LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 10/10/2018

GCAL Report 218081812

Project Williston LTA, #60520956

Deliver To	***Additional Recipients***
Naoum Tavantzis AECOM 1600 Peremeter Park Drive Suite 400 Morrisville, NC 27560 919-461-1100	Jennifer Li, AECOM Laurie Stenberg, AECOM

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics **-** The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Authorized Signature
GCAL Report 218081812

Certifications

Certification	Certification Number
DOD ELAP	L16-398-R5
Alabama	01955
Arkansas	18-062-0
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: AECOM **Report:** 218081812

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.1 as specified in the contract.

PROJECT MANAGER COMMENTS

Per Jennifer Li's email on 10/5/18, hold samples do not need to be analyzed. (Amanda Cobb 10/05/2018 10:30)

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

In the EPA 8330B analysis for prep batch 642698, the MS/MSD exhibited RPD failures. The LCS and/or LCSD (standard reference material) recoveries for all analytes were below the lower DOD control limit. The LCS/LCSD exhibited RPD failures. All samples were re-extracted outside holding time in prep batch 643342. The recovery for the surrogate is below the lower control limit for the LCSD (1843191).

In the EPA 8330B analysis for prep batch 643342, all samples were outside the holding time. The samples are reported as samples 21808181213-21808181217 with (RE) added to the client ID. The MS/MSD exhibited recovery and RPD failures. The LCS and/or LCSD (standard reference material) recoveries are above the upper control limit for 1,3,5-Trinitrobenzene, 1,3-Dinitrobenzene, 3-Nitrotoluene, 4-Nitrotoluene, and Pentaerythritol Tetranitrate. These analytes werre not detected in the associated samples. The LCS/LCSD recoveries are 0% for Tetryl. This is a poor performing analyte.

METALS

In the EPA 6020B analysis for prep batch 642222, the MS and/or MSD recovery is outside the control limits for Antimony and Zinc. The LCS recovery is within control limits. This indicates the analysis is in control and the sample is affected by matrix interference or the element is non-homogeneous in the sample. A post-digestion spike was performed. The MS/MSD recoveries and RPD are not applicable for Copper and Lead because the sample concentration is greater than four times the spike concentration. Zinc is flagged E on the serial dilution form due to the fact that the % difference between the original result and the serial dilution result for the batch QC sample is greater than 10.

Q Flag Summary

Client Sample ID: **WIL02DA02A** Lab Sample ID: **21808181206**

Method: **EPA 8330B**	Analysis Date: **9/13/2018 5:40:10 AM**					
Analyte	**CAS**	**CCV OUL**	**LCS/LCSD OUL**	**SURROGATE OUL**	**IS OUL**	**CLCCV OUL**
1,3,5-Trinitrobenzene	99-35-4		X			
1,3-Dinitrobenzene	99-65-0		X			
2,4,6-Trinitrotoluene	118-96-7		X			
2,4-Dinitrotoluene	121-14-2		X			
2,6-Dinitrotoluene	606-20-2		X			
2-Amino-4,6-dinitrotoluene	35572-78-2		X			
2-Nitrotoluene	88-72-2		X			
3,5-Dinitroaniline	618-87-1		X			
3-Nitrotoluene	99-08-1		X			
4-Amino-2,6-dinitrotoluene	19406-51-0		X			
4-Nitrotoluene	99-99-0		X			
HMX	2691-41-0		X			
Nitrobenzene	98-95-3		X			
Nitroglycerin	55-63-0		X			
Pentaerythritol Tetranitrate	78-11-5		X			
RDX	121-82-4		X			
Tetryl	479-45-8		X			

Client Sample ID: **WIL02DA01A** Lab Sample ID: **21808181209**

Method: **EPA 8330B**	Analysis Date: **9/13/2018 6:39:30 AM**					
Analyte	**CAS**	**CCV OUL**	**LCS/LCSD OUL**	**SURROGATE OUL**	**IS OUL**	**CLCCV OUL**
1,3,5-Trinitrobenzene	99-35-4		X			
1,3-Dinitrobenzene	99-65-0		X			
2,4,6-Trinitrotoluene	118-96-7		X			
2,4-Dinitrotoluene	121-14-2		X			
2,6-Dinitrotoluene	606-20-2		X			
2-Amino-4,6-dinitrotoluene	35572-78-2		X			
2-Nitrotoluene	88-72-2		X			
3,5-Dinitroaniline	618-87-1		X			
3-Nitrotoluene	99-08-1		X			
4-Amino-2,6-dinitrotoluene	19406-51-0		X			
4-Nitrotoluene	99-99-0		X			
HMX	2691-41-0		X			
Nitrobenzene	98-95-3		X			
Nitroglycerin	55-63-0		X			
Pentaerythritol Tetranitrate	78-11-5		X			
RDX	121-82-4		X			
Tetryl	479-45-8		X			

Client Sample ID: **WIL02DA01B** Lab Sample ID: **21808181210**

Method: **EPA 8330B**	Analysis Date: **9/13/2018 6:59:16 AM**					
Analyte	**CAS**	**CCV OUL**	**LCS/LCSD OUL**	**SURROGATE OUL**	**IS OUL**	**CLCCV OUL**
1,3,5-Trinitrobenzene	99-35-4		X			
1,3-Dinitrobenzene	99-65-0		X			
2,4,6-Trinitrotoluene	118-96-7		X			
2,4-Dinitrotoluene	121-14-2		X			
2,6-Dinitrotoluene	606-20-2		X			
2-Amino-4,6-dinitrotoluene	35572-78-2		X			
2-Nitrotoluene	88-72-2		X			
3,5-Dinitroaniline	618-87-1		X			
3-Nitrotoluene	99-08-1		X			
4-Amino-2,6-dinitrotoluene	19406-51-0		X			

4-Nitrotoluene	99-99-0		X			
HMX	2691-41-0		X			
Nitrobenzene	98-95-3		X			
Nitroglycerin	55-63-0		X			
Pentaerythritol Tetranitrate	78-11-5		X			
RDX	121-82-4		X			
Tetryl	479-45-8		X			

Client Sample ID: **WIL02DA02A (RE)** Lab Sample ID: **21808181213**

Method: **EPA 8330B**	Analysis Date: **9/13/2018 8:18:22 AM**					
Analyte	**CAS**	**CCV OUL**	**LCS/LCSD OUL**	**SURROGATE OUL**	**IS OUL**	**CLCCV OUL**
1,3,5-Trinitrobenzene	99-35-4		X			
3-Nitrotoluene	99-08-1		X			
4-Nitrotoluene	99-99-0		X			
Pentaerythritol Tetranitrate	78-11-5		X			
Tetryl	479-45-8		X			

Client Sample ID: **WIL02DA01A (RE)** Lab Sample ID: **21808181216**

Method: **EPA 8330B**	Analysis Date: **9/13/2018 9:17:42 AM**					
Analyte	**CAS**	**CCV OUL**	**LCS/LCSD OUL**	**SURROGATE OUL**	**IS OUL**	**CLCCV OUL**
1,3,5-Trinitrobenzene	99-35-4		X			
3-Nitrotoluene	99-08-1		X			
4-Nitrotoluene	99-99-0		X			
Pentaerythritol Tetranitrate	78-11-5		X			
Tetryl	479-45-8		X			

Client Sample ID: **WIL02DA01B (RE)** Lab Sample ID: **21808181217**

Method: **EPA 8330B**	Analysis Date: **9/13/2018 9:37:28 AM**					
Analyte	**CAS**	**CCV OUL**	**LCS/LCSD OUL**	**SURROGATE OUL**	**IS OUL**	**CLCCV OUL**
1,3,5-Trinitrobenzene	99-35-4		X			
3-Nitrotoluene	99-08-1		X			
4-Nitrotoluene	99-99-0		X			
Pentaerythritol Tetranitrate	78-11-5		X			
Tetryl	479-45-8		X			

CCV OUL=CCV out of limits
LCS/LCSD OUL=LCS/LCSD out of limits
SURROGATE OUL=Surrogate out of limits
IS OUL=Internal Standard out of limits
CLCCV OUL=Closing CCV out of limits

Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21808181206	WIL02DA02A	Solid	08/16/2018 10:20	08/18/2018 10:45
21808181207	WIL02DA02A MS	Solid	08/16/2018 10:20	08/18/2018 10:45
21808181208	WIL02DA02A MSD	Solid	08/16/2018 10:20	08/18/2018 10:45
21808181209	WIL02DA01A	Solid	08/16/2018 09:30	08/18/2018 10:45
21808181210	WIL02DA01B	Solid	08/16/2018 09:35	08/18/2018 10:45
21808181213	WIL02DA02A (RE)	Solid	08/16/2018 10:20	08/18/2018 10:45
21808181214	WIL02DA02A MS (RE)	Solid	08/16/2018 10:20	08/18/2018 10:45
21808181215	WIL02DA02A MSD (RE)	Solid	08/16/2018 10:20	08/18/2018 10:45
21808181216	WIL02DA01A (RE)	Solid	08/16/2018 09:30	08/18/2018 10:45
21808181217	WIL02DA01B (RE)	Solid	08/16/2018 09:35	08/18/2018 10:45

Test Summary

GCAL ID	Client ID	Matrix	Procedure
21808181206	WIL02DA02A	S	EPA 6020B
21808181206	WIL02DA02A	S	EPA 6020 Solid Prep
21808181206	WIL02DA02A	S	EPA 8330B Solid
21808181206	WIL02DA02A	S	EPA 8330B Prep Solid
21808181206	WIL02DA02A	S	Dry Weight/Percent Moisture
21808181206	WIL02DA02A	S	Incremental Sampling Method
21808181207	WIL02DA02A MS	S	EPA 6020B
21808181207	WIL02DA02A MS	S	EPA 6020 Solid Prep
21808181207	WIL02DA02A MS	S	EPA 8330B Solid
21808181207	WIL02DA02A MS	S	EPA 8330B Prep Solid
21808181207	WIL02DA02A MS	S	Dry Weight/Percent Moisture
21808181207	WIL02DA02A MS	S	Incremental Sampling Method
21808181208	WIL02DA02A MSD	S	EPA 6020B
21808181208	WIL02DA02A MSD	S	EPA 6020 Solid Prep
21808181208	WIL02DA02A MSD	S	EPA 8330B Solid
21808181208	WIL02DA02A MSD	S	EPA 8330B Prep Solid
21808181208	WIL02DA02A MSD	S	Dry Weight/Percent Moisture
21808181208	WIL02DA02A MSD	S	Incremental Sampling Method
21808181209	WIL02DA01A	S	EPA 6020B
21808181209	WIL02DA01A	S	EPA 6020 Solid Prep
21808181209	WIL02DA01A	S	EPA 8330B Solid
21808181209	WIL02DA01A	S	EPA 8330B Prep Solid
21808181209	WIL02DA01A	S	Dry Weight/Percent Moisture
21808181209	WIL02DA01A	S	Incremental Sampling Method
21808181210	WIL02DA01B	S	EPA 6020B
21808181210	WIL02DA01B	S	EPA 6020 Solid Prep
21808181210	WIL02DA01B	S	EPA 8330B Solid
21808181210	WIL02DA01B	S	EPA 8330B Prep Solid
21808181210	WIL02DA01B	S	Dry Weight/Percent Moisture
21808181210	WIL02DA01B	S	Incremental Sampling Method
21808181213	WIL02DA02A (RE)	S	EPA 8330B Solid
21808181213	WIL02DA02A (RE)	S	EPA 8330B Prep Solid
21808181213	WIL02DA02A (RE)	S	Dry Weight/Percent Moisture
21808181213	WIL02DA02A (RE)	S	Incremental Sampling Method
21808181214	WIL02DA02A MS (RE)	S	EPA 8330B Solid
21808181214	WIL02DA02A MS (RE)	S	EPA 8330B Prep Solid
21808181214	WIL02DA02A MS (RE)	S	Dry Weight/Percent Moisture
21808181214	WIL02DA02A MS (RE)	S	Incremental Sampling Method
21808181215	WIL02DA02A MSD (RE)	S	EPA 8330B Solid
21808181215	WIL02DA02A MSD (RE)	S	EPA 8330B Prep Solid
21808181215	WIL02DA02A MSD (RE)	S	Dry Weight/Percent Moisture
21808181215	WIL02DA02A MSD (RE)	S	Incremental Sampling Method
21808181216	WIL02DA01A (RE)	S	EPA 8330B Solid
21808181216	WIL02DA01A (RE)	S	EPA 8330B Prep Solid
21808181216	WIL02DA01A (RE)	S	Dry Weight/Percent Moisture
21808181216	WIL02DA01A (RE)	S	Incremental Sampling Method
21808181217	WIL02DA01B (RE)	S	EPA 8330B Solid
21808181217	WIL02DA01B (RE)	S	EPA 8330B Prep Solid
21808181217	WIL02DA01B (RE)	S	Dry Weight/Percent Moisture
21808181217	WIL02DA01B (RE)	S	Incremental Sampling Method

Manual Integrations

Manual Integrations for LC and IC (if performed) are documented in the raw data.
No other manual integrations were performed by GCAL.

Summary of Compounds Detected

WIL02DA02A	**Collect Date**	08/16/2018 10:20	**GCAL ID**	21808181206
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	35400	143	287	574	ug/Kg
7439-92-1	Lead	18900	143	287	574	ug/Kg
7440-66-6	Zinc	101000	2870	5740	11500	ug/Kg

WIL02DA01A	**Collect Date**	08/16/2018 09:30	**GCAL ID**	21808181209
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	39300	122	245	490	ug/Kg
7439-92-1	Lead	17600	122	245	490	ug/Kg
7440-66-6	Zinc	98900	2450	4900	9790	ug/Kg

WIL02DA01B	**Collect Date**	08/16/2018 09:35	**GCAL ID**	21808181210
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	38400	134	268	535	ug/Kg
7439-92-1	Lead	17300	134	268	535	ug/Kg
7440-66-6	Zinc	98500	2680	5350	10700	ug/Kg

Metals

Form I

Sample Results

I

INORGANIC ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA02A
Collect Date:	08/16/18 Time: 1020	GCAL Sample ID:	21808181206
Matrix:	Solid % Solids: 69.73	Instrument ID:	ICPMS2
Sample Amt:	1.25 g	Lab File ID:	2180820B_MS2.b\121277SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/20/18	Analysis Date:	08/20/18 Time: 1802
Prep Batch:	642222	Analytical Batch:	642309
Prep Method:	3050B	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	574	ug/kg	U	287	574	1150
Copper	35400	ug/kg		143	287	574
Lead	18900	ug/kg		143	287	574
Zinc	101000	ug/kg		2870	5740	11500

FORM I - IN

Reference Sample Report

Sample Name	21808181206
File Name	121277SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
Acq Time	08/20/2018 18:02:53
Sample Type	AllRef
Total Dilution	400.0000
Comment	ICPMS-2,LWZ
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fial	Fail
ISTD QC Pass/Fail	Pass

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Conc. RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	10929.818	4.24	704432.96	500	
Be	9	45	No Gas	559.805	2.04	9729.81	1000	
B	11	45	No Gas	4693.844	2.32	53073.77	500	
Sr	88	72	No Gas	64352.924	0.56	5594090.33	1000	
Zr	90	72	No Gas	9726.676	0.30	529627.96	100	
Mo	95	115	No Gas	559.758	1.48	8758.33	1000	
Ag	107	115	No Gas	107.349	3.15	3901.69	100	
Cd	111	115	No Gas	347.467	4.91	2560.26	1000	
Sb	121	115	No Gas	23.108	8.89	1068.94	1000	
Ba	137	115	No Gas	85870.798	2.01	879172.05	1000	
Tl	205	209	No Gas	170.134	4.16	5147.85	100	
Pb	208	209	No Gas	13194.529	3.47	525461.62	1000	
Na	23	45	He	618361.281	1.33	620900.77	100000	
Mg	24	45	He	8550466.087	0.47	3248347.45	100000	
Al	27	45	He	8212615.683	1.40	708580.12	20000	>LDR
Si	29	45	He	-4021080.278	N/A	7699.50	10000	
K	39	45	He	1190000.073	1.33	399355.03	100000	
Ca	44	45	He	18711655.039	0.74	266578.77	500000	
Ti	47	45	He	108872.349	3.08	15394.94	1000	
V	51	72	He	25445.082	0.86	151189.50	1000	
Cr	52	72	He	18300.273	2.13	146396.46	1000	
Mn	55	72	He	501638.946	1.60	1347168.49	5000	
Fe	57	72	He	19174091.600	1.68	2490245.54	100000	
Co	59	72	He	10015.030	1.05	132199.63	1000	
Ni	60	72	He	31720.683	1.97	116896.48	2000	
Cu	63	45	He	24704.553	2.03	255837.10	1000	
Zn	66	72	He	70388.094	2.68	100721.99	20000	
As	75	72	He	4482.708	2.96	6709.56	1000	
Se	78	72	He	-54.069	N/A	3.67	50	
Sn	120	115	He	153.370	6.90	818.92	1000	

QC ISTD Table

Reference Sample Report

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	5887648.10	2.35	5538601.16666667	106.3	70	120	
Ge	72	No Gas	1139527.53	1.97	1156430.33666667	98.54	70	120	
Rh	103	No Gas	5367589.93	2.86	5515557.00333333	97.32	70	120	
In	115	No Gas	5108071.58	3.87	5237310.61666667	97.53	70	120	
Tb	159	No Gas	4801187.53	5.69	4855676.28	98.88	70	120	
Lu	175	No Gas	3987410.46	6.52	4014375.88	99.33	70	120	
Bi	209	No Gas	2149994.66	4.69	2336732.1	92.01	70	120	
Sc	45	He	103151.84	0.24	98241.74	105	70	120	
Ge	72	He	80857.85	1.11	76690.4733333333	105.43	70	120	
Rh	103	He	2238853.31	2.09	2150131.65	104.13	70	120	
In	115	He	550631.30	1.84	527518.896666667	104.38	70	120	
Tb	159	He	1847048.77	1.99	1707326.38	108.18	70	120	
Lu	175	He	888406.05	1.68	811094.676666667	109.53	70	120	
Bi	209	He	1137069.49	1.78	1066636.57333333	106.6	70	120	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA02A MS
Collect Date:	08/16/18 Time: 1020	GCAL Sample ID:	21808181207
Matrix:	Solid % Solids: 69.73	Instrument ID:	ICPMS2
Sample Amt:	1.25 g	Lab File ID:	2180820B_MS2.b\121278SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/20/18	Analysis Date:	08/20/18 Time: 1806
Prep Batch:	642222	Analytical Batch:	642309
Prep Method:	3050B	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	373	ug/kg	J	287	574	1150
Copper	36500	ug/kg		143	287	574
Lead	20800	ug/kg		143	287	574
Zinc	157000	ug/kg		2870	5740	11500

FORM I - IN

MS Report

Sample Name	21808181207	**Total Dilution**	400.0000
File Name	121278SMPL.d	**Comment**	ICPMS-2,LWZ
Data Path Name	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b	**ISTD Ref FileName**	004CALB.d
Acq Time	08/20/2018 18:06:26	**Sample QC Pass/Fail**	Fail
Sample Type	MSSOIL	**ISTD QC Pass/Fail**	Pass

Analyte Table **Units : ppb**

Name	Mass	ISTD	Mode	MeasValue	FinalConc	RSD	CPS	Ref Conc	%Rec	QC Flag
Ag	107	115	No Gas	5.1079497138122	2043.180	2.52	77285.80	107.34924689546	96.791531931471	
Al	27	45	He	25413.5952776646	10165438.111	0.32	875028.27	8212615.68334169	4882.05606931038	> +/- 20%
As	75	72	He	16.4233398768094	6569.336	1.36	9757.61	4482.70759595941	104.331417738217	
B	11	45	No Gas	29.4402172521193	11776.087	1.57	132225.82	4693.84359560944	70.8224330523827	> +/- 20%
Ba	137	115	No Gas	239.818936830924	95927.575	4.25	1031288.81	85870.7981662877	502.838828304099	> +/- 20%
Be	9	45	No Gas	5.77937674141217	2311.751	0.92	41115.21	559.805428520991	87.5972634021939	
Ca	44	45	He	57926.0989231572	23170439.569	0.57	329256.70	18711655.0391349	445.878453012797	> +/- 20%
Cd	111	115	No Gas	5.93310879839171	2373.244	5.02	18263.11	347.467290630142	101.288811436327	
Co	59	72	He	29.5884815564623	11835.393	0.35	155187.06	10015.0295292001	91.018154669242	
Cr	52	72	He	56.5638885209394	22625.555	1.29	178879.53	18300.2733047808	216.264105179745	> +/- 20%
Cu	63	45	He	63.6487997650014	25459.520	0.70	262984.38	24704.5526168409	37.7483644579816	> +/- 20%
Fe	57	72	He	50211.3589262181	20084543.570	0.41	2591339.80	19174091.6000272	455.225985229997	> +/- 20%
K	39	45	He	3693.34273982749	1477337.096	1.43	491013.62	1190000.07344861	143.668511241192	> +/- 20%
Li	7	45	No Gas	50.6577432876475	20263.097	1.47	1172393.08	10929.8181666582	93.3327914840082	
Mg	24	45	He	24806.4573018481	9922582.921	0.67	3760847.97	8550466.08692482	686.058416907211	> +/- 20%
Mn	55	72	He	1291.33144792202	516532.579	0.37	1378130.67	501638.945537025	744.681681589107	> +/- 20%
Mo	95	115	No Gas	4.84975347828302	1939.901	1.42	31605.01	559.757621956039	69.0071884678584	> +/- 20%
Na	23	45	He	2000.28466905963	800113.868	0.97	798735.41	618361.280647623	90.876293488115	
Ni	60	72	He	88.3410132924091	35336.405	1.27	129335.89	31720.6827319512	90.3930646253114	
Pb	208	209	No Gas	36.3401053770172	14536.042	1.72	630456.53	13194.529123053	67.0756513876931	> +/- 20%
Sb	121	115	No Gas	0.650520410510535	260.208	3.52	8583.92	23.1075009808051	5.92751658058522	> +/- 20%
Se	78	72	He	0.791803156020914	316.721	4.30	27.44	-54.0688207849445	92.6975207983276	
Si	29	45	He	-7714.19287647334	-3085677.151	6.34	10476.62	-4021080.2775223	467.701563466481	> +/- 20%
Sn	120	115	He	0.794595000558526	317.838	7.96	1522.32	153.370279912627	8.22338601553917	> +/- 20%
Sr	88	72	No Gas	174.294736535695	69717.895	2.78	6269039.28	64352.9235346444	268.248553981681	> +/- 20%
Ti	47	45	He	356.559365307653	142623.746	2.35	20119.98	108872.348519088	1687.56988019867	> +/- 20%
Tl	205	209	No Gas	5.42707586514191	2170.830	3.48	69865.61	170.13368758473	100.034832923602	
V	51	72	He	79.0596403574903	31623.856	0.13	186633.82	25445.0815680551	308.938728747051	> +/- 20%
Zn	66	72	He	273.720712727618	109488.285	0.86	155543.18	70388.0940061886	97.7504777121462	
Zr	90	72	No Gas	29.9304645484637	11972.186	2.50	674173.51	9726.67610058559	561.37742969997	> +/- 20%

QC ISTD Table **Recovery Limits: 70 - 120%**

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1151781.29	1066636.57333333	107.98	
Ge	72	He	80322.77	76690.4733333333	104.74	
In	115	He	545569.26	527518.896666667	103.42	

MS Report

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Lu	175	He	891870.82	811094.676666667	109.96	
Rh	103	He	2245530.33	2150131.65	104.44	
Sc	45	He	102912.57	98241.74	104.75	
Tb	159	He	1855825.75	1707326.38	108.7	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2341395.59	2336732.1	100.2	
Ge	72	No Gas	1178568.98	1156430.33666667	101.91	
In	115	No Gas	5359882.95	5237310.61666667	102.34	
Lu	175	No Gas	4289969.52	4014375.88	106.87	
Rh	103	No Gas	5565454.08	5515557.00333333	100.9	
Sc	45	No Gas	6053644.34	5538601.16666667	109.3	
Tb	159	No Gas	5216948.47	4855676.28	107.44	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA02A MSD
Collect Date:	08/16/18 Time: 1020	GCAL Sample ID:	21808181208
Matrix:	Solid % Solids: 69.73	Instrument ID:	ICPMS2
Sample Amt:	1.25 g	Lab File ID:	2180820B_MS2.b\121279SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/20/18	Analysis Date:	08/20/18 Time: 1810
Prep Batch:	642222	Analytical Batch:	642309
Prep Method:	3050B	Analytical Method:	EPA 6020B

ANALYTE	RESULT	UNITS	Q	DL	LOD	LOQ
Antimony	314	ug/kg	J	287	574	1150
Copper	42100	ug/kg		143	287	574
Lead	23000	ug/kg		143	287	574
Zinc	170000	ug/kg		2870	5740	11500

Matrix Spike Duplicate (MSD) Sample Report

Sample Name	21808181208	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121279SMPL.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:10:00	**Total Dilution**	400.0000
Sample Type	MSDSOIL	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

RPD Limits: 0-20%

Name	Mass	Mode	MeasValue	Final Conc	RSD	CPS	RefConc	RPD	Flag
Li	7	No Gas	53.8032327120765	21521.293	1.95	1236668.99	50.6577432876475	6.02	
Be	9	No Gas	6.08785890383959	2435.144	2.15	43442.95	5.77937674141217	5.2	
B	11	No Gas	29.176030549009	11670.412	1.53	131468.12	29.4402172521193	0.9	
Sr	88	No Gas	181.463322051083	72585.329	2.08	6471733.65	174.294736535695	4.03	
Zr	90	No Gas	31.6361403582536	12654.456	2.73	706597.21	29.9304645484637	5.54	
Mo	95	No Gas	4.85958058407923	1943.832	0.96	31645.15	4.84975347828302	0.2	
Ag	107	No Gas	5.40439854223378	2161.759	2.88	81696.12	5.1079497138122	5.64	
Cd	111	No Gas	6.30408469633147	2521.634	3.27	19390.17	5.93310879839171	6.06	
Sb	121	No Gas	0.546867646142975	218.747	3.97	7273.14	0.650520410510535	17.31	
Ba	137	No Gas	244.323033403093	97729.213	2.25	1049689.85	239.818936830924	1.86	
Tl	205	No Gas	5.50162363470284	2200.649	3.33	71001.80	5.42707586514191	1.36	
Pb	208	No Gas	40.0365170601902	16014.607	0.50	696310.34	36.3401053770172	9.68	
Na	23	He	2154.24713231821	861698.853	0.75	865005.59	2000.28466905963	7.41	
Mg	24	He	24397.251950288	9758900.780	0.33	3722648.80	24806.4573018481	1.66	
Al	27	He	26323.9292783814	10529571.711	0.13	912194.23	25413.5952776646	3.52	
Si	29	He	-9978.95635782154	-3991582.543	6.24	7822.18	-7714.19287647334	-25.6	
K	39	He	3653.9913923518	1461596.557	0.44	489054.79	3693.34273982749	1.07	
Ca	44	He	53159.2922280078	21263716.891	0.84	304140.37	57926.0989231572	8.58	
Ti	47	He	343.41086178302	137364.345	1.71	19501.51	356.559365307653	3.76	
V	51	He	82.7952084437483	33118.083	1.65	198406.35	79.0596403574903	4.62	
Cr	52	He	59.7600406784108	23904.016	1.66	191618.56	56.5638885209394	5.5	
Mn	55	He	1285.64456460306	514257.826	0.60	1392518.80	1291.33144792202	0.44	
Fe	57	He	53279.9145026885	21311965.801	0.86	2790727.56	50211.3589262181	5.93	
Co	59	He	32.412349609115	12964.940	0.24	172528.30	29.5884815564623	9.11	
Ni	60	He	95.3593194138657	38143.728	0.50	141667.67	88.3410132924091	7.64	
Cu	63	He	73.3535127591906	29341.405	1.58	304675.91	63.6487997650014	14.17	
Zn	66	He	296.482696521279	118593.079	1.75	170980.23	273.720712727618	7.98	
As	75	He	17.43017664611	6972.071	1.22	10509.46	16.4233398768094	5.95	
Se	78	He	0.76291928038268	305.168	4.89	27.07	0.791803156020914	3.72	
Sn	120	He	0.737234685655084	294.894	2.24	1457.87	0.794595000558526	7.49	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1187849.49	1066636.57333333	111.36	
Ge	72	He	81548.36	76690.4733333333	106.33	
In	115	He	558653.14	527518.896666667	105.9	
Lu	175	He	915956.26	811094.676666667	112.93	
Rh	103	He	2243393.04	2150131.65	104.34	
Sc	45	He	103576.66	98241.74	105.43	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2347806.47	2336732.1	100.47	
Ge	72	No Gas	1168662.28	1156430.33666667	101.06	
In	115	No Gas	5357970.80	5237310.61666667	102.3	
Lu	175	No Gas	4250438.06	4014375.88	105.88	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1885854.40	1707326.38	110.46	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5519425.75	5515557.00333333	100.07	
Sc	45	No Gas	6071891.01	5538601.16666667	109.63	
Tb	159	No Gas	5096416.28	4855676.28	104.96	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA01A
Collect Date:	08/16/18 Time: 0930	GCAL Sample ID:	21808181209
Matrix:	Solid % Solids: 70.44	Instrument ID:	ICPMS2
Sample Amt:	1.45 g	Lab File ID:	2180820B_MS2.b\121282SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/20/18	Analysis Date:	08/20/18 Time: 1820
Prep Batch:	642222	Analytical Batch:	642309
Prep Method:	3050B	Analytical Method:	EPA 6020B

ANALYTE	RESULT	UNITS	Q	DL	LOD	LOQ
Antimony	490	ug/kg	U	245	490	979
Copper	39300	ug/kg		122	245	490
Lead	17600	ug/kg		122	245	490
Zinc	98900	ug/kg		2450	4900	9790

FORM I - IN

Sample Report

Sample Name	21808181209	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121282SMPL.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:20:39	**Total Dilution**	344.8276
Sample Type	Sample	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	31.4740704873253	10853.128	1.27	807962.18	500	
Be	9	45	No Gas	1.46752248071197	506.042	1.87	10539.01	1000	
B	11	45	No Gas	9.50568149759774	3277.821	1.37	45010.78	500	
Sr	88	72	No Gas	188.415410449911	64970.831	3.30	6878209.27	1000	
Zr	90	72	No Gas	30.5176977803611	10523.344	3.60	697723.29	100	
Mo	95	115	No Gas	1.63021387047199	562.143	6.35	11094.45	1000	
Ag	107	115	No Gas	0.355382199887299	122.546	2.87	5611.16	100	
Cd	111	115	No Gas	0.984719496485308	339.558	6.65	3159.28	1000	
Sb	121	115	No Gas	0.162301293287703	55.966	8.40	2530.26	1000	
Ba	137	115	No Gas	242.671165390071	83679.712	2.57	1081939.16	1000	
Tl	205	209	No Gas	0.444474428744863	153.267	3.72	6094.97	100	
Pb	208	209	No Gas	35.86942975576	12368.769	3.19	648736.45	1000	
Na	23	45	He	1674.81277593384	577521.647	0.47	679771.60	100000	
Mg	24	45	He	24098.126750308	8309698.879	0.26	3705058.38	100000	
Al	27	45	He	21991.3980226581	7583240.697	0.61	767917.50	20000	>LDR
Si	29	45	He	-11179.0110505735	-3854831.397	5.54	6426.86	10000	
K	39	45	He	2970.58014897832	1024337.982	0.84	403480.01	100000	
Ca	44	45	He	51370.9682342797	17714126.977	0.47	296161.68	500000	
Ti	47	45	He	297.795356270465	102688.054	0.39	17042.31	1000	
V	51	72	He	74.0910647695452	25548.643	1.54	176954.75	1000	
Cr	52	72	He	52.7618942581377	18193.757	0.73	169058.01	1000	
Mn	55	72	He	1440.46266276822	496711.263	0.88	1554941.47	5000	
Fe	57	72	He	54217.6660048708	18695746.898	0.59	2830356.73	100000	
Co	59	72	He	29.6916571707033	10238.502	1.07	157545.80	1000	
Ni	60	72	He	96.783466305607	33373.609	0.81	143308.00	2000	
Cu	63	45	He	80.221866777819	27662.713	0.77	335556.06	1000	
Zn	66	72	He	202.05758783945	69675.030	0.31	116210.89	20000	
As	75	72	He	13.511652378221	4659.190	1.99	8126.61	1000	
Se	78	72	He	-0.0207323639190792	-7.149	108.96	6.55	50	
Sn	120	115	He	0.337338408666364	116.324	3.72	745.58	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1192697.35	1066636.57333333	111.82	
Ge	72	He	81262.28	76690.4733333333	105.96	
In	115	He	556168.37	527518.896666667	105.43	
Lu	175	He	914479.02	811094.676666667	112.75	
Rh	103	He	2243706.93	2150131.65	104.35	
Sc	45	He	104366.99	98241.74	106.23	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2441252.67	2336732.1	104.47	
Ge	72	No Gas	1196142.73	1156430.33666667	103.43	
In	115	No Gas	5560312.04	5237310.61666667	106.17	
Lu	175	No Gas	4421935.46	4014375.88	110.15	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1873111.12	1707326.38	109.71	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5629877.00	5515557.00333333	102.07	
Sc	45	No Gas	6081567.95	5538601.16666667	109.8	
Tb	159	No Gas	5253001.90	4855676.28	108.18	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA01B
Collect Date:	08/16/18 Time: 0935	GCAL Sample ID:	21808181210
Matrix:	Solid % Solids: 70.26	Instrument ID:	ICPMS2
Sample Amt:	1.33 g	Lab File ID:	2180820B_MS2.b\121283SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/20/18	Analysis Date:	08/20/18 Time: 1824
Prep Batch:	642222	Analytical Batch:	642309
Prep Method:	3050B	Analytical Method:	EPA 6020B

ANALYTE	RESULT	UNITS	Q	DL	LOD	LOQ
Antimony	535	ug/kg	U	268	535	1070
Copper	38400	ug/kg		134	268	535
Lead	17300	ug/kg		134	268	535
Zinc	98500	ug/kg		2680	5350	10700

FORM I - IN

Sample Report

Sample Name	21808181210	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121283SMPL.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:24:13	**Total Dilution**	375.9398
Sample Type	Sample	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	30.1758000822208	11344.286	1.15	768307.02	500	
Be	9	45	No Gas	1.36484408165499	513.099	2.50	9624.42	1000	
B	11	45	No Gas	7.59068996297332	2853.643	0.30	35893.25	500	
Sr	88	72	No Gas	165.483309272039	62211.770	1.97	5939856.37	1000	
Zr	90	72	No Gas	25.2420068060116	9489.476	1.32	567475.06	100	
Mo	95	115	No Gas	1.28228470098374	482.062	1.08	8611.58	1000	
Ag	107	115	No Gas	0.311412730566944	117.072	4.95	4848.65	100	
Cd	111	115	No Gas	0.825520879136876	310.346	5.81	2610.27	1000	
Sb	121	115	No Gas	0.0863957301539288	32.480	7.53	1511.21	1000	
Ba	137	115	No Gas	199.457520221799	74984.030	2.33	875981.48	1000	
Tl	205	209	No Gas	0.398247910359317	149.717	3.92	5317.91	100	
Pb	208	209	No Gas	32.3107684657159	12146.905	1.39	566536.54	1000	
Na	23	45	He	1511.78346605179	568339.649	0.89	616323.11	100000	
Mg	24	45	He	21027.2102947576	7904966.276	0.42	3242176.72	100000	
Al	27	45	He	20525.299372435	7716277.960	0.13	718755.89	20000	>LDR
Si	29	45	He	-11308.5280637945	-4251326.340	12.38	6292.83	10000	
K	39	45	He	2698.42605852254	1014445.887	0.67	368968.05	100000	
Ca	44	45	He	45118.4790560507	16961834.232	0.52	260892.73	500000	
Ti	47	45	He	264.065403150143	99272.708	3.38	15156.89	1000	
V	51	72	He	66.5922018734459	25034.662	0.40	162600.94	1000	
Cr	52	72	He	48.0421804198204	18060.970	0.84	157738.16	1000	
Mn	55	72	He	1033.72977291321	388620.215	1.01	1141245.61	5000	
Fe	57	72	He	48251.1510116583	18139530.456	1.51	2576201.26	100000	
Co	59	72	He	26.2472045132646	9867.370	0.93	142394.98	1000	
Ni	60	72	He	84.4016744915181	31729.953	1.08	127803.19	2000	
Cu	63	45	He	71.7729185617433	26982.300	0.23	301305.45	1000	
Zn	66	72	He	184.163991262893	69234.583	1.90	108346.78	20000	
As	75	72	He	11.3602921360325	4270.787	0.66	6988.69	1000	
Se	78	72	He	-0.152421561402694	-57.301	58.59	3.29	50	
Sn	120	115	He	0.46646197663206	175.362	7.31	1006.73	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1228625.84	1066636.57333333	115.19	
Ge	72	He	83111.22	76690.4733333333	108.37	
In	115	He	574839.66	527518.896666667	108.97	
Lu	175	He	943459.05	811094.676666667	116.32	
Rh	103	He	2311688.10	2150131.65	107.51	
Sc	45	He	104669.08	98241.74	106.54	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2366368.77	2336732.1	101.27	
Ge	72	No Gas	1176323.74	1156430.33666667	101.72	
In	115	No Gas	5475504.73	5237310.61666667	104.55	
Lu	175	No Gas	4323638.58	4014375.88	107.7	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1945717.42	1707326.38	113.96	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5563866.17	5515557.00333333	100.88	
Sc	45	No Gas	5968519.62	5538601.16666667	107.76	
Tb	159	No Gas	5198973.98	4855676.28	107.07	

Metals

Form II

Calibration Verifications

II

INITIAL CALIBRATION VERIFICATION (ICV) STANDARD

Report No:	218081812	GCAL QC ID:	1600
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\009_ICV.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1046	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	50.0	52.2	104		ug/L
Copper	50.0	50.1	100		ug/L
Lead	50.0	48.8	98		ug/L
Zinc	1000	994	99		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	1600	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	009_ICV.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 10:46:39	**Total Dilution**	1.0000
Sample Type	ICV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	247.402	247.402	1.1	8815087.16	250	
Be	9	45	No Gas	49.78	49.780	1.0	322157.92	50	
B	11	45	No Gas	279.21	279.210	2.2	1211518.06	250	> +/- 10%
Sr	88	103	No Gas	47.888	47.888	1.1	1022588.11	50	
Zr	90	72	No Gas	46.463	46.463	1.5	665704.94	50	
Mo	95	115	No Gas	48.647	48.647	1.5	201836.96	50	
Ag	107	115	No Gas	48.288	48.288	0.8	497854.04	50	
Cd	111	115	No Gas	49.934	49.934	1.1	107485.09	50	
Sb	121	115	No Gas	52.168	52.168	0.2	427255.89	50	
Ba	137	115	No Gas	48.382	48.382	0.9	144095.13	50	
Tl	205	175	No Gas	48.799	48.799	0.7	992417.70	50	
Pb	208	209	No Gas	48.847	48.847	1.7	1396128.61	50	
Na	23	45	He	5134.194	5134.194	0.8	2405597.93	5000	
Mg	24	45	He	4988.104	4988.104	0.4	1129936.52	5000	
Al	27	45	He	1017.801	1017.801	0.6	68839.39	1000	
Si	29	45	He	5518.831	5518.831	2.0	9964.32	5000	> +/- 10%
K	39	45	He	5005.502	5005.502	0.3	493957.23	5000	
Ca	44	45	He	24889.549	24889.549	1.0	140928.62	25000	
Ti	47	45	He	48.959	48.959	2.5	2228.16	50	
V	51	72	He	49.376	49.376	0.5	80163.05	50	
Cr	52	72	He	49.88	49.880	0.3	105475.13	50	
Mn	55	45	He	50.92	50.920	0.5	50357.45	50	
Fe	57	72	He	4925.472	4925.472	0.9	211510.25	5000	
Co	59	72	He	49.561	49.561	0.8	172598.90	50	
Ni	60	72	He	100.253	100.253	0.3	95697.20	100	
Cu	63	103	He	50.064	50.064	0.9	133000.73	50	
Zn	66	103	He	994.407	994.407	0.2	331188.70	1000	
As	75	72	He	49.823	49.823	0.4	13473.70	50	
Se	78	72	He	24.46	24.460	1.5	553.77	25	
Sn	120	115	He	49.403	49.403	0.9	70873.77	50	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1453191.75	1548427.37333333	93.85	
Ge	72	He	44107.28	44394.6333333333	99.35	
In	115	He	392990.71	404099.316666667	97.25	
Lu	175	He	1169784.15	1190023.24	98.3	
Rh	103	He	1511697.82	1573916.12	96.05	
Sc	45	He	75769.74	75790.99	99.97	
Tb	159	He	1995773.36	2036132.52	98.02	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3390327.14	3602753.49	94.1	
Ge	72	No Gas	554437.57	552452.773333333	100.36	
In	115	No Gas	3690873.86	3822230.42333333	96.56	
Lu	175	No Gas	5424220.33	5635183.66666667	96.26	
Rh	103	No Gas	3549489.51	3660203.32666667	96.98	
Sc	45	No Gas	2974970.30	3019672.93666667	98.52	
Tb	159	No Gas	5448510.54	5550323.25333333	98.17	

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION (LLCCV) STANDARD

Report No:	218081812	GCAL QC ID:	1803
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\014CCV1.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1108	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	2.00	2.07	103		ug/L
Copper	1.00	0.810	81		ug/L
Lead	1.00	0.980	98		ug/L
Zinc	20.0	20.8	104		ug/L

CONTROL LIMITS 80-120%

FORM II - IN

Sample Report

Sample Name	1803	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	014CCV1.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:08:36	**Total Dilution**	1.0000
Sample Type	LLCCV1	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	5.001	5.001	2.7	488000.58	5	
Be	9	45	No Gas	1.015	1.015	3.0	6704.68	1	
B	11	45	No Gas	11.29	11.290	2.7	54417.89	10	
Sr	88	103	No Gas	0.939	0.939	1.8	21258.01	1	
Zr	90	72	No Gas	0.851	0.851	4.0	12732.89	1	
Mo	95	115	No Gas	0.961	0.961	1.4	4320.64	1	
Ag	107	115	No Gas	0.987	0.987	1.7	10540.24	1	
Cd	111	115	No Gas	0.984	0.984	4.8	2199.83	1	
Sb	121	115	No Gas	2.067	2.067	3.0	18032.65	2	
Ba	137	115	No Gas	1.02	1.020	6.2	3182.59	1	
Tl	205	175	No Gas	0.927	0.927	2.8	20990.47	1	
Pb	208	209	No Gas	0.978	0.978	2.1	29836.05	1	
Na	23	45	He	98.645	98.645	2.2	51492.46	100	
Mg	24	45	He	101.009	101.009	0.9	24201.36	100	
Al	27	45	He	21.108	21.108	3.5	1532.08	20	
Si	29	45	He	189.752	189.752	2.6	1333.40	200	
K	39	45	He	99.977	99.977	4.2	12955.51	100	
Ca	44	45	He	503.55	503.550	3.5	3115.35	500	
Ti	47	45	He	0.934	0.934	18.0	48.00	1	
V	51	72	He	0.992	0.992	8.6	1720.11	1	
Cr	52	72	He	0.979	0.979	3.5	2226.84	1	
Mn	55	45	He	5.087	5.087	6.4	5332.04	5	
Fe	57	72	He	102.171	102.171	3.6	4600.80	100	
Co	59	72	He	1.027	1.027	2.2	3737.13	1	
Ni	60	72	He	2.017	2.017	1.9	2016.82	2	
Cu	63	103	He	0.809	0.809	1.7	3021.42	1	
Zn	66	103	He	20.753	20.753	2.1	7495.13	20	
As	75	72	He	0.965	0.965	3.8	280.50	1	
Se	78	72	He	1.037	1.037	8.5	26.00	1	
Sn	120	115	He	1.016	1.016	5.7	1742.34	1	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1570639.45	1548427.37333333	101.43	
Ge	72	He	45912.09	44394.6333333333	103.42	
In	115	He	415982.10	404099.316666667	102.94	
Lu	175	He	1282720.92	1190023.24	107.79	
Rh	103	He	1625353.23	1573916.12	103.27	
Sc	45	He	79997.23	75790.99	105.55	
Tb	159	He	2066878.20	2036132.52	101.51	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3547350.57	3602753.49	98.46	
Ge	72	No Gas	563816.40	552452.773333333	102.06	
In	115	No Gas	3817505.38	3822230.42333333	99.88	
Lu	175	No Gas	5479182.42	5635183.66666667	97.23	
Rh	103	No Gas	3711721.93	3660203.32666667	101.41	
Sc	45	No Gas	3029225.71	3019672.93666667	100.32	
Tb	159	No Gas	5463535.13	5550323.25333333	98.44	

II

LINEAR DYNAMIC RANGE (LDR) STANDARD

Report No:	218081812	GCAL QC ID:	2500
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\017_QC1.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1121	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	1000	901	90		ug/L
Copper	1000	1030	103		ug/L
Lead	1000	928	93		ug/L
Zinc	20000	18500	93		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	LDR	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	017_QC1.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:21:48	**Total Dilution**	1.0000
Sample Type	QC1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Be	9	45	No Gas	856.348	856.348	2.7	5449843.50	1000	>= +/- 30%
Sr	88	103	No Gas	978.643	978.643	1.9	18103214.32	1000	
Mo	95	115	No Gas	986.31	986.310	2.4	3633123.05	1000	
Cd	111	115	No Gas	882.74	882.740	2.5	1688402.67	1000	>= +/- 30%
Sb	121	115	No Gas	900.762	900.762	2.7	6548115.02	1000	
Ba	137	115	No Gas	962.312	962.312	2.7	2546253.51	1000	
Tl	205	175	No Gas	870.522	870.522	1.3	16129582.69	1000	>= +/- 30%
Pb	208	209	No Gas	927.747	927.747	1.6	21722449.36	1000	
Na	23	45	He	93271.23	93271.230	1.2	42174303.54	100000	
Mg	24	45	He	91265.999	91265.999	0.6	19972468.45	100000	
Al	27	45	He	19645.073	19645.073	1.7	1283113.13	20000	
K	39	45	He	94344.483	94344.483	0.5	8952268.20	100000	
Ca	44	45	He	487084.264	487084.264	0.4	2662764.65	500000	
Ti	47	45	He	952.57	952.570	0.5	41830.31	1000	
V	51	72	He	1011.471	1011.471	1.2	1524915.77	1000	
Cr	52	72	He	962.669	962.669	0.6	1890207.77	1000	
Mn	55	45	He	4736.488	4736.488	0.4	4523367.04	5000	
Fe	57	72	He	91878.375	91878.375	0.3	3665262.24	100000	
Co	59	72	He	931.604	931.604	0.8	3013916.89	1000	
Ni	60	72	He	1812.018	1812.018	1.0	1606841.95	2000	
Cu	63	103	He	1027.683	1027.683	0.5	2156386.86	1000	
Zn	66	103	He	18544.539	18544.539	0.8	4901153.97	20000	
As	75	72	He	911.128	911.128	0.2	228794.87	1000	
Sn	120	115	He	962.663	962.663	0.1	1225025.61	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag	Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1068627.80	1548427.37333333	69.01	<70%;>120%	Bi	209	No Gas	2779357.15	3602753.49	77.15	
Ge	72	He	40982.28	44394.6333333333	92.31		Ge	72	No Gas	542412.23	552452.773333333	98.18	
In	115	He	349510.98	404099.316666667	86.49		In	115	No Gas	3279823.60	3822230.42333333	85.81	
Lu	175	He	1052346.89	1190023.24	88.43		Lu	175	No Gas	4950253.99	5635183.66666667	87.85	
Rh	103	He	1199769.95	1573916.12	76.23		Rh	103	No Gas	3076186.13	3660203.32666667	84.04	
Sc	45	He	73205.17	75790.99	96.59		Sc	45	No Gas	2926856.06	3019672.93666667	96.93	
Tb	159	He	1762229.56	2036132.52	86.55		Tb	159	No Gas	4975196.70	5550323.25333333	89.64	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081812	GCAL QC ID:	1800
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\024_CCV.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1156	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	20.0	100		ug/L
Copper	10.0	10.1	101		ug/L
Lead	10.0	9.57	96		ug/L
Zinc	200	205	102		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	024_CCV.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:56:16	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	52.822	52.822	1.5	2257327.52	50	
Be	9	45	No Gas	10.077	10.077	2.9	69330.84	10	
B	11	45	No Gas	48.632	48.632	3.6	228357.60	50	
Sr	88	103	No Gas	9.571	9.571	1.6	217744.55	10	
Zr	90	72	No Gas	9.364	9.364	3.4	141886.27	10	
Mo	95	115	No Gas	9.736	9.736	3.1	42557.39	10	
Ag	107	115	No Gas	10.115	10.115	1.4	109464.46	10	
Cd	111	115	No Gas	9.912	9.912	3.0	22402.37	10	
Sb	121	115	No Gas	20.013	20.013	2.2	172363.93	20	
Ba	137	115	No Gas	9.763	9.763	3.0	30548.88	10	
Tl	205	175	No Gas	9.934	9.934	2.0	206908.08	10	
Pb	208	209	No Gas	9.571	9.571	2.8	287462.04	10	
Na	23	45	He	1024.682	1024.682	0.1	502451.67	1000	
Mg	24	45	He	1017.849	1017.849	1.5	240302.87	1000	
Al	27	45	He	207.484	207.484	1.6	14643.71	200	
Si	29	45	He	2183.744	2183.744	1.2	4708.68	2000	
K	39	45	He	1022.723	1022.723	0.4	107199.42	1000	
Ca	44	45	He	5171.1	5171.100	1.3	30593.33	5000	
Ti	47	45	He	10.029	10.029	5.3	478.01	10	
V	51	72	He	9.831	9.831	2.3	16890.95	10	
Cr	52	72	He	9.924	9.924	1.5	22219.44	10	
Mn	55	45	He	51.602	51.602	0.7	53177.29	50	
Fe	57	72	He	1004.777	1004.777	2.4	45590.54	1000	
Co	59	72	He	10.102	10.102	0.1	37158.34	10	
Ni	60	72	He	20.144	20.144	0.5	20314.87	20	
Cu	63	103	He	10.077	10.077	1.0	28928.89	10	
Zn	66	103	He	204.675	204.675	0.7	72277.88	200	
As	75	72	He	9.926	9.926	1.2	2841.91	10	
Se	78	72	He	10.139	10.139	4.5	243.41	10	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1541847.32	1548427.37333333	99.58	
Ge	72	He	46574.03	44394.6333333333	104.91	
In	115	He	417541.78	404099.316666667	103.33	
Lu	175	He	1288249.77	1190023.24	108.25	
Rh	103	He	1602216.50	1573916.12	101.8	
Sc	45	He	78956.68	75790.99	104.18	
Tb	159	He	2059131.74	2036132.52	101.13	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3556874.32	3602753.49	98.73	
Ge	72	No Gas	585161.14	552452.773333333	105.92	
In	115	No Gas	3873596.95	3822230.42333333	101.34	
Lu	175	No Gas	5511143.04	5635183.66666667	97.8	
Rh	103	No Gas	3776917.49	3660203.32666667	103.19	
Sc	45	No Gas	3162783.35	3019672.93666667	104.74	
Tb	159	No Gas	5568278.67	5550323.25333333	100.32	

II

INITIAL CALIBRATION VERIFICATION (ICV) STANDARD

Report No:	218081812	GCAL QC ID:	1600
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\009_ICV.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1324	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	50.0	54.6	109		ug/L
Copper	50.0	52.0	104		ug/L
Lead	50.0	49.3	99		ug/L
Zinc	1000	1010	101		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Initial Calibration Verification (ICV) Report

Sample Name	1600	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	009_ICV.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 13:24:36	**Total Dilution**	1.0000
Sample Type	ICV	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	256.926	0.78	4765977.43	250	102.77	
Be	9	45	No Gas	49.219	0.86	324758.59	50	98.44	
B	11	45	No Gas	271.082	1.34	1107007.04	250	108.43	
Sr	88	72	No Gas	50.148	1.68	1783311.69	50	100.3	
Zr	90	72	No Gas	47.688	1.76	1061488.50	50	95.38	
Mo	95	115	No Gas	49.496	0.19	312468.61	50	98.99	
Ag	107	115	No Gas	49.383	0.99	725534.56	50	98.77	
Cd	111	115	No Gas	50.231	1.35	150059.41	50	100.46	
Sb	121	115	No Gas	54.644	0.42	668635.29	50	109.29	
Ba	137	115	No Gas	50.056	1.63	209213.00	50	100.11	
Tl	205	209	No Gas	49.608	2.31	645282.09	50	99.22	
Pb	208	209	No Gas	49.307	1.87	865907.93	50	98.61	
Na	23	45	He	5124.848	0.41	1890837.42	5000	102.5	
Mg	24	45	He	5028.750	0.89	709685.07	5000	100.58	
Al	27	45	He	1003.098	0.63	32229.86	1000	100.31	
Si	29	45	He	4622.486	2.68	23470.29	5000	92.45	
K	39	45	He	5061.344	0.82	621100.47	5000	101.23	
Ca	44	45	He	24776.384	1.32	131261.23	25000	99.11	
Ti	47	45	He	49.827	1.79	2622.24	50	99.65	
V	51	72	He	50.075	1.06	113788.22	50	100.15	
Cr	52	72	He	50.602	0.93	154367.84	50	101.2	
Mn	55	72	He	50.060	0.98	51576.96	50	100.12	
Fe	57	72	He	5007.359	0.76	249036.05	5000	100.15	
Co	59	72	He	50.141	1.22	253016.33	50	100.28	
Ni	60	72	He	102.414	0.42	144211.51	100	102.41	
Cu	63	45	He	52.025	0.88	200453.65	50	104.05	
Zn	66	72	He	1005.281	1.45	549100.17	1000	100.53	
As	75	72	He	50.941	1.03	29070.59	50	101.88	
Se	78	72	He	24.406	3.38	610.85	25	97.62	
Sn	120	115	He	49.200	1.18	82083.66	50	98.4	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1043952.43	1066636.57333333	97.87	
Ge	72	He	77302.39	76690.4733333333	100.8	
In	115	He	525268.60	527518.896666667	99.57	
Lu	175	He	813263.97	811094.676666667	100.27	
Rh	103	He	2117960.05	2150131.65	98.5	
Sc	45	He	95792.28	98241.74	97.51	
Tb	159	He	1705747.48	1707326.38	99.91	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2370201.32	2336732.1	101.43	
Ge	72	No Gas	1165127.07	1156430.33666667	100.75	
In	115	No Gas	5207853.40	5237310.61666667	99.44	
Lu	175	No Gas	4137358.27	4014375.88	103.06	
Rh	103	No Gas	5465794.51	5515557.00333333	99.1	
Sc	45	No Gas	5622917.41	5538601.16666667	101.52	
Tb	159	No Gas	4994729.09	4855676.28	102.86	

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION (LLCCV) STANDARD

Report No:	218081812	GCAL QC ID:	1803
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121211CCV1.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1353	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	2.00	1.90	95		ug/L
Copper	1.00	1.06	106		ug/L
Lead	1.00	0.990	99		ug/L
Zinc	20.0	21.2	106		ug/L

CONTROL LIMITS 80-120%

FORM II - IN

Low Level Continuing Calibration Verification(LLCCV) Report

Sample Name	1803	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121211CCV1.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 13:53:00	**Total Dilution**	1.0000
Sample Type	LLCCV1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: Initial 6020A DOD 80-120% / 70-130% 6020A and 200.8

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	5.439	0.95	270213.76	5	108.77	
Be	9	45	No Gas	0.988	1.88	6288.66	1	98.82	
B	11	45	No Gas	10.085	1.57	42022.29	10	100.85	
Sr	88	72	No Gas	1.019	0.81	35033.73	1	101.86	
Zr	90	72	No Gas	0.890	2.68	19453.32	1	89.05	
Mo	95	115	No Gas	0.925	1.72	5748.98	1	92.53	
Ag	107	115	No Gas	0.985	1.76	14048.20	1	98.54	
Cd	111	115	No Gas	0.987	5.44	2865.88	1	98.65	
Sb	121	115	No Gas	1.899	2.74	22871.03	2	94.95	
Ba	137	115	No Gas	0.958	3.52	4022.85	1	95.82	
Tl	205	209	No Gas	0.998	4.90	11718.97	1	99.8	
Pb	208	209	No Gas	0.991	2.49	15700.93	1	99.11	
Na	23	45	He	106.118	1.00	46389.03	100	106.12	
Mg	24	45	He	101.882	1.67	14050.43	100	101.88	
Al	27	45	He	20.275	7.00	716.02	20	101.38	
Si	29	45	He	-4123.111	4.97	13351.97	200	-2061.56	> +/- 20%
K	39	45	He	101.003	0.24	25332.28	100	101	
Ca	44	45	He	533.137	0.78	3032.03	500	106.63	
Ti	47	45	He	1.019	8.63	58.33	1	101.91	
V	51	72	He	0.968	3.35	2256.86	1	96.82	
Cr	52	72	He	1.031	3.59	6709.37	1	103.06	
Mn	55	72	He	5.081	3.42	5225.42	5	101.62	
Fe	57	72	He	101.763	1.44	5294.46	100	101.76	
Co	59	72	He	1.036	2.54	5148.73	1	103.6	
Ni	60	72	He	2.116	5.67	3231.50	2	105.81	
Cu	63	45	He	1.062	0.34	5959.05	1	106.24	
Zn	66	72	He	21.208	1.01	11407.93	20	106.04	
As	75	72	He	0.968	4.85	558.01	1	96.76	
Se	78	72	He	0.909	7.23	28.40	1	90.95	
Sn	120	115	He	1.051	3.37	1804.58	1	105.09	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	986680.87	1066636.57333333	92.5	
Ge	72	He	74823.12	76690.4733333333	97.57	
In	115	He	500670.01	527518.896666667	94.91	
Lu	175	He	739148.38	811094.676666667	91.13	
Rh	103	He	2064983.53	2150131.65	96.04	
Sc	45	He	93036.44	98241.74	94.7	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2115284.13	2336732.1	90.52	
Ge	72	No Gas	1111879.71	1156430.33666667	96.15	
In	115	No Gas	5045690.93	5237310.61666667	96.34	
Lu	175	No Gas	3665539.53	4014375.88	91.31	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1582309.71	1707326.38	92.68	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5194770.77	5515557.00333333	94.18	
Sc	45	No Gas	5372612.01	5538601.16666667	97	
Tb	159	No Gas	4456966.08	4855676.28	91.79	

II

LINEAR DYNAMIC RANGE (LDR) STANDARD

Report No:	218081812	GCAL QC ID:	2500
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121214_QC1.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1403	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	1000	924	92		ug/L
Copper	1000	929	93		ug/L
Lead	1000	915	92		ug/L
Zinc	20000	18100	91		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Linear Dynamic Range Check (LDR) Report

Sample Name	LDR	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121214_QC1.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 14:03:43	**Total Dilution**	1.0000
Sample Type	QC1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Be	9	45	No Gas	934.284	0.74	5721924.00	1000	93.43	
Sr	88	72	No Gas	909.183	0.83	31184417.87	1000	90.92	
Mo	95	115	No Gas	960.274	1.93	5813266.57	1000	96.03	
Cd	111	115	No Gas	935.025	4.01	2679848.92	1000	93.5	
Sb	121	115	No Gas	923.672	2.59	10834581.24	1000	92.37	
Ba	137	115	No Gas	917.731	4.23	3677141.24	1000	91.77	
Tl	205	209	No Gas	880.214	4.03	10976977.34	1000	88.02	QC1 Main CR1 Failed
Pb	208	209	No Gas	915.209	5.11	15418017.27	1000	91.52	
Na	23	45	He	93570.457	0.57	36146531.13	100000	93.57	
Mg	24	45	He	92650.428	1.21	13747984.79	100000	92.65	
Al	27	45	He	18993.333	0.35	640098.62	20000	94.97	
K	39	45	He	93812.387	1.04	11847885.66	100000	93.81	
Ca	44	45	He	479352.057	0.63	2664453.61	500000	95.87	
Ti	47	45	He	948.001	0.90	52345.26	1000	94.8	
V	51	72	He	967.389	0.67	2292730.12	1000	96.74	
Cr	52	72	He	946.441	0.15	2943372.87	1000	94.64	
Mn	55	72	He	4813.431	0.51	5160151.74	5000	96.27	
Fe	57	72	He	93477.753	1.02	4846174.72	100000	93.48	
Co	59	72	He	927.664	0.43	4885027.44	1000	92.77	
Ni	60	72	He	1875.984	0.53	2751536.00	2000	93.8	
Cu	63	45	He	928.931	0.78	3726674.57	1000	92.89	
Zn	66	72	He	18115.636	0.65	10328402.09	20000	90.58	
As	75	72	He	964.432	0.45	574155.40	1000	96.44	
Sn	120	115	He	961.181	0.84	1712711.29	1000	96.12	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1193211.15	1066636.57333333	111.87	
Ge	72	He	80694.69	76690.4733333333	105.22	
In	115	He	561815.26	527518.896666667	106.5	
Lu	175	He	969575.04	811094.676666667	119.54	
Rh	103	He	2154535.12	2150131.65	100.2	
Sc	45	He	100726.14	98241.74	102.53	
Tb	159	He	1945703.77	1707326.38	113.96	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2275046.22	2336732.1	97.36	
Ge	72	No Gas	1124466.86	1156430.33666667	97.24	
In	115	No Gas	4995767.19	5237310.61666667	95.39	
Lu	175	No Gas	4113343.58	4014375.88	102.47	
Rh	103	No Gas	5049534.10	5515557.00333333	91.55	
Sc	45	No Gas	5220334.51	5538601.16666667	94.25	
Tb	159	No Gas	4823223.47	4855676.28	99.33	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081812	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121269_CCV.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1734	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	19.9	99		ug/L
Copper	10.0	10.2	102		ug/L
Lead	10.0	9.84	98		ug/L
Zinc	200	201	100		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121269_CCV.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 17:34:28	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	51.297	1.73	1139759.54	50	102.59	
Be	9	45	No Gas	9.498	1.75	64968.81	10	94.98	
B	11	45	No Gas	47.673	0.62	204105.07	50	95.35	
Sr	88	72	No Gas	10.390	3.05	387529.19	10	103.9	
Zr	90	72	No Gas	10.047	2.69	234765.13	10	100.47	
Mo	95	115	No Gas	9.168	1.73	64974.96	10	91.68	
Ag	107	115	No Gas	9.770	2.35	160945.37	10	97.7	
Cd	111	115	No Gas	9.780	2.27	32770.32	10	97.8	
Sb	121	115	No Gas	19.890	2.40	273172.22	20	99.45	
Ba	137	115	No Gas	9.875	3.15	46414.32	10	98.75	
Tl	205	209	No Gas	9.848	3.09	142797.74	10	98.48	
Pb	208	209	No Gas	9.844	3.56	192712.60	10	98.44	
Na	23	45	He	1008.354	0.55	398471.60	1000	100.84	
Mg	24	45	He	1006.685	0.68	149388.29	1000	100.67	
Al	27	45	He	196.571	2.41	6712.86	200	98.29	
Si	29	45	He	-10293.416	8.86	7239.12	2000	-514.67	> +/- 10%
K	39	45	He	982.744	1.27	138591.95	1000	98.27	
Ca	44	45	He	5032.421	1.50	28277.23	5000	100.65	
Ti	47	45	He	9.634	2.05	538.34	10	96.34	
V	51	72	He	9.867	2.40	23841.64	10	98.67	
Cr	52	72	He	9.796	1.65	34920.31	10	97.96	
Mn	55	72	He	49.360	0.80	53815.90	50	98.72	
Fe	57	72	He	985.292	0.76	52200.61	1000	98.53	
Co	59	72	He	10.154	1.24	54287.84	10	101.54	
Ni	60	72	He	20.420	1.16	30735.64	20	102.1	
Cu	63	45	He	10.176	2.23	42978.59	10	101.76	
Zn	66	72	He	200.996	1.77	116366.35	200	100.5	
As	75	72	He	9.773	3.18	5924.22	10	97.73	
Se	78	72	He	9.795	3.74	263.82	10	97.95	
Sn	120	115	He	9.796	3.87	18421.15	10	97.96	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1268887.01	1066636.57333333	118.96	
Ge	72	He	81792.23	76690.4733333333	106.65	
In	115	He	587701.76	527518.896666667	111.41	
Lu	175	He	958420.90	811094.676666667	118.16	
Rh	103	He	2365133.94	2150131.65	110	
Sc	45	He	100680.59	98241.74	102.48	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2639430.84	2336732.1	112.95	
Ge	72	No Gas	1220518.14	1156430.33666667	105.54	
In	115	No Gas	5840318.55	5237310.61666667	111.51	
Lu	175	No Gas	4615056.39	4014375.88	114.96	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1967163.67	1707326.38	115.22	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5951840.04	5515557.00333333	107.91	
Sc	45	No Gas	5823532.96	5538601.16666667	105.14	
Tb	159	No Gas	5536022.00	4855676.28	114.01	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081812	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121287_CCV.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1838	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	19.7	99		ug/L
Copper	10.0	10.4	104		ug/L
Lead	10.0	9.61	96		ug/L
Zinc	200	196	98		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121287_CCV.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:38:23	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	49.300	1.59	1103267.41	50	98.6	
Be	9	45	No Gas	9.282	1.77	63514.05	10	92.82	
B	11	45	No Gas	46.859	1.63	200779.58	50	93.72	
Sr	88	72	No Gas	10.287	1.68	385186.86	10	102.87	
Zr	90	72	No Gas	9.837	1.26	230757.73	10	98.37	
Mo	95	115	No Gas	9.216	1.93	66061.10	10	92.16	
Ag	107	115	No Gas	9.784	0.87	162975.66	10	97.84	
Cd	111	115	No Gas	9.884	0.32	33478.59	10	98.84	
Sb	121	115	No Gas	19.733	3.18	274033.62	20	98.67	
Ba	137	115	No Gas	9.751	0.59	46323.89	10	97.51	
Tl	205	209	No Gas	9.518	1.70	137894.61	10	95.18	
Pb	208	209	No Gas	9.609	2.30	187983.75	10	96.09	
Na	23	45	He	989.961	0.56	387288.04	1000	99	
Mg	24	45	He	983.075	0.72	144368.30	1000	98.31	
Al	27	45	He	192.710	2.59	6511.44	200	96.36	
Si	29	45	He	-11293.154	12.52	5996.57	2000	-564.66	> +/- 10%
K	39	45	He	985.924	0.64	137534.77	1000	98.59	
Ca	44	45	He	4953.722	0.31	27549.14	5000	99.07	
Ti	47	45	He	9.525	4.08	526.68	10	95.25	
V	51	72	He	9.513	1.15	23518.87	10	95.13	
Cr	52	72	He	9.417	3.00	34504.78	10	94.17	
Mn	55	72	He	48.932	0.99	54574.16	50	97.86	
Fe	57	72	He	968.172	0.95	52481.09	1000	96.82	
Co	59	72	He	10.046	1.15	54947.04	10	100.46	
Ni	60	72	He	20.184	1.64	31080.85	20	100.92	
Cu	63	45	He	10.351	0.51	43219.38	10	103.51	
Zn	66	72	He	196.331	0.62	116262.87	200	98.17	
As	75	72	He	9.753	0.94	6046.27	10	97.53	
Se	78	72	He	9.214	1.04	254.23	10	92.14	
Sn	120	115	He	9.728	0.87	18813.83	10	97.28	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1318431.44	1066636.57333333	123.61	<70% or >120%
Ge	72	He	83661.69	76690.4733333333	109.09	
In	115	He	604540.10	527518.896666667	114.6	
Lu	175	He	993753.45	811094.676666667	122.52	<70% or >120%
Rh	103	He	2422889.42	2150131.65	112.69	
Sc	45	He	99642.71	98241.74	101.43	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2639074.18	2336732.1	112.94	
Ge	72	No Gas	1225376.55	1156430.33666667	105.96	
In	115	No Gas	5904818.38	5237310.61666667	112.75	
Lu	175	No Gas	4587923.58	4014375.88	114.29	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	2032804.09	1707326.38	119.06	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	6045851.71	5515557.00333333	109.61	
Sc	45	No Gas	5826106.99	5538601.16666667	105.19	
Tb	159	No Gas	5526344.08	4855676.28	113.81	

Metals

Form III

Blanks

III

INITIAL CALIBRATION BLANK

Report No:	218081812	Blank ID:	1700
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\011_ICB.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1055	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Sample Report

Sample Name	1700	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	011_ICB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 10:55:25	**Total Dilution**	1.0000
Sample Type	ICB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	-0.106	-0.106	3.4	314082.25	2.5	
Be	9	45	No Gas	0.014	0.014	11.4	116.67	0.5	
B	11	45	No Gas	9.117	9.117	8.1	45649.22	5	>LOD
Sr	88	103	No Gas	0.01	0.010	12.4	523.36	0.5	
Zr	90	72	No Gas	0.018	0.018	3.0	621.13	0.5	
Mo	95	115	No Gas	0.018	0.018	4.5	277.78	0.5	
Ag	107	115	No Gas	0.014	0.014	4.3	161.12	0.5	
Cd	111	115	No Gas	0.013	0.013	19.4	39.33	0.5	
Sb	121	115	No Gas	0.162	0.162	4.5	1932.36	1	
Ba	137	115	No Gas	0.008	0.008	13.0	64.44	0.5	
Tl	205	175	No Gas	-0.046	-0.046	5.0	1036.72	0.5	
Pb	208	209	No Gas	0.008	0.008	11.6	820.05	0.5	
Na	23	45	He	0.673	0.673	3.4	3103.75	50	
Mg	24	45	He	0.708	0.708	39.8	216.68	50	
Al	27	45	He	0.609	0.609	24.2	69.33	10	
Si	29	45	He	-27.18	-27.180	8.5	968.04	100	
K	39	45	He	0.306	0.306	6.3	2643.66	50	
Ca	44	45	He	10.018	10.018	30.3	168.34	250	
Ti	47	45	He	0.016	0.016	50.0	4.00	0.5	
V	51	72	He	-0.004	-0.004	22.0	40.00	0.5	
Cr	52	72	He	0.006	0.006	14.2	88.89	0.5	
Mn	55	45	He	0.025	0.025	52.3	51.11	2.5	
Fe	57	72	He	0.317	0.317	20.0	50.00	50	
Co	59	72	He	0.008	0.008	22.4	45.56	0.5	
Ni	60	72	He	0.008	0.008	87.0	21.11	1	
Cu	63	103	He	-0.012	-0.012	12.2	700.03	0.5	
Zn	66	103	He	0.383	0.383	31.1	206.67	10	
As	75	72	He	-0.001	-0.001	33.8	9.00	0.5	
Se	78	72	He	0.023	0.023	50.6	2.24	0.5	
Sn	120	115	He	0.042	0.042	3.2	273.34	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1592771.54	1548427.37333333	102.86	
Ge	72	He	47169.02	44394.6333333333	106.25	
In	115	He	425534.18	404099.316666667	105.3	
Lu	175	He	1317904.17	1190023.24	110.75	
Rh	103	He	1652846.05	1573916.12	105.01	
Sc	45	He	80726.19	75790.99	106.51	
Tb	159	He	2086000.91	2036132.52	102.45	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3550166.72	3602753.49	98.54	
Ge	72	No Gas	569924.77	552452.773333333	103.16	
In	115	No Gas	3843037.97	3822230.42333333	100.54	
Lu	175	No Gas	5507683.04	5635183.66666667	97.74	
Rh	103	No Gas	3738119.16	3660203.32666667	102.13	
Sc	45	No Gas	3077741.27	3019672.93666667	101.92	
Tb	159	No Gas	5540524.50	5550323.25333333	99.82	

III

METHOD BLANK

Report No:	218081812	Blank ID:	MB1840818
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\020SMPL.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1138	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	21.7	ug/kg	J	20.0	40.0	80.0
Copper	13.0	ug/kg	J	10.0	20.0	40.0
Lead	20.0	ug/kg	U	10.0	20.0	40.0
Zinc	518	ug/kg	J	200	400	800

FORM III - IN

Sample Report

Sample Name	1840818	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	020SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:38:42	**Total Dilution**	40.0000
Sample Type	MBSOIL	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	0.29	11.610	1.3	347029.21	2.5	
Be	9	45	No Gas	0.017	0.675	11.8	144.67	0.5	
B	11	45	No Gas	0.905	36.187	8.3	9399.62	5	
Sr	88	103	No Gas	0.582	23.274	18.0	13663.00	0.5	> 1/2 LOQ
Zr	90	72	No Gas	0.084	3.364	10.9	1615.66	0.5	
Mo	95	115	No Gas	0.23	9.195	3.1	1194.50	0.5	
Ag	107	115	No Gas	0.003	0.119	35.4	44.45	0.5	
Cd	111	115	No Gas	0.005	0.205	41.6	21.67	0.5	
Sb	121	115	No Gas	0.542	21.679	3.6	5180.91	1	
Ba	137	115	No Gas	1.176	47.041	5.6	3694.93	0.5	> 1/2 LOQ
Tl	205	175	No Gas	-0.058	-2.332	9.2	778.92	0.5	
Pb	208	209	No Gas	0.118	4.730	11.1	3977.03	0.5	
Na	23	45	He	30.6	1224.009	5.0	19715.55	50	
Mg	24	45	He	19.7	788.014	2.7	5251.03	50	
Al	27	45	He	9.886	395.445	8.3	807.36	10	
Si	29	45	He	71.682	2867.282	7.8	1246.72	100	
K	39	45	He	10.689	427.575	6.3	4080.67	50	
Ca	44	45	He	527.389	21095.563	7.4	3595.46	250	> 1/2 LOQ
Ti	47	45	He	0.626	25.049	17.3	36.67	0.5	> 1/2 LOQ
V	51	72	He	0.004	0.156	38.6	56.67	0.5	
Cr	52	72	He	0.052	2.082	14.8	206.67	0.5	
Mn	55	45	He	5.878	235.123	2.0	6800.37	2.5	> 1/2 LOQ
Fe	57	72	He	8.509	340.379	9.9	456.69	50	
Co	59	72	He	0.036	1.441	13.7	160.00	0.5	
Ni	60	72	He	0.206	8.245	19.8	238.89	1	
Cu	63	103	He	0.326	13.047	9.9	1730.11	0.5	
Zn	66	103	He	12.938	517.513	2.6	4933.01	10	> 1/2 LOQ
As	75	72	He	0.04	1.585	22.0	22.33	0.5	
Se	78	72	He	0.097	3.880	17.6	4.31	0.5	
Sn	120	115	He	0.994	39.762	62.1	1880.12	0.5	> 1/2 LOQ

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1588629.09	1548427.37333333	102.6	
Ge	72	He	50521.10	44394.6333333333	113.8	
In	115	He	456555.14	404099.316666667	112.98	
Lu	175	He	1417734.09	1190023.24	119.13	
Rh	103	He	1706787.95	1573916.12	108.44	
Sc	45	He	88318.62	75790.99	116.53	
Tb	159	He	2210113.14	2036132.52	108.54	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3416720.78	3602753.49	94.84	
Ge	72	No Gas	579408.43	552452.773333333	104.88	
In	115	No Gas	3851703.73	3822230.42333333	100.77	
Lu	175	No Gas	5450114.09	5635183.66666667	96.72	
Rh	103	No Gas	3813191.93	3660203.32666667	104.18	
Sc	45	No Gas	3254543.62	3019672.93666667	107.78	
Tb	159	No Gas	5527723.46	5550323.25333333	99.59	

III

CONTINUING CALIBRATION BLANK

Report No:	218081812	Blank ID:	1900
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\025_CCB.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1200	Analytical Method:	EPA 6020B

ANALYTE	***RESULT***	***UNITS***	***Q***	***DL***	***LOD***	***LOQ***
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Sample Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	025_CCB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 12:00:39	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	0.097	0.097	2.2	333868.77	2.5	
Be	9	45	No Gas	0.004	0.004	25.9	51.33	0.5	
B	11	45	No Gas	1.18	1.180	10.9	10516.96	5	
Sr	88	103	No Gas	0.007	0.007	23.6	476.69	0.5	
Zr	90	72	No Gas	0.008	0.008	4.2	483.35	0.5	
Mo	95	115	No Gas	0.011	0.011	15.2	255.56	0.5	
Ag	107	115	No Gas	0.008	0.008	30.3	104.44	0.5	
Cd	111	115	No Gas	0.007	0.007	7.9	26.33	0.5	
Sb	121	115	No Gas	0.221	0.221	4.7	2508.01	1	
Ba	137	115	No Gas	0.01	0.010	23.0	74.45	0.5	
Tl	205	175	No Gas	-0.069	-0.069	6.6	565.57	0.5	
Pb	208	209	No Gas	0.003	0.003	8.4	676.70	0.5	
Na	23	45	He	0.991	0.991	4.4	3313.81	50	
Mg	24	45	He	0.419	0.419	29.1	150.01	50	
Al	27	45	He	0.563	0.563	27.6	67.33	10	
Si	29	45	He	-16.817	-16.817	2.8	1002.04	100	
K	39	45	He	0.627	0.627	5.1	2720.32	50	
Ca	44	45	He	8.946	8.946	22.9	165.00	250	
Ti	47	45	He	0.076	0.076	28.6	7.00	0.5	
V	51	72	He	-0.002	-0.002	25.4	42.22	0.5	
Cr	52	72	He	-0.007	-0.007	38.9	60.00	0.5	
Mn	55	45	He	0.037	0.037	26.5	64.44	2.5	
Fe	57	72	He	1.549	1.549	35.5	106.67	50	
Co	59	72	He	0.002	0.002	48.2	22.22	0.5	
Ni	60	72	He	0.009	0.009	74.0	22.22	1	
Cu	63	103	He	0.006	0.006	13.6	758.92	0.5	
Zn	66	103	He	0.243	0.243	14.0	156.67	10	
As	75	72	He	-0.001	-0.001	33.3	9.17	0.5	
Se	78	72	He	0.082	0.082	41.0	3.66	0.5	
Sn	120	115	He	0.065	0.065	20.5	311.13	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1582651.38	1548427.37333333	102.21	
Ge	72	He	47202.37	44394.6333333333	106.32	
In	115	He	427451.66	404099.316666667	105.78	
Lu	175	He	1334746.91	1190023.24	112.16	
Rh	103	He	1671437.19	1573916.12	106.2	
Sc	45	He	82039.30	75790.99	108.24	
Tb	159	He	2079710.96	2036132.52	102.14	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3622573.18	3602753.49	100.55	
Ge	72	No Gas	588526.82	552452.773333333	106.53	
In	115	No Gas	3959922.46	3822230.42333333	103.6	
Lu	175	No Gas	5598589.71	5635183.66666667	99.35	
Rh	103	No Gas	3868578.60	3660203.32666667	105.69	
Sc	45	No Gas	3197875.98	3019672.93666667	105.9	
Tb	159	No Gas	5668229.92	5550323.25333333	102.12	

III
INITIAL CALIBRATION BLANK

Report No:	218081812	Blank ID:	1700
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\1211_ICB.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1342	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Initial Calibration Blank (ICB) Report

Sample Name	1700	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	1211_ICB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 13:42:21	**Total Dilution**	1.0000
Sample Type	ICB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	0.238	1.10	182400.02	2.5	
Be	9	45	No Gas	-0.001	19.11	52.67	0.5	
B	11	45	No Gas	0.917	5.75	6364.86	5	
Sr	88	72	No Gas	-0.002	19.51	410.02	0.5	
Zr	90	72	No Gas	0.008	10.04	704.47	0.5	
Mo	95	115	No Gas	0.002	23.38	108.89	0.5	
Ag	107	115	No Gas	0.001	15.23	45.55	0.5	
Cd	111	115	No Gas	0.001	20.01	16.67	0.5	
Sb	121	115	No Gas	0.035	5.98	786.70	1	
Ba	137	115	No Gas	-0.021	22.04	61.11	0.5	
Tl	205	209	No Gas	-0.002	19.80	116.67	0.5	
Pb	208	209	No Gas	0.002	20.83	220.00	0.5	
Na	23	45	He	0.557	1.29	8832.88	50	
Mg	24	45	He	0.176	8.33	120.00	50	
Al	27	45	He	-0.911	36.05	56.67	10	
Si	29	45	He	-3222.379	4.70	14473.01	100	
K	39	45	He	-2.542	2.22	13413.03	50	
Ca	44	45	He	-4.031	15.28	278.34	250	
Ti	47	45	He	0.012	42.86	7.00	0.5	
V	51	72	He	-0.003	23.09	121.11	0.5	
Cr	52	72	He	-0.003	5.53	3726.06	0.5	
Mn	55	72	He	-0.035	6.30	140.00	2.5	
Fe	57	72	He	0.289	5.00	416.69	50	
Co	59	72	He	-0.002	21.14	77.78	0.5	
Ni	60	72	He	0.012	8.42	367.79	1	
Cu	63	45	He	-0.093	3.16	1700.12	0.5	
Zn	66	72	He	-0.151	14.53	117.78	10	
As	75	72	He	-0.006	11.17	20.67	0.5	
Se	78	72	He	-0.076	13.90	4.75	0.5	
Sn	120	115	He	0.039	13.24	196.67	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	999473.27	1066636.57333333	93.7	
Ge	72	He	74688.56	76690.4733333333	97.39	
In	115	He	496072.09	527518.896666667	94.04	
Lu	175	He	758856.42	811094.676666667	93.56	
Rh	103	He	2069740.96	2150131.65	96.26	
Sc	45	He	94004.91	98241.74	95.69	
Tb	159	He	1615236.49	1707326.38	94.61	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2186160.33	2336732.1	93.56	
Ge	72	No Gas	1104944.89	1156430.33666667	95.55	
In	115	No Gas	5067715.02	5237310.61666667	96.76	
Lu	175	No Gas	3719454.42	4014375.88	92.65	
Rh	103	No Gas	5203215.90	5515557.00333333	94.34	
Sc	45	No Gas	5395318.12	5538601.16666667	97.41	
Tb	159	No Gas	4555014.72	4855676.28	93.81	

III

CONTINUING CALIBRATION BLANK

Report No:	218081812	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121270_CCB.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1738	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121270_CCB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 17:38:01	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	-0.093	0.84	185739.94	2.5	
Be	9	45	No Gas	-0.003	10.58	39.33	0.5	
B	11	45	No Gas	0.002	8.77	2933.69	5	
Sr	88	72	No Gas	0.010	17.56	860.06	0.5	
Zr	90	72	No Gas	0.007	16.21	742.25	0.5	
Mo	95	115	No Gas	0.001	9.08	112.22	0.5	
Ag	107	115	No Gas	0.006	23.57	134.45	0.5	
Cd	111	115	No Gas	-0.001	66.64	14.44	0.5	
Sb	121	115	No Gas	0.049	6.64	1036.72	1	
Ba	137	115	No Gas	0.055	7.05	402.23	0.5	
Tl	205	209	No Gas	-0.005	37.50	80.00	0.5	
Pb	208	209	No Gas	0.013	18.17	416.68	0.5	
Na	23	45	He	-1.501	3.74	8662.75	50	
Mg	24	45	He	0.095	24.74	116.67	50	
Al	27	45	He	3.817	9.09	220.00	10	
Si	29	45	He	-12573.414	14.55	4565.40	100	
K	39	45	He	-0.149	1.51	14664.32	50	
Ca	44	45	He	14.024	10.15	398.34	250	
Ti	47	45	He	0.057	50.00	10.00	0.5	
V	51	72	He	0.000	17.03	138.89	0.5	
Cr	52	72	He	-0.209	7.94	3392.65	0.5	
Mn	55	72	He	0.000	10.64	188.89	2.5	
Fe	57	72	He	0.711	28.06	473.36	50	
Co	59	72	He	-0.002	15.81	87.78	0.5	
Ni	60	72	He	0.018	9.48	407.79	1	
Cu	63	45	He	-0.392	1.60	623.35	0.5	
Zn	66	72	He	0.056	11.55	245.56	10	
As	75	72	He	-0.008	12.60	21.00	0.5	
Se	78	72	He	-0.031	32.68	6.32	0.5	
Sn	120	115	He	0.423	3.56	936.71	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1208143.13	1066636.57333333	113.27	
Ge	72	He	80918.50	76690.4733333333	105.51	
In	115	He	580421.46	527518.896666667	110.03	
Lu	175	He	924646.05	811094.676666667	114	
Rh	103	He	2343811.23	2150131.65	109.01	
Sc	45	He	100656.24	98241.74	102.46	
Tb	159	He	1906200.55	1707326.38	111.65	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2351613.04	2336732.1	100.64	
Ge	72	No Gas	1170784.67	1156430.33666667	101.24	
In	115	No Gas	5482362.96	5237310.61666667	104.68	
Lu	175	No Gas	4165176.29	4014375.88	103.76	
Rh	103	No Gas	5719195.05	5515557.00333333	103.69	
Sc	45	No Gas	5668190.19	5538601.16666667	102.34	
Tb	159	No Gas	5052110.65	4855676.28	104.05	

III

CONTINUING CALIBRATION BLANK

Report No:	218081812	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121288_CCB.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1841	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121288_CCB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:41:56	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	-0.115	0.93	187411.02	2.5	
Be	9	45	No Gas	0.003	8.79	82.00	0.5	
B	11	45	No Gas	0.639	2.52	5611.20	5	
Sr	88	72	No Gas	0.016	5.62	1086.75	0.5	
Zr	90	72	No Gas	0.007	4.50	742.25	0.5	
Mo	95	115	No Gas	0.005	4.76	140.00	0.5	
Ag	107	115	No Gas	0.006	11.76	127.78	0.5	
Cd	111	115	No Gas	0.004	34.44	31.11	0.5	
Sb	121	115	No Gas	0.049	6.75	1063.39	1	
Ba	137	115	No Gas	0.069	8.63	472.24	0.5	
Tl	205	209	No Gas	-0.005	13.32	86.67	0.5	
Pb	208	209	No Gas	0.010	7.90	386.68	0.5	
Na	23	45	He	-5.286	1.04	7115.25	50	
Mg	24	45	He	0.332	30.55	150.01	50	
Al	27	45	He	5.348	21.01	268.67	10	
Si	29	45	He	-13632.507	18.23	3287.06	100	
K	39	45	He	-4.208	4.39	13983.66	50	
Ca	44	45	He	7.635	8.97	358.34	250	
Ti	47	45	He	-0.026	39.03	5.33	0.5	
V	51	72	He	-0.003	28.83	133.33	0.5	
Cr	52	72	He	-0.207	3.12	3454.89	0.5	
Mn	55	72	He	0.022	12.40	215.56	2.5	
Fe	57	72	He	-0.065	15.75	440.03	50	
Co	59	72	He	-0.004	9.32	74.45	0.5	
Ni	60	72	He	-0.021	3.01	355.56	1	
Cu	63	45	He	-0.398	11.07	588.91	0.5	
Zn	66	72	He	0.056	10.41	250.00	10	
As	75	72	He	-0.006	14.18	22.67	0.5	
Se	78	72	He	0.019	19.71	7.74	0.5	
Sn	120	115	He	0.430	3.35	955.60	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1245320.03	1066636.57333333	116.75	
Ge	72	He	82226.93	76690.4733333333	107.22	
In	115	He	584566.87	527518.896666667	110.81	
Lu	175	He	940283.89	811094.676666667	115.93	
Rh	103	He	2371895.88	2150131.65	110.31	
Sc	45	He	99435.41	98241.74	101.22	
Tb	159	He	1943466.84	1707326.38	113.83	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2493734.65	2336732.1	106.72	
Ge	72	No Gas	1185051.93	1156430.33666667	102.47	
In	115	No Gas	5616991.54	5237310.61666667	107.25	
Lu	175	No Gas	4291674.94	4014375.88	106.91	
Rh	103	No Gas	5881599.63	5515557.00333333	106.64	
Sc	45	No Gas	5731960.05	5538601.16666667	103.49	
Tb	159	No Gas	5235570.65	4855676.28	107.82	

Metals

Form IV

Interference Checks

IV

ICPMS INTERFERENCE CHECKS

Report No:	218081812	ICSA \ AB ID:	2000 \ 2100
Instrument ID:	ICPMS1	Analytical Batch:	642381
Analyst:	LWZ	Analytical Method:	EPA 6020B
Lab File ID ICSA1:	2180821A_MS1.b\015ICSA.d	Lab File ID ICSAB1:	2180821A_MS1.b\016ICSB.d
Lab File ID ICSA2:		Lab File ID ICSAB2:	

Concentration Units: ug/L

		Analyzed (A/AB):	08/21/18 1112	08/21/18 1117				
ANALYTE	***TRUE A***	***TRUE AB***	***ICSA1***	***ICSAB1***	***%R***	***ICSA2***	***ICSAB2***	***%R***
Aluminum	1000	1000	1010	1010	101			
Antimony	0	0	0.063	0.065				
Arsenic	0	10.0	-0.0010	10.3	103			
Barium	0	0	0.039	0.034				
Beryllium	0	0	0.0	0.0				
Boron	0	20.0	1.21	20.2	101			
Cadmium	0	10.0	0.027	10.1	101			
Calcium	3000	3000	2960	3010	100			
Chromium	0	20.0	0.0060	20.4	102			
Cobalt	0	20.0	0.014	20.8	104			
Copper	0	20.0	-0.17	20.2	101			
Iron	2500	2500	2530	2510	100			
Lead	0	0	-0.0040	-0.0090				
Lithium	0	20.0	-0.051	22.7	114			
Magnesium	1000	1000	1010	1010	101			
Manganese	0	20.0	0.031	20.8	104			
Molybdenum	20.0	20.0	19.2	19.0	95			
Nickel	0	20.0	0.022	21.2	106			
Potassium	1000	1000	1020	992	99			
Selenium	0	10.0	0.063	10.1	101			
Silicon	0	1000	-23	1100	110			
Silver	0	5.00	0.0070	5.15	103			
Sodium	2500	2500	2590	2570	103			
Strontium	0	10.0	0.094	9.55	96			
Thallium	0	0	-0.067	-0.069				
Tin	0	10.0	0.010	7.32	73			
Titanium	20.0	20.0	20.5	20.0	100			
Vanadium	0	20.0	-0.0020	17.4	87			
Zinc	0	20.0	0.27	21.6	108			
Zirconium	0	20.0	0.027	18.8	94			

FORM IV - IN

Sample Report

Sample Name	2000	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	015ICSA.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:12:59	**Total Dilution**	1.0000
Sample Type	ICSA	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	-0.051	-0.051	1.4	313610.54	2.5	
Be	9	45	No Gas	0	0.000	35.6	25.33	0.5	
B	11	45	No Gas	1.207	1.207	2.4	10150.04	5	
Sr	88	103	No Gas	0.094	0.094	7.2	2386.94	0.5	
Zr	90	72	No Gas	0.027	0.027	9.9	742.28	0.5	
Mo	95	115	No Gas	19.211	19.211	1.8	82505.52	20	
Ag	107	115	No Gas	0.007	0.007	5.7	88.89	0.5	
Cd	111	115	No Gas	0.027	0.027	2.4	71.00	0.5	
Sb	121	115	No Gas	0.063	0.063	0.9	1085.61	1	
Ba	137	115	No Gas	0.039	0.039	4.4	158.89	0.5	
Tl	205	175	No Gas	-0.067	-0.067	11.6	613.36	0.5	
Pb	208	209	No Gas	-0.004	-0.004	6.5	466.68	0.5	
Na	23	45	He	2590.838	2590.838	0.9	1260873.86	2500	
Mg	24	45	He	1006.979	1006.979	1.1	236709.75	1000	
Al	27	45	He	1012.546	1012.546	0.5	71058.39	1000	
Si	29	45	He	-23.267	-23.267	5.7	949.37	100	
K	39	45	He	1020.368	1020.368	0.4	106504.56	1000	
Ca	44	45	He	2962.915	2962.915	2.6	17499.38	3000	
Ti	47	45	He	20.466	20.466	2.0	968.36	20	
V	51	72	He	-0.002	-0.002	61.4	41.11	0.5	
Cr	52	72	He	0.006	0.006	24.7	85.55	0.5	
Mn	55	45	He	0.031	0.031	30.2	55.55	2.5	
Fe	57	72	He	2529.05	2529.050	0.3	112506.30	2500	
Co	59	72	He	0.014	0.014	30.3	64.45	0.5	
Ni	60	72	He	0.022	0.022	34.0	34.44	1	
Cu	63	103	He	-0.17	-0.170	10.8	233.33	0.5	
Zn	66	103	He	0.266	0.266	11.3	156.67	10	
As	75	72	He	-0.001	-0.001	38.4	8.67	0.5	
Se	78	72	He	0.063	0.063	24.2	3.11	0.5	
Sn	120	115	He	0.01	0.010	6.7	216.67	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1512143.47	1548427.37333333	97.66	
Ge	72	He	45695.94	44394.6333333333	102.93	
In	115	He	411335.09	404099.316666667	101.79	
Lu	175	He	1252210.81	1190023.24	105.23	
Rh	103	He	1583189.35	1573916.12	100.59	
Sc	45	He	78620.67	75790.99	103.73	
Tb	159	He	2028812.57	2036132.52	99.64	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3541941.51	3602753.49	98.31	
Ge	72	No Gas	570584.23	552452.773333333	103.28	
In	115	No Gas	3816668.43	3822230.42333333	99.85	
Lu	175	No Gas	5555764.71	5635183.66666667	98.59	
Rh	103	No Gas	3708059.02	3660203.32666667	101.31	
Sc	45	No Gas	3053938.91	3019672.93666667	101.13	
Tb	159	No Gas	5513593.67	5550323.25333333	99.34	

Sample Report

Sample Name	2100	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	016ICSB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:17:25	**Total Dilution**	1.0000
Sample Type	ICSB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	22.689	22.689	3.3	1113383.01	20	
Be	9	45	No Gas	0	0.000	34.0	20.67	0.5	
B	11	45	No Gas	20.188	20.188	2.1	94092.80	20	
Sr	88	103	No Gas	9.549	9.549	1.9	209948.57	10	
Zr	90	72	No Gas	18.83	18.830	3.0	274126.14	20	
Mo	95	115	No Gas	18.964	18.964	1.6	80702.52	20	
Ag	107	115	No Gas	5.149	5.149	1.2	54379.28	5	
Cd	111	115	No Gas	10.085	10.085	1.0	22242.51	10	
Sb	121	115	No Gas	0.065	0.065	5.2	1092.28	1	
Ba	137	115	No Gas	0.034	0.034	5.4	142.23	0.5	
Tl	205	175	No Gas	-0.069	-0.069	5.9	568.91	0.5	
Pb	208	209	No Gas	-0.009	-0.009	14.3	320.01	0.5	
Na	23	45	He	2574.029	2574.029	0.5	1240882.20	2500	
Mg	24	45	He	1008.183	1008.183	1.3	234794.83	1000	
Al	27	45	He	1005.006	1005.006	1.3	69872.88	1000	
Si	29	45	He	1098.396	1098.396	3.5	2823.59	1000	
K	39	45	He	991.728	991.728	1.4	102607.77	1000	
Ca	44	45	He	3010.955	3010.955	0.9	17616.14	3000	
Ti	47	45	He	20.036	20.036	4.8	939.03	20	
V	51	72	He	17.445	17.445	1.0	28975.32	20	
Cr	52	72	He	20.375	20.375	1.0	44080.53	20	
Mn	55	45	He	20.846	20.846	1.3	21201.47	20	
Fe	57	72	He	2508.814	2508.814	1.9	110129.39	2500	
Co	59	72	He	20.779	20.779	1.1	73966.92	20	
Ni	60	72	He	21.19	21.190	2.2	20684.22	20	
Cu	63	103	He	20.205	20.205	0.2	56544.38	20	
Zn	66	103	He	21.592	21.592	0.9	7581.82	20	
As	75	72	He	10.272	10.272	0.4	2846.42	10	
Se	78	72	He	10.074	10.074	3.0	234.08	10	
Sn	120	115	He	7.318	7.318	1.2	11027.29	10	> +/- 20%

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1516772.01	1548427.37333333	97.96	
Ge	72	He	45080.93	44394.6333333333	101.55	
In	115	He	406456.75	404099.316666667	100.58	
Lu	175	He	1192480.71	1190023.24	100.21	
Rh	103	He	1580725.49	1573916.12	100.43	
Sc	45	He	77885.77	75790.99	102.76	
Tb	159	He	2048742.99	2036132.52	100.62	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3494572.03	3602753.49	97	
Ge	72	No Gas	563265.06	552452.773333333	101.96	
In	115	No Gas	3781561.05	3822230.42333333	98.94	
Lu	175	No Gas	5501209.29	5635183.66666667	97.62	
Rh	103	No Gas	3649788.47	3660203.32666667	99.72	
Sc	45	No Gas	3046422.52	3019672.93666667	100.89	
Tb	159	No Gas	5508685.33	5550323.25333333	99.25	

IV
ICPMS INTERFERENCE CHECKS

Report No:	218081812	ICSA \ AB ID:	2000 \ 2100
Instrument ID:	ICPMS2	Analytical Batch:	642309
Analyst:	LWZ	Analytical Method:	EPA 6020B
Lab File ID ICSA1:	2180820B_MS2.b\121212ICSA.d	Lab File ID ICSAB1:	2180820B_MS2.b\121213ICSB.d
Lab File ID ICSA2:		Lab File ID ICSAB2:	

Concentration Units: ug/L

		Analyzed (A/AB):	08/20/18 1356	08/20/18 1400				
ANALYTE	***TRUE A***	***TRUE AB***	***ICSA1***	***ICSAB1***	***%R***	***ICSA2***	***ICSAB2***	***%R***
Aluminum	1000	1000	1010	999	100			
Antimony	0	0	0.039	0.031				
Arsenic	0	10.0	0.0030	10.3	103			
Barium	0	0	-0.0040	0.016				
Beryllium	0	0	-0.0010	-0.0010				
Boron	0	20.0	0.17	20.2	101			
Cadmium	0	10.0	0.017	10.1	101			
Calcium	3000	3000	2950	2980	99			
Chromium	0	20.0	0.088	20.8	104			
Cobalt	0	20.0	0.0040	21.0	105			
Copper	0	20.0	0.18	21.5	108			
Iron	2500	2500	2570	2510	100			
Lead	0	0	0.0040	-0.0020				
Lithium	0	20.0	-0.069	23.9	120			
Magnesium	1000	1000	1020	1020	102			
Manganese	0	20.0	0.035	20.6	103			
Molybdenum	20.0	20.0	19.5	19.3	96			
Nickel	0	20.0	0.032	21.3	106			
Potassium	1000	1000	1010	1010	101			
Selenium	0	10.0	-0.040	10.1	101			
Silicon	0	1000	-4500	-3500	-351			
Silver	0	5.00	0.0060	5.15	103			
Sodium	2500	2500	2540	2540	102			
Strontium	0	10.0	0.10	10.1	101			
Thallium	0	0	0.0	-0.0010				
Tin	0	10.0	0.040	7.34	73			
Titanium	20.0	20.0	19.4	19.3	96			
Vanadium	0	20.0	-0.015	17.6	88			
Zinc	0	20.0	0.029	21.1	106			
Zirconium	0	20.0	0.017	19.1	96			

FORM IV - IN

Interference Check Solution A (ICS-A) Report

Sample Name	2000	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121212ICSA.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 13:56:37	**Total Dilution**	1.0000
Sample Type	ICSA	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	-0.069	1.27	177698.58	2.5	
Be	9	45	No Gas	-0.001	5.73	53.33	0.5	
B	11	45	No Gas	0.170	4.93	3460.50	5	
Sr	88	72	No Gas	0.104	7.52	4070.70	0.5	
Zr	90	72	No Gas	0.017	12.61	925.60	0.5	
Mo	95	115	No Gas	19.520	1.65	115848.66	20	
Ag	107	115	No Gas	0.006	8.77	122.22	0.5	
Cd	111	115	No Gas	0.017	24.16	62.22	0.5	
Sb	121	115	No Gas	0.039	4.67	802.25	1	
Ba	137	115	No Gas	-0.004	41.28	127.78	0.5	
Tl	205	209	No Gas	0.000	45.83	133.34	0.5	
Pb	208	209	No Gas	0.004	36.95	233.34	0.5	
Na	23	45	He	2540.912	0.69	929445.51	2500	
Mg	24	45	He	1022.095	0.42	142401.41	1000	
Al	27	45	He	1006.384	2.17	31904.51	1000	
Si	29	45	He	-4525.522	5.96	13117.10	100	> LOD
K	39	45	He	1008.065	1.04	133098.60	1000	
Ca	44	45	He	2952.620	0.94	15698.52	3000	
Ti	47	45	He	19.356	4.58	1009.04	20	
V	51	72	He	-0.015	24.14	96.67	0.5	
Cr	52	72	He	0.088	6.18	4006.14	0.5	
Mn	55	72	He	0.035	9.91	210.01	2.5	
Fe	57	72	He	2565.824	2.26	124088.62	2500	
Co	59	72	He	0.004	26.24	110.00	0.5	
Ni	60	72	He	0.032	8.60	397.79	1	
Cu	63	45	He	0.181	3.90	2739.17	0.5	
Zn	66	72	He	0.029	13.62	213.34	10	
As	75	72	He	0.003	5.95	25.67	0.5	
Se	78	72	He	-0.040	34.76	5.68	0.5	
Sn	120	115	He	0.040	16.11	198.89	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	950539.93	1066636.57333333	89.12	
Ge	72	He	75044.30	76690.4733333333	97.85	
In	115	He	500473.77	527518.896666667	94.87	
Lu	175	He	729893.50	811094.676666667	89.99	
Rh	103	He	2009488.67	2150131.65	93.46	
Sc	45	He	94512.88	98241.74	96.2	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2087107.73	2336732.1	89.32	
Ge	72	No Gas	1126330.41	1156430.33666667	97.4	
In	115	No Gas	4892673.64	5237310.61666667	93.42	
Lu	175	No Gas	3651382.76	4014375.88	90.96	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1566263.99	1707326.38	91.74	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5130434.38	5515557.00333333	93.02	
Sc	45	No Gas	5412084.09	5538601.16666667	97.72	
Tb	159	No Gas	4447898.27	4855676.28	91.6	

Interference Check Solution AB (ICS-AB) Report

Sample Name	2100	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121213ICSB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 14:00:10	**Total Dilution**	1.0000
Sample Type	ICSB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	23.920	2.01	583900.44	20	
Be	9	45	No Gas	-0.001	18.19	55.33	0.5	
B	11	45	No Gas	20.180	2.79	81150.50	20	
Sr	88	72	No Gas	10.081	2.75	343479.38	10	
Zr	90	72	No Gas	19.123	3.46	407746.41	20	
Mo	95	115	No Gas	19.296	1.28	115520.61	20	
Ag	107	115	No Gas	5.148	2.16	71738.80	5	
Cd	111	115	No Gas	10.102	2.82	28622.49	10	
Sb	121	115	No Gas	0.031	9.25	722.25	1	
Ba	137	115	No Gas	0.016	7.39	206.67	0.5	
Tl	205	209	No Gas	-0.001	41.67	120.01	0.5	
Pb	208	209	No Gas	-0.002	41.31	133.33	0.5	
Na	23	45	He	2542.550	1.97	918312.93	2500	
Mg	24	45	He	1021.232	1.64	140483.26	1000	
Al	27	45	He	999.478	1.50	31286.58	1000	
Si	29	45	He	-3512.550	5.45	14050.61	1000	> +/- 20%
K	39	45	He	1005.914	0.54	131165.70	1000	
Ca	44	45	He	2978.152	0.55	15631.79	3000	
Ti	47	45	He	19.331	4.60	995.04	20	
V	51	72	He	17.571	1.19	38665.09	20	
Cr	52	72	He	20.764	0.51	63404.56	20	
Mn	55	72	He	20.598	2.07	20611.24	20	
Fe	57	72	He	2512.470	3.03	120947.44	2500	
Co	59	72	He	21.015	1.42	102491.72	20	
Ni	60	72	He	21.345	1.73	29311.60	20	
Cu	63	45	He	21.465	0.70	81768.48	20	
Zn	66	72	He	21.082	1.79	11321.16	20	
As	75	72	He	10.292	1.26	5693.79	10	
Se	78	72	He	10.102	5.75	248.21	10	
Sn	120	115	He	7.337	2.87	11807.33	10	> +/- 20%

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	982543.19	1066636.57333333	92.12	
Ge	72	He	74682.18	76690.4733333333	97.38	
In	115	He	501598.40	527518.896666667	95.09	
Lu	175	He	746046.21	811094.676666667	91.98	
Rh	103	He	2049155.26	2150131.65	95.3	
Sc	45	He	93317.75	98241.74	94.99	
Tb	159	He	1591109.41	1707326.38	93.19	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2061393.31	2336732.1	88.22	
Ge	72	No Gas	1114969.81	1156430.33666667	96.41	
In	115	No Gas	4936301.64	5237310.61666667	94.25	
Lu	175	No Gas	3632920.57	4014375.88	90.5	
Rh	103	No Gas	5137095.49	5515557.00333333	93.14	
Sc	45	No Gas	5361753.12	5538601.16666667	96.81	
Tb	159	No Gas	4481901.50	4855676.28	92.3	

Metals

Form V1

Matrix Spikes

V1

MS/MSD RECOVERY

Report No:	218081812	Parent Sample ID:	WIL02DA02A
Prep Method:	3050B	Parent GCAL ID:	21808181206
Prep Date:	08/20/18 Time: 1100	Prep Batch:	642222
Analytical Method:	EPA 6020B	Analytical Batch:	642309

GCAL QC ID:	**21808181207 MS**	Instrument ID:	ICPMS2
Analyst:	LWZ	Lab File ID:	2180820B_MS2.b\121278SMPL.d
Analysis Date:	08/20/18 1806	Dilution:	10

ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	MS RESULT	MS % REC	#	QC LIMITS
Antimony	ug/kg	5740	0	373	7	*	72 - 124
Copper	ug/kg	2870	35400	36500	38	*	84 - 119
Lead	ug/kg	2870	18900	20800	67	*	84 - 118
Zinc	ug/kg	57400	101000	157000	98		82 - 119

GCAL QC ID:	**21808181208 MSD**	Instrument ID:	ICPMS2
Analyst:	LWZ	Lab File ID:	2180820B_MS2.b\121279SMPL.d
Analysis Date:	08/20/18 1810	Dilution:	10

ANALYTE	UNITS	SPIKE ADDED	MSD RESULT	MSD % REC	#	% RPD	#	QC LIMITS %REC	QC LIMITS RPD
Antimony	ug/kg	5740	314	5	*	17		72 - 124	0 - 20
Copper	ug/kg	2870	42100	232	*	14		84 - 119	0 - 20
Lead	ug/kg	2870	23000	141	*	10		84 - 118	0 - 20
Zinc	ug/kg	57400	170000	121	*	8		82 - 119	0 - 20

RPD : 0 out of 4 outside limits

Spike Recovery: 7 out of 8 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM V (PART 1) - IN

MS Report

Sample Name	21808181207	**Total Dilution**	400.0000
File Name	121278SMPL.d	**Comment**	ICPMS-2,LWZ
Data Path Name	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b	**ISTD Ref FileName**	004CALB.d
Acq Time	08/20/2018 18:06:26	**Sample QC Pass/Fail**	Fail
Sample Type	MSSOIL	**ISTD QC Pass/Fail**	Pass

Analyte Table **Units : ppb**

Name	Mass	ISTD	Mode	MeasValue	FinalConc	RSD	CPS	Ref Conc	%Rec	QC Flag
Ag	107	115	No Gas	5.1079497138122	2043.180	2.52	77285.80	107.34924689546	96.791531931471	
Al	27	45	He	25413.5952776646	10165438.111	0.32	875028.27	8212615.68334169	4882.05606931038	> +/- 20%
As	75	72	He	16.4233398768094	6569.336	1.36	9757.61	4482.70759595941	104.331417738217	
B	11	45	No Gas	29.4402172521193	11776.087	1.57	132225.82	4693.84359560944	70.8224330523827	> +/- 20%
Ba	137	115	No Gas	239.818936830924	95927.575	4.25	1031288.81	85870.7981662877	502.838828304099	> +/- 20%
Be	9	45	No Gas	5.77937674141217	2311.751	0.92	41115.21	559.805428520991	87.5972634021939	
Ca	44	45	He	57926.0989231572	23170439.569	0.57	329256.70	18711655.0391349	445.878453012797	> +/- 20%
Cd	111	115	No Gas	5.93310879839171	2373.244	5.02	18263.11	347.467290630142	101.288811436327	
Co	59	72	He	29.5884815564623	11835.393	0.35	155187.06	10015.0295292001	91.018154669242	
Cr	52	72	He	56.5638885209394	22625.555	1.29	178879.53	18300.2733047808	216.264105179745	> +/- 20%
Cu	63	45	He	63.6487997650014	25459.520	0.70	262984.38	24704.5526168409	37.7483644579816	> +/- 20%
Fe	57	72	He	50211.3589262181	20084543.570	0.41	2591339.80	19174091.6000272	455.225985229997	> +/- 20%
K	39	45	He	3693.34273982749	1477337.096	1.43	491013.62	1190000.07344861	143.668511241192	> +/- 20%
Li	7	45	No Gas	50.6577432876475	20263.097	1.47	1172393.08	10929.8181666582	93.3327914840082	
Mg	24	45	He	24806.4573018481	9922582.921	0.67	3760847.97	8550466.08692482	686.058416907211	> +/- 20%
Mn	55	72	He	1291.33144792202	516532.579	0.37	1378130.67	501638.945537025	744.681681589107	> +/- 20%
Mo	95	115	No Gas	4.84975347828302	1939.901	1.42	31605.01	559.757621956039	69.0071884678584	> +/- 20%
Na	23	45	He	2000.28466905963	800113.868	0.97	798735.41	618361.280647623	90.876293488115	
Ni	60	72	He	88.3410132924091	35336.405	1.27	129335.89	31720.6827319512	90.3930646253114	
Pb	208	209	No Gas	36.3401053770172	14536.042	1.72	630456.53	13194.529123053	67.0756513876931	> +/- 20%
Sb	121	115	No Gas	0.650520410510535	260.208	3.52	8583.92	23.1075009808051	5.92751658058522	> +/- 20%
Se	78	72	He	0.791803156020914	316.721	4.30	27.44	-54.0688207849445	92.6975207983276	
Si	29	45	He	-7714.19287647334	-3085677.151	6.34	10476.62	-4021080.2775223	467.701563466481	> +/- 20%
Sn	120	115	He	0.794595000558526	317.838	7.96	1522.32	153.370279912627	8.22338601553917	> +/- 20%
Sr	88	72	No Gas	174.294736535695	69717.895	2.78	6269039.28	64352.9235346444	268.248553981681	> +/- 20%
Ti	47	45	He	356.559365307653	142623.746	2.35	20119.98	108872.348519088	1687.56988019867	> +/- 20%
Tl	205	209	No Gas	5.42707586514191	2170.830	3.48	69865.61	170.13368758473	100.034832923602	
V	51	72	He	79.0596403574903	31623.856	0.13	186633.82	25445.0815680551	308.938728747051	> +/- 20%
Zn	66	72	He	273.720712727618	109488.285	0.86	155543.18	70388.0940061886	97.7504777121462	
Zr	90	72	No Gas	29.9304645484637	11972.186	2.50	674173.51	9726.67610058559	561.37742969997	> +/- 20%

QC ISTD Table **Recovery Limits: 70 - 120%**

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1151781.29	1066636.57333333	107.98	
Ge	72	He	80322.77	76690.4733333333	104.74	
In	115	He	545569.26	527518.896666667	103.42	

MS Report

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Lu	175	He	891870.82	811094.676666667	109.96	
Rh	103	He	2245530.33	2150131.65	104.44	
Sc	45	He	102912.57	98241.74	104.75	
Tb	159	He	1855825.75	1707326.38	108.7	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2341395.59	2336732.1	100.2	
Ge	72	No Gas	1178568.98	1156430.33666667	101.91	
In	115	No Gas	5359882.95	5237310.61666667	102.34	
Lu	175	No Gas	4289969.52	4014375.88	106.87	
Rh	103	No Gas	5565454.08	5515557.00333333	100.9	
Sc	45	No Gas	6053644.34	5538601.16666667	109.3	
Tb	159	No Gas	5216948.47	4855676.28	107.44	

Matrix Spike Duplicate (MSD) Sample Report

Sample Name	21808181208	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121279SMPL.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:10:00	**Total Dilution**	400.0000
Sample Type	MSDSOIL	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

RPD Limits: 0-20%

Name	Mass	Mode	MeasValue	Final Conc	RSD	CPS	RefConc	RPD	Flag
Li	7	No Gas	53.8032327120765	21521.293	1.95	1236668.99	50.6577432876475	6.02	
Be	9	No Gas	6.08785890383959	2435.144	2.15	43442.95	5.77937674141217	5.2	
B	11	No Gas	29.176030549009	11670.412	1.53	131468.12	29.4402172521193	0.9	
Sr	88	No Gas	181.463322051083	72585.329	2.08	6471733.65	174.294736535695	4.03	
Zr	90	No Gas	31.6361403582536	12654.456	2.73	706597.21	29.9304645484637	5.54	
Mo	95	No Gas	4.85958058407923	1943.832	0.96	31645.15	4.84975347828302	0.2	
Ag	107	No Gas	5.40439854223378	2161.759	2.88	81696.12	5.1079497138122	5.64	
Cd	111	No Gas	6.30408469633147	2521.634	3.27	19390.17	5.93310879839171	6.06	
Sb	121	No Gas	0.546867646142975	218.747	3.97	7273.14	0.650520410510535	17.31	
Ba	137	No Gas	244.323033403093	97729.213	2.25	1049689.85	239.818936830924	1.86	
Tl	205	No Gas	5.50162363470284	2200.649	3.33	71001.80	5.42707586514191	1.36	
Pb	208	No Gas	40.0365170601902	16014.607	0.50	696310.34	36.3401053770172	9.68	
Na	23	He	2154.24713231821	861698.853	0.75	865005.59	2000.28466905963	7.41	
Mg	24	He	24397.251950288	9758900.780	0.33	3722648.80	24806.4573018481	1.66	
Al	27	He	26323.9292783814	10529571.711	0.13	912194.23	25413.5952776646	3.52	
Si	29	He	-9978.95635782154	-3991582.543	6.24	7822.18	-7714.19287647334	-25.6	
K	39	He	3653.9913923518	1461596.557	0.44	489054.79	3693.34273982749	1.07	
Ca	44	He	53159.2922280078	21263716.891	0.84	304140.37	57926.0989231572	8.58	
Ti	47	He	343.41086178302	137364.345	1.71	19501.51	356.559365307653	3.76	
V	51	He	82.7952084437483	33118.083	1.65	198406.35	79.0596403574903	4.62	
Cr	52	He	59.7600406784108	23904.016	1.66	191618.56	56.5638885209394	5.5	
Mn	55	He	1285.64456460306	514257.826	0.60	1392518.80	1291.33144792202	0.44	
Fe	57	He	53279.9145026885	21311965.801	0.86	2790727.56	50211.3589262181	5.93	
Co	59	He	32.412349609115	12964.940	0.24	172528.30	29.5884815564623	9.11	
Ni	60	He	95.3593194138657	38143.728	0.50	141667.67	88.3410132924091	7.64	
Cu	63	He	73.3535127591906	29341.405	1.58	304675.91	63.6487997650014	14.17	
Zn	66	He	296.482696521279	118593.079	1.75	170980.23	273.720712727618	7.98	
As	75	He	17.43017664611	6972.071	1.22	10509.46	16.4233398768094	5.95	
Se	78	He	0.76291928038268	305.168	4.89	27.07	0.791803156020914	3.72	
Sn	120	He	0.737234685655084	294.894	2.24	1457.87	0.794595000558526	7.49	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1187849.49	1066636.57333333	111.36	
Ge	72	He	81548.36	76690.4733333333	106.33	
In	115	He	558653.14	527518.896666667	105.9	
Lu	175	He	915956.26	811094.676666667	112.93	
Rh	103	He	2243393.04	2150131.65	104.34	
Sc	45	He	103576.66	98241.74	105.43	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2347806.47	2336732.1	100.47	
Ge	72	No Gas	1168662.28	1156430.33666667	101.06	
In	115	No Gas	5357970.80	5237310.61666667	102.3	
Lu	175	No Gas	4250438.06	4014375.88	105.88	

Matrix Spike Duplicate (MSD) Sample Report

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1885854.40	1707326.38	110.46	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5519425.75	5515557.00333333	100.07	
Sc	45	No Gas	6071891.01	5538601.16666667	109.63	
Tb	159	No Gas	5096416.28	4855676.28	104.96	

Metals

Form V2

Post Digestion Spikes

V2

POST DIGEST SPIKE SAMPLE RECOVERY

Report No:	218081812	GCAL PDS ID:	1841231
Matrix:	Solid	Parent Sample ID:	WIL02DA02A (21808181206)
Analyst:	LWZ	Instrument ID:	ICPMS2
Analysis Date:	08/20/18 Time: 1813	Lab File ID:	2180820B_MS2.b\121280SMPL.d
Analytical Method:	EPA 6020B	Analytical Batch:	642309

ANALYTE	*UNITS*	*SPIKED SAMPLE RESULT*	*C*	*SAMPLE RESULT*	*C*	*SPIKE ADDED*	*% R*	*Q*	*LCL*	*UCL*
Antimony	ug/kg	54000		0	U	57400	94		80	120
Copper	ug/kg	64600		35400		28700	102		80	120
Lead	ug/kg	48100		18900		28700	102		80	120
Zinc	ug/kg	652000		101000		574000	96		80	120

FORM V (PART 2) - IN

Post Digestion Spike (PDS) Report

Sample Name	1841231
File Name	121280SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
Acq Time	08/20/2018 18:13:33
Sample Type	PDS
Total Dilution	400.0000
Comment	ICPMS-2,LWZ
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fial	Fail
ISTD QC Pass/Fail	Pass
QC Ref File Name	121277SMPL.d

QC Analyte Table

Name	Mass	Tune	Conc.	Conc. RSD	CPS	Reference Conc	Spk Amt	% Rec	%Low	%High	Flag
Li	7	No Gas	101858.254	1.37	5135044.92	27.3245454166455	250	91.82	75	125	
Be	9	No Gas	17352.794	1.55	311064.11	1.39951357130248	50	84.4	75	125	
B	11	No Gas	91521.330	0.65	1015866.39	11.7346089890236	250	87.42	75	125	
Sr	88	No Gas	86639.607	1.43	7892068.63	160.882308836611	50	102.71	75	125	
Zr	90	No Gas	30531.422	1.52	1740981.98	24.316690251464	10	222.42	75	125	> +/- 25%
Mo	95	No Gas	19883.666	0.91	330196.81	1.3993940548901	50	96.71	75	125	
Ag	107	No Gas	19830.865	0.85	766323.63	0.268373117238649	50	98.62	75	125	
Cd	111	No Gas	20060.085	1.48	157594.57	0.868668226575355	50	98.59	75	125	
Sb	121	No Gas	37671.153	1.91	1212276.76	0.0577687524520127	100	94.12	75	125	
Ba	137	No Gas	111910.380	0.38	1229381.34	214.676995415719	50	105.7	75	125	
Tl	205	No Gas	19717.415	0.69	655267.71	0.425334218961825	50	97.76	75	125	
Pb	208	No Gas	33531.305	0.14	1504402.75	32.9863228076325	50	101.01	75	125	
Na	23	He	2468097.840	0.97	2508175.64	1545.90320161906	5000	94.26	75	125	
Mg	24	He	10830839.446	0.95	4212604.31	21376.165217312	5000	102.66	75	125	
Al	27	He	9076786.257	1.40	801760.92	20531.5392083542	1000	105.39	75	125	
Si	29	He	-3986908.938	N/A	7992.31	-10052.7006938057	5000	197.27	75	125	> +/- 25%
K	39	He	3056162.308	2.24	1025788.84	2975.00018362153	5000	95.8	75	125	
Ca	44	He	28991680.295	0.94	422683.85	46779.1375978373	25000	100.98	75	125	
Ti	47	He	135202.026	3.23	19570.13	272.180871297719	50	104.91	75	125	
V	51	He	46833.236	1.60	281415.19	63.6127039201378	50	103.05	75	125	
Cr	52	He	39013.881	1.52	311171.61	45.7506832619521	50	101.86	75	125	
Mn	55	He	565667.194	0.48	1537118.03	1254.09736384256	50	108.44	75	125	
Fe	57	He	22658258.012	1.85	2977143.18	47935.2290000681	5000	107.01	75	125	
Co	59	He	30294.226	2.65	404351.16	25.0375738230002	50	100.93	75	125	
Ni	60	He	73155.296	1.36	272277.40	79.301706829878	100	102	75	125	
Cu	63	He	45037.429	1.08	475622.34	61.7613815421024	50	100.74	75	125	
Zn	66	He	454932.971	1.12	657548.03	175.970235015472	1000	96.71	75	125	
As	75	He	24309.643	1.60	36702.69	11.2067689898985	50	99.29	75	125	
Se	78	He	3844.695	3.26	259.01	-0.135172051962361	10	97.43	75	125	
Sn	120	He	20462.953	1.63	90475.21	0.383425699781568	50	101.54	75	125	

QC ISTD Table

Post Digestion Spike (PDS) Report

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6110292.81	1.31	5538601.16666667	110.32	70	120	
Ge	72	No Gas	1194221.17	1.45	1156430.33666667	103.27	70	120	
Rh	103	No Gas	5657040.33	2.27	5515557.00333333	102.57	70	120	
In	115	No Gas	5478250.60	1.03	5237310.61666667	104.6	70	120	
Tb	159	No Gas	5279425.13	0.58	4855676.28	108.73	70	120	
Lu	175	No Gas	4424396.60	1.15	4014375.88	110.21	70	120	
Bi	209	No Gas	2422475.95	2.07	2336732.1	103.67	70	120	
Sc	45	He	105614.77	1.16	98241.74	107.5	70	120	
Ge	72	He	81810.85	1.17	76690.4733333333	106.68	70	120	
Rh	103	He	2271643.31	0.31	2150131.65	105.65	70	120	
In	115	He	556780.59	0.84	527518.896666667	105.55	70	120	
Tb	159	He	1922929.35	1.47	1707326.38	112.63	70	120	
Lu	175	He	937898.89	0.38	811094.676666667	115.63	70	120	
Bi	209	He	1209708.18	1.17	1066636.57333333	113.41	70	120	

Metals

Form VII

Lab Control Spikes

VII
LABORATORY CONTROL SAMPLE

Report No:	218081812	GCAL ID:	1840819 (LCS)
Matrix:	Solid	Instrument ID:	ICPMS1
Analyst:	LWZ	Lab File ID:	2180821A_MS1.b\021SMPL.d
Prep Date:	08/20/18 Time: 1100	Analysis Date:	08/21/18 Time: 1143
Prep Batch:	642222	Analytical Batch:	642381
Prep Method:	3050B	Analytical Method:	EPA 6020B

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% R*	*Q*	*LCL*	*UCL*
Antimony	ug/kg	4000	3800	95		72	124
Copper	ug/kg	2000	1990	100		84	119
Lead	ug/kg	2000	1970	99		84	118
Zinc	ug/kg	40000	34700	87		82	119

FORM VII - IN

Sample Report

Sample Name	1840819	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	021SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:43:07	**Total Dilution**	40.0000
Sample Type	LCS6020	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	260.025	10400.993	1.7	10007942.77	250	
Be	9	45	No Gas	47.61	1904.410	0.9	333408.11	50	
B	11	45	No Gas	266.608	10664.302	2.1	1251992.17	250	
Sr	88	103	No Gas	49.82	1992.806	1.2	1093233.68	50	
Zr	90	72	No Gas	10.032	401.293	1.4	149506.19	10	
Mo	95	115	No Gas	51.188	2047.501	1.0	219077.12	50	
Ag	107	115	No Gas	49.015	1960.581	0.8	521293.89	50	
Cd	111	115	No Gas	45.458	1818.322	1.3	100942.86	50	
Sb	121	115	No Gas	95.118	3804.714	1.6	803185.51	100	
Ba	137	115	No Gas	49.796	1991.832	1.5	152993.90	50	
Tl	205	175	No Gas	49.066	1962.627	1.5	1006027.56	50	
Pb	208	209	No Gas	49.317	1972.662	2.2	1389147.21	50	
Na	23	45	He	5027.789	201111.577	1.4	2669357.25	5000	
Mg	24	45	He	5157.884	206315.369	0.5	1323959.15	5000	
Al	27	45	He	1039.955	41598.217	0.5	79700.57	1000	
Si	29	45	He	4876.207	195048.289	2.5	10101.05	5000	
K	39	45	He	5081.034	203241.378	0.1	568128.22	5000	
Ca	44	45	He	26236.646	1049465.838	0.2	168332.78	25000	
Ti	47	45	He	49.852	1994.087	3.4	2570.87	50	
V	51	72	He	51.954	2078.162	2.1	90437.45	50	
Cr	52	72	He	51.827	2073.061	0.8	117499.47	50	
Mn	55	45	He	57.818	2312.722	0.9	64789.08	50	
Fe	57	72	He	5231.194	209247.750	0.4	240859.54	5000	
Co	59	72	He	51.399	2055.972	1.3	191930.47	50	
Ni	60	72	He	101.478	4059.112	1.6	103868.29	100	
Cu	63	103	He	49.772	1990.867	0.9	142851.34	50	
Zn	66	103	He	868.427	34737.078	0.3	312494.92	1000	
As	75	72	He	46.921	1876.836	0.8	13606.14	50	
Se	78	72	He	9.092	363.681	8.9	221.78	10	
Sn	120	115	He	50.782	2031.282	2.2	81111.38	50	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1513447.95	1548427.37333333	97.74	
Ge	72	He	47292.73	44394.6333333333	106.53	
In	115	He	437560.41	404099.316666667	108.28	
Lu	175	He	1374977.53	1190023.24	115.54	
Rh	103	He	1633206.88	1573916.12	103.77	
Sc	45	He	85857.19	75790.99	113.28	
Tb	159	He	2142058.15	2036132.52	105.2	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3341301.83	3602753.49	92.74	
Ge	72	No Gas	575580.15	552452.773333333	104.19	
In	115	No Gas	3807322.92	3822230.42333333	99.61	
Lu	175	No Gas	5467313.04	5635183.66666667	97.02	
Rh	103	No Gas	3646982.08	3660203.32666667	99.64	
Sc	45	No Gas	3219081.26	3019672.93666667	106.6	
Tb	159	No Gas	5504389.92	5550323.25333333	99.17	

Metals

Form VIII

Tunes

VIII
ICP-MS TUNE

Report No:	218081812	GCAL QC ID:	1150
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\QCTune\2180821A_MS1-QCTu
Analyst:	AWG	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 0931	Analytical Method:	EPA 6020B

ELEMENT - MASS	***AVG MEASURED MASS (amu)***	***PEAK WIDTH AT 5% PEAK HEIGHT (amu)***	***%RSD***
Be-9	9	.7803	.2982
Mg-24	23.9	.7774	.8215
Mg-25	24.9	.7735	.9524
Mg-26	25.9	.7497	.5087
Co-59	58.95	.7688	.6382
In-115	115	.7517	.5548
Pb-206	206	.7916	.8925
Pb-207	207	.8145	1.0512
Pb-208	208	.8111	.8122

FORM VIII - IN

US EPA Tune Check Sample Report

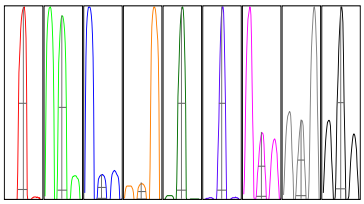
Batch Folder C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
Report Comment
Instrument Name G3281A JP10280491

[No Gas]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
9	14835	0.30	5.00	
24	50239	0.82	5.00	
25	6729	0.95	5.00	
26	7462	0.51	5.00	
59	76361	0.64	5.00	
115	59709	0.55	5.00	
206	14492	0.89	5.00	
207	13113	1.05	5.00	
208	31763	0.81	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	14798	14789	14834	14896	14859
24	50074	50675	50640	50099	49706
25	6766	6790	6765	6639	6685
26	7490	7485	7495	7422	7420
59	76344	76894	76632	75592	76343
115	59425	60096	60034	59567	59422
206	14340	14637	14371	14558	14552
207	13045	13104	13272	13219	12927
208	31627	32146	31881	31480	31680

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
9	2414	9.00	8.9 - 9.1		0.780	0.849	
24	8222	23.90	23.9 - 24.1		0.777	0.849	
25	1062	24.90	24.9 - 25.1		0.774	0.849	
26	1248	25.90	25.9 - 26.1		0.750	0.849	
59	13361	58.95	58.9 - 59.1		0.769	0.849	
115	11737	115.00	114.9 - 115.1		0.752	0.849	
206	2705	206.00	205.9 - 206.1		0.792	0.849	
207	2439	207.00	206.9 - 207.1		0.814	0.849	
208	5915	208.00	207.9 - 208.1		0.811	0.849	

X% = 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1550	W	Carrier Gas	0.50	L/min			
RF Matching	1.00	V	Option Gas	0.0	%			
Smpl Depth	10.0	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	℃						

Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	6.6	V			
Extract 2	-90.0	V	Cell Entrance	-30	V			
Omega Bias	-45	V	Cell Exit	-50	V			
Deflect	13.0	V						

Cell Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	120	V			
Energy Discrimination	5.0	V						

VIII
ICP-MS TUNE

Report No:	218081812	GCAL QC ID:	1150
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\QCTune\2180820B_MS2-QCTu
Analyst:	AWG	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1253	Analytical Method:	EPA 6020B

ELEMENT - MASS	***AVG MEASURED MASS (amu)***	***PEAK WIDTH AT 5% PEAK HEIGHT (amu)***	***%RSD***
Be-9	9.05	.7887	.7645
Mg-24	24	.7914	.9917
Mg-25	25	.7928	1.2727
Mg-26	26	.8258	.4753
Co-59	58.95	.7864	.6309
In-115	115	.7729	1.2881
Pb-206	206	.8291	2.0969
Pb-207	206.95	.7931	1.9959
Pb-208	207.95	.8279	2.4434

FORM VIII - IN

US EPA Tune Check Sample Report

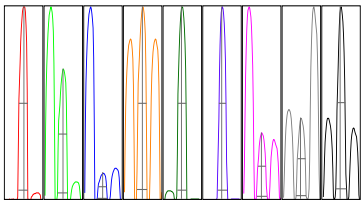
Batch Folder C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
Report Comment
Instrument Name G8403A JP14170244

[No Gas]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
9	16157	0.76	5.00	
24	74276	0.99	5.00	
25	10089	1.27	5.00	
26	12116	0.48	5.00	
59	132818	0.63	5.00	
115	83633	1.29	5.00	
206	9829	2.10	5.00	
207	8696	2.00	5.00	
208	20542	2.44	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	16023	16132	16247	16318	16064
24	75494	74205	73765	74286	73627
25	10294	10026	9971	10132	10023
26	12095	12115	12210	12053	12109
59	133319	132514	131517	133658	133081
115	83080	83531	82629	85448	83475
206	9985	9783	9639	10096	9640
207	8668	8643	8621	8997	8551
208	20512	20187	20337	21413	20259

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
9	2561	9.05	8.9 - 9.1		0.789	0.849	
24	11932	24.00	23.9 - 24.1		0.791	0.849	
25	1636	25.00	24.9 - 25.1		0.793	0.849	
26	1964	26.00	25.9 - 26.1		0.826	0.849	
59	21884	58.95	58.9 - 59.1		0.786	0.849	
115	15090	115.00	114.9 - 115.1		0.773	0.849	
206	1633	206.00	205.9 - 206.1		0.829	0.849	
207	1481	206.95	206.9 - 207.1		0.793	0.849	
208	3499	207.95	207.9 - 208.1		0.828	0.849	

X% = 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1550	W	Carrier Gas	0.90	L/min			
RF Matching	1.90	V	Option Gas	0.0	%			
Smpl Depth	8.0	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	℃						

Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	6.9	V			
Extract 2	-200.0	V	Cell Entrance	-30	V			
Omega Bias	-115	V	Cell Exit	-50	V			
Deflect	14.6	V						

Cell Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	190	V			
Energy Discrimination	4.0	V						

Metals

Form IX

Serial Dilutions

IX
SERIAL DILUTIONS

Report No:	218081812			GCAL SD ID:	1841232
Matrix:	Solid			Parent Sample ID:	WIL02DA02A (21808181206)
Analyst:	LWZ			Instrument ID:	ICPMS2
Analysis Date:	08/20/18	Time:	1817	Lab File ID:	2180820B_MS2.b\121281SMPL.d
Analytical Method:	EPA 6020B			Analytical Batch:	642309

ANALYTE	UNITS	PARENT SAMPLE RESULT	C	SERIAL DILUTION RESULT	C	% DIFF	Q	LCL	UCL
Antimony	ug/kg	0	U	0	U				
Copper	ug/kg	35400		38200		7.9		0	10
Lead	ug/kg	18900		19600		3.7		0	10
Zinc	ug/kg	101000		112000		10.9	E	0	10

FORM IX - IN

Sample Report

Sample Name	1841232	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121281SMPL.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:17:06	**Total Dilution**	2000.0000
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	5.79647249525065	11592.945	0.64	298816.54	500	
Be	9	45	No Gas	0.32270916884989	645.418	4.11	2263.51	1000	
B	11	45	No Gas	3.63371724551249	7267.434	1.52	18288.31	500	
Sr	88	72	No Gas	34.9248117801658	69849.624	2.23	1298692.64	1000	
Zr	90	72	No Gas	5.22086889348905	10441.738	1.89	122034.49	100	
Mo	95	115	No Gas	0.311843756454969	623.688	7.51	2262.43	1000	
Ag	107	115	No Gas	0.0573659294555383	114.732	3.82	961.15	100	
Cd	111	115	No Gas	0.187782134603988	375.564	7.13	631.13	1000	
Sb	121	115	No Gas	0.276738682622423	553.477	4.78	4117.32	1000	
Ba	137	115	No Gas	45.2100485863157	90420.097	1.12	206738.48	1000	
Tl	205	209	No Gas	0.0910889382435145	182.178	14.31	1433.47	100	
Pb	208	209	No Gas	6.83257744266483	13665.155	2.32	129117.88	1000	
Na	23	45	He	345.272316718299	690544.633	0.13	140791.62	100000	
Mg	24	45	He	4711.80629897405	9423612.598	0.61	690375.15	100000	
Al	27	45	He	4568.12793673825	9136255.873	0.38	152066.86	20000	
Si	29	45	He	-12770.2896579547	-25540579.316	14.67	4283.35	10000	
K	39	45	He	633.920176016365	1267840.352	0.90	93454.58	100000	
Ca	44	45	He	10308.8598242225	20617719.648	0.63	56887.26	500000	
Ti	47	45	He	60.2078936648603	120415.787	7.56	3287.14	1000	
V	51	72	He	13.3792173889445	26758.435	2.02	32328.94	1000	
Cr	52	72	He	9.45920985778266	18918.420	0.67	33915.77	1000	
Mn	55	72	He	264.948863425196	529897.727	0.40	288498.98	5000	
Fe	57	72	He	10060.7411120057	20121482.224	0.41	529857.84	100000	
Co	59	72	He	5.32736282046775	10654.726	1.04	28576.78	1000	
Ni	60	72	He	16.7446635485031	33489.327	1.17	25314.20	2000	
Cu	63	45	He	13.3278770791967	26655.754	0.61	54927.05	1000	
Zn	66	72	He	39.0204116919233	78040.823	0.66	22797.96	20000	
As	75	72	He	2.34762490583863	4695.250	1.60	1445.08	1000	
Se	78	72	He	-0.122762649902449	-245.525	56.74	3.98	50	
Sn	120	115	He	0.350611791548785	701.224	4.06	783.36	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1199472.48	1066636.57333333	112.45	
Ge	72	He	81917.26	76690.4733333333	106.82	
In	115	He	566470.48	527518.896666667	107.38	
Lu	175	He	916225.95	811094.676666667	112.96	
Rh	103	He	2308109.98	2150131.65	107.35	
Sc	45	He	99457.88	98241.74	101.24	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2546957.36	2336732.1	109	
Ge	72	No Gas	1218185.23	1156430.33666667	105.34	
In	115	No Gas	5699158.04	5237310.61666667	108.82	
Lu	175	No Gas	4551860.14	4014375.88	113.39	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1911962.42	1707326.38	111.99	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5909925.04	5515557.00333333	107.15	
Sc	45	No Gas	5809862.83	5538601.16666667	104.9	
Tb	159	No Gas	5402379.29	4855676.28	111.26	

Metals

Form XIII

Preparation Logs

XIII
PREPARATION LOG

Report No: 218081812

Prep Method: EPA 3050B Prep Batch: 642222

CLIENT SAMPLE ID	*GCAL SAMPLE ID*	*PREP DATE*	*WEIGHT*	*UNITS*	*VOLUME*	*UNITS*
LCS1840819	1840819	08/20/18	1.25	g	50	mL
MB1840818	1840818	08/20/18	1.25	g	50	mL
WIL02DA01A	21808181209	08/20/18	1.45	g	50	mL
WIL02DA01B	21808181210	08/20/18	1.33	g	50	mL
WIL02DA02A	21808181206	08/20/18	1.25	g	50	mL
WIL02DA02A MS	21808181207	08/20/18	1.25	g	50	mL
WIL02DA02A MSD	21808181208	08/20/18	1.25	g	50	mL

FORM XIII - IN

Metals

Form XIV

Run Logs

XIV

ANALYSIS RUN LOG

Report No: 218081812 Analytical Batch: 642381 Start Date: 08/21/18

Instrument ID: ICPMS1 Analytical Method: EPA 6020B End Date: 08/21/18

CLIENT SAMPLE ID	GCAL SAMPLE ID	PF	D/F	TIME	Analyte Symbols																																				
					Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	V	Zn	Zr							
ITUNE	1150	*	1	0930		X									X		X																	X								
IICALB	1300	*	1	1023		X									X		X																	X								
IICAL2	1302	*	1	1027		X									X		X																	X								
IICAL4	1304	*	1	1033		X									X		X																	X								
IICAL5	1305	*	1	1037		X									X		X																	X								
IICAL6	1306	*	1	1042		X									X		X																	X								
ICV	1600	*	1	1046		X									X		X																	X								
ICB	1700	*	1	1055		X									X		X																	X								
LLCCV	1803	*	1	1108		X									X		X																	X								
ICSA	2000	*	1	1112		X									X		X																	X								
ICSAB	2100	*	1	1117		X									X		X																	X								
LDR	2500	*	1	1121		X									X		X																	X								
MB1840818	1840818	*	1	1138		X									X		X																	X								
LCS1840819	1840819	*	1	1143		X									X		X																	X								
CCV	1800	*	1	1156		X									X		X																	X								
CCB	1900	*	1	1200		X									X		X																	X								

FORM XIV - IN

XIV

ANALYSIS RUN LOG

Report No: 218081812 Analytical Batch: 642309 Start Date: 08/20/18

Instrument ID: ICPMS2 Analytical Method: EPA 6020B End Date: 08/20/18

CLIENT SAMPLE ID	GCAL SAMPLE ID	PF	D/F	TIME	Analyte Symbols																																			
					Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	V	Zn	Zr
ITUNE	1150	*	1	1252		X									X		X																	X	
IICALB	1300	*	1	1305		X									X		X																	X	
IICAL2	1302	*	1	1309		X									X		X																	X	
IICAL4	1304	*	1	1313		X									X		X																	X	
IICAL5	1305	*	1	1317		X									X		X																	X	
IICAL6	1306	*	1	1320		X									X		X																	X	
ICV	1600	*	1	1324		X									X		X																	X	
ICB	1700	*	1	1342		X									X		X																	X	
LLCCV	1803	*	1	1353		X									X		X																	X	
ICSA	2000	*	1	1356		X									X		X																	X	
ICSAB	2100	*	1	1400		X									X		X																	X	
LDR	2500	*	1	1403		X									X		X																	X	
CCV	1800	*	1	1734		X									X		X																	X	
CCB	1900	*	1	1738		X									X		X																	X	
WIL02DA02A	21808181206	*	10	1802		X									X		X																	X	
WIL02DA02A MS	21808181207	*	10	1806		X									X		X																	X	
WIL02DA02A MSD	21808181208	*	10	1810		X									X		X																	X	
WIL02DA02APDS	1841231	*	10	1813		X									X		X																	X	
WIL02DA02ASD	1841232	*	50	1817		X									X		X																	X	
WIL02DA01A	21808181209	*	10	1820		X									X		X																	X	
WIL02DA01B	21808181210	*	10	1824		X									X		X																	X	
CCV	1800	*	1	1838		X									X		X																	X	
CCB	1900	*	1	1841		X									X		X																	X	

FORM XIV - IN

Metals

Form XV

Internal Standards

XV (He)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081812	Start Date:	08/21/18
Instrument ID:	ICPMS1	End Date:	08/21/18
Analytical Method	EPA 6020B	Analytical Batch:	642381

			Internal Standards %RI For:													
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD1***	***Q***	***ISTD2***	***Q***	***ISTD3***	***Q***	***ISTD4***	***Q***	***ISTD5***	***Q***	***ISTD6***	***Q***	***ISTD7***	***Q***
MB1840818	1840818	1138	103		114		113		119		108		117		109	
LCS1840819	1840819	1143	98		107		108		116		104		113		105	

ISTD 1: Bismuth (He)
ISTD 2: Germanium (He)
ISTD 3: Indium (He)
ISTD 4: Lutetium (He)
ISTD 5: Rhodium (He)
ISTD 6: Scandium (He)
ISTD 7: Terbium (He)

FORM XV - IN

XV (No Gas)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081812	Start Date:	08/21/18
Instrument ID:	ICPMS1	End Date:	08/21/18
Analytical Method	EPA 6020B	Analytical Batch:	642381

			Internal Standards %RI For:															
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD8***	***Q***	***ISTD9***	***Q***	***ISTD10***	***Q***	***ISTD11***	***Q***	***ISTD12***	***Q***	***ISTD13***	***Q***	***ISTD14***	***Q***
MB1840818	1840818	1138	95		105		101		97		104		108		100	
LCS1840819	1840819	1143	93		104		100		97		100		107		99	

ISTD 8: Bismuth (No Gas)
ISTD 9: Germanium (No Gas)
ISTD 10 Indium (No Gas)
ISTD 11 Lutetium (No Gas)
ISTD 12 Rhodium (No Gas)
ISTD 13 Scandium (No Gas)
ISTD 14 Terbium (No Gas)

FORM XV - IN

XV (He)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081812	Start Date:	08/20/18
Instrument ID:	ICPMS2	End Date:	08/20/18
Analytical Method	EPA 6020B	Analytical Batch:	642309

			Internal Standards %RI For:													
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD1***	***Q***	***ISTD2***	***Q***	***ISTD3***	***Q***	***ISTD4***	***Q***	***ISTD5***	***Q***	***ISTD6***	***Q***	***ISTD7***	***Q***
WIL02DA02A	21808181206	1802	107		105		104		110		104		105		108	
WIL02DA02A MS	21808181207	1806	108		105		103		110		104		105		109	
WIL02DA02A MSD	21808181208	1810	111		106		106		113		104		105		110	
WIL02DA02APDS	1841231	1813	113		107		106		116		106		108		113	
WIL02DA02ASD	1841232	1817	112		107		107		113		107		101		112	
WIL02DA01A	21808181209	1820	112		106		105		113		104		106		110	
WIL02DA01B	21808181210	1824	115		108		109		116		108		107		114	

ISTD 1: Bismuth (He)
ISTD 2: Germanium (He)
ISTD 3: Indium (He)
ISTD 4: Lutetium (He)
ISTD 5: Rhodium (He)
ISTD 6: Scandium (He)
ISTD 7: Terbium (He)

FORM XV - IN

XV (No Gas)
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081812	Start Date:	08/20/18
Instrument ID:	ICPMS2	End Date:	08/20/18
Analytical Method	EPA 6020B	Analytical Batch:	642309

