.5	1.5	
1	9	1118007-9	SMP	10	9.1715	0.0000	0	200	200	200	9.2552	83.7	2	
1	10	1118007-10	SMP	10	9.1351	0.0000	0	200	200	200	9.2194	84.3	2	
1	11	1118007-11	SMP	10	9.1447	0.0000	0	200	200	200	9.2509	106.2	2.5	
1	12	1118007-12	SMP	10	9.1506	0.0000	0	200	200	200	9.2574	106.8	2.5	
1	13	1118007-13	SMP	10	9.1339	0.0000	0	200	200	200	9.2605	126.6	3	
1	14	1118007-14	SMP	10	9.1621	0.0000	0	200	200	200	9.2895	127.4	3	
1	15	1118007-15	SMP	10	9.0634	0.0000	0	200	200	200	9.2220	158.6	3.5	
1	16	1118007-16	SMP	10	9.2095	0.0000	0	200	200	200	9.3575	148	3.5	

Project 955, 4095.10 Am-241 ~~Intermediate~~ Working Standard MEL 11/8/11

Continued from Page

MEL 11/8/11

Prepare a working dilution of 955, Am-241

1. Density of 1M HCl, lot # K22032
   - Mass of 100mL vol. flask: 66.4295g Balance # 12
   - Mass of flask & 100mL acid: 167.9701g Balance# 12
   - Net Mass: 101.5406g
   - Density: 1.0154g/mL

2. Mass of 955 transferred:
   - Mass of empty voa vial: 21.3568g Balance# 12
   - Mass of voa vial & standard: 26.4318g Balance# 12
   - Net mass of standard transferred: 5.0750g

MEL 11/8/11 MEL 11/8/11

3. Dilute to final volume:
   - Mass of vial, standard, & diluent: 42.8085g Balance# 12
   - Mass of empty voa vial: 21.3568g Balance# 12
   - Net mass of new dilution: 21.4517g

4. Final activity calculation:

$$\left(1.965\times10^{4}\,Bq\right)\left(\frac{60\,dpm}{1\,Bq}\right)\left(\frac{5.0750g}{5.13441g}\right)\left(\frac{1.0154\,g/mL}{21.4517g}\right) = \cancel{55,161.32}\ 55,161.33\ dpm/mL$$

MEL 11/8/11 MEL 11/8/11

MEL 11/8/11

RG 11/29/11

Stnd ID: 955.4095.10

RG 11/29/11

Description: Am-241
Expiration: 11/11/2012
Activity: 55161.33 dpm/mL

RG 11/29/11

2s Uncertainty: 992.90 dpm/mL
Ref. Date: 10/25/2011
Ref Time: N/A
Prep Date: 11/8/2011 Prep by: MEL
Matrix/Comp. 3M HCl
Half Life (y): 4.33E+02

Reverification Log		
Analysis Date	Initials	Expiration Date

RG 11/29/11

Continued on Page

Signed 11/8/11 Date

Read and Understood By Signed 11/29/11 Date

Eckert & Ziegler
Analytics

RSO# 955
Rec 10-31-11

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

85983-307

Am-241 5 mL Liquid in Flame Sealed Vial

Customer: ALS Laboratory Group / Fort Collins
P.O. No.: 73625, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Am-241	1.580E+05	1.965E+04	0.1	0.9	1.8	10/25/2011

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities < 0.1 %, α-impurities < 0.1 %. 5.13441 g 1M HCl solution, carrier free.

Source Prepared by: MTaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 26 Oct 11
J. D. McCorvey, QA Manager Alternate

ACCREDITED SOURCE CALIBRATION LABORATORY
HEALTH PHYSICS SOCIETY
FOUNDED 1958

ANA Form005 Rev. —

Single Isotope Certificate, Rev 1 9/28/2009

Prepare a primary dilution of RSO #777 (Analytics #69573-307) in 0.1M HCl to a final volume of approx. 500mL.

1) Prepare 0.1M HCl by diluting 8.3 mL HCl (12M) (Fisher Scientific Lot # 055784) to a final volume of 1L.

2) Determine the density of 0.1M HCl

Weight of empty volumetric flask (100mL)		68.54g (Bal 26)
Mass of flask + 100mL 0.1M HCl		168.31g
Mass of 100mL of 0.1M HCl		99.77g
÷ 100mL = density =		0.9977

3) Transfer #777 to a 500mL

Mass of bottle	47.9687 (Bal 12)
Mass of bottle + std.	52.9160
mass of std.	4.9473

4) Dilute to volume w/ 0.1M HCl

Mass of bottle + std. + soln	494.52g (Bal 26)
Mass of bottle (from above)	-47.9687g
mass of soln	~~446.31g~~ HB 2/8/06 446.55g

5) Final activity (dpm/mL)

$$\frac{(3.812\times10^4\ dps)(60\ sec/1\ min)(4.9473\ g)}{(5.05960\ g)(\cancel{446.31\ g})\ 446.55\ g} = \cancel{5010.94}\ HB\ 2/8/06\ 5008.25\ dpm/g$$

$$\frac{\cancel{5010.94}\ dpm}{5008.25\ g} \times \frac{0.9977\ g}{mL} = \cancel{4999.42}\ HB\ 2/8/06\ 4996.73\ dpm/mL$$

RG 3/9/06

Stnd ID: 777.3020.11
Description: Sr-90
Expiration: 2/27/07
Activity: 4996.73 dpm/mL
2s Uncertainty: 99.93 dpm/mL
Ref. Date: 12/2/04
Ref Time: N/A
Prep Date: 2/8/06 Prep by: HB
Matrix/Comp. 0.1 M HCl
Half Life (y): 2.88E+01

RG 3/9/06

ANALYSIS DATE = 06/8/10
NEW EXP. = DATE 07/06/07/11
NC 07/15/10

Reverification Log		
Analysis Date	Initials	Expiration Date
7/7/10	RG	7/7/11
4/1/11	RG	4/1/12

RG 3/9/06 RG 3/20/10

Reverification Log		
Analysis Date	Initials	Expiration Date
11/8/06	RG	11/8/07
8/3/07	DJS	8/3/08
2/28/08	MBC	2/25/09
1/30/09	RG	1/30/2010
7/17/09	RG	7/17/2010

RG 3/14/06

Read and Understood

Signed: Heather Burpa Date: 2/8/06 Signed: [signature] Date: 2/8/06

ANALYTICS

RSO #777
Rec'd 12/9/04 DCB

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

69573-307

Sr-90 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Sr-90
ACTIVITY (dps):	3.812 E4
HALF-LIFE:	28.79 years
CALIBRATION DATE:	December 2, 2004 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	2.0%

Impurities: γ-impurities <0.1%

5.05960 grams in 0.1M HCl solution with 30 μg/g Sr carrier.

This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

P O NUMBER 71069, Item 1

SOURCE PREPARED BY: M. Dimitrova
M. Dimitrova, Radiochemist

Q A APPROVED: 12-6-04

Internal Calculation Verifications

ICBs
&
ICVs

Gross Alpha/Beta LB4100C ICV's/ICB's AM241/SR90

Atten. Constants	b	m	a	x0
Alpha	0.8949	0.9914	0.9119	21.4875
Beta	0.9681	0.9996	0.9174	0.0

X-Talk Constants	m	b
α > β	0.9990	0.2414
β > α	0.0018	1.118E-05

						Alpha							Beta					
Detector	Sample ID	Initial Aliquot	Final Sam. Size	Count Date	Count Dur.	Residual Mass (mg)	Gross CPM	Bkg CPM	β > α X-Talk	Net CPM	Atten.	Efficiency	Gross CPM	Bkg CPM	α > β X-Talk	Net CPM	Atten.	Efficiency
A2	1224001-1	0.200	0.200	6/11/2017	360	21.4	16.761	0.094	0.083	16.584	0.896	0.2221	42.139	1.336	4.1105	36.6925	0.9605	0.4238
B3	1224001-2	0.200	0.200	6/11/2017	360	43.8	15.022	0.084	0.094	14.844	0.751	0.204	42.767	1.545	3.7676	37.4544	0.9527	0.4289
C1	1224001-3	0.200	0.200	6/11/2017	360	64.0	13.211	0.110	0.009	13.092	0.640	0.2054	43.011	1.540	3.3717	38.0993	0.9456	0.4214
D2	1224001-4	0.200	0.200	6/11/2017	360	91.2	12.131	0.087	0.110	11.934	0.517	0.2166	40.619	1.607	3.1852	35.8268	0.9362	0.4107
A4	AB121206-3AMB	0.200	0.200	6/11/2017	360	22.4	0.128	0.083	0.001	0.044	0.888	0.2068	1.817	1.532	0.0111	0.2739	0.9602	0.4284
B2	AB121206-3BMB	0.200	0.200	6/11/2017	360	46.4	0.136	0.117	0.000	0.019	0.735	0.2192	1.856	1.650	0.0048	0.2012	0.9518	0.4122
C3	AB121206-3CMB	0.200	0.200	6/11/2017	360	69.8	0.133	0.096	0.000	0.037	0.612	0.2134	1.778	1.640	0.0096	0.1284	0.9436	0.4278
D3	AB121206-3EMB	0.200	0.200	6/11/2017	360	96.0	0.142	0.171	0.000	-0.029	0.498	0.2056	1.836	1.665	-0.0077	0.1787	0.9346	0.4196

Spike Information				
Alpha Std ID	Ref. Date	Act (dpm/ml)	Spike Vol (mL)	Decay Corr. Spike Act. Added
616.4095.13	4/18/2002	100.000	1.0	97.599

Spike Information				
Beta Std ID	Ref. Date	Act (dpm/ml)	Spike Vol (mL)	Decay Corr. Spike Act. Added
931.4095.33	4/11/2011	51.950	1.0	44.783

Acceptance criteria for LCS's --> 70-130%

	Alpha					Beta				
Sample ID	Act (pCi/L)	TPU (2 sig)	MDC	% Recov.	Act<MDCa	Act (pCi/L)	TPU (2 sig)	MDC	% Recov.	Act<MDCa
1224001-1	187.79	30.3	1.25	85.4%	NA	203.01	32.6	3.21	100.6%	NA
1224001-2	218.31	35.3	1.63	99.3%	NA	206.46	33.1	3.16	102.3%	NA
1224001-3	224.22	36.3	1.58	102.0%	NA	215.34	34.5	3.11	106.7%	NA
1224001-4	240.12	39.0	2.34	109.2%	NA	209.85	33.7	3.19	104.0%	NA
AB121206-3AMB	0.54	0.5	0.96	0.2%	PASS	1.50	0.9	1.71	NA	PASS
AB121206-3BMB	0.26	0.6	1.28	0.1%	PASS	1.16	1.0	1.85	NA	PASS
AB121206-3CMB	0.63	0.0	1.44	0.3%	PASS	0.72	0.0	1.80	NA	PASS
AB121206-3EMB	-0.65	0.0	2.40	-0.3%	PASS	1.03	0.0	1.86	NA	PASS

Alpha CU (1 sig)	Alpha TPU (1 sig)	Beta CU (1 sig)	Beta TPU (1 sig)
2.4519	15.1519	1.9934	16.2865
3.0168	17.6419	1.9936	16.5586
3.2868	18.1523	2.0408	17.2664
3.7150	19.4762	2.0567	16.8348
0.2572	0.2608	0.4452	0.4609
0.3112	0.3119	0.4741	0.4829

OK JP 6/12/17

PAI - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC0611
Batch ID: AB121206-3
Count Preset (m): 360
Batch Ended: 6/11/2017 17:49

Background logfile: BKGABW
Date of Bkg. Cal: 6/8/2017
Alpha efficiency logfile: Am241R-06/17 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0610, 0611 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr90F-06/17 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	0.89490	Beta b=	0.9681
m=	0.99140	m=	0.9996
a=	0.9119	a=	0.9174
x0=	21.4875	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2414	b ->a xtalk b=	1.12E-05
a ->b xtalk m=	0.9990	b ->a xtalk m=	0.0018

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A2	1224001-1	6/11/2017 17:48	360.00	21.4	16.761	0.094	0.083	0.2221	0.896	n/a	n/a	42.139	1.336	4.1105	0.4238	0.961	n/a	n/a
A4	AB121206-3AMB	6/11/2017 17:48	360.00	22.4	0.128	0.083	0.001	0.2068	0.888	n/a	n/a	1.817	1.532	0.0111	0.4284	0.960	n/a	n/a
C1	1224001-3	6/11/2017 17:49	360.00	64.0	13.211	0.110	0.104	0.2054	0.640	n/a	n/a	43.011	1.540	3.3717	0.4214	0.946	n/a	n/a
C3	AB121206-3CMB	6/11/2017 17:49	360.00	69.8	0.133	0.096	0.000	0.2134	0.612	n/a	n/a	1.778	1.640	0.0097	0.4278	0.944	n/a	n/a
B2	AB121206-3BMB	6/11/2017 17:49	360.00	46.4	0.136	0.117	0.000	0.2192	0.735	n/a	n/a	1.856	1.650	0.0048	0.4122	0.952	n/a	n/a
B3	1224001-2	6/11/2017 17:49	360.00	43.8	15.022	0.084	0.094	0.2040	0.751	n/a	n/a	42.767	1.545	3.7676	0.4289	0.953	n/a	n/a
D2	1224001-4	6/11/2017 17:49	360.00	91.2	12.131	0.087	0.110	0.2166	0.517	n/a	n/a	40.619	1.607	3.1851	0.4107	0.936	n/a	n/a
D3	AB121206-3EMB	6/11/2017 17:49	360.00	96.0	0.142	0.171	0.000	0.2056	0.498	n/a	n/a	1.836	1.665	0.0000	0.4196	0.935	n/a	n/a

JP 6/12/17

Date 6/12/17

SOP 724r12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7						Hα	JKB	P	
8						P			
9						Hβ	JKB	P	
10						P			
11									
12									
13									
14									
15						Hα	JKB	P	
16						Hβ	JKB	Hβ	Hβ

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKC0607W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	1900	Dr A	10
		Dr B	
Tank 2	1800	Dr C	
		Dr D	

Comments:

Page No.: 471494 A

Form 780r8.doc (6/23/06)

Reviewed By / Date JP 6/13/17

Date 6/11/17

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Daily Response Check Status	Daily Response Check Start 2	Daily Response Check Status	Background Check Start 1	Background Check Status	Background Check Start 2	Background Check Status	Det. Status
1	TP	P			TP	P			P
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15						(HB)			(HB)
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BK060710			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	2200	Dr A	10
		Dr B	
Tank 2	1800	Dr C	
		Dr D	

Comments:

Reviewed By / Date TP 6/11/17

Date 6/11/17 SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily EFF	—	—	30	6:20	JP	EFC0611	JP
1-16	Daily BKs	—	—	~~60~~ 30	6:28	JP	BKC0611	JP 6/11/17
1-16	1223001-1-3,6-14	AB12109-1	Am241	30	7:11	JP	AAM0611	JP
	→ 16-19		Alpha					
1-16	1118007-1-16	AB10619-4	Sr90 Alpha	30	9:10	JP	ASR0611	
2	1224001-1	AB12120-63	α/β	~~α/β~~	11:48	JP	ABC0611	JP
7	-2		ICVs/	360				JP 6/11/17
9	-3		ICBs	360				
14	-4							
4	AB12120-63 AMB							
6	BMB							
11	CMB							
15	EMB							

JP 6/12/17

Comments:

Page No.: 471493 B

(cont. from page NA B)

Form 780r8.doc (6/23/06)

Reviewed By / Date JP 6/12/17

Radiochemistry Instrument Worksheet

Prep Batch: AB121206-3

ALS Environmental -- FC

Prep Procedure: GAB ICB's, ICV's

Analytical QASS / NCR? Y / N NA

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	1224001-1	SMP	200	200	ml	PCI/L	21.4	ABC0611	2	JP							
1	1224001-2	SMP	200	200	ml	PCI/L	43.8		7								
1	1224001-3	SMP	200	200	ml	PCI/L	64		9								
1	1224001-4	SMP	200	200	ml	PCI/L	91.2		14								
1	AB121206-3A	MB	200	200	ml	PCI/L	22.4		4								
1	AB121206-3B	MB	200	200	ml	PCI/L	46.4		6								
1	AB121206-3C	MB	200	200	ml	PCI/L	69.8		11								
1	AB121206-3E	MB	200	200	ml	PCI/L	96		15								

JP 6/13/17

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	AM-241	616.4095.13	98.308	DPM/ml	12/06/12	1	ml	RS-016
S2	Sr-90	931.4095.33	49.916	DPM/ml	12/06/12	1	ml	RS-016

Sample Barcodes

1224001-1
AB121206-3PS1

1224001-2
AB121206-3PS2

1224001-3
AB121206-3PS3

1224001-4
AB121206-3PS4

AB121206-3AMB
AB121206-3PS5

AB121206-3BMB
AB121206-3PS6

AB121206-3CMB
AB121206-3PS7

AB121206-3EMB
AB121206-3PS8

Reporting Units

LabID:	TstGrpName:	RptUnits:
1224001-1	GrossAlpha/Beta	PCI/L
1224001-2	GrossAlpha/Beta	PCI/L
1224001-3	GrossAlpha/Beta	PCI/L
1224001-4	GrossAlpha/Beta	PCI/L

Supersedes: NA

Radiochemistry Prep Worksheet

ALS Environmental -- FC

Prep Batch: AB121206-3

Prep Procedure: GAB

Reviewed By: jtl JTL **Review Date:** 12/6/2012

Non-Routine Pre-Treatment? Y (N) **Batch:** N/A **Re-Prep?** Y (N) **Batch:** N/A **Prep QASS / NCR?** Y (N) N/A

Prep SOP: PAI 702 **Rev:** 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Jeffrey T. Lee
Prep Date: 12/6/2012
Prep Dept: RS

Balance: 13
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1224001-1	SMP		200	200	Unfiltered	S1,S2	
2	1	1224001-2	SMP		200	200	Unfiltered	S1,S2	
3	1	1224001-3	SMP		200	200	Unfiltered	S1,S2	
4	1	1224001-4	SMP		200	200	Unfiltered	S1,S2	
5	1	AB121206-3A	MB		200	200	Unfiltered		
6	1	AB121206-3B	MB		200	200	Unfiltered		
7	1	AB121206-3C	MB		200	200	Unfiltered		
8	1	AB121206-3E	MB		200	200	Unfiltered		

JTL 12/6/12

Comments
ICV/ICBs. Samples desiccated on 12/6/12 @ 17:15.

Spiked By: Jeffrey T. Lee **Date:** 12/6/2012
Witnessed By: Eric K. Gobel **Date:** 12/6/2012

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	AM-241	616.4095.13	98.308	DPM/ml	12/06/12	1	ml	RS-016
S2	Sr-90	931.4095.33	49.916	DPM/ml	12/06/12	1	ml	RS-016

Reagent Solution IDs*

J12036

*Except where otherwise noted, all reagents were applied in accordance with the specifications of the preparation methods associated with this batch.

ALS Environmental -- FC

Radiochemistry Prep Worksheet

Prep Batch: AB121206-3

Prep Procedure: GAB

Prep Batch Not Validated!!!

Reviewed By: Review Date:

Non-Routine Pre-Treatment? Y / N Batch: _____ Re-Prep? Y / N Batch: _____ Prep QASS / NCR? Y / N _____

Prep SOP: PAI 702 Rev: 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Jeffrey T. Lee
Prep Date: 12/6/2012
Prep Dept: RS

Balance: 13
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Standards	Prep Notes
1	1	1224001-1	SMP		200	200	Unfiltered	S1,S2	
2	1	1224001-2	SMP		200	200	Unfiltered	S1,S2	
3	1	1224001-3	SMP		200	200	Unfiltered	S1,S2	
4	1	1224001-4	SMP		200	200	Unfiltered	S1,S2	
5	1	AB121206-3A	MB		200	200	Unfiltered		
6	1	AB121206-3B	MB		200	200	Unfiltered		
7	1	AB121206-3C	MB		200	200	Unfiltered		
8	1	AB121206-3E	MB		200	200	Unfiltered		

Comments

Spiked By: TL Date: 12/6/12
Witnessed By: EKG Date: 12/6/12

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	AM-241	616.4095.13	98.308	DPM/ml	12/06/12	1	ml	RS-016
S2	Sr-90	931.4095.33	49.916	DPM/ml	12/06/12	1	ml	RS-016

S1: 4/24/13
S2: 9/8/13

Reagent Solution IDs

J12036

*Except where otherwise noted, all reagents were applied in accordance with the specifications of the preparation methods associated with this batch.

ALS Environmental -- FC

Radiochemistry Gravimetric Worksheet

Prep Batch: AB121206-3

Prep Procedure: GAB

Reviewed By: jtl JM

Review Date: 12/6/2012

Prep Num	Planc. Num	LabID	QC Type	Test Alq (ml)	Tare Mass (g)	Initial Gross Mass (g)	Initial Net Mass (mg)	Suggested Alq (ml)	Samp Vol Available (ml)	Samp Vol Taken (ml)	Fin Gross Mass (g)	Final Net Mass (mg)	Salt Sol. Added (ml)	Flag
1	1	1224001-1	SMP	10	9.1723	0.0000	0	200	200	200	9.1937	21.4	0.5	
1	2	1224001-2	SMP	10	9.1914	0.0000	0	200	200	200	9.2352	43.8	1	
1	3	1224001-3	SMP	10	9.2220	0.0000	0	200	200	200	9.2860	64	1.5	
1	4	1224001-4	SMP	10	9.1331	0.0000	0	200	200	200	9.2243	91.2	2	
1	5	AB121206-3A	MB	10	9.1271	0.0000	0	200	200	200	9.1495	22.4	0.5	
1	6	AB121206-3B	MB	10	9.2092	0.0000	0	200	200	200	9.2556	46.4	1	
1	7	AB121206-3C	MB	10	9.1743	0.0000	0	200	200	200	9.2441	69.8	1.5	
1	8	AB121206-3E	MB	10	9.2158	0.0000	0	200	200	200	9.3118	96	2	

Project 616.4095.13 Am-241

Continued from Page

MEL 1/6/12

Prepare a working dilution of 616.2382.91

1. Density of 1M HCl, lot # K43J20
   Mass of 100mL vol. flask: 56.4421 g Balance # 12
   Mass of flask & 100mL acid: 157.7445 g Balance# 12
   Net Mass: 101.3024 g
   Density: 1.0130 g/mL

2. Mass of 616.2382.91 transferred:
   Mass of open empty nalgene: 74.7685 g Balance# 12
   Mass of nalgene & standard: 78.4340 g Balance# 12
   Net mass of standard transferred: 3.6655 g Balance# NA

MEL 1/6/12

MEL 1/6/12

3. Dilute to final volume:
   Mass of nalgene, standard, & diluent: 1084.8 g Balance# 26
   Mass of empty nalgene (from above): 74.7685 g Balance# 12
   Net mass of new dilution: 1010.0315 g Balance# NA

4. Final activity calculation:

$$27{,}201.49 \text{ dpm/g} \left(\frac{3.6655\text{g}}{1010.0315\text{g}}\right)(1.0130\text{g/mL}) = 100.00 \text{ dpm/mL}$$

MEL 1/6/12

JP 5/1/12

Stnd ID: **616.4095.13**

Description: **Am-241**
Expiration: **4/21/2013**
Activity: **100.00** **dpm/mL**
2s Uncertainty: **3.30** **dpm/mL**
Ref. Date: **4/18/2002**
Ref Time: **N/A**
Prep Date: **4/21/2012** *Prep by:* **TE**
Matrix/Comp. **1M HCl**
Half Life (y): **4.32E+02**

JP 5/1/12

Reverification Log		
Analysis Date	Initials	Expiration Date

JP 5/1/12

JP 5/1/12

Continued on Page

Signed 1/6/12 Date

Read and Understood By: Signed 05/01/12 Date

Am-241 intermediary dilution

Prepare an intermediate dilution of 616.2382.38 by diluting with 1M HCL (lot 43015)

(1) Determine the density of 1M HCL

mass of 100 ml Class A volumetric flask	67.5757 g (bal)
mass of flask and 1M HCl	168.8580 g
net mass of 1M HCL	101.2823

ρ = 1.01283 g/ml

(2) Transfer Am-241 (616.2382.38) to a 40 ml VOA vial

mass of empty VOA vial without lid & 50 ml beaker	54.0248 g (bal)
mass of standard, transfer pipet & 50 ml beaker (initial)	95.0640 g
mass of standard, transfer pipet & 50 ml beaker after transfer	~~74~~ 75.0086 g (corrected)
net mass of standard transferred	20.0564 g

(3) Dilute to final volume with 1M HCL

mass of empty VOA VIAL w/o lid & 50 ml beaker (from above)	54.0248 g (bal)
mass of standard, 1M HCL VOA vial & 50 ml beaker	92.4609 g
net mass of standard	38.4361 g

(4) final activity calculation

$$\frac{\overset{52,128.96}{\cancel{52,066}}\ dpm/g)(20.0564\ g)}{38.4361\ g} = \cancel{27,158.64}\ dpm/g$$

MC 11/1/07

27,201.49

Continued on Page

Read and Understood By

C Moncavage 4/25/03 Signed Date

Renee Valleyo 5/5/03 Signed Date

Am-241 primary dilution

prepare a primary dilution of RSO lolle (NIST: ~~SEM~~ SRS 63651-307) by diluting w/ 1M HCl

1) Determine the density of 1M HCl (Lot # 42223 & Lot # 42316)

mass of 100ml vol flask	62.4712 g	(Bal 12)
mass of flask + 1M HCl	163.8021 g	
Net mass of ~~std~~ HCl	101.330909 g	

2) Transfer contents of ampule to 40 ml vol vial

mass of VOA vial w/o lid	22.3577 g	(Bal 12)
~~mass of opened ampule + mass of VOA vial~~ + 50ml beaker	37.9238 g	
mass of beaker + empty ampule	32.9863 g	
Net mass of std transferred	4.937600 g	

3) Dilute std to final Vol w/ 1M HCl

mass of VOA vial w/o lid (from above)	22.3577 g	(Bal 12)
mass of std + VOA vial + 1M HCl	63.7403 g	
Net mass of diluted std	41.382600 g	

4) Final Activity Calc

$$\frac{\left(\frac{3.728 \times 10^4 \text{ dps}}{5.11972 \text{ g}}\right)\left(60 \frac{\text{dpm}}{\text{dps}}\right)(4.9376 \text{ g})}{41.382 \text{ g}} = \cancel{52,066 \text{ dpm/g}}$$

52,128.98 dpm/g

ANALYTICS
1380 Seaboard Ind Blvd. Atlanta, GA 30318 USA 404-352-8677
Am-241
SRS 63651-307 Amount 1.008 µCi QA
Date 4/18/02 12:00 EST Exp. ———
PO # EW040502, Item 3
5.11972 g 1M HCl solution
CAUTION RADIOACTIVE MATERIAL

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[illegible]	10-14-02	[illegible]	2/4/03

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.
Phone (404) 352-8677
Fax (404) 352-2837

PAI.FO 0616
rec'd 4-22-02

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

63651-307

Am-241 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Am-241
ACTIVITY (dps):	3.728 E4
HALF-LIFE:	4.322 E2 years
CALIBRATION DATE:	April 18, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.3%
SYSTEMATIC:	3.0%
RANDOM:	0.3%

*99% confidence level.

Impurities: γ-impurities <0.1%

5.11972 grams 1M HCl solution.

P O NUMBER EW040502, Item 3

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: M Rodgers 4-19-02

Project: Sr-90 working dilution 931.4095.33

Continued from Page

TE 9/8/12

Prepare a working dilution of 931.4095.11

1. Density of 0.1 M HCl lot # L09031
   Mass of 100mL vol. flask: 68.5649 g — Balance # 12
   Mass of flask & 100mL acid: 168.4557 g — Balance# 12
   Net Mass: 99.8908 g
   Density: 0.9989 g/mL

2. Mass of 931.4095.11 transferred:
   Mass of open empty nalgene: 75.0081 g — Balance# 12
   Mass of nalgene & standard: 76.5548 g — Balance# 12
   Net mass of standard transferred: 1.5467 g — Balance# NA

TE 9/8/12 TE 9/8/12

3. Dilute to final volume:
   Mass of nalgene, standard, & diluent: 1085.2 g — Balance# 26
   Mass of empty nalgene (from above): 75.0081 g — Balance# 12
   Net mass of new dilution: 1010.1919 g — Balance# NA

4. Final activity calculation:

$$33{,}966.93\ \text{dpm/g}\,(0.9989\ \text{g/mL})\left(\frac{1.5467\ \text{g}}{1010.1919\ \text{g}}\right) = 51.95\ \text{dpm/mL}$$

TE 9/8/12

MC 10/17/2012 MC 10/17/2012

Stnd ID: 931.4095.33

Description: Sr-90
Expiration: 9/8/2013
Activity: 51.95 dpm/mL

2s Uncertainty: 93.51 dpm/mL
Ref. Date: 4/11/2011
Ref Time: N/A
Prep Date: 9/8/2012 Prep by: TE
Matrix/Comp. 0.1 M HCl
Half Life (y): 2.88E+01

Reverification Log		
Analysis Date	Initials	Expiration Date

MC 10/17/2012 MC 10/17/2012

Continued on Page

T Ellis 9/8/12 Read and Understood by 9/8/12

Signed Date Signed Date

MEL 12/14/11

Prepare an intermediate dilution of 931 Sr-90

1. Density of 0.1 M HCl, lot # K30039
   Mass of 100mL vol. flask: 66.4305 g Balance # 12
   Mass of flask & 100mL acid: 166.2718 g Balance# 12
   Net Mass: 99.8413 g
   Density: 0.9984 g/mL

2. Mass of 931 transferred:
   Mass of open empty 40mL Voa vial: 21.7293 g Balance# 12
   Mass of Voa vial and standard: 27.0645 g Balance# 12
   Net mass of standard transferred: 5.3352 g

MEL 12/14/11

MEL 12/14/11

3. Dilute to final volume:
   Mass of open empty 40mL Voa vial: 21.7293 g Balance# 12
   Mass of vial, standard, & diluent: 56.1105 g Balance# 12
   Net mass of new dilution: 34.3812 g

4. Final activity calculation:

$$1.967\times10^{4}\,Bq\left(\frac{5.3352\,g}{5.39174\,g}\right)\left(\frac{60\,dpm}{1\,Bq}\right)\left(\frac{0.9984\,g/mL}{34.3812\,g}\right)=\cancel{33{,}966.93}\ dpm/g$$

JP 6/20/12

33,912.59 dpm/mL

MEL 12/14/11

JP 6/20/12

Stnd ID: 931.4095.11

Description: Sr-90
Expiration: 1/19/2013
Activity: 33912.59 dpm/mL

2s Uncertainty: 610.43 dpm/mL
Ref. Date: 4/11/2011
Ref Time: N/A
Prep Date: 12/14/2011 Prep by: ML ~~PS~~ JP 6/20/12
Matrix/Comp. 0.1 M HCl
Half Life (y): 2.88E+01

JP 6/20/12

Reverification Log		
Analysis Date	Initials	Expiration Date

JP 6/20/12

JP 6/20/12

Continued on Page

Megan Lewis Signed 12/14/11 Date

Read and Understood By T Elliott Signed 12/14/11 Date

Eckert & Ziegler Analytics

rec 4-5-11 RSO# 931

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

84379-307

5 mL Liquid in Flame Sealed Vial

Customer: ALS Laboratory Group/Fort Collins, CO
P.O. No.: 73625, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Sr-90	1.052E+04	1.967E+04	0.1	0.9	1.8	04/11/2011

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities < 0.1 %. 5.39174 grams 0.1M HCl solution with approximately 30 μg/g each of Sr and Y carriers.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared by: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 3/31/11
J. D. McCorvey, QA Manager Alternate

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

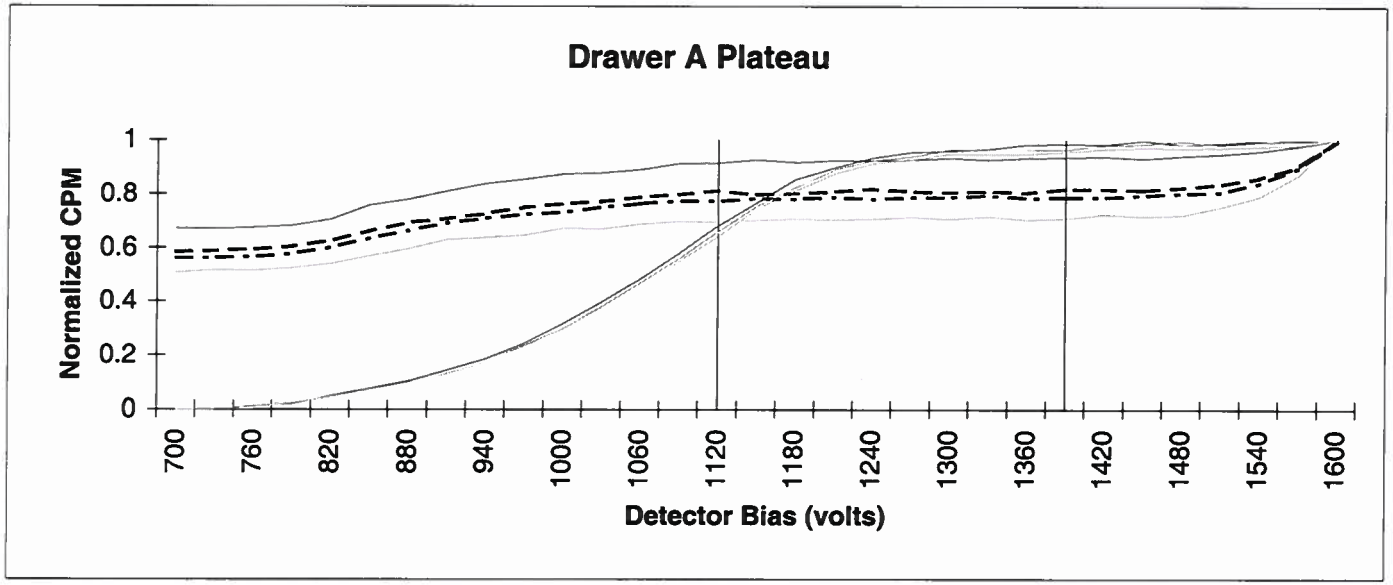
Single Isotope Certificate, Rev 1 9/28/2009

ANA Form005 Rev. —

Addendum

Unit Type: LB4100/W
Date Performed: 6/2/18 07:55
FileName: PTC0602A
Batch ID: DRWAER A PLAT CHECK

Unit Id: Magenta
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1402.5

Optimum alpha only operating voltage: 1120

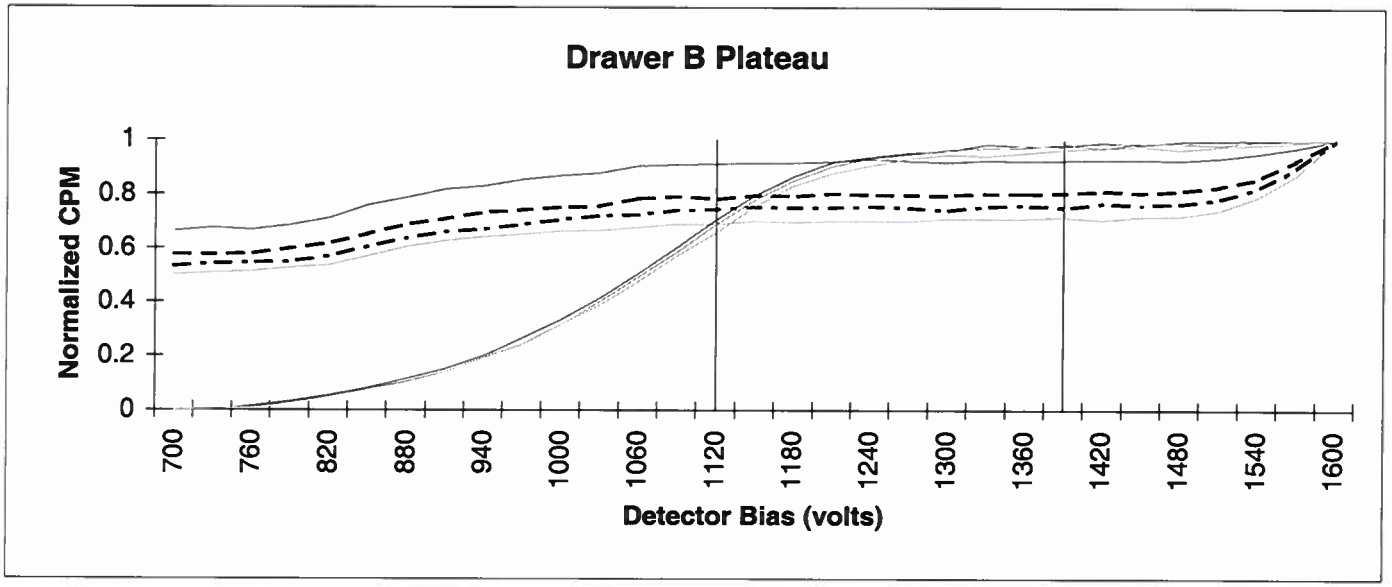
	A1	A2	A3	A4
Beta slope at beta voltage	2.10%	2.20%	2.41%	1.51%
Alpha slope at beta voltage	0.33%	0.97%	0.93%	0.20%
Alpha slope at alpha voltage	2.55%	1.10%	1.89%	1.94%

OK JP 6/3/18

Printed 6/3/2018 6:06 AM

Unit Type: LB4100/W
Date Performed: 6/2/18 07:55
FileName: PTC0602B
Batch ID: DRAWER B PLAT CHECK

Unit Id: Magenta
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1402.5

Optimum alpha only operating voltage: 1120

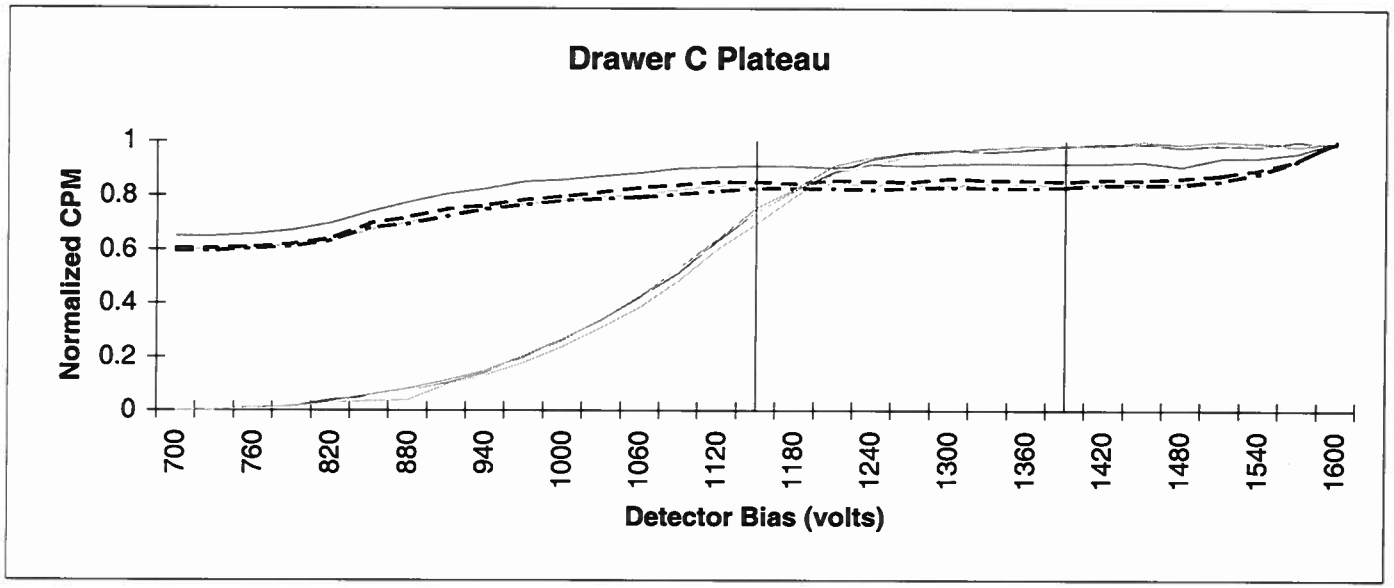
	B1	B2	B3	B4
Beta slope at beta voltage	0.42%	1.22%	3.10%	1.72%
Alpha slope at beta voltage	0.20%	0.62%	0.40%	0.91%
Alpha slope at alpha voltage	1.11%	1.14%	2.51%	2.84%

OK JP 6/3/18

Printed 6/3/2018 6:06 AM

Unit Type: LB4100/W
Date Performed: 6/3/18 07:24
FileName: PTC0603C
Batch ID: DRAWER C PLAT CHECK

Unit Id: Magenta
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1402.5

Optimum alpha only operating voltage: 1150

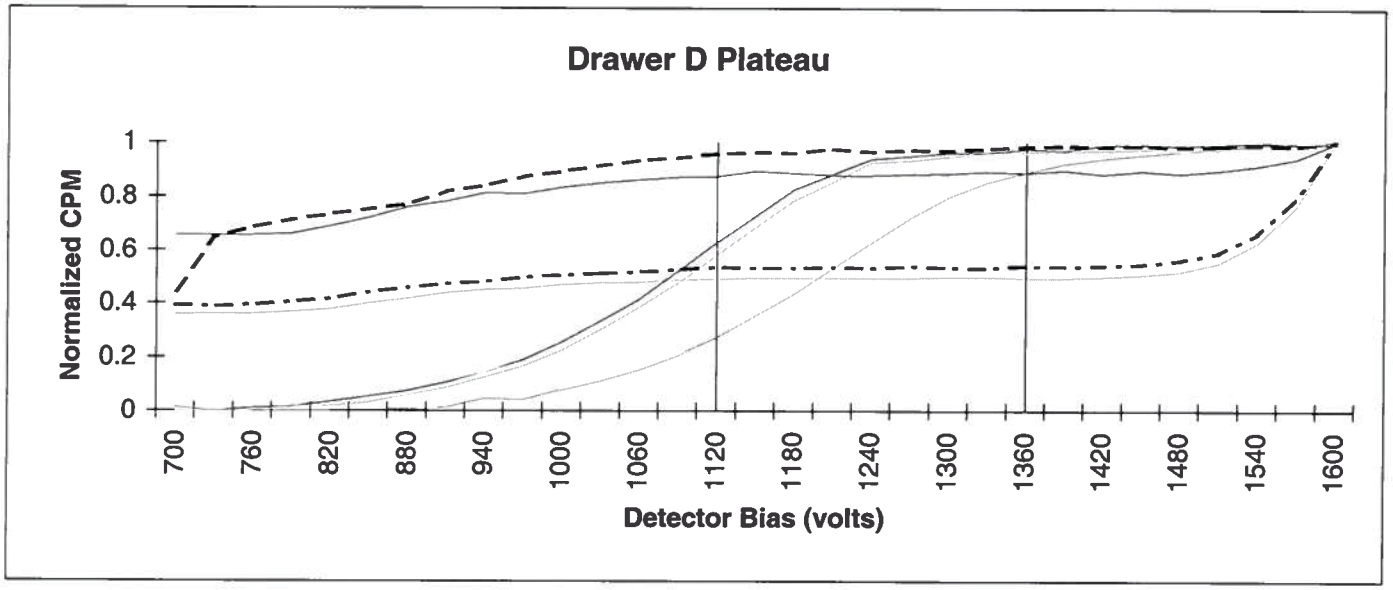
	C1	C2	C3	C4
Beta slope at beta voltage	2.92%	1.83%	1.22%	1.27%
Alpha slope at beta voltage	0.25%	0.07%	-0.04%	1.28%
Alpha slope at alpha voltage	0.32%	1.11%	1.63%	2.25%

OK JP 6/4/18

Printed 6/4/2018 6:27 AM

Unit Type: LB4100/W
Date Performed: 6/3/18 07:24
FileName: PTC0603D
Batch ID: DRAWER D PLAT CHECK

Unit Id: Magenta
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1372.5

Optimum alpha only operating voltage: 1120

	D1	D2	D3	D4
Beta slope at beta voltage	2.32%	13.59%	1.82%	1.73%
Alpha slope at beta voltage	-0.16%	1.52%	-0.37%	1.29%
Alpha slope at alpha voltage	2.52%	2.72%	2.90%	2.27%

OK JP 6/4/18

Printed 6/4/2018 6:28 AM

Date 6/2/18

SOP 724r 12

ALS
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14		α LB							α
15		P							P
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BLC0527W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	1300	Dr A	10
		Dr B	
Tank 2	1600	Dr C	
		Dr D	

Comments:

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Form 780r8.doc (6/23/06)

Reviewed By / Date JP 6/2/18

Date 6/2/18

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test #	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily Eff	—	—	30	6:45	JP	EFC0602	JP
1-16	Daily Bks	—	—	60	6:52	JP	BKC0602	JP
1-4	Alpha/Beta	Drawer A Plat Check	Plateau	5 min/STEP	7:55	JP	PTC0602A	JP
5-8	Beta/Alpha	Drawer B Plat Chk					PTC0602B	JP
9	1806007-2	AB180601-5	α/β	120	8:00	JP	ABC0602	JP
10	1806007-2	GA180601-1	α	60	8:02		ABC0602A	
11	GA180601-1MB							
12	LCS							
13	AB180601-5LCS	AB180601-5	α/β	30	8:03		ABC0602B	
15	1805659-1MS	AB180601-4			8:13	JP	ABC0602C	
16	AB180601-4LCS							
10	1805349-1	AB180531-1	α/β	30	9:11	JP	ABC0602D	
11	-2							
12	1805426-1							
13	-2							
15	-2D							
16	-3							
10	1805505-1				9:44	JP	ABC0602E	JP
11	-2							
12	-3							
13	-4							
15	-5							
16	-6							
9	1805509-1				10:17	JP	ABC0602F	
10	-2							
11	1805516-1							
12	-2							
13	-3							
15	-4							
16	-5							
9	-6				10:49	JP	ABC0602G	
10	-6MS							
11	AB180531 1MB							
12	LCS							
9	1804480-1	SR180516-1	Sr 90	1000	11:24	JP	SRC0602	
10	4481-1							
11	-2							
12	SR180516 1MB							
13	1806007 1	AB180601-5	α/β	720	11:10	JP	ABC0602H	
15	1D							
16	AB180601 5MB							

JP 6/3/18

Comments

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(cont. from page N1 B)

Form 780r8.doc (6/23/06)

Reviewed By / Date JP 6/3/18

.te 6/3/18

SOP 724r 12

ALS
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14		(L,U)							
15		P							α
16									P

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BU005270			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1		Dr A	10
		Dr B	
Tank 2		Dr C	
		Dr D	

Comments:

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Form 780r8.doc (6/23/06)

Reviewed By / Date JP 6/3/18

Date 6/3/18

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test #	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily EFF	—	—	30	6:05	JP	EFC0603	JP
1-16	Daily Blks	—	—	60	6:13	JP	BLC0603	JP
9-12	Alpha/Beta	Drawer C Plat Check	Plateau	5 Min/Step	7:24	JP	PTC0603C	JP
13-16	Beta/Alpha	Drawer D Plat Check	↓	↓	7:24	JP	PTC0603D	JP
1	1804255-1	AB1805363	αIB	1000	7:26	JP	ABC0603	JP
2	-9	↓	↓	↓	↓	↓	↓	↓
3	-17							
4	-25							
5	-33							
6	-41							
7	-49							
8	1804298-1	↓	↓	↓	↓	↓	↓	↓

JP 6/4/18

Comments:

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(cont. from page NA B)

Form 780r8.doc (6 23 06)

Reviewed By / Date JP 6/4/18

2/7/18

Th-230 Co-Precip Mass Attenuation

Filename: ATH0207
ATH0208

Benchsheet: GA170405-1 Source: 1716001->16

	8:24				2/7/18										2/8/18	
A1	1	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
A2	2	16	16	15	14	13	12	11	10	9	8	7	6	5	4	3
A3	3	2	1	16	15	14	13	12	11	10	9	8	7	6	5	4
A4	4	3	2	1	16	15	14	13	12	11	10	9	8	7	6	5
B1	5	4	3	2	1	16	15	14	13	12	11	10	9	8	7	6
B2	6	5	4	3	2	1	16	15	14	13	12	11	10	9	8	7
B3	7	6	5	4	3	2	1	16	15	14	13	12	11	10	9	8
B4	8	7	6	5	4	3	2	1	16	15	14	13	12	11	10	9
C1	9	8	7	6	5	4	3	2	1	16	15	14	13	12	11	10
C2	10	9	8	7	6	5	4	3	2	1	16	15	14	13	12	11
C3	11	10	9	8	7	6	5	4	3	2	1	16	15	14	13	12
C4	12	11	10	9	8	7	6	5	4	3	2	1	16	15	14	13
D1	13	12	11	10	9	8	7	6	5	4	3	2	1	16	15	14
D3	14	13	12	11	10	9	8	7	6	5	4	3	2	1	16	15
D4	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	16
	8:24	8:53	9:24	9:53	10:23	11:00	11:30	12:06	12:38	13:02	13:34	14:03	14:47	15:19	10:18	11:03

6/2/18 / 6/3/18

Voltage Plateau Check For 2017 Instrument Calibration Re-Verification

α Sources Used		β Sources Used		Detectors
410		406		A1 B1 C1 D1
411	Am-241	407	Sr90/Y90	A2 B2 C2 D2
412	17,800 DPM	408	29,600 DPM	A3 B3 C3 D3
413	2-16-1995	409	9-15-1992	A4 B4 C4 D4

Parameters

Starting Voltage 700
Ending Voltage 1600
30 V / Step
5 min / Step

Count Preset: 40,000
Time Between Step: 0.1
Weak Check Times: 0.1
Weak Check Limit 20 Cnts

Filenames
PTC06021
↓ B
PTC06030
↓ D

Continued on Page

Read and Understood By

Signed 6/2/18 Date Signed Date

Gross Alpha/Beta LB4100C ICV's/ICB's AM241/SR90

Atten. Constants	b	m	a	x0
Alpha	0.8949	0.9914	0.9119	21.448
Beta	0.9681	0.9996	0.9174	0.0

X-Talk Constants	m	b
α > β	0.9990	0.2414
β > α	0.0018	1.118E-05

							Alpha						Beta					
Detector	Sample ID	Initial Aliquot	Final Sam. Size	Count Date	Count Dur.	Residual Mass (mg)	Gross CPM	Bkg CPM	β > α X-Talk	Net CPM	Atten.	Efficiency	Gross CPM	Bkg CPM	α > β X-Talk	Net CPM	Atten.	Efficiency
A4	1224001-1	0.200	0.200	6/4/2018	360	21.4	16.417	0.067	0.083	16.267	0.895	0.2068	42.336	1.48	4.0323	36.8237	0.9605	0.4284
B4	1224001-2	0.200	0.200	6/4/2018	360	43.8	15.144	0.09	0.092	14.962	0.750	0.2008	41.983	1.671	3.7968	36.5152	0.9527	0.4195
C3	1224001-3	0.200	0.200	6/4/2018	360	64.0	12.881	0.105	0.099	12.677	0.640	0.2134	41.153	1.616	3.2881	36.2489	0.9456	0.4278
D4	1224001-4	0.200	0.200	6/4/2018	360	91.2	11.292	0.104	0.108	11.080	0.517	0.1996	40.031	1.722	2.9588	35.3502	0.9362	0.4214
A2	AB121206-3AMB	0.200	0.200	6/4/2018	360	22.4	0.156	0.127	0.001	0.028	0.888	0.2221	1.864	1.575	0.0072	0.2818	0.9602	0.4238
B3	AB121206-3BMB	0.200	0.200	6/4/2018	360	46.4	0.150	0.134	0.001	0.015	0.735	0.2040	1.925	1.695	0.0040	0.2260	0.9518	0.4289
C1	AB121206-3CMB	0.200	0.200	6/4/2018	360	69.8	0.117	0.106	0.001	0.010	0.611	0.2054	1.894	1.666	0.0028	0.2252	0.9436	0.4214
D1	AB121206-3EMB	0.200	0.200	6/4/2018	360	96.0	0.144	0.122	0.001	0.021	0.497	0.1946	2.000	1.735	0.0058	0.2592	0.9346	0.4099

Spike Information

Alpha Std ID	Ref. Date	Act (dpm/ml)	Spike Vol (mL)	Decay Corr. Spike Act. Added
616.4095.13	4/18/2002	100.000	1.0	97.445

Spike Information

Beta Std ID	Ref. Date	Act (dpm/ml)	Spike Vol (mL)	Decay Corr. Spike Act. Added
931.4095.33	4/11/2011	51.950	1.0	43.739

Acceptance criteria for LCS's --> 70-130%

	Alpha					Beta				
Sample ID	Act (pCi/L)	TPU (2 sig)	MDC	% Recov.	Act<MDCa	Act (pCi/L)	TPU (2 sig)	MDC	% Recov.	Act<MDCa
1224001-1	197.89	31.9	1.25	90.2%	NA	201.55	32.3	3.19	102.3%	NA
1224001-2	223.62	36.1	1.68	101.9%	NA	205.79	33.0	3.27	104.4%	NA
1224001-3	209.03	33.9	1.95	95.2%	NA	201.81	32.4	3.06	102.4%	NA
1224001-4	242.00	39.3	2.63	110.3%	NA	201.80	32.4	3.07	102.4%	NA
AB121206-3AMB	0.32	0.5	1.09	0.1%	PASS	1.56	0.9	1.75	NA	PASS
AB121206-3BMB	0.23	0.7	1.46	0.1%	PASS	1.25	0.9	1.80	NA	PASS
AB121206-3CMB	0.19	0.0	1.57	0.1%	PASS	1.28	0.0	1.84	NA	PASS
AB121206-3EMB	0.49	0.0	2.17	0.2%	PASS	1.52	0.0	1.95	NA	PASS

Alpha CU (1 sig)	Alpha TPU (1 sig)	Beta CU (1 sig)	Beta TPU (1 sig)
2.6064	15.9704	1.9756	16.1688
3.0781	18.0692	2.0229	16.5094
3.1356	16.9357	1.9689	16.1888
3.8931	19.6576	1.9869	16.1902
0.2707	0.2719	0.4555	0.4721
0.3529	0.3533	0.4634	0.4739

ALS - Gas Flow Proportional Sample Analysis LB4100-C

Unit Type: LB4100 -C
Counting Unit ID: Magenta
High Voltage Mode: Simultaneous
Application Revision: 2
Application Version: Standard
Rev.12/01/08 JCP

Data file name: ABC0604K
Batch ID: AB121206-3
Count Preset (m): 360
Batch Ended: 6/4/2018 20:05

Background logfile: BKGABW
Date of Bkg. Cal: 5/28/2018
Alpha efficiency logfile: Am241R-06/17 Alpha prog. logfile: n/a
Alpha attenuation calibration: AAM0610, 0611 Alpha prog. attenuation: n/a
Beta efficiency logfile: Sr90R-06/17 Beta prog. logfile: n/a
Beta attenuation calibration: ASR0611 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
y = b*m^(a*(mass-x0))		y = b*m^(a*(mass-x0))	
Alpha b=	0.89490	Beta b=	0.9651
m=	0.99140	m=	0.9996
a=	0.9119	a=	0.9174
x0=	21.4480	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
y = b *m^-mass		y = b*mass + m	
a ->b xtalk b=	0.2414	b ->a xtalk b=	1.12E-05
a ->b xtalk m=	0.9990	b ->a xtalk m=	0.0018

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity Gross CPM	Alpha Bkg. CPM	Alpha b>a xtlk CPM	Alpha Base Eff	Alpha Base Cor.Fact.	Alpha Progeny Eff	Alpha Progeny Cor.Fact.	Beta Activity Gross CPM	Beta Bkg. CPM	Beta a>b xtlk CPM	Beta Base Eff	Beta Base Cor.Fact.	Beta Progeny Eff	Beta Progeny Cor.Fact.
A2	AB121206-3AMB	6/4/2018 20:04	360.00	22.4	0.156	0.127	0.001	0.2221	0.888	n/a	n/a	1.864	1.575	0.0070	0.4238	0.960	n/a	n/a
A4	1224001-1	6/4/2018 20:04	360.00	21.4	16.417	0.067	0.083	0.2068	0.895	n/a	n/a	42.336	1.480	4.0322	0.4284	0.961	n/a	n/a
C1	AB121206-3CMB	6/4/2018 20:05	360.00	69.8	0.117	0.106	0.001	0.2054	0.611	n/a	n/a	1.894	1.666	0.0028	0.4214	0.944	n/a	n/a
C3	1224001-3	6/4/2018 20:05	360.00	64.0	12.881	0.105	0.099	0.2134	0.640	n/a	n/a	41.153	1.616	3.2880	0.4278	0.946	n/a	n/a
D1	AB121206-3EMB	6/4/2018 20:05	360.00	96.0	0.144	0.122	0.001	0.1946	0.497	n/a	n/a	2.000	1.735	0.0060	0.4099	0.935	n/a	n/a
D4	1224001-4	6/4/2018 20:05	360.00	91.2	11.292	0.104	0.108	0.1996	0.517	n/a	n/a	40.031	1.722	2.9587	0.4214	0.936	n/a	n/a
B3	AB121206-3BMB	6/4/2018 20:05	360.00	46.4	0.150	0.134	0.001	0.2040	0.735	n/a	n/a	1.925	1.695	0.0040	0.4289	0.952	n/a	n/a
B4	1224001-2	6/4/2018 20:05	360.00	43.8	15.144	0.090	0.092	0.2008	0.750	n/a	n/a	41.983	1.671	3.7969	0.4195	0.953	n/a	n/a

JP 6/5/18

Date 6/4/18

SOP 724r 12

ALS
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100C

Instrument Daily Response and Background Checks

Det.	Daily Response Check Start 1	Status	Start 2	Status	Background Check Start 1	Status	Start 2	Status	Det. Status
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7									
8									
9						(H2)	JP	P	
10						P			
11									
12									
13									
14									α
15									P
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKC0527W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	700	Dr A	10
		Dr B	
Tank 2	1600	Dr C	
		Dr D	

Comments:

Page No.: 478922 A

Form 780r8.doc (6/23/06)

Reviewed By / Date JP 6/4/18

Date 6/4/18

SOP 724r 12

ALS

Low Background Gas Flow Proportional Counter Log

Instrument: LB4100C

Det.	Sample ID	Batch	Test #	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1	1804142-1	RA180529-4	R-228	90	9:47	JP	RAC0604A	JP
2	1804453-1							
3	-2							
4	-3							
5	-4							
6	-5							
7	1804558-1							
8	-2							
9	1804586-1							
10	-2							
11	-3							
12	-4							
13	-5							
15	-6							
16	-7							
1	-8			120	11:26	JP	RAC0604B	
3	-9							
5	-10							
6	1805085-1							
10	1805145-1							
12	RA180529-4MB							
2	1624002-1	AB1612208-2	α/β	150	11:25	JP	ABC0604G	JP
7	-2							
9	-3							
13	-4							
4	AB1612208-2AMB							
8	BMB							
11	CMB							
16	EMB							
15	AB180530-3LCS	AB180530-3	α/β	30	11:52	JP	ABC0604H	JP
15	LCSD			1	12:37	JP	ABC0604I	
1	1804298-2			1000	13:39	JP	ABC0604J	JP
3	-3							
5	-4							
6	-5							
15	AB180530-3MB							
4	1224001-1	AB121206-3	α/β	360	14:05	JP	ABC0604K	JP
8	-2							
11	-3							
16	-4							
2	AB121206-3AMB							
7	BMB							
9	CMB							
13	EMB							

6/4/18 JP

6/4/18 JP

JP 6/5/18

Comments:

Page No.: 478923 **B**

(cont. from page 478922 B)

Form 780r8.doc (6/23/06)

Reviewed By / Date JP 6/5/18

Radiochemistry Instrument Worksheet

ALS Environmental -- FC

Prep Batch: AB121206-3

Prep Procedure: GAB ICB's, ICV's

Analytical QASS / NCR? Y / N _____

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	1224001-1	SMP	200	200	ml	PCI/L	21.4	ABC0604K	4	JP							
1	1224001-2	SMP	200	200	ml	PCI/L	43.8		8								
1	1224001-3	SMP	200	200	ml	PCI/L	64		11								
1	1224001-4	SMP	200	200	ml	PCI/L	91.2		16								
1	AB121206-3A	MB	200	200	ml	PCI/L	22.4		2								
1	AB121206-3B	MB	200	200	ml	PCI/L	46.4		7								
1	AB121206-3C	MB	200	200	ml	PCI/L	69.8		9								
1	AB121206-3E	MB	200	200	ml	PCI/L	96		13								

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	AM-241	616.4095.13	98.308	DPM/ml	12/06/12	1	ml	RS-016
S2	Sr-90	931.4095.33	49.916	DPM/ml	12/06/12	1	ml	RS-016

Sample Barcodes

1224001-1
AB121206-3PS1

1224001-2
AB121206-3PS2

1224001-3
AB121206-3PS3

1224001-4
AB121206-3PS4

AB121206-3AMB
AB121206-3PS5

AB121206-3BMB
AB121206-3PS6

AB121206-3CMB
AB121206-3PS7

AB121206-3EMB
AB121206-3PS8

Reporting Units

LabID:	TstGrpName:	RptUnits:
1224001-1	GrossAlpha/Beta	PCI/L
1224001-2	GrossAlpha/Beta	PCI/L
1224001-3	GrossAlpha/Beta	PCI/L
1224001-4	GrossAlpha/Beta	PCI/L

Radiochemistry Prep Worksheet

ALS Environmental -- FC

Prep Batch: AB121206-8

Prep Procedure: GAB

Reviewed By: jtl JN **Review Date:** 12/6/2012

Non-Routine Pre-Treatment? Y (N) **Batch:** N/A **Re-Prep?** Y (N) **Batch:** N/A **Prep QASS / NCR?** Y (N) N/A

Prep SOP: PAI 702 **Rev:** 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Jeffrey T. Lee
Prep Date: 12/6/2012
Prep Dept: RS

Balance: 13
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Aliq ml	Fin Aliq ml	Prep Basis	Standards	Prep Notes
1	1	1224001-1	SMP		200	200	Unfiltered	S1,S2	
2	1	1224001-2	SMP		200	200	Unfiltered	S1,S2	
3	1	1224001-3	SMP		200	200	Unfiltered	S1,S2	
4	1	1224001-4	SMP		200	200	Unfiltered	S1,S2	
5	1	AB121206-3A	MB		200	200	Unfiltered		
6	1	AB121206-3B	MB		200	200	Unfiltered		
7	1	AB121206-3C	MB		200	200	Unfiltered		
8	1	AB121206-3E	MB		200	200	Unfiltered		

JN 12/6/12

Comments
ICV/ICBs. Samples desiccated on 12/6/12 @ 17:15.

Spiked By: Jeffrey T. Lee **Date:** 12/6/2012
Witnessed By: Eric K. Gobel **Date:** 12/6/2012

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	AM-241	616.4095.13	98.308	DPM/ml	12/06/12	1	ml	RS-016
S2	Sr-90	931.4095.33	49.916	DPM/ml	12/06/12	1	ml	RS-016

Reagent Solution IDs*:

J12036

*Except where otherwise noted, all reagents were applied in accordance with the specifications of the preparation methods associated with this batch.

ALS Environmental – FC

Radiochemistry Prep Worksheet

Prep Batch: AB121206-3

Prep Procedure: GAB

Prep Batch Not Validated!!!

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N Batch: _____ Re-Prep? Y / N Batch: _____ Prep QASS / NCR? Y / N _____

Prep SOP: PAI 702 Rev: 20
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Jeffrey T. Lee
Prep Date: 12/6/2012
Prep Dept: RS

Balance: 13
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Aiq ml	Fin Aiq ml	Prep Basis	Standards	Prep Notes
1	1	1224001-1	SMP		200	200	Unfiltered	S1,S2	
2	1	1224001-2	SMP		200	200	Unfiltered	S1,S2	
3	1	1224001-3	SMP		200	200	Unfiltered	S1,S2	
4	1	1224001-4	SMP		200	200	Unfiltered	S1,S2	
5	1	AB121206-3A	MB		200	200	Unfiltered		
6	1	AB121206-3B	MB		200	200	Unfiltered		
7	1	AB121206-3C	MB		200	200	Unfiltered		
8	1	AB121206-3E	MB		200	200	Unfiltered		

Comments

Spiked By: JL Date: 12/6/12
Witnessed By: EKG Date: 12/6/12

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	AM-241	616.4095.13	98.308	DPM/ml	12/06/12	1	ml	RS-016
S2	Sr-90	931.4095.33	49.916	DPM/ml	12/06/12	1	ml	RS-016

S1: 4/24/13
S2: 9/8/13

Reagent Solution IDs*

J12036

*Except where otherwise noted, all reagents were applied in accordance with the specifications of the preparation methods associated with this batch.