			Internal Standards %RI For:															
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD8***	***Q***	***ISTD9***	***Q***	***ISTD10***	***Q***	***ISTD11***	***Q***	***ISTD12***	***Q***	***ISTD13***	***Q***	***ISTD14***	***Q***
WIL02DA02A	21808181206	1802	92		99		98		99		97		106		99	
WIL02DA02A MS	21808181207	1806	100		102		102		107		101		109		107	
WIL02DA02A MSD	21808181208	1810	100		101		102		106		100		110		105	
WIL02DA02APDS	1841231	1813	104		103		105		110		103		110		109	
WIL02DA02ASD	1841232	1817	109		105		109		113		107		105		111	
WIL02DA01A	21808181209	1820	104		103		106		110		102		110		108	
WIL02DA01B	21808181210	1824	101		102		105		108		101		108		107	

ISTD 8: Bismuth (No Gas)
ISTD 9: Germanium (No Gas)
ISTD 10 Indium (No Gas)
ISTD 11 Lutetium (No Gas)
ISTD 12 Rhodium (No Gas)
ISTD 13 Scandium (No Gas)
ISTD 14 Terbium (No Gas)

FORM XV - IN

Metals

ICPMS ICALs

GCAL ANALYTICAL LABORATORIES, LLC

BATCH COVERSHEET

ANALYST AWG

DATE 08/21/18

ICP/MS Metals Analysis

HBN **642381**

STANDARDS

ICAL Standard	316-66-8
ICV Standard	316-66-4
ICSA Standard	316-66-9
ICSAB Standard	316-66-3
Internal Standard	316-66-12
Tune	316-63-4
P/A	316-56-9

ADDITIONAL STANDARDS

LDR Standard	316-66-10
	ICVB 316-66-11

ACID MATRIX

2% HNO3 \ 0.5% HCL Solution	317-48-20
5% HNO3 \ 2% HCL Solution	317-49-3

ICPMS DATA FILE

Reference File	2180821A_MS1

GCAL QC LIMITS

200.8 Correlation Coefficient (R) =0.998

6020B Correlation Coefficient (R) =0.995

ICV Recovery 90-110%

LLCCV Recovery 80-120%

ICSA \ ICSAB Recovery 80-120%

CCV Recovery 90-110%

Sample						
Data File	Acq. Date-Time	Type	Sample Name	Total Dil.	Vial Number	Comment
001SMPL.d	8/21/2018 10:10	Sample	Blank	1	5	
002SMPL.d	8/21/2018 10:14	Sample	Blank	1	5	
003SMPL.d	8/21/2018 10:19	Sample	Blank	1	1107	
004CALB.d	8/21/2018 10:23	CalBlk	1300	1	1107	
005CALS.d	8/21/2018 10:27	CalStd	1302	1	1105	
006CALS.d	8/21/2018 10:33	CalStd	1304	1	1103	
007CALS.d	8/21/2018 10:37	CalStd	1305	1	1102	
008CALS.d	8/21/2018 10:42	CalStd	1306	1	1101	
009_ICV.d	8/21/2018 10:46	ICV	1600	1	1201	
010_ICV.d	8/21/2018 10:51	ICV	1600 B	1	1203	
011_ICB.d	8/21/2018 10:55	ICB	1700	1	1107	
012_0.1.d	8/21/2018 10:59	LLCCV0.1	1804	1	1105	
013_0.5.d	8/21/2018 11:04	LLCCV0.5	1804	1	1104	
014CCV1.d	8/21/2018 11:08	LLCCV1	1803	1	1103	
015ICSA.d	8/21/2018 11:12	ICSA	2000	1	1205	
016ICSB.d	8/21/2018 11:17	ICSB	2100	1	1206	
017_QC1.d	8/21/2018 11:21	QC1	LDR	1	1204	
018SMPL.d	8/21/2018 11:26	Sample	2500	1	5	
019SMPL.d	8/21/2018 11:34	Sample	21808171001	5	2101	
020SMPL.d	8/21/2018 11:38	MBSOIL	1840818	40	2102	
021SMPL.d	8/21/2018 11:43	LCS6020	1840819	40	2103	
022SMPL.d	8/21/2018 11:47	Sample	21808172902	787.4016	2104	
023SMPL.d	8/21/2018 11:51	Sample	21808181303	1	2105	
024_CCV.d	8/21/2018 11:56	CCV	1800	1	1102	
025_CCB.d	8/21/2018 12:00	CCB	1900	1	1107	
026SMPL.d	8/21/2018 12:43	Sample	21808166201 D 100X	100	3101	
027SMPL.d	8/21/2018 12:48	Sample	21808166201 D	5	3102	
028SMPL.d	8/21/2018 12:52	Sample	21808166202 D 1000X	1000	3103	
029SMPL.d	8/21/2018 12:57	Sample	21808166202 D	50	3104	
030SMPL.d	8/21/2018 13:01	Sample	21808167509	1	3105	
031SMPL.d	8/21/2018 13:05	Sample	21808167510	1	3106	
032SMPL.d	8/21/2018 13:10	Sample	21808167514	5	3107	
033SMPL.d	8/21/2018 13:14	Sample	21808167515	5	3108	
034SMPL.d	8/21/2018 13:18	Sample	21808167516	5	3109	
035SMPL.d	8/21/2018 13:23	Sample	1841163	25	3110	
036_CCV.d	8/21/2018 13:27	CCV	1800	1	1102	
037_CCB.d	8/21/2018 13:32	CCB	1900	1	1107	
038SMPL.d	8/21/2018 13:36	Sample	21808166201 100X	100	3111	
039SMPL.d	8/21/2018 13:40	Sample	21808166201	5	3112	
040SMPL.d	8/21/2018 13:45	Sample	21808166202 1000X	1000	3201	
041SMPL.d	8/21/2018 13:49	Sample	21808166202	50	3202	
042SMPL.d	8/21/2018 13:53	Sample	21808167501	1	3203	
043SMPL.d	8/21/2018 13:58	Sample	21808167502	1	3204	
044SMPL.d	8/21/2018 14:02	AllRef	21808167506	5	3205	
045SMPL.d	8/21/2018 14:06	MS	21808167507	5	3206	

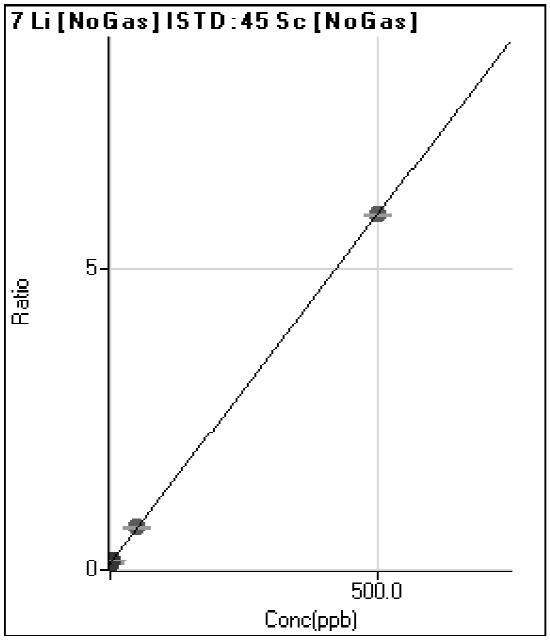
046SMPL.d	8/21/2018 14:11	MSD	21808167508	5	3207	
047SMPL.d	8/21/2018 14:15	PDS	1841229	5	3208	
048SMPL.d	8/21/2018 14:20	Sample	1841230	25	3209	
049_CCV.d	8/21/2018 14:24	CCV	1800	1	1102	
050_CCB.d	8/21/2018 14:28	CCB	1900	1	1107	
051SMPL.d	8/21/2018 14:33	AllRef	21808150306	100000	4101	
052SMPL.d	8/21/2018 14:37	MSSOIL	1841046	100000	4102	
053SMPL.d	8/21/2018 14:41	MSDSOIL	1841047	100000	4103	
054SMPL.d	8/21/2018 14:46	Sample	21808150307	100000	4104	
055SMPL.d	8/21/2018 14:50	Sample	21808150309	100000	4105	
056SMPL.d	8/21/2018 14:54	Sample	21808150310	100000	4106	
057SMPL.d	8/21/2018 14:59	Sample	21808150311	100000	4107	
058SMPL.d	8/21/2018 15:03	Sample	LCS1	5000	4108	
059SMPL.d	8/21/2018 15:08	Sample	LCS2	5000	4109	
060_CCV.d	8/21/2018 15:12	CCV	1800	1	1102	
061_CCB.d	8/21/2018 15:16	CCB	1900	1	1107	

Tune Mode	Mass	Name	ISTD	R	a	b (blank)	DL	BEC	Units
No Gas	7	Li	45 Sc [No Gas]	0.999992908	0.011559146	0.103284016	0.224983216	8.935263363	ppb
No Gas	9	Be	45 Sc [No Gas]	0.999998589	0.002175284	7.73E-06	0.000701971	0.003555284	ppb
No Gas	11	B	45 Sc [No Gas]	0.999999478	0.001452889	0.001571421	0.054929186	1.081583624	ppb
He	23	Na	45 Sc [He]	0.999999971	0.0061771	0.034289131	2.007242383	5.551007645	ppb
He	24	Mg	45 Sc [He]	0.999999836	0.002989616	0.000570225	0.674122996	0.190735124	ppb
He	27	Al	45 Sc [He]	0.999999819	0.000892333	0.000316129	0.532143519	0.354272506	ppb
He	29	Si	45 Sc [He]	0.999907543	2.15E-05	0.012577599	127.4498222	583.6762082	ppb
He	39	K	45 Sc [He]	0.999999275	0.001295954	0.0323621	7.976928018	24.97165048	ppb
He	44	Ca	45 Sc [He]	0.999999165	7.47E-05	0.001339815	12.9914657	17.94138123	ppb
He	47	Ti	45 Sc [He]	0.999999684	0.000599849	3.96E-05	0.114734392	0.066070551	ppb
He	51	V	72 Ge [He]	0.99999155	0.036789059	0.000975678	0.018218663	0.026520864	ppb
He	52	Cr	72 Ge [He]	0.999993475	0.047910665	0.001601115	0.037870385	0.033418761	ppb
He	55	Mn	45 Sc [He]	0.999999875	0.013046327	0.000307996	0.026788626	0.023607878	ppb
He	57	Fe	72 Ge [He]	0.999998339	0.00097347	0.000750465	1.057860116	0.770917265	ppb
He	59	Co	72 Ge [He]	0.999999661	0.078949288	0.000325853	0.007233026	0.004127366	ppb
He	60	Ni	72 Ge [He]	0.999999693	0.021639471	0.000275155	0.005876668	0.012715435	ppb
He	63	Cu	103 Rh [He]	0.999992401	0.001748479	0.000444205	0.108310688	0.254052204	ppb
He	66	Zn	103 Rh [He]	0.999998606	0.000220281	4.03E-05	0.14070711	0.18316939	ppb
He	75	As	72 Ge [He]	0.999996944	0.006127408	0.000198878	0.025735406	0.032457174	ppb
He	78	Se	72 Ge [He]	0.999986359	0.000511873	3.57E-05	0.018988364	0.069674634	ppb
No Gas	88	Sr	103 Rh [No Gas]	0.999995003	0.006015436	7.84E-05	0.002630017	0.013028674	ppb
No Gas	90	Zr	72 Ge [No Gas]	0.999996638	0.025830849	0.000613659	0.002543786	0.023756831	ppb
No Gas	95	Mo	115 In [No Gas]	0.999994325	0.001123095	5.20E-05	0.009500058	0.046322396	ppb
No Gas	107	Ag	115 In [No Gas]	0.999999456	0.002793373	3.20E-06	0.000576093	0.001146151	ppb
No Gas	111	Cd	115 In [No Gas]	0.99999995	0.000583166	2.62E-06	0.00609514	0.004487807	ppb
No Gas	118	[Sn]	115 In [No Gas]	0.999999446	0.00179769	0.000250525	0.034232447	0.139359473	ppb
He	118	[Sn]	115 In [He]	0.999997404	0.002496212	0.000340861	0.083283483	0.136551482	ppb
He	120	Sn	115 In [He]	0.999991328	0.00364056	0.000489393	0.012519205	0.134427898	ppb
No Gas	121	Sb	115 In [No Gas]	0.999999924	0.002216256	0.000143931	0.009745978	0.064943274	ppb
No Gas	137	Ba	115 In [No Gas]	0.999999513	0.000806738	1.04E-05	0.013224508	0.012912571	ppb
He	156	[Se]	115 In [He]						ppb
No Gas	205	Tl	175 Lu [No Gas]	0.999999577	0.003742841	0.000360994	0.004054827	0.096449109	ppb
No Gas	206	[Pb]	209 Bi [No Gas]	0.999999752	0.002014871	3.14E-05	0.009535255	0.015573487	ppb
No Gas	207	[Pb]	209 Bi [No Gas]	0.999998957	0.001853965	3.16E-05	0.019181243	0.017047523	ppb
No Gas	208	Pb	209 Bi [No Gas]	0.999997198	0.008426789	0.000165541	0.002267711	0.019644608	ppb
No Gas	45	Sc							ppb
He	45	Sc							ppb
No Gas	72	Ge							ppb
He	72	Ge							ppb
No Gas	103	Rh							ppb
He	103	Rh							ppb
No Gas	115	In							ppb
He	115	In							ppb
No Gas	159	Tb							ppb
He	159	Tb							ppb
No Gas	175	Lu							ppb
He	175	Lu							ppb
No Gas	209	Bi							ppb
He	209	Bi							ppb

Calibration for 025_CCB.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b\
Analysis File: 2180821A_MS1.batch.bin
DA Date-Time: 2018-08-21 12:02:40
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

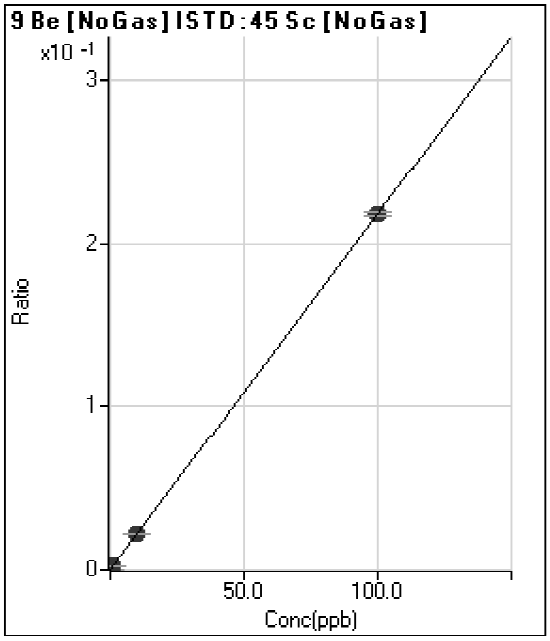
Level	Standard Data File	Sample Name	Acq. Date-Time
1	004CALB.d	1300	2018-08-21 10:23:40
2	005CALS.d	1302	2018-08-21 10:27:59
3	006CALS.d	1304	2018-08-21 10:33:00
4	007CALS.d	1305	2018-08-21 10:37:34
5	008CALS.d	1306	2018-08-21 10:42:08



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	311846.36	0.1033	P	0.8
2	☐	0.500	0.552	326323.97	0.1097	P	1.5
3	☐	5.000	5.074	473749.65	0.1619	P	1.7
4	☐	50.000	51.879	2062896.11	0.7030	A	0.7
5	☐	500.000	499.811	17058693.5	5.8807	A	0.8

y = 0.0116 * x + 0.1033
R = 1.0000
DL = 0.225
BEC = 8.935

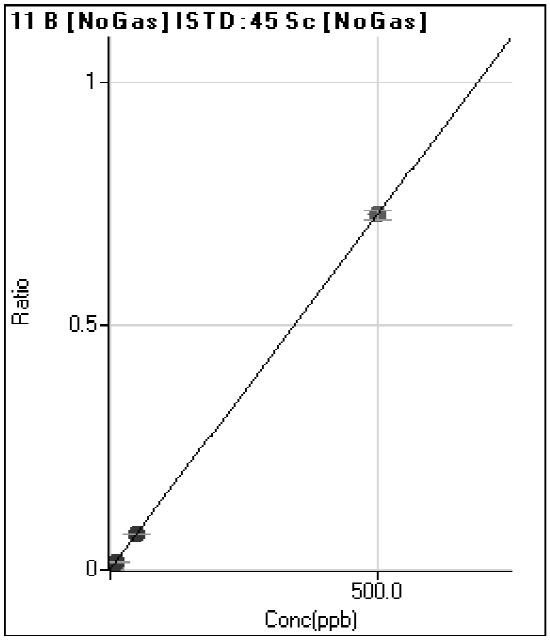
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	6.6
2	☐	0.100	0.106	708.02	0.0002	P	3.9
3	☐	1.000	1.007	6434.58	0.0022	P	0.8
4	☐	10.000	10.168	64912.44	0.0221	P	2.3
5	☐	100.000	99.983	630913.31	0.2175	P	1.1

y = 0.0022 * x + 7.7338E-006
R = 1.0000
DL = 0.000702
BEC = 0.003555

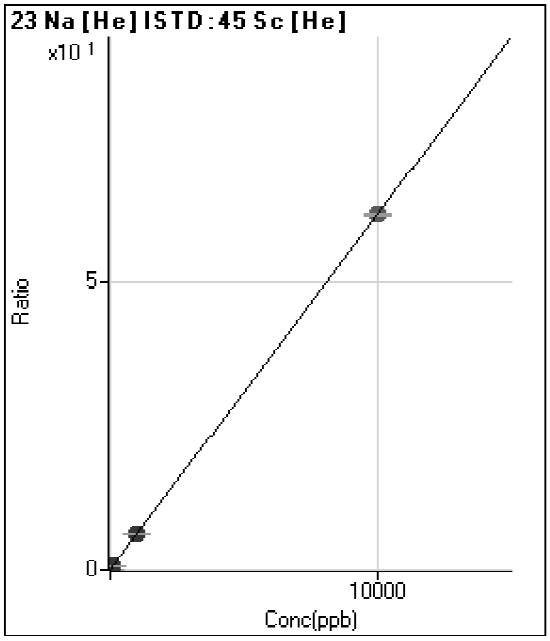
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4744.21	0.0016	P	1.7
2	☐	1.000	1.274	10183.46	0.0034	P	5.6
3	☐	10.000	10.111	47560.69	0.0163	P	3.3
4	☐	50.000	49.667	216308.53	0.0737	P	2.2
5	☐	500.000	500.031	2111786.68	0.7281	A	2.4

y = 0.0015 * x + 0.0016
R = 1.0000
DL = 0.05493
BEC = 1.082

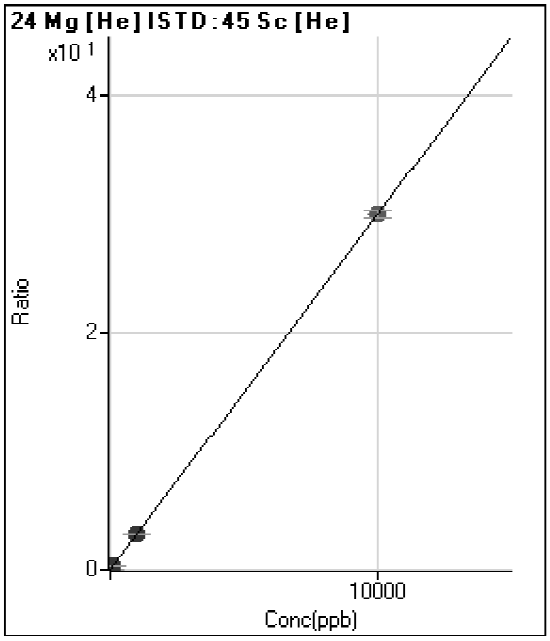
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2596.98	0.0343	P	12.1
2	☐	10.000	11.619	8095.56	0.1061	P	2.8
3	☐	100.000	102.934	51519.05	0.6701	P	2.0
4	☐	1000.000	1001.063	485622.86	6.2180	P	2.5
5	☐	10000.00	9999.863	4591485.97	61.804	A	0.7

y = 0.0062 * x + 0.0343
R = 1.0000
DL = 2.007
BEC = 5.551

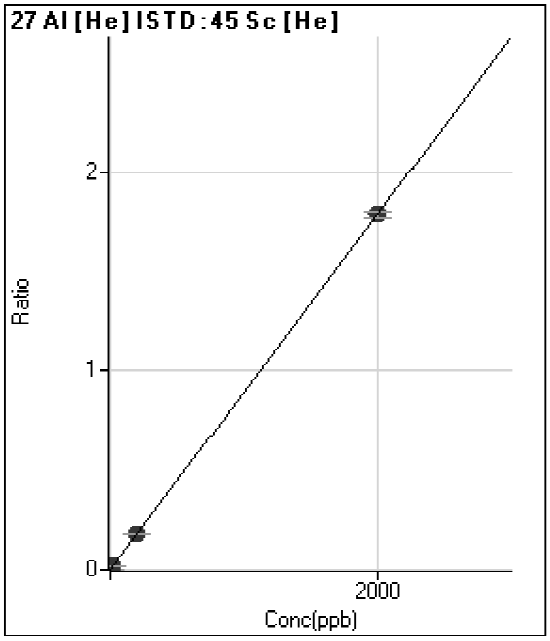
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	43.33	0.0006	P	117.
2	☐	10.000	10.109	2350.25	0.0308	P	4.3
3	☐	100.000	100.543	23149.88	0.3012	P	2.5
4	☐	1000.000	994.595	232272.28	2.9740	P	2.4
5	☐	10000.00	10000.53	2220802.73	29.898	A	2.2

y = 0.0030 * x + 5.7022E-004
R = 1.0000
DL = 0.6741
BEC = 0.1907

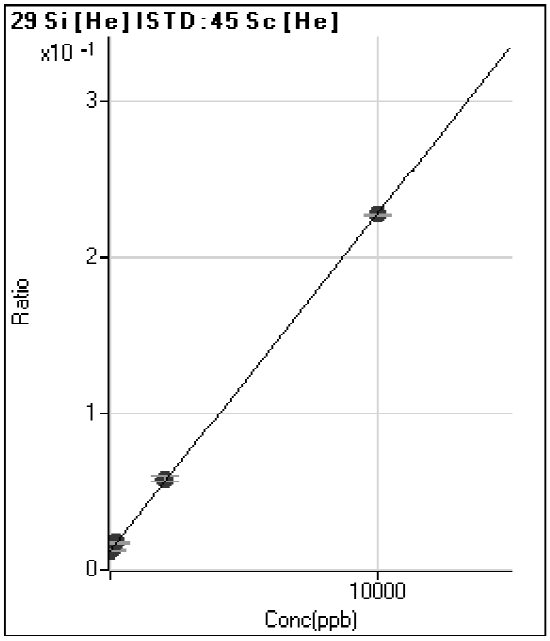
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	24.00	0.0003	P	50.1
2	☐	2.000	2.921	223.33	0.0029	P	14.7
3	☐	20.000	21.440	1494.74	0.0194	P	5.0
4	☐	200.000	200.894	14025.85	0.1796	P	2.2
5	☐	2000.000	1999.895	132584.48	1.7849	P	1.5

y = 8.9233E-004 * x + 3.1613E-004
R = 1.0000
DL = 0.5321
BEC = 0.3543

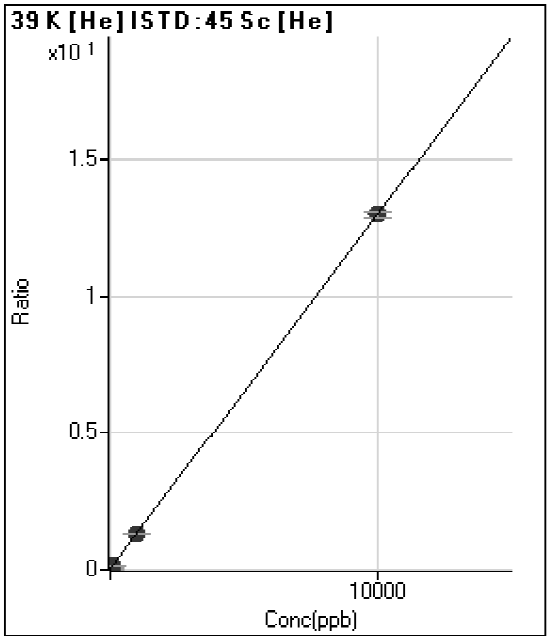
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	953.37	0.0126	P	7.3
2	☐	20.000	16.835	988.04	0.0129	P	7.2
3	☐	200.000	229.537	1347.40	0.0175	P	2.9
4	☐	2000.000	2129.233	4563.98	0.0585	P	4.8
5	☐	10000.00	9973.569	16899.83	0.2275	P	0.6

y = 2.1549E-005 * x + 0.0126
R = 0.9999
DL = 127.4
BEC = 583.7

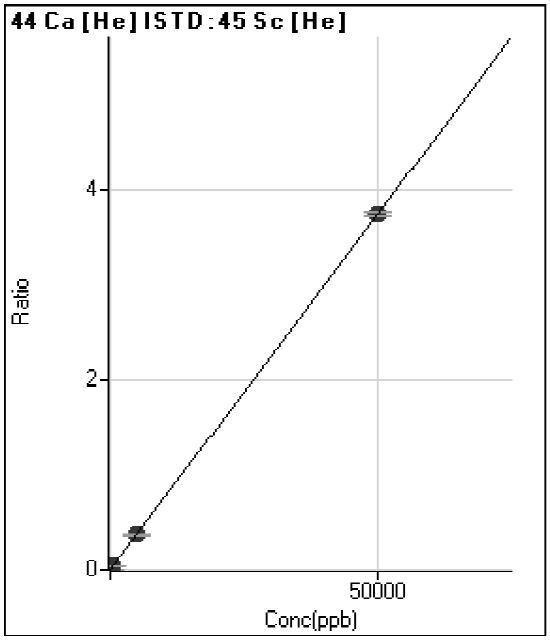
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2453.60	0.0324	P	10.6
2	☐	10.000	13.611	3817.23	0.0500	P	1.8
3	☐	100.000	101.715	12621.90	0.1642	P	4.2
4	☐	1000.000	990.144	102738.44	1.3155	P	2.7
5	☐	10000.00	10000.96	965130.40	12.993	P	1.8

y = 0.0013 * x + 0.0324
R = 1.0000
DL = 7.977
BEC = 24.97

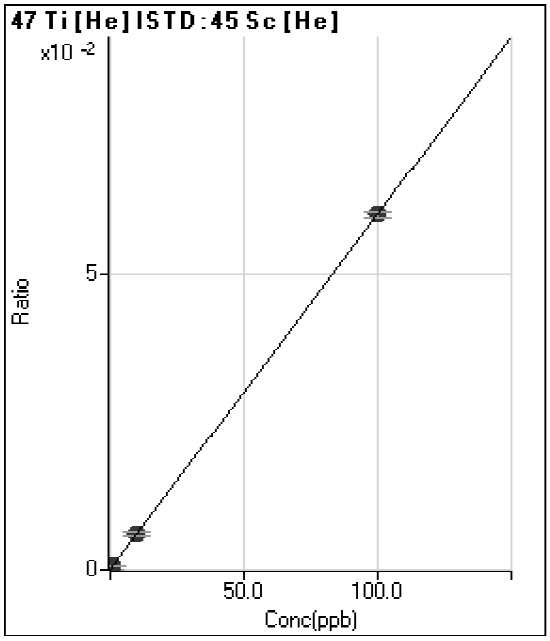
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	101.67	0.0013	P	24.1
2	☐	50.000	58.641	436.68	0.0057	P	5.8
3	☐	500.000	501.561	2981.99	0.0388	P	3.7
4	☐	5000.000	4940.171	28922.03	0.3703	P	2.8
5	☐	50000.00	50005.95	277499.50	3.7357	P	1.0

y = 7.4677E-005 * x + 0.0013
R = 1.0000
DL = 12.99
BEC = 17.94

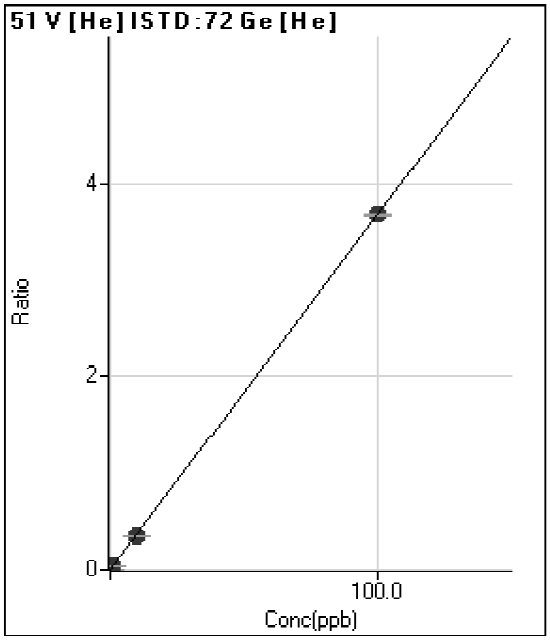
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3.00	0.0000	P	57.9
2	☐	0.100	0.050	5.33	0.0001	P	77.1
3	☐	1.000	1.040	51.00	0.0007	P	8.1
4	☐	10.000	9.967	469.68	0.0060	P	7.5
5	☐	100.000	100.003	4458.94	0.0600	P	1.5

y = 5.9985E-004 * x + 3.9632E-005
R = 1.0000
DL = 0.1147
BEC = 0.06607

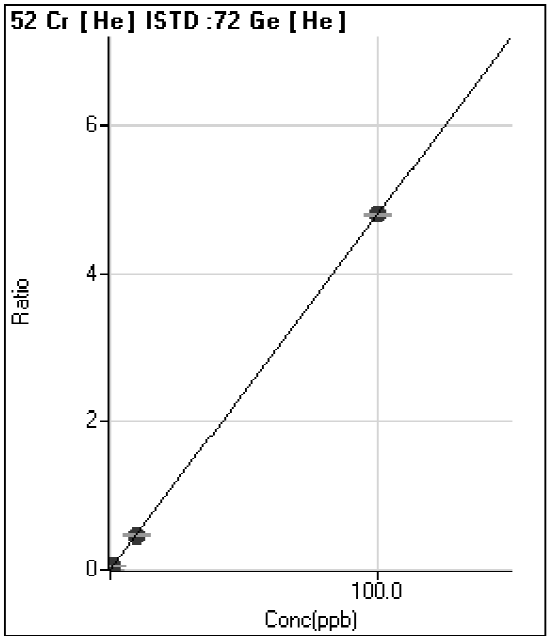
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	43.33	0.0010	P	22.9
2	☐	0.100	0.111	226.67	0.0050	P	16.6
3	☐	1.000	1.055	1793.45	0.0398	P	1.9
4	☐	10.000	9.619	16031.17	0.3549	P	2.3
5	☐	100.000	100.038	156394.46	3.6813	P	0.9

y = 0.0368 * x + 9.7568E-004
R = 1.0000
DL = 0.01822
BEC = 0.02652

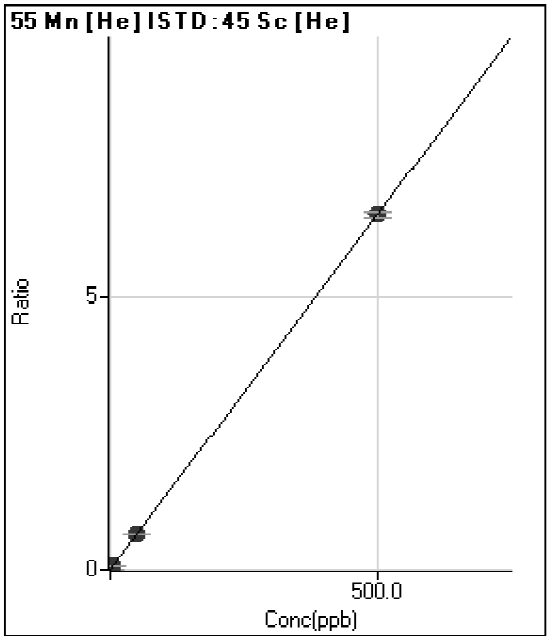
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	71.11	0.0016	P	37.8
2	☐	0.100	0.103	294.45	0.0066	P	4.5
3	☐	1.000	0.972	2170.17	0.0481	P	7.8
4	☐	10.000	9.640	20934.45	0.4634	P	3.1
5	☐	100.000	100.036	203682.24	4.7944	P	0.9

y = 0.0479 * x + 0.0016
R = 1.0000
DL = 0.03787
BEC = 0.03342

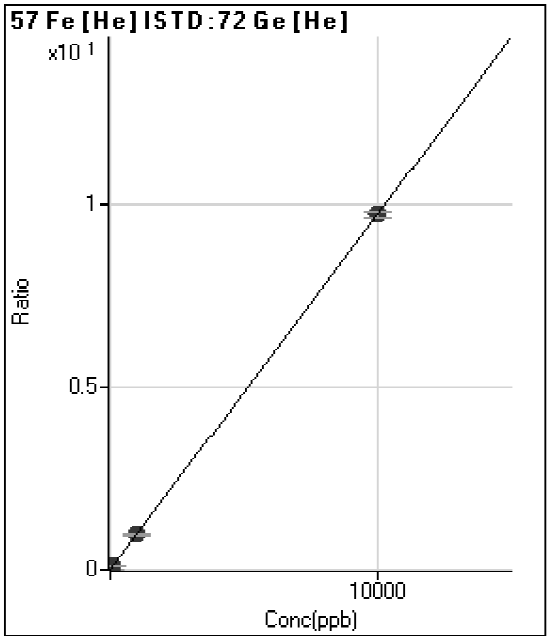
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0003	P	37.8
2	☐	0.500	0.577	597.80	0.0078	P	0.9
3	☐	5.000	5.124	5164.21	0.0672	P	4.9
4	☐	50.000	49.836	50800.92	0.6505	P	2.6
5	☐	500.000	500.015	484591.25	6.5237	P	1.5

y = 0.0130 * x + 3.0800E-004
R = 1.0000
DL = 0.02679
BEC = 0.02361

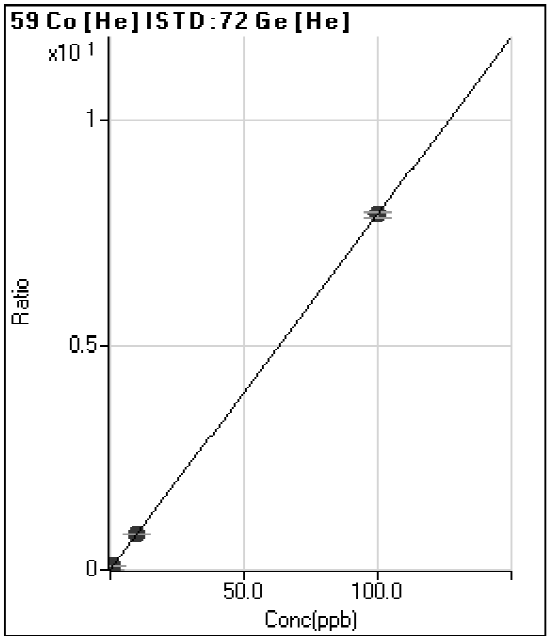
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	33.33	0.0008	P	45.7
2	☐	10.000	8.307	396.69	0.0088	P	10.9
3	☐	100.000	99.453	4397.42	0.0976	P	5.1
4	☐	1000.000	981.525	43194.24	0.9562	P	3.6
5	☐	10000.00	10001.85	413663.91	9.7373	P	1.3

y = 9.7347E-004 * x + 7.5046E-004
R = 1.0000
DL = 1.058
BEC = 0.7709

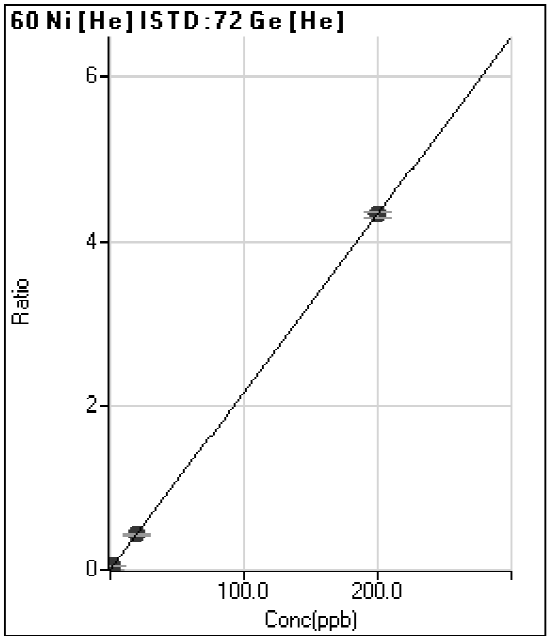
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14.44	0.0003	P	58.4
2	☐	0.100	0.108	396.68	0.0088	P	15.0
3	☐	1.000	1.054	3764.91	0.0835	P	1.7
4	☐	10.000	9.952	35507.11	0.7860	P	3.0
5	☐	100.000	100.004	335421.46	7.8956	P	1.6

y = 0.0789 * x + 3.2585E-004
R = 1.0000
DL = 0.007233
BEC = 0.004127

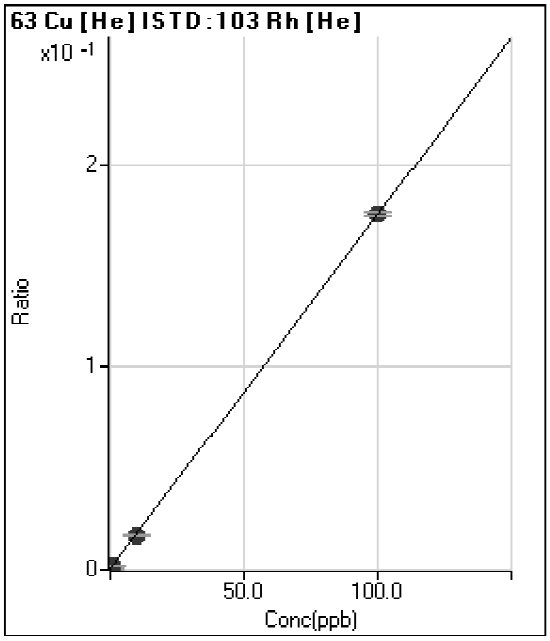
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12.22	0.0003	P	15.4
2	☐	0.200	0.197	203.34	0.0045	P	18.5
3	☐	2.000	2.109	2070.16	0.0459	P	1.9
4	☐	20.000	19.917	19481.65	0.4313	P	3.8
5	☐	200.000	200.007	183877.59	4.3283	P	1.3

y = 0.0216 * x + 2.7516E-004
R = 1.0000
DL = 0.005877
BEC = 0.01272

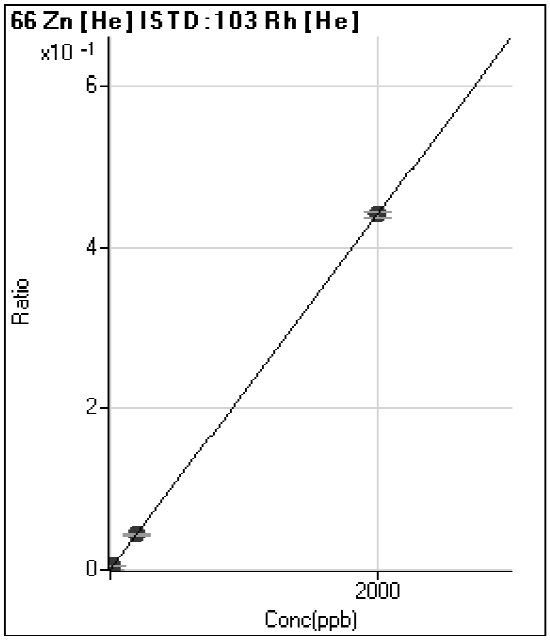
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	700.03	0.0004	P	14.2
2	☐	0.100	-0.047	571.13	0.0004	P	13.3
3	☐	1.000	0.892	3134.77	0.0020	P	4.0
4	☐	10.000	9.561	27096.77	0.0172	P	3.6
5	☐	100.000	100.045	252124.98	0.1754	P	1.0

y = 0.0017 * x + 4.4420E-004
R = 1.0000
DL = 0.1083
BEC = 0.2541

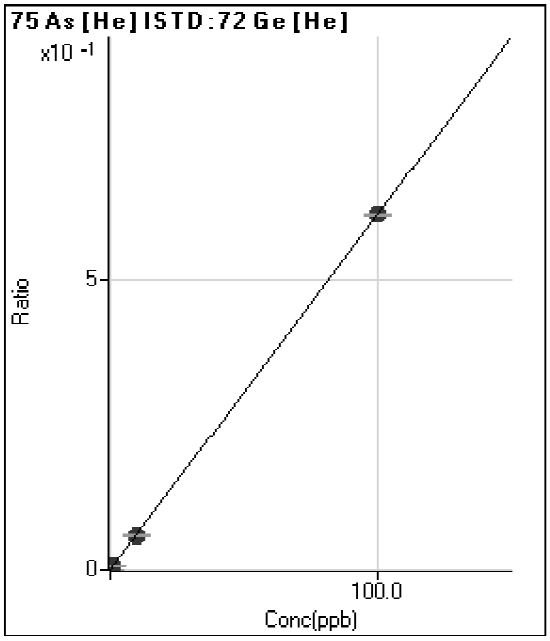
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	63.34	0.0000	P	25.6
2	☐	2.000	2.297	864.48	0.0005	P	8.4
3	☐	20.000	21.081	7326.16	0.0047	P	3.5
4	☐	200.000	197.260	68678.20	0.0435	P	2.9
5	☐	2000.000	2000.263	633506.83	0.4407	P	1.3

y = 2.2028E-004 * x + 4.0349E-005
R = 1.0000
DL = 0.1407
BEC = 0.1832

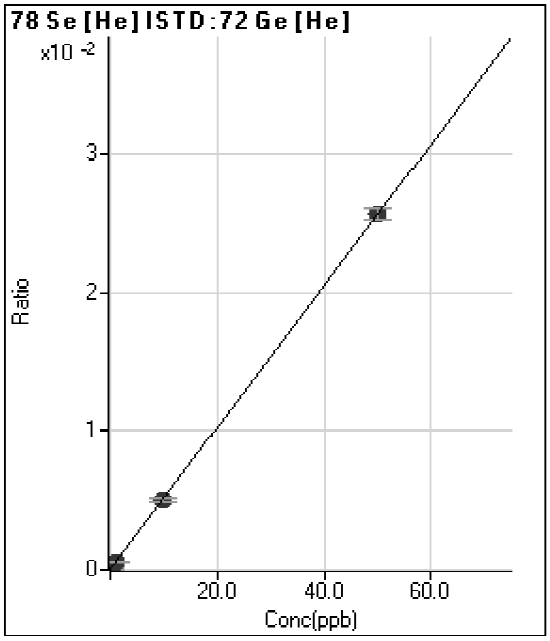
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8.83	0.0002	P	26.4
2	☐	0.100	0.096	35.33	0.0008	P	21.8
3	☐	1.000	0.981	280.00	0.0062	P	3.0
4	☐	10.000	9.752	2708.23	0.0600	P	2.7
5	☐	100.000	100.025	26047.60	0.6131	P	0.8

y = 0.0061 * x + 1.9888E-004
R = 1.0000
DL = 0.02574
BEC = 0.03246

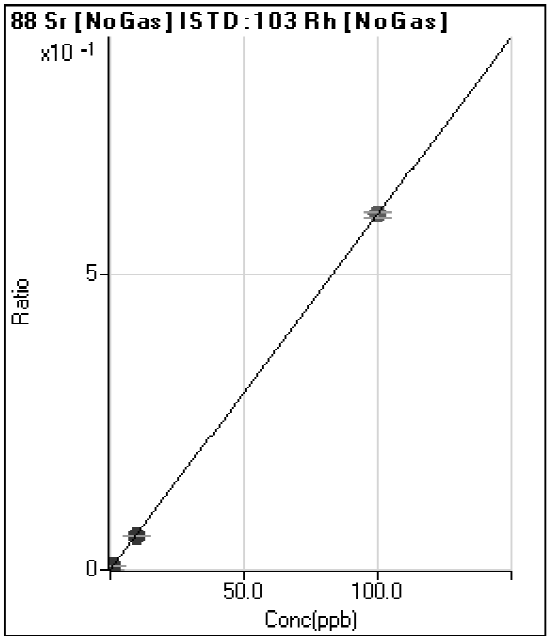
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1.58	0.0000	P	9.1
2	☐	0.100	0.093	3.74	0.0001	P	30.7
3	☐	1.000	1.078	26.50	0.0006	P	3.7
4	☐	10.000	9.786	227.91	0.0050	P	3.3
5	☐	50.000	50.041	1089.60	0.0257	P	3.3

y = 5.1187E-004 * x + 3.5665E-005
R = 1.0000
DL = 0.01899
BEC = 0.06967

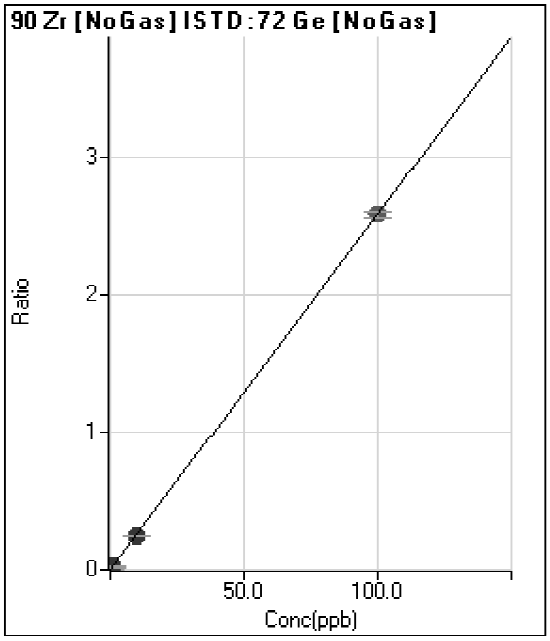
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	286.68	0.0001	P	6.7
2	☐	0.100	0.099	2466.95	0.0007	P	11.8
3	☐	1.000	0.944	20550.38	0.0058	P	4.6
4	☐	10.000	9.677	206046.02	0.0583	P	1.5
5	☐	100.000	100.033	2046116.64	0.6018	A	1.5

y = 0.0060 * x + 7.8373E-005
R = 1.0000
DL = 0.00263
BEC = 0.01303

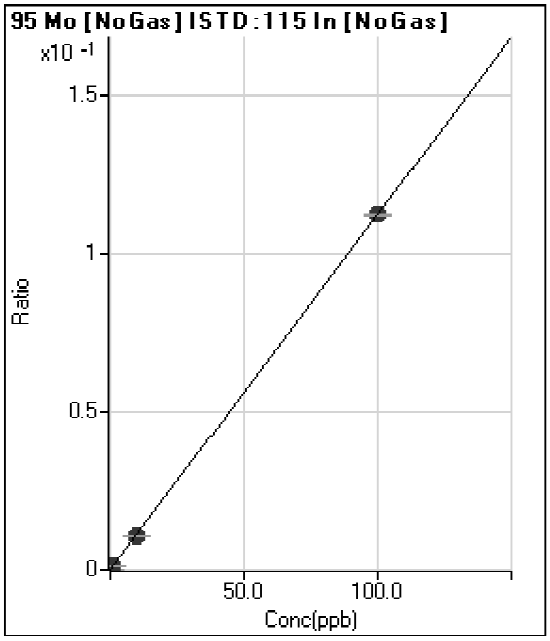
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	338.90	0.0006	P	3.6
2	☐	0.100	0.045	991.16	0.0018	P	10.7
3	☐	1.000	0.782	11369.71	0.0208	P	2.6
4	☐	10.000	9.740	138074.56	0.2522	P	0.8
5	☐	100.000	100.028	1386860.95	2.5844	A	1.3

y = 0.0258 * x + 6.1366E-004
R = 1.0000
DL = 0.002544
BEC = 0.02376

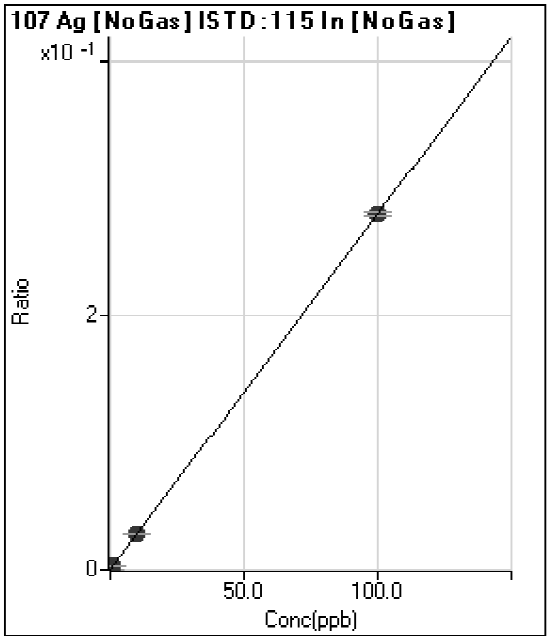
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	198.89	0.0001	P	6.8
2	☐	0.100	0.108	663.36	0.0002	P	2.8
3	☐	1.000	0.973	4218.38	0.0011	P	5.2
4	☐	10.000	9.665	40342.76	0.0109	P	1.9
5	☐	100.000	100.034	398251.87	0.1124	P	0.5

y = 0.0011 * x + 5.2024E-005
R = 1.0000
DL = 0.0095
BEC = 0.04632

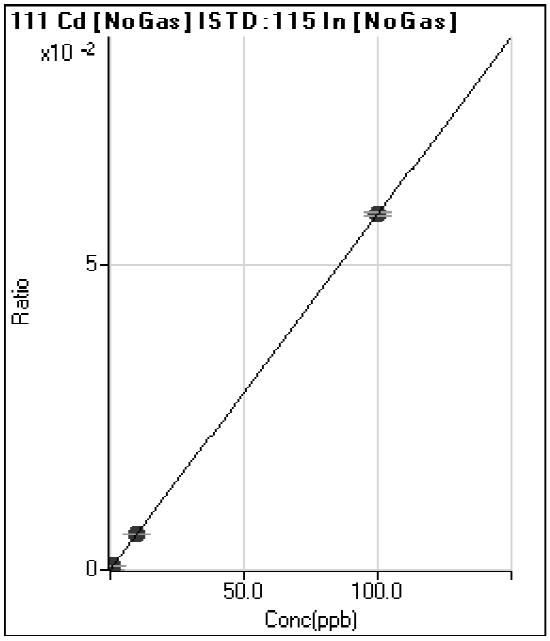
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12.22	0.0000	P	16.8
2	☐	0.100	0.105	1130.06	0.0003	P	3.5
3	☐	1.000	1.024	10551.39	0.0029	P	3.4
4	☐	10.000	10.109	104473.96	0.0282	P	1.4
5	☐	100.000	99.989	989643.33	0.2793	P	1.2

y = 0.0028 * x + 3.2016E-006
R = 1.0000
DL = 0.0005761
BEC = 0.001146

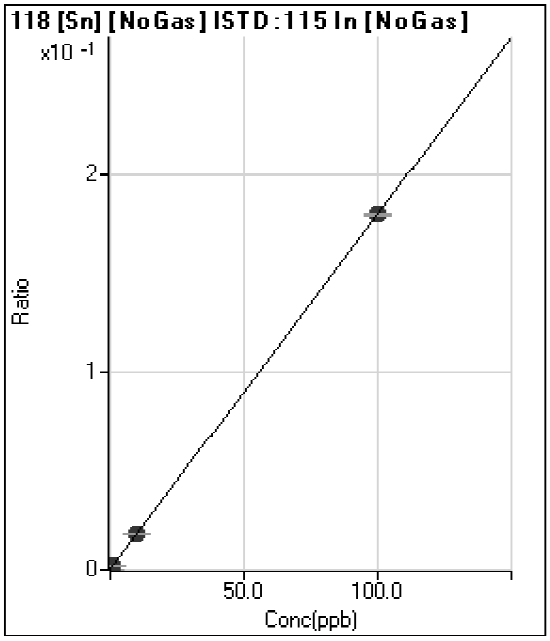
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10.00	0.0000	P	45.3
2	☐	0.100	0.098	228.33	0.0001	P	7.6
3	☐	1.000	0.997	2152.49	0.0006	P	2.9
4	☐	10.000	9.967	21511.83	0.0058	P	1.2
5	☐	100.000	100.003	206641.79	0.0583	P	1.1

y = 5.8317E-004 * x + 2.6171E-006
R = 1.0000
DL = 0.006095
BEC = 0.004488

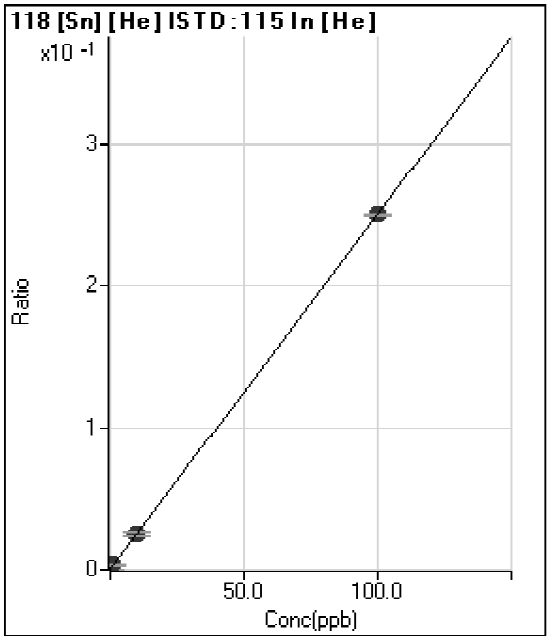
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	958.93	0.0003	P	8.2
2	☐	0.100	0.096	1620.11	0.0004	P	3.1
3	☐	1.000	0.976	7388.48	0.0020	P	2.7
4	☐	10.000	9.891	66690.01	0.0180	P	1.9
5	☐	100.000	100.011	637911.75	0.1800	P	0.6

y = 0.0018 * x + 2.5053E-004
R = 1.0000
DL = 0.03423
BEC = 0.1394

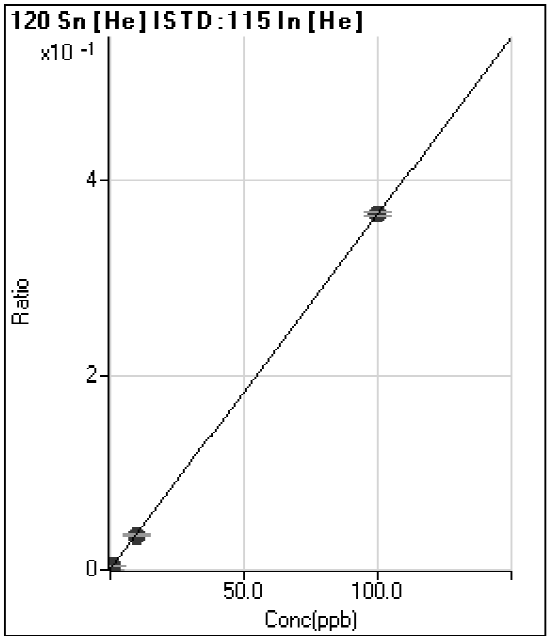
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	137.78	0.0003	P	20.3
2	☐	0.100	0.088	227.78	0.0006	P	22.5
3	☐	1.000	1.216	1374.81	0.0034	P	17.7
4	☐	10.000	9.970	10335.72	0.0252	P	6.6
5	☐	100.000	100.001	94747.00	0.2500	P	0.4

y = 0.0025 * x + 3.4086E-004
R = 1.0000
DL = 0.08328
BEC = 0.1366

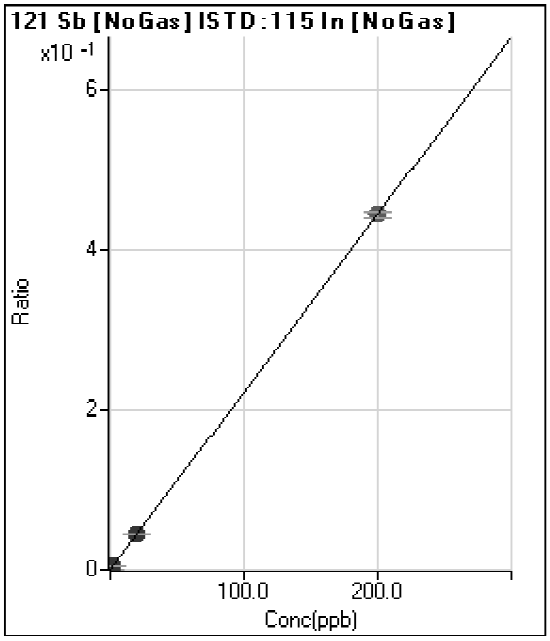
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	197.78	0.0005	P	3.1
2	☐	0.100	0.100	346.67	0.0009	P	13.8
3	☐	1.000	1.031	1726.78	0.0042	P	4.9
4	☐	10.000	9.602	14535.69	0.0354	P	2.0
5	☐	100.000	100.040	138229.77	0.3647	P	1.2

y = 0.0036 * x + 4.8939E-004
R = 1.0000
DL = 0.01252
BEC = 0.1344

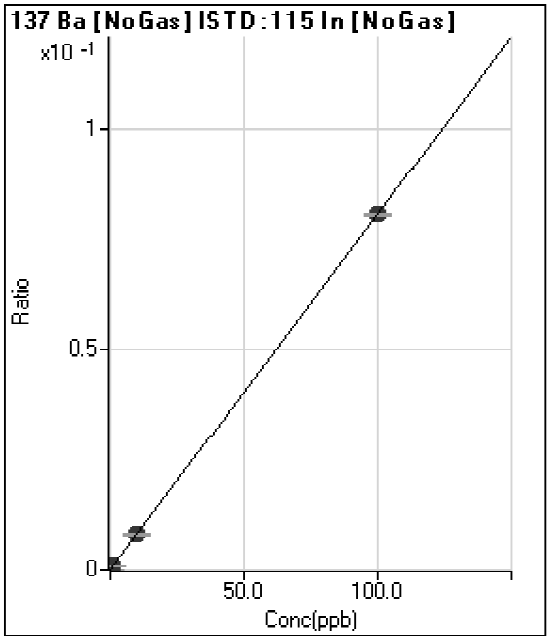
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	550.02	0.0001	P	5.0
2	☐	0.200	0.200	2245.74	0.0006	P	2.2
3	☐	2.000	2.036	17165.01	0.0047	P	0.5
4	☐	20.000	20.079	165137.43	0.0446	P	1.6
5	☐	200.000	199.992	1570967.72	0.4434	A	1.4

y = 0.0022 * x + 1.4393E-004
R = 1.0000
DL = 0.009746
BEC = 0.06494

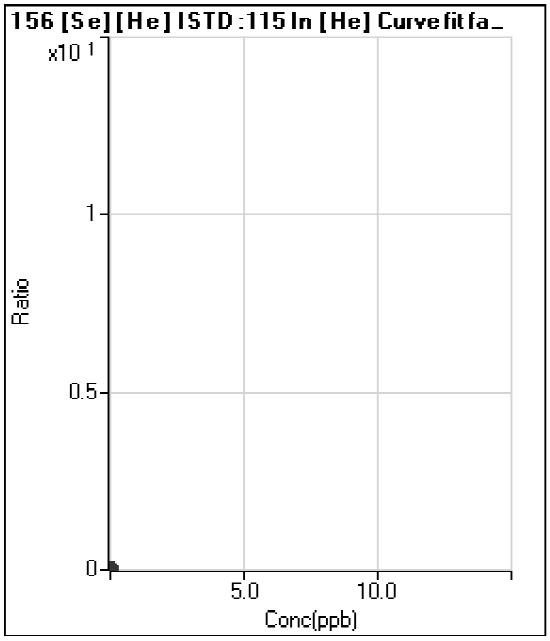
Weight: <None>
Min Conc: <None>



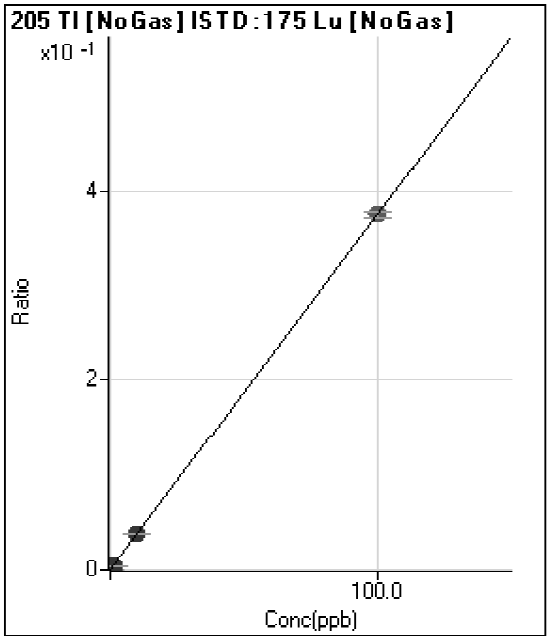
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	40.00	0.0000	P	34.1
2	☐	0.100	0.109	375.57	0.0001	P	2.8
3	☐	1.000	1.003	3021.44	0.0008	P	1.7
4	☐	10.000	9.907	29595.94	0.0080	P	3.0
5	☐	100.000	100.009	285906.82	0.0807	P	0.6

y = 8.0674E-004 * x + 1.0417E-005
R = 1.0000
DL = 0.01322
BEC = 0.01291

Weight: <None>
Min Conc: <None>



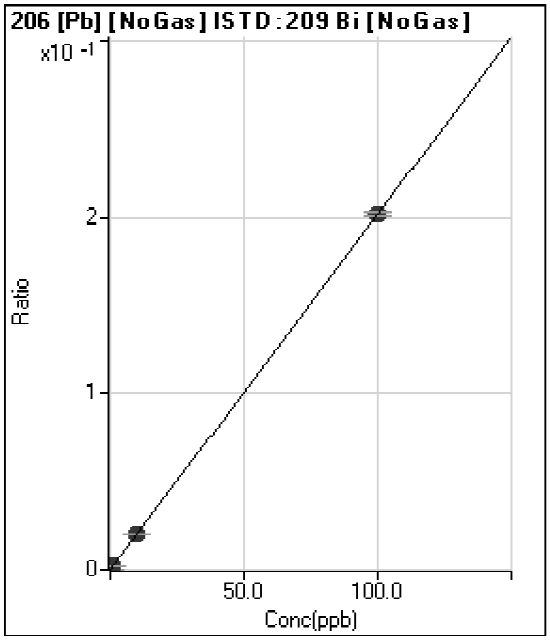
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000		0.00	0.0000	P	
2	☐			2.22	0.0000	P	86.6
3	☐			1.11	0.0000	P	173.
4	☐			2.22	0.0000	P	173.
5	☐			5.55	0.0000	P	69.8



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2034.61	0.0004	P	1.4
2	☐	0.100	0.080	3613.81	0.0007	P	2.1
3	☐	1.000	0.973	21263.12	0.0040	P	2.2
4	☐	10.000	9.899	202400.13	0.0374	P	0.8
5	☐	100.000	100.010	1977494.65	0.3747	A	1.6

y = 0.0037 * x + 3.6099E-004
R = 1.0000
DL = 0.004055
BEC = 0.09645

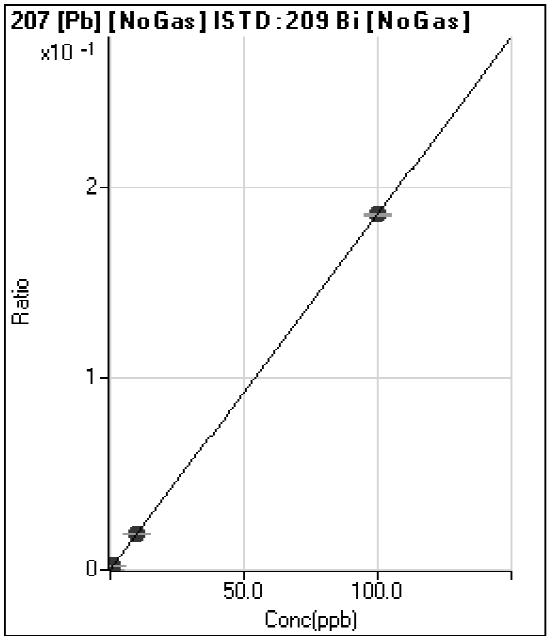
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113.34	0.0000	P	20.4
2	☐	0.100	0.106	870.05	0.0002	P	4.7
3	☐	1.000	0.996	7048.62	0.0020	P	2.2
4	☐	10.000	9.932	69145.70	0.0200	P	0.7
5	☐	100.000	100.007	650907.01	0.2015	P	1.0

y = 0.0020 * x + 3.1379E-005
R = 1.0000
DL = 0.009535
BEC = 0.01557

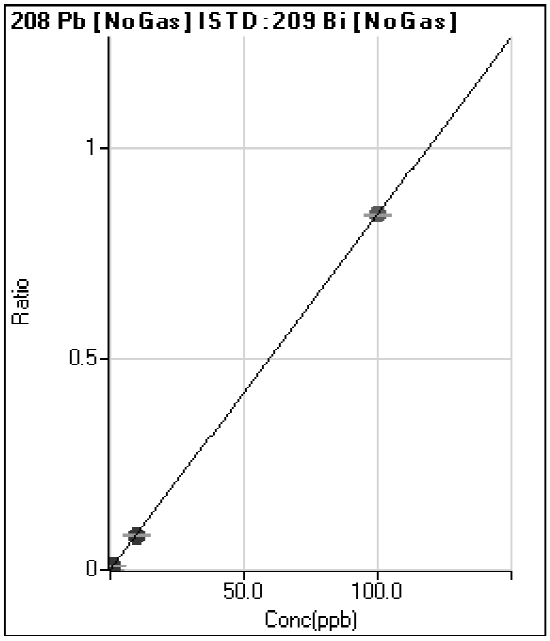
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113.33	0.0000	P	37.5
2	☐	0.100	0.127	950.07	0.0003	P	6.9
3	☐	1.000	0.952	6218.21	0.0018	P	4.5
4	☐	10.000	9.866	63205.80	0.0183	P	0.9
5	☐	100.000	100.014	598984.11	0.1855	P	0.6

y = 0.0019 * x + 3.1606E-005
R = 1.0000
DL = 0.01918
BEC = 0.01705

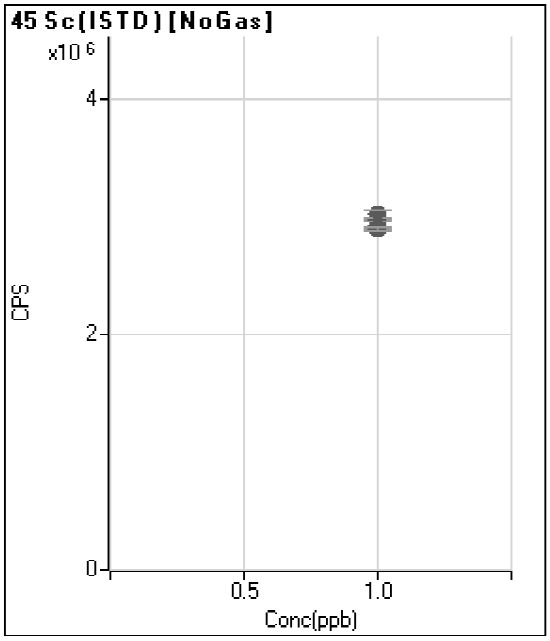
Weight: <None>
Min Conc: <None>



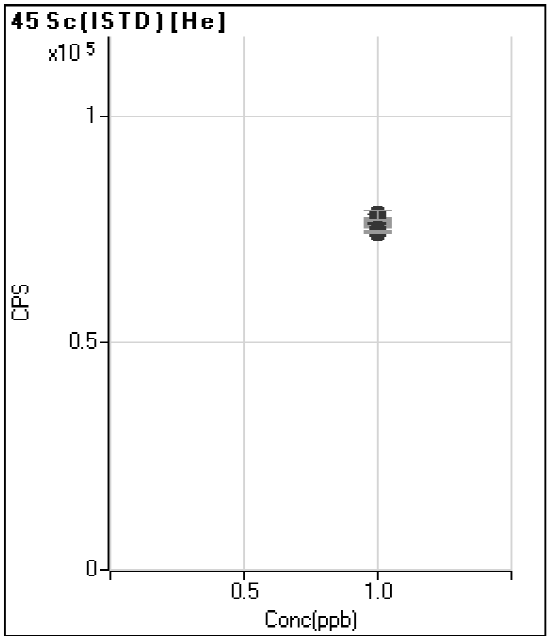
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	596.69	0.0002	P	3.8
2	☐	0.100	0.109	3847.02	0.0011	P	0.9
3	☐	1.000	0.954	28381.69	0.0082	P	2.9
4	☐	10.000	9.762	284333.92	0.0824	P	0.9
5	☐	100.000	100.024	2722887.65	0.8430	A	0.7

y = 0.0084 * x + 1.6554E-004
R = 1.0000
DL = 0.002268
BEC = 0.01964

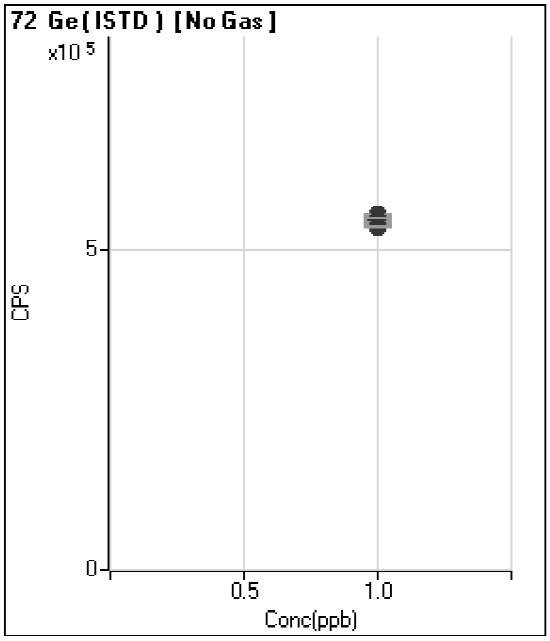
Weight: <None>
Min Conc: <None>



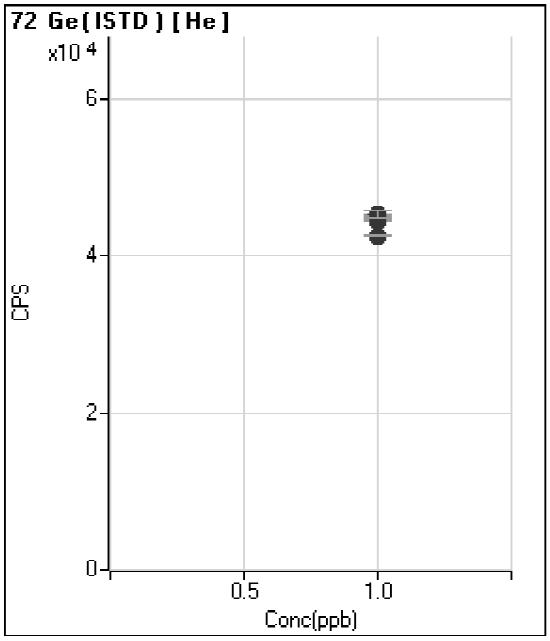
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3019672.94		A	2.6
2	☐	1.000		2975998.35		A	0.8
3	☐	1.000		2926323.91		A	2.4
4	☐	1.000		2934444.40		A	1.6
5	☐	1.000		2900925.37		A	0.8



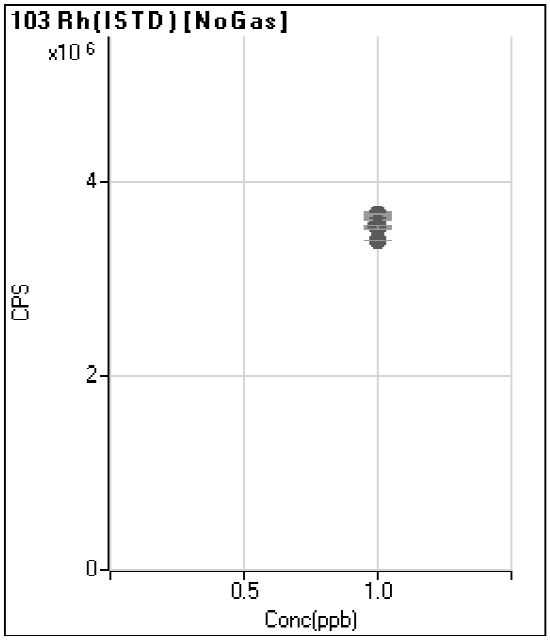
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		75790.99		P	0.9
2	☐	1.000		76347.90		P	1.3
3	☐	1.000		76882.87		P	1.0
4	☐	1.000		78128.82		P	2.4
5	☐	1.000		74288.74		P	1.0



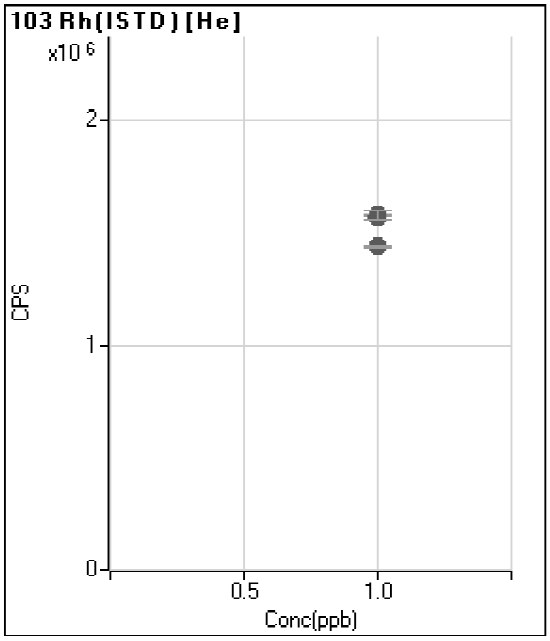
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		552452.77		P	1.5
2	☐	1.000		555824.44		P	0.3
3	☐	1.000		546320.74		P	1.6
4	☐	1.000		547483.74		P	1.4
5	☐	1.000		536652.05		P	0.7



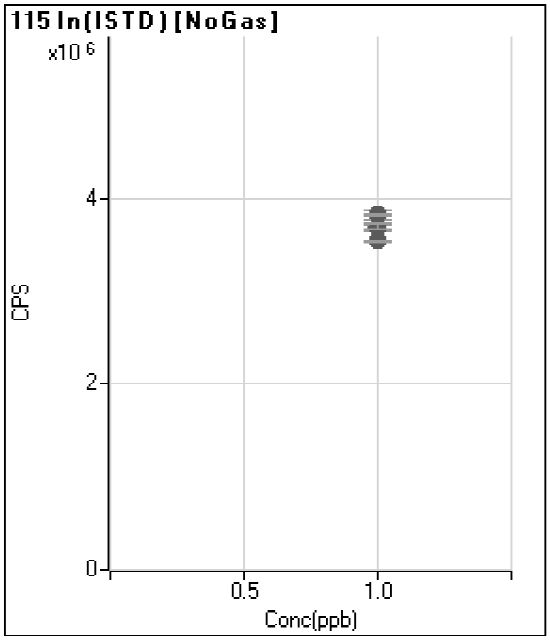
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		44394.63		P	0.4
2	☐	1.000		44900.37		P	1.1
3	☐	1.000		45082.13		P	0.7
4	☐	1.000		45191.73		P	2.1
5	☐	1.000		42485.10		P	0.8



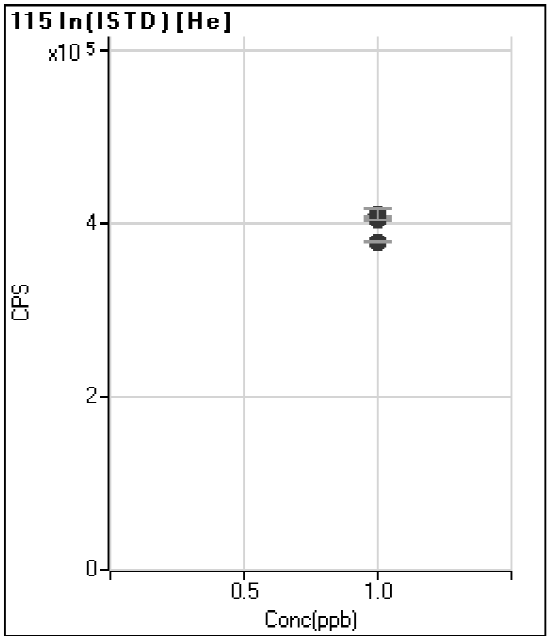
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3660203.33		A	1.6
2	☐	1.000		3657811.38		A	0.5
3	☐	1.000		3572770.13		A	2.3
4	☐	1.000		3534992.50		A	0.9
5	☐	1.000		3399936.05		A	0.2



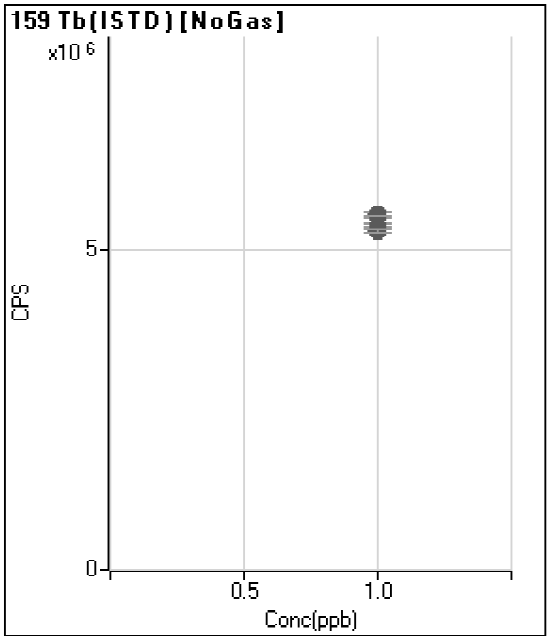
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1573916.12		A	1.8
2	☐	1.000		1581645.32		A	0.5
3	☐	1.000		1564388.34		A	1.0
4	☐	1.000		1579741.67		A	2.3
5	☐	1.000		1437746.50		A	1.0



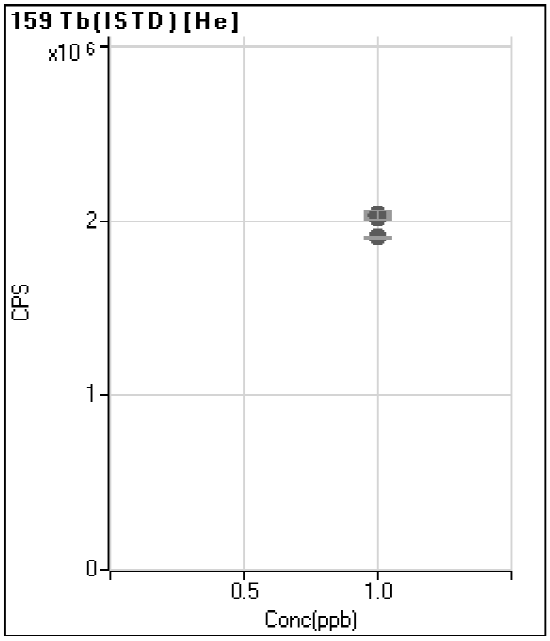
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3822230.42		A	2.8
2	☐	1.000		3828513.07		A	0.8
3	☐	1.000		3686108.80		A	1.7
4	☐	1.000		3699585.76		A	1.9
5	☐	1.000		3543248.72		A	0.5



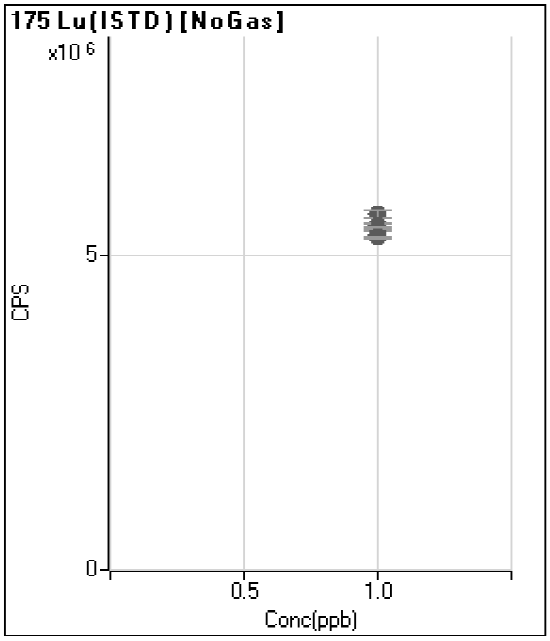
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		404099.32		P	0.4
2	☐	1.000		406013.60		P	0.5
3	☐	1.000		407080.14		P	0.4
4	☐	1.000		410257.78		P	3.1
5	☐	1.000		379045.31		P	0.4



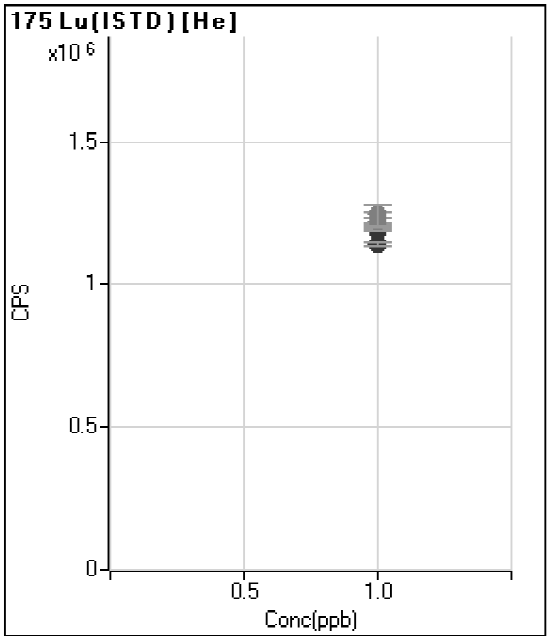
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5550323.25		A	1.9
2	☐	1.000		5533553.25		A	0.3
3	☐	1.000		5362943.88		A	1.8
4	☐	1.000		5349789.50		A	0.5
5	☐	1.000		5289538.46		A	1.0



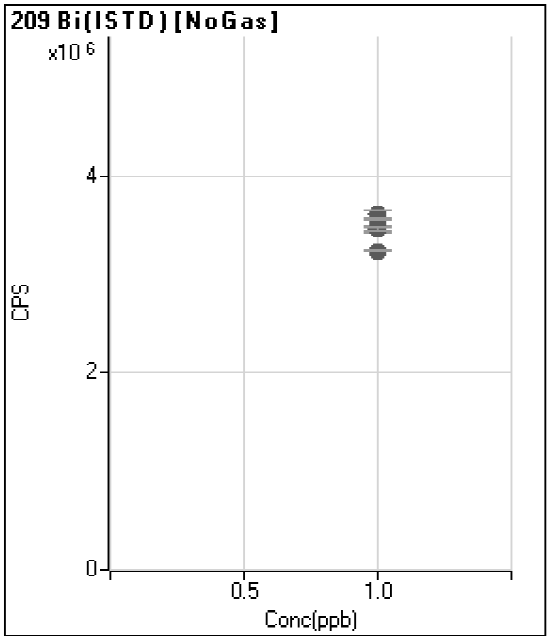
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2036132.52		A	0.1
2	☐	1.000		2038302.16		A	0.9
3	☐	1.000		2021511.01		A	0.5
4	☐	1.000		2034919.60		A	2.8
5	☐	1.000		1910311.53		A	0.5



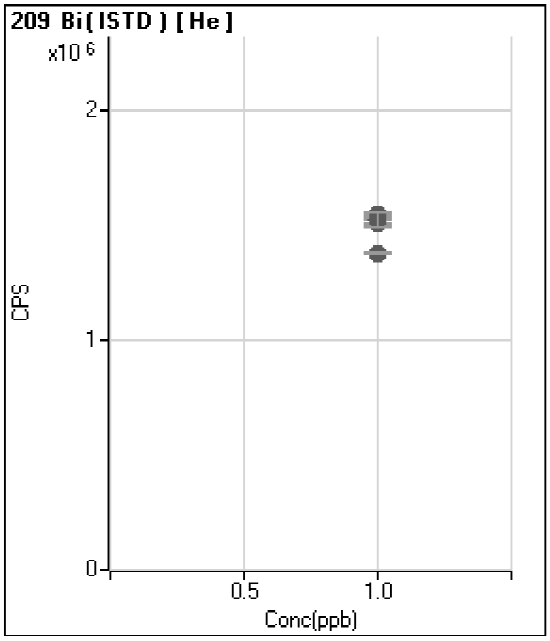
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5635183.67		A	2.1
2	☐	1.000		5467330.54		A	1.3
3	☐	1.000		5311394.19		A	2.1
4	☐	1.000		5410173.46		A	0.7
5	☐	1.000		5277796.80		A	0.4



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1190023.24		P	0.5
2	☐	1.000		1234377.38		M	2.8
3	☐	1.000		1218433.24		M	2.8
4	☐	1.000		1244946.88		M	5.9
5	☐	1.000		1141518.53		P	0.9



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3602753.49		A	2.4
2	☐	1.000		3558021.51		A	0.5
3	☐	1.000		3460002.14		A	1.9
4	☐	1.000		3449715.16		A	1.1
5	☐	1.000		3229902.76		A	0.6



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1548427.37		A	0.3
2	☐	1.000		1532127.94		A	0.2
3	☐	1.000		1506771.44		A	0.5
4	☐	1.000		1527251.75		A	4.6
5	☐	1.000		1379748.16		A	0.6

GCAL ANALYTICAL LABORATORIES, LLC

BATCH COVERSHEET

ANALYST AWG

DATE 08/20/18

ICP/MS Metals Analysis

HBN **642309**

STANDARDS

ICAL Standard	316-66-8
ICV Standard	316-66-4
ICSA Standard	316-66-9
ICSAB Standard	316-66-3
Internal Standard	316-66-12
Tune	316-63-4
P/A	316-56-9

ADDITIONAL STANDARDS

LDR Standard	316-66-10
	ICVB 316-66-11

ACID MATRIX

2% HNO3 \ 0.5% HCL Solution	317-48-20
5% HNO3 \ 2% HCL Solution	317-49-3

ICPMS DATA FILE

Reference File: 2180820B_MS2

GCAL QC LIMITS

200.8 Correlation Coefficient (R) =0.998

6020B Correlation Coefficient (R) =0.995

ICV Recovery 90-110%

LLCCV Recovery 80-120%

ICSA \ ICSAB Recovery 80-120%

CCV Recovery 90-110%

Sample						
Data File	Acq. Date-Time	Type	Sample Name	Dilution	Vial Number	Comment
004CALB.d	8/20/2018 13:05	CalBlk	1300	1	1107	
005CALS.d	8/20/2018 13:09	CalStd	1302	1	1105	
006CALS.d	8/20/2018 13:13	CalStd	1304	1	1103	
007CALS.d	8/20/2018 13:17	CalStd	1305	1	1102	
008CALS.d	8/20/2018 13:20	CalStd	1306	1	1101	
009_ICV.d	8/20/2018 13:24	ICV	1600	1	1201	
010_ICV.d	8/20/2018 13:28	ICV	1600 B	1	1203	
011_ICB.d	8/20/2018 13:31	ICB	1700	1	1107	
0120.1.d	8/20/2018 13:35	LLCCV0.1	1804	1	1105	
1210.5.d	8/20/2018 13:38	LLCCV0.5	1804	1	1104	
1211_ICB.d	8/20/2018 13:42	ICB	1700	1	1107	
12120.1.d	8/20/2018 13:45	LLCCV0.1	1804	1	1105	
121210.5.d	8/20/2018 13:49	LLCCV0.5	1804	1	1104	
121211CCV1.d	8/20/2018 13:53	LLCCV1	1803	1	1103	
121212ICSA.d	8/20/2018 13:56	ICSA	2000	1	1205	
121213ICSB.d	8/20/2018 14:00	ICSB	2100	1	1206	
121214_QC1.d	8/20/2018 14:03	QC1	LDR	1	1204	
121215SMPL.d	8/20/2018 14:07	Sample	2500	1	3	
121216SMPL.d	8/20/2018 14:14	MBSOIL	1839944	40	2105	
121217SMPL.d	8/20/2018 14:17	LCS6020	1839945	40	2106	
121218SMPL.d	8/20/2018 14:21	Sample	21808140401	306.7485	2205	
121219_CCV.d	8/20/2018 14:30	CCV	1800	1	1102	
121220_CCB.d	8/20/2018 14:34	CCB	1900	1	1107	
121221SMPL.d	8/20/2018 14:37	LCS6020	1839945	40	2106	
121222SMPL.d	8/20/2018 14:41	MBSOIL	1841044	5000	2101	
121223SMPL.d	8/20/2018 14:45	LCS6020	1841045	5000	2102	
121224SMPL.d	8/20/2018 14:48	Sample	21807276111	100000	2103	
121225_CCV.d	8/20/2018 14:52	CCV	1800	1	1102	
121226_CCB.d	8/20/2018 14:55	CCB	1900	1	1107	
121227SMPL.d	8/20/2018 14:59	Sample	21808144804	100000	2104	
121228SMPL.d	8/20/2018 15:02	AllRef	21808144803	4000	2107	
121229SMPL.d	8/20/2018 15:06	MSSOIL	1839946	4000	2108	
121230SMPL.d	8/20/2018 15:09	MSDSOIL	1839947	4000	2109	
121231SMPL.d	8/20/2018 15:13	PDS	1841153	4000	2110	
121232SMPL.d	8/20/2018 15:16	Sample	1841154	20000	2111	
121233SMPL.d	8/20/2018 15:20	Sample	21808161601	396.8254	2112	
121234SMPL.d	8/20/2018 15:24	Sample	21807263415	367.6471	2201	
121235SMPL.d	8/20/2018 15:27	Sample	21807263416	364.9635	2202	
121236SMPL.d	8/20/2018 15:31	Sample	21807263417	400	2203	
121237SMPL.d	8/20/2018 15:34	Sample	21808164901	364.9635	2204	
121238SMPL.d	8/20/2018 15:38	MBWATER	1840743	1	2206	
121239SMPL.d	8/20/2018 15:41	LCS6020	1840744	1	2207	
121240SMPL.d	8/20/2018 15:45	Sample	21808164901 TCLP	100	2303	
121241SMPL.d	8/20/2018 15:48	Sample	21808144804	1000000	2104	
121242_CCV.d	8/20/2018 15:52	CCV	1800	1	1102	

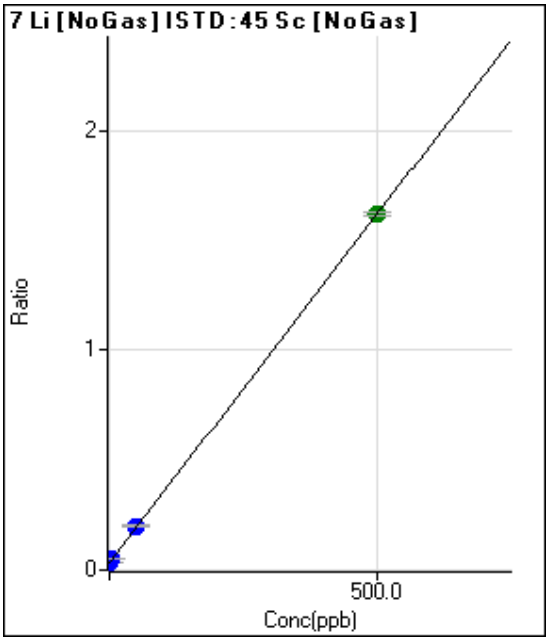
121243_CCB.d	8/20/2018 15:55	CCB	1900	1	1107	
121244SMPL.d	8/20/2018 16:05	AllRef	21808151502	100	2208	
121245SMPL.d	8/20/2018 16:09	MS10XP	1840761	100	2209	
121246SMPL.d	8/20/2018 16:12	MSD10XP	1840762	100	2210	
121247SMPL.d	8/20/2018 16:16	PDS	1841155	100	2211	
121248SMPL.d	8/20/2018 16:20	Sample	1841156	500	2212	
121249SMPL.d	8/20/2018 16:23	AllRef	21808153701	100	2301	
121250SMPL.d	8/20/2018 16:27	MS10XP	1840763	100	2302	
121251SMPL.d	8/20/2018 16:30	Sample	21808166101	100	2304	
121252SMPL.d	8/20/2018 16:34	Sample	21808166102	100	2305	
121253SMPL.d	8/20/2018 16:37	Sample	21808162601	100	2306	
121254SMPL.d	8/20/2018 16:41	Sample	21808162602	100	2307	
121255SMPL.d	8/20/2018 16:44	Sample	21808162603	100	2308	
121256SMPL.d	8/20/2018 16:48	Sample	21808162604	100	2309	
121257SMPL.d	8/20/2018 16:51	Sample	21808165601	100	2310	
121258SMPL.d	8/20/2018 16:55	Sample	TBLK	100	2407	
121259_CCV.d	8/20/2018 16:58	CCV	1800	1	1102	
121260_CCB.d	8/20/2018 17:02	CCB	1900	1	1107	
121261SMPL.d	8/20/2018 17:06	Sample	21808171001	1	2311	
121262SMPL.d	8/20/2018 17:09	Sample	21808171501	1	2312	
121263SMPL.d	8/20/2018 17:13	Sample	21808171502	1	2401	
121264SMPL.d	8/20/2018 17:16	Sample	21808171503	1	2402	
121265SMPL.d	8/20/2018 17:20	Sample	21808171504	1	2403	
121266SMPL.d	8/20/2018 17:23	Sample	21808171301	1	2404	
121267SMPL.d	8/20/2018 17:27	Sample	21808171302	1	2405	
121268SMPL.d	8/20/2018 17:30	Sample	21808171303	1	2406	
121269_CCV.d	8/20/2018 17:34	CCV	1800	1	1102	
121270_CCB.d	8/20/2018 17:38	CCB	1900	1	1107	
121271SMPL.d	8/20/2018 17:41	Sample	1840818	40	2512	
121272SMPL.d	8/20/2018 17:45	Sample	1840819	40	3101	
121273SMPL.d	8/20/2018 17:48	Sample	21808172801	400	3102	
121274SMPL.d	8/20/2018 17:52	Sample	21808172802	384.6154	3103	
121275SMPL.d	8/20/2018 17:55	Sample	21808172901	378.7879	3104	
121276SMPL.d	8/20/2018 17:59	Sample	21808172902	393.7008	3105	
121277SMPL.d	8/20/2018 18:02	Sample	21808181206	400	3106	
121278SMPL.d	8/20/2018 18:06	Sample	21808181207	400	3107	
121279SMPL.d	8/20/2018 18:10	Sample	21808181208	400	3108	
121280SMPL.d	8/20/2018 18:13	Sample	1841231	400	3109	
121281SMPL.d	8/20/2018 18:17	Sample	1841232	2000	3110	
121282SMPL.d	8/20/2018 18:20	Sample	21808181209	344.8276	3111	
121283SMPL.d	8/20/2018 18:24	Sample	21808181210	375.9398	3112	
121284SMPL.d	8/20/2018 18:27	Sample	1841052	1	2409	
121285SMPL.d	8/20/2018 18:31	Sample	1841053	1	2410	
121286SMPL.d	8/20/2018 18:34	Sample	21808166103	100	2411	
121287_CCV.d	8/20/2018 18:38	CCV	1800	1	1102	
121288_CCB.d	8/20/2018 18:41	CCB	1900	1	1107	
121289SMPL.d	8/20/2018 18:45	Sample	21808173601	100	2412	

121290SMPL.d	8/20/2018 18:49	Sample	1841056	100	2501	
121291SMPL.d	8/20/2018 18:52	Sample	1841057	100	2502	
121292SMPL.d	8/20/2018 18:56	Sample	1841177	100	2503	
121293SMPL.d	8/20/2018 18:59	Sample	1841178	500	2504	
121294SMPL.d	8/20/2018 19:03	Sample	21808180601	1	2505	
121295SMPL.d	8/20/2018 19:06	Sample	21808180602	1	2506	
121296SMPL.d	8/20/2018 19:10	Sample	21808181303	1	2507	
121297SMPL.d	8/20/2018 19:13	Sample	21808201101 200X	200	2508	
121298SMPL.d	8/20/2018 19:17	Sample	21808201101	2	2509	
121299SMPL.d	8/20/2018 19:20	Sample	21808201102	2	2510	
121300SMPL.d	8/20/2018 19:24	Sample	21808201401	5	2511	
121301_CCV.d	8/20/2018 19:28	CCV	1800	1	1102	
121302_CCB.d	8/20/2018 19:31	CCB	1900	1	1107	
121303SMPL.d	8/20/2018 19:35	Sample	1840541	1	3201	
121304SMPL.d	8/20/2018 19:38	Sample	1840542	1	3202	
121305SMPL.d	8/20/2018 19:42	Sample	21808165702	1	3203	
121306SMPL.d	8/20/2018 19:45	Sample	1840543	1	3204	
121307SMPL.d	8/20/2018 19:49	Sample	1840544	1	3205	
121308SMPL.d	8/20/2018 19:52	Sample	21808167402	300	3206	
121309SMPL.d	8/20/2018 19:56	Sample	21808167403	300	3207	
121310SMPL.d	8/20/2018 20:00	Sample	21808167404	300	3208	
121311SMPL.d	8/20/2018 20:03	Sample	21808167405	300	3209	
121312SMPL.d	8/20/2018 20:07	Sample	21808167406	300	3210	
121313_CCV.d	8/20/2018 20:10	CCV	1800	1	1102	
121314_CCB.d	8/20/2018 20:14	CCB	1900	1	1107	

Tune Step	Mass	Name	R	a	b (blank)	DL	BEC	Units
1	7	Li	0.99998149	0.003170743	0.033064029	0.447253492	10.42784749	ppb
1	9	Be	0.999999628	0.001173366	1.10E-05	0.001982123	0.009336024	ppb
1	11	B	0.999998954	0.000724388	0.00051648	0.189466672	0.712987132	ppb
2	23	Na	0.999995811	0.003834224	0.091838566	3.068144747	23.95232237	ppb
2	24	Mg	0.999995147	0.001473142	0.001018018	0.544777565	0.691051836	ppb
2	27	Al	0.999999936	0.000334536	0.000908944	0.664423871	2.717028541	ppb
2	29	Si	0.997304416	1.16E-05	0.191331946	1106.741663	16484.36387	ppb
2	39	K	0.999998404	0.001252325	0.145874175	11.26686306	116.4826397	ppb
2	44	Ca	0.999999651	5.52E-05	0.003185442	27.11017306	57.73093847	ppb
2	47	Ti	0.999998808	0.000548109	6.79E-05	0.03446045	0.123867616	ppb
2	51	V	0.99999553	0.029368214	0.001723521	0.006292158	0.058686611	ppb
2	52	Cr	0.999999291	0.038486969	0.049988369	0.236864746	1.298838813	ppb
2	55	Mn	0.999999742	0.013284795	0.002334697	0.04648892	0.175742014	ppb
2	57	Fe	0.999999146	0.000642419	0.005391155	1.032164016	8.39195998	ppb
2	59	Co	0.999999223	0.065257264	0.001198493	0.015077114	0.018365671	ppb
2	60	Ni	0.99999425	0.018173531	0.004711903	0.057561921	0.259272843	ppb
2	63	Cu	0.999991624	0.039806334	0.021785749	0.021973648	0.547293533	ppb
2	66	Zn	0.999997876	0.007065179	0.00264182	0.18675415	0.373921183	ppb
2	75	As	0.999997948	0.00737736	0.000321118	0.017466971	0.043527545	ppb
2	78	Se	0.999999349	0.000320273	8.80E-05	0.102934441	0.274764066	ppb
1	88	Sr	0.999998342	0.03051246	0.000435225	0.003431872	0.01426383	ppb
1	90	Zr	0.999998915	0.01909408	0.000491966	0.002282972	0.025765352	ppb
1	95	Mo	0.999982935	0.001212112	1.87E-05	0.002067198	0.015405761	ppb
1	107	Ag	0.999999046	0.002821337	6.78E-06	0.001303031	0.002402111	ppb
1	111	Cd	0.999999994	0.000573616	2.96E-06	0.006726126	0.005163713	ppb
1	118	(Sn)	0.999992282	0.001594285	0.000156022	0.015816689	0.0978631	ppb
2	118	(Sn)	0.999992996	0.002213689	0.000208654	0.053060838	0.094256382	ppb
2	120	Sn	0.999991643	0.003171391	0.000271521	0.039751592	0.085615735	ppb
1	121	Sb	0.999991699	0.002348679	7.33E-05	0.007905006	0.031230279	ppb
1	137	Ba	0.999995936	0.000802001	2.89E-05	0.026641343	0.036042406	ppb
2	156	[Se]						ppb
1	205	Tl	0.999997859	0.005486358	6.28E-05	0.001142314	0.011439712	ppb
1	206	(Pb)	0.999994898	0.001837164	2.14E-05	0.018607928	0.011663223	ppb
1	207	(Pb)	0.999996275	0.001663422	2.29E-05	0.009236984	0.013739649	ppb
1	208	Pb	0.999997536	0.007407163	8.27E-05	0.005183701	0.011165276	ppb
1	45	Sc						ppb
2	45	Sc						ppb
1	72	Ge						ppb
2	72	Ge						ppb
1	103	Rh						ppb
2	103	Rh						ppb
1	115	In						ppb
2	115	In						ppb
1	159	Tb						ppb
2	159	Tb						ppb
1	175	Lu						ppb
2	175	Lu						ppb
1	209	Bi						ppb
2	209	Bi						ppb

Batch Folder: C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b\
Analysis File: 2180820B_MS2.batch.bin
DA Date-Time: 08/20/2018 15:57:37
Calibration Title: EPA6020
Calibration Method: External Calibration
VIS Interpolation Fit:

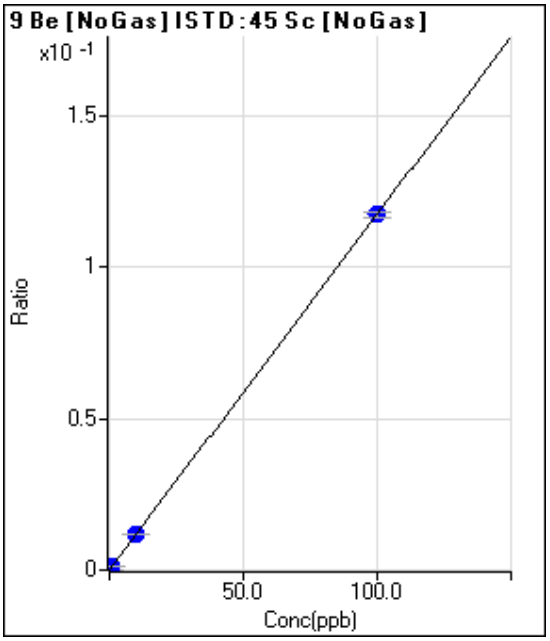
Level	Standard Data File	Sample Name	Acq. Date-Time
1	004CALB.d	1300	08/20/2018 13:05:58
2	005CALS.d	1302	08/20/2018 13:09:46
3	006CALS.d	1304	08/20/2018 13:13:29
4	007CALS.d	1305	08/20/2018 13:17:11
5	008CALS.d	1306	08/20/2018 13:20:54



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	183129.21	0.0331	P	1.4
2	☐	0.500	0.523	190090.01	0.0347	P	1.1
3	☐	5.000	5.437	277534.71	0.0503	P	0.4
4	☐	50.000	53.084	1126194.44	0.2014	P	0.3
5	☐	500.000	499.687	8947600.49	1.6174	A	1.2

y = 0.0032 * x + 0.0331
R = 1.0000
DL = 0.4473
BEC = 10.43

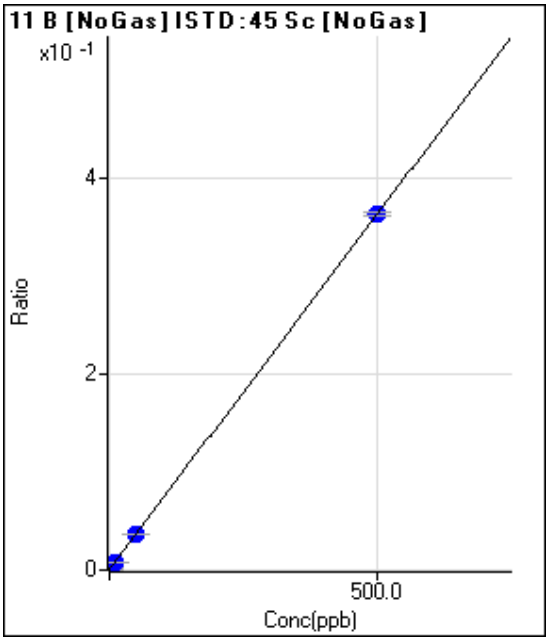
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	60.67	0.0000	P	7.1
2	☐	0.100	0.098	686.69	0.0001	P	2.8
3	☐	1.000	1.007	6576.79	0.0012	P	1.8
4	☐	10.000	9.917	65132.92	0.0116	P	1.3
5	☐	100.000	100.008	649194.86	0.1174	P	1.5

y = 0.0012 * x + 1.0955E-005
R = 1.0000
DL = 0.001982
BEC = 0.009336

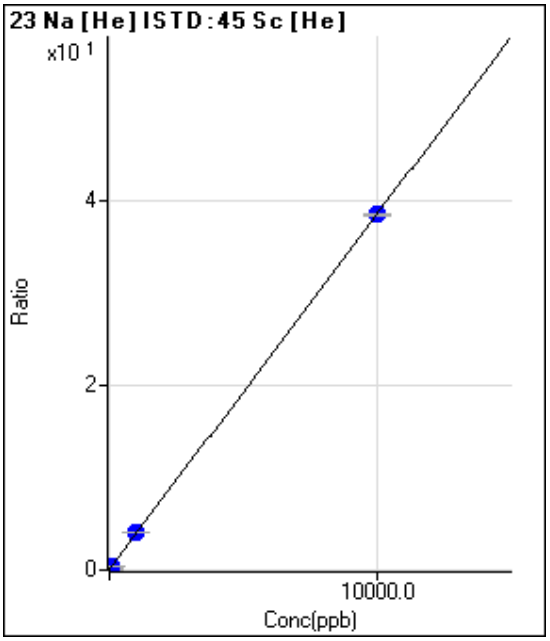
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2860.36	0.0005	P	8.9
2	☐	1.000	0.872	6288.18	0.0011	P	3.9
3	☐	10.000	9.794	41992.20	0.0076	P	0.5
4	☐	50.000	49.214	202246.76	0.0362	P	1.6
5	☐	500.000	500.083	2006822.78	0.3628	P	0.9

y = 7.2439E-004 * x + 5.1648E-004
R = 1.0000
DL = 0.1895
BEC = 0.713

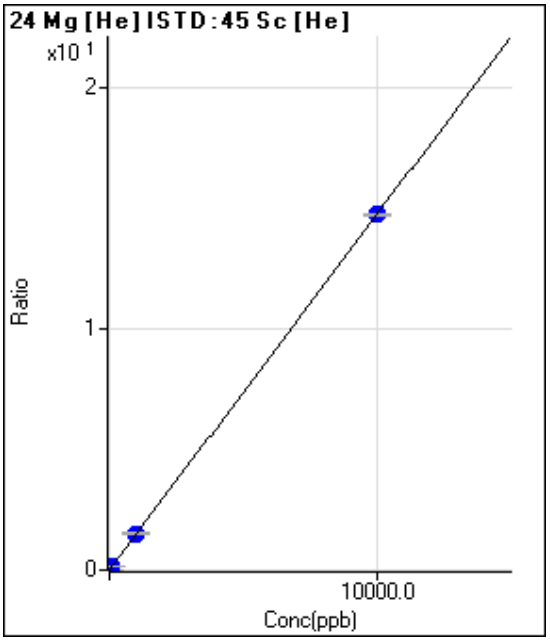
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	9026.29	0.0918	P	4.3
2	☐	10.000	10.146	12795.76	0.1307	P	4.1
3	☐	100.000	102.845	47545.79	0.4862	P	1.3
4	☐	1000.000	1029.093	392819.32	4.0376	P	0.9
5	☐	10000.000	9997.062	3802651.71	38.4228	P	0.8

y = 0.0038 * x + 0.0918
R = 1.0000
DL = 3.068
BEC = 23.95

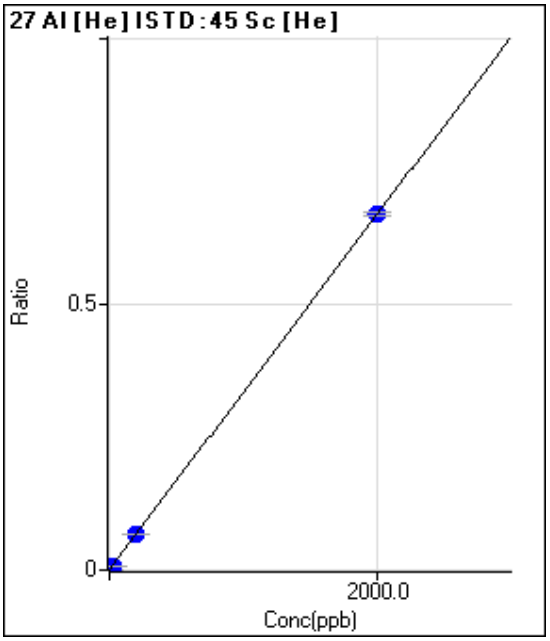
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	100.00	0.0010	P	26.3
2	☐	10.000	10.288	1583.48	0.0162	P	2.6
3	☐	100.000	103.294	14977.91	0.1532	P	3.5
4	☐	1000.000	1031.405	147923.04	1.5204	P	1.1
5	☐	10000.000	9996.826	1457558.36	14.7278	P	0.7

y = 0.0015 * x + 0.0010
R = 1.0000
DL = 0.5448
BEC = 0.6911

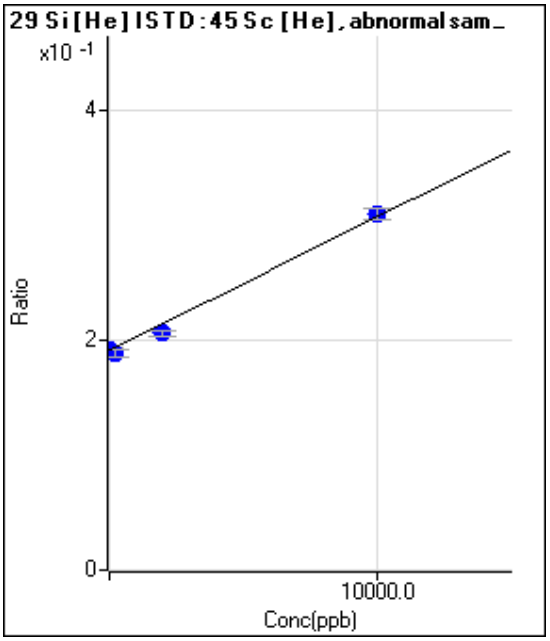
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	89.33	0.0009	P	8.2
2	☐	2.000	1.619	142.00	0.0015	P	4.7
3	☐	20.000	19.124	714.69	0.0073	P	2.2
4	☐	200.000	199.653	6586.82	0.0677	P	2.3
5	☐	2000.000	2000.044	66305.50	0.6700	P	1.2

y = 3.3454E-004 * x + 9.0894E-004
R = 1.0000
DL = 0.6644
BEC = 2.717

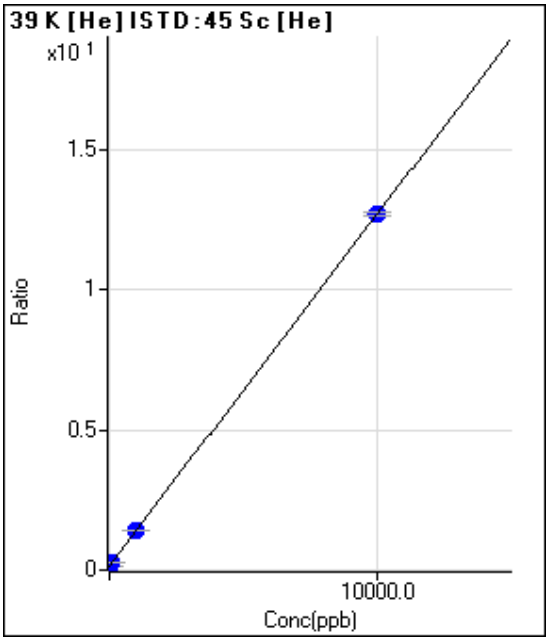
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	18791.77	0.1913	P	2.2
2	☐	20.000	-129.763	18582.85	0.1898	P	1.0
3	☐	200.000	-286.261	18384.58	0.1880	P	3.2
4	☐	2000.000	1240.725	20015.98	0.2057	P	2.2
5	☐	10000.000	10161.880	30605.74	0.3093	P	3.0

y = 1.1607E-005 * x + 0.1913
R = 0.9973
DL = 1107
BEC = 1.648E+04

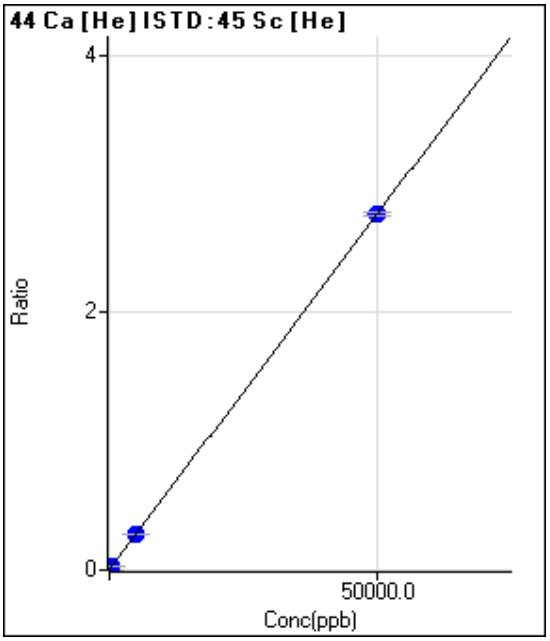
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14327.31	0.1459	P	3.2
2	☐	10.000	9.705	15468.49	0.1580	P	3.1
3	☐	100.000	97.908	26260.57	0.2685	P	1.0
4	☐	1000.000	1016.696	138060.52	1.4191	P	0.5
5	☐	10000.000	9998.352	1253593.52	12.6671	P	1.0

y = 0.0013 * x + 0.1459
R = 1.0000
DL = 11.27
BEC = 116.5

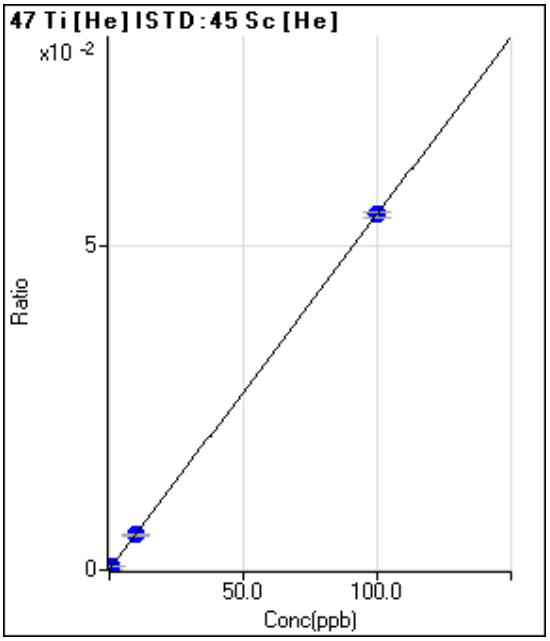
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	313.34	0.0032	P	15.7
2	☐	50.000	51.199	588.35	0.0060	P	13.2
3	☐	500.000	519.895	3117.04	0.0319	P	3.7
4	☐	5000.000	5043.064	27382.26	0.2814	P	1.0
5	☐	50000.000	49995.493	273322.95	2.7618	P	1.0

y = 5.5177E-005 * x + 0.0032
R = 1.0000
DL = 27.11
BEC = 57.73

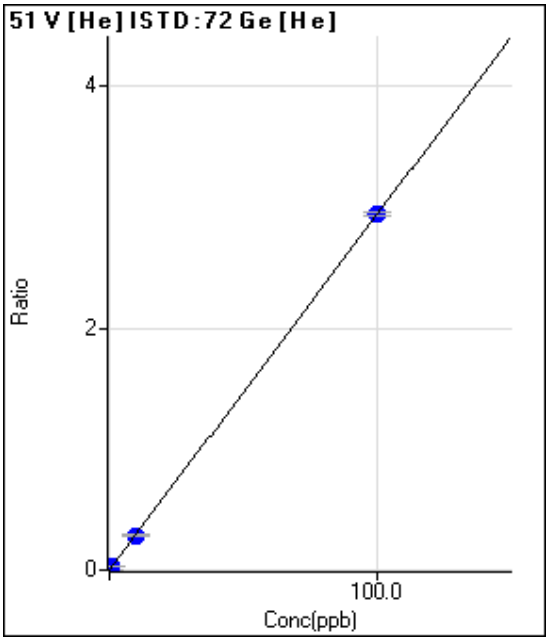
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6.67	0.0001	P	9.3
2	☐	0.100	0.081	11.00	0.0001	P	17.6
3	☐	1.000	1.032	62.00	0.0006	P	10.0
4	☐	10.000	9.858	532.34	0.0055	P	4.5
5	☐	100.000	100.014	5431.67	0.0549	P	1.6

y = 5.4811E-004 * x + 6.7893E-005
R = 1.0000
DL = 0.03446
BEC = 0.1239

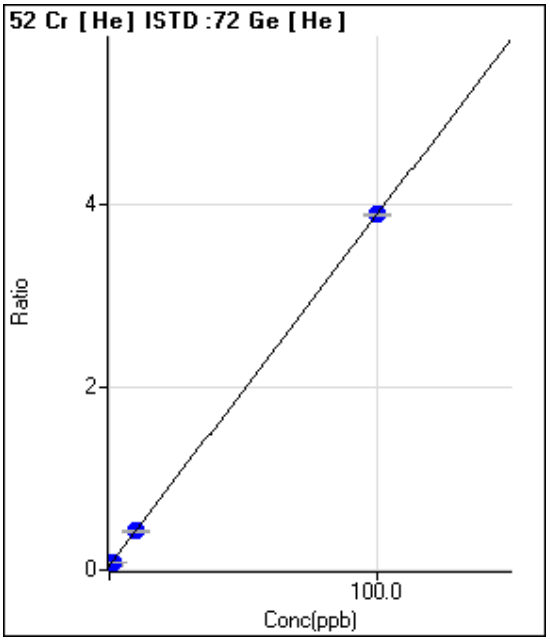
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	132.22	0.0017	P	3.6
2	☐	0.100	0.087	328.89	0.0043	P	3.2
3	☐	1.000	0.978	2362.44	0.0305	P	2.3
4	☐	10.000	9.697	22580.71	0.2865	P	2.5
5	☐	100.000	100.031	232618.19	2.9394	P	1.2

y = 0.0294 * x + 0.0017
R = 1.0000
DL = 0.006292
BEC = 0.05869

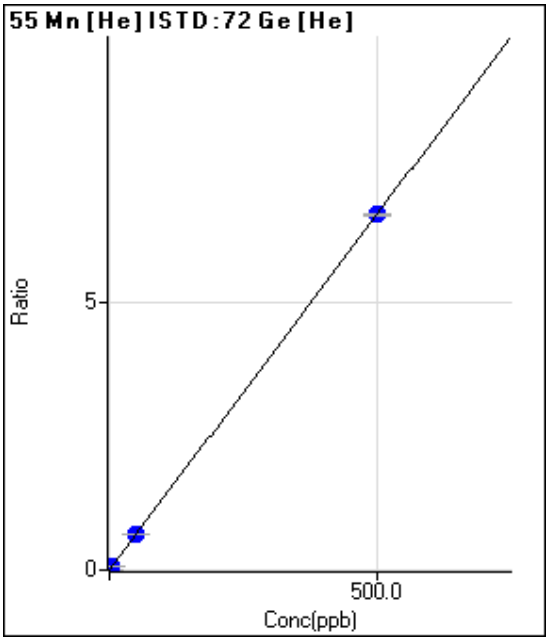
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3830.53	0.0500	P	6.1
2	☐	0.100	0.097	4125.06	0.0537	P	4.2
3	☐	1.000	0.973	6781.61	0.0874	P	3.0
4	☐	10.000	9.877	33897.83	0.4301	P	3.4
5	☐	100.000	100.013	308570.40	3.8992	P	0.2

y = 0.0385 * x + 0.0500
R = 1.0000
DL = 0.2369
BEC = 1.299

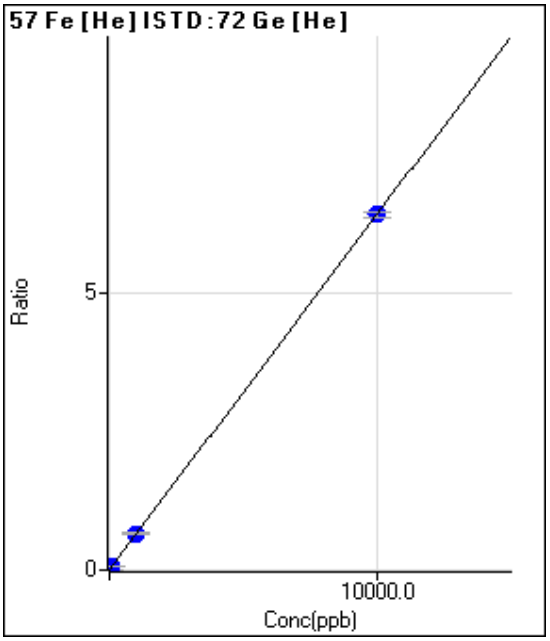
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	178.89	0.0023	P	8.8
2	☐	0.500	0.522	711.14	0.0093	P	14.8
3	☐	5.000	5.090	5425.50	0.0699	P	3.5
4	☐	50.000	50.377	52927.13	0.6716	P	3.6
5	☐	500.000	499.961	525806.18	6.6442	P	0.4

y = 0.0133 * x + 0.0023
R = 1.0000
DL = 0.04649
BEC = 0.1757

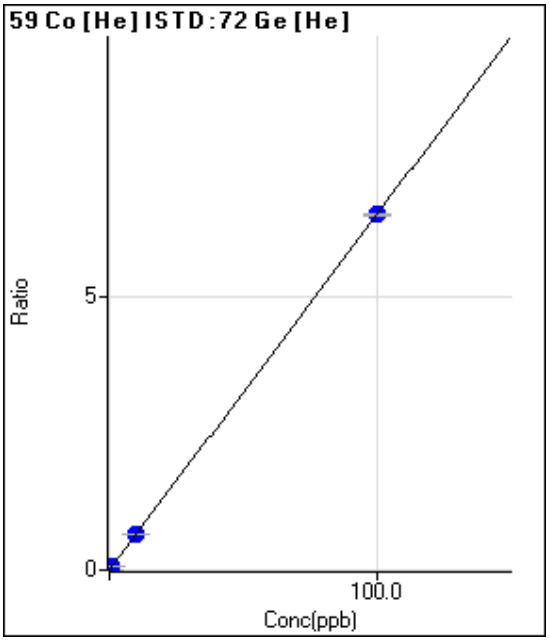
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	413.35	0.0054	P	4.1
2	☐	10.000	9.732	893.39	0.0116	P	19.5
3	☐	100.000	98.608	5331.15	0.0687	P	4.0
4	☐	1000.000	1012.256	51675.39	0.6557	P	2.9
5	☐	10000.000	9998.789	508752.53	6.4288	P	1.6

y = 6.4242E-004 * x + 0.0054
R = 1.0000
DL = 1.032
BEC = 8.392

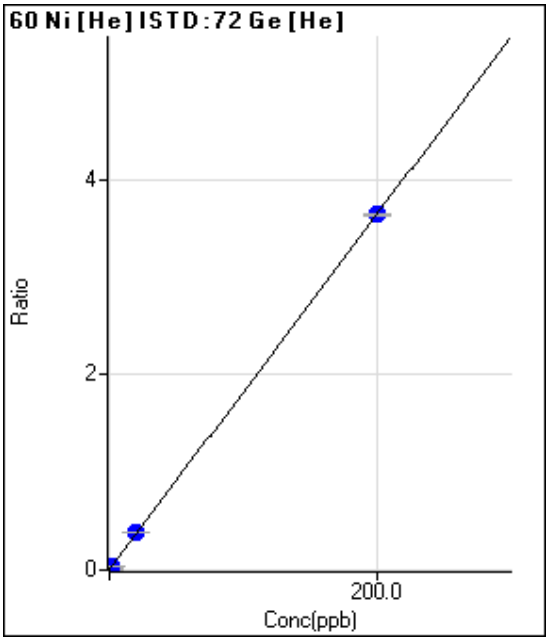
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	92.22	0.0012	P	27.4
2	☐	0.100	0.110	641.14	0.0084	P	7.7
3	☐	1.000	1.002	5164.30	0.0666	P	2.5
4	☐	10.000	10.125	52169.17	0.6619	P	2.4
5	☐	100.000	99.987	516458.10	6.5261	P	0.9

y = 0.0653 * x + 0.0012
R = 1.0000
DL = 0.01508
BEC = 0.01837

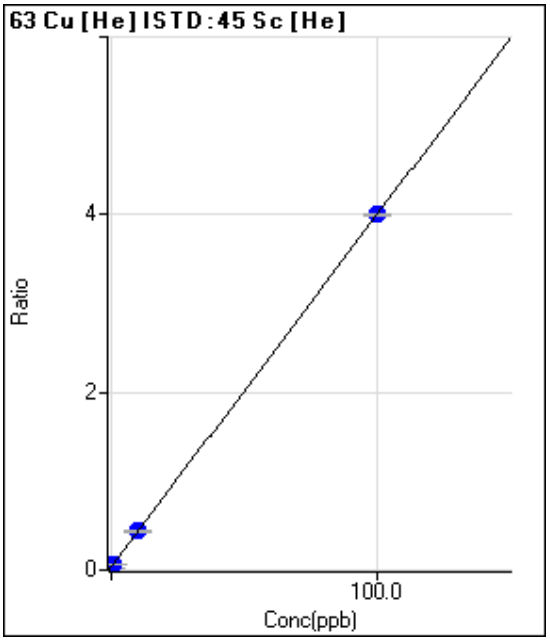
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	361.12	0.0047	P	7.4
2	☐	0.200	0.253	714.47	0.0093	P	10.0
3	☐	2.000	2.147	3391.54	0.0437	P	1.9
4	☐	20.000	20.712	30038.64	0.3811	P	1.0
5	☐	200.000	199.927	287909.88	3.6381	P	0.2

y = 0.0182 * x + 0.0047
R = 1.0000
DL = 0.05756
BEC = 0.2593

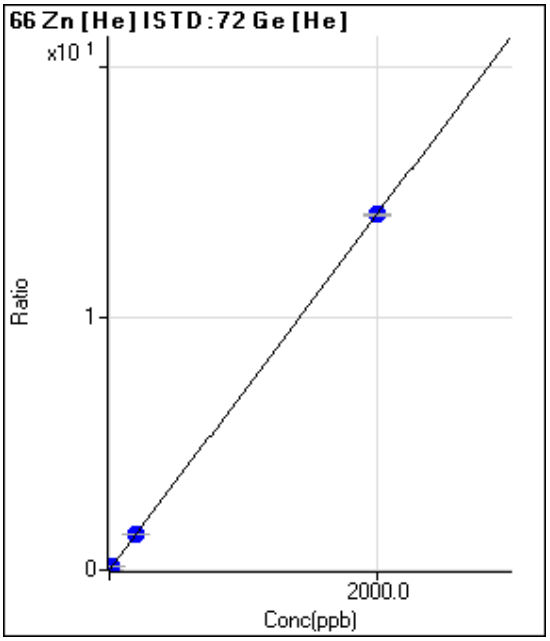
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2140.18	0.0218	P	1.3
2	☐	0.100	0.063	2380.22	0.0243	P	3.3
3	☐	1.000	1.035	6160.25	0.0630	P	2.1
4	☐	10.000	10.396	42380.25	0.4356	P	1.1
5	☐	100.000	99.960	395955.32	4.0008	P	0.4

y = 0.0398 * x + 0.0218
R = 1.0000
DL = 0.02197
BEC = 0.5473

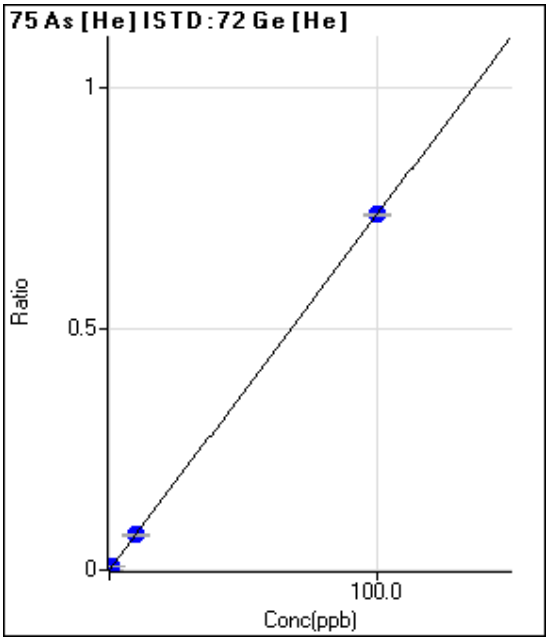
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	202.22	0.0026	P	16.6
2	☐	2.000	2.129	1357.86	0.0177	P	4.1
3	☐	20.000	20.803	11603.57	0.1496	P	4.3
4	☐	200.000	204.251	113944.15	1.4457	P	1.3
5	☐	2000.000	1999.567	1118208.39	14.1299	P	0.6

y = 0.0071 * x + 0.0026
R = 1.0000
DL = 0.1868
BEC = 0.3739

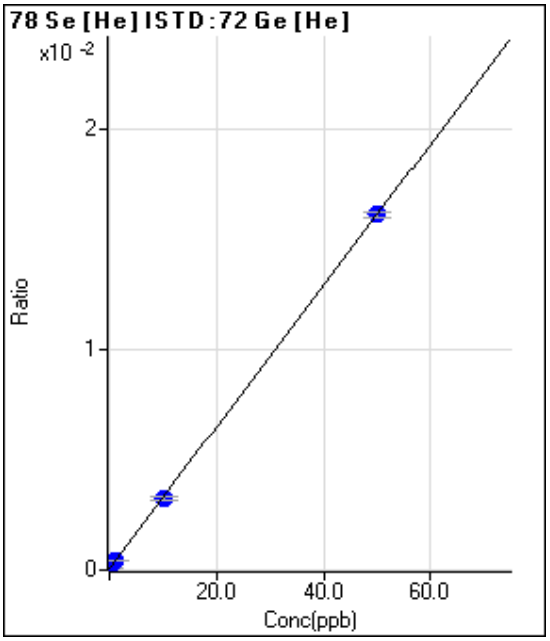
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	24.67	0.0003	P	13.4
2	☐	0.100	0.098	80.00	0.0010	P	11.2
3	☐	1.000	0.988	590.35	0.0076	P	7.7
4	☐	10.000	9.798	5722.14	0.0726	P	0.9
5	☐	100.000	100.020	58420.33	0.7382	P	0.8

y = 0.0074 * x + 3.2112E-004
R = 1.0000
DL = 0.01747
BEC = 0.04353

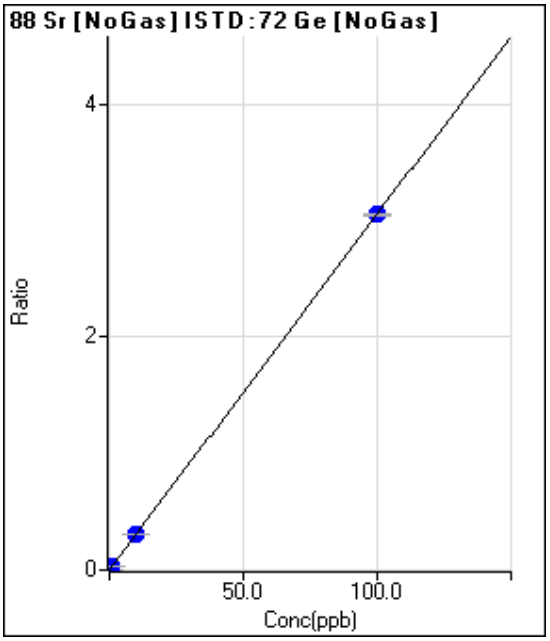
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6.74	0.0001	P	12.5
2	☐	0.100	0.087	8.91	0.0001	P	13.1
3	☐	1.000	1.000	31.66	0.0004	P	10.3
4	☐	10.000	9.945	257.99	0.0033	P	5.1
5	☐	50.000	50.011	1274.53	0.0161	P	1.6

y = 3.2027E-004 * x + 8.7999E-005
R = 1.0000
DL = 0.1029
BEC = 0.2748

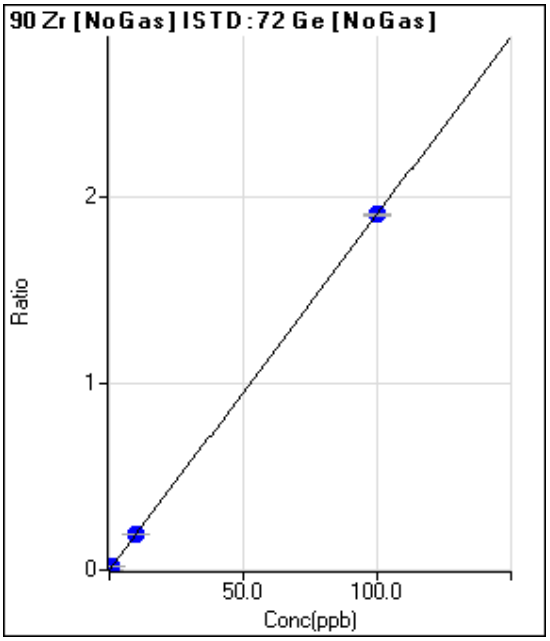
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	503.36	0.0004	P	8.0
2	☐	0.100	0.105	4154.08	0.0036	P	3.0
3	☐	1.000	1.016	36012.75	0.0314	P	0.6
4	☐	10.000	10.184	360786.54	0.3112	P	1.4
5	☐	100.000	99.981	3487640.36	3.0511	P	0.4

y = 0.0305 * x + 4.3522E-004
R = 1.0000
DL = 0.003432
BEC = 0.01426

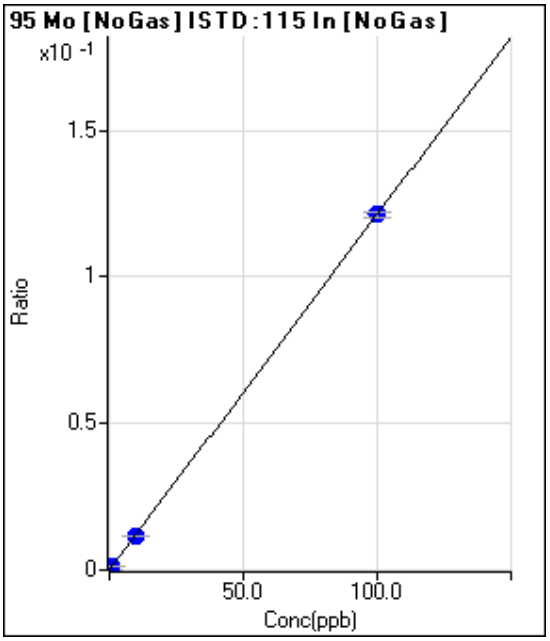
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	568.91	0.0005	P	3.0
2	☐	0.100	0.074	2182.44	0.0019	P	4.7
3	☐	1.000	0.833	18790.23	0.0164	P	2.5
4	☐	10.000	9.962	221049.46	0.1907	P	3.5
5	☐	100.000	100.005	2183299.15	1.9100	P	0.5

y = 0.0191 * x + 4.9197E-004
R = 1.0000
DL = 0.002283
BEC = 0.02577

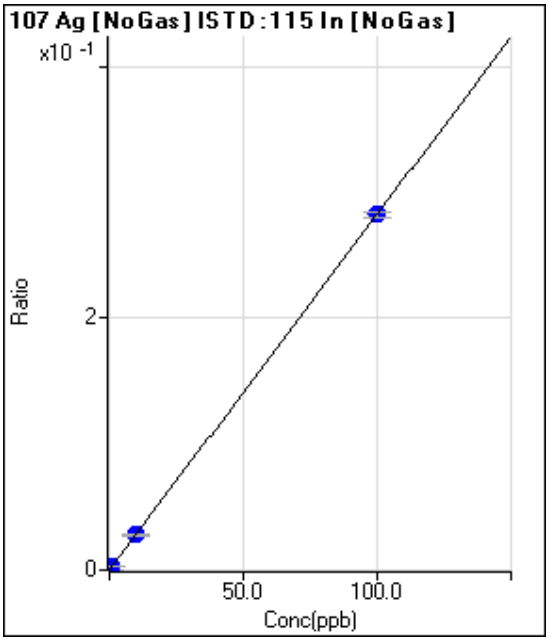
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	97.78	0.0000	P	4.5
2	☐	0.100	0.095	692.25	0.0001	P	7.8
3	☐	1.000	0.941	6135.82	0.0012	P	1.3
4	☐	10.000	9.410	61132.48	0.0114	P	1.4
5	☐	100.000	100.060	613226.43	0.1213	P	1.6

y = 0.0012 * x + 1.8674E-005
R = 1.0000
DL = 0.002067
BEC = 0.01541

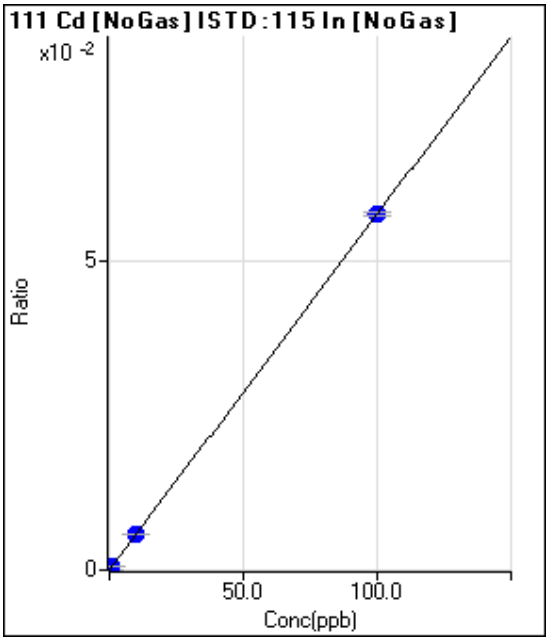
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	35.55	0.0000	P	18.1
2	☐	0.100	0.095	1430.09	0.0003	P	1.7
3	☐	1.000	0.980	14688.87	0.0028	P	3.1
4	☐	10.000	9.858	148840.78	0.0278	P	2.5
5	☐	100.000	100.014	1426643.97	0.2822	P	1.9

y = 0.0028 * x + 6.7772E-006
R = 1.0000
DL = 0.001303
BEC = 0.002402

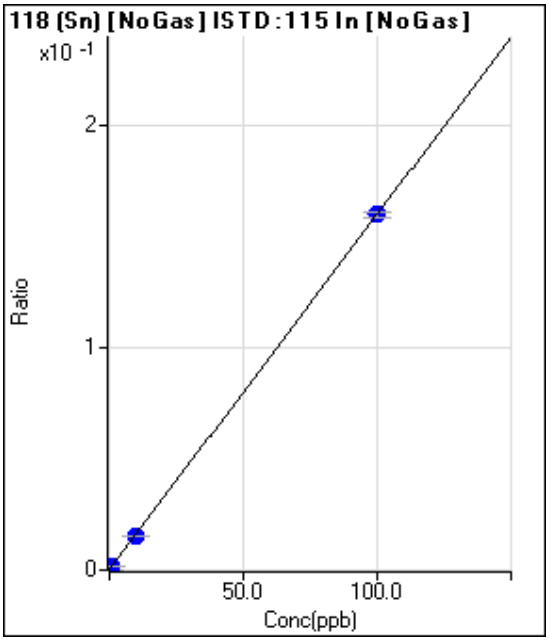
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	15.55	0.0000	P	43.4
2	☐	0.100	0.110	342.23	0.0001	P	4.9
3	☐	1.000	1.008	3077.04	0.0006	P	2.5
4	☐	10.000	10.013	30747.06	0.0057	P	1.2
5	☐	100.000	99.999	290027.74	0.0574	P	1.1

y = 5.7362E-004 * x + 2.9620E-006
R = 1.0000
DL = 0.006726
BEC = 0.005164

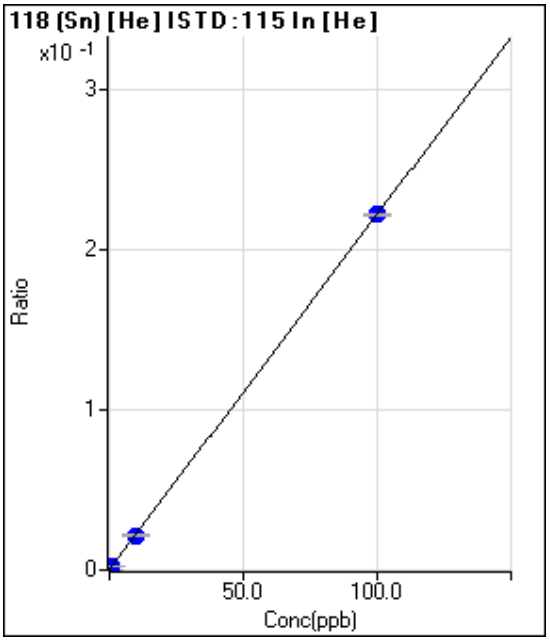
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	816.70	0.0002	P	5.4
2	☐	0.100	0.115	1765.69	0.0003	P	7.3
3	☐	1.000	1.052	9710.12	0.0018	P	3.4
4	☐	10.000	9.637	83074.56	0.0155	P	1.5
5	☐	100.000	100.036	807048.01	0.1596	P	1.4

y = 0.0016 * x + 1.5602E-004
R = 1.0000
DL = 0.01582
BEC = 0.09786

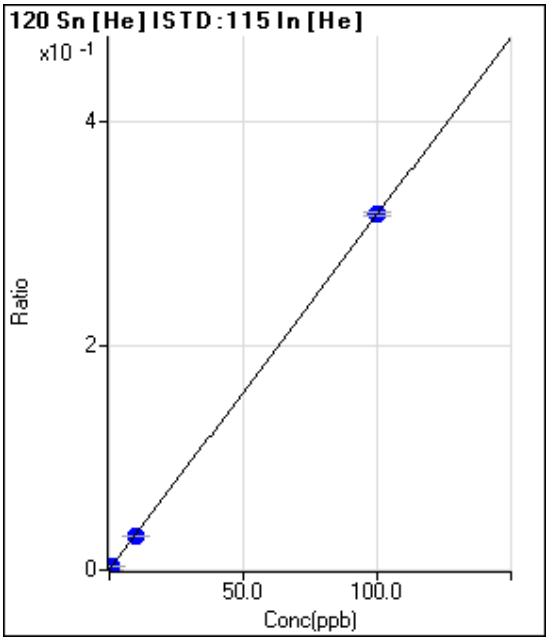
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	110.00	0.0002	P	18.8
2	☐	0.100	0.114	243.34	0.0005	P	5.8
3	☐	1.000	1.019	1320.08	0.0025	P	6.1
4	☐	10.000	9.643	11835.11	0.0216	P	3.0
5	☐	100.000	100.035	118384.71	0.2217	P	0.5

y = 0.0022 * x + 2.0865E-004
R = 1.0000
DL = 0.05306
BEC = 0.09426

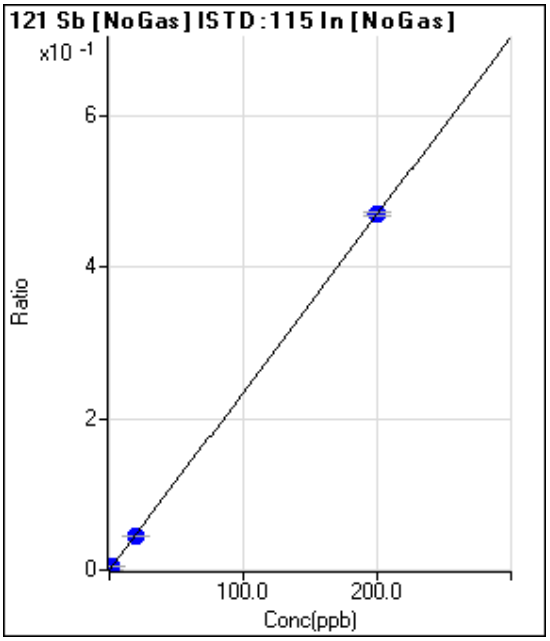
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0003	P	15.5
2	☐	0.100	0.108	324.45	0.0006	P	8.2
3	☐	1.000	1.042	1915.89	0.0036	P	12.9
4	☐	10.000	9.616	16893.59	0.0308	P	1.5
5	☐	100.000	100.038	169573.26	0.3175	P	1.2

y = 0.0032 * x + 2.7152E-004
R = 1.0000
DL = 0.03975
BEC = 0.08562

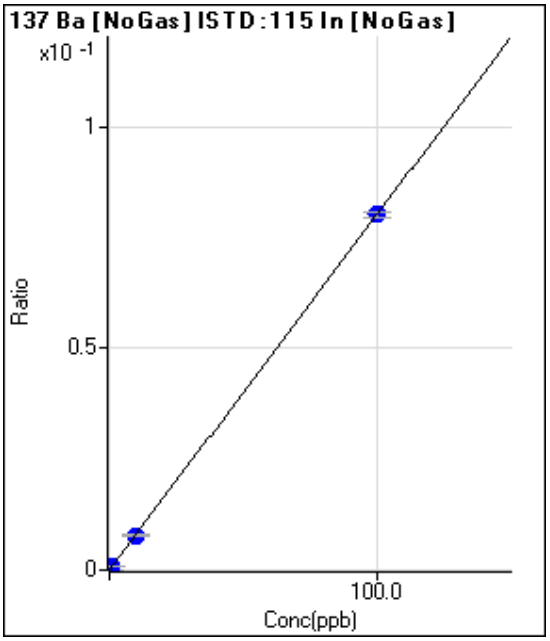
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	384.45	0.0001	P	8.4
2	☐	0.200	0.181	2595.83	0.0005	P	1.3
3	☐	2.000	1.909	24133.14	0.0046	P	1.1
4	☐	20.000	19.172	241365.75	0.0451	P	0.6
5	☐	200.000	200.084	2376131.99	0.4700	P	1.1

y = 0.0023 * x + 7.3350E-005
R = 1.0000
DL = 0.007905
BEC = 0.03123

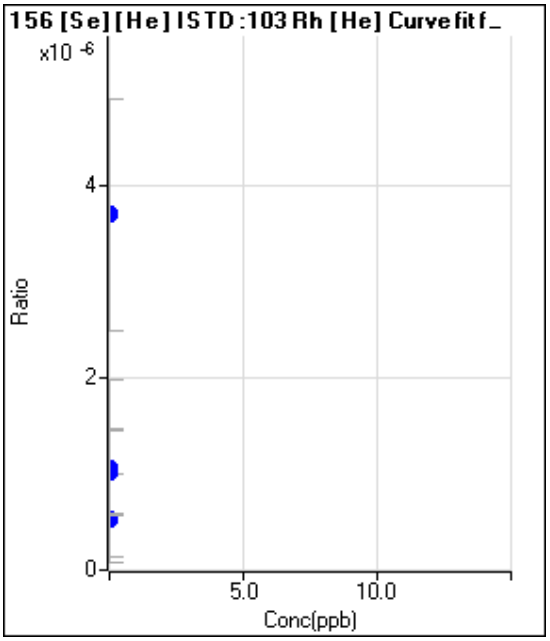
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	151.11	0.0000	P	24.6
2	☐	0.100	0.088	515.57	0.0001	P	1.5
3	☐	1.000	0.958	4222.92	0.0008	P	2.5
4	☐	10.000	9.707	41818.68	0.0078	P	2.5
5	☐	100.000	100.030	405772.78	0.0803	P	1.4

y = 8.0200E-004 * x + 2.8906E-005
R = 1.0000
DL = 0.02664
BEC = 0.03604

Weight: <None>
Min Conc: <None>



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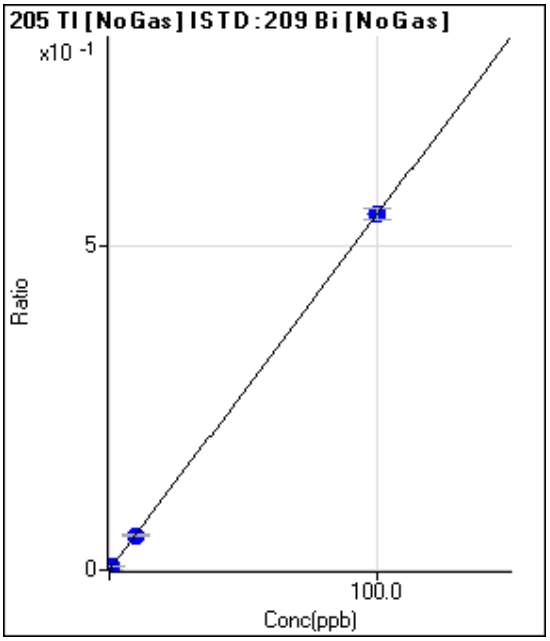
1	☐	0.000		2.22	0.0000	P	173.2
2	☐	0.000		1.11	0.0000	P	173.2
3	☐	0.000		2.22	0.0000	P	86.6
4	☐	0.000		2.22	0.0000	P	86.6
5	☐	0.000		7.78	0.0000	P	65.2



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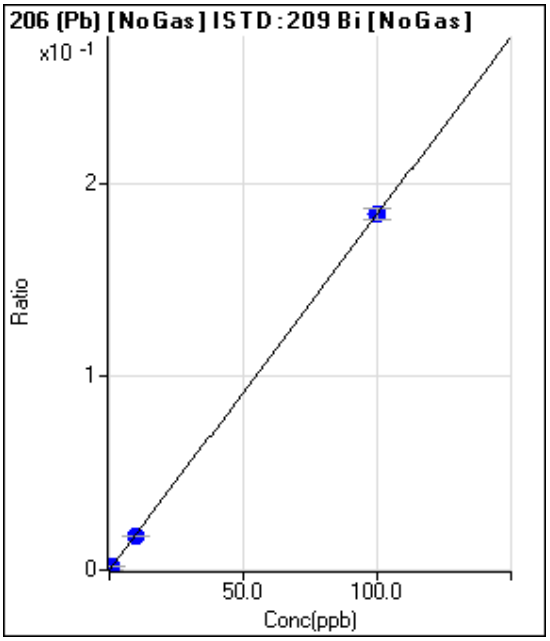
1	☐	0.000	0.000	146.68	0.0001	P	3.3
2	☐	0.100	0.113	1563.48	0.0007	P	4.9
3	☐	1.000	0.958	12456.33	0.0053	P	0.4
4	☐	10.000	9.794	128810.08	0.0538	P	0.5
5	☐	100.000	100.021	1221421.86	0.5488	P	3.1

y = 0.0055 * x + 6.2762E-005
R = 1.0000
DL = 0.001142
BEC = 0.01144

Weight: <None>
Min Conc: <None>



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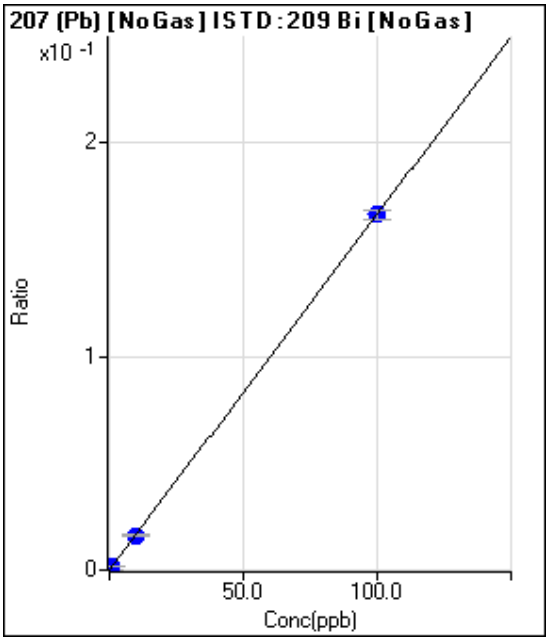
1	☐	0.000	0.000	50.00	0.0000	P	53.2
2	☐	0.100	0.091	433.36	0.0002	P	15.6
3	☐	1.000	1.002	4360.87	0.0019	P	4.7
4	☐	10.000	9.685	42646.88	0.0178	P	2.2
5	☐	100.000	100.032	409021.86	0.1838	P	3.3

y = 0.0018 * x + 2.1427E-005
R = 1.0000
DL = 0.01861
BEC = 0.01166

Weight: <None>
Min Conc: <None>



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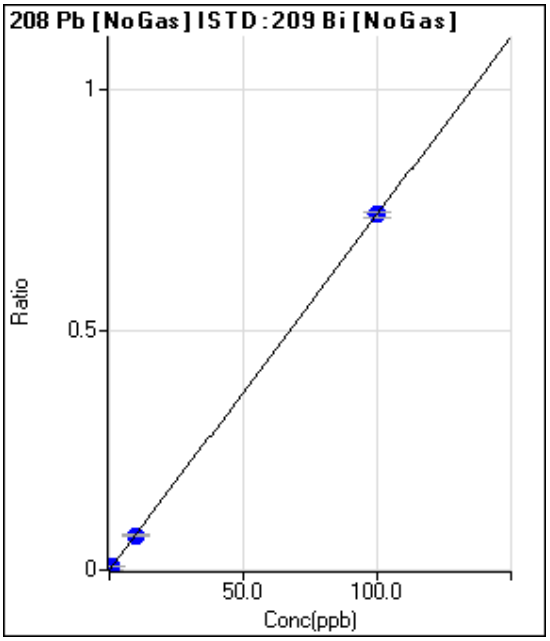
1	☐	0.000	0.000	53.33	0.0000	P	22.4
2	☐	0.100	0.106	456.69	0.0002	P	6.1
3	☐	1.000	1.000	3950.76	0.0017	P	5.7
4	☐	10.000	9.734	38818.41	0.0162	P	2.6
5	☐	100.000	100.027	370374.68	0.1664	P	2.3

y = 0.0017 * x + 2.2855E-005
R = 1.0000
DL = 0.009237
BEC = 0.01374

Weight: <None>
Min Conc: <None>



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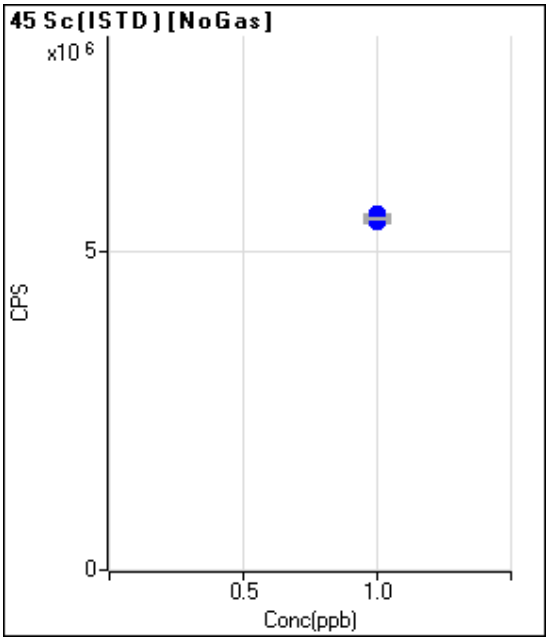
1	☐	0.000	0.000	193.33	0.0001	P	15.5
2	☐	0.100	0.105	1976.80	0.0009	P	8.6
3	☐	1.000	1.012	17742.02	0.0076	P	3.8
4	☐	10.000	9.788	173774.73	0.0726	P	1.6
5	☐	100.000	100.021	1649276.53	0.7410	P	1.7

y = 0.0074 * x + 8.2703E-005
R = 1.0000
DL = 0.005184
BEC = 0.01117

Weight: <None>
Min Conc: <None>



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2	☐	1.000		5474951.31		P	0.7
3	☐	1.000		5517155.75		P	0.2
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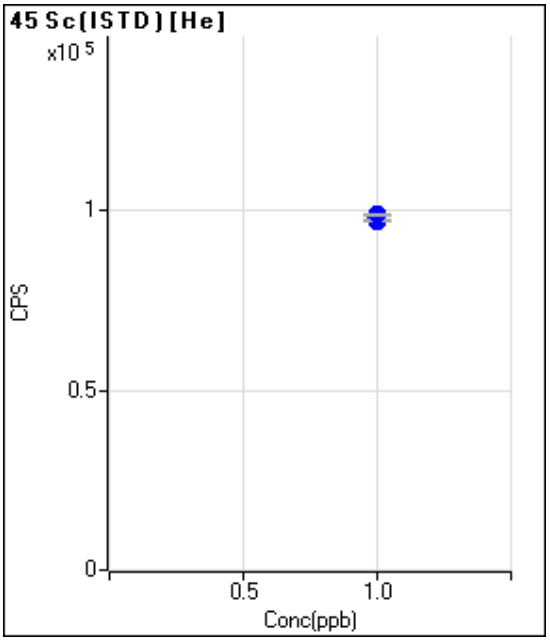

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2	☐	1.000		97892.55		P	1.0
3	☐	1.000		97801.35		P	1.2
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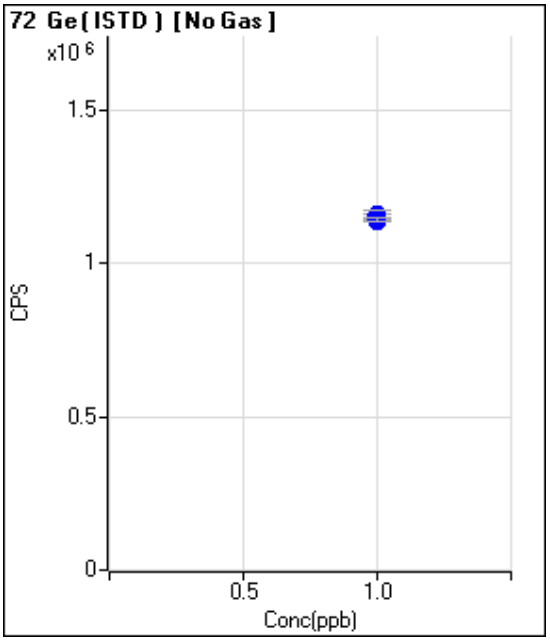
5	☐	1.000		98969.38		P	0.7



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2	☐	1.000		1140126.13		P	0.6
3	☐	1.000		1145687.21		P	0.9
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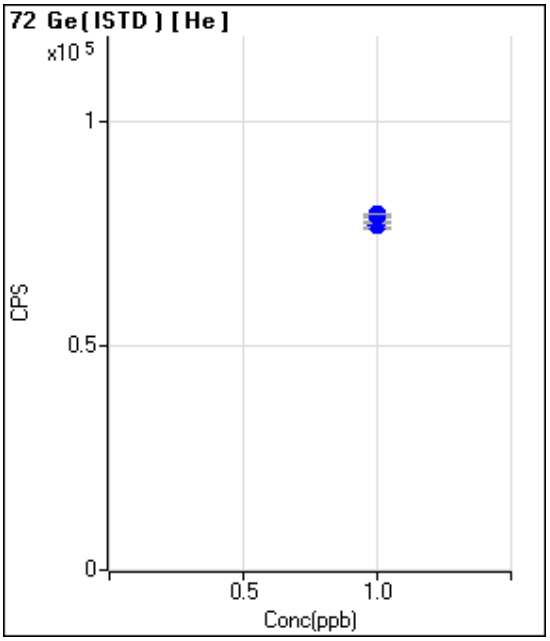
5	☐	1.000		1143058.67		P	1.1



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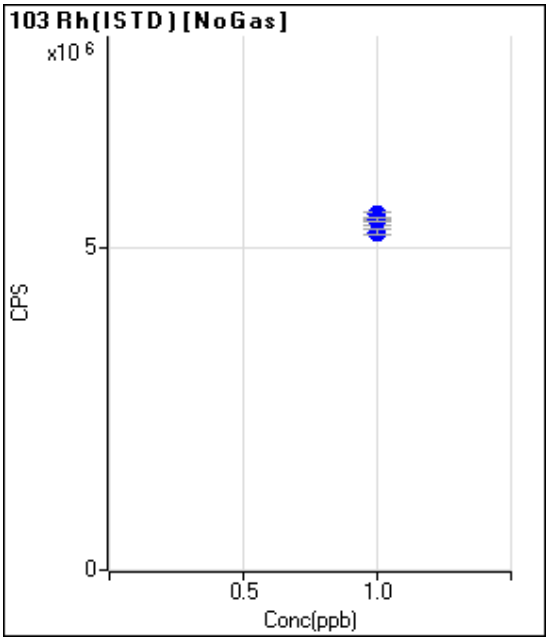
2	☐	1.000		76766.20		P	1.1
3	☐	1.000		77566.85		P	0.5
4	☐	1.000		78818.08		P	0.4
5	☐	1.000		79137.66		P	0.2



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1	☐	1.000		5515557.00		P	1.6
2	☐	1.000		5403376.59		P	2.1
3	☐	1.000		5428432.01		P	0.4
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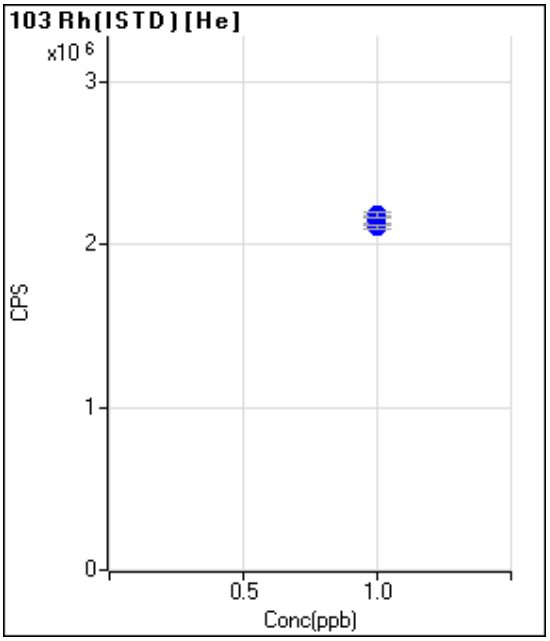

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2	☐	1.000		2143210.47		P	2.2
3	☐	1.000		2173341.79		P	0.6
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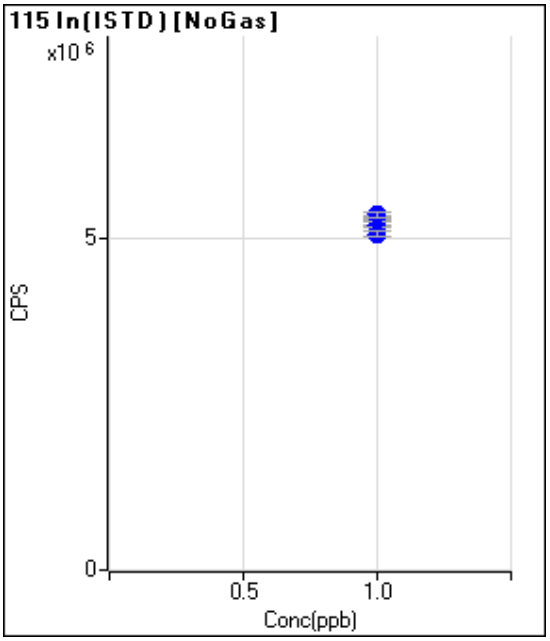

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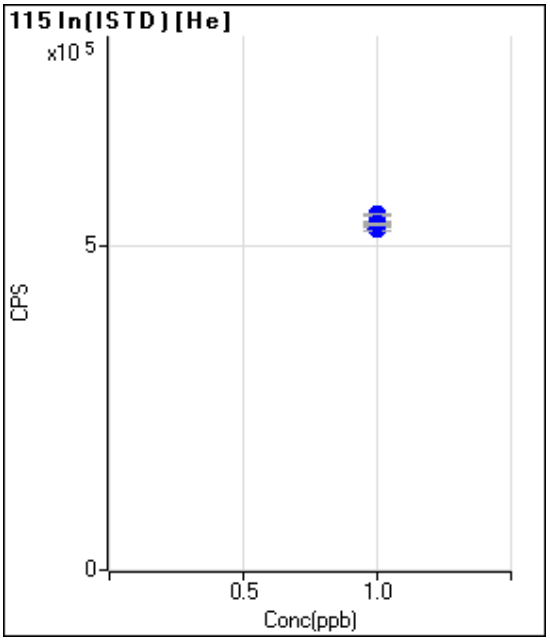
2	☐	1.000		5197528.90		P	1.5
3	☐	1.000		5295491.65		P	1.8
4	☐	1.000		5351562.67		P	1.9
5	☐	1.000		5056195.22		P	1.7



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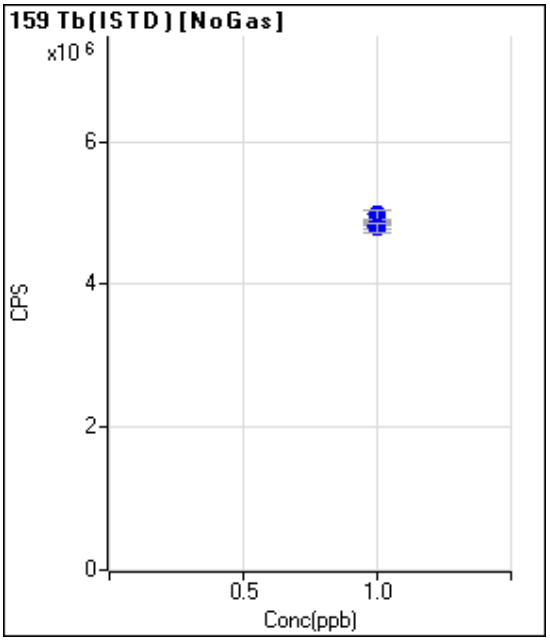
2	☐	1.000		527945.46		P	1.2
3	☐	1.000		535630.39		P	0.6
4	☐	1.000		549107.37		P	0.5
5	☐	1.000		534077.21		P	0.9



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2	☐	1.000		4848704.82		P	1.0
3	☐	1.000		4824778.06		P	1.7
4	☐	1.000		4978849.09		P	2.4
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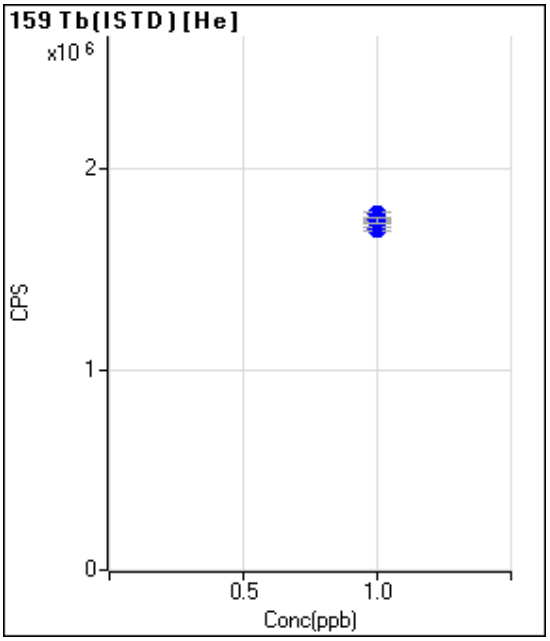

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2	☐	1.000		1751367.73		P	0.8
3	☐	1.000		1731710.76		P	2.1
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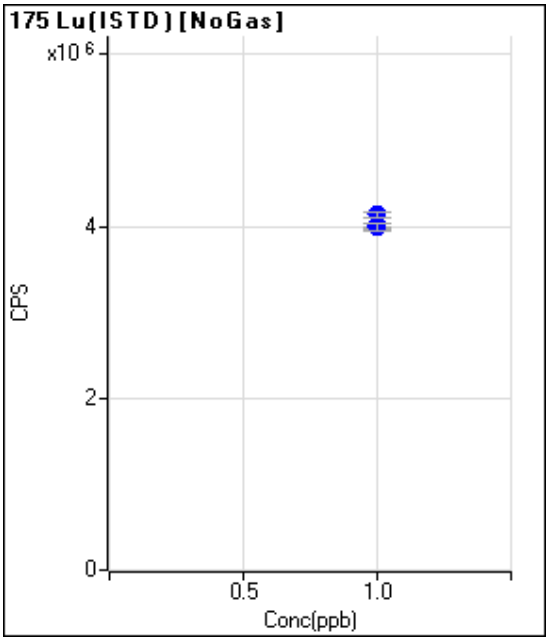

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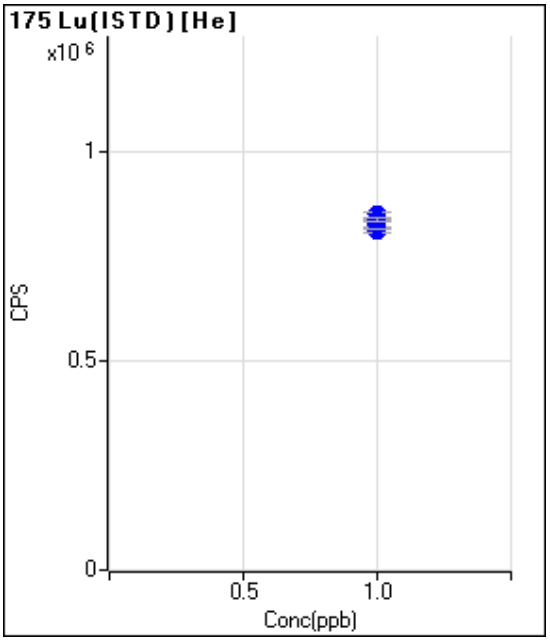

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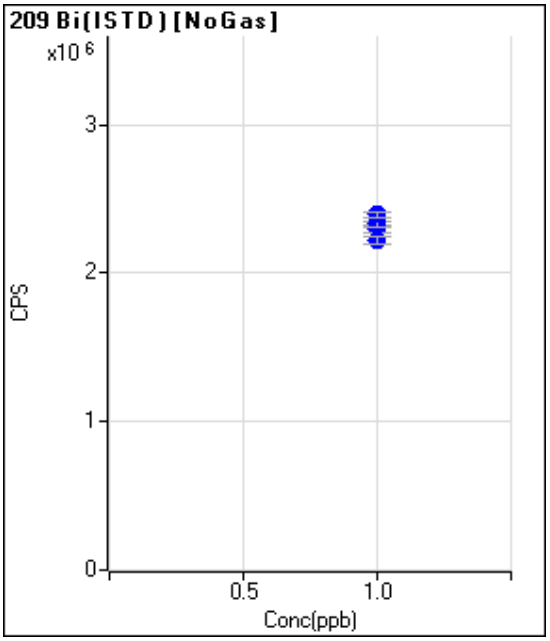

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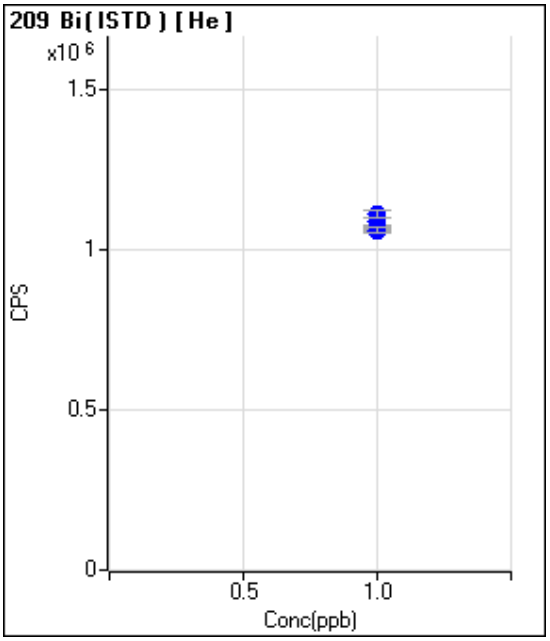

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3	☐	1.000		1085604.54		P	2.7
4	☐	1.000		1109411.05		P	2.2
5	☐	1.000		1059447.56		P	1.8

Metals

PrepSheets

3050B Metals Solid Preparation

ANALYST/ TECH	JSL	START DATE/TIME	11:00 6/20/18	END DATE/TIME	14:00	BATCH	642222

#	CLIENT	TYPE	CLIENT ID	GCAL ID	INITIAL WGT (g)	FINAL VOL (mL)	COMMENT	STANDARDS\ REAGENTS
1	QC	MB	MB 1840818	1840818	1.28	50		GCAL - 8 - 250uL 171918
2	QC	LCS	LCS 1840819	1840819	1.25			
3	4574	SAMP	16231-Borrow-072	21808172801	1.75			Sb,Ag,Se SPIKE - 250uL 316-45-2
4	4574	SAMP	16231-Borrow-073	21808172802	1.30			
5	4574	SAMP	17029-BB-096	21808172901	1.32			Li,B,Zr SPIKE - 250uL 316-66-2
6	4574	SAMP	17029-BB-097	21808172902	1.27			
7	4838	SAMP	WIL02DA02A	21808181206	1.25			Si SPIKE - 250uL 171775
8	4838	MS	WIL02DA02A MS	21808181207	1.25			
9	4838	MSD	WIL02DA02A MSD	21808181208	1.25			HNO3 301-11-15
10	4838	SAMP	WIL02DA01A	21808181209	1.45			
11	4838	SAMP	WIL02DA01B	21808181210	1.33			H2O2 171997
12								
13								HCL N/A
14								
15								1:1 HNO3 TCL 27-16
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								Digestion Vessel Lot # 180510
28								
29								
30								

EQUIPMENT\CONDITIONS

DIGESTION BLOCK	B2	TEMPERATURE	93°	

NOTES

Matrix-Soil. 6020_S_EX

EPA 8330B

Form 1D

Results

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA02A
Collect Date:	08/16/18 Time: 1020	GCAL Sample ID:	21808181206
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.3 g	Lab File ID:	2180912\A64
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	09/13/18 Time: 0540
Prep Batch:	642698	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	97.1	UQ	40.8	97.1	194
99-65-0	1,3-Dinitrobenzene	97.1	UQ	74.8	97.1	194
118-96-7	2,4,6-Trinitrotoluene	97.1	UQ	49.5	97.1	194
121-14-2	2,4-Dinitrotoluene	97.1	UQ	96.1	97.1	194
606-20-2	2,6-Dinitrotoluene	97.1	UQ	59.2	97.1	194
35572-78-2	2-Amino-4,6-dinitrotoluene	97.1	UQ	95.1	97.1	194
88-72-2	2-Nitrotoluene	97.1	UQJ	62.1	97.1	194
618-87-1	3,5-Dinitroaniline	97.1	UQ	80.6	97.1	194
99-08-1	3-Nitrotoluene	146	UQ	121	146	194
19406-51-0	4-Amino-2,6-dinitrotoluene	97.1	UQ	74.8	97.1	194
99-99-0	4-Nitrotoluene	97.1	UQJ	74.8	97.1	194
2691-41-0	HMX	97.1	UQ	25.2	97.1	194
98-95-3	Nitrobenzene	97.1	UQ	35.0	97.1	194
55-63-0	Nitroglycerin	97.1	UQ	71.8	97.1	194
78-11-5	Pentaerythritol Tetranitrate	146	UQ	118	146	194
121-82-4	RDX	97.1	UQ	17.5	97.1	194
479-45-8	Tetryl	97.1	UQJ	39.8	97.1	194

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000064.D
Sample Name: 21808181206

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==========================================================================
Acq. Operator   : MEG                          Seq. Line :  46
Acq. Instrument : HPLC3                         Location : P1-A-01
Injection Date  : 9/13/2018 5:40:10 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 11:49:10 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
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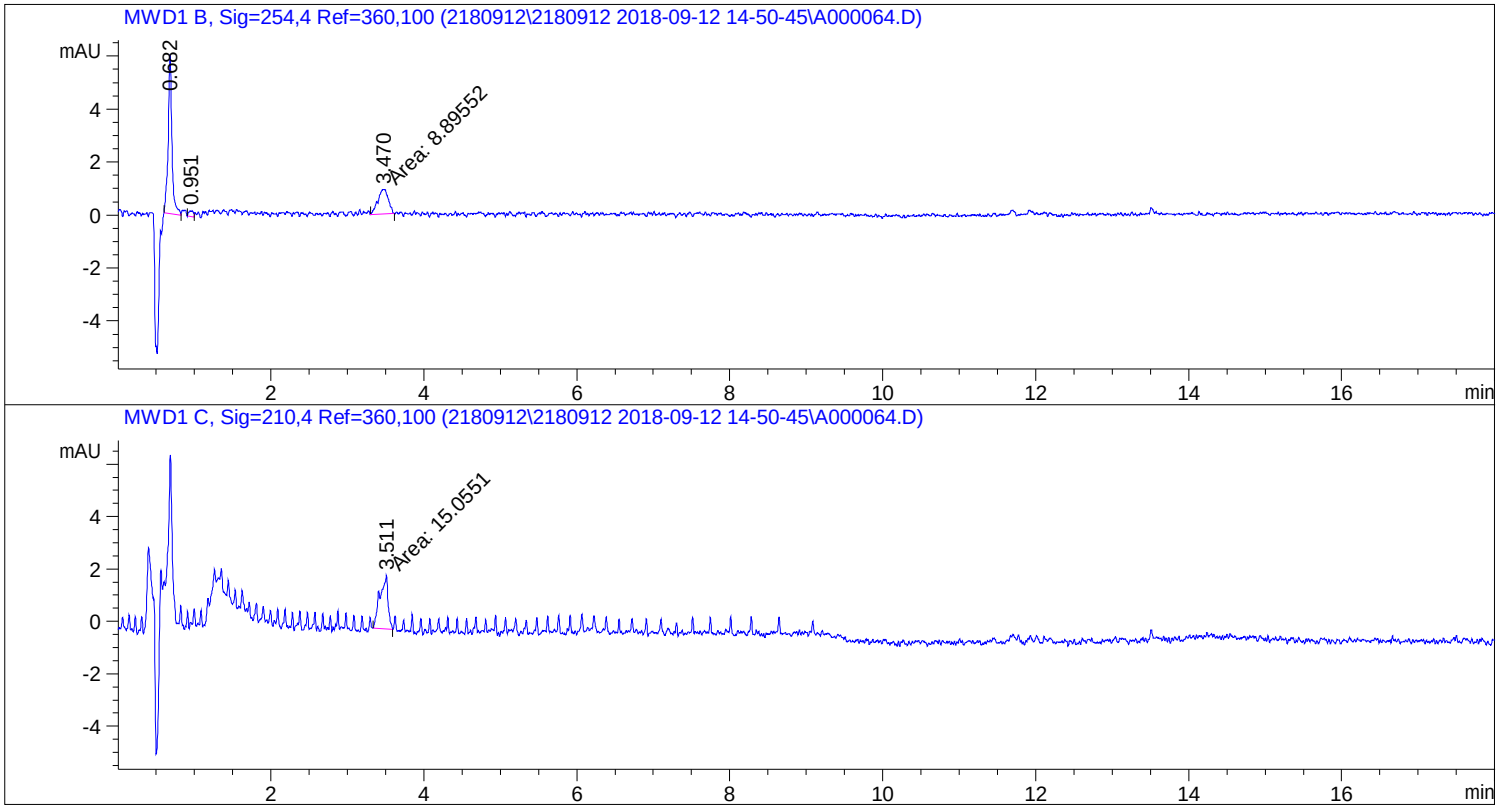


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==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 11:49:33 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
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RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.750	1		-	-	-		RDX
2.700	2		-	-	-		1,3,5-TNB
3.511	2	MM	15.05506	17.58403	264.72851		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000064.D
Sample Name: 21808181206

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.000	2		-	-	-		3,5-DNA
4.600	1		-	-	-		NB
4.900	2		-	-	-		NG
5.500	1		-	-	-		TETRYL
6.050	1		-	-	-		2,4,6-TNT
6.700	1		-	-	-		2-A-4,6-DNT
7.050	1		-	-	-		4-A-2,6-DNT
7.600	1		-	-	-		2,4-DNT
7.900	1		-	-	-		2,6-DNT
10.800	2		-	-	-		2-NT
11.700	2		-	-	-		4-NT
12.700	2		-	-	-		3-NT
13.400	2		-	-	-		PETN

Totals : 264.72851

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA02A MS
Collect Date:	08/16/18 Time: 1020	GCAL Sample ID:	21808181207
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180912\A65
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	09/13/18 Time: 0559
Prep Batch:	642698	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

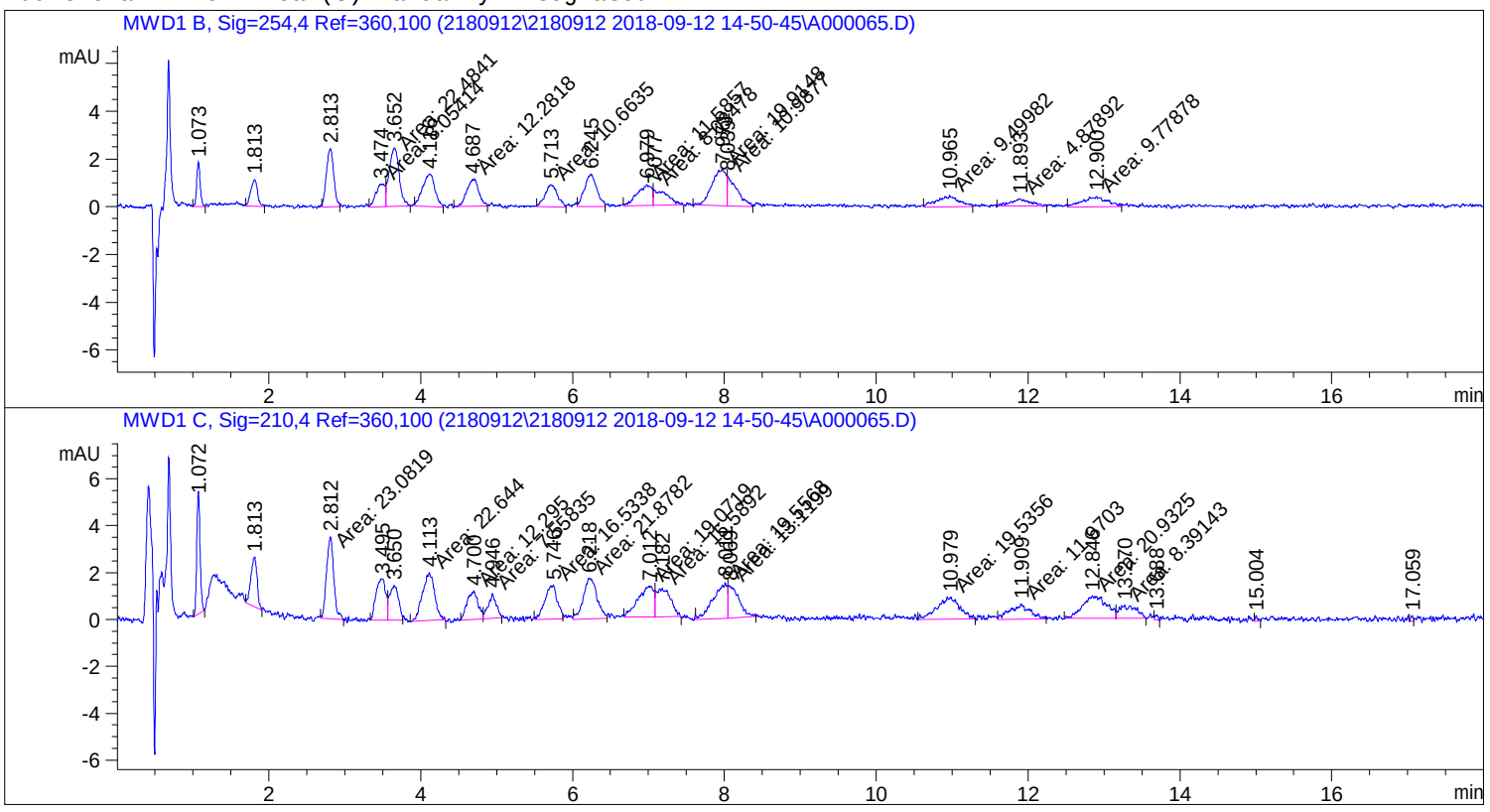
CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	1090		42.0	100	200
99-65-0	1,3-Dinitrobenzene	1090		77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	1060		51.0	100	200
121-14-2	2,4-Dinitrotoluene	1060		99.0	100	200
606-20-2	2,6-Dinitrotoluene	1100		61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	997		98.0	100	200
88-72-2	2-Nitrotoluene	1130		64.0	100	200
618-87-1	3,5-Dinitroaniline	1040		83.0	100	200
99-08-1	3-Nitrotoluene	1040		125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	1050		77.0	100	200
99-99-0	4-Nitrotoluene	1120		77.0	100	200
2691-41-0	HMX	986		26.0	100	200
98-95-3	Nitrobenzene	1010		36.0	100	200
55-63-0	Nitroglycerin	977		74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	987		122	150	200
121-82-4	RDX	917		18.0	100	200
479-45-8	Tetryl	1030		41.0	100	200

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000065.D
Sample Name: 21808181207

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  47
Acq. Instrument : HPLC3                         Location : P1-A-02
Injection Date  : 9/13/2018 5:59:56 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:06:33 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:06:36 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100

RetTime Sig Type     Area      Amt/Area    Amount   Grp   Name
 [min]             [mAU*s]
-------|--|------|----------|----------|----------|--|---------------
  1.073  1 BV        5.93177   41.55880  246.51719    HMX
  1.813  1 VV        6.97221   32.88013  229.24705    RDX
  2.812  2 MM       23.08187   11.79190  272.17917    1,3,5-TNB
  3.495  2 BV       15.82793   17.58403  278.31875    1,2-DNB
```

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000065.D
Sample Name: 21808181207

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.652	1	FM	22.48415	12.08328	271.68224		1,3-DNB
4.113	2	MM	22.64403	11.51055	260.64533		3,5-DNA
4.687	1	MM	12.28181	20.54823	252.36940		NB
4.946	2	FM	7.55835	32.32469	244.32139		NG
5.713	1	MM	10.66345	24.14035	257.41941		TETRYL
6.245	1	VV	15.14612	17.49447	264.97326		2,4,6-TNT
6.979	1	MF	11.58572	21.50419	249.14156		2-A-4,6-DNT
7.077	1	FM	8.03478	32.60655	261.98647		4-A-2,6-DNT
7.971	1	MF	19.91478	13.30050	264.87659		2,4-DNT
8.039	1	FM	10.98767	24.95418	274.18823		2,6-DNT
10.979	2	MM	19.53560	14.40165	281.34497		2-NT
11.909	2	MM	11.97030	23.40253	280.13538		4-NT
12.846	2	MF	20.93254	12.38296	259.20681		3-NT
13.270	2	FM	8.39143	29.39954	246.70416		PETN

Totals : 4695.25735

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA02A MSD
Collect Date:	08/16/18 Time: 1020	GCAL Sample ID:	21808181208
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.5 g	Lab File ID:	2180912\A66
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	09/13/18 Time: 0619
Prep Batch:	642698	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

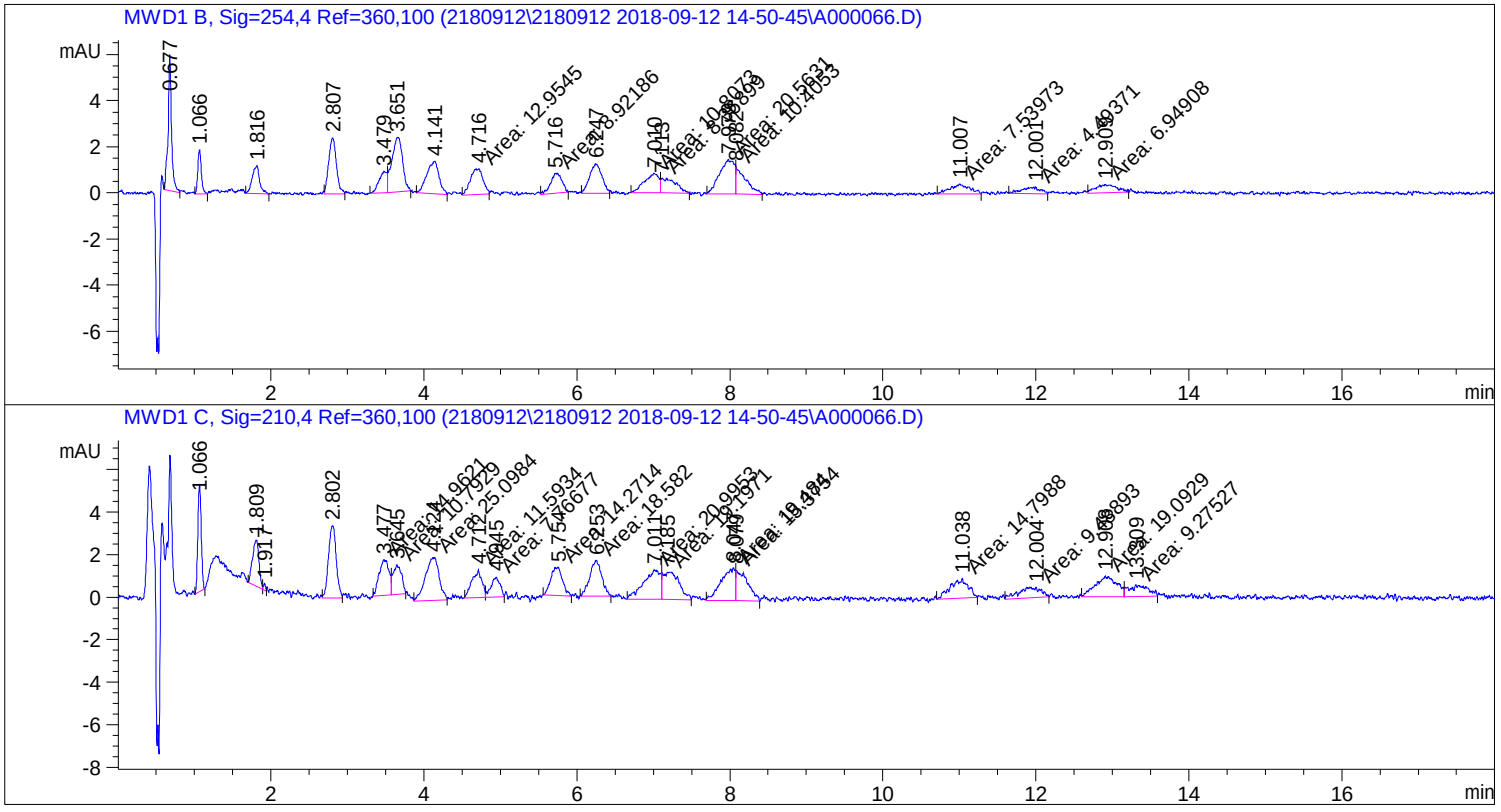
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	1080		40.0	95.2	190
99-65-0	1,3-Dinitrobenzene	1070		73.3	95.2	190
118-96-7	2,4,6-Trinitrotoluene	957		48.6	95.2	190
121-14-2	2,4-Dinitrotoluene	1040		94.3	95.2	190
606-20-2	2,6-Dinitrotoluene	989		58.1	95.2	190
35572-78-2	2-Amino-4,6-dinitrotoluene	885		93.3	95.2	190
88-72-2	2-Nitrotoluene	812		61.0	95.2	190
618-87-1	3,5-Dinitroaniline	1100		79.0	95.2	190
99-08-1	3-Nitrotoluene	901		119	143	190
19406-51-0	4-Amino-2,6-dinitrotoluene	1040		73.3	95.2	190
99-99-0	4-Nitrotoluene	846		73.3	95.2	190
2691-41-0	HMX	955		24.8	95.2	190
98-95-3	Nitrobenzene	1010		34.3	95.2	190
55-63-0	Nitroglycerin	956		70.5	95.2	190
78-11-5	Pentaerythritol Tetranitrate	1040		116	143	190
121-82-4	RDX	1010		17.1	95.2	190
479-45-8	Tetryl	820		39.0	95.2	190

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000066.D
Sample Name: 21808181208

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  48
Acq. Instrument : HPLC3                         Location : P1-A-03
Injection Date  : 9/13/2018 6:19:44 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:06:33 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:06:36 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.066	1	BB	6.03210	41.55880	250.68672		HMX
1.816	1	BB	8.05413	32.88013	264.82095		RDX
2.802	2	VV	24.09661	11.79190	284.14488		1,3,5-TNB
3.477	2	MF	14.96214	17.58403	263.09460		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000066.D
Sample Name: 21808181208

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.651	1	VB	23.21589	12.08328	280.52409		1,3-DNB
4.124	2	MM	25.09835	11.51055	288.89595		3,5-DNA
4.716	1	MM	12.95454	20.54823	266.19276		NB
4.945	2	FM	7.76677	32.32469	251.05852		NG
5.716	1	MM	8.92186	24.14035	215.37690		TETRYL
6.247	1	VV	14.35436	17.49447	251.12191		2,4,6-TNT
7.010	1	MF	10.80732	21.50419	232.40269		2-A-4,6-DNT
7.113	1	FM	8.36899	32.60655	272.88376		4-A-2,6-DNT
7.979	1	MF	20.56306	13.30050	273.49911		2,4-DNT
8.082	1	FM	10.40525	24.95418	259.65453		2,6-DNT
11.038	2	MM	14.79877	14.40165	213.12680		2-NT
12.004	2	MM	9.48893	23.40253	222.06505		4-NT
12.908	2	MF	19.09294	12.38296	236.42703		3-NT
13.309	2	FM	9.27527	29.39954	272.68864		PETN

Totals : 4598.66490

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA01A
Collect Date:	08/16/18 Time: 0930	GCAL Sample ID:	21808181209
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.5 g	Lab File ID:	2180912\A67
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	09/13/18 Time: 0639
Prep Batch:	642698	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

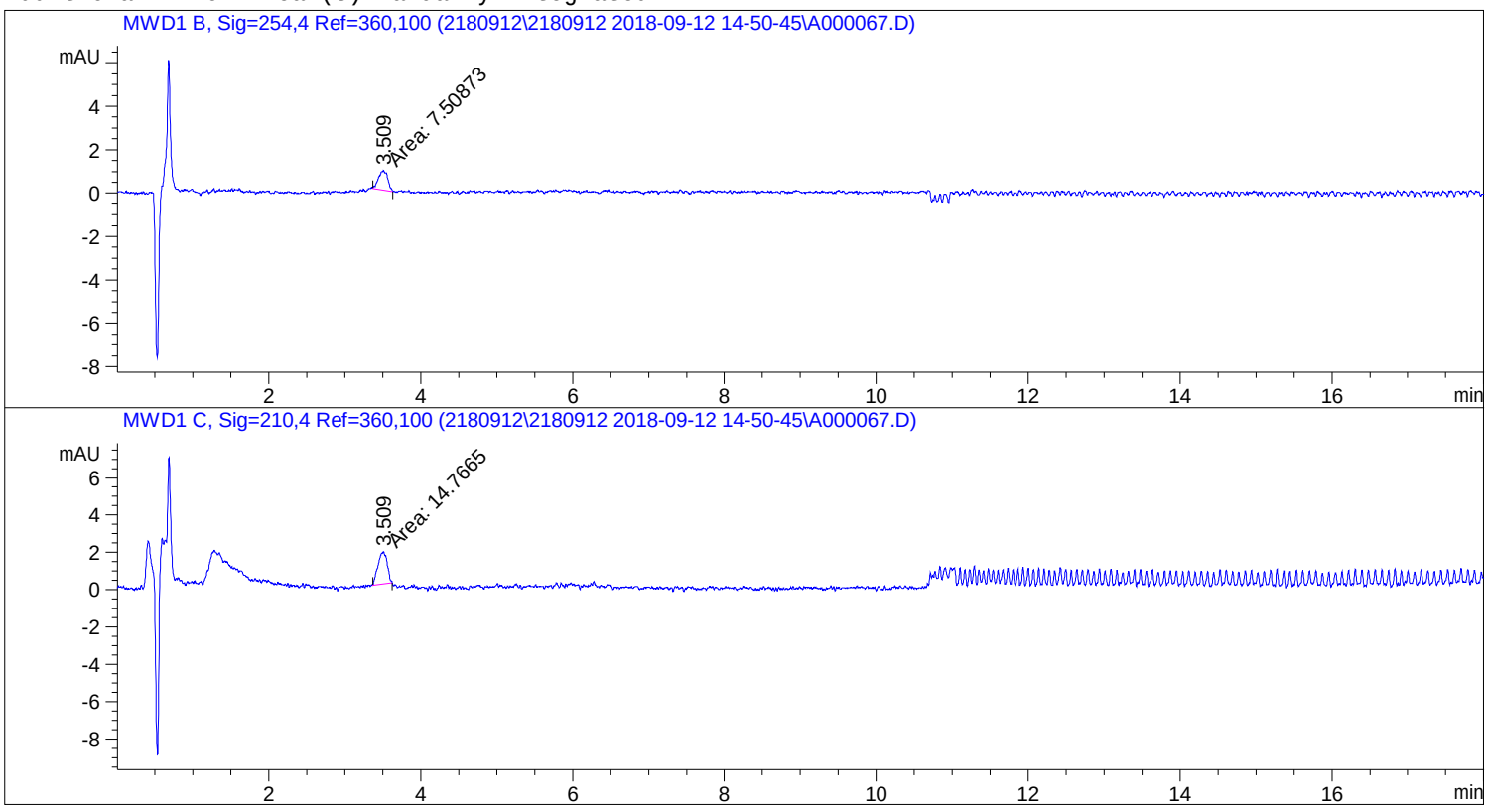
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	95.2	UQ	40.0	95.2	190
99-65-0	1,3-Dinitrobenzene	95.2	UQ	73.3	95.2	190
118-96-7	2,4,6-Trinitrotoluene	95.2	UQ	48.6	95.2	190
121-14-2	2,4-Dinitrotoluene	95.2	UQ	94.3	95.2	190
606-20-2	2,6-Dinitrotoluene	95.2	UQ	58.1	95.2	190
35572-78-2	2-Amino-4,6-dinitrotoluene	95.2	UQ	93.3	95.2	190
88-72-2	2-Nitrotoluene	95.2	UQ	61.0	95.2	190
618-87-1	3,5-Dinitroaniline	95.2	UQ	79.0	95.2	190
99-08-1	3-Nitrotoluene	143	UQ	119	143	190
19406-51-0	4-Amino-2,6-dinitrotoluene	95.2	UQ	73.3	95.2	190
99-99-0	4-Nitrotoluene	95.2	UQ	73.3	95.2	190
2691-41-0	HMX	95.2	UQ	24.8	95.2	190
98-95-3	Nitrobenzene	95.2	UQ	34.3	95.2	190
55-63-0	Nitroglycerin	95.2	UQ	70.5	95.2	190
78-11-5	Pentaerythritol Tetranitrate	143	UQ	116	143	190
121-82-4	RDX	95.2	UQ	17.1	95.2	190
479-45-8	Tetryl	95.2	UQ	39.0	95.2	190

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000067.D
Sample Name: 21808181209

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  49
Acq. Instrument : HPLC3                         Location : P1-A-04
Injection Date  : 9/13/2018 6:39:30 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:06:33 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:06:36 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.800	1		-	-	-		RDX
2.800	2		-	-	-		1,3,5-TNB
3.509	2	MM	14.76652	17.58403	259.65492		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000067.D
Sample Name: 21808181209

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.100	2		-	-	-		3,5-DNA
4.700	1		-	-	-		NB
5.000	2		-	-	-		NG
5.700	1		-	-	-		TETRYL
6.200	1		-	-	-		2,4,6-TNT
6.950	1		-	-	-		2-A-4,6-DNT
7.100	1		-	-	-		4-A-2,6-DNT
7.900	1		-	-	-		2,4-DNT
8.100	1		-	-	-		2,6-DNT
11.000	2		-	-	-		2-NT
11.900	2		-	-	-		4-NT
12.900	2		-	-	-		3-NT
13.300	2		-	-	-		PETN

Totals : 259.65492

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA01B
Collect Date:	08/16/18 Time: 0935	GCAL Sample ID:	21808181210
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180912\A68
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	09/13/18 Time: 0659
Prep Batch:	642698	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

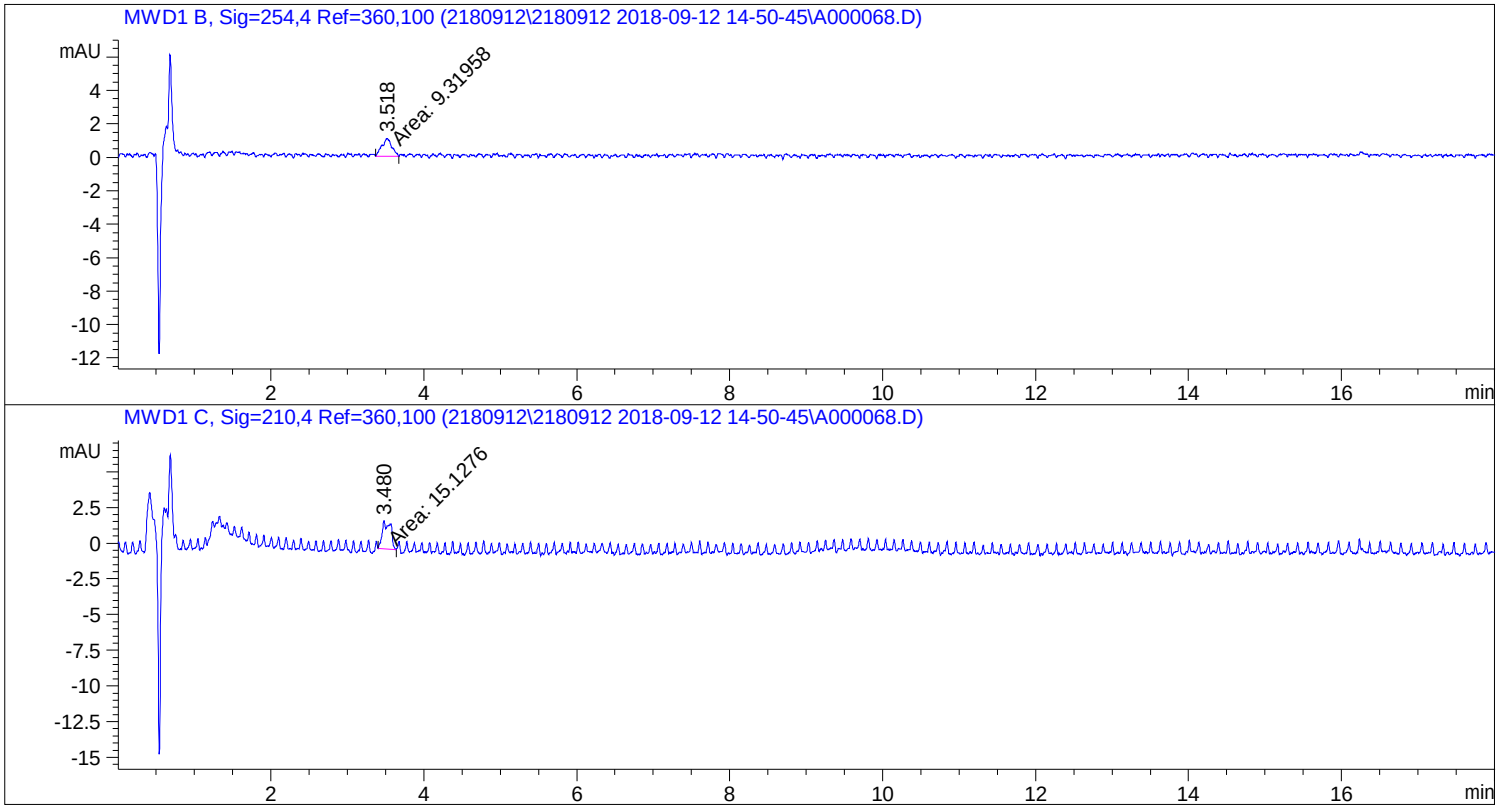
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	UQ	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	UQ	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	UQ	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	UQ	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	UQ	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	UQ	98.0	100	200
88-72-2	2-Nitrotoluene	100	UQ	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	UQ	83.0	100	200
99-08-1	3-Nitrotoluene	150	UQ	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	UQ	77.0	100	200
99-99-0	4-Nitrotoluene	100	UQ	77.0	100	200
2691-41-0	HMX	100	UQ	26.0	100	200
98-95-3	Nitrobenzene	100	UQ	36.0	100	200
55-63-0	Nitroglycerin	100	UQ	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	UQ	122	150	200
121-82-4	RDX	100	UQ	18.0	100	200
479-45-8	Tetryl	100	UQ	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000068.D
Sample Name: 21808181210

```
=====================================================================
Acq. Operator   : MEG                          Seq. Line :  50
Acq. Instrument : HPLC3                         Location : P1-A-05
Injection Date  : 9/13/2018 6:59:16 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:06:33 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
=====================================================================
                    External Standard Report
=====================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:06:36 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.800	1		-	-	-		RDX
2.800	2		-	-	-		1,3,5-TNB
3.480	2	MM	15.12763	17.58403	266.00457		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000068.D
Sample Name: 21808181210

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.100	2		-	-	-		3,5-DNA
4.700	1		-	-	-		NB
5.000	2		-	-	-		NG
5.700	1		-	-	-		TETRYL
6.200	1		-	-	-		2,4,6-TNT
6.950	1		-	-	-		2-A-4,6-DNT
7.100	1		-	-	-		4-A-2,6-DNT
7.900	1		-	-	-		2,4-DNT
8.100	1		-	-	-		2,6-DNT
11.000	2		-	-	-		2-NT
11.900	2		-	-	-		4-NT
12.900	2		-	-	-		3-NT
13.300	2		-	-	-		PETN

Totals : 266.00457

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA02A (RE)
Collect Date:	08/16/18 Time: 1020	GCAL Sample ID:	21808181213
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.1 g	Lab File ID:	2180912\A72
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0818
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

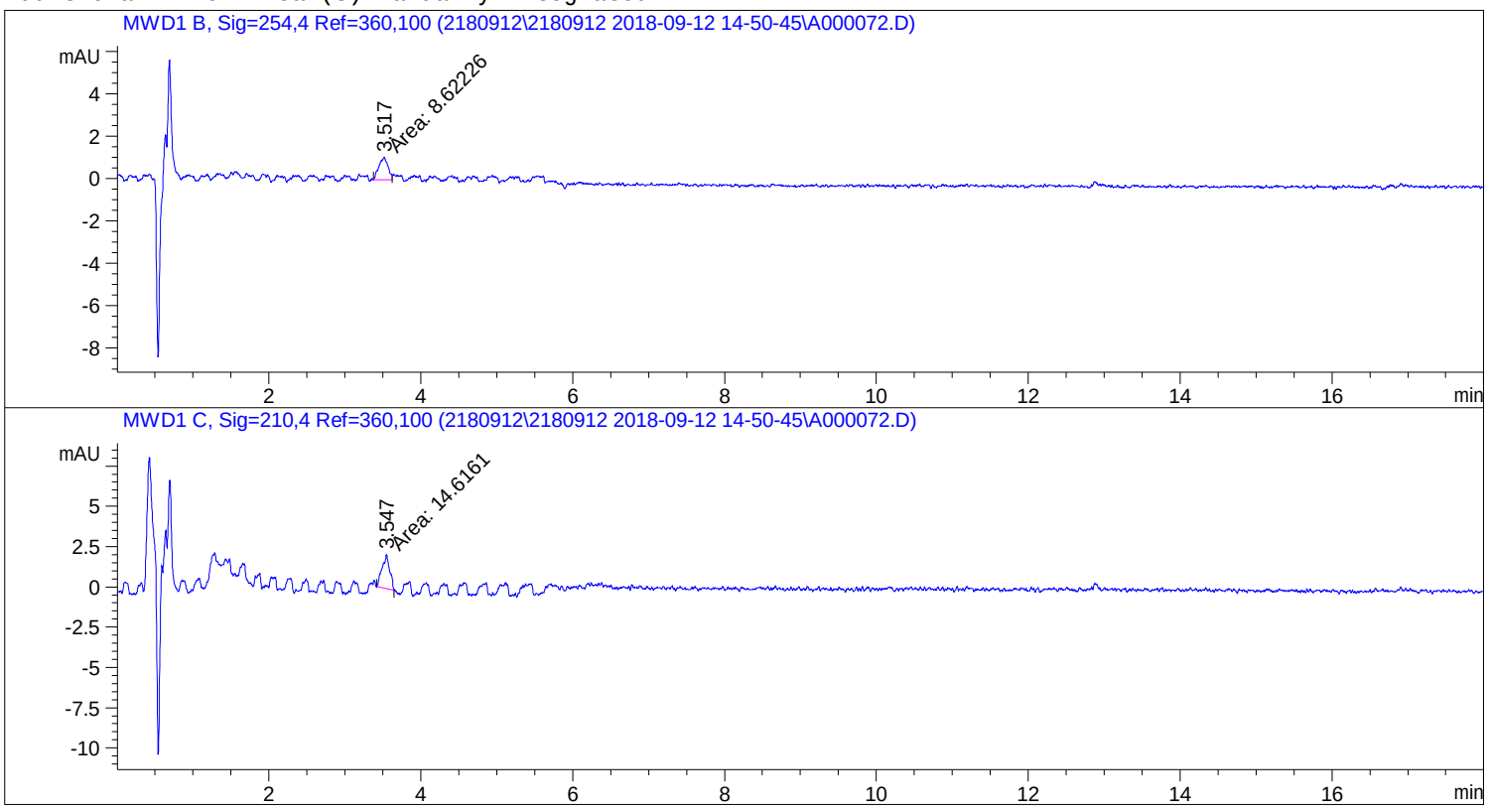
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	99.0	UQ	41.6	99.0	198
99-65-0	1,3-Dinitrobenzene	99.0	U	76.2	99.0	198
118-96-7	2,4,6-Trinitrotoluene	99.0	U	50.5	99.0	198
121-14-2	2,4-Dinitrotoluene	99.0	U	98.0	99.0	198
606-20-2	2,6-Dinitrotoluene	99.0	UJ	60.4	99.0	198
35572-78-2	2-Amino-4,6-dinitrotoluene	99.0	U	97.0	99.0	198
88-72-2	2-Nitrotoluene	99.0	U	63.4	99.0	198
618-87-1	3,5-Dinitroaniline	99.0	U	82.2	99.0	198
99-08-1	3-Nitrotoluene	149	UQ	124	149	198
19406-51-0	4-Amino-2,6-dinitrotoluene	99.0	U	76.2	99.0	198
99-99-0	4-Nitrotoluene	99.0	UQ	76.2	99.0	198
2691-41-0	HMX	99.0	UJ	25.7	99.0	198
98-95-3	Nitrobenzene	99.0	U	35.6	99.0	198
55-63-0	Nitroglycerin	99.0	U	73.3	99.0	198
78-11-5	Pentaerythritol Tetranitrate	149	UQ	121	149	198
121-82-4	RDX	99.0	U	17.8	99.0	198
479-45-8	Tetryl	99.0	UQ	40.6	99.0	198

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000072.D
Sample Name: 21808181213

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  54
Acq. Instrument : HPLC3                         Location : P1-A-09
Injection Date  : 9/13/2018 8:18:22 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```

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==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.800	1		-	-	-		RDX
2.800	2		-	-	-		1,3,5-TNB
3.547	2	MM	14.61614	17.58403	257.01055		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000072.D
Sample Name: 21808181213

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.100	2		-	-	-		3,5-DNA
4.700	1		-	-	-		NB
5.000	2		-	-	-		NG
5.700	1		-	-	-		TETRYL
6.200	1		-	-	-		2,4,6-TNT
7.050	1		-	-	-		2-A-4,6-DNT
7.300	1		-	-	-		4-A-2,6-DNT
7.900	1		-	-	-		2,4-DNT
8.200	1		-	-	-		2,6-DNT
11.000	2		-	-	-		2-NT
11.900	2		-	-	-		4-NT
12.900	2		-	-	-		3-NT
13.300	2		-	-	-		PETN

Totals : 257.01055

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA02A MS (RE)
Collect Date:	08/16/18 Time: 1020	GCAL Sample ID:	21808181214
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.3 g	Lab File ID:	2180912\A73
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0838
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

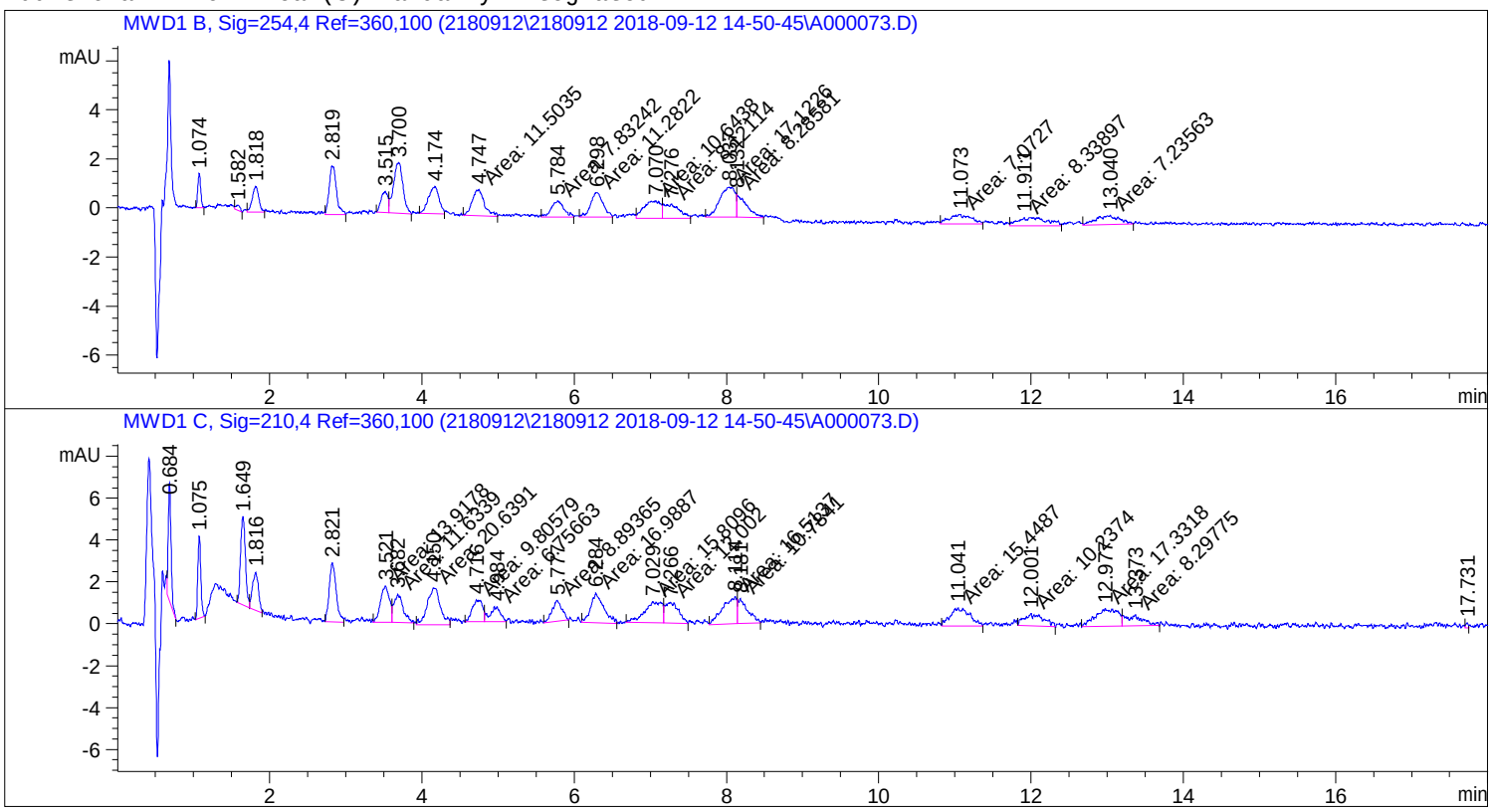
CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	828		40.8	97.1	194
99-65-0	1,3-Dinitrobenzene	836		74.8	97.1	194
118-96-7	2,4,6-Trinitrotoluene	767		49.5	97.1	194
121-14-2	2,4-Dinitrotoluene	884		96.1	97.1	194
606-20-2	2,6-Dinitrotoluene	803		59.2	97.1	194
35572-78-2	2-Amino-4,6-dinitrotoluene	889		95.1	97.1	194
88-72-2	2-Nitrotoluene	864		62.1	97.1	194
618-87-1	3,5-Dinitroaniline	923		80.6	97.1	194
99-08-1	3-Nitrotoluene	833		121	146	194
19406-51-0	4-Amino-2,6-dinitrotoluene	1030		74.8	97.1	194
99-99-0	4-Nitrotoluene	930		74.8	97.1	194
2691-41-0	HMX	596		25.2	97.1	194
98-95-3	Nitrobenzene	918		35.0	97.1	194
55-63-0	Nitroglycerin	848		71.8	97.1	194
78-11-5	Pentaerythritol Tetranitrate	947		118	146	194
121-82-4	RDX	816		17.5	97.1	194
479-45-8	Tetryl	734		39.8	97.1	194

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000073.D
Sample Name: 21808181214

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  55
Acq. Instrument : HPLC3                         Location : P1-B-01
Injection Date  : 9/13/2018 8:38:08 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```

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                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.074	1	BV	3.69188	41.55880	153.43001		HMX
1.818	1	VV	6.38868	32.88013	210.06070		RDX
2.821	2	BV	18.08335	11.79190	213.23711		1,3,5-TNB
3.521	2	MF	13.91775	17.58403	244.73014		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000073.D
Sample Name: 21808181214

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.700	1	VB	17.80894	12.08328	215.19034		1,3-DNB
4.150	2	MM	20.63910	11.51055	237.56747		3,5-DNA
4.747	1	MM	11.50348	20.54823	236.37622		NB
4.984	2	FM	6.75663	32.32469	218.40592		NG
5.784	1	MM	7.83242	24.14035	189.07725		TETRYL
6.298	1	MM	11.28225	17.49447	197.37692		2,4,6-TNT
7.070	1	MF	10.64378	21.50419	228.88582		2-A-4,6-DNT
7.276	1	FM	8.12114	32.60655	264.80228		4-A-2,6-DNT
8.037	1	MF	17.12256	13.30050	227.73865		2,4-DNT
8.132	1	FM	8.28581	24.95418	206.76552		2,6-DNT
11.041	2	MM	15.44866	14.40165	222.48619		2-NT
12.001	2	MM	10.23739	23.40253	239.58077		4-NT
12.977	2	MF	17.33177	12.38296	214.61854		3-NT
13.373	2	FM	8.29775	29.39954	243.95005		PETN

Totals : 3964.27991

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA02A MSD (RE)
Collect Date:	08/16/18 Time: 1020	GCAL Sample ID:	21808181215
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.5 g	Lab File ID:	2180912\A74
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0857
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

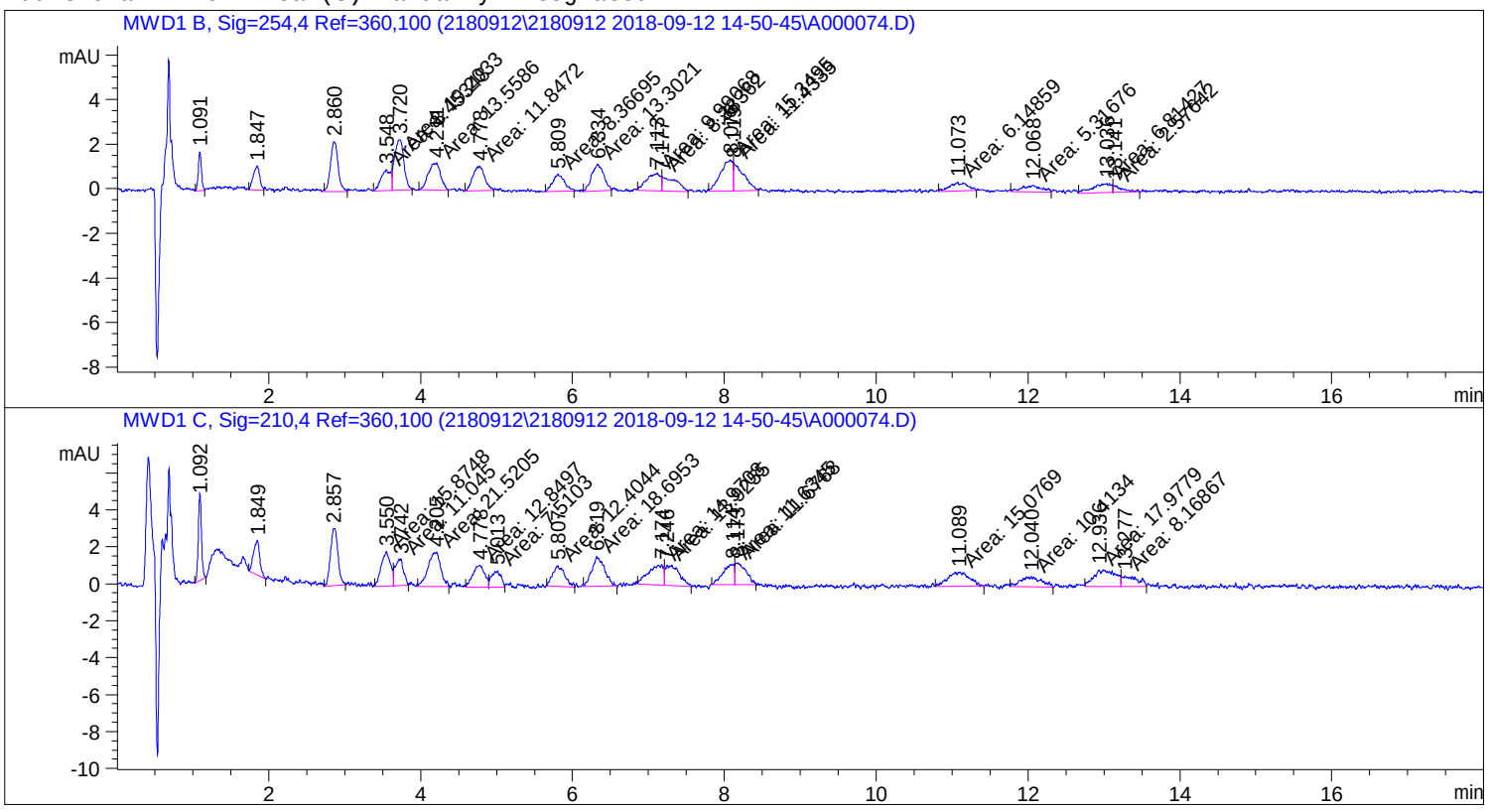
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	956		40.0	95.2	190
99-65-0	1,3-Dinitrobenzene	884		73.3	95.2	190
118-96-7	2,4,6-Trinitrotoluene	887		48.6	95.2	190
121-14-2	2,4-Dinitrotoluene	778		94.3	95.2	190
606-20-2	2,6-Dinitrotoluene	1090		58.1	95.2	190
35572-78-2	2-Amino-4,6-dinitrotoluene	818		93.3	95.2	190
88-72-2	2-Nitrotoluene	827		61.0	95.2	190
618-87-1	3,5-Dinitroaniline	944		79.0	95.2	190
99-08-1	3-Nitrotoluene	848		119	143	190
19406-51-0	4-Amino-2,6-dinitrotoluene	1040		73.3	95.2	190
99-99-0	4-Nitrotoluene	928		73.3	95.2	190
2691-41-0	HMX	794		24.8	95.2	190
98-95-3	Nitrobenzene	927		34.3	95.2	190
55-63-0	Nitroglycerin	925		70.5	95.2	190
78-11-5	Pentaerythritol Tetranitrate	915		116	143	190
121-82-4	RDX	808		17.1	95.2	190
479-45-8	Tetryl	769		39.0	95.2	190

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000074.D
Sample Name: 21808181215

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  56
Acq. Instrument : HPLC3                         Location : P1-B-02
Injection Date  : 9/13/2018 8:57:54 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.091	1	BV	5.01701	41.55880	208.50088		HMX
1.847	1	VV	6.45295	32.88013	212.17378		RDX
2.857	2	BV	21.28160	11.79190	250.95047		1,3,5-TNB
3.550	2	MF	15.87476	17.58403	279.14228		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000074.D
Sample Name: 21808181215

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.720	1	FM	19.20328	12.08328	232.03855		1,3-DNB
4.205	2	MM	21.52048	11.51055	247.71269		3,5-DNA
4.778	1	MM	11.84725	20.54823	243.43999		NB
5.013	2	FM	7.51030	32.32469	242.76810		NG
5.809	1	MM	8.36695	24.14035	201.98096		TETRYL
6.334	1	MM	13.30214	17.49447	232.71392		2,4,6-TNT
7.113	1	MF	9.99068	21.50419	214.84139		2-A-4,6-DNT
7.177	1	FM	8.38362	32.60655	273.36080		4-A-2,6-DNT
8.076	1	MF	15.34949	13.30050	204.15592		2,4-DNT
8.119	1	FM	11.43348	24.95418	285.31308		2,6-DNT
11.089	2	MM	15.07695	14.40165	217.13293		2-NT
12.040	2	MM	10.41337	23.40253	243.69911		4-NT
12.936	2	MF	17.97795	12.38296	222.62015		3-NT
13.277	2	FM	8.16867	29.39954	240.15511		PETN

Totals : 4252.70011

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA01A (RE)
Collect Date:	08/16/18 Time: 0930	GCAL Sample ID:	21808181216
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.1 g	Lab File ID:	2180912\A75
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0917
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

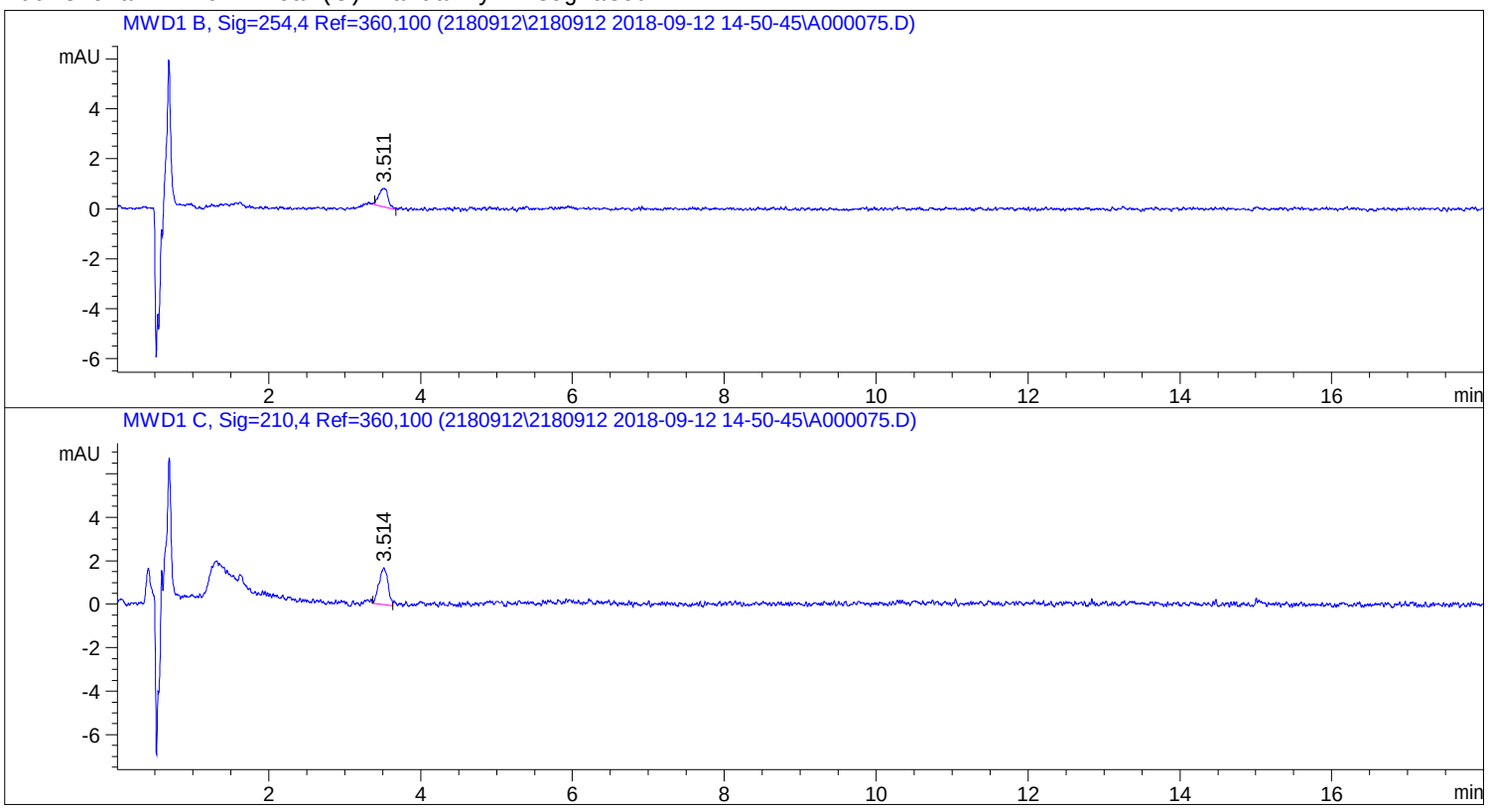
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	99.0	UQ	41.6	99.0	198
99-65-0	1,3-Dinitrobenzene	99.0	U	76.2	99.0	198
118-96-7	2,4,6-Trinitrotoluene	99.0	U	50.5	99.0	198
121-14-2	2,4-Dinitrotoluene	99.0	U	98.0	99.0	198
606-20-2	2,6-Dinitrotoluene	99.0	U	60.4	99.0	198
35572-78-2	2-Amino-4,6-dinitrotoluene	99.0	U	97.0	99.0	198
88-72-2	2-Nitrotoluene	99.0	U	63.4	99.0	198
618-87-1	3,5-Dinitroaniline	99.0	U	82.2	99.0	198
99-08-1	3-Nitrotoluene	149	UQ	124	149	198
19406-51-0	4-Amino-2,6-dinitrotoluene	99.0	U	76.2	99.0	198
99-99-0	4-Nitrotoluene	99.0	UQ	76.2	99.0	198
2691-41-0	HMX	99.0	U	25.7	99.0	198
98-95-3	Nitrobenzene	99.0	U	35.6	99.0	198
55-63-0	Nitroglycerin	99.0	U	73.3	99.0	198
78-11-5	Pentaerythritol Tetranitrate	149	UQ	121	149	198
121-82-4	RDX	99.0	U	17.8	99.0	198
479-45-8	Tetryl	99.0	UQ	40.6	99.0	198

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000075.D
Sample Name: 21808181216

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  57
Acq. Instrument : HPLC3                         Location : P1-B-03
Injection Date  : 9/13/2018 9:17:42 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.800	1		-	-	-		RDX
2.800	2		-	-	-		1,3,5-TNB
3.514	2	BV	13.83010	17.58403	243.18883		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000075.D
Sample Name: 21808181216

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.100	2		-	-	-		3,5-DNA
4.700	1		-	-	-		NB
5.000	2		-	-	-		NG
5.700	1		-	-	-		TETRYL
6.200	1		-	-	-		2,4,6-TNT
7.050	1		-	-	-		2-A-4,6-DNT
7.300	1		-	-	-		4-A-2,6-DNT
7.900	1		-	-	-		2,4-DNT
8.200	1		-	-	-		2,6-DNT
11.000	2		-	-	-		2-NT
11.900	2		-	-	-		4-NT
12.900	2		-	-	-		3-NT
13.300	2		-	-	-		PETN

Totals : 243.18883

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA01B (RE)
Collect Date:	08/16/18 Time: 0935	GCAL Sample ID:	21808181217
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.1 g	Lab File ID:	2180912\A76
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0937
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

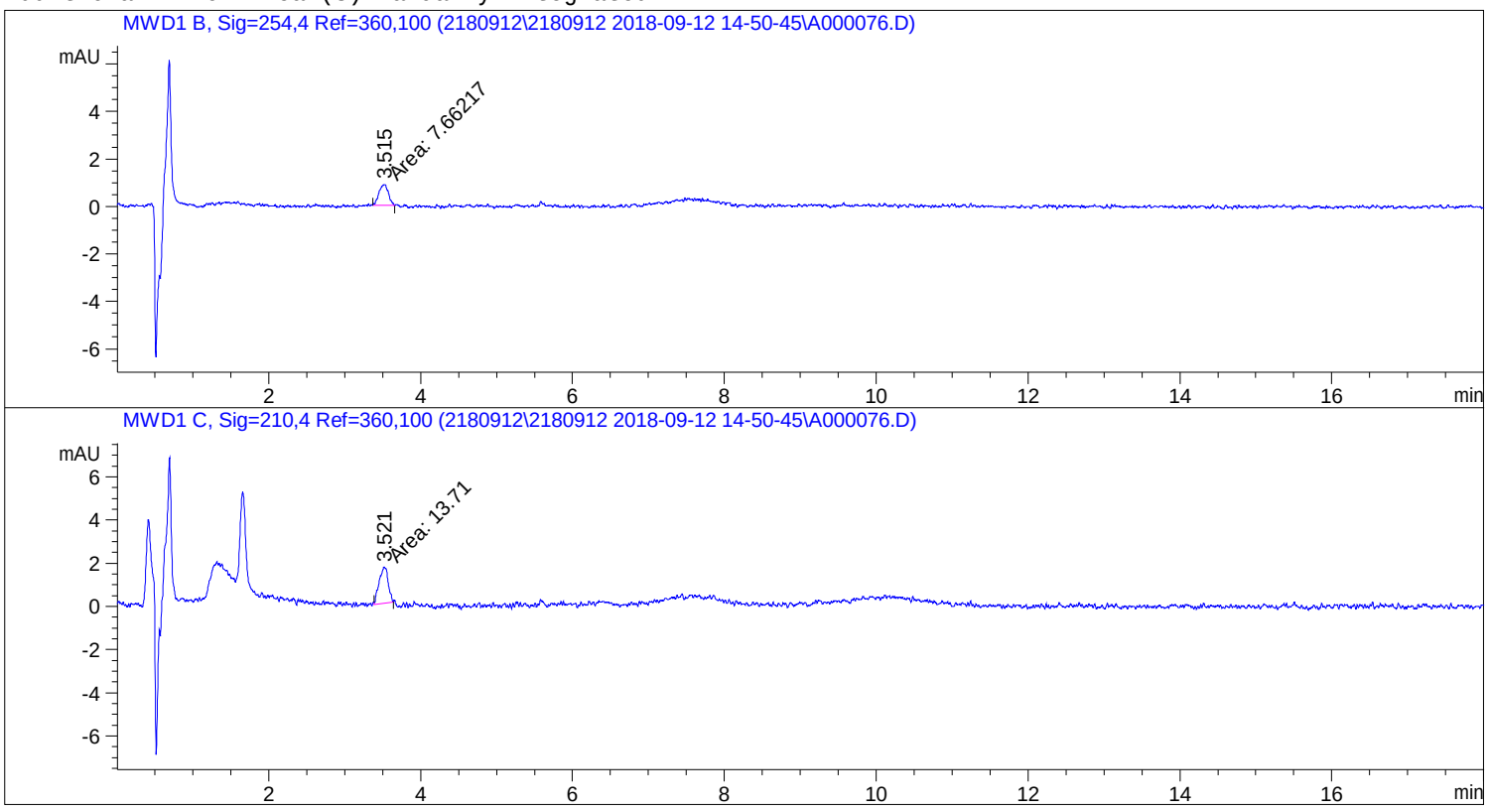
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	99.0	UQ	41.6	99.0	198
99-65-0	1,3-Dinitrobenzene	99.0	U	76.2	99.0	198
118-96-7	2,4,6-Trinitrotoluene	99.0	U	50.5	99.0	198
121-14-2	2,4-Dinitrotoluene	99.0	U	98.0	99.0	198
606-20-2	2,6-Dinitrotoluene	99.0	U	60.4	99.0	198
35572-78-2	2-Amino-4,6-dinitrotoluene	99.0	U	97.0	99.0	198
88-72-2	2-Nitrotoluene	99.0	U	63.4	99.0	198
618-87-1	3,5-Dinitroaniline	99.0	U	82.2	99.0	198
99-08-1	3-Nitrotoluene	149	UQ	124	149	198
19406-51-0	4-Amino-2,6-dinitrotoluene	99.0	U	76.2	99.0	198
99-99-0	4-Nitrotoluene	99.0	UQ	76.2	99.0	198
2691-41-0	HMX	99.0	U	25.7	99.0	198
98-95-3	Nitrobenzene	99.0	U	35.6	99.0	198
55-63-0	Nitroglycerin	99.0	U	73.3	99.0	198
78-11-5	Pentaerythritol Tetranitrate	149	UQ	121	149	198
121-82-4	RDX	99.0	U	17.8	99.0	198
479-45-8	Tetryl	99.0	UQ	40.6	99.0	198

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000076.D
Sample Name: 21808181217

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  58
Acq. Instrument : HPLC3                         Location : P1-B-04
Injection Date  : 9/13/2018 9:37:28 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```

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==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.800	1		-	-	-		RDX
2.800	2		-	-	-		1,3,5-TNB
3.521	2	MM	13.70996	17.58403	241.07633		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000076.D
Sample Name: 21808181217

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.100	2		-	-	-		3,5-DNA
4.700	1		-	-	-		NB
5.000	2		-	-	-		NG
5.700	1		-	-	-		TETRYL
6.200	1		-	-	-		2,4,6-TNT
7.050	1		-	-	-		2-A-4,6-DNT
7.300	1		-	-	-		4-A-2,6-DNT
7.900	1		-	-	-		2,4-DNT
8.200	1		-	-	-		2,6-DNT
11.000	2		-	-	-		2-NT
11.900	2		-	-	-		4-NT
12.900	2		-	-	-		3-NT
13.300	2		-	-	-		PETN

Totals : 241.07633

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	MB1843189
Collect Date:	NA Time: NA	GCAL Sample ID:	1843189
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A04
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	08/30/18 Time: 1145
Prep Batch:	642698	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

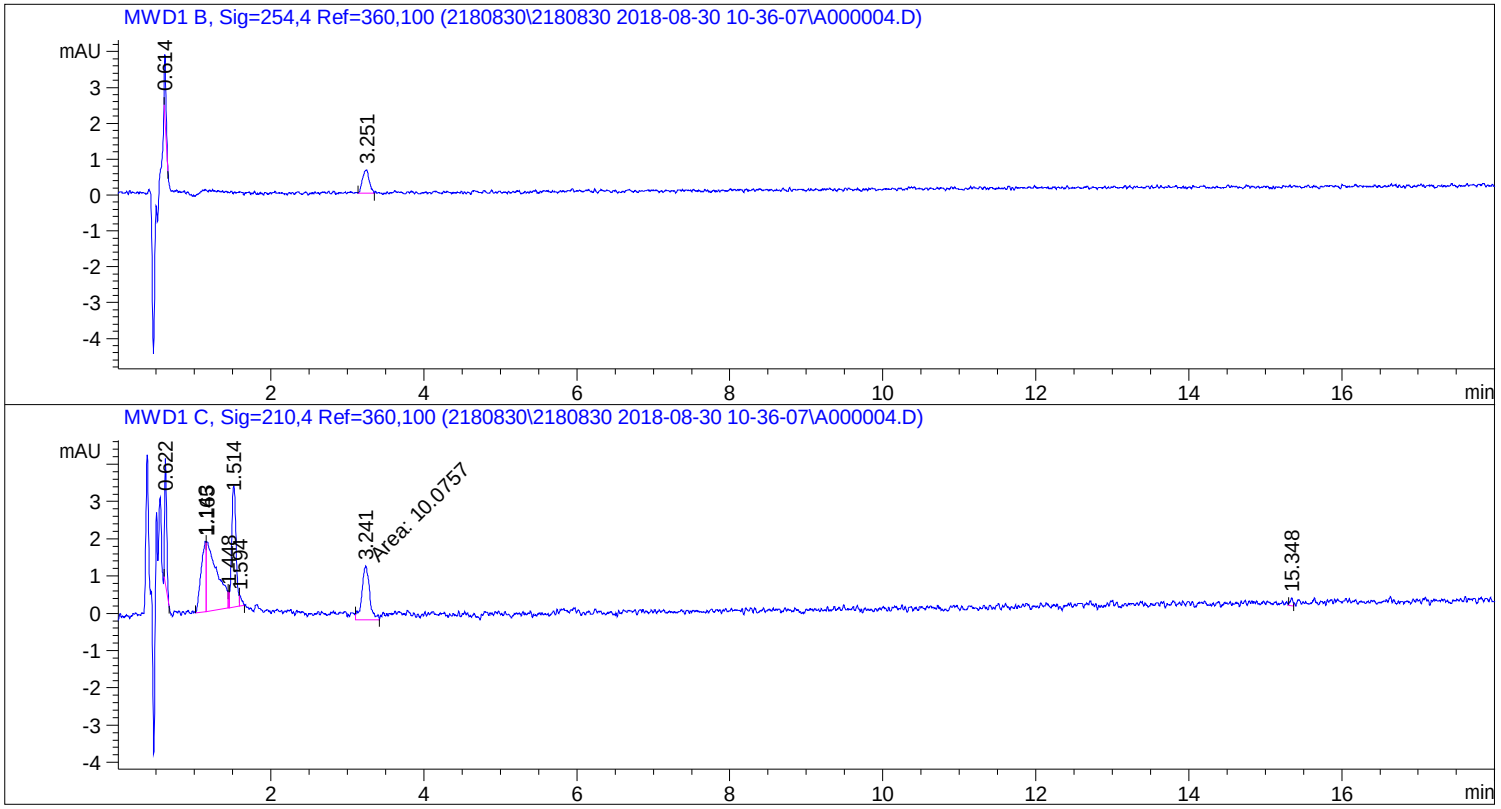
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000004.D
Sample Name: 1843189

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   4
Acq. Instrument : HPLC3                         Location : P2-A-01
Injection Date  : 8/30/2018 11:45:30 AM              Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 4/28/2018 12:48:13 PM by DLB
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/30/2018 11:41:16 AM by MEG
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/29/2018 9:00:44 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100

RetTime Sig Type     Area     Amt/Area    Amount    Grp   Name
 [min]             [mAU*s]
-------|--|------|----------|----------|----------|--|---------------
  0.940  1            -          -          -         HMX
  1.650  1            -          -          -         RDX
  2.600  2            -          -          -         1,3,5-TNB
  3.241  2 MM       10.07574   17.58403  177.17214    1,2-DNB
  3.400  1            -          -          -         1,3-DNB
```

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000004.D
Sample Name: 1843189

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.900	2		-	-	-		3,5-DNA
4.400	1		-	-	-		NB
4.700	2		-	-	-		NG
5.400	1		-	-	-		TETRYL
5.900	1		-	-	-		2,4,6-TNT
6.550	1		-	-	-		2-A-4,6-DNT
6.850	1		-	-	-		4-A-2,6-DNT
7.500	1		-	-	-		2,4-DNT
7.750	1		-	-	-		2,6-DNT
10.500	2		-	-	-		2-NT
11.400	2		-	-	-		4-NT
12.300	2		-	-	-		3-NT
12.650	2		-	-	-		PETN
Totals :					177.17214		

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	LCS1843190
Collect Date:	NA Time: NA	GCAL Sample ID:	1843190
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A05
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	08/30/18 Time: 1205
Prep Batch:	642698	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

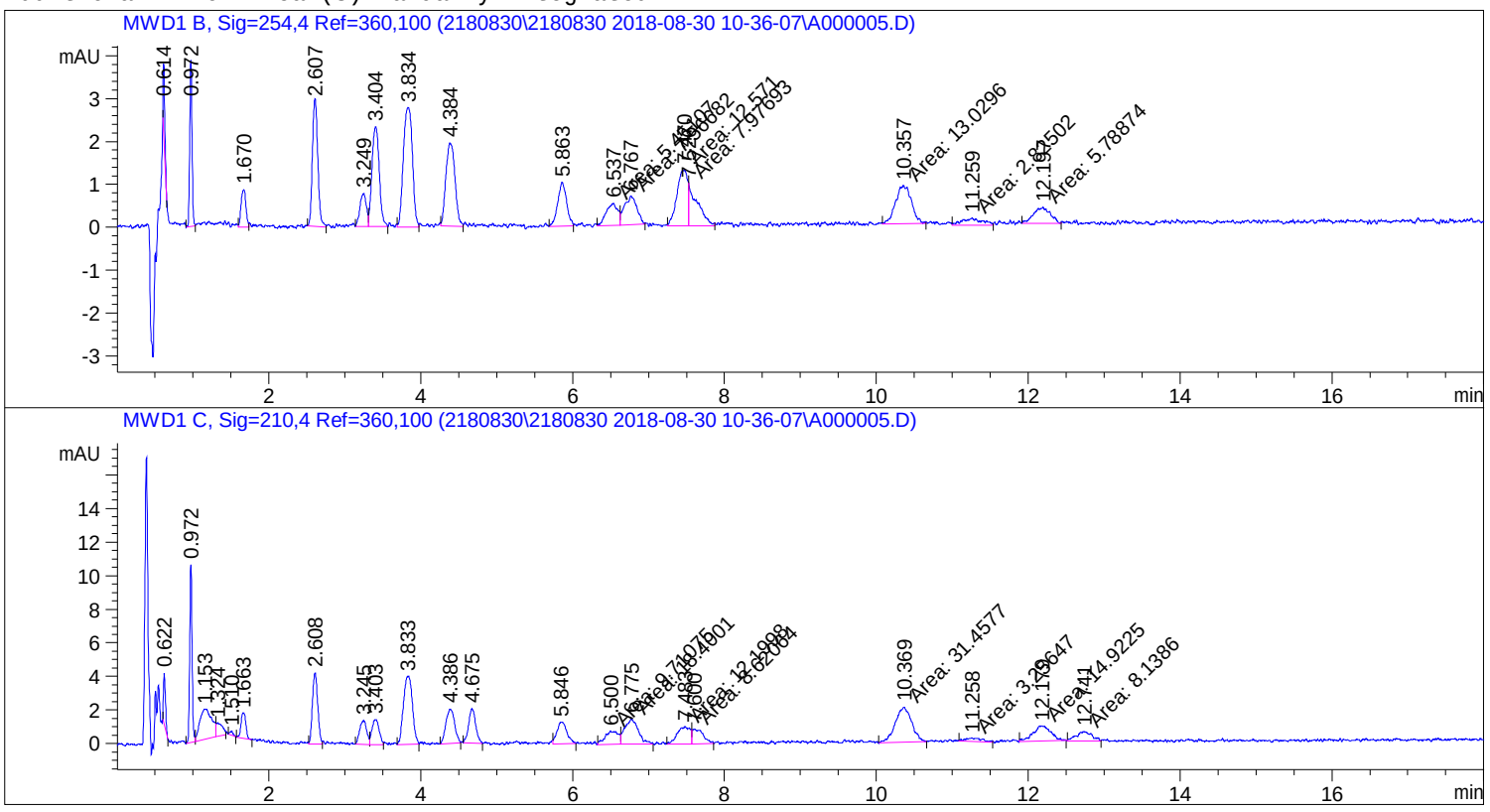
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	971		42.0	100	200
99-65-0	1,3-Dinitrobenzene	755		77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	584		51.0	100	200
121-14-2	2,4-Dinitrotoluene	424		99.0	100	200
606-20-2	2,6-Dinitrotoluene	1250		61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	469		98.0	100	200
88-72-2	2-Nitrotoluene	1810		64.0	100	200
618-87-1	3,5-Dinitroaniline	1530		83.0	100	200
99-08-1	3-Nitrotoluene	739		125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	987		77.0	100	200
99-99-0	4-Nitrotoluene	305		77.0	100	200
2691-41-0	HMX	1350		26.0	100	200
98-95-3	Nitrobenzene	1320		36.0	100	200
55-63-0	Nitroglycerin	1710		74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	957		122	150	200
121-82-4	RDX	506		18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000005.D
Sample Name: 1843190

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   5
Acq. Instrument : HPLC3                         Location : P2-A-02
Injection Date  : 8/30/2018 12:05:22 PM              Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 4/28/2018 12:48:13 PM by DLB
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 9/7/2018 9:41:33 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/7/2018 9:41:33 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.972	1	BV	8.12747	41.55880	337.76793		HMX
1.670	1	VV	3.85031	32.88013	126.59859		RDX
2.608	2	VV	20.57924	11.79190	242.66842		1,3,5-TNB
3.245	2	BV	9.16194	17.58403	161.10387		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000005.D
Sample Name: 1843190

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.404	1	VB	15.61482	12.08328	188.67820		1,3-DNB
3.833	2	BB	33.31809	11.51055	383.50967		3,5-DNA
4.384	1	VV	16.05406	20.54823	329.88258		NB
4.675	2	BB	13.24455	32.32469	428.12594		NG
5.250	1		-	-	-		TETRYL
5.863	1	BV	8.35067	17.49447	146.09061		2,4,6-TNT
6.150	1		-	-	-		2-A-4,6-DNT
6.537	1	MF	5.45107	32.60655	177.74063		4-A-2,6-DNT
7.470	1	MF	12.57102	13.30050	167.20087		2,4-DNT
7.526	1	FM	7.97693	24.95418	199.05778		2,6-DNT
9.900	2		-	-	-		2-NT
10.369	2	MM	31.45767	23.40253	736.18899		4-NT
11.258	2	MM	3.25647	12.38296	40.32470		3-NT
12.741	2	MM	8.13860	29.39954	239.27120		PETN

Totals : 3904.20997

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

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*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	LCSD1843191
Collect Date:	NA Time: NA	GCAL Sample ID:	1843191
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A06
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	08/30/18 Time: 1225
Prep Batch:	642698	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	842		42.0	100	200
99-65-0	1,3-Dinitrobenzene	657		77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	542		51.0	100	200
121-14-2	2,4-Dinitrotoluene	519		99.0	100	200
606-20-2	2,6-Dinitrotoluene	673		61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	430		98.0	100	200
88-72-2	2-Nitrotoluene	1450		64.0	100	200
618-87-1	3,5-Dinitroaniline	1340		83.0	100	200
99-08-1	3-Nitrotoluene	607		125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	886		77.0	100	200
99-99-0	4-Nitrotoluene	392		77.0	100	200
2691-41-0	HMX	1190		26.0	100	200
98-95-3	Nitrobenzene	1140		36.0	100	200
55-63-0	Nitroglycerin	1460		74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	915		122	150	200
121-82-4	RDX	499		18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

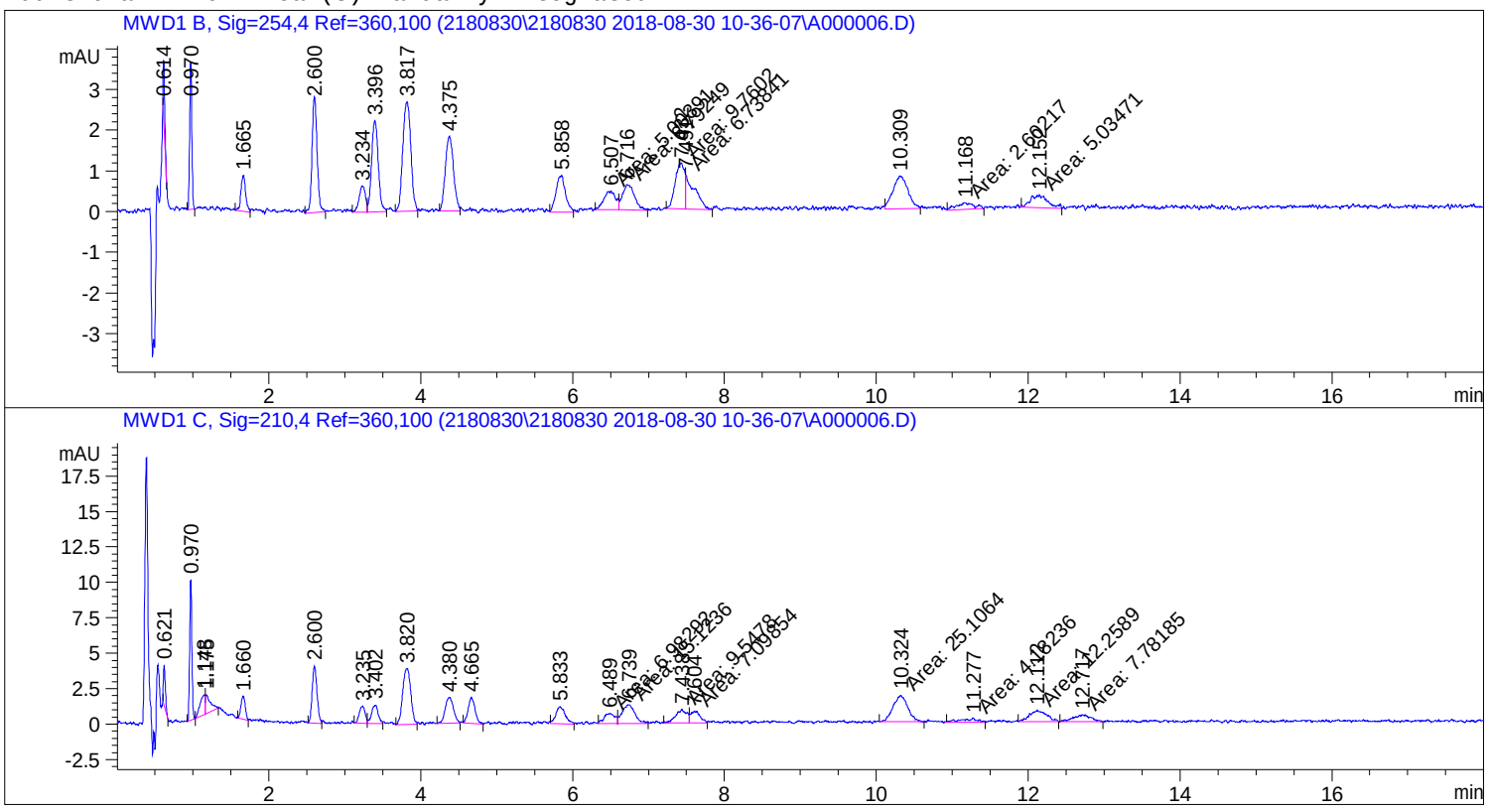
FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000006.D
Sample Name: 1843191

==========

Acq. Operator : MEG Seq. Line : 6
Acq. Instrument : HPLC3 Location : P2-A-03
Injection Date : 8/30/2018 12:25:10 PM Inj : 1
Inj Volume : 25.000 µl
Acq. Method : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed : 4/28/2018 12:48:13 PM by DLB
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed : 9/7/2018 9:41:33 AM by MEG
(modified after loading)
Method Info : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated



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External Standard Report

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Sorted By : Retention Time
Calib. Data Modified : 9/7/2018 9:41:33 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.970	1	BB	7.13302	41.55880	296.43986		HMX
1.665	1	BV	3.79728	32.88013	124.85501		RDX
2.600	2	BV	17.85053	11.79190	210.49165		1,3,5-TNB
3.235	2	BV	6.46765	17.58403	113.72741		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000006.D
Sample Name: 1843191

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.396	1	VV	13.60303	12.08328	164.36919		1,3-DNB
3.820	2	BV	29.06825	11.51055	334.59163		3,5-DNA
4.375	1	BV	13.81910	20.54823	283.95802		NB
4.665	2	VB	11.30748	32.32469	365.51096		NG
5.250	1		-	-	-		TETRYL
5.858	1	VV	7.74149	17.49447	135.43318		2,4,6-TNT
6.150	1		-	-	-		2-A-4,6-DNT
6.507	1	MF	5.00391	32.60655	163.16018		4-A-2,6-DNT
7.432	1	MF	9.76020	13.30050	129.81562		2,4-DNT
7.491	1	FM	6.73841	24.95418	168.15159		2,6-DNT
9.900	2		-	-	-		2-NT
10.800	2		-	-	-		4-NT
12.112	2	MM	12.25887	12.38296	151.80111		3-NT
12.717	2	MM	7.78185	29.39954	228.78281		PETN
Totals :					2871.08823		

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	GRBLK for HBN 642698 [EXTO/549
Collect Date:	NA Time: NA	GCAL Sample ID:	1843194
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A10
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	08/30/18 Time: 1344
Prep Batch:	642698	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

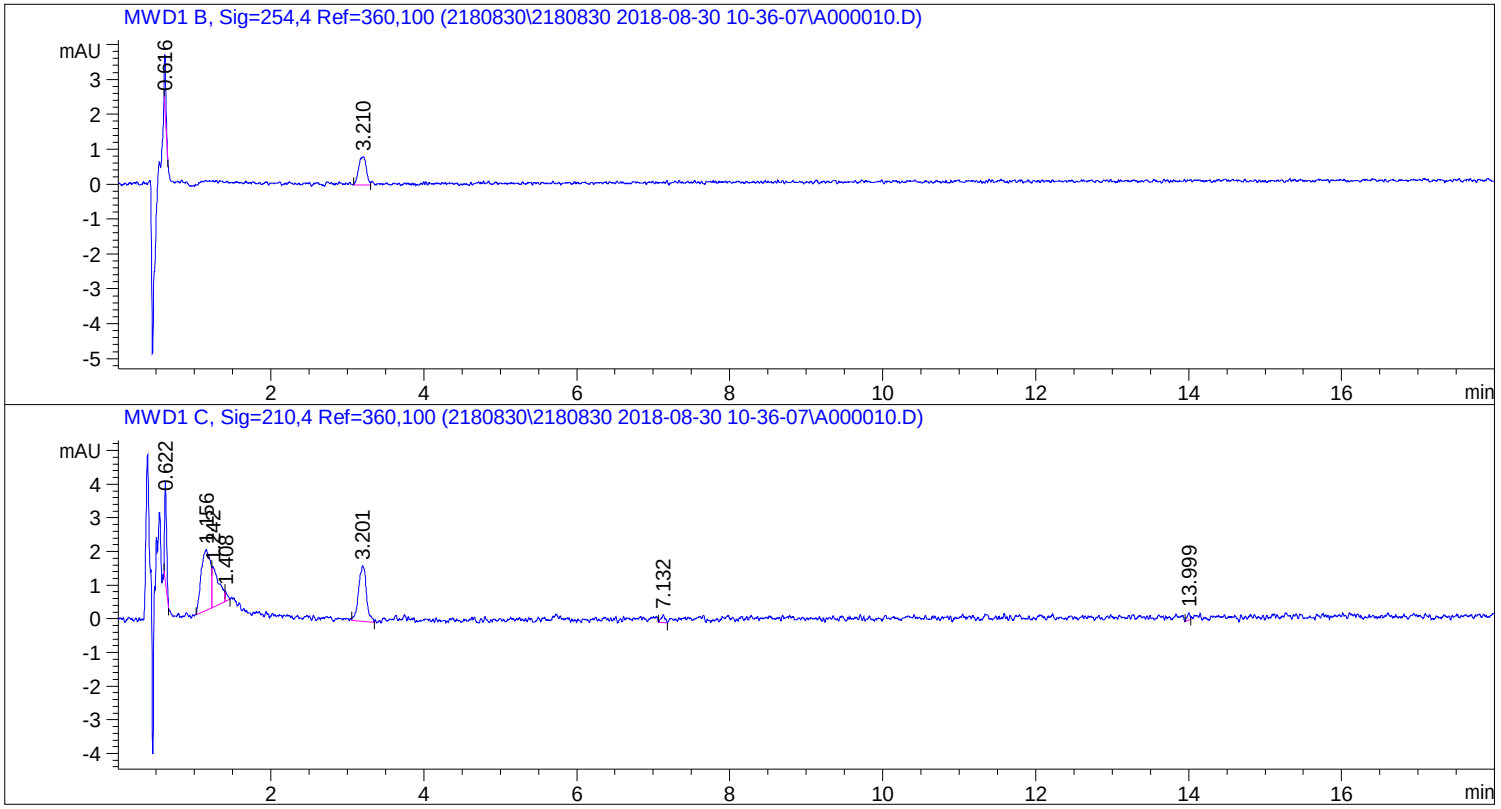
CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000010.D
Sample Name: 1843194

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  10
Acq. Instrument : HPLC3                         Location : P2-A-07
Injection Date  : 8/30/2018 1:44:19 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 4/28/2018 12:48:13 PM by DLB
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:25:19 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:25:20 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100

RetTime Sig Type     Area     Amt/Area    Amount    Grp   Name
 [min]             [mAU*s]
-------|--|------|----------|----------|----------|--|---------------
  0.940  1            -          -          -         HMX
  1.650  1            -          -          -         RDX
  2.600  2            -          -          -         1,3,5-TNB
  3.201  2 VV       11.78087   17.58403  207.15505    1,2-DNB
  3.400  1            -          -          -         1,3-DNB
```

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000010.D
Sample Name: 1843194

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.900	2		-	-	-		3,5-DNA
4.400	1		-	-	-		NB
4.700	2		-	-	-		NG
5.400	1		-	-	-		TETRYL
5.900	1		-	-	-		2,4,6-TNT
6.450	1		-	-	-		2-A-4,6-DNT
6.750	1		-	-	-		4-A-2,6-DNT
7.400	1		-	-	-		2,4-DNT
7.650	1		-	-	-		2,6-DNT
10.300	2		-	-	-		2-NT
11.200	2		-	-	-		4-NT
12.150	2		-	-	-		3-NT
12.700	2		-	-	-		PETN

Totals : 207.15505

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	MB1846370
Collect Date:	NA Time: NA	GCAL Sample ID:	1846370
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180912\A69
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0719
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

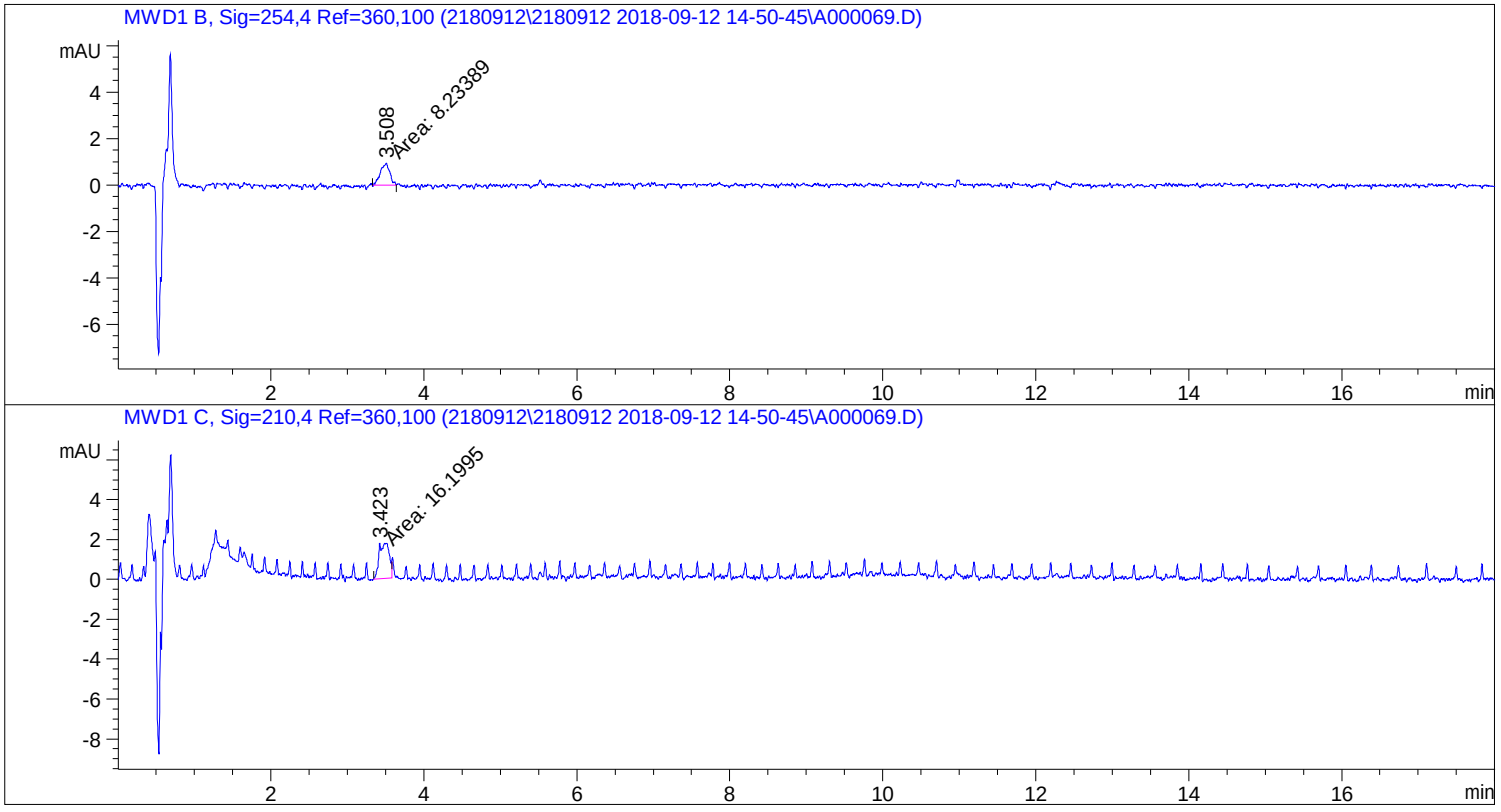
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000069.D
Sample Name: 1846370

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  51
Acq. Instrument : HPLC3                         Location : P1-A-06
Injection Date  : 9/13/2018 7:19:02 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:06:33 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```

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==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:06:36 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.800	1		-	-	-		RDX
2.800	2		-	-	-		1,3,5-TNB
3.423	2	MM	16.19952	17.58403	284.85282		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000069.D
Sample Name: 1846370

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.100	2		-	-	-		3,5-DNA
4.700	1		-	-	-		NB
5.000	2		-	-	-		NG
5.700	1		-	-	-		TETRYL
6.200	1		-	-	-		2,4,6-TNT
6.950	1		-	-	-		2-A-4,6-DNT
7.100	1		-	-	-		4-A-2,6-DNT
7.900	1		-	-	-		2,4-DNT
8.100	1		-	-	-		2,6-DNT
11.000	2		-	-	-		2-NT
11.900	2		-	-	-		4-NT
12.900	2		-	-	-		3-NT
13.300	2		-	-	-		PETN

Totals : 284.85282

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	LCS1846371
Collect Date:	NA Time: NA	GCAL Sample ID:	1846371
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180912\A70
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0738
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

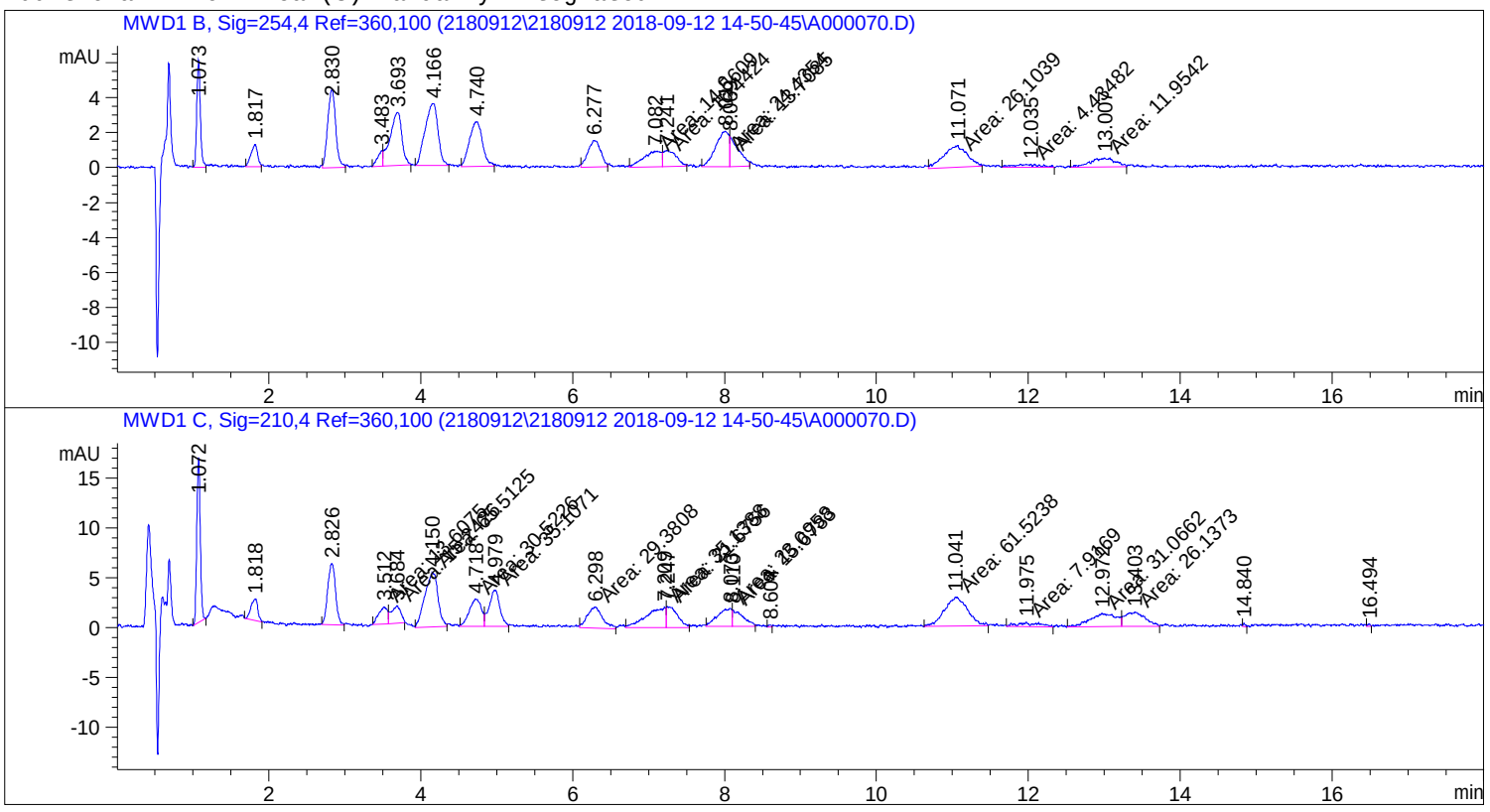
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	2110		42.0	100	200
99-65-0	1,3-Dinitrobenzene	1620		77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	1240		51.0	100	200
121-14-2	2,4-Dinitrotoluene	1300		99.0	100	200
606-20-2	2,6-Dinitrotoluene	1370		61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	1250		98.0	100	200
88-72-2	2-Nitrotoluene	3540		64.0	100	200
618-87-1	3,5-Dinitroaniline	3020		83.0	100	200
99-08-1	3-Nitrotoluene	1540		125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	1360		77.0	100	200
99-99-0	4-Nitrotoluene	741		77.0	100	200
2691-41-0	HMX	3290		26.0	100	200
98-95-3	Nitrobenzene	2510		36.0	100	200
55-63-0	Nitroglycerin	4540		74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	3070		122	150	200
121-82-4	RDX	1030		18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000070.D
Sample Name: 1846371

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  52
Acq. Instrument : HPLC3                         Location : P1-A-07
Injection Date  : 9/13/2018 7:38:50 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.073	1	BV	19.80932	41.55880	823.25141		HMX
1.817	1	VV	7.82193	32.88013	257.18616		RDX
2.826	2	VV	44.72707	11.79190	527.41724		1,3,5-TNB
3.512	2	MF	13.60745	17.58403	239.27380		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000070.D
Sample Name: 1846371

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.693	1	VV	33.42910	12.08328	403.93317		1,3-DNB
4.150	2	MM	65.51247	11.51055	754.08480		3,5-DNA
4.740	1	VV	30.50387	20.54823	626.80059		NB
4.979	2	FM	35.10712	32.32469	1134.82700		NG
5.700	1		-	-	-		TETRYL
6.277	1	VV	17.72060	17.49447	310.01254		2,4,6-TNT
7.082	1	MF	14.56087	21.50419	313.11977		2-A-4,6-DNT
7.241	1	FM	10.44237	32.60655	340.48961		4-A-2,6-DNT
8.012	1	MF	24.43538	13.30050	325.00291		2,4-DNT
8.069	1	FM	13.70849	24.95418	342.08421		2,6-DNT
11.041	2	MM	61.52382	14.40165	886.04467		2-NT
11.975	2	MM	7.91690	23.40253	185.27542		4-NT
12.972	2	MF	31.06616	12.38296	384.69089		3-NT
13.403	2	FM	26.13731	29.39954	768.42506		PETN

Totals : 8621.91922

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	LCSD1846372
Collect Date:	NA Time: NA	GCAL Sample ID:	1846372
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180912\A71
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0758
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