ALS Environmental -- FC

Radiochemistry Gravimetric Worksheet

Prep Batch: AB121206-3

Prep Procedure: **GAB**

Reviewed By: jtl JM

Review Date: 12/6/2012

Prep Num	Planc. Num	LabID	QC Type	Test Alq (ml)	Tare Mass (g)	Initial Gross Mass (g)	Initial Net Mass (mg)	Suggested Alq (ml)	Samp Vol Available (ml)	Samp Vol Taken (ml)	Fin Gross Mass (g)	Final Net Mass (mg)	Salt Sol. Added (ml)	Flag
1	1	1224001-1	SMP	10	9.1723	0.0000	0	200	200	200	9.1937	21.4	0.5	
1	2	1224001-2	SMP	10	9.1914	0.0000	0	200	200	200	9.2352	43.8	1	
1	3	1224001-3	SMP	10	9.2220	0.0000	0	200	200	200	9.2860	64	1.5	
1	4	1224001-4	SMP	10	9.1331	0.0000	0	200	200	200	9.2243	91.2	2	
1	5	AB121206-3A	MB	10	9.1271	0.0000	0	200	200	200	9.1495	22.4	0.5	
1	6	AB121206-3B	MB	10	9.2092	0.0000	0	200	200	200	9.2556	46.4	1	
1	7	AB121206-3C	MB	10	9.1743	0.0000	0	200	200	200	9.2441	69.8	1.5	
1	8	AB121206-3E	MB	10	9.2158	0.0000	0	200	200	200	9.3118	96	2	

Supersedes: NA

Continued from Page

MEL 1/6/12

Prepare a working dilution of 616.2382.91

1. Density of 1M HCl, lot # K43J20
   Mass of 100mL vol. flask: 56.4421 g Balance # 12
   Mass of flask & 100mL acid: 157.7445 g Balance# 12
   Net Mass: 101.3024 g
   Density: 1.0130 g/mL

2. Mass of 616.2382.91 transferred:
   Mass of open empty nalgene: 74.7685 g Balance# 12
   Mass of nalgene & standard: 78.4340 g Balance# 12
   Net mass of standard transferred: 3.6655 g Balance# NA

MEL 1/6/12

3. Dilute to final volume:
   Mass of nalgene, standard, & diluent: 1084.8 g Balance# 26
   Mass of empty nalgene (from above): 74.7685 g Balance# 12
   Net mass of new dilution: 1010.0315 g Balance# NA

4. Final activity calculation:

$$27{,}201.49 \text{ dpm/g} \left(\frac{3.6655\text{g}}{1010.0315\text{g}}\right)(1.0130\text{ g/mL}) = 100.00 \text{ dpm/mL}$$

MEL 1/6/12

JP 5/1/12

Stnd ID: 616.4095.13

Description: Am-241
Expiration: 4/21/2013
Activity: 100.00 dpm/mL
2s Uncertainty: 3.30 dpm/mL
Ref. Date: 4/18/2002
Ref Time: N/A
Prep Date: 4/21/2012 Prep by: TE
Matrix/Comp. 1M HCl
Half Life (y): 4.32E+02

JP 5/1/12

Reverification Log		
Analysis Date	Initials	Expiration Date

JP 5/1/12

JP 5/1/12

Continued on Page

Signed 1/6/12 Date

Read and Understood By 05/01/12 Date

Am-241 intermediary dilution

Prepare an intermediate dilution of 616.2382.38 by diluting with 1M HCl (lot 43015)

(1) Determine the density of M HCl

mass of 100 ml Class A volumetric flask	67.5757 g (bal)
mass of flask and 1M HCl	168.8580 g
net mass of 1M HCl	101.2823
	ρ = 1.0128 g/ml

(2) Transfer Am-241 (616.2382.38) to a 40 ml VOA vial

mass of empty VOA vial without lid & 50 ml beaker	54.0248 g (bal)
mass of standard, transfer pipet & 50 ml beaker (initial)	95.0640 g
mass of standard, transfer pipet & 50 ml beaker after transfer	75.0076 g
net mass of standard transferred	20.0564 g

(3) Dilute to final volume with 1M HCl

mass of empty VOA vial w/o lid & 50 ml beaker (from above)	54.0248 g (bal)
mass of standard, 1M HCl VOA vial & 50 ml beaker	92.4609 g
net mass of standard	38.4361 g

(4) final activity calculation

$$\frac{8.186 \times (52{,}2896 \text{ dpm/g}) \times 20.0564 \text{ g}}{38.4361 \text{ g}} = \frac{27{,}158.644 \text{ dpm/g}}{27{,}201.49}$$

MC 11/1/07

Continued on Page

Read and Understood By

C Moncavage 4/25/03 Signed Date

Renee Hollenbeck 5/5/03 Signed Date

Am-241 primary dilution

prepare a primary dilution of RSD lelle (NIST: ~~SRS~~ SRS 63651-307) by diluting w/ 1M HCl

1.) Determine the density of 1M HCl (Lot # 42323 & Lot # 42216)

mass of 100ml Vol flask	162.4712 g	(Bal 12)
mass of flask + 1M HCl	163.8021 g	↓
Net mass of ~~std~~ HCl	101.330909 g	

2.) Transfer contents of ampule to 40 ml vial Vial

mass of VOA vial w/o lid	22.3577 g	(Bal 12)
mass of empty ampule + 50ml beaker	37.9238 g	↓
mass of beaker + empty ampule	32.9816 g	
Net mass of std transferred	4.937600 g	

3.) Dilute std to final Vol w/ 1M HCl

mass of VOA vial w/o lid (from above)	22.3577 g	(Bal 12)
mass of std + VOA Vial + 1M HCl	103.7403 g	↓
Net mass of diluted std	41.382600 g	

4.) Final Activity Calc

$$\frac{\left(\frac{3.728 \times 10^4 \text{ dps}}{5.11972 \text{ g}}\right)\left(100 \frac{\text{dpm}}{\text{dps}}\right)\left(4.9376 \text{ g}\right)}{41.3826 \text{ g}} = \cancel{52,000 \text{ dpm/g}}$$

52,128.98 dpm/g

ANALYTICS
1380 Seaboard Ind Blvd. Atlanta GA 30318, USA 404-352-8677
Am-241
SRS 63651-307 Amount 1.608 Lot QA
Date 4/18/02 12:00 EST Exp
PO # EW040502, Item 3
5.11972 g 1M HCl solution
CAUTION RADIOACTIVE MATERIAL

Continued on Page

Read and Understood By

Signed 10-14-02 Date

Signed 2/4/03 Date

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 • U.S.A.
Phone (404) 352-3677
Fax (404) 352-2837

PAI.FO 0616
rec'd 4-22-02

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

63651-307

Am-241 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Am-241
ACTIVITY (dps):	3.728 E4
HALF-LIFE:	4.322 E2 years
CALIBRATION DATE:	April 18, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.3%
SYSTEMATIC:	3.0%
RANDOM:	0.3%

*99% confidence level.

Impurities: γ-impurities <0.1%

5.11972 grams 1M HCl solution.

P O NUMBER EW040502, Item 3

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: M Rooty 4-19-02

1E 9/8/12

Prepare a working dilution of 931.4095.11

1. Density of 0.1 M HCl lot # L09031
   Mass of 100mL vol. flask: 68.5649 g Balance # 12
   Mass of flask & 100mL acid: 168.4557 g Balance# 12
   Net Mass: 99.8908 g
   Density: 0.9989 g/mL

2. Mass of 931.4095.11 transferred:
   Mass of open empty nalgene: 75.0081 g Balance# 12
   Mass of nalgene & standard: 76.5548 g Balance# 12
   Net mass of standard transferred: 1.5467 g Balance# NA

1E 9/8/12 1E 9/8/12

3. Dilute to final volume:
   Mass of nalgene, standard, & diluent: 1085.2 g Balance# 26
   Mass of empty nalgene (from above): 75.0081 g Balance# 12
   Net mass of new dilution: 1010.1919 g Balance# NA

4. Final activity calculation:

$$33{,}966.93\ \text{dpm/g}\ (0.9989\ \text{g/mL})\left(\frac{1.5467\ \text{g}}{1010.1919\ \text{g}}\right) = 51.95\ \text{dpm/mL}$$

1E 9/8/12

MC 10/17/2012 MC 10/17/2012

Stnd ID: 931.4095.33

Description: Sr-90
Expiration: 9/8/2013
Activity: 51.95 dpm/mL

2s Uncertainty: 93.51 dpm/mL
Ref. Date: 4/11/2011
Ref Time: N/A
Prep Date: 9/8/2012 *Prep by:* TE
Matrix/Comp. 0.1 M HCl
Half Life (y): 2.88E+01

Reverification Log		
Analysis Date	Initials	Expiration Date

MC 10/17/2012 MC 10/17/2012

Continued on Page

T Ellet 9/8/12
Signed Date

Read and Understood By
Signed 9/8/12
Date

Project 931.4095.11 Sr-90 Intermediate Standard

Continued from Page

11

MEL 12/14/11

Prepare an intermediate dilution of 931 Sr-90

1. Density of 0.1 M HCl, lot # K30039
   Mass of 100mL vol. flask: 66.4305 g Balance # 12
   Mass of flask & 100mL acid: 166.2718 g Balance# 12
   Net Mass: 99.8413 g
   Density: 0.9984 g/mL

2. Mass of 931 transferred:
   Mass of open empty 40mL Voa vial: 21.7293 g Balance# 12
   Mass of Voa vial and standard: 27.0645 g Balance# 12
   Net mass of standard transferred: 5.3352 g

MEL 12/14/11

MEL 12/14/11

3. Dilute to final volume:
   Mass of open empty 40mL Voa vial: 21.7293 g Balance# 12
   Mass of vial, standard, & diluent: 56.1105 g Balance# 12
   Net mass of new dilution: 34.3812 g

4. Final activity calculation:

$$1.967\times10^{4}\,Bq\left(\frac{5.3352\,g}{5.39174\,g}\right)\left(\frac{60\,dpm}{1\,Bq}\right)\left(\frac{0.9984\,g/mL}{34.3812\,g}\right)=\cancel{33{,}966.93}\ dpm/g$$

JP 6/20/12

33,912.59 dpm/mL

MEL 12/14/11

JP 6/20/12

Stnd ID: 931.4095.11

Description: Sr-90
Expiration: 1/19/2013
Activity: 33912.59 dpm/mL
2s Uncertainty: 610.43 dpm/mL
Ref. Date: 4/11/2011
Ref Time: N/A
Prep Date: 12/14/2011 Prep by: ML ~~TS~~ JP 6/20/12
Matrix/Comp. 0.1 M HCl
Half Life (y): 2.88E+01

JP 6/20/12

Reverification Log		
Analysis Date	Initials	Expiration Date

JP 6/20/12

JP 6/20/12

Continued on Page

Signed 12/14/11 Date

Read and Understood By

Signed 12/14/11 Date

Eckert & Ziegler Analytics

rec 4-5-11 RSO# 931

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

84379-307

5 mL Liquid in Flame Sealed Vial

Customer: ALS Laboratory Group/Fort Collins, CO
P.O. No.: 73625, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Sr-90	1.082E+04	1.867E+04	0.1	0.9	1.8	04/11/2011

*Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities < 0.1 %. 5.39174 grams 0.1M HCl solution with approximately 30 µg/g each of Sr and Y carriers.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared by: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 3/31/11
J. D. McCorvey, QA Manager Alternate

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1958

ANA Form005 Rev. —

Single Isotope Certificate, Rev 1 9/28/2009

1C 9/8/12

Prepare a working dilution of 931.4095.11

1. Density of 0.1 M HCl lot # L09031
   Mass of 100mL vol. flask: 68.5649 g Balance # 12
   Mass of flask & 100mL acid: 168.4557 g Balance# 12
   Net Mass: 99.8908 g
   Density: 0.9989 g/mL

2. Mass of 931.4095.11 transferred:
   Mass of open empty nalgene: 75.0081 g Balance# 12
   Mass of nalgene & standard: 76.5548 g Balance# 12
   Net mass of standard transferred: 1.5467 g Balance# NA

1C 9/8/12 1C 9/8/12

3. Dilute to final volume:
   Mass of nalgene, standard, & diluent: 1085.2 g Balance# 26
   Mass of empty nalgene (from above): 75.0081 g Balance# 12
   Net mass of new dilution: 1010.1919 g Balance# NA

4. Final activity calculation:

$$33{,}966.93\ \text{dpm/g}\,(0.9989\ \text{g/mL})\left(\frac{1.5467\ \text{g}}{1010.1919\ \text{g}}\right) = 51.95\ \text{dpm/mL}$$

1C 9/8/12

MC 10/17/2012 MC 10/17/2012

Stnd ID: **931.4095.33**

Description: **Sr-90**
Expiration: **9/8/2013**
Activity: **51.95** **dpm/mL**

2s Uncertainty: **93.51** **dpm/mL**
Ref. Date: **4/11/2011**
Ref Time: **N/A**
Prep Date: **9/8/2012** Prep by: **TE**
Matrix/Comp. **0.1 M HCl**
Half Life (y): **2.88E+01**

Reverification Log		
Analysis Date	Initials	Expiration Date

MC 10/17/2012 MC 10/17/2012

Continued on Page

T Ellt 9/8/12
Signed Date

Read and Understood by
Signed

9/8/12
Date

Project 931.4095.11 Sr-90 Intermediate Standard

Continued from Page

MEL 12/14/11

Prepare an intermediate dilution of 931 Sr-90

1. Density of 0.1 M HCl, lot # K30039
   Mass of 100mL vol. flask: 66.4305 g Balance # 12
   Mass of flask & 100mL acid: 166.2718 g Balance# 12
   Net Mass: 99.8413 g
   Density: 0.9984 g/mL

2. Mass of 931 transferred:
   Mass of open empty 40mL Voa vial: 21.7293 g Balance# 12
   Mass of Voa vial and standard: 27.0645 g Balance# 12
   Net mass of standard transferred: 5.3352 g

MEL 12/14/11

MEL 12/14/11

3. Dilute to final volume:
   Mass of open empty 40mL Voa vial: 21.7293 g Balance# 12
   Mass of vial, standard, & diluent: 56.1105 g Balance# 12
   Net mass of new dilution: 34.3812 g

4. Final activity calculation:

$$1.967\times10^{4}\,Bq\left(\frac{5.3352\,g}{5.39174\,g}\right)\left(\frac{60\,dpm}{1\,Bq}\right)\left(\frac{0.9984\,g/mL}{34.3812\,g}\right)=\cancel{33966.93}\ dpm/g$$

JP 6/20/12

33,912.59 dpm/mL

MEL 12/14/11

JP 6/20/12

Stnd ID: 931.4095.11

Description: Sr-90
Expiration: 1/19/2013
Activity: 33912.59 dpm/mL

2s Uncertainty: 610.43 dpm/mL
Ref. Date: 4/11/2011
Ref Time: N/A
Prep Date: 12/14/2011 Prep by: ML ~~PE~~ JP 6/20/12
Matrix/Comp. 0.1 M HCl
Half Life (y): 2.88E+01

JP 6/20/12

Reverification Log		
Analysis Date	Initials	Expiration Date

JP 6/20/12

JP 6/20/12

Continued on Page

Signed 12/14/11 Date

Read and Understood By Signed 12/14/11 Date

Eckert & Ziegler Analytics

rec 4-5-11 RSO# 931

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

84379-307

5 mL Liquid in Flame Sealed Vial

Customer: ALS Laboratory Group/Fort Collins, CO
P.O. No.: 73625, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Sr-90	1.052E+04	1.967E+04	0.1	0.9	1.8	04/11/2011

*Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities < 0.1 %. 5.39174 grams 0.1M HCl solution with approximately 30 μg/g each of Sr and Y carriers.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared by: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 3/31/11
J. D. McCorvey, QA Manager Alternate

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

ANA Form005 Rev. —

Single Isotope Certificate, Rev 1 9/28/2009

MEL 1/6/12

Prepare a working dilution of 616.2382.91

1. Density of 1M HCl, lot # K43J20
   Mass of 100mL vol. flask: 56.4421 g Balance # 12
   Mass of flask & 100mL acid: 157.7445 g Balance# 12
   Net Mass: 101.3024 g
   Density: 1.0130 g/mL

2. Mass of 616.2382.91 transferred:
   Mass of open empty nalgene: 74.7685 g Balance# 12
   Mass of nalgene & standard: 78.4340 g Balance# 12
   Net mass of standard transferred: 3.6655 g Balance# NA

MEL 1/6/12

MEL 1/6/12

3. Dilute to final volume:
   Mass of nalgene, standard, & diluent: 1084.8 g Balance# 26
   Mass of empty nalgene (from above): 74.7685 g Balance# 12
   Net mass of new dilution: 1010.0315 g Balance# NA

4. Final activity calculation:

$$27{,}201.49 \text{ dpm/g} \left(\frac{3.6655\text{g}}{1010.0315\text{g}}\right)(1.0130\text{g/mL}) = 100.00 \text{ dpm/mL}$$

MEL 1/6/12

JP 5/1/12

Stnd ID: **616.4095.13**

Description: **Am-241**
Expiration: **4/21/2013**
Activity: **100.00** **dpm/mL**

2s Uncertainty: **3.30** **dpm/mL**
Ref. Date: **4/18/2002**
Ref Time: **N/A**
Prep Date: **4/21/2012** *Prep by:* **TE**
Matrix/Comp. **1M HCl**
Half Life (y): **4.32E+02**

JP 5/1/12

Reverification Log		
Analysis Date	Initials	Expiration Date

JP 5/1/12

JP 5/1/12

Continued on Page

Signed 1/6/12 Date

Read and Understood By: Signed 05/01/12 Date

Am-241 intermediary dilution

Prepare an intermediate dilution of 616.2382.38 by diluting with 1M HCL (Lot 43015)

(1) Determine the density of 1M HCL

mass of 100 ml Class A volumetric flask	67.5757 g (tare)
mass of flask and 1M HCl	168.8580 g
net mass of 1M HCl	101.2823
	ρ = 1.0128 g/ml

(2) Transfer Am-241 (616.2382.38) to a 40 ml VOA vial

mass of empty VOA vial without lid & 50 ml beaker	54.0248 g (tare)
mass of standard, transfer pipet & 50 ml beaker (initial)	95.0640 g
mass of standard, transfer pipet & 50 ml beaker after transfer	~~74~~ 75.0076 g
net mass of standard transferred	20.0564 g

(3) Dilute to final volume with 1M HCL

mass of empty VOA vial w/o lid & 50 ml beaker (from above)	54.0248 g tare
mass of standard, 1M HCL, VOA vial & 50 ml beaker	92.4609 g
net mass of standard	38.4361 g

(4) final activity calculation

$$\frac{52{,}128.96 \text{ dpm/g}}{38.4361 \text{ g}} \times 20.0564 \text{ g} = \frac{27{,}158.64 \text{ dpm/g}}{27{,}201.49}$$

MC 11/1/07

Continued on Page

Read and Understood By

C Moncavage	4/25/03	Renee Walleyes	5/5/03
Signed	Date	Signed	Date

Am-241 primary dilution

prepare a primary dilution of RSO lolle (NIST: ~~SRM~~ SRS 63651-307) by diluting w/ 1M HCl

1) Determine the density of 1M HCl (Lot # 42223 & Lot # 42216)

mass of 100ml vol flask	62.4712 g (Bal 12)
mass of flask + 1M HCl	163.8021 g
Net mass of ~~std~~ HCl (Bal 12)	101.330909 g

2) Transfer contents of ampule to 40 ml vial

mass of VOA vial w/o lid	22.3577 g (Bal 12)
mass of opened ampule + 50ml beaker	37.9238 g
mass of beaker + empty ampule	32.98162 g
Net mass of std transferred	4.937600 g

3) Dilute std to final vol w/ 1M HCl

mass of VOA vial w/o lid (from above)	22.3577 g (Bal 12)
mass of std + VOA vial + 1M HCl	63.7403 g
Net mass of diluted std	41.382600 g

4) Final Activity Calc

$$\frac{\left(\frac{3.728 \times 10^4 \text{ dps}}{5.11972 \text{ g}}\right)\left(60 \frac{\text{dpm}}{\text{dps}}\right)(4.9376 \text{ g})}{41.3826 \text{ g}} = \cancel{52,000 \text{ dpm/g}}$$

52,128.98 dpm/g

ANALYTICS
1380 Seaboard Ind Blvd. Atlanta, GA 30318 USA 404-352-8677
Am-241
SRS 63651-307 Amount 1.008 µCi QA
Date 4/18/02 12:00 EST Exp. ____
PO # EW040502, Item 3
5.11972 g 1M HCl solution
CAUTION RADIOACTIVE MATERIAL

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[illegible]	10-14-02	[illegible]	2/4/03

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30331 B · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

PRI.FO 0616
rec'd 4-22-02

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

63651-307

Am-241 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Am-241
ACTIVITY (dps):	3.728 E4
HALF-LIFE:	4.322 E2 years
CALIBRATION DATE:	April 18, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.3%
SYSTEMATIC:	3.0%
RANDOM:	0.3%

*99% confidence level.

Impurities: γ-impurities <0.1%

5.11972 grams 1M HCl solution.

P O NUMBER EW040502, Item 3

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: M Rooty 4-19-02

Metals

Case Narrative

Tidewater, Inc.

Phase 1 RI OU2 Great Kills Park -- 2016-007

Work Order Number: 1810475

1. This report consists of 6 water samples.

2. The samples were received intact at ambient temperature by ALS on 10/20/18.

3. The samples had a pH less than 2 upon receipt.

4. The samples were prepared and analyzed based on Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures.

   For analysis by ICP-MS, the samples were digested following method 200.2 and the current revision of SOP 806.

5. Analysis by ICP-MS followed method 200.8 and the current revision of SOP 827.

6. All standards and solutions are NIST traceable and were used within their recommended shelf life.

7. The samples were prepared and analyzed within the established hold times.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.

   - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch.
   - The preparation (method) blank associated with this digestion batch was below the reporting limit for the requested analytes.

   - All laboratory control sample criteria were met.

- All initial and continuing calibration blanks were below the reporting limit for the requested analytes.

- All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.

- The interference check samples associated with Method 200.8 were analyzed.

9. Matrix specific quality control procedures.

   Per method requirements, matrix QC was performed for this analysis. Since a sample from this order number was not the selected quality control (QC) sample, matrix specific QC results are not included in this report.

10. It is a standard practice that samples for ICP-MS are analyzed at a dilution.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Megan Johnstone — 11/28/18
Megan Johnstone
Inorganics Primary Data Reviewer
Date

11/28/18
Inorganics Final Data Reviewer
Date

Inorganic Data Reporting Qualifiers

The following qualifiers are used by the laboratory when reporting results of inorganic analyses:

- Result qualifier -- If the analyte was analyzed for but not detected a “U” is entered.
- QC qualifier -- Specified entries and their meanings are as follows:

  E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

  M - Duplicate injection precision was not met.

  N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

  Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

  * - Duplicate analysis (relative percent difference) not within control limits.

  S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Chain of Custody

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1810475
Client Name: Tidewater, Inc.
Client Project Name: Phase 1 RI OU2 Great Kills Park
Client Project Number: 2016-007
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
OU2-1-SW001	1810475-1		WATER	18-Oct-18	10:10
OU2-1-SW003	1810475-2		WATER	18-Oct-18	11:40
OU2-1-SW004	1810475-3		WATER	18-Oct-18	13:55
REF-1-SW001	1810475-4		WATER	18-Oct-18	15:40
OU1-1-SW005	1810475-5		WATER	19-Oct-18	9:10
OU2-1-SW002	1810475-6		WATER	19-Oct-18	12:50

ALS Environmental

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

Chain-of-Custody

Turnaround time for samples received after 2 p.m. will be calculated beginning from the next business day.
Turnaround time for samples received Saturday will be calculated beginning from the next business day.

ALS WORKORDER # 1810475

TURNAROUND TIME		SAMPLER	John C Schroeder	PAGE	1 of 1
SITE ID				DISPOSAL	BY LAB or RETURN
EDD FORMAT	contact Ryan Wensink				
PURCHASE ORDER					
BILL TO COMPANY	Tidewater				
INVOICE ATTN TO	Ryan Wensink				
ADDRESS	3761 Attucks Drive				
CITY / STATE / ZIP	Powell, OH 43065				
PHONE	614-389-6251				
FAX					
E-MAIL	ryan.wensink@ ~~tidewater~~ tideh2o.net				

PROJECT NAME	Phase I RI OU2 Great Kills Park	
PROJECT No.	2016-007	
COMPANY NAME	Tidewater	
SEND REPORT TO	Ryan Wensink (Tidewater)	
ADDRESS	Devon Chicoine (AECOM)	
CITY / STATE / ZIP	devon.chicoine@aecom.com	
PHONE	(703) 966-5484	
FAX	Collen Scott	
E-MAIL	colleen.scott@aecom.com	

PARAMETER/METHOD REQUEST FOR ANALYSIS

A	Radium 226/228	EPA 903/904
B	Gross Alpha + Beta	EPA 900
C	Total Uranium	EPA 200.8
D		
E		
F		
G		
H		
I		
J		

LAB ID	FIELD ID	MATRIX	SAMPLE DATE	SAMPLE TIME	# OF BOTTLES	PRESERVATIVE	QC	A	B	C	D	E	F	G	H	I	J	SEE NOTES SECTION
1	OU2-1-SW001	W	101818	1010	5	HNO_3		X	X	X								
2	OU2-1-SW003	W	101818	1140	5	HNO_3		X	X	X								
3	OU2-1-SW004	W	101818	1355	5	HNO_3		X	X	X								
4	REF-1-SW001	W	~~101818~~ 101818	1540	5	HNO_3		X	X	X								
5	OU1-1-SW005	W	101918	0910	5	HNO_3		X	X	X								
6	OU2-1-SW002	W	101918	1250	5	HNO_3		X	X	X								

10/19/18

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

NOTES

REPORT LEVEL / QC REQUIRED	
	Summary (Standard QC)
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw

Form 202r9

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	John C Schroeder	John C Schroeder	10/19/18	1900
RECEIVED BY	Fed Ex	Fed Ex	10/19/18	1900
RELINQUISHED BY	FED EX			
RECEIVED BY	C Trimble	C Trimble	10-20-18	0930
RELINQUISHED BY				
RECEIVED BY				

PRESERVATION KEY 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaOH/ZnAcetate 6-NaHSO4 7-4°C 8-Other

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Tidewater Workorder No: 1810475

Project Manager: LS Initials: CDT Date: 10-20-18

1.	Are airbills / shipping documents present and/or removable?	DROP OFF	YES	NO
2.	Are custody seals on **shipping** containers intact?	NONE	YES	NO
3.	Are custody seals on **sample** containers intact?	NONE	YES	NO
4.	Is there a COC (chain-of-custody) present?		YES	NO
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		YES	NO
6.	Are short-hold samples present?		YES	NO
7.	Are all samples within holding times for the requested analyses?		YES	NO
8.	Were all sample containers received intact? (not broken or leaking)		YES	NO
9.	Is there sufficient sample for the requested analyses?		YES	NO
10.	Are all samples in the proper containers for the requested analyses?		YES	NO
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)	N/A	YES	NO
12.	Are all aqueous non-preserved samples pH 4-9?	N/A	YES	NO
13.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	N/A	YES	NO
14.	Were the samples shipped on ice?		YES	NO
15.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #1 #3 #4	RAD ONLY	YES	NO

Cooler #:	1	2						
Temperature (°C):	Amb	Amb						
No. of custody seals on cooler:	1	1						
DOT Survey/ Acceptance Information — External µR/hr reading:	12	11						
Background µR/hr reading:	11							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

Additional Information: **Please provide details here for any NO responses to gray-shaded boxes above, or any other issues noted:**

All client bottle ID's vs ALS lab ID's double-checked by: CAT

If applicable, was the client contacted? **YES / NO / NA** Contact: _____ Date/Time: _____

Project Manager Signature / Date: 10/20/18

Form 201r26.xls
(06/29/2018)

*IR Gun #1, VWR SN 170560549
*IR Gun #3, VWR SN 170647571
*IR Gun #4, Oakton, SN 2372220101-0002

1810475

SAMPLES RECEIVING
ALS ENVIRONMENTAL
225 COMMERCE DR

FORT COLLINS CO 80524

FedEx

1 of 2

7833 4373 4828

MASTER

XO FTCA

SATURDAY 12:00P
PRIORITY OVERNIGHT
AHS
80524
CO - US DEN

1810470

ORIGIN ID:LDJA (614) 389-6251
TIDEWATER
6625 SELNICK DR STE A

ELKRIDGE, MD 21075
UNITED STATES US

SHIP DATE: 19OCT18
ACTWGT: 36.40 LB
CAD: 6991560/SSF0192
DIMS: 24x13x13 IN

BILL THIRD PARTY

TO SAMPLES RECEIVING
ALS ENVIRONMENTAL
225 COMMERCE DR

FORT COLLINS CO 80524
(999) 999-9999
INV:
PO:
REF:
DEPT:

2 of 2
MPS# 0263 7833 4373 4839
Mstr# 7833 4373 4828
XO FTCA

0201

SATURDAY 12:00
PRIORITY OVERNIGHT
AH
80524
CO-US DEN

Sample Results

Total Recoverable URANIUM

Method EPA200.8 Revision 5.4

Sample Results

Lab Name: **ALS -- Fort Collins**
Client Name: Tidewater, Inc.
Client Project ID: Phase 1 RI OU2 Great Kills Park 2016-007
Work Order Number: 1810475 **Final Volume:** 50 ml
Reporting Basis: As Received **Matrix:** WATER
Prep Method: EPA200.22.2 **Result Units:** UG/L
Analyst: Brent A. Stanfield

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit/ LOQ/LOD	Flag	Sample Aliquot
OU2-1-SW001	1810475-1	10/18/2018	11/03/2018	11/09/2018	N/A	10	0.53	0.1		50 ml
OU2-1-SW003	1810475-2	10/18/2018	11/03/2018	11/09/2018	N/A	10	0.41	0.1		50 ml
OU2-1-SW004	1810475-3	10/18/2018	11/03/2018	11/09/2018	N/A	10	0.21	0.1		50 ml
REF-1-SW001	1810475-4	10/18/2018	11/03/2018	11/09/2018	N/A	10	0.36	0.1		50 ml
OU1-1-SW005	1810475-5	10/19/2018	11/03/2018	11/09/2018	N/A	10	0.58	0.1		50 ml
OU2-1-SW002	1810475-6	10/19/2018	11/03/2018	11/09/2018	N/A	10	0.25	0.1		50 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *IM1810475-1*

Summary Report Forms

Metals by 200.8

Method EPA200.8 Revision 5.4

Method Blank

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Lab ID: IP181103-2MB

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 03-Nov-18
Date Analyzed: 09-Nov-18
Prep Method: EPA200.2 Rev 2.2

Prep Batch: IP181103-2
QCBatchID: IP181103-2-1
Run ID: IM181109-10A8
Cleanup: NONE
Basis: N/A
File Name: 082SMPL_

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	DF	Result	Result Qualifier	LOQ	LOD
7440-61-1	URANIUM	10	0.1	U	0.11	0.1

Data Package ID: *IM1810475-1*

Metals by 200.8

Method EPA200.8 Revision 5.4

Laboratory Control Sample

Lab Name: ALS -- Fort Collins
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Lab ID: IM181103-2LCS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 11/03/2018
Date Analyzed: 11/09/2018
Prep Method: EPA200.22.2

Prep Batch: IP181103-2
QCBatchID: IP181103-2-1
Run ID: IM181109-10A8
Cleanup: NONE
Basis: N/A
File Name: 083SMPL_

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-61-1	URANIUM	10	9.92	0.1		99	85 - 115%

Data Package ID: *IM1810475-1*

Prep Batch ID: IP181103-2

Start Date: 11/03/18
Start Time: 11:18
Prep Analyst: Jill M. Latelle

End Date: 11/03/18
End Time: 18:00

Concentration Method: NONE
Extract Method: EPA200.22.2
Initial Volume Units: ml
Final Volume Units: ml

Batch Created By: jml
Date Created: 11/03/18
Time Created: 11:18
Validated By: jml
Date Validated: 11/03/18
Time Validated: 11:58

Comments:

QC Batch ID: IP181103-2-1

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IP181103-2	MB	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1810637
IM181103-2	LCS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1810637
1810637-1	MS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1810637
1810637-2	MS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1810637
1810637-1	MSD	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1810637
1810637-2	MSD	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1810637
1810475-1	SMP	OU2-1-SW001	WATER	10/18/2018	50	50	NONE	1	1810475
1810475-2	SMP	OU2-1-SW003	WATER	10/18/2018	50	50	NONE	1	1810475
1810475-3	SMP	OU2-1-SW004	WATER	10/18/2018	50	50	NONE	1	1810475
1810475-4	SMP	REF-1-SW001	WATER	10/18/2018	50	50	NONE	1	1810475
1810475-5	SMP	OU1-1-SW005	WATER	10/19/2018	50	50	NONE	1	1810475
1810475-6	SMP	OU2-1-SW002	WATER	10/19/2018	50	50	NONE	1	1810475
1810637-1	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1810637
1810637-2	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1810637
1810637-3	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1810637
1811004-21	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1811004
1811004-22	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1811004
1811004-23	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1811004
1811004-24	SMP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1811004

QC Types

CAR	Carrier reference sample	DUP	Laboratory Duplicate
LCS	Laboratory Control Sample	LCSD	Laboratory Control Sample Duplicat
MB	Method Blank	MS	Laboratory Matrix Spike
MSD	Laboratory Matrix Spike Duplicate	REP	Sample replicate
RVS	Reporting Level Verification Standar	SMP	Field Sample
SYS	Sample Yield Spike		

URANIUM

Method SW6020

Calibration Verifications

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Run ID: IM181109-10A8
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
ICV	Initial Calibration	11/9/2018	10:30	0.002	0.00200	0.00001	N/A	100	90 - 110
CCV9	Continuing Calibration	11/9/2018	15:39	0.001	0.00103	0.00001	N/A	103	90 - 110
CCV10	Continuing Calibration	11/9/2018	16:24	0.001	0.00102	0.00001	N/A	101	90 - 110

Data Package ID: *IM1810475-1*

URANIUM

Method SW6020

Calibration Blanks

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Run ID: IM181109-10A8
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Result	Reporting Limit	Flag
ICB	Initial Calibration	11/9/2018	10:36	0.00001	0.00001	U
CCB9	Continuing Calibration	11/9/2018	15:45	0.00001	0.00001	U
CCB10	Continuing Calibration	11/9/2018	16:30	0.00001	0.00001	U

Data Package ID: *IM1810475-1*

ICPMS Metals

Method SW6020

ICP Interference Check Sample

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Run ID: IM181109-10A8
Date Analyzed: 11/09/2018
Result Units: MG/L

CASNO	Target Analyte	Spike Added		Results		% Rec.
		ICSA1	ICSAB1	ICSA1	ICSAB1	
7440-61-1	URANIUM		0.001		0.00102	102

Data Package ID: *IM1810475-1*

Metals Linear Ranges

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1810475
Client Name: Tidewater, Inc.
ClientProject ID: Phase 1 RI OU2 Great Kills Park 2016-007

Instrument ID: ICPMS2
Active Date: 03/14/2016
Expiration Date: 06/12/2020

CASNO	Target Analyte	Concentration (ppm)
7440-61-1	URANIUM	0.1

ICPMS2 Run Log -- 11/9/2018

Instrument ID: ICPMS2
File Name: 001CALB.
AnalRunID: IM181109-10A1
CalibRefID: IM181109-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		RINSE	1	11/9/2018	08:54
		RINSE	1	11/9/2018	09:00
		BLANK	1	11/9/2018	09:06
		H/1000	1	11/9/2018	09:12
		H/100	1	11/9/2018	09:15
		H/10	1	11/9/2018	09:18
		HIGH	1	11/9/2018	09:21
		RINSE	1	11/9/2018	10:27
		ICV	1	11/9/2018	10:30
		ICB	1	11/9/2018	10:36
		LIV	1	11/9/2018	10:42
		ICSA1	1	11/9/2018	10:46
		ICSAB1	1	11/9/2018	10:52
		CCV1	1	11/9/2018	10:58
		CCB1	1	11/9/2018	11:04
Ag,Al,As,B,Ba,Be,Ca,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y,Zn		IP181101-5MB	10	11/9/2018	11:07
Ag,Al,As,B,Ba,Be,Ca,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y,Zn		IM181101-5LCS	10	11/9/2018	11:10
		1810184-1	100	11/9/2018	11:15
		1810184-2	100	11/9/2018	11:18
		1810184-3	100	11/9/2018	11:21
		1810184-4	100	11/9/2018	11:24
		1810184-5	100	11/9/2018	11:27
		1810184-6	100	11/9/2018	11:30
		1810184-7	100	11/9/2018	11:33
		1810184-8	100	11/9/2018	11:36
		CCV2	1	11/9/2018	11:42
		CCB2	1	11/9/2018	11:48
		1810184-18	100	11/9/2018	11:51
Ag,Al,As,B,Ba,Be,Ca,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y,Zn		1810203-2	10	11/9/2018	11:54
Ag,Al,As,B,Ba,Be,Ca,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y,Zn		1810203-2SER	50	11/9/2018	11:57
Ag,Al,As,B,Ba,Be,Ca,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y,Zn		1810203-2MS	10	11/9/2018	12:00
Ag,Al,As,B,Ba,Be,Ca,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y,Zn		1810203-2MSD	10	11/9/2018	12:03
Ag,Al,As,B,Ba,Be,Ca,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y,Zn		1810203-4	10	11/9/2018	12:09
		CCV3	1	11/9/2018	12:15
		CCB3	1	11/9/2018	12:21

Data Package ID: IM1810475-1

ICPMS2 Run Log -- 11/9/2018

Instrument ID: ICPMS2
File Name: 029SMPL_
AnalRunID: IM181109-10A1
CalibRefID: IM181109-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		IP181101-6MB	10	11/9/2018	12:24
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		IM181101-6LCS	10	11/9/2018	12:27
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-1	10	11/9/2018	12:33
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-2	10	11/9/2018	12:36
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-3	10	11/9/2018	12:39
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-4	10	11/9/2018	12:42
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-5	10	11/9/2018	12:45
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-6	10	11/9/2018	12:48
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-7	10	11/9/2018	12:51
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-8	10	11/9/2018	12:54
		CCV4	1	11/9/2018	13:00
		CCB4	1	11/9/2018	13:06
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-9	10	11/9/2018	13:09
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-10	10	11/9/2018	13:12
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-11	10	11/9/2018	13:15
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-12	10	11/9/2018	13:18
Ag,Al,As,B,Ba,Be,Ca,Cd,Ce,Co,Cr,Cu,Fe,K,La,Li,Mg,Mn,Mo,Na,Nd,Ni,Pb,Pr,Sb,Sn,Sr,Th,Ti,Tl,U,V,Y		1810182-13	10	11/9/2018	13:21
		CCV5	1	11/9/2018	13:27
		CCB5	1	11/9/2018	13:33
		IP181102-1MB	10	11/9/2018	13:36
		IM181102-1LCS	10	11/9/2018	13:39
		1810328-12	10	11/9/2018	13:45
		CCV6	1	11/9/2018	13:51
		CCB6	1	11/9/2018	13:57
		IP181102-2MB	10	11/9/2018	14:00
		IM181102-2LCS	10	11/9/2018	14:03
		1810247-4	10	11/9/2018	14:09
		1810247-4SER	50	11/9/2018	14:12
		1810247-4MS	10	11/9/2018	14:15
		1810247-4MSD	10	11/9/2018	14:18
		1810247-7	10	11/9/2018	14:24
		1810247-9	10	11/9/2018	14:27
		1810330-16	10	11/9/2018	14:30
		1810444-1	10	11/9/2018	14:33
		CCV7	1	11/9/2018	14:39

Data Package ID: IM1810475-1

ICPMS2 Run Log -- 11/9/2018

Instrument ID: ICPMS2
File Name: 064SMPL_
AnalRunID: IM181109-10A1
CalibRefID: IM181109-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		CCB7	1	11/9/2018	14:45
		1810444-2	10	11/9/2018	14:48
		1810444-3	10	11/9/2018	14:51
		1810444-4	10	11/9/2018	14:54
		1810444-5	10	11/9/2018	14:57
		1810444-6	10	11/9/2018	15:00
		1810444-7	10	11/9/2018	15:03
		1810444-8	10	11/9/2018	15:06
		1810444-9	10	11/9/2018	15:09
		1810444-10	10	11/9/2018	15:12
		1810444-11	10	11/9/2018	15:15
		CCV8	1	11/9/2018	15:21
		CCB8	1	11/9/2018	15:27
		1810444-12	10	11/9/2018	15:30
		1810444-13	10	11/9/2018	15:33
		CCV9	1	11/9/2018	15:39
		CCB9	1	11/9/2018	15:45
		FP181030-2MB	10	11/9/2018	15:48
		IP181103-2MB	10	11/9/2018	15:51
		IM181103-2LCS	10	11/9/2018	15:54
	OU2-1-SW001	1810475-1	10	11/9/2018	16:00
	OU2-1-SW003	1810475-2	10	11/9/2018	16:03
	OU2-1-SW004	1810475-3	10	11/9/2018	16:06
	REF-1-SW001	1810475-4	10	11/9/2018	16:09
	OU1-1-SW005	1810475-5	10	11/9/2018	16:12
	OU2-1-SW002	1810475-6	10	11/9/2018	16:15
		1810601-1	10	11/9/2018	16:18
		CCV10	1	11/9/2018	16:24
		CCB10	1	11/9/2018	16:30
		1810612-1	10	11/9/2018	16:33
		1810612-3	10	11/9/2018	16:36
		1810612-4	10	11/9/2018	16:39
		1810628-1	10	11/9/2018	16:42
		1810637-1	10	11/9/2018	16:45
		1810637-1SER	50	11/9/2018	16:48

Data Package ID: IM1810475-1

ICPMS2 Run Log -- 11/9/2018

Instrument ID: ICPMS2
File Name: 099SMPL_
AnalRunID: IM181109-10A1
CalibRefID: IM181109-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		1810637-1MS	10	11/9/2018	16:51
		1810637-1MSD	10	11/9/2018	16:54
		1810637-2	10	11/9/2018	17:00
		1810637-2SER	50	11/9/2018	17:03
		CCV11	1	11/9/2018	17:09
		CCB11	1	11/9/2018	17:15
		1810637-2MS	10	11/9/2018	17:18
		1810637-2MSD	10	11/9/2018	17:21
		1810637-3	10	11/9/2018	17:27
		1811004-21	10	11/9/2018	17:30
		1811004-22	10	11/9/2018	17:33
		1811004-23	10	11/9/2018	17:36
		1811004-24	10	11/9/2018	17:39
		CCV12	1	11/9/2018	17:45
		CCB12	1	11/9/2018	17:51
		IP181105-1MB	10	11/9/2018	17:54
		IM181105-1	10	11/9/2018	17:57
		IM181105-1LCS	10	11/9/2018	18:00
		1810412-1	10	11/9/2018	18:06
		1810412-1SER	50	11/9/2018	18:09
		1810412-1MS	10	11/9/2018	18:12
		1810412-1MSD	10	11/9/2018	18:15
		1810412-2	10	11/9/2018	18:21
		1810412-3	10	11/9/2018	18:24
		1810412-4	10	11/9/2018	18:27
		CCV13	1	11/9/2018	18:33
		CCB13	1	11/9/2018	18:38
		1810412-5	10	11/9/2018	18:42
		1810412-6	10	11/9/2018	18:45
		1810412-7	10	11/9/2018	18:48
		1810412-8	10	11/9/2018	18:51
		1810412-9	10	11/9/2018	18:54
		1810412-10	10	11/9/2018	18:57
		1810412-11	10	11/9/2018	19:00
		1810412-12	10	11/9/2018	19:03

Data Package ID: IM1810475-1

ICPMS2 Run Log -- 11/9/2018

Instrument ID: ICPMS2
File Name: 134SMPL_
AnalRunID: IM181109-10A1
CalibRefID: IM181109-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		1810506-1	10	11/9/2018	19:06
		1810506-2	10	11/9/2018	19:09
		CCV14	1	11/9/2018	19:15
		CCB14	1	11/9/2018	19:20
		1810506-5	10	11/9/2018	19:23
		1810506-6	10	11/9/2018	19:26
		1810544-2	10	11/9/2018	19:29
		1810544-3	10	11/9/2018	19:32
		1810544-4	10	11/9/2018	19:35
		1811031-1	10	11/9/2018	19:38
		CCV15	1	11/9/2018	19:44
		CCB15	1	11/9/2018	19:50
		IP181104-5MB	10	11/9/2018	19:53
		IM181104-5LCS	10	11/9/2018	19:56
		1810328-1	10	11/9/2018	20:02
		1810328-2	10	11/9/2018	20:05
		1810328-3	10	11/9/2018	20:08
		1810328-4	10	11/9/2018	20:11
		1810328-5	10	11/9/2018	20:14
		1810328-6	10	11/9/2018	20:17
		1810328-7	10	11/9/2018	20:20
		1810328-8	10	11/9/2018	20:23
		CCV16	1	11/9/2018	20:29
		CCB16	1	11/9/2018	20:35
		1810328-9	10	11/9/2018	20:38
		1810328-10	10	11/9/2018	20:41
		1810328-11	10	11/9/2018	20:44
		1810328-13	10	11/9/2018	20:47
		1810328-13SER	50	11/9/2018	20:50
		1810328-13MS	10	11/9/2018	20:53
		1810328-13MSD	10	11/9/2018	20:56
		1810328-13A	10	11/9/2018	20:59
		1810328-14	10	11/9/2018	21:05
		1810328-15	10	11/9/2018	21:08
		CCV17	1	11/9/2018	21:14

Data Package ID: IM1810475-1

ICPMS2 Run Log -- 11/9/2018

Instrument ID: ICPMS2
File Name: 169SMPL_
AnalRunID: IM181109-10A1
CalibRefID: IM181109-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		CCB17	1	11/9/2018	21:20
		1810328-16	10	11/9/2018	21:23
		1810328-17	10	11/9/2018	21:26
		1810328-18	10	11/9/2018	21:29
		1810328-19	10	11/9/2018	21:32
		1810328-20	10	11/9/2018	21:35
		1810328-21	10	11/9/2018	21:38
		CCV18	1	11/9/2018	21:44
		CCB18	1	11/9/2018	21:50
		IP181104-3MB	10	11/9/2018	21:53
		IM181104-3LCS	10	11/9/2018	21:56
		1810195-1	10	11/9/2018	22:02
		1810195-2	10	11/9/2018	22:05
		1810195-3	10	11/9/2018	22:08
		1810195-4	10	11/9/2018	22:11
		1810195-5	10	11/9/2018	22:14
		1810195-6	10	11/9/2018	22:17
		1810195-7	10	11/9/2018	22:20
		1810195-7SER	50	11/9/2018	22:23
		CCV19	1	11/9/2018	22:29
		CCB19	1	11/9/2018	22:35
		1810195-7MS	10	11/9/2018	22:38
		1810195-7MSD	10	11/9/2018	22:41
		1810195-7A	10	11/9/2018	22:44
		1810195-8	10	11/9/2018	22:50
		1810195-9	10	11/9/2018	22:53
		1810195-11	10	11/9/2018	22:56
		1810195-12	10	11/9/2018	22:59
		1810195-13	10	11/9/2018	23:02
		1810195-14	10	11/9/2018	23:05
		1810195-15	10	11/9/2018	23:08
		CCV20	1	11/9/2018	23:14
		CCB20	1	11/9/2018	23:20
		1810195-16	10	11/9/2018	23:23
		1810195-17	10	11/9/2018	23:26

Data Package ID: IM1810475-1

ICPMS2 Run Log -- 11/9/2018

Instrument ID: ICPMS2
File Name: 204SMPL_
AnalRunID: IM181109-10A1
CalibRefID: IM181109-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		1810195-18	10	11/9/2018	23:29
- U,V		1810195-19	10	11/9/2018	23:32
- U,V		1810195-19SER	50	11/9/2018	23:35
- U,V		1810195-19MS	10	11/9/2018	23:38
- U,V		1810195-19MSD	10	11/9/2018	23:41
- U,V		1810195-19A	10	11/9/2018	23:44
		1810195-20	10	11/9/2018	23:50
		CCV21	1	11/9/2018	23:55
		CCB21	1	11/10/2018	00:01

Data Package ID: IM1810475-1

Raw Data

Header Information for Analytical Sequence 18K09i00

Instrument: Agilent ICPMS Model 7700X; Serial No. JP09400112
Software Revision: B.01.01
Date of Analysis: 11/09/2018
Analyst: Brent A. Stanfield

Calibration Standards

High Calibration Standard: ST180305-3 (expires 09/30/2020)
This standard contains the following elements at the listed concentrations (ng/ml).

100,000 - Na
50,000 – Ca, K
10,000 - Mg
5,000 – Fe, Al
3,000 - Ti
2,000 – Zn
1,000 – B, Cu, Li
500 – Cr, Ni, Sn
200 - Mn
100 – V, Co, As, Se, Mo, Ba, Sr
50 – Pb, Be
30 – Sb, Cd, La, Ce, Pr, Nd
20 - Y
10 – Th, U, Ag
2 - Tl

1/10,1/100, and 1/1000 dilutions of the High Calibration Standard are prepared daily to provide additional calibration standards.

ICV

The ICV is prepared by diluting 1ml of the 2nd Source intermediate (ST181018-1, expires 03/08/2019) to 5ml giving the following concentrations (ng/ml).

20,000 – Na
10,000 – Ca, K
2,000 – Mg
1,000 – Fe, Al
400 – Zn, Ti
200 – B, Cu, Li
100 – Cr, Ni, Sn
60 -- Nd
40 – Mn
20 – V, Co, As, Se, Mo, Ba, Sr
10 – Pb, Be
6 – Sb, Cd, Y, La, Ce, Pr, Nd
2 – Th, U, Ag
0.4 - Tl

LIV

The LIV is prepared by diluting 0.05ml of the Reporting Limit Verification Spike Solution (ST181018-3 expires 09/30/2020) to 50ml giving the following concentrations (ng/ml).

100 – Na, Ca, K
20 – Ti
15 – B
10 – Al, Fe, Mg, Zn
2 – Cu, Li, Ni
1 – Cr, Se, Sn
0.5 – Ba, Co, Mn, Sr, V
0.2 – As, Cd, Mo, Pb
0.1 – Sb
0.05 – Ag, Be, Ce, La, Nd, Pr, Y
0.02 – Th
0.01– U, Tl

ICSA

The ICSA is prepared by diluting 0.5ml of ICSA intermediate (ST150423-1, expires 04/03/2018) to a final volume of 50ml giving the following concentrations (ng/ml).

42,500,000 – Cl
30,000 – Ca
25,000 – Fe, Na
20,000 – C
10,000 – Al, K, Mg, P, S
200 – Mo, Ti

ICSAB

The ICSAB is prepared by diluting 0.5ml of ICSA intermediate (ST150423-1, expires 04/03/2018) and 5ml of High Calibration Standard: ST180305-3 (expires 09/30/2020) to a final volume of 50ml. The ICSAB contains the following elements at the listed concentrations (ng/ml).

42,500,000 – Cl
35,000 – Ca, Na
25,500 – Fe
20,000 – C
15,000 – K
11,000 – Mg
10,500 – Al
10,000 – P, S
400 - Ti
210 – Mo
200 – Zn
100 – B, Cu, Li
50 – Cr, Ni, Sn
20 – Mn
10 – V, Co, As, Se, Ba, Sr
5 – Pb, Be
3 – Sb, Cd, Y, La, Ce, Pr, Nd
1 – Th, U, Ag
0.2 - Tl

CCV

The CCV is prepared by diluting 5ml of the High Calibration Standard: ST180305-3 (expires 09/30/2020) to a final volume of 50ml. The CCV contains the following elements at the listed concentrations (ng/ml).

10,000 - Na
5,000 – Ca, K
1,000 - Mg
500 – Fe, Al
300 - Ti
200 – Zn
100 – B, Cu, Li
50 – Cr, Ni, Sn
20 - Mn
10 – V, Co, As, Se, Mo, Ba, Sr
5 – Pb, Be
3 – Sb, Cd, La, Ce, Pr, Nd
2 - Y
1 – Th, U, Ag
0.2 - Tl

Linear Dynamic Range Standards

LDR-Ca,Na,K

The LDR-Ca,Na,K standard is prepared by diluting 1ml of the High Calibration Standard Intermediate Mix (ST180305-2, expires 09/30/2020) to a final volume of 10ml. The LDR-Ca,Na,K standard contains the following elements at the listed concentrations (ng/ml).

100,000 - Mg
50,000 – Fe, Al
30,000 - Ti
20,000 – Zn
10,000 – B, Cu, Li
5,000 – Cr, Ni, Sn
2,000 – Mn
1,000 – V, Co, As, Se, Mo, Ba, Sr
500 – Pb, Be
300 – Sb, Cd, La, Ce, Pr, Nd
200 – Y
100 – Th, U, Ag
20 - Tl

1000 Na

The 1000 Na standard is prepared by diluting 1ml of the 10000mg/L Na stock solution (ST140409-4, expires 12/31/2020) to a final volume of 10ml. The 1000 Na standard contains Na at 1000000 ng/ml.

500 Ca

The 500 Ca standard is prepared by diluting 0.5ml of the 10000mg/L Ca stock solution (ST140409-5, expires 04/30/2021) to a final volume of 10ml. The 500 Ca standard contains Ca at 500000 ng/ml.

500 K

The 500 K standard is prepared by diluting 0.5ml of the 10000mg/L K stock solution (ST140409-6, expires 01/31/2021) to a final volume of 10ml. The 500 K standard contains K at 500000 ng/ml.

Linear Dynamic Range

The instrument Linear Dynamic Range (LDR) is determined at least every 6 months. The current LDR was determined on 10/18/2018. The instrument LDR is given below (ng/ml).

1,000,000 - Na
500,000 – Ca, K
100,000 - Mg
50,000 – Fe, Al
30,000 - Ti
20,000 – Zn
10,000 – B, Cu, Li
5,000 – Cr, Ni, Sn
2,000 - Mn
1,000 – V, Co, As, Se, Mo, Ba, Sr
500 – Pb, Be
30 – Sb, Cd, La, Ce, Pr, Nd
200 - Y
100 – Th, U, Ag
20 - Tl

ICB/CCB and all diluent

1% HNO_3, 1%HCl in double deionized water

HNO_3 Lot No. 137345
HCl Lot No. 132880

Internal Standards

The internal standard intermediate contains 4 PPM each of Ga, Ge, Pt, In, Rh, Bi and Sc. This intermediate is added to all standards and samples in the same proportion by a peristaltic pump.

Pipet ID Numbers

1.0 to 5.0 ml -- M-87
0.1 to 1.0ml -- M-60
0.01 to 0.1ml -- M-56

Dilutions

2X dilutions made by diluting 5ml of sample to 10ml final volume
5X dilutions made by diluting 1ml of sample to 5ml final volume
10X dilutions made by diluting 1ml of sample to 10ml final volume
50X dilutions made by diluting 0.1ml of sample to 5ml final volume
100X dilutions made by diluting 0.1ml of sample to 10ml final volume
200X dilutions made by diluting 0.05ml of sample to 10ml final volume
500X dilutions made by diluting 0.02ml of sample to 10ml final volume

Analytical Spikes

1810328-13A, 1810195-7A, and 1810195-19A were post spiked by diluting ST180305-2 and ST180709-5 500 fold then ten-fold dilution of the sample digestates.

Daily Maintenance Items

1. Check / change pump tubing
2. Check / clean drain containers
3. Tune instrument per manufacturer's procedures
4. Perform resolution / mass calibration / stability test and print QC tune report

Monthly Maintenance Items

1. Check / clean torch and cones
2. Check / clean nebulizer and spray chamber
3. Check / fill water recirculating reservoir
4. Check / fill vacuum pump oil

Additional Comments

No additional comments.

QC Tune Report

Data File: C:\ICPMH\1\7500\QCTUNE.D
Date Acquired: 9 Nov 2018 08:46:41 am
Operator:
Misc Info:
Vial Number: 0
Current Method: C:\ICPMH\1\METHODS\2008TUNE.m

Minimum Response(CPS)

Element	Actual	Required	Flag

RSD (%)

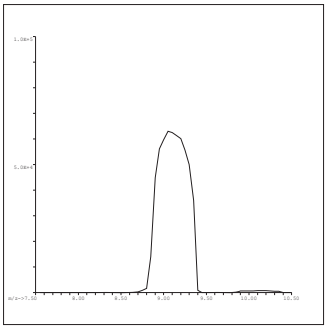
Element	Actual	Required	Flag
9 Be	1.44	5.00	
24 Mg	0.49	5.00	
25 Mg	1.33	5.00	
26 Mg	0.99	5.00	
59 Co	0.61	5.00	
115 In	0.44	5.00	
206 Pb	0.48	5.00	
207 Pb	1.05	5.00	
208 Pb	0.43	5.00	

Ion Ratio

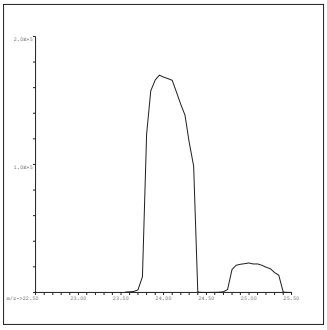
Element	Actual	Required	Flag

Maximum Bkg. Count(CPS)

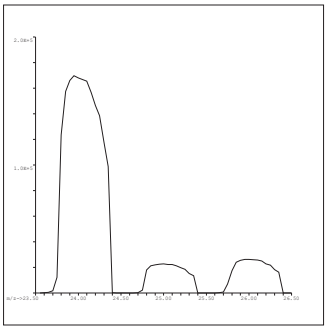
Element	Actual	Required	Flag



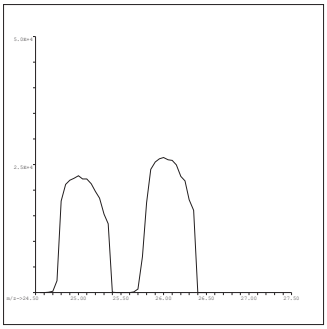
9 Be
Mass Calib.
Actual: 9.10
Required: 8.90-9.10
Flag:
Peak Width
Actual: 0.50
Required: 0.80
Flag:



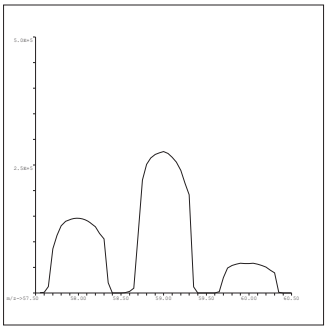
24 Mg
Mass Calib.
Actual: 24.00
Required: 23.90-24.10
Flag:
Peak Width
Actual: 0.60
Required: 0.80
Flag:



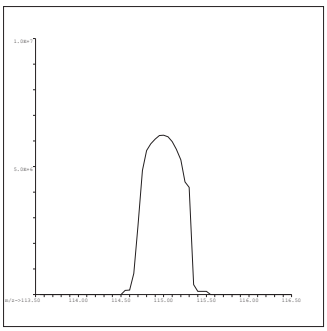
25 Mg
Mass Calib.
Actual: 25.00
Required: 24.90-25.10
Flag:
Peak Width
Actual: 0.60
Required: 0.80
Flag:



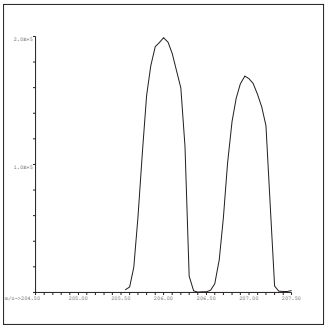
26 Mg
Mass Calib.
Actual: 26.00
Required: 25.90-26.10
Flag:
Peak Width
Actual: 0.60
Required: 0.80
Flag:



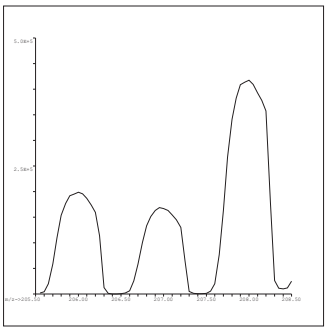
59 Co
Mass Calib.
Actual: 59.00
Required: 58.90-59.10
Flag:
Peak Width
Actual: 0.60
Required: 0.80
Flag:



115 In
Mass Calib.
Actual: 115.00
Required: 114.90-115.10
Flag:
Peak Width
Actual: 0.65
Required: 0.80
Flag:

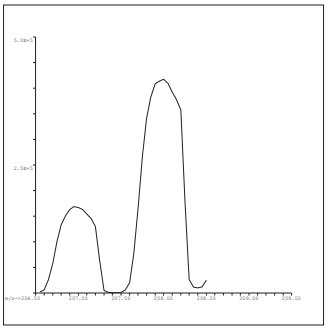


206 Pb
Mass Calib.
Actual: 206.00
Required: 205.90-206.10
Flag:
Peak Width
Actual: 0.65
Required: 0.80
Flag:



207 Pb
Mass Calib.
Actual: 207.00
Required: 206.90-207.10
Flag:
Peak Width
Actual: 0.60
Required: 0.80
Flag:

C:\ICPMH\1\7500\QCTUNE.D



208 Pb
Mass Calib.
   Actual: 208.00
   Required: 207.90-208.10
   Flag:
Peak Width
   Actual: 0.60
   Required: 0.80
   Flag:

QC Tune Result:Pass

Batch Summary Report

Batch Folder: C:¥ICPMH¥1¥DATA¥18K09i00.B¥
Analysis File: 18K09i00.batch.xml
Tune Step: #1 nogas.u
#2 hehe.u

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
1		11/9/2018 08:54:52	001CALB.D	RINSE	CalBlk	1	1.0000
2		11/9/2018 09:00:48	002CALB.D	RINSE	CalBlk	1	1.0000
3		11/9/2018 09:06:47	003CALB.D	BLANK	CalBlk	1	1.0000
4		11/9/2018 09:12:46	004CALS.D	H/1000	CalStd	2	1.0000
5		11/9/2018 09:15:48	005CALS.D	H/100	CalStd	3	1.0000
6		11/9/2018 09:18:48	006CALS.D	H/10	CalStd	4	1.0000
7		11/9/2018 09:21:47	007CALS.D	HIGH	CalStd	5	1.0000
8		11/9/2018 10:27:23	001SMPL_18K09k00.D	RINSE	Sample		1.0000
9		11/9/2018 10:30:35	002SMPL_18K09k00.D	ICV	6-ICV		1.0000
10		11/9/2018 10:36:30	003SMPL_18K09k00.D	ICB	6-CCB		1.0000
11		11/9/2018 10:42:29	004SMPL_18K09k00.D	LIV	RLCV		1.0000
12		11/9/2018 10:46:15	005SMPL_18K09k00.D	ICSA	6-ICSA		1.0000
13		11/9/2018 10:52:12	006SMPL_18K09k00.D	ICSAB	6-ICSAB		1.0000
14		11/9/2018 10:58:07	007SMPL_18K09k00.D	CCV	6-CCV		1.0000
15		11/9/2018 11:04:03	008SMPL_18K09k00.D	CCB	6-CCB		1.0000
16		11/9/2018 11:07:03	009SMPL_18K09k00.D	IP181101-5MB 10X	6-CCB		1.0000
17		11/9/2018 11:10:04	010SMPL_18K09k00.D	IM181101-5LCS 10X	6-LCS		1.0000
18		11/9/2018 11:15:59	011SMPL_18K09k00.D	1810184-1 100X	Sample		1.0000
19		11/9/2018 11:18:58	012SMPL_18K09k00.D	1810184-2 100X	Sample		1.0000
20		11/9/2018 11:21:56	013SMPL_18K09k00.D	1810184-3 100X	Sample		1.0000
21		11/9/2018 11:24:57	014SMPL_18K09k00.D	1810184-4 100X	Sample		1.0000
22		11/9/2018 11:27:56	015SMPL_18K09k00.D	1810184-5 100X	Sample		1.0000
23		11/9/2018 11:30:57	016SMPL_18K09k00.D	1810184-6 100X	Sample		1.0000
24		11/9/2018 11:33:57	017SMPL_18K09k00.D	1810184-7 100X	Sample		1.0000
25		11/9/2018 11:36:57	018SMPL_18K09k00.D	1810184-8 100X	Sample		1.0000
26		11/9/2018 11:42:52	019SMPL_18K09k00.D	CCV	6-CCV		1.0000
27		11/9/2018 11:48:49	020SMPL_18K09k00.D	CCB	6-CCB		1.0000

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
28		11/9/2018 11:51:49	021SMPL_18K09k00.D	1810184-18 100X	Sample		1.0000
29		11/9/2018 11:54:51	022SMPL_18K09k00.D	1810203-2 10X	Sample		1.0000
30		11/9/2018 11:57:51	023SMPL_18K09k00.D	1810203-2L 50X	Sample		1.0000
31		11/9/2018 12:00:53	024SMPL_18K09k00.D	1810203-2MS 10X	Sample		1.0000
32		11/9/2018 12:03:52	025SMPL_18K09k00.D	1810203-2MSD 10X	Sample		1.0000
33		11/9/2018 12:09:48	026SMPL_18K09k00.D	1810203-4 10X	Sample		1.0000
34		11/9/2018 12:15:45	027SMPL_18K09k00.D	CCV	6-CCV		1.0000
35		11/9/2018 12:21:40	028SMPL_18K09k00.D	CCB	6-CCB		1.0000
36		11/9/2018 12:24:41	029SMPL_18K09k00.D	IP181101-6MB 10X	6-CCB		1.0000
37		11/9/2018 12:27:41	030SMPL_18K09k00.D	IM181101-6LCS 10X	6-LCS		1.0000
38		11/9/2018 12:33:36	031SMPL_18K09k00.D	1810182-1 10X	Sample		1.0000
39		11/9/2018 12:36:35	032SMPL_18K09k00.D	1810182-2 10X	Sample		1.0000
40		11/9/2018 12:39:35	033SMPL_18K09k00.D	1810182-3 10X	Sample		1.0000
41		11/9/2018 12:42:36	034SMPL_18K09k00.D	1810182-4 10X	Sample		1.0000
42		11/9/2018 12:45:35	035SMPL_18K09k00.D	1810182-5 10X	Sample		1.0000
43		11/9/2018 12:48:35	036SMPL_18K09k00.D	1810182-6 10X	Sample		1.0000
44		11/9/2018 12:51:35	037SMPL_18K09k00.D	1810182-7 10X	Sample		1.0000
45		11/9/2018 12:54:36	038SMPL_18K09k00.D	1810182-8 10X	Sample		1.0000
46		11/9/2018 13:00:33	039SMPL_18K09k00.D	CCV	6-CCV		1.0000
47		11/9/2018 13:06:35	040SMPL_18K09k00.D	CCB	6-CCB		1.0000
48		11/9/2018 13:09:36	041SMPL_18K09k00.D	1810182-9 10X	Sample		1.0000
49		11/9/2018 13:12:36	042SMPL_18K09k00.D	1810182-10 10X	Sample		1.0000
50		11/9/2018 13:15:37	043SMPL_18K09k00.D	1810182-11 10X	Sample		1.0000
51		11/9/2018 13:18:37	044SMPL_18K09k00.D	1810182-12 10X	Sample		1.0000
52		11/9/2018 13:21:37	045SMPL_18K09k00.D	1810182-13 10X	Sample		1.0000
53		11/9/2018 13:27:34	046SMPL_18K09k00.D	CCV	6-CCV		1.0000
54		11/9/2018 13:33:32	047SMPL_18K09k00.D	CCB	6-CCB		1.0000
55		11/9/2018 13:36:33	048SMPL_18K09k00.D	IP181102-1MB 10X	6-CCB		1.0000
56		11/9/2018 13:39:34	049SMPL_18K09k00.D	IM181102-1LCS 10X	6-LCS		1.0000
57		11/9/2018 13:45:34	050SMPL_18K09k00.D	1810328-12 10X	Sample		1.0000
58		11/9/2018 13:51:31	051SMPL_18K09k00.D	CCV	6-CCV		1.0000
59		11/9/2018 13:57:29	052SMPL_18K09k00.D	CCB	6-CCB		1.0000
60		11/9/2018 14:00:31	053SMPL_18K09k00.D	IP181102-2MB 10X	6-CCB		1.0000