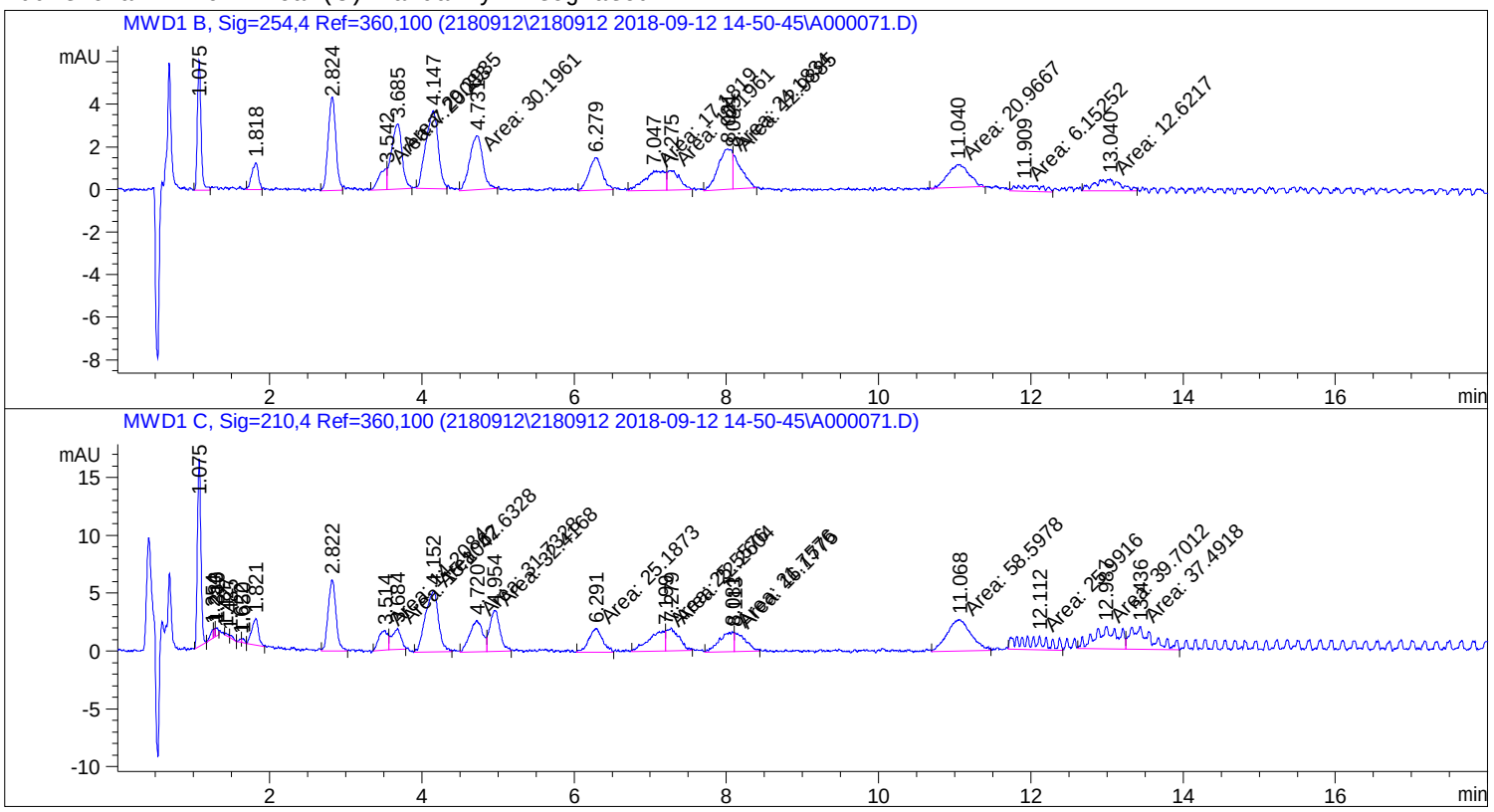
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	2070		42.0	100	200
99-65-0	1,3-Dinitrobenzene	1420		77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	1320		51.0	100	200
121-14-2	2,4-Dinitrotoluene	1290		99.0	100	200
606-20-2	2,6-Dinitrotoluene	1300		61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	1480		98.0	100	200
88-72-2	2-Nitrotoluene	3380		64.0	100	200
618-87-1	3,5-Dinitroaniline	2880		83.0	100	200
99-08-1	3-Nitrotoluene	1970		125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	1330		77.0	100	200
99-99-0	4-Nitrotoluene	2430		77.0	100	200
2691-41-0	HMX	3370		26.0	100	200
98-95-3	Nitrobenzene	2480		36.0	100	200
55-63-0	Nitroglycerin	4190		74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	4410		122	150	200
121-82-4	RDX	1010		18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000071.D
Sample Name: 1846372

```
==========================================================================
Acq. Operator   : MEG                              Seq. Line :  53
Acq. Instrument : HPLC3                             Location : P1-A-08
Injection Date  : 9/13/2018 7:58:36 AM                   Inj :   1
                                                  Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.075	1	BV	20.26317	41.55880	842.11286		HMX
1.818	1	VV	7.70177	32.88013	253.23521		RDX
2.822	2	VV	43.98149	11.79190	518.62540		1,3,5-TNB
3.514	2	MF	14.20844	17.58403	249.84152		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000071.D
Sample Name: 1846372

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.685	1	FM	29.29345	12.08328	353.96095		1,3-DNB
4.152	2	MM	62.63280	11.51055	720.93821		3,5-DNA
4.731	1	MM	30.19608	20.54823	620.47607		NB
4.954	2	FM	32.41684	32.32469	1047.86437		NG
5.700	1		-	-	-		TETRYL
6.279	1	BV	18.89552	17.49447	330.56702		2,4,6-TNT
7.047	1	MF	17.18185	21.50419	369.48178		2-A-4,6-DNT
7.275	1	FM	10.19611	32.60655	332.45983		4-A-2,6-DNT
8.021	1	MF	24.18341	13.30050	321.65156		2,4-DNT
8.085	1	FM	12.98846	24.95418	324.11643		2,6-DNT
11.068	2	MM	58.59776	14.40165	843.90457		2-NT
12.112	2	MM	25.99157	23.40253	608.26851		4-NT
12.987	2	MF	39.70123	12.38296	491.61862		3-NT
13.436	2	FM	37.49179	29.39954	1102.24156		PETN
Totals :					9331.36447		

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA01B (RE)DUP
Collect Date:	08/16/18 Time: 0935	GCAL Sample ID:	1846373
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180912\A77
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0957
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

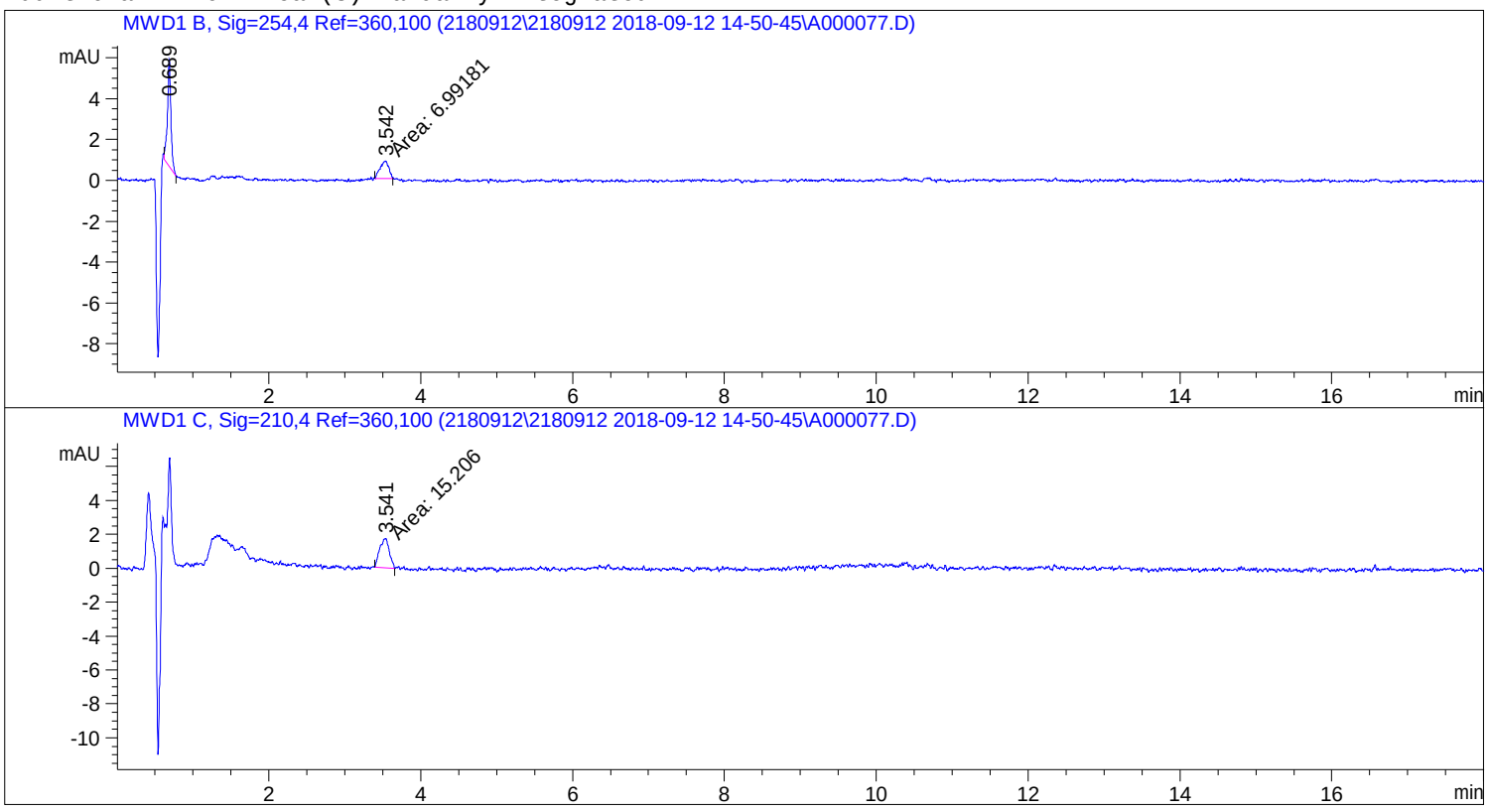
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000077.D
Sample Name: 1846373

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  59
Acq. Instrument : HPLC3                         Location : P1-B-05
Injection Date  : 9/13/2018 9:57:12 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.800	1		-	-	-		RDX
2.800	2		-	-	-		1,3,5-TNB
3.541	2	MM	15.20599	17.58403	267.38255		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000077.D
Sample Name: 1846373

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.100	2		-	-	-		3,5-DNA
4.700	1		-	-	-		NB
5.000	2		-	-	-		NG
5.700	1		-	-	-		TETRYL
6.200	1		-	-	-		2,4,6-TNT
7.050	1		-	-	-		2-A-4,6-DNT
7.300	1		-	-	-		4-A-2,6-DNT
7.900	1		-	-	-		2,4-DNT
8.200	1		-	-	-		2,6-DNT
11.000	2		-	-	-		2-NT
11.900	2		-	-	-		4-NT
12.900	2		-	-	-		3-NT
13.300	2		-	-	-		PETN

Totals : 267.38255

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	WIL02DA01B (RE)DUP
Collect Date:	08/16/18 Time: 0935	GCAL Sample ID:	1846374
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180912\A78
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 1016
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

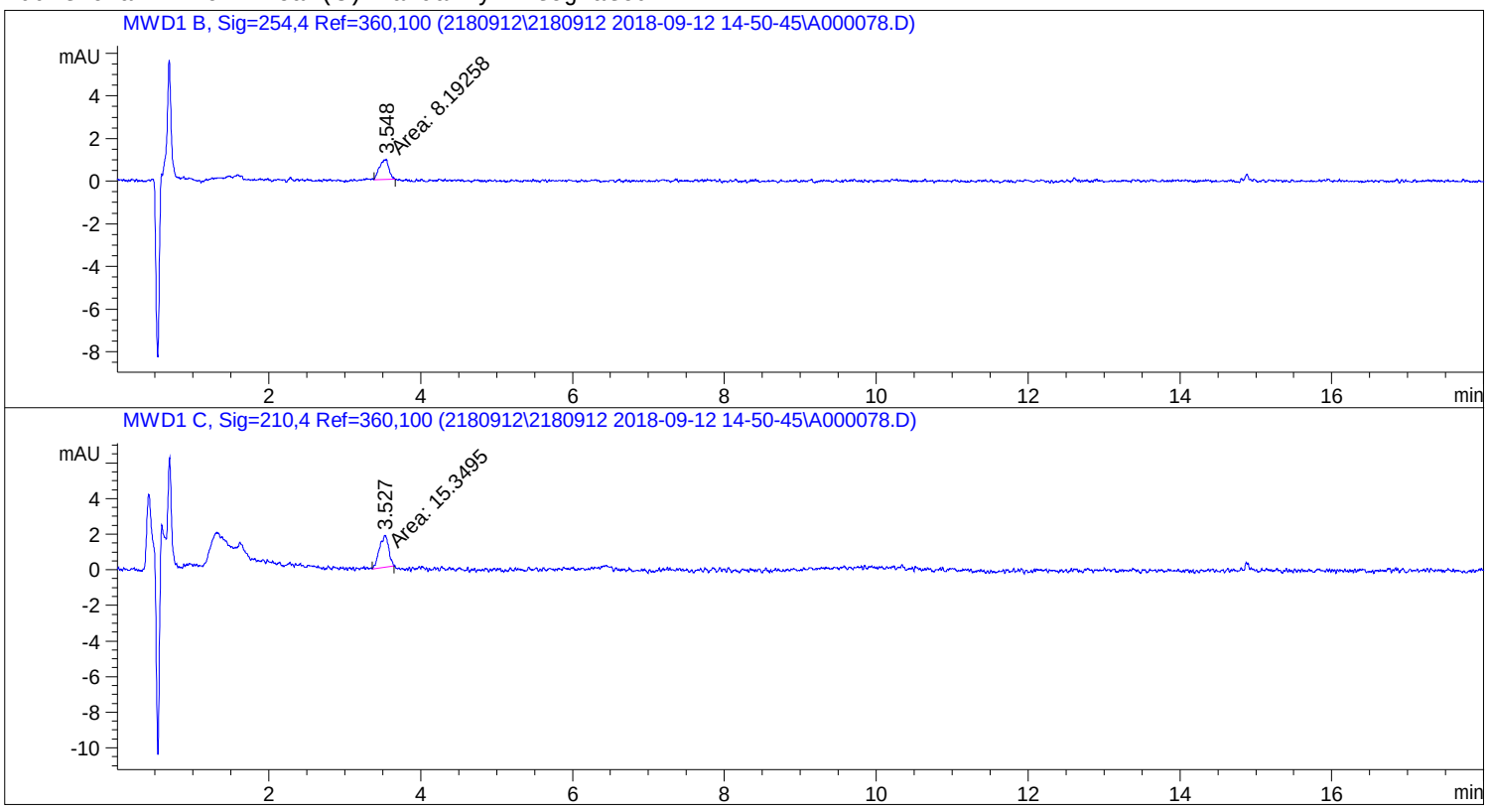
CAS	*ANALYTE*	*RESULT*	*Q*	*DL*	*LOD*	*LOQ*
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000078.D
Sample Name: 1846374

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  60
Acq. Instrument : HPLC3                         Location : P1-B-06
Injection Date  : 9/13/2018 10:16:58 AM              Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.800	1		-	-	-		RDX
2.800	2		-	-	-		1,3,5-TNB
3.527	2	MM	15.34950	17.58403	269.90604		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000078.D
Sample Name: 1846374

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.100	2		-	-	-		3,5-DNA
4.700	1		-	-	-		NB
5.000	2		-	-	-		NG
5.700	1		-	-	-		TETRYL
6.200	1		-	-	-		2,4,6-TNT
7.050	1		-	-	-		2-A-4,6-DNT
7.300	1		-	-	-		4-A-2,6-DNT
7.900	1		-	-	-		2,4-DNT
8.200	1		-	-	-		2,6-DNT
11.000	2		-	-	-		2-NT
11.900	2		-	-	-		4-NT
12.900	2		-	-	-		3-NT
13.300	2		-	-	-		PETN

Totals : 269.90604

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081812	Client Sample ID:	GRBLK for HBN 643342 [EXTO/550
Collect Date:	NA Time: NA	GCAL Sample ID:	1846375
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180912\A79
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 1036
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

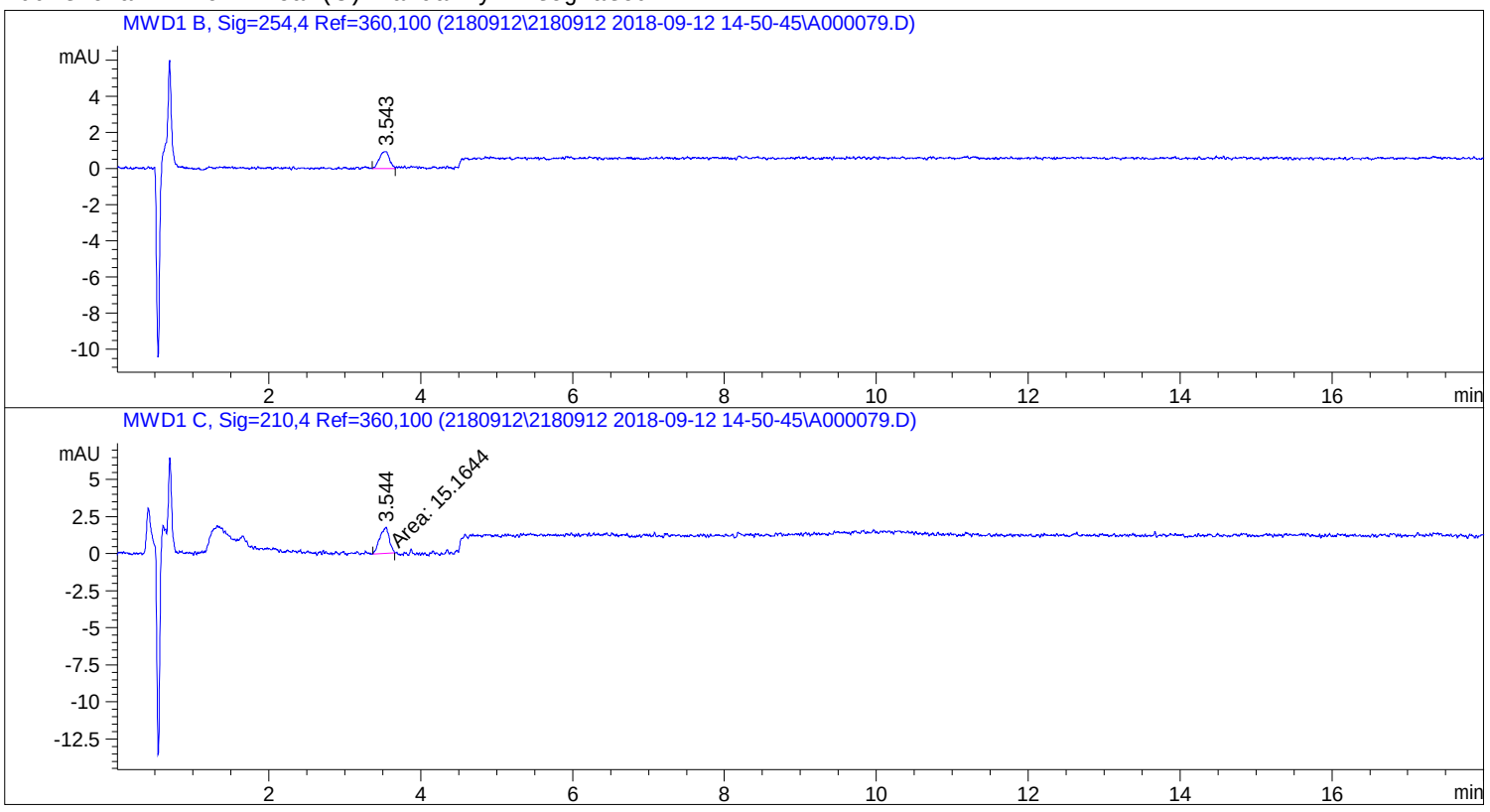
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000079.D
Sample Name: 1846375

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  61
Acq. Instrument : HPLC3                         Location : P1-B-07
Injection Date  : 9/13/2018 10:36:50 AM              Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 12:25:38 PM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 12:25:43 PM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.050	1		-	-	-		HMX
1.800	1		-	-	-		RDX
2.800	2		-	-	-		1,3,5-TNB
3.544	2	MM	15.16444	17.58403	266.65188		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000079.D
Sample Name: 1846375

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.650	1		-	-	-		1,3-DNB
4.100	2		-	-	-		3,5-DNA
4.700	1		-	-	-		NB
5.000	2		-	-	-		NG
5.700	1		-	-	-		TETRYL
6.200	1		-	-	-		2,4,6-TNT
7.050	1		-	-	-		2-A-4,6-DNT
7.300	1		-	-	-		4-A-2,6-DNT
7.900	1		-	-	-		2,4-DNT
8.200	1		-	-	-		2,6-DNT
11.000	2		-	-	-		2-NT
11.900	2		-	-	-		4-NT
12.900	2		-	-	-		3-NT
13.300	2		-	-	-		PETN

Totals : 266.65188

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

EPA 8330B REPLICATE SUMMARY

Report No:	218081812	Parent Sample ID:	WIL02DA01B (RE)
Prep Method:	EPA 8330B	Parent GCAL ID:	21808181217
Prep Date:	9/5/2018 6:51:00 PM	Prep Batch:	643342
Analytical Method:	EPA 8330B		

ANALYTE	*CAS*	*UNITS*	*PARENT RESULT*	*REP #1 RESULT (1846373)*	*REP #2 RESULT (1846374)*	*%RSD*	*#*
1,3,5-Trinitrobenzene	99-35-4	ug/Kg	0	0	0	0	
1,3-Dinitrobenzene	99-65-0	ug/Kg	0	0	0	0	
2,4,6-Trinitrotoluene	118-96-7	ug/Kg	0	0	0	0	
2,4-Dinitrotoluene	121-14-2	ug/Kg	0	0	0	0	
2,6-Dinitrotoluene	606-20-2	ug/Kg	0	0	0	0	
2-Amino-4,6-dinitrotoluene	35572-78-2	ug/Kg	0	0	0	0	
2-Nitrotoluene	88-72-2	ug/Kg	0	0	0	0	
3,5-Dinitroaniline	618-87-1	ug/Kg	0	0	0	0	
3-Nitrotoluene	99-08-1	ug/Kg	0	0	0	0	
4-Amino-2,6-dinitrotoluene	19406-51-0	ug/Kg	0	0	0	0	
4-Nitrotoluene	99-99-0	ug/Kg	0	0	0	0	
HMX	2691-41-0	ug/Kg	0	0	0	0	
Nitrobenzene	98-95-3	ug/Kg	0	0	0	0	
Nitroglycerin	55-63-0	ug/Kg	0	0	0	0	
Pentaerythritol Tetranitrate	78-11-5	ug/Kg	0	0	0	0	
RDX	121-82-4	ug/Kg	0	0	0	0	
Tetryl	479-45-8	ug/Kg	0	0	0	0	

*** - RSD greater than 20%**

EPA 8330B

Form 2F

Surrogates

2F

ORGANIC SURROGATE RECOVERY

Report No: 218081812 Analytical Method: EPA 8330B

Client Sample ID	*GCALSample ID*	*SMC1*	#	*SMC2*	#	*SMC3*	#	*SMC4*	#	*TOT OUT*
WIL02DA02A	21808181206	106								0
WIL02DA02A MS	21808181207	111								0
WIL02DA02A MSD	21808181208	105								0
WIL02DA01A	21808181209	104								0
WIL02DA01B	21808181210	106								0
WIL02DA02A (RE)	21808181213	103								0
WIL02DA02A MS (RE)	21808181214	98								0
WIL02DA02A MSD (RE)	21808181215	112								0
WIL02DA01A (RE)	21808181216	97								0
WIL02DA01B (RE)	21808181217	96								0
MB1843189	1843189	71								0
LCS1843190	1843190	64								0
LCSD1843191	1843191	45	*							1
GRBLK for HBN 642698 [EXTO/549	1843194	83								0
MB1846370	1846370	114								0
LCS1846371	1846371	96								0
LCSD1846372	1846372	100								0
WIL02DA01B (RE)DUP	1846373	107								0
WIL02DA01B (RE)DUP	1846374	108								0
GRBLK for HBN 643342 [EXTO/550	1846375	107								0

QC LIMITS

SMC 1 :	1,2-Dinitrobenzene	50	150
SMC 2 :			
SMC 3 :			
SMC 4 :			

Column to be used to flag recovery limits

* Value outside of QC limits

D Surrogate diluted out

FORM II ORG-2

EPA 8330B

Form 3F

Spikes

3F

SOIL ORGANICS MS/MSD RECOVERY

Report No:	218081812	Parent Sample ID:	WIL02DA02A (RE)
Prep Method:	8330B	Prep Batch:	643342
Analytical Method:	EPA 8330B	Analytical Batch:	643776

GCAL QC ID: 21808181214

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*MS RESULT*	*MS % REC*	#	*QC LIMITS*
1,3,5-Trinitrobenzene	ug/kg	971	0	828	85		80 - 116
1,3-Dinitrobenzene	ug/kg	971	0	836	86		73 - 119
2,4,6-Trinitrotoluene	ug/kg	971	0	767	79		71 - 120
2,4-Dinitrotoluene	ug/kg	971	0	884	91		75 - 121
2,6-Dinitrotoluene	ug/kg	971	0	803	83		79 - 117
2-Amino-4,6-dinitrotoluene	ug/kg	971	0	889	92		71 - 123
2-Nitrotoluene	ug/kg	971	0	864	89		84 - 120
3,5-Dinitroaniline	ug/kg	971	0	923	95		86 - 118
3-Nitrotoluene	ug/kg	971	0	833	86		67 - 129
4-Amino-2,6-dinitrotoluene	ug/kg	971	0	1030	106		64 - 127
4-Nitrotoluene	ug/kg	971	0	930	96		71 - 124
HMX	ug/kg	971	0	596	61	*	74 - 124
Nitrobenzene	ug/kg	971	0	918	95		80 - 128
Nitroglycerin	ug/kg	971	0	848	87		73 - 124
Pentaerythritol Tetranitrate	ug/kg	971	0	947	98		72 - 128
RDX	ug/kg	971	0	816	84		67 - 129
Tetryl	ug/kg	971	0	734	76		68 - 135

RPD : 2 out of 17 outside limits

Spike Recovery: 1 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS MS/MSD RECOVERY

Report No:	218081812	Parent Sample ID:	WIL02DA02A (RE)
Prep Method:	8330B	Prep Batch:	643342
Analytical Method:	EPA 8330B	Analytical Batch:	643776

GCAL QC ID: 21808181215

ANALYTE	UNITS	SPIKE ADDED	MSD RESULT	MSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
1,3,5-Trinitrobenzene	ug/kg	952	956	100		14		80 - 116	0 - 20
1,3-Dinitrobenzene	ug/kg	952	884	93		6		73 - 119	0 - 20
2,4,6-Trinitrotoluene	ug/kg	952	887	93		15		71 - 120	0 - 20
2,4-Dinitrotoluene	ug/kg	952	778	82		13		75 - 121	0 - 20
2,6-Dinitrotoluene	ug/kg	952	1090	114		30	*	79 - 117	0 - 20
2-Amino-4,6-dinitrotoluene	ug/kg	952	818	86		8		71 - 123	0 - 20
2-Nitrotoluene	ug/kg	952	827	87		4		84 - 120	0 - 20
3,5-Dinitroaniline	ug/kg	952	944	99		2		86 - 118	0 - 20
3-Nitrotoluene	ug/kg	952	848	89		2		67 - 129	0 - 20
4-Amino-2,6-dinitrotoluene	ug/kg	952	1040	109		1		64 - 127	0 - 20
4-Nitrotoluene	ug/kg	952	928	97		.2		71 - 124	0 - 20
HMX	ug/kg	952	794	83		29	*	74 - 124	0 - 20
Nitrobenzene	ug/kg	952	927	97		1		80 - 128	0 - 20
Nitroglycerin	ug/kg	952	925	97		9		73 - 124	0 - 20
Pentaerythritol Tetranitrate	ug/kg	952	915	96		3		72 - 128	0 - 20
RDX	ug/kg	952	808	85		.9		67 - 129	0 - 20
Tetryl	ug/kg	952	769	81		5		68 - 135	0 - 20

RPD : 2 out of 17 outside limits

Spike Recovery: 1 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS MS/MSD RECOVERY

Report No:	218081812	Parent Sample ID:	WIL02DA02A
Prep Method:	8330B	Prep Batch:	642698
Analytical Method:	EPA 8330B	Analytical Batch:	643776

GCAL QC ID: 21808181207

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*MS RESULT*	*MS % REC*	#	*QC LIMITS*
1,3,5-Trinitrobenzene	ug/kg	1000	0	1090	109		80 - 116
1,3-Dinitrobenzene	ug/kg	1000	0	1090	109		73 - 119
2,4,6-Trinitrotoluene	ug/kg	1000	0	1060	106		71 - 120
2,4-Dinitrotoluene	ug/kg	1000	0	1060	106		75 - 121
2,6-Dinitrotoluene	ug/kg	1000	0	1100	110		79 - 117
2-Amino-4,6-dinitrotoluene	ug/kg	1000	0	997	100		71 - 123
2-Nitrotoluene	ug/kg	1000	0	1130	113		84 - 120
3,5-Dinitroaniline	ug/kg	1000	0	1040	104		86 - 118
3-Nitrotoluene	ug/kg	1000	0	1040	104		67 - 129
4-Amino-2,6-dinitrotoluene	ug/kg	1000	0	1050	105		64 - 127
4-Nitrotoluene	ug/kg	1000	0	1120	112		71 - 124
HMX	ug/kg	1000	0	986	99		74 - 124
Nitrobenzene	ug/kg	1000	0	1010	101		80 - 128
Nitroglycerin	ug/kg	1000	0	977	98		73 - 124
Pentaerythritol Tetranitrate	ug/kg	1000	0	987	99		72 - 128
RDX	ug/kg	1000	0	917	92		67 - 129
Tetryl	ug/kg	1000	0	1030	103		68 - 135

RPD : 3 out of 17 outside limits

Spike Recovery: 0 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS MS/MSD RECOVERY

Report No:	218081812	Parent Sample ID:	WIL02DA02A
Prep Method:	8330B	Prep Batch:	642698
Analytical Method:	EPA 8330B	Analytical Batch:	643776

GCAL QC ID: 21808181208

ANALYTE	*UNITS*	*SPIKE ADDED*	*MSD RESULT*	*MSD % REC*	#	*% RPD*	#	*QC LIMITS REC*	*QC LIMITS RPD*
1,3,5-Trinitrobenzene	ug/kg	952	1080	114		.6		80 - 116	0 - 20
1,3-Dinitrobenzene	ug/kg	952	1070	112		2		73 - 119	0 - 20
2,4,6-Trinitrotoluene	ug/kg	952	957	100		10		71 - 120	0 - 20
2,4-Dinitrotoluene	ug/kg	952	1040	109		2		75 - 121	0 - 20
2,6-Dinitrotoluene	ug/kg	952	989	104		10		79 - 117	0 - 20
2-Amino-4,6-dinitrotoluene	ug/kg	952	885	93		12		71 - 123	0 - 20
2-Nitrotoluene	ug/kg	952	812	85		32	*	84 - 120	0 - 20
3,5-Dinitroaniline	ug/kg	952	1100	116		5		86 - 118	0 - 20
3-Nitrotoluene	ug/kg	952	901	95		14		67 - 129	0 - 20
4-Amino-2,6-dinitrotoluene	ug/kg	952	1040	109		.8		64 - 127	0 - 20
4-Nitrotoluene	ug/kg	952	846	89		28	*	71 - 124	0 - 20
HMX	ug/kg	952	955	100		3		74 - 124	0 - 20
Nitrobenzene	ug/kg	952	1010	106		.5		80 - 128	0 - 20
Nitroglycerin	ug/kg	952	956	100		2		73 - 124	0 - 20
Pentaerythritol Tetranitrate	ug/kg	952	1040	109		5		72 - 128	0 - 20
RDX	ug/kg	952	1010	106		10		67 - 129	0 - 20
Tetryl	ug/kg	952	820	86		23	*	68 - 135	0 - 20

RPD : 3 out of 17 outside limits

Spike Recovery: 0 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS LCS/LCSD RECOVERY

Report No: 218081812

Prep Method: 8330B | Prep Batch: 643342

Analytical Method: EPA 8330B | Analytical Batch: 643776

GCAL QC ID: 1846371

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	#	*QC LIMITS*
1,3,5-Trinitrobenzene	ug/kg	1750	0	2110	121	*	80 - 116
1,3-Dinitrobenzene	ug/kg	1280	0	1620	126	*	73 - 119
2,4,6-Trinitrotoluene	ug/kg	1120	0	1240	111		71 - 120
2,4-Dinitrotoluene	ug/kg	1210	0	1300	107		75 - 121
2,6-Dinitrotoluene	ug/kg	1310	0	1370	104		79 - 117
2-Amino-4,6-dinitrotoluene	ug/kg	1210	0	1250	104		71 - 123
2-Nitrotoluene	ug/kg	3160	0	3540	112		84 - 120
3,5-Dinitroaniline	ug/kg	2690	0	3020	112		86 - 118
3-Nitrotoluene	ug/kg	1360	0	1540	113		67 - 129
4-Amino-2,6-dinitrotoluene	ug/kg	1390	0	1360	98		64 - 127
4-Nitrotoluene	ug/kg	688	0	741	108		71 - 124
HMX	ug/kg	2850	0	3290	116		74 - 124
Nitrobenzene	ug/kg	2340	0	2510	107		80 - 128
Nitroglycerin	ug/kg	3870	0	4540	117		73 - 124
Pentaerythritol Tetranitrate	ug/kg	2650	0	3070	116		72 - 128
RDX	ug/kg	923	0	1030	111		67 - 129
Tetryl	ug/kg	100	0	0	0	*	68 - 135

RPD : 3 out of 17 outside limits

Spike Recovery: 8 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS LCS/LCSD RECOVERY

Report No: 218081812

Prep Method: 8330B | Prep Batch: 643342

Analytical Method: EPA 8330B | Analytical Batch: 643776

GCAL QC ID: 1846372

ANALYTE	UNITS	SPIKE ADDED	LCSD RESULT	LCSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
1,3,5-Trinitrobenzene	ug/kg	1750	2070	119	*	2		80 - 116	0 - 20
1,3-Dinitrobenzene	ug/kg	1280	1420	111		13		73 - 119	0 - 20
2,4,6-Trinitrotoluene	ug/kg	1120	1320	118		6		71 - 120	0 - 20
2,4-Dinitrotoluene	ug/kg	1210	1290	106		1		75 - 121	0 - 20
2,6-Dinitrotoluene	ug/kg	1310	1300	99		5		79 - 117	0 - 20
2-Amino-4,6-dinitrotoluene	ug/kg	1210	1480	122		17		71 - 123	0 - 20
2-Nitrotoluene	ug/kg	3160	3380	107		5		84 - 120	0 - 20
3,5-Dinitroaniline	ug/kg	2690	2880	107		4		86 - 118	0 - 20
3-Nitrotoluene	ug/kg	1360	1970	145	*	24	*	67 - 129	0 - 20
4-Amino-2,6-dinitrotoluene	ug/kg	1390	1330	96		2		64 - 127	0 - 20
4-Nitrotoluene	ug/kg	688	2430	354	*	107	*	71 - 124	0 - 20
HMX	ug/kg	2850	3370	118		2		74 - 124	0 - 20
Nitrobenzene	ug/kg	2340	2480	106		1		80 - 128	0 - 20
Nitroglycerin	ug/kg	3870	4190	108		8		73 - 124	0 - 20
Pentaerythritol Tetranitrate	ug/kg	2650	4410	166	*	36	*	72 - 128	0 - 20
RDX	ug/kg	923	1010	110		2		67 - 129	0 - 20
Tetryl	ug/kg	100	0	0	*	0		68 - 135	0 - 20

RPD : 3 out of 17 outside limits

Spike Recovery: 8 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS LCS/LCSD RECOVERY

Report No: 218081812

Prep Method: 8330B | Prep Batch: 642698

Analytical Method: EPA 8330B | Analytical Batch: 643050

GCAL QC ID: 1843190

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	#	*QC LIMITS*
1,3,5-Trinitrobenzene	ug/kg	2050	0	971	47	*	80 - 116
1,3-Dinitrobenzene	ug/kg	1520	0	755	50	*	73 - 119
2,4,6-Trinitrotoluene	ug/kg	1400	0	584	42	*	71 - 120
2,4-Dinitrotoluene	ug/kg	1610	0	424	26	*	75 - 121
2,6-Dinitrotoluene	ug/kg	1200	0	1250	105		79 - 117
2-Amino-4,6-dinitrotoluene	ug/kg	1260	0	469	37	*	71 - 123
2-Nitrotoluene	ug/kg	4080	0	1810	44	*	84 - 120
3,5-Dinitroaniline	ug/kg	3910	0	1530	39	*	86 - 118
3-Nitrotoluene	ug/kg	1750	0	739	42	*	67 - 129
4-Amino-2,6-dinitrotoluene	ug/kg	2600	0	987	38	*	64 - 127
4-Nitrotoluene	ug/kg	652	0	305	47	*	71 - 124
HMX	ug/kg	3500	0	1350	39	*	74 - 124
Nitrobenzene	ug/kg	3390	0	1320	39	*	80 - 128
Nitroglycerin	ug/kg	4600	0	1710	37	*	73 - 124
Pentaerythritol Tetranitrate	ug/kg	3100	0	957	31	*	72 - 128
RDX	ug/kg	1200	0	506	42	*	67 - 129
Tetryl	ug/kg	100	0	0	0	*	68 - 135

RPD : 3 out of 17 outside limits

Spike Recovery: 33 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS LCS/LCSD RECOVERY

Report No: 218081812

Prep Method: 8330B | Prep Batch: 642698

Analytical Method: EPA 8330B | Analytical Batch: 643050

GCAL QC ID: 1843191

ANALYTE	UNITS	SPIKE ADDED	LCSD RESULT	LCSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
1,3,5-Trinitrobenzene	ug/kg	2050	842	41	*	14		80 - 116	0 - 20
1,3-Dinitrobenzene	ug/kg	1520	657	43	*	14		73 - 119	0 - 20
2,4,6-Trinitrotoluene	ug/kg	1400	542	39	*	8		71 - 120	0 - 20
2,4-Dinitrotoluene	ug/kg	1610	519	32	*	20		75 - 121	0 - 20
2,6-Dinitrotoluene	ug/kg	1200	673	56	*	60	*	79 - 117	0 - 20
2-Amino-4,6-dinitrotoluene	ug/kg	1260	430	34	*	9		71 - 123	0 - 20
2-Nitrotoluene	ug/kg	4080	1450	35	*	22	*	84 - 120	0 - 20
3,5-Dinitroaniline	ug/kg	3910	1340	34	*	14		86 - 118	0 - 20
3-Nitrotoluene	ug/kg	1750	607	35	*	20		67 - 129	0 - 20
4-Amino-2,6-dinitrotoluene	ug/kg	2600	886	34	*	11		64 - 127	0 - 20
4-Nitrotoluene	ug/kg	652	392	60	*	25	*	71 - 124	0 - 20
HMX	ug/kg	3500	1190	34	*	13		74 - 124	0 - 20
Nitrobenzene	ug/kg	3390	1140	34	*	15		80 - 128	0 - 20
Nitroglycerin	ug/kg	4600	1460	32	*	16		73 - 124	0 - 20
Pentaerythritol Tetranitrate	ug/kg	3100	915	30	*	4		72 - 128	0 - 20
RDX	ug/kg	1200	499	42	*	1		67 - 129	0 - 20
Tetryl	ug/kg	100	0	0	*	0		68 - 135	0 - 20

RPD : 3 out of 17 outside limits

Spike Recovery: 33 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

EPA 8330B

Form 4C

Method Blanks

4C

ORGANIC METHOD BLANK SUMMARY

Report No:	218081812	Method Blank ID:	1843189
Matrix:	Solid	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A04
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/25/18	Analysis Date:	08/30/18 Time: 1145
Prep Batch:	642698	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	DATE ANALYZED	TIME ANALYZED	INSTRUMENT ID
1.	LCS1843190	1843190	08/30/18	1205	HPLC3
2.	LCSD1843191	1843191	08/30/18	1225	HPLC3
3.	GRBLK for HBN 642698 [EXTO/549	1843194	08/30/18	1344	HPLC3
4.	WIL02DA02A	21808181206	09/13/18	0540	HPLC3
5.	WIL02DA02A MS	21808181207	09/13/18	0559	HPLC3
6.	WIL02DA02A MSD	21808181208	09/13/18	0619	HPLC3
7.	WIL02DA01A	21808181209	09/13/18	0639	HPLC3
8.	WIL02DA01B	21808181210	09/13/18	0659	HPLC3

4C

ORGANIC METHOD BLANK SUMMARY

Report No:	218081812	Method Blank ID:	1846370
Matrix:	Solid	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180912\A69
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	09/05/18	Analysis Date:	09/13/18 Time: 0719
Prep Batch:	643342	Analytical Batch:	643776
Prep Method:	8330B	Analytical Method:	EPA 8330B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	DATE ANALYZED	TIME ANALYZED	INSTRUMENT ID
1 .	LCS1846371	1846371	09/13/18	0738	HPLC3
2 .	LCSD1846372	1846372	09/13/18	0758	HPLC3
3 .	WIL02DA02A (RE)	21808181213	09/13/18	0818	HPLC3
4 .	WIL02DA02A MS (RE)	21808181214	09/13/18	0838	HPLC3
5 .	WIL02DA02A MSD (RE)	21808181215	09/13/18	0857	HPLC3
6 .	WIL02DA01A (RE)	21808181216	09/13/18	0917	HPLC3
7 .	WIL02DA01B (RE)	21808181217	09/13/18	0937	HPLC3
8 .	WIL02DA01B (RE)DUP	1846373	09/13/18	0957	HPLC3
9 .	WIL02DA01B (RE)DUP	1846374	09/13/18	1016	HPLC3
10 .	GRBLK for HBN 643342 [EXTO/550	1846375	09/13/18	1036	HPLC3

EPA 8330B

Form 6E

Calibrations

6E

ORGANICS INITIAL CALIBRATION DATA

				GCALID - FileID - Conc	1201 ~ 2180724\A09 ~ 50	
Report No:	218081812	Instrument ID:	HPLC3	1202 ~ 2180724\A08 ~ 125	1203 ~ 2180724\A07 ~ 250	
GC Column:	ID (mm)	Analyst:	MEG	1204 ~ 2180724\A06 ~ 500	1205 ~ 2180724\A05 ~ 1000	
Calib. Date 1:	07/24/18 Time 1: 1355	Analytical Batch:	640653	1206 ~ 2180724\A04 ~ 1250	1207 ~ 2180724\A03 ~ 2500	
Calib. Date 2:	07/24/18 Time 2: 1552	Analytical Method:	EPA 8330B			

ANALYTE	***1201***	***1202***	***1203***	***1204***	***1205***	***1206***	***1207***	***1208***	***1209***	***$\overline{RF}$ / b / A***	***m / B***	***C***	***FIT***	***TYPE***
1,2-Dinitrobenzene	16.7	16.6	16.5	17.4	18.6	18.5	17.5			17.8			11.78	A
1,3,5-Trinitrobenzene	10.9	11.5	11.4	11.1	12.4	12.4	11.9			11.9			11.66	A
1,3-Dinitrobenzene	11.5	12.0	11.4	10.7	12.8	12.7	12.5			12.2			12.12	A
2,4,6-Trinitrotoluene	17.2	16.3	16.4	16.5	18.2	18.1	17.9			17.6			10.85	A
2,4-Dinitrotoluene	12.1	12.0	12.2	13.6	14.1	14.0	13.6			13.5			12.38	A
2,6-Dinitrotoluene	22.7	25.0	25.1	21.1	26.4	26.8	27.1			25.3			13.72	A
2-Amino-4,6-dinitrotoluene	19.0	20.9	20.4	18.9	23.5	23.4	23.2			21.9			14.61	A
2-Nitrotoluene	13.3	13.1	13.5	14.0	15.1	15.1	15.3			14.6			11.90	A
3,5-Dinitroaniline	11.1	10.7	10.7	11.2	11.9	11.8	11.8			11.6			10.28	A
3-Nitrotoluene	11.7	11.5	11.4	12.0	13.0	12.7	13.1			12.5			10.60	A
4-Amino-2,6-dinitrotoluene	28.6	32.3	30.0	35.0	33.3	33.1	33.0			32.9			11.12	A
4-Nitrotoluene	21.1	23.5	24.3	22.2	23.0	23.7	23.8			23.6			10.02	A
HMX	36.9	37.6	39.7	40.7	44.2	43.6	43.9			42.1			12.44	A
Nitrobenzene	18.3	19.7	19.6	19.8	21.6	21.6	21.5			20.8			11.95	A
Nitroglycerin	29.6	29.3	30.7	31.0	34.1	34.1	34.4			32.7			12.34	A
Pentaerythritol Tetranitrate	26.2	27.6	27.5	28.4	30.3	30.6	32.0			29.7			11.85	A
RDX	29.5	30.1	31.0	32.0	34.6	34.6	35.0			33.3			12.36	A
Tetryl	21.6	23.2	23.6	23.3	25.6	25.8	25.5			24.4			12.87	A

FIT = %RSD For Average Curve And Calibration Coefficent For Linear And Quadratic

Curve Types: A - Averged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

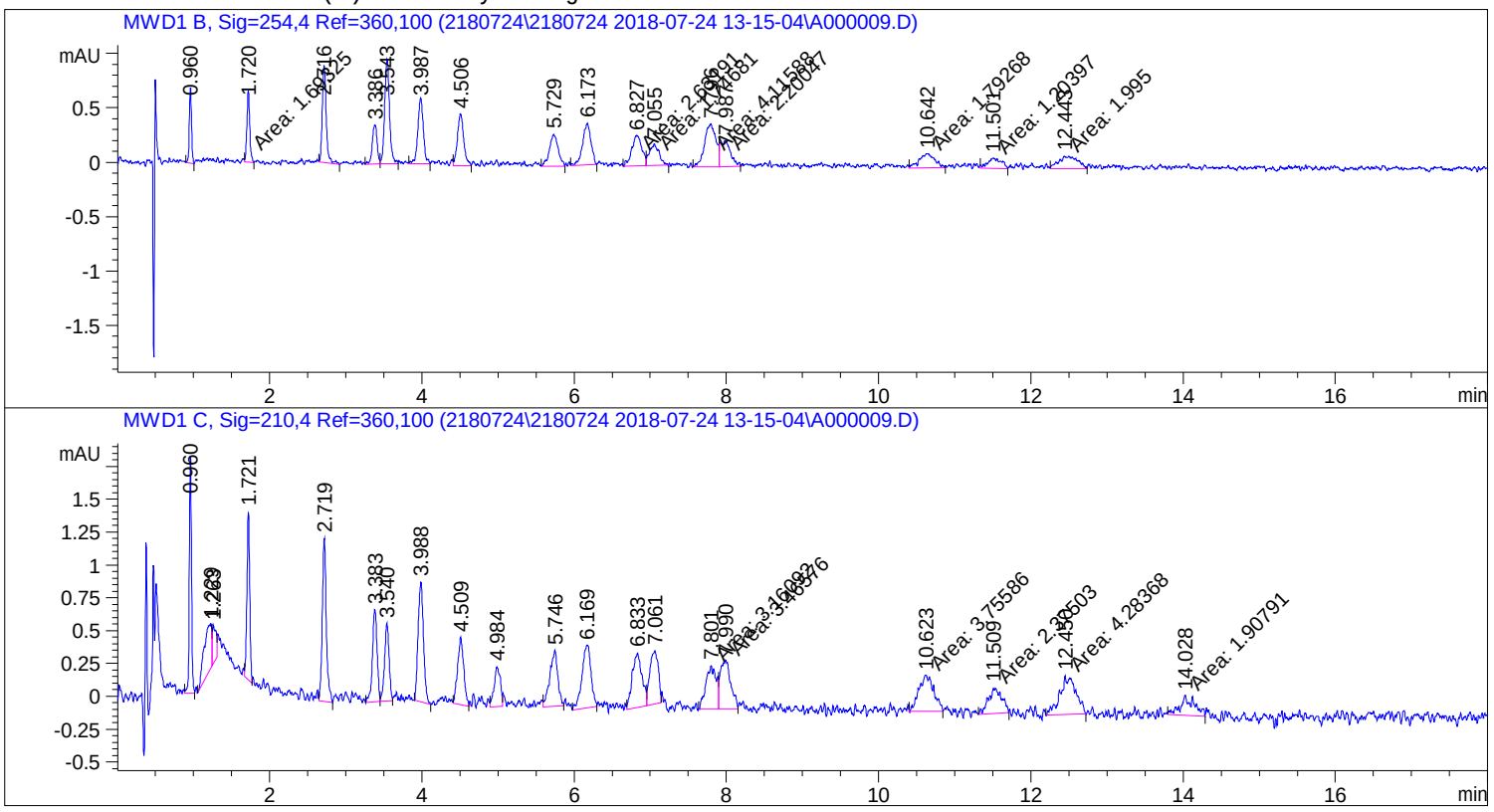
A,B,C = Coefficents For Quadratic Curve

FORM V I SVOA

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000009.D
Sample Name: 1201*50

```
==========================================================================
Acq. Operator   : MEG                              Seq. Line :   9
Acq. Instrument : HPLC3                             Location : P1-A-03
Injection Date  : 7/24/2018 3:52:40 PM                   Inj :   1
                                                  Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 2.500 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 3:51:18 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.960	1	BB	1.35531	43.28142	58.65993		HMX
1.720	1	MM	1.69325	34.17624	57.86886		RDX
2.719	2	VB	4.58750	11.40094	52.30188		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000009.D
Sample Name: 1201*50

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.383	2	BV	2.99621	17.09373	51.21648		1,2-DNB
3.543	1	VV	4.33286	12.16929	52.72788		1,3-DNB
3.988	2	BB	4.51660	11.61752	52.47169		3,5-DNA
4.506	1	VV	2.73563	20.86415	57.07666		NB
4.984	2	VV	1.69013	33.42634	56.49481		NG
5.729	1	BV	2.31638	23.56085	54.57586		TETRYL
6.173	1	VB	2.90180	17.18879	49.87844		2,4,6-TNT
6.827	1	MF	2.63191	22.30068	58.69328		2-A-4,6-DNT
7.055	1	FM	1.74681	31.52164	55.06242		4-A-2,6-DNT
7.796	1	MF	4.11588	13.61872	56.05307		2,4-DNT
7.987	1	FM	2.20047	25.17563	55.39810		2,6-DNT
10.623	2	MM	3.75586	14.98143	56.26820		2-NT
11.509	2	MM	2.37503	22.61455	53.71032		4-NT
12.450	2	MM	4.28368	12.66263	54.24265		3-NT
14.028	2	MM	1.90791	29.48171	56.24844		PETN

Totals : 988.94897

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

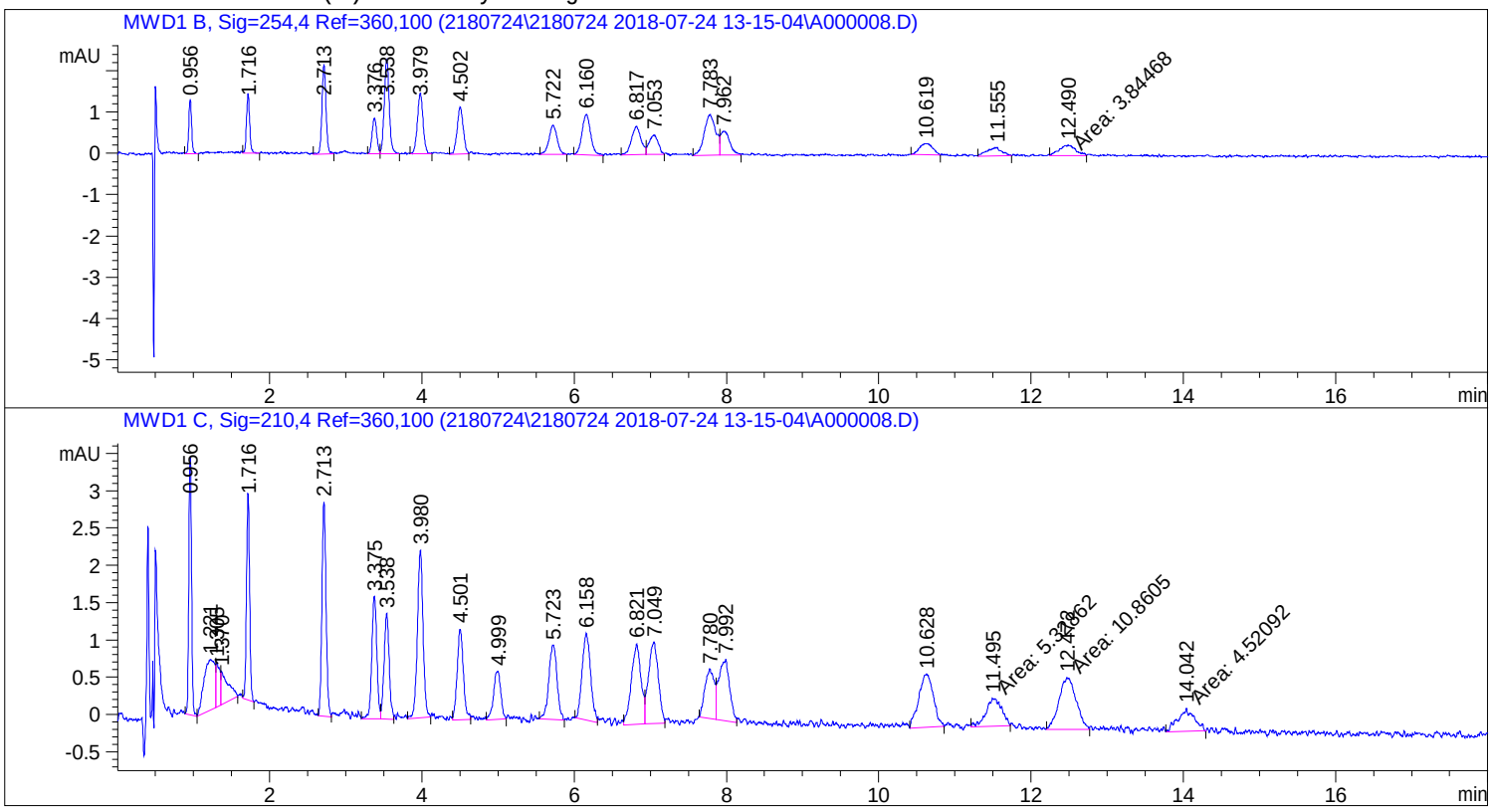
==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000008.D
Sample Name: 1202*125

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   8
Acq. Instrument : HPLC3                         Location : P1-A-03
Injection Date  : 7/24/2018 3:33:19 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 6.250 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 3:31:49 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.956	1	VB	3.32248	43.28142	143.80173		HMX
1.716	1	VB	4.14600	34.17624	141.69456		RDX
2.713	2	BV	10.82306	11.40094	123.39309		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000008.D
Sample Name: 1202*125

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.375	2	BV	7.54769	17.09373	129.01815		1,2-DNB
3.538	1	VB	10.46008	12.16929	127.29171		1,3-DNB
3.980	2	BB	11.63497	11.61752	135.16942		3,5-DNA
4.502	1	BV	6.35121	20.86415	132.51253		NB
4.999	2	VV	4.27213	33.42634	142.80163		NG
5.722	1	BB	5.37763	23.56085	126.70146		TETRYL
6.160	1	BB	7.67269	17.18879	131.88421		2,4,6-TNT
6.817	1	BV	5.98759	22.30068	133.52721		2-A-4,6-DNT
7.053	1	VV	3.87154	31.52164	122.03742		4-A-2,6-DNT
7.783	1	BV	10.40961	13.61872	141.76551		2,4-DNT
7.962	1	VB	4.99924	25.17563	125.85908		2,6-DNT
10.628	2	BB	9.52387	14.98143	142.68120		2-NT
11.495	2	MM	5.32862	22.61455	120.50440		4-NT
12.472	2	MM	10.86049	12.66263	137.52230		3-NT
14.042	2	MM	4.52092	29.48171	133.28454		PETN

Totals : 2391.45016

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

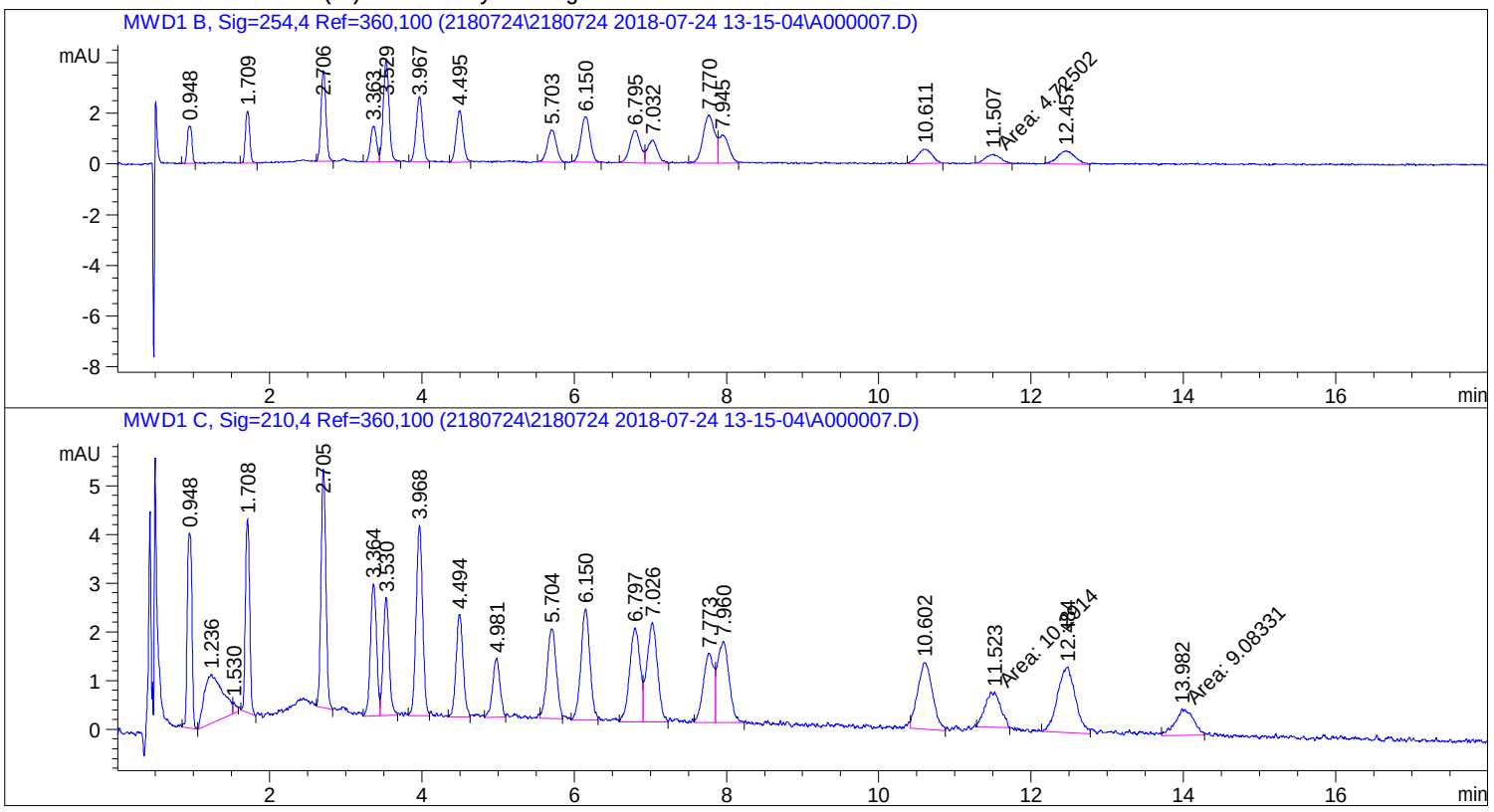
==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000007.D
Sample Name: 1203*250

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   7
Acq. Instrument : HPLC3                         Location : P1-A-03
Injection Date  : 7/24/2018 3:13:49 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 12.500 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 3:12:11 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.948	1	VV	6.30158	43.28142	272.74143		HMX
1.709	1	VV	8.07662	34.17624	276.02871		RDX
2.705	2	BV	21.89115	11.40094	249.57983		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000007.D
Sample Name: 1203*250

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.364	2	BV	15.18353	17.09373	259.54311		1,2-DNB
3.529	1	VV	21.92476	12.16929	266.80874		1,3-DNB
3.968	2	VV	23.33715	11.61752	271.11976		3,5-DNA
4.495	1	BV	12.77829	20.86415	266.60816		NB
4.981	2	BV	8.14934	33.42634	272.40264		NG
5.703	1	BV	10.57367	23.56085	249.12477		TETRYL
6.150	1	BV	15.22820	17.18879	261.75432		2,4,6-TNT
6.795	1	BV	12.26246	22.30068	273.46116		2-A-4,6-DNT
7.032	1	VB	8.33874	31.52164	262.85069		4-A-2,6-DNT
7.770	1	BV	20.47220	13.61872	278.80520		2,4-DNT
7.945	1	VV	9.95350	25.17563	250.58574		2,6-DNT
10.602	2	VV	18.53687	14.98143	277.70892		2-NT
11.523	2	MM	10.29138	22.61455	232.73497		4-NT
12.484	2	BV	21.84314	12.66263	276.59152		3-NT
13.982	2	MM	9.08331	29.48171	267.79162		PETN

Totals : 4766.24130

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

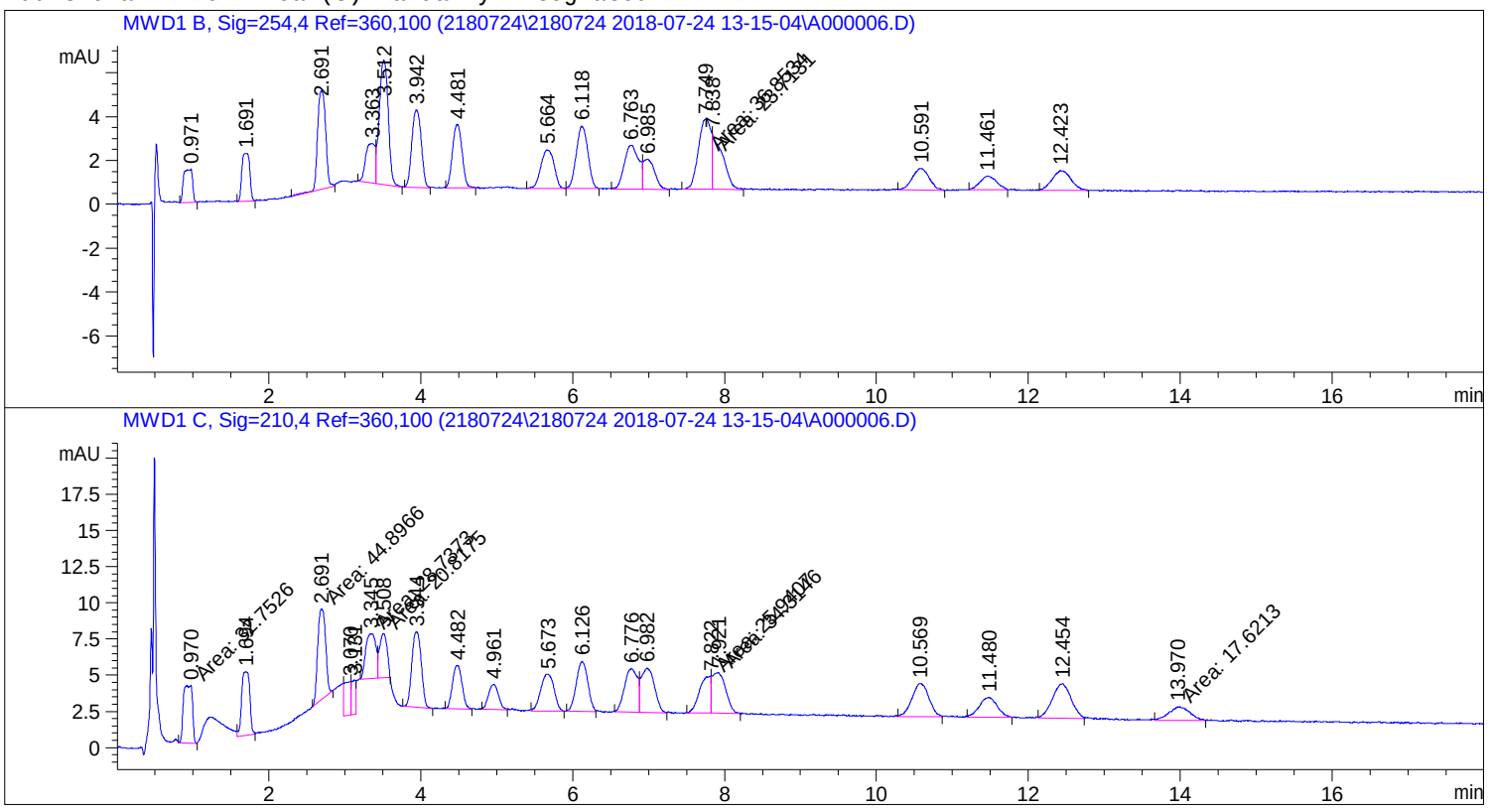
==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000006.D
Sample Name: 1204*500

```
==========================================================================
Acq. Operator   : MEG                              Seq. Line :   6
Acq. Instrument : HPLC3                             Location : P1-A-03
Injection Date  : 7/24/2018 2:54:11 PM                   Inj :   1
                                                  Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 2:52:33 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100

RetTime Sig Type     Area      Amt/Area    Amount   Grp   Name
 [min]             [mAU*s]
-------|--|------|----------|----------|----------|--|---------------
  0.971  1 BB       12.28218   43.28142  531.59027    HMX
  1.691  1 BB       15.60504   34.17624  533.32182    RDX
  2.691  2 MM       44.89665   11.40094  511.86421    1,3,5-TNB
  3.345  2 MF       28.73733   17.09373  491.22805    1,2-DNB
```

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000006.D
Sample Name: 1204*500

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.512	1	VB	46.85833	12.16929	570.23268		1,3-DNB
3.944	2	BB	44.74712	11.61752	519.85042		3,5-DNA
4.481	1	VB	25.21857	20.86415	526.16417		NB
4.961	2	VV	16.12783	33.42634	539.09423		NG
5.664	1	BV	21.48870	23.56085	506.29197		TETRYL
6.118	1	VV	30.23722	17.18879	519.74137		2,4,6-TNT
6.763	1	BV	26.51565	22.30068	591.31690		2-A-4,6-DNT
6.985	1	VV	14.27866	31.52164	450.08684		4-A-2,6-DNT
7.749	1	MF	36.85341	13.61872	501.89628		2,4-DNT
7.838	1	FM	23.71310	25.17563	596.99227		2,6-DNT
10.569	2	VV	35.74021	14.98143	535.43959		2-NT
11.480	2	VB	22.52265	22.61455	509.33969		4-NT
12.454	2	VV	41.60176	12.66263	526.78771		3-NT
13.970	2	MM	17.62127	29.48171	519.50531		PETN