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
61		11/9/2018 14:03:32	054SMPL_18K09k00.D	IM181102-2LCS 10X	6-LCS		1.0000
62		11/9/2018 14:09:28	055SMPL_18K09k00.D	1810247-4 10X	Sample		1.0000
63		11/9/2018 14:12:28	056SMPL_18K09k00.D	1810247-4L 50X	Sample		1.0000
64		11/9/2018 14:15:28	057SMPL_18K09k00.D	1810247-4MS 10X	Sample		1.0000
65		11/9/2018 14:18:27	058SMPL_18K09k00.D	1810247-4MSD 10X	Sample		1.0000
66		11/9/2018 14:24:23	059SMPL_18K09k00.D	1810247-7 10X	Sample		1.0000
67		11/9/2018 14:27:24	060SMPL_18K09k00.D	1810247-9 10X	Sample		1.0000
68		11/9/2018 14:30:25	061SMPL_18K09k00.D	1810330-16 10X	Sample		1.0000
69		11/9/2018 14:33:27	062SMPL_18K09k00.D	1810444-1 10X	Sample		1.0000
70		11/9/2018 14:39:25	063SMPL_18K09k00.D	CCV	6-CCV		1.0000
71		11/9/2018 14:45:21	064SMPL_18K09k00.D	CCB	6-CCB		1.0000
72		11/9/2018 14:48:24	065SMPL_18K09k00.D	1810444-2 10X	Sample		1.0000
73		11/9/2018 14:51:24	066SMPL_18K09k00.D	1810444-3 10X	Sample		1.0000
74		11/9/2018 14:54:25	067SMPL_18K09k00.D	1810444-4 10X	Sample		1.0000
75		11/9/2018 14:57:27	068SMPL_18K09k00.D	1810444-5 10X	Sample		1.0000
76		11/9/2018 15:00:28	069SMPL_18K09k00.D	1810444-6 10X	Sample		1.0000
77		11/9/2018 15:03:28	070SMPL_18K09k00.D	1810444-7 10X	Sample		1.0000
78		11/9/2018 15:06:29	071SMPL_18K09k00.D	1810444-8 10X	Sample		1.0000
79		11/9/2018 15:09:30	072SMPL_18K09k00.D	1810444-9 10X	Sample		1.0000
80		11/9/2018 15:12:31	073SMPL_18K09k00.D	1810444-10 10X	Sample		1.0000
81		11/9/2018 15:15:32	074SMPL_18K09k00.D	1810444-11 10X	Sample		1.0000
82		11/9/2018 15:21:35	075SMPL_18K09k00.D	CCV	6-CCV		1.0000
83		11/9/2018 15:27:34	076SMPL_18K09k00.D	CCB	Sample		1.0000
84		11/9/2018 15:30:34	077SMPL_18K09k00.D	1810444-12 10X	Sample		1.0000
85		11/9/2018 15:33:35	078SMPL_18K09k00.D	1810444-13 10X	Sample		1.0000
86		11/9/2018 15:39:32	079SMPL_18K09k00.D	CCV	6-CCV		1.0000
87		11/9/2018 15:45:28	080SMPL_18K09k00.D	CCB	6-CCB		1.0000
88		11/9/2018 15:48:32	081SMPL_18K09k00.D	FP181030-2MB 10X	6-CCB		1.0000
89		11/9/2018 15:51:32	082SMPL_18K09k00.D	IP181103-2MB 10X	6-CCB		1.0000
90		11/9/2018 15:54:33	083SMPL_18K09k00.D	IM181103-2LCS 10X	6-LCS		1.0000
91		11/9/2018 16:00:28	084SMPL_18K09k00.D	1810475-1 10X	Sample		1.0000
92		11/9/2018 16:03:29	085SMPL_18K09k00.D	1810475-2 10X	Sample		1.0000
93		11/9/2018 16:06:29	086SMPL_18K09k00.D	1810475-3 10X	Sample		1.0000

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
94		11/9/2018 16:09:30	087SMPL_18K09k00.D	1810475-4 10X	Sample		1.0000
95		11/9/2018 16:12:31	088SMPL_18K09k00.D	1810475-5 10X	Sample		1.0000
96		11/9/2018 16:15:32	089SMPL_18K09k00.D	1810475-6 10X	Sample		1.0000
97		11/9/2018 16:18:33	090SMPL_18K09k00.D	1810601-1 10X	Sample		1.0000
98		11/9/2018 16:24:30	091SMPL_18K09k00.D	CCV	6-CCV		1.0000
99		11/9/2018 16:30:26	092SMPL_18K09k00.D	CCB	6-CCB		1.0000
100		11/9/2018 16:33:29	093SMPL_18K09k00.D	1810612-1 10X	Sample		1.0000
101		11/9/2018 16:36:29	094SMPL_18K09k00.D	1810612-3 10X	Sample		1.0000
102		11/9/2018 16:39:31	095SMPL_18K09k00.D	1810612-4 10X	Sample		1.0000
103		11/9/2018 16:42:31	096SMPL_18K09k00.D	1810628-1 10X	Sample		1.0000
104		11/9/2018 16:45:31	097SMPL_18K09k00.D	1810637-1 10X	Sample		1.0000
105		11/9/2018 16:48:31	098SMPL_18K09k00.D	1810637-1L 50X	Sample		1.0000
106		11/9/2018 16:51:31	099SMPL_18K09k00.D	1810637-1MS 10X	Sample		1.0000
107		11/9/2018 16:54:30	100SMPL_18K09k00.D	1810637-1MSD 10X	Sample		1.0000
108		11/9/2018 17:00:26	101SMPL_18K09k00.D	1810637-2 10X	Sample		1.0000
109		11/9/2018 17:03:27	102SMPL_18K09k00.D	1810637-2L 50X	Sample		1.0000
110		11/9/2018 17:09:23	103SMPL_18K09k00.D	CCV	6-CCV		1.0000
111		11/9/2018 17:15:20	104SMPL_18K09k00.D	CCB	6-CCB		1.0000
112		11/9/2018 17:18:21	105SMPL_18K09k00.D	1810637-2MS 10X	Sample		1.0000
113		11/9/2018 17:21:21	106SMPL_18K09k00.D	1810637-2MSD 10X	Sample		1.0000
114		11/9/2018 17:27:17	107SMPL_18K09k00.D	1810637-3 10X	Sample		1.0000
115		11/9/2018 17:30:18	108SMPL_18K09k00.D	1811004-21 10X	Sample		1.0000
116		11/9/2018 17:33:19	109SMPL_18K09k00.D	1811004-22 10X	Sample		1.0000
117		11/9/2018 17:36:19	110SMPL_18K09k00.D	1811004-23 10X	Sample		1.0000
118		11/9/2018 17:39:20	111SMPL_18K09k00.D	1811004-24 10X	Sample		1.0000
119		11/9/2018 17:45:16	112SMPL_18K09k00.D	CCV	6-CCV		1.0000
120		11/9/2018 17:51:13	113SMPL_18K09k00.D	CCB	6-CCB		1.0000
121		11/9/2018 17:54:14	114SMPL_18K09k00.D	IP181105-1MB 10X	6-CCB		1.0000
122		11/9/2018 17:57:15	115SMPL_18K09k00.D	IM181105-1RVS 10X	Sample		1.0000
123		11/9/2018 18:00:16	116SMPL_18K09k00.D	IM181105-1LCS 10X	6-LCS		1.0000
124		11/9/2018 18:06:11	117SMPL_18K09k00.D	1810412-1 10X	Sample		1.0000
125		11/9/2018 18:09:13	118SMPL_18K09k00.D	1810412-1L 50X	Sample		1.0000
126		11/9/2018 18:12:14	119SMPL_18K09k00.D	1810412-1MS 10X	Sample		1.0000

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
127		11/9/2018 18:15:12	120SMPL_18K09k00.D	1810412-1MSD 10X	Sample		1.0000
128		11/9/2018 18:21:09	121SMPL_18K09k00.D	1810412-2 10X	Sample		1.0000
129		11/9/2018 18:24:10	122SMPL_18K09k00.D	1810412-3 10X	Sample		1.0000
130		11/9/2018 18:27:09	123SMPL_18K09k00.D	1810412-4 10X	Sample		1.0000
131		11/9/2018 18:33:03	124SMPL_18K09k00.D	CCV	6-CCV		1.0000
132		11/9/2018 18:38:58	125SMPL_18K09k00.D	CCB	6-CCB		1.0000
133		11/9/2018 18:42:00	126SMPL_18K09k00.D	1810412-5 10X	Sample		1.0000
134		11/9/2018 18:45:00	127SMPL_18K09k00.D	1810412-6 10X	Sample		1.0000
135		11/9/2018 18:48:01	128SMPL_18K09k00.D	1810412-7 10X	Sample		1.0000
136		11/9/2018 18:51:00	129SMPL_18K09k00.D	1810412-8 10X	Sample		1.0000
137		11/9/2018 18:54:02	130SMPL_18K09k00.D	1810412-9 10X	Sample		1.0000
138		11/9/2018 18:57:02	131SMPL_18K09k00.D	1810412-10 10X	Sample		1.0000
139		11/9/2018 19:00:04	132SMPL_18K09k00.D	1810412-11 10X	Sample		1.0000
140		11/9/2018 19:03:04	133SMPL_18K09k00.D	1810412-12 10X	Sample		1.0000
141		11/9/2018 19:06:04	134SMPL_18K09k00.D	1810506-1 10X	Sample		1.0000
142		11/9/2018 19:09:05	135SMPL_18K09k00.D	1810506-2 10X	Sample		1.0000
143		11/9/2018 19:15:00	136SMPL_18K09k00.D	CCV	6-CCV		1.0000
144		11/9/2018 19:20:55	137SMPL_18K09k00.D	CCB	6-CCB		1.0000
145		11/9/2018 19:23:55	138SMPL_18K09k00.D	1810506-5 10X	Sample		1.0000
146		11/9/2018 19:26:55	139SMPL_18K09k00.D	1810506-6 10X	Sample		1.0000
147		11/9/2018 19:29:55	140SMPL_18K09k00.D	1810544-2 10X	Sample		1.0000
148		11/9/2018 19:32:56	141SMPL_18K09k00.D	1810544-3 10X	Sample		1.0000
149		11/9/2018 19:35:57	142SMPL_18K09k00.D	1810544-4 10X	Sample		1.0000
150		11/9/2018 19:38:57	143SMPL_18K09k00.D	1811031-1 10X	Sample		1.0000
151		11/9/2018 19:44:54	144SMPL_18K09k00.D	CCV	6-CCV		1.0000
152		11/9/2018 19:50:48	145SMPL_18K09k00.D	CCB	6-CCB		1.0000
153		11/9/2018 19:53:49	146SMPL_18K09k00.D	IP181104-5MB 10X	6-CCB		1.0000
154		11/9/2018 19:56:50	147SMPL_18K09k00.D	IM181104-5LCS 10X	6-LCS		1.0000
155		11/9/2018 20:02:46	148SMPL_18K09k00.D	1810328-1 10X	Sample		1.0000
156		11/9/2018 20:05:48	149SMPL_18K09k00.D	1810328-2 10X	Sample		1.0000
157		11/9/2018 20:08:48	150SMPL_18K09k00.D	1810328-3 10X	Sample		1.0000
158		11/9/2018 20:11:48	151SMPL_18K09k00.D	1810328-4 10X	Sample		1.0000
159		11/9/2018 20:14:48	152SMPL_18K09k00.D	1810328-5 10X	Sample		1.0000

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
160		11/9/2018 20:17:49	153SMPL_18K09k00.D	1810328-6 10X	Sample		1.0000
161		11/9/2018 20:20:50	154SMPL_18K09k00.D	1810328-7 10X	Sample		1.0000
162		11/9/2018 20:23:49	155SMPL_18K09k00.D	1810328-8 10X	Sample		1.0000
163		11/9/2018 20:29:44	156SMPL_18K09k00.D	CCV	6-CCV		1.0000
164		11/9/2018 20:35:40	157SMPL_18K09k00.D	CCB	6-CCB		1.0000
165		11/9/2018 20:38:41	158SMPL_18K09k00.D	1810328-9 10X	Sample		1.0000
166		11/9/2018 20:41:42	159SMPL_18K09k00.D	1810328-10 10X	Sample		1.0000
167		11/9/2018 20:44:40	160SMPL_18K09k00.D	1810328-11 10X	Sample		1.0000
168		11/9/2018 20:47:41	161SMPL_18K09k00.D	1810328-13 10X	Sample		1.0000
169		11/9/2018 20:50:42	162SMPL_18K09k00.D	1810328-13L 50X	Sample		1.0000
170		11/9/2018 20:53:42	163SMPL_18K09k00.D	1810328-13MS 10X	Sample		1.0000
171		11/9/2018 20:56:43	164SMPL_18K09k00.D	1810328-13MSD 10X	Sample		1.0000
172		11/9/2018 20:59:43	165SMPL_18K09k00.D	1810328-13A 10X	Sample		1.0000
173		11/9/2018 21:05:38	166SMPL_18K09k00.D	1810328-14 10X	Sample		1.0000
174		11/9/2018 21:08:40	167SMPL_18K09k00.D	1810328-15 10X	Sample		1.0000
175		11/9/2018 21:14:35	168SMPL_18K09k00.D	CCV	6-CCV		1.0000
176		11/9/2018 21:20:31	169SMPL_18K09k00.D	CCB	6-CCB		1.0000
177		11/9/2018 21:23:33	170SMPL_18K09k00.D	1810328-16 10X	Sample		1.0000
178		11/9/2018 21:26:34	171SMPL_18K09k00.D	1810328-17 10X	Sample		1.0000
179		11/9/2018 21:29:35	172SMPL_18K09k00.D	1810328-18 10X	Sample		1.0000
180		11/9/2018 21:32:36	173SMPL_18K09k00.D	1810328-19 10X	Sample		1.0000
181		11/9/2018 21:35:37	174SMPL_18K09k00.D	1810328-20 10X	Sample		1.0000
182		11/9/2018 21:38:37	175SMPL_18K09k00.D	1810328-21 10X	Sample		1.0000
183		11/9/2018 21:44:32	176SMPL_18K09k00.D	CCV	6-CCV		1.0000
184		11/9/2018 21:50:28	177SMPL_18K09k00.D	CCB	6-CCB		1.0000
185		11/9/2018 21:53:29	178SMPL_18K09k00.D	IP181104-3MB 10X	6-CCB		1.0000
186		11/9/2018 21:56:30	179SMPL_18K09k00.D	IM181104-3LCS 10X	6-LCS		1.0000
187		11/9/2018 22:02:27	180SMPL_18K09k00.D	1810195-1 10X	Sample		1.0000
188		11/9/2018 22:05:28	181SMPL_18K09k00.D	1810195-2 10X	Sample		1.0000
189		11/9/2018 22:08:29	182SMPL_18K09k00.D	1810195-3 10X	Sample		1.0000
190		11/9/2018 22:11:30	183SMPL_18K09k00.D	1810195-4 10X	Sample		1.0000
191		11/9/2018 22:14:30	184SMPL_18K09k00.D	1810195-5 10X	Sample		1.0000
192		11/9/2018 22:17:31	185SMPL_18K09k00.D	1810195-6 10X	Sample		1.0000

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
193		11/9/2018 22:20:31	186SMPL_18K09k00.D	1810195-7 10X	Sample		1.0000
194		11/9/2018 22:23:34	187SMPL_18K09k00.D	1810195-7L 50X	Sample		1.0000
195		11/9/2018 22:29:29	188SMPL_18K09k00.D	CCV	6-CCV		1.0000
196		11/9/2018 22:35:25	189SMPL_18K09k00.D	CCB	6-CCB		1.0000
197		11/9/2018 22:38:26	190SMPL_18K09k00.D	1810195-7MS 10X	Sample		1.0000
198		11/9/2018 22:41:25	191SMPL_18K09k00.D	1810195-7MSD 10X	Sample		1.0000
199		11/9/2018 22:44:24	192SMPL_18K09k00.D	1810195-7A 10X	Sample		1.0000
200		11/9/2018 22:50:20	193SMPL_18K09k00.D	1810195-8 10X	Sample		1.0000
201		11/9/2018 22:53:20	194SMPL_18K09k00.D	1810195-9 10X	Sample		1.0000
202		11/9/2018 22:56:20	195SMPL_18K09k00.D	1810195-11 10X	Sample		1.0000
203		11/9/2018 22:59:20	196SMPL_18K09k00.D	1810195-12 10X	Sample		1.0000
204		11/9/2018 23:02:21	197SMPL_18K09k00.D	1810195-13 10X	Sample		1.0000
205		11/9/2018 23:05:21	198SMPL_18K09k00.D	1810195-14 10X	Sample		1.0000
206		11/9/2018 23:08:23	199SMPL_18K09k00.D	1810195-15 10X	Sample		1.0000
207		11/9/2018 23:14:18	200SMPL_18K09k00.D	CCV	6-CCV		1.0000
208		11/9/2018 23:20:14	201SMPL_18K09k00.D	CCB	6-CCB		1.0000
209		11/9/2018 23:23:15	202SMPL_18K09k00.D	1810195-16 10X	Sample		1.0000
210		11/9/2018 23:26:15	203SMPL_18K09k00.D	1810195-17 10X	Sample		1.0000
211		11/9/2018 23:29:15	204SMPL_18K09k00.D	1810195-18 10X	Sample		1.0000
212		11/9/2018 23:32:16	205SMPL_18K09k00.D	1810195-19 10X	Sample		1.0000
213		11/9/2018 23:35:13	206SMPL_18K09k00.D	1810195-19L 50X	Sample		1.0000
214		11/9/2018 23:38:14	207SMPL_18K09k00.D	1810195-19MS 10X	Sample		1.0000
215		11/9/2018 23:41:12	208SMPL_18K09k00.D	1810195-19MSD 10X	Sample		1.0000
216		11/9/2018 23:44:09	209SMPL_18K09k00.D	1810195-19A 10X	Sample		1.0000
217		11/9/2018 23:50:02	210SMPL_18K09k00.D	1810195-20 10X	Sample		1.0000
218		11/9/2018 23:55:54	211SMPL_18K09k00.D	CCV	6-CCV		1.0000
219		11/10/2018 00:01:49	212SMPL_18K09k00.D	CCB	6-CCB		1.0000

Analyte Table

		7 Li [1]		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	RINSE	0.0065	209.33	0.0050	38.00	0.0657	3427.06	18.5716	2376.95	1.3893	66.67
2	RINSE	0.0069	217.33	0.0008	14.00	0.0478	3297.03	18.8422	2390.27	1.3355	63.33
3	BLANK	0.0000	97.33	0.0000	10.67	0.0000	3159.22	14.6734	1413.45	0.0000	23.33
4	H/1000	0.9930	19146.21	0.0459	275.34	1.0218	9990.83	109.2674	26054.49	10.1908	350.02
5	H/100	9.8817	207258.63	0.4588	2957.61	10.0334	76443.74	973.3091	259716.92	103.5200	3480.50
6	H/10	107.0969	2259374.42	4.7976	30502.53	100.1010	736159.78	10002.6477	2733905.74	1003.7442	34349.49
7	HIGH	999.2915	20880238.00	50.0207	272218.47	999.9895	7253018.88	99999.2296	25554362.12	9999.5902	311865.03
8	RINSE	0.0104	276.67	-0.0006	6.67	0.2100	4268.38	19.8633	2683.67	0.7376	46.67
9	ICV	207.1309	4143652.25	9.9190	56703.96	214.1974	1514242.03	20142.8907	5317667.21	1891.6172	66104.04
10	ICB	0.0281	623.35	0.0001	10.67	1.1273	10488.89	17.9257	2210.25	0.2206	30.00
11	LIV	2.0806	39468.42	0.0507	296.01	15.6995	106237.66	113.2368	26715.62	9.4406	323.35
12	ICSA	0.0534	1179.39	0.0021	23.33	0.6930	8195.41	25662.5362	6646065.73	10141.2268	324135.56
13	ICSAB	107.8677	2124523.75	5.0381	28015.00	99.1189	680625.06	35711.6219	9112432.37	11051.4065	351460.44
14	CCV	104.6542	2096782.33	4.6393	28358.20	99.3422	693830.62	10217.4540	2765492.77	1003.4456	33631.39
15	CCB	0.0193	464.68	0.0001	10.67	0.7791	8319.90	18.2529	2366.94	-0.0131	23.33
16	IP181101-5MB ...	0.0155	401.34	-0.0011	4.67	0.3972	5902.21	17.5819	2176.91	1.0477	56.67
17	IM181101-5LCS...	101.3900	2133855.42	4.4907	28990.58	96.1828	705437.14	952.4843	265284.00	949.7525	33280.79
18	1810184-1 100X	6.2224	128739.29	-0.0019	0.00	9.3836	70743.76	66613.2786	18823763.89	9996.4700	323941.58
19	1810184-2 100X	4.8203	104274.09	-0.0010	5.33	7.6034	60607.02	34084.1435	9636993.82	6714.1964	227017.93
20	1810184-3 100X	4.5214	96993.65	-0.0010	5.33	6.0640	48666.09	32374.5279	9219902.36	6342.1894	217409.85
21	1810184-4 100X	3.9782	84837.38	-0.0009	6.00	4.9494	40119.45	23792.3503	6706439.28	5145.6994	175225.89
22	1810184-5 100X	3.5372	75432.87	-0.0006	8.00	8.0361	62922.19	40338.1517	11427074.83	6204.7465	209684.85
23	1810184-6 100X	3.3906	73116.27	-0.0014	2.67	8.9713	70580.55	43106.2539	12370544.40	7498.6469	253857.39
24	1810184-7 100X	3.6219	78279.57	-0.0012	4.00	9.0506	71379.47	44975.5093	13018543.97	8671.7490	291713.58
25	1810184-8 100X	3.9868	85414.24	-0.0018	0.67	4.9971	40661.75	23697.1777	6912093.86	5216.8572	182018.78
26	CCV	103.9399	2171601.92	4.5008	28873.05	95.7240	697204.97	9865.0824	2798157.67	985.6664	34563.34
27	CCB	0.0132	350.68	-0.0017	0.67	0.7173	7963.09	19.9301	2890.38	0.2648	33.33
28	1810184-18 100X	5.3372	112718.12	-0.0004	8.67	10.5516	80749.46	69842.9095	20065988.45	8219.4356	271112.47
29	1810203-2 10X	0.7246	15701.34	0.0003	14.00	3.1889	27390.99	926.7156	267236.68	1495.3308	53362.64
30	1810203-2L 50X	0.1509	3147.65	-0.0009	6.00	1.0035	10379.93	203.1210	54661.16	309.1313	10824.00
31	1810203-2MS 10X	106.5220	2170464.54	4.5882	28640.62	101.1901	718638.51	1846.2985	510357.19	2446.9449	84485.46

Analyte Table

		7 Li [1]		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1810203-2MSD ...	106.5809	2190189.92	4.6168	29229.62	104.2773	746963.60	1852.2265	521762.58	2450.1353	86606.45
33	1810203-4 10X	0.6850	13552.82	0.0001	12.00	3.4551	26822.43	871.7419	237637.99	1477.1270	50403.12
34	CCV	105.9586	2180095.04	4.6023	28996.58	97.3340	698248.41	10099.5904	2862942.56	1012.0220	35742.59
35	CCB	0.0155	394.68	-0.0002	9.33	0.7679	8283.23	18.7593	2583.65	0.1635	30.00
36	IP181101-6MB ...	0.0141	366.01	-0.0013	3.33	0.4728	6274.57	16.4053	1943.54	-0.2358	16.67
37	IM181101-6LCS...	108.5258	2165276.17	4.6364	28696.04	101.2040	703887.86	968.6784	266662.69	973.0610	33424.21
38	1810182-1 10X	1.6377	32132.44	-0.0011	4.67	2.6025	20918.55	3002.8293	811845.35	1629.1551	55064.32
39	1810182-2 10X	1.5038	30664.31	-0.0006	8.00	2.2351	19144.24	2091.5272	571855.26	1245.8322	42391.44
40	1810182-3 10X	1.7371	35035.38	-0.0012	4.00	2.5802	21341.27	2763.2273	756388.87	1577.6799	54492.83
41	1810182-4 10X	1.6828	34227.78	-0.0008	6.67	3.1442	25496.98	2367.5337	648772.74	1173.3263	39417.66
42	1810182-5 10X	2.0485	40817.58	-0.0014	2.67	3.5992	28125.56	2531.4246	679374.29	1060.5861	35695.67
43	1810182-6 10X	1.5391	30175.46	-0.0009	6.00	3.1204	24399.89	2450.1488	653201.28	1000.9389	33170.29
44	1810182-7 10X	2.1534	42154.79	-0.0012	4.00	2.3379	19091.94	4195.2288	1104344.67	3041.1554	99745.76
45	1810182-8 10X	1.6117	31936.05	-0.0015	2.00	2.1982	18352.28	2203.8053	598348.35	1185.2957	40506.64
46	CCV	107.3654	2111913.79	4.7081	28260.04	98.5571	675721.50	10179.7418	2766483.40	985.4224	33387.50
47	CCB	0.0128	338.68	-0.0007	6.67	0.6773	7568.45	17.3463	2163.57	-0.5272	6.67
48	1810182-9 10X	1.4785	29366.71	-0.0011	4.67	2.6362	21394.64	1787.8727	484732.47	1117.3283	37663.35
49	1810182-10 10X	1.7375	33737.54	-0.0011	4.67	2.4804	19883.96	1843.2033	494983.36	1241.0897	41973.47
50	1810182-11 10X	1.6274	31509.84	-0.0014	2.67	2.3127	18699.26	2211.3337	589123.48	1188.9473	39751.71
51	1810182-12 10X	3.2345	61776.90	-0.0016	1.33	5.3390	38499.08	2538.5200	665632.12	1413.7295	46458.57
52	1810182-13 10X	1.9892	37501.96	-0.0016	1.33	3.1345	23583.17	2200.1817	577342.95	1171.2408	38645.44
53	CCV	106.3510	2055589.58	4.9546	27490.11	98.1041	661049.40	10186.7134	2716555.90	997.9581	33307.18
54	CCB	0.0126	326.68	-0.0009	5.33	0.6450	7191.61	17.8403	2256.93	-0.4237	10.00
55	IP181102-1MB ...	0.0090	263.34	-0.0015	2.00	0.4201	5811.07	16.0706	1823.53	0.0848	26.67
56	IM181102-1LCS...	110.0501	2143561.58	4.7041	28477.70	103.1625	700303.06	1004.7180	267906.72	1010.8101	34122.59
57	1810328-12 10X	0.0120	310.01	-0.0017	0.67	0.8100	8085.33	15.8353	1710.17	-0.1042	20.00
58	CCV	107.6654	2039619.88	5.0162	27364.55	99.9930	660223.33	10172.9309	2695427.77	996.1257	32669.55
59	CCB	0.0156	381.34	-0.0003	8.67	0.6702	7327.21	18.1902	2350.26	-0.0037	23.33
60	IP181102-2MB ...	0.0097	278.68	-0.0012	3.33	0.4104	5794.40	15.7194	1716.84	0.1948	30.00
61	IM181102-2LCS...	109.4672	2131611.87	4.9212	28521.80	103.2113	699968.64	989.5511	271324.42	1024.7199	35197.89
62	1810247-4 10X	1.5872	30079.95	-0.0007	6.67	10.7817	73809.85	1236.5993	327442.57	1703.0888	55746.64

Analyte Table

		7 Li [1]		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1810247-4L 50X	0.3454	6824.10	-0.0013	3.33	2.8825	22700.80	259.0052	67377.19	330.9692	11097.44
64	1810247-4MS 10X	114.4500	2260219.25	4.9700	29440.00	114.2736	786214.03	2302.6257	613671.37	2726.8484	90720.45
65	1810247-4MSD ...	111.1070	2188303.42	4.8763	28814.92	116.2242	797337.90	2254.1182	595618.90	2731.5132	89966.89
66	1810247-7 10X	1.4820	28494.59	0.0000	10.00	9.3266	65187.49	3762.7811	992284.54	2302.9770	75694.56
67	1810247-9 10X	0.0859	1764.78	-0.0012	4.00	13.5204	94431.14	380.3779	99375.35	814.3078	26966.07
68	1810330-16 10X	0.0150	373.34	-0.0011	4.00	1.1369	10376.61	17.9945	2280.26	1.0519	56.67
69	1810444-1 10X	26.1093	508596.06	0.0037	29.33	18.4489	127908.70	43177.7018	11334113.16	20067.1734	620180.46
70	CCV	108.0665	2103853.50	4.8653	27972.86	99.3089	674059.07	10286.2268	2758405.69	999.5326	33364.25
71	CCB	0.0137	346.68	-0.0015	2.00	0.7410	7808.56	17.8516	2263.59	-0.1248	20.00
72	1810444-2 10X	0.8468	16981.21	-0.0003	9.33	4.5602	34853.48	6401.7709	1756178.15	1338.6635	44891.22
73	1810444-3 10X	0.1098	2287.51	-0.0011	4.67	5.2467	39539.19	4430.1695	1224977.25	261.7399	8812.67
74	1810444-4 10X	0.2527	4999.45	-0.0013	3.33	4.7174	34950.38	11183.5755	2973451.42	107.6130	3533.87
75	1810444-5 10X	0.5258	10211.81	0.0002	12.00	1.6920	14468.51	1976.5686	522984.46	1178.3542	39313.60
76	1810444-6 10X	2.7095	51988.50	0.0001	11.33	3.2970	25088.63	3827.1843	1005608.91	3063.2912	98515.72
77	1810444-7 10X	0.7215	13691.58	-0.0001	10.00	1.0693	10130.89	448.2932	115918.17	301.4613	9923.35
78	1810444-8 10X	1.7871	33829.61	-0.0012	4.00	2.3837	18754.95	4756.3840	1242992.38	394.6726	12855.42
79	1810444-9 10X	1.0006	19164.86	-0.0013	3.33	2.1953	17680.45	4148.4497	1080947.56	453.2786	14737.02
80	1810444-10 10X	0.8157	15641.96	-0.0011	4.00	1.5207	13207.47	1013.3102	264279.70	734.4854	23974.62
81	1810444-11 10X	1.4818	28381.73	0.0000	10.67	1.5845	13667.84	2591.1723	681386.68	505.0063	16492.07
82	CCV	109.7959	2110659.71	5.1594	28469.72	101.2657	678578.77	10256.0826	2719165.27	1014.9870	33380.59
83	CCB	0.0094	266.00	-0.0003	8.67	0.6836	7381.69	18.6891	2460.30	0.4922	40.00
84	1810444-12 10X	1.3520	26610.86	-0.0009	6.00	5.4069	40042.53	1789.6095	484401.87	1804.8763	60784.22
85	1810444-13 10X	1.3298	25561.23	-0.0011	4.67	5.6003	40394.48	1756.2644	463853.21	1754.4341	57251.79
86	CCV	108.4600	2028211.06	5.1054	27589.63	101.6904	666576.00	10325.0375	2774860.69	1036.8092	34543.31
87	CCB	0.0103	286.01	-0.0002	9.33	0.6457	7263.87	18.5902	2500.30	-0.4266	10.00
88	FP181030-2MB...	0.0076	248.00	-0.0009	6.00	0.2813	5171.97	18.1461	2486.96	0.2584	33.33
89	IP181103-2MB ...	0.0054	198.00	-0.0016	1.33	0.1296	3972.75	16.3809	1880.18	0.1892	30.00
90	IM181103-2LCS...	109.5667	2195381.79	4.8570	29116.15	102.2729	713971.10	1005.6287	271606.62	1009.2125	34302.85
91	1810475-1 10X	1.3357	25814.28	0.0015	19.33	20.2984	138768.60	25964.4947	6948819.48	3811.5113	123295.75
92	1810475-2 10X	5.1963	105667.58	0.0008	14.67	43.6266	310895.04	63976.9680	17467995.57	8765.7197	276196.46
93	1810475-3 10X	2.0793	42380.04	-0.0015	2.00	14.7295	107283.67	4893.0671	1341475.40	1299.2679	44008.92

Analyte Table

		7 Li [1]		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1810475-4 10X	3.4260	68947.54	-0.0009	6.00	11.4968	83524.93	6548.0151	1779992.58	2655.6140	88332.21
95	1810475-5 10X	2.0439	40386.52	-0.0012	4.00	13.0189	92309.74	13021.1312	3523490.15	2502.9568	83477.69
96	1810475-6 10X	6.8264	133518.26	-0.0009	6.00	19.8837	138091.89	6859.1770	1824809.77	2519.7899	83490.87
97	1810601-1 10X	2.1833	44353.67	-0.0019	0.00	1.5783	14486.35	886.5008	238979.94	10022.7823	341834.25
98	CCV	107.3046	2078565.25	5.0019	28191.20	100.3491	677628.14	10140.0136	2713230.90	1019.1937	33584.59
99	CCB	0.0125	320.01	0.0000	10.00	0.6678	7250.54	20.2095	2843.70	-0.2160	16.67
100	1810612-1 10X	3.8663	75372.63	-0.0002	9.33	16.0928	111948.99	5485.0778	1475315.60	4498.9677	149700.32
101	1810612-3 10X	3.8005	75780.43	-0.0008	6.00	16.2887	115835.61	5356.9830	1449801.43	4536.6254	149934.72
102	1810612-4 10X	3.8934	78246.24	-0.0012	4.00	16.6690	119407.65	5567.9388	1500744.46	4558.4253	151449.62
103	1810628-1 10X	1.9366	38448.08	-0.0017	0.67	17.9029	126272.00	7700.9376	2072950.33	2622.3449	86183.26
104	1810637-1 10X	5.0150	100064.64	-0.0007	6.67	45.8748	320623.23	9486.9854	2516829.34	6604.9509	216983.63
105	1810637-1L 50X	1.0194	20482.41	-0.0015	2.00	11.0415	79932.71	1727.8175	470339.22	1291.5426	43066.28
106	1810637-1MS 10X	112.7499	2233426.67	5.0014	28424.26	157.0076	1082227.77	10327.1207	2748438.29	7600.5335	249440.67
107	1810637-1MSD ...	115.3144	2357396.17	5.0894	30273.39	170.2477	1210941.65	10445.1654	2771769.13	7671.9545	253535.35
108	1810637-2 10X	4.8948	94193.65	-0.0006	7.33	45.8232	308828.77	9209.7249	2426608.82	6600.8916	212479.36
109	1810637-2L 50X	1.0052	20021.88	-0.0013	3.33	11.5107	82430.55	1721.1094	465959.42	1277.5699	43049.51
110	CCV	105.3000	2033579.38	4.9242	27202.26	98.5421	663425.02	10183.1249	2724380.07	1012.2245	33604.42
111	CCB	0.0130	335.34	-0.0003	8.67	0.7914	8162.05	19.3645	2660.33	0.5219	40.00
112	1810637-2MS 10X	113.7529	2260443.00	4.9974	28577.21	162.2162	1121955.82	10410.7336	2738662.56	7658.8857	249110.62
113	1810637-2MSD ...	115.6007	2325514.92	5.0751	29500.07	168.2030	1177365.13	10463.6006	2831026.21	7751.3041	256940.67
114	1810637-3 10X	0.0176	415.34	-0.0005	7.33	1.5407	12819.40	18.5435	2433.63	1.4632	70.00
115	1811004-21 10X	1.0250	20358.29	-0.0011	4.67	4.9469	37221.78	2986.2039	808237.51	4727.1123	160589.05
116	1811004-22 10X	1.5706	31555.96	0.0002	12.67	4.5838	35176.26	5725.2762	1545799.04	5554.2049	185324.67
117	1811004-23 10X	1.5857	31811.07	0.0010	17.33	4.4955	34509.38	5865.1285	1582297.16	5638.4689	189705.34
118	1811004-24 10X	1.3643	27271.89	-0.0008	6.00	3.9599	30681.07	17880.3024	4814955.34	4840.8434	158917.47
119	CCV	105.3772	2075552.42	4.9298	27807.94	97.6905	670866.10	10097.2638	2751093.81	1013.6466	34366.28
120	CCB	0.0124	326.68	-0.0004	8.00	0.6509	7327.23	19.5661	2770.37	-0.1240	20.00
121	IP181105-1MB ...	0.0086	264.67	-0.0009	6.00	0.2992	5228.65	16.4045	1923.54	-0.0263	23.33
122	IM181105-1RVS...	1.0403	19658.12	0.0208	128.67	7.8391	54260.55	64.5007	14863.81	3.4475	136.68
123	IM181105-1LCS...	108.0138	2138194.75	4.8256	29369.88	101.6815	701551.29	969.3412	265133.28	989.2327	33594.55
124	1810412-1 10X	1.5478	30029.86	0.0094	64.67	3.0398	23616.49	6702.4763	1819846.07	1350.1712	44817.54

Analyte Table

		7 Li [1]		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
125	1810412-1L 50X	0.3433	6637.34	0.0007	14.67	0.9038	9147.02	1280.5179	345249.16	252.9456	8652.61
126	1810412-1MS 10X	109.1590	2130230.58	4.8408	27956.87	102.6031	697719.80	7486.5211	2030048.35	2296.7180	77240.92
127	1810412-1MSD ...	109.3807	2111848.63	5.0045	28241.30	107.8638	725802.06	7564.4106	2008719.35	2253.1840	74204.25
128	1810412-2 10X	1.4126	27060.91	0.0000	10.00	3.4477	26005.52	6801.2498	1807540.86	1293.1075	41883.34
129	1810412-3 10X	0.2855	5785.70	0.0870	454.68	102.0848	708270.32	172779.6504	48586922.61	2602.2054	75955.41
130	1810412-4 10X	0.2803	5957.09	0.0859	471.34	107.7730	784030.61	176813.2435	51576565.90	2628.1971	79549.14
131	CCV	107.2071	2073012.92	4.6902	27207.64	98.9671	667148.12	10072.3902	2749054.65	984.4504	33083.57
132	CCB	0.0139	346.01	-0.0008	6.00	1.0003	9353.79	25.4368	4347.43	-0.3158	13.33
133	1810412-5 10X	1.7867	35981.43	0.0156	99.33	2.8167	22964.51	37599.8249	10467535.26	712.3136	23163.36
134	1810412-6 10X	1.7922	35718.79	0.0173	105.33	2.6733	21741.85	37540.2079	10407386.51	732.1781	23503.91
135	1810412-7 10X	1.0839	22380.14	0.0150	94.00	3.0921	25466.91	109995.3203	32502222.02	1745.1355	55402.73
136	1810412-8 10X	1.0713	23308.05	0.0166	112.00	3.0108	26221.43	109277.8498	33650994.50	1651.4204	55127.82
137	1810412-9 10X	0.1992	4144.54	0.0004	14.00	8.7118	64628.32	6102.2488	1732409.66	1183.2667	39965.12
138	1810412-10 10X	0.1966	3924.49	-0.0007	6.67	9.1646	65112.45	6107.0848	1699768.73	1163.9796	39103.24
139	1810412-11 10X	0.1910	3847.14	0.0005	14.00	9.1931	65809.66	6050.0567	1681433.62	1188.5581	39547.44
140	1810412-12 10X	1.0827	21005.72	-0.0014	2.67	3.2722	25137.50	7757.4679	2158244.60	1227.5902	40563.40
141	1810506-1 10X	0.1780	3521.06	-0.0009	5.33	1.5559	13583.33	422.3224	116749.43	1041.4941	35214.65
142	1810506-2 10X	0.1659	3333.02	-0.0014	2.67	1.4320	12927.26	428.7765	118378.05	1069.6411	36393.79
143	CCV	107.5008	2136741.42	4.6411	27590.24	96.8462	671178.93	9803.6020	2830931.21	1017.2593	34964.18
144	CCB	0.0094	302.67	0.0000	12.00	0.6866	8445.53	23.5017	4634.18	0.0660	30.00
145	1810506-5 10X	0.3260	7085.52	-0.0008	6.67	0.9458	10585.64	562.1056	171056.78	600.4992	22218.83
146	1810506-6 10X	0.3213	7012.17	-0.0001	12.00	0.7808	9393.81	572.7209	175384.40	620.6274	23530.64
147	1810544-2 10X	0.0152	444.68	-0.0011	5.33	9.6403	76861.11	1950.1126	613625.93	12.5285	506.70
148	1810544-3 10X	0.0114	364.68	-0.0015	2.67	10.2846	82426.36	1921.0548	621315.81	13.7757	553.36
149	1810544-4 10X	0.0082	295.34	-0.0014	3.33	10.5484	84924.24	1902.8417	624606.16	8.5543	356.69
150	1811031-1 10X	0.6173	13650.88	-0.0013	4.00	2.3392	21463.65	2715.6968	843492.83	1215.2924	45449.22
151	CCV	107.5821	2304759.08	4.5935	29908.09	95.5460	713717.07	9985.0632	3063405.58	1018.6649	37940.52
152	CCB	0.0106	329.34	-0.0011	4.67	0.4979	7096.02	21.0662	3703.91	0.1476	33.33
153	IP181104-5MB ...	0.0065	253.34	-0.0017	1.33	0.2430	5456.50	17.4826	2683.67	0.9050	63.34
154	IM181104-5LCS...	108.9859	2365755.58	4.4025	29550.86	94.5195	715336.41	939.2844	298598.82	980.5714	37342.73
155	1810328-1 10X	5.2721	106816.42	0.2366	1537.42	2.7865	22938.94	120.1684	31884.85	2637.8285	96536.61

Analyte Table

		7 Li [1]		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
156	1810328-2 10X	11.5823	234172.10	0.3717	2340.18	7.7134	57448.46	1389.6096	396316.93	5387.1908	200371.57
157	1810328-3 10X	24.7121	496255.44	0.4708	2898.94	10.0359	73265.14	113.0829	29213.22	9379.3618	346197.98
158	1810328-4 10X	8.7167	179334.55	0.1109	728.69	2.9150	24216.25	87.0411	22956.59	3039.9667	111454.20
159	1810328-5 10X	5.1479	107564.99	0.1966	1316.73	2.5791	22154.56	56.4405	14226.77	2459.8554	93744.10
160	1810328-6 10X	5.5352	119452.89	0.2372	1631.42	3.0272	26232.59	69.3236	18444.13	2320.4281	90755.34
161	1810328-7 10X	8.5507	181744.54	0.1933	1287.39	3.3044	27894.04	256.2754	72900.35	3586.7641	133536.87
162	1810328-8 10X	3.7886	81565.28	0.0514	363.34	1.8894	17674.85	530.7523	164533.22	2124.9367	80479.53
163	CCV	103.8764	2230386.08	4.3719	29108.74	91.5546	685563.95	9537.6364	3012728.91	988.8153	37499.81
164	CCB	0.0118	360.68	-0.0009	6.67	0.3713	6309.01	20.0446	3497.20	1.1975	73.34
165	1810328-9 10X	4.5781	101797.41	0.0506	358.01	1.1789	12783.83	304.3547	88950.02	2335.7941	87544.88
166	1810328-10 10X	28.0592	618443.79	0.5881	4186.55	10.7251	85669.96	1416.0470	415721.16	11027.9475	441234.81
167	1810328-11 10X	6.0681	135002.04	0.2445	1714.76	3.3459	29506.81	67.3849	18374.18	2578.9519	102716.53
168	1810328-13 10X	7.3371	165475.69	0.2494	1754.11	2.9808	27062.79	60.8203	15924.92	3527.8126	139460.19
169	1810328-13L 50X	1.5379	35454.22	0.0520	389.34	0.6620	9101.44	23.3866	4860.93	736.0782	29643.71
170	1810328-13MS ...	111.7520	2527423.67	4.4113	30999.39	80.9104	638577.25	1005.8302	307134.29	4726.2852	187745.83
171	1810328-13MSD...	114.5326	2550780.92	4.5378	31605.17	87.3401	678618.48	1021.2656	306190.57	4617.9177	179666.38
172	1810328-13A 10X	137.4915	3044879.42	4.4266	30648.76	98.6332	761492.45	1946.1525	578470.12	6255.8935	240683.89
173	1810328-14 10X	6.8530	143141.01	0.2322	1524.75	3.8787	31562.71	60.0148	15053.98	3367.6165	127135.71
174	1810328-15 10X	6.0930	134986.96	0.2127	1478.74	3.1497	27875.23	65.1932	17162.82	3025.9566	117485.43
175	CCV	105.7821	2262452.83	4.4668	29149.53	93.2741	695655.08	9800.6460	3019508.29	982.4293	36634.14
176	CCB	0.0120	366.01	-0.0001	12.00	0.5325	7500.64	19.8119	3390.50	-0.0234	26.67
177	1810328-16 10X	6.1720	135296.71	0.2215	1508.75	2.9435	26016.66	66.8270	17202.85	3015.6696	114286.90
178	1810328-17 10X	6.9270	155125.08	0.2448	1711.44	3.3744	29925.29	65.7502	17309.62	3236.8887	127534.13
179	1810328-18 10X	5.3340	119815.86	0.1959	1384.74	2.7220	24929.49	54.4600	14059.86	2646.4388	103119.08
180	1810328-19 10X	6.1508	135598.30	0.1174	820.03	1.9802	18801.67	40.5692	9479.75	2636.7277	99630.90
181	1810328-20 10X	6.6686	148105.93	0.2358	1633.42	2.8114	25343.37	55.3930	13949.75	3203.7127	124154.41
182	1810328-21 10X	6.6650	146565.98	0.2166	1490.08	2.7312	24482.16	163.3248	46078.07	3335.7039	126502.97
183	CCV	106.9628	2319213.42	4.4350	29618.98	93.2770	705328.79	10001.2804	3038036.10	1003.9379	37563.06
184	CCB	0.0134	396.01	-0.0006	8.67	0.4485	6884.82	19.4288	3157.11	0.2437	36.67
185	IP181104-3MB ...	0.0090	306.01	-0.0012	4.67	0.2053	5130.83	16.1790	2153.57	0.3404	40.00
186	IM181104-3LCS...	107.2493	2355063.25	4.3199	29192.22	93.4378	715563.81	970.1470	296588.85	985.3915	37269.10

Analyte Table

		7 Li [1]		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
187	1810195-1 10X	28.4620	622105.39	0.4405	3058.96	3.4525	29819.41	335.3066	98805.32	9707.8273	382257.56
188	1810195-2 10X	7.0505	159641.67	0.1858	1325.39	2.5868	24070.46	35.4773	8162.33	3281.6354	128373.46
189	1810195-3 10X	7.3089	161578.08	0.1697	1175.38	2.1048	19810.53	38.6066	8869.37	3145.9857	118955.04
190	1810195-4 10X	6.6487	147395.05	0.1860	1292.06	2.7848	25088.63	30.7083	6604.97	3174.4260	121470.18
191	1810195-5 10X	6.8496	153321.74	0.2128	1498.08	2.9615	26706.57	65.3315	17052.72	3179.8022	124380.44
192	1810195-6 10X	26.1983	576969.46	0.3764	2614.22	4.3489	36898.91	246.2903	70676.78	7204.1282	280292.58
193	1810195-7 10X	6.6308	144545.96	0.1463	1002.71	2.2437	20572.60	84.3821	22272.33	2727.5263	99895.61
194	1810195-7L 50X	1.3364	29718.01	0.0327	238.67	0.4618	7238.31	27.8309	5991.36	540.4984	20776.89
195	CCV	104.3155	2245631.00	4.4947	29308.42	92.6487	695514.38	9812.7323	2977975.27	993.0789	36283.61
196	CCB	0.0121	362.01	-0.0012	4.00	0.4168	6539.12	19.0780	3017.07	0.5479	46.67
197	1810195-7MS 10X	113.8560	2436235.33	4.4212	29237.64	87.5942	653891.88	1055.3529	303914.68	3874.4060	144254.18
198	1810195-7MSD ...	115.2450	2507756.50	4.5290	30736.94	93.0254	705939.21	1078.2586	310043.89	3926.9478	145284.98
199	1810195-7A 10X	136.4002	2952996.92	4.5301	29884.09	98.6791	744832.33	2003.5795	573823.49	5551.9954	202766.82
200	1810195-8 10X	6.6100	135903.54	0.1485	964.03	3.1429	25825.24	88.6730	22863.13	2782.9761	100918.84
201	1810195-9 10X	7.3666	158646.11	0.1854	1242.06	2.8130	24586.82	58.5994	14463.57	3299.1903	122403.02
202	1810195-11 10X	11.2446	238969.96	0.3216	2170.15	3.5562	29751.65	57.3967	13953.10	5290.4478	198155.60
203	1810195-12 10X	10.7396	229816.84	0.3042	2075.48	4.0442	33575.47	76.3630	19679.08	4702.4275	177994.70
204	1810195-13 10X	6.8973	146943.01	0.1578	1064.04	1.8117	16924.13	34.1428	7291.91	2842.1107	103796.88
205	1810195-14 10X	5.0683	107869.58	0.1061	706.69	1.3262	13325.41	29.0181	5831.28	2093.8857	75862.41
206	1810195-15 10X	14.8543	302394.05	0.2344	1426.07	3.3402	26973.73	77.5840	18087.15	6088.7446	209456.75
207	CCV	103.2862	2119806.29	4.3915	27661.02	91.4546	654599.73	9967.4951	2866767.04	1011.4596	35277.96
208	CCB	0.0112	328.68	-0.0005	8.67	0.4480	6474.66	18.2766	2653.68	0.2017	33.33
209	1810195-16 10X	7.9101	160801.96	0.1667	1056.71	2.1928	18835.02	34.2688	7001.76	2907.9033	102373.76
210	1810195-17 10X	7.0405	144154.42	0.1494	960.04	2.1295	18521.32	31.8818	6368.16	2796.7666	98202.30
211	1810195-18 10X	4.9867	102251.50	0.0594	390.01	0.7980	9081.42	21.9570	3627.25	1510.7701	53579.71
212	1810195-19 10X	11.0856	221671.84	0.1855	1162.05	1.3414	12630.34	30.9490	5991.34	3650.9422	126815.47
213	1810195-19L 50X	2.3302	47597.72	0.0417	282.01	0.2547	5191.97	17.2383	2343.59	744.5658	26491.96
214	1810195-19MS ...	11.1129	223312.86	0.1873	1196.05	1.4030	13112.96	33.3596	6598.27	3552.1040	123356.42
215	1810195-19MSD...	11.6215	232071.23	0.1675	1058.71	1.3684	12800.51	30.4053	5791.28	3836.3668	132296.81
216	1810195-19A 10X	143.2089	2836139.75	4.4859	27477.39	94.5478	653044.14	1952.0159	524738.72	6480.2474	221762.41
217	1810195-20 10X	9.5665	186344.39	0.1434	859.36	1.5606	13782.39	28.2135	5154.40	3127.3357	107234.18

Analyte Table

		7 Li [1]		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
218	CCV	105.9589	2124354.79	4.5949	27587.55	93.0317	650469.59	10121.1616	2819427.88	1029.0959	34773.58
219	CCB	0.0127	352.01	-0.0015	2.00	0.4843	6604.72	19.2355	2887.04	0.2238	33.33

Analyte Table

		27 Al [2]		39 K [2]		44 Ca [2]		49 Ti [2]		51 V [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	RINSE	6.8697	780.05	5.7632	606.71	3.5741	54.69	1.7833	36.67	0.0411	192.67
2	RINSE	6.0598	673.38	5.7441	590.04	0.6496	35.05	1.2291	6.67	0.0356	179.33
3	BLANK	1.7664	203.34	6.1244	636.71	0.0000	32.52	1.2258	6.67	-0.0335	57.00
4	H/1000	45.0519	5261.11	49.8639	3327.17	53.9009	385.97	4.4555	183.34	0.1339	370.68
5	H/100	83.3798	10073.43	493.2997	31621.10	521.6753	3588.14	27.0167	1470.13	0.9999	2084.81
6	H/10	495.9571	60684.25	5000.6951	324065.42	4803.8387	33562.14	300.2969	17276.36	9.9996	20088.16
7	HIGH	4999.9703	561340.36	49999.9767	3120532.35	50019.3955	318347.65	2999.9881	165363.50	99.9998	193796.27
8	RINSE	7.0791	796.72	3.6224	473.36	-1.0817	25.14	1.5378	23.33	0.0198	154.67
9	ICV	974.6458	114820.81	10192.8039	640173.65	9163.4479	65356.41	411.2924	22706.52	19.5357	38253.52
10	ICB	1.7010	193.34	6.0829	623.38	1.4806	41.44	1.2262	6.67	-0.0357	52.33
11	LIV	10.4437	1203.42	107.6728	6785.04	87.5162	599.13	18.8666	960.08	0.5028	1050.71
12	ICSA	8526.3271	1131033.03	10318.5356	631618.82	29398.1697	191762.35	214.0586	11367.77	-0.0132	96.67
13	ICSAB	8976.3271	1168088.11	15484.1774	937707.54	34112.2936	221444.39	527.9240	27817.63	10.4874	19942.97
14	CCV	487.7490	59071.60	4971.4741	318962.83	4941.1514	33809.31	296.8890	16912.70	10.0167	19972.68
15	CCB	1.7709	206.68	5.9542	636.71	-2.1204	18.74	1.2849	10.00	-0.0333	58.00
16	IP181101-5MB ...	1.1727	136.68	4.8429	563.37	1.5295	42.70	1.2816	10.00	-0.0282	67.33
17	IM181101-5LCS...	441.6667	56135.10	467.2598	31277.20	1031.3464	7402.86	182.3301	10817.30	9.5047	19638.60
18	1810184-1 100X	2.1699	253.35	3014.9609	187238.19	7283.7913	48200.45	1.4053	16.67	-0.0157	94.33
19	1810184-2 100X	2.4980	303.35	1341.8168	86381.27	6004.3733	41468.74	1.1012	0.00	-0.0109	106.33
20	1810184-3 100X	1.0266	126.67	1136.9763	73871.53	5720.3371	40050.96	1.2180	6.67	-0.0039	122.67
21	1810184-4 100X	1.4410	176.67	1007.9335	65533.16	5679.1058	39494.62	1.3306	13.33	0.2590	652.35
22	1810184-5 100X	0.9384	113.34	1148.7831	73522.69	5891.5988	40655.17	1.2194	6.67	0.0076	142.33
23	1810184-6 100X	1.7240	210.01	1059.9443	68508.70	5897.6794	40770.86	1.2197	6.67	0.0112	152.00
24	1810184-7 100X	0.9242	113.34	1282.1173	83379.47	6067.2050	41676.91	1.2741	10.00	0.0448	221.00
25	1810184-8 100X	1.5263	193.34	982.5687	66108.80	5606.0428	39942.80	1.2689	10.00	0.2854	723.69
26	CCV	472.1889	59931.50	4852.5624	326225.67	4872.1942	34871.45	288.7429	17229.69	9.8321	20589.44
27	CCB	1.7131	206.68	6.9902	720.04	1.7059	45.32	1.2775	10.00	-0.0385	50.33
28	1810184-18 100X	1.3784	163.34	1954.5617	122589.33	7453.1639	50196.17	1.2825	10.00	0.0141	155.33
29	1810203-2 10X	2.0169	263.35	205.8262	14426.85	7645.8331	55693.28	1.2103	6.67	-0.0058	123.33
30	1810203-2L 50X	1.2721	160.01	43.9045	3207.14	1535.9026	10989.35	1.2165	6.67	-0.0236	83.00
31	1810203-2MS 10X	444.1265	55713.38	686.5187	45243.15	8930.7480	62932.36	191.6732	11230.92	9.5592	19706.36

Analyte Table

		27 Al [2]		39 K [2]		44 Ca [2]		49 Ti [2]		51 V [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1810203-2MSD ...	451.6574	57733.69	660.7125	44387.07	8533.2931	61570.90	197.3178	11788.01	9.4780	20075.80
33	1810203-4 10X	2.4344	300.02	203.5770	13499.39	7602.8307	52935.75	1.2156	6.67	-0.0105	108.67
34	CCV	491.7990	62400.47	4957.5460	333168.72	4925.3639	35507.59	293.8155	17523.41	9.9412	20909.48
35	CCB	1.5426	186.68	6.2268	673.38	0.6325	38.02	1.1012	0.00	-0.0351	57.00
36	IP181101-6MB ...	1.1588	140.01	3.3977	493.36	-2.1693	19.46	1.3405	13.33	-0.0188	89.00
37	IM181101-6LCS...	453.9045	57024.38	476.3354	31500.82	1053.9025	7418.66	192.4598	11294.29	9.6774	19779.80
38	1810182-1 10X	5.9120	716.71	213.2247	13859.67	12378.5129	85400.82	1.6312	30.00	0.3615	850.36
39	1810182-2 10X	2.5007	306.68	187.6276	12405.20	8647.8801	60052.57	1.1589	3.33	0.3752	881.70
40	1810182-3 10X	2.0106	246.68	205.2692	13529.41	11438.4332	80602.52	1.2728	10.00	0.3553	858.03
41	1810182-4 10X	1.6785	206.68	186.9966	12375.16	7048.2605	48317.09	1.3878	16.67	0.3473	827.69
42	1810182-5 10X	1.7708	213.35	450.9533	28862.73	5910.9342	40646.55	1.1012	0.00	0.3967	923.70
43	1810182-6 10X	2.1679	260.01	171.8829	11080.77	7090.9070	47947.84	1.4588	20.00	0.2902	700.35
44	1810182-7 10X	3.0633	360.02	281.0216	17673.48	24134.4531	161524.55	1.3442	13.33	0.2768	668.35
45	1810182-8 10X	1.8062	220.01	188.7040	12375.19	7386.2373	51496.96	1.2157	6.67	0.4438	1016.04
46	CCV	483.2619	58767.32	4915.3713	316574.37	4719.2594	32639.25	288.0506	16462.23	9.8351	19849.55
47	CCB	1.8491	220.01	7.2628	726.71	-2.1189	18.83	1.1611	3.33	-0.0289	68.33
48	1810182-9 10X	5.3618	653.38	198.6805	13025.63	6307.5623	43394.00	1.3354	13.33	0.4181	968.70
49	1810182-10 10X	1.7736	213.34	191.2279	12425.19	6881.3246	47492.06	1.3931	16.67	0.4882	1092.04
50	1810182-11 10X	1.8871	226.68	179.0162	11534.44	8013.5132	54668.12	1.2212	6.67	0.4355	991.03
51	1810182-12 10X	2.7779	326.69	340.9892	21384.60	7327.1534	49136.03	1.2242	6.67	0.4600	1016.37
52	1810182-13 10X	4.2790	503.36	226.0223	14280.06	6413.1651	43221.41	1.2210	6.67	0.5177	1133.04
53	CCV	490.7177	58560.15	4922.9397	311096.91	4880.0641	33246.66	296.2533	16618.96	9.7918	19488.09
54	CCB	1.4529	170.01	8.0498	763.39	-0.4960	29.28	1.2227	6.67	-0.0319	61.33
55	IP181102-1MB ...	1.0353	123.34	3.6658	500.03	0.4497	36.04	1.4008	16.67	-0.0229	79.33
56	IM181102-1LCS...	481.0690	58549.79	490.5013	31407.37	1016.2597	7028.64	194.6474	11060.82	9.8805	19771.44
57	1810328-12 10X	1.2423	143.34	4.0994	513.37	0.0711	32.61	1.3468	13.33	-0.0226	77.33
58	CCV	493.3493	58499.34	4952.4979	311004.97	4947.6710	33114.60	289.7746	16148.52	9.7250	19189.79
59	CCB	2.1314	250.01	7.7555	746.72	1.8405	43.70	1.1012	0.00	-0.0332	58.33
60	IP181102-2MB ...	1.5908	186.68	3.8454	506.70	0.3375	35.59	1.1012	0.00	-0.0217	80.67
61	IM181102-2LCS...	467.5926	58513.02	489.6736	32245.64	971.2728	6840.40	200.8925	11747.92	9.7642	20041.09
62	1810247-4 10X	4.1050	490.04	253.5852	16208.61	7648.9304	51099.70	1.1012	0.00	0.0057	136.67

Analyte Table

		27 Al [2]		39 K [2]		44 Ca [2]		49 Ti [2]		51 V [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1810247-4L 50X	1.7650	213.34	54.8474	3763.93	1501.1118	10284.03	1.1012	0.00	-0.0258	75.67
64	1810247-4MS 10X	488.8813	59071.48	758.6220	48113.97	8714.8661	59196.43	195.5419	11034.15	10.2002	20363.17
65	1810247-4MSD ...	465.3399	55730.58	764.8071	48087.48	8739.4354	58755.02	205.9061	11527.89	9.8627	19509.46
66	1810247-7 10X	4.5454	536.71	414.4638	26001.33	16328.8021	109478.26	1.4659	20.00	-0.0096	105.67
67	1810247-9 10X	9.1859	1103.42	506.8508	32295.54	4023.9020	27204.31	1.4002	16.67	0.0201	166.00
68	1810330-16 10X	29.4024	3417.17	5.1866	583.37	11.6102	108.03	1.2249	6.67	-0.0162	90.67
69	1810444-1 10X	1.7913	200.01	805.0561	47605.97	45079.8506	284306.40	1.1012	0.00	-0.0175	88.00
70	CCV	487.3756	58463.04	4943.9366	314175.52	4989.0651	33988.62	286.5443	16155.16	9.8177	19623.93
71	CCB	1.5063	176.68	9.1202	830.06	1.9670	45.41	1.1610	3.33	-0.0348	56.00
72	1810444-2 10X	1.5304	186.68	206.9556	13582.75	4877.2777	33396.06	1.5650	26.67	-0.0233	81.67
73	1810444-3 10X	1.4762	180.01	118.6257	7988.91	1240.4455	8530.43	1.4496	20.00	-0.0188	91.00
74	1810444-4 10X	2.0980	246.68	90.3380	5857.95	649.3018	4358.32	1.1615	3.33	-0.0166	92.00
75	1810444-5 10X	1.3173	156.68	144.4630	9306.30	4222.1353	28768.19	1.2198	6.67	0.0597	241.00
76	1810444-6 10X	2.4151	283.35	166.4494	10563.80	10477.4772	68768.70	1.3435	13.33	0.0100	144.67
77	1810444-7 10X	1.4745	173.34	64.6229	4290.75	2366.3712	15882.41	1.4099	16.67	-0.0180	89.33
78	1810444-8 10X	1.3996	163.34	145.9597	9226.29	3685.0852	24474.33	1.4056	16.67	-0.0149	95.33
79	1810444-9 10X	1.8025	210.01	44.5912	2997.08	2806.1237	18615.29	1.2223	6.67	0.0093	140.67
80	1810444-10 10X	2.3502	276.68	58.4466	3893.93	4396.0782	29285.96	1.2819	10.00	0.0208	164.67
81	1810444-11 10X	1.7536	206.68	140.2401	8969.43	4027.0469	26826.61	1.3428	13.33	-0.0203	85.00
82	CCV	502.0640	59573.21	5024.6031	315764.10	5042.8584	33852.52	302.1556	16859.33	9.8338	19476.76
83	CCB	1.8401	213.35	7.2031	706.72	1.8288	44.42	1.1012	0.00	-0.0289	67.00
84	1810444-12 10X	1.1764	143.34	160.7071	10570.47	8095.9110	55625.02	1.1598	3.33	-0.0159	95.67
85	1810444-13 10X	1.2630	150.01	148.2557	9533.12	7841.3723	52231.21	1.3408	13.33	-0.0185	89.00
86	CCV	504.6636	60680.61	4981.4158	317210.00	4974.8397	33834.73	292.8106	16538.83	9.9527	19868.88
87	CCB	1.5660	186.68	7.4341	740.06	0.6732	37.48	1.1012	0.00	-0.0323	61.00
88	FP181030-2MB...	1.7394	216.68	3.8462	536.70	0.7495	39.28	1.2134	6.67	-0.0311	66.33
89	IP181103-2MB ...	2.1302	250.01	3.2210	466.69	-3.0462	12.43	1.2248	6.67	-0.0311	63.00
90	IM181103-2LCS...	469.5199	57864.05	493.1618	31985.21	1067.2372	7429.56	194.4809	11190.93	9.8333	19873.56
91	1810475-1 10X	8.4389	980.08	1348.2089	82997.77	6140.5029	40553.03	1.5267	23.33	0.0367	194.67
92	1810475-2 10X	12.6948	1436.80	2875.1895	172996.38	9527.3588	61277.99	1.6656	30.00	0.1321	372.68
93	1810475-3 10X	4.3016	526.70	688.6171	44697.97	2493.5743	17261.10	1.2750	10.00	0.4393	1014.37

Analyte Table

		27 Al [2]		39 K [2]		44 Ca [2]		49 Ti [2]		51 V [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1810475-4 10X	2.2318	270.02	543.7832	34951.13	8444.3971	57345.54	1.3978	16.67	-0.0023	123.67
95	1810475-5 10X	6.4672	773.39	667.9241	42301.51	5671.2100	38620.13	1.1616	3.33	0.0374	199.33
96	1810475-6 10X	6.7270	796.73	681.2513	42766.63	13305.5850	89964.51	1.3419	13.33	0.0350	195.67
97	1810601-1 10X	2.6494	323.35	722.6597	46743.74	9295.8416	64734.90	1.2176	6.67	0.0013	131.00
98	CCV	484.7203	58038.09	4983.2878	316104.72	4994.6284	33593.50	304.0331	17126.34	9.9378	19760.42
99	CCB	1.6166	186.67	9.5572	846.73	2.9230	51.98	1.3452	13.33	-0.0281	67.67
100	1810612-1 10X	2.9415	353.36	302.0413	19348.57	11022.2750	74862.69	1.3971	16.67	0.1421	409.34
101	1810612-3 10X	1.9624	236.68	301.2584	19425.48	11177.3765	75386.26	1.2769	10.00	0.1410	410.34
102	1810612-4 10X	2.3577	283.35	311.1550	19962.69	11388.2688	77223.07	1.2190	6.67	0.1381	401.01
103	1810628-1 10X	6.3529	760.05	383.7171	24445.49	6740.8242	45225.89	1.2186	6.67	0.1382	400.34
104	1810637-1 10X	54.1573	6374.82	2316.4231	144646.11	8215.6612	55095.99	1.3433	13.33	0.0040	133.00
105	1810637-1L 50X	1.7975	220.01	438.4205	28541.92	1615.3383	11014.51	1.2176	6.67	-0.0169	93.67
106	1810637-1MS 10X	490.3825	58392.35	2815.4734	176425.39	9019.9352	60431.92	208.8215	11621.25	10.0675	19994.36
107	1810637-1MSD ...	486.3822	57730.25	2832.0671	176901.18	9101.6103	61399.15	217.0699	12048.22	10.1777	20087.49
108	1810637-2 10X	135.1580	15844.91	2304.8017	143033.49	7852.4937	51611.21	1.1012	0.00	0.0065	137.00
109	1810637-2L 50X	1.8349	223.35	455.8396	29507.31	1481.7064	10218.24	1.3942	16.67	-0.0288	70.00
110	CCV	488.3610	58466.13	4997.9995	316966.48	4914.8913	33302.60	308.5590	17383.20	9.9387	19698.67
111	CCB	1.4249	166.68	8.6193	800.05	0.8227	37.75	1.1615	3.33	-0.0285	67.33
112	1810637-2MS 10X	500.5597	58921.36	2872.6507	177921.86	9137.1860	60691.12	203.1617	11167.58	10.1286	19892.23
113	1810637-2MSD ...	483.2421	58479.62	2884.6292	183767.89	9416.3380	63717.92	207.1371	11717.99	10.1765	20520.99
114	1810637-3 10X	9.1821	1073.43	5.6897	616.71	2.3887	47.75	1.1621	3.33	-0.0274	69.67
115	1811004-21 10X	1.7510	213.35	420.4130	27126.60	13595.9098	94281.18	1.1587	3.33	0.2406	616.01
116	1811004-22 10X	3.6476	440.03	543.4746	34730.53	12291.3863	83707.86	1.2190	6.67	0.1041	336.00
117	1811004-23 10X	11.4736	1380.12	551.5144	35211.50	12510.7442	85900.43	1.5744	26.67	0.1150	355.01
118	1811004-24 10X	19.5707	2310.28	630.0947	39478.08	10272.1454	68828.74	1.3993	16.67	1.8939	3848.46
119	CCV	493.6643	60208.67	4940.9690	319118.37	4822.9565	33373.36	288.5777	16535.59	9.8111	19767.76
120	CCB	1.4188	170.01	6.9294	710.05	5.7406	71.53	1.1012	0.00	-0.0315	63.67
121	IP181105-1MB ...	1.5602	186.68	4.3364	546.70	-2.0904	19.37	1.1012	0.00	-0.0230	79.33
122	IM181105-1RVS...	14.2478	1716.85	54.0665	3700.58	43.0180	320.73	11.7157	600.04	0.2360	587.68
123	IM181105-1LCS...	459.8874	57412.78	488.1527	32072.05	1092.9928	7603.55	190.9299	11137.54	9.7400	19759.76
124	1810412-1 10X	166.8249	20226.30	1898.1294	121638.38	4170.8930	28279.47	12.0236	620.04	2.4605	5032.11

Analyte Table

		27 Al [2]		39 K [2]		44 Ca [2]		49 Ti [2]		51 V [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
125	1810412-1L 50X	34.7463	4230.70	388.4500	25129.85	839.7105	5878.92	4.4083	190.01	0.4629	1053.71
126	1810412-1MS 10X	631.4846	77134.21	2360.1633	151109.12	5205.1170	35739.18	204.7083	11658.03	11.9649	24179.25
127	1810412-1MSD ...	648.3314	77573.68	2395.2880	150142.39	5305.8222	35673.14	197.9952	11027.56	12.1068	24057.74
128	1810412-2 10X	1.5502	183.34	1875.0363	117627.69	4191.7710	27723.28	1.1612	3.33	2.0901	4229.23
129	1810412-3 10X	137.2386	14209.89	64122.1996	4233015.15	1836.4346	10966.86	2.6118	73.33	2.9810	5393.90
130	1810412-4 10X	138.6287	14823.83	65605.8139	4491945.76	1843.9833	11416.75	2.0366	46.67	3.0054	5599.96
131	CCV	477.6238	58325.67	4830.8154	312392.32	4811.8581	33019.61	286.6053	16435.45	9.6435	19676.99
132	CCB	1.5792	190.01	8.2674	796.72	7.4993	81.27	1.1012	0.00	-0.0256	75.67
133	1810412-5 10X	7.7401	923.40	8623.6257	556072.14	1045.3576	6966.75	1.5188	23.33	4.8831	9867.62
134	1810412-6 10X	8.2275	976.74	8607.6698	552740.72	1088.6218	7158.41	1.4006	16.67	4.8650	9776.57
135	1810412-7 10X	14.1512	1643.49	31772.1230	2148283.04	2174.0346	14105.62	1.6511	30.00	3.6488	7271.28
136	1810412-8 10X	12.1067	1466.80	31732.4115	2237230.07	2137.3600	14586.55	1.2766	10.00	3.5891	7440.69
137	1810412-9 10X	1.5561	196.68	1321.9578	88609.75	4165.0222	28720.45	1.1569	3.33	0.6972	1587.08
138	1810412-10 10X	2.6082	323.35	1295.9011	85141.51	4151.8829	28467.11	1.1589	3.33	0.6972	1549.08
139	1810412-11 10X	2.7750	343.35	1290.7200	84695.99	4258.0578	28924.78	1.1594	3.33	0.6800	1523.41
140	1810412-12 10X	1.7774	220.01	935.4023	61293.55	3993.0596	26929.05	1.1012	0.00	1.8815	4007.83
141	1810506-1 10X	3.9739	503.37	200.9913	13682.89	5647.7130	39006.82	1.2710	10.00	0.1878	522.68
142	1810506-2 10X	1.4785	186.68	205.9374	13989.88	5618.7569	39020.77	1.2128	6.67	0.1858	518.68
143	CCV	473.5128	61195.78	4731.4262	323785.01	4874.6054	34201.59	284.7007	17292.98	9.4766	20309.75
144	CCB	1.1240	163.34	6.1635	806.73	4.7039	73.60	1.2507	10.00	-0.0238	92.33
145	1810506-5 10X	1.5875	220.01	227.0834	16879.29	2769.2846	20921.14	1.3063	13.33	0.0076	162.33
146	1810506-6 10X	1.7208	240.01	221.6070	16578.93	2836.0492	21957.74	1.2549	10.00	0.0011	148.33
147	1810544-2 10X	1.9696	280.01	487.2239	36604.73	1014.8735	7939.85	1.2023	6.67	-0.0014	144.33
148	1810544-3 10X	1.7210	250.01	483.9842	37386.28	1031.2328	8077.82	1.3427	16.67	-0.0028	143.00
149	1810544-4 10X	2.1650	320.02	480.7830	37703.96	986.7394	7776.87	1.4419	23.33	-0.0151	115.00
150	1811031-1 10X	26.2071	3650.56	572.4292	42311.68	5471.6337	41787.66	1.3055	13.33	0.6721	1674.42
151	CCV	485.4319	66666.22	4857.2696	353219.69	4981.5794	37868.47	285.1815	18404.31	9.7867	22341.02
152	CCB	1.6471	230.01	7.5094	873.40	7.1720	94.60	1.3050	13.33	-0.0296	79.67
153	IP181104-5MB ...	1.3082	190.01	4.1084	646.71	-0.0536	38.92	1.1012	0.00	-0.0174	108.33
154	IM181104-5LCS...	439.5243	63747.97	461.0819	35228.15	1124.2826	8769.88	178.8708	12108.25	9.2700	21718.52
155	1810328-1 10X	3598.2371	498593.91	792.5987	54119.04	19833.5016	148101.63	49.2539	2920.41	9.3185	20522.02

Analyte Table

		27 Al [2]		39 K [2]		44 Ca [2]		49 Ti [2]		51 V [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
156	1810328-2 10X	5048.9270	717659.42	1217.4290	82880.04	23351.0802	177238.28	42.5152	2503.64	11.0784	23853.45
157	1810328-3 10X	7486.1626	1092346.49	2388.1658	159836.34	39206.5165	295313.71	31.5212	1803.51	75.4185	170183.88
158	1810328-4 10X	2935.5370	412111.33	672.6224	47171.14	27882.0440	208593.11	10.1248	560.04	76.0417	179700.31
159	1810328-5 10X	3163.6120	455490.11	910.7238	65151.92	16082.1589	125058.20	37.6857	2323.60	11.0896	25221.46
160	1810328-6 10X	3456.7479	509808.51	961.0202	70012.04	15236.9902	121604.89	41.6908	2623.67	8.7034	19982.70
161	1810328-7 10X	3739.3405	533384.65	851.7093	59691.79	34095.2158	259023.10	22.6099	1336.78	123.3439	308465.44
162	1810328-8 10X	1714.9458	251150.41	348.1100	26234.91	13822.9148	106832.23	6.3279	346.69	15.3012	35387.94
163	CCV	466.1132	65893.14	4770.4047	357174.73	4982.9654	38562.83	269.1688	17877.17	9.6215	22314.30
164	CCB	1.7479	253.35	7.4431	896.74	1.8416	53.79	1.3489	16.67	-0.0334	71.67
165	1810328-9 10X	2274.7274	321932.48	319.9313	23053.57	44458.7134	339967.33	5.3051	266.68	22.1232	51062.14
166	1810328-10 10X	9122.6416	1438249.67	2320.0334	162895.86	37019.6277	302258.32	80.3233	4940.97	110.8351	274179.05
167	1810328-11 10X	3506.9423	533237.78	1059.2960	79456.65	18208.5870	147979.00	38.4724	2486.96	9.9556	23185.83
168	1810328-13 10X	3772.1084	563111.46	1236.3494	90602.83	25607.1850	206574.80	36.7620	2320.28	11.5037	26605.93
169	1810328-13L 50X	761.6503	118828.29	238.0960	19592.21	5204.3682	42775.39	9.1917	583.38	2.2598	5603.97
170	1810328-13MS ...	5239.9984	802785.80	1968.5473	144132.52	26033.9406	211004.49	142.5442	9243.04	21.4664	50109.24
171	1810328-13MSD...	5244.5867	788906.42	1964.6452	141176.58	25343.3435	201235.45	161.2424	10270.32	21.7927	50282.01
172	1810328-13A 10X	4184.0882	608062.23	3140.3804	223187.33	27373.0620	214886.35	327.2126	20797.28	21.0089	47506.57
173	1810328-14 10X	3716.3631	532218.96	1238.3853	87158.34	25611.3566	197338.91	40.4139	2456.99	12.6087	28110.73
174	1810328-15 10X	3345.3278	492056.52	1117.8586	81388.75	21738.6504	172205.44	40.2435	2530.31	9.8240	22420.44
175	CCV	479.7401	66157.58	4885.3711	356809.67	4971.0091	37836.42	290.5839	18834.95	9.6566	22112.72
176	CCB	1.7631	253.35	7.0712	860.06	7.7288	97.21	1.2000	6.67	-0.0287	80.67
177	1810328-16 10X	3325.5401	476324.55	1114.5569	79034.41	23143.9811	178974.34	38.9997	2386.97	8.9345	20319.42
178	1810328-17 10X	3721.7799	550730.19	1331.3904	96811.07	17710.6347	142394.29	41.5775	2613.67	11.0416	25477.52
179	1810328-18 10X	3290.5760	489925.90	1079.5663	79655.33	16312.1299	129708.35	42.2217	2697.02	22.3006	51803.03
180	1810328-19 10X	2992.4413	430886.14	625.6661	44965.42	26999.2063	208122.00	20.9989	1266.78	125.7354	315472.62
181	1810328-20 10X	3554.0630	517038.37	1124.0792	80609.56	22541.6945	178229.72	42.1371	2613.66	17.3054	39355.15
182	1810328-21 10X	3785.4694	547672.26	1048.8662	74470.62	30245.7043	234040.11	48.4133	2983.75	32.1386	73296.97
183	CCV	477.1530	64862.73	4935.1828	355399.93	4856.2870	37090.90	288.5616	18444.40	9.7799	21962.52
184	CCB	1.9988	276.71	7.2425	843.40	1.0928	46.58	1.1012	0.00	-0.0301	76.00
185	IP181104-3MB ...	1.6974	236.68	5.7367	733.39	-1.2544	28.11	1.4092	20.00	-0.0235	90.00
186	IM181104-3LCS...	458.3664	63952.46	476.6092	35004.51	1036.5065	8031.93	189.6969	12358.43	9.4221	21515.27

Analyte Table

		27 Al [2]		39 K [2]		44 Ca [2]		49 Ti [2]		51 V [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
187	1810195-1 10X	7728.3140	1220184.30	1591.9898	114583.52	7689.5196	61842.44	45.9667	2867.08	6.9804	15786.20
188	1810195-2 10X	3582.1814	536272.10	1018.2076	75110.28	13956.7538	111395.57	37.8759	2406.98	24.3101	56262.37
189	1810195-3 10X	3378.4772	489176.70	569.5484	40867.81	21098.7801	162808.31	23.5027	1423.47	34.8400	80028.09
190	1810195-4 10X	3582.4495	530055.89	1188.6231	86662.51	16759.1187	130871.27	32.1241	2006.89	10.8064	24687.65
191	1810195-5 10X	3993.6408	589601.53	1234.9815	89112.33	15531.4683	123988.39	32.2785	1996.90	12.0961	27386.88
192	1810195-6 10X	7322.7291	1129204.49	1296.2816	91762.56	24235.7065	192432.34	28.3196	1710.16	16.4337	36791.60
193	1810195-7 10X	3095.3613	437784.66	520.4059	36701.70	31095.3314	232379.87	21.1777	1253.44	23.5433	52765.09
194	1810195-7L 50X	642.6692	93791.93	98.7656	7815.53	6026.2505	47250.48	4.4956	230.01	4.6639	10905.27
195	CCV	469.7009	63798.97	4876.3431	350853.90	4961.7500	37009.35	288.0419	18397.66	9.6423	21536.30
196	CCB	1.8511	253.35	6.5333	783.39	2.2643	53.88	1.1530	3.33	-0.0287	78.33
197	1810195-7MS 10X	4347.0705	617169.63	1176.2913	81064.07	27437.9753	208442.07	150.0906	9169.65	27.7362	61583.42
198	1810195-7MSD ...	4464.9921	634319.81	1241.8975	85439.23	27697.8006	209102.18	155.0129	9456.51	34.2520	77023.93
199	1810195-7A 10X	3530.4611	488011.96	2476.2036	169218.62	32109.8447	239298.26	303.9424	18584.40	32.6542	72111.90
200	1810195-8 10X	3245.1815	447125.41	573.4419	39260.37	27681.8646	204729.39	21.8271	1256.77	18.3377	40036.39
201	1810195-9 10X	3860.8653	547937.35	724.3610	50413.99	22385.0491	169477.13	30.8705	1836.84	13.0399	28829.96
202	1810195-11 10X	5748.4550	836289.34	1900.8455	130834.05	20193.4389	154349.71	45.6942	2723.69	17.2526	37498.18
203	1810195-12 10X	5954.4562	880174.15	1567.6650	109140.38	16388.6107	126593.97	44.6239	2690.34	15.5028	34001.03
204	1810195-13 10X	2903.7877	403723.86	521.0204	36257.22	16596.5704	123702.80	25.5114	1503.48	10.1076	22216.83
205	1810195-14 10X	2199.1036	303504.73	410.6427	28825.97	11152.0232	82454.29	21.0026	1233.43	8.9046	19427.03
206	1810195-15 10X	4530.9046	588418.69	868.5956	54580.66	96029.1937	673968.98	48.0609	2620.32	11.7944	24152.55
207	CCV	479.3322	61701.25	4934.9791	336475.80	4945.5046	35213.30	285.4965	17269.74	9.6504	20593.43
208	CCB	1.9087	250.01	7.3504	806.73	6.5307	83.43	1.1012	0.00	-0.0291	74.33
209	1810195-16 10X	3820.4480	516574.59	737.6137	48943.22	17454.7900	125424.84	26.4915	1493.47	252.4042	659034.21
210	1810195-17 10X	3412.4369	460139.02	743.3451	49582.06	20408.7478	146222.92	30.4573	1736.84	245.7168	635851.27
211	1810195-18 10X	2214.6730	295372.07	317.4211	21584.75	10398.2023	75248.89	15.6825	873.40	132.9086	313874.66
212	1810195-19 10X	4587.5382	621145.64	660.4882	43260.61	16014.1075	113491.37	34.1696	1920.20	676.8615	2310827.67
213	1810195-19L 50X	974.9915	129996.33	128.0243	9099.56	3318.7836	24102.85	6.9701	360.02	186.0478	468515.30
214	1810195-19MS ...	4685.9109	630204.08	778.4561	50517.83	18501.3519	131093.14	33.1829	1846.86	709.5939	2470481.00
215	1810195-19MSD...	4862.9539	656222.30	678.5989	44059.42	16029.8310	112807.04	32.1985	1790.18	712.4651	2494230.25
216	1810195-19A 10X	4991.3736	666274.60	2604.7081	167160.67	18253.4198	127482.65	316.6530	18190.65	688.9418	2345733.92
217	1810195-20 10X	4033.7487	531648.27	598.2512	38569.42	15227.7251	106560.04	27.8412	1526.81	576.4922	1837681.21

Analyte Table

		27 Al [2]		39 K [2]		44 Ca [2]		49 Ti [2]		51 V [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
218	CCV	486.0966	60603.99	4944.2250	326448.32	4985.7193	34389.43	289.1415	16939.32	9.6717	19953.65
219	CCB	1.5815	203.35	7.3636	793.39	6.9958	84.06	1.1012	0.00	-0.0155	101.00

Analyte Table

		52 Cr [2]		55 Mn [2]		56 Fe [2]		59 Co [2]		60 Ni [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	RINSE	0.0265	148.89	0.0348	114.45	2.2653	7962.27	0.0061	42.22	-0.0035	27.78
2	RINSE	0.0361	168.89	0.0224	88.89	2.2819	7855.51	-0.0003	12.22	-0.0097	20.00
3	BLANK	0.0000	85.56	0.0000	50.00	0.0000	1536.81	0.0000	14.45	0.0000	32.22
4	H/1000	0.5888	1588.99	0.2586	552.24	6.0032	18998.39	0.1140	560.02	0.5559	698.92
5	H/100	5.0820	13598.01	2.1676	4437.33	50.6334	155466.72	1.0087	5040.84	5.3230	6704.79
6	H/10	49.1551	133933.21	20.6147	42766.45	528.8562	1623607.53	10.2582	52340.87	52.2698	66164.50
7	HIGH	500.0836	1241602.59	199.9368	377831.39	4997.1070	13640056.88	99.9741	465028.65	499.7697	562536.45
8	RINSE	0.0455	196.67	0.0389	122.23	2.3207	8152.40	0.0008	17.78	-0.0081	22.22
9	ICV	93.3826	259761.80	39.2881	83202.53	1029.0365	3058663.50	19.6824	102559.13	99.5962	122053.81
10	ICB	0.0260	148.89	0.0196	86.67	0.1974	2086.90	0.0029	27.78	0.0217	57.78
11	LIV	1.0283	2683.59	0.5527	1112.28	10.3363	31244.08	0.5538	2635.81	2.2211	2665.81
12	ICSA	0.3229	905.59	0.4334	888.93	24488.6825	72220425.59	0.0040	33.33	0.0223	60.00
13	ICSAB	51.0084	129232.88	21.5470	41575.65	24933.3973	72384377.25	10.5463	50043.74	51.0063	61098.61
14	CCV	49.7627	132786.17	20.5661	41790.76	518.1030	1578867.48	10.3198	51572.88	52.5131	65968.34
15	CCB	0.0124	117.78	0.0120	73.33	0.5906	3280.47	0.0009	18.89	0.0162	52.22
16	IP181101-5MB ...	0.0137	120.00	0.0076	64.44	0.6612	3470.51	0.0042	34.44	-0.0067	24.44
17	IM181101-5LCS...	47.9852	133846.76	9.9999	21268.30	487.5872	1540219.61	10.1829	53195.96	51.3884	66910.09
18	1810184-1 100X	0.0330	171.11	55.9233	109855.73	1.8143	7105.20	0.0777	390.01	0.2361	328.90
19	1810184-2 100X	0.0143	127.78	20.3439	41732.89	0.2069	2290.27	0.0257	144.45	0.2139	308.90
20	1810184-3 100X	0.0161	134.45	58.2817	121127.72	0.1487	2150.23	0.0363	201.12	0.2390	346.68
21	1810184-4 100X	0.0230	152.22	14.6523	30276.79	-0.0134	1620.16	0.0036	33.33	0.1852	274.45
22	1810184-5 100X	0.0101	116.67	5.4932	11298.46	0.0536	1800.18	0.0036	33.33	0.1547	231.12
23	1810184-6 100X	0.0237	153.33	8.5844	17656.27	-0.0027	1650.16	0.0073	52.22	0.1723	257.79
24	1810184-7 100X	0.0295	167.78	25.2540	51519.17	0.1615	2180.28	0.0090	60.00	0.1586	241.12
25	1810184-8 100X	0.0148	133.34	14.6804	31078.35	0.2815	2610.35	0.0019	25.55	0.1875	284.45
26	CCV	49.2254	137394.22	20.5890	43760.17	511.2560	1636550.70	10.2605	53636.07	51.4540	67888.35
27	CCB	-0.0001	87.78	0.0059	63.33	0.0514	1776.84	0.0015	22.22	0.0170	55.56
28	1810184-18 100X	0.0172	132.23	52.9667	105887.46	0.0701	1853.52	0.0747	382.23	0.1830	267.78
29	1810203-2 10X	0.0375	201.12	0.1697	422.24	1.7647	7542.12	0.0016	24.44	0.0246	70.00
30	1810203-2L 50X	0.0122	126.67	0.0535	166.67	0.2299	2426.95	0.0002	16.67	-0.0102	22.22
31	1810203-2MS 10X	47.8871	131679.01	10.2503	21488.67	489.2229	1541709.30	10.1518	52282.86	50.6764	65835.82

Analyte Table

		52 Cr [2]		55 Mn [2]		56 Fe [2]		59 Co [2]		60 Ni [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1810203-2MSD ...	47.7156	134371.96	10.2524	22011.49	490.3840	1587889.30	10.2380	53990.54	49.9685	66705.96
33	1810203-4 10X	0.0511	228.89	0.0569	170.00	0.7614	4064.02	0.0005	17.78	0.0312	75.56
34	CCV	49.5467	139308.60	20.6987	44316.18	521.6952	1676976.43	10.3588	54547.87	52.0666	68991.73
35	CCB	-0.0019	83.34	0.0021	55.56	0.0744	1846.86	0.0010	20.00	0.0037	38.89
36	IP181101-6MB ...	-0.0043	76.67	0.0127	77.78	0.1222	1990.21	-0.0005	12.22	-0.0114	20.00
37	IM181101-6LCS...	48.8594	133562.73	10.3283	21527.57	502.2774	1569315.86	10.3942	53222.65	52.4594	67569.34
38	1810182-1 10X	0.1601	520.01	0.1424	343.34	8.4925	27978.10	0.0054	42.22	0.0206	61.11
39	1810182-2 10X	0.0789	303.34	0.0947	247.78	6.5428	22022.23	-0.0001	14.44	0.0222	63.33
40	1810182-3 10X	0.1082	388.90	0.1003	263.34	2.0855	8305.83	0.0039	35.56	0.0204	62.22
41	1810182-4 10X	0.0598	248.90	0.0452	143.34	0.5268	3300.47	0.0021	25.56	0.0082	45.56
42	1810182-5 10X	0.0951	343.34	0.8771	1837.91	1.0695	4974.31	0.0012	21.11	0.0302	73.33
43	1810182-6 10X	0.0625	252.23	0.0570	165.56	0.7008	3780.60	0.0006	17.78	-0.0156	14.44
44	1810182-7 10X	0.1759	546.68	0.0941	237.78	2.4478	9069.59	-0.0007	11.11	0.0057	41.11
45	1810182-8 10X	0.0866	325.56	0.0299	114.45	0.6180	3567.22	0.0006	17.78	0.0041	40.00
46	CCV	49.0544	132303.10	20.5829	42275.38	510.9132	1576225.03	10.2011	51529.45	51.5197	65519.91
47	CCB	0.0087	107.78	0.0108	71.11	0.0822	1846.86	0.0007	17.78	0.0104	46.67
48	1810182-9 10X	0.1172	403.34	0.1330	323.34	2.9420	10824.01	0.0001	15.56	0.0195	60.00
49	1810182-10 10X	0.0948	344.45	0.0467	147.78	2.8994	10520.55	0.1103	571.13	-0.0053	27.78
50	1810182-11 10X	0.0955	342.23	0.0372	126.67	0.5318	3273.82	0.0013	21.11	0.0026	37.78
51	1810182-12 10X	0.1007	350.01	0.0449	140.00	0.4309	2890.38	-0.0003	13.33	-0.0056	26.67
52	1810182-13 10X	0.0536	227.78	0.1720	394.46	4.2050	14310.15	0.0029	28.89	0.0094	45.56
53	CCV	49.2097	130729.88	20.5342	41542.22	505.3111	1537189.40	10.1314	50414.77	51.3602	64405.59
54	CCB	-0.0024	78.89	0.0088	66.67	0.0622	1756.85	0.0019	23.33	0.0084	43.33
55	IP181102-1MB ...	0.0096	110.01	0.0102	70.00	0.2389	2300.28	-0.0009	10.00	-0.0181	11.11
56	IM181102-1LCS...	49.7479	133690.29	10.7351	21992.63	524.2808	1603825.76	10.5776	53237.11	52.9980	66825.23
57	1810328-12 10X	0.0153	122.23	0.0174	82.22	0.6215	3337.15	-0.0002	13.33	-0.0067	24.45
58	CCV	49.3058	128690.82	20.7831	41307.23	511.7653	1543419.97	10.2623	50170.69	51.2189	63677.02
59	CCB	0.0149	122.22	0.0140	76.67	0.1482	1990.21	0.0014	21.11	0.0031	36.66
60	IP181102-2MB ...	0.0082	106.67	0.0222	93.34	0.2039	2170.24	0.0000	14.44	-0.0026	30.00
61	IM181102-2LCS...	49.7753	136089.93	10.3941	21665.52	514.2203	1613019.92	10.5889	54223.60	53.0088	68553.45
62	1810247-4 10X	0.0290	162.23	0.8458	1726.79	3.8717	13392.89	0.0105	65.56	0.0855	141.11

Analyte Table

		52 Cr [2]		55 Mn [2]		56 Fe [2]		59 Co [2]		60 Ni [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1810247-4L 50X	0.0239	152.23	0.1702	396.68	0.6420	3597.23	0.0019	24.44	-0.0069	25.56
64	1810247-4MS 10X	51.5453	136598.16	11.8185	23876.38	537.0632	1638435.50	10.9060	54133.28	53.3742	67141.10
65	1810247-4MSD ...	49.6143	130189.26	11.3023	22603.46	511.6345	1547135.60	10.6956	52550.43	52.1853	65033.62
66	1810247-7 10X	0.0232	147.78	34.6052	68929.66	12.9782	40691.51	0.0297	160.00	0.4430	584.46
67	1810247-9 10X	0.0343	177.78	4.3472	8765.77	7.7308	25317.09	0.0155	91.11	0.0872	144.45
68	1810330-16 10X	0.0215	137.78	0.0400	125.56	0.5982	3317.14	-0.0002	13.33	0.0031	36.67
69	1810444-1 10X	0.0129	113.34	136.0691	254832.97	422.2005	1240717.01	4.2906	19793.19	6.6515	8084.31
70	CCV	49.1332	130594.74	20.8254	42151.69	516.8798	1579429.61	10.3306	51423.50	51.8315	65289.97
71	CCB	0.0113	114.45	0.0154	80.00	0.1240	1943.54	0.0007	17.78	0.0063	41.11
72	1810444-2 10X	0.0150	128.89	10.5879	21553.18	27.7688	88042.59	0.0006	17.78	0.0318	75.56
73	1810444-3 10X	0.0156	130.00	8.2006	16736.44	4.6129	16048.53	0.0028	28.89	-0.0021	32.22
74	1810444-4 10X	0.0327	171.11	0.4979	1034.49	4.4969	15144.37	0.0034	31.11	0.0481	93.34
75	1810444-5 10X	0.0015	92.23	53.1127	107358.20	304.2802	921291.81	0.0571	298.89	0.0318	73.33
76	1810444-6 10X	0.1251	405.57	0.1052	254.45	3.5546	12388.48	0.0176	98.89	0.0333	75.55
77	1810444-7 10X	0.0071	105.56	0.2721	593.36	20.1484	62209.68	0.0013	21.11	0.0052	40.00
78	1810444-8 10X	0.0015	90.00	0.4885	1012.27	1.0156	4647.55	-0.0002	13.33	-0.0164	13.33
79	1810444-9 10X	-0.0001	85.56	0.0468	142.22	0.6670	3570.55	0.0016	22.22	-0.0027	30.00
80	1810444-10 10X	0.0344	175.56	0.0598	168.89	1.3290	5597.91	0.0020	24.45	-0.0011	32.22
81	1810444-11 10X	0.0104	113.34	3.7251	7409.55	15.3025	47747.08	0.0013	21.11	-0.0030	30.00
82	CCV	49.8946	130622.53	20.8945	41661.52	502.1718	1520466.70	10.3791	50907.60	51.3824	64123.38
83	CCB	-0.0012	82.22	0.0196	87.78	0.5567	3213.80	0.0000	14.44	-0.0025	30.00
84	1810444-12 10X	0.0116	120.00	10.6726	21811.21	5.0667	17259.77	0.0125	77.78	0.0638	115.56
85	1810444-13 10X	0.0096	111.12	10.4646	20733.21	5.1376	17146.47	0.0134	80.00	0.0575	105.56
86	CCV	49.8500	132208.87	20.9313	42274.17	526.4622	1606271.90	10.4483	51898.35	51.8917	65266.70
87	CCB	0.0059	101.11	0.0022	54.44	0.6174	3420.53	-0.0002	13.33	0.0045	38.89
88	FP181030-2MB...	0.0144	128.89	0.0509	156.67	0.3177	2650.33	0.0001	15.56	0.0005	35.56
89	IP181103-2MB ...	0.0003	85.55	0.0169	83.33	0.1779	2103.56	0.0017	22.22	-0.0127	17.78
90	IM181103-2LCS...	49.9911	135239.18	10.6880	22046.00	511.3455	1579509.09	10.6487	53956.00	53.6140	68267.89
91	1810475-1 10X	0.0470	206.67	18.6298	36549.49	33.9450	103345.38	0.1271	627.80	1.1989	1515.65
92	1810475-2 10X	0.1700	510.02	66.2561	126545.49	318.3103	940138.27	0.1029	496.68	0.9215	1153.39
93	1810475-3 10X	0.0983	354.45	6.7432	13883.75	637.7270	1995633.67	0.1592	818.92	1.6928	2219.07

Analyte Table

		52 Cr [2]		55 Mn [2]		56 Fe [2]		59 Co [2]		60 Ni [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1810475-4 10X	0.0315	171.11	96.3485	194230.98	122.1413	381891.78	0.1222	622.24	0.8562	1133.39
95	1810475-5 10X	0.0641	258.89	76.7370	155079.34	156.5236	479199.73	0.0888	456.68	0.7484	975.60
96	1810475-6 10X	0.0721	277.78	126.7963	254529.37	1237.6856	3796289.63	0.1882	944.48	0.7110	933.37
97	1810601-1 10X	0.0232	153.34	0.2836	638.91	3.4153	12285.18	0.0020	25.56	0.1175	185.56
98	CCV	50.0939	131404.39	20.8995	41748.40	522.5332	1588095.19	10.5815	51986.45	51.7574	64845.11
99	CCB	0.0147	122.23	0.0295	106.67	0.5758	3227.16	0.0007	17.78	0.0172	53.33
100	1810612-1 10X	0.1727	545.58	0.0533	158.89	1.2094	5361.24	0.0035	32.22	0.0289	71.11
101	1810612-3 10X	0.1818	565.57	0.0448	141.11	0.5511	3360.53	0.0040	34.44	0.0345	78.89
102	1810612-4 10X	0.1725	544.46	0.0701	192.23	1.3906	5914.67	0.0125	76.67	0.0473	94.44
103	1810628-1 10X	0.0866	313.34	0.1514	352.23	3.0098	10874.86	0.0120	73.34	0.0939	153.34
104	1810637-1 10X	0.0739	280.01	238.3918	474475.71	756.1919	2293355.44	0.2733	1353.41	1.8457	2341.31
105	1810637-1L 50X	0.0137	124.45	46.7741	94494.01	143.7246	445315.70	0.0440	233.34	0.0749	130.00
106	1810637-1MS 10X	51.0063	133338.43	247.0509	491273.24	1233.7795	3743154.01	10.9932	53824.53	52.5223	65716.13
107	1810637-1MSD ...	50.3419	132510.58	248.8890	498335.52	1252.5579	3776009.01	10.9554	54009.57	52.2763	65000.03
108	1810637-2 10X	0.3140	890.04	238.0174	464215.29	734.7009	2215358.46	0.2625	1275.62	0.3272	440.01
109	1810637-2L 50X	0.0240	153.33	45.9981	93923.00	140.4053	434723.68	0.0534	283.34	0.1083	172.22
110	CCV	49.6279	131170.81	21.1416	42552.62	516.2188	1563764.67	10.3837	51409.12	52.3036	65317.92
111	CCB	0.0066	101.11	0.0420	130.00	0.6593	3497.22	0.0012	20.00	0.0151	51.11
112	1810637-2MS 10X	51.2868	132879.43	248.2597	489254.67	1251.0746	3753055.99	11.0913	53815.60	52.7792	65307.93
113	1810637-2MSD ...	51.5263	136036.43	252.3021	506714.25	1246.7191	3840280.98	11.2082	55420.71	52.7961	67069.22
114	1810637-3 10X	0.0137	118.89	0.1305	301.12	21.0021	63627.52	0.0010	18.89	0.0120	47.78
115	1811004-21 10X	0.1063	377.79	0.0707	197.78	4.6400	16231.93	0.0079	55.56	0.0262	68.89
116	1811004-22 10X	0.0266	158.89	0.9258	1923.48	4.0506	14206.93	0.0059	44.45	0.0753	131.12
117	1811004-23 10X	0.0888	326.68	1.0155	2121.27	6.8484	22706.50	0.0119	74.44	0.0918	151.12
118	1811004-24 10X	10.2613	26897.59	1.0434	2125.73	5.1045	17159.71	0.0143	84.45	0.1253	191.11
119	CCV	48.6972	131424.52	20.6970	42538.14	510.6616	1572678.31	10.2314	51715.56	51.9253	65920.21
120	CCB	0.0175	132.23	0.0328	115.56	0.5152	3173.78	0.0013	21.11	0.0146	52.22
121	IP181105-1MB ...	0.0216	143.34	0.0364	123.34	0.3147	2533.64	0.0015	22.22	0.0097	45.56
122	IM181105-1RVS...	0.4782	1332.29	0.2937	632.24	5.2624	17613.48	0.2890	1424.53	0.9696	1250.06
123	IM181105-1LCS...	49.6964	134373.63	10.6000	21852.39	517.9865	1605865.86	10.6100	53735.28	53.2226	68027.70
124	1810412-1 10X	0.4552	1290.07	5.2473	10602.48	187.5015	580310.88	0.1205	611.13	0.1919	278.90

Analyte Table

		52 Cr [2]		55 Mn [2]		56 Fe [2]		59 Co [2]		60 Ni [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
125	1810412-1L 50X	0.0884	330.01	1.0839	2292.42	37.5560	118197.67	0.0206	120.00	0.0490	97.78
126	1810412-1MS 10X	48.9001	130931.89	15.4030	31417.89	692.9472	2138321.68	10.4617	52460.06	50.7406	64563.95
127	1810412-1MSD ...	49.4382	129660.83	15.3816	30732.12	680.9517	2065601.74	10.4351	51260.78	50.4632	63118.35
128	1810412-2 10X	0.2641	765.58	0.1296	304.45	1.0112	4687.56	0.0431	222.23	0.0181	56.67
129	1810412-3 10X	0.7784	1883.47	9.6531	17114.57	27.2065	76040.01	0.1925	852.26	2.0733	2374.65
130	1810412-4 10X	0.8107	2032.38	9.7797	17973.26	22.2280	64253.44	0.1979	906.71	2.1578	2544.68
131	CCV	49.0786	131300.97	20.6778	42123.68	497.0019	1550191.54	10.1719	50972.13	49.9788	64252.72
132	CCB	0.0227	142.22	0.0321	111.12	0.5397	3263.81	0.0005	16.67	0.0234	63.34
133	1810412-5 10X	0.3104	887.81	0.1347	315.57	3.1702	11404.48	0.0248	134.45	0.0518	100.00
134	1810412-6 10X	0.3205	903.37	0.0955	234.45	4.8344	16435.61	0.0012	20.00	0.0291	71.11
135	1810412-7 10X	0.3741	1027.83	0.3713	763.36	4.8621	16332.19	0.0090	56.67	0.1339	201.12
136	1810412-8 10X	0.3145	923.37	0.2627	582.24	2.5031	9556.52	0.0099	64.44	0.1329	207.78
137	1810412-9 10X	0.3014	898.93	0.0783	212.22	0.5626	3537.21	0.0027	28.89	0.0428	93.33
138	1810412-10 10X	0.2969	882.26	0.0728	200.00	0.6643	3770.60	0.0073	51.11	0.0430	91.11
139	1810412-11 10X	0.2744	814.48	0.1159	284.45	0.9332	4650.89	0.0048	38.89	0.0349	81.11
140	1810412-12 10X	0.2653	785.59	0.0573	165.56	0.5476	3440.51	0.0033	31.11	0.0896	153.34
141	1810506-1 10X	0.3581	1053.38	0.2825	631.13	5.5070	19442.23	0.0058	44.44	0.0214	64.45
142	1810506-2 10X	0.3335	992.27	0.0852	227.78	0.3482	2833.71	0.0306	170.00	0.0088	47.78
143	CCV	50.0216	136863.40	20.9157	43588.69	496.3610	1626425.81	10.3050	52813.43	49.7893	67250.31
144	CCB	0.0226	165.56	0.0394	146.67	0.5432	3827.29	0.0008	21.11	0.0174	65.55
145	1810506-5 10X	0.2748	906.70	514.1806	1151398.08	136.2547	481194.32	0.1447	814.47	0.1306	228.89
146	1810506-6 10X	0.0308	193.34	504.5808	1157820.79	134.5949	477281.03	0.1516	873.37	0.0828	160.00
147	1810544-2 10X	2.4545	7558.51	11.3097	26207.63	1.6191	7688.78	10.6383	60585.40	10.1182	14966.95
148	1810544-3 10X	2.4502	7550.74	10.7249	24902.32	1.2638	6498.26	10.9099	62206.97	9.8691	14781.27
149	1810544-4 10X	2.3965	7431.76	10.6001	24736.46	1.3585	6881.76	10.8402	62142.47	10.0040	15073.76
150	1811031-1 10X	6.2968	18836.48	0.3346	814.48	32.4047	116222.22	0.0453	268.90	3.2286	4736.31
151	CCV	49.6070	147038.20	21.0707	47551.69	504.9341	1761996.64	10.4692	58108.81	51.3123	73809.23
152	CCB	0.0229	170.00	0.0474	167.78	0.5763	3967.31	0.0006	20.00	0.0293	83.33
153	IP181104-5MB ...	0.0480	248.90	0.0221	111.11	0.8005	4797.59	-0.0003	15.56	0.0081	52.22
154	IM181104-5LCS...	48.6422	147465.96	10.4104	24060.00	488.4509	1749974.04	10.5352	59821.61	50.1279	74001.31
155	1810328-1 10X	3.5175	10341.12	257.0992	569975.62	5096.9188	17145508.91	2.2593	12345.86	3.5518	4964.16

Analyte Table

		52 Cr [2]		55 Mn [2]		56 Fe [2]		59 Co [2]		60 Ni [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
156	1810328-2 10X	5.0038	14913.57	269.0570	606364.65	6828.4871	22441466.33	3.0469	16919.99	5.0536	6884.88
157	1810328-3 10X	6.5942	19470.52	108.2692	242184.33	10140.7048	32969777.84	6.9747	38410.46	10.5914	14235.20
158	1810328-4 10X	1.6505	4913.03	208.7407	463629.39	4637.1344	15781530.18	1.7266	9455.06	3.1763	4494.02
159	1810328-5 10X	2.7086	8315.53	196.6604	453991.41	4283.5924	14870449.78	1.8588	10579.08	3.1893	4604.04
160	1810328-6 10X	3.0423	9572.91	229.2157	543063.28	5162.0110	18104321.81	2.2450	13109.80	3.7059	5399.85
161	1810328-7 10X	3.1688	9489.50	284.9782	642772.11	4375.6863	15091992.69	3.4403	19114.60	4.6985	6720.34
162	1810328-8 10X	0.9646	3006.98	91.6928	210407.59	1336.8433	4708683.99	0.7358	4171.69	1.2791	1896.80
163	CCV	49.3480	148959.46	21.0551	48403.18	504.6094	1788949.14	10.3792	58681.00	50.5107	73811.42
164	CCB	0.0107	134.45	0.0289	126.67	0.6896	4430.82	-0.0005	14.44	0.0041	46.67
165	1810328-9 10X	1.5071	4592.92	371.2915	842972.33	2444.9234	8544872.79	1.3439	7526.26	1.4765	2166.84
166	1810328-10 10X	9.5110	30396.98	169.6610	411311.63	14844.2441	51210084.24	6.6351	39608.78	14.1475	20170.32
167	1810328-11 10X	3.1983	10243.30	229.8595	554545.24	5246.8081	18660399.72	2.3279	13842.61	3.7532	5544.34
168	1810328-13 10X	3.5928	11407.38	223.0209	534077.57	5433.3252	19176506.38	2.4065	14205.18	4.2417	6212.37
169	1810328-13L 50X	0.7269	2433.55	46.3073	112947.21	1115.5050	4168098.79	0.4976	3003.66	0.8833	1402.31
170	1810328-13MS ...	50.2698	159038.02	237.5231	571609.58	6357.7259	22477513.83	12.3433	73133.84	53.6908	78322.98
171	1810328-13MSD...	51.0748	158289.89	223.8190	527647.20	6063.2880	21187199.68	12.4824	72448.54	53.7450	77489.12
172	1810328-13A 10X	50.2347	153936.06	241.7353	563468.55	5871.9430	20121860.53	12.1646	69815.06	53.6815	75894.18
173	1810328-14 10X	3.2799	9958.68	211.1417	482972.36	5099.5189	17339296.41	2.2785	12844.03	3.9892	5631.05
174	1810328-15 10X	3.1656	9884.20	209.1842	491992.53	4830.3786	16835605.17	2.1080	12221.38	3.8164	5524.33
175	CCV	49.5338	147018.69	20.9674	47387.84	501.2795	1754838.98	10.4112	57871.36	50.7635	73237.62
176	CCB	0.0074	121.11	0.0327	132.23	0.8223	4797.60	0.0012	23.33	0.0055	47.78
177	1810328-16 10X	3.0354	9254.93	186.1508	427366.76	4593.8680	15959715.18	2.1170	11976.71	3.5180	5078.64
178	1810328-17 10X	3.5360	11191.71	205.4263	490326.45	5514.2899	19421925.96	2.3848	14029.50	4.3197	6313.52
179	1810328-18 10X	2.6601	8351.11	190.5883	449929.15	4601.8747	16182376.43	1.8611	10829.25	3.1575	4618.50
180	1810328-19 10X	1.8169	5563.25	176.2907	403510.26	2772.6359	9574011.11	1.5519	8758.00	2.4753	3562.66
181	1810328-20 10X	3.2304	10067.65	203.5694	477893.47	5413.6546	18714054.30	2.2463	12997.48	3.9106	5613.26
182	1810328-21 10X	3.8424	11697.59	220.6030	506834.04	5057.0596	17306034.32	2.4037	13610.22	4.1570	5903.37
183	CCV	48.7140	145085.24	20.8157	47204.03	508.1019	1744126.69	10.4623	58350.75	51.9004	73438.48
184	CCB	0.0204	160.00	0.0297	125.56	0.6948	4257.43	0.0024	30.00	0.0047	45.55
185	IP181104-3MB ...	0.0680	300.01	0.0642	202.22	1.7827	7962.37	0.0006	20.00	0.0105	53.33
186	IM181104-3LCS...	48.7276	146704.07	10.2754	23587.04	499.3751	1743032.37	10.4791	59087.92	50.9227	73272.36

Analyte Table

		52 Cr [2]		55 Mn [2]		56 Fe [2]		59 Co [2]		60 Ni [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
187	1810195-1 10X	8.2962	26107.44	155.5069	371005.52	9545.8536	32975973.68	4.1107	24151.18	8.2741	11825.52
188	1810195-2 10X	3.1901	10034.27	170.6711	404360.66	4095.7185	14323899.79	1.9983	11672.07	3.4902	5071.96
189	1810195-3 10X	2.6431	8054.29	156.9089	359463.03	3548.4257	12200229.82	1.8744	10584.65	3.3222	4748.53
190	1810195-4 10X	3.2773	10083.20	143.6811	333103.51	4116.8474	14356776.04	1.9972	11414.09	3.6238	5252.03
191	1810195-5 10X	5.4180	16971.14	129.8454	307725.32	4679.3091	16162616.84	2.2403	13085.34	4.8934	7009.36
192	1810195-6 10X	6.0981	18988.85	162.8416	383908.55	9599.0781	32686632.01	4.4579	25886.03	9.0210	12706.19
193	1810195-7 10X	2.3892	7064.95	268.5458	595855.55	3408.2656	11550825.25	1.8040	9870.87	3.2569	4588.49
194	1810195-7L 50X	0.4574	1498.98	53.4920	124480.21	713.2230	2543195.80	0.3711	2142.39	0.6745	1031.16
195	CCV	49.3655	143591.93	20.8290	46140.02	510.2458	1741994.35	10.3677	56458.72	51.0660	71854.67
196	CCB	0.0141	136.67	0.0376	138.89	0.7769	4494.16	0.0007	20.00	0.0162	61.11
197	1810195-7MS 10X	49.1605	145768.23	231.6264	522448.99	4179.7972	13980955.21	11.8259	65667.04	51.9419	71682.95
198	1810195-7MSD ...	51.1847	150833.67	234.1815	524933.85	4150.7413	13978820.62	12.2198	67440.79	53.2496	73984.58
199	1810195-7A 10X	49.5928	144262.18	281.3620	622564.51	3860.1341	12785084.81	11.5871	63126.17	51.9563	70994.73
200	1810195-8 10X	2.3830	6970.45	232.1868	509870.62	3373.7189	11188146.50	1.7537	9493.97	3.0839	4253.95
201	1810195-9 10X	3.0826	9206.02	171.1664	384797.85	4175.1702	14074450.21	2.1667	12006.77	3.5947	5034.17
202	1810195-11 10X	5.2132	15643.10	248.6220	564206.80	6781.5013	22405332.16	3.2057	17925.48	6.0141	8231.06
203	1810195-12 10X	5.3436	16199.21	190.6435	437203.35	7196.9545	24025321.31	3.3741	19063.42	6.1524	8506.75
204	1810195-13 10X	2.9517	8675.69	121.8162	269556.87	2983.8226	10016467.98	1.4223	7763.04	2.2507	3152.57
205	1810195-14 10X	2.0807	6096.76	105.3087	231165.92	2095.9863	6986247.61	1.0346	5604.37	1.6119	2252.41
206	1810195-15 10X	4.1765	11526.37	140.9804	293799.81	5268.3929	16461415.17	2.2491	11553.07	3.5951	4667.40
207	CCV	49.3513	137038.98	20.8566	44096.60	504.7078	1647077.32	10.4429	54305.99	51.0607	68657.05
208	CCB	0.0103	123.33	0.0342	128.89	0.7933	4370.80	0.0027	30.00	0.0047	43.33
209	1810195-16 10X	2.8419	8055.39	148.5009	316720.61	3937.2650	12702114.39	2.2379	11762.11	3.5434	4749.65
210	1810195-17 10X	2.6312	7445.09	173.8603	369789.51	3694.0335	11876414.40	2.0328	10659.18	3.3844	4522.91
211	1810195-18 10X	1.1159	3242.60	81.9903	176128.18	2601.9827	8402990.92	4.7641	25199.43	3.3152	4450.67
212	1810195-19 10X	3.3240	9273.81	176.7778	371956.48	7252.2954	22785912.99	3.4381	17822.04	6.2099	8080.98
213	1810195-19L 50X	0.6546	1944.59	36.2992	78206.33	1484.8497	4882188.58	0.6818	3628.23	1.2690	1756.78
214	1810195-19MS ...	3.3384	9319.42	191.5969	403068.50	5425.0930	17046611.83	3.7462	19416.06	6.0894	7925.35
215	1810195-19MSD...	3.1251	8667.95	167.6098	350176.53	5699.5705	17977796.81	3.4734	17876.55	6.3641	8313.32
216	1810195-19A 10X	50.6572	138069.95	196.0019	406393.07	7704.4203	23966112.98	13.2964	67879.36	54.9603	70536.98
217	1810195-20 10X	2.8159	7776.37	180.3895	374735.20	5310.1044	16578379.75	2.9098	14893.58	5.5116	7130.54

Analyte Table

		52 Cr [2]		55 Mn [2]		56 Fe [2]		59 Co [2]		60 Ni [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
218	CCV	49.6212	133479.76	21.1432	43306.71	506.0399	1595869.93	10.4511	52654.02	50.9916	66295.41
219	CCB	0.0201	145.56	0.0408	137.78	0.7642	4170.73	0.0009	20.00	0.0072	45.56

Analyte Table

		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]		88 Sr [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	RINSE	0.0729	241.12	0.6822	710.05	-0.0264	0.67	0.0000	0.00	0.0195	73.34
2	RINSE	0.0682	220.01	0.4871	560.04	-0.0209	2.00	0.0079	0.40	0.0140	60.00
3	BLANK	0.4392	1474.53	0.0000	216.68	-0.0277	0.33	0.0000	0.00	-0.0001	30.00
4	H/1000	1.0959	3714.92	2.2168	1896.87	0.0880	29.67	0.1026	5.47	0.1044	273.35
5	H/100	10.3170	36153.24	19.6958	15568.18	1.0445	284.00	1.1270	62.13	0.9952	2433.63
6	H/10	101.1107	355670.85	202.0474	158799.66	9.9952	2690.57	10.6268	588.28	10.0004	24579.72
7	HIGH	999.8857	2950037.80	1999.7981	1216155.37	100.0082	23378.73	99.9360	4639.73	99.9997	233155.31
8	RINSE	0.0664	217.78	0.5571	630.04	-0.0251	1.00	0.0025	0.13	0.0123	56.67
9	ICV	202.4796	678924.94	398.4276	294436.35	21.8023	6736.41	20.6882	1091.77	19.8634	47180.56
10	ICB	0.5000	1647.89	0.0654	266.68	-0.0168	3.00	0.0155	0.80	0.0181	70.01
11	LIV	2.1643	7238.35	10.4024	8085.74	0.1856	54.33	1.1002	57.87	0.4839	1143.43
12	ICSA	0.1231	402.23	0.3409	440.03	-0.0211	2.00	0.0052	0.27	0.3326	776.73
13	ICSAB	99.6288	316727.27	206.7248	140606.57	10.3450	2592.88	10.6473	532.54	11.4600	25511.22
14	CCV	101.9314	354980.67	203.2733	158408.57	10.1457	2674.56	10.4928	575.08	10.3020	25073.81
15	CCB	0.4967	1689.00	0.0333	250.01	-0.0249	1.00	0.0051	0.27	0.0069	46.67
16	IP181101-5MB ...	0.0529	178.89	-0.0345	196.67	-0.0276	0.33	0.0050	0.27	-0.0028	23.33
17	IM181101-5LCS...	97.5802	356956.96	186.7114	158570.13	9.8538	2747.57	9.8734	568.41	9.4551	24149.07
18	1810184-1 100X	0.1972	668.92	2.7748	2180.24	-0.0151	3.67	0.0175	0.93	148.2012	421988.30
19	1810184-2 100X	0.0746	263.34	0.0191	233.35	-0.0178	3.00	0.0192	1.07	113.8963	323372.62
20	1810184-3 100X	0.0733	261.12	-0.0509	183.34	-0.0079	5.67	0.1164	6.53	104.3325	295314.00
21	1810184-4 100X	0.0676	241.11	-0.0679	173.35	-0.0051	6.33	0.1020	5.73	91.3024	254180.81
22	1810184-5 100X	0.0675	236.67	-0.0722	163.34	-0.0106	5.00	0.1040	5.73	118.0253	334907.61
23	1810184-6 100X	0.0680	241.12	-0.0357	196.68	-0.0138	4.00	0.2265	12.67	117.7855	337311.54
24	1810184-7 100X	0.0936	333.34	0.1430	330.02	-0.0191	2.67	0.0451	2.53	116.7207	335956.42
25	1810184-8 100X	0.0744	274.45	0.8477	986.74	0.0106	11.00	0.1473	8.53	91.6848	264322.48
26	CCV	99.7399	364133.90	190.4421	165393.30	10.4289	2831.59	10.2095	586.68	10.1146	25805.11
27	CCB	0.4331	1518.98	-0.0186	230.01	-0.0251	1.00	0.0121	0.67	0.0077	50.00
28	1810184-18 100X	0.1249	428.90	-0.0867	146.67	-0.0039	6.67	0.0640	3.47	135.5634	384931.65
29	1810203-2 10X	0.7359	2788.06	1.6471	1753.51	-0.0133	4.33	0.0424	2.53	22.2999	60054.27
30	1810203-2L 50X	0.1883	688.92	0.3778	596.71	-0.0229	1.67	0.0142	0.80	4.4766	11407.91
31	1810203-2MS 10X	98.2928	354783.87	185.4977	160006.00	9.8524	2670.56	9.9636	565.88	32.4950	84589.64

Analyte Table

		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]		88 Sr [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1810203-2MSD ...	97.7307	359482.51	180.2534	162043.11	9.7454	2741.91	10.1608	588.41	32.1793	85307.44
33	1810203-4 10X	1.0331	3702.70	1.0302	1143.42	-0.0100	5.00	0.0331	1.87	22.5662	57510.63
34	CCV	100.5069	366669.61	192.7356	167890.71	10.0278	2807.25	10.6386	610.81	10.0113	25517.87
35	CCB	0.4404	1547.87	0.1049	330.02	-0.0198	2.33	0.0120	0.67	0.0173	73.33
36	IP181101-6MB ...	0.0478	167.78	-0.0311	220.01	-0.0262	0.67	0.0074	0.40	-0.0046	20.00
37	IM181101-6LCS...	99.8740	361001.71	190.7930	162354.51	9.6538	2670.56	10.0069	569.21	9.6774	24429.40
38	1810182-1 10X	0.1396	491.12	0.1519	363.36	0.0375	18.00	0.8095	44.80	52.6227	137306.90
39	1810182-2 10X	0.0614	218.89	-0.0627	193.34	0.0116	11.00	0.7191	40.40	46.3453	121552.55
40	1810182-3 10X	0.7833	2792.50	0.3555	530.04	0.0233	14.00	0.8136	45.60	58.2461	155166.70
41	1810182-4 10X	0.2011	717.81	0.0582	293.35	0.0034	8.67	0.1401	7.87	36.1254	93542.87
42	1810182-5 10X	0.1592	556.69	0.2278	436.69	0.0406	19.00	0.0896	4.93	35.7874	90653.05
43	1810182-6 10X	0.0532	185.56	-0.0264	220.01	0.0079	10.00	0.1774	9.73	31.6744	79246.60
44	1810182-7 10X	0.0638	217.78	-0.0314	206.68	0.0095	10.00	2.0634	111.07	89.9251	239668.65
45	1810182-8 10X	0.0423	150.00	0.0494	290.02	0.0257	14.67	0.4176	23.33	46.8774	122135.83
46	CCV	100.2880	350693.06	201.2418	161942.73	10.2120	2734.24	10.7087	589.34	10.1210	24733.26
47	CCB	0.4574	1583.43	0.1031	320.02	-0.0263	0.67	0.0050	0.27	0.0053	43.34
48	1810182-9 10X	0.0690	244.45	2.9097	2753.68	0.0490	21.33	0.3443	19.20	45.1899	117475.10
49	1810182-10 10X	0.0662	232.23	-0.0326	210.01	0.0439	19.33	0.4372	24.13	52.5059	136546.64
50	1810182-11 10X	0.0517	178.89	-0.0537	196.68	0.0589	23.33	0.4867	26.67	47.6168	121870.90
51	1810182-12 10X	0.0541	184.45	0.0308	256.68	0.0462	19.33	0.3350	18.00	65.9351	170119.57
52	1810182-13 10X	0.0604	206.67	0.0193	253.35	0.0379	17.33	0.1437	7.73	40.1852	100243.32
53	CCV	100.5926	345138.60	198.0816	158203.93	10.1500	2662.23	10.5713	570.81	10.4209	24997.04
54	CCB	0.3083	1048.94	0.2792	460.03	-0.0210	2.00	0.0025	0.13	-0.0016	26.67
55	IP181102-1MB ...	0.0411	142.23	-0.0253	220.01	-0.0264	0.67	0.0025	0.13	-0.0032	23.33
56	IM181102-1LCS...	103.4890	362220.49	195.3981	161384.16	10.4653	2771.58	10.6070	584.41	10.3343	25284.31
57	1810328-12 10X	0.0471	157.78	-0.0299	200.01	-0.0212	2.00	0.0000	0.00	-0.0014	26.67
58	CCV	100.9432	344143.44	200.3999	157773.08	10.3917	2700.57	10.3687	556.28	10.3090	24566.38
59	CCB	0.3081	1048.94	0.1441	350.02	-0.0263	0.67	0.0050	0.27	0.0341	110.00
60	IP181102-2MB ...	0.0490	167.78	0.1935	400.03	-0.0263	0.67	0.0051	0.27	0.0040	40.00
61	IM181102-2LCS...	102.3382	368407.70	192.4635	166124.57	10.4044	2836.92	10.5447	597.34	10.1210	25461.04
62	1810247-4 10X	0.0929	322.23	0.2124	403.36	-0.0095	5.00	0.0317	1.73	17.1765	42049.83

Analyte Table

		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]		88 Sr [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1810247-4L 50X	0.0519	182.22	0.2176	430.03	-0.0173	3.00	0.0121	0.67	3.3375	8129.10
64	1810247-4MS 10X	104.3625	362572.56	199.4227	163766.26	10.7094	2815.59	10.8785	594.68	27.5585	68564.20
65	1810247-4MSD ...	101.5334	349790.37	195.0114	157776.60	10.1093	2691.24	10.5869	573.88	27.0496	66703.05
66	1810247-7 10X	0.1427	488.90	0.6578	726.72	0.0048	8.67	0.0197	1.07	44.2993	111295.24
67	1810247-9 10X	0.1186	413.35	3.9053	3563.91	0.0992	34.33	0.0218	1.20	15.4380	37879.31
68	1810330-16 10X	0.0781	263.34	0.5388	686.71	-0.0276	0.33	0.0051	0.27	0.0185	73.33
69	1810444-1 10X	0.2749	891.15	21.4528	15261.02	-0.0263	0.67	0.0365	1.87	155.6404	427267.28
70	CCV	100.9389	348239.49	196.2360	160154.18	10.4003	2715.24	10.8293	588.01	10.2545	24733.36
71	CCB	0.3248	1106.72	0.1885	386.69	-0.0276	0.33	0.0174	0.93	0.0069	46.67
72	1810444-2 10X	1.1847	4203.94	0.6096	766.72	-0.0191	2.67	0.0024	0.13	94.0094	261581.80
73	1810444-3 10X	0.0582	208.89	0.3905	600.04	-0.0195	2.67	0.0024	0.13	28.6058	73617.20
74	1810444-4 10X	0.4579	1564.54	1.2925	1260.10	-0.0201	2.33	0.0075	0.40	7.5039	17854.00
75	1810444-5 10X	0.1197	413.34	0.5070	673.38	0.1122	36.33	0.0098	0.53	25.4248	62677.12
76	1810444-6 10X	0.2242	765.58	3.2417	2837.06	-0.0121	4.33	0.3453	18.53	228.8233	720357.33
77	1810444-7 10X	24.8413	85354.93	5.4629	4837.59	-0.0171	3.00	0.0146	0.80	18.9335	46013.70
78	1810444-8 10X	0.1659	562.24	3.0548	2767.02	-0.0089	5.00	0.0474	2.53	148.2224	421792.15
79	1810444-9 10X	0.3278	1108.94	0.6614	783.38	-0.0185	2.67	0.0527	2.80	29.6606	72069.07
80	1810444-10 10X	0.1021	350.01	124.4399	105057.57	0.0017	8.00	0.0397	2.13	63.1735	162747.34
81	1810444-11 10X	0.0512	175.56	0.5258	683.39	-0.0276	0.33	0.0050	0.27	136.1556	385825.53
82	CCV	101.6645	346781.04	194.5996	157774.56	10.6414	2731.24	10.9280	586.54	10.4078	24819.92
83	CCB	0.2971	1003.38	1.3353	1333.44	-0.0195	2.33	0.0076	0.40	0.0227	83.34
84	1810444-12 10X	0.6457	2282.41	1.3729	1430.13	-0.0076	5.67	0.0359	2.00	122.6890	352804.02
85	1810444-13 10X	0.6624	2285.75	1.5492	1550.14	-0.0108	4.67	0.0466	2.53	121.1954	339470.03
86	CCV	102.1598	353087.30	199.8433	161834.92	10.2493	2708.90	10.6290	577.88	10.3958	25127.09
87	CCB	0.3060	1061.16	1.1121	1196.77	-0.0223	1.67	0.0074	0.40	0.0261	93.34
88	FP181030-2MB...	0.0759	274.45	-0.0109	253.34	-0.0227	1.67	0.0070	0.40	-0.0023	26.67
89	IP181103-2MB ...	0.0578	196.67	0.0646	290.02	-0.0235	1.33	0.0049	0.27	0.0014	33.34
90	IM181103-2LCS...	103.3375	366351.54	193.2447	163090.16	10.3582	2795.58	10.6839	596.01	10.5363	26119.01
91	1810475-1 10X	0.2852	962.27	1.1829	1106.76	0.0735	26.33	0.0201	1.07	35.6641	87183.50
92	1810475-2 10X	0.8350	2744.72	2.1469	1723.52	0.1075	35.67	0.0541	2.80	70.2310	175380.59
93	1810475-3 10X	1.7360	6171.26	3.4307	3123.77	0.2909	85.67	0.0404	2.27	16.0474	40191.74

Analyte Table

		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]		88 Sr [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1810475-4 10X	0.1393	488.91	0.9487	1016.74	0.1270	42.33	0.0265	1.47	38.4952	98417.33
95	1810475-5 10X	0.1862	645.58	0.4737	600.04	0.1280	41.00	0.0197	1.07	27.5553	68447.39
96	1810475-6 10X	0.1893	650.02	0.9277	943.41	0.3930	111.00	0.0171	0.93	61.7834	159546.87
97	1810601-1 10X	0.0944	334.46	0.5776	743.38	0.0338	16.67	0.0623	3.47	14.6878	36603.15
98	CCV	101.7446	350350.73	202.8921	160852.06	10.3062	2667.89	10.7870	584.54	10.5450	25390.92
99	CCB	0.3168	1064.49	1.1185	1143.43	-0.0262	0.67	0.0125	0.67	0.0086	50.00
100	1810612-1 10X	0.0967	336.68	0.6282	736.72	0.0003	7.67	0.2506	13.73	129.5943	370582.80
101	1810612-3 10X	0.0854	300.01	0.4349	580.04	0.0152	11.67	0.2803	15.47	129.6453	373162.16
102	1810612-4 10X	0.1053	367.79	0.7890	860.06	0.0101	10.33	0.2596	14.27	131.6010	377976.27
103	1810628-1 10X	0.2522	876.71	16.5433	13749.68	0.0198	12.67	0.3484	19.07	57.7017	149753.85
104	1810637-1 10X	0.1719	587.79	14.5926	11637.97	0.6853	187.67	0.0199	1.07	25.9005	63225.41
105	1810637-1L 50X	0.0679	241.11	0.7796	900.07	0.1120	37.00	0.0166	0.93	4.9897	12325.22
106	1810637-1MS 10X	102.1840	349865.09	205.6912	157776.03	11.0441	2851.93	11.0057	593.08	35.6222	88343.64
107	1810637-1MSD ...	101.5696	346661.22	206.1286	157113.33	11.1968	2903.27	10.6137	570.14	35.8235	88588.98
108	1810637-2 10X	0.1106	375.57	0.8447	866.73	0.7353	192.33	0.0050	0.27	25.7065	62349.09
109	1810637-2L 50X	0.0719	254.45	0.6907	840.06	0.1606	48.67	0.0095	0.53	5.2031	12785.73
110	CCV	101.2481	348548.07	197.8210	157250.85	10.4309	2687.57	10.7530	582.54	10.6040	25528.13
111	CCB	0.3253	1107.83	1.1013	1126.75	-0.0249	1.00	0.0075	0.40	0.0227	83.34
112	1810637-2MS 10X	102.2579	346006.41	207.1742	156554.58	11.0630	2871.26	10.8512	577.88	36.0018	88283.04
113	1810637-2MSD ...	102.6614	357305.54	201.3695	160287.27	11.1676	2948.62	10.6282	582.14	35.8659	90441.24
114	1810637-3 10X	0.1947	660.02	15.2377	12532.02	-0.0206	2.00	0.0074	0.40	0.0226	83.34
115	1811004-21 10X	0.0980	345.56	13.0584	11064.23	0.1341	43.00	0.8348	46.27	36.3733	92912.33
116	1811004-22 10X	0.0779	272.23	0.5539	663.38	0.0321	16.00	0.1046	5.73	57.9004	151229.72
117	1811004-23 10X	0.0812	283.34	0.6539	733.38	0.0265	14.67	0.1795	9.87	58.9071	153916.00
118	1811004-24 10X	0.1927	661.13	0.3870	520.03	0.5563	154.33	1.1396	61.47	27.2591	66937.94
119	CCV	100.7832	353360.76	194.5478	160955.10	10.0715	2662.90	10.7740	594.41	10.3068	25260.69
120	CCB	0.3082	1071.16	0.8870	1010.08	-0.0237	1.33	0.0073	0.40	0.0149	66.67
121	IP181105-1MB ...	0.0479	166.67	0.5533	706.72	-0.0237	1.33	0.0122	0.67	-0.0033	23.33
122	IM181105-1RVS...	1.0548	3694.92	8.9630	7962.30	0.0719	26.00	0.6381	35.20	0.2316	590.04
123	IM181105-1LCS...	101.1494	363293.74	190.9506	165481.51	10.2738	2751.24	10.9030	616.41	9.9080	24863.53
124	1810412-1 10X	0.4534	1591.21	5.0868	4577.53	1.7198	463.34	0.2826	15.60	22.0239	54924.72

Analyte Table

		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]		88 Sr [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
125	1810412-1L 50X	0.1235	436.68	0.8932	1023.42	0.3228	92.00	0.0818	4.53	4.2163	10327.07
126	1810412-1MS 10X	100.2756	351133.14	196.1597	165170.37	11.9749	3224.66	10.8749	599.74	31.0505	78254.65
127	1810412-1MSD ...	100.7510	345477.88	198.0340	160029.98	11.7096	3081.97	10.9251	589.61	31.1867	76975.67
128	1810412-2 10X	0.2425	833.37	1.1472	1236.77	1.5203	405.01	0.3649	19.73	21.8232	53263.30
129	1810412-3 10X	901.0442	2702256.49	17.6212	11010.84	4.8140	1140.71	0.2912	13.73	3.1563	6564.95
130	1810412-4 10X	903.8302	2799868.92	17.2069	10987.49	4.7269	1159.71	0.2569	12.53	3.0042	6454.97
131	CCV	99.1029	348037.00	188.7672	158849.79	10.3681	2713.24	10.4277	576.01	10.4820	25741.48
132	CCB	0.3263	1137.83	1.1453	1236.77	-0.0263	0.67	0.0073	0.40	0.0189	76.67
133	1810412-5 10X	0.5673	1963.48	3.5571	2960.42	7.4066	1915.45	0.3128	17.07	4.3431	10427.17
134	1810412-6 10X	0.4060	1398.97	3.0510	2570.32	7.6503	1988.13	0.2684	14.53	4.5403	10860.85
135	1810412-7 10X	6.8372	23063.08	2.0261	1653.49	11.0150	2861.93	0.0778	4.13	6.4857	15217.91
136	1810412-8 10X	6.3849	22463.34	1.3200	1173.44	11.1988	2977.95	0.0553	3.07	6.3627	15568.17
137	1810412-9 10X	0.5425	1993.48	1.2991	1466.80	0.5609	158.67	0.2583	14.93	21.5715	56283.16
138	1810412-10 10X	0.5164	1860.13	1.5831	1700.17	0.5363	149.33	0.2587	14.67	22.3108	57123.04
139	1810412-11 10X	0.5383	1936.81	1.6959	1706.83	0.5447	156.00	0.2524	14.27	22.1989	56752.07
140	1810412-12 10X	0.0768	275.56	0.2711	500.03	1.3319	363.34	0.2497	14.13	18.3481	46585.20
141	1810506-1 10X	0.1100	404.46	0.3462	573.36	0.0368	18.00	0.2692	15.60	25.2335	66254.57
142	1810506-2 10X	0.1350	495.57	0.3096	543.37	0.0284	15.33	0.2677	15.47	26.2205	68834.99
143	CCV	98.3531	365623.22	187.7316	168038.07	9.9771	2732.57	10.4092	609.08	10.4772	27234.05
144	CCB	0.3005	1266.73	1.0066	1296.78	-0.0210	2.33	0.0000	0.00	0.0261	113.34
145	1810506-5 10X	0.1015	408.90	0.5162	806.72	0.3654	114.33	0.0021	0.13	15.1606	42952.11
146	1810506-6 10X	0.1089	441.12	0.3356	616.71	0.3602	115.67	0.0083	0.53	15.1324	43132.47
147	1810544-2 10X	2.4655	10126.59	9.5956	9796.74	-0.0243	1.33	0.0062	0.40	0.1500	460.03
148	1810544-3 10X	2.4552	10365.60	9.8131	10140.31	-0.0236	1.67	0.0020	0.13	0.1295	413.36
149	1810544-4 10X	2.3981	10279.99	9.8418	10523.76	-0.0190	3.00	0.0038	0.27	0.1371	443.36
150	1811031-1 10X	0.1261	510.02	0.7138	1000.08	0.3141	102.33	0.1025	6.53	34.6037	101236.12
151	CCV	99.3524	392324.59	187.4391	179793.40	10.2231	3039.63	10.6320	660.68	10.6435	29387.89
152	CCB	0.3234	1312.29	1.0593	1360.13	-0.0256	1.00	0.0082	0.53	0.0146	76.67
153	IP181104-5MB ...	0.0602	254.45	-0.0014	290.02	-0.0235	1.67	0.0059	0.40	0.0007	40.00
154	IM181104-5LCS...	95.2809	397786.94	173.1851	170249.88	9.4223	2845.93	8.9451	587.74	9.7635	28482.88
155	1810328-1 10X	3.8903	14554.38	10.5521	9843.40	2.4434	694.69	0.7063	41.60	78.8380	226703.60