Totals : 9480.74378

1 Warnings or Errors :

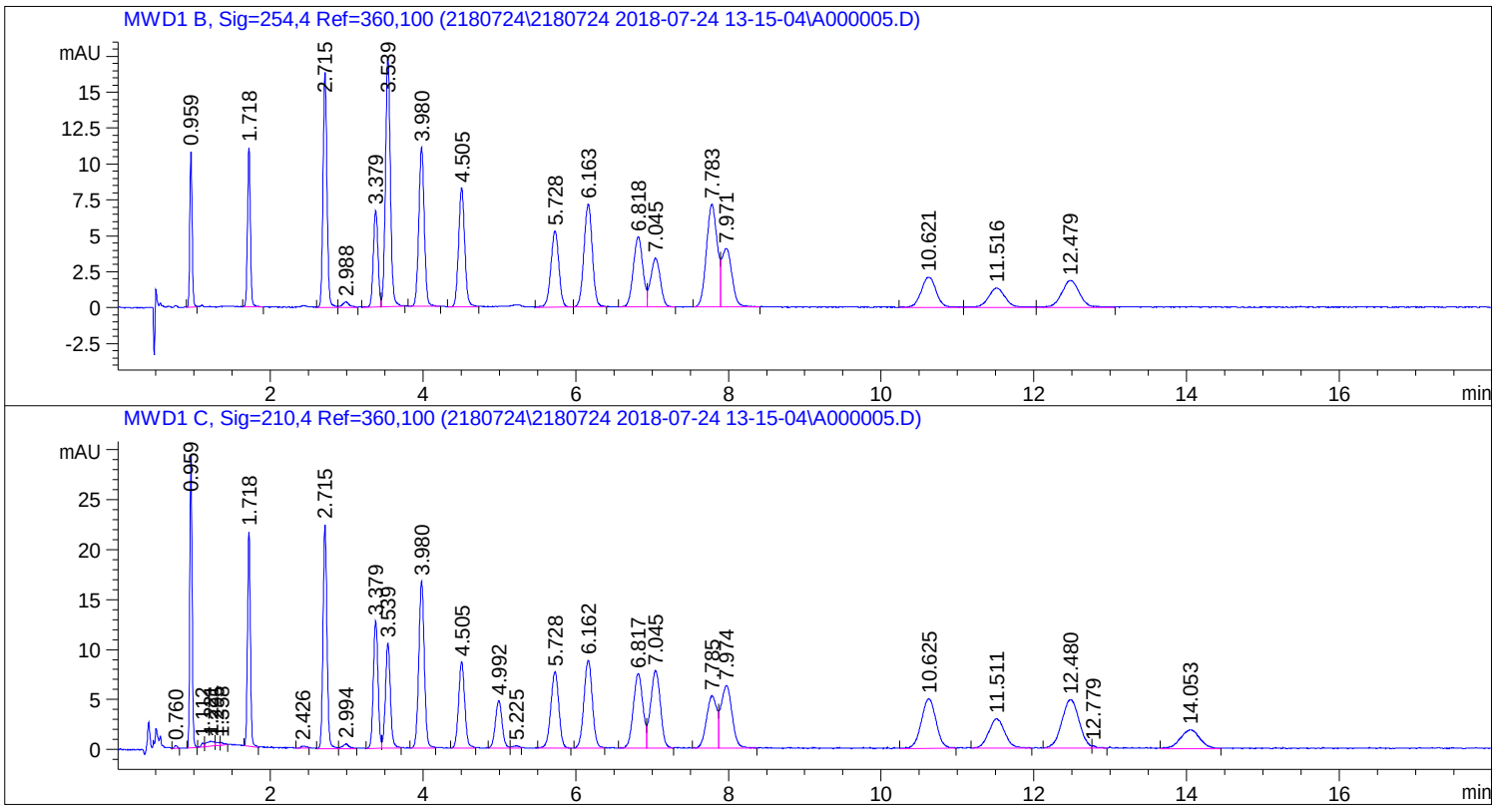
Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000005.D
Sample Name: 1205*1000

```
==================================================================
Acq. Operator   : MEG                          Seq. Line :   5
Acq. Instrument : HPLC3                         Location : P1-A-02
Injection Date  : 7/24/2018 2:34:34 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 2:33:10 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```

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==================================================================
                    External Standard Report
==================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.959	1	VV	22.60220	43.28142	978.25546		HMX
1.718	1	VV	28.88193	34.17624	987.07589		RDX
2.715	2	BV	80.87807	11.40094	922.08638		1,3,5-TNB
3.379	2	BV	53.66630	17.09373	917.35707		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000005.D
Sample Name: 1205*1000

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.539	1	VV	78.24905	12.16929	952.23539		1,3-DNB
3.980	2	BV	84.35162	11.61752	979.95624		3,5-DNA
4.505	1	BV	46.39737	20.86415	968.04184		NB
4.992	2	BV	29.32183	33.42634	980.12133		NG
5.728	1	BV	38.98650	23.56085	918.55515		TETRYL
6.163	1	VV	54.90339	17.18879	943.72288		2,4,6-TNT
6.818	1	BV	42.63153	22.30068	950.71209		2-A-4,6-DNT
7.045	1	VB	29.99186	31.52164	945.39274		4-A-2,6-DNT
7.783	1	BV	71.08776	13.61872	968.12425		2,4-DNT
7.971	1	VB	37.89296	25.17563	953.97919		2,6-DNT
10.625	2	VB	66.42320	14.98143	995.11476		2-NT
11.511	2	BV	43.43806	22.61455	982.33248		4-NT
12.480	2	BV	76.79498	12.66263	972.42627		3-NT
14.053	2	VV	33.00681	29.48171	973.09715		PETN
Totals :			1.72886e4				

1 Warnings or Errors :

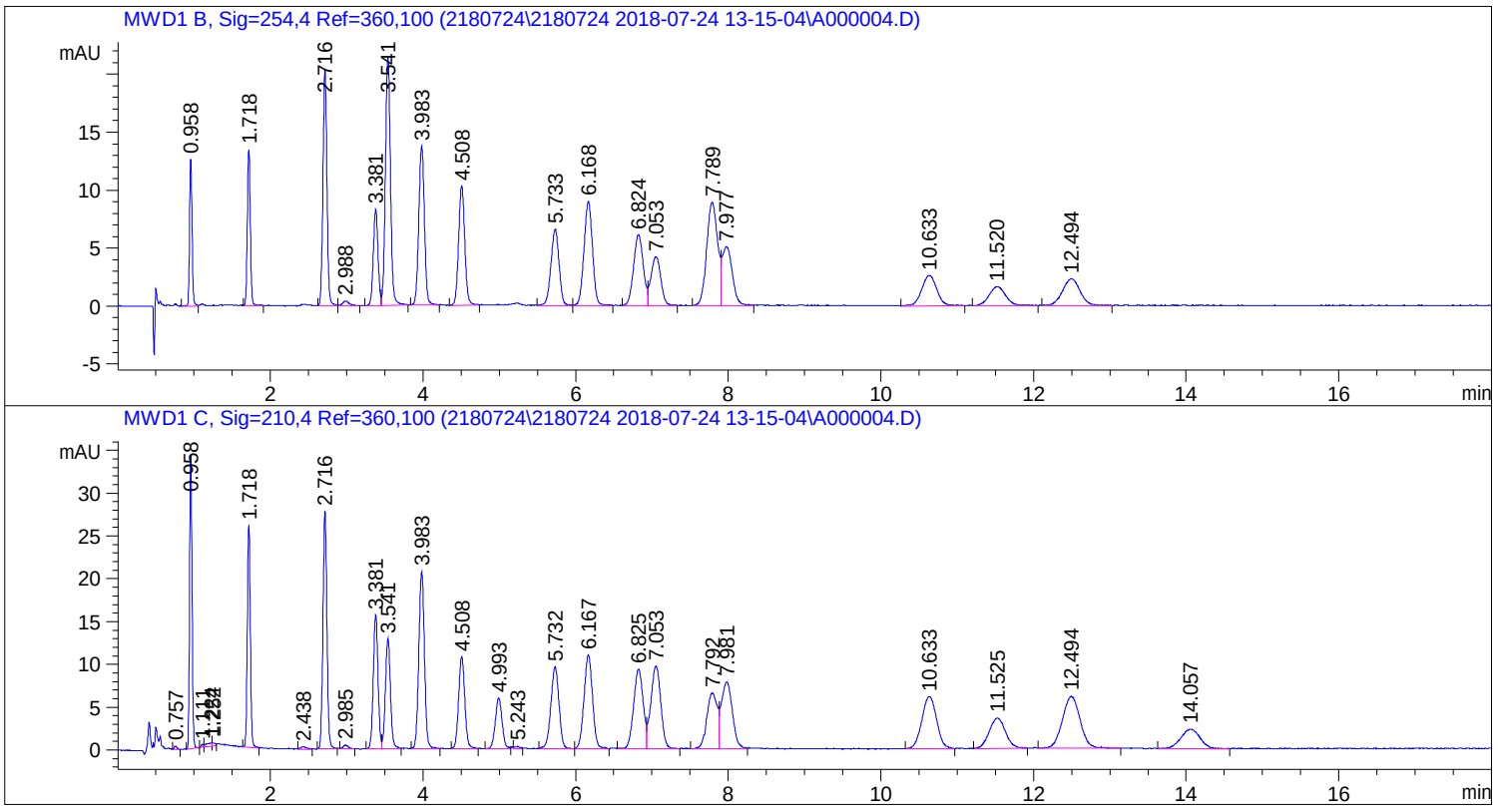
Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000004.D
Sample Name: 1206*1250

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   4
Acq. Instrument : HPLC3                         Location : P1-A-02
Injection Date  : 7/24/2018 2:15:09 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 6.250 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 2:13:39 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.958	1	BV	28.67828	43.28142	1241.23678		HMX
1.718	1	VB	36.10154	34.17624	1233.81519		RDX
2.716	2	BV	100.84308	11.40094	1149.70637		1,3,5-TNB
3.381	2	BV	67.67097	17.09373	1156.74920		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000004.D
Sample Name: 1206*1250

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.541	1	VB	98.36615	12.16929	1197.04627		1,3-DNB
3.983	2	VV	106.02518	11.61752	1231.74927		3,5-DNA
4.508	1	BV	57.85638	20.86415	1207.12449		NB
4.993	2	BV	36.70203	33.42634	1226.81442		NG
5.733	1	BB	48.37185	23.56085	1139.68198		TETRYL
6.168	1	BB	69.03387	17.18879	1186.60880		2,4,6-TNT
6.824	1	BV	53.52020	22.30068	1193.53668		2-A-4,6-DNT
7.053	1	VB	37.74605	31.52164	1189.81763		4-A-2,6-DNT
7.789	1	BV	89.49778	13.61872	1218.84513		2,4-DNT
7.977	1	VB	46.69450	25.17563	1175.56332		2,6-DNT
10.633	2	BV	82.82270	14.98143	1240.80274		2-NT
11.525	2	BV	52.75821	22.61455	1193.10340		4-NT
12.494	2	BB	98.73505	12.66263	1250.24525		3-NT
14.057	2	BB	40.90085	29.48171	1205.82706		PETN

Totals : 2.16383e4

1 Warnings or Errors :

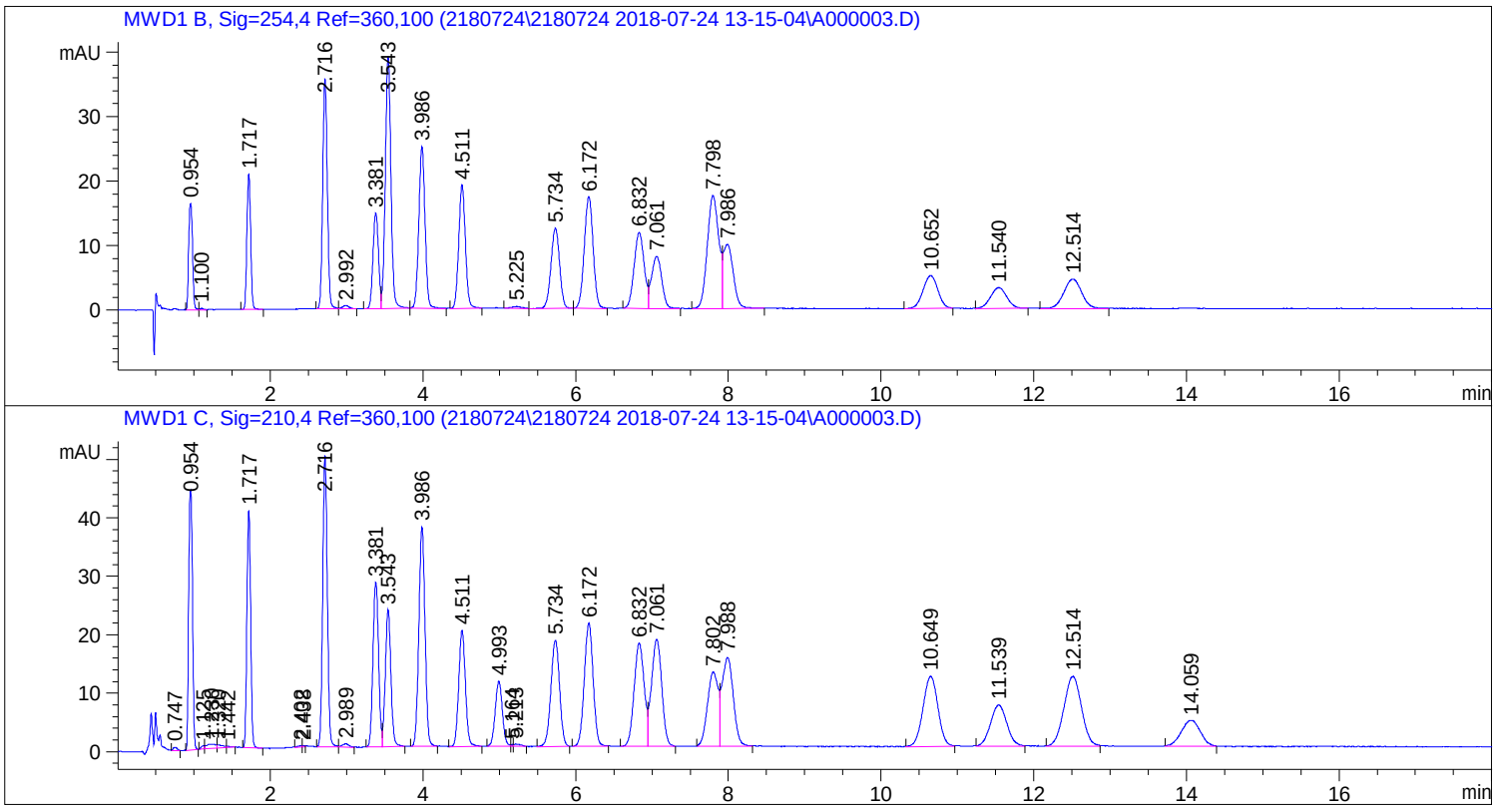
Warning : Calibration warnings (see calibration table listing)

==

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000003.D
Sample Name: 1207*2500

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   3
Acq. Instrument : HPLC3                         Location : P1-A-02
Injection Date  : 7/24/2018 1:55:40 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 12.500 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 4/28/2018 12:48:13 PM by DLB
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.954	1	VV	56.88475	43.28142	2462.05314		HMX
1.717	1	VV	71.41743	34.17624	2440.77947		RDX
2.716	2	BV	209.45576	11.40094	2387.99361		1,3,5-TNB
3.381	2	BV	142.47247	17.09373	2435.38563		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000003.D
Sample Name: 1207*2500

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.543	1	VB	199.32970	12.16929	2425.70101		1,3-DNB
3.986	2	BV	211.35422	11.61752	2455.41098		3,5-DNA
4.511	1	VV	116.06274	20.86415	2421.55077		NB
4.993	2	BV	72.71998	33.42634	2430.76249		NG
5.734	1	BB	98.17678	23.56085	2313.12861		TETRYL
6.172	1	BV	139.89934	17.18879	2404.70066		2,4,6-TNT
6.832	1	BV	107.73643	22.30068	2402.59529		2-A-4,6-DNT
7.061	1	VB	75.78456	31.52164	2388.85401		4-A-2,6-DNT
7.798	1	BV	183.41721	13.61872	2497.90742		2,4-DNT
7.986	1	VV	92.08646	25.17563	2318.33447		2,6-DNT
10.649	2	VV	163.19543	14.98143	2444.90148		2-NT
11.539	2	VV	105.19282	22.61455	2378.88872		4-NT
12.514	2	VV	191.36002	12.66263	2423.12086		3-NT
14.059	2	VV	78.14223	29.48171	2303.76669		PETN

Totals : 4.33358e4

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

EPA 8330B

Form 6I

ICAL Verifications

6I

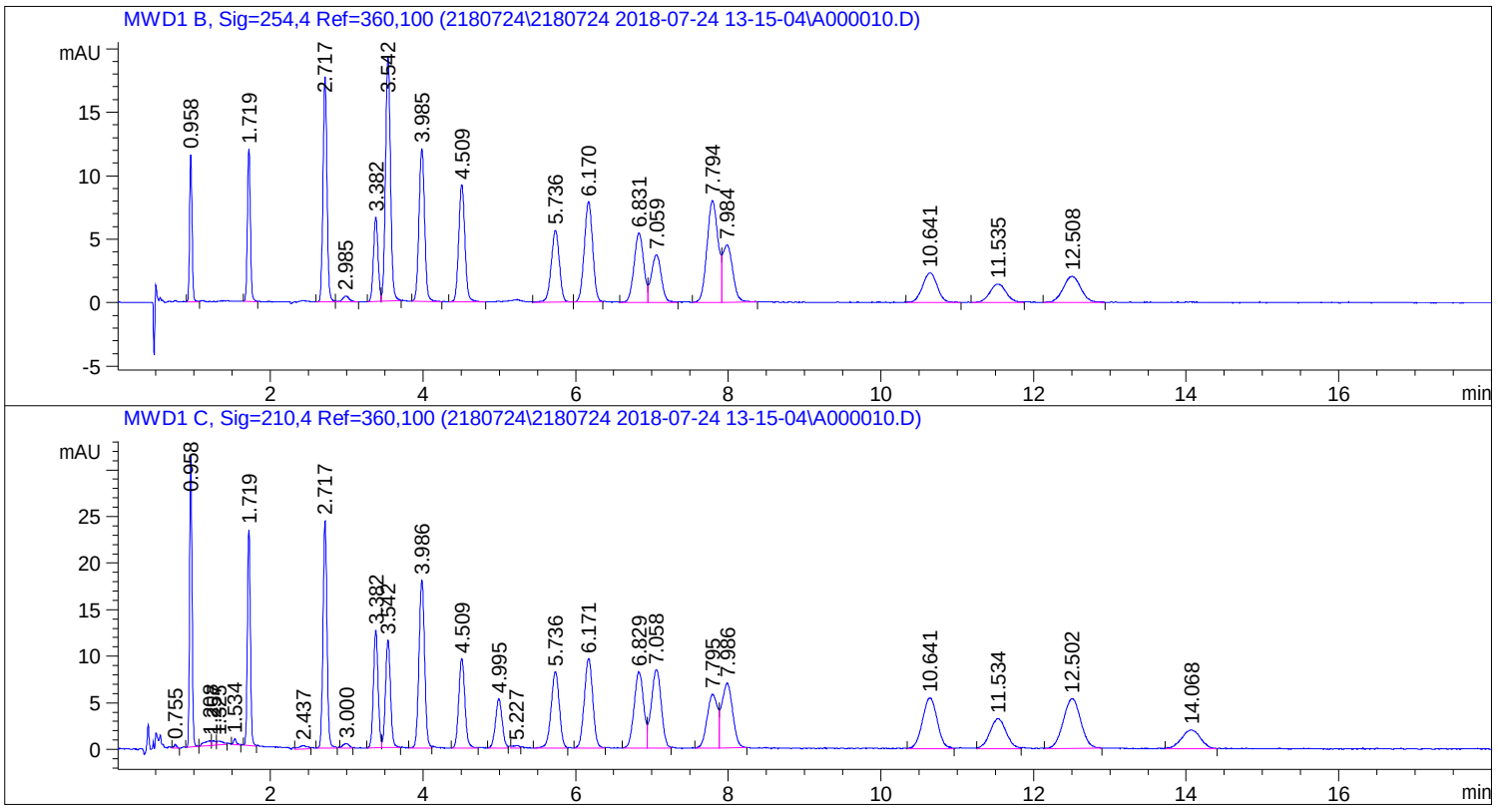
ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	218081812	Instrument ID:	HPLC3
Analysis Date:	07/24/18 1612	Lab File ID:	2180724\A10
Analytical Method:	EPA 8330B	Analytical Batch:	640653

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
1,3,5-Trinitrobenzene	ug/L	1000	1060	106	80	120	
1,3-Dinitrobenzene	ug/L	1000	1050	105	80	120	
2,4,6-Trinitrotoluene	ug/L	1000	1060	106	80	120	
2,4-Dinitrotoluene	ug/L	1000	1070	107	80	120	
2,6-Dinitrotoluene	ug/L	1000	1050	105	80	120	
2-Amino-4,6-dinitrotoluene	ug/L	1000	1030	103	80	120	
2-Nitrotoluene	ug/L	1000	1060	106	80	120	
3,5-Dinitroaniline	ug/L	1000	1060	106	80	120	
3-Nitrotoluene	ug/L	1000	1060	106	80	120	
4-Amino-2,6-dinitrotoluene	ug/L	1000	1100	110	80	120	
4-Nitrotoluene	ug/L	1000	1100	110	80	120	
HMX	ug/L	1000	1070	107	80	120	
Nitrobenzene	ug/L	1000	1080	108	80	120	
Nitroglycerin	ug/L	1000	1050	105	80	120	
Pentaerythritol Tetranitrate	ug/L	1000	1030	103	80	120	
RDX	ug/L	1000	1050	105	80	120	
Tetryl	ug/L	1000	1010	101	80	120	

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000010.D
Sample Name: 1600*1000

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  10
Acq. Instrument : HPLC3                         Location : P1-A-04
Injection Date  : 7/24/2018 4:12:03 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 4:10:39 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 11:11:31 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```

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==========================================================================
                      External Standard Report
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Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 9:35:27 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.958	1	VV	25.69548	41.55880	1067.87330		HMX
1.719	1	BV	32.06019	32.88013	1054.14340		RDX
2.717	2	BV	89.49841	11.79190	1055.35636		1,3,5-TNB
3.382	2	BV	53.92324	17.58403	948.18763		1,2-DNB

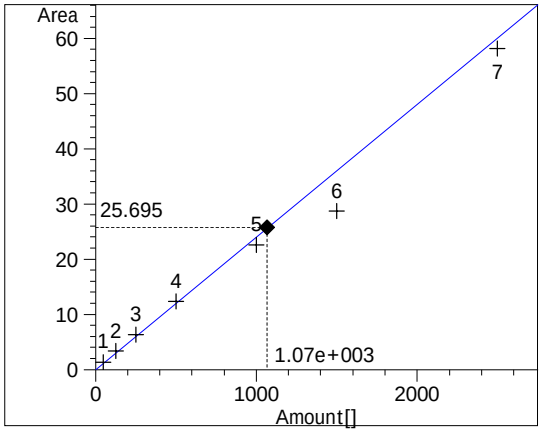
Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000010.D
Sample Name: 1600*1000

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.542	1	VB	86.62687	12.08328	1046.73657		1,3-DNB
3.986	2	BV	91.69115	11.51055	1055.41601		3,5-DNA
4.509	1	BB	52.46961	20.54823	1078.15761		NB
4.995	2	BV	32.40728	32.32469	1047.55536		NG
5.736	1	BB	42.02353	24.14035	1014.46256		TETRYL
6.170	1	BV	60.48479	17.49447	1058.14941		2,4,6-TNT
6.831	1	BV	47.87838	21.50419	1029.58575		2-A-4,6-DNT
7.059	1	VV	33.73661	32.60655	1100.03446		4-A-2,6-DNT
7.794	1	BV	80.37498	13.30050	1069.02774		2,4-DNT
7.984	1	VB	42.00169	24.95418	1048.11775		2,6-DNT
10.641	2	VB	73.26495	14.40165	1055.13634		2-NT
11.534	2	BV	47.13138	23.40253	1102.99346		4-NT
12.502	2	VV	85.94993	12.38296	1064.31429		3-NT
14.068	2	BV	35.13242	29.39954	1032.87723		PETN
Totals :					1.89281e4		

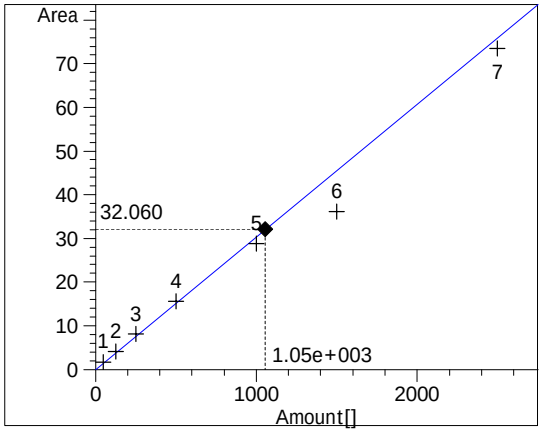
1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

Calibration Curves



HMX at exp. RT: 0.960
MWD1 B, Sig=254,4 Ref=360,100
Correlation: 0.99360
Residual Std. Dev.: 3.50499
Formula: y = mx
m: 2.40623e-2
x: Amount
y: Area



RDX at exp. RT: 1.720
MWD1 B, Sig=254,4 Ref=360,100
Correlation: 0.99328
Residual Std. Dev.: 4.47127
Formula: y = mx
m: 3.04135e-2
x: Amount
y: Area

EPA 8330B

Form 7B

CCAL Verifications

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	218081812			CCAL ID:	1400
GC Column:	ARC18	ID	3 (mm)	Instrument ID:	HPLC3
Injection Vol.:	1.0		(µL)	Lab File ID:	2180830\A03
Init. Calib. Date 1:	07/24/18	Time 1:	1355	Analyst:	MEG
Init. Calib. Date 2:	07/24/18	Time 2:	1552	Analytical Batch:	643050
Analysis Date:	08/30/18	Time:	1116	Analytical Method:	EPA 8330B

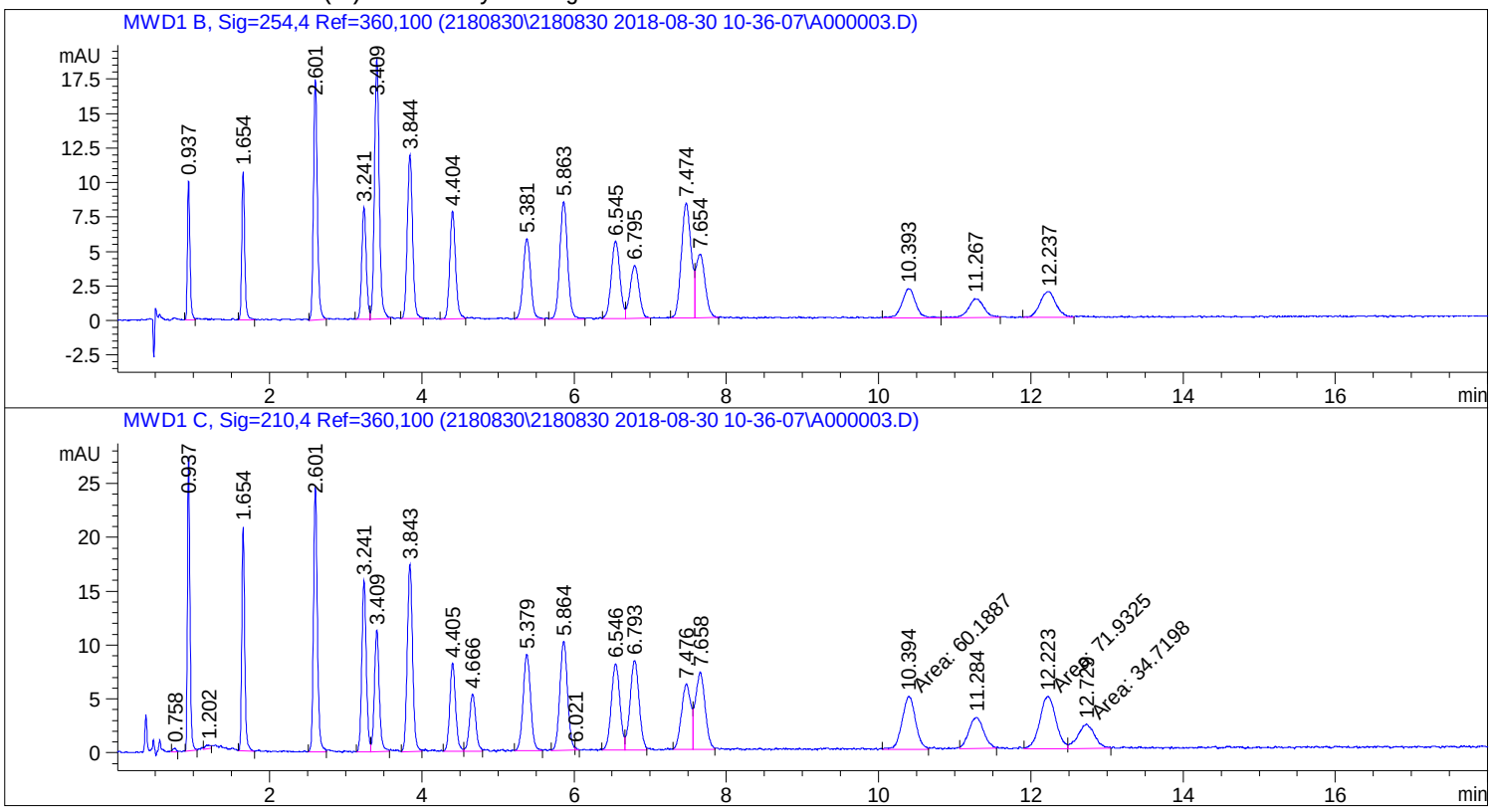
ANALYTE	*TRUE*	*CONC*	*$\overline{RRF}$*	*RRF CCV*	*Min RRF*	*%D/%Drift*	*Max %D/ %Drift*	*TYPE*	*Q*
1,2-Dinitrobenzene	1000	1156	17.8	15.2	NA	-14.6	20	A	
1,3,5-Trinitrobenzene	1000	1037	11.9	11.4	NA	-4.2	20	A	
1,3-Dinitrobenzene	1000	995.7	12.2	12.1	NA	-.8	20	A	
2,4,6-Trinitrotoluene	1000	1061	17.6	16.5	NA	-6.3	20	A	
2,4-Dinitrotoluene	1000	986.4	13.5	13.5	NA	0	20	A	
2,6-Dinitrotoluene	1000	976.3	25.3	25.6	NA	1.2	20	A	
2-Amino-4,6-dinitrotoluene	1000	960.0	21.9	22.4	NA	2.3	20	A	
2-Nitrotoluene	1000	866.8	14.6	16.6	NA	13.7	20	A	
3,5-Dinitroaniline	1000	970.9	11.6	11.9	NA	2.6	20	A	
3-Nitrotoluene	1000	890.7	12.5	13.9	NA	11.2	20	A	
4-Amino-2,6-dinitrotoluene	1000	1033	32.9	31.6	NA	-4	20	A	
4-Nitrotoluene	1000	921.0	23.6	25.4	NA	7.6	20	A	
HMX	1000	958.3	42.1	43.4	NA	3.1	20	A	
Nitrobenzene	1000	858.6	20.8	23.9	NA	14.9	20	A	
Nitroglycerin	1000	989.0	32.7	32.7	NA	0	20	A	
Pentaerythritol Tetranitrate	1000	1021	29.7	28.8	NA	-3	20	A	
RDX	1000	961.8	33.3	34.2	NA	2.7	20	A	
Tetryl	1000	972.3	24.4	24.8	NA	1.6	20	A	

FORM V II SV

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000003.D
Sample Name: 1400*1000

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   3
Acq. Instrument : HPLC3                         Location : Vial 2
Injection Date  : 8/30/2018 11:16:56 AM              Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 4/28/2018 12:48:13 PM by DLB
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:33:06 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:33:08 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.937	1	BV	23.05980	41.55880	958.33756		HMX
1.654	1	VV	29.25039	32.88013	961.75664		RDX
2.601	2	BV	87.90765	11.79190	1036.59828		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000003.D
Sample Name: 1400*1000

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.241	2	BV	65.75185	17.58403	1156.18234		1,2-DNB
3.409	1	VV	82.40276	12.08328	995.69553		1,3-DNB
3.843	2	BV	84.35259	11.51055	970.94509		3,5-DNA
4.404	1	BV	41.78473	20.54823	858.60211		NB
4.666	2	VV	30.59510	32.32469	988.97733		NG
5.381	1	VV	40.27678	24.14035	972.29541		TETRYL
5.863	1	BV	60.64202	17.49447	1060.90007		2,4,6-TNT
6.545	1	BV	44.64230	21.50419	959.99631		2-A-4,6-DNT
6.795	1	VB	31.67759	32.60655	1032.89683		4-A-2,6-DNT
7.474	1	BV	74.16203	13.30050	986.39226		2,4-DNT
7.654	1	VB	39.12200	24.95418	976.25740		2,6-DNT
10.394	2	MM	60.18867	14.40165	866.81628		2-NT
11.284	2	VV	39.35466	23.40253	920.99860		4-NT
12.223	2	MF	71.93251	12.38296	890.73720		3-NT
12.729	2	FM	34.71984	29.39954	1020.74738		PETN
Totals :			1.76151e4				

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

7E

ORGANICS CONTINUING CALIBRATION CHECK

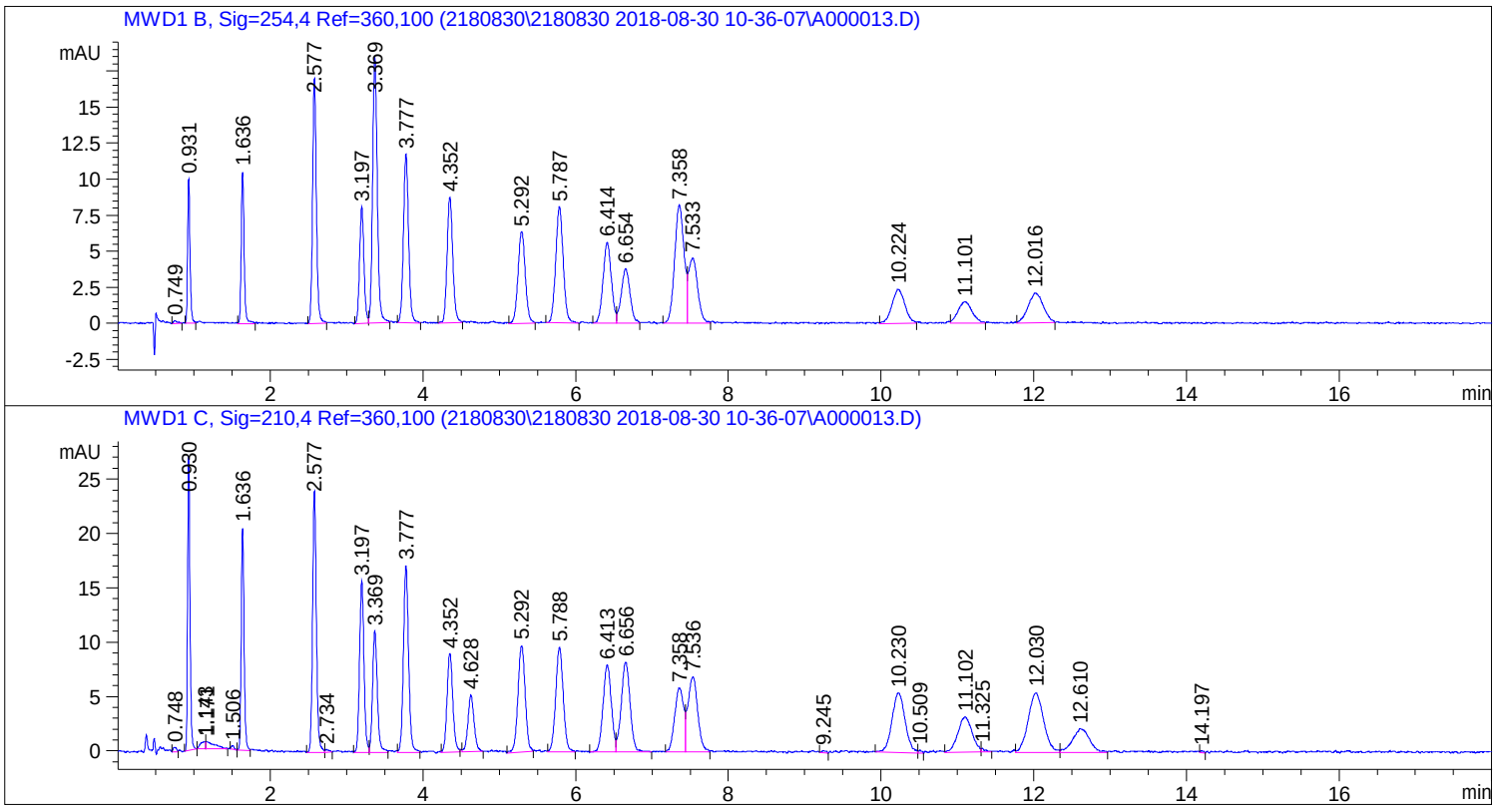
Report No:	218081812			CCAL ID:	1400
GC Column:	ARC18	ID	3 (mm)	Instrument ID:	HPLC3
Injection Vol.:	1.0		(µL)	Lab File ID:	2180830\A13
Init. Calib. Date 1:	07/24/18	Time 1:	1355	Analyst:	MEG
Init. Calib. Date 2:	07/24/18	Time 2:	1552	Analytical Batch:	643050
Analysis Date:	08/30/18	Time:	1443	Analytical Method:	EPA 8330B

ANALYTE	*TRUE*	*CONC*	*$\overline{RRF}$*	*RRF CCV*	*Min RRF*	*%D/%Drift*	*Max %D/ %Drift*	*TYPE*	*Q*
1,2-Dinitrobenzene	1000	1108	17.8	15.9	NA	-10.7	20	A	
1,3,5-Trinitrobenzene	1000	992.1	11.9	11.9	NA	0	20	A	
1,3-Dinitrobenzene	1000	952.0	12.2	12.7	NA	4.1	20	A	
2,4,6-Trinitrotoluene	1000	965.8	17.6	18.1	NA	2.8	20	A	
2,4-Dinitrotoluene	1000	937.7	13.5	14.2	NA	5.2	20	A	
2,6-Dinitrotoluene	1000	933.9	25.3	26.7	NA	5.5	20	A	
2-Amino-4,6-dinitrotoluene	1000	906.6	21.9	23.7	NA	8.2	20	A	
2-Nitrotoluene	1000	935.7	14.6	15.4	NA	5.5	20	A	
3,5-Dinitroaniline	1000	929.8	11.6	12.4	NA	6.9	20	A	
3-Nitrotoluene	1000	953.7	12.5	13.0	NA	4	20	A	
4-Amino-2,6-dinitrotoluene	1000	993.7	32.9	32.8	NA	-.3	20	A	
4-Nitrotoluene	1000	991.7	23.6	23.6	NA	0	20	A	
HMX	1000	916.9	42.1	45.3	NA	7.6	20	A	
Nitrobenzene	1000	928.8	20.8	22.1	NA	6.3	20	A	
Nitroglycerin	1000	945.8	32.7	34.2	NA	4.6	20	A	
Pentaerythritol Tetranitrate	1000	1008	29.7	29.2	NA	-1.7	20	A	
RDX	1000	924.8	33.3	35.6	NA	6.9	20	A	
Tetryl	1000	1021	24.4	23.6	NA	-3.3	20	A	

FORM V II SV

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000013.D
Sample Name: 1400*1000

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  13
Acq. Instrument : HPLC3                         Location : Vial 2
Injection Date  : 8/30/2018 2:43:25 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 4/28/2018 12:48:13 PM by DLB
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:31:03 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:31:06 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.931	1	BV	22.06237	41.55880	916.88577		HMX
1.636	1	VV	28.12696	32.88013	924.81804		RDX
2.577	2	BV	84.13049	11.79190	992.05847		1,3,5-TNB
3.197	2	BV	63.03367	17.58403	1108.38570		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000013.D
Sample Name: 1400*1000

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.369	1	VV	78.78964	12.08328	952.03718		1,3-DNB
3.777	2	VV	80.78083	11.51055	929.83213		3,5-DNA
4.352	1	BV	45.20202	20.54823	928.82144		NB
4.628	2	VB	29.25956	32.32469	945.80620		NG
5.292	1	VV	42.28638	24.14035	1020.80799		TETRYL
5.787	1	BB	55.20606	17.49447	965.80079		2,4,6-TNT
6.414	1	BV	42.16058	21.50419	906.62910		2-A-4,6-DNT
6.654	1	VV	30.47441	32.60655	993.66533		4-A-2,6-DNT
7.358	1	BV	70.50220	13.30050	937.71480		2,4-DNT
7.533	1	VV	37.42438	24.95418	933.89468		2,6-DNT
10.230	2	BV	64.97518	14.40165	935.74994		2-NT
11.102	2	VV	42.37397	23.40253	991.65808		4-NT
12.030	2	VV	77.01581	12.38296	953.68346		3-NT
12.610	2	VV	34.29773	29.39954	1008.33772		PETN

Totals : 1.73466e4

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	218081812			CCAL ID:	1400
GC Column:	ARC18	ID	3 (mm)	Instrument ID:	HPLC3
Injection Vol.:	1.0		(µL)	Lab File ID:	2180912\A63
Init. Calib. Date 1:	07/24/18	Time 1:	1355	Analyst:	MEG
Init. Calib. Date 2:	07/24/18	Time 2:	1552	Analytical Batch:	643776
Analysis Date:	09/13/18	Time:	0520	Analytical Method:	EPA 8330B

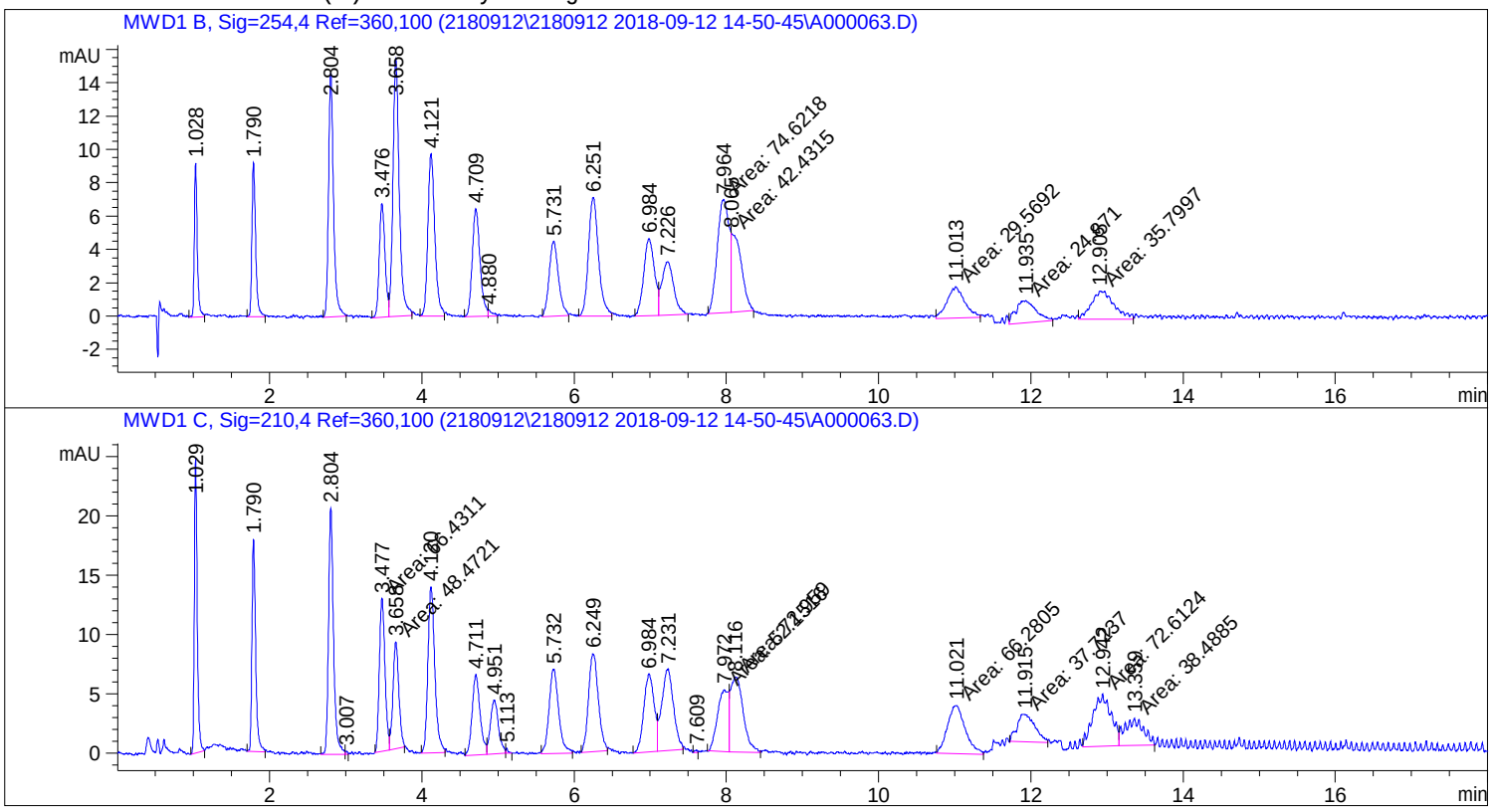
ANALYTE	*TRUE*	*CONC*	*$\overline{RRF}$*	*RRF CCV*	*Min RRF*	*%D/%Drift*	*Max %D/ %Drift*	*TYPE*	*Q*
1,2-Dinitrobenzene	1000	1168	17.8	15.1	NA	-15.2	20	A	
1,3,5-Trinitrobenzene	1000	1128	11.9	10.5	NA	-11.8	20	A	
1,3-Dinitrobenzene	1000	1083	12.2	11.2	NA	-8.2	20	A	
2,4,6-Trinitrotoluene	1000	1150	17.6	15.2	NA	-13.6	20	A	
2,4-Dinitrotoluene	1000	992.5	13.5	13.4	NA	-.7	20	A	
2,6-Dinitrotoluene	1000	1059	25.3	23.6	NA	-6.7	20	A	
2-Amino-4,6-dinitrotoluene	1000	980.6	21.9	21.9	NA	0	20	A	
2-Nitrotoluene	1000	954.5	14.6	15.1	NA	3.4	20	A	
3,5-Dinitroaniline	1000	1017	11.6	11.3	NA	-2.6	20	A	
3-Nitrotoluene	1000	899.2	12.5	13.8	NA	10.4	20	A	
4-Amino-2,6-dinitrotoluene	1000	1117	32.9	29.2	NA	-11.2	20	A	
4-Nitrotoluene	1000	882.8	23.6	26.5	NA	12.3	20	A	
HMX	1000	1035	42.1	40.1	NA	-4.8	20	A	
Nitrobenzene	1000	939.4	20.8	21.9	NA	5.3	20	A	
Nitroglycerin	1000	1071	32.7	30.2	NA	-7.6	20	A	
Pentaerythritol Tetranitrate	1000	1132	29.7	26.0	NA	-12.5	20	A	
RDX	1000	1024	33.3	32.1	NA	-3.6	20	A	
Tetryl	1000	935.7	24.4	25.8	NA	5.7	20	A	

FORM V II SV

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000063.D
Sample Name: 1400*1000

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  45
Acq. Instrument : HPLC3                         Location : Vial 2
Injection Date  : 9/13/2018 5:20:35 AM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 2:01:27 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/13/2018 9:15:17 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/13/2018 9:15:37 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.028	1	BV	24.91076	41.55880	1035.26114		HMX
1.790	1	BV	31.14426	32.88013	1024.02744		RDX
2.804	2	VV	95.67411	11.79190	1128.17966		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000063.D
Sample Name: 1400*1000

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.477	2	MF	66.43113	17.58403	1168.12674		1,2-DNB
3.658	1	VV	89.60676	12.08328	1082.74340		1,3-DNB
4.120	2	VV	88.35750	11.51055	1017.04378		3,5-DNA
4.709	1	BV	45.71809	20.54823	939.42571		NB
4.951	2	VV	33.14728	32.32469	1071.47568		NG
5.731	1	VV	38.76224	24.14035	935.73385		TETRYL
6.251	1	BV	65.71951	17.49447	1149.72790		2,4,6-TNT
6.984	1	BV	45.59994	21.50419	980.58970		2-A-4,6-DNT
7.226	1	VB	34.26304	32.60655	1117.19947		4-A-2,6-DNT
7.964	1	MF	74.62178	13.30050	992.50723		2,4-DNT
8.065	1	FM	42.43149	24.95418	1058.84292		2,6-DNT
11.021	2	MM	66.28046	14.40165	954.54816		2-NT
11.915	2	MM	37.72365	23.40253	882.82880		4-NT
12.942	2	MF	72.61236	12.38296	899.15573		3-NT
13.359	2	FM	38.48848	29.39954	1131.54364		PETN

Totals : 1.85690e4

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	218081812			CCAL ID:	1400
GC Column:	ARC18	ID	3 (mm)	Instrument ID:	HPLC3
Injection Vol.:	1.0		(µL)	Lab File ID:	2180912\A82
Init. Calib. Date 1:	07/24/18	Time 1:	1355	Analyst:	MEG
Init. Calib. Date 2:	07/24/18	Time 2:	1552	Analytical Batch:	643776
Analysis Date:	09/13/18	Time:	1135	Analytical Method:	EPA 8330B

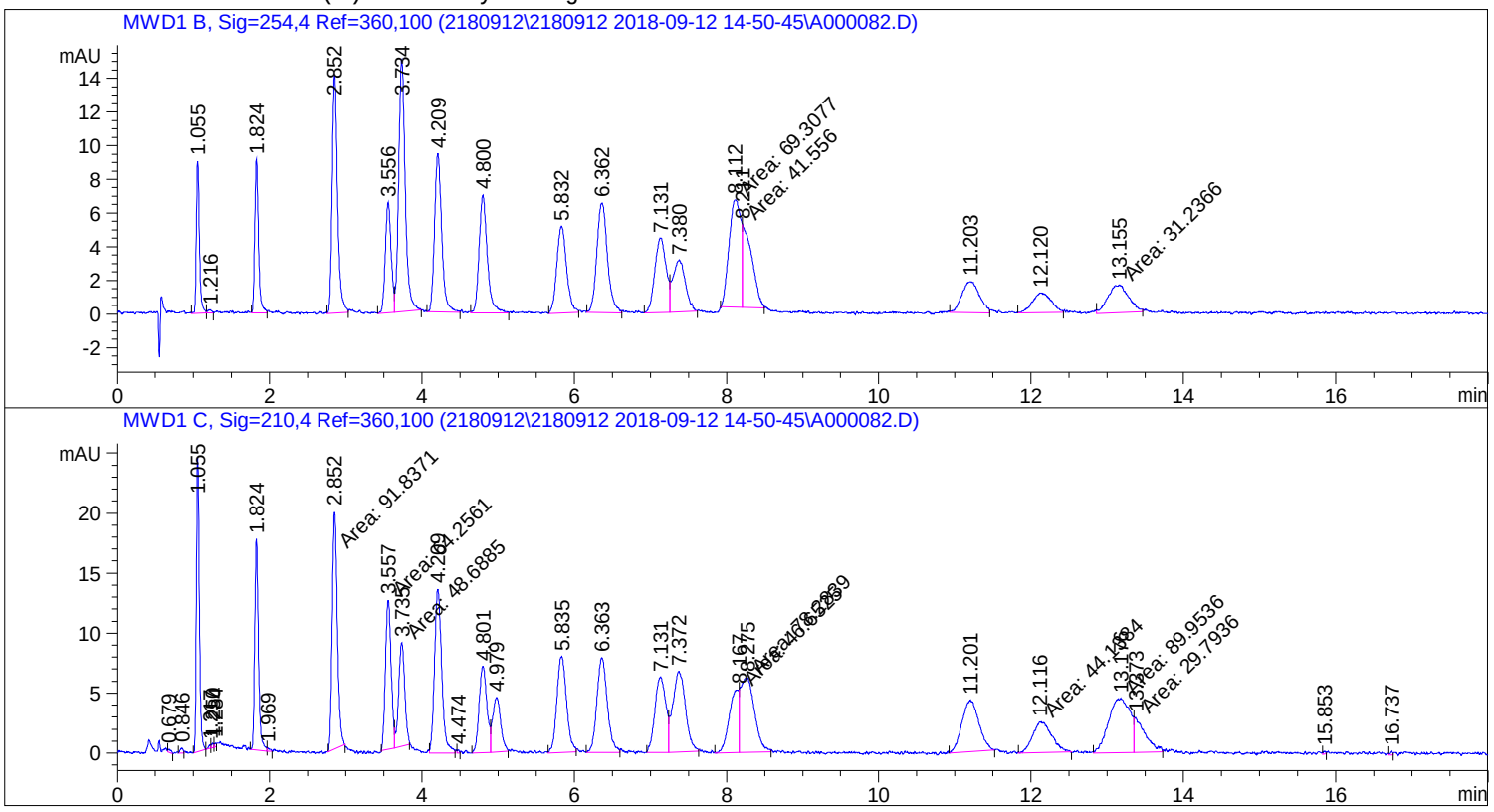
ANALYTE	*TRUE*	*CONC*	*$\overline{RRF}$*	*RRF CCV*	*Min RRF*	*%D/%Drift*	*Max %D/ %Drift*	*TYPE*	*Q*
1,2-Dinitrobenzene	1000	1130	17.8	15.6	NA	-12.4	20	A	
1,3,5-Trinitrobenzene	1000	1083	11.9	10.9	NA	-8.4	20	A	
1,3-Dinitrobenzene	1000	1081	12.2	11.2	NA	-8.2	20	A	
2,4,6-Trinitrotoluene	1000	1108	17.6	15.8	NA	-10.2	20	A	
2,4-Dinitrotoluene	1000	921.8	13.5	14.4	NA	6.7	20	A	
2,6-Dinitrotoluene	1000	1037	25.3	24.1	NA	-4.7	20	A	
2-Amino-4,6-dinitrotoluene	1000	987.5	21.9	21.8	NA	-.5	20	A	
2-Nitrotoluene	1000	969.2	14.6	14.9	NA	2.1	20	A	
3,5-Dinitroaniline	1000	1037	11.6	11.1	NA	-4.3	20	A	
3-Nitrotoluene	1000	827.4	12.5	15.0	NA	20	20	A	
4-Amino-2,6-dinitrotoluene	1000	1139	32.9	28.6	NA	-13.1	20	A	
4-Nitrotoluene	1000	1033	23.6	22.7	NA	-3.8	20	A	
HMX	1000	1031	42.1	40.3	NA	-4.3	20	A	
Nitrobenzene	1000	1078	20.8	19.1	NA	-8.2	20	A	
Nitroglycerin	1000	1083	32.7	29.9	NA	-8.6	20	A	
Pentaerythritol Tetranitrate	1000	1100	29.7	26.7	NA	-10.1	20	A	
RDX	1000	1012	33.3	32.5	NA	-2.4	20	A	
Tetryl	1000	1115	24.4	21.7	NA	-11.1	20	A	

FORM V II SV

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000082.D
Sample Name: 1400*1000

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  64
Acq. Instrument : HPLC3                         Location : Vial 2
Injection Date  : 9/13/2018 11:35:57 AM              Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\8330_ARC1.M
Last changed    : 9/13/2018 5:38:34 AM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180912\8330_ARC_2180724ICAL_0912.M
Last changed    : 9/21/2018 8:49:50 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      9/21/2018 8:50:00 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
1.055	1	VV	24.79993	41.55880	1030.65541		HMX
1.824	1	VV	30.78008	32.88013	1012.05330		RDX
2.852	2	MM	91.83706	11.79190	1082.93353		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180912\2180912 2018-09-12 14-50-45\A000082.D
Sample Name: 1400*1000

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.557	2	MF	64.25615	17.58403	1129.88183		1,2-DNB
3.734	1	VB	89.43484	12.08328	1080.66603		1,3-DNB
4.209	2	VV	90.07504	11.51055	1036.81367		3,5-DNA
4.800	1	VB	52.47724	20.54823	1078.31438		NB
4.979	2	VV	33.49323	32.32469	1082.65845		NG
5.832	1	BV	46.18414	24.14035	1114.90123		TETRYL
6.362	1	VV	63.31346	17.49447	1107.63543		2,4,6-TNT
7.131	1	BV	45.92134	21.50419	987.50122		2-A-4,6-DNT
7.380	1	VV	34.91672	32.60655	1138.51380		4-A-2,6-DNT
8.112	1	MF	69.30769	13.30050	921.82710		2,4-DNT
8.211	1	FM	41.55595	24.95418	1036.99459		2,6-DNT
11.201	2	BB	67.29735	14.40165	969.19297		2-NT
12.116	2	MM	44.13841	23.40253	1032.95032		4-NT
13.176	2	MF	89.95358	12.38296	1113.89128		3-NT
13.373	2	FM	29.79365	29.39954	875.91972		PETN

Totals : 1.88333e4

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

EPA 8330B

RunLogs

Vial	Sample	Dilution	File Number
P1-A-02	1207*2500	1	A000003.D
P1-A-02	1206*1250	1	A000004.D
P1-A-02	1205*1000	1	A000005.D
P1-A-03	1204*500	1	A000006.D
P1-A-03	1203*250	1	A000007.D
P1-A-03	1202*125	1	A000008.D
P1-A-03	1201*50	1	A000009.D
P1-A-04	1600*1000	1	A000010.D
P1-E-07	21807123417	1	A000011.D
P1-E-08	1831319	1	A000012.D
P1-E-09	1831318	1	A000013.D
P1-F-02	21807123418	1	A000014.D
P1-F-03	21807123419	1	A000015.D
P1-F-04	21807123420	1	A000016.D
P1-F-05	21807123421	1	A000017.D
P1-F-06	21807123422	1	A000018.D
P1-F-07	1831320	1	A000019.D
P1-F-08	1831314	1	A000020.D
P1-F-09	1831315	1	A000021.D
P1-A-01	1400*1000	1	A000022.D
P2-A-01	1831831	1	A000023.D
P2-A-02	1831832	1	A000024.D
P2-A-03	1831833	1	A000025.D
P2-A-04	21807132408	1	A000026.D
P2-A-05	21807132410	1	A000027.D
P2-A-06	21807132411	1	A000028.D
P2-A-07	21807132412	1	A000029.D
P2-A-08	21807132413	1	A000030.D
P2-A-09	1831834	1	A000031.D
P2-B-01	1831835	1	A000032.D
P2-B-02	21807132414	1	A000033.D
P2-B-03	21807132415	1	A000034.D
P2-B-04	21807132416	1	A000035.D
P1-A-01	1400*1000	1	A000036.D
P2-B-05	21807132417	1	A000037.D
P2-B-06	1831836	1	A000038.D
P2-B-07	1831837	1	A000039.D
P2-B-08	21807132418	5	A000040.D
P2-B-09	21807132419	1	A000041.D
P2-C-01	21807132421	5	A000042.D
P2-C-02	1831838	1	A000043.D
P2-C-03	1831832	1	A000044.D
P2-C-04	1831833	1	A000045.D
P1-A-01	1400*1000	1	A000046.D

Analyst	MEG
Method	ARCI
CCV	005-45-6
RunDate	7/24/2018

Vial	Sample	Dilution	File Number
Vial 2	1400*1000	1	A000003.D
P2-A-01	1843189	1	A000004.D
P2-A-02	1843190	1	A000005.D
P2-A-03	1843191	1	A000006.D
P2-A-04	21808241101	1	A000007.D
P2-A-05	1843193	1	A000008.D
P2-A-06	1843192	1	A000009.D
P2-A-07	1843194	1	A000010.D
P2-A-08	1843195	1	A000011.D
P2-A-09	1843196	1	A000012.D
Vial 2	1400*1000	1	A000013.D
P2-B-01	21808172601	1	A000014.D
P2-B-02	21808172602	1	A000015.D
P2-B-03	21808172603	1	A000016.D
P2-B-04	21808172604	1	A000017.D
Vial 2	1400*1000	1	A000018.D
P2-B-06	1843101	1	A000019.D
P2-B-07	1843102	1	A000020.D
P2-B-08	1843103	1	A000021.D
P2-B-09	21808181401	1	A000022.D
P2-C-01	21808181402	1	A000023.D
P2-C-02	21808181403	1	A000024.D
P2-C-03	21808181404	1	A000025.D
P2-C-04	21808181407	1	A000026.D
P2-C-05	1843105	1	A000027.D
P2-C-06	1843104	1	A000028.D
P2-C-07	1843106	1	A000029.D
P2-C-08	1843214	1	A000030.D
P2-C-09	1843215	1	A000031.D
Vial 2	1400*1000	1	A000032.D

Analyst	MEG
Method	ARCI
CCV	005-49-4
RunDate	8/30/2018

Vial	Sample	Dilution	File Number
Vial 2	1400*1000	1	A000004.D
P2-A-01	1845522	1	A000010.D
P2-A-02	1845523	1	A000011.D
P2-A-03	1845524	1	A000012.D
P2-A-04	21808311301	1	A000013.D
P2-A-05	1845525	1	A000014.D
P2-A-06	1845526	1	A000015.D
P2-A-07	1845527	1	A000016.D
P2-A-08	1845523	1	A000017.D
P2-A-09	1845524	1	A000021.D
P2-B-09	21808220401	1	A000022.D
Vial 2	1400*1000	1	A000023.D
P2-B-01	21808241301	1	A000024.D
P2-B-02	21808241302	1	A000025.D
P2-B-04	21808242301	1	A000026.D
P2-B-05	1843500	1	A000027.D
P2-B-06	1843499	1	A000028.D
P2-B-07	21808242302	1	A000029.D
P2-B-08	21808242303	1	A000030.D
Vial 2	1400*1000	1	A000031.D
P2-C-01	21808240301	1	A000032.D
P2-C-02	21808240302	1	A000033.D
P2-C-03	21808240303	1	A000034.D
P2-C-04	21808240304	1	A000035.D
P2-C-05	21808240305	1	A000036.D
P2-C-06	21808240306	1	A000037.D
P2-C-07	21808240307	1	A000038.D
P2-C-08	21808240308	1	A000039.D
P2-D-01	21808172301	1	A000040.D
Vial 2	1400*1000	1	A000041.D
P2-D-02	21808172302	1	A000042.D
P2-D-03	21808172303	1	A000043.D
P2-D-04	21808172304	1	A000044.D
P2-D-05	21808172305	1	A000045.D
P2-D-06	21808172306	1	A000046.D
P2-D-07	21808172307	1	A000047.D
P2-D-08	21808172308	1	A000048.D
P2-D-09	21808172309	1	A000049.D
P2-E-01	21808172310	1	A000050.D
P2-E-02	21808172311	1	A000051.D
Vial 2	1400*1000	1	A000052.D
P2-E-03	21808172312	1	A000053.D
P2-E-04	21808172313	1	A000054.D
P2-E-05	21808172314	1	A000055.D
P2-E-06	21808172315	1	A000056.D
P2-E-07	21808172316	1	A000057.D

P2-E-08	21808172317	1	A000058.D
P2-E-09	21808172318	1	A000059.D
P2-F-01	21808172319	1	A000060.D
P2-F-02	21808172320	1	A000061.D
P2-F-03	21808172321	1	A000062.D
Vial 2	1400*1000	1	A000063.D
P1-A-01	21808181206	1	A000064.D
P1-A-02	21808181207	1	A000065.D
P1-A-03	21808181208	1	A000066.D
P1-A-04	21808181209	1	A000067.D
P1-A-05	21808181210	1	A000068.D
P1-A-06	1846370	1	A000069.D
P1-A-07	1846371	1	A000070.D
P1-A-08	1846372	1	A000071.D
P1-A-09	21808181213	1	A000072.D
P1-B-01	21808181214	1	A000073.D
P1-B-02	21808181215	1	A000074.D
P1-B-03	21808181216	1	A000075.D
P1-B-04	21808181217	1	A000076.D
P1-B-05	1846373	1	A000077.D
P1-B-06	1846374	1	A000078.D
P1-B-07	1846375	1	A000079.D
P1-B-08	1846376	1	A000080.D
P1-B-09	1846377	1	A000081.D
Vial 2	1400*1000	1	A000082.D
P2-F-06	1845471	1	A000083.D
P2-F-07	1845472	1	A000084.D
P2-F-08	1845473	1	A000085.D
P2-F-09	21808302601	1	A000086.D
Vial 2	1400*1000	1	A000087.D

Analyst	MEG
Method	ARCI
CCV	005-49-9
RunDate	9/12/2018

EPA 8330B

PrepSheets

GCAL ANALYTICAL LABORATORIES, LLC

8330B Explosives Prep Solid

643342

ANALYST/ TECH		START DATE/TIME	9/5/18 1851	END DATE/TIME	9/6/18 1510	BATCH	643342

#	CLIENT	TYPE	CLIENT ID	GCAL ID	INITIAL WGT (g)	FINAL VOL (mL)	COMMENT	STANDARDS\ REAGENTS
1	QC	MB	MB 1846370	1846370	10.0	40		8330 Surrogate 4/10ug/ml / Volume 1.0ml 703-27-9
2	QC	LCS	SRM 1846371 ** Use SRM **	1846371	10.0	40		
3	QC	LCSD	SRMD 1846372 ** Use SRM **	1846372	10.0	40		8330 Spike 4/10ug/ml / Volume 1.0ml 703-23-1
4	4838	SAMP	WIL02DB02A (RE)	21808181211	10.1	40		
5	4838	SAMP	WIL02DB01A (RE)	21808181212	10.5	40		Solid Reference Material 218150
6	4838	SAMP	WIL02DA02A (RE)	21808181213	10.1	40		
7	4838	MS	WIL02DA02A MS (RE)	21808181214	10.3	40		HPLC Water 218989
8	4838	MSD	WIL02DA02A MSD (RE)	21808181215	10.5	40		
9	4838	SAMP	WIL02DA01A (RE)	21808181216	10.1	40		Acetonitrile B124002
10	4838	SAMP	WIL02DA01B (RE)	21808181217	10.1	40		
11	QC	DUP	DUP 1846374	1846374	10.0	40		Sand
12	QC	DUP	DUP 1846373	1846373	10.0	40		
13	QC	GRBLK	GRBLK 1846375	1846375	10.0	40		
14			LCS	1846376	10.0	40		
15			LCSD	1846377	10.0	40		
16								
17								
18								
19								
20								
21								
22								
23								
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26								
27								
28								
29								
30								

EQUIPMENT\CONDITIONS

BALANCE ID	GRINDER ID - PUCK 01	

NOTES

Matrix-Solid. Batch Batch Rule 8330B_S_EX.

8330B Explosives Prep Solid

642698

ANALYST/ TECH	DWB	START DATE/TIME	8/25/18 1649	END DATE/TIME	8/26/18 15:02	BATCH	642698

#	CLIENT	TYPE	CLIENT ID	GCAL ID	INITIAL WGT (g)	FINAL VOL (mL)	COMMENT	STANDARDS\ REAGENTS
1	QC	MB	MB 1843189	1843189	10.0	40.0		8330 Surrogate 4/10ug/ml / Volume 1.0ml 703-27-9
2	QC	LCS	SRM 1843190 ** Use SRM **	1843190	10.0	40.0		
3	QC	LCSD	SRMD 1843191 ** Use SRM **	1843191	10.0	40.0		8330 Spike 4/10ug/ml / Volume 1.0ml 703-23-1
4	4838	SAMP	WIL02DB02A	21808181204	10.1	40.0		
5	4838	SAMP	WIL02DB01A	21808181205	10.0	40.0		Solid Reference Material 21071150
6	4838	SAMP	WIL02DA02A	21808181206	10.3	40.0		
7	4838	MS	WIL02DA02A MS	21808181207	10.0	40.0		HPLC Water
8	4838	MSD	WIL02DA02A MSD	21808181208	10.5	40.0		
9	4838	SAMP	WIL02DA01A	21808181209	10.5	40.0		Acetonitrile 21270544
10	4838	SAMP	WIL02DA01B	21808181210	10.5	40.0		
11	4612	SAMP	ADA-20X38-A03-SP07...	21808241101	10.1	40.0		Sand
12	QC	DUP	DUP 1843193	1843193	10.1	40.0		
13	QC	DUP	DUP 1843192	1843192	10.5	40.0		
14	QC	GRBLK	GRBLK 1843194	1843194	10.0	40.0		
15	QC	LCS	SRM 1843195 ** Use SRM **	1843195	10.0	40.0		
16	QC	LCSD	SRMD 1843196 ** Use SRM **	1843196	10.0	40.0		
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

EQUIPMENT\CONDITIONS

BALANCE ID	D3	GRINDER ID - PUCK 01	

NOTES

Matrix-Solid. Batch Batch Rule 8330B_S_EX.

GCAL

SOLIDS DATA SHEET

TS/TSS Oven Temp: 103 - 105 °C
TDS Oven Temp: 180 ± 2 °C
TVS/VSS Muffle Furnace Temp: 550 ± 5% (27) °C
Ash Muffle Furnace Temp: 800 ± 5% (40) °C

Test: DW

HBN: 642622

SOLI Batch Number: 300611

Initial Weight
Balance ID: BAL 15
Date/Time: 8-24-18 12:31
Analyst: CSS

Oven ID: O11
Date/Time IN: 8-24-18 12:31
Oven Temp °C IN: 104
Oven Temp °C OUT: 104
Date/Time OUT/Desiccator#: 8-26-18 D5 16:54
Analyst: LDH

TDS Oven ID: NA
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 1
Balance ID: BAL 15
Date/Time: 8-26-18 18:00
Analyst: LDH

Oven ID: NA
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 2
Balance ID:
Date/Time:
Analyst:

Oven ID:
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 3 (If needed):
Balance ID: NA
Date/Time:
Analyst:

Oven ID:
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 4 (If needed):
Balance ID:
Date/Time:
Analyst:

Comments:

Rev 005: 10/13/2017

Secondary Reviewer/Date: AJE 8/27/18

TOTAL SOLIDS AND MOISTURE ANALYSIS (SOLID MATRIX)

Method 2540G

HBN	642622			ANALYST:	CJS							DATE:	8/24/2018
SOLI	30061			REVIEW:	ADC 8/27/18							TIME:	12:01:00

Sample ID	Pan ID	Pan Mass (g)	Initial Mass (g) (Sample & Pan)	Final Wt. 1 (g) (Sample & Pan)	Final Wt. 2 (g) (Sample & Pan)	Diff (g)	Final Wt. 3 (g) (Sample & Pan)	Diff (g)	Initial Mass Less Pan (g)	Final Mass Less Pan (g)	Total Solid %	Totol Moisture %
21808240601	-1	1.0364	11.6121	10.0169					10.5757	8.9805	84.92	15.08
21808240603	-2	1.0268	11.6273	9.8877					10.6005	8.8609	83.59	16.41
21808181204	-3	1.0467	11.5980	8.5594					10.5513	7.5127	71.20	28.80
1842784	-4	1.0388	11.4495	8.2756					10.4107	7.2368	69.51	30.49
21808181205	[illegible]	1.0075	11.3943	8.3372					10.3868	7.3297	70.57	29.43
1842785	-6	1.0434	11.4668	8.6065					10.4234	7.5631	72.56	27.44
21808181206	-7	1.0470	11.7307	8.4978					10.6837	7.4508	69.74	30.26
21808181207	-7	1.0470	11.7307	8.4978					10.6837	7.4508	69.74	30.26
21808181208	-7	1.0470	11.7307	8.4978					10.6837	7.4508	69.74	30.26
21808181209	-8	1.0471	11.8269	8.6407					10.7798	7.5936	70.44	29.56
21808181210	-9	1.0313	11.7118	8.5359					10.6805	7.5046	70.26	29.74
21808181301	-10	1.0281	11.4999	10.3255					10.4718	9.2974	88.79	11.21
21808181302	-11	1.0283	11.0661	10.4217					10.0378	9.3934	93.58	6.42
21808181304	-12	1.0222	11.4997	11.2354					10.4775	10.2132	97.48	2.52
21808181305	-13	1.0428	11.1502	10.9159					10.1074	9.8731	97.68	2.32
21808181306	-14	1.0552	11.1740	10.9712					10.1188	9.9160	98.00	2.00
21808181307	-15	1.0707	11.1541	8.1628					10.0834	7.0921	70.33	29.67
21808181308	-16	1.0343	11.2408	10.4522					10.2065	9.4179	92.27	7.73

TS % = ((Final Sample Mass - Initial Sample Mass) x 100) / Initial Sample Mass

TM % = 100-TS%

Method 2540G

Total Solids Solid Spreadsheet, Version 2, 01/26/11

GCAL ANALYTICAL LABORATORIES, LLC

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

CHAIN OF CUSTODY RECORD

Client ID: 4838 - AECOM
SDG: 218081812
PM: AEC

GCAL USE ONLY

Report to:	Bill to:
Client: AECOM	Client:
Address: 12420 Milestone Center Dr. St. 150 Germantown, MD, 20876	Address: Same as "Report to:"
Contact: Jennifer Li	Contact:
Phone: 301-820-3476	Phone:
E-mail: Jennifer.j.li@aecom.com	E-mail:

P.O. Number

Project Name/Number: Williston LTA, # 60520956

Sampled By:

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Con-tainers	Total Metals (6020B) Se, Cu, Pb, Cr	Explosives (8330B)	TCLP Metals (lead) 1311/6020B	Preservative
SOIL	8-16-18	1100		X	WIL03X18E	1			X	Hold pending ISM Result -4
SOIL	8-16-18	0920		X	WIL02X22E	1			X	Hold " -2
SOIL	8-16-18	1115		X	WIL01X21E	1			X	Hold " -3
SOIL	8-16-18	1030		X	WIL02DB02A	2	X	X		Hold pending "DA" result -4
SOIL	8-16-18	0950		X	WIL02DB01A	2	X	X		Hold " -5
SOIL	8-16-18	1020		X	WIL02DA02A	6	X	X		-6,7,8
SOIL	8-16-18	0930		X	WIL02DA01A	2	X	X		-9
SOIL	8-16-18	0935		X	WIL02DA01B	2	X	X		-10

Analytical Requests & Method

GCAL use only:
Custody Seal used ☐ yes ☐ no intact ☐ yes ☐ no E29
Temperature °C 3.2,2,4,1.9
33,38,45 CPM

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

Air Bill No: 7823-5315-3431

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☒ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	8/17/18	1100			
Relinquished by: (Signature) FedEx	8/18/18	1045	Received by: (Signature)	8/18/18	1045
Relinquished by: (Signature)			Received by: (Signature)		

Note: WIL02DA02A is an MS/MSD

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT CANARY: CLIENT

SAMPLE RECEIVING CHECKLIST

218081812

SAMPLE DELIVERY GROUP 218081812	
Client **PM** AEC 4838 - AECOM	**Transport Method** FEDEX
Profile Number 277537	**Received By** Savage, Tiffany R
Line Item(s) 2 - S-Metals/Explosives	**Receive Date(s)** 08/18/18

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by GCAL?	☑	☐

COOLERS

Airbill	Thermometer ID: E29	Temp °C
7823-5315-3431		3.2
		2.4
		1.9

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

GCAL
ANALYTICAL LABORATORIES, LLC

LELAP CERTIFICATE NUMBER: 01955
DOD-ELAP ACCREDITATION NUMBER: 74960

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 08/30/2018

GCAL Report 218081813

Project Williston LTA, #60520956

Deliver To	***Additional Recipients***
Naoum Tavantzis AECOM 1600 Peremeter Park Drive Suite 400 Morrisville, NC 27560 919-461-1100	Jennifer Li, AECOM Laurie Stenberg, AECOM

PJLA Testing DoD ELAP

ISO 17025

NELAP ACCREDITED TNI LABORATORY

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics **-** The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Authorized Signature
GCAL Report 218081813

Certifications

Certification	Certification Number
DOD ELAP	L14-243
Alabama	01955
Arkansas	12-060-0
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
USDA Soil Permit	P330-10-00117

Case Narrative

Client: AECOM **Report:** 218081813

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.1 as specified in the contract.

METALS

In the EPA 6020B analysis for prep batch 642442, the MS and/or MSD recovery is outside the control limits for Antimony. The LCS recovery is within control limits. This indicates the analysis is in control and the sample is affected by matrix interference or the element is non-homogeneous in the sample. A post-digestion spike was performed. The MS/MSD recoveries and RPD are not applicable for Copper and Lead because the sample concentration is greater than four times the spike concentration.

Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21808181301	WIL03IS01	Solid	08/14/2018 16:00	08/18/2018 10:45
21808181302	WIL01IS02	Solid	08/14/2018 13:50	08/18/2018 10:45
21808181303	WIL03IS00	Water	08/16/2018 08:20	08/18/2018 10:45
21808181304	WIL04IS03	Solid	08/15/2018 16:10	08/18/2018 10:45
21808181305	WIL04IS01	Solid	08/15/2018 16:00	08/18/2018 10:45
21808181306	WIL04IS02	Solid	08/15/2018 16:05	08/18/2018 10:45
21808181307	WIL03IS03	Solid	08/14/2018 16:10	08/18/2018 10:45
21808181308	WIL03IS02	Solid	08/14/2018 16:05	08/18/2018 10:45

Test Summary

GCAL ID	Client ID	Matrix	Procedure
21808181301	WIL03IS01	S	EPA 6020B
21808181301	WIL03IS01	S	EPA 6020 ISM Prep
21808181301	WIL03IS01	S	Dry Weight/Percent Moisture
21808181301	WIL03IS01	S	Incremental Sampling Method
21808181302	WIL01IS02	S	EPA 6020B
21808181302	WIL01IS02	S	EPA 6020 ISM Prep
21808181302	WIL01IS02	S	Dry Weight/Percent Moisture
21808181302	WIL01IS02	S	Incremental Sampling Method
21808181303	WIL03IS00	W	EPA 6020B
21808181303	WIL03IS00	W	EPA 6020 Water Prep
21808181304	WIL04IS03	S	EPA 6020B
21808181304	WIL04IS03	S	EPA 6020 ISM Prep
21808181304	WIL04IS03	S	Dry Weight/Percent Moisture
21808181304	WIL04IS03	S	Incremental Sampling Method
21808181305	WIL04IS01	S	EPA 6020B
21808181305	WIL04IS01	S	EPA 6020 ISM Prep
21808181305	WIL04IS01	S	Dry Weight/Percent Moisture
21808181305	WIL04IS01	S	Incremental Sampling Method
21808181306	WIL04IS02	S	EPA 6020B
21808181306	WIL04IS02	S	EPA 6020 ISM Prep
21808181306	WIL04IS02	S	Dry Weight/Percent Moisture
21808181306	WIL04IS02	S	Incremental Sampling Method
21808181307	WIL03IS03	S	EPA 6020B
21808181307	WIL03IS03	S	EPA 6020 ISM Prep
21808181307	WIL03IS03	S	Dry Weight/Percent Moisture
21808181307	WIL03IS03	S	Incremental Sampling Method
21808181308	WIL03IS02	S	EPA 6020B
21808181308	WIL03IS02	S	EPA 6020 ISM Prep
21808181308	WIL03IS02	S	Dry Weight/Percent Moisture
21808181308	WIL03IS02	S	Incremental Sampling Method

Manual Integrations

Manual Integrations for LC and IC (if performed) are documented in the raw data.
No other manual integrations were performed by GCAL.

Summary of Compounds Detected

WIL03IS01	**Collect Date**	08/14/2018 16:00	**GCAL ID**	21808181301
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	27300	104	209	417	ug/Kg
7439-92-1	Lead	14700	104	209	417	ug/Kg
7440-66-6	Zinc	72900	2090	4170	8340	ug/Kg

WIL01IS02	**Collect Date**	08/14/2018 13:50	**GCAL ID**	21808181302
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	21000	107	214	427	ug/Kg
7439-92-1	Lead	63500	107	214	427	ug/Kg
7440-66-6	Zinc	61200	2140	4270	8550	ug/Kg

WIL03IS00	**Collect Date**	08/16/2018 08:20	**GCAL ID**	21808181303
	Receive Date	08/18/2018 10:45	**Matrix**	Water

EPA 6020B

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-36-0	Antimony	0.74J	0.50	1.00	2.00	ug/L
7440-50-8	Copper	0.26J	0.25	0.50	1.00	ug/L

WIL04IS03	**Collect Date**	08/15/2018 16:10	**GCAL ID**	21808181304
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	15400	96.4	193	386	ug/Kg
7439-92-1	Lead	7260	96.4	193	386	ug/Kg
7440-66-6	Zinc	56500	1930	3860	7710	ug/Kg

Summary of Compounds Detected

WIL04IS01	**Collect Date**	08/15/2018 16:00	**GCAL ID**	21808181305
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	14900	94.8	190	379	ug/Kg
7439-92-1	Lead	7110	94.8	190	379	ug/Kg
7440-66-6	Zinc	56400	1900	3790	7580	ug/Kg

WIL04IS02	**Collect Date**	08/15/2018 16:05	**GCAL ID**	21808181306
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	14400	96.6	193	387	ug/Kg
7439-92-1	Lead	6660	96.6	193	387	ug/Kg
7440-66-6	Zinc	51100	1930	3870	7730	ug/Kg

WIL03IS03	**Collect Date**	08/14/2018 16:10	**GCAL ID**	21808181307
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	35700	141	282	564	ug/Kg
7439-92-1	Lead	22700	141	282	564	ug/Kg
7440-66-6	Zinc	81700	2820	5640	11300	ug/Kg

WIL03IS02	**Collect Date**	08/14/2018 16:05	**GCAL ID**	21808181308
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	23100	106	212	423	ug/Kg
7439-92-1	Lead	14300	106	212	423	ug/Kg
7440-66-6	Zinc	66900	2120	4230	8470	ug/Kg

Metals

Form I

Sample Results

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081813	Client Sample ID:	WIL03IS01
Collect Date:	08/14/18 Time: 1600	GCAL Sample ID:	21808181301
Matrix:	Solid % Solids: 88.78	Instrument ID:	ICPMS2
Sample Amt:	1.35 g	Lab File ID:	2180828B_MS2.b\1841SMPL_2180828A_MS2.D
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1305
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	417	ug/kg	U	209	417	834
Copper	27300	ug/kg		104	209	417
Lead	14700	ug/kg		104	209	417
Zinc	72900	ug/kg		2090	4170	8340

FORM I - IN

Sample Report

Sample Name	21808181301	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1841SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:05:03	**Total Dilution**	370.3704
Sample Type	Sample	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	34.7843541058241	12883.094	0.43	658976.55	500	
Be	9	45	No Gas	1.51291615811282	560.339	3.55	7896.09	1000	
B	11	45	No Gas	13.8599379886126	5133.310	2.86	47782.92	500	
Sr	88	72	No Gas	224.174713702484	83027.672	1.24	7096687.81	1000	
Zr	90	72	No Gas	34.9040526972456	12927.427	1.55	683211.36	100	
Mo	95	115	No Gas	1.78687546398662	661.806	0.77	9771.21	1000	
Ag	107	115	No Gas	0.285336630190074	105.680	4.23	3658.29	100	
Cd	111	115	No Gas	0.879966344631997	325.913	3.66	2318.00	1000	
Sb	121	115	No Gas	0.0874862614392537	32.402	1.71	2415.79	1000	
Ba	137	115	No Gas	386.994956213879	143331.465	3.11	1410380.26	1000	
Tl	205	209	No Gas	0.357171757581415	132.286	0.70	4387.55	1000	
Pb	208	209	No Gas	35.2553864463624	13057.551	3.65	515899.41	1000	
Na	23	45	He	2127.8886467725	788106.906	0.49	657718.91	100000	
Mg	24	45	He	28152.1842405963	10426734.904	0.70	3367840.47	100000	
Al	27	45	He	20336.5009422956	7532037.386	0.67	556686.00	20000	>LDR
Si	29	45	He	-3050.55647247597	-1129835.731	13.15	4382.01	10000	
K	39	45	He	2717.48721269441	1006476.745	0.24	283099.61	100000	
Ca	44	45	He	68172.0978990696	25248925.148	1.18	311717.99	500000	
Ti	47	45	He	249.600787094645	92444.736	1.50	11315.31	1000	
V	51	72	He	72.4524804215182	26834.252	0.48	136573.07	1000	
Cr	52	72	He	49.9940155982367	18516.302	0.54	127072.11	1000	
Mn	55	72	He	1258.26136195625	466022.727	0.63	1101849.96	5000	
Fe	57	72	He	52631.5429358431	19493164.050	0.36	2263215.90	100000	
Co	59	72	He	28.0333718756573	10382.730	0.21	120918.34	1000	
Ni	60	72	He	86.6363390344984	32087.533	0.83	105847.24	2000	
Cu	63	72	He	65.4539172623065	24242.192	1.23	221590.49	1000	
Zn	66	72	He	174.791134569183	64737.457	0.66	82491.47	20000	
As	75	72	He	18.8671585434614	6987.836	0.57	9144.55	1000	
Se	78	72	He	0.749239218706169	277.496	9.56	20.25	50	
Sn	120	115	He	2.22238923540336	823.107	4.18	3689.42	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1010046.16	1156007.06333333	87.37	
Ge	72	He	68626.95	68942.6933333333	99.54	
In	115	He	485859.29	515120.94	94.32	
Lu	175	He	664237.62	860474.493333333	77.19	
Rh	103	He	1925451.94	2061162.14	93.42	
Sc	45	He	87033.45	86332.2766666667	100.81	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2104350.33	2430541.58	86.58	
Ge	72	No Gas	1057260.16	1116846.20666667	94.66	
In	115	No Gas	4742227.35	5301929.88666667	89.44	
Lu	175	No Gas	3463596.20	4111004.52	84.25	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1485258.31	1790396.84666667	82.96	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	4883522.58	5479027.00333333	89.13	
Sc	45	No Gas	4901365.64	5061380.49333333	96.84	
Tb	159	No Gas	4282400.04	4997578.57333333	85.69	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081813	Client Sample ID:	WIL01IS02
Collect Date:	08/14/18 Time: 1350	GCAL Sample ID:	21808181302
Matrix:	Solid % Solids: 93.58	Instrument ID:	ICPMS1
Sample Amt:	1.25 g	Lab File ID:	2180823A_MS1.b\038SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/22/18	Analysis Date:	08/23/18 Time: 1209
Prep Batch:	642442	Analytical Batch:	642536
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	***RESULT***	***UNITS***	***Q***	***DL***	***LOD***	***LOQ***
Antimony	427	ug/kg	U	214	427	855
Copper	21000	ug/kg		107	214	427
Lead	63500	ug/kg		107	214	427
Zinc	61200	ug/kg		2140	4270	8550

FORM I - IN

Sample Report

Sample Name	21808181302	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	038SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:09:39	**Total Dilution**	400.0000
Sample Type	AllRef	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	25.047	10018.809	0.9	1180866.78	500	
Be	9	45	No Gas	1.093	437.112	1.5	7380.96	100	
B	11	45	No Gas	8.223	3289.221	3.8	48142.48	500	
Sr	88	72	No Gas	158.737	63494.667	2.4	3554879.74	1000	
Zr	90	72	No Gas	23.154	9261.527	2.7	351168.58	100	
Mo	95	115	No Gas	1.292	516.866	1.7	5637.71	1000	
Ag	107	115	No Gas	0.196	78.549	4.9	2137.95	100	
Cd	111	115	No Gas	0.71	283.860	2.6	1573.08	1000	
Sb	121	115	No Gas	0.242	96.979	4.5	2943.65	1000	
Ba	137	115	No Gas	320.794	128317.533	2.7	993387.39	1000	
Tl	205	175	No Gas	0.257	102.786	2.4	6611.55	100	
Pb	208	209	No Gas	148.62	59448.179	1.5	4183813.82	1000	
Na	23	45	He	1304.95	521980.034	0.7	610429.97	100000	
Mg	24	45	He	25999.349	10399739.751	0.4	5936695.12	100000	
Al	27	45	He	15864.286	6345714.443	0.4	1054683.66	20000	
Si	29	45	He	981.283	392513.146	4.3	2546.88	10000	
K	39	45	He	2638.835	1055534.058	1.1	270236.04	100000	
Ca	44	45	He	66068.121	26427248.535	0.2	380629.31	500000	
Ti	47	45	He	247.838	99135.221	1.2	11243.46	1000	
V	51	72	He	57.299	22919.716	0.8	93289.41	1000	
Cr	52	72	He	36.663	14665.271	0.4	77078.74	1000	
Mn	55	72	He	1085.168	434067.305	0.6	1046724.33	5000	
Fe	57	72	He	43336.331	17334532.331	0.3	1769738.67	100000	
Co	59	72	He	21.251	8500.510	0.5	73350.64	1000	
Ni	60	72	He	65.724	26289.763	1.5	61354.41	2000	
Cu	63	72	He	49.144	19657.599	0.3	126281.84	1000	
Zn	66	103	He	143.276	57310.505	0.3	45597.66	20000	
As	75	72	He	12.577	5030.648	1.1	3236.99	1000	
Se	78	72	He	-0.149	-59.550	-1821.4	-0.04	50	
Sn	120	115	He	0.121	48.529	4.3	427.79	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1308612.82	1457156.02	89.81	
Ge	72	He	45126.52	46567.3733333333	96.91	
In	115	He	374110.82	401074.37	93.28	
Lu	175	He	1063902.43	1106922.95333333	96.11	
Rh	103	He	1439130.05	1576304.55666667	91.3	
Sc	45	He	79278.23	77709.7233333333	102.02	
Tb	159	He	1861983.05	1926533.77666667	96.65	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3428342.86	3553207.86333333	96.49	
Ge	72	No Gas	617639.72	588164.35	105.01	
In	115	No Gas	3882551.84	3846213.84666667	100.94	
Lu	175	No Gas	5657329.71	5505661.37666667	102.75	
Rh	103	No Gas	3745344.16	3760261.65666667	99.6	
Sc	45	No Gas	3325701.19	3052080.71	108.97	
Tb	159	No Gas	5692492.63	5497134.5	103.55	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081813	Client Sample ID:	WIL03IS00
Collect Date:	08/16/18 Time: 0820	GCAL Sample ID:	21808181303
Matrix:	Water % Solids: NA	Instrument ID:	ICPMS1
Sample Amt:	50 mL	Lab File ID:	2180821A_MS1.b\023SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	1 Analyst: LWZ
Prep Date:	08/20/18	Analysis Date:	08/21/18 Time: 1151
Prep Batch:	642277	Analytical Batch:	642381
Prep Method:	3010A	Analytical Method:	EPA 6020B

ANALYTE	RESULT	UNITS	Q	DL	LOD	LOQ
Antimony	0.74	ug/L	J	0.50	1.00	2.00
Copper	0.26	ug/L	J	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM I - IN

Sample Report

Sample Name	21808181303	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	023SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:51:52	**Total Dilution**	1.0000
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	0.229	0.229	2.1	334077.23	500	
Be	9	45	No Gas	0.006	0.006	22.3	67.33	100	
B	11	45	No Gas	1.754	1.754	6.1	12998.76	500	
Sr	88	103	No Gas	0.141	0.141	2.4	3543.86	1000	
Zr	90	72	No Gas	0.021	0.021	14.3	674.47	100	
Mo	95	115	No Gas	0.049	0.049	18.0	415.57	1000	
Ag	107	115	No Gas	0.009	0.009	7.8	107.78	100	
Cd	111	115	No Gas	0.007	0.007	9.9	25.33	100	
Sb	121	115	No Gas	0.741	0.741	4.5	6950.50	1000	
Ba	137	115	No Gas	0.297	0.297	7.0	973.38	1000	
Tl	205	175	No Gas	-0.071	-0.071	9.9	532.24	100	
Pb	208	209	No Gas	0.126	0.126	4.8	4433.78	1000	
Na	23	45	He	28.548	28.548	2.3	16615.36	100000	
Mg	24	45	He	12.798	12.798	10.1	3063.72	100000	
Al	27	45	He	14.165	14.165	3.4	1022.04	20000	
Si	29	45	He	-42.831	-42.831	3.2	919.37	10000	
K	39	45	He	11.384	11.384	7.6	3717.22	100000	
Ca	44	45	He	98.042	98.042	8.2	683.36	500000	
Ti	47	45	He	0.251	0.251	24.0	15.00	1000	
V	51	72	He	0.118	0.118	10.5	240.00	1000	
Cr	52	72	He	0.163	0.163	7.6	423.34	1000	
Mn	55	45	He	1.535	1.535	8.0	1604.54	5000	
Fe	57	72	He	79.365	79.365	14.8	3527.17	100000	
Co	59	72	He	0.014	0.014	26.3	63.33	1000	
Ni	60	72	He	0.181	0.181	1.0	188.89	2000	
Cu	63	103	He	0.257	0.257	3.4	1442.31	1000	
Zn	66	103	He	2.547	2.547	9.4	970.04	20000	
As	75	72	He	0.008	0.008	24.3	11.33	1000	
Se	78	72	He	0.066	0.066	15.3	3.14	50	
Sn	120	115	He	0.002	0.002	9.8	203.34	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1555159.82	1548427.37333333	100.43	
Ge	72	He	45120.92	44394.6333333333	101.64	
In	115	He	409795.10	404099.316666667	101.41	
Lu	175	He	1280464.59	1190023.24	107.6	
Rh	103	He	1614004.38	1573916.12	102.55	
Sc	45	He	78879.54	75790.99	104.08	
Tb	159	He	2056659.29	2036132.52	101.01	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3605627.55	3602753.49	100.08	
Ge	72	No Gas	579339.40	552452.773333333	104.87	
In	115	No Gas	3893200.90	3822230.42333333	101.86	
Lu	175	No Gas	5575350.75	5635183.66666667	98.94	
Rh	103	No Gas	3824139.85	3660203.32666667	104.48	
Sc	45	No Gas	3153900.85	3019672.93666667	104.45	
Tb	159	No Gas	5624404.29	5550323.25333333	101.33	

I

INORGANIC ANALYSIS DATA SHEET

Report No:	218081813	Client Sample ID:	WIL04IS03
Collect Date:	08/15/18 Time: 1610	GCAL Sample ID:	21808181304
Matrix:	Solid % Solids: 97.47	Instrument ID:	ICPMS1
Sample Amt:	1.33 g	Lab File ID:	2180823A_MS1.b\043SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/22/18	Analysis Date:	08/23/18 Time: 1231
Prep Batch:	642442	Analytical Batch:	642536
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	386	ug/kg	U	193	386	771
Copper	15400	ug/kg		96.4	193	386
Lead	7260	ug/kg		96.4	193	386
Zinc	56500	ug/kg		1930	3860	7710

FORM I - IN

Sample Report

Sample Name	21808181304	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	043SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:31:34	**Total Dilution**	375.9398
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	24.096	9058.798	0.9	1134007.61	500	
Be	9	45	No Gas	1.139	428.187	1.6	7595.06	100	
B	11	45	No Gas	11.986	4506.086	0.7	62414.94	500	
Sr	88	72	No Gas	189.667	71303.388	1.8	4217301.81	1000	
Zr	90	72	No Gas	31.468	11829.893	2.5	473686.94	100	
Mo	95	115	No Gas	1.53	575.205	1.5	6637.01	1000	
Ag	107	115	No Gas	0.138	51.950	11.2	1526.76	100	
Cd	111	115	No Gas	0.771	289.980	4.6	1703.76	1000	
Sb	121	115	No Gas	0.497	186.723	4.8	5174.25	1000	
Ba	137	115	No Gas	325.156	122239.017	1.8	1005140.41	1000	
Tl	205	175	No Gas	0.326	122.584	2.2	8013.36	100	
Pb	208	209	No Gas	18.817	7074.177	2.0	533032.21	1000	
Na	23	45	He	1516.66	570172.815	0.3	700379.03	100000	
Mg	24	45	He	22758.937	8555991.278	0.9	5134557.11	100000	
Al	27	45	He	14370.519	5402450.712	0.5	943942.39	20000	
Si	29	45	He	658.693	247628.995	3.8	1996.13	10000	
K	39	45	He	2058.583	773903.531	0.7	208948.69	100000	
Ca	44	45	He	39203.139	14738022.061	1.4	223202.48	500000	
Ti	47	45	He	370.702	139361.772	0.1	16612.91	1000	
V	51	72	He	55.276	20780.353	0.8	91866.21	1000	
Cr	52	72	He	35.907	13498.940	1.2	77062.14	1000	
Mn	55	72	He	821.457	308818.369	0.6	808876.03	5000	
Fe	57	72	He	40085.12	15069594.066	0.8	1670974.87	100000	
Co	59	72	He	22.033	8283.180	0.8	77633.42	1000	
Ni	60	72	He	69.435	26103.225	0.7	66162.95	2000	
Cu	63	72	He	39.9	15000.149	0.5	104769.13	1000	
Zn	66	103	He	146.603	55113.915	0.5	46502.22	20000	
As	75	72	He	11.256	4231.706	2.3	2958.27	1000	
Se	78	72	He	-0.161	-60.343	-3186.5	-0.29	50	
Sn	120	115	He	0.074	27.780	6.5	370.01	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1351626.91	1457156.02	92.76	
Ge	72	He	46062.47	46567.3733333333	98.92	
In	115	He	380219.65	401074.37	94.8	
Lu	175	He	1076831.73	1106922.95333333	97.28	
Rh	103	He	1434431.43	1576304.55666667	91	
Sc	45	He	78329.23	77709.7233333333	100.8	
Tb	159	He	1881691.48	1926533.77666667	97.67	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3445566.61	3553207.86333333	96.97	
Ge	72	No Gas	613244.35	588164.35	104.26	
In	115	No Gas	3876491.01	3846213.84666667	100.79	
Lu	175	No Gas	5636647.00	5505661.37666667	102.38	
Rh	103	No Gas	3747052.77	3760261.65666667	99.65	
Sc	45	No Gas	3284736.74	3052080.71	107.62	
Tb	159	No Gas	5718583.46	5497134.5	104.03	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081813	Client Sample ID:	WIL04IS01
Collect Date:	08/15/18 Time: 1600	GCAL Sample ID:	21808181305
Matrix:	Solid % Solids: 97.68	Instrument ID:	ICPMS1
Sample Amt:	1.35 g	Lab File ID:	2180823A_MS1.b\044SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/22/18	Analysis Date:	08/23/18 Time: 1235
Prep Batch:	642442	Analytical Batch:	642536
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	379	ug/kg	U	190	379	758
Copper	14900	ug/kg		94.8	190	379
Lead	7110	ug/kg		94.8	190	379
Zinc	56400	ug/kg		1900	3790	7580

FORM I - IN

Sample Report

Sample Name	21808181305	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	044SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:35:57	**Total Dilution**	370.3704
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	24.967	9246.869	1.3	1167195.58	500	
Be	9	45	No Gas	1.134	420.018	2.8	7584.39	100	
B	11	45	No Gas	10.282	3808.285	1.3	55848.60	500	
Sr	88	72	No Gas	183.36	67911.077	1.4	4099666.08	1000	
Zr	90	72	No Gas	30.617	11339.501	3.2	463458.73	100	
Mo	95	115	No Gas	1.458	540.145	2.6	6333.54	1000	
Ag	107	115	No Gas	0.129	47.594	6.3	1425.64	100	
Cd	111	115	No Gas	0.732	271.112	4.0	1619.09	1000	
Sb	121	115	No Gas	0.279	103.168	5.3	3255.93	1000	
Ba	137	115	No Gas	338.063	125208.657	2.6	1045220.83	1000	
Tl	205	175	No Gas	0.312	115.450	1.2	7732.09	100	
Pb	208	209	No Gas	18.761	6948.392	2.2	533016.49	1000	
Na	23	45	He	1523.249	564166.236	0.8	704960.20	100000	
Mg	24	45	He	23934.319	8864562.578	1.3	5411860.13	100000	
Al	27	45	He	14998.019	5554821.779	0.6	987223.73	20000	
Si	29	45	He	786.769	291396.022	2.7	2206.83	10000	
K	39	45	He	2143.717	793969.383	0.9	217924.61	100000	
Ca	44	45	He	41263.187	15282661.706	1.3	235452.30	500000	
Ti	47	45	He	380.967	141098.729	1.5	17110.43	1000	
V	51	72	He	56.934	21086.488	0.7	93979.05	1000	
Cr	52	72	He	37.644	13942.372	0.5	80247.01	1000	
Mn	55	72	He	809.34	299755.632	0.8	791558.01	5000	
Fe	57	72	He	40330.509	14937225.411	0.0	1670016.80	100000	
Co	59	72	He	22.472	8322.803	0.6	78643.68	1000	
Ni	60	72	He	72.196	26739.283	0.7	68333.80	2000	
Cu	63	72	He	39.351	14574.593	1.3	102631.52	1000	
Zn	66	103	He	148.808	55114.079	1.5	47531.94	20000	
As	75	72	He	11.979	4436.624	1.0	3126.30	1000	
Se	78	72	He	0.101	37.299	174.1	4.86	50	
Sn	120	115	He	0.077	28.642	11.0	374.45	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1309218.76	1457156.02	89.85	
Ge	72	He	45764.08	46567.3733333333	98.27	
In	115	He	380091.89	401074.37	94.77	
Lu	175	He	1080207.62	1106922.95333333	97.59	
Rh	103	He	1444638.62	1576304.55666667	91.65	
Sc	45	He	78512.26	77709.7233333333	101.03	
Tb	159	He	1890525.39	1926533.77666667	98.13	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3455748.38	3553207.86333333	97.26	
Ge	72	No Gas	616577.39	588164.35	104.83	
In	115	No Gas	3876678.86	3846213.84666667	100.79	
Lu	175	No Gas	5647581.58	5505661.37666667	102.58	
Rh	103	No Gas	3756261.24	3760261.65666667	99.89	
Sc	45	No Gas	3294654.94	3052080.71	107.95	
Tb	159	No Gas	5729742.83	5497134.5	104.23	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081813	Client Sample ID:	WIL04IS02
Collect Date:	08/15/18 Time: 1605	GCAL Sample ID:	21808181306
Matrix:	Solid % Solids: 97.99	Instrument ID:	ICPMS1
Sample Amt:	1.32 g	Lab File ID:	2180823A_MS1.b\045SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/22/18	Analysis Date:	08/23/18 Time: 1240
Prep Batch:	642442	Analytical Batch:	642536
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	387	ug/kg	U	193	387	773
Copper	14400	ug/kg		96.6	193	387
Lead	6660	ug/kg		96.6	193	387
Zinc	51100	ug/kg		1930	3870	7730

FORM I - IN

Sample Report

Sample Name	21808181306	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	045SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:40:19	**Total Dilution**	378.7879
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	23.031	8723.988	4.0	1097641.57	500	
Be	9	45	No Gas	0.999	378.385	2.4	6671.34	100	
B	11	45	No Gas	9.024	3418.240	3.3	50699.65	500	
Sr	88	72	No Gas	167.889	63594.436	2.0	3756753.90	1000	
Zr	90	72	No Gas	27.549	10435.108	4.4	417428.33	100	
Mo	95	115	No Gas	1.368	518.252	3.4	6035.64	1000	
Ag	107	115	No Gas	0.123	46.528	6.0	1385.63	100	
Cd	111	115	No Gas	0.657	248.985	0.3	1478.40	1000	
Sb	121	115	No Gas	0.186	70.628	2.7	2483.56	1000	
Ba	137	115	No Gas	342.432	129708.956	2.8	1074014.37	1000	
Tl	205	175	No Gas	0.267	101.250	3.9	6922.81	100	
Pb	208	209	No Gas	17.24	6530.306	2.6	493206.75	1000	
Na	23	45	He	1485.105	562539.679	1.6	693621.06	100000	
Mg	24	45	He	22028.662	8344190.112	1.8	5026261.80	100000	
Al	27	45	He	13555.541	5134674.686	0.9	900431.33	20000	
Si	29	45	He	703.339	266416.402	2.1	2091.48	10000	
K	39	45	He	1885.066	714040.065	1.1	193736.14	100000	
Ca	44	45	He	37499.874	14204497.599	0.8	215899.13	500000	
Ti	47	45	He	337.885	127986.713	0.6	15312.34	1000	
V	51	72	He	52.808	20002.961	0.8	87249.33	1000	
Cr	52	72	He	34.475	13058.587	0.6	73560.82	1000	
Mn	55	72	He	786.184	297796.977	0.4	769618.32	5000	
Fe	57	72	He	39417.277	14930786.817	1.7	1633669.30	100000	
Co	59	72	He	20.588	7798.447	1.0	72123.08	1000	
Ni	60	72	He	64.342	24371.991	0.7	60954.28	2000	
Cu	63	72	He	37.174	14081.222	0.5	97079.14	1000	
Zn	66	103	He	132.071	50026.958	0.5	43225.59	20000	
As	75	72	He	10.489	3973.082	1.4	2741.07	1000	
Se	78	72	He	0.096	36.214	5.8	4.86	50	
Sn	120	115	He	0.062	23.631	6.5	356.68	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1351579.51	1457156.02	92.75	
Ge	72	He	45796.12	46567.3733333333	98.34	
In	115	He	382439.63	401074.37	95.35	
Lu	175	He	1088826.41	1106922.95333333	98.37	
Rh	103	He	1479657.48	1576304.55666667	93.87	
Sc	45	He	79217.73	77709.7233333333	101.94	
Tb	159	He	1882803.83	1926533.77666667	97.73	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3480004.84	3553207.86333333	97.94	
Ge	72	No Gas	617026.54	588164.35	104.91	
In	115	No Gas	3933700.13	3846213.84666667	102.27	
Lu	175	No Gas	5736999.70	5505661.37666667	104.2	
Rh	103	No Gas	3822205.27	3760261.65666667	101.65	
Sc	45	No Gas	3284301.75	3052080.71	107.61	
Tb	159	No Gas	5772331.99	5497134.5	105.01	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081813	Client Sample ID:	WIL03IS03
Collect Date:	08/14/18 Time: 1610	GCAL Sample ID:	21808181307
Matrix:	Solid % Solids: 70.33	Instrument ID:	ICPMS2
Sample Amt:	1.26 g	Lab File ID:	2180828C_MS2.b\001SMPL.d
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1355
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	564	ug/kg	U	282	564	1130
Copper	35700	ug/kg		141	282	564
Lead	22700	ug/kg		141	282	564
Zinc	81700	ug/kg		2820	5640	11300

FORM I - IN

Sample Report

Sample Name	21808181307	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	001SMPL.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:55:03	**Total Dilution**	396.8254
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	27.5913281898446	10948.940	1.45	564031.15	500	
Be	9	45	No Gas	1.14635680236432	454.903	2.81	6097.92	1000	
B	11	45	No Gas	12.9983102645623	5158.060	4.43	45793.08	500	
Sr	88	72	No Gas	199.829623382859	79297.470	0.60	6519589.70	1000	
Zr	90	72	No Gas	31.4284821200826	12471.620	3.15	634150.04	100	
Mo	95	115	No Gas	1.59153080134503	631.560	0.94	9143.01	1000	
Ag	107	115	No Gas	0.218137827288481	86.563	4.08	2943.67	100	
Cd	111	115	No Gas	0.708526005150152	281.161	6.00	1961.27	1000	
Sb	121	115	No Gas	0.0959506711567522	38.076	2.34	2631.39	1000	
Ba	137	115	No Gas	499.500915845774	198214.649	2.61	1907740.97	1000	
Tl	205	209	No Gas	0.304696390337226	120.911	4.96	4057.42	1000	
Pb	208	209	No Gas	40.2483828710579	15971.581	2.93	625812.65	1000	
Na	23	45	He	2640.29154537584	1047734.740	0.83	812795.69	100000	
Mg	24	45	He	24232.5006293793	9616071.678	0.66	2891106.52	100000	
Al	27	45	He	16601.2347311277	6587791.560	0.58	453261.23	20000	
Si	29	45	He	-2392.51092994339	-949409.099	21.91	5048.24	10000	
K	39	45	He	2466.54894074672	978789.262	0.34	257307.85	100000	
Ca	44	45	He	56341.3461177015	22357677.031	0.99	257000.20	500000	
Ti	47	45	He	255.127273169188	101240.981	1.42	11536.82	1000	
V	51	72	He	59.7269453840595	23701.169	0.78	115844.41	1000	
Cr	52	72	He	40.1494919411648	15932.338	0.65	105399.21	1000	
Mn	55	72	He	958.092047331104	380195.257	0.70	863193.23	5000	
Fe	57	72	He	41523.3478908348	16477519.004	1.09	1837101.01	100000	
Co	59	72	He	21.1113974063945	8377.539	1.07	93706.50	1000	
Ni	60	72	He	68.8854416011552	27335.493	0.38	86639.46	2000	
Cu	63	72	He	63.2350848551066	25093.288	0.90	220245.76	1000	
Zn	66	72	He	144.792476612239	57457.332	0.34	70500.39	20000	
As	75	72	He	15.3110403162449	6075.810	1.46	7639.01	1000	
Se	78	72	He	0.109297715174647	43.372	93.52	7.08	50	
Sn	120	115	He	2.25770545179702	895.915	1.68	3939.49	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1087489.00	1156007.06333333	94.07	
Ge	72	He	70613.84	68942.6933333333	102.42	
In	115	He	511866.49	515120.94	99.37	
Lu	175	He	710996.21	860474.493333333	82.63	
Rh	103	He	2035035.75	2061162.14	98.73	
Sc	45	He	86806.62	86332.2766666667	100.55	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2236619.03	2430541.58	92.02	
Ge	72	No Gas	1089746.80	1116846.20666667	97.57	
In	115	No Gas	4971569.75	5301929.88666667	93.77	
Lu	175	No Gas	3775828.07	4111004.52	91.85	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1614750.86	1790396.84666667	90.19	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5131224.10	5479027.00333333	93.65	
Sc	45	No Gas	4980498.83	5061380.49333333	98.4	
Tb	159	No Gas	4678517.74	4997578.57333333	93.62	

I

INORGANIC ANALYSIS DATA SHEET

Report No:	218081813	Client Sample ID:	WIL03IS02
Collect Date:	08/14/18 Time: 1605	GCAL Sample ID:	21808181308
Matrix:	Solid % Solids: 92.27	Instrument ID:	ICPMS2
Sample Amt:	1.28 g	Lab File ID:	2180828B_MS2.b\1842SMPL_2180828A_MS2.D
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1308
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	423	ug/kg	U	212	423	847
Copper	23100	ug/kg		106	212	423
Lead	14300	ug/kg		106	212	423
Zinc	66900	ug/kg		2120	4230	8470

FORM I - IN

Sample Report

Sample Name	21808181308	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1842SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:08:36	**Total Dilution**	390.6250
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	32.2808623430283	12609.712	1.37	621430.19	500	
Be	9	45	No Gas	1.17403844485939	458.609	3.63	6129.93	1000	
B	11	45	No Gas	12.4541448509837	4864.900	0.44	43222.19	500	
Sr	88	72	No Gas	180.986722677037	70697.939	2.37	5802882.41	1000	
Zr	90	72	No Gas	26.4795746544216	10343.584	2.60	525060.59	100	
Mo	95	115	No Gas	1.38504455546929	541.033	1.42	7821.12	1000	
Ag	107	115	No Gas	0.241412846654603	94.302	3.12	3182.61	100	
Cd	111	115	No Gas	0.752281912046537	293.860	6.51	2037.94	1000	
Sb	121	115	No Gas	0.0657481738914089	25.683	6.10	2229.09	1000	
Ba	137	115	No Gas	301.923573848772	117938.896	1.44	1128631.90	1000	
Tl	205	209	No Gas	0.329898637097024	128.867	7.30	4244.17	1000	
Pb	208	209	No Gas	33.7513066579312	13184.104	2.86	512921.55	1000	
Na	23	45	He	2844.59333649324	1111169.272	0.37	870116.55	100000	
Mg	24	45	He	25827.5212265851	10088875.479	0.89	3063218.91	100000	
Al	27	45	He	18245.9500601158	7127324.242	1.19	495181.43	20000	
Si	29	45	He	-2789.91729056437	-1089811.442	8.96	4613.40	10000	
K	39	45	He	2803.31432203088	1095044.657	0.38	289185.17	100000	
Ca	44	45	He	58807.179274329	22971554.404	1.25	266637.37	500000	
Ti	47	45	He	297.331607199362	116145.159	2.34	13363.70	1000	
V	51	72	He	61.3035882162084	23946.714	0.11	117510.03	1000	
Cr	52	72	He	43.4306286697812	16965.089	2.02	112493.33	1000	
Mn	55	72	He	1034.71539514026	404185.701	0.38	921272.99	5000	
Fe	57	72	He	42602.3263263969	16641533.721	0.40	1862750.07	100000	
Co	59	72	He	23.2246144321499	9072.115	0.40	101870.71	1000	
Ni	60	72	He	72.5942517621144	28357.130	1.32	90225.87	2000	
Cu	63	72	He	54.5060608479484	21291.430	0.80	187657.46	1000	
Zn	66	72	He	157.920736273518	61687.788	0.28	75888.18	20000	
As	75	72	He	13.562785431333	5297.963	0.31	6690.22	1000	
Se	78	72	He	0.420780495077762	164.367	29.63	13.56	50	
Sn	120	115	He	5.71281501312994	2231.568	5.60	8692.78	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1050948.19	1156007.06333333	90.91	
Ge	72	He	69784.04	68942.6933333333	101.22	
In	115	He	488685.77	515120.94	94.87	
Lu	175	He	682289.89	860474.493333333	79.29	
Rh	103	He	1969078.12	2061162.14	95.53	
Sc	45	He	86286.35	86332.2766666667	99.95	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2185542.89	2430541.58	89.92	
Ge	72	No Gas	1070531.00	1116846.20666667	95.85	
In	115	No Gas	4866264.81	5301929.88666667	91.78	
Lu	175	No Gas	3536246.51	4111004.52	86.02	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1522872.63	1790396.84666667	85.06	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	4998002.30	5479027.00333333	91.22	
Sc	45	No Gas	4889372.17	5061380.49333333	96.6	
Tb	159	No Gas	4384072.95	4997578.57333333	87.72	

Metals

Form II

Calibration Verifications

II

INITIAL CALIBRATION VERIFICATION (ICV) STANDARD

Report No:	218081813	GCAL QC ID:	1600
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\017_ICV.d
Analyst:	LWZ	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 1036	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	50.0	49.7	99		ug/L
Copper	50.0	50.9	102		ug/L
Lead	50.0	48.8	98		ug/L
Zinc	1000	1000	100		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	1600	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	017_ICV.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 10:36:40	**Total Dilution**	1.0000
Sample Type	ICV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	246.381	246.381	1.8	8181672.38	250	
Be	9	45	No Gas	49.238	49.238	1.7	304791.88	50	
B	11	45	No Gas	275.124	275.124	1.7	1036109.99	250	> +/- 10%
Sr	88	72	No Gas	48.956	48.956	1.5	1053434.96	50	
Zr	90	72	No Gas	46.874	46.874	2.0	682390.35	50	
Mo	95	115	No Gas	48.962	48.962	3.4	207217.15	50	
Ag	107	115	No Gas	48.124	48.124	0.8	501695.01	50	
Cd	111	115	No Gas	49.894	49.894	2.3	108055.40	50	
Sb	121	115	No Gas	49.689	49.689	1.7	436563.47	50	
Ba	137	115	No Gas	48.806	48.806	3.3	150697.77	50	
Tl	205	175	No Gas	48.73	48.730	2.7	997909.19	50	
Pb	208	209	No Gas	48.772	48.772	2.0	1389206.42	50	
Na	23	45	He	5187.813	5187.813	0.9	2317212.36	5000	
Mg	24	45	He	4896.993	4896.993	0.6	1072598.63	5000	
Al	27	45	He	1013.026	1013.026	1.0	64662.54	1000	
Si	29	45	He	5432.968	5432.968	1.8	9412.66	5000	
K	39	45	He	5057.886	5057.886	0.6	494150.90	5000	
Ca	44	45	He	24662.898	24662.898	0.9	136352.84	25000	
Ti	47	45	He	51.555	51.555	1.2	2247.16	50	
V	51	72	He	49.233	49.233	0.7	79767.76	50	
Cr	52	72	He	50.301	50.301	0.7	105216.78	50	
Mn	55	72	He	50.128	50.128	0.7	48177.60	50	
Fe	57	72	He	5020.6	5020.600	0.2	204079.36	5000	
Co	59	72	He	50.164	50.164	0.3	172263.04	50	
Ni	60	72	He	101.243	101.243	0.6	94022.92	100	
Cu	63	72	He	50.948	50.948	0.2	130266.13	50	
Zn	66	103	He	1001.496	1001.496	1.1	330236.73	1000	
As	75	72	He	50.514	50.514	2.0	12903.90	50	
Se	78	72	He	25.555	25.555	1.4	505.15	25	
Sn	120	115	He	49.378	49.378	0.8	68657.34	50	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1387723.99	1457156.02	95.24	
Ge	72	He	44917.03	46567.3733333333	96.46	
In	115	He	387075.74	401074.37	96.51	
Lu	175	He	1085991.52	1106922.95333333	98.11	
Rh	103	He	1497555.43	1576304.55666667	95	
Sc	45	He	76038.66	77709.7233333333	97.85	
Tb	159	He	1867698.62	1926533.77666667	96.95	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3467671.41	3553207.86333333	97.59	
Ge	72	No Gas	593338.78	588164.35	100.88	
In	115	No Gas	3870560.33	3846213.84666667	100.63	
Lu	175	No Gas	5591599.71	5505661.37666667	101.56	
Rh	103	No Gas	3700885.55	3760261.65666667	98.42	
Sc	45	No Gas	3088690.92	3052080.71	101.2	
Tb	159	No Gas	5585487.21	5497134.5	101.61	

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION (LLCCV) STANDARD

Report No:	218081813	GCAL QC ID:	1803
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\019CCV1.d
Analyst:	LWZ	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 1045	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	2.00	1.95	98		ug/L
Copper	1.00	0.960	96		ug/L
Lead	1.00	0.980	98		ug/L
Zinc	20.0	20.4	102		ug/L

CONTROL LIMITS 80-120%

FORM II - IN

Sample Report

Sample Name	1803	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	019CCV1.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 10:45:30	**Total Dilution**	1.0000
Sample Type	LLCCV1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	5.1	5.100	2.1	460164.38	5	
Be	9	45	No Gas	1.018	1.018	4.1	6421.91	1	
B	11	45	No Gas	12.087	12.087	2.5	59330.67	10	> +/- 20%
Sr	88	72	No Gas	1.003	1.003	1.7	22192.74	1	
Zr	90	72	No Gas	0.895	0.895	2.2	13616.98	1	
Mo	95	115	No Gas	0.995	0.995	5.1	4413.98	1	
Ag	107	115	No Gas	0.998	0.998	1.8	10621.43	1	
Cd	111	115	No Gas	1.035	1.035	1.5	2301.84	1	
Sb	121	115	No Gas	1.953	1.953	2.2	18166.19	2	
Ba	137	115	No Gas	1.045	1.045	6.5	3365.96	1	
Tl	205	175	No Gas	0.983	0.983	1.6	21124.05	1	
Pb	208	209	No Gas	0.984	0.984	2.2	29806.16	1	
Na	23	45	He	104.092	104.092	2.1	50800.53	100	
Mg	24	45	He	101.731	101.731	3.5	22816.28	100	
Al	27	45	He	20.071	20.071	3.0	1376.07	20	
Si	29	45	He	234.238	234.238	2.5	1295.39	200	
K	39	45	He	101.021	101.021	1.3	12928.73	100	
Ca	44	45	He	516.85	516.850	7.3	3023.67	500	
Ti	47	45	He	0.956	0.956	17.7	47.33	1	
V	51	72	He	0.984	0.984	2.4	1713.45	1	
Cr	52	72	He	0.972	0.972	3.9	2199.06	1	
Mn	55	72	He	5.104	5.104	3.3	5140.87	5	
Fe	57	72	He	107.118	107.118	4.1	4570.82	100	
Co	59	72	He	1.031	1.031	5.9	3717.12	1	
Ni	60	72	He	2.054	2.054	6.4	2024.59	2	
Cu	63	72	He	0.963	0.963	2.9	3108.11	1	
Zn	66	103	He	20.429	20.429	1.5	7352.84	20	
As	75	72	He	1.029	1.029	3.5	283.50	1	
Se	78	72	He	1.099	1.099	4.9	25.42	1	
Sn	120	115	He	0.978	0.978	5.2	1693.45	1	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1463353.00	1457156.02	100.43	
Ge	72	He	46596.21	46567.3733333333	100.06	
In	115	He	402479.97	401074.37	100.35	
Lu	175	He	1104702.41	1106922.95333333	99.8	
Rh	103	He	1580554.59	1576304.55666667	100.27	
Sc	45	He	77384.76	77709.7233333333	99.58	
Tb	159	He	1934761.79	1926533.77666667	100.43	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3587777.13	3553207.86333333	100.97	
Ge	72	No Gas	597630.39	588164.35	101.61	
In	115	No Gas	3920349.82	3846213.84666667	101.93	
Lu	175	No Gas	5527214.71	5505661.37666667	100.39	
Rh	103	No Gas	3857161.24	3760261.65666667	102.58	
Sc	45	No Gas	3103171.82	3052080.71	101.67	
Tb	159	No Gas	5539687.21	5497134.5	100.77	

II

LINEAR DYNAMIC RANGE (LDR) STANDARD

Report No:	218081813	GCAL QC ID:	2500
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\022_QC1.d
Analyst:	LWZ	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 1058	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	1000	909	91		ug/L
Copper	1000	923	92		ug/L
Lead	1000	952	95		ug/L
Zinc	20000	19600	98		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	LDR	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	022_QC1.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 10:58:42	**Total Dilution**	1.0000
Sample Type	QC1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Be	9	45	No Gas	888.033	888.033	3.3	5407549.33	1000	>= +/- 30%
Sr	88	72	No Gas	909.852	909.852	3.0	19019265.97	1000	
Mo	95	115	No Gas	1010.891	1010.891	2.8	3783476.93	1000	
Cd	111	115	No Gas	926.51	926.510	3.6	1775458.21	1000	
Sb	121	115	No Gas	908.966	908.966	3.5	7054488.61	1000	
Ba	137	115	No Gas	996.865	996.865	4.0	2722394.89	1000	
Tl	205	175	No Gas	890.764	890.764	1.7	16760064.89	1000	>= +/- 30%
Pb	208	209	No Gas	951.719	951.719	2.2	22559187.27	1000	
Na	23	45	He	94268.138	94268.138	0.7	41823611.88	100000	
Mg	24	45	He	90488.522	90488.522	1.0	19713051.79	100000	
Al	27	45	He	19657.897	19657.897	3.3	1247014.58	20000	
K	39	45	He	96432.926	96432.926	1.3	9319952.36	100000	
Ca	44	45	He	493753.64	493753.640	1.0	2713219.54	500000	
Ti	47	45	He	975.619	975.619	1.0	42211.94	1000	
V	51	72	He	1017.558	1017.558	1.2	1565087.89	1000	
Cr	52	72	He	1000.119	1000.119	1.8	1985594.29	1000	
Mn	55	72	He	5010.273	5010.273	1.1	4568695.79	5000	
Fe	57	72	He	97087.165	97087.165	0.8	3747730.98	100000	
Co	59	72	He	950.948	950.948	1.0	3101410.02	1000	
Ni	60	72	He	1895.189	1895.189	2.3	1671528.13	2000	
Cu	63	72	He	922.587	922.587	0.3	2231764.98	1000	
Zn	66	103	He	19644.989	19644.989	1.1	5213689.10	20000	
As	75	72	He	947.611	947.611	0.9	229811.74	1000	
Sn	120	115	He	975.119	975.119	0.5	1225154.01	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1037640.87	1457156.02	71.21	
Ge	72	He	42666.71	46567.3733333333	91.62	
In	115	He	351109.53	401074.37	87.54	
Lu	175	He	1010501.94	1106922.95333333	91.29	
Rh	103	He	1205937.38	1576304.55666667	76.5	
Sc	45	He	75636.83	77709.7233333333	97.33	
Tb	159	He	1720142.27	1926533.77666667	89.29	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2888011.83	3553207.86333333	81.28	
Ge	72	No Gas	576592.23	588164.35	98.03	
In	115	No Gas	3424065.46	3846213.84666667	89.02	
Lu	175	No Gas	5143915.13	5505661.37666667	93.43	
Rh	103	No Gas	3236756.96	3760261.65666667	86.08	
Sc	45	No Gas	3039285.30	3052080.71	99.58	
Tb	159	No Gas	5142799.30	5497134.5	93.55	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081813	GCAL QC ID:	1800
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\036_CCV.d
Analyst:	LWZ	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 1200	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	19.5	98		ug/L
Copper	10.0	9.97	100		ug/L
Lead	10.0	9.44	94		ug/L
Zinc	200	198	99		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	036_CCV.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:00:37	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	50.647	50.647	0.4	2049928.46	50	
Be	9	45	No Gas	9.897	9.897	1.3	65613.61	10	
B	11	45	No Gas	47.132	47.132	3.4	202370.46	50	
Sr	88	72	No Gas	9.784	9.784	0.8	226128.69	10	
Zr	90	72	No Gas	9.848	9.848	1.5	154133.36	10	
Mo	95	115	No Gas	9.699	9.699	2.3	43485.44	10	
Ag	107	115	No Gas	10.109	10.109	1.2	111356.68	10	
Cd	111	115	No Gas	10.043	10.043	1.3	22991.88	10	
Sb	121	115	No Gas	19.506	19.506	1.8	181484.39	20	
Ba	137	115	No Gas	9.977	9.977	1.3	32610.87	10	
Tl	205	175	No Gas	9.565	9.565	1.5	206379.61	10	
Pb	208	209	No Gas	9.44	9.440	0.5	288353.93	10	
Na	23	45	He	993.009	993.009	0.5	470204.59	1000	
Mg	24	45	He	989.17	989.170	1.0	228351.55	1000	
Al	27	45	He	202.454	202.454	0.7	13673.55	200	
Si	29	45	He	2051.633	2051.633	3.2	4338.59	2000	
K	39	45	He	1014.413	1014.413	0.5	106836.30	1000	
Ca	44	45	He	5199.177	5199.177	1.3	30376.26	5000	
Ti	47	45	He	10.49	10.490	3.5	485.68	10	
V	51	72	He	9.684	9.684	2.5	17068.93	10	
Cr	52	72	He	9.795	9.795	0.4	22293.99	10	
Mn	55	72	He	49.525	49.525	0.3	51615.78	50	
Fe	57	72	He	989.38	989.380	0.1	43658.65	1000	
Co	59	72	He	9.866	9.866	2.0	36768.64	10	
Ni	60	72	He	20.034	20.034	0.7	20214.67	20	
Cu	63	72	He	9.974	9.974	2.3	28127.42	10	
Zn	66	103	He	198.17	198.170	1.0	71612.91	200	
As	75	72	He	9.832	9.832	1.7	2732.73	10	
Se	78	72	He	10.126	10.126	4.6	218.98	10	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1510137.53	1457156.02	103.64	
Ge	72	He	48709.11	46567.3733333333	104.6	
In	115	He	417696.53	401074.37	104.14	
Lu	175	He	1143707.64	1106922.95333333	103.32	
Rh	103	He	1636226.05	1576304.55666667	103.8	
Sc	45	He	80099.92	77709.7233333333	103.08	
Tb	159	He	2011698.51	1926533.77666667	104.42	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3709867.55	3553207.86333333	104.41	
Ge	72	No Gas	636102.63	588164.35	108.15	
In	115	No Gas	4086200.90	3846213.84666667	106.24	
Lu	175	No Gas	5859889.29	5505661.37666667	106.43	
Rh	103	No Gas	4049541.23	3760261.65666667	107.69	
Sc	45	No Gas	3304310.49	3052080.71	108.26	
Tb	159	No Gas	5861983.04	5497134.5	106.64	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081813	GCAL QC ID:	1800
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\056_CCV.d
Analyst:	LWZ	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 1328	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	19.8	99		ug/L
Copper	10.0	10.1	101		ug/L
Lead	10.0	9.43	94		ug/L
Zinc	200	199	100		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	056_CCV.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 13:28:34	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	52.006	52.006	1.5	1981174.45	50	
Be	9	45	No Gas	9.912	9.912	2.0	62110.10	10	
B	11	45	No Gas	46.839	46.839	3.4	190212.59	50	
Sr	88	72	No Gas	9.978	9.978	2.3	216772.11	10	
Zr	90	72	No Gas	10.674	10.674	2.7	157009.21	10	
Mo	95	115	No Gas	9.702	9.702	3.0	42127.35	10	
Ag	107	115	No Gas	10.006	10.006	1.4	106770.21	10	
Cd	111	115	No Gas	9.895	9.895	2.0	21945.41	10	
Sb	121	115	No Gas	19.791	19.791	0.8	178358.58	20	
Ba	137	115	No Gas	9.974	9.974	0.2	31580.94	10	
Tl	205	175	No Gas	9.615	9.615	1.4	200090.63	10	
Pb	208	209	No Gas	9.431	9.431	1.4	280490.95	10	
Na	23	45	He	986.06	986.060	1.0	448288.76	1000	
Mg	24	45	He	980.221	980.221	0.3	217248.91	1000	
Al	27	45	He	202.196	202.196	2.0	13111.14	200	
Si	29	45	He	2051.97	2051.970	0.8	4165.87	2000	
K	39	45	He	1003.581	1003.581	1.9	101503.99	1000	
Ca	44	45	He	5110.79	5110.790	1.8	28668.28	5000	
Ti	47	45	He	9.71	9.710	4.7	432.01	10	
V	51	72	He	9.506	9.506	2.1	15905.51	10	
Cr	52	72	He	9.802	9.802	0.7	21178.09	10	
Mn	55	72	He	50.516	50.516	0.9	49979.55	50	
Fe	57	72	He	1007.346	1007.346	1.2	42198.27	1000	
Co	59	72	He	10.033	10.033	1.6	35503.84	10	
Ni	60	72	He	20.115	20.115	2.4	19269.19	20	
Cu	63	72	He	10.072	10.072	1.0	26961.01	10	
Zn	66	103	He	199.316	199.316	1.3	68356.77	200	
As	75	72	He	10.037	10.037	2.0	2648.88	10	
Se	78	72	He	10.081	10.081	4.6	206.98	10	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1451045.60	1457156.02	99.58	
Ge	72	He	46230.78	46567.3733333333	99.28	
In	115	He	397653.19	401074.37	99.15	
Lu	175	He	1104978.81	1106922.95333333	99.82	
Rh	103	He	1553022.58	1576304.55666667	98.52	
Sc	45	He	76901.54	77709.7233333333	98.96	
Tb	159	He	1946660.34	1926533.77666667	101.04	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3612223.07	3553207.86333333	101.66	
Ge	72	No Gas	597906.73	588164.35	101.66	
In	115	No Gas	3958181.33	3846213.84666667	102.91	
Lu	175	No Gas	5652581.79	5505661.37666667	102.67	
Rh	103	No Gas	3867977.21	3760261.65666667	102.86	
Sc	45	No Gas	3122405.78	3052080.71	102.3	
Tb	159	No Gas	5681091.58	5497134.5	103.35	

II

INITIAL CALIBRATION VERIFICATION (ICV) STANDARD

Report No:	218081813	GCAL QC ID:	1600
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\009_ICV.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1046	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	50.0	52.2	104		ug/L
Copper	50.0	50.1	100		ug/L
Lead	50.0	48.8	98		ug/L
Zinc	1000	994	99		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	1600	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	009_ICV.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 10:46:39	**Total Dilution**	1.0000
Sample Type	ICV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	247.402	247.402	1.1	8815087.16	250	
Be	9	45	No Gas	49.78	49.780	1.0	322157.92	50	
B	11	45	No Gas	279.21	279.210	2.2	1211518.06	250	> +/- 10%
Sr	88	103	No Gas	47.888	47.888	1.1	1022588.11	50	
Zr	90	72	No Gas	46.463	46.463	1.5	665704.94	50	
Mo	95	115	No Gas	48.647	48.647	1.5	201836.96	50	
Ag	107	115	No Gas	48.288	48.288	0.8	497854.04	50	
Cd	111	115	No Gas	49.934	49.934	1.1	107485.09	50	
Sb	121	115	No Gas	52.168	52.168	0.2	427255.89	50	
Ba	137	115	No Gas	48.382	48.382	0.9	144095.13	50	
Tl	205	175	No Gas	48.799	48.799	0.7	992417.70	50	
Pb	208	209	No Gas	48.847	48.847	1.7	1396128.61	50	
Na	23	45	He	5134.194	5134.194	0.8	2405597.93	5000	
Mg	24	45	He	4988.104	4988.104	0.4	1129936.52	5000	
Al	27	45	He	1017.801	1017.801	0.6	68839.39	1000	
Si	29	45	He	5518.831	5518.831	2.0	9964.32	5000	> +/- 10%
K	39	45	He	5005.502	5005.502	0.3	493957.23	5000	
Ca	44	45	He	24889.549	24889.549	1.0	140928.62	25000	
Ti	47	45	He	48.959	48.959	2.5	2228.16	50	
V	51	72	He	49.376	49.376	0.5	80163.05	50	
Cr	52	72	He	49.88	49.880	0.3	105475.13	50	
Mn	55	45	He	50.92	50.920	0.5	50357.45	50	
Fe	57	72	He	4925.472	4925.472	0.9	211510.25	5000	
Co	59	72	He	49.561	49.561	0.8	172598.90	50	
Ni	60	72	He	100.253	100.253	0.3	95697.20	100	
Cu	63	103	He	50.064	50.064	0.9	133000.73	50	
Zn	66	103	He	994.407	994.407	0.2	331188.70	1000	
As	75	72	He	49.823	49.823	0.4	13473.70	50	
Se	78	72	He	24.46	24.460	1.5	553.77	25	
Sn	120	115	He	49.403	49.403	0.9	70873.77	50	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1453191.75	1548427.37333333	93.85	
Ge	72	He	44107.28	44394.6333333333	99.35	
In	115	He	392990.71	404099.316666667	97.25	
Lu	175	He	1169784.15	1190023.24	98.3	
Rh	103	He	1511697.82	1573916.12	96.05	
Sc	45	He	75769.74	75790.99	99.97	
Tb	159	He	1995773.36	2036132.52	98.02	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3390327.14	3602753.49	94.1	
Ge	72	No Gas	554437.57	552452.773333333	100.36	
In	115	No Gas	3690873.86	3822230.42333333	96.56	
Lu	175	No Gas	5424220.33	5635183.66666667	96.26	
Rh	103	No Gas	3549489.51	3660203.32666667	96.98	
Sc	45	No Gas	2974970.30	3019672.93666667	98.52	
Tb	159	No Gas	5448510.54	5550323.25333333	98.17	

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION (LLCCV) STANDARD

Report No:	218081813	GCAL QC ID:	1803
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\014CCV1.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1108	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	2.00	2.07	103		ug/L
Copper	1.00	0.810	81		ug/L
Lead	1.00	0.980	98		ug/L
Zinc	20.0	20.8	104		ug/L

CONTROL LIMITS 80-120%

FORM II - IN

Sample Report

Sample Name	1803	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	014CCV1.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:08:36	**Total Dilution**	1.0000
Sample Type	LLCCV1	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	5.001	5.001	2.7	488000.58	5	
Be	9	45	No Gas	1.015	1.015	3.0	6704.68	1	
B	11	45	No Gas	11.29	11.290	2.7	54417.89	10	
Sr	88	103	No Gas	0.939	0.939	1.8	21258.01	1	
Zr	90	72	No Gas	0.851	0.851	4.0	12732.89	1	
Mo	95	115	No Gas	0.961	0.961	1.4	4320.64	1	
Ag	107	115	No Gas	0.987	0.987	1.7	10540.24	1	
Cd	111	115	No Gas	0.984	0.984	4.8	2199.83	1	
Sb	121	115	No Gas	2.067	2.067	3.0	18032.65	2	
Ba	137	115	No Gas	1.02	1.020	6.2	3182.59	1	
Tl	205	175	No Gas	0.927	0.927	2.8	20990.47	1	
Pb	208	209	No Gas	0.978	0.978	2.1	29836.05	1	
Na	23	45	He	98.645	98.645	2.2	51492.46	100	
Mg	24	45	He	101.009	101.009	0.9	24201.36	100	
Al	27	45	He	21.108	21.108	3.5	1532.08	20	
Si	29	45	He	189.752	189.752	2.6	1333.40	200	
K	39	45	He	99.977	99.977	4.2	12955.51	100	
Ca	44	45	He	503.55	503.550	3.5	3115.35	500	
Ti	47	45	He	0.934	0.934	18.0	48.00	1	
V	51	72	He	0.992	0.992	8.6	1720.11	1	
Cr	52	72	He	0.979	0.979	3.5	2226.84	1	
Mn	55	45	He	5.087	5.087	6.4	5332.04	5	
Fe	57	72	He	102.171	102.171	3.6	4600.80	100	
Co	59	72	He	1.027	1.027	2.2	3737.13	1	
Ni	60	72	He	2.017	2.017	1.9	2016.82	2	
Cu	63	103	He	0.809	0.809	1.7	3021.42	1	
Zn	66	103	He	20.753	20.753	2.1	7495.13	20	
As	75	72	He	0.965	0.965	3.8	280.50	1	
Se	78	72	He	1.037	1.037	8.5	26.00	1	
Sn	120	115	He	1.016	1.016	5.7	1742.34	1	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1570639.45	1548427.37333333	101.43	
Ge	72	He	45912.09	44394.6333333333	103.42	
In	115	He	415982.10	404099.316666667	102.94	
Lu	175	He	1282720.92	1190023.24	107.79	
Rh	103	He	1625353.23	1573916.12	103.27	
Sc	45	He	79997.23	75790.99	105.55	
Tb	159	He	2066878.20	2036132.52	101.51	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3547350.57	3602753.49	98.46	
Ge	72	No Gas	563816.40	552452.773333333	102.06	
In	115	No Gas	3817505.38	3822230.42333333	99.88	
Lu	175	No Gas	5479182.42	5635183.66666667	97.23	
Rh	103	No Gas	3711721.93	3660203.32666667	101.41	
Sc	45	No Gas	3029225.71	3019672.93666667	100.32	
Tb	159	No Gas	5463535.13	5550323.25333333	98.44	

II

LINEAR DYNAMIC RANGE (LDR) STANDARD

Report No:	218081813	GCAL QC ID:	2500
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\017_QC1.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1121	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	1000	901	90		ug/L
Copper	1000	1030	103		ug/L
Lead	1000	928	93		ug/L
Zinc	20000	18500	93		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	LDR	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	017_QC1.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:21:48	**Total Dilution**	1.0000
Sample Type	QC1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Be	9	45	No Gas	856.348	856.348	2.7	5449843.50	1000	>= +/- 30%
Sr	88	103	No Gas	978.643	978.643	1.9	18103214.32	1000	
Mo	95	115	No Gas	986.31	986.310	2.4	3633123.05	1000	
Cd	111	115	No Gas	882.74	882.740	2.5	1688402.67	1000	>= +/- 30%
Sb	121	115	No Gas	900.762	900.762	2.7	6548115.02	1000	
Ba	137	115	No Gas	962.312	962.312	2.7	2546253.51	1000	
Tl	205	175	No Gas	870.522	870.522	1.3	16129582.69	1000	>= +/- 30%
Pb	208	209	No Gas	927.747	927.747	1.6	21722449.36	1000	
Na	23	45	He	93271.23	93271.230	1.2	42174303.54	100000	
Mg	24	45	He	91265.999	91265.999	0.6	19972468.45	100000	
Al	27	45	He	19645.073	19645.073	1.7	1283113.13	20000	
K	39	45	He	94344.483	94344.483	0.5	8952268.20	100000	
Ca	44	45	He	487084.264	487084.264	0.4	2662764.65	500000	
Ti	47	45	He	952.57	952.570	0.5	41830.31	1000	
V	51	72	He	1011.471	1011.471	1.2	1524915.77	1000	
Cr	52	72	He	962.669	962.669	0.6	1890207.77	1000	
Mn	55	45	He	4736.488	4736.488	0.4	4523367.04	5000	
Fe	57	72	He	91878.375	91878.375	0.3	3665262.24	100000	
Co	59	72	He	931.604	931.604	0.8	3013916.89	1000	
Ni	60	72	He	1812.018	1812.018	1.0	1606841.95	2000	
Cu	63	103	He	1027.683	1027.683	0.5	2156386.86	1000	
Zn	66	103	He	18544.539	18544.539	0.8	4901153.97	20000	
As	75	72	He	911.128	911.128	0.2	228794.87	1000	
Sn	120	115	He	962.663	962.663	0.1	1225025.61	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag	Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1068627.80	1548427.37333333	69.01	<70%;>120%	Bi	209	No Gas	2779357.15	3602753.49	77.15	
Ge	72	He	40982.28	44394.6333333333	92.31		Ge	72	No Gas	542412.23	552452.773333333	98.18	
In	115	He	349510.98	404099.316666667	86.49		In	115	No Gas	3279823.60	3822230.42333333	85.81	
Lu	175	He	1052346.89	1190023.24	88.43		Lu	175	No Gas	4950253.99	5635183.66666667	87.85	
Rh	103	He	1199769.95	1573916.12	76.23		Rh	103	No Gas	3076186.13	3660203.32666667	84.04	
Sc	45	He	73205.17	75790.99	96.59		Sc	45	No Gas	2926856.06	3019672.93666667	96.93	
Tb	159	He	1762229.56	2036132.52	86.55		Tb	159	No Gas	4975196.70	5550323.25333333	89.64	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081813	GCAL QC ID:	1800
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\024_CCV.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1156	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	20.0	100		ug/L
Copper	10.0	10.1	101		ug/L
Lead	10.0	9.57	96		ug/L
Zinc	200	205	102		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Sample Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	024_CCV.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:56:16	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	52.822	52.822	1.5	2257327.52	50	
Be	9	45	No Gas	10.077	10.077	2.9	69330.84	10	
B	11	45	No Gas	48.632	48.632	3.6	228357.60	50	
Sr	88	103	No Gas	9.571	9.571	1.6	217744.55	10	
Zr	90	72	No Gas	9.364	9.364	3.4	141886.27	10	
Mo	95	115	No Gas	9.736	9.736	3.1	42557.39	10	
Ag	107	115	No Gas	10.115	10.115	1.4	109464.46	10	
Cd	111	115	No Gas	9.912	9.912	3.0	22402.37	10	
Sb	121	115	No Gas	20.013	20.013	2.2	172363.93	20	
Ba	137	115	No Gas	9.763	9.763	3.0	30548.88	10	
Tl	205	175	No Gas	9.934	9.934	2.0	206908.08	10	
Pb	208	209	No Gas	9.571	9.571	2.8	287462.04	10	
Na	23	45	He	1024.682	1024.682	0.1	502451.67	1000	
Mg	24	45	He	1017.849	1017.849	1.5	240302.87	1000	
Al	27	45	He	207.484	207.484	1.6	14643.71	200	
Si	29	45	He	2183.744	2183.744	1.2	4708.68	2000	
K	39	45	He	1022.723	1022.723	0.4	107199.42	1000	
Ca	44	45	He	5171.1	5171.100	1.3	30593.33	5000	
Ti	47	45	He	10.029	10.029	5.3	478.01	10	
V	51	72	He	9.831	9.831	2.3	16890.95	10	
Cr	52	72	He	9.924	9.924	1.5	22219.44	10	
Mn	55	45	He	51.602	51.602	0.7	53177.29	50	
Fe	57	72	He	1004.777	1004.777	2.4	45590.54	1000	
Co	59	72	He	10.102	10.102	0.1	37158.34	10	
Ni	60	72	He	20.144	20.144	0.5	20314.87	20	
Cu	63	103	He	10.077	10.077	1.0	28928.89	10	
Zn	66	103	He	204.675	204.675	0.7	72277.88	200	
As	75	72	He	9.926	9.926	1.2	2841.91	10	
Se	78	72	He	10.139	10.139	4.5	243.41	10	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1541847.32	1548427.37333333	99.58	
Ge	72	He	46574.03	44394.6333333333	104.91	
In	115	He	417541.78	404099.316666667	103.33	
Lu	175	He	1288249.77	1190023.24	108.25	
Rh	103	He	1602216.50	1573916.12	101.8	
Sc	45	He	78956.68	75790.99	104.18	
Tb	159	He	2059131.74	2036132.52	101.13	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3556874.32	3602753.49	98.73	
Ge	72	No Gas	585161.14	552452.773333333	105.92	
In	115	No Gas	3873596.95	3822230.42333333	101.34	
Lu	175	No Gas	5511143.04	5635183.66666667	97.8	
Rh	103	No Gas	3776917.49	3660203.32666667	103.19	
Sc	45	No Gas	3162783.35	3019672.93666667	104.74	
Tb	159	No Gas	5568278.67	5550323.25333333	100.32	

II

INITIAL CALIBRATION VERIFICATION (ICV) STANDARD

Report No:	218081813	GCAL QC ID:	1600
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\009_ICV.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1324	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	50.0	54.6	109		ug/L
Copper	50.0	52.0	104		ug/L
Lead	50.0	49.3	99		ug/L
Zinc	1000	1010	101		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Initial Calibration Verification (ICV) Report

Sample Name	1600	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	009_ICV.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 13:24:36	**Total Dilution**	1.0000
Sample Type	ICV	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	256.926	0.78	4765977.43	250	102.77	
Be	9	45	No Gas	49.219	0.86	324758.59	50	98.44	
B	11	45	No Gas	271.082	1.34	1107007.04	250	108.43	
Sr	88	72	No Gas	50.148	1.68	1783311.69	50	100.3	
Zr	90	72	No Gas	47.688	1.76	1061488.50	50	95.38	
Mo	95	115	No Gas	49.496	0.19	312468.61	50	98.99	
Ag	107	115	No Gas	49.383	0.99	725534.56	50	98.77	
Cd	111	115	No Gas	50.231	1.35	150059.41	50	100.46	
Sb	121	115	No Gas	54.644	0.42	668635.29	50	109.29	
Ba	137	115	No Gas	50.056	1.63	209213.00	50	100.11	
Tl	205	209	No Gas	49.608	2.31	645282.09	50	99.22	
Pb	208	209	No Gas	49.307	1.87	865907.93	50	98.61	
Na	23	45	He	5124.848	0.41	1890837.42	5000	102.5	
Mg	24	45	He	5028.750	0.89	709685.07	5000	100.58	
Al	27	45	He	1003.098	0.63	32229.86	1000	100.31	
Si	29	45	He	4622.486	2.68	23470.29	5000	92.45	
K	39	45	He	5061.344	0.82	621100.47	5000	101.23	
Ca	44	45	He	24776.384	1.32	131261.23	25000	99.11	
Ti	47	45	He	49.827	1.79	2622.24	50	99.65	
V	51	72	He	50.075	1.06	113788.22	50	100.15	
Cr	52	72	He	50.602	0.93	154367.84	50	101.2	
Mn	55	72	He	50.060	0.98	51576.96	50	100.12	
Fe	57	72	He	5007.359	0.76	249036.05	5000	100.15	
Co	59	72	He	50.141	1.22	253016.33	50	100.28	
Ni	60	72	He	102.414	0.42	144211.51	100	102.41	
Cu	63	45	He	52.025	0.88	200453.65	50	104.05	
Zn	66	72	He	1005.281	1.45	549100.17	1000	100.53	
As	75	72	He	50.941	1.03	29070.59	50	101.88	
Se	78	72	He	24.406	3.38	610.85	25	97.62	
Sn	120	115	He	49.200	1.18	82083.66	50	98.4	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1043952.43	1066636.57333333	97.87	
Ge	72	He	77302.39	76690.4733333333	100.8	
In	115	He	525268.60	527518.896666667	99.57	
Lu	175	He	813263.97	811094.676666667	100.27	
Rh	103	He	2117960.05	2150131.65	98.5	
Sc	45	He	95792.28	98241.74	97.51	
Tb	159	He	1705747.48	1707326.38	99.91	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2370201.32	2336732.1	101.43	
Ge	72	No Gas	1165127.07	1156430.33666667	100.75	
In	115	No Gas	5207853.40	5237310.61666667	99.44	
Lu	175	No Gas	4137358.27	4014375.88	103.06	
Rh	103	No Gas	5465794.51	5515557.00333333	99.1	
Sc	45	No Gas	5622917.41	5538601.16666667	101.52	
Tb	159	No Gas	4994729.09	4855676.28	102.86	

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION (LLCCV) STANDARD

Report No:	218081813	GCAL QC ID:	1803
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121211CCV1.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1353	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	2.00	1.90	95		ug/L
Copper	1.00	1.06	106		ug/L
Lead	1.00	0.990	99		ug/L
Zinc	20.0	21.2	106		ug/L

CONTROL LIMITS 80-120%

FORM II - IN

Low Level Continuing Calibration Verification(LLCCV) Report

Sample Name	1803	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121211CCV1.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 13:53:00	**Total Dilution**	1.0000
Sample Type	LLCCV1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: Initial 6020A DOD 80-120% / 70-130% 6020A and 200.8

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	5.439	0.95	270213.76	5	108.77	
Be	9	45	No Gas	0.988	1.88	6288.66	1	98.82	
B	11	45	No Gas	10.085	1.57	42022.29	10	100.85	
Sr	88	72	No Gas	1.019	0.81	35033.73	1	101.86	
Zr	90	72	No Gas	0.890	2.68	19453.32	1	89.05	
Mo	95	115	No Gas	0.925	1.72	5748.98	1	92.53	
Ag	107	115	No Gas	0.985	1.76	14048.20	1	98.54	
Cd	111	115	No Gas	0.987	5.44	2865.88	1	98.65	
Sb	121	115	No Gas	1.899	2.74	22871.03	2	94.95	
Ba	137	115	No Gas	0.958	3.52	4022.85	1	95.82	
Tl	205	209	No Gas	0.998	4.90	11718.97	1	99.8	
Pb	208	209	No Gas	0.991	2.49	15700.93	1	99.11	
Na	23	45	He	106.118	1.00	46389.03	100	106.12	
Mg	24	45	He	101.882	1.67	14050.43	100	101.88	
Al	27	45	He	20.275	7.00	716.02	20	101.38	
Si	29	45	He	-4123.111	4.97	13351.97	200	-2061.56	> +/- 20%
K	39	45	He	101.003	0.24	25332.28	100	101	
Ca	44	45	He	533.137	0.78	3032.03	500	106.63	
Ti	47	45	He	1.019	8.63	58.33	1	101.91	
V	51	72	He	0.968	3.35	2256.86	1	96.82	
Cr	52	72	He	1.031	3.59	6709.37	1	103.06	
Mn	55	72	He	5.081	3.42	5225.42	5	101.62	
Fe	57	72	He	101.763	1.44	5294.46	100	101.76	
Co	59	72	He	1.036	2.54	5148.73	1	103.6	
Ni	60	72	He	2.116	5.67	3231.50	2	105.81	
Cu	63	45	He	1.062	0.34	5959.05	1	106.24	
Zn	66	72	He	21.208	1.01	11407.93	20	106.04	
As	75	72	He	0.968	4.85	558.01	1	96.76	
Se	78	72	He	0.909	7.23	28.40	1	90.95	
Sn	120	115	He	1.051	3.37	1804.58	1	105.09	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	986680.87	1066636.57333333	92.5	
Ge	72	He	74823.12	76690.4733333333	97.57	
In	115	He	500670.01	527518.896666667	94.91	
Lu	175	He	739148.38	811094.676666667	91.13	
Rh	103	He	2064983.53	2150131.65	96.04	
Sc	45	He	93036.44	98241.74	94.7	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2115284.13	2336732.1	90.52	
Ge	72	No Gas	1111879.71	1156430.33666667	96.15	
In	115	No Gas	5045690.93	5237310.61666667	96.34	
Lu	175	No Gas	3665539.53	4014375.88	91.31	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1582309.71	1707326.38	92.68	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5194770.77	5515557.00333333	94.18	
Sc	45	No Gas	5372612.01	5538601.16666667	97	
Tb	159	No Gas	4456966.08	4855676.28	91.79	

II

LINEAR DYNAMIC RANGE (LDR) STANDARD

Report No:	218081813	GCAL QC ID:	2500
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121214_QC1.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1403	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	1000	924	92		ug/L
Copper	1000	929	93		ug/L
Lead	1000	915	92		ug/L
Zinc	20000	18100	91		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Linear Dynamic Range Check (LDR) Report

Sample Name	LDR	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121214_QC1.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 14:03:43	**Total Dilution**	1.0000
Sample Type	QC1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Be	9	45	No Gas	934.284	0.74	5721924.00	1000	93.43	
Sr	88	72	No Gas	909.183	0.83	31184417.87	1000	90.92	
Mo	95	115	No Gas	960.274	1.93	5813266.57	1000	96.03	
Cd	111	115	No Gas	935.025	4.01	2679848.92	1000	93.5	
Sb	121	115	No Gas	923.672	2.59	10834581.24	1000	92.37	
Ba	137	115	No Gas	917.731	4.23	3677141.24	1000	91.77	
Tl	205	209	No Gas	880.214	4.03	10976977.34	1000	88.02	QC1 Main CR1 Failed
Pb	208	209	No Gas	915.209	5.11	15418017.27	1000	91.52	
Na	23	45	He	93570.457	0.57	36146531.13	100000	93.57	
Mg	24	45	He	92650.428	1.21	13747984.79	100000	92.65	
Al	27	45	He	18993.333	0.35	640098.62	20000	94.97	
K	39	45	He	93812.387	1.04	11847885.66	100000	93.81	
Ca	44	45	He	479352.057	0.63	2664453.61	500000	95.87	
Ti	47	45	He	948.001	0.90	52345.26	1000	94.8	
V	51	72	He	967.389	0.67	2292730.12	1000	96.74	
Cr	52	72	He	946.441	0.15	2943372.87	1000	94.64	
Mn	55	72	He	4813.431	0.51	5160151.74	5000	96.27	
Fe	57	72	He	93477.753	1.02	4846174.72	100000	93.48	
Co	59	72	He	927.664	0.43	4885027.44	1000	92.77	
Ni	60	72	He	1875.984	0.53	2751536.00	2000	93.8	
Cu	63	45	He	928.931	0.78	3726674.57	1000	92.89	
Zn	66	72	He	18115.636	0.65	10328402.09	20000	90.58	
As	75	72	He	964.432	0.45	574155.40	1000	96.44	
Sn	120	115	He	961.181	0.84	1712711.29	1000	96.12	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1193211.15	1066636.57333333	111.87	
Ge	72	He	80694.69	76690.4733333333	105.22	
In	115	He	561815.26	527518.896666667	106.5	
Lu	175	He	969575.04	811094.676666667	119.54	
Rh	103	He	2154535.12	2150131.65	100.2	
Sc	45	He	100726.14	98241.74	102.53	
Tb	159	He	1945703.77	1707326.38	113.96	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2275046.22	2336732.1	97.36	
Ge	72	No Gas	1124466.86	1156430.33666667	97.24	
In	115	No Gas	4995767.19	5237310.61666667	95.39	
Lu	175	No Gas	4113343.58	4014375.88	102.47	
Rh	103	No Gas	5049534.10	5515557.00333333	91.55	
Sc	45	No Gas	5220334.51	5538601.16666667	94.25	
Tb	159	No Gas	4823223.47	4855676.28	99.33	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081813	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121269_CCV.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1734	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	19.9	99		ug/L
Copper	10.0	10.2	102		ug/L
Lead	10.0	9.84	98		ug/L
Zinc	200	201	100		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121269_CCV.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 17:34:28	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	51.297	1.73	1139759.54	50	102.59	
Be	9	45	No Gas	9.498	1.75	64968.81	10	94.98	
B	11	45	No Gas	47.673	0.62	204105.07	50	95.35	
Sr	88	72	No Gas	10.390	3.05	387529.19	10	103.9	
Zr	90	72	No Gas	10.047	2.69	234765.13	10	100.47	
Mo	95	115	No Gas	9.168	1.73	64974.96	10	91.68	
Ag	107	115	No Gas	9.770	2.35	160945.37	10	97.7	
Cd	111	115	No Gas	9.780	2.27	32770.32	10	97.8	
Sb	121	115	No Gas	19.890	2.40	273172.22	20	99.45	
Ba	137	115	No Gas	9.875	3.15	46414.32	10	98.75	
Tl	205	209	No Gas	9.848	3.09	142797.74	10	98.48	
Pb	208	209	No Gas	9.844	3.56	192712.60	10	98.44	
Na	23	45	He	1008.354	0.55	398471.60	1000	100.84	
Mg	24	45	He	1006.685	0.68	149388.29	1000	100.67	
Al	27	45	He	196.571	2.41	6712.86	200	98.29	
Si	29	45	He	-10293.416	8.86	7239.12	2000	-514.67	> +/- 10%
K	39	45	He	982.744	1.27	138591.95	1000	98.27	
Ca	44	45	He	5032.421	1.50	28277.23	5000	100.65	
Ti	47	45	He	9.634	2.05	538.34	10	96.34	
V	51	72	He	9.867	2.40	23841.64	10	98.67	
Cr	52	72	He	9.796	1.65	34920.31	10	97.96	
Mn	55	72	He	49.360	0.80	53815.90	50	98.72	
Fe	57	72	He	985.292	0.76	52200.61	1000	98.53	
Co	59	72	He	10.154	1.24	54287.84	10	101.54	
Ni	60	72	He	20.420	1.16	30735.64	20	102.1	
Cu	63	45	He	10.176	2.23	42978.59	10	101.76	
Zn	66	72	He	200.996	1.77	116366.35	200	100.5	
As	75	72	He	9.773	3.18	5924.22	10	97.73	
Se	78	72	He	9.795	3.74	263.82	10	97.95	
Sn	120	115	He	9.796	3.87	18421.15	10	97.96	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1268887.01	1066636.57333333	118.96	
Ge	72	He	81792.23	76690.4733333333	106.65	
In	115	He	587701.76	527518.896666667	111.41	
Lu	175	He	958420.90	811094.676666667	118.16	
Rh	103	He	2365133.94	2150131.65	110	
Sc	45	He	100680.59	98241.74	102.48	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2639430.84	2336732.1	112.95	
Ge	72	No Gas	1220518.14	1156430.33666667	105.54	
In	115	No Gas	5840318.55	5237310.61666667	111.51	
Lu	175	No Gas	4615056.39	4014375.88	114.96	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1967163.67	1707326.38	115.22	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5951840.04	5515557.00333333	107.91	
Sc	45	No Gas	5823532.96	5538601.16666667	105.14	
Tb	159	No Gas	5536022.00	4855676.28	114.01	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081813	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121287_CCV.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1838	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	19.7	99		ug/L
Copper	10.0	10.4	104		ug/L
Lead	10.0	9.61	96		ug/L
Zinc	200	196	98		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121287_CCV.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:38:23	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	49.300	1.59	1103267.41	50	98.6	
Be	9	45	No Gas	9.282	1.77	63514.05	10	92.82	
B	11	45	No Gas	46.859	1.63	200779.58	50	93.72	
Sr	88	72	No Gas	10.287	1.68	385186.86	10	102.87	
Zr	90	72	No Gas	9.837	1.26	230757.73	10	98.37	
Mo	95	115	No Gas	9.216	1.93	66061.10	10	92.16	
Ag	107	115	No Gas	9.784	0.87	162975.66	10	97.84	
Cd	111	115	No Gas	9.884	0.32	33478.59	10	98.84	
Sb	121	115	No Gas	19.733	3.18	274033.62	20	98.67	
Ba	137	115	No Gas	9.751	0.59	46323.89	10	97.51	
Tl	205	209	No Gas	9.518	1.70	137894.61	10	95.18	
Pb	208	209	No Gas	9.609	2.30	187983.75	10	96.09	
Na	23	45	He	989.961	0.56	387288.04	1000	99	
Mg	24	45	He	983.075	0.72	144368.30	1000	98.31	
Al	27	45	He	192.710	2.59	6511.44	200	96.36	
Si	29	45	He	-11293.154	12.52	5996.57	2000	-564.66	> +/- 10%
K	39	45	He	985.924	0.64	137534.77	1000	98.59	
Ca	44	45	He	4953.722	0.31	27549.14	5000	99.07	
Ti	47	45	He	9.525	4.08	526.68	10	95.25	
V	51	72	He	9.513	1.15	23518.87	10	95.13	
Cr	52	72	He	9.417	3.00	34504.78	10	94.17	
Mn	55	72	He	48.932	0.99	54574.16	50	97.86	
Fe	57	72	He	968.172	0.95	52481.09	1000	96.82	
Co	59	72	He	10.046	1.15	54947.04	10	100.46	
Ni	60	72	He	20.184	1.64	31080.85	20	100.92	
Cu	63	45	He	10.351	0.51	43219.38	10	103.51	
Zn	66	72	He	196.331	0.62	116262.87	200	98.17	
As	75	72	He	9.753	0.94	6046.27	10	97.53	
Se	78	72	He	9.214	1.04	254.23	10	92.14	
Sn	120	115	He	9.728	0.87	18813.83	10	97.28	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1318431.44	1066636.57333333	123.61	<70% or >120%
Ge	72	He	83661.69	76690.4733333333	109.09	
In	115	He	604540.10	527518.896666667	114.6	
Lu	175	He	993753.45	811094.676666667	122.52	<70% or >120%
Rh	103	He	2422889.42	2150131.65	112.69	
Sc	45	He	99642.71	98241.74	101.43	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2639074.18	2336732.1	112.94	
Ge	72	No Gas	1225376.55	1156430.33666667	105.96	
In	115	No Gas	5904818.38	5237310.61666667	112.75	
Lu	175	No Gas	4587923.58	4014375.88	114.29	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	2032804.09	1707326.38	119.06	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	6045851.71	5515557.00333333	109.61	
Sc	45	No Gas	5826106.99	5538601.16666667	105.19	
Tb	159	No Gas	5526344.08	4855676.28	113.81	

II

INITIAL CALIBRATION VERIFICATION (ICV) STANDARD

Report No:	218081813	GCAL QC ID:	1600
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\015_ICV_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1042	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	50.0	50.9	102		ug/L
Copper	50.0	51.6	103		ug/L
Lead	50.0	49.6	99		ug/L
Zinc	1000	1010	101		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Initial Calibration Verification (ICV) Report

Sample Name	1600	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	015_ICV_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 10:42:54	**Total Dilution**	1.0000
Sample Type	ICV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	267.084	0.96	4178653.38	250	106.83	
Be	9	45	No Gas	50.159	0.84	269902.82	50	100.32	
B	11	45	No Gas	278.532	2.39	921185.69	250	111.41	> +/- 10%
Sr	88	72	No Gas	50.262	1.22	1719658.00	50	100.52	
Zr	90	72	No Gas	49.423	2.55	1044821.80	50	98.85	
Mo	95	115	No Gas	49.186	3.00	302849.85	50	98.37	
Ag	107	115	No Gas	47.420	1.56	690003.26	50	94.84	
Cd	111	115	No Gas	48.946	1.41	146807.55	50	97.89	
Sb	121	115	No Gas	50.932	1.45	657006.03	50	101.86	
Ba	137	115	No Gas	48.693	1.53	204329.15	50	97.39	
Tl	205	209	No Gas	49.624	2.72	658400.61	50	99.25	
Pb	208	209	No Gas	49.620	2.61	885429.64	50	99.24	
Na	23	45	He	5113.313	0.79	1583034.93	5000	102.27	
Mg	24	45	He	5018.923	1.04	603955.59	5000	100.38	
Al	27	45	He	1008.151	0.87	27863.12	1000	100.82	
Si	29	45	He	4951.157	2.99	12778.80	5000	99.02	
K	39	45	He	5017.645	0.59	516227.22	5000	100.35	
Ca	44	45	He	25059.478	0.23	115465.98	25000	100.24	
Ti	47	45	He	50.394	1.20	2306.19	50	100.79	
V	51	72	He	49.637	0.89	98916.53	50	99.27	
Cr	52	72	He	50.567	1.37	135801.07	50	101.13	
Mn	55	72	He	49.170	2.63	45670.80	50	98.34	
Fe	57	72	He	5009.631	1.32	227878.01	5000	100.19	
Co	59	72	He	49.470	0.83	225443.00	50	98.94	
Ni	60	72	He	100.620	0.34	129878.01	100	100.62	
Cu	63	72	He	51.565	1.51	184546.07	50	103.13	
Zn	66	72	He	1007.295	1.00	496733.82	1000	100.73	
As	75	72	He	49.978	1.05	25562.65	50	99.96	
Se	78	72	He	24.727	1.85	551.96	25	98.91	
Sn	120	115	He	50.563	0.80	80787.08	50	101.13	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1253555.24	1156007.06333333	108.44	
Ge	72	He	72529.97	68942.6933333333	105.2	
In	115	He	543023.93	515120.94	105.42	
Lu	175	He	947743.42	860474.493333333	110.14	
Rh	103	He	2143845.26	2061162.14	104.01	
Sc	45	He	87536.50	86332.2766666667	101.39	
Tb	159	He	1922711.12	1790396.84666667	107.39	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2566854.28	2430541.58	105.61	
Ge	72	No Gas	1141938.53	1116846.20666667	102.25	
In	115	No Gas	5457328.24	5301929.88666667	102.93	
Lu	175	No Gas	4420505.45	4111004.52	107.53	
Rh	103	No Gas	5500197.84	5479027.00333333	100.39	
Sc	45	No Gas	5103707.85	5061380.49333333	100.84	
Tb	159	No Gas	5366762.21	4997578.57333333	107.39	

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION (LLCCV) STANDARD

Report No:	218081813	GCAL QC ID:	1803
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1811CCV1_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1100	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	2.00	1.91	95		ug/L
Copper	1.00	1.08	108		ug/L
Lead	1.00	0.980	98		ug/L
Zinc	20.0	19.1	95		ug/L

CONTROL LIMITS 80-120%

FORM II - IN

Low Level Continuing Calibration Verification(LLCCV) Report

Sample Name	1803	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1811CCV1_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 11:00:38	**Total Dilution**	1.0000
Sample Type	LLCCV1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: Initial 6020A DOD 80-120% / 70-130% 6020A and 200.8

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	5.239	1.03	241717.47	5	104.79	
Be	9	45	No Gas	0.982	1.49	5354.97	1	98.17	
B	11	45	No Gas	9.732	1.41	36100.23	10	97.32	
Sr	88	72	No Gas	0.988	0.87	34315.16	1	98.8	
Zr	90	72	No Gas	0.866	3.33	18694.50	1	86.6	
Mo	95	115	No Gas	0.945	3.74	6041.33	1	94.46	
Ag	107	115	No Gas	0.991	3.39	14417.46	1	99.1	
Cd	111	115	No Gas	0.970	2.70	2925.89	1	97.03	
Sb	121	115	No Gas	1.907	2.22	26076.57	2	95.33	
Ba	137	115	No Gas	0.936	1.77	4069.53	1	93.56	
Tl	205	209	No Gas	0.934	1.37	13126.95	1	93.43	
Pb	208	209	No Gas	0.978	2.00	17938.80	1	97.82	
Na	23	45	He	99.424	3.09	34707.46	100	99.42	
Mg	24	45	He	101.667	1.90	12158.58	100	101.67	
Al	27	45	He	17.891	2.70	594.68	20	89.45	
Si	29	45	He	-837.769	6.75	6604.16	200	-418.88	> +/- 20%
K	39	45	He	101.441	1.29	21058.76	100	101.44	
Ca	44	45	He	507.546	3.23	2646.95	500	101.51	
Ti	47	45	He	0.923	11.54	52.00	1	92.32	
V	51	72	He	1.025	6.13	2087.95	1	102.48	
Cr	52	72	He	0.999	0.94	4618.54	1	99.9	
Mn	55	72	He	4.829	2.48	4500.73	5	96.59	
Fe	57	72	He	102.236	7.73	4747.60	100	102.24	
Co	59	72	He	1.020	2.78	4576.31	1	101.98	
Ni	60	72	He	2.089	0.73	2853.64	2	104.46	
Cu	63	72	He	1.078	4.04	4046.16	1	107.83	
Zn	66	72	He	19.059	0.66	10234.79	20	95.3	
As	75	72	He	0.990	5.53	512.34	1	98.96	
Se	78	72	He	0.939	17.77	24.82	1	93.91	
Sn	120	115	He	0.819	1.49	1862.36	1	81.92	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1224013.78	1156007.06333333	105.88	
Ge	72	He	70279.02	68942.6933333333	101.94	
In	115	He	532895.82	515120.94	103.45	
Lu	175	He	898085.58	860474.493333333	104.37	
Rh	103	He	2144609.71	2061162.14	104.05	
Sc	45	He	86007.71	86332.2766666667	99.62	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2591251.78	2430541.58	106.61	
Ge	72	No Gas	1126011.42	1116846.20666667	100.82	
In	115	No Gas	5434246.70	5301929.88666667	102.5	
Lu	175	No Gas	4286149.73	4111004.52	104.26	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1867646.95	1790396.84666667	104.31	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5573936.17	5479027.00333333	101.73	
Sc	45	No Gas	5095502.58	5061380.49333333	100.67	
Tb	159	No Gas	5252611.90	4997578.57333333	105.1	

II

LINEAR DYNAMIC RANGE (LDR) STANDARD

Report No:	218081813	GCAL QC ID:	2500
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1814_QC1_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1111	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	1000	955	96		ug/L
Copper	1000	950	95		ug/L
Lead	1000	972	97		ug/L
Zinc	20000	18900	94		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Linear Dynamic Range Check (LDR) Report

Sample Name	LDR	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1814_QC1_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 11:11:18	**Total Dilution**	1.0000
Sample Type	QC1	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Be	9	45	No Gas	1045.857	1.44	5388049.67	1000	104.59	
Sr	88	72	No Gas	961.512	1.03	32857590.34	1000	96.15	
Mo	95	115	No Gas	1000.862	3.25	6186529.89	1000	100.09	
Cd	111	115	No Gas	988.891	2.73	2979620.99	1000	98.89	
Sb	121	115	No Gas	955.020	0.26	12343244.79	1000	95.5	
Ba	137	115	No Gas	997.901	2.85	4204242.19	1000	99.79	
Tl	205	209	No Gas	946.783	2.56	13164688.97	1000	94.68	
Pb	208	209	No Gas	971.986	3.86	18193412.02	1000	97.2	
Na	23	45	He	98800.579	0.38	32351446.19	100000	98.8	
Mg	24	45	He	98387.525	0.25	12554190.64	100000	98.39	
Al	27	45	He	20363.163	0.63	594570.09	20000	101.82	
K	39	45	He	99676.582	0.37	10651679.01	100000	99.68	
Ca	44	45	He	516088.251	0.26	2514518.87	500000	103.22	
Ti	47	45	He	1000.795	0.70	48363.20	1000	100.08	
V	51	72	He	1004.969	0.47	2136018.04	1000	100.5	
Cr	52	72	He	987.507	0.62	2789942.80	1000	98.75	
Mn	55	72	He	4919.668	0.85	4861373.84	5000	98.39	
Fe	57	72	He	97193.076	0.65	4716300.35	100000	97.19	
Co	59	72	He	959.486	0.08	4667537.04	1000	95.95	
Ni	60	72	He	1923.114	0.47	2645756.49	2000	96.16	
Cu	63	72	He	949.645	0.81	3623100.83	1000	94.96	
Zn	66	72	He	18898.363	0.99	9928861.27	20000	94.49	
As	75	72	He	1008.028	0.06	550040.73	1000	100.8	
Sn	120	115	He	1055.324	0.98	1857359.23	1000	105.53	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1438697.37	1156007.06333333	124.45	<70% or >120%
Ge	72	He	77463.49	68942.6933333333	112.36	
In	115	He	602406.29	515120.94	116.94	
Lu	175	He	1139283.76	860474.493333333	132.4	<70% or >120%
Rh	103	He	2262698.59	2061162.14	109.78	
Sc	45	He	92835.14	86332.2766666667	107.53	
Tb	159	He	2248260.02	1790396.84666667	125.57	<70% or >120%

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2693872.46	2430541.58	110.83	
Ge	72	No Gas	1141259.02	1116846.20666667	102.19	
In	115	No Gas	5483042.28	5301929.88666667	103.42	
Lu	175	No Gas	4791864.93	4111004.52	116.56	
Rh	103	No Gas	5473343.12	5479027.00333333	99.9	
Sc	45	No Gas	4887352.86	5061380.49333333	96.56	
Tb	159	No Gas	5665825.75	4997578.57333333	113.37	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081813	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1834_CCV_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1240	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	20.1	100		ug/L
Copper	10.0	10.7	107		ug/L
Lead	10.0	9.83	98		ug/L
Zinc	200	205	102		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1834_CCV_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 12:40:10	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	57.009	1.21	967970.40	50	114.02	> +/- 10%
Be	9	45	No Gas	10.549	0.64	53901.11	10	105.49	
B	11	45	No Gas	50.893	2.44	162870.34	50	101.79	
Sr	88	72	No Gas	10.255	2.92	338174.86	10	102.55	
Zr	90	72	No Gas	10.474	0.38	213298.35	10	104.74	
Mo	95	115	No Gas	9.575	1.86	57364.64	10	95.75	
Ag	107	115	No Gas	9.912	2.91	139960.80	10	99.12	
Cd	111	115	No Gas	9.761	3.37	28425.28	10	97.61	
Sb	121	115	No Gas	20.077	3.06	252224.75	20	100.39	
Ba	137	115	No Gas	9.694	3.54	39596.47	10	96.94	
Tl	205	209	No Gas	9.796	3.35	128827.03	10	97.96	
Pb	208	209	No Gas	9.831	3.55	173508.05	10	98.31	
Na	23	45	He	1046.636	0.39	315657.23	1000	104.66	
Mg	24	45	He	1042.467	2.07	120958.20	1000	104.25	
Al	27	45	He	204.687	2.46	5535.71	200	102.34	
Si	29	45	He	1221.498	26.15	8537.92	2000	61.07	> +/- 10%
K	39	45	He	1018.657	1.28	109571.29	1000	101.87	
Ca	44	45	He	5043.575	1.22	22665.91	5000	100.87	
Ti	47	45	He	9.438	3.54	424.68	10	94.38	
V	51	72	He	9.915	3.14	18785.42	10	99.15	
Cr	52	72	He	10.317	1.00	27812.99	10	103.17	
Mn	55	72	He	51.315	2.82	45082.35	50	102.63	
Fe	57	72	He	1025.499	1.43	44321.36	1000	102.55	
Co	59	72	He	10.297	0.99	44458.35	10	102.97	
Ni	60	72	He	20.760	1.29	25540.12	20	103.8	
Cu	63	72	He	10.669	1.01	36372.93	10	106.69	
Zn	66	72	He	204.971	1.86	96543.02	200	102.49	
As	75	72	He	10.140	0.59	4924.51	10	101.4	
Se	78	72	He	9.787	3.84	209.50	10	97.87	
Sn	120	115	He	10.043	0.94	15861.25	10	100.43	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1244286.34	1156007.06333333	107.64	
Ge	72	He	68625.62	68942.6933333333	99.54	
In	115	He	521161.17	515120.94	101.17	
Lu	175	He	868828.58	860474.493333333	100.97	
Rh	103	He	2078752.28	2061162.14	100.85	
Sc	45	He	84319.36	86332.2766666667	97.67	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2535782.31	2430541.58	104.33	
Ge	72	No Gas	1098023.36	1116846.20666667	98.31	
In	115	No Gas	5294376.44	5301929.88666667	99.86	
Lu	175	No Gas	4220256.50	4111004.52	102.66	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1782875.08	1790396.84666667	99.58	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5355780.07	5479027.00333333	97.75	
Sc	45	No Gas	4842100.78	5061380.49333333	95.67	
Tb	159	No Gas	5072084.20	4997578.57333333	101.49	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081813	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1850_CCV_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1337	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	19.7	99		ug/L
Copper	10.0	10.6	106		ug/L
Lead	10.0	9.67	97		ug/L
Zinc	200	203	102		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1850_CCV_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:37:03	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	54.312	1.54	932462.43	50	108.62	
Be	9	45	No Gas	9.888	0.76	50684.52	10	98.88	
B	11	45	No Gas	48.229	1.13	155011.72	50	96.46	
Sr	88	72	No Gas	10.271	0.98	340201.44	10	102.71	
Zr	90	72	No Gas	10.188	0.52	208480.70	10	101.88	
Mo	95	115	No Gas	9.717	1.08	58403.04	10	97.17	
Ag	107	115	No Gas	10.016	0.83	141848.04	10	100.16	
Cd	111	115	No Gas	9.698	0.28	28320.63	10	96.98	
Sb	121	115	No Gas	19.746	2.29	248869.24	20	98.73	
Ba	137	115	No Gas	9.376	1.88	38406.45	10	93.76	
Tl	205	209	No Gas	9.492	0.48	117553.98	10	94.92	
Pb	208	209	No Gas	9.665	0.52	160585.44	10	96.65	
Na	23	45	He	1006.425	1.35	299297.68	1000	100.64	
Mg	24	45	He	1015.667	1.88	116123.73	1000	101.57	
Al	27	45	He	198.509	1.68	5293.63	200	99.25	
Si	29	45	He	-2045.718	7.86	5179.59	2000	-102.29	> +/- 10%
K	39	45	He	983.744	1.59	104638.11	1000	98.37	
Ca	44	45	He	4991.681	1.96	22108.42	5000	99.83	
Ti	47	45	He	10.007	6.46	443.01	10	100.07	
V	51	72	He	10.065	1.36	19051.24	10	100.65	
Cr	52	72	He	10.105	1.10	27266.39	10	101.05	
Mn	55	72	He	50.855	0.52	44656.60	50	101.71	
Fe	57	72	He	1030.378	0.36	44504.92	1000	103.04	
Co	59	72	He	10.509	1.26	45335.38	10	105.09	
Ni	60	72	He	20.985	0.52	25798.32	20	104.92	
Cu	63	72	He	10.640	1.71	36245.00	10	106.4	
Zn	66	72	He	203.447	3.02	95761.59	200	101.72	
As	75	72	He	10.077	1.95	4890.50	10	100.77	
Se	78	72	He	9.452	1.98	202.32	10	94.52	
Sn	120	115	He	9.890	1.36	15483.11	10	98.9	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1105422.53	1156007.06333333	95.62	
Ge	72	He	68570.64	68942.6933333333	99.46	
In	115	He	516329.97	515120.94	100.23	
Lu	175	He	696858.11	860474.493333333	80.99	
Rh	103	He	2078222.97	2061162.14	100.83	
Sc	45	He	83093.53	86332.2766666667	96.25	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2386321.99	2430541.58	98.18	
Ge	72	No Gas	1103202.63	1116846.20666667	98.78	
In	115	No Gas	5310676.21	5301929.88666667	100.16	
Lu	175	No Gas	3783985.67	4111004.52	92.05	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1606872.37	1790396.84666667	89.75	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5411690.76	5479027.00333333	98.77	
Sc	45	No Gas	4857940.78	5061380.49333333	95.98	
Tb	159	No Gas	4720913.06	4997578.57333333	94.46	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081813	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180828C_MS2.b\002_CCV.d
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1358	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	20.2	101		ug/L
Copper	10.0	10.5	105		ug/L
Lead	10.0	9.64	96		ug/L
Zinc	200	203	102		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	002_CCV.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:58:34	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	53.871	0.47	930141.50	50	107.74	
Be	9	45	No Gas	9.826	0.36	50595.52	10	98.26	
B	11	45	No Gas	47.924	0.91	154719.10	50	95.85	
Sr	88	72	No Gas	10.361	1.78	340855.67	10	103.61	
Zr	90	72	No Gas	10.143	0.98	206174.52	10	101.43	
Mo	95	115	No Gas	9.845	0.94	58876.18	10	98.45	
Ag	107	115	No Gas	10.182	1.02	143473.05	10	101.82	
Cd	111	115	No Gas	9.855	2.00	28639.21	10	98.55	
Sb	121	115	No Gas	20.235	1.52	253682.28	20	101.17	
Ba	137	115	No Gas	9.461	2.33	38567.89	10	94.61	
Tl	205	209	No Gas	9.562	3.20	116807.82	10	95.62	
Pb	208	209	No Gas	9.639	1.68	157975.77	10	96.39	
Na	23	45	He	995.089	1.57	299935.22	1000	99.51	
Mg	24	45	He	997.126	0.56	115539.12	1000	99.71	
Al	27	45	He	192.639	0.92	5209.60	200	96.32	
Si	29	45	He	-2328.871	8.44	4964.85	2000	-116.44	> +/- 10%
K	39	45	He	991.390	0.88	106781.94	1000	99.14	
Ca	44	45	He	5014.914	0.97	22508.93	5000	100.3	
Ti	47	45	He	9.627	2.15	432.34	10	96.27	
V	51	72	He	9.948	1.74	19393.97	10	99.48	
Cr	52	72	He	10.006	0.52	27825.21	10	100.06	
Mn	55	72	He	50.429	1.71	45611.64	50	100.86	
Fe	57	72	He	1018.543	1.86	45314.02	1000	101.85	
Co	59	72	He	10.296	2.81	45756.77	10	102.96	
Ni	60	72	He	20.656	2.23	26160.07	20	103.28	
Cu	63	72	He	10.543	2.38	36988.86	10	105.43	
Zn	66	72	He	203.403	1.01	98595.61	200	101.7	
As	75	72	He	10.074	0.63	5034.88	10	100.74	
Se	78	72	He	9.767	6.22	215.07	10	97.67	
Sn	120	115	He	9.854	0.38	15625.47	10	98.54	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1093711.47	1156007.06333333	94.61	
Ge	72	He	70623.65	68942.6933333333	102.44	
In	115	He	522949.11	515120.94	101.52	
Lu	175	He	688739.05	860474.493333333	80.04	
Rh	103	He	2088153.74	2061162.14	101.31	
Sc	45	He	84209.73	86332.2766666667	97.54	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2353990.75	2430541.58	96.85	
Ge	72	No Gas	1095485.27	1116846.20666667	98.09	
In	115	No Gas	5283551.03	5301929.88666667	99.65	
Lu	175	No Gas	3728778.18	4111004.52	90.7	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1575791.80	1790396.84666667	88.01	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5458338.12	5479027.00333333	99.62	
Sc	45	No Gas	4877437.45	5061380.49333333	96.37	
Tb	159	No Gas	4666497.33	4997578.57333333	93.38	

Metals

Form III

Blanks

III

INITIAL CALIBRATION BLANK

Report No:	218081813	Blank ID:	1700
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\018_ICB.d
Analyst:	LWZ	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 1041	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Sample Report

Sample Name	1700	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	018_ICB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 10:41:05	**Total Dilution**	1.0000
Sample Type	ICB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	0.301	0.301	2.5	298195.91	2.5	
Be	9	45	No Gas	0.037	0.037	1.7	316.01	0.5	
B	11	45	No Gas	8.138	8.138	3.8	43483.20	5	>LOD
Sr	88	72	No Gas	0.037	0.037	14.8	1256.77	0.5	
Zr	90	72	No Gas	0.037	0.037	16.4	1022.27	0.5	
Mo	95	115	No Gas	0.095	0.095	15.6	556.68	0.5	
Ag	107	115	No Gas	0.04	0.040	14.2	502.24	0.5	
Cd	111	115	No Gas	0.036	0.036	8.5	109.67	0.5	
Sb	121	115	No Gas	0.093	0.093	3.4	1630.10	1	
Ba	137	115	No Gas	0.027	0.027	10.4	182.23	0.5	
Tl	205	175	No Gas	0.023	0.023	7.7	1738.46	0.5	
Pb	208	209	No Gas	0.041	0.041	18.2	2000.14	0.5	
Na	23	45	He	3.208	3.208	12.0	4990.90	50	
Mg	24	45	He	2.831	2.831	14.5	770.05	50	
Al	27	45	He	1.11	1.110	41.1	145.34	10	
Si	29	45	He	30.709	30.709	4.8	967.37	100	
K	39	45	He	3.407	3.407	4.2	3267.12	50	
Ca	44	45	He	29.361	29.361	8.2	281.68	250	
Ti	47	45	He	0.038	0.038	31.2	6.67	0.5	
V	51	72	He	0.015	0.015	27.4	85.55	0.5	
Cr	52	72	He	0.011	0.011	4.4	115.56	0.5	
Mn	55	72	He	0.081	0.081	17.2	137.78	2.5	
Fe	57	72	He	2.238	2.238	33.6	146.67	50	
Co	59	72	He	0.024	0.024	1.5	128.89	0.5	
Ni	60	72	He	0.039	0.039	34.2	83.33	1	
Cu	63	72	He	0.021	0.021	15.9	614.46	0.5	
Zn	66	103	He	0.568	0.568	2.3	441.12	10	
As	75	72	He	0.034	0.034	3.9	19.67	0.5	
Se	78	72	He	0.063	0.063	36.7	4.24	0.5	
Sn	120	115	He	0.273	0.273	72.2	671.83	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1442562.32	1457156.02	99	
Ge	72	He	46359.96	46567.3733333333	99.55	
In	115	He	400171.72	401074.37	99.77	
Lu	175	He	1109709.04	1106922.95333333	100.25	
Rh	103	He	1566640.81	1576304.55666667	99.39	
Sc	45	He	77079.08	77709.7233333333	99.19	
Tb	159	He	1910123.15	1926533.77666667	99.15	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3530557.24	3553207.86333333	99.36	
Ge	72	No Gas	587446.16	588164.35	99.88	
In	115	No Gas	3884646.79	3846213.84666667	101	
Lu	175	No Gas	5540915.54	5505661.37666667	100.64	
Rh	103	No Gas	3825516.51	3760261.65666667	101.74	
Sc	45	No Gas	3024618.49	3052080.71	99.1	
Tb	159	No Gas	5529247.21	5497134.5	100.58	

III
METHOD BLANK

Report No:	218081813	Blank ID:	MB1841866
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\029SMPL.d
Analyst:	LWZ	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 1129	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	40.0	ug/kg	U	20.0	40.0	80.0
Copper	20.0	ug/kg	U	10.0	20.0	40.0
Lead	20.0	ug/kg	U	10.0	20.0	40.0
Zinc	400	ug/kg	U	200	400	800

Sample Report

Sample Name	1841866	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	029SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 11:29:46	**Total Dilution**	40.0000
Sample Type	MBSOIL	**Sample Pass/Fail**	Fail
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	-0.036	-1.429	1.1	306627.41	2.5	
Be	9	45	No Gas	0.006	0.237	7.8	134.00	0.5	
B	11	45	No Gas	-2.194	-87.748	1.4	6274.73	5	
Sr	88	72	No Gas	0.371	14.841	19.9	8629.38	0.5	
Zr	90	72	No Gas	0.145	5.791	16.0	2653.58	0.5	
Mo	95	115	No Gas	0.098	3.921	6.8	581.13	0.5	
Ag	107	115	No Gas	-0.004	-0.172	8.3	40.00	0.5	
Cd	111	115	No Gas	-0.007	-0.277	3.5	16.67	0.5	
Sb	121	115	No Gas	0.235	9.418	5.7	2943.65	1	
Ba	137	115	No Gas	1.011	40.449	9.7	3297.06	0.5	> 1/2 LOQ
Tl	205	175	No Gas	-0.031	-1.258	3.9	634.47	0.5	
Pb	208	209	No Gas	0.02	0.817	28.8	1386.75	0.5	
Na	23	45	He	14.602	584.072	8.5	11270.85	50	
Mg	24	45	He	15.716	628.634	3.8	4033.95	50	
Al	27	45	He	10.523	420.915	5.6	837.36	10	> 1/2 LOQ
Si	29	45	He	50.572	2022.880	7.7	1110.05	100	
K	39	45	He	-1.337	-53.474	6.1	3112.10	50	
Ca	44	45	He	136.321	5452.838	5.9	978.38	250	
Ti	47	45	He	0.098	3.921	20.1	10.33	0.5	
V	51	72	He	-0.017	-0.670	20.1	34.45	0.5	
Cr	52	72	He	0.007	0.294	9.3	115.56	0.5	
Mn	55	72	He	0.652	26.065	0.9	762.25	2.5	
Fe	57	72	He	4.447	177.876	10.2	260.01	50	
Co	59	72	He	0.019	0.741	14.0	117.78	0.5	
Ni	60	72	He	0.002	0.074	26.4	51.11	1	
Cu	63	72	He	-0.094	-3.760	4.4	338.90	0.5	
Zn	66	103	He	2.802	112.098	1.9	1274.51	10	
As	75	72	He	0.005	0.209	26.9	13.17	0.5	
Se	78	72	He	0.035	1.391	12.6	3.99	0.5	
Sn	120	115	He	-0.053	-2.125	25.5	226.67	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1487621.80	1457156.02	102.09	
Ge	72	He	50244.73	46567.3733333333	107.9	
In	115	He	436107.31	401074.37	108.73	
Lu	175	He	1244805.22	1106922.95333333	112.46	
Rh	103	He	1648192.19	1576304.55666667	104.56	
Sc	45	He	85630.31	77709.7233333333	110.19	
Tb	159	He	2053651.95	1926533.77666667	106.6	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3480126.72	3553207.86333333	97.94	
Ge	72	No Gas	605021.96	588164.35	102.87	
In	115	No Gas	3963542.44	3846213.84666667	103.05	
Lu	175	No Gas	5575651.38	5505661.37666667	101.27	
Rh	103	No Gas	3847966.38	3760261.65666667	102.33	
Sc	45	No Gas	3224937.09	3052080.71	105.66	
Tb	159	No Gas	5618638.25	5497134.5	102.21	

III

CONTINUING CALIBRATION BLANK

Report No:	218081813	Blank ID:	1900
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\037_CCB.d
Analyst:	LWZ	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 1205	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Sample Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	037_CCB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:05:02	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	-0.048	-0.048	1.4	302985.87	2.5	
Be	9	45	No Gas	0	0.000	23.2	95.33	0.5	
B	11	45	No Gas	-1.263	-1.263	6.5	9786.54	5	
Sr	88	72	No Gas	0.001	0.001	3.0	513.37	0.5	
Zr	90	72	No Gas	0.003	0.003	9.3	556.68	0.5	
Mo	95	115	No Gas	-0.002	-0.002	17.8	151.11	0.5	
Ag	107	115	No Gas	0.004	0.004	9.6	131.11	0.5	
Cd	111	115	No Gas	-0.004	-0.004	14.2	24.67	0.5	
Sb	121	115	No Gas	0.039	0.039	3.2	1197.84	1	
Ba	137	115	No Gas	0.01	0.010	17.1	136.67	0.5	
Tl	205	175	No Gas	-0.04	-0.040	6.3	463.35	0.5	
Pb	208	209	No Gas	0.004	0.004	3.6	963.39	0.5	
Na	23	45	He	0.525	0.525	1.8	3900.62	50	
Mg	24	45	He	0.303	0.303	39.8	216.68	50	
Al	27	45	He	-0.067	-0.067	5.8	71.33	10	
Si	29	45	He	-40.372	-40.372	2.7	881.36	100	
K	39	45	He	-1.888	-1.888	11.4	2830.35	50	
Ca	44	45	He	1.545	1.545	15.4	130.00	250	
Ti	47	45	He	0.07	0.070	48.5	8.33	0.5	
V	51	72	He	-0.021	-0.021	60.2	25.56	0.5	
Cr	52	72	He	-0.006	-0.006	41.4	81.11	0.5	
Mn	55	72	He	-0.021	-0.021	39.8	37.78	2.5	
Fe	57	72	He	0.26	0.260	60.6	66.67	50	
Co	59	72	He	-0.002	-0.002	9.1	36.67	0.5	
Ni	60	72	He	-0.02	-0.020	34.6	27.78	1	
Cu	63	72	He	0.01	0.010	6.6	613.35	0.5	
Zn	66	103	He	0.009	0.009	5.8	258.90	10	
As	75	72	He	0.001	0.001	7.5	11.50	0.5	
Se	78	72	He	0.12	0.120	25.7	5.65	0.5	
Sn	120	115	He	0.002	0.002	6.8	296.67	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1512938.15	1457156.02	103.83	
Ge	72	He	48473.82	46567.3733333333	104.09	
In	115	He	414641.60	401074.37	103.38	
Lu	175	He	1140435.87	1106922.95333333	103.03	
Rh	103	He	1634022.68	1576304.55666667	103.66	
Sc	45	He	79525.84	77709.7233333333	102.34	
Tb	159	He	1991308.62	1926533.77666667	103.36	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3667214.32	3553207.86333333	103.21	
Ge	72	No Gas	610588.47	588164.35	103.81	
In	115	No Gas	4047438.84	3846213.84666667	105.23	
Lu	175	No Gas	5725554.71	5505661.37666667	103.99	
Rh	103	No Gas	3964266.09	3760261.65666667	105.43	
Sc	45	No Gas	3191018.21	3052080.71	104.55	
Tb	159	No Gas	5756248.45	5497134.5	104.71	

III

CONTINUING CALIBRATION BLANK

Report No:	218081813	Blank ID:	1900
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\057_CCB.d
Analyst:	LWZ	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 1332	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Sample Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	057_CCB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 13:32:57	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	-0.123	-0.123	1.5	294702.63	2.5	
Be	9	45	No Gas	-0.004	-0.004	44.6	66.00	0.5	
B	11	45	No Gas	-0.689	-0.689	2.2	11751.15	5	
Sr	88	72	No Gas	0.007	0.007	7.7	616.70	0.5	
Zr	90	72	No Gas	0.012	0.012	3.5	673.36	0.5	
Mo	95	115	No Gas	0.003	0.003	13.0	171.11	0.5	
Ag	107	115	No Gas	0.005	0.005	19.7	135.56	0.5	
Cd	111	115	No Gas	-0.001	-0.001	23.2	30.33	0.5	
Sb	121	115	No Gas	0.138	0.138	7.9	2086.83	1	
Ba	137	115	No Gas	0.031	0.031	5.8	200.00	0.5	
Tl	205	175	No Gas	-0.045	-0.045	3.8	358.90	0.5	
Pb	208	209	No Gas	0	0.000	4.2	830.04	0.5	
Na	23	45	He	0.342	0.342	4.6	3660.52	50	
Mg	24	45	He	0.195	0.195	3.1	183.34	50	
Al	27	45	He	0.301	0.301	13.2	92.00	10	
Si	29	45	He	-51.051	-51.051	7.0	829.36	100	
K	39	45	He	-1.998	-1.998	3.0	2706.98	50	
Ca	44	45	He	0.996	0.996	29.2	121.67	250	
Ti	47	45	He	0.086	0.086	48.0	8.67	0.5	
V	51	72	He	-0.018	-0.018	96.2	30.00	0.5	
Cr	52	72	He	-0.016	-0.016	10.2	56.66	0.5	
Mn	55	72	He	0.024	0.024	8.6	81.11	2.5	
Fe	57	72	He	0.796	0.796	26.6	86.67	50	
Co	59	72	He	-0.005	-0.005	33.1	26.67	0.5	
Ni	60	72	He	-0.012	-0.012	45.8	33.34	1	
Cu	63	72	He	-0.013	-0.013	2.4	524.46	0.5	
Zn	66	103	He	-0.075	-0.075	16.1	218.89	10	
As	75	72	He	-0.019	-0.019	39.8	5.67	0.5	
Se	78	72	He	-0.04	-0.040	29.1	2.16	0.5	
Sn	120	115	He	0.029	0.029	12.2	323.34	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1462757.11	1457156.02	100.38	
Ge	72	He	46298.74	46567.3733333333	99.42	
In	115	He	398076.96	401074.37	99.25	
Lu	175	He	1084347.33	1106922.95333333	97.96	
Rh	103	He	1561342.19	1576304.55666667	99.05	
Sc	45	He	76294.53	77709.7233333333	98.18	
Tb	159	He	1919384.82	1926533.77666667	99.63	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3633723.49	3553207.86333333	102.27	
Ge	72	No Gas	594901.09	588164.35	101.15	
In	115	No Gas	3996963.23	3846213.84666667	103.92	
Lu	175	No Gas	5632531.37	5505661.37666667	102.3	
Rh	103	No Gas	3914622.07	3760261.65666667	104.11	
Sc	45	No Gas	3128830.71	3052080.71	102.51	
Tb	159	No Gas	5643672.42	5497134.5	102.67	

III

INITIAL CALIBRATION BLANK

Report No:	218081813	Blank ID:	1700
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\011_ICB.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1055	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Sample Report

Sample Name	1700	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	011_ICB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 10:55:25	**Total Dilution**	1.0000
Sample Type	ICB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	-0.106	-0.106	3.4	314082.25	2.5	
Be	9	45	No Gas	0.014	0.014	11.4	116.67	0.5	
B	11	45	No Gas	9.117	9.117	8.1	45649.22	5	>LOD
Sr	88	103	No Gas	0.01	0.010	12.4	523.36	0.5	
Zr	90	72	No Gas	0.018	0.018	3.0	621.13	0.5	
Mo	95	115	No Gas	0.018	0.018	4.5	277.78	0.5	
Ag	107	115	No Gas	0.014	0.014	4.3	161.12	0.5	
Cd	111	115	No Gas	0.013	0.013	19.4	39.33	0.5	
Sb	121	115	No Gas	0.162	0.162	4.5	1932.36	1	
Ba	137	115	No Gas	0.008	0.008	13.0	64.44	0.5	
Tl	205	175	No Gas	-0.046	-0.046	5.0	1036.72	0.5	
Pb	208	209	No Gas	0.008	0.008	11.6	820.05	0.5	
Na	23	45	He	0.673	0.673	3.4	3103.75	50	
Mg	24	45	He	0.708	0.708	39.8	216.68	50	
Al	27	45	He	0.609	0.609	24.2	69.33	10	
Si	29	45	He	-27.18	-27.180	8.5	968.04	100	
K	39	45	He	0.306	0.306	6.3	2643.66	50	
Ca	44	45	He	10.018	10.018	30.3	168.34	250	
Ti	47	45	He	0.016	0.016	50.0	4.00	0.5	
V	51	72	He	-0.004	-0.004	22.0	40.00	0.5	
Cr	52	72	He	0.006	0.006	14.2	88.89	0.5	
Mn	55	45	He	0.025	0.025	52.3	51.11	2.5	
Fe	57	72	He	0.317	0.317	20.0	50.00	50	
Co	59	72	He	0.008	0.008	22.4	45.56	0.5	
Ni	60	72	He	0.008	0.008	87.0	21.11	1	
Cu	63	103	He	-0.012	-0.012	12.2	700.03	0.5	
Zn	66	103	He	0.383	0.383	31.1	206.67	10	
As	75	72	He	-0.001	-0.001	33.8	9.00	0.5	
Se	78	72	He	0.023	0.023	50.6	2.24	0.5	
Sn	120	115	He	0.042	0.042	3.2	273.34	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1592771.54	1548427.37333333	102.86	
Ge	72	He	47169.02	44394.6333333333	106.25	
In	115	He	425534.18	404099.316666667	105.3	
Lu	175	He	1317904.17	1190023.24	110.75	
Rh	103	He	1652846.05	1573916.12	105.01	
Sc	45	He	80726.19	75790.99	106.51	
Tb	159	He	2086000.91	2036132.52	102.45	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3550166.72	3602753.49	98.54	
Ge	72	No Gas	569924.77	552452.773333333	103.16	
In	115	No Gas	3843037.97	3822230.42333333	100.54	
Lu	175	No Gas	5507683.04	5635183.66666667	97.74	
Rh	103	No Gas	3738119.16	3660203.32666667	102.13	
Sc	45	No Gas	3077741.27	3019672.93666667	101.92	
Tb	159	No Gas	5540524.50	5550323.25333333	99.82	

III

CONTINUING CALIBRATION BLANK

Report No:	218081813	Blank ID:	1900
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\025_CCB.d
Analyst:	LWZ	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 1200	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Sample Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	025_CCB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 12:00:39	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	0.097	0.097	2.2	333868.77	2.5	
Be	9	45	No Gas	0.004	0.004	25.9	51.33	0.5	
B	11	45	No Gas	1.18	1.180	10.9	10516.96	5	
Sr	88	103	No Gas	0.007	0.007	23.6	476.69	0.5	
Zr	90	72	No Gas	0.008	0.008	4.2	483.35	0.5	
Mo	95	115	No Gas	0.011	0.011	15.2	255.56	0.5	
Ag	107	115	No Gas	0.008	0.008	30.3	104.44	0.5	
Cd	111	115	No Gas	0.007	0.007	7.9	26.33	0.5	
Sb	121	115	No Gas	0.221	0.221	4.7	2508.01	1	
Ba	137	115	No Gas	0.01	0.010	23.0	74.45	0.5	
Tl	205	175	No Gas	-0.069	-0.069	6.6	565.57	0.5	
Pb	208	209	No Gas	0.003	0.003	8.4	676.70	0.5	
Na	23	45	He	0.991	0.991	4.4	3313.81	50	
Mg	24	45	He	0.419	0.419	29.1	150.01	50	
Al	27	45	He	0.563	0.563	27.6	67.33	10	
Si	29	45	He	-16.817	-16.817	2.8	1002.04	100	
K	39	45	He	0.627	0.627	5.1	2720.32	50	
Ca	44	45	He	8.946	8.946	22.9	165.00	250	
Ti	47	45	He	0.076	0.076	28.6	7.00	0.5	
V	51	72	He	-0.002	-0.002	25.4	42.22	0.5	
Cr	52	72	He	-0.007	-0.007	38.9	60.00	0.5	
Mn	55	45	He	0.037	0.037	26.5	64.44	2.5	
Fe	57	72	He	1.549	1.549	35.5	106.67	50	
Co	59	72	He	0.002	0.002	48.2	22.22	0.5	
Ni	60	72	He	0.009	0.009	74.0	22.22	1	
Cu	63	103	He	0.006	0.006	13.6	758.92	0.5	
Zn	66	103	He	0.243	0.243	14.0	156.67	10	
As	75	72	He	-0.001	-0.001	33.3	9.17	0.5	
Se	78	72	He	0.082	0.082	41.0	3.66	0.5	
Sn	120	115	He	0.065	0.065	20.5	311.13	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1582651.38	1548427.37333333	102.21	
Ge	72	He	47202.37	44394.6333333333	106.32	
In	115	He	427451.66	404099.316666667	105.78	
Lu	175	He	1334746.91	1190023.24	112.16	
Rh	103	He	1671437.19	1573916.12	106.2	
Sc	45	He	82039.30	75790.99	108.24	
Tb	159	He	2079710.96	2036132.52	102.14	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3622573.18	3602753.49	100.55	
Ge	72	No Gas	588526.82	552452.773333333	106.53	
In	115	No Gas	3959922.46	3822230.42333333	103.6	
Lu	175	No Gas	5598589.71	5635183.66666667	99.35	
Rh	103	No Gas	3868578.60	3660203.32666667	105.69	
Sc	45	No Gas	3197875.98	3019672.93666667	105.9	
Tb	159	No Gas	5668229.92	5550323.25333333	102.12	

III

INITIAL CALIBRATION BLANK

Report No:	218081813	Blank ID:	1700
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\1211_ICB.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1342	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Initial Calibration Blank (ICB) Report

Sample Name	1700	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	1211_ICB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 13:42:21	**Total Dilution**	1.0000
Sample Type	ICB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	0.238	1.10	182400.02	2.5	
Be	9	45	No Gas	-0.001	19.11	52.67	0.5	
B	11	45	No Gas	0.917	5.75	6364.86	5	
Sr	88	72	No Gas	-0.002	19.51	410.02	0.5	
Zr	90	72	No Gas	0.008	10.04	704.47	0.5	
Mo	95	115	No Gas	0.002	23.38	108.89	0.5	
Ag	107	115	No Gas	0.001	15.23	45.55	0.5	
Cd	111	115	No Gas	0.001	20.01	16.67	0.5	
Sb	121	115	No Gas	0.035	5.98	786.70	1	
Ba	137	115	No Gas	-0.021	22.04	61.11	0.5	
Tl	205	209	No Gas	-0.002	19.80	116.67	0.5	
Pb	208	209	No Gas	0.002	20.83	220.00	0.5	
Na	23	45	He	0.557	1.29	8832.88	50	
Mg	24	45	He	0.176	8.33	120.00	50	
Al	27	45	He	-0.911	36.05	56.67	10	
Si	29	45	He	-3222.379	4.70	14473.01	100	
K	39	45	He	-2.542	2.22	13413.03	50	
Ca	44	45	He	-4.031	15.28	278.34	250	
Ti	47	45	He	0.012	42.86	7.00	0.5	
V	51	72	He	-0.003	23.09	121.11	0.5	
Cr	52	72	He	-0.003	5.53	3726.06	0.5	
Mn	55	72	He	-0.035	6.30	140.00	2.5	
Fe	57	72	He	0.289	5.00	416.69	50	
Co	59	72	He	-0.002	21.14	77.78	0.5	
Ni	60	72	He	0.012	8.42	367.79	1	
Cu	63	45	He	-0.093	3.16	1700.12	0.5	
Zn	66	72	He	-0.151	14.53	117.78	10	
As	75	72	He	-0.006	11.17	20.67	0.5	
Se	78	72	He	-0.076	13.90	4.75	0.5	
Sn	120	115	He	0.039	13.24	196.67	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	999473.27	1066636.57333333	93.7	
Ge	72	He	74688.56	76690.4733333333	97.39	
In	115	He	496072.09	527518.896666667	94.04	
Lu	175	He	758856.42	811094.676666667	93.56	
Rh	103	He	2069740.96	2150131.65	96.26	
Sc	45	He	94004.91	98241.74	95.69	
Tb	159	He	1615236.49	1707326.38	94.61	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2186160.33	2336732.1	93.56	
Ge	72	No Gas	1104944.89	1156430.33666667	95.55	
In	115	No Gas	5067715.02	5237310.61666667	96.76	
Lu	175	No Gas	3719454.42	4014375.88	92.65	
Rh	103	No Gas	5203215.90	5515557.00333333	94.34	
Sc	45	No Gas	5395318.12	5538601.16666667	97.41	
Tb	159	No Gas	4555014.72	4855676.28	93.81	

III

CONTINUING CALIBRATION BLANK

Report No:	218081813	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121270_CCB.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1738	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121270_CCB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 17:38:01	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	-0.093	0.84	185739.94	2.5	
Be	9	45	No Gas	-0.003	10.58	39.33	0.5	
B	11	45	No Gas	0.002	8.77	2933.69	5	
Sr	88	72	No Gas	0.010	17.56	860.06	0.5	
Zr	90	72	No Gas	0.007	16.21	742.25	0.5	
Mo	95	115	No Gas	0.001	9.08	112.22	0.5	
Ag	107	115	No Gas	0.006	23.57	134.45	0.5	
Cd	111	115	No Gas	-0.001	66.64	14.44	0.5	
Sb	121	115	No Gas	0.049	6.64	1036.72	1	
Ba	137	115	No Gas	0.055	7.05	402.23	0.5	
Tl	205	209	No Gas	-0.005	37.50	80.00	0.5	
Pb	208	209	No Gas	0.013	18.17	416.68	0.5	
Na	23	45	He	-1.501	3.74	8662.75	50	
Mg	24	45	He	0.095	24.74	116.67	50	
Al	27	45	He	3.817	9.09	220.00	10	
Si	29	45	He	-12573.414	14.55	4565.40	100	
K	39	45	He	-0.149	1.51	14664.32	50	
Ca	44	45	He	14.024	10.15	398.34	250	
Ti	47	45	He	0.057	50.00	10.00	0.5	
V	51	72	He	0.000	17.03	138.89	0.5	
Cr	52	72	He	-0.209	7.94	3392.65	0.5	
Mn	55	72	He	0.000	10.64	188.89	2.5	
Fe	57	72	He	0.711	28.06	473.36	50	
Co	59	72	He	-0.002	15.81	87.78	0.5	
Ni	60	72	He	0.018	9.48	407.79	1	
Cu	63	45	He	-0.392	1.60	623.35	0.5	
Zn	66	72	He	0.056	11.55	245.56	10	
As	75	72	He	-0.008	12.60	21.00	0.5	
Se	78	72	He	-0.031	32.68	6.32	0.5	
Sn	120	115	He	0.423	3.56	936.71	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1208143.13	1066636.57333333	113.27	
Ge	72	He	80918.50	76690.4733333333	105.51	
In	115	He	580421.46	527518.896666667	110.03	
Lu	175	He	924646.05	811094.676666667	114	
Rh	103	He	2343811.23	2150131.65	109.01	
Sc	45	He	100656.24	98241.74	102.46	
Tb	159	He	1906200.55	1707326.38	111.65	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2351613.04	2336732.1	100.64	
Ge	72	No Gas	1170784.67	1156430.33666667	101.24	
In	115	No Gas	5482362.96	5237310.61666667	104.68	
Lu	175	No Gas	4165176.29	4014375.88	103.76	
Rh	103	No Gas	5719195.05	5515557.00333333	103.69	
Sc	45	No Gas	5668190.19	5538601.16666667	102.34	
Tb	159	No Gas	5052110.65	4855676.28	104.05	

III
METHOD BLANK

Report No:	218081813	Blank ID:	MB1841052
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121284SMPL.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1827	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Method Blank (MB) Report

Sample Name	1841052	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121284SMPL.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:27:45	**Total Dilution**	1.0000
Sample Type	MBWATER	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	0.347	0.99	193643.34	2.5	
Be	9	45	No Gas	0.001	3.36	68.67	0.5	
B	11	45	No Gas	0.283	1.77	4087.34	5	
Sr	88	72	No Gas	0.112	4.08	4500.87	0.5	
Zr	90	72	No Gas	0.145	7.58	3805.01	0.5	
Mo	95	115	No Gas	0.003	7.73	124.45	0.5	
Ag	107	115	No Gas	0.004	19.44	94.44	0.5	
Cd	111	115	No Gas	0.006	9.10	36.67	0.5	
Sb	121	115	No Gas	0.050	10.07	1073.39	1	
Ba	137	115	No Gas	0.146	8.11	822.26	0.5	
Tl	205	209	No Gas	-0.005	35.26	86.67	0.5	
Pb	208	209	No Gas	0.108	4.19	2163.48	0.5	
Na	23	45	He	18.368	0.62	15378.25	50	
Mg	24	45	He	9.859	4.52	1473.46	50	
Al	27	45	He	3.813	17.43	206.67	10	
Si	29	45	He	-13680.323	15.94	3088.34	100	
K	39	45	He	-12.021	5.37	12399.94	50	
Ca	44	45	He	90.108	3.32	773.37	250	
Ti	47	45	He	0.299	75.10	22.00	0.5	
V	51	72	He	0.000	12.48	134.45	0.5	
Cr	52	72	He	-0.153	1.83	3462.69	0.5	
Mn	55	72	He	0.329	3.17	526.68	2.5	
Fe	57	72	He	1.523	14.42	500.03	50	
Co	59	72	He	-0.001	11.77	91.11	0.5	
Ni	60	72	He	0.027	16.38	407.79	1	
Cu	63	45	He	0.162	1.87	2675.83	0.5	
Zn	66	72	He	2.341	3.15	1505.65	10	
As	75	72	He	0.003	24.29	27.00	0.5	
Se	78	72	He	-0.030	20.42	6.16	0.5	
Sn	120	115	He	0.006	21.10	164.45	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1219547.20	1066636.57333333	114.34	
Ge	72	He	78502.90	76690.4733333333	102.36	
In	115	He	564900.25	527518.896666667	107.09	
Lu	175	He	899592.25	811094.676666667	110.91	
Rh	103	He	2330785.19	2150131.65	108.4	
Sc	45	He	94788.58	98241.74	96.49	
Tb	159	He	1881575.70	1707326.38	110.21	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2450206.68	2336732.1	104.86	
Ge	72	No Gas	1169075.82	1156430.33666667	101.09	
In	115	No Gas	5620280.20	5237310.61666667	107.31	
Lu	175	No Gas	4369236.60	4014375.88	108.84	
Rh	103	No Gas	5876777.96	5515557.00333333	106.55	
Sc	45	No Gas	5668300.47	5538601.16666667	102.34	
Tb	159	No Gas	5246348.05	4855676.28	108.05	

III

CONTINUING CALIBRATION BLANK

Report No:	218081813	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\121288_CCB.d
Analyst:	LWZ	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1841	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121288_CCB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:41:56	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	-0.115	0.93	187411.02	2.5	
Be	9	45	No Gas	0.003	8.79	82.00	0.5	
B	11	45	No Gas	0.639	2.52	5611.20	5	
Sr	88	72	No Gas	0.016	5.62	1086.75	0.5	
Zr	90	72	No Gas	0.007	4.50	742.25	0.5	
Mo	95	115	No Gas	0.005	4.76	140.00	0.5	
Ag	107	115	No Gas	0.006	11.76	127.78	0.5	
Cd	111	115	No Gas	0.004	34.44	31.11	0.5	
Sb	121	115	No Gas	0.049	6.75	1063.39	1	
Ba	137	115	No Gas	0.069	8.63	472.24	0.5	
Tl	205	209	No Gas	-0.005	13.32	86.67	0.5	
Pb	208	209	No Gas	0.010	7.90	386.68	0.5	
Na	23	45	He	-5.286	1.04	7115.25	50	
Mg	24	45	He	0.332	30.55	150.01	50	
Al	27	45	He	5.348	21.01	268.67	10	
Si	29	45	He	-13632.507	18.23	3287.06	100	
K	39	45	He	-4.208	4.39	13983.66	50	
Ca	44	45	He	7.635	8.97	358.34	250	
Ti	47	45	He	-0.026	39.03	5.33	0.5	
V	51	72	He	-0.003	28.83	133.33	0.5	
Cr	52	72	He	-0.207	3.12	3454.89	0.5	
Mn	55	72	He	0.022	12.40	215.56	2.5	
Fe	57	72	He	-0.065	15.75	440.03	50	
Co	59	72	He	-0.004	9.32	74.45	0.5	
Ni	60	72	He	-0.021	3.01	355.56	1	
Cu	63	45	He	-0.398	11.07	588.91	0.5	
Zn	66	72	He	0.056	10.41	250.00	10	
As	75	72	He	-0.006	14.18	22.67	0.5	
Se	78	72	He	0.019	19.71	7.74	0.5	
Sn	120	115	He	0.430	3.35	955.60	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1245320.03	1066636.57333333	116.75	
Ge	72	He	82226.93	76690.4733333333	107.22	
In	115	He	584566.87	527518.896666667	110.81	
Lu	175	He	940283.89	811094.676666667	115.93	
Rh	103	He	2371895.88	2150131.65	110.31	
Sc	45	He	99435.41	98241.74	101.22	
Tb	159	He	1943466.84	1707326.38	113.83	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2493734.65	2336732.1	106.72	
Ge	72	No Gas	1185051.93	1156430.33666667	102.47	
In	115	No Gas	5616991.54	5237310.61666667	107.25	
Lu	175	No Gas	4291674.94	4014375.88	106.91	
Rh	103	No Gas	5881599.63	5515557.00333333	106.64	
Sc	45	No Gas	5731960.05	5538601.16666667	103.49	
Tb	159	No Gas	5235570.65	4855676.28	107.82	

III

INITIAL CALIBRATION BLANK

Report No:	218081813	Blank ID:	1700
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\017_ICB_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1050	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Initial Calibration Blank (ICB) Report

Sample Name	1700	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	017_ICB_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 10:50:00	**Total Dilution**	1.0000
Sample Type	ICB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	-0.079	1.54	160296.26	2.5	
Be	9	45	No Gas	-0.003	11.27	64.00	0.5	
B	11	45	No Gas	1.624	5.32	9356.48	5	
Sr	88	72	No Gas	-0.006	9.63	806.72	0.5	
Zr	90	72	No Gas	-0.001	3.94	634.46	0.5	
Mo	95	115	No Gas	-0.006	6.38	211.12	0.5	
Ag	107	115	No Gas	-0.001	22.05	40.00	0.5	
Cd	111	115	No Gas	0.000	33.08	26.67	0.5	
Sb	121	115	No Gas	-0.026	2.77	1285.63	1	
Ba	137	115	No Gas	0.006	6.35	184.45	0.5	
Tl	205	209	No Gas	-0.026	11.76	273.35	0.5	
Pb	208	209	No Gas	-0.007	11.74	196.67	0.5	
Na	23	45	He	-0.347	2.35	4480.81	50	
Mg	24	45	He	-0.062	11.46	133.33	50	
Al	27	45	He	-0.676	6.19	93.33	10	
Si	29	45	He	-653.915	7.45	6848.26	100	
K	39	45	He	2.334	4.71	11351.35	50	
Ca	44	45	He	11.783	10.14	413.34	250	
Ti	47	45	He	-0.097	48.24	6.33	0.5	
V	51	72	He	0.009	16.57	127.78	0.5	
Cr	52	72	He	0.003	5.73	2055.72	0.5	
Mn	55	72	He	0.014	5.88	182.22	2.5	
Fe	57	72	He	-1.364	12.60	183.34	50	
Co	59	72	He	-0.002	2.99	64.44	0.5	
Ni	60	72	He	0.012	25.61	260.01	1	
Cu	63	72	He	-0.011	12.91	273.34	0.5	
Zn	66	72	He	-0.023	5.27	1132.28	10	
As	75	72	He	-0.012	18.70	16.33	0.5	
Se	78	72	He	0.048	24.28	5.66	0.5	
Sn	120	115	He	0.010	5.93	595.57	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1194226.18	1156007.06333333	103.31	
Ge	72	He	69904.88	68942.6933333333	101.4	
In	115	He	526195.24	515120.94	102.15	
Lu	175	He	882958.92	860474.493333333	102.61	
Rh	103	He	2116807.21	2061162.14	102.7	
Sc	45	He	86694.13	86332.2766666667	100.42	
Tb	159	He	1838390.70	1790396.84666667	102.68	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2496468.97	2430541.58	102.71	
Ge	72	No Gas	1106945.20	1116846.20666667	99.11	
In	115	No Gas	5314768.67	5301929.88666667	100.24	
Lu	175	No Gas	4120318.27	4111004.52	100.23	
Rh	103	No Gas	5526451.86	5479027.00333333	100.87	
Sc	45	No Gas	5045383.97	5061380.49333333	99.68	
Tb	159	No Gas	5038610.97	4997578.57333333	100.82	

III

CONTINUING CALIBRATION BLANK

Report No:	218081813	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1835_CCB_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1243	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1835_CCB_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 12:43:44	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	0.736	1.29	165508.88	2.5	
Be	9	45	No Gas	-0.008	14.68	39.33	0.5	
B	11	45	No Gas	-0.513	10.11	2303.58	5	
Sr	88	72	No Gas	-0.005	9.43	803.38	0.5	
Zr	90	72	No Gas	0.006	7.98	747.81	0.5	
Mo	95	115	No Gas	-0.020	14.00	122.22	0.5	
Ag	107	115	No Gas	0.003	26.71	90.00	0.5	
Cd	111	115	No Gas	-0.003	26.96	18.89	0.5	
Sb	121	115	No Gas	0.000	2.25	1557.88	1	
Ba	137	115	No Gas	0.007	19.21	185.56	0.5	
Tl	205	209	No Gas	-0.036	32.74	140.01	0.5	
Pb	208	209	No Gas	-0.004	11.71	246.67	0.5	
Na	23	45	He	3.723	4.08	5404.49	50	
Mg	24	45	He	-0.203	27.27	110.00	50	
Al	27	45	He	-0.145	18.91	102.00	10	
Si	29	45	He	-2838.054	12.08	4332.65	100	
K	39	45	He	5.671	1.10	11024.38	50	
Ca	44	45	He	8.544	23.61	376.68	250	
Ti	47	45	He	-0.010	33.25	9.67	0.5	
V	51	72	He	-0.014	14.43	80.00	0.5	
Cr	52	72	He	0.000	6.05	1964.60	0.5	
Mn	55	72	He	-0.017	11.49	148.89	2.5	
Fe	57	72	He	-0.386	16.21	216.68	50	
Co	59	72	He	-0.003	36.83	58.89	0.5	
Ni	60	72	He	-0.003	14.27	230.00	1	
Cu	63	72	He	0.000	4.44	300.01	0.5	
Zn	66	72	He	0.053	3.89	1120.05	10	
As	75	72	He	-0.004	28.00	19.67	0.5	
Se	78	72	He	0.022	7.77	4.92	0.5	
Sn	120	115	He	0.002	9.03	558.91	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1164516.86	1156007.06333333	100.74	
Ge	72	He	67138.15	68942.6933333333	97.38	
In	115	He	503940.04	515120.94	97.83	
Lu	175	He	816667.72	860474.493333333	94.91	
Rh	103	He	2029086.72	2061162.14	98.44	
Sc	45	He	81827.20	86332.2766666667	94.78	
Tb	159	He	1722137.47	1790396.84666667	96.19	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2451501.89	2430541.58	100.86	
Ge	72	No Gas	1084649.37	1116846.20666667	97.12	
In	115	No Gas	5152461.53	5301929.88666667	97.18	
Lu	175	No Gas	4000779.31	4111004.52	97.32	
Rh	103	No Gas	5296808.12	5479027.00333333	96.67	
Sc	45	No Gas	4843807.31	5061380.49333333	95.7	
Tb	159	No Gas	4887757.01	4997578.57333333	97.8	

III

METHOD BLANK

Report No:	218081813	Blank ID:	MB1842310
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1836SMPL_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1247	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	40.0	ug/kg	U	20.0	40.0	80.0
Copper	20.0	ug/kg	U	10.0	20.0	40.0
Lead	20.0	ug/kg	U	10.0	20.0	40.0
Zinc	400	ug/kg	U	200	400	800

FORM III - IN

Method Blank (MB) Report

Sample Name	1842310	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1836SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 12:47:18	**Total Dilution**	40.0000
Sample Type	MBSOIL	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	36.039	2.41	171891.45	2.5	
Be	9	45	No Gas	-0.082	32.48	68.67	0.5	
B	11	45	No Gas	-2.750	10.52	3787.26	5	
Sr	88	72	No Gas	2.308	4.25	3023.76	0.5	
Zr	90	72	No Gas	43.770	3.43	23978.66	0.5	> 1/2 LOQ
Mo	95	115	No Gas	-0.294	13.15	215.56	0.5	
Ag	107	115	No Gas	0.044	29.37	75.56	0.5	
Cd	111	115	No Gas	-0.035	12.51	26.67	0.5	
Sb	121	115	No Gas	-0.828	0.47	1430.09	1	
Ba	137	115	No Gas	1.627	2.01	345.56	0.5	
Tl	205	209	No Gas	-1.177	4.17	240.01	0.5	
Pb	208	209	No Gas	0.015	8.90	343.35	0.5	
Na	23	45	He	373.188	0.79	8385.91	50	
Mg	24	45	He	587.114	2.15	2130.23	50	
Al	27	45	He	369.568	4.80	410.01	10	
Si	29	45	He	-129069.061	9.44	4714.77	100	
K	39	45	He	-295.840	2.27	11701.68	50	
Ca	44	45	He	5014.113	10.28	1048.39	250	
Ti	47	45	He	-4.266	43.30	6.67	0.5	
V	51	72	He	-1.629	18.18	36.67	0.5	
Cr	52	72	He	-6.960	4.34	1817.91	0.5	
Mn	55	72	He	11.753	9.89	488.90	2.5	
Fe	57	72	He	22.721	16.92	303.34	50	
Co	59	72	He	0.778	6.47	181.11	0.5	
Ni	60	72	He	-0.697	18.75	252.23	1	
Cu	63	72	He	6.682	3.37	1003.38	0.5	
Zn	66	72	He	54.292	5.36	2023.50	10	
As	75	72	He	-0.659	38.02	16.00	0.5	
Se	78	72	He	0.527	6.77	5.58	0.5	
Sn	120	115	He	-9.292	36.91	264.50	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1453122.27	1156007.06333333	125.7	<70% or >120%
Ge	72	He	79164.76	68942.6933333333	114.83	
In	115	He	624026.71	515120.94	121.14	<70% or >120%
Lu	175	He	1054076.08	860474.493333333	122.5	<70% or >120%
Rh	103	He	2354085.88	2061162.14	114.21	
Sc	45	He	97729.14	86332.2766666667	113.2	
Tb	159	He	2137930.23	1790396.84666667	119.41	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2677510.58	2430541.58	110.16	
Ge	72	No Gas	1151202.52	1116846.20666667	103.08	
In	115	No Gas	5625065.44	5301929.88666667	106.09	
Lu	175	No Gas	4445490.45	4111004.52	108.14	
Rh	103	No Gas	5698426.02	5479027.00333333	104	
Sc	45	No Gas	4959847.02	5061380.49333333	97.99	
Tb	159	No Gas	5366503.36	4997578.57333333	107.38	

III

CONTINUING CALIBRATION BLANK

Report No:	218081813	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1851_CCB_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1340	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1851_CCB_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:40:36	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	0.778	0.98	163034.76	2.5	
Be	9	45	No Gas	-0.005	14.24	49.33	0.5	
B	11	45	No Gas	-0.436	4.85	2500.29	5	
Sr	88	72	No Gas	-0.001	7.50	936.72	0.5	
Zr	90	72	No Gas	0.021	22.02	1040.19	0.5	
Mo	95	115	No Gas	-0.022	11.36	111.11	0.5	
Ag	107	115	No Gas	0.002	2.34	82.22	0.5	
Cd	111	115	No Gas	-0.001	14.29	23.33	0.5	
Sb	121	115	No Gas	-0.019	5.35	1296.74	1	
Ba	137	115	No Gas	0.012	10.10	198.89	0.5	
Tl	205	209	No Gas	-0.033	32.13	156.67	0.5	
Pb	208	209	No Gas	-0.002	12.06	253.34	0.5	
Na	23	45	He	1.582	1.58	4790.91	50	
Mg	24	45	He	0.005	15.62	133.34	50	
Al	27	45	He	-0.222	13.86	100.00	10	
Si	29	45	He	-4168.056	15.42	3033.66	100	
K	39	45	He	-8.028	3.24	9750.15	50	
Ca	44	45	He	-7.334	4.95	308.34	250	
Ti	47	45	He	-0.011	36.33	9.67	0.5	
V	51	72	He	-0.029	24.17	52.22	0.5	
Cr	52	72	He	-0.016	2.75	1935.70	0.5	
Mn	55	72	He	0.023	3.64	183.34	2.5	
Fe	57	72	He	-0.498	18.94	213.34	50	
Co	59	72	He	-0.005	33.63	48.89	0.5	
Ni	60	72	He	-0.009	6.86	224.45	1	
Cu	63	72	He	-0.004	21.35	286.67	0.5	
Zn	66	72	He	-0.006	2.06	1098.94	10	
As	75	72	He	-0.011	21.50	16.33	0.5	
Se	78	72	He	-0.016	15.24	4.16	0.5	
Sn	120	115	He	0.008	6.06	562.24	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1041527.43	1156007.06333333	90.1	
Ge	72	He	67394.19	68942.6933333333	97.75	
In	115	He	499961.23	515120.94	97.06	
Lu	175	He	664922.15	860474.493333333	77.27	
Rh	103	He	2011190.34	2061162.14	97.58	
Sc	45	He	81917.19	86332.2766666667	94.89	
Tb	159	He	1527003.31	1790396.84666667	85.29	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2222331.32	2430541.58	91.43	
Ge	72	No Gas	1069798.36	1116846.20666667	95.79	
In	115	No Gas	5027461.27	5301929.88666667	94.82	
Lu	175	No Gas	3556572.86	4111004.52	86.51	
Rh	103	No Gas	5239280.49	5479027.00333333	95.62	
Sc	45	No Gas	4755255.64	5061380.49333333	93.95	
Tb	159	No Gas	4443307.75	4997578.57333333	88.91	

III

CONTINUING CALIBRATION BLANK

Report No:	218081813	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180828C_MS2.b\003_CCB.d
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1402	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	003_CCB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 14:02:08	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	0.419	1.26	159366.29	2.5	
Be	9	45	No Gas	-0.007	19.88	40.67	0.5	
B	11	45	No Gas	-0.585	10.97	2060.20	5	
Sr	88	72	No Gas	0.000	9.42	963.41	0.5	
Zr	90	72	No Gas	0.010	6.79	845.59	0.5	
Mo	95	115	No Gas	-0.027	15.39	86.67	0.5	
Ag	107	115	No Gas	0.001	25.59	65.55	0.5	
Cd	111	115	No Gas	-0.004	34.64	16.67	0.5	
Sb	121	115	No Gas	-0.036	3.90	1128.95	1	
Ba	137	115	No Gas	0.015	7.71	217.78	0.5	
Tl	205	209	No Gas	-0.034	37.12	150.01	0.5	
Pb	208	209	No Gas	-0.001	3.70	270.01	0.5	
Na	23	45	He	-1.031	3.91	4104.04	50	
Mg	24	45	He	0.016	30.47	136.67	50	
Al	27	45	He	-0.794	7.42	86.67	10	
Si	29	45	He	-4426.446	13.87	2826.96	100	
K	39	45	He	-7.988	4.38	9916.95	50	
Ca	44	45	He	6.746	6.93	375.01	250	
Ti	47	45	He	-0.069	31.49	7.33	0.5	
V	51	72	He	-0.029	3.54	54.44	0.5	
Cr	52	72	He	-0.032	3.59	1932.37	0.5	
Mn	55	72	He	0.000	6.93	166.67	2.5	
Fe	57	72	He	-0.835	20.47	203.34	50	
Co	59	72	He	-0.003	30.04	61.11	0.5	
Ni	60	72	He	-0.023	12.20	212.23	1	
Cu	63	72	He	0.008	4.06	332.23	0.5	
Zn	66	72	He	-0.001	3.00	1122.27	10	
As	75	72	He	-0.014	33.47	15.33	0.5	
Se	78	72	He	-0.039	34.75	3.75	0.5	
Sn	120	115	He	-0.006	13.68	557.79	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1081100.71	1156007.06333333	93.52	
Ge	72	He	68677.77	68942.6933333333	99.62	
In	115	He	514173.90	515120.94	99.82	
Lu	175	He	685517.59	860474.493333333	79.67	
Rh	103	He	2078208.39	2061162.14	100.83	
Sc	45	He	83311.33	86332.2766666667	96.5	
Tb	159	He	1578757.95	1790396.84666667	88.18	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2281802.10	2430541.58	93.88	
Ge	72	No Gas	1088622.38	1116846.20666667	97.47	
In	115	No Gas	5178462.46	5301929.88666667	97.67	
Lu	175	No Gas	3697559.94	4111004.52	89.94	
Rh	103	No Gas	5365108.68	5479027.00333333	97.92	
Sc	45	No Gas	4795057.45	5061380.49333333	94.74	
Tb	159	No Gas	4571952.64	4997578.57333333	91.48	

Metals

Form IV

Interference Checks

IV
ICPMS INTERFERENCE CHECKS

Report No:	218081813	ICSA \ AB ID:	2000 \ 2100
Instrument ID:	ICPMS1	Analytical Batch:	642536
Analyst:	LWZ	Analytical Method:	EPA 6020B
Lab File ID ICSA1:	2180823A_MS1.b\020ICSA.d	Lab File ID ICSAB1:	2180823A_MS1.b\021ICSB.d
Lab File ID ICSA2:		Lab File ID ICSAB2:	

Concentration Units: ug/L

		Analyzed (A/AB):	08/23/18 1049	08/23/18 1054				
ANALYTE	***TRUE A***	***TRUE AB***	***ICSA1***	***ICSAB1***	***%R***	***ICSA2***	***ICSAB2***	***%R***
Aluminum	1000	1000	1010	999	100			
Antimony	0	0	-0.0020	-0.012				
Arsenic	0	10.0	0.0040	10.0	100			
Barium	0	0	0.025	0.025				
Beryllium	0	0	-0.0010	-0.0050				
Boron	0	20.0	0.42	19.5	98			
Cadmium	0	10.0	0.020	10.1	101			
Calcium	3000	3000	2870	2960	99			
Chromium	0	20.0	0.0	19.9	100			
Cobalt	0	20.0	0.0040	20.2	101			
Copper	0	20.0	-0.098	20.6	103			
Iron	2500	2500	2490	2480	99			
Lead	0	0	0.0010	-0.010				
Lithium	0	20.0	-0.026	22.4	112			
Magnesium	1000	1000	997	991	99			
Manganese	0	20.0	0.028	20.2	101			
Molybdenum	20.0	20.0	19.5	19.3	96			
Nickel	0	20.0	-0.0080	20.5	102			
Potassium	1000	1000	1010	998	100			
Selenium	0	10.0	0.021	10.4	104			
Silicon	0	1000	-1.4	1090	109			
Silver	0	5.00	0.0070	5.16	103			
Sodium	2500	2500	2600	2520	101			
Strontium	0	10.0	0.10	9.92	99			
Thallium	0	0	-0.026	-0.034				
Tin	0	10.0	-0.038	7.41	74			
Titanium	20.0	20.0	20.0	20.8	104			
Vanadium	0	20.0	-0.011	17.1	86			
Zinc	0	20.0	-0.13	19.8	99			
Zirconium	0	20.0	0.021	19.1	96			

FORM IV - IN

Sample Report

Sample Name	2000	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	020ICSA.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 10:49:53	**Total Dilution**	1.0000
Sample Type	ICSA	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	-0.026	-0.026	0.6	297098.07	2.5	
Be	9	45	No Gas	-0.001	-0.001	11.7	84.67	0.5	
B	11	45	No Gas	0.419	0.419	2.0	15884.60	5	
Sr	88	72	No Gas	0.101	0.101	10.8	2683.65	0.5	
Zr	90	72	No Gas	0.021	0.021	0.2	815.59	0.5	
Mo	95	115	No Gas	19.539	19.539	2.0	84618.99	20	
Ag	107	115	No Gas	0.007	0.007	11.3	156.67	0.5	
Cd	111	115	No Gas	0.02	0.020	12.3	75.67	0.5	
Sb	121	115	No Gas	-0.002	-0.002	5.2	805.59	1	
Ba	137	115	No Gas	0.025	0.025	29.1	180.00	0.5	
Tl	205	175	No Gas	-0.026	-0.026	4.5	750.03	0.5	
Pb	208	209	No Gas	0.001	0.001	2.9	856.71	0.5	
Na	23	45	He	2597.064	2597.064	1.0	1211163.47	2500	
Mg	24	45	He	997.085	997.085	1.2	227801.92	1000	
Al	27	45	He	1014.948	1014.948	0.6	67540.27	1000	
Si	29	45	He	-1.368	-1.368	6.8	942.70	100	
K	39	45	He	1013.577	1013.577	1.0	105648.98	1000	
Ca	44	45	He	2867.947	2867.947	3.2	16638.54	3000	
Ti	47	45	He	20	20.000	3.6	912.03	20	
V	51	72	He	-0.011	-0.011	19.9	42.22	0.5	
Cr	52	72	He	0	0.000	14.3	93.33	0.5	
Mn	55	72	He	0.028	0.028	15.3	87.78	2.5	
Fe	57	72	He	2487.677	2487.677	0.7	106891.95	2500	
Co	59	72	He	0.004	0.004	25.5	60.00	0.5	
Ni	60	72	He	-0.008	-0.008	13.1	38.89	1	
Cu	63	72	He	-0.098	-0.098	11.9	308.89	0.5	
Zn	66	103	He	-0.128	-0.128	13.0	203.34	10	
As	75	72	He	0.004	0.004	13.2	12.17	0.5	
Se	78	72	He	0.021	0.021	25.8	3.48	0.5	
Sn	120	115	He	-0.038	-0.038	7.9	232.23	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1462077.32	1457156.02	100.34	
Ge	72	He	47459.87	46567.3733333333	101.92	
In	115	He	405673.15	401074.37	101.15	
Lu	175	He	1122886.47	1106922.95333333	101.44	
Rh	103	He	1582835.91	1576304.55666667	100.41	
Sc	45	He	79271.64	77709.7233333333	102.01	
Tb	159	He	1950882.36	1926533.77666667	101.26	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3548642.55	3553207.86333333	99.87	
Ge	72	No Gas	602713.76	588164.35	102.47	
In	115	No Gas	3955818.39	3846213.84666667	102.85	
Lu	175	No Gas	5646390.12	5505661.37666667	102.56	
Rh	103	No Gas	3855383.88	3760261.65666667	102.53	
Sc	45	No Gas	3121490.57	3052080.71	102.27	
Tb	159	No Gas	5704121.58	5497134.5	103.77	

Sample Report

Sample Name	2100	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	021ICSB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 10:54:19	**Total Dilution**	1.0000
Sample Type	ICSB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	22.426	22.426	1.5	1038096.15	20	
Be	9	45	No Gas	-0.005	-0.005	14.5	65.33	0.5	
B	11	45	No Gas	19.5	19.500	2.9	88782.02	20	
Sr	88	72	No Gas	9.923	9.923	1.9	219764.99	10	
Zr	90	72	No Gas	19.066	19.066	3.9	285460.67	20	
Mo	95	115	No Gas	19.322	19.322	2.2	84225.80	20	
Ag	107	115	No Gas	5.158	5.158	2.6	55394.86	5	
Cd	111	115	No Gas	10.146	10.146	3.1	22631.04	10	
Sb	121	115	No Gas	-0.012	-0.012	11.7	724.47	1	
Ba	137	115	No Gas	0.025	0.025	10.3	178.89	0.5	
Tl	205	175	No Gas	-0.034	-0.034	6.7	600.02	0.5	
Pb	208	209	No Gas	-0.01	-0.010	15.2	536.69	0.5	
Na	23	45	He	2520.805	2520.805	2.1	1158022.90	2500	
Mg	24	45	He	990.774	990.774	0.8	222989.99	1000	
Al	27	45	He	998.619	998.619	0.9	65464.72	1000	
Si	29	45	He	1089.374	1089.374	6.8	2682.90	1000	
K	39	45	He	997.874	997.874	1.5	102509.82	1000	
Ca	44	45	He	2956.884	2956.884	0.8	16892.11	3000	
Ti	47	45	He	20.824	20.824	4.0	935.36	20	
V	51	72	He	17.092	17.092	0.8	28963.08	20	
Cr	52	72	He	19.947	19.947	1.4	43629.47	20	
Mn	55	72	He	20.163	20.163	0.6	20272.53	20	
Fe	57	72	He	2482.945	2482.945	1.2	105439.84	2500	
Co	59	72	He	20.215	20.215	0.4	72523.71	20	
Ni	60	72	He	20.496	20.496	1.3	19917.72	20	
Cu	63	72	He	20.569	20.569	1.2	55268.02	20	
Zn	66	103	He	19.776	19.776	1.3	7128.28	20	
As	75	72	He	10.026	10.026	1.6	2684.22	10	
Se	78	72	He	10.375	10.375	0.9	216.01	10	
Sn	120	115	He	7.414	7.414	1.5	10946.12	10	> +/- 20%

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1441776.91	1457156.02	98.94	
Ge	72	He	46900.55	46567.3733333333	100.72	
In	115	He	401949.14	401074.37	100.22	
Lu	175	He	1108487.12	1106922.95333333	100.14	
Rh	103	He	1581265.60	1576304.55666667	100.31	
Sc	45	He	78093.74	77709.7233333333	100.49	
Tb	159	He	1944122.37	1926533.77666667	100.91	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3613003.49	3553207.86333333	101.68	
Ge	72	No Gas	609472.20	588164.35	103.62	
In	115	No Gas	3980946.17	3846213.84666667	103.5	
Lu	175	No Gas	5732960.33	5505661.37666667	104.13	
Rh	103	No Gas	3902740.54	3760261.65666667	103.79	
Sc	45	No Gas	3166057.10	3052080.71	103.73	
Tb	159	No Gas	5725771.37	5497134.5	104.16	

IV

ICPMS INTERFERENCE CHECKS

Report No:	218081813	ICSA \ AB ID:	2000 \ 2100
Instrument ID:	ICPMS1	Analytical Batch:	642381
Analyst:	LWZ	Analytical Method:	EPA 6020B
Lab File ID ICSA1:	2180821A_MS1.b\015ICSA.d	Lab File ID ICSAB1:	2180821A_MS1.b\016ICSB.d
Lab File ID ICSA2:		Lab File ID ICSAB2:	

Concentration Units: ug/L

		Analyzed (A/AB):	08/21/18 1112	08/21/18 1117				
ANALYTE	***TRUE A***	***TRUE AB***	***ICSA1***	***ICSAB1***	***%R***	***ICSA2***	***ICSAB2***	***%R***
Aluminum	1000	1000	1010	1010	101			
Antimony	0	0	0.063	0.065				
Arsenic	0	10.0	-0.0010	10.3	103			
Barium	0	0	0.039	0.034				
Beryllium	0	0	0.0	0.0				
Boron	0	20.0	1.21	20.2	101			
Cadmium	0	10.0	0.027	10.1	101			
Calcium	3000	3000	2960	3010	100			
Chromium	0	20.0	0.0060	20.4	102			
Cobalt	0	20.0	0.014	20.8	104			
Copper	0	20.0	-0.17	20.2	101			
Iron	2500	2500	2530	2510	100			
Lead	0	0	-0.0040	-0.0090				
Lithium	0	20.0	-0.051	22.7	114			
Magnesium	1000	1000	1010	1010	101			
Manganese	0	20.0	0.031	20.8	104			
Molybdenum	20.0	20.0	19.2	19.0	95			
Nickel	0	20.0	0.022	21.2	106			
Potassium	1000	1000	1020	992	99			
Selenium	0	10.0	0.063	10.1	101			
Silicon	0	1000	-23	1100	110			
Silver	0	5.00	0.0070	5.15	103			
Sodium	2500	2500	2590	2570	103			
Strontium	0	10.0	0.094	9.55	96			
Thallium	0	0	-0.067	-0.069				
Tin	0	10.0	0.010	7.32	73			
Titanium	20.0	20.0	20.5	20.0	100			
Vanadium	0	20.0	-0.0020	17.4	87			
Zinc	0	20.0	0.27	21.6	108			
Zirconium	0	20.0	0.027	18.8	94			

FORM IV - IN

Sample Report

Sample Name	2000	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	015ICSA.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:12:59	**Total Dilution**	1.0000
Sample Type	ICSA	**Sample Pass/Fail**	Pass
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	-0.051	-0.051	1.4	313610.54	2.5	
Be	9	45	No Gas	0	0.000	35.6	25.33	0.5	
B	11	45	No Gas	1.207	1.207	2.4	10150.04	5	
Sr	88	103	No Gas	0.094	0.094	7.2	2386.94	0.5	
Zr	90	72	No Gas	0.027	0.027	9.9	742.28	0.5	
Mo	95	115	No Gas	19.211	19.211	1.8	82505.52	20	
Ag	107	115	No Gas	0.007	0.007	5.7	88.89	0.5	
Cd	111	115	No Gas	0.027	0.027	2.4	71.00	0.5	
Sb	121	115	No Gas	0.063	0.063	0.9	1085.61	1	
Ba	137	115	No Gas	0.039	0.039	4.4	158.89	0.5	
Tl	205	175	No Gas	-0.067	-0.067	11.6	613.36	0.5	
Pb	208	209	No Gas	-0.004	-0.004	6.5	466.68	0.5	
Na	23	45	He	2590.838	2590.838	0.9	1260873.86	2500	
Mg	24	45	He	1006.979	1006.979	1.1	236709.75	1000	
Al	27	45	He	1012.546	1012.546	0.5	71058.39	1000	
Si	29	45	He	-23.267	-23.267	5.7	949.37	100	
K	39	45	He	1020.368	1020.368	0.4	106504.56	1000	
Ca	44	45	He	2962.915	2962.915	2.6	17499.38	3000	
Ti	47	45	He	20.466	20.466	2.0	968.36	20	
V	51	72	He	-0.002	-0.002	61.4	41.11	0.5	
Cr	52	72	He	0.006	0.006	24.7	85.55	0.5	
Mn	55	45	He	0.031	0.031	30.2	55.55	2.5	
Fe	57	72	He	2529.05	2529.050	0.3	112506.30	2500	
Co	59	72	He	0.014	0.014	30.3	64.45	0.5	
Ni	60	72	He	0.022	0.022	34.0	34.44	1	
Cu	63	103	He	-0.17	-0.170	10.8	233.33	0.5	
Zn	66	103	He	0.266	0.266	11.3	156.67	10	
As	75	72	He	-0.001	-0.001	38.4	8.67	0.5	
Se	78	72	He	0.063	0.063	24.2	3.11	0.5	
Sn	120	115	He	0.01	0.010	6.7	216.67	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1512143.47	1548427.37333333	97.66	
Ge	72	He	45695.94	44394.6333333333	102.93	
In	115	He	411335.09	404099.316666667	101.79	
Lu	175	He	1252210.81	1190023.24	105.23	
Rh	103	He	1583189.35	1573916.12	100.59	
Sc	45	He	78620.67	75790.99	103.73	
Tb	159	He	2028812.57	2036132.52	99.64	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3541941.51	3602753.49	98.31	
Ge	72	No Gas	570584.23	552452.773333333	103.28	
In	115	No Gas	3816668.43	3822230.42333333	99.85	
Lu	175	No Gas	5555764.71	5635183.66666667	98.59	
Rh	103	No Gas	3708059.02	3660203.32666667	101.31	
Sc	45	No Gas	3053938.91	3019672.93666667	101.13	
Tb	159	No Gas	5513593.67	5550323.25333333	99.34	

Sample Report

Sample Name	2100	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
File Name	016ICSB.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-21 11:17:25	**Total Dilution**	1.0000
Sample Type	ICSB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	22.689	22.689	3.3	1113383.01	20	
Be	9	45	No Gas	0	0.000	34.0	20.67	0.5	
B	11	45	No Gas	20.188	20.188	2.1	94092.80	20	
Sr	88	103	No Gas	9.549	9.549	1.9	209948.57	10	
Zr	90	72	No Gas	18.83	18.830	3.0	274126.14	20	
Mo	95	115	No Gas	18.964	18.964	1.6	80702.52	20	
Ag	107	115	No Gas	5.149	5.149	1.2	54379.28	5	
Cd	111	115	No Gas	10.085	10.085	1.0	22242.51	10	
Sb	121	115	No Gas	0.065	0.065	5.2	1092.28	1	
Ba	137	115	No Gas	0.034	0.034	5.4	142.23	0.5	
Tl	205	175	No Gas	-0.069	-0.069	5.9	568.91	0.5	
Pb	208	209	No Gas	-0.009	-0.009	14.3	320.01	0.5	
Na	23	45	He	2574.029	2574.029	0.5	1240882.20	2500	
Mg	24	45	He	1008.183	1008.183	1.3	234794.83	1000	
Al	27	45	He	1005.006	1005.006	1.3	69872.88	1000	
Si	29	45	He	1098.396	1098.396	3.5	2823.59	1000	
K	39	45	He	991.728	991.728	1.4	102607.77	1000	
Ca	44	45	He	3010.955	3010.955	0.9	17616.14	3000	
Ti	47	45	He	20.036	20.036	4.8	939.03	20	
V	51	72	He	17.445	17.445	1.0	28975.32	20	
Cr	52	72	He	20.375	20.375	1.0	44080.53	20	
Mn	55	45	He	20.846	20.846	1.3	21201.47	20	
Fe	57	72	He	2508.814	2508.814	1.9	110129.39	2500	
Co	59	72	He	20.779	20.779	1.1	73966.92	20	
Ni	60	72	He	21.19	21.190	2.2	20684.22	20	
Cu	63	103	He	20.205	20.205	0.2	56544.38	20	
Zn	66	103	He	21.592	21.592	0.9	7581.82	20	
As	75	72	He	10.272	10.272	0.4	2846.42	10	
Se	78	72	He	10.074	10.074	3.0	234.08	10	
Sn	120	115	He	7.318	7.318	1.2	11027.29	10	> +/- 20%

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1516772.01	1548427.37333333	97.96	
Ge	72	He	45080.93	44394.6333333333	101.55	
In	115	He	406456.75	404099.316666667	100.58	
Lu	175	He	1192480.71	1190023.24	100.21	