Analyte Table

		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]		88 Sr [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
156	1810328-2 10X	5.9695	22277.57	15.1465	13742.99	2.9672	861.70	1.1783	69.20	412.8182	1711569.30
157	1810328-3 10X	13.5060	49446.60	26.1461	22125.77	9.6817	2726.57	1.2817	73.87	492.8437	2152855.54
158	1810328-4 10X	9.0558	34779.15	39.0338	35883.86	23.6477	6583.02	1.3614	82.27	263.8973	971205.33
159	1810328-5 10X	3.7066	14534.39	10.1820	9920.07	2.2403	672.02	0.7865	48.53	90.0313	275361.13
160	1810328-6 10X	4.5787	18284.78	12.0971	11421.13	2.6524	800.36	0.8032	50.53	83.8248	258972.65
161	1810328-7 10X	8.6338	33162.49	12.7783	12111.78	4.0379	1155.71	1.2879	77.87	105.8238	323627.96
162	1810328-8 10X	2.3630	9699.67	4.6530	4570.85	0.6957	216.00	0.6982	45.20	53.2475	162252.59
163	CCV	97.9521	398392.17	186.1877	178602.72	10.3374	3083.31	10.2685	657.61	9.9565	28295.92
164	CCB	0.3226	1352.30	0.9289	1266.79	-0.0268	0.67	0.0000	0.00	0.0241	106.67
165	1810328-9 10X	1.7665	6930.45	6.2253	5634.56	0.9204	281.67	0.4106	25.33	106.7375	333797.20
166	1810328-10 10X	25.1887	96768.52	38.9124	34207.10	4.2006	1269.72	1.8242	110.27	262.4794	964726.10
167	1810328-11 10X	4.2906	17648.57	11.9506	12074.99	2.6224	809.02	0.8523	55.20	97.1722	314662.09
168	1810328-13 10X	4.0738	16368.35	11.3885	11110.90	2.8505	888.36	0.8881	56.13	168.3382	581788.26
169	1810328-13L 50X	0.8749	3902.74	28.1635	28679.62	0.6154	202.33	0.1652	11.60	36.9816	119720.83
170	1810328-13MS ...	97.1604	389403.07	190.2056	175071.91	12.0823	3710.77	9.8499	621.61	175.0330	608332.87
171	1810328-13MSD...	98.8570	388989.78	202.6799	173656.23	12.0503	3638.08	10.1654	629.48	174.6158	595488.65
172	1810328-13A 10X	98.2491	381162.49	193.3618	169633.86	12.4051	3693.10	10.4821	640.01	176.1186	593232.35
173	1810328-14 10X	3.9302	15162.73	11.5414	10697.33	2.8123	825.36	0.8521	51.73	158.5869	520212.96
174	1810328-15 10X	3.5137	14025.03	10.8905	10470.48	2.5038	768.35	0.7662	48.13	123.6578	401983.76
175	CCV	99.0141	392708.26	194.4275	179244.01	10.1094	3030.96	10.3399	645.61	10.2238	28345.94
176	CCB	0.3142	1307.85	1.0673	1360.11	-0.0223	2.00	0.0020	0.13	0.0229	103.34
177	1810328-16 10X	3.4501	13410.07	9.4301	9263.10	2.5355	769.69	0.7107	43.47	136.9018	440748.73
178	1810328-17 10X	4.0997	16341.65	11.7486	11147.60	2.9436	903.36	0.9477	59.47	106.3506	337728.76
179	1810328-18 10X	3.1723	12829.65	10.5458	10553.88	2.2895	707.35	0.8817	56.13	83.0583	259645.82
180	1810328-19 10X	4.0693	16011.31	10.6174	9923.49	1.4660	440.68	0.6761	41.87	85.0650	259359.80
181	1810328-20 10X	4.0124	15776.64	12.0518	11371.14	2.8315	855.03	0.9396	58.13	137.5016	447960.33
182	1810328-21 10X	4.4494	17319.31	11.4845	10450.40	3.0656	902.03	1.0406	63.73	126.2247	401436.93
183	CCV	100.4116	392586.28	188.6558	177137.43	10.2583	2996.62	10.6511	655.21	10.4708	28619.85
184	CCB	0.3149	1264.51	1.2562	1493.48	-0.0278	0.33	0.0000	0.00	0.0329	126.67
185	IP181104-3MB ...	0.0606	243.34	0.2120	470.03	-0.0243	1.33	0.0084	0.53	0.0123	70.00
186	IM181104-3LCS...	98.3645	394876.56	186.3820	168567.22	9.5828	2819.59	9.5281	602.01	10.1643	28512.91

Analyte Table

		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]		88 Sr [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
187	1810195-1 10X	4.4445	17529.49	31.2038	30035.19	5.8210	1779.77	1.4370	89.20	169.6895	576674.12
188	1810195-2 10X	3.6617	14805.72	11.4728	9776.69	2.7249	814.02	0.7006	44.53	32.8529	95845.88
189	1810195-3 10X	3.8798	15232.78	9.0741	8706.02	2.8115	830.36	0.5871	36.27	48.3481	139972.27
190	1810195-4 10X	3.4517	13794.85	11.2303	10550.50	2.9368	891.70	0.7261	45.73	50.7232	149951.07
191	1810195-5 10X	4.4659	17666.35	12.4509	11130.97	4.1524	1241.05	0.7173	44.67	61.6804	183227.99
192	1810195-6 10X	10.6848	41465.77	27.2178	24278.95	16.5539	4854.74	2.3006	140.53	152.1595	498177.65
193	1810195-7 10X	3.7082	14303.05	8.8863	8295.81	3.5216	1033.04	0.7473	45.33	47.9526	136282.74
194	1810195-7L 50X	0.7858	3287.05	7.0902	7028.49	0.7591	231.33	0.1210	8.00	9.6263	28125.77
195	CCV	99.2343	387705.56	192.5730	175729.87	10.4216	2986.62	10.4654	643.48	10.3544	28279.31
196	CCB	0.3231	1284.51	1.1675	1356.78	-0.0196	2.67	0.0043	0.27	0.0248	103.34
197	1810195-7MS 10X	96.6296	365075.27	185.3605	163985.77	12.4958	3616.08	9.6022	570.94	55.1668	155126.81
198	1810195-7MSD ...	100.6174	379523.37	194.1363	166743.08	12.8226	3795.46	9.9455	590.54	55.3392	155396.25
199	1810195-7A 10X	96.6097	361068.96	198.5675	164356.12	12.8538	3654.76	10.2799	604.68	56.9311	158751.04
200	1810195-8 10X	3.7877	14186.30	9.4082	8372.48	3.2917	932.03	0.6025	35.47	47.1948	130133.94
201	1810195-9 10X	4.0809	15558.66	11.5075	10470.40	4.0076	1161.72	0.6645	39.87	51.1985	144491.50
202	1810195-11 10X	6.5712	24768.85	19.1513	17446.68	4.0016	1175.38	1.0158	60.27	64.4559	183148.75
203	1810195-12 10X	6.6226	25266.27	20.2689	18010.61	3.7913	1128.04	0.9921	59.60	78.0634	228657.72
204	1810195-13 10X	2.1127	8040.96	7.8349	7211.91	1.9610	574.01	0.5031	30.13	55.1003	156073.35
205	1810195-14 10X	1.4222	5449.87	7.9628	6988.43	1.2473	365.01	0.3252	19.60	35.7667	99287.37
206	1810195-15 10X	1.6744	5765.54	12.2359	9036.19	3.4497	918.70	1.0038	54.40	353.2588	1277233.88
207	CCV	99.1842	367163.39	195.3281	167878.71	10.2224	2809.59	10.6038	617.74	10.3919	26893.24
208	CCB	0.3346	1273.40	1.2756	1410.12	-0.0228	1.67	0.0000	0.00	0.0328	120.01
209	1810195-16 10X	4.1403	15053.74	10.3582	8802.78	10.5604	2884.27	1.0628	60.80	35.9438	94679.68
210	1810195-17 10X	4.0840	14923.62	10.0710	8699.36	10.8652	2890.93	0.8807	50.67	41.1784	109854.26
211	1810195-18 10X	4.0202	14881.38	5.4701	5041.01	12.1317	3261.68	0.7417	43.20	14.5486	37862.62
212	1810195-19 10X	5.8022	20810.00	12.7746	11130.94	47.6549	12339.35	2.1903	123.60	28.7913	74078.55
213	1810195-19L 50X	1.2326	4678.51	2.5180	2530.30	9.3504	2570.88	0.5132	30.67	5.7432	15147.72
214	1810195-19MS ...	5.8809	20911.27	13.3029	10944.08	22.5261	6034.47	1.3722	76.80	31.3496	80258.20
215	1810195-19MSD...	5.4923	19529.62	13.0000	10890.79	26.7700	6899.81	1.3313	74.53	28.6577	73086.92
216	1810195-19A 10X	100.9805	354307.98	205.6347	156220.71	56.7147	14469.12	11.5708	638.94	38.8594	99209.33
217	1810195-20 10X	4.7435	16738.73	13.8417	10970.81	27.2215	7112.90	1.1982	66.53	26.6268	67201.33

Analyte Table

		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]		88 Sr [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
218	CCV	99.8068	357765.03	196.6033	161277.27	10.4007	2766.58	10.3658	584.81	10.4601	26219.10
219	CCB	0.3162	1184.51	1.1833	1343.46	-0.0252	1.00	0.0114	0.67	0.0245	96.67

Analyte Table

		89 Y [2]		98 Mo [2]		109 Ag [2]		111 Cd [2]		118 Sn [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	RINSE	0.0015	6.67	0.0072	31.11	0.0000	2.22	0.0000	0.00	0.1021	2777.05
2	RINSE	0.0022	10.00	0.0063	27.78	0.0005	5.56	0.0000	0.00	0.0968	2660.33
3	BLANK	0.0000	0.00	0.0000	10.00	0.0000	2.22	0.0000	0.00	0.0000	1326.80
4	H/1000	0.0187	86.67	0.0912	287.79	0.0079	55.56	0.0407	49.97	0.5151	9396.60
5	H/100	0.1930	930.07	0.9163	2918.09	0.1016	707.81	0.3289	417.72	4.5642	77547.15
6	H/10	1.9999	9866.83	9.8077	31871.98	0.9936	6956.07	3.1517	4016.05	47.7487	782161.44
7	HIGH	20.0001	90020.30	100.0201	296245.28	10.0006	54215.79	29.9845	32046.49	500.2295	7183393.64
8	RINSE	0.0008	3.33	-0.0002	8.89	0.0008	7.78	0.0000	0.00	0.1343	3170.47
9	ICV	5.8914	29698.70	18.6027	61721.09	1.9577	12888.72	6.2364	7577.75	100.8353	1529000.86
10	ICB	0.0029	13.33	0.0038	21.11	0.0010	8.89	0.0011	1.33	0.0756	2466.97
11	LIV	0.0553	253.35	0.2145	656.69	0.0509	345.57	0.1848	223.93	1.0029	16796.36
12	ICSA	0.0044	20.00	210.3539	638515.77	0.0069	45.56	0.0141	16.79	0.1066	2933.77
13	ICSAB	1.9660	9022.97	219.8622	664117.15	1.0458	6336.91	3.1302	3606.04	49.8606	740634.76
14	CCV	2.0294	9813.39	9.9651	31712.71	1.0100	7010.53	3.1688	3998.73	47.3335	744383.53
15	CCB	0.0043	20.00	0.0144	54.44	0.0009	8.89	0.0016	1.99	0.0601	2266.96
16	IP181101-5MB ...	0.0050	23.33	0.0109	43.33	0.0009	8.89	0.0011	1.33	0.1045	2983.73
17	IM181101-5LCS...	1.8975	9593.25	9.2816	30877.71	0.9603	7262.88	3.0634	4059.50	44.5110	749119.54
18	1810184-1 100X	0.0079	36.67	7.9421	24458.93	0.0021	15.56	0.0073	8.91	0.0686	2393.62
19	1810184-2 100X	0.0116	56.67	7.9110	25420.40	0.0002	3.33	0.0069	8.82	0.0737	2617.00
20	1810184-3 100X	0.0073	36.67	8.6001	28009.16	0.0011	10.00	0.0129	16.56	0.0727	2590.33
21	1810184-4 100X	0.0000	0.00	8.3199	26918.42	0.0011	10.00	0.0036	4.67	0.0560	2333.62
22	1810184-5 100X	0.0048	23.33	14.4039	46235.74	-0.0003	0.00	0.0053	6.76	0.0494	2170.24
23	1810184-6 100X	0.0048	23.33	11.7067	37651.18	0.0003	4.44	0.0038	4.94	0.0657	2470.31
24	1810184-7 100X	0.0069	33.34	8.0354	25681.97	0.0005	5.56	0.0084	10.79	0.0475	2176.92
25	1810184-8 100X	0.0027	13.33	8.2644	27392.60	0.0007	7.78	0.0019	2.62	0.0619	2460.30
26	CCV	1.9492	9856.82	9.9097	32987.48	0.9425	7290.65	3.1789	4203.33	47.0491	785438.58
27	CCB	0.0083	40.00	0.0045	24.45	0.0013	12.22	0.0010	1.33	0.0538	2220.25
28	1810184-18 100X	0.0119	56.67	7.9261	24838.39	0.0029	21.11	0.0302	37.54	0.0541	2183.59
29	1810203-2 10X	0.0318	163.34	0.1406	486.68	0.0009	10.00	0.0029	3.95	0.1057	3293.83
30	1810203-2L 50X	0.0132	66.67	0.0235	88.89	0.0006	7.78	0.0015	1.99	0.0646	2486.99
31	1810203-2MS 10X	2.0227	10076.94	9.6974	31800.78	0.9404	7226.18	3.0501	3988.05	47.3577	773978.30

Analyte Table

		89 Y [2]		98 Mo [2]		109 Ag [2]		111 Cd [2]		118 Sn [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1810203-2MSD ...	1.9842	10120.35	9.6772	32498.75	0.9021	7222.86	3.1750	4230.06	47.3472	778672.82
33	1810203-4 10X	0.0338	166.68	0.1225	407.79	0.0008	8.89	0.0015	1.96	0.1339	3510.59
34	CCV	1.9799	10086.92	9.9207	33263.67	0.9419	7306.23	3.0529	4035.25	47.3426	778389.73
35	CCB	0.0048	23.33	0.0006	12.22	0.0002	4.45	0.0005	0.67	0.0511	2180.24
36	IP181101-6MB ...	0.0034	16.67	0.0031	20.00	0.0008	8.89	0.0000	0.00	0.1112	3067.09
37	IM181101-6LCS...	1.9203	9513.19	9.6527	31477.82	0.9654	7315.12	3.2089	4201.48	46.6559	755001.32
38	1810182-1 10X	0.0096	46.67	0.1432	470.01	0.0015	13.33	0.0000	-0.05	0.1324	3433.90
39	1810182-2 10X	0.0027	13.33	0.1625	535.57	0.0027	23.34	0.0005	0.61	0.1409	3703.94
40	1810182-3 10X	0.0047	23.33	0.1370	460.01	0.0011	11.11	0.0015	1.95	0.1129	3167.13
41	1810182-4 10X	0.0035	16.67	0.1388	453.35	0.0017	15.56	0.0005	0.62	0.1107	3207.14
42	1810182-5 10X	0.0034	16.67	0.2645	857.81	0.0010	10.00	0.0020	2.58	0.1043	3020.42
43	1810182-6 10X	0.0000	0.00	0.1246	402.23	0.0020	17.78	0.0005	0.63	0.1072	3030.44
44	1810182-7 10X	0.0063	30.00	0.1066	342.23	0.0017	14.44	0.0000	-0.03	0.1151	3090.45
45	1810182-8 10X	0.0047	23.33	0.1723	571.13	0.0002	4.44	0.0031	3.94	0.1044	3033.78
46	CCV	1.9576	9566.66	9.8303	31620.35	0.9775	6998.30	3.2595	4128.77	47.2954	749844.44
47	CCB	0.0028	13.33	0.0003	11.11	0.0012	11.11	0.0000	0.00	0.0432	2023.55
48	1810182-9 10X	0.0055	26.67	0.2041	663.36	0.0005	6.67	0.0020	2.60	0.1107	3163.80
49	1810182-10 10X	0.0048	23.33	0.1328	436.68	0.0008	8.89	0.0000	-0.04	0.1018	2917.07
50	1810182-11 10X	0.0063	30.00	0.1674	541.13	0.0016	14.44	0.0000	-0.05	0.1004	2890.40
51	1810182-12 10X	0.0021	10.00	0.1890	600.02	0.0009	8.89	0.0010	1.27	0.0971	2807.04
52	1810182-13 10X	0.0091	43.33	0.1771	565.57	0.0007	7.78	0.0000	-0.06	0.1015	2827.04
53	CCV	1.9740	9503.26	9.8931	31345.34	0.9666	6879.37	3.2219	4004.77	47.5570	730521.24
54	CCB	0.0029	13.33	0.0018	15.55	0.0008	7.78	0.0005	0.67	0.0547	2133.58
55	IP181102-1MB ...	0.0021	10.00	0.0004	11.11	0.0004	5.56	0.0005	0.67	0.1057	2913.72
56	IM181102-1LCS...	2.0150	9813.45	9.8982	31718.39	0.9481	6972.74	3.3342	4228.13	47.9091	755059.16
57	1810328-12 10X	0.0051	23.33	0.0034	20.00	0.0014	12.22	0.0005	0.67	0.1172	3010.43
58	CCV	2.0697	9783.45	9.9012	30815.57	0.9804	6877.14	3.2720	4026.51	48.0316	720985.30
59	CCB	0.0007	3.33	0.0019	15.56	0.0000	2.22	0.0005	0.67	0.0637	2276.94
60	IP181102-2MB ...	0.0000	0.00	0.0018	15.55	0.0007	7.78	0.0005	0.67	0.1112	3033.76
61	IM181102-2LCS...	2.0385	10096.98	9.7286	31721.66	0.9764	7506.34	3.1672	4130.10	47.4961	748767.02
62	1810247-4 10X	0.0240	113.34	0.0639	208.89	0.0026	21.11	0.0063	7.98	0.1406	3473.88

Analyte Table

		89 Y [2]		98 Mo [2]		109 Ag [2]		111 Cd [2]		118 Sn [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1810247-4L 50X	0.0089	43.34	0.0118	47.78	0.0005	6.67	0.0016	2.00	0.0981	2937.09
64	1810247-4MS 10X	2.1448	10300.40	10.1976	32239.49	0.9991	7298.46	3.3196	4178.06	48.8822	769693.01
65	1810247-4MSD ...	2.0676	9830.11	10.0438	31418.86	0.9670	6967.18	3.2441	4048.11	48.1767	760064.05
66	1810247-7 10X	0.0203	96.67	0.0632	207.78	0.0003	4.45	0.1413	175.31	0.1602	3790.67
67	1810247-9 10X	0.0028	13.33	0.5291	1673.45	0.0013	12.22	0.0015	1.84	0.1314	3420.53
68	1810330-16 10X	0.0066	30.00	0.0023	16.66	0.0009	8.89	0.0011	1.33	0.1544	3663.95
69	1810444-1 10X	0.0419	186.67	11.4302	33559.83	0.0009	7.78	0.0079	9.34	0.1401	3243.83
70	CCV	2.0524	9876.83	9.8618	31251.76	0.9752	6999.98	3.2964	4120.15	47.6795	742717.18
71	CCB	0.0028	13.33	0.0007	12.22	0.0009	8.89	0.0000	0.00	0.0794	2543.65
72	1810444-2 10X	0.0007	3.33	0.1499	487.79	0.0003	4.44	0.0015	1.95	0.1166	3250.50
73	1810444-3 10X	0.0041	20.00	0.0302	106.67	0.0005	6.67	0.0005	0.66	0.1184	3300.51
74	1810444-4 10X	0.0043	20.00	0.1469	465.57	0.0005	5.56	0.0016	1.95	0.1136	3067.10
75	1810444-5 10X	0.0256	123.34	0.0543	182.22	0.0000	2.22	0.0000	-0.02	0.1209	3197.18
76	1810444-6 10X	0.0086	40.00	0.2208	684.47	0.0005	5.56	0.0005	0.60	0.1196	3137.11
77	1810444-7 10X	0.0042	20.00	0.0043	23.33	0.0016	14.45	0.0010	1.33	0.1330	3337.15
78	1810444-8 10X	0.0043	20.00	0.2339	732.25	0.0009	8.89	0.0005	0.60	0.0997	2820.39
79	1810444-9 10X	0.0071	33.33	0.0832	266.67	0.0001	3.33	0.0000	-0.03	0.1253	3230.51
80	1810444-10 10X	0.0056	26.67	0.0380	127.78	0.0020	17.78	0.0032	3.99	0.1009	2880.39
81	1810444-11 10X	0.0106	50.00	0.1344	426.68	-0.0002	1.11	0.0000	-0.04	0.0914	2717.05
82	CCV	2.1374	10137.06	9.9262	30990.28	0.9622	6943.82	3.2540	4020.81	48.0024	738567.46
83	CCB	0.0043	20.00	0.0015	14.44	0.0007	7.78	0.0000	0.00	0.0620	2233.59
84	1810444-12 10X	0.0035	16.67	0.2086	676.69	0.0003	4.44	0.0000	-0.06	0.1139	3137.12
85	1810444-13 10X	0.0064	30.00	0.2151	676.69	0.0003	4.44	-0.0001	-0.07	0.1240	3250.49
86	CCV	2.0291	9750.03	9.9825	31573.62	0.9841	7096.11	3.1759	3980.08	48.4020	725749.05
87	CCB	0.0078	36.67	0.0036	21.11	0.0016	14.44	0.0000	0.00	0.0594	2236.92
88	FP181030-2MB...	0.0028	13.33	0.0013	14.44	0.0011	11.11	0.0000	0.00	0.0705	2500.32
89	IP181103-2MB ...	0.0015	6.67	-0.0011	6.67	0.0024	20.00	0.0000	0.00	0.0815	2557.00
90	IM181103-2LCS...	1.9704	9656.74	9.8021	31622.57	0.9524	7158.38	3.3591	4312.83	47.5775	761494.26
91	1810475-1 10X	0.0179	83.33	0.0524	171.12	0.0020	15.56	0.0044	5.31	0.0675	2300.27
92	1810475-2 10X	0.0380	173.34	0.1243	382.23	0.0055	36.67	0.0106	12.63	0.1215	3113.76
93	1810475-3 10X	0.0314	153.34	0.1312	432.23	0.0266	201.12	0.0320	41.29	0.0854	2763.73

Analyte Table

		89 Y [2]		98 Mo [2]		109 Ag [2]		111 Cd [2]		118 Sn [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1810475-4 10X	0.0083	40.00	0.0923	302.23	0.0003	4.44	0.0026	3.30	0.0534	2210.27
95	1810475-5 10X	0.0194	93.34	0.1264	411.12	0.0005	5.56	0.0000	-0.04	0.0616	2290.27
96	1810475-6 10X	0.0175	83.34	0.0917	298.89	0.0024	18.89	0.0037	4.64	0.0691	2390.29
97	1810601-1 10X	0.0047	23.33	0.0403	141.12	0.0008	8.89	0.0041	5.32	0.0649	2386.95
98	CCV	2.0395	9693.37	10.1014	31602.59	0.9587	6767.08	3.2947	4110.10	48.3235	743546.92
99	CCB	0.0007	3.33	0.0004	11.11	0.0007	7.78	0.0000	0.00	0.0477	1993.55
100	1810612-1 10X	0.0090	43.33	0.5635	1791.24	0.0013	12.22	0.0014	1.82	0.0585	2223.60
101	1810612-3 10X	0.0105	50.00	0.5764	1819.02	0.0015	13.33	0.0025	3.15	0.0644	2350.28
102	1810612-4 10X	0.0084	40.00	0.5232	1661.22	0.0008	7.78	0.0051	6.50	0.0582	2276.93
103	1810628-1 10X	0.0119	56.67	0.3543	1115.61	0.0020	16.67	0.0004	0.56	0.0488	2100.25
104	1810637-1 10X	0.0098	46.67	0.3756	1181.18	0.0040	30.00	0.0112	13.88	0.1330	3410.52
105	1810637-1L 50X	0.0035	16.67	0.0662	220.01	0.0007	7.78	0.0026	3.31	0.0420	2060.23
106	1810637-1MS 10X	2.0592	9753.36	10.4856	32691.41	1.0386	7095.01	3.3076	4102.00	48.7912	748573.48
107	1810637-1MSD ...	2.0446	9750.03	10.4357	32759.27	1.0071	6837.14	3.2189	3980.62	49.5739	781084.55
108	1810637-2 10X	0.0086	40.00	0.3612	1114.50	0.0013	11.11	0.0043	5.23	0.0631	2260.27
109	1810637-2L 50X	0.0027	13.33	0.0762	254.45	0.0005	6.66	0.0005	0.64	0.0571	2276.94
110	CCV	2.0386	9763.43	9.9889	31484.51	0.9670	6836.00	3.2956	4110.12	48.0086	730434.54
111	CCB	0.0022	10.00	0.0033	20.00	0.0009	8.89	0.0000	0.00	0.0434	1963.54
112	1810637-2MS 10X	2.1462	10077.00	10.4661	32344.05	1.0413	7008.31	3.2957	4039.34	48.5860	755123.03
113	1810637-2MSD ...	2.1864	10460.59	10.9103	34354.78	1.0304	7308.45	3.2460	4092.51	49.9348	780816.05
114	1810637-3 10X	0.0044	20.00	0.0110	43.33	0.0003	4.44	0.0021	2.66	0.0556	2130.24
115	1811004-21 10X	0.0014	6.67	0.0443	153.34	0.0013	12.22	0.0021	2.65	0.0511	2126.89
116	1811004-22 10X	0.0104	50.00	0.7001	2227.97	0.0000	2.22	0.0067	8.44	0.0655	2380.28
117	1811004-23 10X	0.0076	36.67	0.6721	2156.85	0.0003	4.44	0.0098	12.45	0.0607	2310.29
118	1811004-24 10X	0.0077	36.67	4.3305	13510.33	0.0011	10.00	0.0108	13.33	0.0475	2060.22
119	CCV	1.9738	9650.01	9.8760	31787.32	0.9647	7106.11	3.1773	4035.40	47.7730	744272.15
120	CCB	0.0049	23.33	0.0010	13.33	0.0011	11.11	0.0005	0.67	0.0509	2116.91
121	IP181105-1MB ...	0.0035	16.67	0.0045	24.44	-0.0003	0.00	0.0000	0.00	0.0584	2290.27
122	IM181105-1RVS...	0.0233	110.01	0.0818	264.45	0.0244	188.89	0.1061	134.64	0.5313	9546.66
123	IM181105-1LCS...	1.9945	9770.04	9.8560	31782.87	0.9618	7420.73	3.2186	4187.45	47.1474	759317.60
124	1810412-1 10X	0.0730	350.02	0.5287	1677.89	0.0061	48.89	0.0019	2.50	0.0743	2503.65

Analyte Table

		89 Y [2]		98 Mo [2]		109 Ag [2]		111 Cd [2]		118 Sn [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
125	1810412-1L 50X	0.0156	76.67	0.0996	333.34	0.0021	18.89	0.0005	0.63	0.0511	2126.91
126	1810412-1MS 10X	2.0587	9990.22	10.3180	32951.90	0.9317	6988.31	3.2864	4172.65	47.8609	749077.52
127	1810412-1MSD ...	2.1159	10053.61	10.2286	31991.06	0.9541	6862.69	3.2559	4044.71	49.2556	758860.33
128	1810412-2 10X	0.0007	3.33	0.5452	1685.67	0.0002	4.44	0.0020	2.50	0.0616	2270.26
129	1810412-3 10X	0.0079	33.33	4.9695	13787.20	0.0276	153.34	0.0012	1.30	0.1111	2727.04
130	1810412-4 10X	0.0023	10.00	5.0200	14431.11	0.0298	168.89	-0.0001	-0.10	0.0664	2176.92
131	CCV	2.0127	9760.08	10.0757	32143.61	0.9243	6931.61	3.2410	4122.72	47.3751	742431.37
132	CCB	0.0022	10.00	0.0008	12.22	0.0008	8.89	0.0005	0.67	0.0185	1586.83
133	1810412-5 10X	0.0050	23.33	0.8823	2732.50	0.0063	45.55	0.0014	1.73	0.0470	2056.90
134	1810412-6 10X	0.0044	20.00	0.8519	2605.81	0.0069	50.00	0.0003	0.41	0.0387	1910.21
135	1810412-7 10X	0.0000	0.00	1.8748	5665.54	0.0290	186.67	0.0006	0.77	0.0399	1873.53
136	1810412-8 10X	0.0048	23.33	1.9036	6041.23	0.0203	134.45	0.0006	0.74	0.0379	1930.21
137	1810412-9 10X	0.0014	6.67	0.7068	2275.75	0.0012	12.22	0.0003	0.44	0.0100	1576.83
138	1810412-10 10X	0.0014	6.67	0.7088	2270.19	0.0010	11.11	0.0014	1.77	0.0420	2023.55
139	1810412-11 10X	0.0028	13.33	0.6735	2136.84	0.0015	14.44	-0.0002	-0.21	0.0132	1580.15
140	1810412-12 10X	0.0028	13.33	0.5608	1770.12	0.0004	5.55	0.0009	1.16	0.0157	1593.50
141	1810506-1 10X	0.0020	10.00	0.0420	145.56	0.0010	11.11	0.0000	-0.01	0.0108	1536.82
142	1810506-2 10X	0.0041	20.00	0.0415	144.45	0.0005	6.67	0.0000	-0.01	0.0031	1416.80
143	CCV	2.0150	9990.22	10.3536	33789.13	0.9128	7277.32	3.2007	4310.61	48.1244	773829.88
144	CCB	0.0000	0.00	0.0005	13.33	0.0002	4.44	0.0000	0.00	0.0129	1716.83
145	1810506-5 10X	0.0069	36.67	0.0942	342.23	0.0001	4.44	0.0018	2.63	0.0181	1826.86
146	1810506-6 10X	0.0073	40.00	0.0804	301.12	0.0014	15.56	0.0009	1.30	0.0268	1970.22
147	1810544-2 10X	0.0006	3.33	-0.0008	8.89	0.0014	15.56	0.0018	2.67	0.0107	1713.51
148	1810544-3 10X	0.0018	10.00	-0.0011	7.78	0.0007	8.89	0.0004	0.67	0.0115	1740.18
149	1810544-4 10X	0.0012	6.67	0.0055	32.22	0.0006	8.89	0.0009	1.33	0.0100	1740.18
150	1811031-1 10X	0.0049	26.67	0.2911	1045.61	0.0025	25.55	-0.0001	-0.10	0.0169	1813.52
151	CCV	2.1315	11441.27	10.1339	35825.79	0.9711	8296.74	3.2857	4699.86	48.5225	837496.76
152	CCB	0.0006	3.33	0.0004	13.33	0.0004	6.67	0.0014	2.00	0.0088	1673.51
153	IP181104-5MB ...	0.0006	3.33	0.0034	24.45	0.0002	4.44	0.0000	0.00	1.2280	23772.29
154	IM181104-5LCS...	1.9413	10663.97	9.9003	35803.67	0.9536	8348.97	3.0868	4668.52	48.0759	856567.57
155	1810328-1 10X	5.0693	26770.00	0.1871	661.13	0.0137	113.34	0.0368	49.93	1.3354	23471.99

Analyte Table

		89 Y [2]		98 Mo [2]		109 Ag [2]		111 Cd [2]		118 Sn [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
156	1810328-2 10X	5.9853	32129.97	0.8748	3103.68	0.0257	206.67	0.0688	93.02	1.4289	24690.58
157	1810328-3 10X	6.7411	35911.50	1.4916	5237.62	0.0654	491.12	0.3006	398.82	1.6079	27064.36
158	1810328-4 10X	3.2967	17436.91	24.8009	86333.04	0.0496	406.68	0.4228	588.14	1.3370	24243.11
159	1810328-5 10X	4.2079	23137.63	0.2196	806.70	0.0154	133.34	0.0502	71.26	1.3504	24793.83
160	1810328-6 10X	5.0016	28225.73	0.2549	958.94	0.0160	133.33	0.0575	83.24	1.2829	24233.10
161	1810328-7 10X	4.9476	26579.77	0.4364	1554.54	0.0566	471.13	0.2247	312.52	1.2956	23699.03
162	1810328-8 10X	1.9558	10687.40	0.2265	826.70	0.0088	74.44	0.0203	30.59	1.3505	25338.03
163	CCV	1.9813	10834.10	10.0984	36354.79	0.9491	8107.75	3.1033	4574.43	47.8436	841211.06
164	CCB	0.0042	23.33	0.0037	25.56	0.0004	6.67	0.0022	3.33	0.0073	1690.18
165	1810328-9 10X	2.5119	13586.33	0.2623	944.49	0.0120	95.56	0.1041	147.91	1.2892	23999.39
166	1810328-10 10X	9.7582	56357.21	0.6591	2515.79	0.0928	724.47	0.2065	287.76	1.4938	27531.70
167	1810328-11 10X	4.9889	28656.69	0.2057	791.14	0.0176	157.78	0.0590	87.92	1.3432	25555.16
168	1810328-13 10X	5.0775	28950.62	0.2445	928.93	0.0142	122.23	0.0678	98.58	1.2956	24974.16
169	1810328-13L 50X	1.0409	6041.44	0.0531	215.56	0.0030	30.00	0.0111	17.98	0.2723	6805.14
170	1810328-13MS ...	7.0628	40485.41	7.9405	29962.71	0.9748	7991.00	3.1234	4535.05	47.3359	854354.47
171	1810328-13MSD...	6.6892	37561.83	8.3895	31009.14	1.0180	7780.91	3.1459	4484.27	50.3340	894286.37
172	1810328-13A 10X	6.8356	37952.68	9.8742	36085.37	1.0016	7823.16	3.1325	4402.41	50.0263	883125.74
173	1810328-14 10X	4.9509	26976.75	0.2450	888.93	0.0164	135.56	0.0557	77.91	1.3490	24266.43
174	1810328-15 10X	4.6687	26159.21	0.2201	823.37	0.0134	114.45	0.0631	91.25	1.3256	25044.09
175	CCV	2.0472	11014.26	10.1065	35786.78	0.9414	7728.65	3.2017	4601.17	47.9241	830125.82
176	CCB	0.0056	30.00	0.0020	18.89	0.0005	7.78	0.0009	1.33	0.0026	1580.15
177	1810328-16 10X	4.3114	23574.95	0.2030	742.25	0.0122	106.67	0.0578	81.26	1.3312	24423.31
178	1810328-17 10X	5.0376	28650.03	0.2292	868.93	0.0124	104.45	0.0553	79.91	1.3831	26276.39
179	1810328-18 10X	4.1101	23107.52	0.2469	925.59	0.0111	98.89	0.0482	70.58	1.3007	25101.15
180	1810328-19 10X	3.2370	17646.96	0.0614	232.23	0.0189	155.56	0.1024	145.98	1.2469	23371.55
181	1810328-20 10X	4.6268	25868.60	0.2331	868.93	0.0175	146.67	0.0603	85.91	1.3195	24897.40
182	1810328-21 10X	4.8821	26716.50	0.5303	1921.26	0.0192	154.45	0.0599	84.47	1.2809	23882.65
183	CCV	2.0779	11211.07	10.0060	35531.84	0.9351	7818.70	3.1787	4501.83	47.5194	834455.48
184	CCB	0.0037	20.00	0.0002	12.22	0.0008	10.00	0.0009	1.33	0.0098	1710.18
185	IP181104-3MB ...	0.0043	23.33	0.0033	23.33	0.0015	15.56	0.0009	1.33	1.2471	23758.93
186	IM181104-3LCS...	2.0166	11000.88	9.5721	34370.59	0.9834	7927.65	2.9862	4342.56	47.8423	856777.51

Analyte Table

		89 Y [2]		98 Mo [2]		109 Ag [2]		111 Cd [2]		118 Sn [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
187	1810195-1 10X	8.0227	45592.95	0.0785	305.56	0.0101	87.78	0.0224	31.97	1.3427	25117.82
188	1810195-2 10X	4.0118	22643.50	0.1513	574.47	0.0171	131.11	0.0563	82.61	1.3225	25648.62
189	1810195-3 10X	3.3503	18284.49	0.1204	444.46	0.0162	136.67	0.0445	63.29	1.2700	23872.45
190	1810195-4 10X	4.0912	22590.17	0.1771	655.58	0.0156	130.00	0.0303	43.94	1.3076	24820.72
191	1810195-5 10X	4.2338	23898.76	0.2579	970.04	0.0258	202.23	0.0344	49.24	1.3068	24810.70
192	1810195-6 10X	8.1628	45833.50	2.0214	7480.75	0.0769	607.80	0.2579	362.60	1.4858	27488.38
193	1810195-7 10X	3.7834	19996.52	0.4399	1542.32	0.0148	122.23	0.0920	128.51	1.2178	22924.35
194	1810195-7L 50X	0.7436	4120.71	0.0860	325.56	0.0038	35.56	0.0288	43.97	0.2409	5981.41
195	CCV	2.0246	10663.99	10.2299	35476.18	0.9780	7947.66	3.1550	4465.16	47.8128	823314.21
196	CCB	0.0025	13.33	0.0035	23.33	0.0015	15.55	0.0000	0.00	0.0075	1630.16
197	1810195-7MS 10X	5.5285	29701.73	8.4418	29858.13	0.9228	7270.66	3.1119	4258.98	47.4716	805709.83
198	1810195-7MSD ...	5.3390	28502.95	8.9584	31485.71	1.0123	7738.66	3.1492	4304.17	49.8172	855018.89
199	1810195-7A 10X	5.3750	28329.27	9.9921	34665.60	0.9723	7167.28	3.1109	4211.83	49.6295	841359.88
200	1810195-8 10X	3.4146	17860.62	0.2142	748.92	0.0135	106.67	0.0653	88.59	1.2913	22727.29
201	1810195-9 10X	3.7825	20253.70	0.4705	1667.89	0.0158	127.78	0.0684	94.50	1.3183	24126.16
202	1810195-11 10X	5.9169	31983.00	0.1939	701.14	0.0229	185.56	0.0776	105.93	1.4019	25291.31
203	1810195-12 10X	5.6099	30640.16	0.1922	702.25	0.0252	200.00	0.0675	93.27	1.3751	25391.56
204	1810195-13 10X	3.1210	16449.09	0.0697	253.34	0.0033	28.89	0.0309	42.64	1.2957	23882.47
205	1810195-14 10X	1.9385	10136.96	0.0513	187.78	0.0054	43.33	0.0211	29.31	1.3125	24126.08
206	1810195-15 10X	6.0064	29808.76	0.0593	204.45	0.0133	87.78	0.0523	65.31	1.4616	24299.74
207	CCV	2.0567	10347.11	9.9402	32916.25	0.9697	7424.05	3.1463	4218.68	46.7073	778413.32
208	CCB	0.0084	43.33	0.0023	18.89	0.0003	5.55	0.0010	1.33	0.0147	1680.17
209	1810195-16 10X	3.9144	19896.38	1.9382	6486.97	0.0407	302.23	0.2846	374.70	1.2564	21649.20
210	1810195-17 10X	3.6085	18284.45	2.4883	8305.60	0.0188	143.33	0.1378	182.51	1.2458	21862.70
211	1810195-18 10X	2.1722	11114.37	0.7357	2488.01	0.0976	764.48	0.0893	119.75	1.2088	21322.12
212	1810195-19 10X	4.3721	21915.87	38.6479	127474.20	0.0403	308.90	0.7964	1034.76	1.2766	21829.31
213	1810195-19L 50X	0.9771	5014.33	7.9887	26971.90	0.0088	73.33	0.1708	234.66	0.2843	6234.92
214	1810195-19MS ...	4.6961	23524.86	20.4501	67434.01	0.0464	334.45	0.5418	698.01	1.2240	21295.36
215	1810195-19MSD...	4.4191	21992.49	24.9202	81609.49	0.0365	270.01	0.5467	703.94	1.2149	20854.60
216	1810195-19A 10X	6.5402	32293.69	49.0224	159329.21	1.0774	7289.58	3.8667	4914.37	49.3017	785334.81
217	1810195-20 10X	4.0759	20166.84	28.7497	93621.10	0.0348	243.34	0.6046	772.76	1.2470	20998.32

Analyte Table

		89 Y [2]		98 Mo [2]		109 Ag [2]		111 Cd [2]		118 Sn [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
218	CCV	2.0312	9900.17	10.0516	32244.88	0.9983	7290.68	3.1972	4151.39	47.5892	764985.85
219	CCB	0.0020	10.00	0.0046	25.55	0.0012	12.22	0.0000	0.00	0.0187	1716.85

Analyte Table

		121 Sb [2]		137 Ba [2]		139 La [2]		140 Ce [1]		141 Pr [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	RINSE	0.0025	21.11	0.0414	56.67	0.0055	70.00	0.0164	1226.78	0.0010	106.67
2	RINSE	0.0031	22.22	0.0236	36.67	0.0035	46.67	0.0080	680.05	0.0011	116.68
3	BLANK	0.0000	14.44	0.0000	13.33	0.0000	10.00	0.0000	170.01	0.0000	23.33
4	H/1000	0.0333	107.78	0.1208	140.01	0.0243	276.69	0.0301	2233.61	0.0289	2673.69
5	H/100	0.3077	904.48	1.0362	1146.77	0.3175	3653.94	0.2727	20284.28	0.2777	27488.89
6	H/10	2.9550	8592.46	9.0018	9950.26	2.8692	33250.19	2.7494	200012.46	2.7745	270757.48
7	HIGH	30.0044	73059.11	100.0994	98315.77	30.0129	309344.12	30.0253	1956962.16	30.0228	2626107.83
8	RINSE	0.0030	22.22	0.1006	116.68	0.0034	46.67	0.0081	676.71	0.0005	66.67
9	ICV	5.8152	16108.41	19.1932	20527.87	5.9005	66213.11	5.5842	384649.87	5.5425	512156.84
10	ICB	-0.0019	8.89	0.0001	13.33	0.0028	40.00	-0.0004	143.34	0.0009	103.34
11	LIV	0.0986	286.67	0.4677	496.70	0.0519	573.37	0.0504	3550.57	0.0458	4154.07
12	ICSA	0.0059	30.00	0.0562	73.34	0.0218	253.35	0.0053	536.70	0.0011	130.01
13	ICSAB	3.0778	8087.75	10.0963	10560.80	3.0378	33313.93	2.8393	192487.76	2.8621	260275.22
14	CCV	2.8583	8231.13	9.5134	10437.36	2.9516	33945.09	2.7395	193427.91	2.7385	259356.17
15	CCB	-0.0001	14.44	-0.0003	13.33	0.0009	20.00	0.0005	203.35	0.0005	70.01
16	IP181101-5MB ...	-0.0016	10.00	-0.0066	6.67	0.0003	13.33	-0.0010	106.67	0.0000	26.67
17	IM181101-5LCS...	2.7008	8167.80	9.1682	10423.97	2.8578	34065.40	2.6233	194857.49	5.2121	519294.56
18	1810184-1 100X	0.0007	16.67	0.1615	190.01	0.0049	66.67	0.0039	446.69	0.0005	73.34
19	1810184-2 100X	0.0058	32.22	0.1508	183.34	0.0022	36.67	0.0025	366.69	0.0007	96.67
20	1810184-3 100X	-0.0007	13.34	0.0895	116.68	0.0058	80.00	0.0025	363.35	0.0001	33.33
21	1810184-4 100X	-0.0015	11.11	0.1792	216.68	0.0002	13.33	-0.0012	96.67	0.0001	36.67
22	1810184-5 100X	0.0028	23.33	0.1134	140.01	0.0014	26.67	-0.0006	136.67	-0.0001	20.00
23	1810184-6 100X	0.0058	32.22	0.0974	123.34	0.0022	36.67	0.0007	236.68	0.0002	50.00
24	1810184-7 100X	0.0027	23.33	0.1103	140.01	0.0033	50.00	0.0033	426.69	0.0003	56.67
25	1810184-8 100X	-0.0001	15.56	0.1630	203.34	0.0015	30.00	0.0001	190.01	0.0001	40.00
26	CCV	2.8793	8690.28	9.6811	11154.48	2.9451	35572.05	2.7421	204892.05	2.7278	273381.34
27	CCB	-0.0014	11.11	-0.0099	3.33	-0.0001	10.00	-0.0005	143.34	0.0003	50.00
28	1810184-18 100X	0.0038	25.56	0.1612	193.35	0.0031	46.67	0.0019	310.02	0.0004	66.67
29	1810203-2 10X	0.0055	33.33	6.0686	7192.04	0.0117	156.68	0.0018	326.69	0.0025	286.68
30	1810203-2L 50X	0.0013	20.00	1.1175	1296.78	0.0016	30.00	-0.0012	96.67	0.0006	80.00
31	1810203-2MS 10X	2.8205	8415.67	15.4989	17577.36	2.8444	33817.96	2.7058	197254.19	5.4746	535312.87

Analyte Table

		121 Sb [2]		137 Ba [2]		139 La [2]		140 Ce [1]		141 Pr [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1810203-2MSD ...	2.8311	8606.90	15.3787	17921.14	2.8365	34660.29	2.7260	200946.27	5.5179	545551.16
33	1810203-4 10X	0.0045	28.89	5.8575	6641.75	0.0151	190.01	0.0017	296.68	0.0030	316.69
34	CCV	2.9484	8892.63	9.6871	11211.17	2.9463	35749.47	2.7302	200678.12	2.7719	273242.83
35	CCB	0.0013	18.89	-0.0008	13.33	-0.0003	6.67	0.0001	180.01	-0.0001	13.33
36	IP181101-6MB ...	-0.0041	3.33	-0.0038	10.00	-0.0001	10.00	-0.0012	90.00	0.0002	40.00
37	IM181101-6LCS...	2.9377	8778.13	9.5957	10794.22	2.8748	33898.36	2.7627	198602.43	5.4712	527493.37
38	1810182-1 10X	0.0148	57.78	2.8082	3147.14	0.0085	110.00	0.0127	1070.10	0.0017	186.68
39	1810182-2 10X	0.0246	87.78	6.3314	7108.62	0.0019	33.33	0.0032	413.36	0.0005	73.34
40	1810182-3 10X	0.0060	33.34	5.7932	6631.77	0.0024	40.00	0.0036	433.36	0.0004	60.00
41	1810182-4 10X	0.0057	32.22	4.2395	4777.63	0.0002	13.33	-0.0001	173.34	-0.0001	20.00
42	1810182-5 10X	0.0063	33.33	9.3343	10467.41	0.0067	90.00	0.0014	276.68	0.0007	96.67
43	1810182-6 10X	0.0007	16.67	3.8621	4277.47	0.0017	30.00	-0.0002	163.34	0.0000	20.00
44	1810182-7 10X	0.0137	53.33	6.1222	6721.77	0.0060	80.00	0.0054	543.37	0.0005	66.67
45	1810182-8 10X	0.0038	26.67	4.8746	5461.22	0.0017	30.00	-0.0011	100.01	0.0000	20.00
46	CCV	2.9459	8515.74	9.5502	10604.14	2.8972	33731.37	2.7595	194243.56	2.7908	263458.80
47	CCB	0.0002	15.55	-0.0037	10.00	0.0014	26.67	-0.0002	156.68	0.0001	36.67
48	1810182-9 10X	0.0047	28.89	19.2016	21549.13	0.0059	80.00	0.0056	580.04	0.0009	110.01
49	1810182-10 10X	-0.0010	12.22	21.8279	24102.93	0.0025	40.00	0.0011	250.02	0.0000	26.67
50	1810182-11 10X	0.0090	41.11	4.5203	5017.69	0.0005	16.67	-0.0010	103.34	-0.0002	6.67
51	1810182-12 10X	0.0003	15.56	17.8086	19292.80	0.0008	20.00	-0.0001	166.68	0.0002	43.33
52	1810182-13 10X	0.0026	22.22	5.8958	6424.98	0.0029	43.33	0.0097	823.40	0.0007	90.00
53	CCV	2.9928	8487.97	9.6449	10560.74	2.8696	32945.93	2.7807	192685.43	2.7930	259597.45
54	CCB	-0.0013	11.11	0.0027	16.67	-0.0006	3.33	0.0008	220.01	0.0001	33.33
55	IP181102-1MB ...	-0.0017	10.00	-0.0036	10.00	0.0029	43.33	-0.0010	100.01	0.0001	30.00
56	IM181102-1LCS...	2.9601	8562.46	10.1125	11131.21	2.9608	34175.72	2.8005	193723.77	5.6634	525256.04
57	1810328-12 10X	-0.0024	7.78	-0.0097	3.33	-0.0006	3.33	-0.0002	150.01	0.0002	40.00
58	CCV	2.9536	8323.44	9.5484	10363.85	2.8610	32558.62	2.7751	186077.77	2.7840	250432.27
59	CCB	-0.0025	7.78	-0.0035	10.00	0.0003	13.33	0.0010	236.68	0.0003	50.00
60	IP181102-2MB ...	-0.0006	13.34	-0.0001	13.33	-0.0003	6.67	-0.0002	153.34	0.0002	40.00
61	IM181102-2LCS...	2.9306	8720.33	9.8854	11164.49	2.8884	34192.60	2.7630	191993.15	5.5390	516211.24
62	1810247-4 10X	0.0068	34.45	9.9156	10870.94	0.0104	130.01	0.0093	803.39	0.0026	263.35

Analyte Table

		121 Sb [2]		137 Ba [2]		139 La [2]		140 Ce [1]		141 Pr [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1810247-4L 50X	0.0028	23.33	1.6512	1836.86	0.0011	23.33	0.0010	246.68	0.0007	93.34
64	1810247-4MS 10X	3.1032	8909.32	20.5366	22530.46	3.0333	34927.27	2.8056	196145.60	5.6369	528594.99
65	1810247-4MSD ...	2.9083	8280.07	19.3724	21061.72	2.9328	33464.01	2.8146	196375.54	5.6478	528457.73
66	1810247-7 10X	0.0172	63.33	21.8338	23675.63	0.0029	43.33	0.0102	870.07	0.0019	196.68
67	1810247-9 10X	0.0133	53.33	8.1965	9053.09	0.0043	60.00	0.0054	543.37	0.0008	96.67
68	1810330-16 10X	0.0020	20.00	0.0409	56.67	0.0015	26.67	0.0002	176.68	0.0002	36.67
69	1810444-1 10X	0.0022	20.00	0.8804	943.41	0.0009	20.00	0.0001	166.67	0.0006	76.67
70	CCV	2.9448	8400.14	9.7075	10680.89	2.9021	33464.12	2.7599	192331.23	2.7892	260721.60
71	CCB	-0.0005	13.34	-0.0005	13.33	0.0009	20.00	0.0006	206.68	0.0004	56.67
72	1810444-2 10X	-0.0018	10.00	10.1649	11391.38	0.0019	33.33	0.0026	360.02	0.0002	46.67
73	1810444-3 10X	0.0001	15.56	5.2105	5864.73	0.0033	50.00	0.0011	256.68	0.0003	53.33
74	1810444-4 10X	0.0062	32.22	2.5546	2783.72	0.0005	16.67	0.0007	220.01	0.0003	50.01
75	1810444-5 10X	0.0037	25.56	11.1687	12162.00	0.0192	230.01	0.0462	3350.51	0.0041	406.69
76	1810444-6 10X	-0.0001	14.44	7.8920	8626.11	0.0005	16.67	0.0013	256.68	0.0001	36.67
77	1810444-7 10X	0.0046	27.78	3.2333	3513.91	0.0089	110.00	0.0052	523.37	0.0003	53.33
78	1810444-8 10X	0.0047	27.78	9.3622	10147.12	0.0020	33.33	0.0012	250.01	0.0003	50.00
79	1810444-9 10X	0.0048	27.78	0.4535	500.04	0.0006	16.67	-0.0009	110.01	0.0001	36.67
80	1810444-10 10X	0.1210	356.67	3.7338	4057.38	0.0032	46.67	0.0006	213.35	0.0002	40.00
81	1810444-11 10X	0.0023	21.11	11.1703	12135.19	0.0014	26.67	0.0003	190.01	0.0003	46.67
82	CCV	2.9905	8431.25	9.2716	10103.79	2.9030	33166.58	2.8380	193289.48	2.8737	262535.00
83	CCB	-0.0004	13.33	0.0091	23.33	0.0012	23.33	0.0010	230.01	0.0005	66.67
84	1810444-12 10X	0.0070	35.55	14.4562	16052.28	-0.0009	0.00	-0.0006	130.01	0.0001	33.33
85	1810444-13 10X	0.0002	15.56	13.7039	14924.52	0.0011	23.33	0.0005	206.68	0.0003	53.33
86	CCV	2.9356	8384.57	9.6469	10600.77	2.9813	34329.30	2.7822	186135.59	2.8064	251836.03
87	CCB	-0.0009	12.22	0.0273	43.33	0.0006	16.67	0.0011	243.35	0.0000	26.67
88	FP181030-2MB...	0.0651	210.01	0.0020	16.67	0.0008	20.00	0.0013	266.68	0.0002	43.33
89	IP181103-2MB ...	-0.0029	6.67	0.0059	20.00	0.0003	13.33	-0.0009	110.01	-0.0001	16.67
90	IM181103-2LCS...	3.0426	8915.99	10.1779	11318.04	2.9353	34219.03	2.7853	196974.15	5.5843	529668.92
91	1810475-1 10X	0.0402	126.67	3.2016	3467.19	0.0094	116.67	0.0225	1680.18	0.0036	353.36
92	1810475-2 10X	0.0517	154.45	27.9309	29646.13	0.0245	283.35	0.0535	3817.34	0.0059	566.70
93	1810475-3 10X	0.0705	222.23	13.2384	14907.81	0.0168	210.01	0.0282	2200.26	0.0039	396.69

Analyte Table

		121 Sb [2]		137 Ba [2]		139 La [2]		140 Ce [1]		141 Pr [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1810475-4 10X	0.0266	92.23	13.4313	15057.98	0.0028	43.33	0.0027	366.69	0.0004	63.34
95	1810475-5 10X	0.0240	83.34	10.9765	12065.19	0.0092	116.67	0.0188	1470.15	0.0023	236.68
96	1810475-6 10X	0.0324	106.67	27.4917	30347.59	0.0120	150.01	0.0174	1380.13	0.0024	246.68
97	1810601-1 10X	0.0028	23.33	6.7047	7522.13	0.0016	30.00	0.0019	306.68	0.0002	43.34
98	CCV	2.9927	8517.98	10.0025	10944.36	2.8786	33006.38	2.8022	191518.39	2.8396	260292.15
99	CCB	-0.0004	13.33	0.0062	20.00	0.0006	16.67	0.0011	236.68	0.0002	43.33
100	1810612-1 10X	0.0148	57.78	3.5353	3934.03	0.0042	60.00	0.0016	280.02	0.0006	76.67
101	1810612-3 10X	0.0209	75.56	3.3959	3810.62	0.0028	43.33	0.0006	216.68	0.0007	86.67
102	1810612-4 10X	0.0426	137.78	3.6073	4010.71	0.0040	56.67	0.0048	513.36	0.0008	96.67
103	1810628-1 10X	0.0277	94.45	11.7871	13042.73	0.0063	83.33	0.0091	813.39	0.0015	170.01
104	1810637-1 10X	0.0389	124.45	97.6091	106458.32	0.0058	76.67	0.0129	1080.09	0.0020	210.01
105	1810637-1L 50X	0.0111	47.78	18.4682	20527.73	0.0031	46.67	0.0019	316.69	0.0005	70.00
106	1810637-1MS 10X	3.0369	8594.69	105.0336	114625.83	2.9353	33624.65	2.8052	193186.86	5.6121	518306.78
107	1810637-1MSD ...	3.1226	8809.23	108.0422	117162.24	3.0465	34683.42	2.8566	202117.49	5.7376	544332.90
108	1810637-2 10X	0.0309	101.11	95.5988	103645.70	0.0061	80.00	0.0040	440.03	0.0012	130.01
109	1810637-2L 50X	0.0024	22.22	18.1302	20133.86	0.0017	30.00	0.0011	253.35	0.0003	53.34
110	CCV	2.9923	8514.67	9.8170	10704.21	2.9475	33697.67	2.7344	187718.60	2.7696	255018.10
111	CCB	-0.0009	12.22	0.0123	26.67	0.0027	40.00	0.0013	253.35	0.0004	60.00
112	1810637-2MS 10X	2.9619	8283.40	106.2015	114608.97	2.9881	33848.36	2.7873	194655.59	5.6183	526271.59
113	1810637-2MSD ...	3.1740	9128.35	106.7498	118273.58	3.0631	35618.91	2.8527	199382.05	5.7850	542299.77
114	1810637-3 10X	0.0598	182.23	0.1379	160.01	0.0039	53.33	0.0052	513.37	0.0012	133.34
115	1811004-21 10X	0.0120	50.00	6.0141	6805.16	0.0007	20.00	0.0014	270.02	0.0005	73.34
116	1811004-22 10X	0.0182	67.78	7.2661	8122.51	0.0053	73.33	0.0106	926.74	0.0013	150.01
117	1811004-23 10X	0.0202	73.33	7.3675	8172.54	0.0060	80.01	0.0123	1046.76	0.0011	126.68
118	1811004-24 10X	0.0309	102.23	2.8727	3160.47	0.0084	106.68	0.0112	956.75	0.0015	160.01
119	CCV	3.0072	8713.65	10.1305	11231.11	2.8927	33621.05	2.7569	192095.31	2.8010	261773.92
120	CCB	-0.0029	6.67	0.0238	40.00	0.0026	40.00	0.0007	216.68	0.0003	53.33
121	IP181105-1MB ...	0.0002	15.55	-0.0067	6.67	0.0020	33.33	0.0000	176.68	0.0002	43.33
122	IM181105-1RVS...	0.0463	148.89	0.2216	256.68	0.0293	346.69	0.0245	1833.53	0.0234	2156.92
123	IM181105-1LCS...	2.9971	8898.19	9.4806	10584.04	3.0273	35418.28	2.7535	194960.81	5.5761	529497.15
124	1810412-1 10X	0.0405	132.23	10.7615	11965.22	0.1041	1223.45	0.2862	20264.16	0.0272	2590.33

Analyte Table

		121 Sb [2]		137 Ba [2]		139 La [2]		140 Ce [1]		141 Pr [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
125	1810412-1L 50X	0.0055	31.11	2.0465	2300.26	0.0268	323.35	0.0583	4190.77	0.0056	546.71
126	1810412-1MS 10X	2.9913	8658.04	20.1133	22323.59	2.9667	34550.12	3.0177	209355.74	5.5665	518072.15
127	1810412-1MSD ...	3.0089	8527.99	20.2554	22106.62	2.9520	33801.44	3.0722	211576.30	5.6334	520344.80
128	1810412-2 10X	0.0414	132.23	8.0220	8792.84	0.0002	13.33	0.0019	303.35	0.0008	100.01
129	1810412-3 10X	1.3266	3295.95	0.3959	403.36	0.0068	80.00	0.0106	836.73	0.0011	120.01
130	1810412-4 10X	1.2939	3320.40	0.3286	346.69	0.0025	36.67	0.0095	803.39	0.0010	110.01
131	CCV	2.9884	8674.70	9.6385	10820.83	2.9070	34222.45	2.7392	193276.13	2.8138	266331.69
132	CCB	0.0002	15.55	-0.0038	10.00	0.0020	33.33	0.0015	276.68	0.0001	30.00
133	1810412-5 10X	0.2883	837.82	0.9458	1063.42	0.0361	430.03	0.0589	4334.17	0.0035	356.69
134	1810412-6 10X	0.3005	868.93	0.9943	1110.09	-0.0003	6.67	0.0023	336.69	0.0004	60.00
135	1810412-7 10X	0.6032	1693.45	1.1762	1296.79	0.0005	16.67	0.0028	370.02	0.0001	36.67
136	1810412-8 10X	0.5976	1750.12	1.1863	1360.13	-0.0006	3.33	0.0009	240.01	0.0002	43.33
137	1810412-9 10X	0.0344	120.00	2.0893	2446.98	0.0831	1026.74	0.0003	206.68	-0.0001	16.67
138	1810412-10 10X	0.0366	124.44	2.0911	2390.32	0.0005	16.67	0.0018	310.02	0.0003	50.00
139	1810412-11 10X	0.0304	105.56	2.1410	2460.30	0.0007	20.00	0.0021	330.02	0.0003	56.67
140	1810412-12 10X	0.0541	175.56	4.3965	5064.39	-0.0001	10.00	0.0001	183.34	0.0000	23.33
141	1810506-1 10X	0.0079	40.00	2.9007	3377.18	0.0043	63.34	0.0052	553.37	0.0010	123.34
142	1810506-2 10X	0.0139	57.78	3.1441	3657.27	0.0018	33.33	0.0034	423.36	0.0004	66.67
143	CCV	2.9557	9081.62	9.4984	11201.13	2.9743	36778.63	2.7543	201067.20	2.8006	274240.16
144	CCB	-0.0020	11.11	0.0026	20.00	0.0001	13.33	0.0016	323.35	0.0001	40.00
145	1810506-5 10X	-0.0005	15.55	4.5635	5791.32	0.0041	66.67	0.0074	783.39	0.0009	120.01
146	1810506-6 10X	0.0174	75.56	4.5410	5788.06	0.0028	50.00	0.0040	513.37	0.0004	73.33
147	1810544-2 10X	-0.0003	16.67	0.0882	130.01	0.0050	80.00	0.0104	1036.75	0.0016	203.34
148	1810544-3 10X	0.0002	18.89	0.0229	46.67	0.0000	13.33	-0.0008	136.68	0.0000	33.33
149	1810544-4 10X	-0.0021	11.11	0.0303	56.67	0.0020	40.00	0.0049	600.04	0.0005	80.00
150	1811031-1 10X	0.0274	108.89	3.6832	4690.93	0.0021	40.00	0.0041	530.04	0.0010	140.01
151	CCV	2.9914	9764.28	9.9499	12495.62	2.8850	37991.10	2.7994	219460.60	2.8358	298170.55
152	CCB	0.0001	17.78	0.0102	30.00	0.0018	36.67	0.0008	260.02	0.0002	50.00
153	IP181104-5MB ...	-0.0027	8.89	0.0051	23.33	-0.0007	3.33	-0.0016	70.00	-0.0001	20.00
154	IM181104-5LCS...	2.7458	9476.31	9.3693	12075.19	2.7762	37526.51	2.6856	214055.80	5.4865	586493.30
155	1810328-1 10X	0.0893	292.23	124.8392	151101.40	8.6964	110477.64	17.1174	1291594.54	2.1792	220710.97

Analyte Table

		121 Sb [2]		137 Ba [2]		139 La [2]		140 Ce [1]		141 Pr [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
156	1810328-2 10X	0.0683	226.67	182.1951	215458.77	10.1970	126563.56	22.1059	1656214.40	2.6603	267555.95
157	1810328-3 10X	0.0838	268.90	42.1603	49333.20	7.7278	94885.12	21.8144	1613777.37	2.8771	285555.01
158	1810328-4 10X	0.2087	677.80	13.0753	16025.63	3.2272	41480.16	7.8572	608838.77	1.2463	129616.06
159	1810328-5 10X	0.0480	172.22	96.8797	121010.65	6.7593	88615.41	13.7293	1080823.65	1.7825	188364.12
160	1810328-6 10X	0.0534	193.34	106.4383	134329.21	8.3675	110821.55	17.7563	1415916.33	2.1655	231926.65
161	1810328-7 10X	0.0793	267.78	48.5228	60214.92	5.0500	65784.88	12.1729	958490.77	1.6602	175474.78
162	1810328-8 10X	0.0023	25.56	9.1296	11581.54	2.3306	30992.10	5.7528	459326.40	0.8152	87358.48
163	CCV	2.9303	9851.00	9.8747	12598.91	2.9403	39337.74	2.7258	216669.04	2.7829	296761.53
164	CCB	-0.0004	16.66	0.0100	30.00	0.0032	56.67	0.0016	333.35	0.0005	86.67
165	1810328-9 10X	0.0030	26.67	132.8177	166995.34	2.3425	30922.08	5.7551	464543.70	0.8149	88283.45
166	1810328-10 10X	0.5867	1875.69	47.3594	58799.38	11.2533	146611.12	26.5614	2139053.67	3.4944	377772.18
167	1810328-11 10X	0.0822	296.67	114.1766	146109.80	8.2254	110472.49	17.7492	1444385.71	2.1815	238320.93
168	1810328-13 10X	0.0849	298.90	148.9244	189132.53	8.4353	112425.75	17.8034	1464029.04	2.1839	241102.33
169	1810328-13L 50X	0.0147	73.33	29.5112	39678.80	1.6747	23632.34	3.6360	312273.11	0.4726	54477.70
170	1810328-13MS ...	1.1809	3922.77	157.0994	199857.19	11.5299	153941.70	20.9573	1710219.97	7.5945	831874.31
171	1810328-13MSD...	1.3110	4273.99	143.3366	180234.24	10.9587	144627.44	20.5944	1677966.12	7.7208	844326.81
172	1810328-13A 10X	2.8998	9299.55	156.3002	192729.38	11.2808	146003.10	20.7109	1664010.55	5.0036	539576.39
173	1810328-14 10X	0.0684	234.45	112.5360	137680.44	8.2244	105604.04	16.0064	1236036.67	2.0788	215496.07
174	1810328-15 10X	0.0677	240.01	107.0507	134255.28	7.6551	100758.50	15.2163	1232525.87	1.9599	213103.01
175	CCV	2.8678	9401.83	9.3764	11815.03	2.8326	37409.90	2.7425	215769.51	2.8017	295644.71
176	CCB	-0.0027	8.89	0.0211	43.34	0.0025	46.67	0.0015	323.36	0.0004	76.67
177	1810328-16 10X	0.0612	213.34	125.6376	157056.82	7.0930	93061.27	14.0824	1118079.54	1.8324	195262.33
178	1810328-17 10X	0.0850	296.67	101.6623	128842.86	8.0377	106909.81	16.6297	1356371.47	2.1396	234334.38
179	1810328-18 10X	0.0477	176.67	110.8750	140286.53	7.0355	93433.09	14.4175	1176921.18	1.8359	201190.82
180	1810328-19 10X	0.0793	274.45	56.8040	70578.29	4.0357	52627.35	8.8660	710978.50	1.2212	131456.33
181	1810328-20 10X	0.0708	246.67	124.2438	154520.49	7.5366	98380.58	15.3113	1230332.27	1.9940	215077.24
182	1810328-21 10X	0.0695	240.01	106.5148	131155.32	7.3079	94446.37	15.2564	1214166.57	2.0502	219005.73
183	CCV	2.9185	9430.74	9.6691	11948.45	2.8580	37025.52	2.7326	216513.89	2.7813	295592.39
184	CCB	-0.0036	5.55	0.0218	43.34	-0.0002	10.00	0.0006	250.01	0.0006	93.34
185	IP181104-3MB ...	-0.0032	6.67	0.0032	20.00	0.0019	36.67	0.0003	223.35	0.0006	86.67
186	IM181104-3LCS...	2.8280	9384.04	9.3808	11785.03	2.7548	36293.97	2.6155	210391.39	5.3825	580692.92