Rh	103	He	1580725.49	1573916.12	100.43	
Sc	45	He	77885.77	75790.99	102.76	
Tb	159	He	2048742.99	2036132.52	100.62	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3494572.03	3602753.49	97	
Ge	72	No Gas	563265.06	552452.773333333	101.96	
In	115	No Gas	3781561.05	3822230.42333333	98.94	
Lu	175	No Gas	5501209.29	5635183.66666667	97.62	
Rh	103	No Gas	3649788.47	3660203.32666667	99.72	
Sc	45	No Gas	3046422.52	3019672.93666667	100.89	
Tb	159	No Gas	5508685.33	5550323.25333333	99.25	

IV

ICPMS INTERFERENCE CHECKS

Report No:	218081813	ICSA \ AB ID:	2000 \ 2100
Instrument ID:	ICPMS2	Analytical Batch:	642309
Analyst:	LWZ	Analytical Method:	EPA 6020B
Lab File ID ICSA1:	2180820B_MS2.b\121212ICSA.d	Lab File ID ICSAB1:	2180820B_MS2.b\121213ICSB.d
Lab File ID ICSA2:		Lab File ID ICSAB2:	

Concentration Units: ug/L

		Analyzed (A/AB):	08/20/18 1356	08/20/18 1400				
ANALYTE	***TRUE A***	***TRUE AB***	***ICSA1***	***ICSAB1***	***%R***	***ICSA2***	***ICSAB2***	***%R***
Aluminum	1000	1000	1010	999	100			
Antimony	0	0	0.039	0.031				
Arsenic	0	10.0	0.0030	10.3	103			
Barium	0	0	-0.0040	0.016				
Beryllium	0	0	-0.0010	-0.0010				
Boron	0	20.0	0.17	20.2	101			
Cadmium	0	10.0	0.017	10.1	101			
Calcium	3000	3000	2950	2980	99			
Chromium	0	20.0	0.088	20.8	104			
Cobalt	0	20.0	0.0040	21.0	105			
Copper	0	20.0	0.18	21.5	108			
Iron	2500	2500	2570	2510	100			
Lead	0	0	0.0040	-0.0020				
Lithium	0	20.0	-0.069	23.9	120			
Magnesium	1000	1000	1020	1020	102			
Manganese	0	20.0	0.035	20.6	103			
Molybdenum	20.0	20.0	19.5	19.3	96			
Nickel	0	20.0	0.032	21.3	106			
Potassium	1000	1000	1010	1010	101			
Selenium	0	10.0	-0.040	10.1	101			
Silicon	0	1000	-4500	-3500	-351			
Silver	0	5.00	0.0060	5.15	103			
Sodium	2500	2500	2540	2540	102			
Strontium	0	10.0	0.10	10.1	101			
Thallium	0	0	0.0	-0.0010				
Tin	0	10.0	0.040	7.34	73			
Titanium	20.0	20.0	19.4	19.3	96			
Vanadium	0	20.0	-0.015	17.6	88			
Zinc	0	20.0	0.029	21.1	106			
Zirconium	0	20.0	0.017	19.1	96			

FORM IV - IN

Interference Check Solution A (ICS-A) Report

Sample Name	2000	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121212ICSA.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 13:56:37	**Total Dilution**	1.0000
Sample Type	ICSA	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	-0.069	1.27	177698.58	2.5	
Be	9	45	No Gas	-0.001	5.73	53.33	0.5	
B	11	45	No Gas	0.170	4.93	3460.50	5	
Sr	88	72	No Gas	0.104	7.52	4070.70	0.5	
Zr	90	72	No Gas	0.017	12.61	925.60	0.5	
Mo	95	115	No Gas	19.520	1.65	115848.66	20	
Ag	107	115	No Gas	0.006	8.77	122.22	0.5	
Cd	111	115	No Gas	0.017	24.16	62.22	0.5	
Sb	121	115	No Gas	0.039	4.67	802.25	1	
Ba	137	115	No Gas	-0.004	41.28	127.78	0.5	
Tl	205	209	No Gas	0.000	45.83	133.34	0.5	
Pb	208	209	No Gas	0.004	36.95	233.34	0.5	
Na	23	45	He	2540.912	0.69	929445.51	2500	
Mg	24	45	He	1022.095	0.42	142401.41	1000	
Al	27	45	He	1006.384	2.17	31904.51	1000	
Si	29	45	He	-4525.522	5.96	13117.10	100	> LOD
K	39	45	He	1008.065	1.04	133098.60	1000	
Ca	44	45	He	2952.620	0.94	15698.52	3000	
Ti	47	45	He	19.356	4.58	1009.04	20	
V	51	72	He	-0.015	24.14	96.67	0.5	
Cr	52	72	He	0.088	6.18	4006.14	0.5	
Mn	55	72	He	0.035	9.91	210.01	2.5	
Fe	57	72	He	2565.824	2.26	124088.62	2500	
Co	59	72	He	0.004	26.24	110.00	0.5	
Ni	60	72	He	0.032	8.60	397.79	1	
Cu	63	45	He	0.181	3.90	2739.17	0.5	
Zn	66	72	He	0.029	13.62	213.34	10	
As	75	72	He	0.003	5.95	25.67	0.5	
Se	78	72	He	-0.040	34.76	5.68	0.5	
Sn	120	115	He	0.040	16.11	198.89	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	950539.93	1066636.57333333	89.12	
Ge	72	He	75044.30	76690.4733333333	97.85	
In	115	He	500473.77	527518.896666667	94.87	
Lu	175	He	729893.50	811094.676666667	89.99	
Rh	103	He	2009488.67	2150131.65	93.46	
Sc	45	He	94512.88	98241.74	96.2	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2087107.73	2336732.1	89.32	
Ge	72	No Gas	1126330.41	1156430.33666667	97.4	
In	115	No Gas	4892673.64	5237310.61666667	93.42	
Lu	175	No Gas	3651382.76	4014375.88	90.96	

Interference Check Solution A (ICS-A) Report

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1566263.99	1707326.38	91.74	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5130434.38	5515557.00333333	93.02	
Sc	45	No Gas	5412084.09	5538601.16666667	97.72	
Tb	159	No Gas	4447898.27	4855676.28	91.6	

Interference Check Solution AB (ICS-AB) Report

Sample Name	2100	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121213ICSB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 14:00:10	**Total Dilution**	1.0000
Sample Type	ICSB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	23.920	2.01	583900.44	20	
Be	9	45	No Gas	-0.001	18.19	55.33	0.5	
B	11	45	No Gas	20.180	2.79	81150.50	20	
Sr	88	72	No Gas	10.081	2.75	343479.38	10	
Zr	90	72	No Gas	19.123	3.46	407746.41	20	
Mo	95	115	No Gas	19.296	1.28	115520.61	20	
Ag	107	115	No Gas	5.148	2.16	71738.80	5	
Cd	111	115	No Gas	10.102	2.82	28622.49	10	
Sb	121	115	No Gas	0.031	9.25	722.25	1	
Ba	137	115	No Gas	0.016	7.39	206.67	0.5	
Tl	205	209	No Gas	-0.001	41.67	120.01	0.5	
Pb	208	209	No Gas	-0.002	41.31	133.33	0.5	
Na	23	45	He	2542.550	1.97	918312.93	2500	
Mg	24	45	He	1021.232	1.64	140483.26	1000	
Al	27	45	He	999.478	1.50	31286.58	1000	
Si	29	45	He	-3512.550	5.45	14050.61	1000	> +/- 20%
K	39	45	He	1005.914	0.54	131165.70	1000	
Ca	44	45	He	2978.152	0.55	15631.79	3000	
Ti	47	45	He	19.331	4.60	995.04	20	
V	51	72	He	17.571	1.19	38665.09	20	
Cr	52	72	He	20.764	0.51	63404.56	20	
Mn	55	72	He	20.598	2.07	20611.24	20	
Fe	57	72	He	2512.470	3.03	120947.44	2500	
Co	59	72	He	21.015	1.42	102491.72	20	
Ni	60	72	He	21.345	1.73	29311.60	20	
Cu	63	45	He	21.465	0.70	81768.48	20	
Zn	66	72	He	21.082	1.79	11321.16	20	
As	75	72	He	10.292	1.26	5693.79	10	
Se	78	72	He	10.102	5.75	248.21	10	
Sn	120	115	He	7.337	2.87	11807.33	10	> +/- 20%

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	982543.19	1066636.57333333	92.12	
Ge	72	He	74682.18	76690.4733333333	97.38	
In	115	He	501598.40	527518.896666667	95.09	
Lu	175	He	746046.21	811094.676666667	91.98	
Rh	103	He	2049155.26	2150131.65	95.3	
Sc	45	He	93317.75	98241.74	94.99	
Tb	159	He	1591109.41	1707326.38	93.19	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2061393.31	2336732.1	88.22	
Ge	72	No Gas	1114969.81	1156430.33666667	96.41	
In	115	No Gas	4936301.64	5237310.61666667	94.25	
Lu	175	No Gas	3632920.57	4014375.88	90.5	
Rh	103	No Gas	5137095.49	5515557.00333333	93.14	
Sc	45	No Gas	5361753.12	5538601.16666667	96.81	
Tb	159	No Gas	4481901.50	4855676.28	92.3	

IV
ICPMS INTERFERENCE CHECKS

Report No:	218081813	ICSA \ AB ID:	2000 \ 2100
Instrument ID:	ICPMS2	Analytical Batch:	642829
Analyst:	LWZ	Analytical Method:	EPA 6020B
Lab File ID ICSA1:	2180828B_MS2.b\1812ICSA_2180828A_MS2.D	Lab File ID ICSAB1:	2180828B_MS2.b\1813ICSB_2180828A_MS2.D
Lab File ID ICSA2:	2180828C_MS2.b\070ICSA.d	Lab File ID ICSAB2:	2180828C_MS2.b\071ICSB.d

Concentration Units: ug/L

		Analyzed (A/AB):	08/28/18 1104	08/28/18 1107		08/28/18 1800	08/28/18 1804	
ANALYTE	***TRUE A***	***TRUE AB***	***ICSA1***	***ICSAB1***	***%R***	***ICSA2***	***ICSAB2***	***%R***
Aluminum	1000	1000	1020	1030	103	988	988	99
Antimony	0	0	-0.059	-0.057		-0.062	-0.069	
Arsenic	0	10.0	-0.0030	10.3	103	-0.018	10.1	101
Barium	0	0	-0.0040	0.014		0.0060	0.021	
Beryllium	0	0	-0.0070	-0.0060		-0.0080	-0.010	
Boron	0	20.0	-0.11	20.1	100	-0.71	18.5	92
Cadmium	0	10.0	0.014	9.83	98	0.0080	9.90	99
Calcium	3000	3000	2950	3030	101	2980	3010	100
Chromium	0	20.0	0.0010	20.4	102	-0.11	19.4	97
Cobalt	0	20.0	0.0070	20.8	104	0.0050	20.2	101
Copper	0	20.0	0.027	21.7	108	0.098	21.1	106
Iron	2500	2500	2550	2550	102	2430	2450	98
Lead	0	0	-0.0050	-0.0030		-0.0050	-0.0070	
Lithium	0	20.0	0.11	23.9	120	-0.24	22.7	114
Magnesium	1000	1000	1020	1040	104	981	980	98
Manganese	0	20.0	-0.010	20.4	102	-0.028	19.7	98
Molybdenum	20.0	20.0	19.4	19.1	96	19.7	19.5	98
Nickel	0	20.0	-0.0020	21.0	105	-0.030	20.3	102
Potassium	1000	1000	991	1020	102	992	985	98
Selenium	0	10.0	-0.020	9.83	98	-0.0070	9.48	95
Silicon	0	1000	-1200	-80	-8	-5500	-4500	-454
Silver	0	5.00	0.0040	5.00	100	0.0030	5.06	101
Sodium	2500	2500	2520	2590	104	2450	2470	99
Strontium	0	10.0	0.10	10.3	103	0.11	10.4	104
Thallium	0	0	-0.023	-0.025		-0.043	-0.041	
Tin	0	10.0	-0.028	9.84	98	0.0060	10.1	101
Titanium	20.0	20.0	19.4	20.3	102	19.7	20.0	100
Vanadium	0	20.0	-0.020	17.5	88	-0.026	16.9	84
Zinc	0	20.0	-0.92	19.5	98	-1.0	18.8	94
Zirconium	0	20.0	0.023	19.4	97	0.0060	19.3	96

FORM IV - IN

Interference Check Solution A (ICS-A) Report

Sample Name	2000	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1812ICSA_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 11:04:11	**Total Dilution**	1.0000
Sample Type	ICSA	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	0.110	1.10	164766.81	2.5	
Be	9	45	No Gas	-0.007	33.11	45.33	0.5	
B	11	45	No Gas	-0.107	5.18	3763.93	5	
Sr	88	72	No Gas	0.100	6.82	4420.83	0.5	
Zr	90	72	No Gas	0.023	4.08	1143.39	0.5	
Mo	95	115	No Gas	19.363	2.53	120401.32	20	
Ag	107	115	No Gas	0.004	20.22	112.22	0.5	
Cd	111	115	No Gas	0.014	31.21	71.11	0.5	
Sb	121	115	No Gas	-0.059	2.79	905.60	1	
Ba	137	115	No Gas	-0.004	6.67	150.00	0.5	
Tl	205	209	No Gas	-0.023	8.84	326.68	0.5	
Pb	208	209	No Gas	-0.005	23.27	236.67	0.5	
Na	23	45	He	2524.641	0.63	778978.55	2500	
Mg	24	45	He	1016.963	0.55	121704.48	1000	
Al	27	45	He	1023.524	0.75	28102.25	1000	
Si	29	45	He	-1180.972	8.10	6323.37	100	> LOD
K	39	45	He	990.753	0.68	110233.45	1000	
Ca	44	45	He	2949.459	1.90	13823.27	3000	
Ti	47	45	He	19.434	2.25	890.36	20	
V	51	72	He	-0.020	2.66	72.22	0.5	
Cr	52	72	He	0.001	0.28	2080.17	0.5	
Mn	55	72	He	-0.010	16.20	163.34	2.5	
Fe	57	72	He	2546.533	2.08	113350.21	2500	
Co	59	72	He	0.007	11.95	105.56	0.5	
Ni	60	72	He	-0.002	7.48	245.56	1	
Cu	63	72	He	0.027	6.75	411.12	0.5	
Zn	66	72	He	-0.922	4.33	715.58	10	
As	75	72	He	-0.003	31.23	21.00	0.5	
Se	78	72	He	-0.020	22.46	4.28	0.5	
Sn	120	115	He	-0.028	9.86	553.35	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1232174.30	1156007.06333333	106.59	
Ge	72	He	70890.74	68942.6933333333	102.83	
In	115	He	542602.91	515120.94	105.34	
Lu	175	He	923182.90	860474.493333333	107.29	
Rh	103	He	2131278.11	2061162.14	103.4	
Sc	45	He	86981.41	86332.2766666667	100.75	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2627806.37	2430541.58	108.12	
Ge	72	No Gas	1132831.87	1116846.20666667	101.43	
In	115	No Gas	5504665.56	5301929.88666667	103.82	
Lu	175	No Gas	4401779.93	4111004.52	107.07	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1910168.25	1790396.84666667	106.69	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5549255.75	5479027.00333333	101.28	
Sc	45	No Gas	5097944.24	5061380.49333333	100.72	
Tb	159	No Gas	5360244.50	4997578.57333333	107.26	

Interference Check Solution AB (ICS-AB) Report

Sample Name	2100	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1813ICSB_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 11:07:45	**Total Dilution**	1.0000
Sample Type	ICSB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	23.850	1.47	518954.91	20	
Be	9	45	No Gas	-0.006	33.10	50.67	0.5	
B	11	45	No Gas	20.050	2.02	69747.61	20	
Sr	88	72	No Gas	10.281	1.87	351067.06	10	
Zr	90	72	No Gas	19.443	2.68	409677.26	20	
Mo	95	115	No Gas	19.125	2.01	119736.41	20	
Ag	107	115	No Gas	4.997	2.83	73908.24	5	
Cd	111	115	No Gas	9.830	1.98	29968.47	10	
Sb	121	115	No Gas	-0.057	1.28	940.04	1	
Ba	137	115	No Gas	0.014	2.94	226.67	0.5	
Tl	205	209	No Gas	-0.025	20.28	300.02	0.5	
Pb	208	209	No Gas	-0.003	41.61	273.34	0.5	
Na	23	45	He	2590.338	1.18	788236.34	2500	
Mg	24	45	He	1042.921	1.48	123115.16	1000	
Al	27	45	He	1031.073	1.12	27925.94	1000	
Si	29	45	He	-79.952	7.53	7365.85	1000	> +/- 20%
K	39	45	He	1017.005	0.24	111325.19	1000	
Ca	44	45	He	3025.280	1.78	13975.11	3000	
Ti	47	45	He	20.326	4.30	918.03	20	
V	51	72	He	17.513	1.16	34395.69	20	
Cr	52	72	He	20.444	0.92	55240.85	20	
Mn	55	72	He	20.422	0.66	18756.51	20	
Fe	57	72	He	2550.010	0.60	114196.83	2500	
Co	59	72	He	20.766	1.64	93109.97	20	
Ni	60	72	He	21.036	1.23	26899.23	20	
Cu	63	72	He	21.721	1.24	76637.16	20	
Zn	66	72	He	19.481	2.45	10591.72	20	
As	75	72	He	10.300	1.95	5198.94	10	
Se	78	72	He	9.831	2.54	218.66	10	
Sn	120	115	He	9.836	1.80	16228.42	10	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1272625.94	1156007.06333333	110.09	
Ge	72	He	71323.83	68942.6933333333	103.45	
In	115	He	544054.76	515120.94	105.62	
Lu	175	He	949509.68	860474.493333333	110.35	
Rh	103	He	2175643.73	2061162.14	105.55	
Sc	45	He	85792.08	86332.2766666667	99.37	
Tb	159	He	1944761.27	1790396.84666667	108.62	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2647649.44	2430541.58	108.93	
Ge	72	No Gas	1137092.00	1116846.20666667	101.81	
In	115	No Gas	5542189.43	5301929.88666667	104.53	
Lu	175	No Gas	4414348.37	4111004.52	107.38	
Rh	103	No Gas	5607264.64	5479027.00333333	102.34	
Sc	45	No Gas	5075708.27	5061380.49333333	100.28	
Tb	159	No Gas	5353751.17	4997578.57333333	107.13	

Interference Check Solution A (ICS-A) Report

Sample Name	2000	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	070ICSA.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 18:00:33	**Total Dilution**	1.0000
Sample Type	ICSA	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	-0.245	0.61	152744.65	2.5	
Be	9	45	No Gas	-0.008	5.97	38.67	0.5	
B	11	45	No Gas	-0.711	10.11	1703.48	5	
Sr	88	72	No Gas	0.106	2.39	4610.91	0.5	
Zr	90	72	No Gas	0.006	9.09	793.36	0.5	
Mo	95	115	No Gas	19.656	0.82	120564.90	20	
Ag	107	115	No Gas	0.003	17.76	94.45	0.5	
Cd	111	115	No Gas	0.008	22.90	51.11	0.5	
Sb	121	115	No Gas	-0.062	6.78	853.37	1	
Ba	137	115	No Gas	0.006	24.98	188.89	0.5	
Tl	205	209	No Gas	-0.043	13.32	43.33	0.5	
Pb	208	209	No Gas	-0.005	8.70	230.00	0.5	
Na	23	45	He	2450.202	0.13	744449.18	2500	
Mg	24	45	He	980.970	1.51	115585.35	1000	
Al	27	45	He	987.895	1.06	26712.35	1000	
Si	29	45	He	-5540.305	24.65	1764.79	100	> LOD
K	39	45	He	991.617	1.20	108622.11	1000	
Ca	44	45	He	2983.205	2.02	13759.88	3000	
Ti	47	45	He	19.689	5.78	887.70	20	
V	51	72	He	-0.026	26.03	64.45	0.5	
Cr	52	72	He	-0.113	3.41	1845.69	0.5	
Mn	55	72	He	-0.028	8.29	152.23	2.5	
Fe	57	72	He	2427.375	1.27	111720.48	2500	
Co	59	72	He	0.005	12.35	102.22	0.5	
Ni	60	72	He	-0.030	26.03	217.78	1	
Cu	63	72	He	0.098	13.55	681.14	0.5	
Zn	66	72	He	-1.040	4.93	681.13	10	
As	75	72	He	-0.018	31.13	14.00	0.5	
Se	78	72	He	-0.007	13.62	4.70	0.5	
Sn	120	115	He	0.006	6.21	617.80	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1237451.54	1156007.06333333	107.05	
Ge	72	He	73293.58	68942.6933333333	106.31	
In	115	He	552273.71	515120.94	107.21	
Lu	175	He	824168.55	860474.493333333	95.78	
Rh	103	He	2172443.11	2061162.14	105.4	
Sc	45	He	85633.57	86332.2766666667	99.19	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2464347.47	2430541.58	101.39	
Ge	72	No Gas	1134928.84	1116846.20666667	101.62	
In	115	No Gas	5431865.32	5301929.88666667	102.45	
Lu	175	No Gas	4032664.31	4111004.52	98.09	

Interference Check Solution A (ICS-A) Report

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1825364.71	1790396.84666667	101.95	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5588667.83	5479027.00333333	102	
Sc	45	No Gas	4883391.33	5061380.49333333	96.48	
Tb	159	No Gas	5015424.20	4997578.57333333	100.36	

Interference Check Solution AB (ICS-AB) Report

Sample Name	2100	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	071ICSB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 18:04:05	**Total Dilution**	1.0000
Sample Type	ICSB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	22.673	1.00	477921.70	20	
Be	9	45	No Gas	-0.010	33.63	29.33	0.5	
B	11	45	No Gas	18.498	2.67	61638.94	20	
Sr	88	72	No Gas	10.376	1.63	351492.59	10	
Zr	90	72	No Gas	19.309	2.98	403663.07	20	
Mo	95	115	No Gas	19.523	2.04	119590.28	20	
Ag	107	115	No Gas	5.055	1.54	73130.14	5	
Cd	111	115	No Gas	9.900	1.72	29529.85	10	
Sb	121	115	No Gas	-0.069	2.86	763.36	1	
Ba	137	115	No Gas	0.021	10.73	251.12	0.5	
Tl	205	209	No Gas	-0.041	19.92	76.67	0.5	
Pb	208	209	No Gas	-0.007	25.78	183.34	0.5	
Na	23	45	He	2470.491	1.41	742275.90	2500	
Mg	24	45	He	979.651	2.15	114165.84	1000	
Al	27	45	He	988.233	1.39	26425.90	1000	
Si	29	45	He	-4538.181	16.96	2760.94	1000	> +/- 20%
K	39	45	He	984.892	0.67	106758.45	1000	
Ca	44	45	He	3014.573	3.35	13749.87	3000	
Ti	47	45	He	19.961	3.42	890.03	20	
V	51	72	He	16.949	1.68	34277.55	20	
Cr	52	72	He	19.439	0.79	54191.25	20	
Mn	55	72	He	19.738	2.08	18673.09	20	
Fe	57	72	He	2453.114	0.73	113128.90	2500	
Co	59	72	He	20.206	0.87	93291.26	20	
Ni	60	72	He	20.256	2.07	26681.00	20	
Cu	63	72	He	21.082	0.66	76600.13	20	
Zn	66	72	He	18.777	3.17	10554.99	20	
As	75	72	He	10.053	2.28	5224.95	10	
Se	78	72	He	9.477	3.14	217.24	10	
Sn	120	115	He	10.126	0.75	16905.83	10	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1221539.67	1156007.06333333	105.67	
Ge	72	He	73442.18	68942.6933333333	106.53	
In	115	He	551158.06	515120.94	107	
Lu	175	He	793659.94	860474.493333333	92.24	
Rh	103	He	2176518.32	2061162.14	105.6	
Sc	45	He	84684.52	86332.2766666667	98.09	
Tb	159	He	1781991.12	1790396.84666667	99.53	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2403353.87	2430541.58	98.88	
Ge	72	No Gas	1128092.49	1116846.20666667	101.01	
In	115	No Gas	5423014.31	5301929.88666667	102.28	
Lu	175	No Gas	3915633.17	4111004.52	95.25	
Rh	103	No Gas	5551746.59	5479027.00333333	101.33	
Sc	45	No Gas	4837856.75	5061380.49333333	95.58	
Tb	159	No Gas	4928378.78	4997578.57333333	98.62	

Metals

Form V1

Matrix Spikes

V1
MS/MSD RECOVERY

Report No:	218081813	Parent Sample ID:	WIL01IS02
Prep Method:	3050B	Parent GCAL ID:	21808181302
Prep Date:	08/22/18 Time: 1210	Prep Batch:	642442
Analytical Method:	EPA 6020B	Analytical Batch:	642536

GCAL QC ID:	**1842047 MS**	Instrument ID:	ICPMS1
Analyst:	LWZ	Lab File ID:	2180823A_MS1.b\039SMPL.d
Analysis Date:	08/23/18 1214	Dilution:	10

ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	MS RESULT	MS % REC	#	QC LIMITS
Antimony	ug/kg	4270	0	471	11	*	72 - 124
Copper	ug/kg	2140	21100	23800	132	*	84 - 119
Lead	ug/kg	2140	63500	66800	152	*	84 - 118
Zinc	ug/kg	42700	61200	110000	114		82 - 119

GCAL QC ID:	**1842048 MSD**	Instrument ID:	ICPMS1
Analyst:	LWZ	Lab File ID:	2180823A_MS1.b\040SMPL.d
Analysis Date:	08/23/18 1218	Dilution:	10

ANALYTE	UNITS	SPIKE ADDED	MSD RESULT	MSD % REC	#	% RPD	#	QC LIMITS %REC	QC LIMITS RPD
Antimony	ug/kg	4270	496	12	*	5		72 - 124	0 - 20
Copper	ug/kg	2140	23500	115		2		84 - 119	0 - 20
Lead	ug/kg	2140	61100	0	*	9		84 - 118	0 - 20
Zinc	ug/kg	42700	112000	119		2		82 - 119	0 - 20

RPD : 0 out of 4 outside limits

Spike Recovery: 5 out of 8 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM V (PART 1) - IN

Sample Report

Sample Name	1842047	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	039SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:14:01	**Total Dilution**	400.0000
Sample Type	MSSOIL	**Sample Pass/Fail**	Fail
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	51.705	20681.862	1.9	2081587.16	100	
Be	9	45	No Gas	6.034	2413.489	3.6	39961.59	100	
B	11	45	No Gas	28.249	11299.513	3.1	127134.03	100	
Sr	88	72	No Gas	174.506	69802.276	2.6	3838070.26	100	> +/- 20%
Zr	90	72	No Gas	27.807	11122.968	3.1	414114.09	100	> +/- 20%
Mo	95	115	No Gas	5.444	2177.454	2.9	23024.38	100	
Ag	107	115	No Gas	4.945	1977.949	3.3	51285.67	100	
Cd	111	115	No Gas	5.871	2348.208	1.0	12654.38	100	
Sb	121	115	No Gas	1.101	440.580	2.1	10396.86	100	> +/- 20%
Ba	137	115	No Gas	332.136	132854.558	2.5	1018175.48	100	> +/- 20%
Tl	205	175	No Gas	5.086	2034.484	2.6	105434.65	100	
Pb	208	209	No Gas	156.226	62490.423	2.9	4324379.15	100	> +/- 20%
Na	23	45	He	1849.936	739974.546	0.5	847617.09	100	
Mg	24	45	He	27762.558	11105023.317	0.8	6220116.78	100	> +/- 20%
Al	27	45	He	21285.683	8514273.321	1.1	1388489.67	100	> +/- 20%
Si	29	45	He	1061.158	424463.293	3.5	2626.23	100	> +/- 20%
K	39	45	He	3340.245	1336098.025	1.4	334818.67	100	> +/- 20%
Ca	44	45	He	69305.779	27722311.501	0.5	391755.96	100	> +/- 20%
Ti	47	45	He	301.069	120427.420	1.2	13400.39	100	> +/- 20%
V	51	72	He	71.559	28623.544	0.2	114639.27	100	> +/- 20%
Cr	52	72	He	48.115	19246.027	1.1	99528.75	100	> +/- 20%
Mn	55	72	He	1133.106	453242.335	0.6	1075701.90	100	> +/- 20%
Fe	57	72	He	47535.759	19014303.528	0.8	1910502.00	100	> +/- 20%
Co	59	72	He	27.165	10866.027	0.3	92264.51	100	
Ni	60	72	He	78.368	31347.096	0.6	71988.23	100	> +/- 20%
Cu	63	72	He	55.741	22296.446	0.6	140899.17	100	> +/- 20%
Zn	66	103	He	257.01	102804.086	0.3	78368.65	100	
As	75	72	He	18.498	7399.014	0.9	4680.50	100	
Se	78	72	He	1.083	433.058	33.4	23.95	100	> +/- 20%
Sn	120	115	He	1.068	427.221	2.4	1663.44	100	> +/- 20%

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1218691.52	1457156.02	83.63	
Ge	72	He	44411.23	46567.3733333333	95.37	
In	115	He	367168.30	401074.37	91.55	
Lu	175	He	1051019.23	1106922.95333333	94.95	
Rh	103	He	1381795.57	1576304.55666667	87.66	
Sc	45	He	77791.12	77709.7233333333	100.1	
Tb	159	He	1831172.37	1926533.77666667	95.05	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3370554.64	3553207.86333333	94.86	
Ge	72	No Gas	606533.69	588164.35	103.12	
In	115	No Gas	3843466.00	3846213.84666667	99.93	
Lu	175	No Gas	5597872.42	5505661.37666667	101.67	
Rh	103	No Gas	3699099.02	3760261.65666667	98.37	
Sc	45	No Gas	3296385.84	3052080.71	108	
Tb	159	No Gas	5625766.79	5497134.5	102.34	

Sample Report

Sample Name	1842048	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	040SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:18:24	**Total Dilution**	400.0000
Sample Type	MSDSOIL	**Sample Pass/Fail**	Fail
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	53.463	21385.357	1.3	2113316.74	20	
Be	9	45	No Gas	6.209	2483.731	2.6	40572.34	20	
B	11	45	No Gas	29.119	11647.673	2.9	128845.87	20	
Sr	88	72	No Gas	174.352	69740.843	2.7	3779477.23	20	
Zr	90	72	No Gas	32.229	12891.545	2.0	472899.91	20	
Mo	95	115	No Gas	5.708	2283.352	1.5	23342.66	20	
Ag	107	115	No Gas	5.159	2063.767	1.7	51745.99	20	
Cd	111	115	No Gas	6.152	2460.861	1.7	12826.84	20	
Sb	121	115	No Gas	1.159	463.694	0.6	10543.61	20	
Ba	137	115	No Gas	345.551	138220.432	2.1	1024469.51	20	
Tl	205	175	No Gas	5.266	2106.553	1.2	107774.80	20	
Pb	208	209	No Gas	142.87	57147.981	1.7	3958359.37	20	
Na	23	45	He	1838.572	735428.635	0.8	850277.15	20	
Mg	24	45	He	27615.611	11046244.255	0.4	6245025.74	20	
Al	27	45	He	20698.767	8279506.658	0.3	1362827.37	20	
Si	29	45	He	1116.245	446498.108	3.0	2740.91	20	
K	39	45	He	3306.691	1322676.307	1.0	334637.42	20	
Ca	44	45	He	69036.831	27614732.540	0.9	393918.26	20	
Ti	47	45	He	306.715	122686.024	1.9	13780.37	20	
V	51	72	He	71.204	28481.641	1.3	114845.24	20	
Cr	52	72	He	48.432	19372.896	0.6	100863.60	20	
Mn	55	72	He	1165.614	466245.484	0.5	1114164.88	20	
Fe	57	72	He	46979.25	18791699.851	1.1	1901220.08	20	
Co	59	72	He	27.839	11135.609	0.6	95210.72	20	
Ni	60	72	He	79.337	31734.862	0.4	73382.87	20	
Cu	63	72	He	54.879	21951.731	1.3	139705.29	20	
Zn	66	103	He	262.464	104985.641	1.1	80535.90	20	
As	75	72	He	18.5	7400.081	1.2	4713.85	20	
Se	78	72	He	0.839	335.474	33.5	19.38	20	> 20%
Sn	120	115	He	0.963	385.106	6.8	1526.76	20	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1263818.34	1457156.02	86.73	
Ge	72	He	44728.77	46567.3733333333	96.05	
In	115	He	367643.62	401074.37	91.66	
Lu	175	He	1050502.72	1106922.95333333	94.9	
Rh	103	He	1391137.79	1576304.55666667	88.25	
Sc	45	He	78518.92	77709.7233333333	101.04	
Tb	159	He	1829426.43	1926533.77666667	94.96	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3374393.70	3553207.86333333	94.97	
Ge	72	No Gas	597780.91	588164.35	101.64	
In	115	No Gas	3717920.11	3846213.84666667	96.66	
Lu	175	No Gas	5529137.21	5505661.37666667	100.43	
Rh	103	No Gas	3612726.11	3760261.65666667	96.08	
Sc	45	No Gas	3253033.55	3052080.71	106.58	
Tb	159	No Gas	5534198.46	5497134.5	100.67	

Metals

Form V2

Post Digestion Spikes

V2

POST DIGEST SPIKE SAMPLE RECOVERY

Report No:	218081813	GCAL PDS ID:	1842322
Matrix:	Solid	Parent Sample ID:	WIL01IS02 (21808181302)
Analyst:	LWZ	Instrument ID:	ICPMS1
Analysis Date:	08/23/18 Time: 1222	Lab File ID:	2180823A_MS1.b\041SMPL.d
Analytical Method:	EPA 6020B	Analytical Batch:	642536

ANALYTE	*UNITS*	*SPIKED SAMPLE RESULT*	*C*	*SAMPLE RESULT*	*C*	*SPIKE ADDED*	*% R*	*Q*	*LCL*	*UCL*
Antimony	ug/kg	38600		0	U	42700	90		80	120
Copper	ug/kg	40700		21100		21400	92		80	120
Lead	ug/kg	84900		63500		21400	100		80	120
Zinc	ug/kg	478000		61200		427000	97		80	120

FORM V (PART 2) - IN

Sample Report

Sample Name	1842322	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	041SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:22:48	**Total Dilution**	400.0000
Sample Type	PDS	**Sample Pass/Fail**	Fail
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	262.304	104921.564	0.9	9282328.20	100	
Be	9	45	No Gas	47.587	19034.614	2.1	314592.21	100	
B	11	45	No Gas	246.199	98479.524	3.2	991761.65	100	
Sr	88	72	No Gas	209.752	83900.673	1.9	4646514.31	100	
Zr	90	72	No Gas	71.977	28790.892	2.6	1078819.36	100	
Mo	95	115	No Gas	52.397	20958.889	2.0	217974.66	100	
Ag	107	115	No Gas	49.795	19918.110	0.8	510221.30	100	
Cd	111	115	No Gas	49.611	19844.318	2.1	105605.53	100	
Sb	121	115	No Gas	90.389	36155.765	1.9	779954.48	100	
Ba	137	115	No Gas	380.724	152289.583	1.7	1154754.12	100	
Tl	205	175	No Gas	48.37	19347.877	0.4	984731.59	100	
Pb	208	209	No Gas	198.707	79482.881	1.8	5528295.47	100	
Na	23	45	He	6134.95	2453980.068	0.5	2837508.71	100	
Mg	24	45	He	30400.058	12160023.020	0.4	6895591.15	100	
Al	27	45	He	17013.162	6805264.926	0.2	1123582.25	100	
Si	29	45	He	1034.215	413686.053	1.4	2615.56	100	> +/- 25%
K	39	45	He	7460.539	2984215.634	1.0	753461.68	100	
Ca	44	45	He	91257.043	36502817.194	0.3	522216.35	100	
Ti	47	45	He	303.436	121374.408	0.4	13673.28	100	
V	51	72	He	106.411	42564.572	1.4	172889.80	100	
Cr	52	72	He	85.173	34069.058	0.5	178641.37	100	
Mn	55	72	He	1146.463	458585.098	0.8	1103960.89	100	
Fe	57	72	He	48434.13	19373652.112	0.2	1974389.50	100	
Co	59	72	He	68.997	27598.808	0.5	237653.98	100	
Ni	60	72	He	160.756	64302.572	0.9	149747.88	100	
Cu	63	72	He	95.334	38133.626	0.9	244060.38	100	
Zn	66	103	He	1117.578	447031.258	0.7	345047.53	100	
As	75	72	He	60.996	24398.307	1.0	15630.76	100	
Se	78	72	He	9.501	3800.374	8.4	190.09	100	
Sn	120	115	He	50.049	20019.531	0.5	66542.80	100	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1256369.15	1457156.02	86.22	
Ge	72	He	45050.90	46567.3733333333	96.74	
In	115	He	370161.53	401074.37	92.29	
Lu	175	He	1055232.04	1106922.95333333	95.33	
Rh	103	He	1402080.08	1576304.55666667	88.95	
Sc	45	He	78757.69	77709.7233333333	101.35	
Tb	159	He	1846294.87	1926533.77666667	95.84	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3388576.82	3553207.86333333	95.37	
Ge	72	No Gas	610946.97	588164.35	103.87	
In	115	No Gas	3803010.52	3846213.84666667	98.88	
Lu	175	No Gas	5558565.33	5505661.37666667	100.96	
Rh	103	No Gas	3673379.02	3760261.65666667	97.69	
Sc	45	No Gas	3298261.60	3052080.71	108.07	
Tb	159	No Gas	5595503.88	5497134.5	101.79	

Metals

Form VII

Lab Control Spikes

VII
LABORATORY CONTROL SAMPLE

Report No:	218081813	GCAL ID:	1841053 (LCS)
Matrix:	Water	Instrument ID:	ICPMS2
Analyst:	LWZ	Lab File ID:	2180820B_MS2.b\121285SMPL.d
Prep Date:	08/20/18 Time: 1130	Analysis Date:	08/20/18 Time: 1831
Prep Batch:	642277	Analytical Batch:	642309
Prep Method:	3010A	Analytical Method:	EPA 6020B

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% R*	*Q*	*LCL*	*UCL*
Antimony	ug/L	100	106	106		85	117
Copper	ug/L	50.0	56.2	112		85	118
Lead	ug/L	50.0	51.9	104		88	115
Zinc	ug/L	1000	1020	102		83	119

FORM VII - IN

Laboratory Control Sample (LCS) Report

Sample Name	1841053	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
File Name	121285SMPL.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/20/2018 18:31:18	**Total Dilution**	1.0000
Sample Type	LCS6020	**Sample Pass/Fail**	Fail
ISTD Ref FileName	004CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 80-120% 6020A / 85-115% 200.8

Name	Mass	ISTD	Mode	Conc	RSD	CPS	SpkAmt	Rec	QC Flag
Li	7	45	No Gas	250.119	0.77	4766882.01	250	100.05	
Be	9	45	No Gas	47.226	0.95	319827.38	50	94.45	
B	11	45	No Gas	241.155	1.33	1011093.97	250	96.46	
Sr	88	72	No Gas	53.847	1.90	1993971.85	50	107.69	
Zr	90	72	No Gas	11.625	1.67	269816.55	10	116.25	
Mo	95	115	No Gas	48.135	1.59	340865.93	50	96.27	
Ag	107	115	No Gas	50.018	1.53	824227.22	50	100.04	
Cd	111	115	No Gas	51.120	1.95	171312.21	50	102.24	
Sb	121	115	No Gas	105.507	1.35	1447784.45	100	105.51	
Ba	137	115	No Gas	51.044	1.99	239291.70	50	102.09	
Tl	205	209	No Gas	51.874	2.37	718356.50	50	103.75	
Pb	208	209	No Gas	51.929	1.75	970847.61	50	103.86	
Na	23	45	He	5131.409	0.70	1886298.67	5000	102.63	
Mg	24	45	He	5046.131	0.42	709479.78	5000	100.92	
Al	27	45	He	993.400	0.35	31798.87	1000	99.34	
Si	29	45	He	-8017.505	7.18	9376.30	5000	-160.35	LCS6020 Main CR1 Failed
K	39	45	He	5020.720	0.72	613911.40	5000	100.41	
Ca	44	45	He	25659.642	0.69	135418.17	25000	102.64	
Ti	47	45	He	49.007	1.55	2569.56	50	98.01	
V	51	72	He	49.752	0.55	117979.85	50	99.5	
Cr	52	72	He	49.873	0.83	158833.12	50	99.75	
Mn	55	72	He	58.053	1.07	62390.69	50	116.11	
Fe	57	72	He	4931.576	0.67	255941.46	5000	98.63	
Co	59	72	He	51.281	0.57	269986.86	50	102.56	
Ni	60	72	He	103.601	1.53	152226.26	100	103.6	
Cu	63	45	He	56.173	0.40	215451.99	50	112.35	
Zn	66	72	He	1017.928	0.66	580268.09	1000	101.79	
As	75	72	He	50.965	0.83	30351.17	50	101.93	
Se	78	72	He	9.575	1.62	254.45	10	95.75	
Sn	120	115	He	51.825	1.96	94286.88	50	103.65	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1241550.66	1066636.57333333	116.4	
Ge	72	He	80656.58	76690.4733333333	105.17	
In	115	He	572747.35	527518.896666667	108.57	
Lu	175	He	957804.52	811094.676666667	118.09	
Rh	103	He	2320051.78	2150131.65	107.9	
Sc	45	He	95433.09	98241.74	97.14	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2523343.87	2336732.1	107.99	
Ge	72	No Gas	1213232.10	1156430.33666667	104.91	
In	115	No Gas	5842048.51	5237310.61666667	111.55	
Lu	175	No Gas	4686659.83	4014375.88	116.75	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1988921.69	1707326.38	116.49	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5893463.24	5515557.00333333	106.85	
Sc	45	No Gas	5771142.27	5538601.16666667	104.2	
Tb	159	No Gas	5597773.25	4855676.28	115.28	

VII
LABORATORY CONTROL SAMPLE

Report No:	218081813	GCAL ID:	1841867 (LCS)
Matrix:	Solid	Instrument ID:	ICPMS1
Analyst:	LWZ	Lab File ID:	2180823A_MS1.b\030SMPL.d
Prep Date:	08/22/18 Time: 1210	Analysis Date:	08/23/18 Time: 1134
Prep Batch:	642442	Analytical Batch:	642536
Prep Method:	3050B	Analytical Method:	EPA 6020B

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% R*	*Q*	*LCL*	*UCL*
Antimony	ug/kg	4000	3820	96		72	124
Copper	ug/kg	2000	1960	98		84	119
Lead	ug/kg	2000	1990	99		84	118
Zinc	ug/kg	40000	36700	92		82	119

FORM VII - IN

Sample Report

Sample Name	1841867	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	030SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 11:34:10	**Total Dilution**	40.0000
Sample Type	LCS6020	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	261.536	10461.421	2.6	9004094.86	250	
Be	9	45	No Gas	49.089	1963.558	2.0	315678.07	50	
B	11	45	No Gas	262.48	10499.182	2.7	1027582.25	250	
Sr	88	72	No Gas	50.96	2038.394	2.1	1116715.79	50	
Zr	90	72	No Gas	10.203	408.125	1.7	151660.37	10	
Mo	95	115	No Gas	52.261	2090.447	2.8	223126.30	50	
Ag	107	115	No Gas	50.584	2023.355	2.0	531907.22	50	
Cd	111	115	No Gas	48.088	1923.516	2.6	105057.01	50	
Sb	121	115	No Gas	95.613	3824.539	1.8	846616.65	100	
Ba	137	115	No Gas	50.693	2027.717	1.6	157874.01	50	
Tl	205	175	No Gas	49.154	1966.179	1.4	1007180.52	50	
Pb	208	209	No Gas	49.629	1985.168	1.1	1389404.84	50	
Na	23	45	He	5070.314	202812.568	0.8	2512269.60	5000	
Mg	24	45	He	5000.438	200017.538	1.5	1214871.49	5000	
Al	27	45	He	1063.5	42539.993	0.9	75295.30	1000	
Si	29	45	He	4851.467	194058.661	2.2	9432.01	5000	
K	39	45	He	5121.9	204876.016	1.4	555006.63	5000	
Ca	44	45	He	26129.987	1045199.482	0.8	160237.92	25000	
Ti	47	45	He	49.44	1977.617	2.7	2390.84	50	
V	51	72	He	50.188	2007.529	0.5	88894.90	50	
Cr	52	72	He	50.314	2012.566	0.5	115036.04	50	
Mn	55	72	He	53.054	2122.162	0.6	55733.49	50	
Fe	57	72	He	5125.657	205026.292	0.3	227761.38	5000	
Co	59	72	He	50.281	2011.240	0.8	188751.75	50	
Ni	60	72	He	99.096	3963.856	1.0	100614.18	100	
Cu	63	72	He	49.089	1963.556	0.8	137235.48	50	
Zn	66	103	He	917.009	36680.346	0.2	320718.21	1000	
As	75	72	He	48.45	1937.991	0.8	13532.58	50	
Se	78	72	He	9.615	384.589	1.7	209.75	10	
Sn	120	115	He	49.959	1998.342	0.7	75947.08	50	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1442292.16	1457156.02	98.98	
Ge	72	He	49091.27	46567.3733333333	105.42	
In	115	He	423240.77	401074.37	105.53	
Lu	175	He	1189203.78	1106922.95333333	107.43	
Rh	103	He	1588067.89	1576304.55666667	100.75	
Sc	45	He	84347.16	77709.7233333333	108.54	
Tb	159	He	2017269.60	1926533.77666667	104.71	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3408173.28	3553207.86333333	95.92	
Ge	72	No Gas	604087.15	588164.35	102.71	
In	115	No Gas	3902817.65	3846213.84666667	101.47	
Lu	175	No Gas	5595043.04	5505661.37666667	101.62	
Rh	103	No Gas	3783303.88	3760261.65666667	100.61	
Sc	45	No Gas	3208435.29	3052080.71	105.12	
Tb	159	No Gas	5635605.75	5497134.5	102.52	

VII
LABORATORY CONTROL SAMPLE

Report No:	218081813	GCAL ID:	1842311 (LCS)
Matrix:	Solid	Instrument ID:	ICPMS2
Analyst:	LWZ	Lab File ID:	2180828B_MS2.b\1837SMPL_2180828A_MS2.D
Prep Date:	08/25/18 Time: 0815	Analysis Date:	08/28/18 Time: 1250
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	3050B	Analytical Method:	EPA 6020B

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% R*	*Q*	*LCL*	*UCL*
Antimony	ug/kg	4000	4190	105		72	124
Copper	ug/kg	2000	2010	101		84	119
Lead	ug/kg	2000	2030	102		84	118
Zinc	ug/kg	40000	40300	101		82	119

FORM VII - IN

Laboratory Control Sample (LCS) Report

Sample Name	1842311	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1837SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 12:50:50	**Total Dilution**	40.0000
Sample Type	LCS6020	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Recovery Limits: 80-120% 6020A / 85-115% 200.8

Name	Mass	ISTD	Mode	Conc	RSD	CPS	SpkAmt	Rec	QC Flag
Li	7	45	No Gas	11358.595	2.12	4344675.98	250	113.59	
Be	9	45	No Gas	2191.553	2.14	288953.30	50	109.58	
B	11	45	No Gas	10495.144	1.67	850593.53	250	104.95	
Sr	88	72	No Gas	2150.065	3.49	1874851.01	50	107.5	
Zr	90	72	No Gas	440.540	1.34	237756.50	10	110.14	
Mo	95	115	No Gas	2076.028	1.59	334345.22	50	103.8	
Ag	107	115	No Gas	2015.802	3.02	767531.76	50	100.79	
Cd	111	115	No Gas	2013.628	2.28	158025.36	50	100.68	
Sb	121	115	No Gas	4191.750	2.43	1412973.42	100	104.79	
Ba	137	115	No Gas	2024.759	2.52	222309.18	50	101.24	
Tl	205	209	No Gas	2028.278	3.04	720232.80	50	101.41	
Pb	208	209	No Gas	2030.781	2.40	969675.65	50	101.54	
Na	23	45	He	206036.120	1.06	1809872.52	5000	103.02	
Mg	24	45	He	210455.826	0.40	718573.04	5000	105.23	
Al	27	45	He	42772.307	1.34	33531.93	1000	106.93	
Si	29	45	He	62030.611	3.99	10464.35	5000	31.02	LCS6020 Main CR1 Failed
K	39	45	He	206547.903	1.17	602564.59	5000	103.27	
Ca	44	45	He	1062846.235	0.30	138930.29	25000	106.28	
Ti	47	45	He	2007.191	1.58	2606.57	50	100.36	
V	51	72	He	2049.708	0.98	115279.07	50	102.49	
Cr	52	72	He	2038.453	0.97	154498.79	50	101.92	
Mn	55	72	He	2113.623	1.50	55398.11	50	105.68	
Fe	57	72	He	204900.724	0.85	263052.59	5000	102.45	
Co	59	72	He	2041.362	0.65	262553.12	50	102.07	
Ni	60	72	He	4043.034	0.40	147286.52	100	101.08	
Cu	63	72	He	2014.298	0.58	203478.70	50	100.71	
Zn	66	72	He	40312.589	0.37	561087.90	1000	100.78	
As	75	72	He	2019.639	0.83	29152.38	50	100.98	
Se	78	72	He	413.102	1.37	263.45	10	103.28	
Sn	120	115	He	2100.829	0.83	98997.85	50	105.04	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1500776.44	1156007.06333333	129.82	<70% or >120%
Ge	72	He	81880.94	68942.6933333333	118.77	
In	115	He	640896.07	515120.94	124.42	<70% or >120%
Lu	175	He	1099905.61	860474.493333333	127.83	<70% or >120%
Rh	103	He	2365792.62	2061162.14	114.78	
Sc	45	He	99344.87	86332.2766666667	115.07	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2747502.98	2430541.58	113.04	
Ge	72	No Gas	1164185.51	1116846.20666667	104.24	
In	115	No Gas	5711620.34	5301929.88666667	107.73	
Lu	175	No Gas	4594121.39	4111004.52	111.75	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	2243932.83	1790396.84666667	125.33	<70% or >120%

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5764564.91	5479027.00333333	105.21	
Sc	45	No Gas	5001880.63	5061380.49333333	98.82	
Tb	159	No Gas	5512546.80	4997578.57333333	110.3	

Metals

Form VIII

Tunes

VIII
ICP-MS TUNE

Report No:	218081813	GCAL QC ID:	1150
Instrument ID:	ICPMS1	Lab File ID:	2180823A_MS1.b\QCTune\2180823A_MS1-QCTu
Analyst:	AWG	Analytical Batch:	642536
Analysis Date:	08/23/18 Time: 0902	Analytical Method:	EPA 6020B

ELEMENT - MASS	***AVG MEASURED MASS (amu)***	***PEAK WIDTH AT 5% PEAK HEIGHT (amu)***	***%RSD***
Be-9	9	.7775	.4292
Mg-24	23.9	.7434	.3034
Mg-25	24.95	.735	1.0936
Mg-26	25.9	.7422	1.4023
Co-59	58.95	.7335	.5488
In-115	115	.7328	.6735
Pb-206	206	.7673	1.1793
Pb-207	207	.7794	.977
Pb-208	208	.8013	.4759

FORM VIII - IN

US EPA Tune Check Sample Report

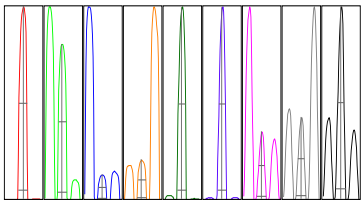
Batch Folder C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
Report Comment
Instrument Name G3281A JP10280491

[No Gas]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
9	13484	0.43	5.00	
24	47328	0.30	5.00	
25	5943	1.09	5.00	
26	6940	1.40	5.00	
59	73592	0.55	5.00	
115	61313	0.67	5.00	
206	13289	1.18	5.00	
207	12327	0.98	5.00	
208	29138	0.48	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	13537	13509	13385	13500	13490
24	47458	47409	47361	47088	47324
25	6003	6022	5879	5913	5897
26	6878	6824	6953	7081	6966
59	73421	73152	73366	74129	73892
115	61839	60934	61675	61059	61056
206	13045	13307	13468	13264	13363
207	12200	12301	12301	12527	12307
208	29116	28976	29158	29355	29086

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
9	2270	9.00	8.9 - 9.1		0.778	0.849	
24	7819	23.90	23.9 - 24.1		0.743	0.849	
25	1000	24.95	24.9 - 25.1		0.735	0.849	
26	1152	25.90	25.9 - 26.1		0.742	0.849	
59	13234	58.95	58.9 - 59.1		0.734	0.849	
115	11926	115.00	114.9 - 115.1		0.733	0.849	
206	2710	206.00	205.9 - 206.1		0.767	0.849	
207	2432	207.00	206.9 - 207.1		0.779	0.849	
208	5736	208.00	207.9 - 208.1		0.801	0.849	

X% = 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1550	W	Carrier Gas	0.50	L/min			
RF Matching	1.70	V	Option Gas	0.0	%			
Smpl Depth	10.0	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	℃						

Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	6.9	V			
Extract 2	-105.0	V	Cell Entrance	-30	V			
Omega Bias	-50	V	Cell Exit	-50	V			
Deflect	13.6	V						

Cell Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	130	V			
Energy Discrimination	5.0	V						

VIII
ICP-MS TUNE

Report No:	218081813	GCAL QC ID:	1150
Instrument ID:	ICPMS1	Lab File ID:	2180821A_MS1.b\QCTune\2180821A_MS1-QCTu
Analyst:	AWG	Analytical Batch:	642381
Analysis Date:	08/21/18 Time: 0931	Analytical Method:	EPA 6020B

ELEMENT - MASS	***AVG MEASURED MASS (amu)***	***PEAK WIDTH AT 5% PEAK HEIGHT (amu)***	***%RSD***
Be-9	9	.7803	.2982
Mg-24	23.9	.7774	.8215
Mg-25	24.9	.7735	.9524
Mg-26	25.9	.7497	.5087
Co-59	58.95	.7688	.6382
In-115	115	.7517	.5548
Pb-206	206	.7916	.8925
Pb-207	207	.8145	1.0512
Pb-208	208	.8111	.8122

FORM VIII - IN

US EPA Tune Check Sample Report

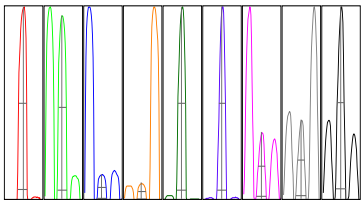
Batch Folder C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b
Report Comment
Instrument Name G3281A JP10280491

[No Gas]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
9	14835	0.30	5.00	
24	50239	0.82	5.00	
25	6729	0.95	5.00	
26	7462	0.51	5.00	
59	76361	0.64	5.00	
115	59709	0.55	5.00	
206	14492	0.89	5.00	
207	13113	1.05	5.00	
208	31763	0.81	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	14798	14789	14834	14896	14859
24	50074	50675	50640	50099	49706
25	6766	6790	6765	6639	6685
26	7490	7485	7495	7422	7420
59	76344	76894	76632	75592	76343
115	59425	60096	60034	59567	59422
206	14340	14637	14371	14558	14552
207	13045	13104	13272	13219	12927
208	31627	32146	31881	31480	31680

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
9	2414	9.00	8.9 - 9.1		0.780	0.849	
24	8222	23.90	23.9 - 24.1		0.777	0.849	
25	1062	24.90	24.9 - 25.1		0.774	0.849	
26	1248	25.90	25.9 - 26.1		0.750	0.849	
59	13361	58.95	58.9 - 59.1		0.769	0.849	
115	11737	115.00	114.9 - 115.1		0.752	0.849	
206	2705	206.00	205.9 - 206.1		0.792	0.849	
207	2439	207.00	206.9 - 207.1		0.814	0.849	
208	5915	208.00	207.9 - 208.1		0.811	0.849	

X% = 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1550	W	Carrier Gas	0.50	L/min			
RF Matching	1.00	V	Option Gas	0.0	%			
Smpl Depth	10.0	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	℃						

Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	6.6	V			
Extract 2	-90.0	V	Cell Entrance	-30	V			
Omega Bias	-45	V	Cell Exit	-50	V			
Deflect	13.0	V						

Cell Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	120	V			
Energy Discrimination	5.0	V						

VIII
ICP-MS TUNE

Report No:	218081813	GCAL QC ID:	1150
Instrument ID:	ICPMS2	Lab File ID:	2180820B_MS2.b\QCTune\2180820B_MS2-QCTu
Analyst:	AWG	Analytical Batch:	642309
Analysis Date:	08/20/18 Time: 1253	Analytical Method:	EPA 6020B

ELEMENT - MASS	***AVG MEASURED MASS (amu)***	***PEAK WIDTH AT 5% PEAK HEIGHT (amu)***	***%RSD***
Be-9	9.05	.7887	.7645
Mg-24	24	.7914	.9917
Mg-25	25	.7928	1.2727
Mg-26	26	.8258	.4753
Co-59	58.95	.7864	.6309
In-115	115	.7729	1.2881
Pb-206	206	.8291	2.0969
Pb-207	206.95	.7931	1.9959
Pb-208	207.95	.8279	2.4434

FORM VIII - IN

US EPA Tune Check Sample Report

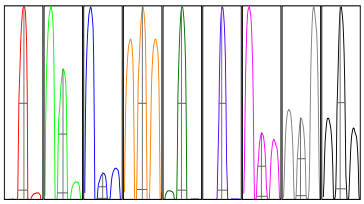
Batch Folder C:\Agilent\ICPMH\1\DATA\2180820B_MS2.b
Report Comment
Instrument Name G8403A JP14170244

[No Gas]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
9	16157	0.76	5.00	
24	74276	0.99	5.00	
25	10089	1.27	5.00	
26	12116	0.48	5.00	
59	132818	0.63	5.00	
115	83633	1.29	5.00	
206	9829	2.10	5.00	
207	8696	2.00	5.00	
208	20542	2.44	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	16023	16132	16247	16318	16064
24	75494	74205	73765	74286	73627
25	10294	10026	9971	10132	10023
26	12095	12115	12210	12053	12109
59	133319	132514	131517	133658	133081
115	83080	83531	82629	85448	83475
206	9985	9783	9639	10096	9640
207	8668	8643	8621	8997	8551
208	20512	20187	20337	21413	20259

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
9	2561	9.05	8.9 - 9.1		0.789	0.849	
24	11932	24.00	23.9 - 24.1		0.791	0.849	
25	1636	25.00	24.9 - 25.1		0.793	0.849	
26	1964	26.00	25.9 - 26.1		0.826	0.849	
59	21884	58.95	58.9 - 59.1		0.786	0.849	
115	15090	115.00	114.9 - 115.1		0.773	0.849	
206	1633	206.00	205.9 - 206.1		0.829	0.849	
207	1481	206.95	206.9 - 207.1		0.793	0.849	
208	3499	207.95	207.9 - 208.1		0.828	0.849	

X% = 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1550	W	Carrier Gas	0.90	L/min			
RF Matching	1.90	V	Option Gas	0.0	%			
Smpl Depth	8.0	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	℃						

Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	6.9	V			
Extract 2	-200.0	V	Cell Entrance	-30	V			
Omega Bias	-115	V	Cell Exit	-50	V			
Deflect	14.6	V						

Cell Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	190	V			
Energy Discrimination	4.0	V						

VIII
ICP-MS TUNE

Report No:	218081813	GCAL QC ID:	1150
Instrument ID:	ICPMS2	Lab File ID:	2180828A_MS2.b\QCTune\2180828A_MS2-QCTu
Analyst:	AWG	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 0932	Analytical Method:	EPA 6020B

ELEMENT - MASS	***AVG MEASURED MASS (amu)***	***PEAK WIDTH AT 5% PEAK HEIGHT (amu)***	***%RSD***
Be-9	9	.785	.4858
Mg-24	24	.7864	.6731
Mg-25	25	.7931	1.2316
Mg-26	26	.7857	.6112
Co-59	59	.7733	.4029
In-115	115.05	.7179	.2559
Pb-206	206.05	.7639	1.0553
Pb-207	207.05	.744	.4899
Pb-208	208.05	.7747	.8738

FORM VIII - IN

US EPA Tune Check Sample Report

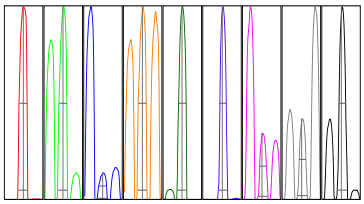
Batch Folder C:\Agilent\ICPMH\1\DATA\2180828A_MS2.b
Report Comment
Instrument Name G8403A JP14170244

[No Gas]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
9	13349	0.49	5.00	
24	46115	0.67	5.00	
25	6418	1.23	5.00	
26	7697	0.61	5.00	
59	117875	0.40	5.00	
115	67039	0.26	5.00	
206	8987	1.06	5.00	
207	8104	0.49	5.00	
208	19229	0.87	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	13341	13295	13395	13433	13280
24	46579	45761	46229	46060	45945
25	6338	6416	6340	6503	6491
26	7758	7640	7702	7662	7722
59	118187	118038	118258	117807	117083
115	67314	66872	66955	67086	66967
206	9116	9016	8868	9011	8924
207	8126	8070	8164	8079	8083
208	19281	19241	19197	18981	19447

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
9	2154	9.00	8.9 - 9.1		0.785	0.849	
24	7724	24.00	23.9 - 24.1		0.786	0.849	
25	1072	25.00	24.9 - 25.1		0.793	0.849	
26	1297	26.00	25.9 - 26.1		0.786	0.849	
59	20308	59.00	58.9 - 59.1		0.773	0.849	
115	13071	115.05	114.9 - 115.1		0.718	0.849	
206	1679	206.05	205.9 - 206.1		0.764	0.849	
207	1503	207.05	206.9 - 207.1		0.744	0.849	
208	3597	208.05	207.9 - 208.1		0.775	0.849	

X% = 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1550	W	Carrier Gas	0.90	L/min			
RF Matching	1.90	V	Option Gas	0.0	%			
Smpl Depth	8.0	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	℃						

Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	7.9	V			
Extract 2	-200.0	V	Cell Entrance	-30	V			
Omega Bias	-110	V	Cell Exit	-50	V			
Deflect	15.6	V						

Cell Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	200	V			
Energy Discrimination	4.0	V						

Metals

Form IX

Serial Dilutions

IX
SERIAL DILUTIONS

Report No:	218081813			GCAL SD ID:	1842323
Matrix:	Solid			Parent Sample ID:	WIL01IS02 (21808181302)
Analyst:	LWZ			Instrument ID:	ICPMS1
Analysis Date:	08/23/18	Time:	1227	Lab File ID:	2180823A_MS1.b\042SMPL.d
Analytical Method:	EPA 6020B			Analytical Batch:	642536

ANALYTE	UNITS	PARENT SAMPLE RESULT	C	SERIAL DILUTION RESULT	C	% DIFF	Q	LCL	UCL
Antimony	ug/kg	0	U	2150	J				
Copper	ug/kg	21000		22200		5.7		0	10
Lead	ug/kg	63500		62500		1.6		0	10
Zinc	ug/kg	61200		63600		3.9		0	10

FORM IX - IN

Sample Report

Sample Name	1842323	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b
File Name	042SMPL.d	**Comment**	ICPMS-1,LWZ
Acq Time	2018-08-23 12:27:11	**Total Dilution**	2000.0000
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	012CALB.d	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	5.525	11050.780	1.1	485178.18	500	
Be	9	45	No Gas	0.3	599.645	3.6	2002.80	100	
B	11	45	No Gas	5.111	10221.442	4.8	34088.18	500	
Sr	88	72	No Gas	33.135	66270.400	1.9	729147.70	1000	
Zr	90	72	No Gas	5.085	10169.078	3.0	76122.97	100	
Mo	95	115	No Gas	0.34	679.117	3.1	1634.55	1000	
Ag	107	115	No Gas	0.099	198.281	8.4	1148.95	100	
Cd	111	115	No Gas	0.199	397.248	2.3	474.34	1000	
Sb	121	115	No Gas	1.006	2012.133	4.6	9908.76	1000	
Ba	137	115	No Gas	64.929	129858.213	2.1	206113.34	1000	
Tl	205	175	No Gas	0.085	169.423	6.2	3051.47	100	
Pb	208	209	No Gas	29.257	58513.676	1.9	866946.22	1000	
Na	23	45	He	277.461	554921.399	1.8	131000.40	100000	
Mg	24	45	He	5638.87	11277739.451	1.7	1271726.15	100000	
Al	27	45	He	3350.907	6701814.685	0.5	220069.70	20000	
Si	29	45	He	197.307	394614.976	8.0	1250.06	10000	
K	39	45	He	564.9	1129799.357	2.0	59483.44	100000	
Ca	44	45	He	13813.87	27627739.452	0.5	78688.05	500000	
Ti	47	45	He	53.593	107185.121	4.3	2404.18	1000	
V	51	72	He	11.449	22898.990	1.7	19385.89	1000	
Cr	52	72	He	7.49	14979.638	1.0	16402.66	1000	
Mn	55	72	He	222.797	445593.630	0.5	222947.01	5000	
Fe	57	72	He	8633.869	17267737.653	0.5	365722.04	100000	
Co	59	72	He	4.333	8665.154	0.4	15545.21	1000	
Ni	60	72	He	13.897	27793.498	2.3	13492.29	2000	
Cu	63	72	He	10.367	20733.303	0.6	28077.33	1000	
Zn	66	103	He	29.747	59494.764	2.0	10434.52	20000	
As	75	72	He	2.735	5469.735	3.1	738.69	1000	
Se	78	72	He	-0.029	-57.699	93.5	2.39	50	
Sn	120	115	He	0.093	185.738	8.3	417.79	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1459466.18	1457156.02	100.16	
Ge	72	He	46813.52	46567.3733333333	100.53	
In	115	He	401362.02	401074.37	100.07	
Lu	175	He	1109876.23	1106922.95333333	100.27	
Rh	103	He	1556617.09	1576304.55666667	98.75	
Sc	45	He	78304.74	77709.7233333333	100.77	
Tb	159	He	1941988.77	1926533.77666667	100.8	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	3606345.26	3553207.86333333	101.5	
Ge	72	No Gas	606604.51	588164.35	103.14	
In	115	No Gas	3979776.45	3846213.84666667	103.47	
Lu	175	No Gas	5662487.42	5505661.37666667	102.85	
Rh	103	No Gas	3865010.40	3760261.65666667	102.79	
Sc	45	No Gas	3176596.19	3052080.71	104.08	
Tb	159	No Gas	5729374.08	5497134.5	104.22	

Metals

Form XIII

Preparation Logs

XIII
PREPARATION LOG

Report No: 218081813

Prep Method: EPA 3010A Prep Batch: 642277

CLIENT SAMPLE ID	*GCAL SAMPLE ID*	*PREP DATE*	*WEIGHT*	*UNITS*	*VOLUME*	*UNITS*
LCS1841053	1841053	08/20/18			50	mL
MB1841052	1841052	08/20/18			50	mL
Nickel Catalyst ...MS	1841056	08/20/18			50	mL
Nickel Catalyst...MSD	1841057	08/20/18			50	mL
WIL03IS00	21808181303	08/20/18			50	mL

FORM XIII - IN

XIII
PREPARATION LOG

Report No: 218081813

Prep Method: EPA 3050B Prep Batch: 642442

CLIENT SAMPLE ID	*GCAL SAMPLE ID*	*PREP DATE*	*WEIGHT*	*UNITS*	*VOLUME*	*UNITS*
LCS1841867	1841867	08/22/18	1.25	g	50	mL
MB1841866	1841866	08/22/18	1.25	g	50	mL
WIL01IS02	21808181302	08/22/18	1.25	g	50	mL
WIL01IS02MS	1842047	08/22/18	1.25	g	50	mL
WIL01IS02MSD	1842048	08/22/18	1.25	g	50	mL
WIL04IS01	21808181305	08/22/18	1.35	g	50	mL
WIL04IS02	21808181306	08/22/18	1.32	g	50	mL
WIL04IS03	21808181304	08/22/18	1.33	g	50	mL

FORM XIII - IN

XIII
PREPARATION LOG

Report No: 218081813

Prep Method: EPA 3050B Prep Batch: 642531

CLIENT SAMPLE ID	*GCAL SAMPLE ID*	*PREP DATE*	*WEIGHT*	*UNITS*	*VOLUME*	*UNITS*
LCS1842311	1842311	08/25/18	1.25	g	50	mL
MB1842310	1842310	08/25/18	1.25	g	50	mL
WIL02IS01 MS	21808181402	08/25/18	1.25	g	50	mL
WIL02IS01 MSD	21808181403	08/25/18	1.25	g	50	mL
WIL03IS01	21808181301	08/25/18	1.35	g	50	mL
WIL03IS02	21808181308	08/25/18	1.28	g	50	mL
WIL03IS03	21808181307	08/25/18	1.26	g	50	mL

FORM XIII - IN

Metals

Form XIV

Run Logs

XIV

ANALYSIS RUN LOG

Report No: 218081813 Analytical Batch: 642536 Start Date: 08/23/18

Instrument ID: ICPMS1 Analytical Method: EPA 6020B End Date: 08/23/18

CLIENT SAMPLE ID	GCAL SAMPLE ID	PF	D/F	TIME	Analyte Symbols																																		
					Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	V	Zn	Zr
ITUNE	1150	*	1	0902		X									X		X																	X	
IICALB	1300	*	1	1014		X									X		X																	X	
IICAL2	1302	*	1	1018		X									X		X																	X	
IICAL4	1304	*	1	1023		X									X		X																	X	
IICAL5	1305	*	1	1027		X									X		X																	X	
IICAL6	1306	*	1	1032		X									X		X																	X	
ICV	1600	*	1	1036		X									X		X																	X	
ICB	1700	*	1	1041		X									X		X																	X	
LLCCV	1803	*	1	1045		X									X		X																	X	
ICSA	2000	*	1	1049		X									X		X																	X	
ICSAB	2100	*	1	1054		X									X		X																	X	
LDR	2500	*	1	1058		X									X		X																	X	
MB1841866	1841866	*	1	1129		X									X		X																	X	
LCS1841867	1841867	*	1	1134		X									X		X																	X	
CCV	1800	*	1	1200		X									X		X																	X	
CCB	1900	*	1	1205		X									X		X																	X	
WIL01IS02	21808181302	*	10	1209		X									X		X																	X	
WIL01IS02MS	1842047	*	10	1214		X									X		X																	X	
WIL01IS02MSD	1842048	*	10	1218		X									X		X																	X	
WIL01IS02PDS	1842322	*	10	1222		X									X		X																	X	
WIL01IS02SD	1842323	*	50	1227		X									X		X																	X	
WIL04IS03	21808181304	*	10	1231		X									X		X																	X	
WIL04IS01	21808181305	*	10	1235		X									X		X																	X	
WIL04IS02	21808181306	*	10	1240		X									X		X																	X	
CCV	1800	*	1	1328		X									X		X																	X	
CCB	1900	*	1	1332		X									X		X																	X	

FORM XIV - IN

XIV

ANALYSIS RUN LOG

Report No: 218081813 Analytical Batch: 642381 Start Date: 08/21/18

Instrument ID: ICPMS1 Analytical Method: EPA 6020B End Date: 08/21/18

CLIENT SAMPLE ID	GCAL SAMPLE ID	PF	D/F	TIME	Analyte Symbols																																				
					Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	V	Zn	Zr							
ITUNE	1150	*	1	0930		X									X		X																	X								
IICALB	1300	*	1	1023		X									X		X																	X								
IICAL2	1302	*	1	1027		X									X		X																	X								
IICAL4	1304	*	1	1033		X									X		X																	X								
IICAL5	1305	*	1	1037		X									X		X																	X								
IICAL6	1306	*	1	1042		X									X		X																	X								
ICV	1600	*	1	1046		X									X		X																	X								
ICB	1700	*	1	1055		X									X		X																	X								
LLCCV	1803	*	1	1108		X									X		X																	X								
ICSA	2000	*	1	1112		X									X		X																	X								
ICSAB	2100	*	1	1117		X									X		X																	X								
LDR	2500	*	1	1121		X									X		X																	X								
WIL03IS00	21808181303	*	1	1151		X									X		X																	X								
CCV	1800	*	1	1156		X									X		X																	X								
CCB	1900	*	1	1200		X									X		X																	X								

FORM XIV - IN

XIV

ANALYSIS RUN LOG

Report No: 218081813 Analytical Batch: 642309 Start Date: 08/20/18

Instrument ID: ICPMS2 Analytical Method: EPA 6020B End Date: 08/20/18

CLIENT SAMPLE ID	GCAL SAMPLE ID	PF	D/F	TIME	Analyte Symbols																																				
					Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	V	Zn	Zr							
ITUNE	1150	*	1	1252		X									X		X																	X								
IICALB	1300	*	1	1305		X									X		X																	X								
IICAL2	1302	*	1	1309		X									X		X																	X								
IICAL4	1304	*	1	1313		X									X		X																	X								
IICAL5	1305	*	1	1317		X									X		X																	X								
IICAL6	1306	*	1	1320		X									X		X																	X								
ICV	1600	*	1	1324		X									X		X																	X								
ICB	1700	*	1	1342		X									X		X																	X								
LLCCV	1803	*	1	1353		X									X		X																	X								
ICSA	2000	*	1	1356		X									X		X																	X								
ICSAB	2100	*	1	1400		X									X		X																	X								
LDR	2500	*	1	1403		X									X		X																	X								
CCV	1800	*	1	1734		X									X		X																	X								
CCB	1900	*	1	1738		X									X		X																	X								
MB1841052	1841052	*	1	1827		X									X		X																	X								
LCS1841053	1841053	*	1	1831		X									X		X																	X								
CCV	1800	*	1	1838		X									X		X																	X								
CCB	1900	*	1	1841		X									X		X																	X								

FORM XIV - IN

XIV

ANALYSIS RUN LOG

Report No: 218081813 Analytical Batch: 642829 Start Date: 08/28/18

Instrument ID: ICPMS2 Analytical Method: EPA 6020B End Date: 08/28/18

CLIENT SAMPLE ID	GCAL SAMPLE ID	PF	D/F	TIME	Analyte Symbols																																				
					Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	V	Zn	Zr
ITUNE	1150	*	1	0931		X									X		X																	X	
IICALB	1300	*	1	1024		X									X		X																	X	
IICAL2	1302	*	1	1028		X									X		X																	X	
IICAL4	1304	*	1	1031		X									X		X																	X	
IICAL5	1305	*	1	1035		X									X		X																	X	
IICAL6	1306	*	1	1039		X									X		X																	X	
ICV	1600	*	1	1042		X									X		X																	X	
ICB	1700	*	1	1050		X									X		X																	X	
LLCCV	1803	*	1	1100		X									X		X																	X	
ICSA	2000	*	1	1104		X									X		X																	X	
ICSAB	2100	*	1	1107		X									X		X																	X	
LDR	2500	*	1	1111		X									X		X																	X	
CCV	1800	*	1	1240		X									X		X																	X	
CCB	1900	*	1	1243		X									X		X																	X	
MB1842310	1842310	*	1	1247		X									X		X																	X	
LCS1842311	1842311	*	1	1250		X									X		X																	X	
WIL03IS01	21808181301	*	10	1305		X									X		X																	X	
WIL03IS02	21808181308	*	10	1308		X									X		X																	X	
CCV	1800	*	1	1337		X									X		X																	X	
CCB	1900	*	1	1340		X									X		X																	X	
WIL03IS03	21808181307	*	10	1355		X									X		X																	X	
CCV	1800	*	1	1358		X									X		X																	X	
CCB	1900	*	1	1402		X									X		X																	X	
ICSA	2000	*	1	1800		X									X		X																	X	
ICSAB	2100	*	1	1804		X									X		X																	X	

FORM XIV - IN

Metals

Form XV

Internal Standards

XV (He)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081813	Start Date:	08/23/18
Instrument ID:	ICPMS1	End Date:	08/23/18
Analytical Method	EPA 6020B	Analytical Batch:	642536

			Internal Standards %RI For:															
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD1***	***Q***	***ISTD2***	***Q***	***ISTD3***	***Q***	***ISTD4***	***Q***	***ISTD5***	***Q***	***ISTD6***	***Q***	***ISTD7***	***Q***
MB1841866	1841866	1129	102		108		109		112		105		110		107	
LCS1841867	1841867	1134	99		105		106		107		101		109		105	
WIL01IS02	21808181302	1209	90		97		93		96		91		102		97	
WIL01IS02MS	1842047	1214	84		95		92		95		88		100		95	
WIL01IS02MSD	1842048	1218	87		96		92		95		88		101		95	
WIL01IS02PDS	1842322	1222	86		97		92		95		89		101		96	
WIL01IS02SD	1842323	1227	100		101		100		100		99		101		101	
WIL04IS03	21808181304	1231	93		99		95		97		91		101		98	
WIL04IS01	21808181305	1235	90		98		95		98		92		101		98	
WIL04IS02	21808181306	1240	93		98		95		98		94		102		98	

ISTD 1: Bismuth (He)
ISTD 2: Germanium (He)
ISTD 3: Indium (He)
ISTD 4: Lutetium (He)
ISTD 5: Rhodium (He)
ISTD 6: Scandium (He)
ISTD 7: Terbium (He)

FORM XV - IN

XV (No Gas)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081813	Start Date:	08/23/18
Instrument ID:	ICPMS1	End Date:	08/23/18
Analytical Method	EPA 6020B	Analytical Batch:	642536

			Internal Standards %RI For:															
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD8***	***Q***	***ISTD9***	***Q***	***ISTD10***	***Q***	***ISTD11***	***Q***	***ISTD12***	***Q***	***ISTD13***	***Q***	***ISTD14***	***Q***
MB1841866	1841866	1129	98		103		103		101		102		106		102	
LCS1841867	1841867	1134	96		103		101		102		101		105		103	
WIL01IS02	21808181302	1209	96		105		101		103		100		109		104	
WIL01IS02MS	1842047	1214	95		103		100		102		98		108		102	
WIL01IS02MSD	1842048	1218	95		102		97		100		96		107		101	
WIL01IS02PDS	1842322	1222	95		104		99		101		98		108		102	
WIL01IS02SD	1842323	1227	101		103		103		103		103		104		104	
WIL04IS03	21808181304	1231	97		104		101		102		100		108		104	
WIL04IS01	21808181305	1235	97		105		101		103		100		108		104	
WIL04IS02	21808181306	1240	98		105		102		104		102		108		105	

ISTD 8: Bismuth (No Gas)
ISTD 9: Germanium (No Gas)
ISTD 10 Indium (No Gas)
ISTD 11 Lutetium (No Gas)
ISTD 12 Rhodium (No Gas)
ISTD 13 Scandium (No Gas)
ISTD 14 Terbium (No Gas)

FORM XV - IN

XV (He)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081813	Start Date:	08/21/18
Instrument ID:	ICPMS1	End Date:	08/21/18
Analytical Method	EPA 6020B	Analytical Batch:	642381

			Internal Standards %RI For:															
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD1***	***Q***	***ISTD2***	***Q***	***ISTD3***	***Q***	***ISTD4***	***Q***	***ISTD5***	***Q***	***ISTD6***	***Q***	***ISTD7***	***Q***
WIL03IS00	21808181303	1151	100		102		101		108		103		104		101	

ISTD 1: Bismuth (He)
ISTD 2: Germanium (He)
ISTD 3: Indium (He)
ISTD 4: Lutetium (He)
ISTD 5: Rhodium (He)
ISTD 6: Scandium (He)
ISTD 7: Terbium (He)

FORM XV - IN

XV (No Gas)
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081813	Start Date:	08/21/18
Instrument ID:	ICPMS1	End Date:	08/21/18
Analytical Method	EPA 6020B	Analytical Batch:	642381

			Internal Standards %RI For:															
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD8***	***Q***	***ISTD9***	***Q***	***ISTD10***	***Q***	***ISTD11***	***Q***	***ISTD12***	***Q***	***ISTD13***	***Q***	***ISTD14***	***Q***
WIL03IS00	21808181303	1151	100		105		102		99		104		104		101	

ISTD 8: Bismuth (No Gas)
ISTD 9: Germanium (No Gas)
ISTD 10 Indium (No Gas)
ISTD 11 Lutetium (No Gas)
ISTD 12 Rhodium (No Gas)
ISTD 13 Scandium (No Gas)
ISTD 14 Terbium (No Gas)

FORM XV - IN

XV (He)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081813	Start Date:	08/20/18
Instrument ID:	ICPMS2	End Date:	08/20/18
Analytical Method	EPA 6020B	Analytical Batch:	642309

			Internal Standards %RI For:													
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD1***	***Q***	***ISTD2***	***Q***	***ISTD3***	***Q***	***ISTD4***	***Q***	***ISTD5***	***Q***	***ISTD6***	***Q***	***ISTD7***	***Q***
MB1841052	1841052	1827	114		102		107		111		108		96		110	
LCS1841053	1841053	1831	116		105		109		118		108		97		116	

ISTD 1: Bismuth (He)
ISTD 2: Germanium (He)
ISTD 3: Indium (He)
ISTD 4: Lutetium (He)
ISTD 5: Rhodium (He)
ISTD 6: Scandium (He)
ISTD 7: Terbium (He)

FORM XV - IN

XV (No Gas)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081813	Start Date:	08/20/18
Instrument ID:	ICPMS2	End Date:	08/20/18
Analytical Method	EPA 6020B	Analytical Batch:	642309

			Internal Standards %RI For:															
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD8***	***Q***	***ISTD9***	***Q***	***ISTD10***	***Q***	***ISTD11***	***Q***	***ISTD12***	***Q***	***ISTD13***	***Q***	***ISTD14***	***Q***
MB1841052	1841052	1827	105		101		107		109		107		102		108	
LCS1841053	1841053	1831	108		105		112		117		107		104		115	

ISTD 8:	Bismuth (No Gas)	ISTD 11	Lutetium (No Gas)	ISTD 14	Terbium (No Gas)
ISTD 9:	Germanium (No Gas)	ISTD 12	Rhodium (No Gas)		
ISTD 10	Indium (No Gas)	ISTD 13	Scandium (No Gas)		

FORM XV - IN

XV (He)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081813	Start Date:	08/28/18
Instrument ID:	ICPMS2	End Date:	08/28/18
Analytical Method	EPA 6020B	Analytical Batch:	642829

			Internal Standards %RI For:													
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD1***	***Q***	***ISTD2***	***Q***	***ISTD3***	***Q***	***ISTD4***	***Q***	***ISTD5***	***Q***	***ISTD6***	***Q***	***ISTD7***	***Q***
MB1842310	1842310	1247	126		115		121		122		114		113		119	
LCS1842311	1842311	1250	130		119		124		128		115		115		125	
WIL03IS01	21808181301	1305	87		100		94		77		93		101		83	
WIL03IS02	21808181308	1308	91		101		95		79		96		100		85	
WIL03IS03	21808181307	1355	94		102		99		83		99		101		90	

ISTD 1: Bismuth (He)
ISTD 2: Germanium (He)
ISTD 3: Indium (He)
ISTD 4: Lutetium (He)
ISTD 5: Rhodium (He)
ISTD 6: Scandium (He)
ISTD 7: Terbium (He)

FORM XV - IN

XV (No Gas)
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081813	Start Date:	08/28/18
Instrument ID:	ICPMS2	End Date:	08/28/18
Analytical Method	EPA 6020B	Analytical Batch:	642829

			Internal Standards %RI For:															
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD8***	***Q***	***ISTD9***	***Q***	***ISTD10***	***Q***	***ISTD11***	***Q***	***ISTD12***	***Q***	***ISTD13***	***Q***	***ISTD14***	***Q***
MB1842310	1842310	1247	110		103		106		108		104		98		107	
LCS1842311	1842311	1250	113		104		108		112		105		99		110	
WIL03IS01	21808181301	1305	87		95		89		84		89		97		86	
WIL03IS02	21808181308	1308	90		96		92		86		91		97		88	
WIL03IS03	21808181307	1355	92		98		94		92		94		98		94	

ISTD 8: Bismuth (No Gas)
ISTD 9: Germanium (No Gas)
ISTD 10 Indium (No Gas)
ISTD 11 Lutetium (No Gas)
ISTD 12 Rhodium (No Gas)
ISTD 13 Scandium (No Gas)
ISTD 14 Terbium (No Gas)

FORM XV - IN

Metals

ICPMS ICALs

GCAL ANALYTICAL LABORATORIES, LLC

BATCH COVERSHEET

ANALYST AWG

DATE 08/21/18

ICP/MS Metals Analysis

HBN **642381**

STANDARDS

ICAL Standard	316-66-8
ICV Standard	316-66-4
ICSA Standard	316-66-9
ICSAB Standard	316-66-3
Internal Standard	316-66-12
Tune	316-63-4
P/A	316-56-9

ADDITIONAL STANDARDS

LDR Standard	316-66-10
	ICVB 316-66-11

ACID MATRIX

2% HNO3 \ 0.5% HCL Solution	317-48-20
5% HNO3 \ 2% HCL Solution	317-49-3

ICPMS DATA FILE

Reference File: 2180821A_MS1

GCAL QC LIMITS

200.8 Correlation Coefficient (R) =0.998

6020B Correlation Coefficient (R) =0.995

ICV Recovery 90-110%

LLCCV Recovery 80-120%

ICSA \ ICSAB Recovery 80-120%

CCV Recovery 90-110%

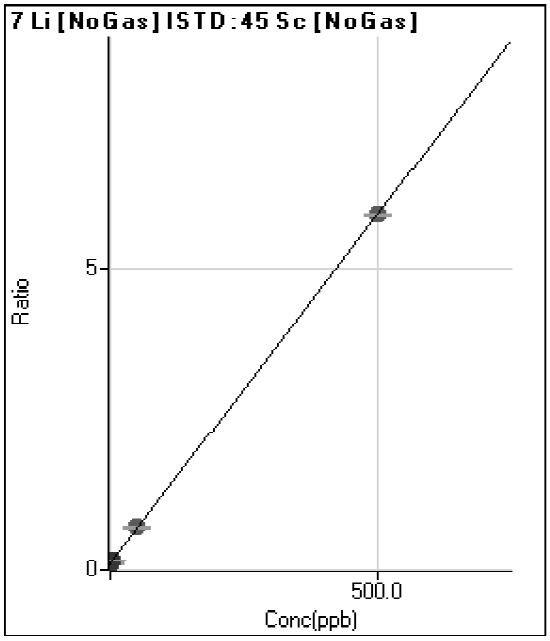
Sample						
Data File	Acq. Date-Time	Type	Sample Name	Total Dil.	Vial Number	Comment
001SMPL.d	8/21/2018 10:10	Sample	Blank	1	5	
002SMPL.d	8/21/2018 10:14	Sample	Blank	1	5	
003SMPL.d	8/21/2018 10:19	Sample	Blank	1	1107	
004CALB.d	8/21/2018 10:23	CalBlk	1300	1	1107	
005CALS.d	8/21/2018 10:27	CalStd	1302	1	1105	
006CALS.d	8/21/2018 10:33	CalStd	1304	1	1103	
007CALS.d	8/21/2018 10:37	CalStd	1305	1	1102	
008CALS.d	8/21/2018 10:42	CalStd	1306	1	1101	
009_ICV.d	8/21/2018 10:46	ICV	1600	1	1201	
010_ICV.d	8/21/2018 10:51	ICV	1600 B	1	1203	
011_ICB.d	8/21/2018 10:55	ICB	1700	1	1107	
012_0.1.d	8/21/2018 10:59	LLCCV0.1	1804	1	1105	
013_0.5.d	8/21/2018 11:04	LLCCV0.5	1804	1	1104	
014CCV1.d	8/21/2018 11:08	LLCCV1	1803	1	1103	
015ICSA.d	8/21/2018 11:12	ICSA	2000	1	1205	
016ICSB.d	8/21/2018 11:17	ICSB	2100	1	1206	
017_QC1.d	8/21/2018 11:21	QC1	LDR	1	1204	
018SMPL.d	8/21/2018 11:26	Sample	2500	1	5	
019SMPL.d	8/21/2018 11:34	Sample	21808171001	5	2101	
020SMPL.d	8/21/2018 11:38	MBSOIL	1840818	40	2102	
021SMPL.d	8/21/2018 11:43	LCS6020	1840819	40	2103	
022SMPL.d	8/21/2018 11:47	Sample	21808172902	787.4016	2104	
023SMPL.d	8/21/2018 11:51	Sample	21808181303	1	2105	
024_CCV.d	8/21/2018 11:56	CCV	1800	1	1102	
025_CCB.d	8/21/2018 12:00	CCB	1900	1	1107	
026SMPL.d	8/21/2018 12:43	Sample	21808166201 D 100X	100	3101	
027SMPL.d	8/21/2018 12:48	Sample	21808166201 D	5	3102	
028SMPL.d	8/21/2018 12:52	Sample	21808166202 D 1000X	1000	3103	
029SMPL.d	8/21/2018 12:57	Sample	21808166202 D	50	3104	
030SMPL.d	8/21/2018 13:01	Sample	21808167509	1	3105	
031SMPL.d	8/21/2018 13:05	Sample	21808167510	1	3106	
032SMPL.d	8/21/2018 13:10	Sample	21808167514	5	3107	
033SMPL.d	8/21/2018 13:14	Sample	21808167515	5	3108	
034SMPL.d	8/21/2018 13:18	Sample	21808167516	5	3109	
035SMPL.d	8/21/2018 13:23	Sample	1841163	25	3110	
036_CCV.d	8/21/2018 13:27	CCV	1800	1	1102	
037_CCB.d	8/21/2018 13:32	CCB	1900	1	1107	
038SMPL.d	8/21/2018 13:36	Sample	21808166201 100X	100	3111	
039SMPL.d	8/21/2018 13:40	Sample	21808166201	5	3112	
040SMPL.d	8/21/2018 13:45	Sample	21808166202 1000X	1000	3201	
041SMPL.d	8/21/2018 13:49	Sample	21808166202	50	3202	
042SMPL.d	8/21/2018 13:53	Sample	21808167501	1	3203	
043SMPL.d	8/21/2018 13:58	Sample	21808167502	1	3204	
044SMPL.d	8/21/2018 14:02	AllRef	21808167506	5	3205	
045SMPL.d	8/21/2018 14:06	MS	21808167507	5	3206	

046SMPL.d	8/21/2018 14:11	MSD	21808167508	5	3207	
047SMPL.d	8/21/2018 14:15	PDS	1841229	5	3208	
048SMPL.d	8/21/2018 14:20	Sample	1841230	25	3209	
049_CCV.d	8/21/2018 14:24	CCV	1800	1	1102	
050_CCB.d	8/21/2018 14:28	CCB	1900	1	1107	
051SMPL.d	8/21/2018 14:33	AllRef	21808150306	100000	4101	
052SMPL.d	8/21/2018 14:37	MSSOIL	1841046	100000	4102	
053SMPL.d	8/21/2018 14:41	MSDSOIL	1841047	100000	4103	
054SMPL.d	8/21/2018 14:46	Sample	21808150307	100000	4104	
055SMPL.d	8/21/2018 14:50	Sample	21808150309	100000	4105	
056SMPL.d	8/21/2018 14:54	Sample	21808150310	100000	4106	
057SMPL.d	8/21/2018 14:59	Sample	21808150311	100000	4107	
058SMPL.d	8/21/2018 15:03	Sample	LCS1	5000	4108	
059SMPL.d	8/21/2018 15:08	Sample	LCS2	5000	4109	
060_CCV.d	8/21/2018 15:12	CCV	1800	1	1102	
061_CCB.d	8/21/2018 15:16	CCB	1900	1	1107	

Tune Mode	Mass	Name	ISTD	R	a	b (blank)	DL	BEC	Units
No Gas	7	Li	45 Sc [No Gas]	0.999992908	0.011559146	0.103284016	0.224983216	8.935263363	ppb
No Gas	9	Be	45 Sc [No Gas]	0.999998589	0.002175284	7.73E-06	0.000701971	0.003555284	ppb
No Gas	11	B	45 Sc [No Gas]	0.999999478	0.001452889	0.001571421	0.054929186	1.081583624	ppb
He	23	Na	45 Sc [He]	0.999999971	0.0061771	0.034289131	2.007242383	5.551007645	ppb
He	24	Mg	45 Sc [He]	0.999999836	0.002989616	0.000570225	0.674122996	0.190735124	ppb
He	27	Al	45 Sc [He]	0.999999819	0.000892333	0.000316129	0.532143519	0.354272506	ppb
He	29	Si	45 Sc [He]	0.999907543	2.15E-05	0.012577599	127.4498222	583.6762082	ppb
He	39	K	45 Sc [He]	0.999999275	0.001295954	0.0323621	7.976928018	24.97165048	ppb
He	44	Ca	45 Sc [He]	0.999999165	7.47E-05	0.001339815	12.9914657	17.94138123	ppb
He	47	Ti	45 Sc [He]	0.999999684	0.000599849	3.96E-05	0.114734392	0.066070551	ppb
He	51	V	72 Ge [He]	0.99999155	0.036789059	0.000975678	0.018218663	0.026520864	ppb
He	52	Cr	72 Ge [He]	0.999993475	0.047910665	0.001601115	0.037870385	0.033418761	ppb
He	55	Mn	45 Sc [He]	0.999999875	0.013046327	0.000307996	0.026788626	0.023607878	ppb
He	57	Fe	72 Ge [He]	0.999998339	0.00097347	0.000750465	1.057860116	0.770917265	ppb
He	59	Co	72 Ge [He]	0.999999661	0.078949288	0.000325853	0.007233026	0.004127366	ppb
He	60	Ni	72 Ge [He]	0.999999693	0.021639471	0.000275155	0.005876668	0.012715435	ppb
He	63	Cu	103 Rh [He]	0.999992401	0.001748479	0.000444205	0.108310688	0.254052204	ppb
He	66	Zn	103 Rh [He]	0.999998606	0.000220281	4.03E-05	0.14070711	0.18316939	ppb
He	75	As	72 Ge [He]	0.999996944	0.006127408	0.000198878	0.025735406	0.032457174	ppb
He	78	Se	72 Ge [He]	0.999986359	0.000511873	3.57E-05	0.018988364	0.069674634	ppb
No Gas	88	Sr	103 Rh [No Gas]	0.999995003	0.006015436	7.84E-05	0.002630017	0.013028674	ppb
No Gas	90	Zr	72 Ge [No Gas]	0.999996638	0.025830849	0.000613659	0.002543786	0.023756831	ppb
No Gas	95	Mo	115 In [No Gas]	0.999994325	0.001123095	5.20E-05	0.009500058	0.046322396	ppb
No Gas	107	Ag	115 In [No Gas]	0.999999456	0.002793373	3.20E-06	0.000576093	0.001146151	ppb
No Gas	111	Cd	115 In [No Gas]	0.99999995	0.000583166	2.62E-06	0.00609514	0.004487807	ppb
No Gas	118	[Sn]	115 In [No Gas]	0.999999446	0.00179769	0.000250525	0.034232447	0.139359473	ppb
He	118	[Sn]	115 In [He]	0.999997404	0.002496212	0.000340861	0.083283483	0.136551482	ppb
He	120	Sn	115 In [He]	0.999991328	0.00364056	0.000489393	0.012519205	0.134427898	ppb
No Gas	121	Sb	115 In [No Gas]	0.999999924	0.002216256	0.000143931	0.009745978	0.064943274	ppb
No Gas	137	Ba	115 In [No Gas]	0.999999513	0.000806738	1.04E-05	0.013224508	0.012912571	ppb
He	156	[Se]	115 In [He]						ppb
No Gas	205	Tl	175 Lu [No Gas]	0.999999577	0.003742841	0.000360994	0.004054827	0.096449109	ppb
No Gas	206	[Pb]	209 Bi [No Gas]	0.999999752	0.002014871	3.14E-05	0.009535255	0.015573487	ppb
No Gas	207	[Pb]	209 Bi [No Gas]	0.999998957	0.001853965	3.16E-05	0.019181243	0.017047523	ppb
No Gas	208	Pb	209 Bi [No Gas]	0.999997198	0.008426789	0.000165541	0.002267711	0.019644608	ppb
No Gas	45	Sc							ppb
He	45	Sc							ppb
No Gas	72	Ge							ppb
He	72	Ge							ppb
No Gas	103	Rh							ppb
He	103	Rh							ppb
No Gas	115	In							ppb
He	115	In							ppb
No Gas	159	Tb							ppb
He	159	Tb							ppb
No Gas	175	Lu							ppb
He	175	Lu							ppb
No Gas	209	Bi							ppb
He	209	Bi							ppb

Batch Folder: C:\Agilent\ICPMH\1\DATA\2180821A_MS1.b\
Analysis File: 2180821A_MS1.batch.bin
DA Date-Time: 2018-08-21 12:02:40
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

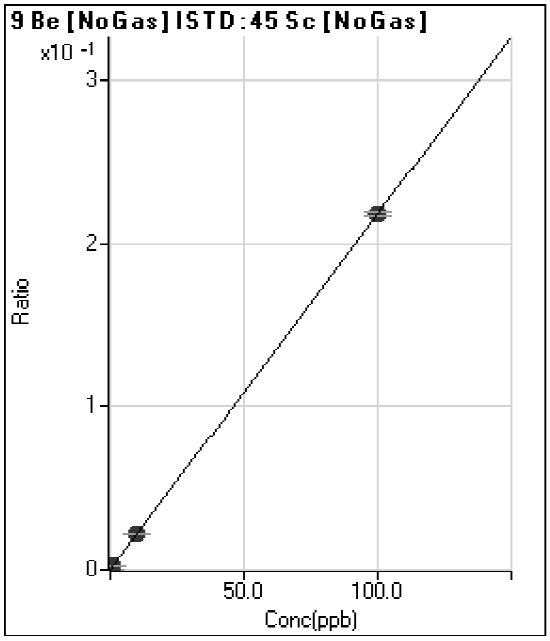
Level	Standard Data File	Sample Name	Acq. Date-Time
1	004CALB.d	1300	2018-08-21 10:23:40
2	005CALS.d	1302	2018-08-21 10:27:59
3	006CALS.d	1304	2018-08-21 10:33:00
4	007CALS.d	1305	2018-08-21 10:37:34
5	008CALS.d	1306	2018-08-21 10:42:08



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	311846.36	0.1033	P	0.8
2	☐	0.500	0.552	326323.97	0.1097	P	1.5
3	☐	5.000	5.074	473749.65	0.1619	P	1.7
4	☐	50.000	51.879	2062896.11	0.7030	A	0.7
5	☐	500.000	499.811	17058693.5	5.8807	A	0.8

y = 0.0116 * x + 0.1033
R = 1.0000
DL = 0.225
BEC = 8.935

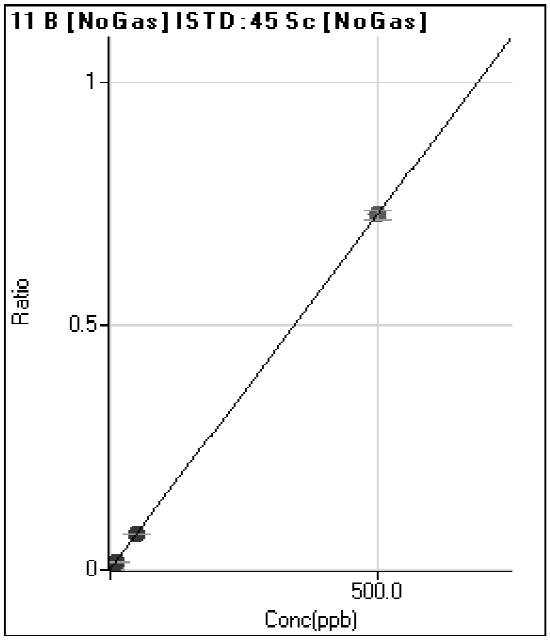
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0000	P	6.6
2	☐	0.100	0.106	708.02	0.0002	P	3.9
3	☐	1.000	1.007	6434.58	0.0022	P	0.8
4	☐	10.000	10.168	64912.44	0.0221	P	2.3
5	☐	100.000	99.983	630913.31	0.2175	P	1.1

y = 0.0022 * x + 7.7338E-006
R = 1.0000
DL = 0.000702
BEC = 0.003555

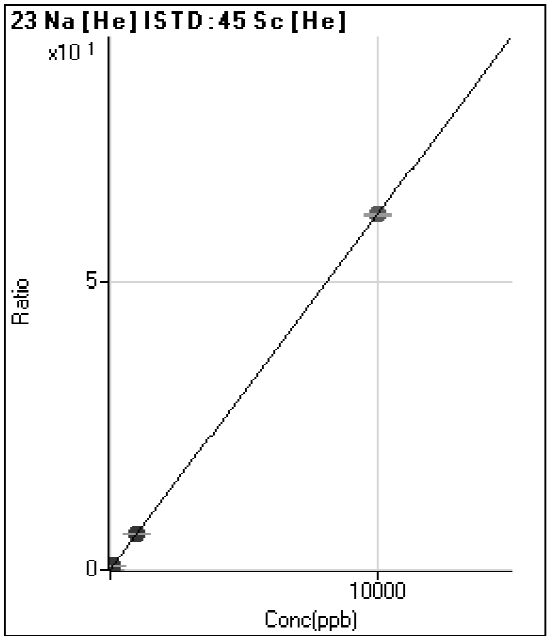
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4744.21	0.0016	P	1.7
2	☐	1.000	1.274	10183.46	0.0034	P	5.6
3	☐	10.000	10.111	47560.69	0.0163	P	3.3
4	☐	50.000	49.667	216308.53	0.0737	P	2.2
5	☐	500.000	500.031	2111786.68	0.7281	A	2.4

y = 0.0015 * x + 0.0016
R = 1.0000
DL = 0.05493
BEC = 1.082

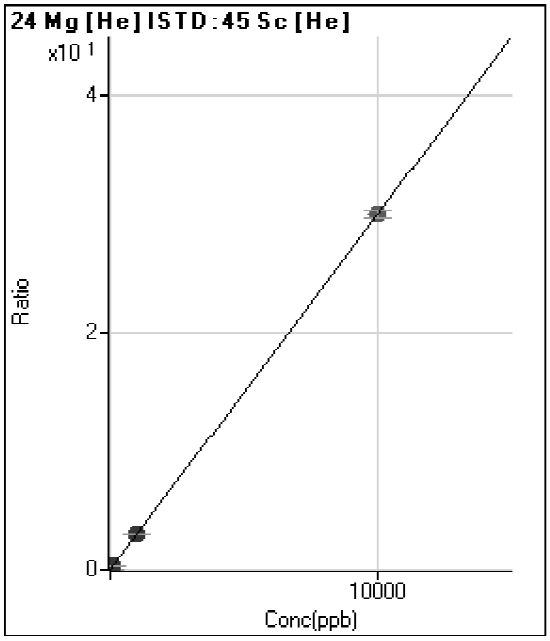
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2596.98	0.0343	P	12.1
2	☐	10.000	11.619	8095.56	0.1061	P	2.8
3	☐	100.000	102.934	51519.05	0.6701	P	2.0
4	☐	1000.000	1001.063	485622.86	6.2180	P	2.5
5	☐	10000.00	9999.863	4591485.97	61.804	A	0.7

y = 0.0062 * x + 0.0343
R = 1.0000
DL = 2.007
BEC = 5.551

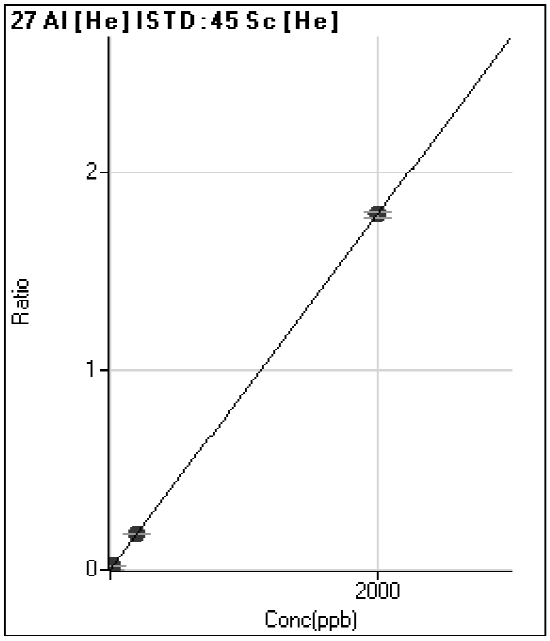
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	43.33	0.0006	P	117.
2	☐	10.000	10.109	2350.25	0.0308	P	4.3
3	☐	100.000	100.543	23149.88	0.3012	P	2.5
4	☐	1000.000	994.595	232272.28	2.9740	P	2.4
5	☐	10000.00	10000.53	2220802.73	29.898	A	2.2

y = 0.0030 * x + 5.7022E-004
R = 1.0000
DL = 0.6741
BEC = 0.1907

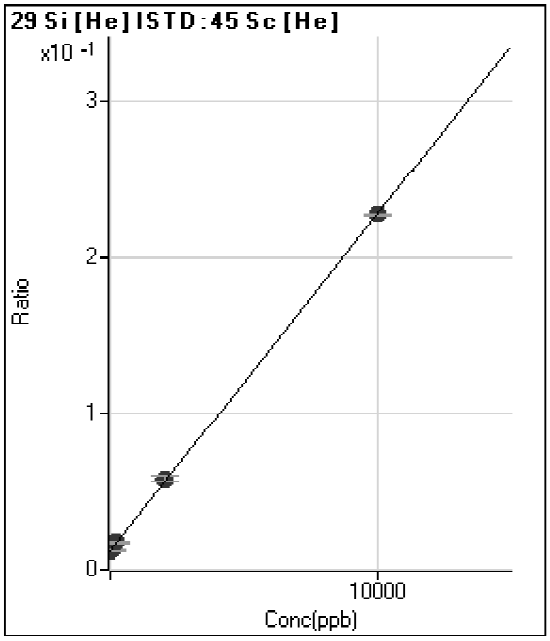
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	24.00	0.0003	P	50.1
2	☐	2.000	2.921	223.33	0.0029	P	14.7
3	☐	20.000	21.440	1494.74	0.0194	P	5.0
4	☐	200.000	200.894	14025.85	0.1796	P	2.2
5	☐	2000.000	1999.895	132584.48	1.7849	P	1.5

y = 8.9233E-004 * x + 3.1613E-004
R = 1.0000
DL = 0.5321
BEC = 0.3543

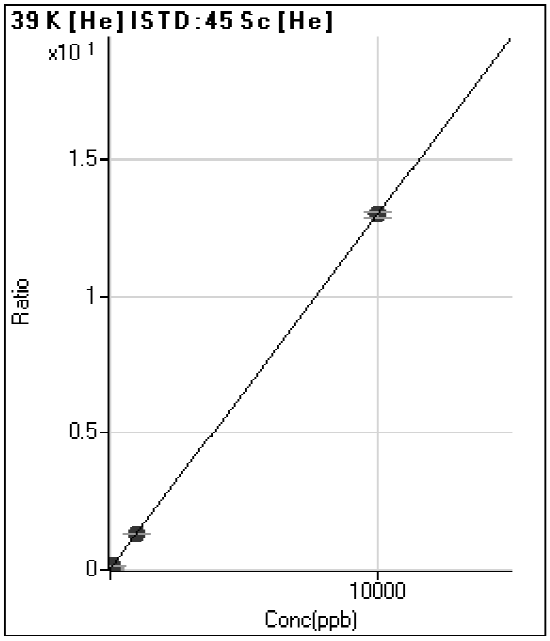
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	953.37	0.0126	P	7.3
2	☐	20.000	16.835	988.04	0.0129	P	7.2
3	☐	200.000	229.537	1347.40	0.0175	P	2.9
4	☐	2000.000	2129.233	4563.98	0.0585	P	4.8
5	☐	10000.00	9973.569	16899.83	0.2275	P	0.6

y = 2.1549E-005 * x + 0.0126
R = 0.9999
DL = 127.4
BEC = 583.7

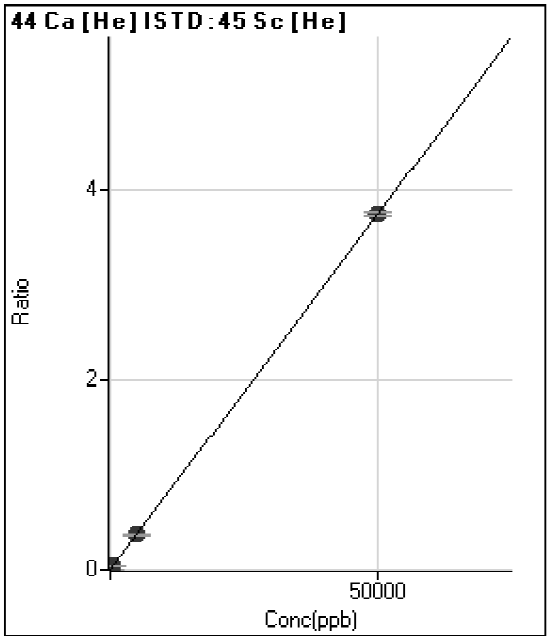
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2453.60	0.0324	P	10.6
2	☐	10.000	13.611	3817.23	0.0500	P	1.8
3	☐	100.000	101.715	12621.90	0.1642	P	4.2
4	☐	1000.000	990.144	102738.44	1.3155	P	2.7
5	☐	10000.00	10000.96	965130.40	12.993	P	1.8

y = 0.0013 * x + 0.0324
R = 1.0000
DL = 7.977
BEC = 24.97

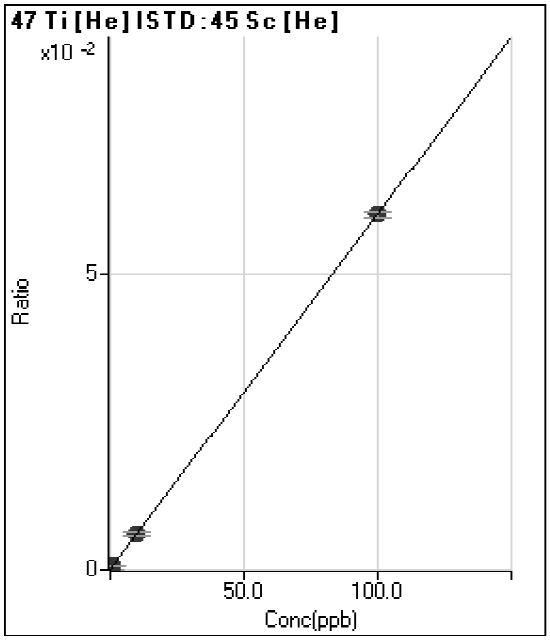
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	101.67	0.0013	P	24.1
2	☐	50.000	58.641	436.68	0.0057	P	5.8
3	☐	500.000	501.561	2981.99	0.0388	P	3.7
4	☐	5000.000	4940.171	28922.03	0.3703	P	2.8
5	☐	50000.00	50005.95	277499.50	3.7357	P	1.0

y = 7.4677E-005 * x + 0.0013
R = 1.0000
DL = 12.99
BEC = 17.94

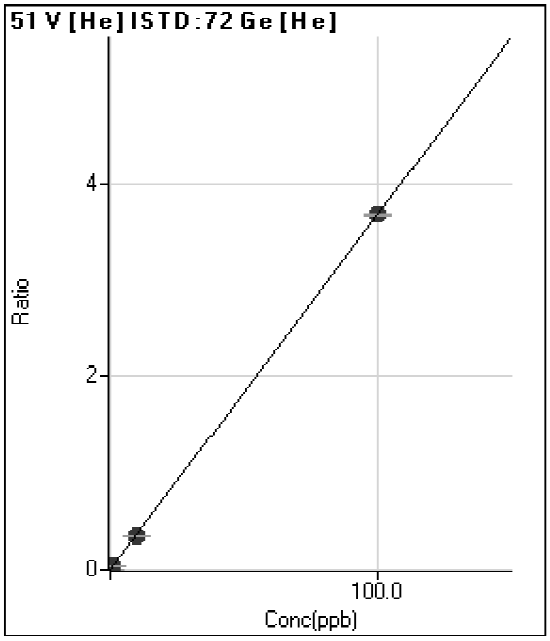
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3.00	0.0000	P	57.9
2	☐	0.100	0.050	5.33	0.0001	P	77.1
3	☐	1.000	1.040	51.00	0.0007	P	8.1
4	☐	10.000	9.967	469.68	0.0060	P	7.5
5	☐	100.000	100.003	4458.94	0.0600	P	1.5

y = 5.9985E-004 * x + 3.9632E-005
R = 1.0000
DL = 0.1147
BEC = 0.06607

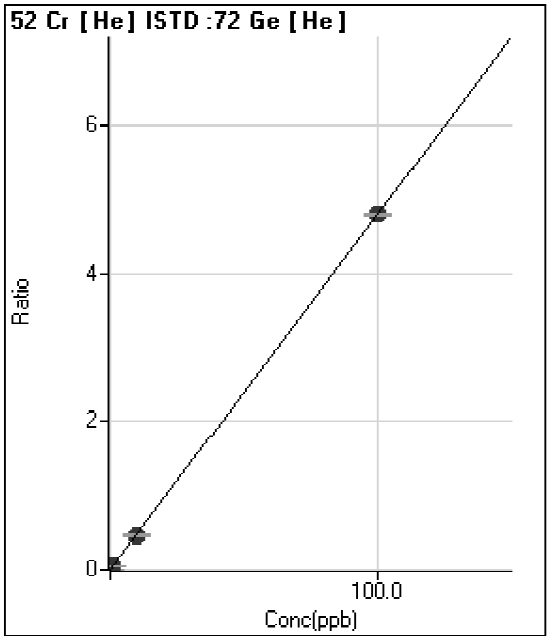
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	43.33	0.0010	P	22.9
2	☐	0.100	0.111	226.67	0.0050	P	16.6
3	☐	1.000	1.055	1793.45	0.0398	P	1.9
4	☐	10.000	9.619	16031.17	0.3549	P	2.3
5	☐	100.000	100.038	156394.46	3.6813	P	0.9

y = 0.0368 * x + 9.7568E-004
R = 1.0000
DL = 0.01822
BEC = 0.02652

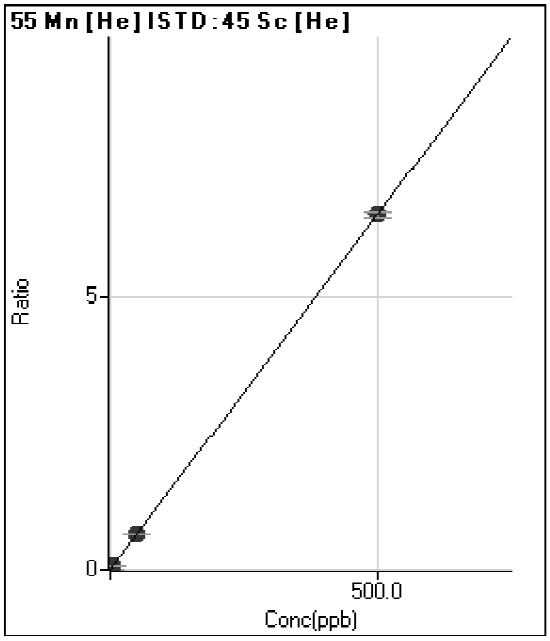
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	71.11	0.0016	P	37.8
2	☐	0.100	0.103	294.45	0.0066	P	4.5
3	☐	1.000	0.972	2170.17	0.0481	P	7.8
4	☐	10.000	9.640	20934.45	0.4634	P	3.1
5	☐	100.000	100.036	203682.24	4.7944	P	0.9

y = 0.0479 * x + 0.0016
R = 1.0000
DL = 0.03787
BEC = 0.03342

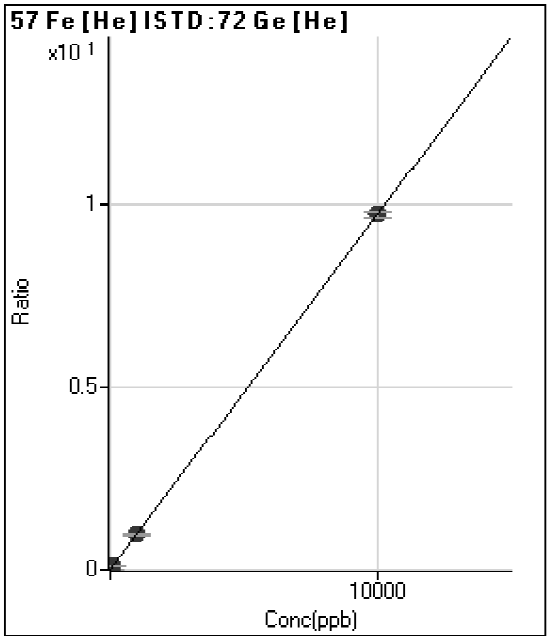
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0003	P	37.8
2	☐	0.500	0.577	597.80	0.0078	P	0.9
3	☐	5.000	5.124	5164.21	0.0672	P	4.9
4	☐	50.000	49.836	50800.92	0.6505	P	2.6
5	☐	500.000	500.015	484591.25	6.5237	P	1.5

y = 0.0130 * x + 3.0800E-004
R = 1.0000
DL = 0.02679
BEC = 0.02361

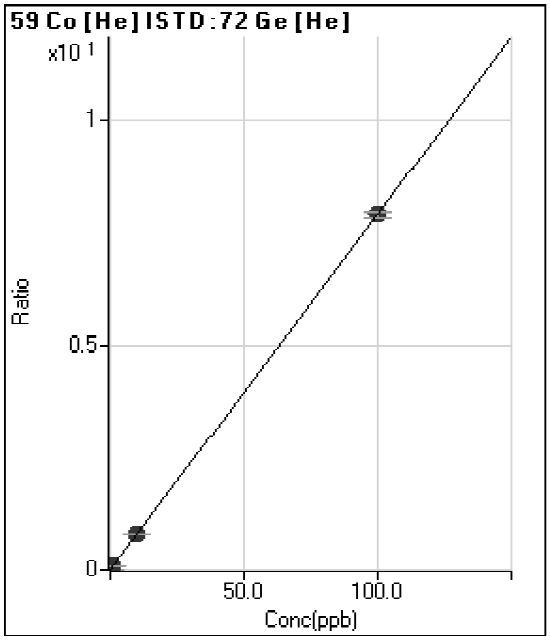
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	33.33	0.0008	P	45.7
2	☐	10.000	8.307	396.69	0.0088	P	10.9
3	☐	100.000	99.453	4397.42	0.0976	P	5.1
4	☐	1000.000	981.525	43194.24	0.9562	P	3.6
5	☐	10000.00	10001.85	413663.91	9.7373	P	1.3

y = 9.7347E-004 * x + 7.5046E-004
R = 1.0000
DL = 1.058
BEC = 0.7709

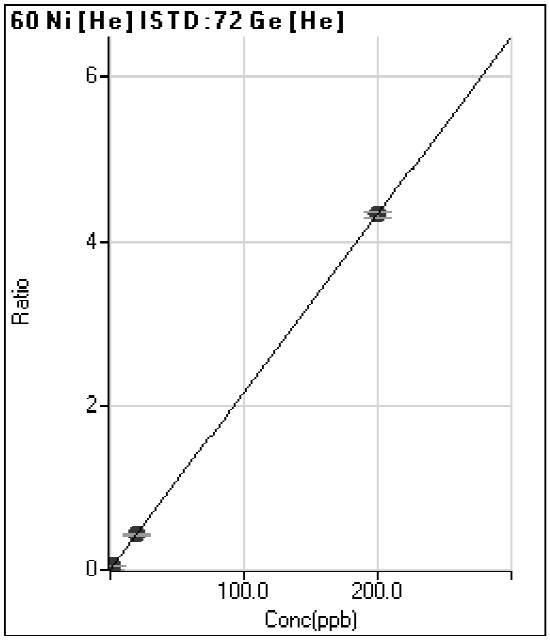
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14.44	0.0003	P	58.4
2	☐	0.100	0.108	396.68	0.0088	P	15.0
3	☐	1.000	1.054	3764.91	0.0835	P	1.7
4	☐	10.000	9.952	35507.11	0.7860	P	3.0
5	☐	100.000	100.004	335421.46	7.8956	P	1.6

y = 0.0789 * x + 3.2585E-004
R = 1.0000
DL = 0.007233
BEC = 0.004127

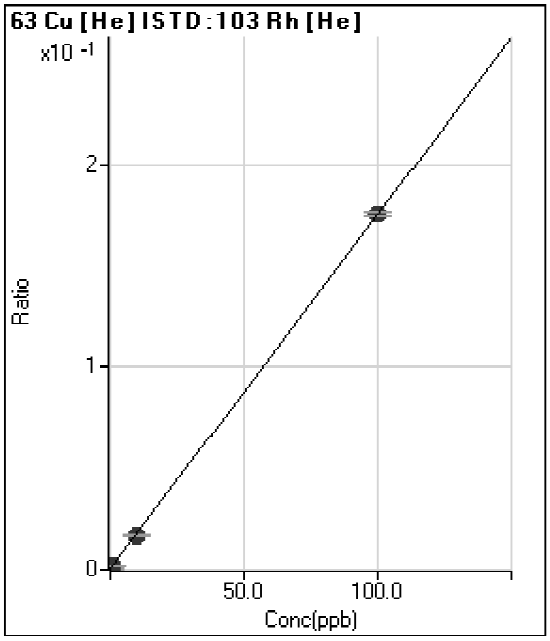
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12.22	0.0003	P	15.4
2	☐	0.200	0.197	203.34	0.0045	P	18.5
3	☐	2.000	2.109	2070.16	0.0459	P	1.9
4	☐	20.000	19.917	19481.65	0.4313	P	3.8
5	☐	200.000	200.007	183877.59	4.3283	P	1.3

y = 0.0216 * x + 2.7516E-004
R = 1.0000
DL = 0.005877
BEC = 0.01272

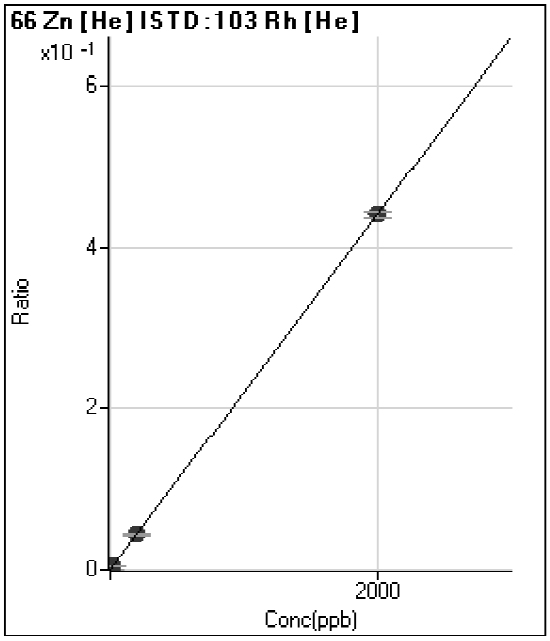
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	700.03	0.0004	P	14.2
2	☐	0.100	-0.047	571.13	0.0004	P	13.3
3	☐	1.000	0.892	3134.77	0.0020	P	4.0
4	☐	10.000	9.561	27096.77	0.0172	P	3.6
5	☐	100.000	100.045	252124.98	0.1754	P	1.0

y = 0.0017 * x + 4.4420E-004
R = 1.0000
DL = 0.1083
BEC = 0.2541

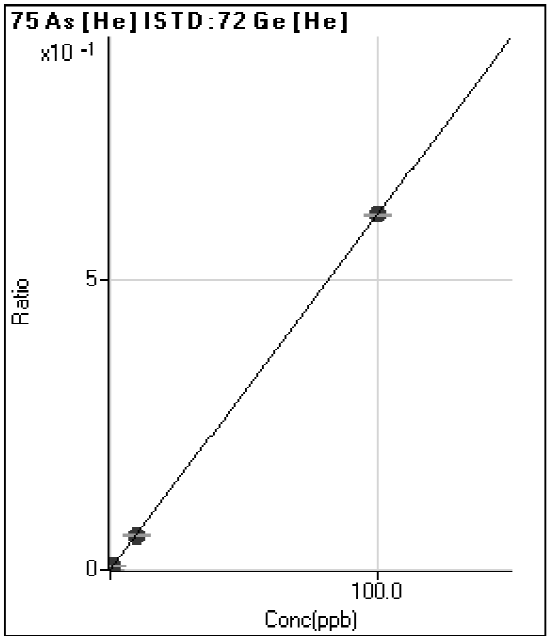
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	63.34	0.0000	P	25.6
2	☐	2.000	2.297	864.48	0.0005	P	8.4
3	☐	20.000	21.081	7326.16	0.0047	P	3.5
4	☐	200.000	197.260	68678.20	0.0435	P	2.9
5	☐	2000.000	2000.263	633506.83	0.4407	P	1.3

y = 2.2028E-004 * x + 4.0349E-005
R = 1.0000
DL = 0.1407
BEC = 0.1832

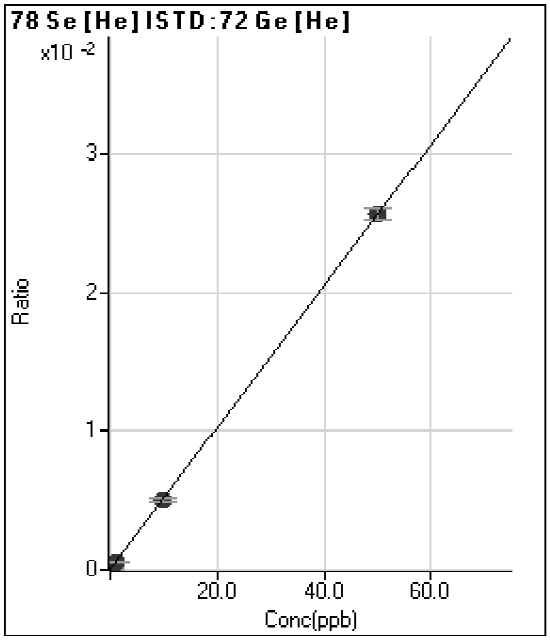
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	8.83	0.0002	P	26.4
2	☐	0.100	0.096	35.33	0.0008	P	21.8
3	☐	1.000	0.981	280.00	0.0062	P	3.0
4	☐	10.000	9.752	2708.23	0.0600	P	2.7
5	☐	100.000	100.025	26047.60	0.6131	P	0.8

y = 0.0061 * x + 1.9888E-004
R = 1.0000
DL = 0.02574
BEC = 0.03246

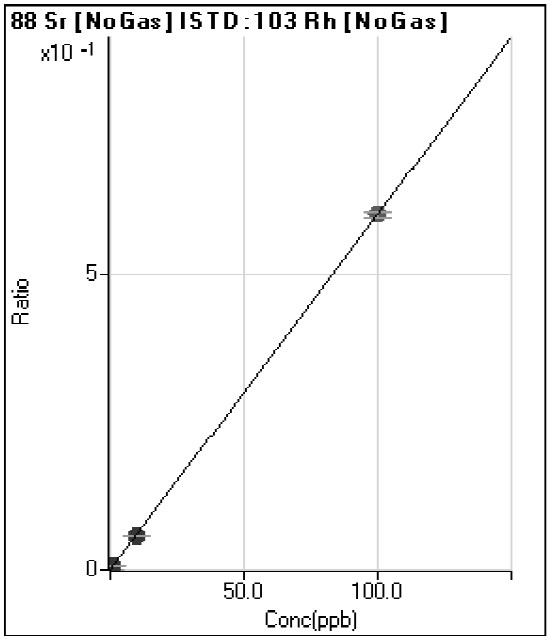
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1.58	0.0000	P	9.1
2	☐	0.100	0.093	3.74	0.0001	P	30.7
3	☐	1.000	1.078	26.50	0.0006	P	3.7
4	☐	10.000	9.786	227.91	0.0050	P	3.3
5	☐	50.000	50.041	1089.60	0.0257	P	3.3

y = 5.1187E-004 * x + 3.5665E-005
R = 1.0000
DL = 0.01899
BEC = 0.06967

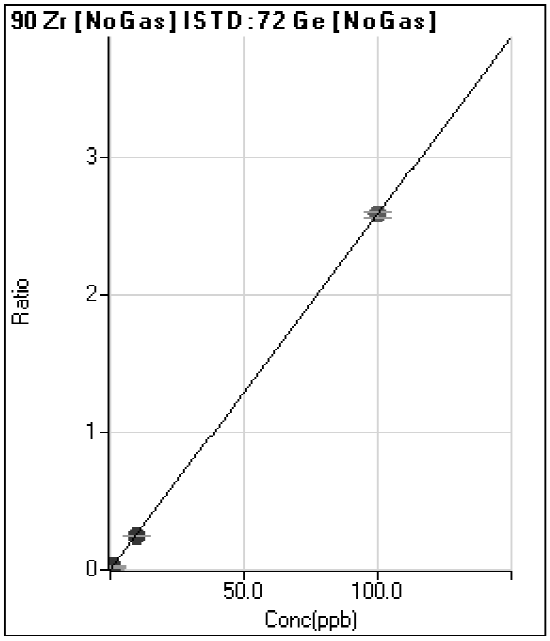
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	286.68	0.0001	P	6.7
2	☐	0.100	0.099	2466.95	0.0007	P	11.8
3	☐	1.000	0.944	20550.38	0.0058	P	4.6
4	☐	10.000	9.677	206046.02	0.0583	P	1.5
5	☐	100.000	100.033	2046116.64	0.6018	A	1.5

y = 0.0060 * x + 7.8373E-005
R = 1.0000
DL = 0.00263
BEC = 0.01303

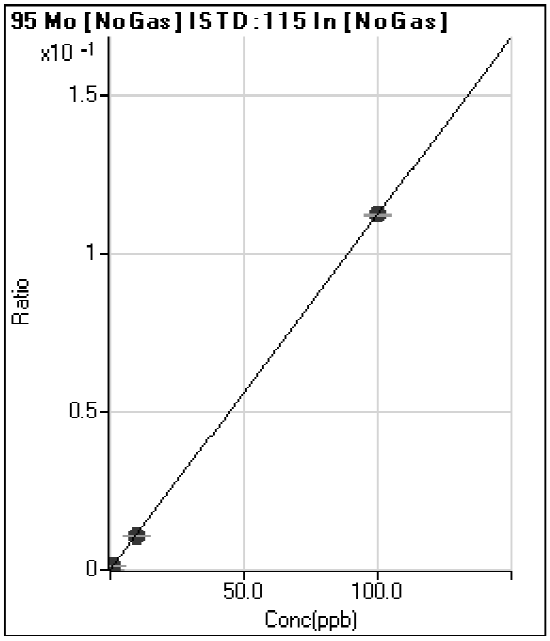
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	338.90	0.0006	P	3.6
2	☐	0.100	0.045	991.16	0.0018	P	10.7
3	☐	1.000	0.782	11369.71	0.0208	P	2.6
4	☐	10.000	9.740	138074.56	0.2522	P	0.8
5	☐	100.000	100.028	1386860.95	2.5844	A	1.3

y = 0.0258 * x + 6.1366E-004
R = 1.0000
DL = 0.002544
BEC = 0.02376

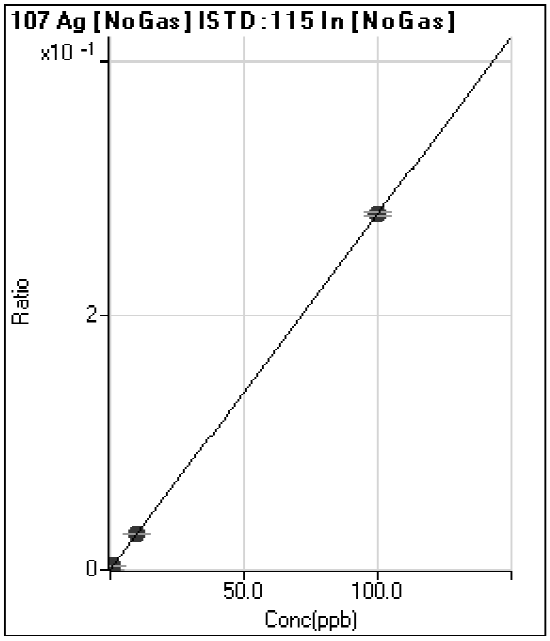
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	198.89	0.0001	P	6.8
2	☐	0.100	0.108	663.36	0.0002	P	2.8
3	☐	1.000	0.973	4218.38	0.0011	P	5.2
4	☐	10.000	9.665	40342.76	0.0109	P	1.9
5	☐	100.000	100.034	398251.87	0.1124	P	0.5

y = 0.0011 * x + 5.2024E-005
R = 1.0000
DL = 0.0095
BEC = 0.04632

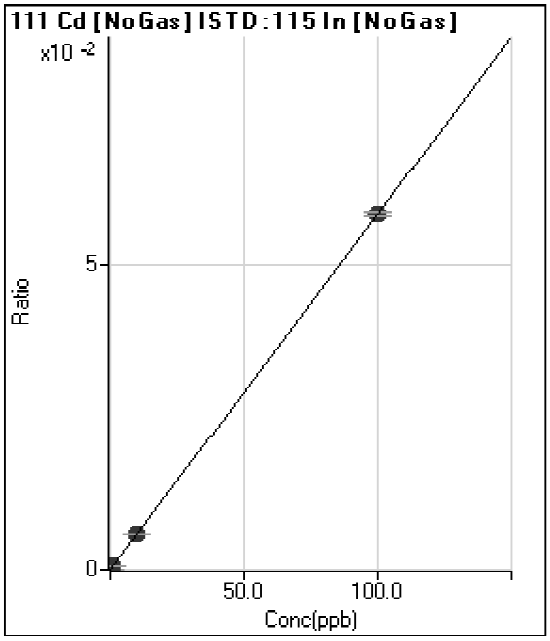
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	12.22	0.0000	P	16.8
2	☐	0.100	0.105	1130.06	0.0003	P	3.5
3	☐	1.000	1.024	10551.39	0.0029	P	3.4
4	☐	10.000	10.109	104473.96	0.0282	P	1.4
5	☐	100.000	99.989	989643.33	0.2793	P	1.2

y = 0.0028 * x + 3.2016E-006
R = 1.0000
DL = 0.0005761
BEC = 0.001146

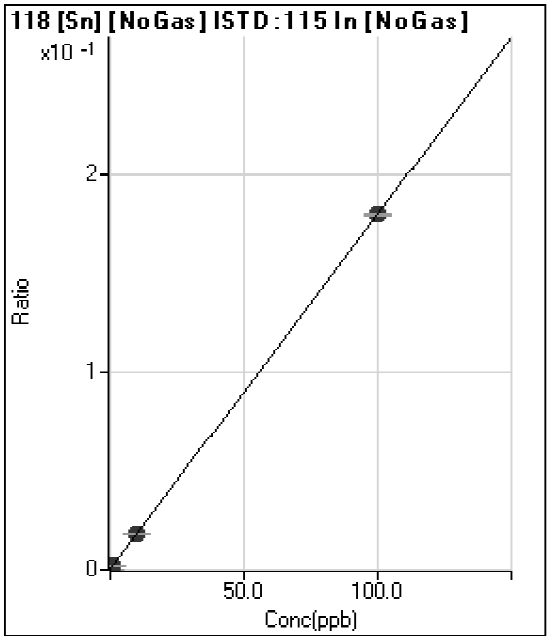
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10.00	0.0000	P	45.3
2	☐	0.100	0.098	228.33	0.0001	P	7.6
3	☐	1.000	0.997	2152.49	0.0006	P	2.9
4	☐	10.000	9.967	21511.83	0.0058	P	1.2
5	☐	100.000	100.003	206641.79	0.0583	P	1.1

y = 5.8317E-004 * x + 2.6171E-006
R = 1.0000
DL = 0.006095
BEC = 0.004488

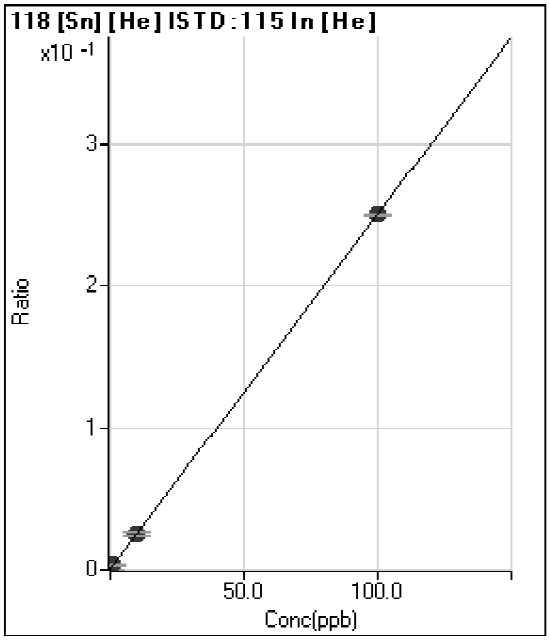
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	958.93	0.0003	P	8.2
2	☐	0.100	0.096	1620.11	0.0004	P	3.1
3	☐	1.000	0.976	7388.48	0.0020	P	2.7
4	☐	10.000	9.891	66690.01	0.0180	P	1.9
5	☐	100.000	100.011	637911.75	0.1800	P	0.6

y = 0.0018 * x + 2.5053E-004
R = 1.0000
DL = 0.03423
BEC = 0.1394

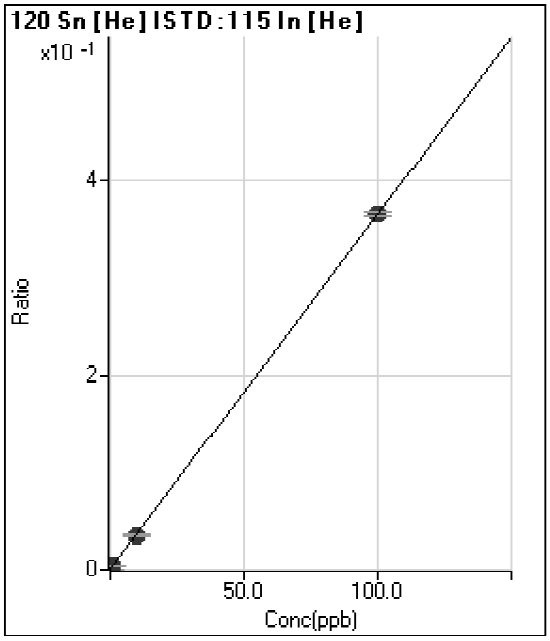
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	137.78	0.0003	P	20.3
2	☐	0.100	0.088	227.78	0.0006	P	22.5
3	☐	1.000	1.216	1374.81	0.0034	P	17.7
4	☐	10.000	9.970	10335.72	0.0252	P	6.6
5	☐	100.000	100.001	94747.00	0.2500	P	0.4

y = 0.0025 * x + 3.4086E-004
R = 1.0000
DL = 0.08328
BEC = 0.1366

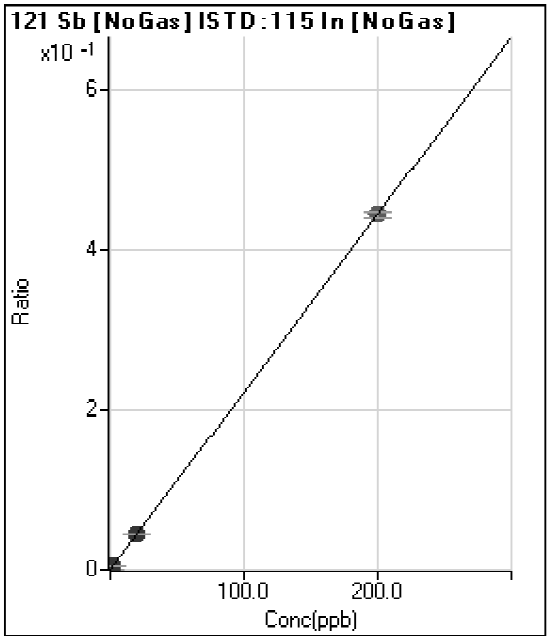
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	197.78	0.0005	P	3.1
2	☐	0.100	0.100	346.67	0.0009	P	13.8
3	☐	1.000	1.031	1726.78	0.0042	P	4.9
4	☐	10.000	9.602	14535.69	0.0354	P	2.0
5	☐	100.000	100.040	138229.77	0.3647	P	1.2

y = 0.0036 * x + 4.8939E-004
R = 1.0000
DL = 0.01252
BEC = 0.1344

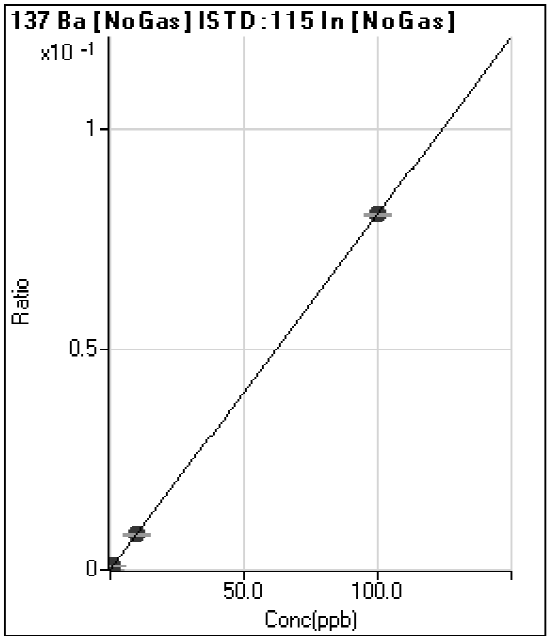
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	550.02	0.0001	P	5.0
2	☐	0.200	0.200	2245.74	0.0006	P	2.2
3	☐	2.000	2.036	17165.01	0.0047	P	0.5
4	☐	20.000	20.079	165137.43	0.0446	P	1.6
5	☐	200.000	199.992	1570967.72	0.4434	A	1.4

y = 0.0022 * x + 1.4393E-004
R = 1.0000
DL = 0.009746
BEC = 0.06494

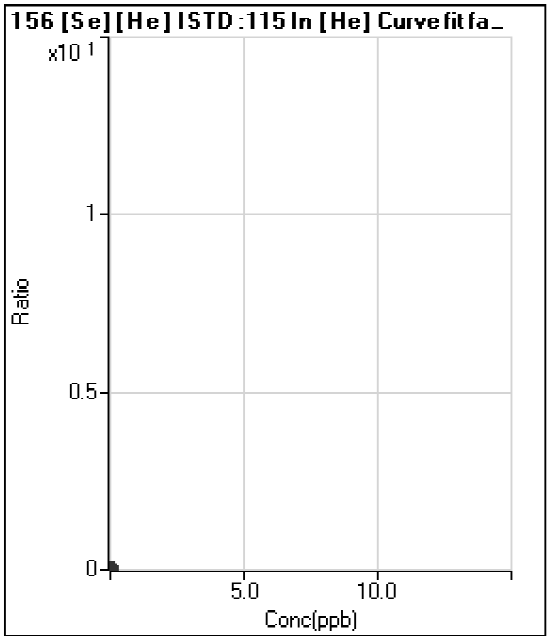
Weight: <None>
Min Conc: <None>



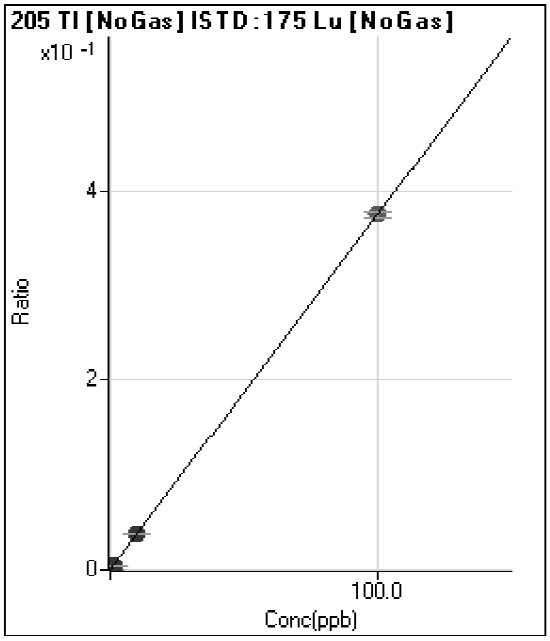
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	40.00	0.0000	P	34.1
2	☐	0.100	0.109	375.57	0.0001	P	2.8
3	☐	1.000	1.003	3021.44	0.0008	P	1.7
4	☐	10.000	9.907	29595.94	0.0080	P	3.0
5	☐	100.000	100.009	285906.82	0.0807	P	0.6

y = 8.0674E-004 * x + 1.0417E-005
R = 1.0000
DL = 0.01322
BEC = 0.01291

Weight: <None>
Min Conc: <None>



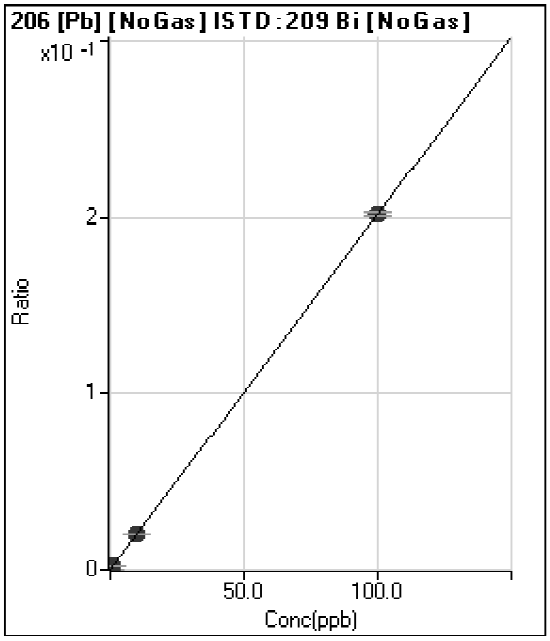
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000		0.00	0.0000	P	
2	☐			2.22	0.0000	P	86.6
3	☐			1.11	0.0000	P	173.
4	☐			2.22	0.0000	P	173.
5	☐			5.55	0.0000	P	69.8



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2034.61	0.0004	P	1.4
2	☐	0.100	0.080	3613.81	0.0007	P	2.1
3	☐	1.000	0.973	21263.12	0.0040	P	2.2
4	☐	10.000	9.899	202400.13	0.0374	P	0.8
5	☐	100.000	100.010	1977494.65	0.3747	A	1.6

y = 0.0037 * x + 3.6099E-004
R = 1.0000
DL = 0.004055
BEC = 0.09645

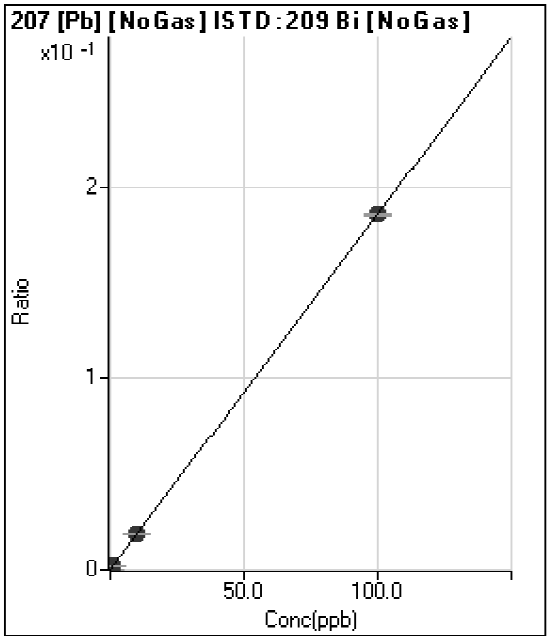
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113.34	0.0000	P	20.4
2	☐	0.100	0.106	870.05	0.0002	P	4.7
3	☐	1.000	0.996	7048.62	0.0020	P	2.2
4	☐	10.000	9.932	69145.70	0.0200	P	0.7
5	☐	100.000	100.007	650907.01	0.2015	P	1.0

y = 0.0020 * x + 3.1379E-005
R = 1.0000
DL = 0.009535
BEC = 0.01557

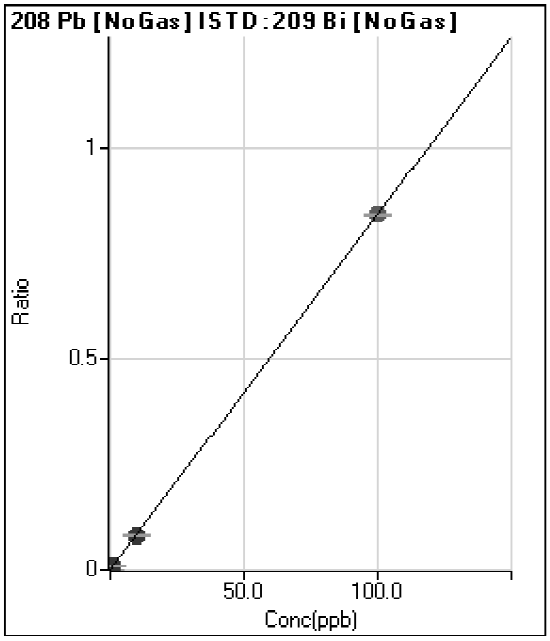
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	113.33	0.0000	P	37.5
2	☐	0.100	0.127	950.07	0.0003	P	6.9
3	☐	1.000	0.952	6218.21	0.0018	P	4.5
4	☐	10.000	9.866	63205.80	0.0183	P	0.9
5	☐	100.000	100.014	598984.11	0.1855	P	0.6

y = 0.0019 * x + 3.1606E-005
R = 1.0000
DL = 0.01918
BEC = 0.01705

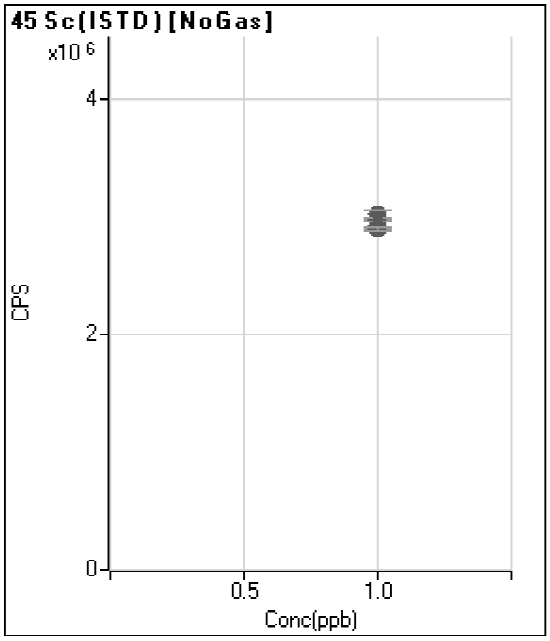
Weight: <None>
Min Conc: <None>