Analyte Table

		121 Sb [2]		137 Ba [2]		139 La [2]		140 Ce [1]		141 Pr [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
187	1810195-1 10X	0.2505	832.26	31.4763	39140.58	8.3758	109276.22	14.5892	1151040.71	2.7703	293364.29
188	1810195-2 10X	0.0457	170.00	60.3634	75963.78	5.7838	76389.90	11.7427	968146.58	1.6208	179364.41
189	1810195-3 10X	0.0438	158.89	51.7294	64000.25	4.2362	55006.32	9.4909	762746.71	1.3075	141048.02
190	1810195-4 10X	0.2117	715.58	65.9507	82768.42	5.9033	77743.05	11.9540	968127.20	1.6165	175744.37
191	1810195-5 10X	0.0618	218.89	55.2688	68700.65	6.3092	82300.37	13.0628	1055134.57	1.7728	192219.24
192	1810195-6 10X	0.2235	732.25	161.5951	198000.16	6.0597	77931.16	14.6107	1177179.20	2.2995	248701.07
193	1810195-7 10X	0.0433	154.45	42.2655	51553.53	4.5015	57609.08	9.9344	791147.62	1.3474	144037.75
194	1810195-7L 50X	0.0154	71.11	8.4149	10804.26	0.8880	11958.49	2.1038	173231.43	0.2832	31293.03
195	CCV	2.9588	9555.27	9.9289	12202.08	2.8442	36648.02	2.6935	213040.55	2.7338	290009.46
196	CCB	0.0005	18.89	0.0276	50.00	0.0016	33.33	0.0016	320.01	0.0002	43.34
197	1810195-7MS 10X	1.2693	3972.78	52.6323	63354.07	7.2382	91434.93	12.1905	942679.39	6.7190	697321.29
198	1810195-7MSD ...	1.2622	3944.99	54.4141	65944.55	7.1459	90884.65	12.4401	976246.03	6.9259	729490.95
199	1810195-7A 10X	2.8224	8720.30	51.7296	61654.11	7.2576	90774.68	12.5720	977019.49	4.1687	434827.75
200	1810195-8 10X	0.0520	176.67	40.3308	48139.29	4.5029	56394.29	9.7519	740865.74	1.3197	134571.56
201	1810195-9 10X	0.1244	407.79	63.9924	77622.09	5.1538	65614.27	10.9184	856886.24	1.5102	159088.60
202	1810195-11 10X	0.1044	341.12	98.9110	117585.36	8.9653	111861.23	19.7435	1536183.10	2.5236	263528.18
203	1810195-12 10X	0.0660	224.45	123.1476	147924.63	8.5373	107628.99	19.3333	1519345.29	2.3804	251110.26
204	1810195-13 10X	0.0638	216.67	100.3433	121195.00	4.1594	52731.41	8.5534	668634.36	1.2450	130621.48
205	1810195-14 10X	0.0447	157.78	74.1650	88942.31	2.6211	32996.46	5.5711	435918.65	0.7696	80822.37
206	1810195-15 10X	0.1547	454.46	259.5049	291745.12	6.2041	73211.95	11.2900	835081.13	2.0985	208330.55
207	CCV	2.8908	8845.93	9.6150	11287.96	2.8787	35445.18	2.6515	200615.20	2.7414	278196.44
208	CCB	-0.0038	4.44	0.0067	23.33	0.0023	40.00	0.0018	323.36	0.0005	80.00
209	1810195-16 10X	0.1263	394.46	43.2208	50189.18	4.4744	54523.91	9.3533	697319.65	1.2526	125338.19
210	1810195-17 10X	0.1157	364.45	50.1161	57983.51	4.2462	51557.99	9.6809	728050.43	1.2520	126361.54
211	1810195-18 10X	0.0934	301.12	10.9380	12722.44	2.5793	31459.98	5.7688	433509.11	0.8261	83314.80
212	1810195-19 10X	0.4897	1464.54	48.8299	55212.92	4.2147	50015.66	8.4121	619739.82	1.2325	121874.01
213	1810195-19L 50X	0.0945	312.23	9.6480	11431.36	0.8479	10537.41	1.8247	139372.98	0.2722	27879.62
214	1810195-19MS ...	0.2815	841.14	47.3114	53500.42	4.2121	49985.32	9.8002	720851.63	1.4339	141554.33
215	1810195-19MSD...	0.2929	874.49	47.9589	54443.27	3.8036	45314.55	8.3597	612745.98	1.1813	116236.17
216	1810195-19A 10X	3.3606	9744.25	58.7452	65757.40	7.1355	83824.97	11.3591	828494.08	4.0163	393223.02
217	1810195-20 10X	0.3115	922.26	57.2985	64375.40	3.7780	44549.14	7.7650	557957.17	1.1094	106991.07

Analyte Table

		121 Sb [2]		137 Ba [2]		139 La [2]		140 Ce [1]		141 Pr [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
218	CCV	2.8826	8543.53	9.8213	11147.87	2.8464	33881.64	2.7220	199499.82	2.7788	273174.61
219	CCB	-0.0020	10.00	-0.0101	3.33	0.0007	20.00	0.0013	283.35	0.0010	123.34

Analyte Table

		146 Nd [1]		205 Tl [2]		208 Pb [2]		232 Th [2]		238 U [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	RINSE	0.0077	120.01	0.0056	100.48	0.0050	560.03	0.0223	323.34	0.0044	94.45
2	RINSE	0.0037	63.34	0.0016	44.76	-0.0045	390.02	0.0068	98.89	0.0008	20.00
3	BLANK	0.0000	10.00	0.0000	24.76	0.0000	500.03	0.0011	16.67	0.0000	3.34
4	H/1000	0.0307	476.70	0.0018	50.95	0.0461	1376.77	0.0085	132.23	0.0100	212.23
5	H/100	0.2861	4657.58	0.0196	325.25	0.5214	10765.47	0.0801	1290.08	0.0980	2150.20
6	H/10	2.9401	47224.09	0.2043	3180.83	5.1812	103502.00	1.0021	16697.60	0.9826	21742.02
7	HIGH	30.0061	432004.93	1.9996	26408.23	49.9817	849466.77	9.9998	175212.07	10.0018	196870.32
8	RINSE	0.0038	63.34	-0.0005	16.67	-0.0036	413.35	0.0106	155.56	0.0001	5.56
9	ICV	60.0669	913480.53	0.3854	5880.24	10.1276	198588.97	2.0461	34441.01	1.9948	42740.31
10	ICB	0.0115	180.01	-0.0013	6.19	0.0088	663.37	0.0011	16.67	0.0004	12.22
11	LIV	0.0470	706.72	0.0089	155.24	0.2144	4560.50	0.0163	252.23	0.0093	196.67
12	ICSA	0.0022	43.33	-0.0009	11.90	-0.0013	473.36	0.0022	33.33	0.0004	11.11
13	ICSAB	3.0416	45522.16	0.2004	2870.30	5.1810	95221.35	1.1718	18042.55	1.0203	21365.86
14	CCV	2.9595	46133.48	0.1985	3079.86	5.1648	102806.50	1.0335	17170.30	0.9855	21645.18
15	CCB	0.0000	10.00	-0.0015	3.33	0.0133	763.38	0.0008	12.22	0.0002	7.78
16	IP181101-5MB ...	0.0013	30.00	-0.0013	6.19	-0.0060	386.69	0.0006	8.89	0.0002	7.78
17	IM181101-5LCS...	2.8278	46374.50	0.1887	3009.85	4.9941	102172.49	0.9928	16935.63	0.9247	21048.79
18	1810184-1 100X	0.0021	43.33	-0.0005	18.57	0.0029	566.70	0.0004	6.67	30.5804	668374.55
19	1810184-2 100X	0.0010	26.67	-0.0004	20.47	-0.0043	443.35	0.0005	7.78	26.7488	599347.64
20	1810184-3 100X	0.0012	30.00	0.0015	50.95	-0.0067	403.36	0.0007	12.22	21.4340	489390.62
21	1810184-4 100X	0.0005	20.00	0.0078	150.00	-0.0085	366.69	0.0003	5.56	17.8640	403723.30
22	1810184-5 100X	0.0008	23.33	0.0015	50.00	-0.0065	396.69	0.0004	6.67	30.2337	672211.89
23	1810184-6 100X	0.0006	20.00	-0.0002	23.81	-0.0075	383.35	0.0013	21.11	32.0552	725007.98
24	1810184-7 100X	0.0009	26.67	0.0011	43.81	-0.0044	450.02	0.0010	16.67	27.0923	615721.66
25	1810184-8 100X	0.0007	23.33	0.0077	151.91	-0.0068	413.35	0.0006	11.11	18.2857	423731.00
26	CCV	2.9433	48527.98	0.1990	3271.33	5.1553	108705.39	1.0087	17744.40	0.9840	22699.04
27	CCB	-0.0001	10.00	-0.0013	6.19	0.0104	726.72	0.0007	11.11	0.0008	22.22
28	1810184-18 100X	0.0033	63.34	0.0001	28.09	-0.0065	393.36	0.0008	13.33	32.3810	720895.70
29	1810203-2 10X	0.0170	300.02	-0.0006	17.62	0.0755	2140.16	0.0012	21.11	0.3720	8822.79
30	1810203-2L 50X	0.0013	33.33	-0.0011	10.00	0.0135	823.39	0.0006	10.00	0.0772	1777.91
31	1810203-2MS 10X	3.0263	48701.69	0.2031	3234.66	5.3763	109882.10	0.9996	17043.54	1.3335	30283.85

Analyte Table

		146 Nd [1]		205 Tl [2]		208 Pb [2]		232 Th [2]		238 U [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1810203-2MSD ...	2.9950	48745.13	0.1932	3169.40	5.3623	112801.55	0.9993	17534.12	1.2972	30274.91
33	1810203-4 10X	0.0166	273.35	-0.0004	20.00	0.2137	4857.23	0.0009	14.44	0.3350	7603.18
34	CCV	3.0258	49103.07	0.2055	3358.49	5.2874	110886.76	1.0205	17857.80	1.0027	23228.78
35	CCB	0.0006	20.00	-0.0012	8.09	0.0103	736.71	0.0007	12.22	0.0004	13.33
36	IP181101-6MB ...	0.0002	13.33	-0.0014	4.76	-0.0068	386.69	0.0016	25.55	0.0004	13.33
37	IM181101-6LCS...	2.9829	47337.59	0.2035	3226.56	5.2929	107690.61	1.0056	17067.98	0.9703	21847.76
38	1810182-1 10X	0.0053	93.34	-0.0010	10.95	0.0027	583.37	0.0026	42.22	0.1067	2390.23
39	1810182-2 10X	0.0030	60.00	-0.0013	6.19	-0.0085	360.02	0.0025	41.11	0.0974	2191.31
40	1810182-3 10X	0.0023	46.67	-0.0013	5.71	-0.0030	473.36	0.0011	17.78	0.1136	2605.83
41	1810182-4 10X	-0.0001	10.00	-0.0013	6.66	-0.0036	456.70	0.0012	20.00	0.2329	5246.58
42	1810182-5 10X	0.0029	56.67	-0.0008	13.33	0.0000	523.37	0.0012	18.89	0.2699	6058.01
43	1810182-6 10X	-0.0003	6.67	-0.0016	1.91	-0.0045	433.36	0.0014	23.33	0.2329	5156.54
44	1810182-7 10X	0.0026	50.00	-0.0014	4.76	-0.0056	406.69	0.0012	18.89	0.1302	2862.55
45	1810182-8 10X	-0.0001	10.00	-0.0015	3.33	-0.0077	376.68	0.0012	18.89	0.1187	2661.40
46	CCV	2.9866	46414.82	0.2090	3285.15	5.2669	106267.24	1.0062	16935.63	0.9954	22130.38
47	CCB	0.0011	26.67	-0.0013	6.19	0.0023	563.36	0.0008	12.22	0.0002	7.78
48	1810182-9 10X	0.0057	100.01	-0.0012	7.14	-0.0032	466.69	0.0010	16.67	0.1416	3185.96
49	1810182-10 10X	0.0017	36.67	-0.0013	6.67	-0.0015	490.03	0.0016	25.55	0.1720	3808.34
50	1810182-11 10X	-0.0002	6.67	0.0000	25.24	-0.0056	410.02	0.0007	11.11	0.1192	2648.06
51	1810182-12 10X	0.0002	13.33	-0.0012	7.14	-0.0044	430.03	0.0005	7.78	0.2781	6038.00
52	1810182-13 10X	0.0033	60.00	-0.0012	8.09	-0.0036	443.36	0.0016	25.56	0.2885	6289.23
53	CCV	3.0098	46050.31	0.2089	3237.99	5.3333	106092.96	1.0296	17098.04	1.0176	22307.28
54	CCB	0.0011	26.67	-0.0015	3.33	0.0202	893.40	0.0008	12.22	0.0002	7.78
55	IP181102-1MB ...	0.0002	13.33	-0.0013	5.71	-0.0088	346.68	0.0003	5.55	0.0000	3.33
56	IM181102-1LCS...	3.0777	46976.67	0.2068	3211.32	5.5289	110158.32	1.0340	17202.59	1.0319	22745.81
57	1810328-12 10X	0.0000	10.00	-0.0012	7.14	-0.0013	473.36	0.0006	10.00	0.0003	8.89
58	CCV	3.0408	45017.22	0.2117	3267.52	5.3336	105655.51	1.0026	16568.52	0.9998	21730.80
59	CCB	0.0000	10.00	-0.0012	7.14	0.0151	796.72	0.0008	12.22	0.0005	13.33
60	IP181102-2MB ...	-0.0002	6.67	-0.0013	5.24	-0.0049	413.36	0.0011	16.67	0.0000	3.33
61	IM181102-2LCS...	3.0177	46324.38	0.2060	3248.95	5.4155	109583.74	1.0269	17346.10	0.9803	22161.57
62	1810247-4 10X	0.0173	270.02	-0.0004	19.53	0.0039	593.38	0.0019	31.11	5.8682	128773.34

Analyte Table

		146 Nd [1]		205 Tl [2]		208 Pb [2]		232 Th [2]		238 U [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1810247-4L 50X	0.0008	23.33	-0.0014	4.29	-0.0010	500.02	0.0008	13.33	1.1417	25258.71
64	1810247-4MS 10X	3.0849	47605.34	0.2133	3284.67	5.6153	111012.37	1.0673	17630.94	7.0671	155354.57
65	1810247-4MSD ...	3.0748	47347.28	0.2047	3117.49	5.5235	107881.00	1.0654	17392.85	6.9325	151021.49
66	1810247-7 10X	0.0090	146.67	-0.0007	14.28	0.0011	536.70	0.0017	26.67	20.2488	439870.11
67	1810247-9 10X	0.0030	56.67	-0.0009	11.43	0.0058	626.71	0.0008	13.33	0.2453	5424.35
68	1810330-16 10X	0.0011	26.67	-0.0013	6.19	-0.0072	366.68	0.0006	8.89	0.0053	114.45
69	1810444-1 10X	0.0023	43.33	-0.0013	5.24	0.0319	1093.41	0.0007	10.00	0.0190	406.68
70	CCV	3.0254	46551.89	0.2145	3331.82	5.3066	105788.51	1.0232	17020.19	1.0046	22122.62
71	CCB	0.0002	13.33	-0.0012	6.67	0.0123	753.38	0.0006	10.00	0.0003	8.89
72	1810444-2 10X	0.0021	43.33	-0.0014	3.81	0.4533	9588.41	0.0009	14.44	0.0212	478.90
73	1810444-3 10X	0.0004	16.67	-0.0013	5.72	-0.0002	526.70	0.0010	15.55	0.0033	77.78
74	1810444-4 10X	-0.0002	6.67	-0.0014	3.81	0.0045	606.70	0.0007	11.11	0.0033	75.56
75	1810444-5 10X	0.0231	363.36	-0.0014	4.29	0.0036	583.37	0.0020	32.22	0.1264	2759.19
76	1810444-6 10X	0.0017	36.67	-0.0009	11.90	0.0190	883.39	0.0010	15.56	3.3948	74254.57
77	1810444-7 10X	0.0013	30.00	-0.0010	10.00	0.0367	1216.75	0.0018	28.89	0.0094	206.67
78	1810444-8 10X	0.0013	30.00	-0.0015	2.38	0.0042	586.70	0.0008	12.22	0.0202	441.13
79	1810444-9 10X	-0.0002	6.67	-0.0010	10.95	0.0867	2200.19	0.0011	16.67	0.3387	7285.24
80	1810444-10 10X	0.0026	50.00	-0.0013	5.24	-0.0001	503.36	0.0002	3.33	0.2386	5183.21
81	1810444-11 10X	0.0013	30.00	-0.0016	0.95	-0.0034	443.37	0.0004	6.67	0.0069	154.45
82	CCV	3.0250	45495.28	0.2033	3151.31	5.2934	105256.92	1.0336	17161.42	1.0128	22095.89
83	CCB	0.0007	20.00	-0.0010	9.53	0.0157	806.71	0.0007	11.11	0.0002	6.67
84	1810444-12 10X	0.0004	16.67	-0.0011	8.57	-0.0051	430.02	0.0011	17.78	1.6879	37536.96
85	1810444-13 10X	0.0006	20.00	-0.0012	6.67	-0.0012	490.03	0.0007	11.11	1.6370	35716.88
86	CCV	3.0763	45441.63	0.2028	3204.65	5.3931	109324.59	1.0176	17220.34	1.0317	22686.81
87	CCB	0.0015	33.33	-0.0013	5.24	0.0160	833.39	0.0010	15.56	0.0001	6.67
88	FP181030-2MB...	0.0019	40.00	-0.0014	5.24	0.0029	590.03	0.0010	16.67	0.0008	22.22
89	IP181103-2MB ...	-0.0007	0.00	-0.0014	4.76	-0.0031	450.03	0.0008	13.33	0.0001	5.56
90	IM181103-2LCS...	2.9785	46515.41	0.2095	3278.00	5.5429	111274.67	1.0184	17066.94	0.9920	22083.62
91	1810475-1 10X	0.0157	243.35	-0.0010	10.95	0.0365	1216.75	0.0021	33.33	0.0535	1160.06
92	1810475-2 10X	0.0352	540.04	-0.0009	11.91	0.1801	3930.40	0.0050	77.78	0.0414	884.49
93	1810475-3 10X	0.0265	430.03	-0.0009	12.38	0.8582	17755.02	0.0020	33.33	0.0208	472.24

Analyte Table

		146 Nd [1]		205 Tl [2]		208 Pb [2]		232 Th [2]		238 U [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1810475-4 10X	0.0012	30.00	-0.0012	8.09	0.0019	560.03	0.0012	20.00	0.0358	807.81
95	1810475-5 10X	0.0123	200.01	-0.0013	6.19	0.0399	1313.42	0.0025	41.11	0.0583	1285.63
96	1810475-6 10X	0.0100	163.34	-0.0015	2.86	0.1393	3233.62	0.0021	33.33	0.0253	563.35
97	1810601-1 10X	0.0030	56.67	-0.0010	10.00	-0.0002	513.36	0.0009	14.45	11.2029	251465.38
98	CCV	3.0527	46057.01	0.2136	3287.05	5.3915	106499.44	1.0589	17479.59	1.0147	22220.49
99	CCB	0.0004	16.67	-0.0016	1.43	0.0114	720.04	0.0010	15.56	0.0006	15.55
100	1810612-1 10X	0.0070	116.67	-0.0009	11.90	-0.0038	446.68	0.0012	18.89	0.7039	15646.35
101	1810612-3 10X	0.0023	46.67	-0.0013	5.71	-0.0038	450.03	0.0014	22.22	0.6788	15213.57
102	1810612-4 10X	0.0066	113.34	-0.0010	10.48	0.0007	533.36	0.0014	22.22	0.6654	14779.93
103	1810628-1 10X	0.0030	56.67	-0.0001	24.76	0.0585	1673.45	0.0011	17.78	0.5729	12696.77
104	1810637-1 10X	0.0060	103.34	-0.0013	6.19	0.4023	8388.01	0.0018	28.89	0.1455	3182.61
105	1810637-1L 50X	0.0021	43.33	-0.0013	6.19	0.0748	2006.82	0.0006	10.00	0.0264	590.02
106	1810637-1MS 10X	3.0203	45923.58	0.2042	3126.54	5.8104	114099.81	1.0611	17413.95	1.1517	25190.83
107	1810637-1MSD ...	3.1175	48658.60	0.2019	3057.95	5.8745	114120.04	1.1125	18088.14	1.1630	25280.04
108	1810637-2 10X	0.0036	63.33	-0.0014	4.29	0.0092	693.37	0.0015	24.44	0.1433	3117.04
109	1810637-2L 50X	0.0012	30.00	-0.0016	1.43	-0.0032	456.69	0.0008	12.22	0.0262	587.80
110	CCV	2.9991	45452.06	0.2069	3227.51	5.3127	106363.40	1.0240	17115.83	0.9978	21782.06
111	CCB	0.0014	30.00	-0.0012	7.14	0.0165	826.72	0.0011	17.78	-0.0001	2.22
112	1810637-2MS 10X	3.0440	46936.45	0.2050	3114.63	5.4190	105607.51	1.0820	17621.98	1.1819	25564.82
113	1810637-2MSD ...	3.1311	48314.09	0.2004	3153.21	5.4037	108995.04	1.0989	18536.45	1.1764	26123.68
114	1810637-3 10X	0.0077	123.34	-0.0008	12.86	0.0092	676.71	0.0014	22.22	0.0007	18.89
115	1811004-21 10X	0.0021	43.33	-0.0010	10.95	0.0143	806.71	0.0010	16.67	0.1945	4407.39
116	1811004-22 10X	0.0057	100.01	0.0014	47.62	0.0022	566.70	0.0022	35.55	0.4611	10317.14
117	1811004-23 10X	0.0051	90.00	0.0010	41.43	0.0034	586.70	0.0028	44.45	0.4656	10335.98
118	1811004-24 10X	0.0071	120.01	0.0132	226.20	0.0032	580.04	0.0019	31.11	0.1996	4388.50
119	CCV	3.0042	46217.64	0.2047	3221.80	5.3124	107314.67	1.0423	17579.67	1.0037	22275.02
120	CCB	0.0002	13.33	-0.0014	4.76	0.0042	596.70	0.0006	8.89	0.0004	13.34
121	IP181105-1MB ...	0.0012	30.00	-0.0013	5.24	-0.0077	370.02	0.0012	18.89	0.0002	7.78
122	IM181105-1RVS...	0.0255	393.36	0.0039	85.72	0.1058	2610.22	0.0094	152.23	0.0051	115.56
123	IM181105-1LCS...	2.9620	46304.16	0.2045	3241.33	5.3396	108597.16	1.0074	17098.04	0.9930	22189.47
124	1810412-1 10X	0.1199	1870.20	0.0014	48.10	0.0592	1723.46	0.0411	676.69	0.9585	21336.78

Analyte Table

		146 Nd [1]		205 Tl [2]		208 Pb [2]		232 Th [2]		238 U [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
125	1810412-1L 50X	0.0260	406.69	-0.0009	12.38	0.0030	593.37	0.0096	158.89	0.1917	4296.26
126	1810412-1MS 10X	3.0965	47467.90	0.2016	3161.79	5.4016	108659.24	1.0550	17731.03	1.9478	43315.41
127	1810412-1MSD ...	3.1979	48618.29	0.2024	3157.97	5.2876	105865.58	1.0838	18138.18	1.9439	42500.81
128	1810412-2 10X	-0.0005	3.33	-0.0005	19.05	-0.0028	470.02	0.0013	21.11	0.8456	18549.66
129	1810412-3 10X	0.0048	76.67	0.0456	630.50	0.0034	513.36	0.0017	23.33	44.4973	879756.87
130	1810412-4 10X	0.0063	103.34	0.0448	643.83	-0.0007	460.03	0.0018	26.67	44.7822	911949.74
131	CCV	3.0706	47842.57	0.2065	3311.82	5.3100	109245.19	1.0132	17390.59	1.0206	22939.40
132	CCB	0.0011	26.67	-0.0012	7.14	0.0096	723.38	0.0003	5.55	0.0008	21.11
133	1810412-5 10X	0.0102	170.01	0.0006	35.72	-0.0003	533.37	0.0085	142.22	0.1859	4132.87
134	1810412-6 10X	0.0017	36.67	0.0004	32.38	-0.0040	456.69	0.0021	34.44	0.1844	4078.40
135	1810412-7 10X	0.0013	30.00	0.0049	100.48	-0.0007	506.70	0.0012	20.00	0.3222	7042.90
136	1810412-8 10X	0.0010	26.67	0.0049	103.33	-0.0059	416.69	0.0007	11.11	0.3310	7522.03
137	1810412-9 10X	0.0011	30.00	0.0000	28.09	-0.0030	503.36	0.0010	17.78	2.1418	49978.40
138	1810412-10 10X	0.0006	20.00	-0.0005	18.57	0.0081	723.38	0.0006	10.00	2.1880	49813.18
139	1810412-11 10X	0.0018	40.00	-0.0007	16.67	0.0018	590.04	0.0009	15.56	2.2198	50855.86
140	1810412-12 10X	0.0002	13.33	-0.0007	15.72	-0.0054	443.36	0.0010	17.78	0.6989	16090.11
141	1810506-1 10X	0.0044	80.00	-0.0014	5.24	-0.0048	456.69	0.0010	16.67	0.0406	947.83
142	1810506-2 10X	0.0004	16.67	-0.0015	3.81	-0.0040	473.37	0.0012	21.11	0.0459	1070.06
143	CCV	3.0402	49009.53	0.2072	3512.34	5.2937	115141.16	1.0001	18144.85	1.0068	23770.75
144	CCB	0.0014	36.67	-0.0013	7.14	0.0129	913.39	0.0012	22.22	0.0004	15.55
145	1810506-5 10X	0.0033	70.00	-0.0014	4.76	-0.0030	533.36	0.0014	26.67	0.0028	75.56
146	1810506-6 10X	0.0052	103.34	-0.0015	2.86	-0.0078	423.36	0.0013	23.33	0.0021	56.67
147	1810544-2 10X	0.0072	140.01	-0.0012	8.10	-0.0003	606.70	0.0014	26.67	9.8957	255294.97
148	1810544-3 10X	-0.0003	6.67	-0.0015	4.29	-0.0016	580.03	0.0006	12.22	9.8794	258055.07
149	1810544-4 10X	0.0038	80.00	-0.0014	5.71	0.0010	640.04	0.0012	23.33	9.9332	261049.40
150	1811031-1 10X	0.0020	46.67	-0.0013	7.14	-0.0014	580.03	0.0013	24.45	0.1869	4758.61
151	CCV	3.0587	52946.04	0.2035	3666.18	5.2717	121859.31	0.9975	19231.82	1.0177	25586.05
152	CCB	0.0014	36.67	-0.0011	10.48	0.0118	886.72	0.0009	16.66	0.0003	11.11
153	IP181104-5MB ...	-0.0001	10.00	-0.0014	5.71	-0.0071	443.36	0.0012	22.22	0.0013	38.89
154	IM181104-5LCS...	3.0206	53153.15	0.2095	3685.25	5.4648	123388.54	0.9814	18476.47	0.9564	24681.22
155	1810328-1 10X	9.3144	155251.85	0.0389	678.59	4.4475	96353.37	2.2819	42542.64	0.7250	17590.74

Analyte Table

		146 Nd [1]		205 Tl [2]		208 Pb [2]		232 Th [2]		238 U [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
156	1810328-2 10X	11.5747	191573.88	0.0625	1060.04	6.0727	129605.08	3.2568	61372.86	3.5462	84051.58
157	1810328-3 10X	13.4159	219137.81	0.9030	14712.58	8.2669	173617.62	4.5844	87834.46	26.5547	622575.22
158	1810328-4 10X	5.7325	98086.62	0.6703	11200.94	7.6207	164085.02	1.5044	27411.67	10.1095	248070.94
159	1810328-5 10X	7.8025	135696.15	0.0390	694.78	4.9256	108886.07	2.0983	39766.88	0.9947	24901.34
160	1810328-6 10X	9.4015	165667.67	0.0451	796.70	4.7330	104386.07	2.5606	48944.77	1.0745	27179.80
161	1810328-7 10X	7.4022	128745.43	0.1520	2574.05	7.9337	171535.89	2.0613	38254.04	19.6986	489912.09
162	1810328-8 10X	3.6474	64338.58	0.0114	225.24	0.2790	6774.21	0.8641	16002.36	6.3014	159997.38
163	CCV	3.0382	53310.67	0.2069	3708.11	5.1945	119517.19	1.0283	19744.72	0.9812	25057.33
164	CCB	0.0012	33.33	-0.0015	2.86	0.0117	886.72	0.0009	17.78	0.0006	21.11
165	1810328-9 10X	3.5924	64047.27	0.0121	231.91	1.4443	31920.90	0.6791	12247.58	10.8020	272215.74
166	1810328-10 10X	16.1255	286933.01	0.1094	1853.46	13.8175	297352.85	5.8952	119449.11	20.4737	509388.53
167	1810328-11 10X	9.3667	168402.92	0.0416	747.16	4.7449	106050.18	2.6146	50741.08	1.1651	29890.65
168	1810328-13 10X	9.4600	171873.54	0.0452	807.65	4.7980	107032.02	2.6140	50631.67	1.3678	34813.59
169	1810328-13L 50X	2.0212	38339.17	0.0089	193.34	0.9812	23715.24	0.5182	10095.87	0.2751	7413.10
170	1810328-13MS ...	12.3734	223067.81	0.2476	4264.92	10.1070	223143.23	3.6454	71851.37	2.3289	59383.37
171	1810328-13MSD...	12.1989	219567.98	0.2502	4271.59	9.9128	216991.16	3.5248	68682.83	2.2476	56641.60
172	1810328-13A 10X	12.3389	218978.74	0.2452	4120.12	10.0620	216730.52	3.6545	70283.83	2.3408	57842.93
173	1810328-14 10X	9.0455	154312.22	0.0461	799.08	4.5637	98846.69	2.5006	46886.80	2.1566	52882.74
174	1810328-15 10X	8.5672	153288.02	0.0408	716.69	4.3798	95796.04	2.2465	42252.67	0.9841	24738.76
175	CCV	3.0160	52390.37	0.2052	3598.08	5.2503	118144.93	1.0237	19227.44	0.9672	24389.53
176	CCB	0.0018	43.33	-0.0013	6.67	0.0101	820.05	0.0011	20.00	0.0003	12.22
177	1810328-16 10X	7.9826	140000.53	0.0365	648.12	4.0320	88714.71	2.1019	39604.15	0.8619	21597.29
178	1810328-17 10X	9.3099	167783.50	0.0450	792.88	4.9800	109441.42	2.5763	49120.57	0.9458	24025.49
179	1810328-18 10X	7.8852	142188.26	0.0403	709.07	4.0297	88109.14	2.0041	37432.97	1.7880	45342.36
180	1810328-19 10X	5.4905	97260.94	0.0364	636.21	4.1309	89430.47	1.4338	26144.89	4.9034	122088.19
181	1810328-20 10X	8.5832	152347.05	0.0442	761.45	4.5681	98102.75	2.2496	41556.33	1.4648	36516.60
182	1810328-21 10X	8.8098	154890.25	0.0524	897.65	4.2717	91859.85	2.1417	39490.60	2.5084	61908.61
183	CCV	3.0662	53641.40	0.1995	3464.71	5.2252	116433.32	1.0082	18742.32	0.9768	24159.20
184	CCB	0.0021	50.00	-0.0011	10.47	0.0112	840.05	0.0014	25.55	0.0004	14.44
185	IP181104-3MB ...	0.0022	50.00	-0.0011	9.05	0.0008	583.37	0.0013	23.33	0.0001	6.67
186	IM181104-3LCS...	2.9449	52300.55	0.2081	3524.25	5.3957	117217.05	0.9866	17879.05	0.9323	23446.93

Analyte Table

		146 Nd [1]		205 Tl [2]		208 Pb [2]		232 Th [2]		238 U [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
187	1810195-1 10X	13.0188	226884.87	0.0550	943.37	5.7459	123659.09	3.5829	68608.43	3.2178	80167.85
188	1810195-2 10X	7.1215	129720.44	0.0453	792.89	3.7092	81114.96	1.6364	30276.28	1.8073	45584.26
189	1810195-3 10X	5.7532	102132.33	0.0433	745.26	3.4127	73314.83	1.3636	24592.18	2.7165	67355.28
190	1810195-4 10X	7.0685	126447.73	0.0447	773.36	3.6764	79462.07	1.5338	27970.55	1.6359	41138.90
191	1810195-5 10X	7.7931	139037.16	0.0601	1033.38	4.2030	91080.23	1.9273	35620.51	2.1110	52581.80
192	1810195-6 10X	10.8725	193538.59	0.4855	8037.46	8.0124	170717.53	3.4174	64603.36	52.7740	1295931.23
193	1810195-7 10X	5.9116	104014.51	0.0514	862.41	3.5723	75306.32	1.3320	23562.65	3.8374	93782.05
194	1810195-7L 50X	1.2397	22540.71	0.0085	175.72	0.7017	16197.38	0.2476	4528.57	0.7369	18940.16
195	CCV	2.9206	50992.77	0.1982	3421.84	5.2644	116603.87	1.0225	18902.48	0.9572	23545.92
196	CCB	0.0007	23.33	-0.0014	5.24	0.0103	806.71	0.0007	13.33	0.0005	15.56
197	1810195-7MS 10X	8.7953	150224.87	0.2405	3928.16	8.5841	179762.50	2.2057	39793.55	4.8847	117821.56
198	1810195-7MSD ...	8.7357	151421.23	0.2439	3999.14	8.7850	184713.78	2.2639	41068.13	4.6207	112219.67
199	1810195-7A 10X	8.7955	151004.71	0.2496	3998.66	8.6899	178513.52	2.3244	41259.91	4.6733	111612.06
200	1810195-8 10X	5.7755	96918.95	0.0392	654.78	3.3935	70577.19	1.3124	22884.96	3.3877	81014.53
201	1810195-9 10X	6.6941	116048.87	0.0501	838.60	3.7725	79244.43	1.5848	28128.66	2.8760	69909.93
202	1810195-11 10X	11.0748	190318.85	0.0688	1110.05	6.1510	125235.31	2.4608	43390.76	1.6308	38857.02
203	1810195-12 10X	10.3640	179931.46	0.0732	1201.49	5.6148	116437.12	2.7716	50139.91	1.4466	34830.31
204	1810195-13 10X	5.5530	95896.09	0.0226	391.91	2.5256	52905.99	1.2945	22666.78	0.6420	15543.95
205	1810195-14 10X	3.4111	58934.53	0.0150	270.48	1.7266	36518.93	0.8997	15673.04	0.5685	13665.41
206	1810195-15 10X	9.7065	158576.10	0.0350	543.82	5.4335	104188.29	2.2581	37286.93	1.8357	41369.32
207	CCV	3.0186	50434.00	0.2059	3324.20	5.3202	110232.36	1.0083	17432.86	0.9593	22549.88
208	CCB	0.0017	40.00	-0.0013	5.71	0.0198	976.73	0.0006	11.11	0.0004	13.34
209	1810195-16 10X	5.5157	90864.89	0.3299	5198.08	6.5573	132843.34	1.4031	23977.81	9.1783	213533.47
210	1810195-17 10X	5.4746	90949.69	0.2191	3416.60	6.0714	121551.06	1.4311	24173.71	36.3401	842460.10
211	1810195-18 10X	3.6488	60577.31	0.0560	900.03	6.1805	124710.12	0.9628	16203.73	13.0044	302815.22
212	1810195-19 10X	5.5458	90255.25	1.3571	20895.68	11.3792	225788.38	1.6302	27489.66	99.2946	2249805.67
213	1810195-19L 50X	1.1812	19920.46	0.2752	4450.69	2.3485	49128.29	0.3065	5222.12	18.2022	431467.81
214	1810195-19MS ...	6.2982	102319.55	1.1591	17705.36	11.6335	228939.21	1.6547	27694.48	122.7370	2781178.49
215	1810195-19MSD...	5.2746	85413.55	1.1200	17300.61	10.5494	209996.77	1.5784	26665.83	76.6380	1743215.57
216	1810195-19A 10X	8.4833	136680.74	1.5418	23410.81	16.4588	321849.43	2.6757	45675.13	101.1943	2270057.36
217	1810195-20 10X	4.8734	77348.82	1.3178	20059.29	9.4383	185223.10	1.5193	25258.91	60.0226	1351359.00

Analyte Table

		146 Nd [1]		205 Tl [2]		208 Pb [2]		232 Th [2]		238 U [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
218	CCV	2.9676	48019.92	0.2018	3181.31	5.2396	105996.77	1.0304	17401.68	0.9611	21841.05
219	CCB	0.0007	23.33	-0.0010	10.95	0.0141	836.72	0.0011	18.89	0.0009	25.56

ISTD Table

		45 Sc (ISTD) [1]		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
1	RINSE	21120298.02		1297101.85	100.0	92912.50	100.0	470323.21	100.0	33298.70	100.0
2	RINSE	21004708.44		1242842.06	100.0	90780.44	100.0	465580.33	100.0	32263.10	100.0
3	BLANK	22165588.00		1340614.67	100.0	95591.11	100.0	470661.90	100.0	32299.88	100.0
4	H/1000	22385336.33		1338967.85	99.9	95095.09	99.5	474719.37	100.9	32653.98	101.1
5	H/100	24428286.30		1493905.24	111.4	98963.48	103.5	509733.31	108.3	34039.78	105.4
6	H/10	24586704.63		1477605.03	110.2	101385.58	106.1	502435.69	106.8	34784.82	107.7
7	HIGH	24366158.80		1266135.55	94.4	92415.68	96.7	456565.81	97.0	32600.47	100.9
8	RINSE	20794825.11		1231772.98	91.9	92962.90	97.3	463837.06	98.5	33234.85	102.9
9	ICV	23346416.32		1332129.41	99.4	103522.43	108.3	481911.20	102.4	40361.35	125.0
10	ICB	21938309.67		1285011.10	95.9	93441.91	97.8	465188.63	98.8	31765.44	98.3
11	LIV	22059998.84		1316118.89	98.2	94058.76	98.4	466359.37	99.1	32587.21	100.9
12	ICSA	23477766.32		1377315.00	102.7	94709.71	99.1	491464.52	104.4	32897.78	101.9
13	ICSAB	22959967.16		1292815.76	96.4	94273.01	98.6	476233.60	101.2	32393.36	100.3
14	CCV	23358638.82		1421313.83	106.0	99275.25	103.9	478670.55	101.7	34059.97	105.4
15	CCB	22204454.67		1326298.26	98.9	96099.97	100.5	468837.02	99.6	32567.08	100.8
16	IP181101-5MB ...	22626659.66		1387088.99	103.5	95466.52	99.9	473759.33	100.7	32640.62	101.1
17	IM181101-5LCS...	24540398.80		1502486.59	112.1	103770.94	108.6	517868.52	110.0	36017.79	111.5
18	1810184-1 100X	24110911.31		1335342.30	99.6	96053.49	100.5	479610.17	101.9	34093.55	105.6
19	1810184-2 100X	25207317.12		1488818.93	111.1	100219.14	104.8	511046.37	108.6	34647.88	107.3
20	1810184-3 100X	25003974.63		1464560.50	109.2	101623.78	106.3	507730.58	107.9	34604.50	107.1
21	1810184-4 100X	24849697.96		1484277.79	110.7	100903.90	105.6	509808.39	108.3	34330.53	106.3
22	1810184-5 100X	24827488.80		1451752.01	108.3	100134.51	104.8	499412.23	106.1	35095.72	108.7
23	1810184-6 100X	25130515.46		1458896.65	108.8	100304.69	104.9	510449.33	108.5	34176.82	105.8
24	1810184-7 100X	25188623.79		1493559.92	111.4	99678.21	104.3	506685.83	107.7	34721.71	107.5
25	1810184-8 100X	24971228.79		1506877.48	112.4	103391.06	108.2	510677.14	108.5	35810.59	110.9
26	CCV	24369347.97		1493280.13	111.4	103833.78	108.6	505193.29	107.3	35092.64	108.6
27	CCB	22359207.17		1412007.06	105.3	98659.17	103.2	477852.73	101.5	33766.23	104.5
28	1810184-18 100X	24604599.63		1412860.08	105.4	97743.29	102.3	484083.37	102.9	33933.15	105.1
29	1810203-2 10X	25089968.79		1547125.66	115.4	105713.37	110.6	533973.48	113.5	35894.11	111.1
30	1810203-2L 50X	23515793.82		1475663.57	110.1	103576.49	108.4	501009.41	106.4	35132.45	108.8
31	1810203-2MS 10X	23760648.81		1452180.40	108.3	102287.79	107.0	504767.55	107.2	35009.06	108.4

ISTD Table

		45 Sc (ISTD) [1]		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
32	1810203-2MSD ...	23973467.14		1472872.90	109.9	104774.10	109.6	501991.59	106.7	36335.11	112.5
33	1810203-4 10X	22909726.33		1441138.00	107.5	101076.92	105.7	487288.83	103.5	33862.94	104.8
34	CCV	23981673.81		1464953.57	109.3	104595.47	109.4	493588.62	104.9	36171.24	112.0
35	CCB	22345298.00		1369839.25	102.2	99020.62	103.6	473413.34	100.6	33351.86	103.3
36	IP181101-6MB ...	22145263.00		1355337.38	101.1	99084.49	103.7	469375.47	99.7	33034.84	102.3
37	IM181101-6LCS...	23272462.16		1439960.60	107.4	101731.93	106.4	491745.97	104.5	35733.68	110.6
38	1810182-1 10X	22811820.49		1396978.89	104.2	100148.36	104.8	480100.80	102.0	34881.91	108.0
39	1810182-2 10X	23708232.15		1456371.49	108.6	100799.06	105.4	500473.01	106.3	34624.51	107.2
40	1810182-3 10X	23463006.32		1419856.18	105.9	102301.11	107.0	495475.36	105.3	34424.49	106.6
41	1810182-4 10X	23655813.81		1438996.39	107.3	99503.87	104.1	502368.96	106.7	34470.96	106.7
42	1810182-5 10X	23173912.16		1395091.59	104.1	99812.70	104.4	490956.27	104.3	34975.39	108.3
43	1810182-6 10X	22790912.16		1385719.77	103.4	98132.50	102.7	490321.07	104.2	35058.59	108.5
44	1810182-7 10X	22797428.83		1342064.07	100.1	97184.20	101.7	472999.65	100.5	33509.04	103.7
45	1810182-8 10X	23032127.16		1419408.73	105.9	101254.53	105.9	483029.84	102.6	34497.77	106.8
46	CCV	22937677.99		1396507.22	104.2	100332.15	105.0	474552.54	100.8	34601.38	107.1
47	CCB	21984444.67		1336981.36	99.7	95785.85	100.2	463748.99	98.5	32717.17	101.3
48	1810182-9 10X	23100993.82		1397294.14	104.2	99832.78	104.4	493507.02	104.9	35282.77	109.2
49	1810182-10 10X	22568673.00		1392770.24	103.9	100161.65	104.8	479497.61	101.9	34103.65	105.6
50	1810182-11 10X	22504232.16		1349223.47	100.6	99017.58	103.6	477646.67	101.5	34116.83	105.6
51	1810182-12 10X	22237154.67		1334420.40	99.5	97334.65	101.8	475720.55	101.1	33081.47	102.4
52	1810182-13 10X	21933353.01		1276945.19	95.3	97747.74	102.3	467807.80	99.4	33135.11	102.6
53	CCV	22528152.16		1290112.38	96.2	98833.64	103.4	464983.17	98.8	33903.28	105.0
54	CCB	21487372.18		1300748.94	97.0	95161.12	99.6	454296.07	96.5	32503.63	100.6
55	IP181102-1MB ...	21703038.01		1341471.75	100.1	95706.00	100.1	461558.52	98.1	32830.92	101.6
56	IM181102-1LCS...	22721229.66		1409856.18	105.2	99984.15	104.6	479461.90	101.9	34230.45	106.0
57	1810328-12 10X	21063578.02		1260656.21	94.0	93834.54	98.2	449577.86	95.5	32780.70	101.5
58	CCV	22092637.17		1268867.25	94.6	97123.00	101.6	453098.17	96.3	33599.18	104.0
59	CCB	21425693.01		1271678.08	94.9	94793.17	99.2	453583.14	96.4	32470.28	100.5
60	IP181102-2MB ...	21898473.84		1318370.53	98.3	96061.08	100.5	466325.44	99.1	33428.86	103.5
61	IM181102-2LCS...	22760705.50		1354093.34	101.0	101720.49	106.4	484230.09	102.9	35255.96	109.2
62	1810247-4 10X	22042421.34		1315499.64	98.1	96965.30	101.4	466820.80	99.2	33686.38	104.3

ISTD Table

		45 Sc (ISTD) [1]		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
63	1810247-4L 50X	22699993.00		1415004.46	105.5	99144.94	103.7	477248.16	101.4	33275.17	103.0
64	1810247-4MS 10X	23031519.66		1377377.89	102.7	98613.08	103.2	484086.32	102.9	33989.86	105.2
65	1810247-4MSD ...	22971846.33		1376399.30	102.7	97592.33	102.1	479661.17	101.9	34407.47	106.5
66	1810247-7 10X	22345029.67		1315518.63	98.1	97387.38	101.9	469015.20	99.7	33104.72	102.5
67	1810247-9 10X	22679085.50		1345226.52	100.3	98066.12	102.6	478501.36	101.7	34390.69	106.5
68	1810330-16 10X	21585342.18		1304489.59	97.3	94105.92	98.4	460868.62	97.9	32510.31	100.7
69	1810444-1 10X	22720108.83		1236837.82	92.3	91585.31	95.8	455470.32	96.8	32690.50	101.2
70	CCV	22692378.00		1337493.94	99.8	98941.00	103.5	467375.43	99.3	33772.73	104.6
71	CCB	21493936.34		1306227.06	97.4	95765.77	100.2	457094.90	97.1	32022.62	99.1
72	1810444-2 10X	23260596.32		1400379.85	104.5	99329.50	103.9	487873.82	103.7	34557.50	107.0
73	1810444-3 10X	23223217.99		1437378.10	107.2	99507.31	104.1	494635.84	105.1	35012.27	108.4
74	1810444-4 10X	22612523.83		1324537.72	98.8	96683.86	101.1	477243.73	101.4	33525.88	103.8
75	1810444-5 10X	22428695.50		1352900.47	100.9	98817.31	103.4	477048.01	101.4	33078.10	102.4
76	1810444-6 10X	22337487.17		1321074.88	98.5	95282.31	99.7	474779.76	100.9	33231.75	102.9
77	1810444-7 10X	21974685.51		1340892.12	100.0	97355.00	101.8	466463.39	99.1	33579.30	104.0
78	1810444-8 10X	22031803.00		1293677.98	96.5	96342.50	100.8	467403.29	99.3	32366.88	100.2
79	1810444-9 10X	22221748.83		1314148.68	98.0	96187.62	100.6	472478.59	100.4	33091.50	102.5
80	1810444-10 10X	22230817.17		1312435.81	97.9	96656.63	101.1	470453.39	100.0	33171.67	102.7
81	1810444-11 10X	22270329.67		1336228.37	99.7	96633.59	101.1	473789.43	100.7	33114.86	102.5
82	CCV	22416287.16		1283646.25	95.8	97438.45	101.9	462062.13	98.2	33181.52	102.7
83	CCB	21318218.85		1260566.65	94.0	95500.65	99.9	448389.40	95.3	31692.14	98.1
84	1810444-12 10X	22863298.83		1411921.49	105.3	99740.07	104.3	484137.28	102.9	34277.60	106.1
85	1810444-13 10X	22332490.50		1363872.92	101.7	96667.33	101.1	479230.41	101.8	33004.53	102.2
86	CCV	21920408.84		1256752.17	93.7	98648.82	103.2	451266.11	95.9	34190.67	105.9
87	CCB	21688305.51		1282973.63	95.7	96143.77	100.6	459229.69	97.6	32359.94	100.2
88	FP181030-2MB...	22845772.99		1392097.53	103.8	100514.26	105.2	475489.03	101.0	34317.44	106.2
89	IP181103-2MB ...	21918539.67		1312486.23	97.9	95202.08	99.6	454537.11	96.6	31798.88	98.4
90	IM181103-2LCS...	23368248.82		1397699.49	104.3	100653.91	105.3	480944.57	102.2	34881.67	108.0
91	1810475-1 10X	22459429.67		1320813.73	98.5	95842.77	100.3	459494.55	97.6	32951.01	102.0
92	1810475-2 10X	23682768.82		1275124.12	95.1	93391.58	97.7	466463.48	99.1	33615.70	104.1
93	1810475-3 10X	23706338.81		1457998.62	108.8	100315.84	104.9	488249.99	103.7	34434.28	106.6

ISTD Table

		45 Sc (ISTD) [1]		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
94	1810475-4 10X	23447737.98		1414712.48	105.5	98628.77	103.2	483741.91	102.8	34841.98	107.9
95	1810475-5 10X	22992168.82		1338349.28	99.8	98833.65	103.4	473916.06	100.7	33579.17	104.0
96	1810475-6 10X	22814699.66		1357361.52	101.2	98163.07	102.7	472717.30	100.4	33859.75	104.8
97	1810601-1 10X	23635065.48		1426670.81	106.4	101076.53	105.7	480436.61	102.1	34046.94	105.4
98	CCV	22586421.33		1312998.13	97.9	97582.76	102.1	466003.25	99.0	33455.50	103.6
99	CCB	21228113.85		1252144.02	93.4	95198.05	99.6	448626.06	95.3	31435.12	97.3
100	1810612-1 10X	22707698.83		1351141.46	100.8	98612.04	103.2	469003.21	99.6	33699.24	104.3
101	1810612-3 10X	23220961.32		1353270.21	100.9	97928.56	102.4	483561.71	102.7	34093.57	105.6
102	1810612-4 10X	23395157.15		1378570.45	102.8	98452.09	103.0	481682.68	102.3	34257.30	106.1
103	1810628-1 10X	23088010.49		1374074.54	102.5	97368.36	101.9	480488.99	102.1	33395.45	103.4
104	1810637-1 10X	23234371.32		1374391.80	102.5	97341.45	101.8	479278.43	101.8	33809.56	104.7
105	1810637-1L 50X	23312109.65		1453347.38	108.4	98746.89	103.3	481782.08	102.4	33739.56	104.5
106	1810637-1MS 10X	23103256.32		1324616.75	98.8	97253.99	101.7	469883.07	99.8	33402.06	103.4
107	1810637-1MSD ...	23850245.48		1387552.77	103.5	97921.08	102.4	481842.75	102.4	33562.58	103.9
108	1810637-2 10X	22417188.00		1318425.58	98.3	95410.06	99.8	461225.33	98.0	32466.83	100.5
109	1810637-2L 50X	23105187.99		1419839.61	105.9	99812.09	104.4	477532.32	101.5	33048.12	102.3
110	CCV	22531302.16		1285275.09	95.9	98330.10	102.9	463314.30	98.4	33308.68	103.1
111	CCB	21587579.68		1296955.29	96.7	94621.77	99.0	453122.43	96.3	32233.26	99.8
112	1810637-2MS 10X	23169652.16		1331658.88	99.3	96395.78	100.8	473516.31	100.6	33586.01	104.0
113	1810637-2MSD ...	23448938.82		1352167.14	100.9	98219.77	102.7	480129.95	102.0	34156.78	105.7
114	1810637-3 10X	21330041.76		1254174.72	93.6	94265.87	98.6	450506.37	95.7	31585.12	97.8
115	1811004-21 10X	23064287.99		1347986.96	100.5	100698.23	105.3	472659.46	100.4	34097.12	105.6
116	1811004-22 10X	23352142.99		1391058.68	103.8	98867.17	103.4	484654.59	103.0	33756.01	104.5
117	1811004-23 10X	23321802.99		1389368.83	103.6	99689.06	104.3	485237.86	103.1	33879.83	104.9
118	1811004-24 10X	23218955.49		1300848.11	97.0	97270.31	101.8	475341.05	101.0	33963.35	105.2
119	CCV	22967887.99		1311722.98	97.8	100406.37	105.0	471512.01	100.2	34177.16	105.8
120	CCB	21777566.34		1316992.45	98.2	96905.70	101.4	461884.39	98.1	33024.63	102.2
121	IP181105-1MB ...	22585858.00		1369959.69	102.2	97465.42	102.0	478389.35	101.6	33148.15	102.6
122	IM181105-1RVS...	21921043.01		1324202.82	98.8	96892.75	101.4	470805.23	100.0	33315.36	103.1
123	IM181105-1LCS...	23084963.82		1415931.70	105.6	100593.82	105.2	491864.85	104.5	34601.33	107.1
124	1810412-1 10X	22547503.00		1330063.73	99.2	98340.61	102.9	479033.31	101.8	34106.78	105.6

ISTD Table

		45 Sc (ISTD) [1]		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
125	1810412-1L 50X	22208742.17		1318570.27	98.4	101070.46	105.7	473061.44	100.5	33615.71	104.1
126	1810412-1MS 10X	22771349.66		1346751.15	100.5	99635.47	104.2	479848.25	102.0	34851.78	107.9
127	1810412-1MSD ...	22520487.17		1314893.73	98.1	97582.92	102.1	474596.63	100.8	34093.59	105.6
128	1810412-2 10X	22261976.33		1279470.35	95.4	95947.13	100.4	474281.78	100.8	33619.44	104.1
129	1810412-3 10X	23212457.15		1191481.83	88.9	86513.72	90.5	438938.14	93.3	30399.55	94.1
130	1810412-4 10X	24333206.30		1249033.84	93.2	89657.96	93.8	456062.53	96.9	31491.74	97.5
131	CCV	22551690.50		1350901.31	100.8	99536.92	104.1	470018.01	99.9	33832.97	104.7
132	CCB	21241872.18		1290635.29	96.3	94498.46	98.9	457673.82	97.2	32760.75	101.4
133	1810412-5 10X	23402461.32		1325348.63	98.9	96301.40	100.7	483090.88	102.6	33298.53	103.1
134	1810412-6 10X	23172193.82		1280953.97	95.5	95084.82	99.5	475707.38	101.1	33485.33	103.7
135	1810412-7 10X	23969992.14		1306382.56	97.4	94082.78	98.4	471067.27	100.1	33635.86	104.1
136	1810412-8 10X	25245445.46		1412819.56	105.4	98880.89	103.4	491512.14	104.4	34421.31	106.6
137	1810412-9 10X	23661195.48		1446437.74	107.9	100020.96	104.6	501289.04	106.5	34588.10	107.1
138	1810412-10 10X	22690267.99		1364900.21	101.8	99487.77	104.1	479853.06	102.0	33963.26	105.1
139	1810412-11 10X	22886268.83		1376682.66	102.7	98544.88	103.1	484396.65	102.9	34952.12	108.2
140	1810412-12 10X	22522968.83		1354352.77	101.0	97855.36	102.4	474300.92	100.8	34394.18	106.5
141	1810506-1 10X	22422657.17		1364855.71	101.8	100222.28	104.8	482399.90	102.5	35172.78	108.9
142	1810506-2 10X	22728106.33		1377558.03	102.8	100756.30	105.4	485489.12	103.2	34371.14	106.4
143	CCV	23174105.49		1383104.88	103.2	101807.94	106.5	477861.63	101.5	35382.99	109.5
144	CCB	24334584.64		1546535.34	115.4	110691.05	115.8	516328.34	109.7	37273.99	115.4
145	1810506-5 10X	24966853.79		1538814.98	114.8	109525.42	114.6	530904.72	112.8	37354.15	115.6
146	1810506-6 10X	25042688.79		1562901.85	116.6	112235.39	117.4	535071.74	113.7	38249.69	118.4
147	1810544-2 10X	25516302.12		1579814.40	117.8	113118.79	118.3	533086.57	113.3	37438.04	115.9
148	1810544-3 10X	25740102.95		1586262.58	118.3	113344.77	118.6	532823.22	113.2	38526.66	119.3
149	1810544-4 10X	25896797.11		1606512.37	119.8	113874.65	119.1	542982.27	115.4	38486.97	119.2
150	1811031-1 10X	25592364.62		1571612.27	117.2	110790.12	115.9	543320.49	115.4	38376.54	118.8
151	CCV	24978940.46		1530411.38	114.2	110269.39	115.4	517239.14	109.9	38419.86	118.9
152	CCB	24399448.80		1531934.66	114.3	112733.45	117.9	522468.53	111.0	38136.14	118.1
153	IP181104-5MB ...	25363652.95		1579512.00	117.8	114183.77	119.5	531358.73	112.9	38967.86	120.6
154	IM181104-5LCS...	25321863.79		1562215.29	116.5	112790.10	118.0	530147.12	112.6	39018.02	120.8
155	1810328-1 10X	23601393.82		1499553.31	111.9	108431.03	113.4	495958.72	105.4	36198.06	112.1

ISTD Table

		45 Sc (ISTD) [1]		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
156	1810328-2 10X	23575925.48		1458389.35	108.8	110226.43	115.3	495577.38	105.3	37073.31	114.8
157	1810328-3 10X	23441613.82		1447674.43	108.0	109379.52	114.4	489957.18	104.1	36395.38	112.7
158	1810328-4 10X	23979449.64		1503278.31	112.1	108631.93	113.6	501222.47	106.5	36411.88	112.7
159	1810328-5 10X	24337505.47		1544538.62	115.2	112897.07	118.1	508958.30	108.1	38135.89	118.1
160	1810328-6 10X	25158094.62		1588904.93	118.5	115868.55	121.2	523803.57	111.3	38446.89	119.0
161	1810328-7 10X	24789400.46		1538849.40	114.8	110319.96	115.4	515999.44	109.6	36669.16	113.5
162	1810328-8 10X	25080559.63		1586079.35	118.3	112205.30	117.4	524887.15	111.5	38356.60	118.8
163	CCV	25035273.79		1548742.84	115.5	112293.89	117.5	521608.12	110.8	38543.59	119.3
164	CCB	24910908.80		1586558.52	118.3	114068.42	119.3	529908.77	112.6	38884.43	120.4
165	1810328-9 10X	25906523.78		1586180.60	118.3	111055.53	116.2	527224.86	112.0	38175.93	118.2
166	1810328-10 10X	25702021.28		1651363.99	123.2	118577.91	124.0	532679.61	113.2	38734.01	119.9
167	1810328-11 10X	25917349.61		1619434.92	120.8	118003.62	123.4	537448.90	114.2	39342.25	121.8
168	1810328-13 10X	26283401.27		1623967.32	121.1	117154.22	122.6	545795.36	116.0	39749.60	123.1
169	1810328-13L 50X	26792220.43		1682606.69	125.5	119240.12	124.7	560113.64	119.0	40394.87	125.1
170	1810328-13MS ...	26374598.77		1634034.77	121.9	117691.67	123.1	547127.47	116.2	39786.51	123.2
171	1810328-13MSD...	25964446.28		1619593.83	120.8	115294.96	120.6	545111.83	115.8	39088.44	121.0
172	1810328-13A 10X	25831020.45		1610820.86	120.2	114002.89	119.3	530270.71	112.7	38570.16	119.4
173	1810328-14 10X	24333795.47		1515574.19	113.1	111876.47	117.0	503203.94	106.9	37417.52	115.8
174	1810328-15 10X	25812204.62		1603538.36	119.6	115029.75	120.3	532320.72	113.1	39101.68	121.1
175	CCV	24939299.63		1518391.85	113.3	110444.50	115.5	518545.27	110.2	38747.37	120.0
176	CCB	24900290.46		1555944.77	116.1	110970.44	116.1	521639.42	110.8	38650.59	119.7
177	1810328-16 10X	25539858.78		1571219.87	117.2	112273.05	117.5	522030.05	110.9	38650.61	119.7
178	1810328-17 10X	26092129.61		1614437.79	120.4	116737.94	122.1	538662.21	114.4	39181.95	121.3
179	1810328-18 10X	26171179.61		1628633.46	121.5	115447.71	120.8	544637.27	115.7	39275.30	121.6
180	1810328-19 10X	25683429.62		1599559.45	119.3	111954.34	117.1	523323.55	111.2	38012.24	117.7
181	1810328-20 10X	25879887.11		1599833.99	119.3	114817.73	120.1	529061.40	112.4	38510.28	119.2
182	1810328-21 10X	25625167.12		1586698.83	118.4	112359.69	117.5	525161.63	111.6	37557.88	116.3
183	CCV	25284438.79		1553459.35	115.9	110802.69	115.9	517662.78	110.0	37761.68	116.9
184	CCB	24926096.29		1583583.73	118.1	110893.68	116.0	522182.17	110.9	37066.74	114.8
185	IP181104-3MB ...	25169652.12		1555916.07	116.1	110363.61	115.5	523899.34	111.3	37357.52	115.7
186	IM181104-3LCS...	25599429.62		1571549.56	117.2	111998.41	117.2	526618.83	111.9	38012.46	117.7

ISTD Table

		45 Sc (ISTD) [1]		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
187	1810195-1 10X	25482905.45		1609881.90	120.1	116741.36	122.1	532333.74	113.1	39315.40	121.7
188	1810195-2 10X	26384357.94		1643392.74	122.6	115898.64	121.2	550447.41	117.0	38106.03	118.0
189	1810195-3 10X	25759620.45		1594106.80	118.9	112048.47	117.2	531197.00	112.9	37681.66	116.7
190	1810195-4 10X	25829797.11		1600646.07	119.4	113373.58	118.6	534691.98	113.6	38737.65	119.9
191	1810195-5 10X	26079232.11		1623448.99	121.1	115891.94	121.2	538879.06	114.5	38286.24	118.5
192	1810195-6 10X	25693719.62		1609582.11	120.1	115290.76	120.6	533745.19	113.4	38135.75	118.1
193	1810195-7 10X	25400491.29		1575109.87	117.5	108555.36	113.6	526088.55	111.8	37504.43	116.1
194	1810195-7L 50X	25830727.12		1606410.39	119.8	113763.86	119.0	539777.19	114.7	37791.86	117.0
195	CCV	25107545.46		1516969.04	113.2	108237.22	113.2	513533.90	109.1	37049.79	114.7
196	CCB	24509012.97		1520658.78	113.4	107682.39	112.6	513446.10	109.1	37103.24	114.9
197	1810195-7MS 10X	24951302.96		1537994.14	114.7	110313.65	115.4	510841.23	108.5	37490.97	116.1
198	1810195-7MSD ...	25378737.96		1579613.47	117.8	109639.33	114.7	519858.94	110.5	38366.62	118.8
199	1810195-7A 10X	25256259.62		1534314.66	114.4	108213.31	113.2	512280.54	108.8	36843.12	114.1
200	1810195-8 10X	23958177.98		1493788.52	111.4	107420.99	112.4	496425.63	105.5	36191.74	112.0
201	1810195-9 10X	25095519.62		1542268.89	115.0	109958.88	115.0	517383.76	109.9	37113.59	114.9
202	1810195-11 10X	24778017.96		1561118.10	116.4	110984.48	116.1	517208.39	109.9	37648.20	116.6
203	1810195-12 10X	24937415.46		1579095.23	117.8	112152.55	117.3	520866.33	110.7	38058.87	117.8
204	1810195-13 10X	24833231.30		1550521.64	115.7	108206.32	113.2	512655.07	108.9	37190.34	115.1
205	1810195-14 10X	24799899.63		1525318.21	113.8	107363.30	112.3	509961.67	108.3	36792.90	113.9
206	1810195-15 10X	23734021.31		1407018.31	105.0	101942.78	106.6	476959.38	101.3	34043.47	105.4
207	CCV	23938706.31		1465027.69	109.3	103294.48	108.1	493932.98	104.9	35513.34	109.9
208	CCB	23453690.48		1456758.21	108.7	105481.57	110.3	491828.04	104.5	34962.03	108.2
209	1810195-16 10X	23698276.31		1461491.75	109.0	104350.48	109.2	486531.00	103.4	35319.36	109.3
210	1810195-17 10X	23861383.81		1477614.56	110.2	104025.94	108.8	492968.57	104.7	34407.58	106.5
211	1810195-18 10X	23890664.65		1479005.92	110.3	105051.92	109.9	486931.49	103.5	34831.83	107.8
212	1810195-19 10X	23315315.49		1445183.52	107.8	102921.80	107.7	475649.63	101.1	34567.92	107.0
213	1810195-19L 50X	23769134.65		1501601.44	112.0	105337.26	110.2	490528.60	104.2	35496.47	109.9
214	1810195-19MS ...	23434350.48		1476151.12	110.1	102887.95	107.6	482712.26	102.6	35035.61	108.5
215	1810195-19MSD...	23278572.15		1455521.96	108.6	102177.02	106.9	476378.65	101.2	33812.89	104.7
216	1810195-19A 10X	23091067.16		1424226.64	106.2	101409.15	106.1	477954.80	101.5	34317.50	106.2
217	1810195-20 10X	22698247.16		1377849.67	102.8	101593.01	106.3	465533.51	98.9	34283.96	106.1

ISTD Table

		45 Sc (ISTD) [1]		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
218	CCV	23380567.99		1396428.73	104.2	100061.07	104.7	476323.13	101.2	34383.96	106.5
219	CCB	23019038.82		1448610.81	108.1	102009.09	106.7	481572.48	102.3	34594.55	107.1

ISTD Table

		103 Rh (ISTD) [1]		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
1	RINSE	4263210.66	100.0	1112656.70	100.0	5363896.04	100.0	707886.57	100.0	1292896.75	100.0
2	RINSE	4202484.94	100.0	1085910.19	100.0	5358443.09	100.0	693555.25	100.0	1293337.19	100.0
3	BLANK	4484227.54	100.0	1130673.08	100.0	5640214.47	100.0	718986.06	100.0	1426448.36	100.0
4	H/1000	4507500.35	100.5	1141573.81	101.0	5661545.65	100.4	722056.58	100.4	1428893.42	100.2
5	H/100	4794823.47	106.9	1179932.38	104.4	6077503.21	107.8	754520.25	104.9	1589905.86	111.5
6	H/10	4702641.91	104.9	1184525.94	104.8	5995149.23	106.3	761720.11	105.9	1587101.59	111.3
7	HIGH	4133035.15	92.2	993623.52	87.9	5380111.78	95.4	677755.32	94.3	1286440.22	90.2
8	RINSE	4154807.85	92.7	1102284.98	97.5	5252499.90	93.1	709486.60	98.7	1269243.65	89.0
9	ICV	4364096.71	97.3	1129122.77	99.9	5685761.40	100.8	737722.80	102.6	1438095.24	100.8
10	ICB	4415625.77	98.5	1110101.57	98.2	5541166.01	98.2	712223.69	99.1	1406978.16	98.6
11	LIV	4439629.21	99.0	1126149.46	99.6	5544114.77	98.3	713957.06	99.3	1382221.80	96.9
12	ICSA	4392617.64	98.0	1099981.96	97.3	5719388.01	101.4	732289.75	101.9	1388807.17	97.4
13	ICSAB	4266785.98	95.2	1070722.51	94.7	5588967.70	99.1	720880.96	100.3	1358722.74	95.3
14	CCV	4517887.64	100.8	1172922.48	103.7	5822312.50	103.2	756039.09	105.2	1499262.37	105.1
15	CCB	4490756.70	100.1	1145542.88	101.3	5640105.27	100.0	727553.95	101.2	1427128.52	100.0
16	IP181101-5MB ...	4524938.16	100.9	1139613.55	100.8	5718197.30	101.4	723786.69	100.7	1443050.39	101.2
17	IM181101-5LCS...	4835236.59	107.8	1231837.53	108.9	6127164.95	108.6	783569.83	109.0	1568519.04	110.0
18	1810184-1 100X	4471501.49	99.7	1142017.51	101.0	5794093.07	102.7	752521.36	104.7	1452327.58	101.8
19	1810184-2 100X	4732026.39	105.5	1188464.62	105.1	6098410.98	108.1	771455.71	107.3	1592395.24	111.6
20	1810184-3 100X	4718649.72	105.2	1199617.38	106.1	6102296.56	108.2	786129.77	109.3	1619681.75	113.5
21	1810184-4 100X	4751600.24	106.0	1200155.66	106.1	6130918.70	108.7	778113.18	108.2	1623133.10	113.8
22	1810184-5 100X	4631732.85	103.3	1181647.04	104.5	6008359.11	106.5	765509.48	106.5	1596653.31	111.9
23	1810184-6 100X	4700566.60	104.8	1192820.58	105.5	6122227.21	108.5	778770.71	108.3	1639077.37	114.9
24	1810184-7 100X	4708025.14	105.0	1200491.02	106.2	6139015.06	108.8	782579.20	108.8	1621948.26	113.7
25	1810184-8 100X	4810022.32	107.3	1242023.05	109.8	6185340.89	109.7	797895.68	111.0	1666712.63	116.8
26	CCV	4796516.18	107.0	1229419.17	108.7	6165116.48	109.3	794076.90	110.4	1655478.73	116.1
27	CCB	4590475.66	102.4	1180666.13	104.4	5834799.67	103.4	758367.58	105.5	1558517.01	109.3
28	1810184-18 100X	4504376.91	100.4	1156795.82	102.3	5896501.01	104.5	766540.89	106.6	1568562.53	110.0
29	1810203-2 10X	4961975.66	110.7	1275706.60	112.8	6333237.54	112.3	816043.28	113.5	1696517.52	118.9
30	1810203-2L 50X	4780726.80	106.6	1235500.63	109.3	6067771.13	107.6	791326.13	110.1	1599977.53	112.2
31	1810203-2MS 10X	4696664.51	104.7	1215475.77	107.5	6010715.88	106.6	781783.20	108.7	1610110.81	112.9

ISTD Table

		103 Rh (ISTD) [1]		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
32	1810203-2MSD ...	4725671.91	105.4	1238644.75	109.5	6081210.16	107.8	803349.13	111.7	1618387.68	113.5
33	1810203-4 10X	4610595.56	102.8	1206846.00	106.7	5911726.80	104.8	781050.45	108.6	1568129.09	109.9
34	CCV	4721643.78	105.3	1228570.11	108.7	6059492.04	107.4	797505.11	110.9	1633634.45	114.5
35	CCB	4596890.14	102.5	1184311.88	104.7	5806767.31	103.0	758423.32	105.5	1518112.01	106.4
36	IP181101-6MB ...	4490994.93	100.2	1180352.85	104.4	5685174.68	100.8	756389.23	105.2	1451684.56	101.8
37	IM181101-6LCS...	4649155.76	103.7	1217280.40	107.7	5928509.27	105.1	775153.58	107.8	1576865.81	110.5
38	1810182-1 10X	4537382.33	101.2	1184858.58	104.8	5831268.09	103.4	770245.29	107.1	1559084.51	109.3
39	1810182-2 10X	4708804.31	105.0	1201161.28	106.2	6045820.35	107.2	773264.79	107.5	1556443.62	109.1
40	1810182-3 10X	4597496.50	102.5	1200350.76	106.2	5909073.90	104.8	788505.46	109.7	1521613.21	106.7
41	1810182-4 10X	4709419.20	105.0	1203030.43	106.4	6028268.76	106.9	775173.98	107.8	1581170.44	110.8
42	1810182-5 10X	4577277.12	102.1	1177424.41	104.1	5889045.54	104.4	772266.59	107.4	1502292.37	105.3
43	1810182-6 10X	4526606.50	100.9	1170116.73	103.5	5831207.28	103.4	762043.18	106.0	1553272.17	108.9
44	1810182-7 10X	4445229.62	99.1	1150767.66	101.8	5716214.77	101.3	756030.17	105.2	1449432.48	101.6
45	1810182-8 10X	4598783.37	102.6	1192392.30	105.5	5909789.10	104.8	771172.25	107.3	1569712.63	110.0
46	CCV	4555018.06	101.6	1177546.10	104.1	5805167.51	102.9	765332.09	106.4	1557764.46	109.2
47	CCB	4528067.53	101.0	1164932.38	103.0	5690552.21	100.9	748441.40	104.1	1488751.33	104.4
48	1810182-9 10X	4645759.10	103.6	1192461.13	105.5	5913110.20	104.8	773946.43	107.6	1541949.15	108.1
49	1810182-10 10X	4480131.18	99.9	1181081.03	104.5	5705262.20	101.2	761718.57	105.9	1443067.53	101.2
50	1810182-11 10X	4473447.75	99.8	1169902.01	103.5	5716359.45	101.4	764115.41	106.3	1471832.74	103.2
51	1810182-12 10X	4429176.50	98.8	1150491.13	101.8	5695135.20	101.0	747038.28	103.9	1396161.85	97.9
52	1810182-13 10X	4350987.75	97.0	1152239.10	101.9	5602270.75	99.3	750233.52	104.3	1419292.79	99.5
53	CCV	4412075.77	98.4	1155420.35	102.2	5713055.53	101.3	754667.19	105.0	1494673.83	104.8
54	CCB	4380138.79	97.7	1145541.68	101.3	5604124.84	99.4	736073.21	102.4	1455768.21	102.1
55	IP181102-1MB ...	4392861.08	98.0	1162838.00	102.8	5572798.29	98.8	742907.27	103.3	1412031.70	99.0
56	IM181102-1LCS...	4529521.49	101.0	1178805.48	104.3	5705823.67	101.2	758780.21	105.5	1502552.01	105.3
57	1810328-12 10X	4275688.48	95.3	1129388.66	99.9	5455855.27	96.7	719432.94	100.1	1352956.85	94.8
58	CCV	4312536.71	96.2	1148050.24	101.5	5534054.45	98.1	748178.18	104.1	1429190.86	100.2
59	CCB	4392325.14	98.0	1146179.07	101.4	5554508.88	98.5	728854.95	101.4	1374295.76	96.3
60	IP181102-2MB ...	4456073.79	99.4	1153010.95	102.0	5559324.94	98.6	733757.90	102.1	1408122.27	98.7
61	IM181102-2LCS...	4535394.83	101.1	1212234.38	107.2	5743921.55	101.8	778286.96	108.2	1462117.69	102.5
62	1810247-4 10X	4420349.31	98.6	1168132.95	103.3	5620124.20	99.6	755547.95	105.1	1461924.30	102.5

ISTD Table

		103 Rh (ISTD) [1]		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
63	1810247-4L 50X	4610361.49	102.8	1182426.18	104.6	5798203.37	102.8	761687.13	105.9	1480125.65	103.8
64	1810247-4MS 10X	4524660.04	100.9	1170027.48	103.5	5767240.46	102.3	756880.13	105.3	1502048.26	105.3
65	1810247-4MSD ...	4532048.37	101.1	1160048.71	102.6	5753740.68	102.0	750031.81	104.3	1479726.96	103.7
66	1810247-7 10X	4443362.85	99.1	1154048.73	102.1	5671357.47	100.6	747949.60	104.0	1430788.36	100.3
67	1810247-9 10X	4537549.73	101.2	1173642.43	103.8	5706420.98	101.2	761050.22	105.9	1476681.75	103.5
68	1810330-16 10X	4394270.87	98.0	1137286.47	100.6	5539923.62	98.2	729302.25	101.4	1392866.33	97.6
69	1810444-1 10X	4140691.71	92.3	1091103.66	96.5	5441904.50	96.5	728778.53	101.4	1392665.13	97.6
70	CCV	4473408.47	99.8	1161935.24	102.8	5745166.25	101.9	758105.80	105.4	1551872.38	108.8
71	CCB	4443934.41	99.1	1147017.28	101.4	5595898.69	99.2	737425.77	102.6	1429096.44	100.2
72	1810444-2 10X	4638127.43	103.4	1195089.36	105.7	5910707.32	104.8	772513.75	107.4	1573662.89	110.3
73	1810444-3 10X	4662870.35	104.0	1207950.58	106.8	5908438.91	104.8	774535.06	107.7	1531578.31	107.4
74	1810444-4 10X	4435174.93	98.9	1150484.59	101.8	5653788.64	100.2	748067.77	104.0	1475466.65	103.4
75	1810444-5 10X	4473805.35	99.8	1162830.01	102.8	5685886.61	100.8	750581.25	104.4	1462233.42	102.5
76	1810444-6 10X	4408134.00	98.3	1149535.30	101.7	5613129.74	99.5	753060.03	104.7	1427366.07	100.1
77	1810444-7 10X	4399091.60	98.1	1157030.53	102.3	5637057.57	99.9	746948.63	103.9	1404178.47	98.4
78	1810444-8 10X	4394454.52	98.0	1141282.33	100.9	5600659.39	99.3	746699.06	103.9	1383318.37	97.0
79	1810444-9 10X	4419817.85	98.6	1139175.35	100.8	5655194.27	100.3	740347.37	103.0	1413319.56	99.1
80	1810444-10 10X	4449177.33	99.2	1152775.84	102.0	5685044.59	100.8	747294.31	103.9	1378818.00	96.7
81	1810444-11 10X	4417652.23	98.5	1153522.48	102.0	5643538.13	100.1	748834.24	104.2	1387256.07	97.3
82	CCV	4420348.68	98.6	1148691.21	101.6	5618001.63	99.6	751011.32	104.5	1493102.53	104.7
83	CCB	4358749.10	97.2	1137294.70	100.6	5496773.65	97.5	733944.42	102.1	1403505.08	98.4
84	1810444-12 10X	4525504.20	100.9	1190423.44	105.3	5792749.95	102.7	765618.68	106.5	1481925.60	103.9
85	1810444-13 10X	4468720.56	99.7	1161683.47	102.7	5656258.36	100.3	751144.73	104.5	1393211.33	97.7
86	CCV	4307482.75	96.1	1164105.19	103.0	5516676.93	97.8	756955.93	105.3	1380546.13	96.8
87	CCB	4446958.16	99.2	1168001.18	103.3	5653932.98	100.2	740249.00	103.0	1479776.17	103.7
88	FP181030-2MB...	4616572.33	103.0	1217749.49	107.7	5833215.12	103.4	775898.61	107.9	1481681.59	103.9
89	IP181103-2MB ...	4407393.68	98.3	1149265.58	101.6	5581777.87	99.0	737135.56	102.5	1395640.40	97.8
90	IM181103-2LCS...	4598951.39	102.6	1193858.27	105.6	5833396.08	103.4	766379.23	106.6	1493563.78	104.7
91	1810475-1 10X	4333003.37	96.6	1136339.67	100.5	5574224.80	98.8	744375.55	103.5	1453880.50	101.9
92	1810475-2 10X	4330620.46	96.6	1106895.98	97.9	5625867.99	99.7	732192.41	101.8	1376929.87	96.5
93	1810475-3 10X	4663153.26	104.0	1197185.97	105.9	5912857.26	104.8	776418.76	108.0	1511627.32	106.0

ISTD Table

		103 Rh (ISTD) [1]		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
94	1810475-4 10X	4584860.14	102.2	1183808.44	104.7	5820187.31	103.2	772923.74	107.5	1501961.96	105.3
95	1810475-5 10X	4492211.81	100.2	1168219.57	103.3	5704658.69	101.1	757647.74	105.4	1439284.67	100.9
96	1810475-6 10X	4451793.79	99.3	1157812.85	102.4	5704677.50	101.1	761452.64	105.9	1423162.58	99.8
97	1810601-1 10X	4570251.29	101.9	1193228.73	105.5	5817648.17	103.1	772847.95	107.5	1527574.87	107.1
98	CCV	4421357.12	98.6	1159657.38	102.6	5637138.18	99.9	753933.74	104.9	1481892.89	103.9
99	CCB	4313167.12	96.2	1131866.10	100.1	5472223.47	97.0	724528.18	100.8	1358829.04	95.3
100	1810612-1 10X	4452544.10	99.3	1173694.15	103.8	5708417.12	101.2	765101.99	106.4	1448930.61	101.6
101	1810612-3 10X	4515534.20	100.7	1181211.68	104.5	5809347.85	103.0	771419.56	107.3	1487965.55	104.3
102	1810612-4 10X	4567119.20	101.8	1175766.41	104.0	5810999.91	103.0	764572.99	106.3	1455016.80	102.0
103	1810628-1 10X	4503090.77	100.4	1170351.65	103.5	5816097.18	103.1	762777.78	106.1	1500268.41	105.2
104	1810637-1 10X	4495548.89	100.3	1150616.26	101.8	5777569.66	102.4	752562.42	104.7	1506499.04	105.6
105	1810637-1L 50X	4651409.83	103.7	1197201.52	105.9	5921507.11	105.0	766517.66	106.6	1488874.36	104.4
106	1810637-1MS 10X	4407980.56	98.3	1153011.31	102.0	5681447.59	100.7	752990.36	104.7	1397905.29	98.0
107	1810637-1MSD ...	4528339.31	101.0	1149337.64	101.7	5837980.77	103.5	748324.27	104.1	1546822.79	108.4
108	1810637-2 10X	4381480.25	97.7	1143535.84	101.1	5588877.65	99.1	748158.81	104.1	1422656.59	99.7
109	1810637-2L 50X	4602332.54	102.6	1191094.70	105.3	5814125.54	103.1	765982.88	106.5	1503306.44	105.4
110	CCV	4372438.37	97.5	1159234.78	102.5	5662274.25	100.4	751515.39	104.5	1446691.49	101.4
111	CCB	4390044.73	97.9	1146745.74	101.4	5537937.43	98.2	729800.65	101.5	1372392.64	96.2
112	1810637-2MS 10X	4465388.89	99.6	1139413.99	100.8	5758287.56	102.1	744655.13	103.6	1512637.32	106.0
113	1810637-2MSD ...	4490548.37	100.1	1172077.74	103.7	5762349.11	102.2	764562.41	106.3	1408379.15	98.7
114	1810637-3 10X	4351305.77	97.0	1142801.68	101.1	5483439.26	97.2	733758.82	102.1	1350746.33	94.7
115	1811004-21 10X	4491044.72	100.2	1185918.65	104.9	5769457.43	102.3	779384.85	108.4	1401338.26	98.2
116	1811004-22 10X	4536616.29	101.2	1177469.43	104.1	5857993.88	103.9	770096.71	107.1	1500833.21	105.2
117	1811004-23 10X	4552927.64	101.5	1176098.13	104.0	5859077.57	103.9	764158.90	106.3	1491610.91	104.6
118	1811004-24 10X	4459346.81	99.4	1155310.35	102.2	5754749.82	102.0	756156.85	105.2	1439300.60	100.9
119	CCV	4476367.54	99.8	1180755.95	104.4	5745894.27	101.9	764048.08	106.3	1475323.00	103.4
120	CCB	4471452.33	99.7	1170819.17	103.6	5674977.57	100.6	753287.07	104.8	1445770.19	101.4
121	IP181105-1MB ...	4585087.54	102.2	1170116.86	103.5	5819635.36	103.2	745030.46	103.6	1506565.97	105.6
122	IM181105-1RVS...	4457737.54	99.4	1179145.48	104.3	5613951.47	99.5	755088.05	105.0	1450474.56	101.7
123	IM181105-1LCS...	4625927.33	103.2	1209484.07	107.0	5839585.30	103.5	769188.45	107.0	1527501.70	107.1
124	1810412-1 10X	4511571.39	100.6	1182011.13	104.5	5794076.32	102.7	766399.47	106.6	1565083.99	109.7

ISTD Table

		103 Rh (ISTD) [1]		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
125	1810412-1L 50X	4481730.04	99.9	1189141.13	105.2	5694713.89	101.0	770599.78	107.2	1445319.15	101.3
126	1810412-1MS 10X	4498835.14	100.3	1179536.52	104.3	5727427.20	101.5	765727.83	106.5	1503205.18	105.4
127	1810412-1MSD ...	4426917.54	98.7	1154703.14	102.1	5681232.33	100.7	752712.20	104.7	1454388.88	102.0
128	1810412-2 10X	4444335.87	99.1	1156994.88	102.3	5730782.30	101.6	755147.49	105.0	1499415.92	105.1
129	1810412-3 10X	3995759.11	89.1	1009926.65	89.3	5285633.61	93.7	680731.58	94.7	1293200.84	90.7
130	1810412-4 10X	4127896.81	92.1	1043169.70	92.3	5510599.65	97.7	701153.21	97.5	1323813.37	92.8
131	CCV	4502370.76	100.4	1182902.77	104.6	5819847.54	103.2	773753.20	107.6	1584124.20	111.1
132	CCB	4400660.97	98.1	1174162.80	103.8	5703428.12	101.1	757381.26	105.3	1502742.22	105.3
133	1810412-5 10X	4470895.46	99.7	1165053.19	103.0	5821761.12	103.2	765108.27	106.4	1597603.05	112.0
134	1810412-6 10X	4429176.91	98.8	1160358.58	102.6	5808138.59	103.0	760842.39	105.8	1567323.68	109.9
135	1810412-7 10X	4303623.90	96.0	1135911.47	100.5	5736271.81	101.7	752324.30	104.6	1472061.54	103.2
136	1810412-8 10X	4505485.04	100.5	1184775.01	104.8	5950063.31	105.5	782177.75	108.8	1609389.19	112.8
137	1810412-9 10X	4749032.64	105.9	1237247.69	109.4	6183708.46	109.6	803395.46	111.7	1670378.68	117.1
138	1810412-10 10X	4573285.46	102.0	1212888.63	107.3	5973218.04	105.9	783823.46	109.0	1616988.21	113.4
139	1810412-11 10X	4613172.02	102.9	1211589.36	107.2	5979610.08	106.0	788810.78	109.7	1627132.79	114.1
140	1810412-12 10X	4539193.47	101.2	1209501.80	107.0	5888254.69	104.4	792531.23	110.2	1614076.75	113.2
141	1810506-1 10X	4597645.45	102.5	1238582.43	109.5	5946558.40	105.4	799692.44	111.2	1592789.46	111.7
142	1810506-2 10X	4607536.70	102.7	1236649.15	109.4	5939946.33	105.3	800526.73	111.3	1619206.59	113.5
143	CCV	4619587.64	103.0	1251838.26	110.7	6019028.59	106.7	812808.18	113.0	1655018.05	116.0
144	CCB	5031277.32	112.2	1422155.66	125.8	6543104.41	116.0	885518.15	123.2	1768223.93	124.0
145	1810506-5 10X	5079182.63	113.3	1355762.74	119.9	6547897.87	116.1	873532.18	121.5	1776056.59	124.5
146	1810506-6 10X	5050954.51	112.6	1364169.25	120.7	6535433.36	115.9	877092.57	122.0	1764041.12	123.7
147	1810544-2 10X	5130444.71	114.4	1383793.05	122.4	6657737.17	118.0	888236.71	123.5	1825167.94	128.0
148	1810544-3 10X	5172882.84	115.4	1421867.37	125.8	6664411.37	118.2	899346.08	125.1	1806136.12	126.6
149	1810544-4 10X	5247129.30	117.0	1444768.62	127.8	6733050.96	119.4	904868.54	125.9	1813677.63	127.1
150	1811031-1 10X	5102111.28	113.8	1362012.90	120.5	6622789.72	117.4	876228.19	121.9	1781326.43	124.9
151	CCV	4958336.49	110.6	1329753.84	117.6	6466034.53	114.6	865602.23	120.4	1774527.01	124.4
152	CCB	5112411.17	114.0	1367447.69	120.9	6532641.48	115.8	890519.55	123.9	1776340.02	124.5
153	IP181104-5MB ...	5208692.53	116.2	1421674.40	125.7	6686438.13	118.5	895344.75	124.5	1761404.09	123.5
154	IM181104-5LCS...	5118283.67	114.1	1406215.97	124.4	6572858.79	116.5	888657.44	123.6	1757175.13	123.2
155	1810328-1 10X	4753198.47	106.0	1260019.88	111.4	6227037.97	110.4	835218.18	116.2	1684342.32	118.1

ISTD Table

		103 Rh (ISTD) [1]		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
156	1810328-2 10X	4692399.10	104.6	1256734.02	111.1	6184011.95	109.6	816038.96	113.5	1642855.86	115.2
157	1810328-3 10X	4608619.10	102.8	1232881.02	109.0	6109540.80	108.3	807249.25	112.3	1626350.65	114.0
158	1810328-4 10X	4905197.64	109.4	1293326.91	114.4	6394051.55	113.4	844965.70	117.5	1691859.51	118.6
159	1810328-5 10X	4968519.92	110.8	1320434.98	116.8	6495629.67	115.2	861895.64	119.9	1707916.95	119.7
160	1810328-6 10X	5097087.21	113.7	1344887.43	118.9	6588259.59	116.8	870875.42	121.1	1755794.35	123.1
161	1810328-7 10X	4940069.20	110.2	1293470.30	114.4	6500056.45	115.2	856358.31	119.1	1696606.38	118.9
162	1810328-8 10X	5082444.61	113.3	1382900.61	122.3	6591946.83	116.9	874297.17	121.6	1741163.83	122.1
163	CCV	5051843.36	112.7	1370036.12	121.2	6558361.07	116.3	879436.18	122.3	1781720.91	124.9
164	CCB	5245407.11	117.0	1412390.97	124.9	6721160.40	119.2	901780.38	125.4	1824312.42	127.9
165	1810328-9 10X	5025135.03	112.1	1321205.79	116.9	6662231.20	118.1	867670.36	120.7	1730308.20	121.3
166	1810328-10 10X	5017026.07	111.9	1293722.33	114.4	6650239.04	117.9	856797.49	119.2	1744502.53	122.3
167	1810328-11 10X	5146437.84	114.8	1385450.40	122.5	6715827.96	119.1	883129.44	122.8	1752645.45	122.9
168	1810328-13 10X	5203961.17	116.1	1352855.55	119.7	6788341.51	120.4	876325.61	121.9	1794207.52	125.8
169	1810328-13L 50X	5473910.75	122.1	1502138.78	132.9	7082539.21	125.6	927388.97	129.0	1874579.45	131.4
170	1810328-13MS ...	5184893.67	115.6	1350259.41	119.4	6734253.31	119.4	877960.80	122.1	1742999.14	122.2
171	1810328-13MSD...	5103601.59	113.8	1325051.07	117.2	6722384.68	119.2	867725.50	120.7	1765947.99	123.8
172	1810328-13A 10X	5072176.18	113.1	1306436.78	115.5	6631221.35	117.6	850887.22	118.3	1736199.72	121.7
173	1810328-14 10X	4867773.57	108.6	1299153.86	114.9	6374315.38	113.0	844207.36	117.4	1679177.58	117.7
174	1810328-15 10X	5107613.88	113.9	1344102.43	118.9	6684713.24	118.5	865376.53	120.4	1729418.10	121.2
175	CCV	4976201.07	111.0	1335783.00	118.1	6488386.68	115.0	868280.93	120.8	1766965.60	123.9
176	CCB	5164234.09	115.2	1401566.44	124.0	6640802.99	117.7	880863.49	122.5	1782158.20	124.9
177	1810328-16 10X	4962362.43	110.7	1309676.96	115.8	6552221.93	116.2	862599.34	120.0	1699445.39	119.1
178	1810328-17 10X	5149476.38	114.8	1342204.04	118.7	6733078.90	119.4	874512.66	121.6	1735861.49	121.7
179	1810328-18 10X	5212818.67	116.2	1362186.81	120.5	6738290.36	119.5	873071.38	121.4	1775918.78	124.5
180	1810328-19 10X	5048055.55	112.6	1324967.95	117.2	6617348.12	117.3	857258.57	119.2	1724839.51	120.9
181	1810328-20 10X	5100091.69	113.7	1323975.55	117.1	6631198.42	117.6	858286.70	119.4	1727069.04	121.1
182	1810328-21 10X	5029906.90	112.2	1310744.82	115.9	6567798.67	116.4	849701.39	118.2	1727969.09	121.1
183	CCV	5045700.86	112.5	1316792.45	116.5	6534803.98	115.9	851569.84	118.4	1747234.40	122.5
184	CCB	5170936.17	115.3	1352847.64	119.6	6628711.79	117.5	862965.14	120.0	1766437.47	123.8
185	IP181104-3MB ...	5133046.80	114.5	1353115.35	119.7	6555102.90	116.2	854779.69	118.9	1707848.83	119.7
186	IM181104-3LCS...	5143557.32	114.7	1351793.78	119.6	6631524.60	117.6	865904.10	120.4	1713934.40	120.2

ISTD Table

		103 Rh (ISTD) [1]		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
187	1810195-1 10X	5062190.97	112.9	1328157.48	117.5	6510435.13	115.4	857785.41	119.3	1711896.95	120.0
188	1810195-2 10X	5242342.00	116.9	1361947.48	120.5	6805364.15	120.7	868353.39	120.8	1760471.48	123.4
189	1810195-3 10X	5069400.34	113.0	1322316.80	116.9	6630594.44	117.6	853643.25	118.7	1728424.92	121.2
190	1810195-4 10X	5128041.80	114.4	1346006.59	119.0	6683441.37	118.5	865916.69	120.4	1732036.74	121.4
191	1810195-5 10X	5127684.19	114.3	1332085.03	117.8	6665977.55	118.2	857566.63	119.3	1750010.96	122.7
192	1810195-6 10X	5038347.74	112.4	1306843.96	115.6	6650406.94	117.9	845496.96	117.6	1715369.19	120.3
193	1810195-7 10X	5061178.15	112.9	1298885.27	114.9	6572035.63	116.5	841510.84	117.0	1696614.51	118.9
194	1810195-7L 50X	5274761.80	117.6	1409381.70	124.6	6787178.03	120.3	884987.45	123.1	1781254.87	124.9
195	CCV	4946822.11	110.3	1315610.76	116.4	6525458.92	115.7	846866.35	117.8	1753744.81	122.9
196	CCB	5043869.82	112.5	1338466.34	118.4	6483151.67	114.9	853464.67	118.7	1731729.77	121.4
197	1810195-7MS 10X	4875236.59	108.7	1272268.71	112.5	6381213.09	113.1	830517.98	115.5	1643730.29	115.2
198	1810195-7MSD ...	4934244.92	110.0	1270263.13	112.3	6479687.14	114.9	836155.38	116.3	1684262.42	118.1
199	1810195-7A 10X	4871865.76	108.6	1258537.77	111.3	6414341.91	113.7	822321.49	114.4	1677615.13	117.6
200	1810195-8 10X	4754638.68	106.0	1261491.21	111.6	6268648.81	111.1	823384.65	114.5	1642736.95	115.2
201	1810195-9 10X	4946077.22	110.3	1283881.91	113.6	6475417.56	114.8	836947.03	116.4	1678712.84	117.7
202	1810195-11 10X	4896538.05	109.2	1269334.20	112.3	6422570.20	113.9	820313.03	114.1	1671895.81	117.2
203	1810195-12 10X	5002711.49	111.6	1284813.60	113.6	6484739.00	115.0	828867.16	115.3	1698764.40	119.1
204	1810195-13 10X	4976305.86	111.0	1281648.57	113.4	6451976.38	114.4	833398.36	115.9	1694445.65	118.8
205	1810195-14 10X	4966355.24	110.8	1290315.21	114.1	6456859.02	114.5	827469.91	115.1	1682528.05	118.0
206	1810195-15 10X	4521511.60	100.8	1159693.39	102.6	6105264.29	108.2	775811.56	107.9	1579889.09	110.8
207	CCV	4788651.60	106.8	1246598.11	110.3	6239700.67	110.6	809248.74	112.6	1684112.22	118.1
208	CCB	4825424.20	107.6	1281664.15	113.4	6267678.05	111.1	819757.17	114.0	1664525.44	116.7
209	1810195-16 10X	4645555.45	103.6	1224172.93	108.3	6156469.11	109.2	801132.32	111.4	1584317.32	111.1
210	1810195-17 10X	4733635.45	105.6	1230565.55	108.8	6207236.95	110.1	798204.01	111.0	1601022.21	112.2
211	1810195-18 10X	4741997.53	105.7	1246507.59	110.2	6202646.18	110.0	801752.09	111.5	1615966.12	113.3
212	1810195-19 10X	4613494.73	102.9	1207777.85	106.8	6080289.92	107.8	780113.19	108.5	1587603.72	111.3
213	1810195-19L 50X	4853945.24	108.2	1277986.39	113.0	6297474.08	111.7	816396.92	113.5	1662971.64	116.6
214	1810195-19MS ...	4682179.72	104.4	1197365.89	105.9	6072977.61	107.7	780199.90	108.5	1596121.49	111.9
215	1810195-19MSD...	4617432.33	103.0	1197332.22	105.9	6050133.36	107.3	783192.69	108.9	1590202.11	111.5
216	1810195-19A 10X	4575241.81	102.0	1181521.49	104.5	6018028.35	106.7	772368.03	107.4	1557255.03	109.2
217	1810195-20 10X	4534768.89	101.1	1188416.34	105.1	5928757.81	105.1	775163.94	107.8	1556216.18	109.1

ISTD Table

		103 Rh (ISTD) [1]		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
218	CCV	4617879.20	103.0	1207072.51	106.8	6044323.65	107.2	782381.55	108.8	1630935.96	114.3
219	CCB	4746495.87	105.8	1261159.98	111.5	6152331.08	109.1	800308.95	111.3	1641695.55	115.1

ISTD Table

		195 Pt (ISTD) [2]		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
1	RINSE	209804.99	100.0	5577886.58	100.0	1353615.06	100.0
2	RINSE	208363.64	100.0	5554827.62	100.0	1338966.33	100.0
3	BLANK	222680.40	100.0	5864148.25	100.0	1395699.82	100.0
4	H/1000	223762.52	100.5	5916321.99	100.9	1403229.20	100.5
5	H/100	231673.61	104.0	6191900.32	105.6	1443092.63	103.4
6	H/10	234308.53	105.2	5964047.83	101.7	1455408.94	104.3
7	HIGH	200258.42	89.9	4709759.62	80.3	1126430.22	80.7
8	RINSE	212859.49	95.6	5534518.88	94.4	1382989.15	99.1
9	ICV	230536.41	103.5	5640436.37	96.2	1368054.41	98.0
10	ICB	222516.59	99.9	5827186.16	99.4	1396173.26	100.0
11	LIV	223138.81	100.2	5829307.62	99.4	1402067.53	100.5
12	ICSA	221962.96	99.7	5442476.38	92.8	1301817.92	93.3
13	ICSAB	215593.26	96.8	5285634.30	90.1	1258433.91	90.2
14	CCV	233494.10	104.9	5861488.25	100.0	1442610.03	103.4
15	CCB	226069.75	101.5	5883828.66	100.3	1452091.49	104.0
16	IP181101-5MB ...	223296.38	100.3	5890256.16	100.4	1438614.51	103.1
17	IM181101-5LCS...	239910.71	107.7	6159592.83	105.0	1570920.24	112.6
18	1810184-1 100X	227843.88	102.3	5432696.79	92.6	1319371.41	94.5
19	1810184-2 100X	235591.23	105.8	5907133.66	100.7	1409738.94	101.0
20	1810184-3 100X	240467.56	108.0	5925117.20	101.0	1432943.73	102.7
21	1810184-4 100X	240525.72	108.0	6059665.95	103.3	1469615.45	105.3
22	1810184-5 100X	235104.98	105.6	5868043.45	100.1	1401630.76	100.4
23	1810184-6 100X	238016.58	106.9	5934779.49	101.2	1451814.88	104.0
24	1810184-7 100X	240656.15	108.1	5952428.66	101.5	1419334.88	101.7
25	1810184-8 100X	246907.29	110.9	6133086.16	104.6	1607470.29	115.2
26	CCV	247363.98	111.1	6299537.20	107.4	1606429.09	115.1
27	CCB	233046.00	104.7	6196831.57	105.7	1585210.29	113.6
28	1810184-18 100X	233009.95	104.6	5613226.79	95.7	1354348.88	97.0
29	1810203-2 10X	247763.49	111.3	6530277.61	111.4	1678681.90	120.3
30	1810203-2L 50X	242724.16	109.0	6388087.82	108.9	1661912.89	119.1
31	1810203-2MS 10X	239786.01	107.7	6240626.57	106.4	1595698.15	114.3

ISTD Table

		195 Pt (ISTD) [2]		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
32	1810203-2MSD ...	246758.99	110.8	6271991.78	107.0	1663289.40	119.2
33	1810203-4 10X	238543.50	107.1	6146749.70	104.8	1607230.91	115.2
34	CCV	246014.43	110.5	6178964.70	105.4	1611712.95	115.5
35	CCB	236556.21	106.2	6173809.49	105.3	1557618.10	111.6
36	IP181101-6MB ...	231827.73	104.1	6037627.83	103.0	1590913.05	114.0
37	IM181101-6LCS...	238663.76	107.2	6158401.16	105.0	1574556.95	112.8
38	1810182-1 10X	236123.01	106.0	5984990.54	102.1	1529490.13	109.6
39	1810182-2 10X	235774.44	105.9	6208611.37	105.9	1590832.11	114.0
40	1810182-3 10X	238170.89	107.0	6085945.33	103.8	1537342.37	110.1
41	1810182-4 10X	235778.33	105.9	6146467.41	104.8	1568836.38	112.4
42	1810182-5 10X	233579.25	104.9	6145408.03	104.8	1567367.69	112.3
43	1810182-6 10X	233526.68	104.9	6038750.12	103.0	1560274.14	111.8
44	1810182-7 10X	229943.61	103.3	5807605.75	99.0	1486011.64	106.5
45	1810182-8 10X	234521.93	105.3	6144136.58	104.8	1591867.06	114.1
46	CCV	236695.16	106.3	5918593.66	100.9	1490122.95	106.8
47	CCB	230870.26	103.7	6018754.70	102.6	1534279.20	109.9
48	1810182-9 10X	236175.70	106.1	6113786.58	104.3	1595640.55	114.3
49	1810182-10 10X	231631.50	104.0	5946943.24	101.4	1532483.68	109.8
50	1810182-11 10X	232616.01	104.5	5926052.83	101.1	1560621.54	111.8
51	1810182-12 10X	230212.62	103.4	5886618.24	100.4	1509581.49	108.2
52	1810182-13 10X	228738.70	102.7	5846605.96	99.7	1535595.19	110.0
53	CCV	233353.58	104.8	5789122.41	98.7	1479642.06	106.0
54	CCB	225148.22	101.1	5894045.12	100.5	1504848.52	107.8
55	IP181102-1MB ...	231392.05	103.9	5822849.29	99.3	1552773.00	111.3
56	IM181102-1LCS...	233758.53	105.0	5942631.79	101.3	1528111.96	109.5
57	1810328-12 10X	221748.12	99.6	5839029.70	99.6	1436623.26	102.9
58	CCV	232366.21	104.3	5702602.00	97.2	1457710.13	104.4
59	CCB	226061.39	101.5	5836231.37	99.5	1505375.97	107.9
60	IP181102-2MB ...	225998.30	101.5	5837948.66	99.6	1542177.32	110.5
61	IM181102-2LCS...	237398.08	106.6	5926080.12	101.1	1597377.48	114.4
62	1810247-4 10X	230773.05	103.6	5844834.50	99.7	1498624.35	107.4

ISTD Table

		195 Pt (ISTD) [2]		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
63	1810247-4L 50X	231140.62	103.8	6039022.20	103.0	1577687.68	113.0
64	1810247-4MS 10X	231937.21	104.2	5963596.16	101.7	1520673.00	109.0
65	1810247-4MSD ...	229159.07	102.9	5875091.58	100.2	1496945.44	107.3
66	1810247-7 10X	229253.47	103.0	5757091.58	98.2	1425593.83	102.1
67	1810247-9 10X	228703.72	102.7	5955141.58	101.6	1574872.32	112.8
68	1810330-16 10X	224607.50	100.9	5857682.83	99.9	1538084.46	110.2
69	1810444-1 10X	220946.17	99.2	5208868.46	88.8	1300301.05	93.2
70	CCV	233847.44	105.0	5921765.75	101.0	1511452.79	108.3
71	CCB	228870.73	102.8	5932247.41	101.2	1517494.20	108.7
72	1810444-2 10X	235609.30	105.8	6064443.66	103.4	1583498.26	113.5
73	1810444-3 10X	236745.00	106.3	6150169.91	104.9	1643869.82	117.8
74	1810444-4 10X	230716.96	103.6	5832958.25	99.5	1479310.60	106.0
75	1810444-5 10X	229023.28	102.8	5987262.41	102.1	1569602.16	112.5
76	1810444-6 10X	229209.58	102.9	5843546.16	99.6	1491658.68	106.9
77	1810444-7 10X	227086.76	102.0	5942074.50	101.3	1555667.11	111.5
78	1810444-8 10X	225254.91	101.2	5857779.29	99.9	1534159.77	109.9
79	1810444-9 10X	229300.07	103.0	5856784.50	99.9	1529203.78	109.6
80	1810444-10 10X	225635.93	101.3	5924830.12	101.0	1560380.34	111.8
81	1810444-11 10X	226313.77	101.6	5920673.87	101.0	1557863.47	111.6
82	CCV	233261.77	104.8	5769328.46	98.4	1501731.33	107.6
83	CCB	225401.92	101.2	5906575.95	100.7	1519233.83	108.9
84	1810444-12 10X	237102.31	106.5	6004952.83	102.4	1597552.79	114.5
85	1810444-13 10X	228497.51	102.6	5875730.74	100.2	1562302.32	111.9
86	CCV	237839.09	106.8	5671062.00	96.7	1499892.42	107.5
87	CCB	230995.13	103.7	6012471.57	102.5	1584883.88	113.6
88	FP181030-2MB...	236793.00	106.3	6038303.87	103.0	1692167.32	121.2
89	IP181103-2MB ...	225964.73	101.5	5838465.33	99.6	1529266.49	109.6
90	IM181103-2LCS...	235535.50	105.8	5987528.87	102.1	1561013.36	111.8
91	1810475-1 10X	227903.49	102.3	5580914.09	95.2	1393701.02	99.9
92	1810475-2 10X	224304.17	100.7	5333680.13	91.0	1311460.89	94.0
93	1810475-3 10X	236590.29	106.2	6047944.08	103.1	1558227.32	111.6

ISTD Table

		195 Pt (ISTD) [2]		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
94	1810475-4 10X	234022.70	105.1	5876220.96	100.2	1522868.78	109.1
95	1810475-5 10X	232823.50	104.6	5682357.83	96.9	1459054.56	104.5
96	1810475-6 10X	229741.63	103.2	5764300.96	98.3	1439582.89	103.1
97	1810601-1 10X	230517.96	103.5	5901233.04	100.6	1588229.67	113.8
98	CCV	231776.60	104.1	5729727.00	97.7	1467607.11	105.2
99	CCB	224328.97	100.7	5773925.96	98.5	1507454.72	108.0
100	1810612-1 10X	232610.25	104.5	5783966.79	98.6	1492611.59	106.9
101	1810612-3 10X	234188.83	105.2	5862791.79	100.0	1490714.04	106.8
102	1810612-4 10X	231514.76	104.0	5884851.37	100.4	1476174.04	105.8
103	1810628-1 10X	232187.78	104.3	5866451.58	100.0	1521208.62	109.0
104	1810637-1 10X	230581.83	103.5	5799693.04	98.9	1447662.69	103.7
105	1810637-1L 50X	233738.26	105.0	6072030.95	103.5	1566501.33	112.2
106	1810637-1MS 10X	230467.83	103.5	5690540.96	97.0	1419016.75	101.7
107	1810637-1MSD ...	227984.47	102.4	5818156.17	99.2	1410017.22	101.0
108	1810637-2 10X	229158.87	102.9	5715090.75	97.5	1418375.03	101.6
109	1810637-2L 50X	231713.89	104.1	5990024.49	102.1	1589890.50	113.9
110	CCV	234885.69	105.5	5774080.54	98.5	1472482.79	105.5
111	CCB	226616.22	101.8	5842147.00	99.6	1504331.70	107.8
112	1810637-2MS 10X	228686.02	102.7	5741071.37	97.9	1398359.15	100.2
113	1810637-2MSD ...	236663.28	106.3	5723922.41	97.6	1474486.28	105.6
114	1810637-3 10X	224164.11	100.7	5738644.08	97.9	1498040.34	107.3
115	1811004-21 10X	232771.30	104.5	5856343.25	99.9	1538873.21	110.3
116	1811004-22 10X	233011.40	104.6	5896731.58	100.6	1459108.47	104.5
117	1811004-23 10X	231830.43	104.1	5884585.12	100.3	1442003.99	103.3
118	1811004-24 10X	230969.09	103.7	5714610.75	97.4	1428620.14	102.4
119	CCV	236967.55	106.4	5891543.45	100.5	1532539.61	109.8
120	CCB	229396.85	103.0	5985374.50	102.1	1589882.11	113.9
121	IP181105-1MB ...	232292.65	104.3	6066837.41	103.5	1554458.88	111.4
122	IM181105-1RVS...	232542.67	104.4	5879636.79	100.3	1595219.35	114.3
123	IM181105-1LCS...	238597.06	107.1	6072515.74	103.6	1603494.30	114.9
124	1810412-1 10X	237287.30	106.6	6026821.58	102.8	1578736.90	113.1

ISTD Table

		195 Pt (ISTD) [2]		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
125	1810412-1L 50X	237721.97	106.8	5995498.03	102.2	1608805.75	115.3
126	1810412-1MS 10X	236031.23	106.0	5881456.37	100.3	1557862.37	111.6
127	1810412-1MSD ...	234843.81	105.5	5851489.91	99.8	1495712.48	107.2
128	1810412-2 10X	234581.07	105.3	5934917.41	101.2	1599963.52	114.6
129	1810412-3 10X	202608.92	91.0	4745083.26	80.9	1138871.26	81.6
130	1810412-4 10X	210331.04	94.5	4844074.31	82.6	1163420.79	83.4
131	CCV	241412.21	108.4	6059574.70	103.3	1559331.12	111.7
132	CCB	236395.87	106.2	6166057.41	105.1	1598842.95	114.6
133	1810412-5 10X	240422.36	108.0	5859949.91	99.9	1425285.24	102.1
134	1810412-6 10X	239324.97	107.5	5813575.54	99.1	1426334.30	102.2
135	1810412-7 10X	231980.37	104.2	5447759.71	92.9	1323263.78	94.8
136	1810412-8 10X	238303.30	107.0	5601888.25	95.5	1351760.76	96.9
137	1810412-9 10X	252397.24	113.3	6565254.90	112.0	1715143.05	122.9
138	1810412-10 10X	246572.26	110.7	6382463.45	108.8	1685782.74	120.8
139	1810412-11 10X	245796.56	110.4	6364581.78	108.5	1595000.60	114.3
140	1810412-12 10X	248782.10	111.7	6287309.28	107.2	1658197.84	118.8
141	1810506-1 10X	248453.45	111.6	6412440.32	109.3	1674694.66	120.0
142	1810506-2 10X	248466.47	111.6	6455883.03	110.1	1684609.61	120.7
143	CCV	255132.26	114.6	6324229.28	107.8	1655730.29	118.6
144	CCB	274082.14	123.1	7102693.23	121.1	1856733.98	133.0
145	1810506-5 10X	268622.76	120.6	7012518.44	119.6	1857164.40	133.1
146	1810506-6 10X	267834.98	120.3	7019505.32	119.7	1833554.50	131.4
147	1810544-2 10X	273168.44	122.7	7072411.56	120.6	1837273.41	131.6
148	1810544-3 10X	275258.25	123.6	7064373.02	120.5	1859534.97	133.2
149	1810544-4 10X	275046.12	123.5	7137329.06	121.7	1924590.18	137.9
150	1811031-1 10X	272302.31	122.3	7012146.77	119.6	1846095.39	132.3
151	CCV	271193.85	121.8	6837942.61	116.6	1774272.47	127.1
152	CCB	273371.50	122.8	7157096.77	122.0	1871444.71	134.1
153	IP181104-5MB ...	269771.15	121.1	7068741.77	120.5	1876927.00	134.5
154	IM181104-5LCS...	264889.88	119.0	6930121.57	118.2	1818109.66	130.3
155	1810328-1 10X	253957.74	114.0	6533803.44	111.4	1682885.39	120.6

ISTD Table

		195 Pt (ISTD) [2]		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
156	1810328-2 10X	250518.38	112.5	6384278.66	108.9	1649528.15	118.2
157	1810328-3 10X	246814.93	110.8	6180811.57	105.4	1551994.77	111.2
158	1810328-4 10X	252949.71	113.6	6557118.86	111.8	1690641.90	121.1
159	1810328-5 10X	259227.39	116.4	6666351.57	113.7	1755830.86	125.8
160	1810328-6 10X	258540.48	116.1	6835958.03	116.6	1710855.39	122.6
161	1810328-7 10X	254066.31	114.1	6566892.61	112.0	1722384.51	123.4
162	1810328-8 10X	261404.88	117.4	6850281.56	116.8	1714491.74	122.8
163	CCV	269871.16	121.2	6778830.11	115.6	1774218.25	127.1
164	CCB	274638.53	123.3	7199139.48	122.8	1942762.99	139.2
165	1810328-9 10X	255876.00	114.9	6655731.98	113.5	1605884.93	115.1
166	1810328-10 10X	253315.14	113.8	6508909.49	111.0	1616343.57	115.8
167	1810328-11 10X	262128.70	117.7	6826988.65	116.4	1828508.88	131.0
168	1810328-13 10X	261568.55	117.5	6801995.94	116.0	1766426.69	126.6
169	1810328-13L 50X	277434.97	124.6	7326079.48	124.9	1867622.52	133.8
170	1810328-13MS ...	259612.42	116.6	6694253.86	114.2	1702786.22	122.0
171	1810328-13MSD...	257392.92	115.6	6692694.48	114.1	1591381.70	114.0
172	1810328-13A 10X	253287.26	113.7	6633193.65	113.1	1623253.57	116.3
173	1810328-14 10X	253916.22	114.0	6538635.53	111.5	1676262.11	120.1
174	1810328-15 10X	256305.04	115.1	6744135.32	115.0	1737128.78	124.5
175	CCV	263949.08	118.5	6710497.40	114.4	1705252.68	122.2
176	CCB	264424.65	118.7	7124741.56	121.5	1855867.21	133.0
177	1810328-16 10X	257777.19	115.8	6626128.44	113.0	1766612.84	126.6
178	1810328-17 10X	257715.70	115.7	6786604.48	115.7	1716764.76	123.0
179	1810328-18 10X	256077.64	115.0	6856831.98	116.9	1806858.15	129.5
180	1810328-19 10X	253593.62	113.9	6633944.07	113.1	1688284.40	121.0
181	1810328-20 10X	251715.75	113.0	6703963.86	114.3	1710452.63	122.6
182	1810328-21 10X	251996.36	113.2	6604558.65	112.6	1644017.27	117.8
183	CCV	261369.12	117.4	6701191.98	114.3	1736766.95	124.4
184	CCB	262469.36	117.9	7074290.94	120.6	1792039.25	128.4
185	IP181104-3MB ...	252331.73	113.3	6917347.81	118.0	1742420.34	124.8
186	IM181104-3LCS...	254902.98	114.5	6784481.36	115.7	1677659.66	120.2

ISTD Table

		195 Pt (ISTD) [2]		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
187	1810195-1 10X	252645.09	113.5	6567845.74	112.0	1779056.80	127.5
188	1810195-2 10X	256046.86	115.0	6843901.77	116.7	1555074.25	111.4
189	1810195-3 10X	251293.91	112.8	6745081.98	115.0	1723721.17	123.5
190	1810195-4 10X	252991.28	113.6	6739293.23	114.9	1697146.43	121.6
191	1810195-5 10X	253880.72	114.0	6764390.32	115.4	1621700.96	116.2
192	1810195-6 10X	250341.92	112.4	6570235.32	112.0	1635148.78	117.2
193	1810195-7 10X	246732.84	110.8	6643712.40	113.3	1675045.24	120.0
194	1810195-7L 50X	262255.98	117.8	7091529.27	120.9	1765439.82	126.5
195	CCV	259807.28	116.7	6660562.19	113.6	1687855.29	120.9
196	CCB	258854.98	116.2	6975136.56	118.9	1730350.60	124.0
197	1810195-7MS 10X	246157.84	110.5	6413973.65	109.4	1637714.66	117.3
198	1810195-7MSD ...	247123.50	111.0	6467206.36	110.3	1590262.84	113.9
199	1810195-7A 10X	241466.00	108.4	6374057.41	108.7	1531561.02	109.7
200	1810195-8 10X	243362.82	109.3	6372174.07	108.7	1598923.99	114.6
201	1810195-9 10X	245918.55	110.4	6552236.15	111.7	1646085.08	117.9
202	1810195-11 10X	239036.20	107.3	6428332.82	109.6	1664682.27	119.3
203	1810195-12 10X	243380.72	109.3	6492266.15	110.7	1623304.09	116.3
204	1810195-13 10X	244405.01	109.8	6550692.82	111.7	1644854.14	117.9
205	1810195-14 10X	245572.54	110.3	6619806.36	112.9	1570212.74	112.5
206	1810195-15 10X	224982.07	101.0	5862056.58	100.0	1336727.27	95.8
207	CCV	243068.43	109.2	6402063.86	109.2	1590285.65	113.9
208	CCB	248968.36	111.8	6717845.53	114.6	1669202.37	119.6
209	1810195-16 10X	237870.21	106.8	6267293.24	106.9	1532264.51	109.8
210	1810195-17 10X	235005.89	105.5	6391653.03	109.0	1555712.11	111.5
211	1810195-18 10X	236865.20	106.4	6451648.44	110.0	1621752.27	116.2
212	1810195-19 10X	233412.91	104.8	6256211.16	106.7	1579236.44	113.2
213	1810195-19L 50X	243896.66	109.5	6626702.61	113.0	1670499.45	119.7
214	1810195-19MS ...	231475.53	103.9	6238039.49	106.4	1491866.18	106.9
215	1810195-19MSD...	234101.75	105.1	6211964.28	105.9	1519485.81	108.9
216	1810195-19A 10X	230170.16	103.4	6060970.12	103.4	1405295.81	100.7
217	1810195-20 10X	230708.46	103.6	6139757.62	104.7	1438305.13	103.1

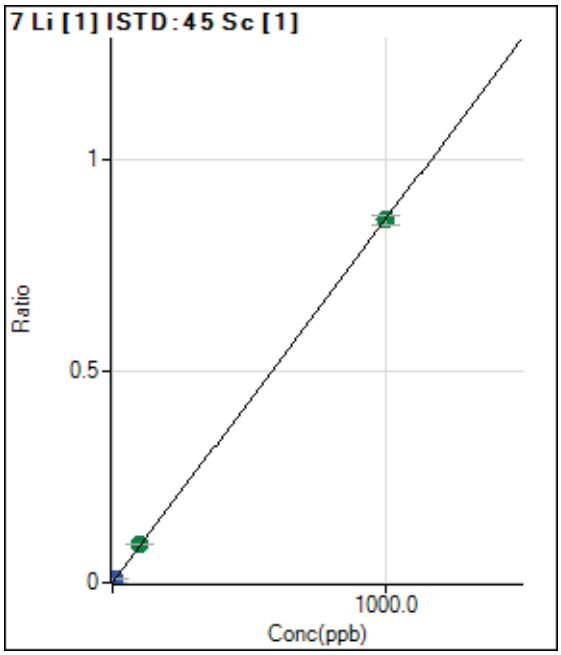
ISTD Table

		195 Pt (ISTD) [2]		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
218	CCV	237324.18	106.6	6197167.41	105.7	1519242.06	108.9
219	CCB	243335.43	109.3	6573996.36	112.1	1691303.41	121.2

Calibration for 211SMPL_18K09k00.D

Batch Folder: C:¥ICPMH¥1¥DATA¥18K09i00.B¥
Analysis File: 18K09i00.batch.xml
DA Date-Time: 11/10/2018 09:09:19
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:
Tune Step: #1 nogas.u
#2 hehe.u

Level	Standard Data File	Sample Name	Acq. Date-Time
1	003CALB.D	BLANK	11/9/2018 09:06:47
2	004CALS.D	H/1000	11/9/2018 09:12:46
3	005CALS.D	H/100	11/9/2018 09:15:48
4	006CALS.D	H/10	11/9/2018 09:18:48
5	007CALS.D	HIGH	11/9/2018 09:21:47
6			



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	97.33	0.0000	P	1.6
2	☐	1.0000	0.9930	19146.21	0.0009	P	6.0
3	☐	10.0000	9.8817	207258.63	0.0085	P	5.0
4	☐	100.0000	107.0969	2259374.42	0.0919	A	2.4
5	☐	1000.0000	999.2915	20880238.00	0.8571	A	3.0
6	☐	200.0000					

y = 8.5768E-004 * x + 4.3915E-006

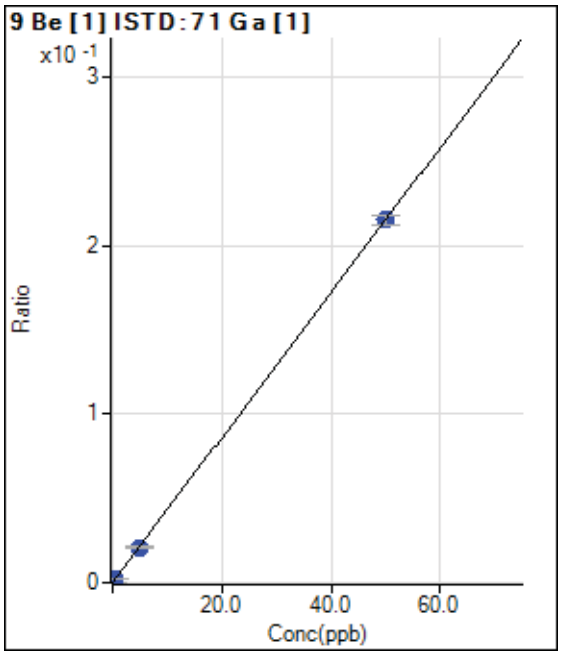
R = 1.0000

DL = 0.0002464

BEC = 0.00512

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	10.67	0.0000	P	29.3
2	☐	0.0500	0.0459	275.34	0.0002	P	5.6
3	☐	0.5000	0.4588	2957.61	0.0020	P	3.7
4	☐	5.0000	4.7976	30502.53	0.0206	P	4.5
5	☐	50.0000	50.0207	272218.47	0.2150	P	2.9
6	☐	10.0000					

y = 0.0043 * x + 7.9849E-006

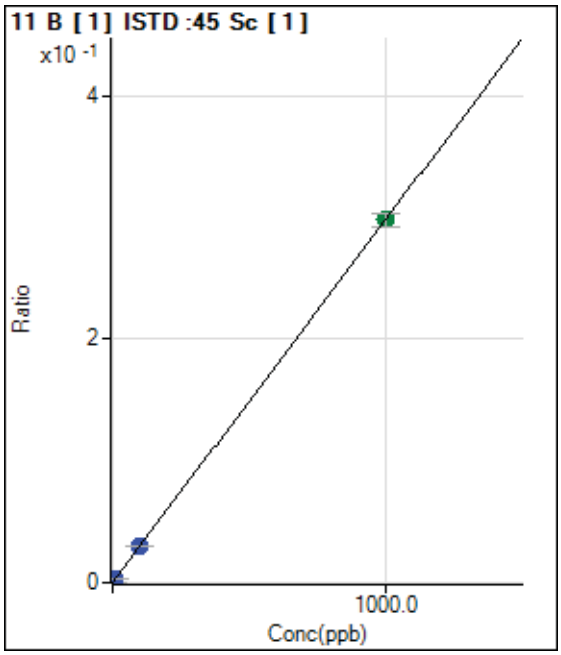
R = 1.0000

DL = 0.001634

BEC = 0.001858

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	3159.22	0.0001	P	8.5
2	☐	1.0000	1.0218	9990.83	0.0004	P	6.2
3	☐	10.0000	10.0334	76443.74	0.0031	P	4.1
4	☐	100.0000	100.1010	736159.78	0.0299	P	2.5
5	☐	1000.0000	999.9895	7253018.88	0.2977	A	3.9
6	☐	200.0000					

y = 2.9759E-004 * x + 1.4277E-004

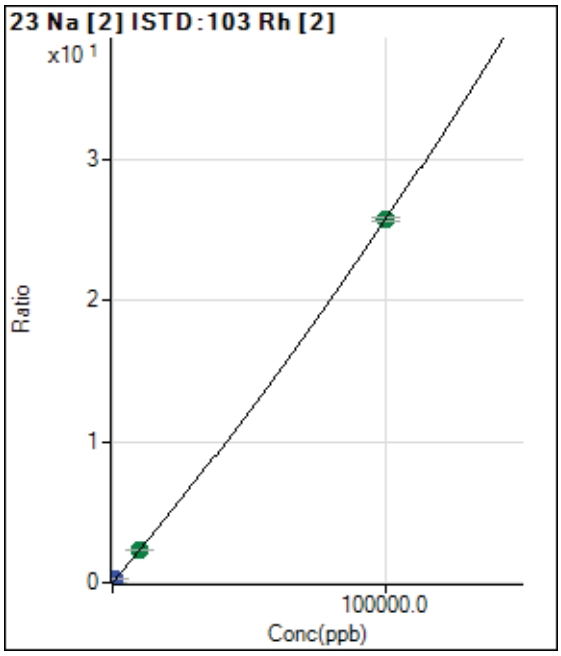
R = 1.0000

DL = 0.1221

BEC = 0.4798

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	14.6734	1413.45	0.0012	P	10.4
2	☐	100.0000	109.2674	26054.49	0.0228	P	1.7
3	☐	1000.0000	973.3091	259716.92	0.2201	P	0.6
4	☐	10000.0000	10002.7696	2733905.74	2.3080	A	3.9
5	☐	100000.0000	99999.9795	25554362.12	25.7198	A	1.2
6	☐	20000.0000					

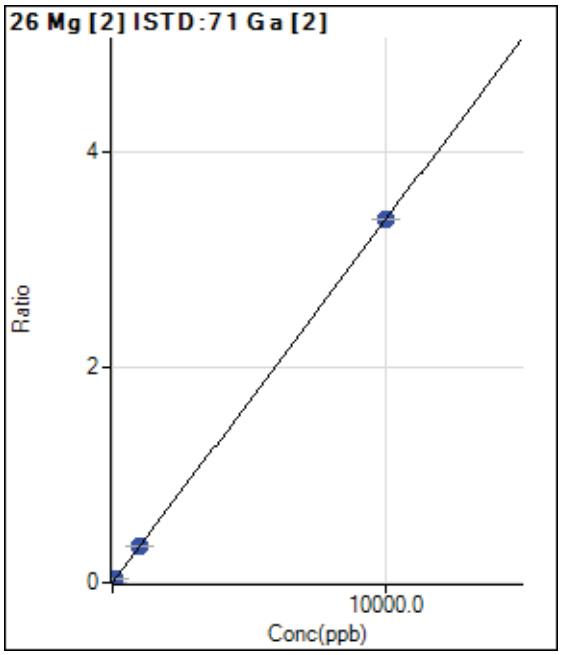
y = 2.9193E-010 * x ^ 2 + 2.2803E-004 * x - 0.0021

DL = 1.716

BEC = -9.195

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	23.33	0.0002	P	89.6
2	☐	10.0000	10.1908	350.02	0.0037	P	33.7
3	☐	100.0000	103.5200	3480.50	0.0352	P	5.6
4	☐	1000.0000	1003.7442	34349.49	0.3390	P	2.9
5	☐	10000.0000	9999.5902	311865.03	3.3746	P	0.1
6	☐	2000.0000					

y = 3.3745E-004 * x + 2.4808E-004

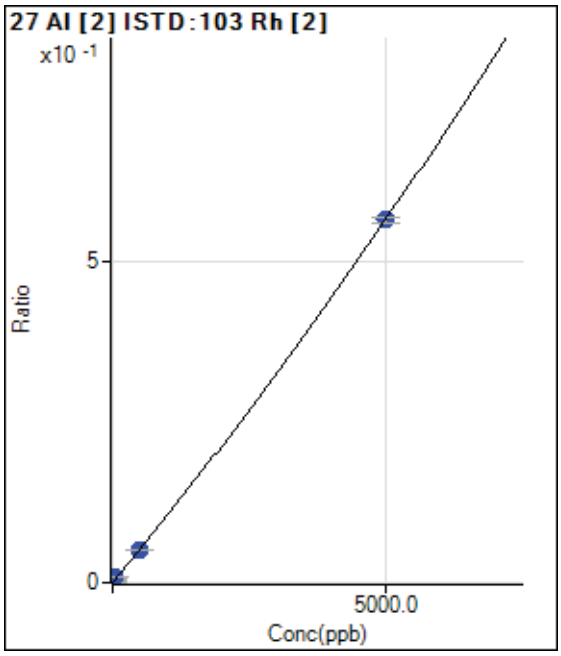
R = 1.0000

DL = 1.977

BEC = 0.7352

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	1.7664	203.34	0.0002	P	44.3
2	☐	5.0000	45.0522	5261.11	0.0046	P	10.8
3	☐	50.0000	83.3799	10073.43	0.0085	P	2.4
4	☐	500.0000	495.9577	60684.25	0.0512	P	1.3
5	☐	5000.0000	5000.0313	561340.36	0.5650	P	1.6
6	☐	1000.0000					

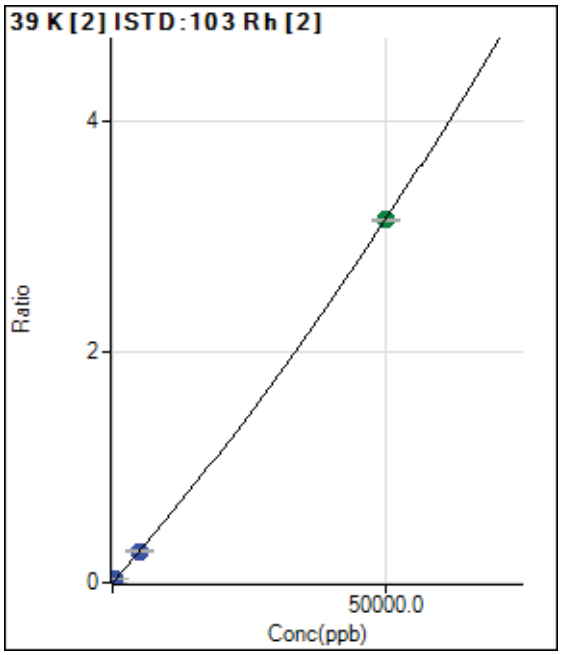
y = 2.1538E-009 * x ^ 2 + 1.0223E-004 * x

DL = 2.349

BEC = 0

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	6.1244	636.71	0.0006	P	3.8
2	☐	50.0000	49.8639	3327.17	0.0029	P	4.0
3	☐	500.0000	493.2998	31621.10	0.0268	P	1.3
4	☐	5000.0000	5000.7169	324065.42	0.2736	P	2.0
5	☐	50000.0000	49999.9950	3120532.35	3.1406	A	0.2
6	☐	10000.0000					

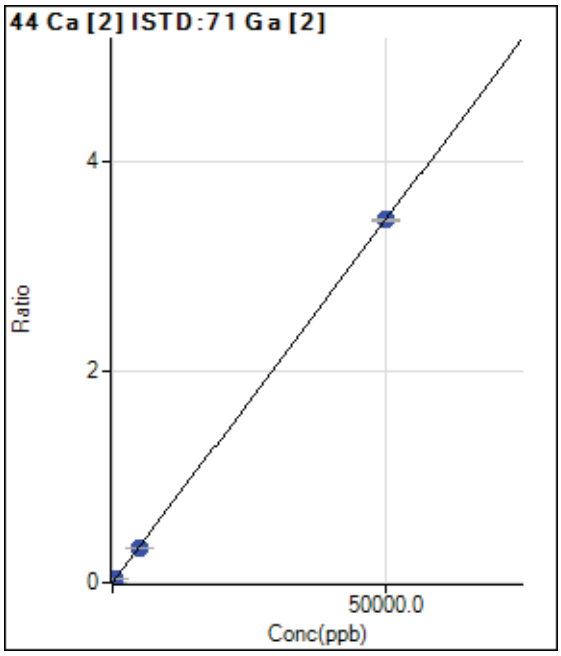
y = 1.8103E-010 * x ^ 2 + 5.3757E-005 * x + 2.3410E-004

DL = 1.205

BEC = 4.355

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	32.52	0.0003	P	38.7
2	☐	50.0000	53.9009	385.97	0.0041	P	22.4
3	☐	500.0000	521.6753	3588.14	0.0363	P	6.2
4	☐	5000.0000	4803.8387	33562.14	0.3311	P	3.4
5	☐	50000.0000	50019.3955	318347.65	3.4446	P	0.8
6	☐	10000.0000					

y = 6.8858E-005 * x + 3.4247E-004

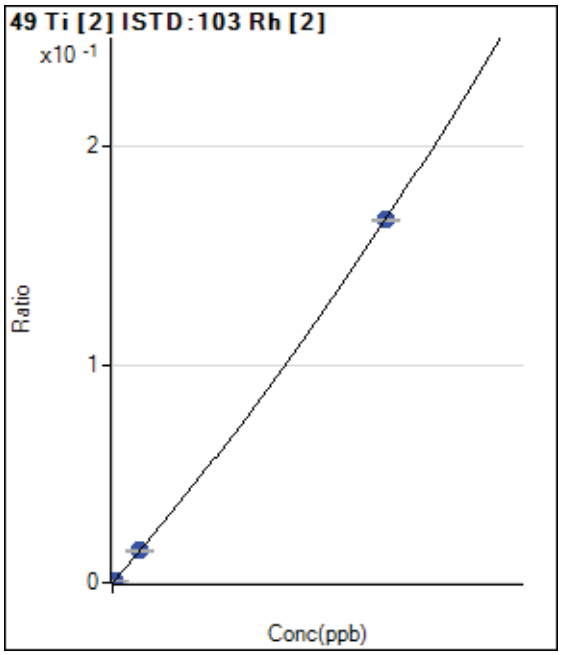
R = 1.0000

DL = 5.775

BEC = 4.974

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	1.2258	6.67	0.0000	P	173.2
2	☐	3.0000	4.4556	183.34	0.0002	P	51.2
3	☐	30.0000	27.0167	1470.13	0.0012	P	4.0
4	☐	300.0000	300.3035	17276.36	0.0146	P	4.8
5	☐	3000.0000	2999.9978	165363.50	0.1664	P	0.7
6	☐	400.0000					

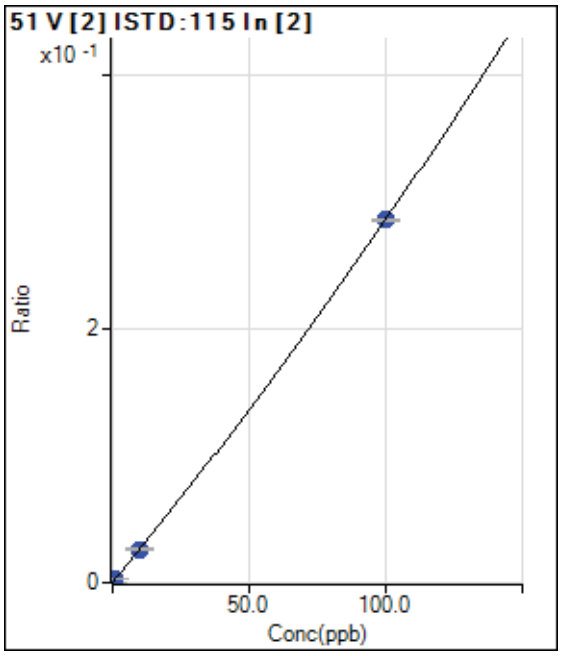
y = 2.4969E-009 * x ^ 2 + 4.7999E-005 * x - 5.2859E-005

DL = 0.6473

BEC = -1.101

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	-0.0335	57.00	0.0001	P	21.4
2	☐	0.1000	0.1339	370.68	0.0005	P	6.3
3	☐	1.0000	0.9999	2084.81	0.0028	P	1.0
4	☐	10.0000	9.9996	20088.16	0.0264	P	1.4
5	☐	100.0000	100.0000	193796.27	0.2859	P	0.6
6	☐	20.0000					

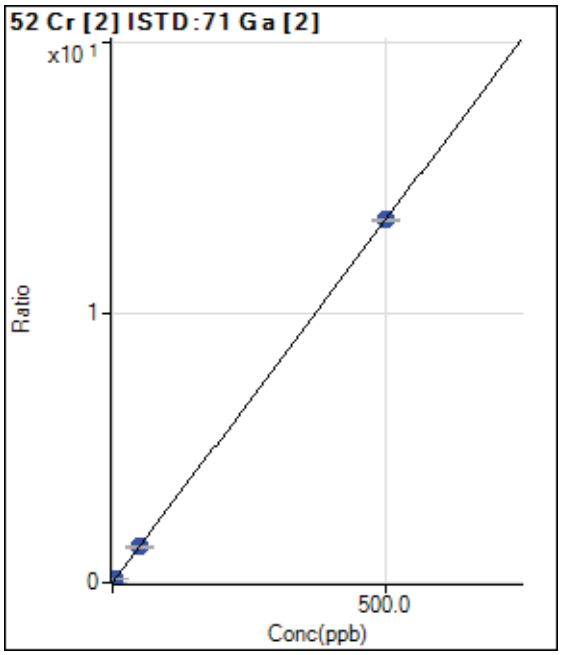
y = 2.6322E-006 * x ^ 2 + 0.0026 * x + 1.6618E-004

DL = 0.0196

BEC = 0.06406

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	85.56	0.0009	P	20.7
2	☐	0.5000	0.5888	1588.99	0.0167	P	10.7
3	☐	5.0000	5.0820	13598.01	0.1374	P	2.0
4	☐	50.0000	49.1551	133933.21	1.3214	P	1.9
5	☐	500.0000	500.0836	1241602.59	13.4348	P	0.3
6	☐	100.0000					

y = 0.0269 * x + 8.9244E-004

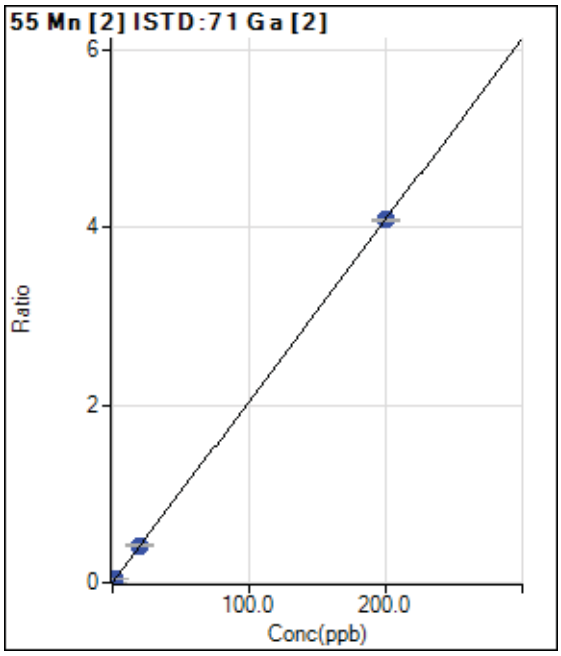
R = 1.0000

DL = 0.02061

BEC = 0.03322

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	50.00	0.0005	P	26.3
2	☐	0.2000	0.2586	552.24	0.0058	P	3.9
3	☐	2.0000	2.1676	4437.33	0.0448	P	3.1
4	☐	20.0000	20.6147	42766.45	0.4220	P	2.6
5	☐	200.0000	199.9368	377831.39	4.0883	P	0.5
6	☐	40.0000					

y = 0.0204 * x + 5.2072E-004

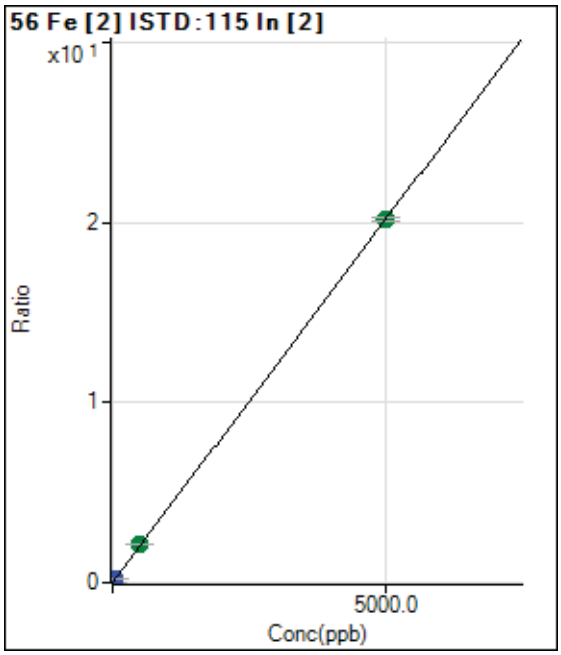
R = 1.0000

DL = 0.02008

BEC = 0.02547

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	1536.81	0.0021	P	8.3
2	☐	5.0000	6.0032	18998.39	0.0263	P	0.4
3	☐	50.0000	50.6334	155466.72	0.2060	P	1.6
4	☐	500.0000	528.8562	1623607.53	2.1319	A	4.5
5	☐	5000.0000	4997.1070	13640056.88	20.1265	A	1.0
6	☐	1000.0000					

y = 0.0040 * x + 0.0021

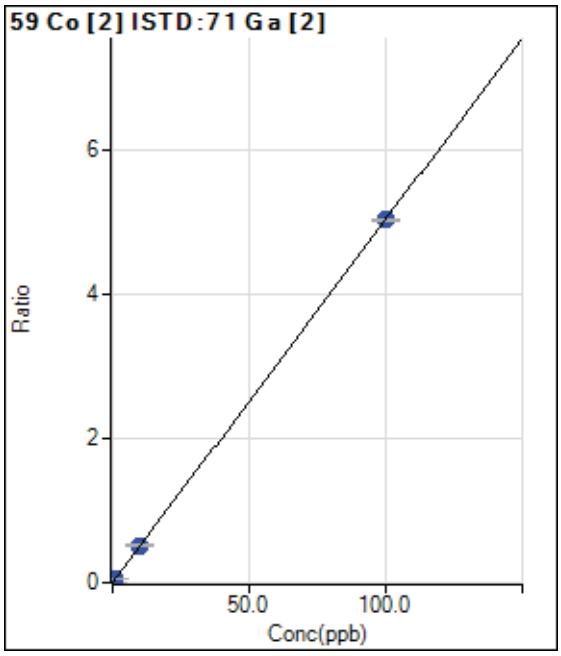
R = 1.0000

DL = 0.1315

BEC = 0.5304

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	14.45	0.0002	P	47.1
2	☐	0.1000	0.1140	560.02	0.0059	P	5.0
3	☐	1.0000	1.0087	5040.84	0.0509	P	5.9
4	☐	10.0000	10.2582	52340.87	0.5165	P	2.7
5	☐	100.0000	99.9741	465028.65	5.0320	P	0.5
6	☐	20.0000					

y = 0.0503 * x + 1.5080E-004

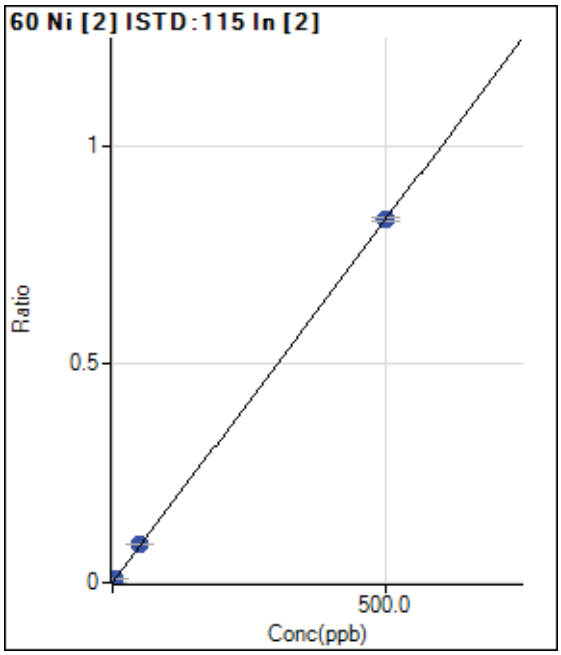
R = 1.0000

DL = 0.004236

BEC = 0.002996

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	32.22	0.0000	P	58.3
2	☐	0.5000	0.5559	698.92	0.0010	P	4.8
3	☐	5.0000	5.3230	6704.79	0.0089	P	2.5
4	☐	50.0000	52.2698	66164.50	0.0869	P	0.9
5	☐	500.0000	499.7697	562536.45	0.8301	P	1.0
6	☐	100.0000					

y = 0.0017 * x + 4.5007E-005

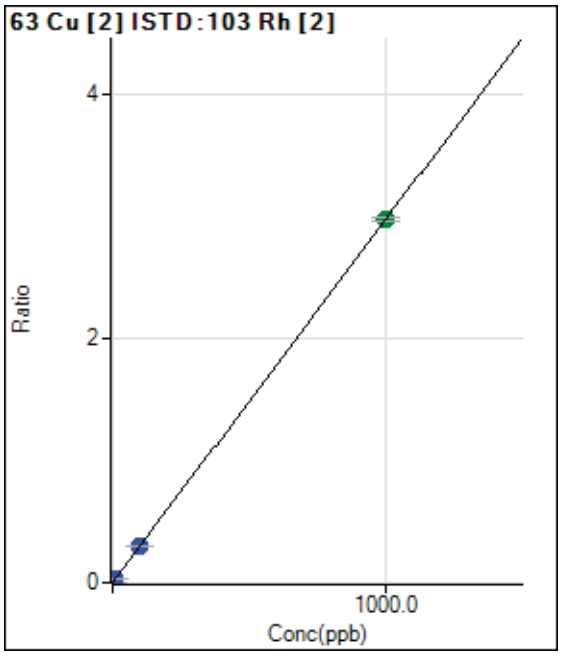
R = 1.0000

DL = 0.04738

BEC = 0.0271

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.4392	1474.53	0.0013	P	3.0
2	☐	1.0000	1.0959	3714.92	0.0033	P	3.5
3	☐	10.0000	10.3170	36153.24	0.0306	P	0.9
4	☐	100.0000	101.1107	355670.85	0.3003	P	0.9
5	☐	1000.0000	999.8857	2950037.80	2.9693	A	1.2
6	☐	200.0000					

y = 0.0030 * x

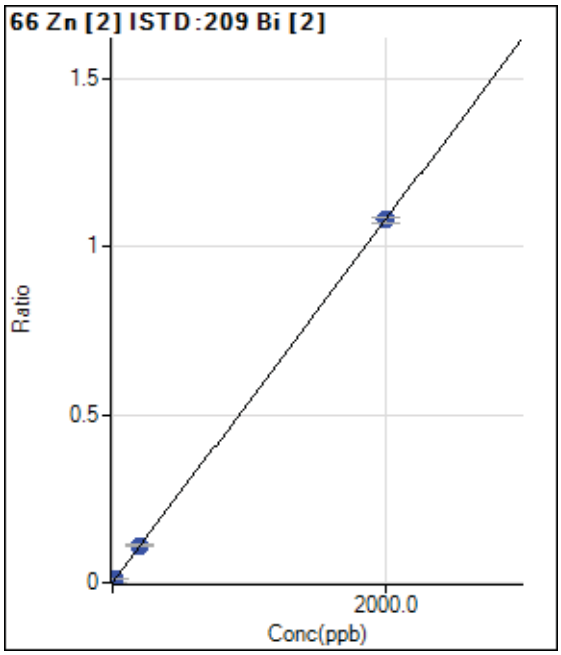
R = 1.0000

DL = 0.03899

BEC = 0

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	216.68	0.0002	P	38.8
2	☐	2.0000	2.2168	1896.87	0.0014	P	11.6
3	☐	20.0000	19.6958	15568.18	0.0108	P	4.0
4	☐	200.0000	202.0474	158799.66	0.1092	P	5.2
5	☐	2000.0000	1999.7981	1216155.37	1.0797	P	1.5
6	☐	400.0000					

y = 5.3984E-004 * x + 1.5533E-004

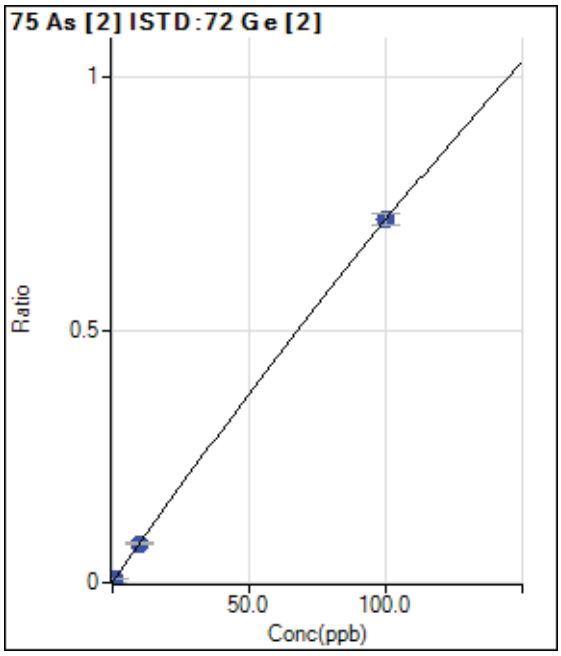
R = 1.0000

DL = 0.3351

BEC = 0.2877

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	-0.0277	0.33	0.0000	P	173.2
2	☐	0.1000	0.0880	29.67	0.0009	P	24.5
3	☐	1.0000	1.0445	284.00	0.0083	P	3.8
4	☐	10.0000	9.9952	2690.57	0.0774	P	3.5
5	☐	100.0000	100.0001	23378.73	0.7174	P	3.3
6	☐	20.0000					

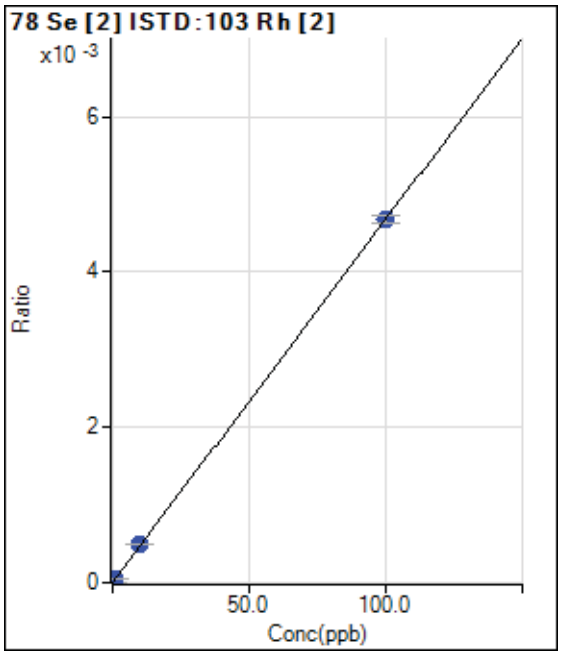
y = -6.0678E-006 * x ^ 2 + 0.0078 * x + 2.2504E-004

DL = 0.006604

BEC = 0.02893

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	0.00	0.0000	P	
2	☐	0.1000	0.1026	5.47	0.0000	P	47.8
3	☐	1.0000	1.1270	62.13	0.0001	P	6.3
4	☐	10.0000	10.6268	588.28	0.0005	P	3.8
5	☐	100.0000	99.9360	4639.73	0.0047	P	2.3
6	☐	20.0000					

y = 4.6737E-005 * x + 0.0000E+000

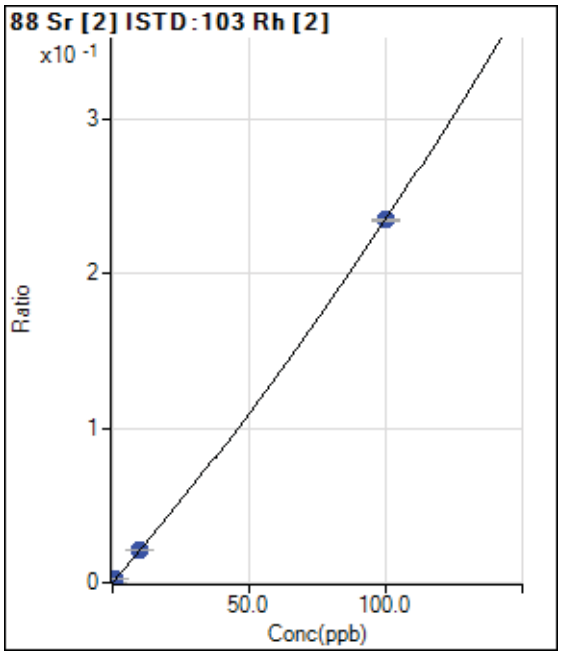
R = 1.0000

DL = 0

BEC = 0

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	-0.0001	30.00	0.0000	P	65.7
2	☐	0.1000	0.1044	273.35	0.0002	P	41.1
3	☐	1.0000	0.9952	2433.63	0.0021	P	7.5
4	☐	10.0000	10.0005	24579.72	0.0208	P	1.4
5	☐	100.0000	100.0000	233155.31	0.2347	P	0.7
6	☐	20.0000					

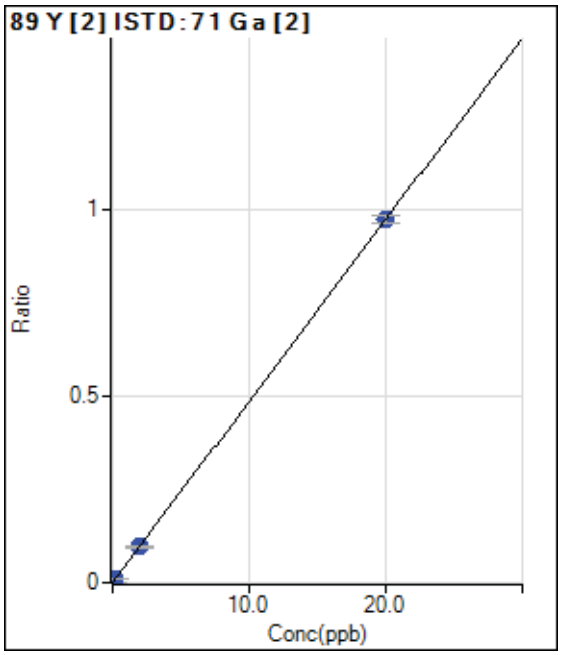
y = 3.0454E-006 * x ^ 2 + 0.0020 * x + 2.6572E-005

DL = 0.02551

BEC = 0.01301

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	0.00	0.0000	P	
2	☐	0.0200	0.0187	86.67	0.0009	P	12.8
3	☐	0.2000	0.1930	930.07	0.0094	P	8.2
4	☐	2.0000	1.9999	9866.83	0.0974	P	5.6
5	☐	20.0000	20.0001	90020.30	0.9741	P	2.0
6	☐	6.0000					

y = 0.0487 * x + 0.0000E+000

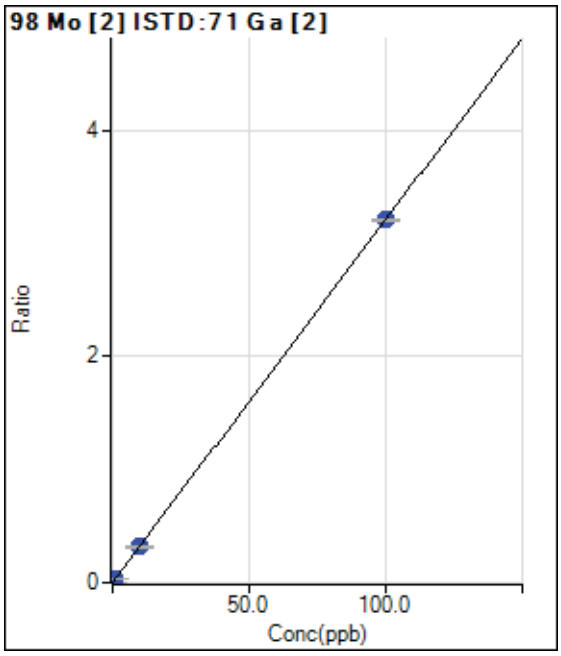
R = 1.0000

DL = 0

BEC = 0

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	10.00	0.0001	P	89.0
2	☐	0.1000	0.0912	287.79	0.0030	P	19.2
3	☐	1.0000	0.9163	2918.09	0.0295	P	9.8
4	☐	10.0000	9.8077	31871.98	0.3144	P	1.6
5	☐	100.0000	100.0201	296245.28	3.2057	P	0.6
6	☐	20.0000					

y = 0.0320 * x + 1.0487E-004

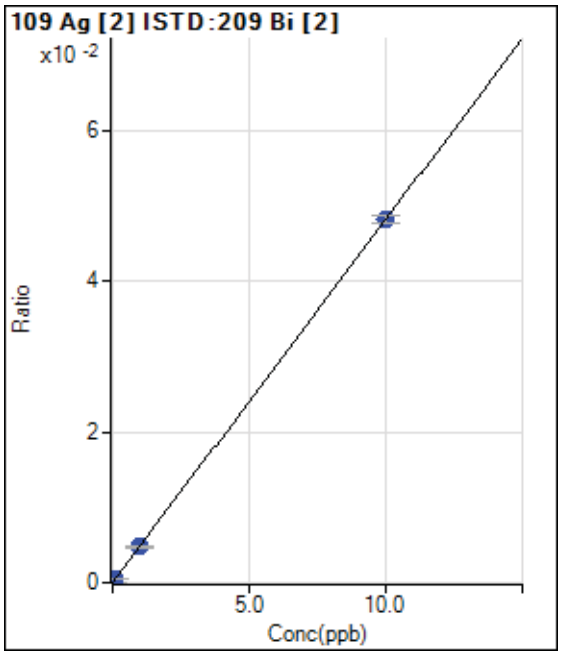
R = 1.0000

DL = 0.008741

BEC = 0.003272

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	2.22	0.0000	P	86.6
2	☐	0.0100	0.0079	55.56	0.0000	P	51.5
3	☐	0.1000	0.1016	707.81	0.0005	P	1.3
4	☐	1.0000	0.9936	6956.07	0.0048	P	4.2
5	☐	10.0000	10.0006	54215.79	0.0481	P	2.1
6	☐	2.0000					

y = 0.0048 * x + 1.6039E-006

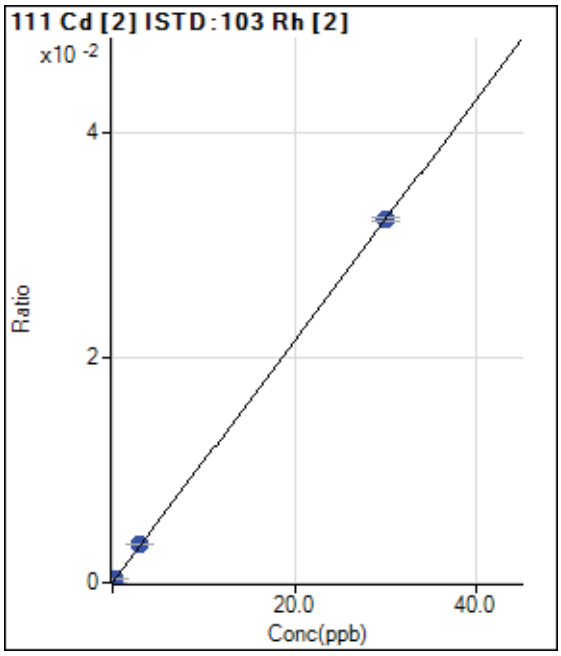
R = 1.0000

DL = 0.0008658

BEC = 0.0003332

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	0.00	0.0000	P	
2	☐	0.0300	0.0407	49.97	0.0000	P	19.0
3	☐	0.3000	0.3289	417.72	0.0004	P	8.2
4	☐	3.0000	3.1517	4016.05	0.0034	P	1.9
5	☐	30.0000	29.9845	32046.49	0.0323	P	1.2
6	☐	6.0000					

y = 0.0011 * x + 0.0000E+000

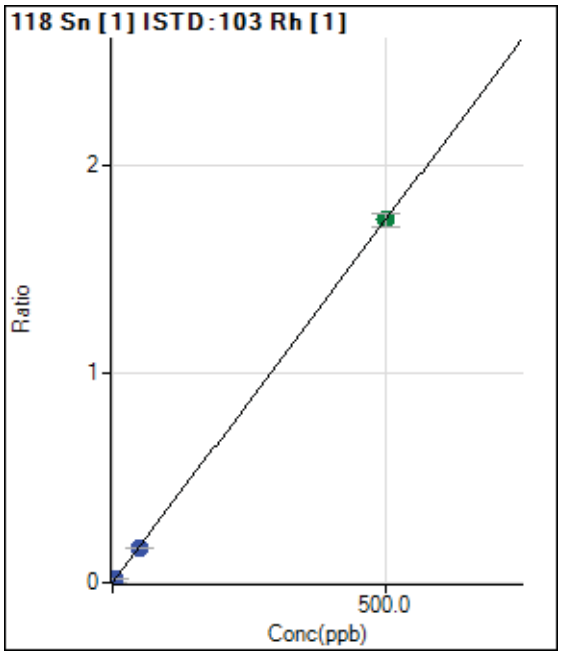
R = 1.0000

DL = 0

BEC = 0

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	1326.80	0.0003	P	14.8
2	☐	0.5000	0.5151	9396.60	0.0021	P	6.9
3	☐	5.0000	4.5642	77547.15	0.0162	P	5.1
4	☐	50.0000	47.7487	782161.44	0.1662	P	4.1
5	☐	500.0000	500.2295	7183393.64	1.7388	A	3.6
6	☐	100.0000					

y = 0.0035 * x + 2.9679E-004

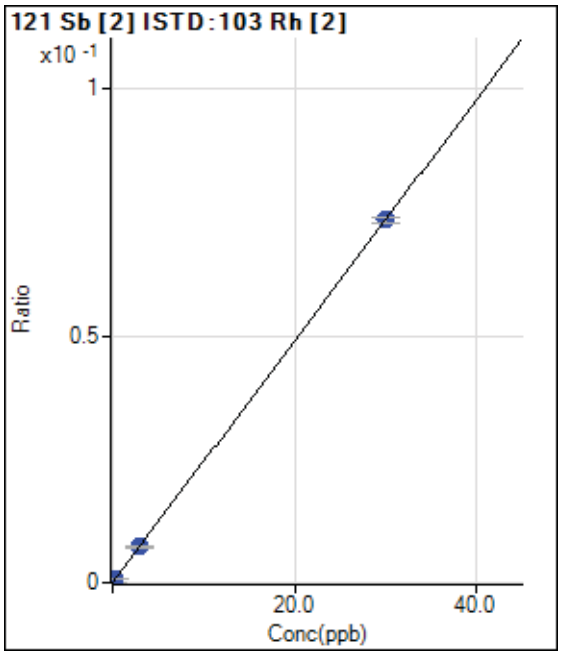
R = 1.0000

DL = 0.03803

BEC = 0.0854

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	14.44	0.0000	P	36.4
2	☐	0.0300	0.0333	107.78	0.0001	P	28.3
3	☐	0.3000	0.3077	904.48	0.0008	P	6.2
4	☐	3.0000	2.9550	8592.46	0.0073	P	3.9
5	☐	30.0000	30.0044	73059.11	0.0735	P	1.5
6	☐	6.0000					

y = 0.0025 * x + 1.2803E-005

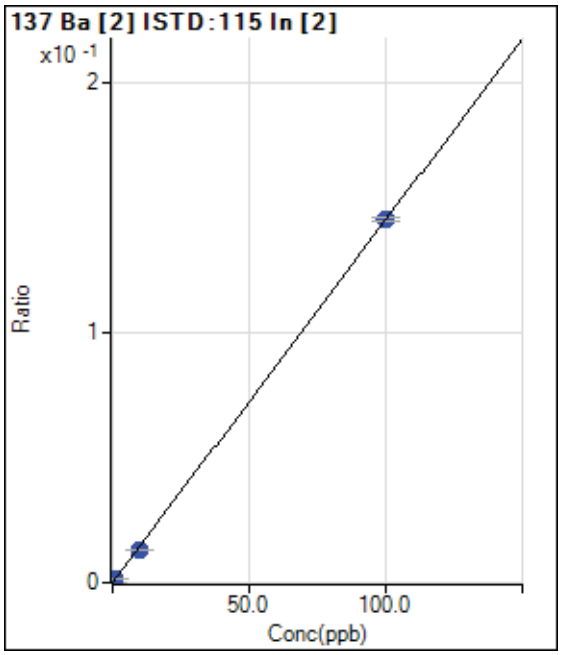
R = 1.0000

DL = 0.005703

BEC = 0.005225

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	13.33	0.0000	P	86.6
2	☐	0.1000	0.1208	140.01	0.0002	P	25.3
3	☐	1.0000	1.0362	1146.77	0.0015	P	14.4
4	☐	10.0000	9.0018	9950.26	0.0131	P	4.2
5	☐	100.0000	100.0994	98315.77	0.1451	P	1.1
6	☐	20.0000					

y = 0.0014 * x + 1.8714E-005

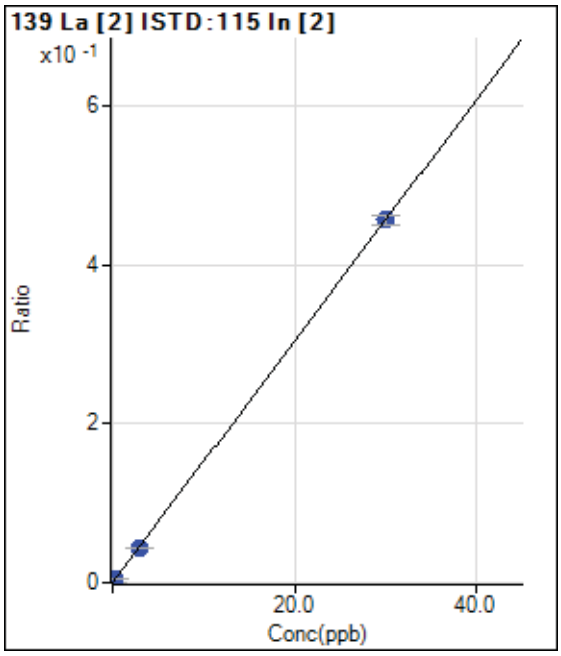
R = 0.9999

DL = 0.03355

BEC = 0.01291

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	10.00	0.0000	P	100.3
2	☐	0.0300	0.0243	276.69	0.0004	P	11.3
3	☐	0.3000	0.3175	3653.94	0.0048	P	11.9
4	☐	3.0000	2.8692	33250.19	0.0437	P	1.2
5	☐	30.0000	30.0129	309344.12	0.4565	P	2.5
6	☐	6.0000					

y = 0.0152 * x + 1.4058E-005

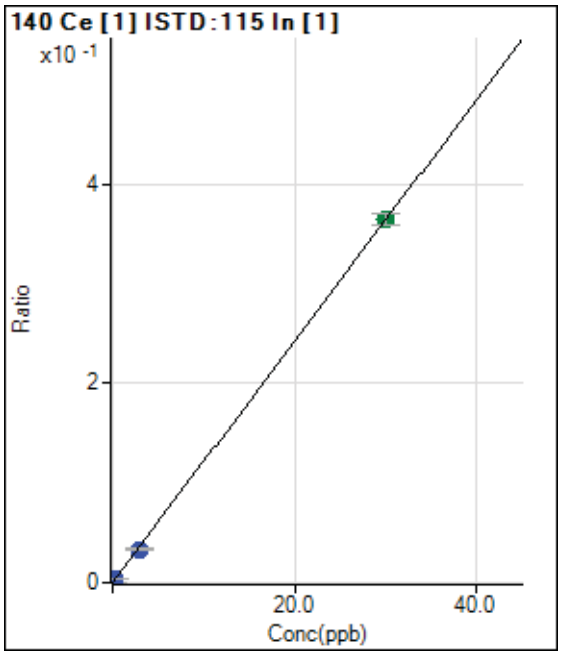
R = 1.0000

DL = 0.002782

BEC = 0.0009244

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	170.01	0.0000	P	18.2
2	☐	0.0300	0.0301	2233.61	0.0004	P	5.3
3	☐	0.3000	0.2727	20284.28	0.0033	P	5.1
4	☐	3.0000	2.7494	200012.46	0.0333	P	3.2
5	☐	30.0000	30.0253	1956962.16	0.3639	A	3.0
6	☐	6.0000					

y = 0.0121 * x + 3.0045E-005

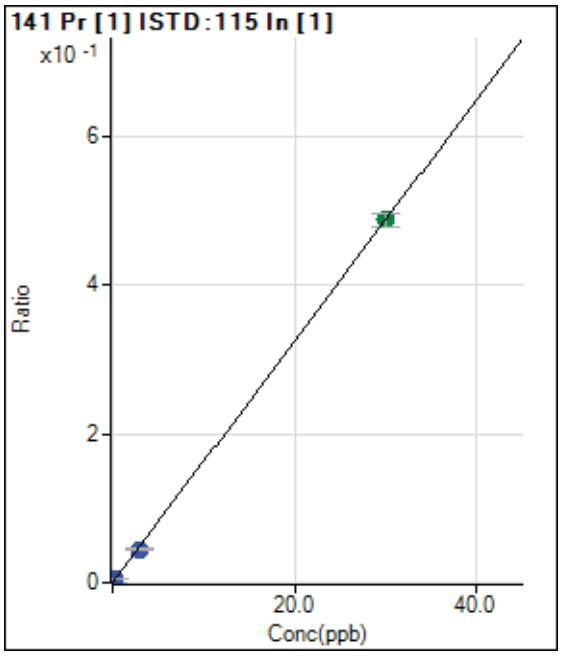
R = 1.0000

DL = 0.001354

BEC = 0.002479

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	23.33	0.0000	P	89.0
2	☐	0.0300	0.0289	2673.69	0.0005	P	13.4
3	☐	0.3000	0.2777	27488.89	0.0045	P	2.4
4	☐	3.0000	2.7745	270757.48	0.0451	P	4.2
5	☐	30.0000	30.0228	2626107.83	0.4883	A	4.1
6	☐	6.0000					

y = 0.0163 * x + 4.2099E-006

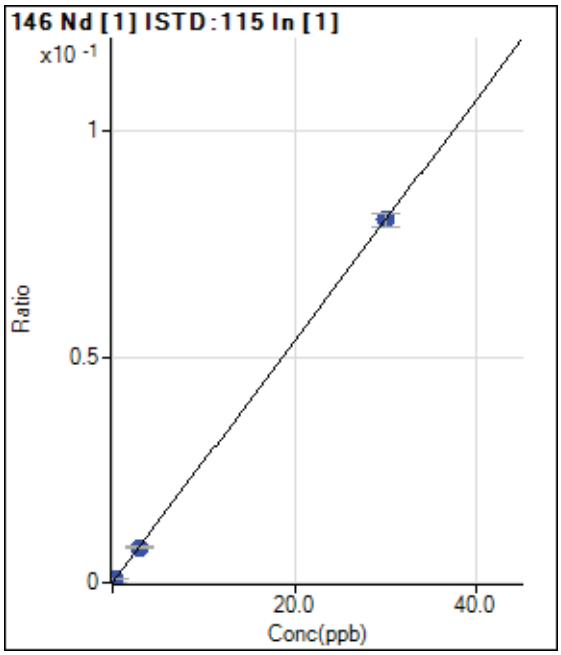
R = 1.0000

DL = 0.0006907

BEC = 0.0002588

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	10.00	0.0000	P	173.2
2	☐	0.0300	0.0307	476.70	0.0001	P	13.3
3	☐	0.3000	0.2861	4657.58	0.0008	P	7.5
4	☐	3.0000	2.9401	47224.09	0.0079	P	3.9
5	☐	30.0000	30.0061	432004.93	0.0803	P	3.7
6	☐	6.0000					

y = 0.0027 * x + 1.8198E-006

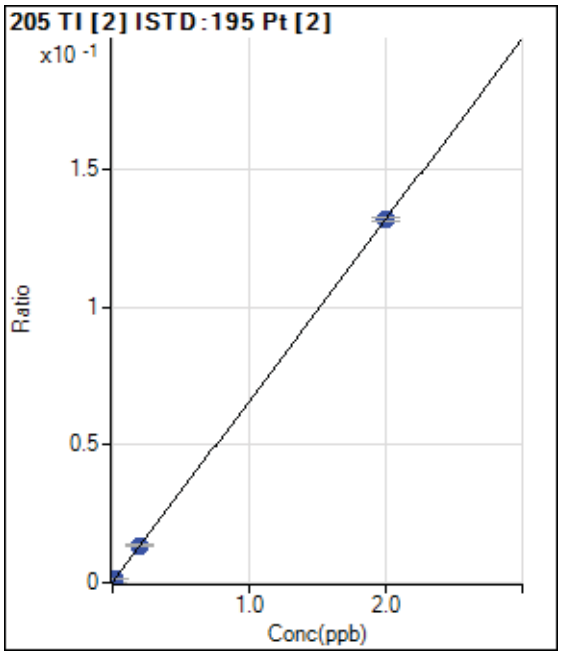
R = 1.0000

DL = 0.003532

BEC = 0.0006798

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	24.76	0.0001	P	17.6
2	☐	0.0020	0.0018	50.95	0.0002	P	10.8
3	☐	0.0200	0.0196	325.25	0.0014	P	4.7
4	☐	0.2000	0.2043	3180.83	0.0136	P	1.1
5	☐	2.0000	1.9996	26408.23	0.1319	P	1.1
6	☐	0.4000					

y = 0.0659 * x + 1.1133E-004

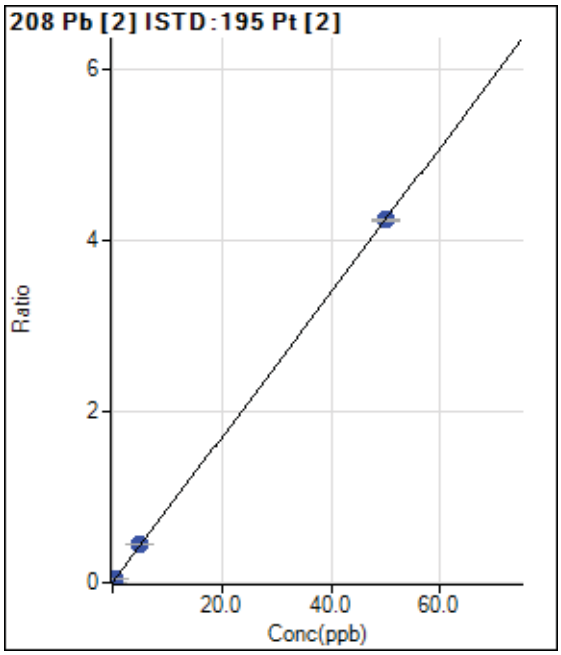
R = 1.0000

DL = 0.0008905

BEC = 0.001689

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	500.03	0.0022	P	5.8
2	☐	0.0500	0.0461	1376.77	0.0062	P	3.1
3	☐	0.5000	0.5214	10765.47	0.0465	P	0.9
4	☐	5.0000	5.1812	103502.00	0.4417	P	1.1
5	☐	50.0000	49.9817	849466.77	4.2420	P	0.8
6	☐	10.0000					

y = 0.0848 * x + 0.0022

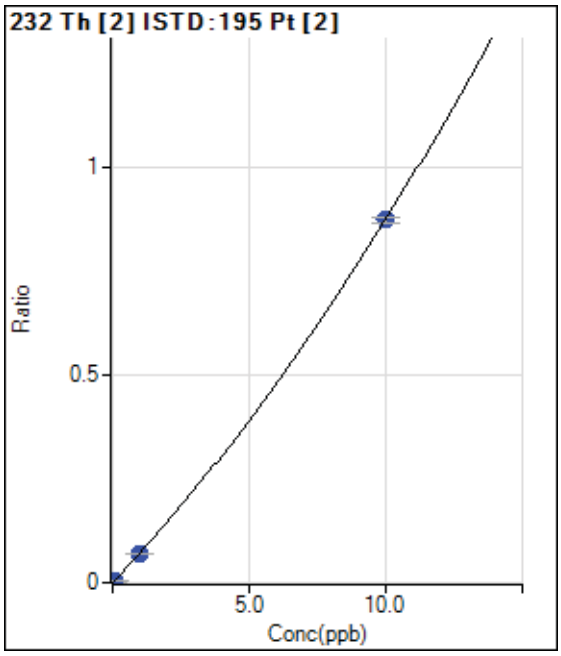
R = 1.0000

DL = 0.004615

BEC = 0.02646

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0011	16.67	0.0001	P	61.1
2	☐	0.0100	0.0085	132.23	0.0006	P	22.3
3	☐	0.1000	0.0801	1290.08	0.0056	P	9.5
4	☐	1.0000	1.0021	16697.60	0.0713	P	1.7
5	☐	10.0000	10.0000	175212.07	0.8750	P	1.4
6	☐	2.0000					

y = 0.0018 * x ^ 2 + 0.0693 * x

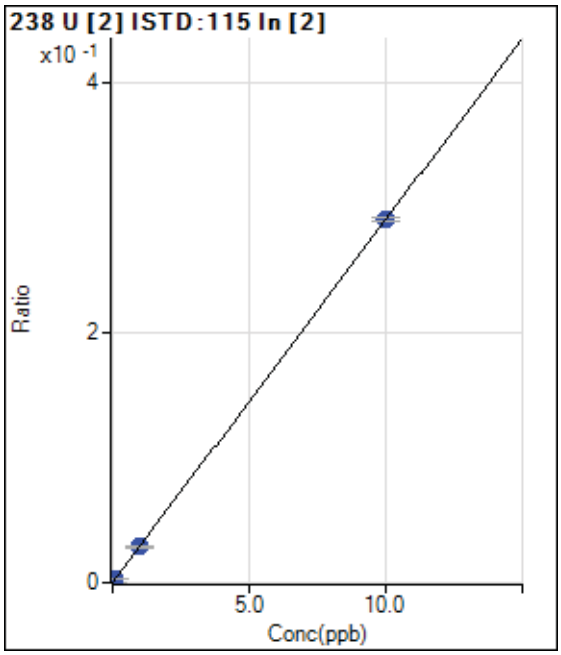
DL = 0.00199

BEC = 0

Weight: None

Min Conc: <None>

Calibration for 211SMPL_18K09k00.D



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.0000	0.0000	3.34	0.0000	P	141.4
2	☐	0.0100	0.0100	212.23	0.0003	P	15.2
3	☐	0.1000	0.0980	2150.20	0.0028	P	6.3
4	☐	1.0000	0.9826	21742.02	0.0285	P	0.8
5	☐	10.0000	10.0018	196870.32	0.2905	P	0.9
6	☐	2.0000					

y = 0.0290 * x + 4.7034E-006

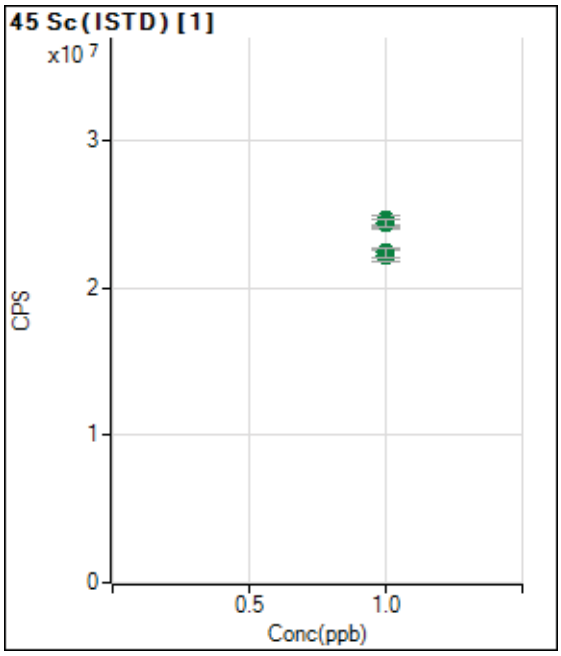
R = 1.0000

DL = 0.000687

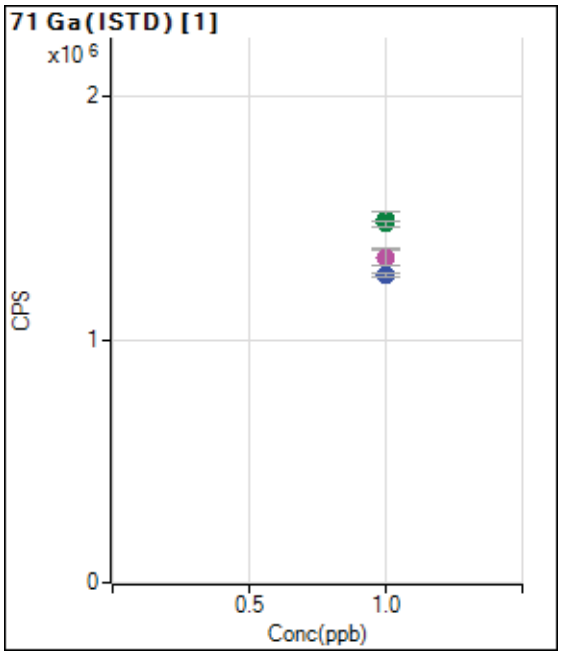
BEC = 0.0001619

Weight: None

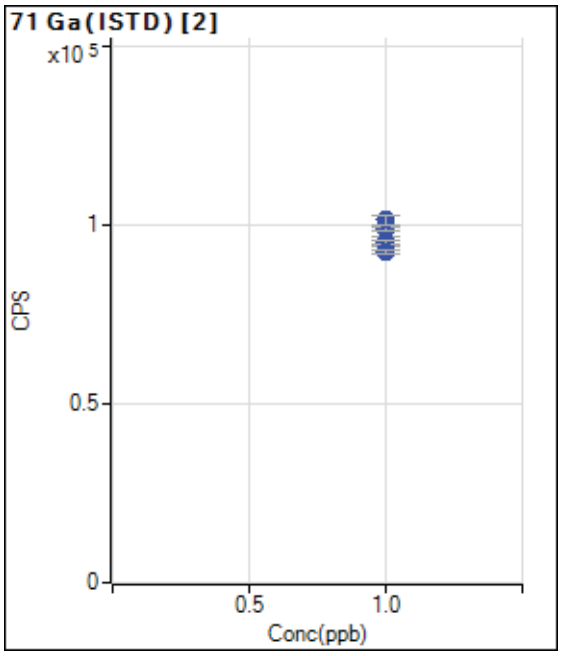
Min Conc: <None>



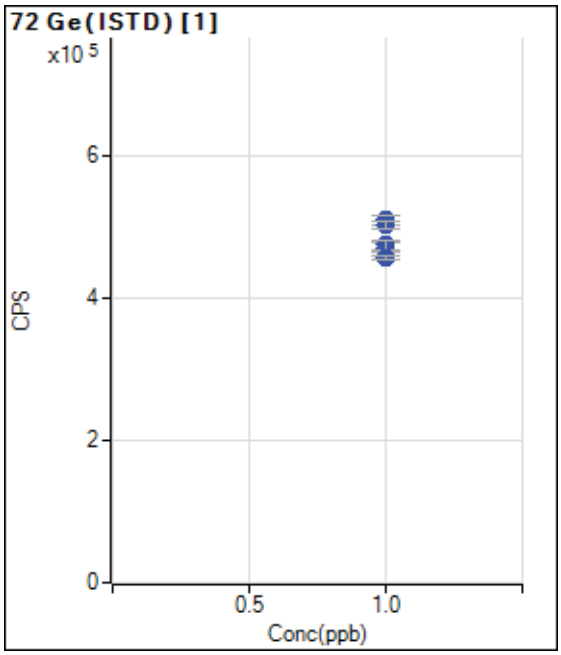
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		22165588.00		A	3.1
2	☐	1.0000		22385336.33		A	3.2
3	☐	1.0000		24428286.30		A	3.5
4	☐	1.0000		24586704.63		A	2.8
5	☐	1.0000		24366158.80		A	1.8
6	☐	1.0000					



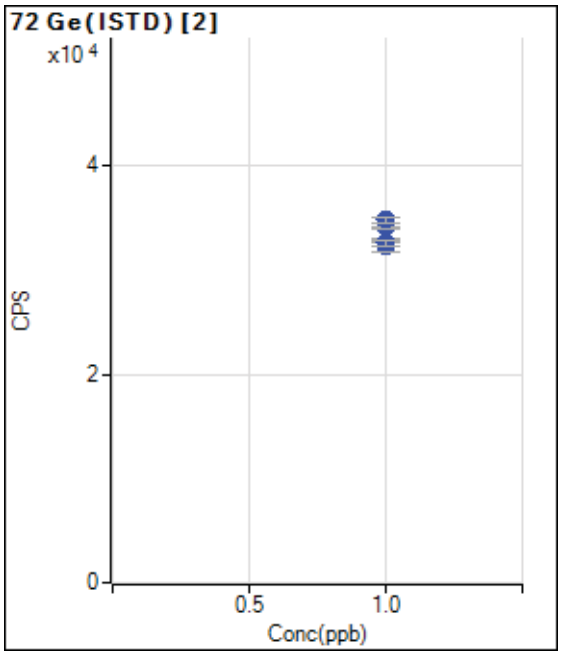
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		1340614.67		M	4.9
2	☐	1.0000		1338967.85		M	5.3
3	☐	1.0000		1493905.24		A	4.1
4	☐	1.0000		1477605.03		A	1.9
5	☐	1.0000		1266135.55		P	0.8
6	☐	1.0000					



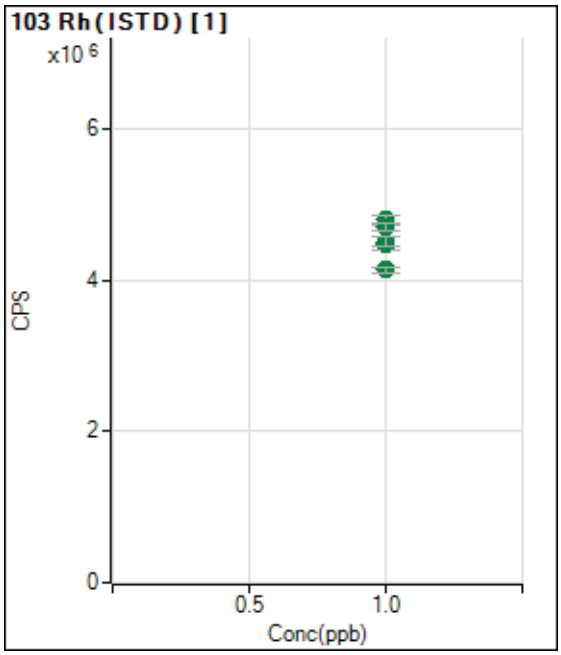
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		95591.11		P	2.7
2	☐	1.0000		95095.09		P	0.8
3	☐	1.0000		98963.48		P	0.9
4	☐	1.0000		101385.58		P	2.5
5	☐	1.0000		92415.68		P	1.1
6	☐	1.0000					



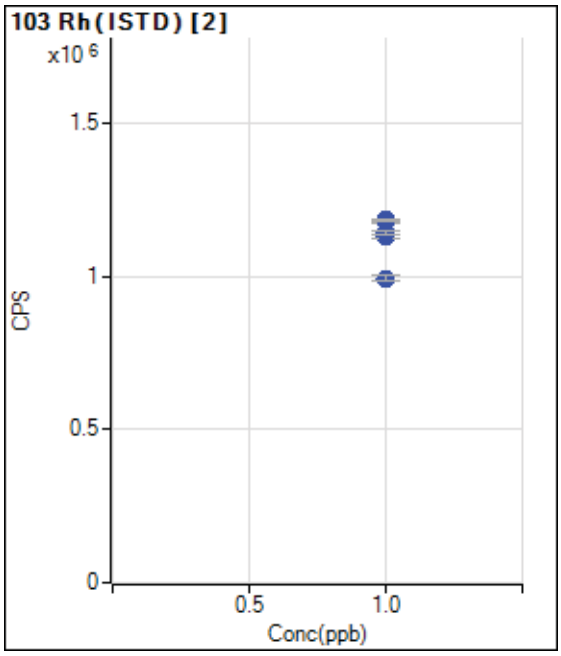
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		470661.90		P	2.8
2	☐	1.0000		474719.37		P	2.6
3	☐	1.0000		509733.31		P	3.0
4	☐	1.0000		502435.69		P	2.6
5	☐	1.0000		456565.81		P	1.4
6	☐	1.0000					



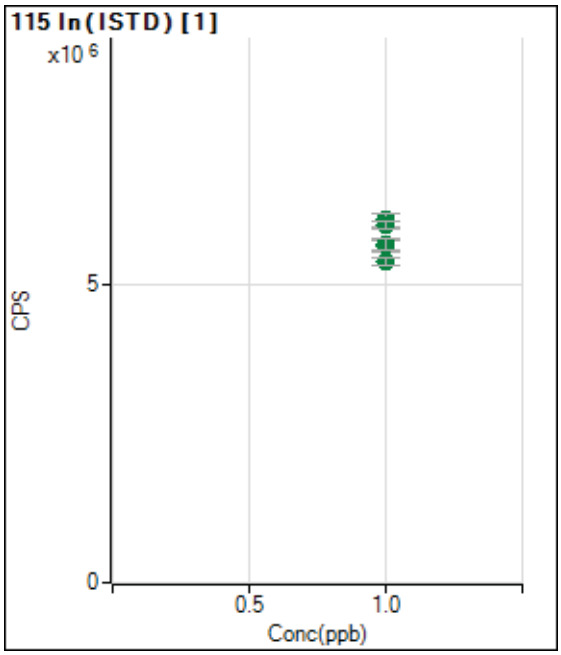
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		32299.88		P	3.8
2	☐	1.0000		32653.98		P	0.7
3	☐	1.0000		34039.78		P	0.8
4	☐	1.0000		34784.82		P	1.3
5	☐	1.0000		32600.47		P	1.8
6	☐	1.0000					



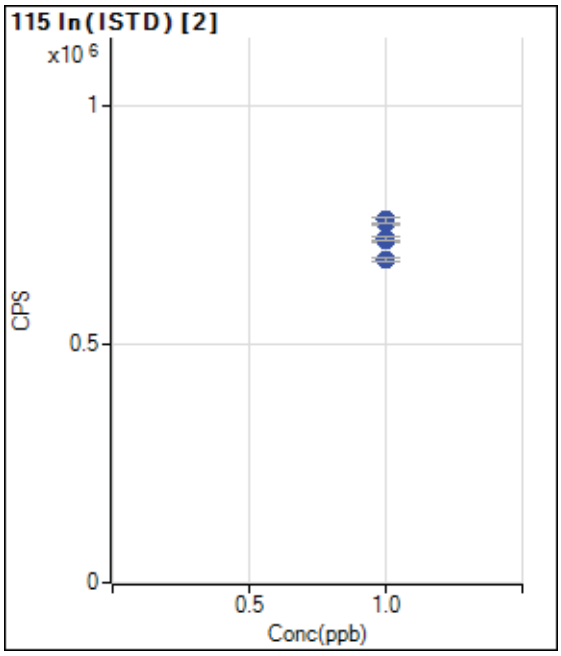
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		4484227.54		A	3.5
2	☐	1.0000		4507500.35		A	2.7
3	☐	1.0000		4794823.47		A	2.9
4	☐	1.0000		4702641.91		A	1.8
5	☐	1.0000		4133035.15		A	2.1
6	☐	1.0000					



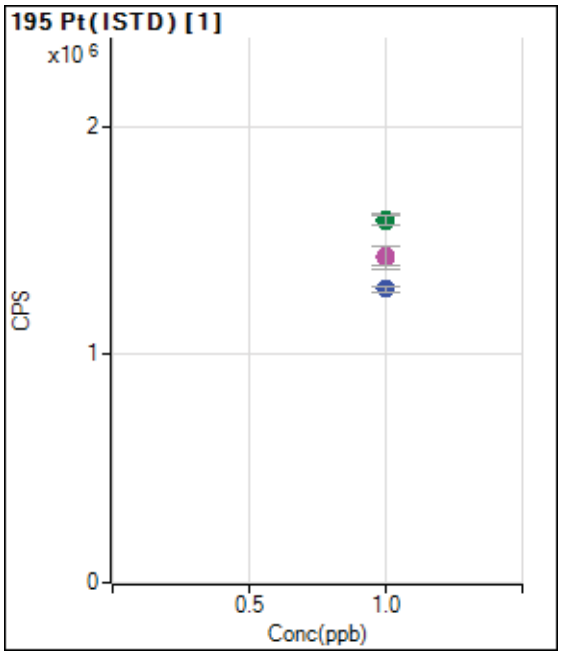
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		1130673.08		P	1.5
2	☐	1.0000		1141573.81		P	0.8
3	☐	1.0000		1179932.38		P	1.2
4	☐	1.0000		1184525.94		P	0.3
5	☐	1.0000		993623.52		P	1.7
6	☐	1.0000					



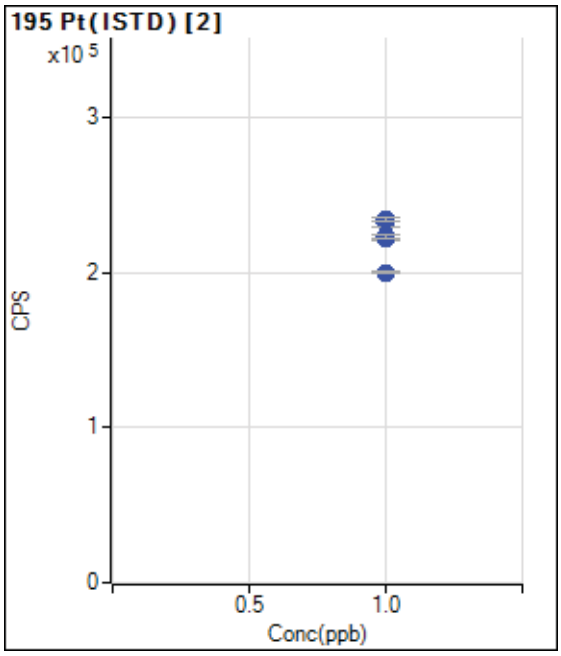
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		5640214.47		A	3.3
2	☐	1.0000		5661545.65		A	3.6
3	☐	1.0000		6077503.21		A	3.7
4	☐	1.0000		5995149.23		A	2.3
5	☐	1.0000		5380111.78		A	1.9
6	☐	1.0000					



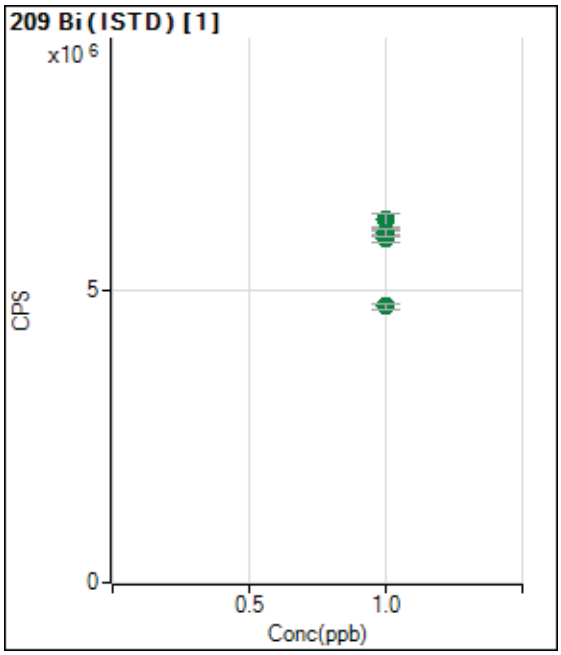
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		718986.06		P	1.6
2	☐	1.0000		722056.58		P	0.9
3	☐	1.0000		754520.25		P	0.5
4	☐	1.0000		761720.11		P	1.3
5	☐	1.0000		677755.32		P	1.5
6	☐	1.0000					



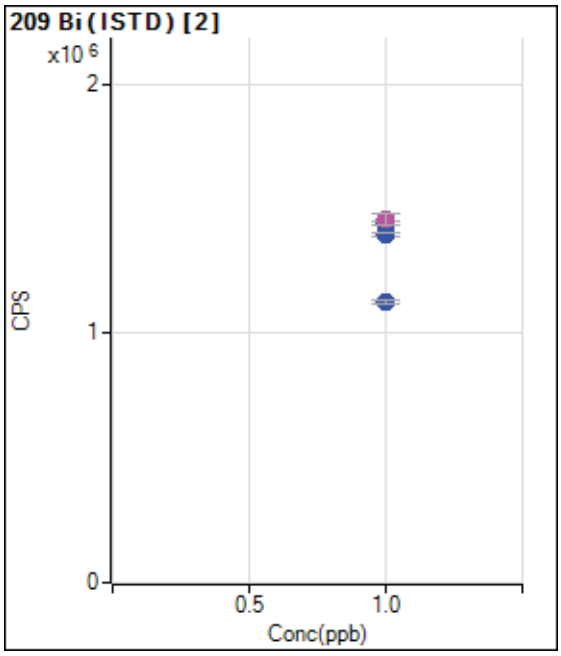
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		1426448.36		M	6.9
2	☐	1.0000		1428893.42		M	5.9
3	☐	1.0000		1589905.86		A	3.1
4	☐	1.0000		1587101.59		A	2.6
5	☐	1.0000		1286440.22		P	2.3
6	☐	1.0000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		222680.40		P	1.4
2	☐	1.0000		223762.52		P	1.3
3	☐	1.0000		231673.61		P	1.7
4	☐	1.0000		234308.53		P	1.0
5	☐	1.0000		200258.42		P	0.8
6	☐	1.0000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		5864148.25		A	2.4
2	☐	1.0000		5916321.99		A	3.1
3	☐	1.0000		6191900.32		A	3.4
4	☐	1.0000		5964047.83		A	2.0
5	☐	1.0000		4709759.62		A	1.8
6	☐	1.0000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.0000		1395699.82		P	1.5
2	☐	1.0000		1403229.20		P	0.3
3	☐	1.0000		1443092.63		P	1.0
4	☐	1.0000		1455408.94		M	3.2
5	☐	1.0000		1126430.22		P	0.8
6	☐	1.0000					

Miscellaneous

Prep Batch: IP181103-2

Metals Prep Worksheet

Start Date: 11/3/2018 **End Date:** 11/3/201 **SOP:** **Balance 1:** **Block Temp:**
Start Time: 11:18 **End Time:** 18:00 **Extract Method:** EPA200.22.2 **Balance 2:** **Peroxide Lot:**
Prep Analyst: Jill M. Latelle **Initial Volume Units:** ml **Avg Beaker Wt.:**
Final Volume Units: ml **Beaker Lot:**

Comments:

Prep Number	Lab ID	Inst	Initial Wt/Vol	Final Wt/Vol	Final Wt/Vol	pH	Prep Notes	Standards
1	1810475-1		50	50				
1	1810475-2		50	50				
1	1810475-3		50	50				
1	1810475-4		50	50				
1	1810475-5		50	50				
1	1810475-6		50	50				
1	1810601-1		50	50				
1	1810612-1		50	50				
1	1810612-3		50	50				
1	1810612-4		50	50				
1	1810628-1		50	50				
1	1810637-1		50	50				
1	1810637-1MS		50	50				S2
1	1810637-1MSD		50	50				S2
1	1810637-2		50	50				
1	1810637-2MS		50	50				S2
1	1810637-2MSD		50	50				S2
1	1810637-3		50	50				
1	1810656-1		50	50				
1	1810657-1		50	50				
1	1811004-21		50	50				
1	1811004-22		50	50				
1	1811004-23		50	50				
1	1811004-24		50	50				
1	FP181030-2MB		50	50				
1	IM181103-2LCS		50	50				S2
1	IP181103-2MB		50	50				
1	IP181103-2LCS		50	50				S1,S3,S4,S5

Prep Batch: IP181103-2

Metals Prep Worksheet

Prep Number	Lab ID	Inst	Initial Wt/Vol	Final Wt/Vol	Final Wt/Vol	pH	Prep Notes	Standards
1	IP181103-2LCSD		50	50				S1,S3,S4,S5

Spike Solution Information

Soln #	SolnID	Aliquot	Units	PiptetID
	RG180815-1	1	ml	
	RG180815-2	0.5	ml	
S1	ST180228-2	0.05	ml	M-50
S2	ST180709-1	0.5	ml	M-18
S3	ST180709-3	0.5	ml	M-18
S4	ST180709-4	1	ml	M-18
S5	ST180709-5	1	ml	M-18