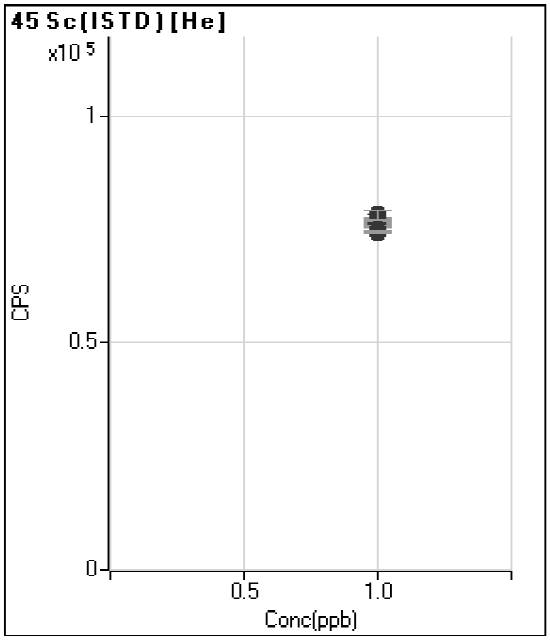
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	596.69	0.0002	P	3.8
2	☐	0.100	0.109	3847.02	0.0011	P	0.9
3	☐	1.000	0.954	28381.69	0.0082	P	2.9
4	☐	10.000	9.762	284333.92	0.0824	P	0.9
5	☐	100.000	100.024	2722887.65	0.8430	A	0.7

y = 0.0084 * x + 1.6554E-004
R = 1.0000
DL = 0.002268
BEC = 0.01964

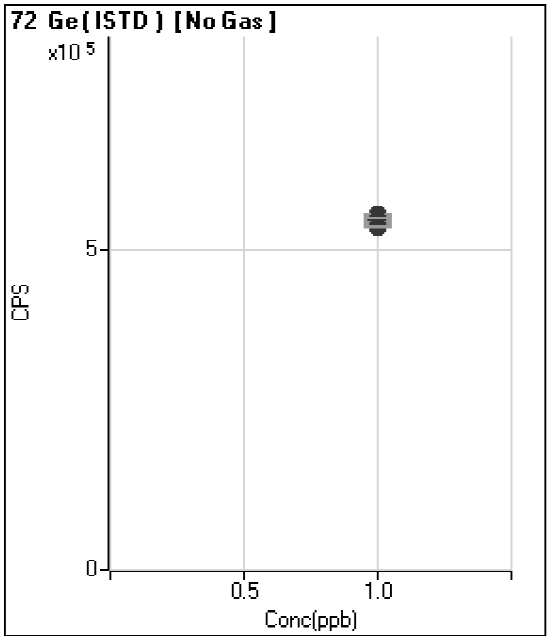
Weight: <None>
Min Conc: <None>



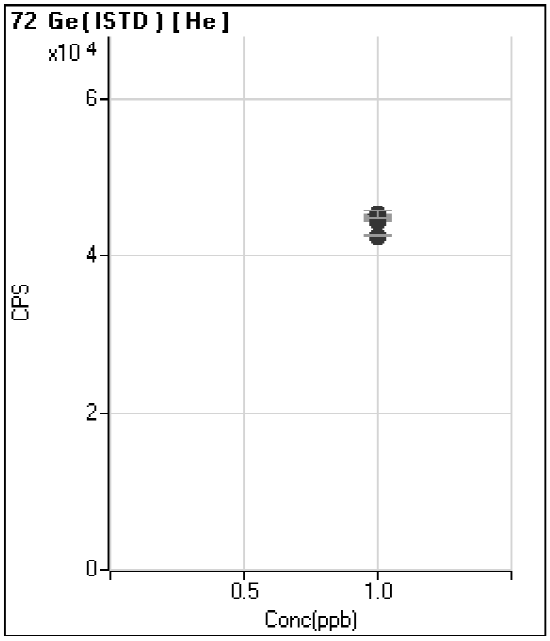
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3019672.94		A	2.6
2	☐	1.000		2975998.35		A	0.8
3	☐	1.000		2926323.91		A	2.4
4	☐	1.000		2934444.40		A	1.6
5	☐	1.000		2900925.37		A	0.8



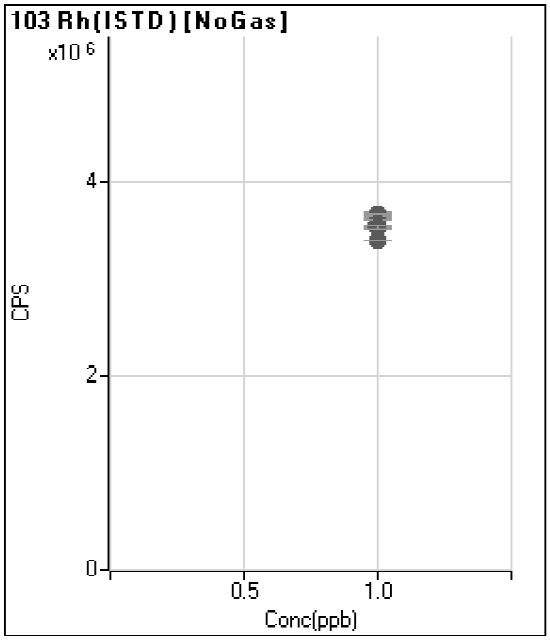
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		75790.99		P	0.9
2	☐	1.000		76347.90		P	1.3
3	☐	1.000		76882.87		P	1.0
4	☐	1.000		78128.82		P	2.4
5	☐	1.000		74288.74		P	1.0



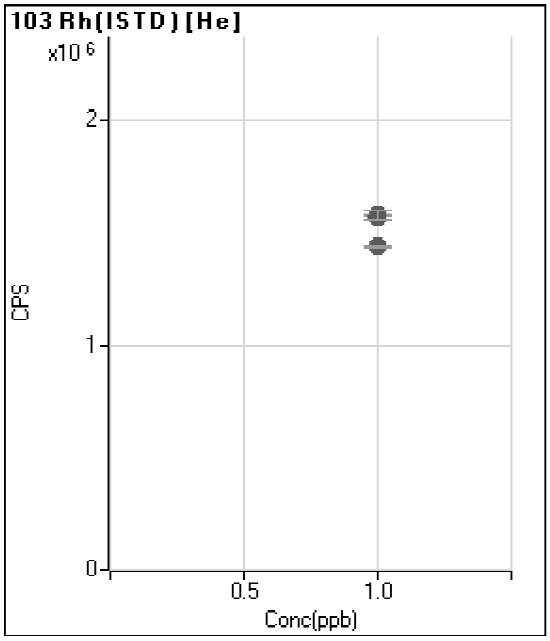
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		552452.77		P	1.5
2	☐	1.000		555824.44		P	0.3
3	☐	1.000		546320.74		P	1.6
4	☐	1.000		547483.74		P	1.4
5	☐	1.000		536652.05		P	0.7



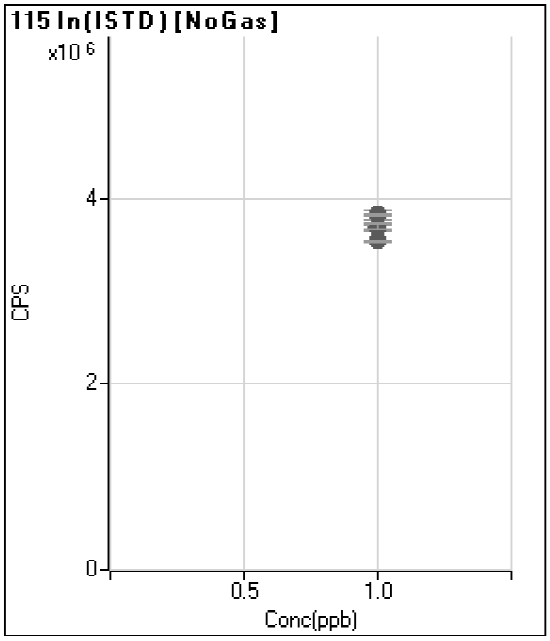
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		44394.63		P	0.4
2	☐	1.000		44900.37		P	1.1
3	☐	1.000		45082.13		P	0.7
4	☐	1.000		45191.73		P	2.1
5	☐	1.000		42485.10		P	0.8



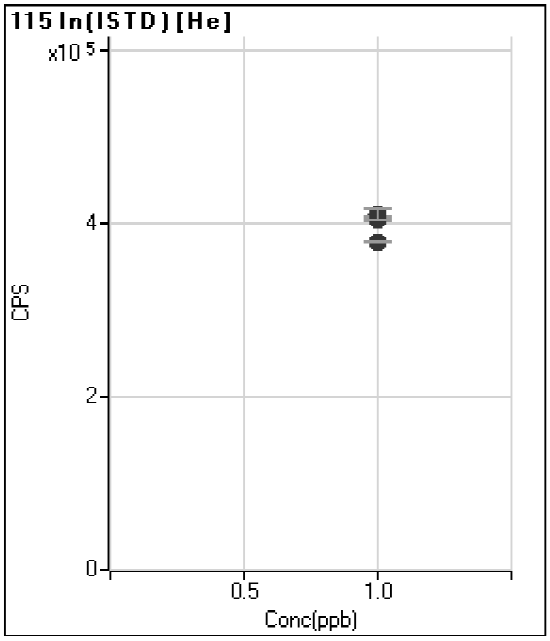
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3660203.33		A	1.6
2	☐	1.000		3657811.38		A	0.5
3	☐	1.000		3572770.13		A	2.3
4	☐	1.000		3534992.50		A	0.9
5	☐	1.000		3399936.05		A	0.2



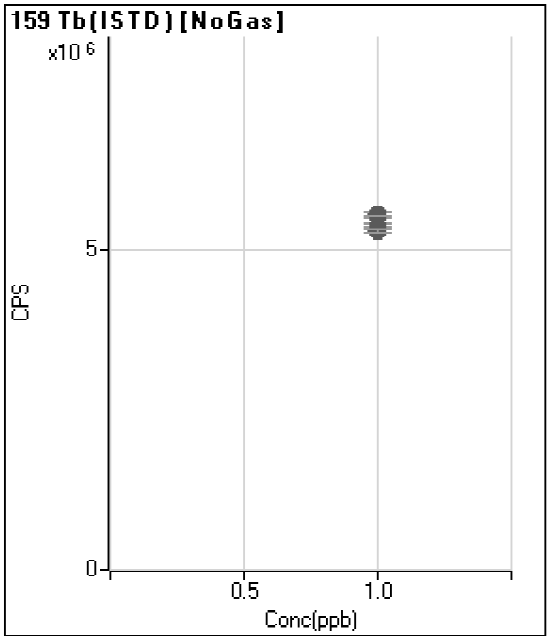
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1573916.12		A	1.8
2	☐	1.000		1581645.32		A	0.5
3	☐	1.000		1564388.34		A	1.0
4	☐	1.000		1579741.67		A	2.3
5	☐	1.000		1437746.50		A	1.0



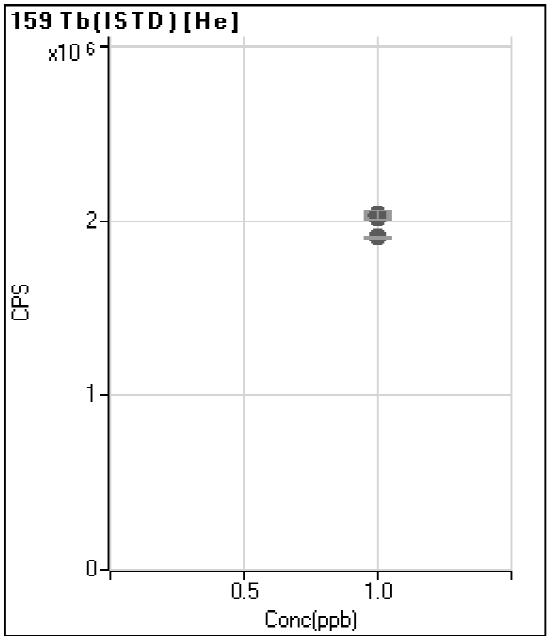
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3822230.42		A	2.8
2	☐	1.000		3828513.07		A	0.8
3	☐	1.000		3686108.80		A	1.7
4	☐	1.000		3699585.76		A	1.9
5	☐	1.000		3543248.72		A	0.5



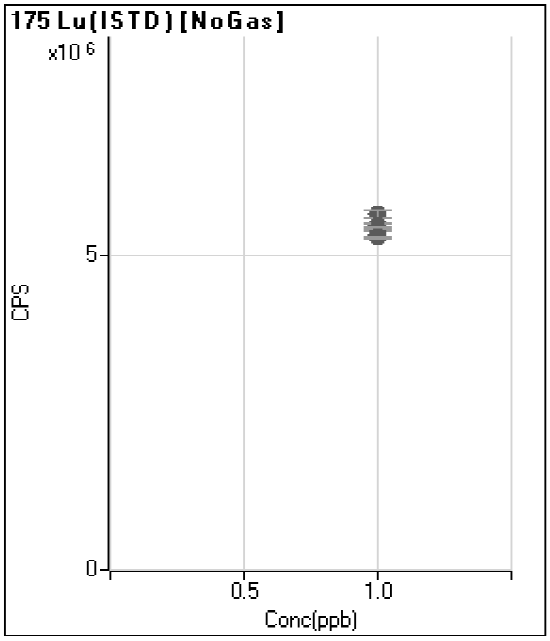
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		404099.32		P	0.4
2	☐	1.000		406013.60		P	0.5
3	☐	1.000		407080.14		P	0.4
4	☐	1.000		410257.78		P	3.1
5	☐	1.000		379045.31		P	0.4



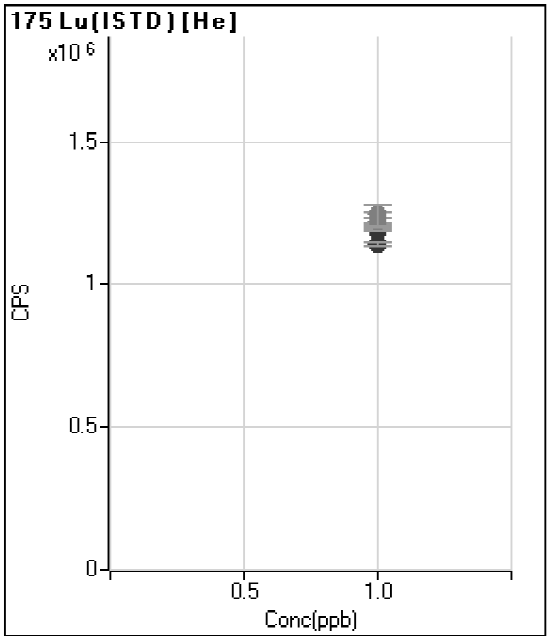
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5550323.25		A	1.9
2	☐	1.000		5533553.25		A	0.3
3	☐	1.000		5362943.88		A	1.8
4	☐	1.000		5349789.50		A	0.5
5	☐	1.000		5289538.46		A	1.0



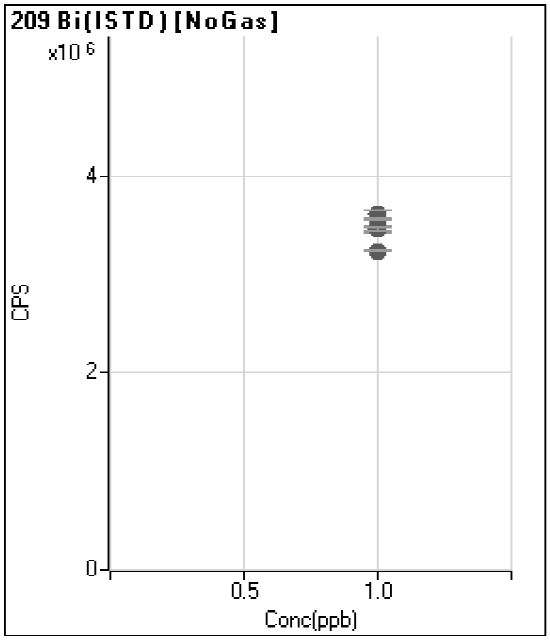
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2036132.52		A	0.1
2	☐	1.000		2038302.16		A	0.9
3	☐	1.000		2021511.01		A	0.5
4	☐	1.000		2034919.60		A	2.8
5	☐	1.000		1910311.53		A	0.5



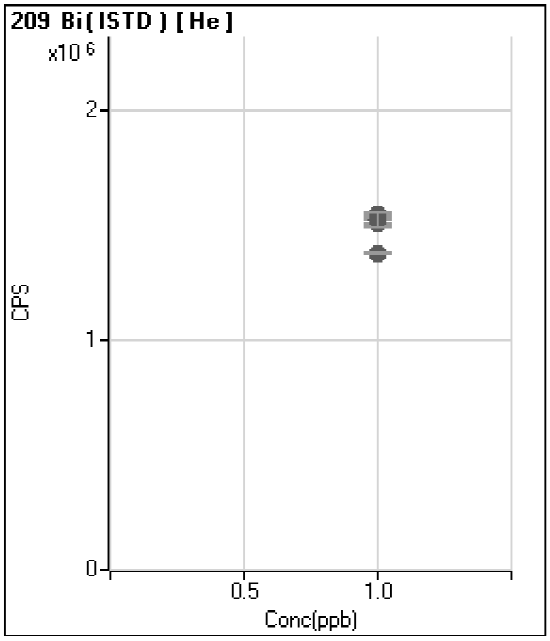
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5635183.67		A	2.1
2	☐	1.000		5467330.54		A	1.3
3	☐	1.000		5311394.19		A	2.1
4	☐	1.000		5410173.46		A	0.7
5	☐	1.000		5277796.80		A	0.4



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1190023.24		P	0.5
2	☐	1.000		1234377.38		M	2.8
3	☐	1.000		1218433.24		M	2.8
4	☐	1.000		1244946.88		M	5.9
5	☐	1.000		1141518.53		P	0.9



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3602753.49		A	2.4
2	☐	1.000		3558021.51		A	0.5
3	☐	1.000		3460002.14		A	1.9
4	☐	1.000		3449715.16		A	1.1
5	☐	1.000		3229902.76		A	0.6



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1548427.37		A	0.3
2	☐	1.000		1532127.94		A	0.2
3	☐	1.000		1506771.44		A	0.5
4	☐	1.000		1527251.75		A	4.6
5	☐	1.000		1379748.16		A	0.6

GCAL ANALYTICAL LABORATORIES, LLC

BATCH COVERSHEET

ANALYST AWG

DATE 08/23/18

ICP/MS Metals Analysis

HBN **642536**

STANDARDS

ICAL Standard	316-66-8
ICV Standard	316-66-4
ICSA Standard	316-66-9
ICSAB Standard	316-66-3
Internal Standard	316-66-12
Tune	316-63-4
P/A	316-56-9

ADDITIONAL STANDARDS

LDR Standard	316-66-10
	ICVB 316-66-13

ACID MATRIX

2% HNO3 \ 0.5% HCL Solution	317-48-20
5% HNO3 \ 2% HCL Solution	317-49-3

ICPMS DATA FILE

Reference File	2180823A_MS1

GCAL QC LIMITS

200.8 Correlation Coefficient (R) =0.998

6020B Correlation Coefficient (R) =0.995

ICV Recovery 90-110%

LLCCV Recovery 80-120%

ICSA \ ICSAB Recovery 80-120%

CCV Recovery 90-110%

Sample						
Data File	Acq. Date-Time	Type	Sample Name	Total Dil.	Vial Number	Comment
012CALB.d	8/23/2018 10:14	CalBlk	1300	1	1107	
013CALS.d	8/23/2018 10:18	CalStd	1302	1	1105	
014CALS.d	8/23/2018 10:23	CalStd	1304	1	1103	
015CALS.d	8/23/2018 10:27	CalStd	1305	1	1102	
016CALS.d	8/23/2018 10:32	CalStd	1306	1	1101	
017_ICV.d	8/23/2018 10:36	ICV	1600	1	1201	
018_ICB.d	8/23/2018 10:41	ICB	1700	1	1107	
019CCV1.d	8/23/2018 10:45	LLCCV1	1803	1	1103	
020ICSA.d	8/23/2018 10:49	ICSA	2000	1	1205	
021ICSB.d	8/23/2018 10:54	ICSB	2100	1	1206	
022_QC1.d	8/23/2018 10:58	QC1	LDR	1	1204	
023SMPL.d	8/23/2018 11:03	Sample	2500	1	5	
024SMPL.d	8/23/2018 11:07	Sample	21808211415	800	2101	
025SMPL.d	8/23/2018 11:12	Sample	21808211416	769.2308	2102	
026SMPL.d	8/23/2018 11:16	Sample	21808211417	800	2103	
027SMPL.d	8/23/2018 11:21	Sample	21808211418	800	2104	
028SMPL.d	8/23/2018 11:25	Sample	21808211419	781.25	2105	
029SMPL.d	8/23/2018 11:29	Sample	1841866	40	3101	
030SMPL.d	8/23/2018 11:34	Sample	1841867	40	3102	
031SMPL.d	8/23/2018 11:38	Sample	21808210501	378.7879	3111	
032SMPL.d	8/23/2018 11:43	Sample	1842085	40	3112	
033SMPL.d	8/23/2018 11:47	Sample	1842086	40	3201	
034SMPL.d	8/23/2018 11:51	Sample	21808221701	316.4557	3202	
035SMPL.d	8/23/2018 11:56	Sample	21808221702	335.5705	3203	
036_CCV.d	8/23/2018 12:00	CCV	1800	1	1102	
037_CCB.d	8/23/2018 12:05	CCB	1900	1	1107	
038SMPL.d	8/23/2018 12:09	Sample	21808181302	400	3103	
039SMPL.d	8/23/2018 12:14	Sample	1842047	400	3104	
040SMPL.d	8/23/2018 12:18	Sample	1842048	400	3105	
041SMPL.d	8/23/2018 12:22	Sample	1842322	400	3106	
042SMPL.d	8/23/2018 12:27	Sample	1842323	2000	3107	
043SMPL.d	8/23/2018 12:31	Sample	21808181304	375.9398	3108	
044SMPL.d	8/23/2018 12:35	Sample	21808181305	370.3704	3109	
045SMPL.d	8/23/2018 12:40	Sample	21808181306	378.7879	3110	
046SMPL.d	8/23/2018 12:44	Sample	21808222001	763.3588	3204	
047SMPL.d	8/23/2018 12:49	Sample	21808222002	781.25	3205	
048SMPL.d	8/23/2018 12:53	Sample	21808222003	729.927	3206	
049SMPL.d	8/23/2018 12:57	Sample	21808222004	740.7407	3207	
050SMPL.d	8/23/2018 13:02	Sample	21808222005	757.5758	3208	
051SMPL.d	8/23/2018 13:06	Sample	21808222006	800	3209	
052SMPL.d	8/23/2018 13:11	Sample	1842087	800	3210	
053SMPL.d	8/23/2018 13:15	Sample	1842088	800	3211	
054SMPL.d	8/23/2018 13:19	Sample	1842327	800	3212	
055SMPL.d	8/23/2018 13:24	Sample	1842328	4000	3301	
056_CCV.d	8/23/2018 13:28	CCV	1800	1	1102	

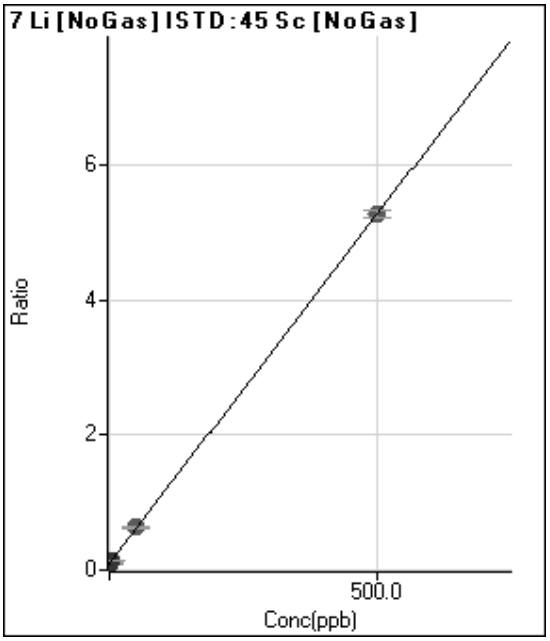
057_CCB.d	8/23/2018 13:32	CCB	1900	1	1107	
058SMPL.d	8/23/2018 13:37	Sample	21808222007	595.2381	3302	
059SMPL.d	8/23/2018 13:41	Sample	21808222008	588.2353	3303	
060SMPL.d	8/23/2018 13:46	Sample	21808222009	775.1938	3304	
061SMPL.d	8/23/2018 13:50	Sample	21808222010	775.1938	3305	
062SMPL.d	8/23/2018 13:54	Sample	21808222011	621.118	3306	
063SMPL.d	8/23/2018 13:59	Sample	21808222012	751.8797	3307	
064SMPL.d	8/23/2018 14:03	Sample	21808222013	800	3308	
065SMPL.d	8/23/2018 14:07	Sample	21808222028	800	3309	
066SMPL.d	8/23/2018 14:12	Sample	21808222029	800	3310	
067SMPL.d	8/23/2018 14:16	Sample	21808222030	787.4016	3311	
068_CCV.d	8/23/2018 14:21	CCV	1800	1	1102	
069_CCB.d	8/23/2018 14:25	CCB	1900	1	1107	
070SMPL.d	8/23/2018 15:04	Sample	1842305	1	4101	
071SMPL.d	8/23/2018 15:09	Sample	1842306	1	4102	
072SMPL.d	8/23/2018 15:13	Sample	21808171401	100	4103	
073SMPL.d	8/23/2018 15:18	Sample	21808171402	100	4104	
074SMPL.d	8/23/2018 15:22	Sample	21808171403	100	4105	
075SMPL.d	8/23/2018 15:26	Sample	21808180701	100	4106	
076SMPL.d	8/23/2018 15:31	Sample	21808172601	100	4107	
077SMPL.d	8/23/2018 15:35	Sample	21808172602	100	4108	
078SMPL.d	8/23/2018 15:39	Sample	21808172603	100	4109	
079SMPL.d	8/23/2018 15:44	Sample	21808172604	100	4110	
080SMPL.d	8/23/2018 15:48	Sample	21808172701	100	4111	
081SMPL.d	8/23/2018 15:53	Sample	1842307	100	4112	
082SMPL.d	8/23/2018 15:57	Sample	1842308	100	4201	
083SMPL.d	8/23/2018 16:01	Sample	1842546	100	4202	
084SMPL.d	8/23/2018 16:06	Sample	1842547	500	4203	
085_CCV.d	8/23/2018 16:10	CCV	1800	1	1102	
086_CCB.d	8/23/2018 16:14	CCB	1900	1	1107	
087SMPL.d	8/23/2018 16:19	Sample	21808173001	100	4204	
088SMPL.d	8/23/2018 16:23	Sample	21808216501	100	4205	
089SMPL.d	8/23/2018 16:28	Sample	21808216601	100	4206	
090SMPL.d	8/23/2018 16:32	Sample	21808201901	100	4207	
091SMPL.d	8/23/2018 16:36	Sample	21808215601	100	4208	
092SMPL.d	8/23/2018 16:41	Sample	1842309	100	4209	
093SMPL.d	8/23/2018 16:45	Sample	21808215602	100	4210	
094SMPL.d	8/23/2018 16:50	Sample	tblk1	100	4211	
095SMPL.d	8/23/2018 16:54	Sample	tblk2	100	4212	
096_CCV.d	8/23/2018 16:58	CCV	1800	1	1102	
097_CCB.d	8/23/2018 17:03	CCB	1900	1	1107	

Tune Mode	Mass	Name	ISTD	R	a	b (blank)	DL	BEC	Units
No Gas	7	Li	45 Sc [No Gas]	0.999995052	0.010366129	0.095463326	0.266101035	9.209158527	ppb
No Gas	9	Be	45 Sc [No Gas]	0.999999545	0.002003962	2.97E-05	0.007631001	0.014812316	ppb
No Gas	11	B	45 Sc [No Gas]	0.999991752	0.001202899	0.004584457	0.088208395	3.811174334	ppb
He	23	Na	45 Sc [He]	0.999999943	0.005865323	0.045965043	1.783256517	7.83674479	ppb
He	24	Mg	45 Sc [He]	0.999999295	0.002880187	0.00184177	0.526261275	0.639462036	ppb
He	27	Al	45 Sc [He]	0.999999091	0.000838533	0.000952803	0.828592129	1.136274442	ppb
He	29	Si	45 Sc [He]	0.999987102	2.06E-05	0.011918037	39.95491061	578.7784102	ppb
He	39	K	45 Sc [He]	0.99999892	0.001277349	0.03804191	4.290900235	29.78191731	ppb
He	44	Ca	45 Sc [He]	0.999998941	7.26E-05	0.001520297	21.57029247	20.92709615	ppb
He	47	Ti	45 Sc [He]	0.999998717	0.000571974	6.45E-05	0.246274157	0.112766651	ppb
He	51	V	72 Ge [He]	0.999995133	0.036056953	0.001289667	0.016814302	0.035767498	ppb
He	52	Cr	72 Ge [He]	0.99999941	0.046537576	0.001957414	0.022285771	0.042060943	ppb
He	55	Mn	72 Ge [He]	0.99999947	0.021375965	0.001241903	0.025080246	0.058098085	ppb
He	57	Fe	72 Ge [He]	0.999999713	0.000904971	0.001150088	2.211478555	1.270855677	ppb
He	59	Co	72 Ge [He]	0.999999011	0.07645038	0.000927837	0.020088853	0.01213646	ppb
He	60	Ni	72 Ge [He]	0.999999605	0.02067249	0.000979348	0.03711695	0.047374447	ppb
He	63	Cu	72 Ge [He]	0.999993909	0.056702142	0.012074642	0.008083917	0.212948611	ppb
He	66	Zn	103 Rh [He]	0.999997047	0.000220065	0.000156618	0.350091088	0.711688246	ppb
He	75	As	72 Ge [He]	0.999999419	0.005685066	0.000232256	0.027831359	0.040853692	ppb
He	78	Se	72 Ge [He]	0.999930096	0.000437761	6.43E-05	0.092538949	0.146784277	ppb
No Gas	88	Sr	72 Ge [No Gas]	0.999999702	0.036258423	0.000787452	0.002136774	0.02171776	ppb
No Gas	90	Zr	72 Ge [No Gas]	0.99999721	0.024523818	0.000830151	0.011755202	0.033850803	ppb
No Gas	95	Mo	115 In [No Gas]	0.999997016	0.001093109	3.96E-05	0.001279741	0.036210056	ppb
No Gas	107	Ag	115 In [No Gas]	0.999998959	0.002693827	2.16E-05	0.002141115	0.008035159	ppb
No Gas	111	Cd	115 In [No Gas]	0.999998749	0.000559566	8.08E-06	0.015884476	0.01443984	ppb
No Gas	118	[Sn]	115 In [No Gas]	0.999999782	0.001724442	0.000390418	0.028562881	0.226402449	ppb
He	118	[Sn]	115 In [He]	0.999998922	0.002466612	0.000612258	0.131113611	0.248218331	ppb
He	120	Sn	115 In [He]	0.999999546	0.003577771	0.00070918	0.020835105	0.19821835	ppb
No Gas	121	Sb	115 In [No Gas]	0.999998923	0.002266607	0.000208654	0.010726307	0.092055631	ppb
No Gas	137	Ba	115 In [No Gas]	0.999999924	0.000797486	2.55E-05	0.011808259	0.031914397	ppb
He	156	[Se]	115 In [He]						ppb
No Gas	205	Tl	175 Lu [No Gas]	0.999998889	0.003658003	0.000228849	0.009465537	0.062561277	ppb
No Gas	206	[Pb]	209 Bi [No Gas]	0.999995483	0.00198013	6.12E-05	0.013363196	0.030888233	ppb
No Gas	207	[Pb]	209 Bi [No Gas]	0.999996808	0.001803901	6.18E-05	0.008953659	0.034262182	ppb
No Gas	208	Pb	209 Bi [No Gas]	0.99999206	0.008209822	0.000230047	0.003445361	0.028020971	ppb
No Gas	45	Sc							ppb
He	45	Sc							ppb
No Gas	72	Ge							ppb
He	72	Ge							ppb
No Gas	103	Rh							ppb
He	103	Rh							ppb
No Gas	115	In							ppb
He	115	In							ppb
No Gas	159	Tb							ppb
He	159	Tb							ppb
No Gas	175	Lu							ppb
He	175	Lu							ppb
No Gas	209	Bi							ppb
He	209	Bi							ppb

Calibration for 095SMPL.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\2180823A_MS1.b\
Analysis File: 2180823A_MS1.batch.bin
DA Date-Time: 2018-08-24 08:28:57
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

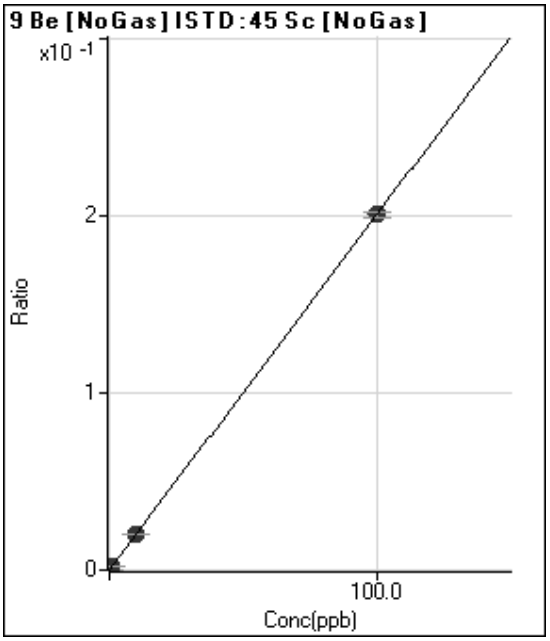
Level	Standard Data File	Sample Name	Acq. Date-Time
1	012CALB.d	1300	2018-08-23 10:14:12
2	013CALS.d	1302	2018-08-23 10:18:35
3	014CALS.d	1304	2018-08-23 10:23:10
4	015CALS.d	1305	2018-08-23 10:27:42
5	016CALS.d	1306	2018-08-23 10:32:13



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	291381.84	0.0955	P	1.0
2	☐	0.500	0.511	310998.88	0.1008	P	0.7
3	☐	5.000	5.044	453284.60	0.1478	P	1.7
4	☐	50.000	51.555	1935936.48	0.6299	A	2.4
5	☐	500.000	499.844	15992015.1	5.2769	A	2.0

y = 0.0104 * x + 0.0955
R = 1.0000
DL = 0.2661
BEC = 9.209

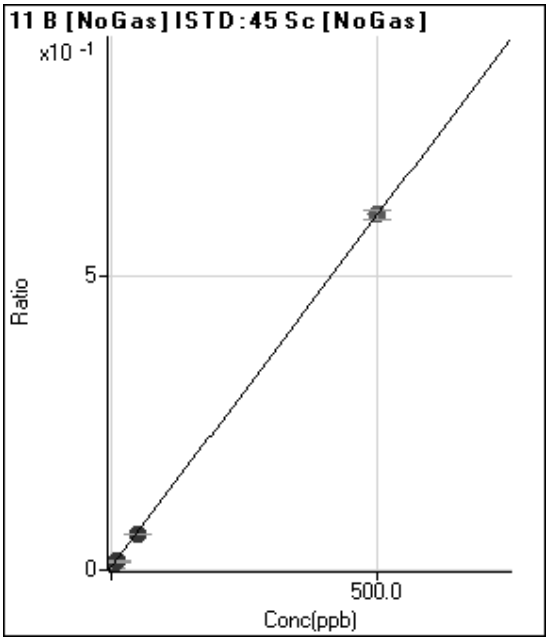
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	90.67	0.0000	P	17.2
2	☐	0.100	0.096	686.02	0.0002	P	2.3
3	☐	1.000	1.012	6317.20	0.0021	P	3.0
4	☐	10.000	10.095	62269.92	0.0203	P	2.1
5	☐	100.000	99.990	607355.25	0.2004	P	1.8

y = 0.0020 * x + 2.9683E-005
R = 1.0000
DL = 0.007631
BEC = 0.01481

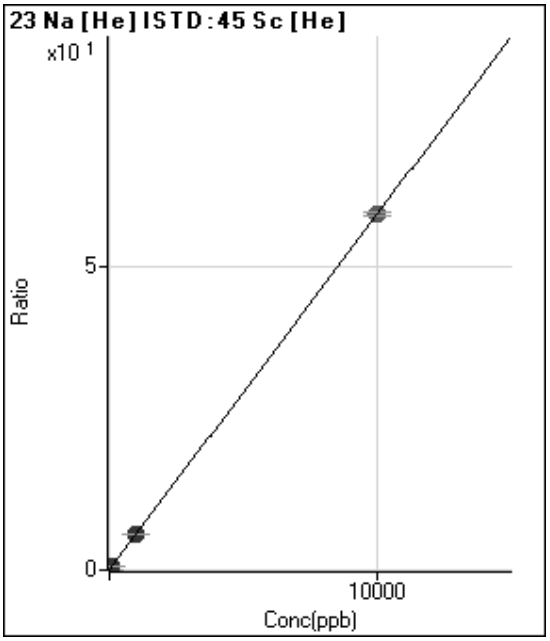
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13992.90	0.0046	P	0.8
2	☐	1.000	-0.189	13435.79	0.0044	P	6.6
3	☐	10.000	8.253	44505.76	0.0145	P	3.5
4	☐	50.000	47.747	190624.91	0.0620	P	2.0
5	☐	500.000	500.263	1837557.84	0.6063	A	2.6

y = 0.0012 * x + 0.0046
R = 1.0000
DL = 0.08821
BEC = 3.811

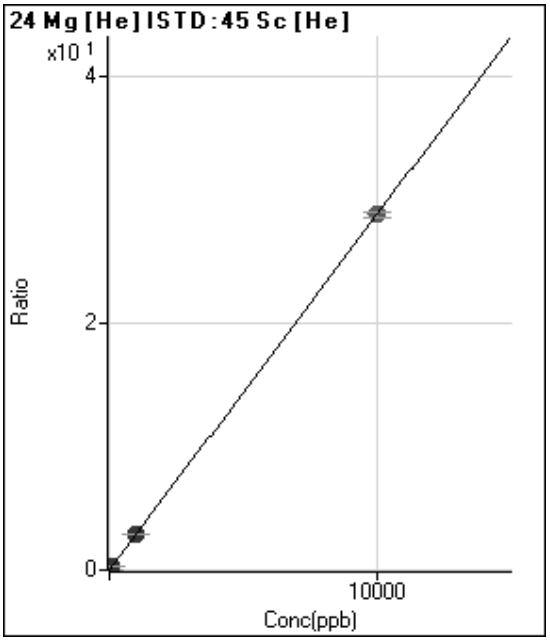
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3570.50	0.0460	P	7.6
2	☐	10.000	10.671	8449.05	0.1086	P	3.1
3	☐	100.000	103.223	50315.61	0.6514	P	2.7
4	☐	1000.000	999.274	458587.68	5.9070	P	1.8
5	☐	10000.00	10000.04	4418074.73	58.699	A	1.1

y = 0.0059 * x + 0.0460
R = 1.0000
DL = 1.783
BEC = 7.837

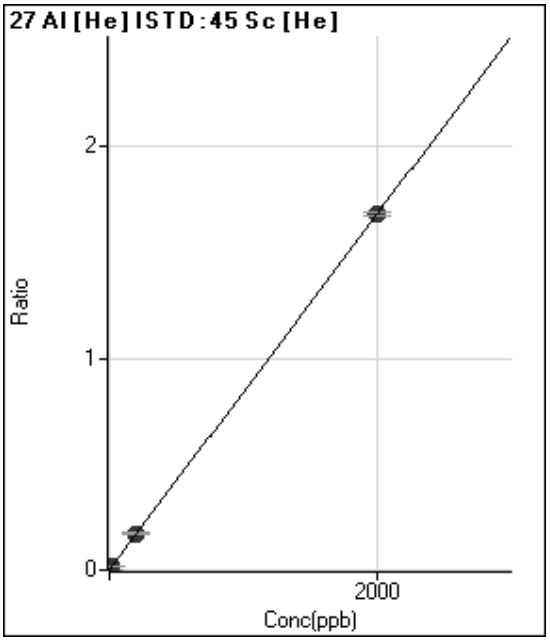
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0018	P	27.4
2	☐	10.000	8.939	2146.89	0.0276	P	8.4
3	☐	100.000	103.946	23266.78	0.3012	P	2.5
4	☐	1000.000	989.997	221511.48	2.8532	P	1.6
5	☐	10000.00	10000.96	2168144.50	28.806	A	1.3

y = 0.0029 * x + 0.0018
R = 1.0000
DL = 0.5263
BEC = 0.6395

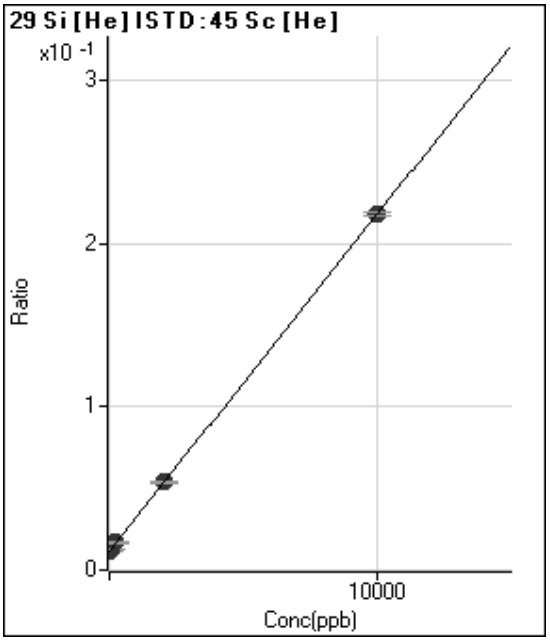
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	74.00	0.0010	P	24.3
2	☐	2.000	2.122	212.67	0.0027	P	13.7
3	☐	20.000	20.288	1388.07	0.0180	P	1.8
4	☐	200.000	202.751	13271.92	0.1710	P	3.3
5	☐	2000.000	1999.722	126280.50	1.6778	P	1.0

y = 8.3853E-004 * x + 9.5280E-004
R = 1.0000
DL = 0.8286
BEC = 1.136

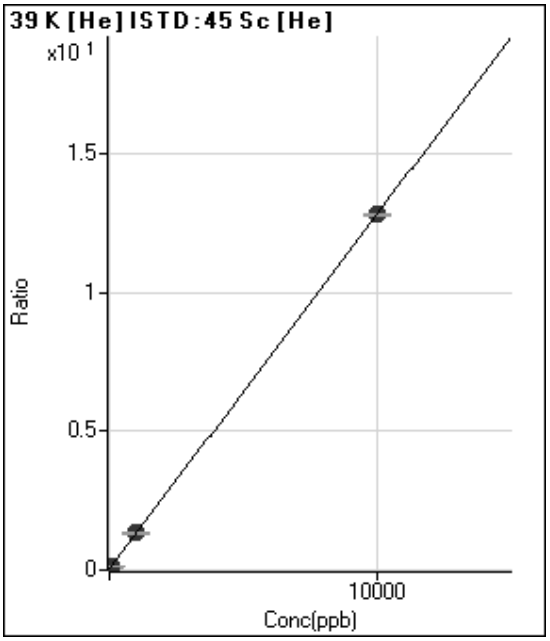
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	926.03	0.0119	P	2.3
2	☐	20.000	22.784	964.04	0.0124	P	2.9
3	☐	200.000	236.736	1297.39	0.0168	P	6.7
4	☐	2000.000	2044.927	4195.88	0.0540	P	2.2
5	☐	10000.00	9990.274	16380.65	0.2176	P	1.2

y = 2.0592E-005 * x + 0.0119
R = 1.0000
DL = 39.95
BEC = 578.8

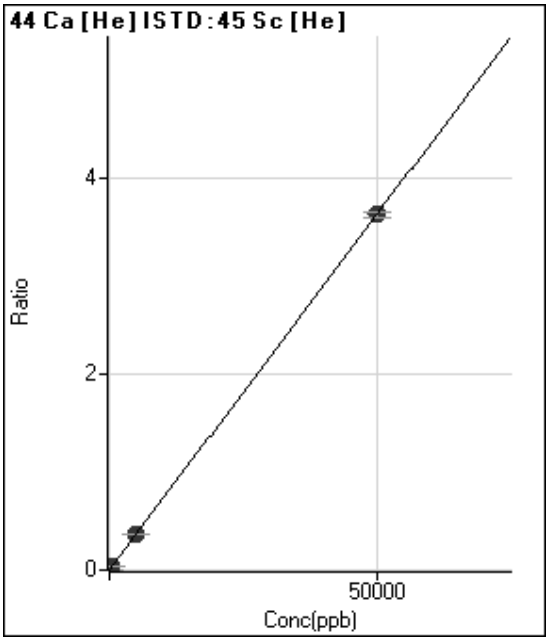
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2957.05	0.0380	P	4.8
2	☐	10.000	12.306	4184.02	0.0538	P	5.5
3	☐	100.000	98.867	12695.26	0.1643	P	1.5
4	☐	1000.000	1014.472	103550.65	1.3339	P	2.2
5	☐	10000.00	9998.562	964159.54	12.809	P	0.4

y = 0.0013 * x + 0.0380
R = 1.0000
DL = 4.291
BEC = 29.78

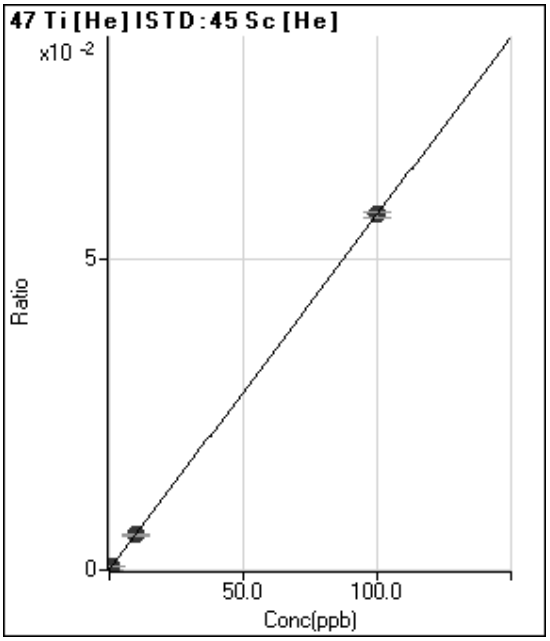
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	118.33	0.0015	P	34.4
2	☐	50.000	48.640	393.34	0.0051	P	5.6
3	☐	500.000	503.844	2943.65	0.0381	P	5.3
4	☐	5000.000	5071.830	28724.94	0.3700	P	0.9
5	☐	50000.00	49992.78	273469.51	3.6334	P	1.4

y = 7.2647E-005 * x + 0.0015
R = 1.0000
DL = 21.57
BEC = 20.93

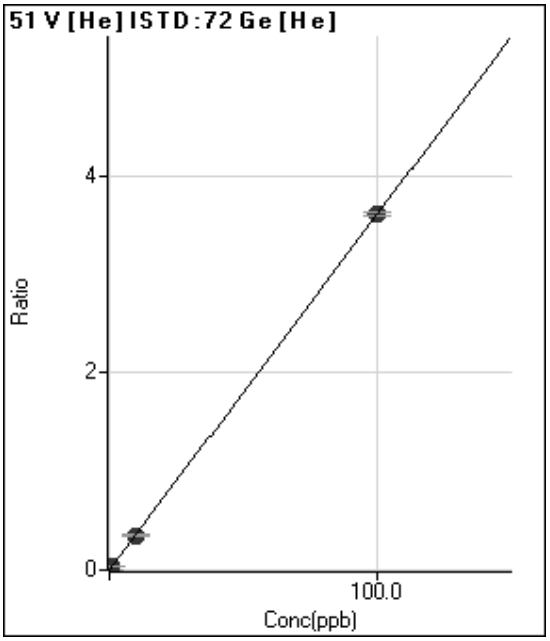
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5.00	0.0001	P	72.8
2	☐	0.100	0.059	7.67	0.0001	P	41.9
3	☐	1.000	0.905	45.00	0.0006	P	16.5
4	☐	10.000	9.822	441.34	0.0057	P	2.4
5	☐	100.000	100.019	4310.90	0.0573	P	1.5

y = 5.7197E-004 * x + 6.4500E-005
R = 1.0000
DL = 0.2463
BEC = 0.1128

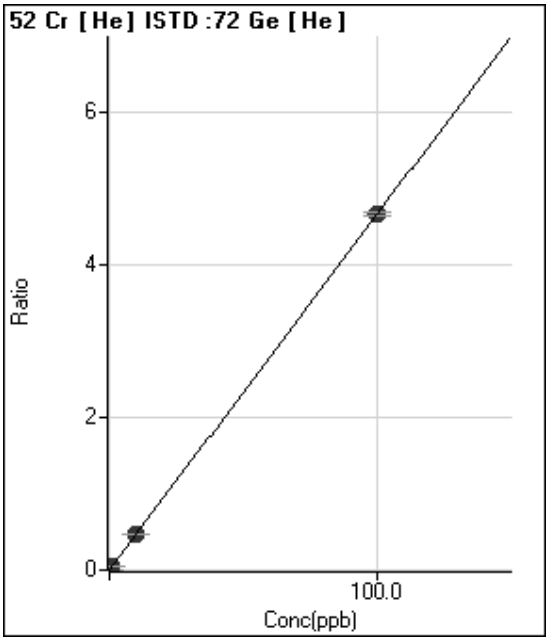
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	60.00	0.0013	P	15.7
2	☐	0.100	0.079	192.23	0.0041	P	14.3
3	☐	1.000	0.989	1710.12	0.0369	P	0.9
4	☐	10.000	9.685	16151.34	0.3505	P	2.5
5	☐	100.000	100.032	159139.51	3.6081	P	1.1

y = 0.0361 * x + 0.0013
R = 1.0000
DL = 0.01681
BEC = 0.03577

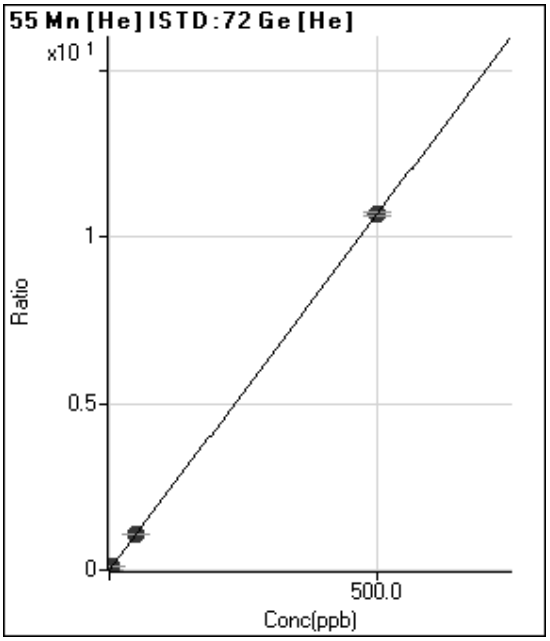
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	91.11	0.0020	P	17.7
2	☐	0.100	0.076	255.56	0.0055	P	4.6
3	☐	1.000	1.053	2357.98	0.0509	P	3.3
4	☐	10.000	10.095	21738.79	0.4717	P	0.6
5	☐	100.000	99.990	205322.13	4.6553	P	1.2

y = 0.0465 * x + 0.0020
R = 1.0000
DL = 0.02229
BEC = 0.04206

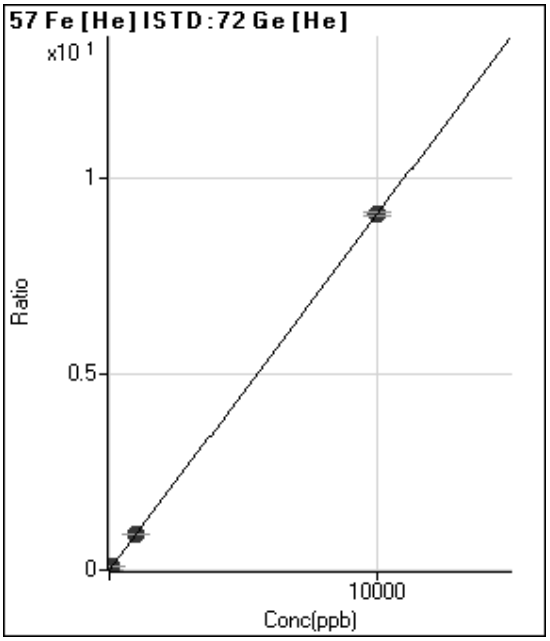
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	57.78	0.0012	P	14.4
2	☐	0.500	0.505	560.02	0.0120	P	9.3
3	☐	5.000	5.214	5215.33	0.1127	P	1.2
4	☐	50.000	50.530	49825.87	1.0814	P	2.1
5	☐	500.000	499.945	471402.64	10.688	P	1.1

y = 0.0214 * x + 0.0012
R = 1.0000
DL = 0.02508
BEC = 0.0581

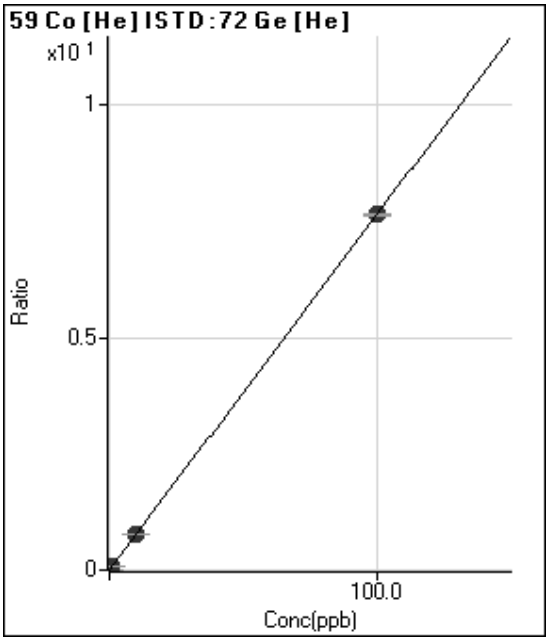
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	53.33	0.0012	P	58.0
2	☐	10.000	7.898	386.69	0.0083	P	17.4
3	☐	100.000	100.007	4240.72	0.0917	P	6.5
4	☐	1000.000	1006.543	42024.41	0.9120	P	1.8
5	☐	10000.00	9999.348	399181.56	9.0503	P	1.0

y = 9.0497E-004 * x + 0.0012
R = 1.0000
DL = 2.211
BEC = 1.271

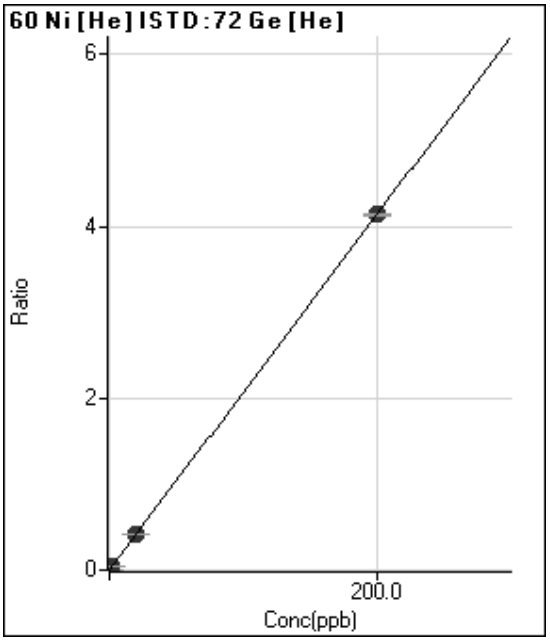
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	43.33	0.0009	P	55.2
2	☐	0.100	0.092	371.12	0.0080	P	12.9
3	☐	1.000	0.979	3507.08	0.0758	P	1.5
4	☐	10.000	10.128	35722.00	0.7752	P	1.7
5	☐	100.000	99.987	337193.21	7.6450	P	0.6

y = 0.0765 * x + 9.2784E-004
R = 1.0000
DL = 0.02009
BEC = 0.01214

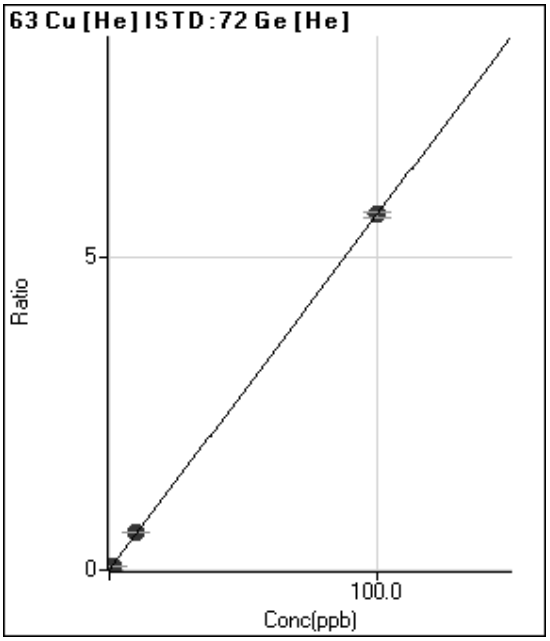
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	45.56	0.0010	P	26.1
2	☐	0.200	0.145	184.45	0.0040	P	13.7
3	☐	2.000	1.987	1946.81	0.0421	P	1.5
4	☐	20.000	20.147	19235.77	0.4175	P	2.2
5	☐	200.000	199.985	182390.13	4.1352	P	0.3

y = 0.0207 * x + 9.7935E-004
R = 1.0000
DL = 0.03712
BEC = 0.04737

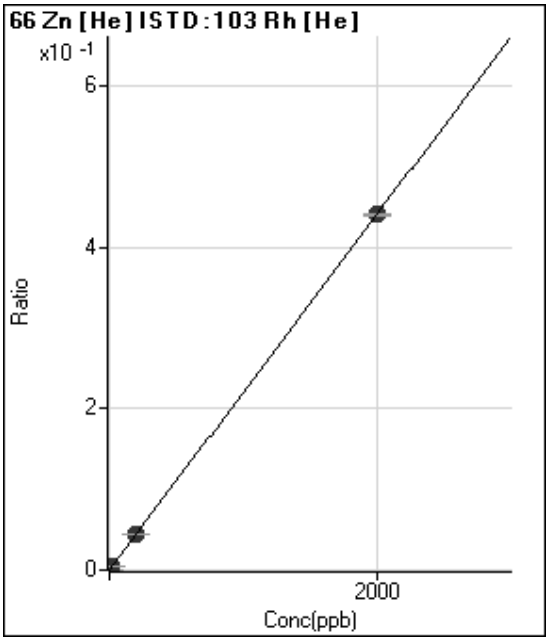
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	562.24	0.0121	P	1.3
2	☐	0.100	-0.020	507.79	0.0109	P	12.0
3	☐	1.000	0.925	2984.75	0.0645	P	6.4
4	☐	10.000	10.270	27388.41	0.5944	P	1.7
5	☐	100.000	99.974	250554.17	5.6808	P	1.4

y = 0.0567 * x + 0.0121
R = 1.0000
DL = 0.008084
BEC = 0.2129

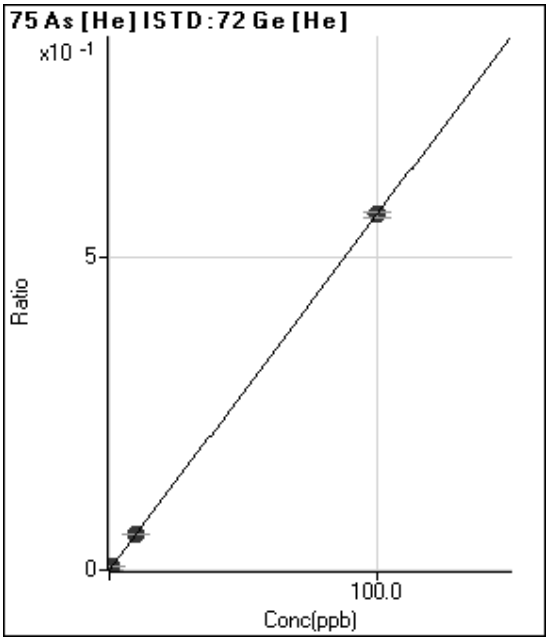
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	246.67	0.0002	P	16.4
2	☐	2.000	2.099	976.71	0.0006	P	6.8
3	☐	20.000	20.194	7249.44	0.0046	P	0.9
4	☐	200.000	204.842	69784.00	0.0452	P	0.7
5	☐	2000.000	1999.514	634361.14	0.4402	P	0.8

y = 2.2007E-004 * x + 1.5662E-004
R = 1.0000
DL = 0.3501
BEC = 0.7117

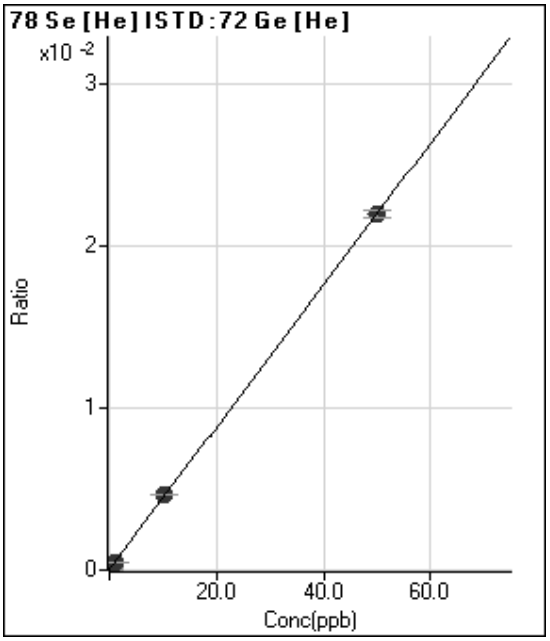
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10.83	0.0002	P	22.7
2	☐	0.100	0.090	34.67	0.0007	P	12.5
3	☐	1.000	0.963	264.17	0.0057	P	3.2
4	☐	10.000	10.087	2653.05	0.0576	P	2.0
5	☐	100.000	99.992	25082.78	0.5687	P	1.5

y = 0.0057 * x + 2.3226E-004
R = 1.0000
DL = 0.02783
BEC = 0.04085

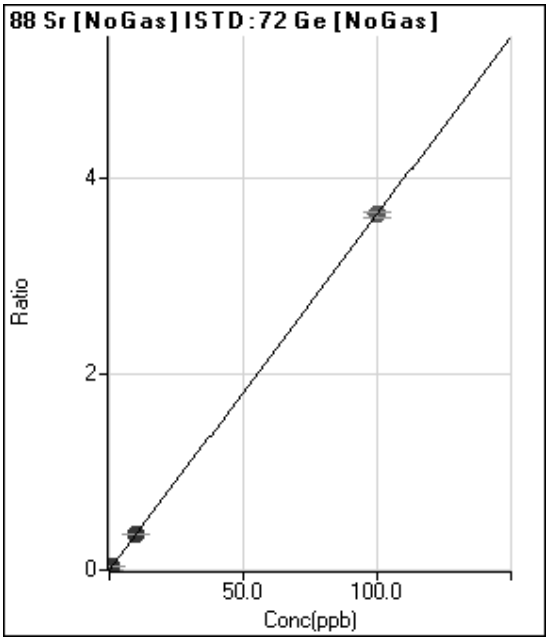
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3.00	0.0001	P	21.0
2	☐	0.100	0.095	4.91	0.0001	P	15.4
3	☐	1.000	0.902	21.24	0.0005	P	5.8
4	☐	10.000	10.515	215.08	0.0047	P	1.2
5	☐	50.000	49.899	966.24	0.0219	P	2.2

y = 4.3776E-004 * x + 6.4256E-005
R = 0.9999
DL = 0.09254
BEC = 0.1468

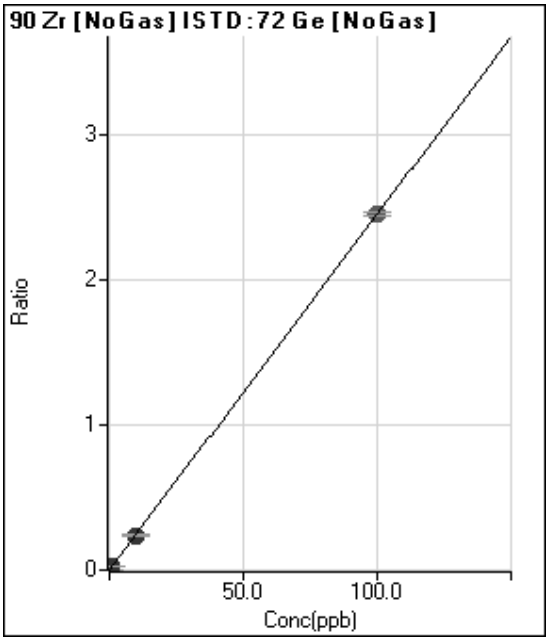
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	463.35	0.0008	P	3.3
2	☐	0.100	0.097	2556.97	0.0043	P	2.3
3	☐	1.000	0.986	21728.76	0.0366	P	6.7
4	☐	10.000	9.920	214037.45	0.3605	P	2.0
5	☐	100.000	100.008	2099735.44	3.6269	A	1.7

y = 0.0363 * x + 7.8745E-004
R = 1.0000
DL = 0.002137
BEC = 0.02172

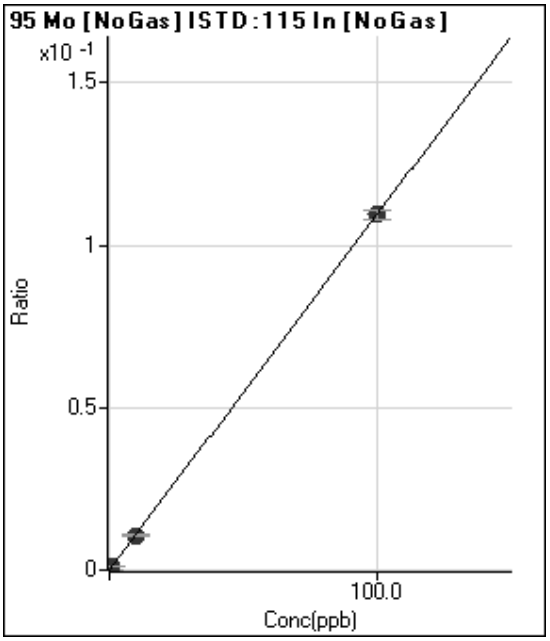
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	487.79	0.0008	P	11.6
2	☐	0.100	0.056	1308.96	0.0022	P	5.7
3	☐	1.000	0.853	12931.96	0.0217	P	3.1
4	☐	10.000	9.745	142396.52	0.2398	P	1.2
5	☐	100.000	100.027	1420470.57	2.4539	A	0.9

y = 0.0245 * x + 8.3015E-004
R = 1.0000
DL = 0.01176
BEC = 0.03385

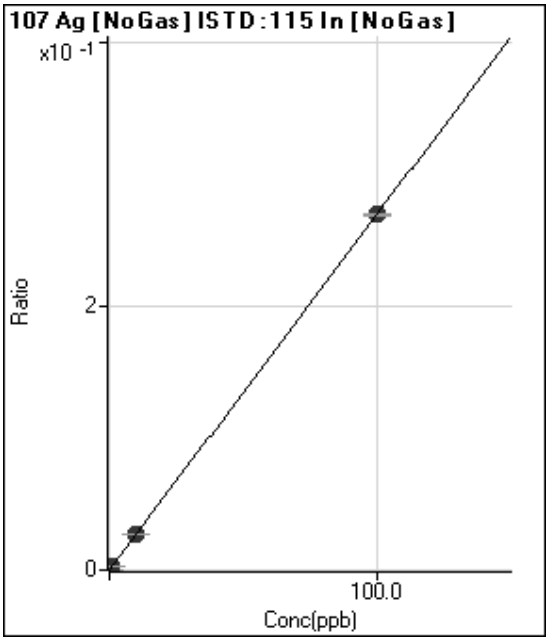
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	152.23	0.0000	P	1.2
2	☐	0.100	0.094	555.57	0.0001	P	1.9
3	☐	1.000	0.964	4246.17	0.0011	P	3.3
4	☐	10.000	9.750	41588.18	0.0107	P	2.6
5	☐	100.000	100.025	412479.11	0.1094	P	2.7

y = 0.0011 * x + 3.9582E-005
R = 1.0000
DL = 0.00128
BEC = 0.03621

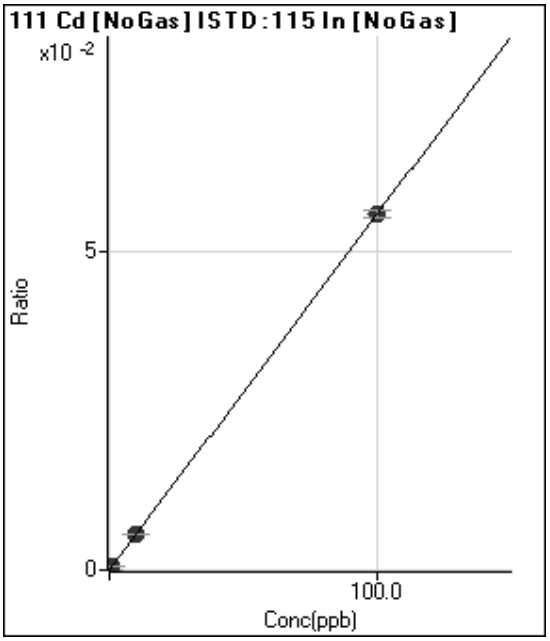
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	83.33	0.0000	P	8.9
2	☐	0.100	0.097	1108.94	0.0003	P	3.0
3	☐	1.000	1.000	10541.37	0.0027	P	1.4
4	☐	10.000	10.140	106292.47	0.0273	P	1.6
5	☐	100.000	99.986	1016102.56	0.2694	P	0.7

y = 0.0027 * x + 2.1645E-005
R = 1.0000
DL = 0.002141
BEC = 0.008035

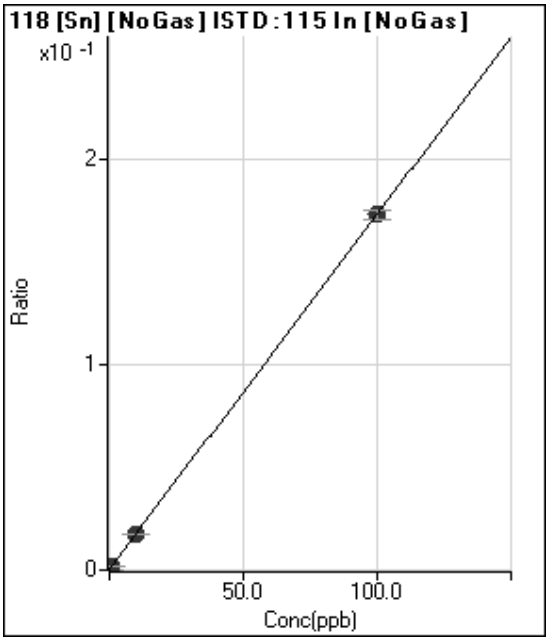
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	31.00	0.0000	P	36.7
2	☐	0.100	0.089	226.33	0.0001	P	1.8
3	☐	1.000	1.026	2260.83	0.0006	P	4.1
4	☐	10.000	10.156	22126.67	0.0057	P	2.0
5	☐	100.000	99.984	211038.36	0.0560	P	2.0

y = 5.5957E-004 * x + 8.0800E-006
R = 1.0000
DL = 0.01588
BEC = 0.01444

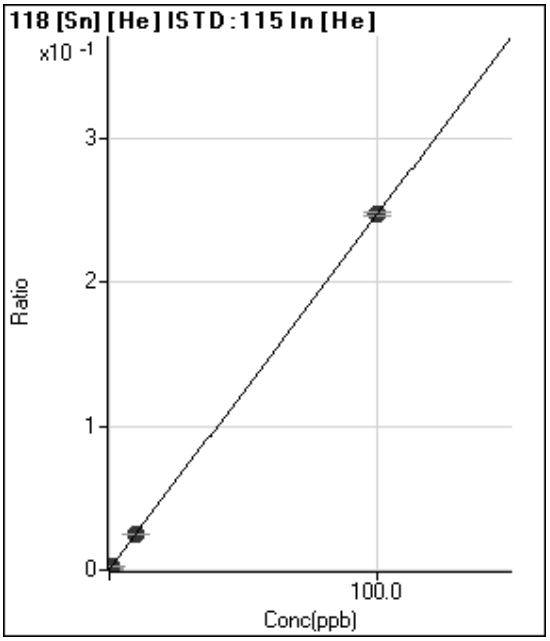
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1502.31	0.0004	P	4.2
2	☐	0.100	0.030	1725.67	0.0004	P	1.3
3	☐	1.000	0.992	8161.09	0.0021	P	3.4
4	☐	10.000	9.955	68272.04	0.0176	P	1.2
5	☐	100.000	100.005	651852.59	0.1728	P	2.4

y = 0.0017 * x + 3.9042E-004
R = 1.0000
DL = 0.02856
BEC = 0.2264

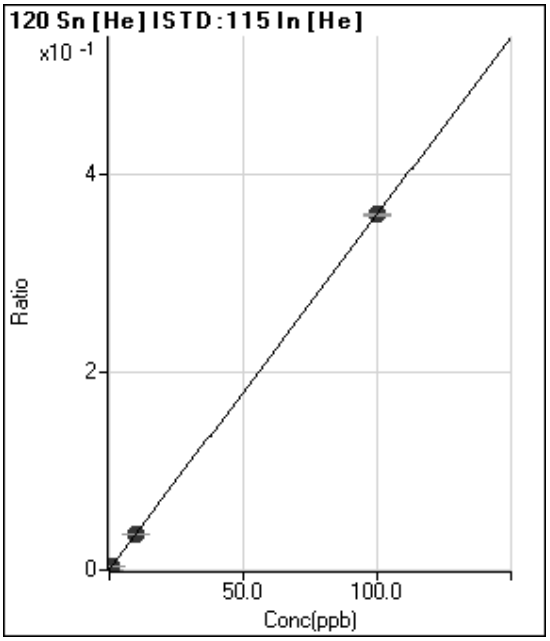
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	245.56	0.0006	P	17.6
2	☐	0.100	0.022	270.01	0.0007	P	10.9
3	☐	1.000	0.957	1198.95	0.0030	P	1.2
4	☐	10.000	9.834	9895.43	0.0249	P	1.6
5	☐	100.000	100.017	92955.41	0.2473	P	1.0

y = 0.0025 * x + 6.1226E-004
R = 1.0000
DL = 0.1311
BEC = 0.2482

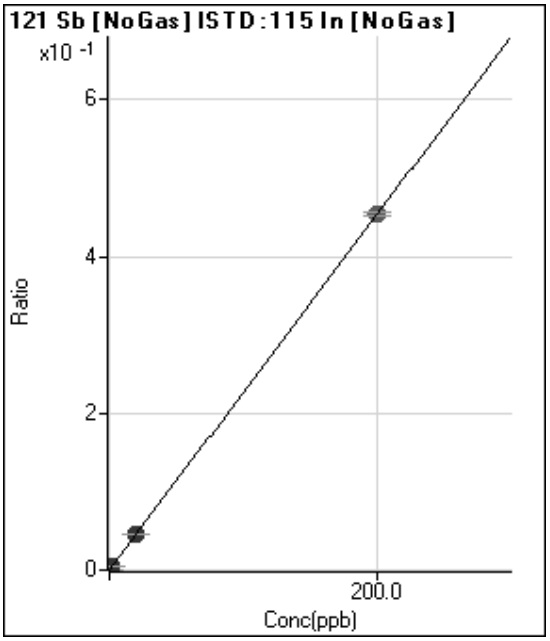
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	284.45	0.0007	P	3.5
2	☐	0.100	0.064	380.01	0.0009	P	0.5
3	☐	1.000	0.953	1661.22	0.0041	P	3.9
4	☐	10.000	9.891	14361.08	0.0361	P	1.5
5	☐	100.000	100.011	134750.23	0.3585	P	0.5

y = 0.0036 * x + 7.0918E-004
R = 1.0000
DL = 0.02084
BEC = 0.1982

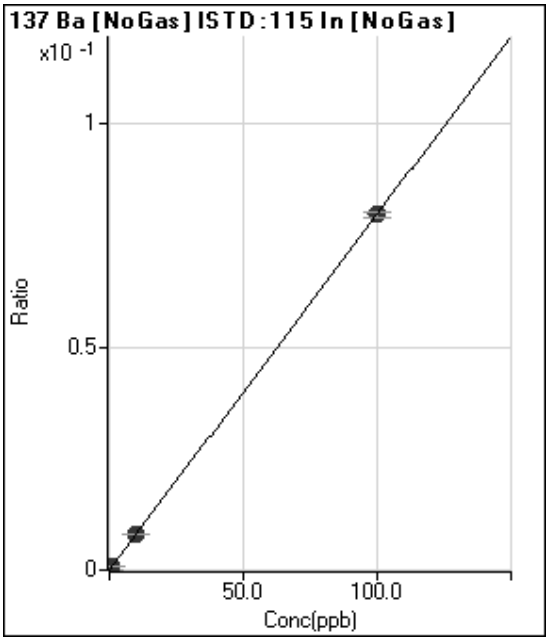
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	802.25	0.0002	P	3.9
2	☐	0.200	0.172	2340.20	0.0006	P	2.3
3	☐	2.000	1.907	17589.94	0.0045	P	3.2
4	☐	20.000	19.687	174316.24	0.0448	P	1.0
5	☐	200.000	200.032	1710971.42	0.4536	A	1.2

y = 0.0023 * x + 2.0865E-004
R = 1.0000
DL = 0.01073
BEC = 0.09206

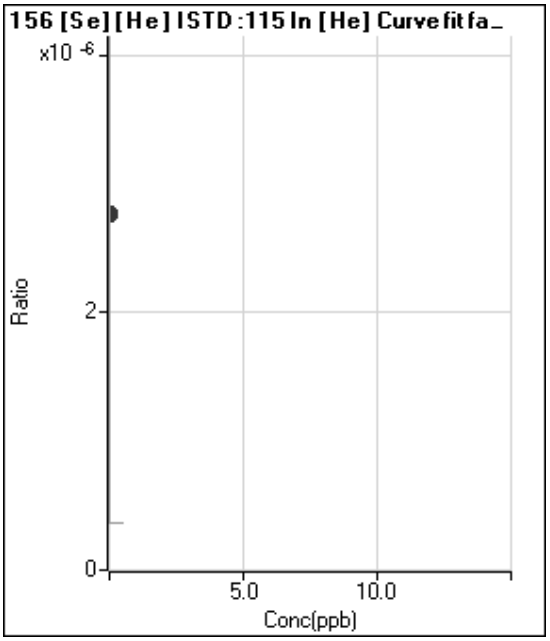
Weight: <None>
Min Conc: <None>



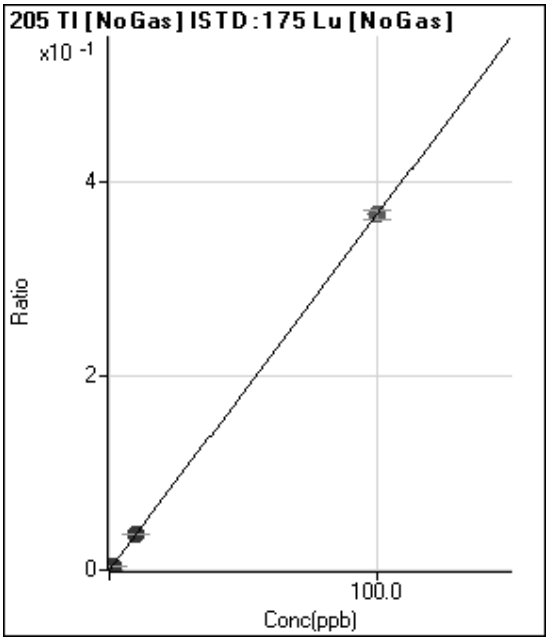
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	97.78	0.0000	P	12.3
2	☐	0.100	0.120	473.35	0.0001	P	11.0
3	☐	1.000	1.017	3249.26	0.0008	P	1.9
4	☐	10.000	10.045	31245.84	0.0080	P	1.5
5	☐	100.000	99.995	300878.02	0.0798	P	1.5

y = 7.9749E-004 * x + 2.5451E-005
R = 1.0000
DL = 0.01181
BEC = 0.03191

Weight: <None>
Min Conc: <None>



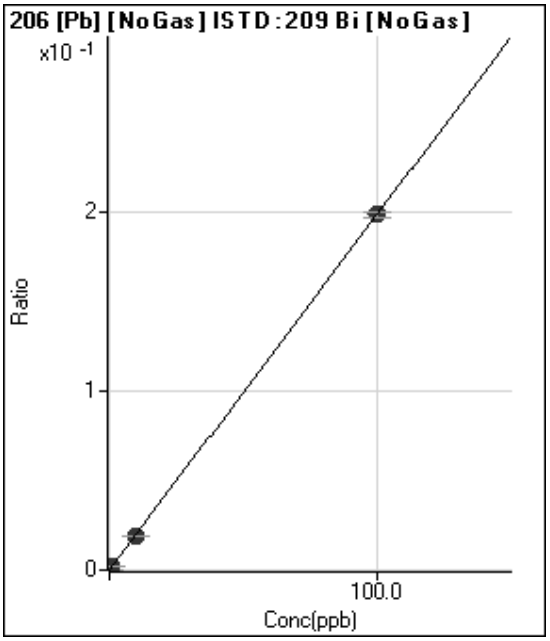
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000		1.11	0.0000	P	173.
2	☐			1.11	0.0000	P	173.
3	☐			3.33	0.0000	P	99.6
4	☐			1.11	0.0000	P	173.
5	☐			10.00	0.0000	P	58.0



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1258.96	0.0002	P	5.0
2	☐	0.100	0.088	3065.91	0.0006	P	2.5
3	☐	1.000	0.969	21041.69	0.0038	P	0.9
4	☐	10.000	9.843	204542.18	0.0362	P	1.2
5	☐	100.000	100.016	2026893.25	0.3661	A	2.4

y = 0.0037 * x + 2.2885E-004
R = 1.0000
DL = 0.009466
BEC = 0.06256

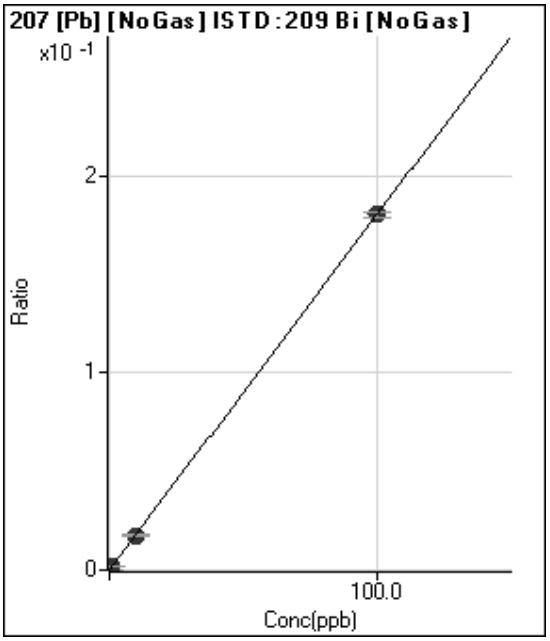
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	216.68	0.0001	P	14.4
2	☐	0.100	0.086	826.72	0.0002	P	3.2
3	☐	1.000	0.961	7031.89	0.0020	P	1.9
4	☐	10.000	9.691	69352.74	0.0193	P	1.0
5	☐	100.000	100.031	663867.20	0.1981	P	1.5

y = 0.0020 * x + 6.1163E-005
R = 1.0000
DL = 0.01336
BEC = 0.03089

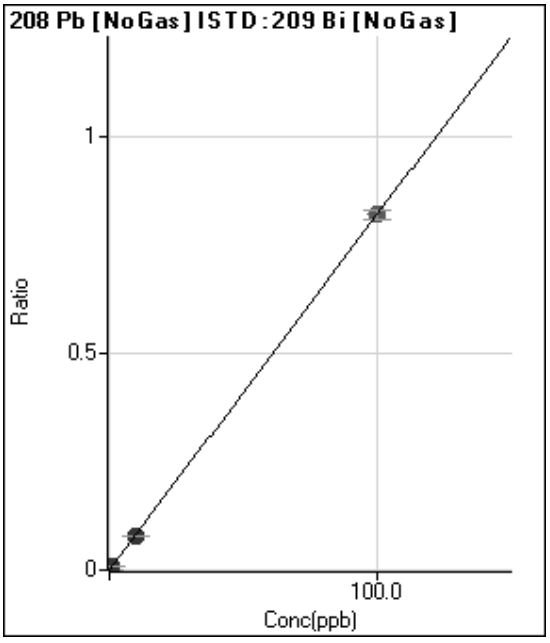
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	220.01	0.0001	P	8.7
2	☐	0.100	0.091	810.05	0.0002	P	23.4
3	☐	1.000	0.990	6618.37	0.0018	P	7.0
4	☐	10.000	9.747	63557.45	0.0176	P	2.1
5	☐	100.000	100.025	604715.29	0.1805	P	1.9

y = 0.0018 * x + 6.1806E-005
R = 1.0000
DL = 0.008954
BEC = 0.03426

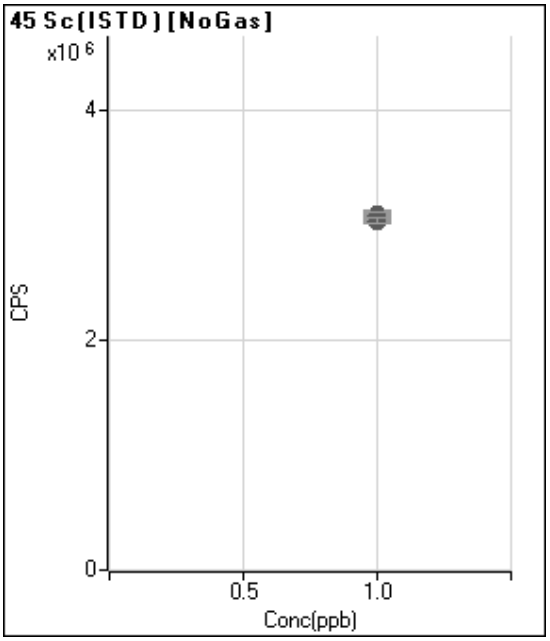
Weight: <None>
Min Conc: <None>



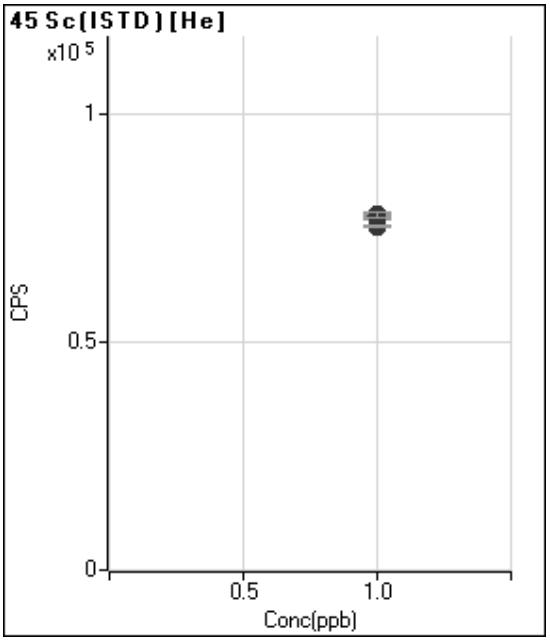
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	816.71	0.0002	P	4.1
2	☐	0.100	0.087	3370.28	0.0009	P	5.5
3	☐	1.000	0.957	28955.35	0.0081	P	2.3
4	☐	10.000	9.594	284575.27	0.0790	P	1.2
5	☐	100.000	100.041	2752140.54	0.8215	A	2.4

y = 0.0082 * x + 2.3005E-004
R = 1.0000
DL = 0.003445
BEC = 0.02802

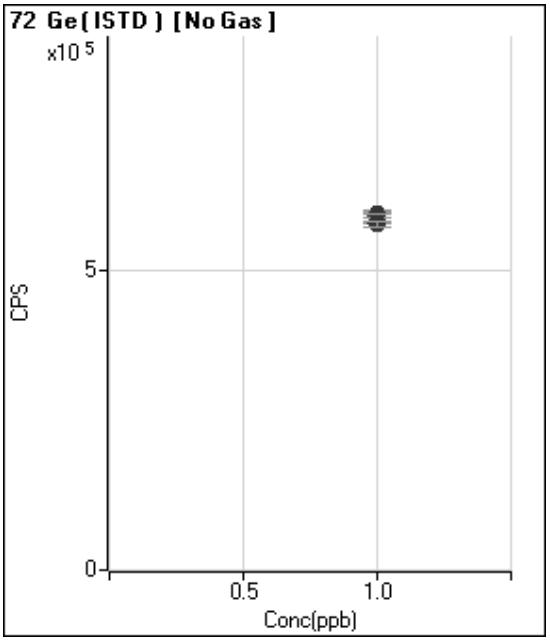
Weight: <None>
Min Conc: <None>



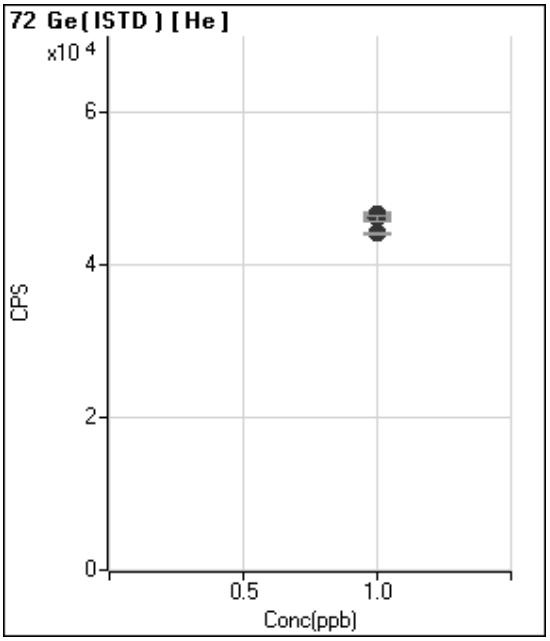
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3052080.71		A	2.0
2	☐	1.000		3086715.43		A	2.6
3	☐	1.000		3068047.87		A	1.8
4	☐	1.000		3074703.84		A	2.7
5	☐	1.000		3031197.52		A	1.6



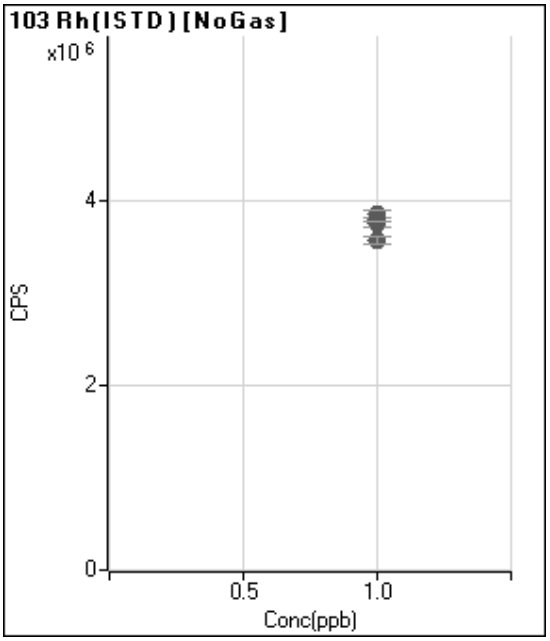
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		77709.72		P	0.9
2	☐	1.000		77828.15		P	0.2
3	☐	1.000		77264.37		P	1.9
4	☐	1.000		77647.13		P	1.4
5	☐	1.000		75268.35		P	0.5



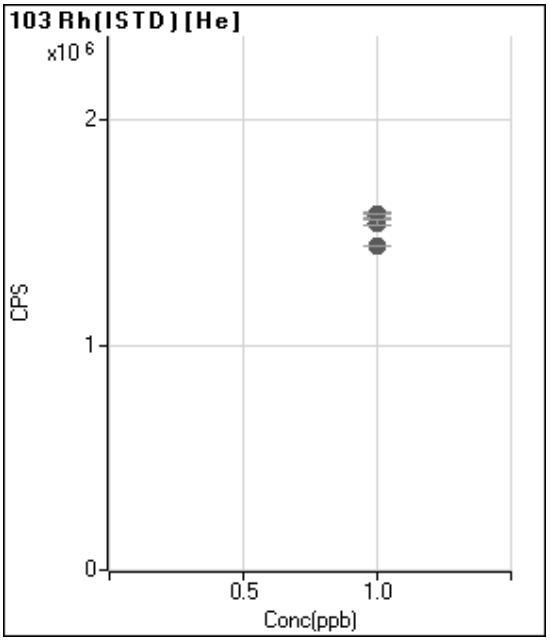
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		588164.35		P	2.3
2	☐	1.000		594834.96		P	1.5
3	☐	1.000		594902.18		P	2.1
4	☐	1.000		593775.03		P	1.0
5	☐	1.000		578934.37		P	2.0



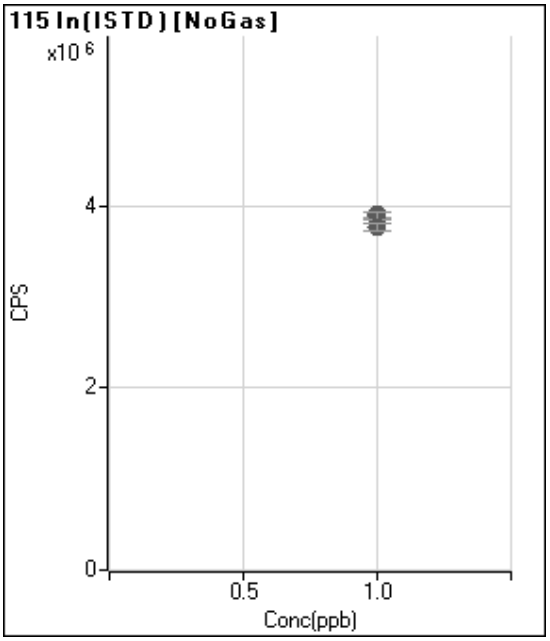
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		46567.37		P	1.1
2	☐	1.000		46534.97		P	1.3
3	☐	1.000		46283.17		P	1.8
4	☐	1.000		46084.70		P	1.4
5	☐	1.000		44107.12		P	0.5



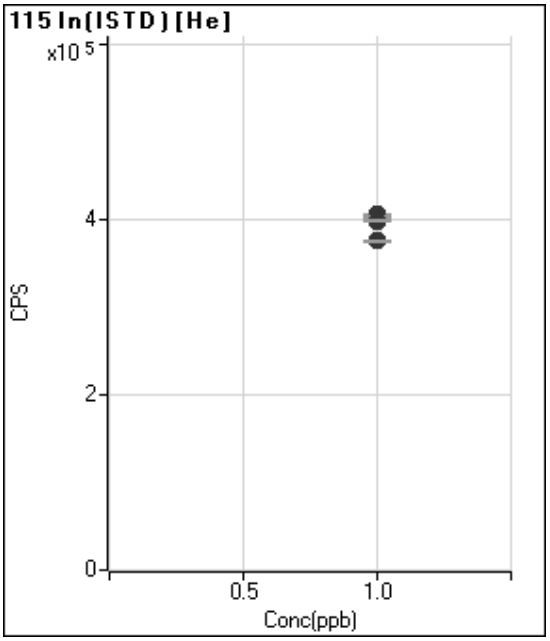
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3760261.66		A	1.7
2	☐	1.000		3859903.04		A	2.0
3	☐	1.000		3805905.27		A	1.1
4	☐	1.000		3790987.63		A	0.2
5	☐	1.000		3587764.03		A	2.4



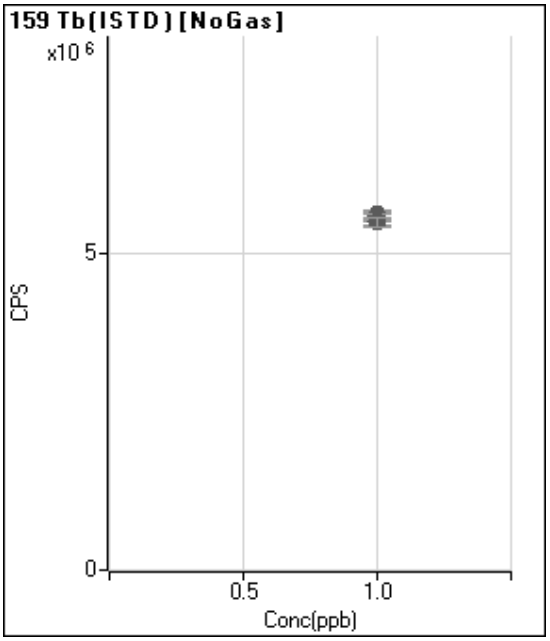
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1576304.56		A	1.7
2	☐	1.000		1579361.40		A	0.2
3	☐	1.000		1575844.35		A	1.2
4	☐	1.000		1542778.76		A	1.3
5	☐	1.000		1441162.48		A	0.3



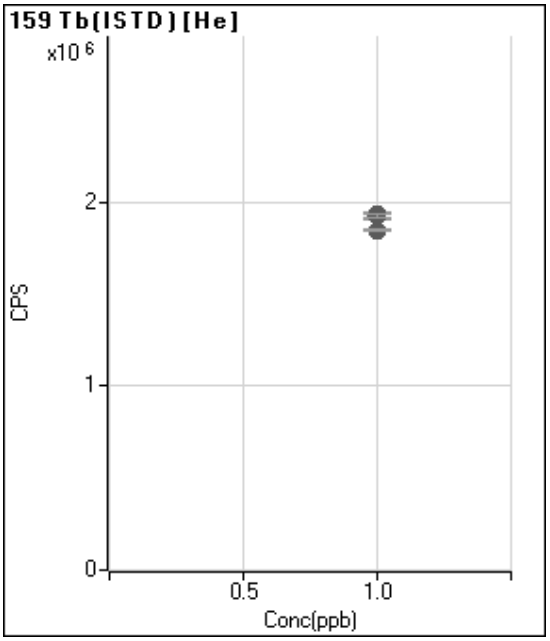
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3846213.85		A	1.6
2	☐	1.000		3906303.02		A	1.7
3	☐	1.000		3884421.16		A	2.2
4	☐	1.000		3888786.48		A	1.8
5	☐	1.000		3772591.27		A	2.2



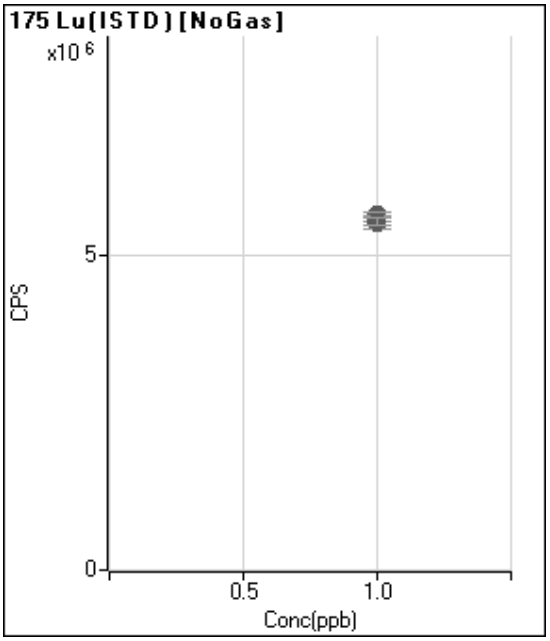
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		401074.37		P	0.4
2	☐	1.000		405490.09		P	0.5
3	☐	1.000		403422.41		P	0.7
4	☐	1.000		397877.48		P	0.6
5	☐	1.000		375846.35		P	0.6



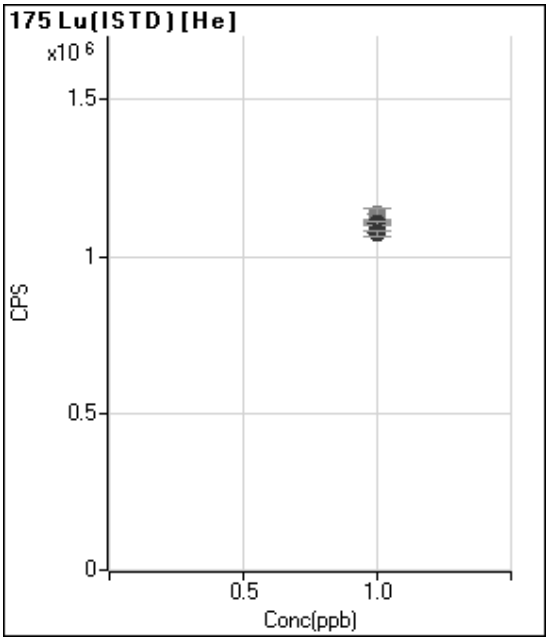
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5497134.50		A	2.2
2	☐	1.000		5616825.33		A	2.4
3	☐	1.000		5583128.04		A	2.3
4	☐	1.000		5595544.92		A	1.0
5	☐	1.000		5496246.38		A	2.6



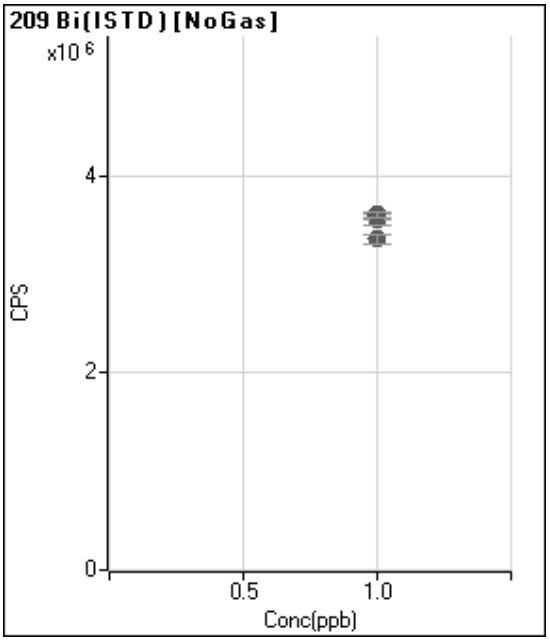
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1926533.78		A	1.8
2	☐	1.000		1923755.70		A	1.6
3	☐	1.000		1934195.70		A	1.4
4	☐	1.000		1924001.17		A	1.0
5	☐	1.000		1848027.99		A	0.7



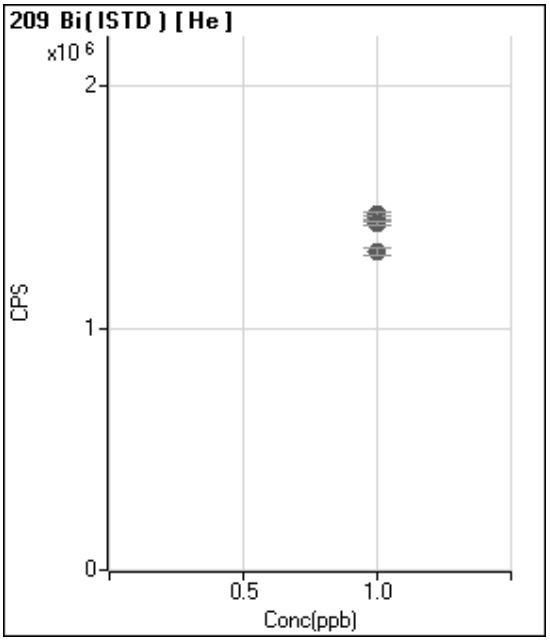
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5505661.38		A	2.9
2	☐	1.000		5573918.25		A	1.9
3	☐	1.000		5575163.88		A	1.2
4	☐	1.000		5645216.79		A	1.0
5	☐	1.000		5538812.84		A	2.5



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1106922.95		P	1.1
2	☐	1.000		1113260.81		P	1.1
3	☐	1.000		1133278.14		M	3.4
4	☐	1.000		1104464.39		P	1.3
5	☐	1.000		1073789.15		P	1.4



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		3553207.86		A	3.3
2	☐	1.000		3580793.80		A	1.5
3	☐	1.000		3580680.99		A	2.1
4	☐	1.000		3602614.43		A	1.3
5	☐	1.000		3351567.14		A	3.0



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1457156.02		A	1.1
2	☐	1.000		1455834.72		A	1.2
3	☐	1.000		1470597.06		A	1.0
4	☐	1.000		1435930.50		A	1.2
5	☐	1.000		1317791.67		A	2.1

GCAL ANALYTICAL LABORATORIES, LLC

BATCH COVERSHEET

ANALYST AWG

DATE 08/20/18

ICP/MS Metals Analysis

HBN **642309**

STANDARDS

ICAL Standard	316-66-8
ICV Standard	316-66-4
ICSA Standard	316-66-9
ICSAB Standard	316-66-3
Internal Standard	316-66-12
Tune	316-63-4
P/A	316-56-9

ADDITIONAL STANDARDS

LDR Standard	316-66-10
	ICVB 316-66-11

ACID MATRIX

2% HNO3 \ 0.5% HCL Solution	317-48-20
5% HNO3 \ 2% HCL Solution	317-49-3

ICPMS DATA FILE

Reference File: 2180820B_MS2

GCAL QC LIMITS

200.8 Correlation Coefficient (R) =0.998

6020B Correlation Coefficient (R) =0.995

ICV Recovery 90-110%

LLCCV Recovery 80-120%

ICSA \ ICSAB Recovery 80-120%

CCV Recovery 90-110%

Sample						
Data File	Acq. Date-Time	Type	Sample Name	Dilution	Vial Number	Comment
004CALB.d	8/20/2018 13:05	CalBlk	1300	1	1107	
005CALS.d	8/20/2018 13:09	CalStd	1302	1	1105	
006CALS.d	8/20/2018 13:13	CalStd	1304	1	1103	
007CALS.d	8/20/2018 13:17	CalStd	1305	1	1102	
008CALS.d	8/20/2018 13:20	CalStd	1306	1	1101	
009_ICV.d	8/20/2018 13:24	ICV	1600	1	1201	
010_ICV.d	8/20/2018 13:28	ICV	1600 B	1	1203	
011_ICB.d	8/20/2018 13:31	ICB	1700	1	1107	
0120.1.d	8/20/2018 13:35	LLCCV0.1	1804	1	1105	
1210.5.d	8/20/2018 13:38	LLCCV0.5	1804	1	1104	
1211_ICB.d	8/20/2018 13:42	ICB	1700	1	1107	
12120.1.d	8/20/2018 13:45	LLCCV0.1	1804	1	1105	
121210.5.d	8/20/2018 13:49	LLCCV0.5	1804	1	1104	
121211CCV1.d	8/20/2018 13:53	LLCCV1	1803	1	1103	
121212ICSA.d	8/20/2018 13:56	ICSA	2000	1	1205	
121213ICSB.d	8/20/2018 14:00	ICSB	2100	1	1206	
121214_QC1.d	8/20/2018 14:03	QC1	LDR	1	1204	
121215SMPL.d	8/20/2018 14:07	Sample	2500	1	3	
121216SMPL.d	8/20/2018 14:14	MBSOIL	1839944	40	2105	
121217SMPL.d	8/20/2018 14:17	LCS6020	1839945	40	2106	
121218SMPL.d	8/20/2018 14:21	Sample	21808140401	306.7485	2205	
121219_CCV.d	8/20/2018 14:30	CCV	1800	1	1102	
121220_CCB.d	8/20/2018 14:34	CCB	1900	1	1107	
121221SMPL.d	8/20/2018 14:37	LCS6020	1839945	40	2106	
121222SMPL.d	8/20/2018 14:41	MBSOIL	1841044	5000	2101	
121223SMPL.d	8/20/2018 14:45	LCS6020	1841045	5000	2102	
121224SMPL.d	8/20/2018 14:48	Sample	21807276111	100000	2103	
121225_CCV.d	8/20/2018 14:52	CCV	1800	1	1102	
121226_CCB.d	8/20/2018 14:55	CCB	1900	1	1107	
121227SMPL.d	8/20/2018 14:59	Sample	21808144804	100000	2104	
121228SMPL.d	8/20/2018 15:02	AllRef	21808144803	4000	2107	
121229SMPL.d	8/20/2018 15:06	MSSOIL	1839946	4000	2108	
121230SMPL.d	8/20/2018 15:09	MSDSOIL	1839947	4000	2109	
121231SMPL.d	8/20/2018 15:13	PDS	1841153	4000	2110	
121232SMPL.d	8/20/2018 15:16	Sample	1841154	20000	2111	
121233SMPL.d	8/20/2018 15:20	Sample	21808161601	396.8254	2112	
121234SMPL.d	8/20/2018 15:24	Sample	21807263415	367.6471	2201	
121235SMPL.d	8/20/2018 15:27	Sample	21807263416	364.9635	2202	
121236SMPL.d	8/20/2018 15:31	Sample	21807263417	400	2203	
121237SMPL.d	8/20/2018 15:34	Sample	21808164901	364.9635	2204	
121238SMPL.d	8/20/2018 15:38	MBWATER	1840743	1	2206	
121239SMPL.d	8/20/2018 15:41	LCS6020	1840744	1	2207	
121240SMPL.d	8/20/2018 15:45	Sample	21808164901 TCLP	100	2303	
121241SMPL.d	8/20/2018 15:48	Sample	21808144804	1000000	2104	
121242_CCV.d	8/20/2018 15:52	CCV	1800	1	1102	

121243_CCB.d	8/20/2018 15:55	CCB	1900	1	1107	
121244SMPL.d	8/20/2018 16:05	AllRef	21808151502	100	2208	
121245SMPL.d	8/20/2018 16:09	MS10XP	1840761	100	2209	
121246SMPL.d	8/20/2018 16:12	MSD10XP	1840762	100	2210	
121247SMPL.d	8/20/2018 16:16	PDS	1841155	100	2211	
121248SMPL.d	8/20/2018 16:20	Sample	1841156	500	2212	
121249SMPL.d	8/20/2018 16:23	AllRef	21808153701	100	2301	
121250SMPL.d	8/20/2018 16:27	MS10XP	1840763	100	2302	
121251SMPL.d	8/20/2018 16:30	Sample	21808166101	100	2304	
121252SMPL.d	8/20/2018 16:34	Sample	21808166102	100	2305	
121253SMPL.d	8/20/2018 16:37	Sample	21808162601	100	2306	
121254SMPL.d	8/20/2018 16:41	Sample	21808162602	100	2307	
121255SMPL.d	8/20/2018 16:44	Sample	21808162603	100	2308	
121256SMPL.d	8/20/2018 16:48	Sample	21808162604	100	2309	
121257SMPL.d	8/20/2018 16:51	Sample	21808165601	100	2310	
121258SMPL.d	8/20/2018 16:55	Sample	TBLK	100	2407	
121259_CCV.d	8/20/2018 16:58	CCV	1800	1	1102	
121260_CCB.d	8/20/2018 17:02	CCB	1900	1	1107	
121261SMPL.d	8/20/2018 17:06	Sample	21808171001	1	2311	
121262SMPL.d	8/20/2018 17:09	Sample	21808171501	1	2312	
121263SMPL.d	8/20/2018 17:13	Sample	21808171502	1	2401	
121264SMPL.d	8/20/2018 17:16	Sample	21808171503	1	2402	
121265SMPL.d	8/20/2018 17:20	Sample	21808171504	1	2403	
121266SMPL.d	8/20/2018 17:23	Sample	21808171301	1	2404	
121267SMPL.d	8/20/2018 17:27	Sample	21808171302	1	2405	
121268SMPL.d	8/20/2018 17:30	Sample	21808171303	1	2406	
121269_CCV.d	8/20/2018 17:34	CCV	1800	1	1102	
121270_CCB.d	8/20/2018 17:38	CCB	1900	1	1107	
121271SMPL.d	8/20/2018 17:41	Sample	1840818	40	2512	
121272SMPL.d	8/20/2018 17:45	Sample	1840819	40	3101	
121273SMPL.d	8/20/2018 17:48	Sample	21808172801	400	3102	
121274SMPL.d	8/20/2018 17:52	Sample	21808172802	384.6154	3103	
121275SMPL.d	8/20/2018 17:55	Sample	21808172901	378.7879	3104	
121276SMPL.d	8/20/2018 17:59	Sample	21808172902	393.7008	3105	
121277SMPL.d	8/20/2018 18:02	Sample	21808181206	400	3106	
121278SMPL.d	8/20/2018 18:06	Sample	21808181207	400	3107	
121279SMPL.d	8/20/2018 18:10	Sample	21808181208	400	3108	
121280SMPL.d	8/20/2018 18:13	Sample	1841231	400	3109	
121281SMPL.d	8/20/2018 18:17	Sample	1841232	2000	3110	
121282SMPL.d	8/20/2018 18:20	Sample	21808181209	344.8276	3111	
121283SMPL.d	8/20/2018 18:24	Sample	21808181210	375.9398	3112	
121284SMPL.d	8/20/2018 18:27	Sample	1841052	1	2409	
121285SMPL.d	8/20/2018 18:31	Sample	1841053	1	2410	
121286SMPL.d	8/20/2018 18:34	Sample	21808166103	100	2411	
121287_CCV.d	8/20/2018 18:38	CCV	1800	1	1102	
121288_CCB.d	8/20/2018 18:41	CCB	1900	1	1107	
121289SMPL.d	8/20/2018 18:45	Sample	21808173601	100	2412	

121290SMPL.d	8/20/2018 18:49	Sample	1841056	100	2501	
121291SMPL.d	8/20/2018 18:52	Sample	1841057	100	2502	
121292SMPL.d	8/20/2018 18:56	Sample	1841177	100	2503	
121293SMPL.d	8/20/2018 18:59	Sample	1841178	500	2504	
121294SMPL.d	8/20/2018 19:03	Sample	21808180601	1	2505	
121295SMPL.d	8/20/2018 19:06	Sample	21808180602	1	2506	
121296SMPL.d	8/20/2018 19:10	Sample	21808181303	1	2507	
121297SMPL.d	8/20/2018 19:13	Sample	21808201101 200X	200	2508	
121298SMPL.d	8/20/2018 19:17	Sample	21808201101	2	2509	
121299SMPL.d	8/20/2018 19:20	Sample	21808201102	2	2510	
121300SMPL.d	8/20/2018 19:24	Sample	21808201401	5	2511	
121301_CCV.d	8/20/2018 19:28	CCV	1800	1	1102	
121302_CCB.d	8/20/2018 19:31	CCB	1900	1	1107	
121303SMPL.d	8/20/2018 19:35	Sample	1840541	1	3201	
121304SMPL.d	8/20/2018 19:38	Sample	1840542	1	3202	
121305SMPL.d	8/20/2018 19:42	Sample	21808165702	1	3203	
121306SMPL.d	8/20/2018 19:45	Sample	1840543	1	3204	
121307SMPL.d	8/20/2018 19:49	Sample	1840544	1	3205	
121308SMPL.d	8/20/2018 19:52	Sample	21808167402	300	3206	
121309SMPL.d	8/20/2018 19:56	Sample	21808167403	300	3207	
121310SMPL.d	8/20/2018 20:00	Sample	21808167404	300	3208	
121311SMPL.d	8/20/2018 20:03	Sample	21808167405	300	3209	
121312SMPL.d	8/20/2018 20:07	Sample	21808167406	300	3210	
121313_CCV.d	8/20/2018 20:10	CCV	1800	1	1102	
121314_CCB.d	8/20/2018 20:14	CCB	1900	1	1107	

Tune Step	Mass	Name	R	a	b (blank)	DL	BEC	Units
1	7	Li	0.99998149	0.003170743	0.033064029	0.447253492	10.42784749	ppb
1	9	Be	0.999999628	0.001173366	1.10E-05	0.001982123	0.009336024	ppb
1	11	B	0.999998954	0.000724388	0.00051648	0.189466672	0.712987132	ppb
2	23	Na	0.999995811	0.003834224	0.091838566	3.068144747	23.95232237	ppb
2	24	Mg	0.999995147	0.001473142	0.001018018	0.544777565	0.691051836	ppb
2	27	Al	0.999999936	0.000334536	0.000908944	0.664423871	2.717028541	ppb
2	29	Si	0.997304416	1.16E-05	0.191331946	1106.741663	16484.36387	ppb
2	39	K	0.999998404	0.001252325	0.145874175	11.26686306	116.4826397	ppb
2	44	Ca	0.999999651	5.52E-05	0.003185442	27.11017306	57.73093847	ppb
2	47	Ti	0.999998808	0.000548109	6.79E-05	0.03446045	0.123867616	ppb
2	51	V	0.99999553	0.029368214	0.001723521	0.006292158	0.058686611	ppb
2	52	Cr	0.999999291	0.038486969	0.049988369	0.236864746	1.298838813	ppb
2	55	Mn	0.999999742	0.013284795	0.002334697	0.04648892	0.175742014	ppb
2	57	Fe	0.999999146	0.000642419	0.005391155	1.032164016	8.39195998	ppb
2	59	Co	0.999999223	0.065257264	0.001198493	0.015077114	0.018365671	ppb
2	60	Ni	0.99999425	0.018173531	0.004711903	0.057561921	0.259272843	ppb
2	63	Cu	0.999991624	0.039806334	0.021785749	0.021973648	0.547293533	ppb
2	66	Zn	0.999997876	0.007065179	0.00264182	0.18675415	0.373921183	ppb
2	75	As	0.999997948	0.00737736	0.000321118	0.017466971	0.043527545	ppb
2	78	Se	0.999999349	0.000320273	8.80E-05	0.102934441	0.274764066	ppb
1	88	Sr	0.999998342	0.03051246	0.000435225	0.003431872	0.01426383	ppb
1	90	Zr	0.999998915	0.01909408	0.000491966	0.002282972	0.025765352	ppb
1	95	Mo	0.999982935	0.001212112	1.87E-05	0.002067198	0.015405761	ppb
1	107	Ag	0.999999046	0.002821337	6.78E-06	0.001303031	0.002402111	ppb
1	111	Cd	0.999999994	0.000573616	2.96E-06	0.006726126	0.005163713	ppb
1	118	(Sn)	0.999992282	0.001594285	0.000156022	0.015816689	0.0978631	ppb
2	118	(Sn)	0.999992996	0.002213689	0.000208654	0.053060838	0.094256382	ppb
2	120	Sn	0.999991643	0.003171391	0.000271521	0.039751592	0.085615735	ppb
1	121	Sb	0.999991699	0.002348679	7.33E-05	0.007905006	0.031230279	ppb
1	137	Ba	0.999995936	0.000802001	2.89E-05	0.026641343	0.036042406	ppb
2	156	[Se]						ppb
1	205	Tl	0.999997859	0.005486358	6.28E-05	0.001142314	0.011439712	ppb
1	206	(Pb)	0.999994898	0.001837164	2.14E-05	0.018607928	0.011663223	ppb
1	207	(Pb)	0.999996275	0.001663422	2.29E-05	0.009236984	0.013739649	ppb
1	208	Pb	0.999997536	0.007407163	8.27E-05	0.005183701	0.011165276	ppb
1	45	Sc						ppb
2	45	Sc						ppb
1	72	Ge						ppb
2	72	Ge						ppb
1	103	Rh						ppb
2	103	Rh						ppb
1	115	In						ppb
2	115	In						ppb
1	159	Tb						ppb
2	159	Tb						ppb
1	175	Lu						ppb
2	175	Lu						ppb
1	209	Bi						ppb
2	209	Bi						ppb

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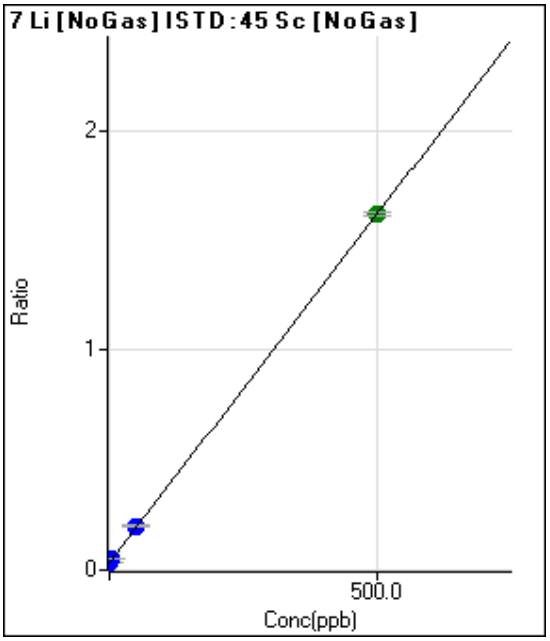
Analysis File: 2180820B_MS2.batch.bin
DA Date-Time: 08/20/2018 15:57:37
Calibration Title: EPA6020
Calibration Method: External Calibration
VIS Interpolation Fit:

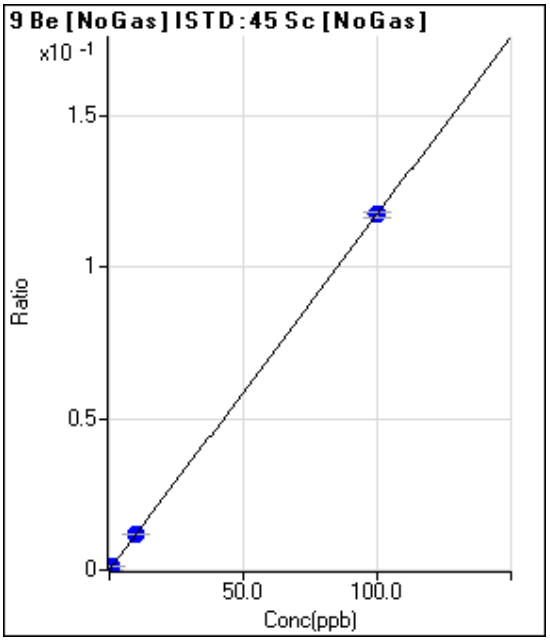
Level	Standard Data File	Sample Name	Acq. Date-Time
1	004CALB.d	1300	08/20/2018 13:05:58
2	005CALS.d	1302	08/20/2018 13:09:46
3	006CALS.d	1304	08/20/2018 13:13:29
4	007CALS.d	1305	08/20/2018 13:17:11
5	008CALS.d	1306	08/20/2018 13:20:54



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	183129.21	0.0331	P	1.4
2	☐	0.500	0.523	190090.01	0.0347	P	1.1
3	☐	5.000	5.437	277534.71	0.0503	P	0.4
4	☐	50.000	53.084	1126194.44	0.2014	P	0.3
5	☐	500.000	499.687	8947600.49	1.6174	A	1.2

y = 0.0032 * x + 0.0331
R = 1.0000
DL = 0.4473
BEC = 10.43

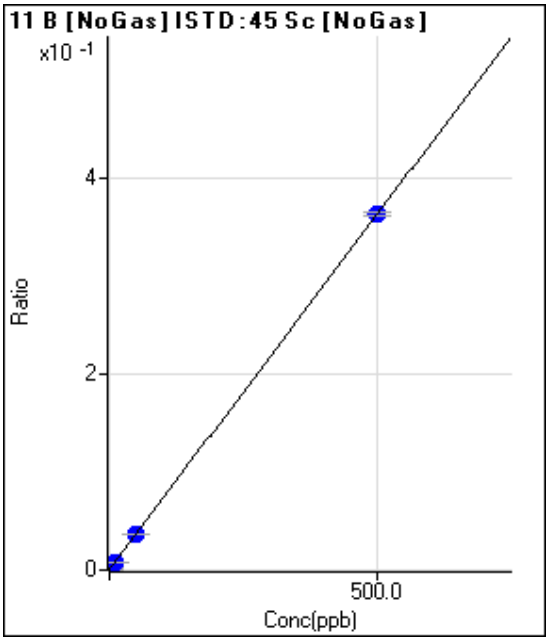
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	60.67	0.0000	P	7.1
2	☐	0.100	0.098	686.69	0.0001	P	2.8
3	☐	1.000	1.007	6576.79	0.0012	P	1.8
4	☐	10.000	9.917	65132.92	0.0116	P	1.3
5	☐	100.000	100.008	649194.86	0.1174	P	1.5

y = 0.0012 * x + 1.0955E-005
R = 1.0000
DL = 0.001982
BEC = 0.009336

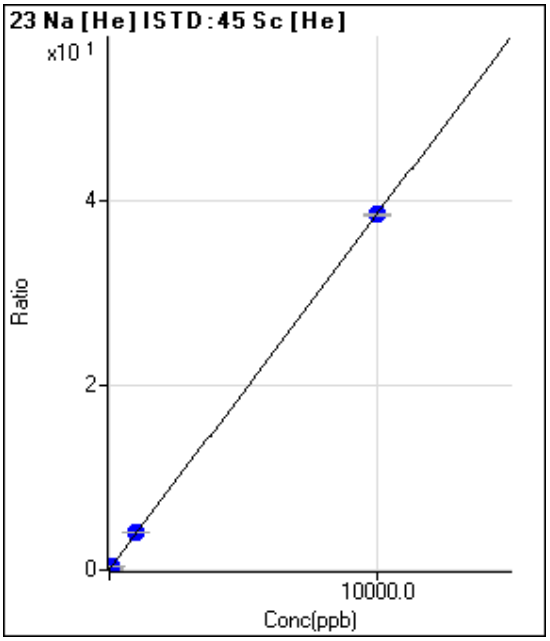
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2860.36	0.0005	P	8.9
2	☐	1.000	0.872	6288.18	0.0011	P	3.9
3	☐	10.000	9.794	41992.20	0.0076	P	0.5
4	☐	50.000	49.214	202246.76	0.0362	P	1.6
5	☐	500.000	500.083	2006822.78	0.3628	P	0.9

y = 7.2439E-004 * x + 5.1648E-004
R = 1.0000
DL = 0.1895
BEC = 0.713

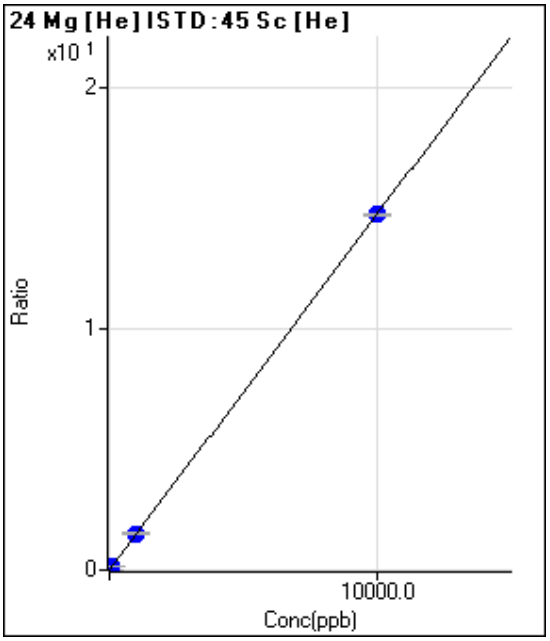
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	9026.29	0.0918	P	4.3
2	☐	10.000	10.146	12795.76	0.1307	P	4.1
3	☐	100.000	102.845	47545.79	0.4862	P	1.3
4	☐	1000.000	1029.093	392819.32	4.0376	P	0.9
5	☐	10000.000	9997.062	3802651.71	38.4228	P	0.8

y = 0.0038 * x + 0.0918
R = 1.0000
DL = 3.068
BEC = 23.95

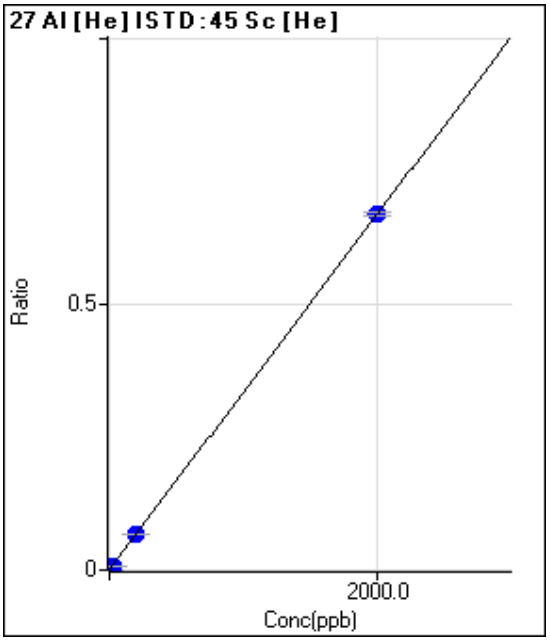
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	100.00	0.0010	P	26.3
2	☐	10.000	10.288	1583.48	0.0162	P	2.6
3	☐	100.000	103.294	14977.91	0.1532	P	3.5
4	☐	1000.000	1031.405	147923.04	1.5204	P	1.1
5	☐	10000.000	9996.826	1457558.36	14.7278	P	0.7

y = 0.0015 * x + 0.0010
R = 1.0000
DL = 0.5448
BEC = 0.6911

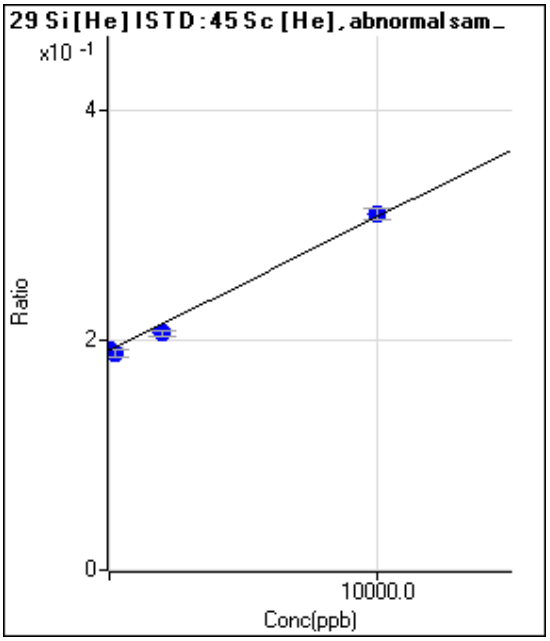
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	89.33	0.0009	P	8.2
2	☐	2.000	1.619	142.00	0.0015	P	4.7
3	☐	20.000	19.124	714.69	0.0073	P	2.2
4	☐	200.000	199.653	6586.82	0.0677	P	2.3
5	☐	2000.000	2000.044	66305.50	0.6700	P	1.2

y = 3.3454E-004 * x + 9.0894E-004
R = 1.0000
DL = 0.6644
BEC = 2.717

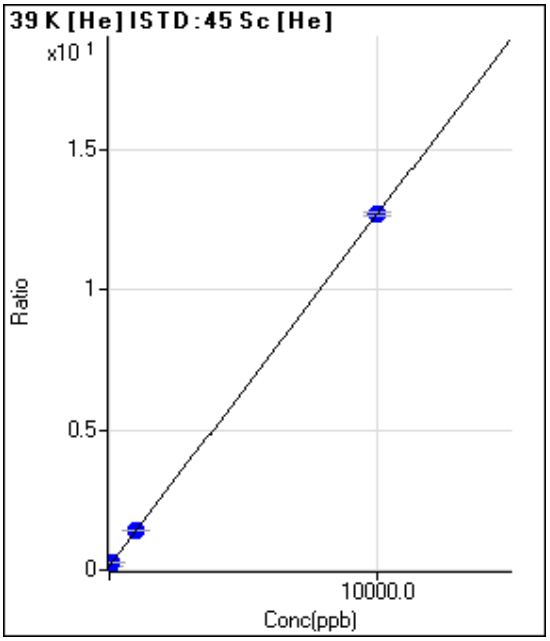
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	18791.77	0.1913	P	2.2
2	☐	20.000	-129.763	18582.85	0.1898	P	1.0
3	☐	200.000	-286.261	18384.58	0.1880	P	3.2
4	☐	2000.000	1240.725	20015.98	0.2057	P	2.2
5	☐	10000.000	10161.880	30605.74	0.3093	P	3.0

y = 1.1607E-005 * x + 0.1913
R = 0.9973
DL = 1107
BEC = 1.648E+04

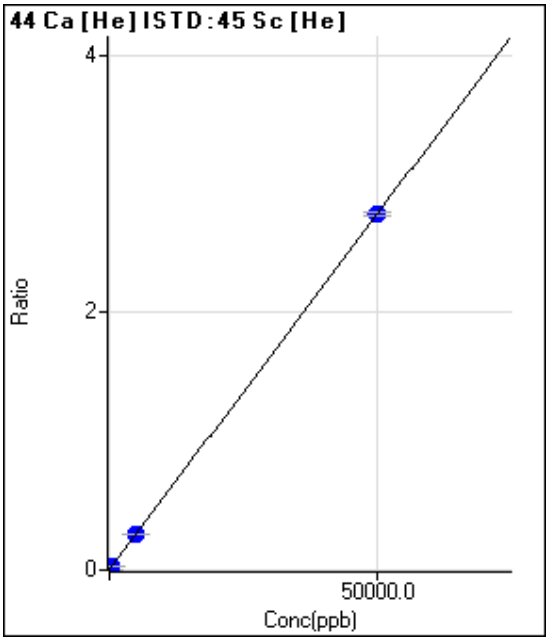
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14327.31	0.1459	P	3.2
2	☐	10.000	9.705	15468.49	0.1580	P	3.1
3	☐	100.000	97.908	26260.57	0.2685	P	1.0
4	☐	1000.000	1016.696	138060.52	1.4191	P	0.5
5	☐	10000.000	9998.352	1253593.52	12.6671	P	1.0

y = 0.0013 * x + 0.1459
R = 1.0000
DL = 11.27
BEC = 116.5

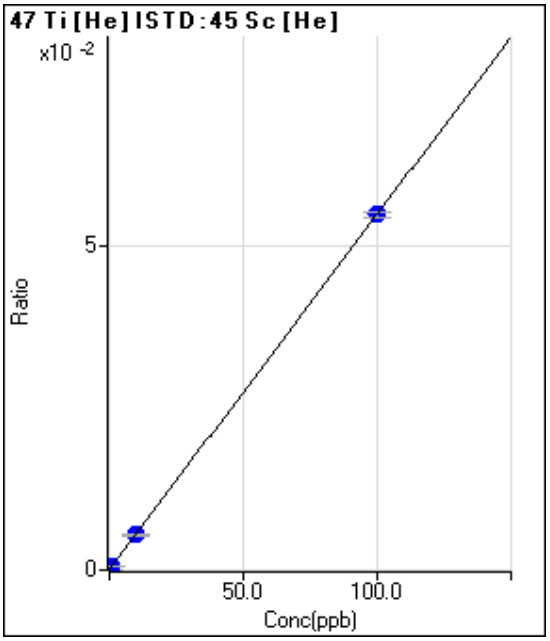
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	313.34	0.0032	P	15.7
2	☐	50.000	51.199	588.35	0.0060	P	13.2
3	☐	500.000	519.895	3117.04	0.0319	P	3.7
4	☐	5000.000	5043.064	27382.26	0.2814	P	1.0
5	☐	50000.000	49995.493	273322.95	2.7618	P	1.0

y = 5.5177E-005 * x + 0.0032
R = 1.0000
DL = 27.11
BEC = 57.73

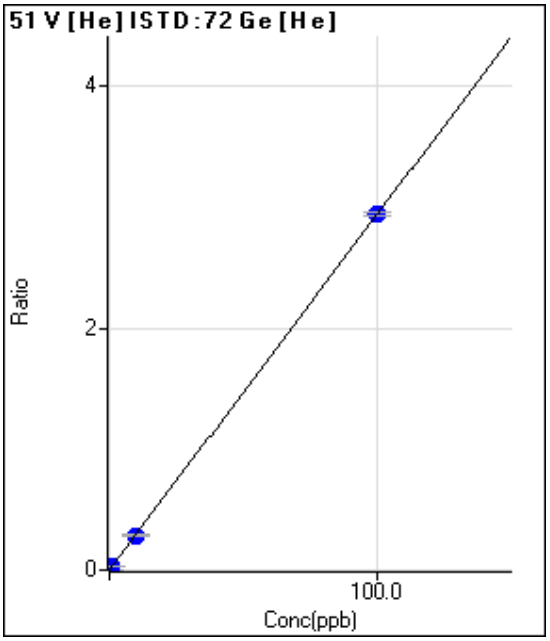
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6.67	0.0001	P	9.3
2	☐	0.100	0.081	11.00	0.0001	P	17.6
3	☐	1.000	1.032	62.00	0.0006	P	10.0
4	☐	10.000	9.858	532.34	0.0055	P	4.5
5	☐	100.000	100.014	5431.67	0.0549	P	1.6

y = 5.4811E-004 * x + 6.7893E-005
R = 1.0000
DL = 0.03446
BEC = 0.1239

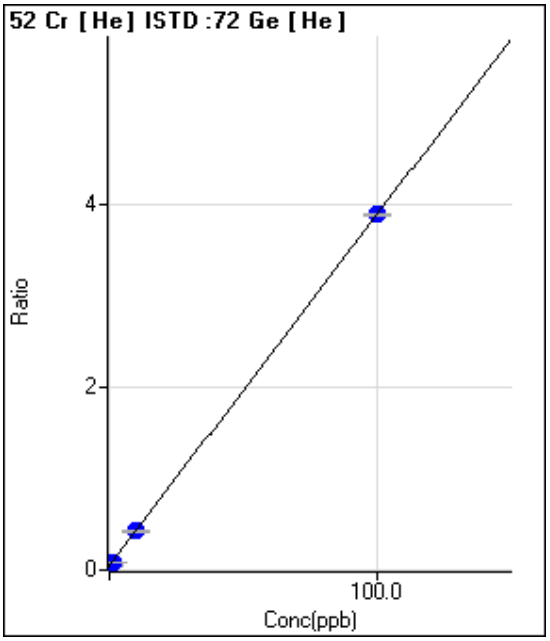
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	132.22	0.0017	P	3.6
2	☐	0.100	0.087	328.89	0.0043	P	3.2
3	☐	1.000	0.978	2362.44	0.0305	P	2.3
4	☐	10.000	9.697	22580.71	0.2865	P	2.5
5	☐	100.000	100.031	232618.19	2.9394	P	1.2

y = 0.0294 * x + 0.0017
R = 1.0000
DL = 0.006292
BEC = 0.05869

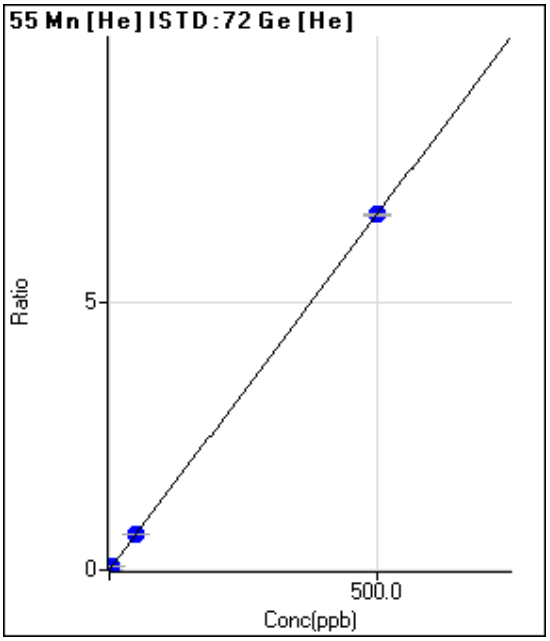
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	3830.53	0.0500	P	6.1
2	☐	0.100	0.097	4125.06	0.0537	P	4.2
3	☐	1.000	0.973	6781.61	0.0874	P	3.0
4	☐	10.000	9.877	33897.83	0.4301	P	3.4
5	☐	100.000	100.013	308570.40	3.8992	P	0.2

y = 0.0385 * x + 0.0500
R = 1.0000
DL = 0.2369
BEC = 1.299

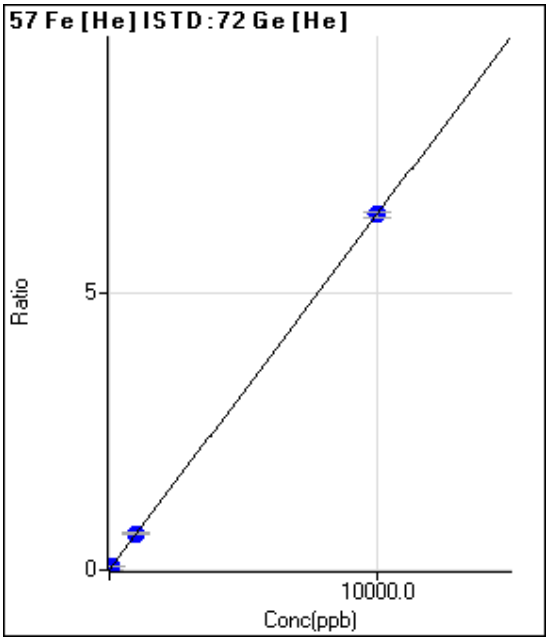
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	178.89	0.0023	P	8.8
2	☐	0.500	0.522	711.14	0.0093	P	14.8
3	☐	5.000	5.090	5425.50	0.0699	P	3.5
4	☐	50.000	50.377	52927.13	0.6716	P	3.6
5	☐	500.000	499.961	525806.18	6.6442	P	0.4

y = 0.0133 * x + 0.0023
R = 1.0000
DL = 0.04649
BEC = 0.1757

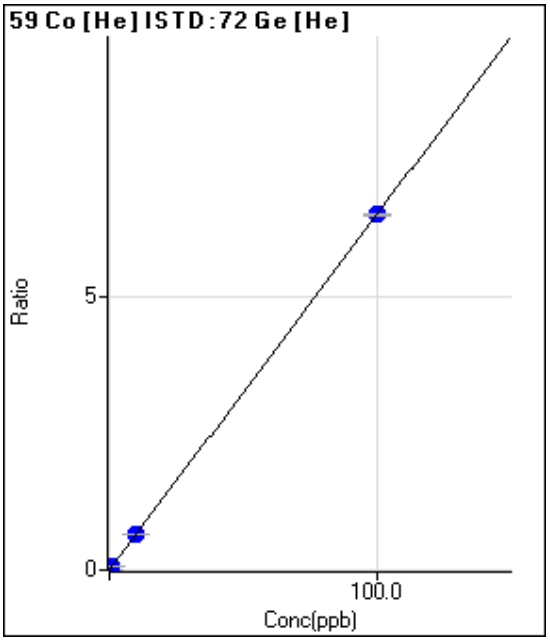
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	413.35	0.0054	P	4.1
2	☐	10.000	9.732	893.39	0.0116	P	19.5
3	☐	100.000	98.608	5331.15	0.0687	P	4.0
4	☐	1000.000	1012.256	51675.39	0.6557	P	2.9
5	☐	10000.000	9998.789	508752.53	6.4288	P	1.6

y = 6.4242E-004 * x + 0.0054
R = 1.0000
DL = 1.032
BEC = 8.392

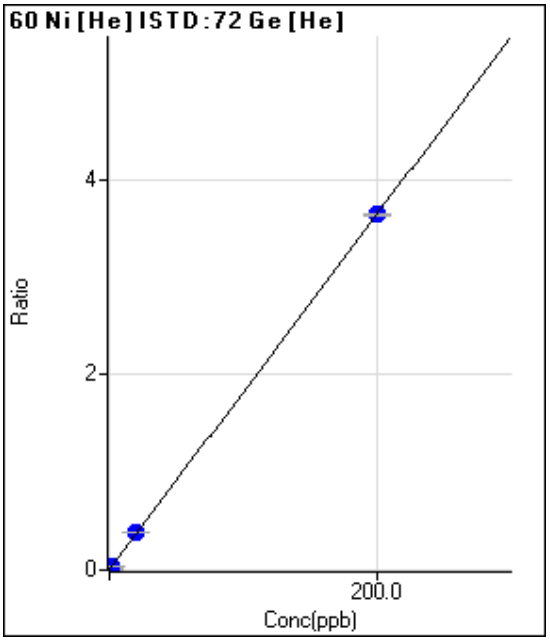
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	92.22	0.0012	P	27.4
2	☐	0.100	0.110	641.14	0.0084	P	7.7
3	☐	1.000	1.002	5164.30	0.0666	P	2.5
4	☐	10.000	10.125	52169.17	0.6619	P	2.4
5	☐	100.000	99.987	516458.10	6.5261	P	0.9

y = 0.0653 * x + 0.0012
R = 1.0000
DL = 0.01508
BEC = 0.01837

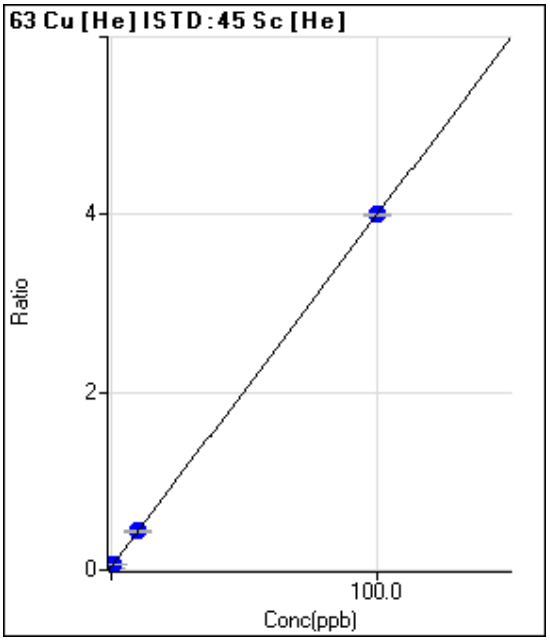
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	361.12	0.0047	P	7.4
2	☐	0.200	0.253	714.47	0.0093	P	10.0
3	☐	2.000	2.147	3391.54	0.0437	P	1.9
4	☐	20.000	20.712	30038.64	0.3811	P	1.0
5	☐	200.000	199.927	287909.88	3.6381	P	0.2

y = 0.0182 * x + 0.0047
R = 1.0000
DL = 0.05756
BEC = 0.2593

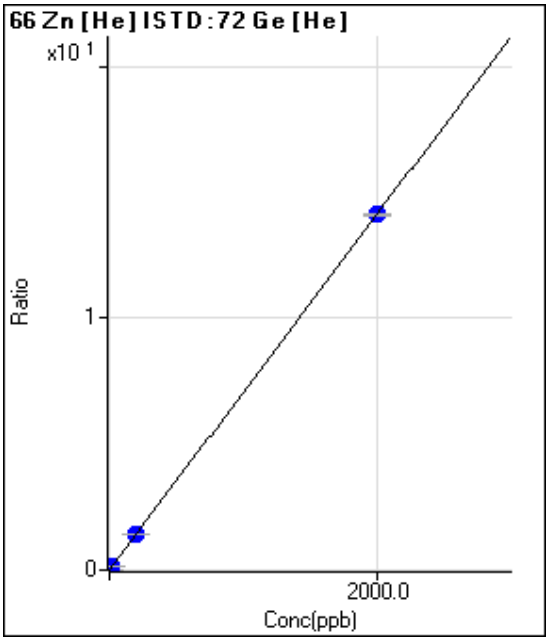
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2140.18	0.0218	P	1.3
2	☐	0.100	0.063	2380.22	0.0243	P	3.3
3	☐	1.000	1.035	6160.25	0.0630	P	2.1
4	☐	10.000	10.396	42380.25	0.4356	P	1.1
5	☐	100.000	99.960	395955.32	4.0008	P	0.4

y = 0.0398 * x + 0.0218
R = 1.0000
DL = 0.02197
BEC = 0.5473

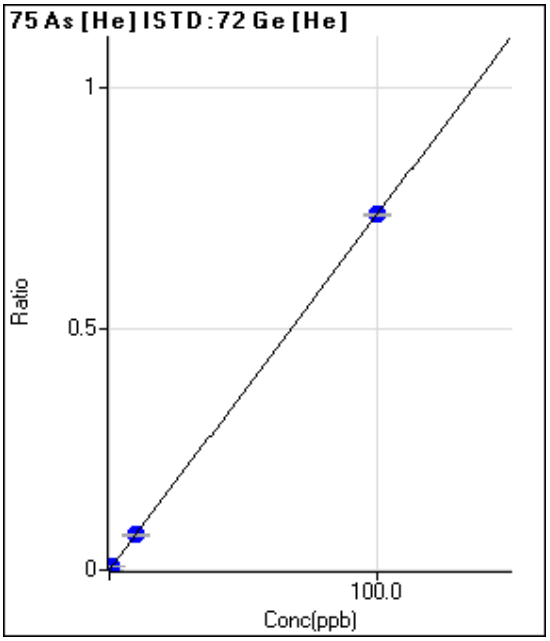
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	202.22	0.0026	P	16.6
2	☐	2.000	2.129	1357.86	0.0177	P	4.1
3	☐	20.000	20.803	11603.57	0.1496	P	4.3
4	☐	200.000	204.251	113944.15	1.4457	P	1.3
5	☐	2000.000	1999.567	1118208.39	14.1299	P	0.6

y = 0.0071 * x + 0.0026
R = 1.0000
DL = 0.1868
BEC = 0.3739

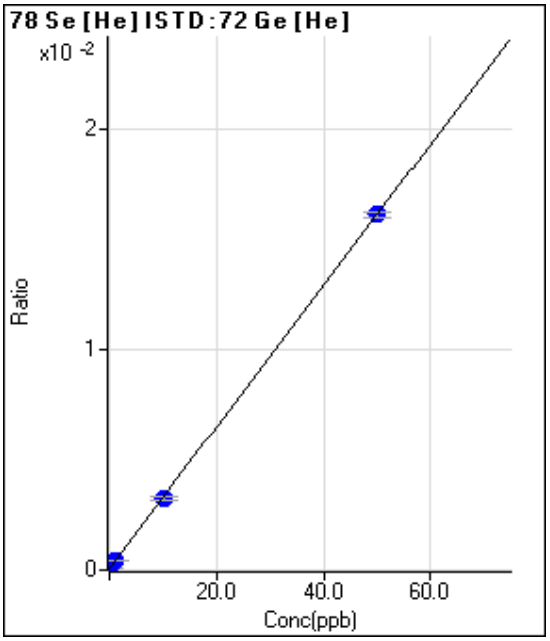
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	24.67	0.0003	P	13.4
2	☐	0.100	0.098	80.00	0.0010	P	11.2
3	☐	1.000	0.988	590.35	0.0076	P	7.7
4	☐	10.000	9.798	5722.14	0.0726	P	0.9
5	☐	100.000	100.020	58420.33	0.7382	P	0.8

y = 0.0074 * x + 3.2112E-004
R = 1.0000
DL = 0.01747
BEC = 0.04353

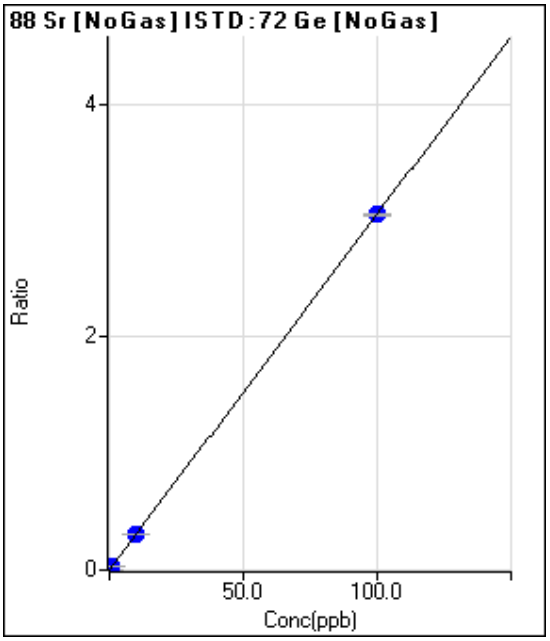
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6.74	0.0001	P	12.5
2	☐	0.100	0.087	8.91	0.0001	P	13.1
3	☐	1.000	1.000	31.66	0.0004	P	10.3
4	☐	10.000	9.945	257.99	0.0033	P	5.1
5	☐	50.000	50.011	1274.53	0.0161	P	1.6

y = 3.2027E-004 * x + 8.7999E-005
R = 1.0000
DL = 0.1029
BEC = 0.2748

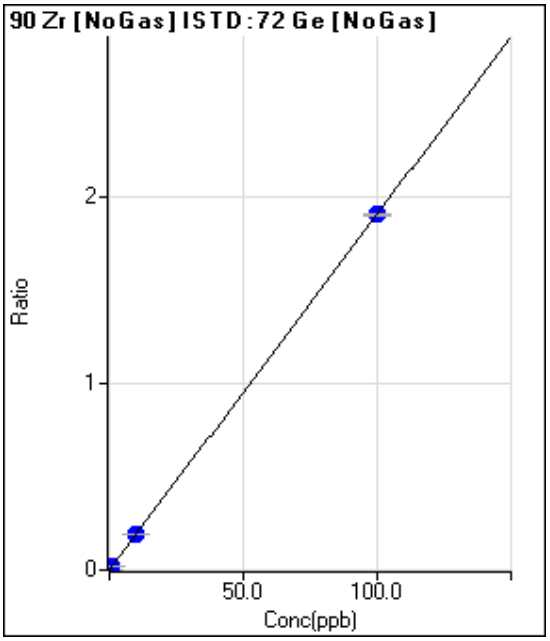
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	503.36	0.0004	P	8.0
2	☐	0.100	0.105	4154.08	0.0036	P	3.0
3	☐	1.000	1.016	36012.75	0.0314	P	0.6
4	☐	10.000	10.184	360786.54	0.3112	P	1.4
5	☐	100.000	99.981	3487640.36	3.0511	P	0.4

y = 0.0305 * x + 4.3522E-004
R = 1.0000
DL = 0.003432
BEC = 0.01426

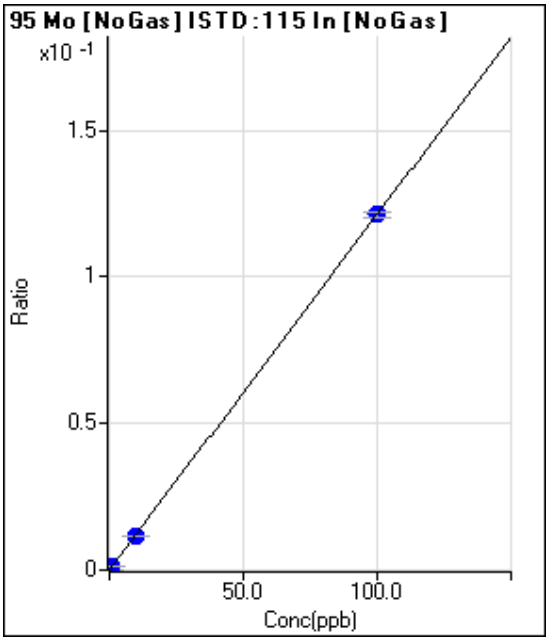
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	568.91	0.0005	P	3.0
2	☐	0.100	0.074	2182.44	0.0019	P	4.7
3	☐	1.000	0.833	18790.23	0.0164	P	2.5
4	☐	10.000	9.962	221049.46	0.1907	P	3.5
5	☐	100.000	100.005	2183299.15	1.9100	P	0.5

y = 0.0191 * x + 4.9197E-004
R = 1.0000
DL = 0.002283
BEC = 0.02577

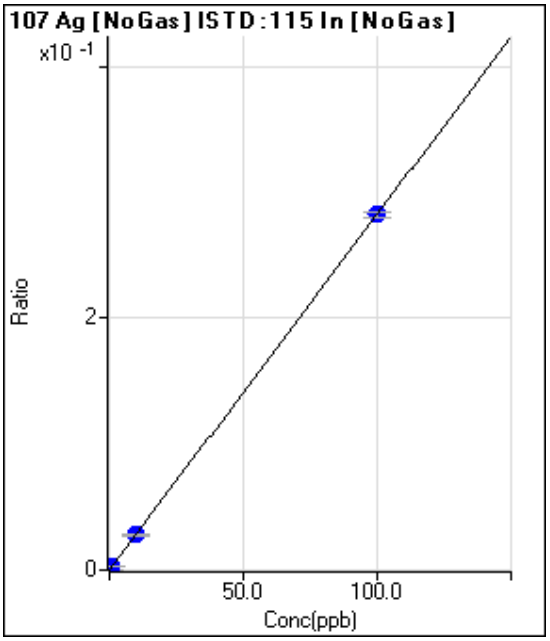
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	97.78	0.0000	P	4.5
2	☐	0.100	0.095	692.25	0.0001	P	7.8
3	☐	1.000	0.941	6135.82	0.0012	P	1.3
4	☐	10.000	9.410	61132.48	0.0114	P	1.4
5	☐	100.000	100.060	613226.43	0.1213	P	1.6

y = 0.0012 * x + 1.8674E-005
R = 1.0000
DL = 0.002067
BEC = 0.01541

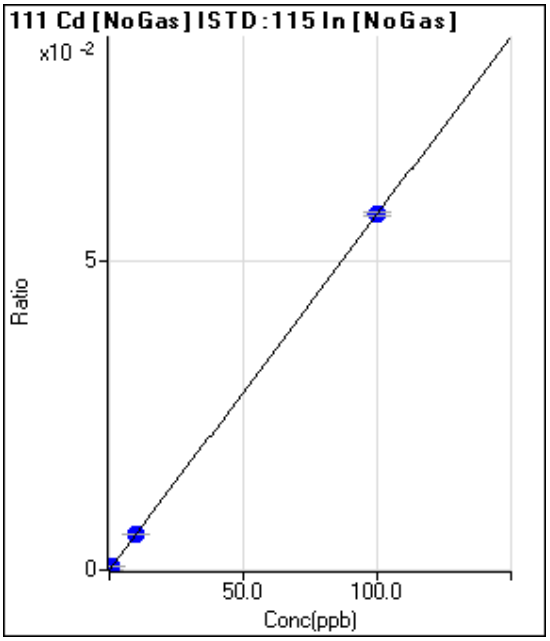
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	35.55	0.0000	P	18.1
2	☐	0.100	0.095	1430.09	0.0003	P	1.7
3	☐	1.000	0.980	14688.87	0.0028	P	3.1
4	☐	10.000	9.858	148840.78	0.0278	P	2.5
5	☐	100.000	100.014	1426643.97	0.2822	P	1.9

y = 0.0028 * x + 6.7772E-006
R = 1.0000
DL = 0.001303
BEC = 0.002402

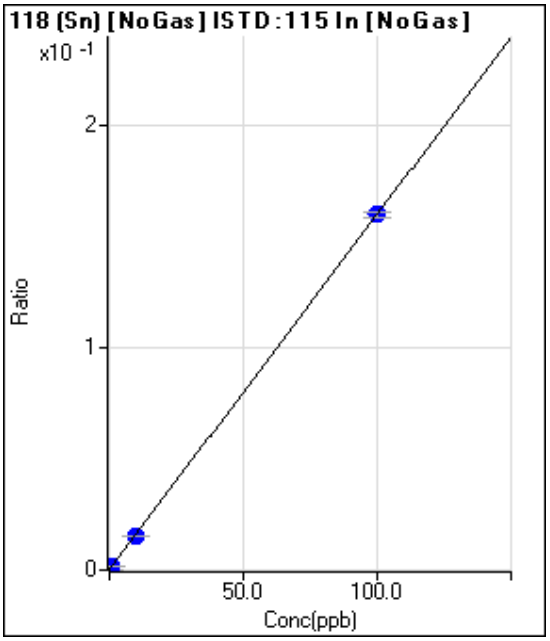
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	15.55	0.0000	P	43.4
2	☐	0.100	0.110	342.23	0.0001	P	4.9
3	☐	1.000	1.008	3077.04	0.0006	P	2.5
4	☐	10.000	10.013	30747.06	0.0057	P	1.2
5	☐	100.000	99.999	290027.74	0.0574	P	1.1

y = 5.7362E-004 * x + 2.9620E-006
R = 1.0000
DL = 0.006726
BEC = 0.005164

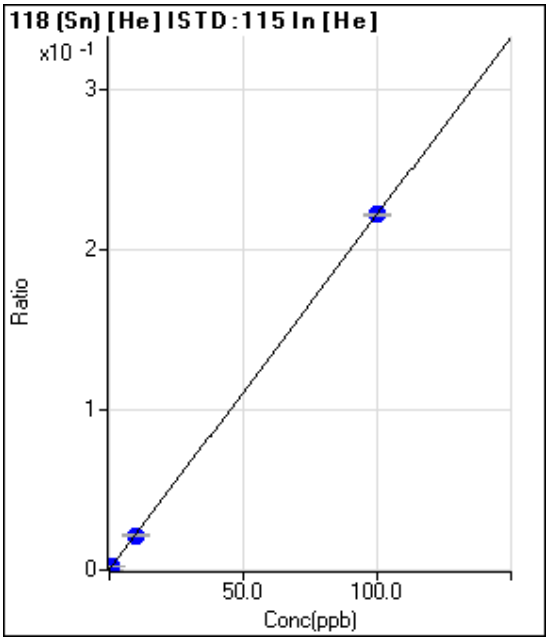
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	816.70	0.0002	P	5.4
2	☐	0.100	0.115	1765.69	0.0003	P	7.3
3	☐	1.000	1.052	9710.12	0.0018	P	3.4
4	☐	10.000	9.637	83074.56	0.0155	P	1.5
5	☐	100.000	100.036	807048.01	0.1596	P	1.4

y = 0.0016 * x + 1.5602E-004
R = 1.0000
DL = 0.01582
BEC = 0.09786

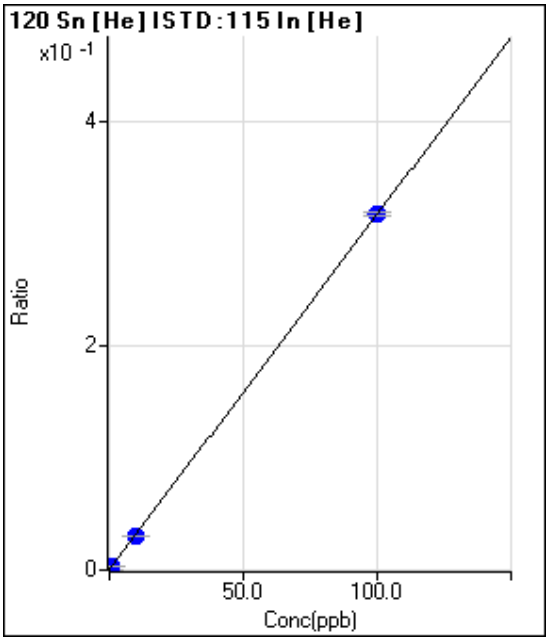
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	110.00	0.0002	P	18.8
2	☐	0.100	0.114	243.34	0.0005	P	5.8
3	☐	1.000	1.019	1320.08	0.0025	P	6.1
4	☐	10.000	9.643	11835.11	0.0216	P	3.0
5	☐	100.000	100.035	118384.71	0.2217	P	0.5

y = 0.0022 * x + 2.0865E-004
R = 1.0000
DL = 0.05306
BEC = 0.09426

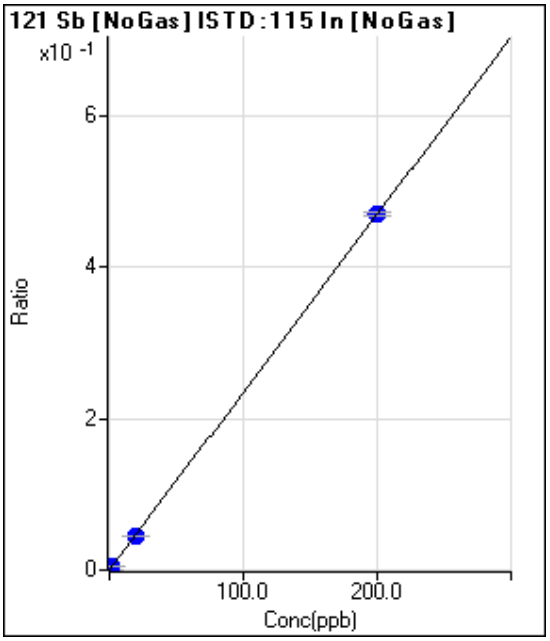
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	143.34	0.0003	P	15.5
2	☐	0.100	0.108	324.45	0.0006	P	8.2
3	☐	1.000	1.042	1915.89	0.0036	P	12.9
4	☐	10.000	9.616	16893.59	0.0308	P	1.5
5	☐	100.000	100.038	169573.26	0.3175	P	1.2

y = 0.0032 * x + 2.7152E-004
R = 1.0000
DL = 0.03975
BEC = 0.08562

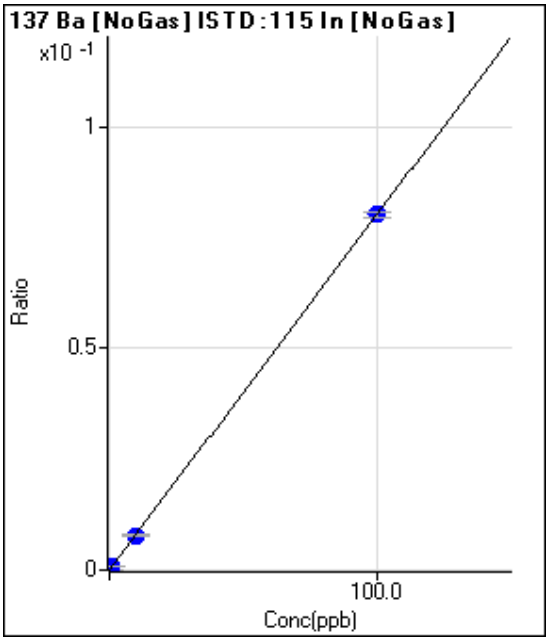
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	384.45	0.0001	P	8.4
2	☐	0.200	0.181	2595.83	0.0005	P	1.3
3	☐	2.000	1.909	24133.14	0.0046	P	1.1
4	☐	20.000	19.172	241365.75	0.0451	P	0.6
5	☐	200.000	200.084	2376131.99	0.4700	P	1.1

y = 0.0023 * x + 7.3350E-005
R = 1.0000
DL = 0.007905
BEC = 0.03123

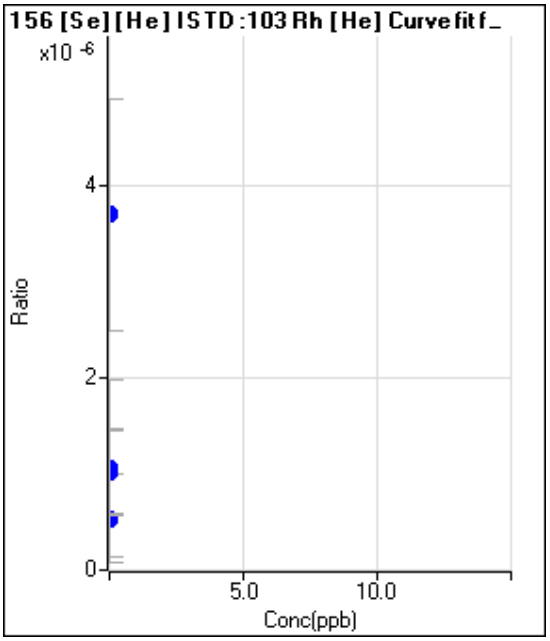
Weight: <None>
Min Conc: <None>



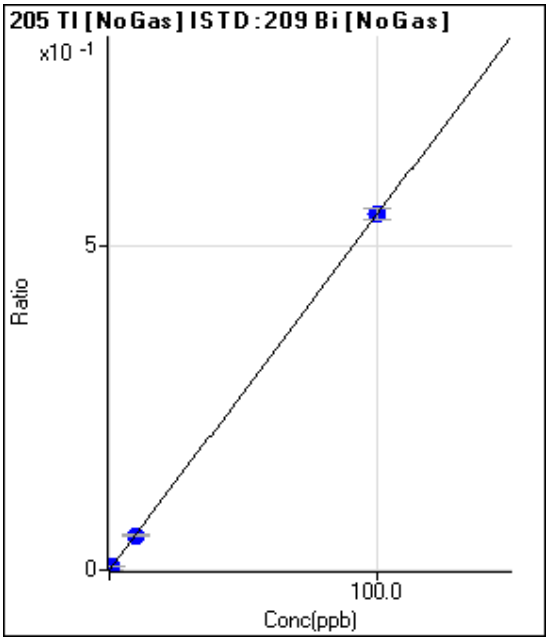
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	151.11	0.0000	P	24.6
2	☐	0.100	0.088	515.57	0.0001	P	1.5
3	☐	1.000	0.958	4222.92	0.0008	P	2.5
4	☐	10.000	9.707	41818.68	0.0078	P	2.5
5	☐	100.000	100.030	405772.78	0.0803	P	1.4

y = 8.0200E-004 * x + 2.8906E-005
R = 1.0000
DL = 0.02664
BEC = 0.03604

Weight: <None>
Min Conc: <None>



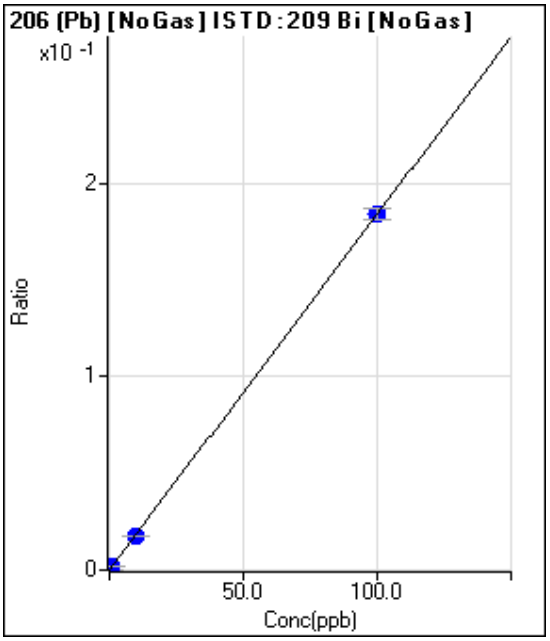
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000		2.22	0.0000	P	173.2
2	☐	0.000		1.11	0.0000	P	173.2
3	☐	0.000		2.22	0.0000	P	86.6
4	☐	0.000		2.22	0.0000	P	86.6
5	☐	0.000		7.78	0.0000	P	65.2



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	146.68	0.0001	P	3.3
2	☐	0.100	0.113	1563.48	0.0007	P	4.9
3	☐	1.000	0.958	12456.33	0.0053	P	0.4
4	☐	10.000	9.794	128810.08	0.0538	P	0.5
5	☐	100.000	100.021	1221421.86	0.5488	P	3.1

y = 0.0055 * x + 6.2762E-005
R = 1.0000
DL = 0.001142
BEC = 0.01144

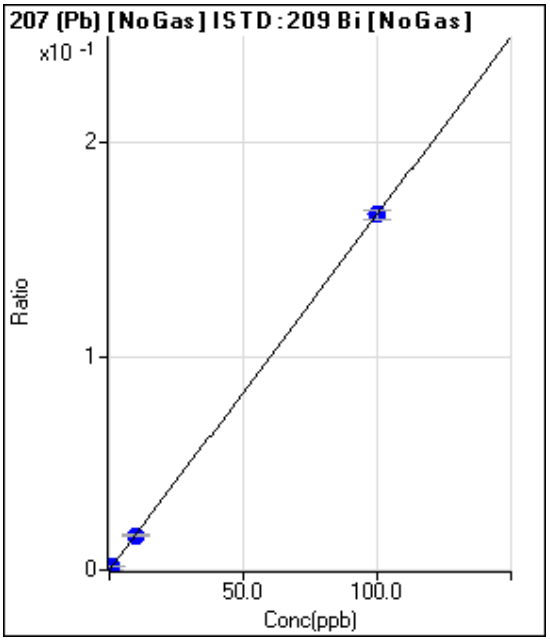
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50.00	0.0000	P	53.2
2	☐	0.100	0.091	433.36	0.0002	P	15.6
3	☐	1.000	1.002	4360.87	0.0019	P	4.7
4	☐	10.000	9.685	42646.88	0.0178	P	2.2
5	☐	100.000	100.032	409021.86	0.1838	P	3.3

y = 0.0018 * x + 2.1427E-005
R = 1.0000
DL = 0.01861
BEC = 0.01166

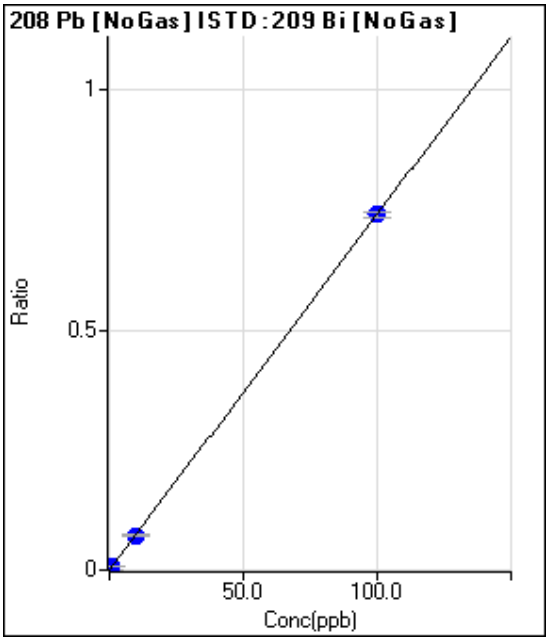
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	53.33	0.0000	P	22.4
2	☐	0.100	0.106	456.69	0.0002	P	6.1
3	☐	1.000	1.000	3950.76	0.0017	P	5.7
4	☐	10.000	9.734	38818.41	0.0162	P	2.6
5	☐	100.000	100.027	370374.68	0.1664	P	2.3

y = 0.0017 * x + 2.2855E-005
R = 1.0000
DL = 0.009237
BEC = 0.01374

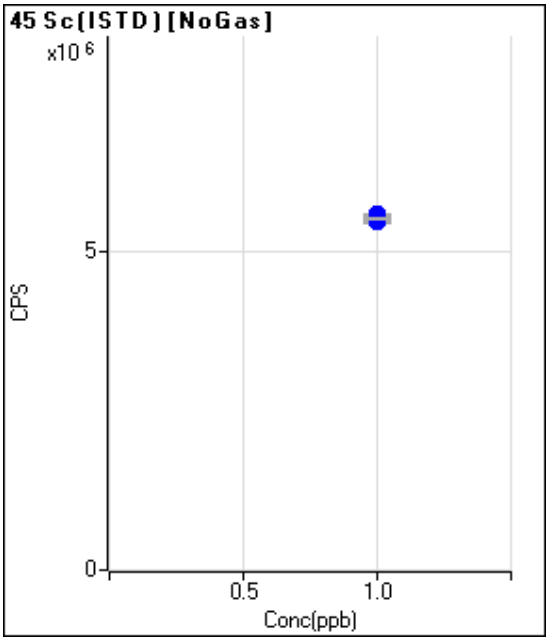
Weight: <None>
Min Conc: <None>



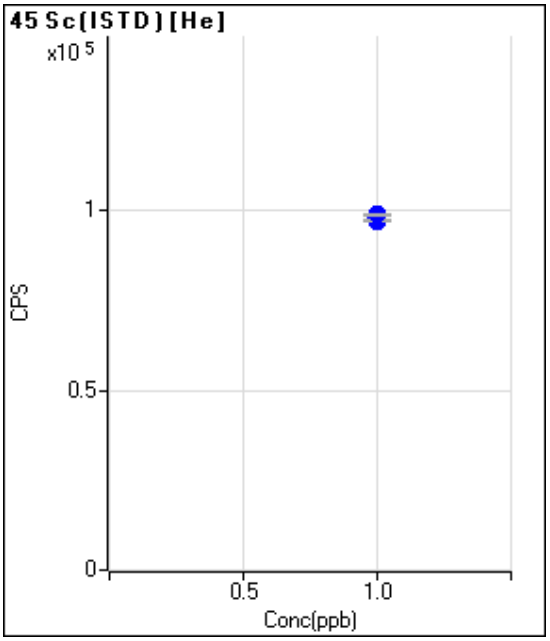
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	193.33	0.0001	P	15.5
2	☐	0.100	0.105	1976.80	0.0009	P	8.6
3	☐	1.000	1.012	17742.02	0.0076	P	3.8
4	☐	10.000	9.788	173774.73	0.0726	P	1.6
5	☐	100.000	100.021	1649276.53	0.7410	P	1.7

y = 0.0074 * x + 8.2703E-005
R = 1.0000
DL = 0.005184
BEC = 0.01117

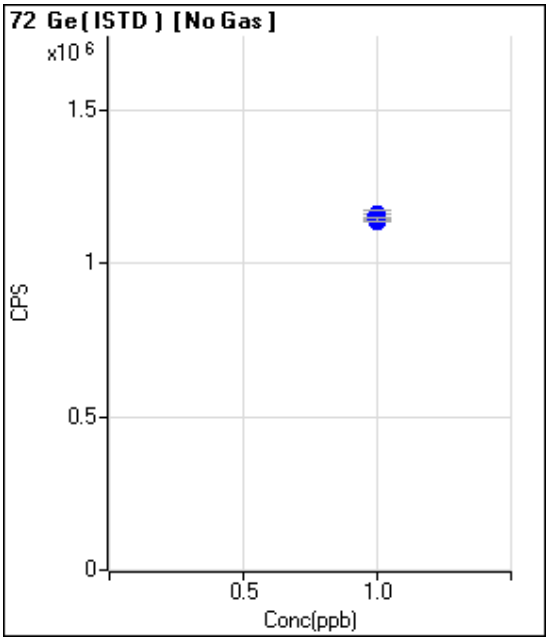
Weight: <None>
Min Conc: <None>



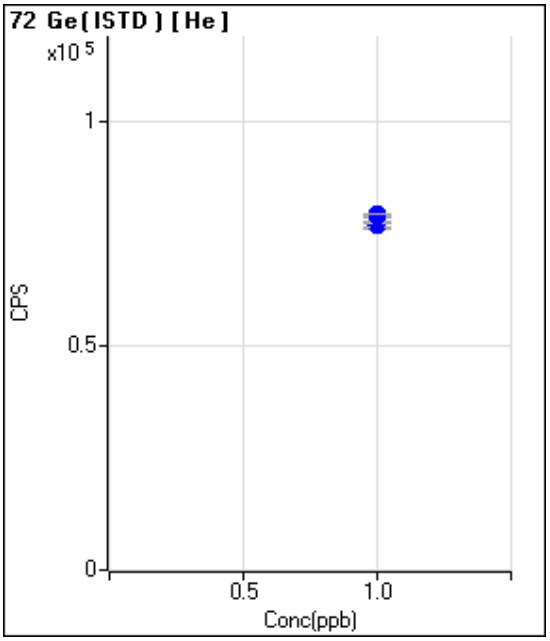
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5538601.17		P	0.2
2	☐	1.000		5474951.31		P	0.7
3	☐	1.000		5517155.75		P	0.2
4	☐	1.000		5592485.89		P	0.9
5	☐	1.000		5532100.62		P	0.6



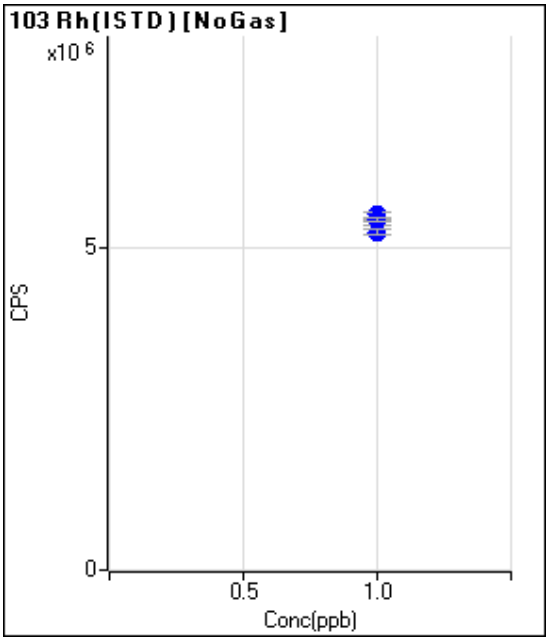
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		98241.74		P	1.9
2	☐	1.000		97892.55		P	1.0
3	☐	1.000		97801.35		P	1.2
4	☐	1.000		97288.10		P	0.4
5	☐	1.000		98969.38		P	0.7



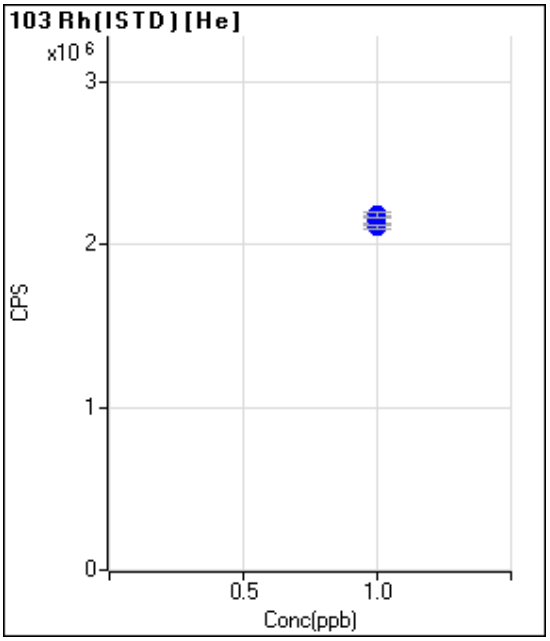
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1156430.34		P	1.1
2	☐	1.000		1140126.13		P	0.6
3	☐	1.000		1145687.21		P	0.9
4	☐	1.000		1159649.57		P	2.1
5	☐	1.000		1143058.67		P	1.1



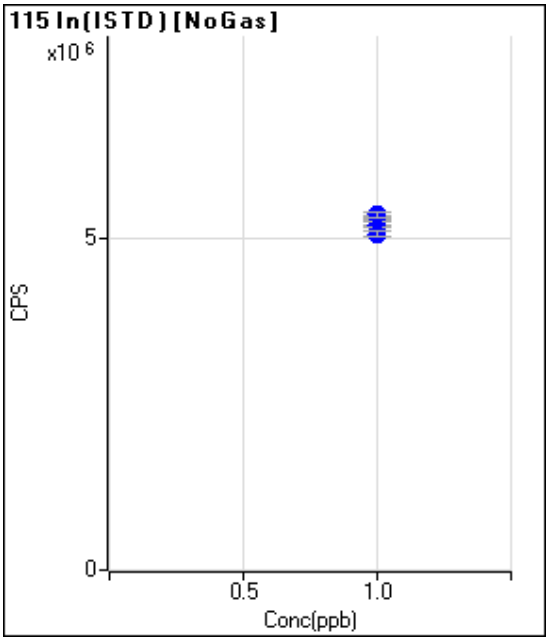
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		76690.47		P	2.0
2	☐	1.000		76766.20		P	1.1
3	☐	1.000		77566.85		P	0.5
4	☐	1.000		78818.08		P	0.4
5	☐	1.000		79137.66		P	0.2



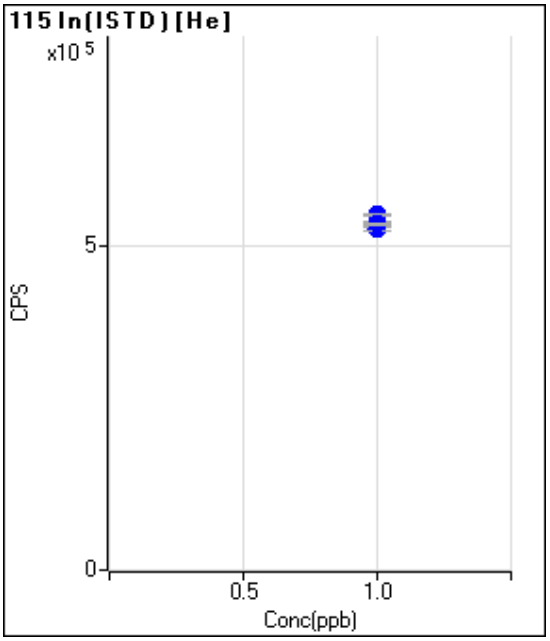
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5515557.00		P	1.6
2	☐	1.000		5403376.59		P	2.1
3	☐	1.000		5428432.01		P	0.4
4	☐	1.000		5430987.70		P	1.3
5	☐	1.000		5246844.79		P	1.3



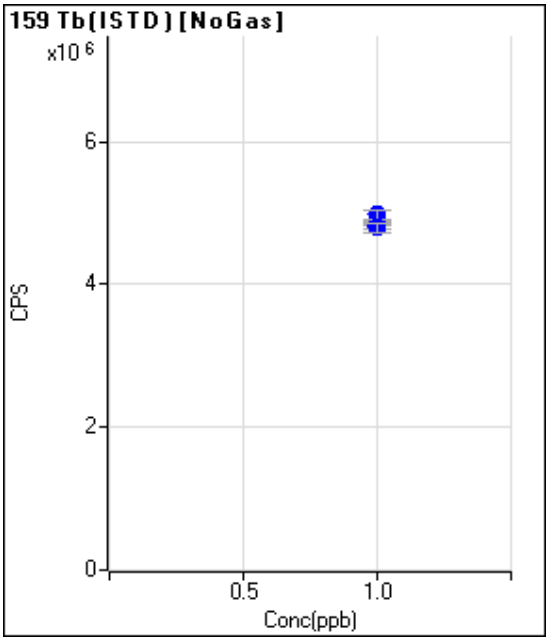
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2150131.65		P	1.7
2	☐	1.000		2143210.47		P	2.2
3	☐	1.000		2173341.79		P	0.6
4	☐	1.000		2182408.94		P	1.5
5	☐	1.000		2104759.01		P	0.6



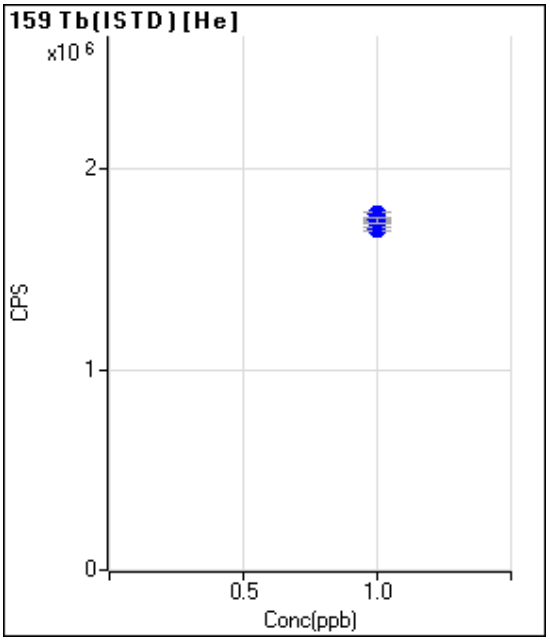
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5237310.62		P	1.5
2	☐	1.000		5197528.90		P	1.5
3	☐	1.000		5295491.65		P	1.8
4	☐	1.000		5351562.67		P	1.9
5	☐	1.000		5056195.22		P	1.7



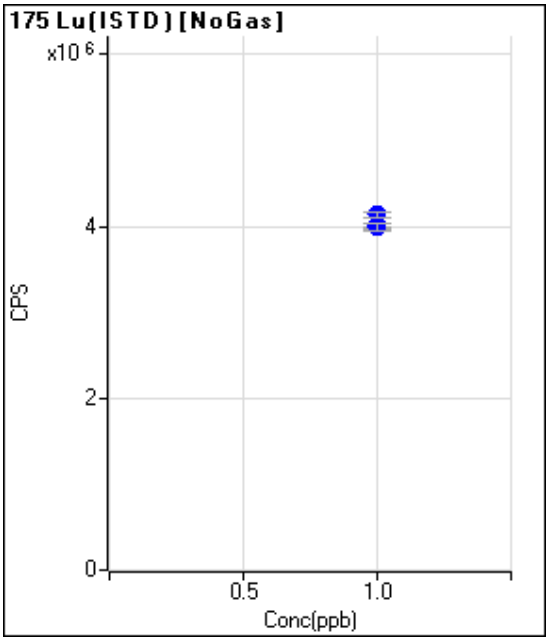
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		527518.90		P	1.2
2	☐	1.000		527945.46		P	1.2
3	☐	1.000		535630.39		P	0.6
4	☐	1.000		549107.37		P	0.5
5	☐	1.000		534077.21		P	0.9



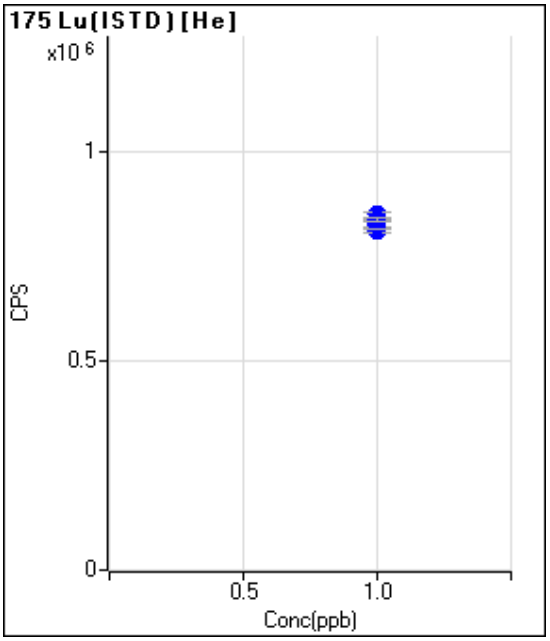
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		4855676.28		P	1.3
2	☐	1.000		4848704.82		P	1.0
3	☐	1.000		4824778.06		P	1.7
4	☐	1.000		4978849.09		P	2.4
5	☐	1.000		4794393.99		P	2.9



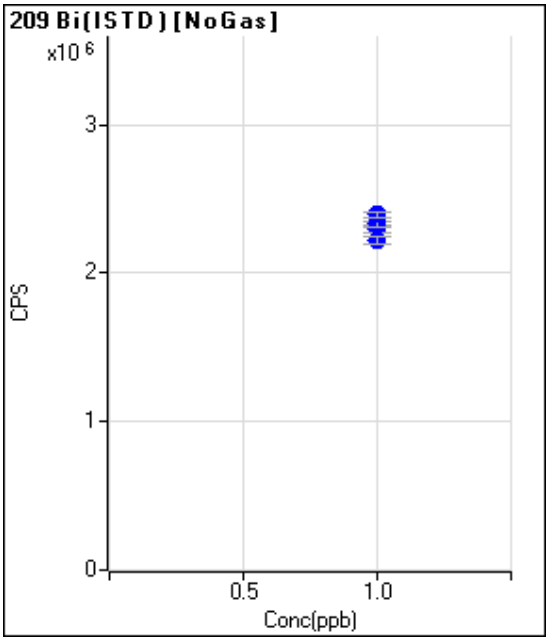
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1707326.38		P	1.1
2	☐	1.000		1751367.73		P	0.8
3	☐	1.000		1731710.76		P	2.1
4	☐	1.000		1775623.10		P	1.8
5	☐	1.000		1749214.30		P	1.6



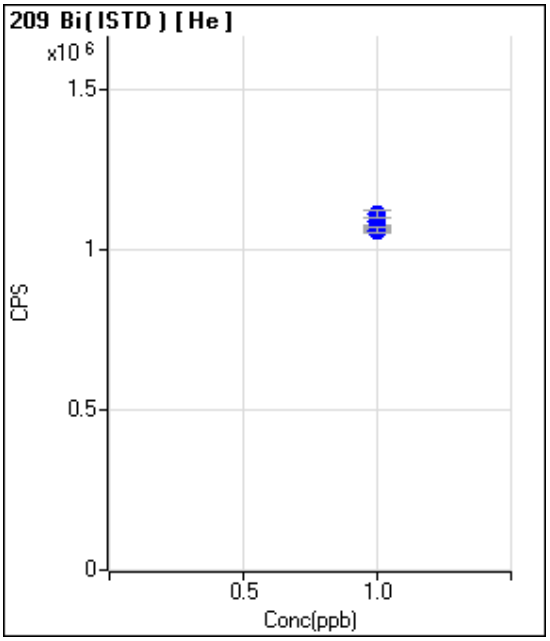
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		4014375.88		P	1.5
2	☐	1.000		3993898.27		P	1.6
3	☐	1.000		4001544.11		P	2.2
4	☐	1.000		4138225.56		P	1.4
5	☐	1.000		3994969.11		P	2.3



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		811094.68		P	1.5
2	☐	1.000		828033.95		P	1.4
3	☐	1.000		825994.62		P	2.6
4	☐	1.000		850725.12		P	1.5
5	☐	1.000		839746.89		P	1.1



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2336732.10		P	0.9
2	☐	1.000		2294994.76		P	1.8
3	☐	1.000		2340853.77		P	2.4
4	☐	1.000		2394589.96		P	1.6
5	☐	1.000		2226441.27		P	2.2



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1066636.57		P	1.6
2	☐	1.000		1058172.17		P	0.8
3	☐	1.000		1085604.54		P	2.7
4	☐	1.000		1109411.05		P	2.2
5	☐	1.000		1059447.56		P	1.8

GCAL ANALYTICAL LABORATORIES, LLC

BATCH COVERSHEET

ANALYST AWG

DATE 08/28/18

ICP/MS Metals Analysis

HBN **642829**

STANDARDS

ICAL Standard	316-66-17
ICV Standard	316-66-16
ICSA Standard	316-66-18
ICSAB Standard	316-66-15
Internal Standard	316-66-12
Tune	316-63-4
P/A	316-56-9

ADDITIONAL STANDARDS

LDR Standard	316-66-19
	ICVB 316-66-13

ACID MATRIX

2% HNO3 \ 0.5% HCL Solution	317-49-10
5% HNO3 \ 2% HCL Solution	317-49-12

ICPMS DATA FILE

Reference File: 2180828B_MS2

GCAL QC LIMITS

200.8 Correlation Coefficient (R) =0.998

6020B Correlation Coefficient (R) =0.995

ICV Recovery 90-110%

LLCCV Recovery 80-120%

ICSA \ ICSAB Recovery 80-120%

CCV Recovery 90-110%

Data File	Acq. Date-Time	Type	Sample Name	Dilution	Vial Number	Comment
009SMPL_2180828A_MS2.D	8/28/2018 10:20	Sample	Blank	1	1107	
010CALB_2180828A_MS2.D	8/28/2018 10:24	CalBlk	1300	1	1107	
011CALS_2180828A_MS2.D	8/28/2018 10:28	CalStd	1302	1	1105	
012CALS_2180828A_MS2.D	8/28/2018 10:31	CalStd	1304	1	1103	
013CALS_2180828A_MS2.D	8/28/2018 10:35	CalStd	1305	1	1102	
014CALS_2180828A_MS2.D	8/28/2018 10:39	CalStd	1306	1	1101	
015_ICV_2180828A_MS2.D	8/28/2018 10:42	ICV	1600	1	1201	
016_ICV_2180828A_MS2.D	8/28/2018 10:46	ICV	1600 B	1	1203	
017_ICB_2180828A_MS2.D	8/28/2018 10:50	ICB	1700	1	1107	
0180.1_2180828A_MS2.D	8/28/2018 10:53	LLCCV0.1	1804	1	1105	
1810.5_2180828A_MS2.D	8/28/2018 10:57	LLCCV0.5	1804	1	1104	
1811CCV1_2180828A_MS2.D	8/28/2018 11:00	LLCCV1	1803	1	1103	
1812ICSA_2180828A_MS2.D	8/28/2018 11:04	ICSA	2000	1	1205	
1813ICSB_2180828A_MS2.D	8/28/2018 11:07	ICSB	2100	1	1206	
1814_QC1_2180828A_MS2.D	8/28/2018 11:11	QC1	LDR	1	1204	
1815SMPL_2180828A_MS2.D	8/28/2018 11:14	Sample	2500	1	3	
1816SMPL_2180828A_MS2.D	8/28/2018 11:20	Sample	1843437	1	2101	
1817SMPL_2180828A_MS2.D	8/28/2018 11:24	LCS6020	1843438	1	2102	
1818SMPL_2180828A_MS2.D	8/28/2018 11:27	LCS6020	1843439	1	2103	
1819SMPL_2180828A_MS2.D	8/28/2018 11:31	MBWATER	1843437	1	2101	
1820SMPL_2180828A_MS2.D	8/28/2018 11:34	Sample	21808271301	10	2104	
1821SMPL_2180828A_MS2.D	8/28/2018 11:38	Sample	21808271401	10	2105	
1822SMPL_2180828A_MS2.D	8/28/2018 11:41	MBWATER	1843088	1	2111	
1823SMPL_2180828A_MS2.D	8/28/2018 11:45	LCS6020	1843089	1	2112	
1824SMPL_2180828A_MS2.D	8/28/2018 11:49	AllRef	21808246101	100	2304	
1825SMPL_2180828A_MS2.D	8/28/2018 11:52	MS10XP	1843294	100	2305	
1826SMPL_2180828A_MS2.D	8/28/2018 11:56	MSD10XP	1843295	100	2306	
1827SMPL_2180828A_MS2.D	8/28/2018 11:59	PDS	1843725	100	2307	
1828SMPL_2180828A_MS2.D	8/28/2018 12:03	Sample	1843726	500	2308	
1829SMPL_2180828A_MS2.D	8/28/2018 12:06	Sample	21808250901	10	2309	
1830SMPL_2180828A_MS2.D	8/28/2018 12:10	Sample	21808271301	5	2505	
1831SMPL_2180828A_MS2.D	8/28/2018 12:13	Sample	21808271401	5	2506	
1832SMPL_2180828A_MS2.D	8/28/2018 12:17	Sample	TBLK	100	2310	
1833SMPL_2180828A_MS2.D	8/28/2018 12:20	Sample	TBLK	100	2311	
1834_CCV_2180828A_MS2.D	8/28/2018 12:40	CCV	1800	1	1102	
1835_CCB_2180828A_MS2.D	8/28/2018 12:43	CCB	1900	1	1107	
1836SMPL_2180828A_MS2.D	8/28/2018 12:47	MBSOIL	1842310	40	2312	
1837SMPL_2180828A_MS2.D	8/28/2018 12:50	LCS6020	1842311	40	2401	
1838SMPL_2180828A_MS2.D	8/28/2018 12:54	Sample	21808223401	3759.3985	2402	
1839SMPL_2180828A_MS2.D	8/28/2018 12:57	Sample	21808223402	4000	2403	
1840SMPL_2180828A_MS2.D	8/28/2018 13:01	Sample	21808223403	3424.6575	2404	
1841SMPL_2180828A_MS2.D	8/28/2018 13:05	Sample	21808181301	370.3704	2405	
1842SMPL_2180828A_MS2.D	8/28/2018 13:08	Sample	21808181308	390.625	2406	
1843SMPL_2180828A_MS2.D	8/28/2018 13:12	AllRef	21808181401	400	2407	
1844SMPL_2180828A_MS2.D	8/28/2018 13:15	MSSOIL	21808181402	400	2408	
1845SMPL_2180828A_MS2.D	8/28/2018 13:19	MSDSOIL	21808181403	400	2409	
1846SMPL_2180828A_MS2.D	8/28/2018 13:22	PDS	1843727	400	2410	
1847SMPL_2180828A_MS2.D	8/28/2018 13:26	Sample	1843728	2000	2411	

1848SMPL_2180828A_MS2.D	8/28/2018 13:29	Sample	21808181404	381.6794	2412	
1849SMPL_2180828A_MS2.D	8/28/2018 13:33	Sample	21808181405	357.1429	2501	
1850_CCV_2180828A_MS2.D	8/28/2018 13:37	CCV	1800	1	1102	
1851_CCB_2180828A_MS2.D	8/28/2018 13:40	CCB	1900	1	1107	
1852SMPL_2180828A_MS2.D	8/28/2018 13:44	Sample	21808181406	396.8254	2502	
1853SMPL_2180828A_MS2.D	8/28/2018 13:47	Sample	21808181407	373.1343	2503	
001SMPL_2180828C_MS2.D	8/28/2018 13:55	Sample	21808181307	396.8254	2504	
002_CCV_2180828C_MS2.D	8/28/2018 13:58	CCV	1800	1	1102	
003_CCB_2180828C_MS2.D	8/28/2018 14:02	CCB	1900	1	1107	
004SMPL_2180828C_MS2.D	8/28/2018 14:05	Sample	21808223401	7518.797	2402	
005SMPL_2180828C_MS2.D	8/28/2018 14:09	Sample	21808223402	8000	2403	
006SMPL_2180828C_MS2.D	8/28/2018 14:12	AllRef	21808223401 SPLP	1	3101	
007SMPL_2180828C_MS2.D	8/28/2018 14:16	MS	1842818	1	3102	
008SMPL_2180828C_MS2.D	8/28/2018 14:19	MSD	1842819	1	3103	
009SMPL_2180828C_MS2.D	8/28/2018 14:23	PDS	1843753	1	3104	
010SMPL_2180828C_MS2.D	8/28/2018 14:27	Sample	1843754	5	3105	
011SMPL_2180828C_MS2.D	8/28/2018 14:30	MBSOIL	1843299	40	4106	
012SMPL_2180828C_MS2.D	8/28/2018 14:34	LCS6020	1843300	40	4107	
013SMPL_2180828C_MS2.D	8/28/2018 14:37	AllRef	21808241101	400	4108	
014SMPL_2180828C_MS2.D	8/28/2018 14:41	MSSOIL	1843599	400	4109	
015SMPL_2180828C_MS2.D	8/28/2018 14:44	MSDSOIL	1843600	400	4110	
016SMPL_2180828C_MS2.D	8/28/2018 14:48	PDS	1843761	400	4111	
017SMPL_2180828C_MS2.D	8/28/2018 14:51	Sample	1843762	2000	4112	
018SMPL_2180828C_MS2.D	8/28/2018 14:55	Sample	21808223401	7518.797	2507	
019SMPL_2180828C_MS2.D	8/28/2018 14:59	Sample	21808223402	8000	2508	
020_CCV_2180828C_MS2.D	8/28/2018 15:02	CCV	1800	1	1102	
021_CCB_2180828C_MS2.D	8/28/2018 15:06	CCB	1900	1	1107	
022SMPL_2180828C_MS2.D	8/28/2018 15:09	Sample	21808210203	5	3306	
023SMPL_2180828C_MS2.D	8/28/2018 15:13	Sample	21808210204	5	3307	
024SMPL_2180828C_MS2.D	8/28/2018 15:16	Sample	21808210205	5	3308	
025SMPL_2180828C_MS2.D	8/28/2018 15:20	Sample	21808210208	5	3309	
026SMPL_2180828C_MS2.D	8/28/2018 15:23	Sample	21808230501	1	3310	
027SMPL_2180828C_MS2.D	8/28/2018 15:27	Sample	21808230502	1	3311	
028SMPL_2180828C_MS2.D	8/28/2018 15:31	MBWATER	1841841	1	3505	
029SMPL_2180828C_MS2.D	8/28/2018 15:34	LCS6020	1841842	1	3506	
030SMPL_2180828C_MS2.D	8/28/2018 15:38	Sample	21808210203 D	5	3507	
031SMPL_2180828C_MS2.D	8/28/2018 15:41	Sample	1842727	5	3508	
032SMPL_2180828C_MS2.D	8/28/2018 15:45	Sample	1842728	5	3509	
033SMPL_2180828C_MS2.D	8/28/2018 15:48	Sample	1842883	25	3510	
034SMPL_2180828C_MS2.D	8/28/2018 15:52	Sample	21808210204 D 100X	100	3511	
035SMPL_2180828C_MS2.D	8/28/2018 15:55	Sample	21808210204 D	5	3512	
036_CCV_2180828C_MS2.D	8/28/2018 15:59	CCV	1800	1	1102	
037_CCB_2180828C_MS2.D	8/28/2018 16:03	CCB	1900	1	1107	
038SMPL_2180828C_MS2.D	8/28/2018 16:06	Sample	21808210205 D 100X	100	4101	
039SMPL_2180828C_MS2.D	8/28/2018 16:10	Sample	21808210205 D	5	4102	
040SMPL_2180828C_MS2.D	8/28/2018 16:13	Sample	21808210206 D	5	4103	
041SMPL_2180828C_MS2.D	8/28/2018 16:17	Sample	21808210207 D	5	4104	
042SMPL_2180828C_MS2.D	8/28/2018 16:20	Sample	21808210208 D	5	4105	
043SMPL_2180828C_MS2.D	8/28/2018 16:24	MBSOIL	1842501	40	3312	
044SMPL_2180828C_MS2.D	8/28/2018 16:28	LCS6020	1842502	40	3401	

045SMPL_2180828C_MS2.D	8/28/2018 16:31	Sample	21808230901	787.4016	3402	
046SMPL_2180828C_MS2.D	8/28/2018 16:35	Sample	21808230902	769.2308	3403	
047SMPL_2180828C_MS2.D	8/28/2018 16:38	Sample	21808230903	800	3404	
048SMPL_2180828C_MS2.D	8/28/2018 16:42	AllRef	21808230904	800	3405	
049SMPL_2180828C_MS2.D	8/28/2018 16:45	MSSOIL	1842503	800	3406	
050SMPL_2180828C_MS2.D	8/28/2018 16:49	MSDSOIL	1842504	800	3407	
051SMPL_2180828C_MS2.D	8/28/2018 16:52	PDS	1842886	800	3408	
052SMPL_2180828C_MS2.D	8/28/2018 16:56	Sample	1842887	4000	3409	
053SMPL_2180828C_MS2.D	8/28/2018 17:00	Sample	21808230905	657.8947	3410	
054_CCV_2180828C_MS2.D	8/28/2018 17:03	CCV	1800	1	1102	
055_CCB_2180828C_MS2.D	8/28/2018 17:07	CCB	1900	1	1107	
056SMPL_2180828C_MS2.D	8/28/2018 17:10	Sample	21808230906	735.2941	3411	
057SMPL_2180828C_MS2.D	8/28/2018 17:14	Sample	21808230907	793.6508	3412	
058SMPL_2180828C_MS2.D	8/28/2018 17:17	Sample	21808230908	781.25	3501	
059SMPL_2180828C_MS2.D	8/28/2018 17:21	Sample	21808230909	787.4016	3502	
060SMPL_2180828C_MS2.D	8/28/2018 17:24	Sample	21808230910	757.5758	3503	
061SMPL_2180828C_MS2.D	8/28/2018 17:28	Sample	21808230911	793.6508	3504	
062SMPL_2180828C_MS2.D	8/28/2018 17:32	MBSOIL	1843090	40	4201	
063SMPL_2180828C_MS2.D	8/28/2018 17:35	LCS6020	1843091	40	4202	
064SMPL_2180828C_MS2.D	8/28/2018 17:39	Sample	21808244401	357.1429	4203	
065SMPL_2180828C_MS2.D	8/28/2018 17:42	Sample	21808244501	384.6154	4204	
066SMPL_2180828C_MS2.D	8/28/2018 17:46	Sample	21808244601	396.8254	4205	
067SMPL_2180828C_MS2.D	8/28/2018 17:49	Sample	21808244701	387.5969	4206	
068_CCV_2180828C_MS2.D	8/28/2018 17:53	CCV	1800	1	1102	
069_CCB_2180828C_MS2.D	8/28/2018 17:57	CCB	1900	1	1107	
070ICSA_2180828C_MS2.D	8/28/2018 18:00	ICSA	2000	1	1205	
071ICSB_2180828C_MS2.D	8/28/2018 18:04	ICSB	2100	1	1206	
072SMPL_2180828C_MS2.D	8/28/2018 18:07	Sample	21808244801	354.6099	4207	
073SMPL_2180828C_MS2.D	8/28/2018 18:11	Sample	21808244901	375.9398	4208	
074SMPL_2180828C_MS2.D	8/28/2018 18:14	Sample	21808245001	400	4209	
075SMPL_2180828C_MS2.D	8/28/2018 18:18	Sample	21808245101	396.8254	4210	
076SMPL_2180828C_MS2.D	8/28/2018 18:21	Sample	21808245301	381.6794	4211	
077SMPL_2180828C_MS2.D	8/28/2018 18:25	AllRef	21808240511	800	4212	
078SMPL_2180828C_MS2.D	8/28/2018 18:29	MSSOIL	1843107	800	4301	
079SMPL_2180828C_MS2.D	8/28/2018 18:32	MSDSOIL	1843108	800	4302	
080SMPL_2180828C_MS2.D	8/28/2018 18:36	PDS	1843827	800	4303	
081SMPL_2180828C_MS2.D	8/28/2018 18:39	Sample	1843828	4000	4304	
082SMPL_2180828C_MS2.D	8/28/2018 18:43	Sample	21808240512	781.25	4305	
083SMPL_2180828C_MS2.D	8/28/2018 18:46	Sample	21808240513	757.5758	4306	
084SMPL_2180828C_MS2.D	8/28/2018 18:50	Sample	21808240514	787.4016	4307	
085SMPL_2180828C_MS2.D	8/28/2018 18:54	Sample	21808240515	757.5758	4308	
086_CCV_2180828C_MS2.D	8/28/2018 18:57	CCV	1800	1	1102	
087_CCB_2180828C_MS2.D	8/28/2018 19:01	CCB	1900	1	1107	
088SMPL_2180828C_MS2.D	8/28/2018 19:04	Sample	21808243808	10	2201	
089SMPL_2180828C_MS2.D	8/28/2018 19:08	Sample	21808243809	10	2202	
090SMPL_2180828C_MS2.D	8/28/2018 19:11	Sample	21808243810	10	2203	
091SMPL_2180828C_MS2.D	8/28/2018 19:15	Sample	21808243811	10	2204	
092SMPL_2180828C_MS2.D	8/28/2018 19:18	Sample	21808243812	10	2205	
093SMPL_2180828C_MS2.D	8/28/2018 19:22	Sample	21808243813	10	2206	
094SMPL_2180828C_MS2.D	8/28/2018 19:25	Sample	21808243814	10	2207	

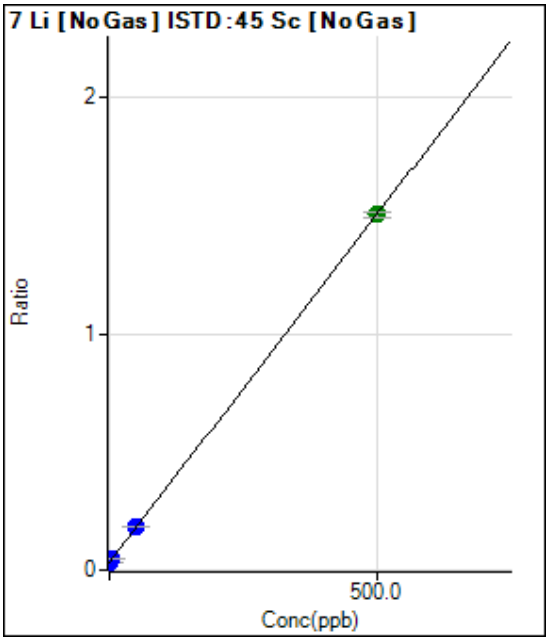
095SMPL_2180828C_MS2.D	8/28/2018 19:29	Sample	21808224601	100	2208	
096SMPL_2180828C_MS2.D	8/28/2018 19:33	AllRef	21808234301	100	2209	
097SMPL_2180828C_MS2.D	8/28/2018 19:36	MS10XP	1843293	100	2210	
098SMPL_2180828C_MS2.D	8/28/2018 19:40	Sample	21808240701	100	2211	
099_CCV_2180828C_MS2.D	8/28/2018 19:43	CCV	1800	1	1302	
100_CCB_2180828C_MS2.D	8/28/2018 19:47	CCB	1900	1	1307	
101SMPL_2180828C_MS2.D	8/28/2018 19:50	Sample	21808240702	100	2212	
102SMPL_2180828C_MS2.D	8/28/2018 19:54	Sample	21808242301	100	2301	
103SMPL_2180828C_MS2.D	8/28/2018 19:57	Sample	21808242302	100	2302	
104SMPL_2180828C_MS2.D	8/28/2018 20:01	Sample	21808242303	100	2303	
105SMPL_2180828C_MS2.D	8/28/2018 20:04	Sample	21808272201 200X	200	2106	
106SMPL_2180828C_MS2.D	8/28/2018 20:08	Sample	21808272201	2	2107	
107SMPL_2180828C_MS2.D	8/28/2018 20:12	Sample	21808272202	2	2108	
108SMPL_2180828C_MS2.D	8/28/2018 20:15	Sample	21808272101	100	2109	
109SMPL_2180828C_MS2.D	8/28/2018 20:19	Sample	21808272701	5	2110	
110_CCV_2180828C_MS2.D	8/28/2018 20:22	CCV	1800	1	1302	
111_CCB_2180828C_MS2.D	8/28/2018 20:26	CCB	1900	1	1307	
112SMPL_2180828C_MS2.D	8/28/2018 20:29	Sample	21808232801	100	3106	
113SMPL_2180828C_MS2.D	8/28/2018 20:33	Sample	21808241001	1	3107	
114SMPL_2180828C_MS2.D	8/28/2018 20:36	Sample	21808241201	1	3108	
115SMPL_2180828C_MS2.D	8/28/2018 20:40	Sample	21808241202	1	3109	
116SMPL_2180828C_MS2.D	8/28/2018 20:44	Sample	21808241203	1	3110	
117SMPL_2180828C_MS2.D	8/28/2018 20:47	Sample	21808241204	1	3111	
118SMPL_2180828C_MS2.D	8/28/2018 20:51	Sample	21808240401	1	3112	
119SMPL_2180828C_MS2.D	8/28/2018 20:54	Sample	21808240402	1	3201	
120SMPL_2180828C_MS2.D	8/28/2018 20:58	Sample	21808243101	1	3202	
121SMPL_2180828C_MS2.D	8/28/2018 21:01	Sample	21808243102	1	3203	
122_CCV_2180828C_MS2.D	8/28/2018 21:05	CCV	1800	1	1302	
123_CCB_2180828C_MS2.D	8/28/2018 21:08	CCB	1900	1	1307	
124SMPL_2180828C_MS2.D	8/28/2018 21:12	Sample	21808243103	1	3204	
125SMPL_2180828C_MS2.D	8/28/2018 21:16	Sample	21808243104	1	3205	
126SMPL_2180828C_MS2.D	8/28/2018 21:19	Sample	21808243107	1	3206	
127SMPL_2180828C_MS2.D	8/28/2018 21:23	Sample	21808243301	100	3207	
128SMPL_2180828C_MS2.D	8/28/2018 21:26	Sample	21808243401	100	3208	
129SMPL_2180828C_MS2.D	8/28/2018 21:30	Sample	21808233501	1	3209	
130SMPL_2180828C_MS2.D	8/28/2018 21:33	MBWATER	1842723	1	3210	
131SMPL_2180828C_MS2.D	8/28/2018 21:37	LCS200.8	1842724	1	3211	
132SMPL_2180828C_MS2.D	8/28/2018 21:40	Sample	21808234102	300	3212	
133SMPL_2180828C_MS2.D	8/28/2018 21:44	Sample	21808234103	300	3301	
134SMPL_2180828C_MS2.D	8/28/2018 21:48	Sample	21808234104	300	3302	
135SMPL_2180828C_MS2.D	8/28/2018 21:51	Sample	21808234105	300	3303	
136_CCV_2180828C_MS2.D	8/28/2018 21:55	CCV	1800	1	1302	
137_CCB_2180828C_MS2.D	8/28/2018 21:58	CCB	1900	1	1307	
138SMPL_2180828C_MS2.D	8/28/2018 22:02	Sample	21808234106	300	3304	
139SMPL_2180828C_MS2.D	8/28/2018 22:05	Sample	21808234107	300	3305	
140SMPL_2180828C_MS2.D	8/28/2018 22:09	MBWATER	1843085	1	4405	
141SMPL_2180828C_MS2.D	8/28/2018 22:12	LCS6020	1843086	1	4406	
142SMPL_2180828C_MS2.D	8/28/2018 22:16	AllRef	21808243808 D	10	4407	
143SMPL_2180828C_MS2.D	8/28/2018 22:20	MS10XP	1843838	10	4408	
144SMPL_2180828C_MS2.D	8/28/2018 22:23	MSD10XP	1848839	10	4409	

145SMPL_2180828C_MS2.D	8/28/2018 22:27	Sample	1848841	50	4410	
146SMPL_2180828C_MS2.D	8/28/2018 22:30	Sample	21808243809 D	10	4411	
147SMPL_2180828C_MS2.D	8/28/2018 22:34	Sample	21808243810 D	10	4412	
148SMPL_2180828C_MS2.D	8/28/2018 22:37	Sample	21808243811 D	10	4501	
149SMPL_2180828C_MS2.D	8/28/2018 22:41	Sample	21808243812 D	10	4502	
150SMPL_2180828C_MS2.D	8/28/2018 22:45	Sample	21808243813 D	10	4503	
151SMPL_2180828C_MS2.D	8/28/2018 22:48	Sample	21808243814 D	10	4504	
152_CCV_2180828C_MS2.D	8/28/2018 22:52	CCV	1800	1	1302	
153_CCB_2180828C_MS2.D	8/28/2018 22:55	CCB	1900	1	1307	
154SMPL_2180828C_MS2.D	8/28/2018 22:59	MBWATER	1843344	1	4309	
155SMPL_2180828C_MS2.D	8/28/2018 23:02	LCS200.8	1843345	1	4310	
156SMPL_2180828C_MS2.D	8/28/2018 23:06	Sample	21808245901	1	4311	
157SMPL_2180828C_MS2.D	8/28/2018 23:10	Sample	21808250401	2	4312	
158SMPL_2180828C_MS2.D	8/28/2018 23:13	AllRef	21808270701	10	4401	
159SMPL_2180828C_MS2.D	8/28/2018 23:17	MS	1843346	10	4402	
160SMPL_2180828C_MS2.D	8/28/2018 23:20	MSD	1843347	10	4403	
161SMPL_2180828C_MS2.D	8/28/2018 23:24	Sample	21808270801	10	4404	
162_CCV_2180828C_MS2.D	8/28/2018 23:27	CCV	1800	1	1302	
163_CCB_2180828C_MS2.D	8/28/2018 23:31	CCB	1900	1	1307	

Tune Step	Mass	Name	R	a	b (blank)	DL	BEC	Units
1	7	Li	0.999988316	0.002946055	0.032002022	0.680566694	10.8626695	ppb
1	9	Be	0.99999994	0.001054065	1.61E-05	0.001101963	0.015244322	ppb
1	11	B	0.999997645	0.00064507	0.000807008	0.123025448	1.251038678	ppb
2	23	Na	0.999999425	0.003526625	0.052908202	0.718085611	15.00250433	ppb
2	24	Mg	0.999997771	0.001374471	0.001621931	1.76778553	1.180040121	ppb
2	27	Al	0.999999217	0.000314458	0.001289566	1.6818286	4.100919054	ppb
2	29	Si	0.998672894	1.19E-05	0.086798955	848.2781896	7263.750645	ppb
2	39	K	0.999999818	0.001149826	0.128243729	7.007423934	111.5331925	ppb
2	44	Ca	0.99999967	5.25E-05	0.00414986	37.70231149	79.0817727	ppb
2	47	Ti	0.999981742	0.000520426	0.000123704	0.370964313	0.237697262	ppb
2	51	V	0.999998745	0.027445466	0.001580455	0.018424861	0.057585293	ppb
2	52	Cr	0.999999861	0.036450887	0.02930402	0.101951838	0.80393159	ppb
2	55	Mn	0.999999538	0.012758201	0.002432323	0.053091043	0.190647767	ppb
2	57	Fe	0.999998719	0.000626529	0.003480694	2.030385283	5.555521678	ppb
2	59	Co	0.999999174	0.062814473	0.001065301	0.012751213	0.016959476	ppb
2	60	Ni	0.999995183	0.017762169	0.003496268	0.027114868	0.196837909	ppb
2	63	Cu	0.99998964	0.049262545	0.004449484	0.019848612	0.090321847	ppb
2	66	Zn	0.99999904	0.006783435	0.016345595	0.244415282	2.409633953	ppb
2	75	As	0.999998853	0.007045683	0.00031862	0.033094755	0.045222062	ppb
2	78	Se	0.999995527	0.00030512	6.64E-05	0.090028369	0.217761332	ppb
1	88	Sr	0.999999919	0.029942888	0.000898586	0.006508973	0.03000999	ppb
1	90	Zr	0.999996749	0.018498842	0.000584262	0.006123952	0.031583732	ppb
1	95	Mo	0.999996789	0.001127149	4.67E-05	0.013556557	0.041447161	ppb
1	107	Ag	0.999999764	0.002666067	1.05E-05	0.000161042	0.003929646	ppb
1	111	Cd	0.999998459	0.000549509	5.22E-06	0.006651607	0.009504514	ppb
1	118	(Sn)	0.999996065	0.001494111	0.000559082	0.044574224	0.3741903	ppb
2	118	(Sn)	0.999991596	0.002060545	0.000778743	0.068083648	0.377930662	ppb
2	120	Sn	0.999996358	0.002920547	0.001102357	0.127019674	0.37744887	ppb
1	121	Sb	0.999999059	0.002357811	0.000303191	0.015844343	0.128590184	ppb
1	137	Ba	0.999997834	0.000768315	3.02E-05	0.010671838	0.039317577	ppb
2	156	[Se]						ppb
1	205	Tl	0.999998116	0.005164717	0.000241655	0.020339063	0.046789603	ppb
1	206	(Pb)	0.999994715	0.00173989	3.01E-05	0.01770027	0.017314566	ppb
1	207	(Pb)	0.999998529	0.001556227	2.74E-05	0.01135061	0.017583516	ppb
1	208	Pb	0.999998967	0.006949569	0.000125892	0.011864927	0.018115036	ppb
1	45	Sc						ppb
2	45	Sc						ppb
1	72	Ge						ppb
2	72	Ge						ppb
1	103	Rh						ppb
2	103	Rh						ppb
1	115	In						ppb
2	115	In						ppb
1	159	Tb						ppb
2	159	Tb						ppb
1	175	Lu						ppb
2	175	Lu						ppb
1	209	Bi						ppb
2	209	Bi						ppb

Batch Folder: C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b\
Analysis File: 2180828B_MS2.batch.bin
DA Date-Time: 08/28/2018 14:04:01
Calibration Title: EPA6020
Calibration Method: External Calibration
VIS Interpolation Fit:

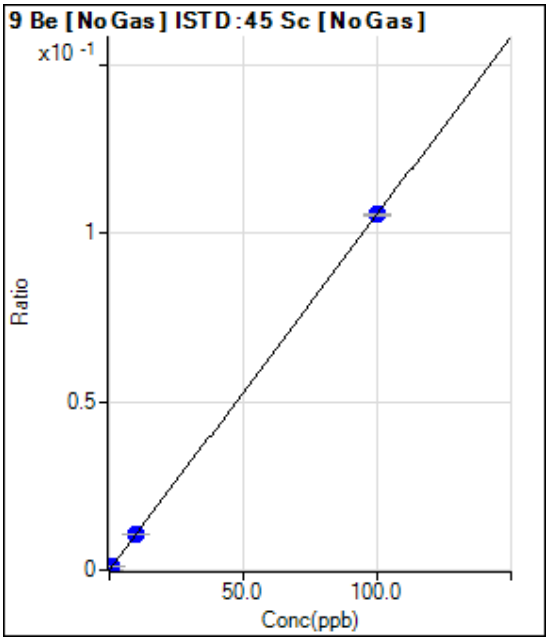
Level	Standard Data File	Sample Name	Acq. Date-Time
1	010CALB_2180828A_MS2.D	1300	08/28/2018 10:24:22
2	011CALS_2180828A_MS2.D	1302	08/28/2018 10:28:05
3	012CALS_2180828A_MS2.D	1304	08/28/2018 10:31:48
4	013CALS_2180828A_MS2.D	1305	08/28/2018 10:35:30
5	014CALS_2180828A_MS2.D	1306	08/28/2018 10:39:12



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	161961.69	0.0320	P	2.1
2	☐	0.500	0.572	169900.51	0.0337	P	1.8
3	☐	5.000	5.179	240225.39	0.0473	P	2.3
4	☐	50.000	52.434	957877.51	0.1865	P	0.7
5	☐	500.000	499.755	7777655.30	1.5043	A	1.6

y = 0.0029 * x + 0.0320
R = 1.0000
DL = 0.6806
BEC = 10.86

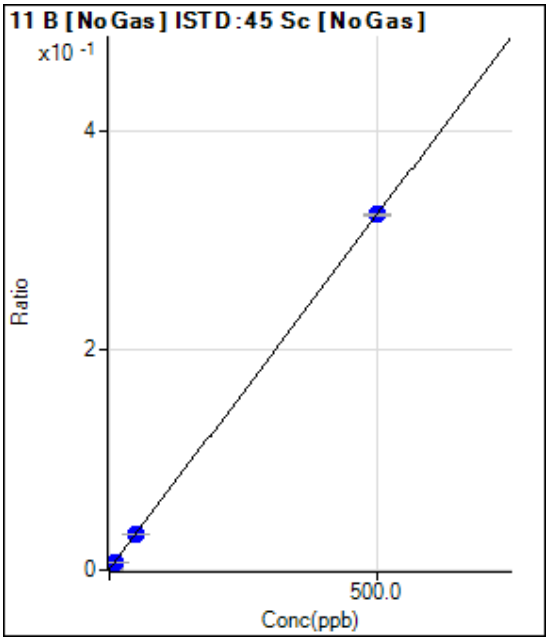
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	81.33	0.0000	P	2.4
2	☐	0.100	0.094	580.01	0.0001	P	7.9
3	☐	1.000	0.982	5340.29	0.0011	P	2.8
4	☐	10.000	9.962	54021.91	0.0105	P	1.3
5	☐	100.000	100.004	545136.85	0.1054	P	0.3

y = 0.0011 * x + 1.6069E-005
R = 1.0000
DL = 0.001102
BEC = 0.01524

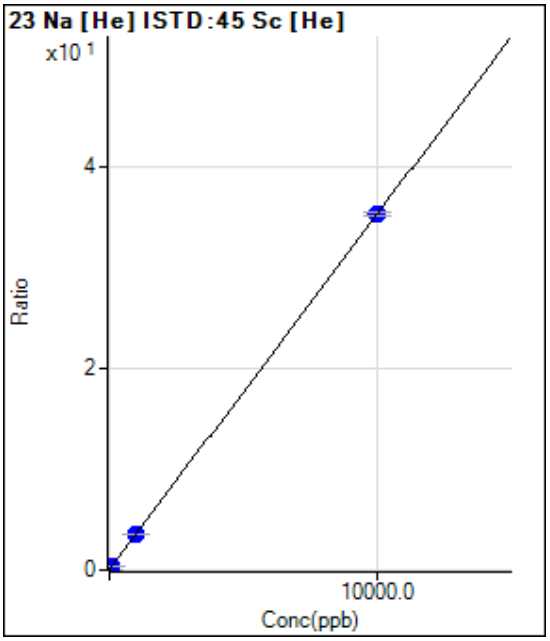
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4084.03	0.0008	P	3.3
2	☐	1.000	0.682	6288.16	0.0012	P	5.0
3	☐	10.000	9.445	35077.90	0.0069	P	1.4
4	☐	50.000	48.778	165772.44	0.0323	P	1.0
5	☐	500.000	500.134	1672437.06	0.3234	P	0.3

y = 6.4507E-004 * x + 8.0701E-004
R = 1.0000
DL = 0.123
BEC = 1.251

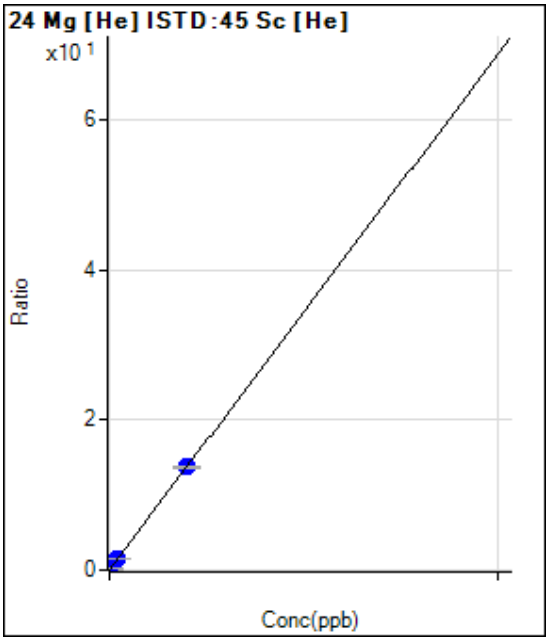
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4567.52	0.0529	P	1.6
2	☐	10.000	8.957	7228.63	0.0845	P	3.7
3	☐	100.000	100.064	35078.37	0.4058	P	1.5
4	☐	1000.000	1010.163	318705.90	3.6154	P	1.4
5	☐	10000.000	9998.984	3139566.72	35.3156	P	1.2

y = 0.0035 * x + 0.0529
R = 1.0000
DL = 0.7181
BEC = 15

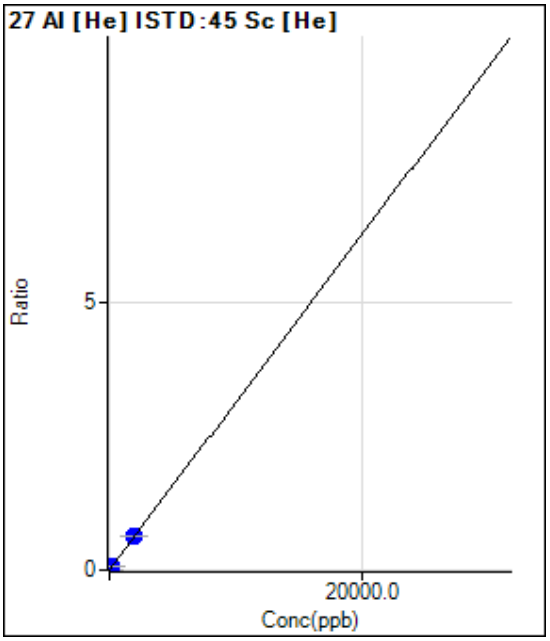
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	140.01	0.0016	P	49.9
2	☐	10.000	9.678	1276.77	0.0149	P	4.5
3	☐	100.000	105.007	12619.03	0.1460	P	3.3
4	☐	1000.000	1021.493	123908.48	1.4056	P	1.9
5	☐	10000.000	9997.801	1221709.64	13.7433	P	2.1

y = 0.0014 * x + 0.0016
R = 1.0000
DL = 1.768
BEC = 1.18

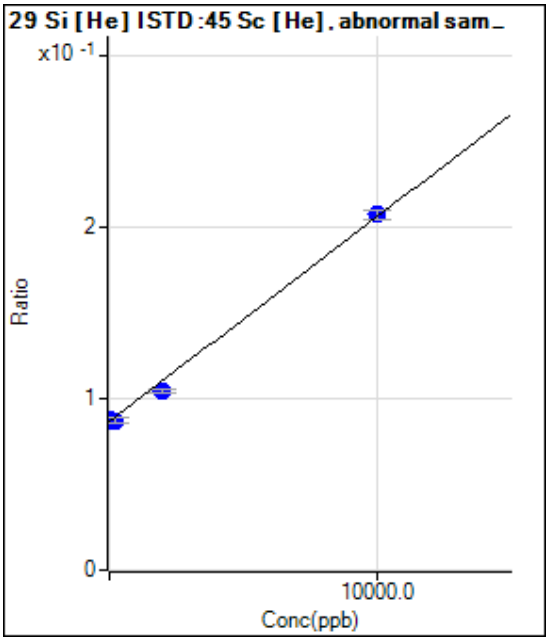
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	111.33	0.0013	P	13.7
2	☐	2.000	-0.434	98.67	0.0012	P	21.8
3	☐	20.000	19.534	642.69	0.0074	P	6.2
4	☐	200.000	197.780	5596.40	0.0635	P	1.5
5	☐	2000.000	2000.229	56027.77	0.6303	P	2.3

y = 3.1446E-004 * x + 0.0013
R = 1.0000
DL = 1.682
BEC = 4.101

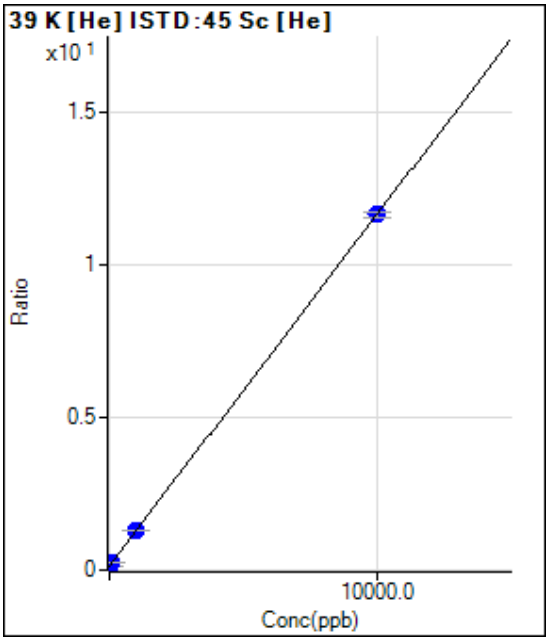
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7493.91	0.0868	P	3.9
2	☐	20.000	68.875	7495.90	0.0876	P	4.1
3	☐	200.000	50.831	7555.28	0.0874	P	3.4
4	☐	2000.000	1515.148	9248.22	0.1049	P	1.9
5	☐	10000.000	10099.856	18444.03	0.2075	P	2.9

y = 1.1950E-005 * x + 0.0868
R = 0.9987
DL = 848.3
BEC = 7264

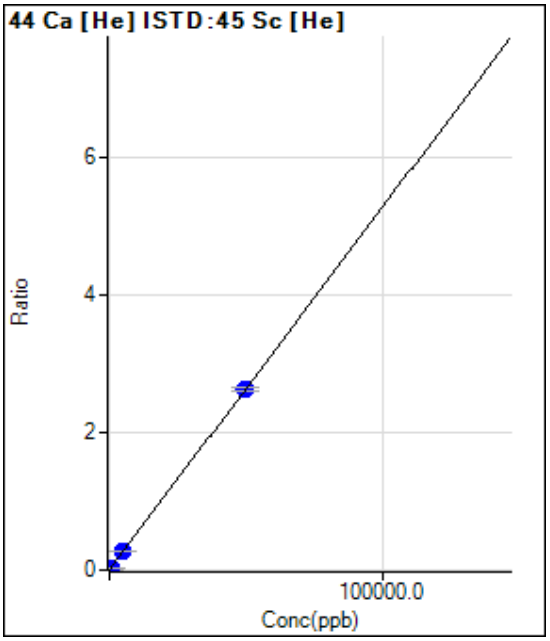
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	11071.14	0.1282	P	2.1
2	☐	10.000	11.660	12118.69	0.1417	P	1.2
3	☐	100.000	98.323	20858.47	0.2413	P	2.7
4	☐	1000.000	994.724	112134.65	1.2720	P	0.2
5	☐	10000.000	10000.543	1033652.48	11.6271	P	1.4

y = 0.0011 * x + 0.1282
R = 1.0000
DL = 7.007
BEC = 111.5

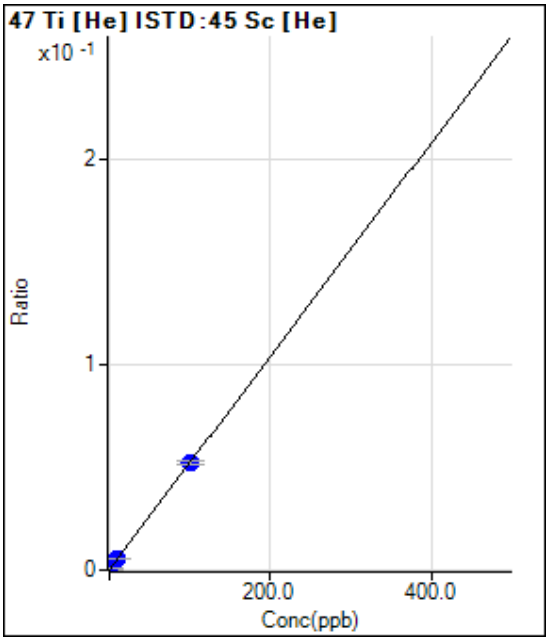
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	358.34	0.0041	P	15.9
2	☐	50.000	27.092	476.68	0.0056	P	8.3
3	☐	500.000	458.829	2440.25	0.0282	P	2.8
4	☐	5000.000	4958.590	23303.57	0.2644	P	2.4
5	☐	50000.000	50004.576	233642.06	2.6282	P	1.4

y = 5.2476E-005 * x + 0.0041
R = 1.0000
DL = 37.7
BEC = 79.08

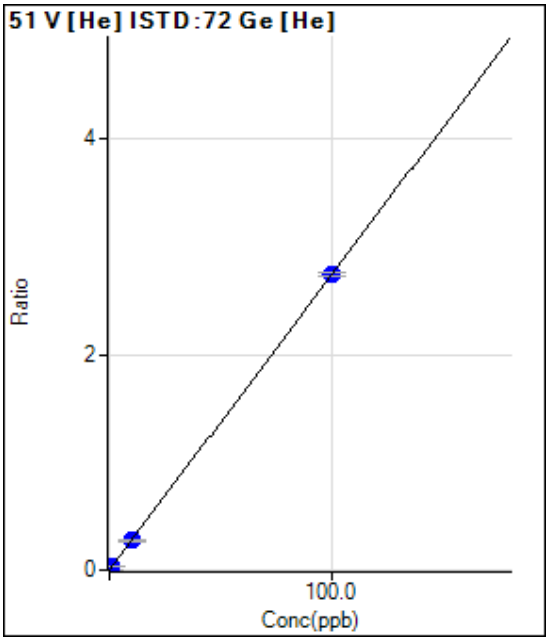
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10.67	0.0001	P	52.0
2	☐	0.100	-0.006	10.33	0.0001	P	11.0
3	☐	1.000	0.799	46.67	0.0005	P	12.2
4	☐	10.000	10.479	491.68	0.0056	P	2.8
5	☐	100.000	99.954	4635.40	0.0521	P	2.6

y = 5.2043E-004 * x + 1.2370E-004
R = 1.0000
DL = 0.371
BEC = 0.2377

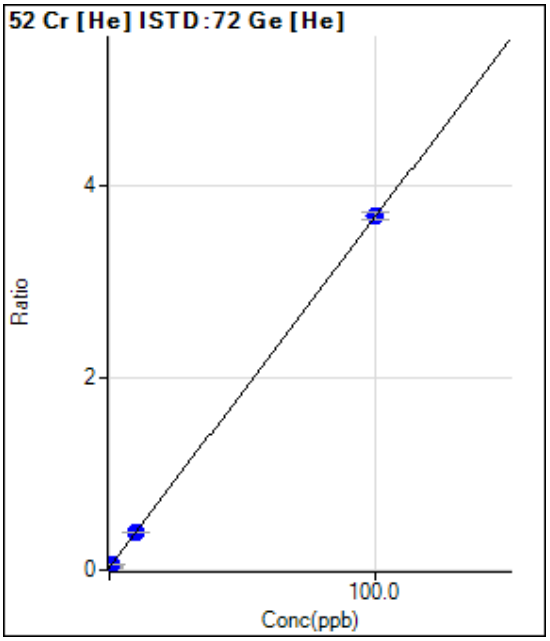
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	108.89	0.0016	P	10.7
2	☐	0.100	0.112	325.56	0.0047	P	5.5
3	☐	1.000	0.991	2042.39	0.0288	P	8.5
4	☐	10.000	9.847	19551.93	0.2718	P	1.6
5	☐	100.000	100.015	200821.09	2.7465	P	1.5

y = 0.0274 * x + 0.0016
R = 1.0000
DL = 0.01842
BEC = 0.05759

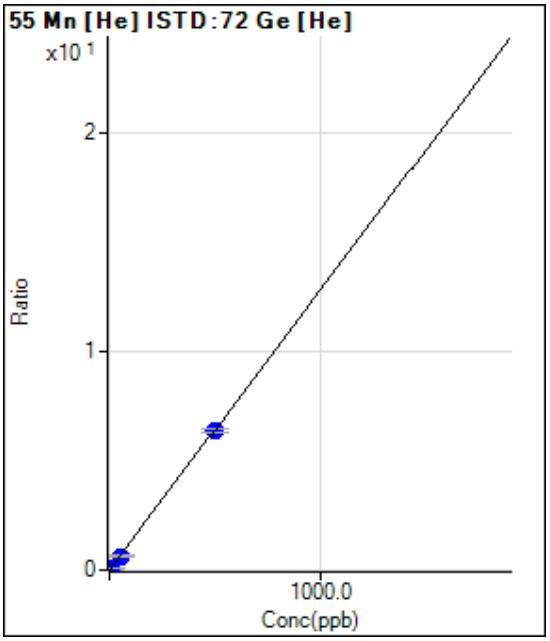
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2020.16	0.0293	P	4.2
2	☐	0.100	0.101	2302.43	0.0330	P	2.8
3	☐	1.000	1.017	4714.13	0.0664	P	3.6
4	☐	10.000	9.956	28213.74	0.3922	P	0.8
5	☐	100.000	100.004	268662.05	3.6745	P	2.1

y = 0.0365 * x + 0.0293
R = 1.0000
DL = 0.102
BEC = 0.8039

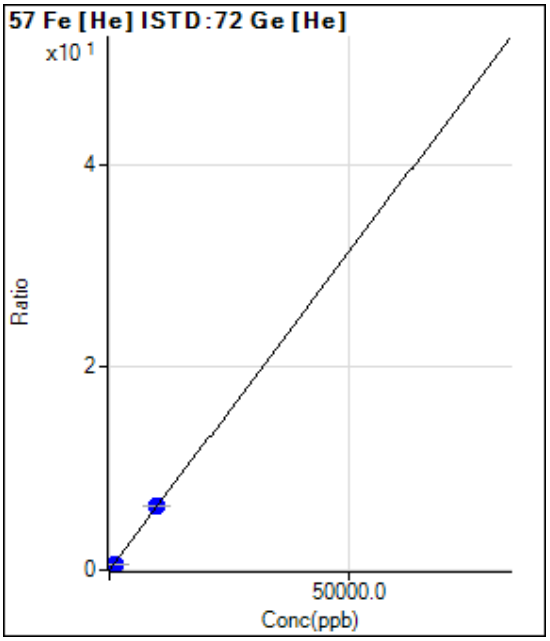
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	167.78	0.0024	P	9.3
2	☐	0.500	0.583	688.91	0.0099	P	8.7
3	☐	5.000	4.844	4558.53	0.0642	P	4.4
4	☐	50.000	50.408	46437.65	0.6456	P	0.4
5	☐	500.000	499.961	466543.89	6.3810	P	1.9

y = 0.0128 * x + 0.0024
R = 1.0000
DL = 0.05309
BEC = 0.1906

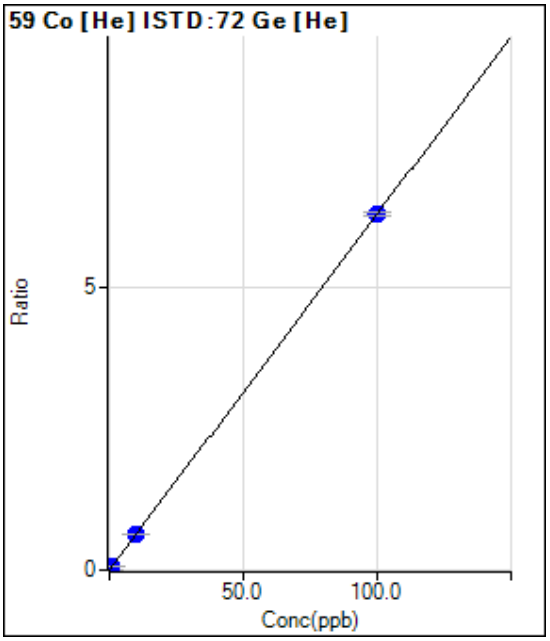
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	240.01	0.0035	P	12.2
2	☐	10.000	10.542	703.37	0.0101	P	13.7
3	☐	100.000	99.953	4694.23	0.0661	P	3.4
4	☐	1000.000	1015.810	46029.48	0.6399	P	0.8
5	☐	10000.000	9998.419	458317.71	6.2678	P	0.8

y = 6.2653E-004 * x + 0.0035
R = 1.0000
DL = 2.03
BEC = 5.556

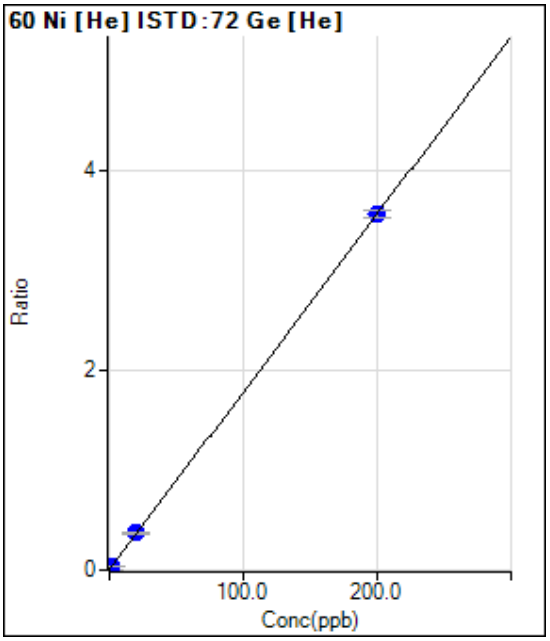
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	73.33	0.0011	P	25.1
2	☐	0.100	0.106	540.02	0.0077	P	6.6
3	☐	1.000	1.025	4645.23	0.0654	P	1.0
4	☐	10.000	10.133	45859.20	0.6376	P	2.6
5	☐	100.000	99.986	459317.79	6.2817	P	1.1

y = 0.0628 * x + 0.0011
R = 1.0000
DL = 0.01275
BEC = 0.01696

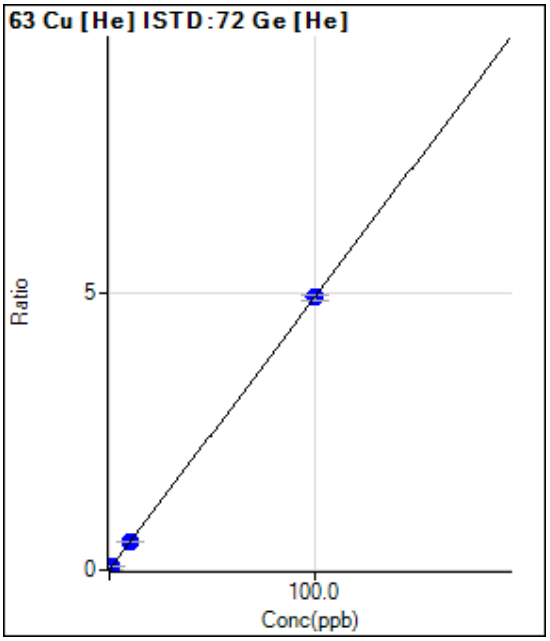
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	241.12	0.0035	P	4.6
2	☐	0.200	0.226	524.46	0.0075	P	14.4
3	☐	2.000	1.964	2724.73	0.0384	P	1.8
4	☐	20.000	20.603	26573.03	0.3694	P	2.3
5	☐	200.000	199.940	259900.78	3.5549	P	2.2

y = 0.0178 * x + 0.0035
R = 1.0000
DL = 0.02711
BEC = 0.1968

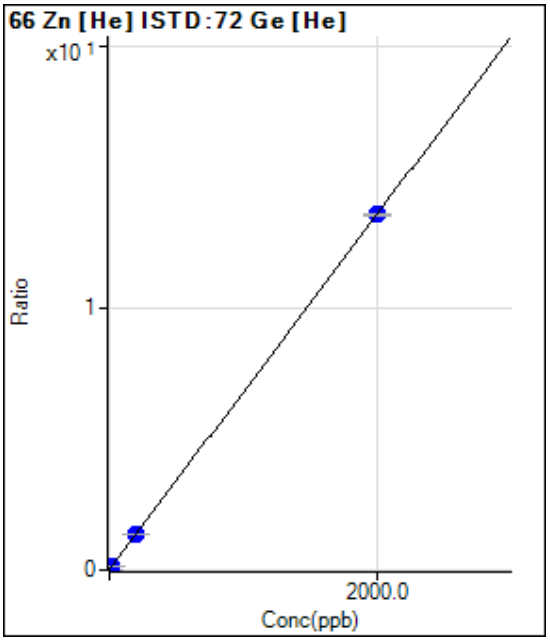
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	306.67	0.0044	P	7.3
2	☐	0.100	0.110	687.80	0.0099	P	1.5
3	☐	1.000	1.075	4075.06	0.0574	P	0.4
4	☐	10.000	10.465	37404.46	0.5200	P	1.0
5	☐	100.000	99.953	360313.90	4.9284	P	2.5

y = 0.0493 * x + 0.0044
R = 1.0000
DL = 0.01985
BEC = 0.09032

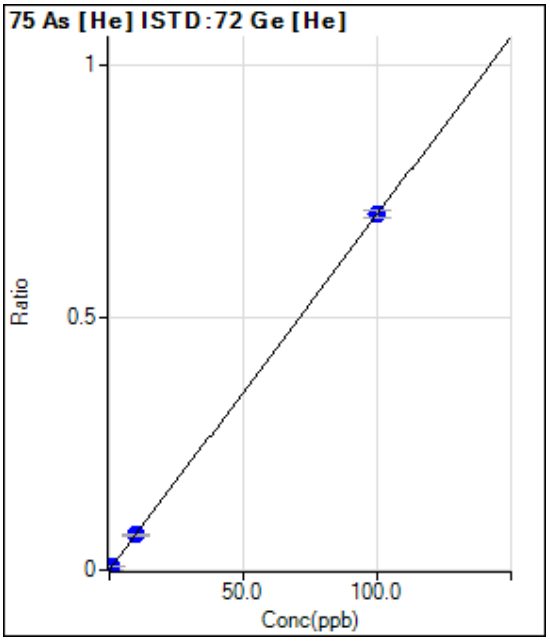
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1126.72	0.0163	P	3.4
2	☐	2.000	0.473	1364.52	0.0196	P	5.4
3	☐	20.000	18.914	10270.35	0.1446	P	1.1
4	☐	200.000	201.633	99557.70	1.3841	P	1.4
5	☐	2000.000	1999.849	993201.14	13.5822	P	0.5

y = 0.0068 * x + 0.0163
R = 1.0000
DL = 0.2444
BEC = 2.41

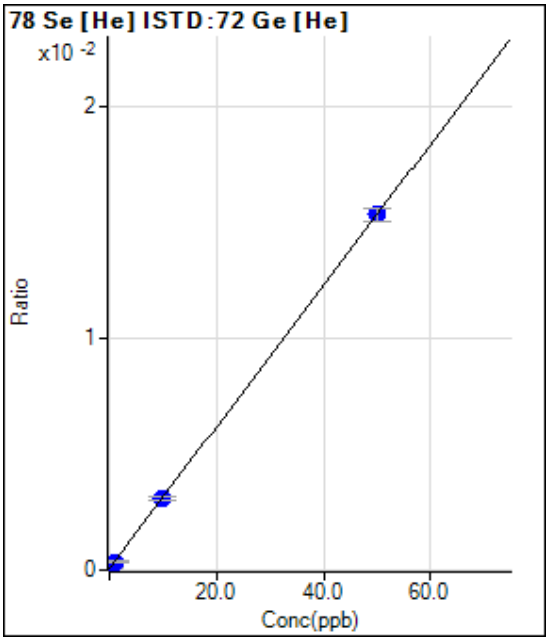
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	22.00	0.0003	P	24.4
2	☐	0.100	0.101	71.67	0.0010	P	17.6
3	☐	1.000	0.988	516.68	0.0073	P	2.5
4	☐	10.000	9.849	5014.20	0.0697	P	1.8
5	☐	100.000	100.015	51543.59	0.7050	P	2.1

y = 0.0070 * x + 3.1862E-004
R = 1.0000
DL = 0.03309
BEC = 0.04522

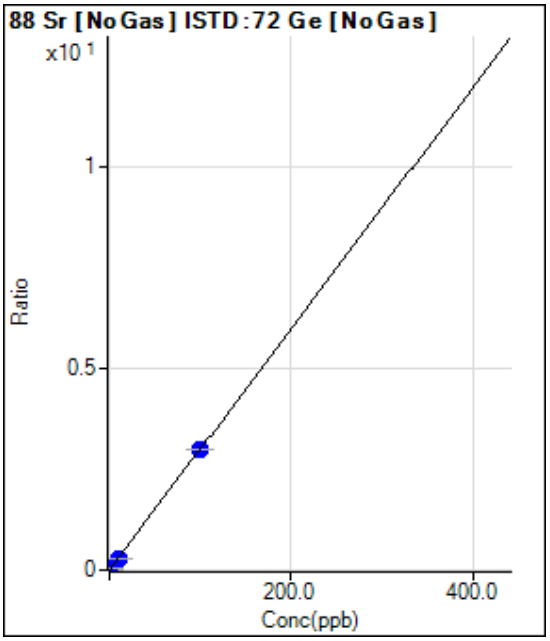
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4.58	0.0001	P	13.8
2	☐	0.100	0.107	6.92	0.0001	P	8.6
3	☐	1.000	0.868	23.57	0.0003	P	22.6
4	☐	10.000	9.898	222.08	0.0031	P	4.2
5	☐	50.000	50.023	1120.64	0.0153	P	3.5

y = 3.0512E-004 * x + 6.6443E-005
R = 1.0000
DL = 0.09003
BEC = 0.2178

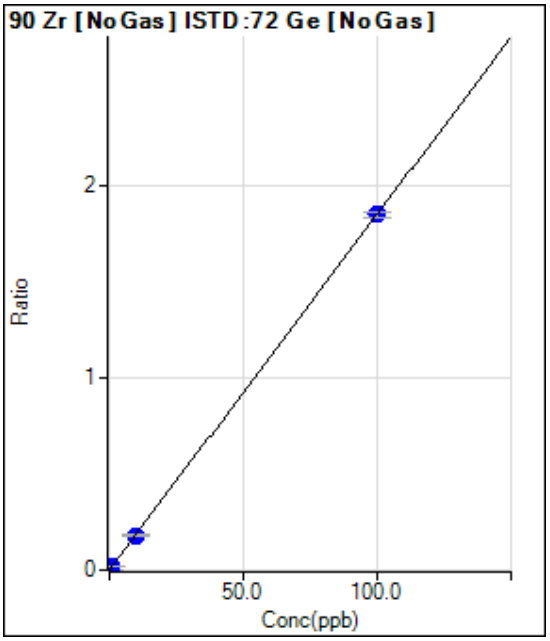
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1003.40	0.0009	P	7.2
2	☐	0.100	0.093	4100.71	0.0037	P	11.3
3	☐	1.000	0.996	34672.79	0.0307	P	0.6
4	☐	10.000	10.036	343610.98	0.3014	P	1.3
5	☐	100.000	99.996	3442006.41	2.9951	P	0.4

y = 0.0299 * x + 8.9859E-004
R = 1.0000
DL = 0.006509
BEC = 0.03001

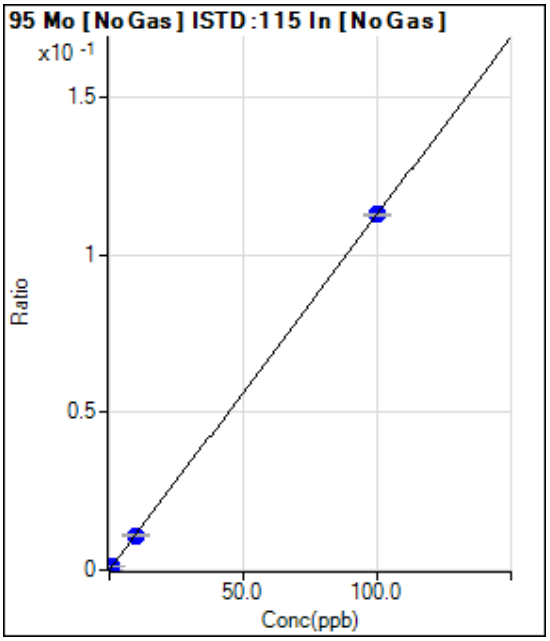
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	652.24	0.0006	P	6.5
2	☐	0.100	0.098	2671.39	0.0024	P	4.6
3	☐	1.000	0.824	17867.92	0.0158	P	1.0
4	☐	10.000	9.756	206394.19	0.1811	P	2.4
5	☐	100.000	100.026	2127197.83	1.8510	P	1.3

y = 0.0185 * x + 5.8426E-004
R = 1.0000
DL = 0.006124
BEC = 0.03158

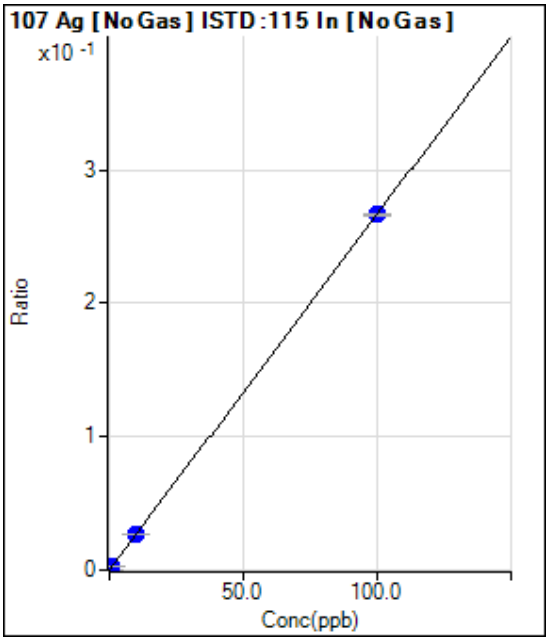
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	247.78	0.0000	P	10.9
2	☐	0.100	0.084	747.81	0.0001	P	3.6
3	☐	1.000	0.928	5881.27	0.0011	P	3.1
4	☐	10.000	9.733	60138.09	0.0110	P	1.3
5	☐	100.000	100.027	611078.76	0.1128	P	0.3

y = 0.0011 * x + 4.6717E-005
R = 1.0000
DL = 0.01356
BEC = 0.04145

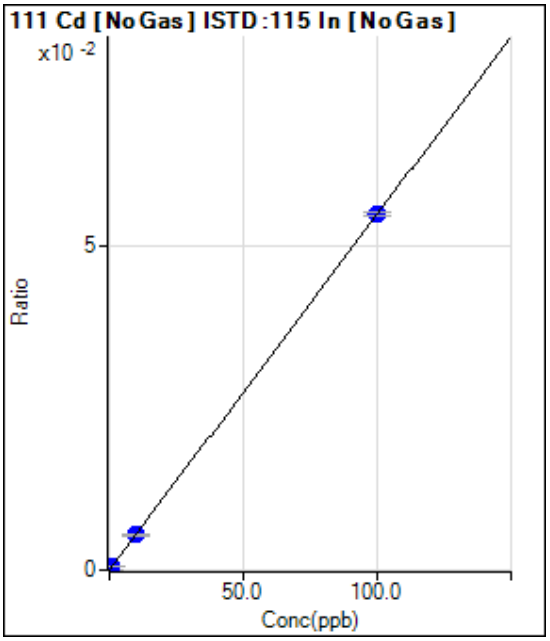
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	55.56	0.0000	P	1.4
2	☐	0.100	0.096	1412.31	0.0003	P	1.7
3	☐	1.000	0.984	14169.41	0.0026	P	2.1
4	☐	10.000	10.060	146472.03	0.0268	P	0.4
5	☐	100.000	99.994	1444410.29	0.2666	P	0.5

y = 0.0027 * x + 1.0477E-005
R = 1.0000
DL = 0.000161
BEC = 0.00393

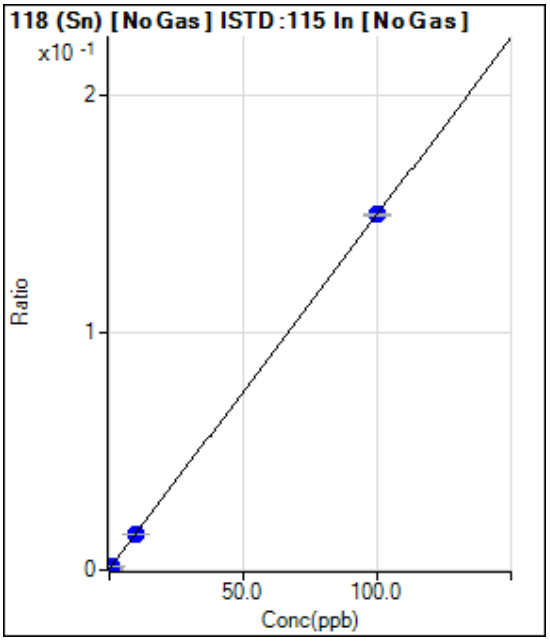
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27.78	0.0000	P	23.3
2	☐	0.100	0.097	311.12	0.0001	P	8.9
3	☐	1.000	0.953	2846.98	0.0005	P	3.2
4	☐	10.000	9.818	29485.33	0.0054	P	1.4
5	☐	100.000	100.019	297815.91	0.0550	P	1.0

y = 5.4951E-004 * x + 5.2228E-006
R = 1.0000
DL = 0.006652
BEC = 0.009505

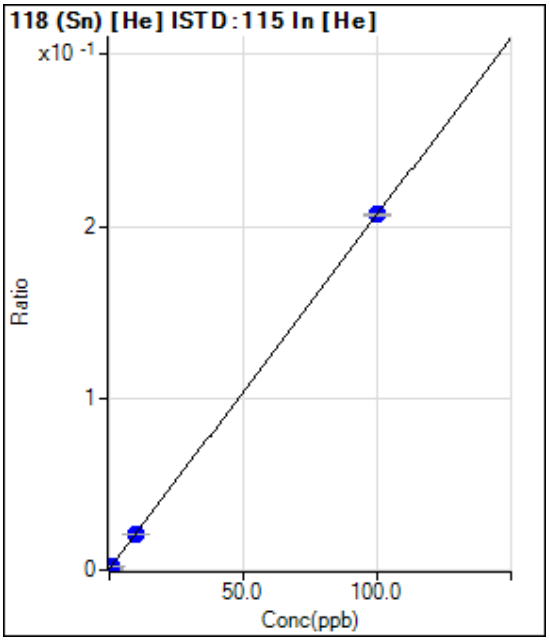
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2962.57	0.0006	P	4.0
2	☐	0.100	-0.110	2092.41	0.0004	P	6.8
3	☐	1.000	0.748	9027.44	0.0017	P	0.3
4	☐	10.000	9.691	82105.85	0.0150	P	0.9
5	☐	100.000	100.034	812805.45	0.1500	P	0.7

y = 0.0015 * x + 5.5908E-004
R = 1.0000
DL = 0.04457
BEC = 0.3742

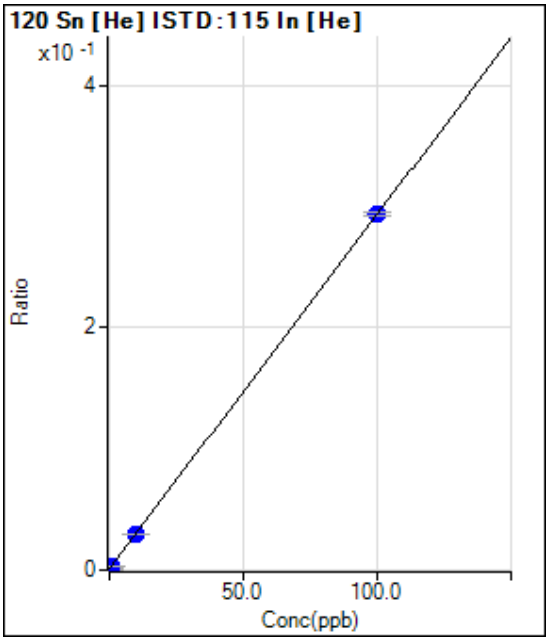
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	401.12	0.0008	P	6.0
2	☐	0.100	-0.122	276.67	0.0005	P	14.4
3	☐	1.000	0.669	1141.17	0.0022	P	4.4
4	☐	10.000	9.536	11068.91	0.0204	P	1.2
5	☐	100.000	100.050	114148.47	0.2069	P	0.6

y = 0.0021 * x + 7.7874E-004
R = 1.0000
DL = 0.06808
BEC = 0.3779

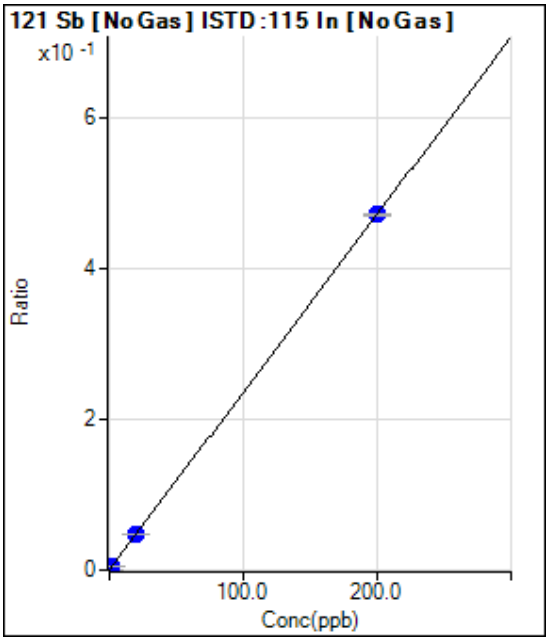
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	567.80	0.0011	P	11.2
2	☐	0.100	-0.114	404.46	0.0008	P	1.4
3	☐	1.000	0.730	1710.13	0.0032	P	4.9
4	☐	10.000	9.720	15978.10	0.0295	P	1.1
5	☐	100.000	100.031	161759.64	0.2932	P	1.1

y = 0.0029 * x + 0.0011
R = 1.0000
DL = 0.127
BEC = 0.3774

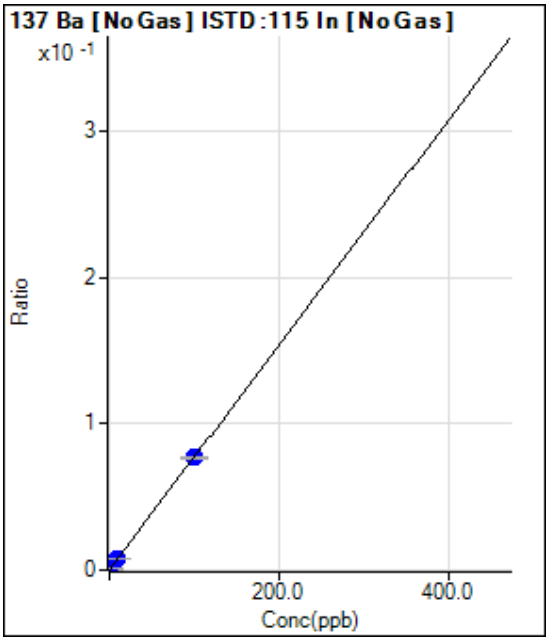
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1606.78	0.0003	P	4.1
2	☐	0.200	0.156	3558.27	0.0007	P	1.7
3	☐	2.000	1.925	26056.45	0.0048	P	0.8
4	☐	20.000	19.703	255243.63	0.0468	P	0.9
5	☐	200.000	200.031	2556847.40	0.4719	P	0.6

y = 0.0024 * x + 3.0319E-004
R = 1.0000
DL = 0.01584
BEC = 0.1286

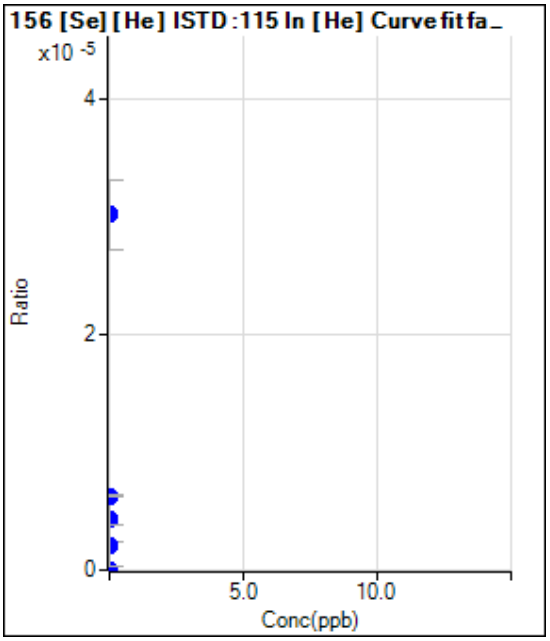
Weight: <None>
Min Conc: <None>



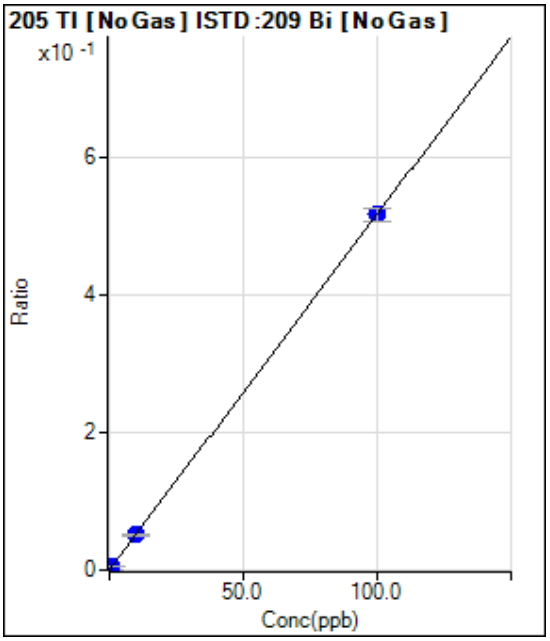
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	160.00	0.0000	P	9.0
2	☐	0.100	0.083	498.91	0.0001	P	8.8
3	☐	1.000	0.956	4115.10	0.0008	P	0.5
4	☐	10.000	9.781	41188.63	0.0075	P	1.1
5	☐	100.000	100.022	416494.71	0.0769	P	0.6

y = 7.6831E-004 * x + 3.0208E-005
R = 1.0000
DL = 0.01067
BEC = 0.03932

Weight: <None>
Min Conc: <None>



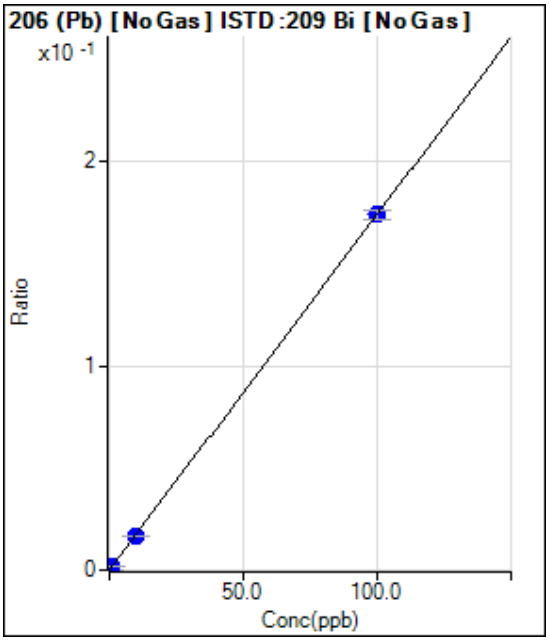
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000		2.22	0.0000	P	86.6
2	☐	0.000		0.00	0.0000	P	
3	☐	0.000		3.33	0.0000	P	1.3
4	☐	0.000		1.11	0.0000	P	173.2
5	☐	0.000		16.67	0.0000	P	19.8



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	586.70	0.0002	P	14.5
2	☐	0.100	0.098	1826.85	0.0007	P	5.2
3	☐	1.000	0.972	13257.19	0.0053	P	3.6
4	☐	10.000	9.802	131814.80	0.0509	P	1.3
5	☐	100.000	100.020	1350053.26	0.5168	P	4.0

y = 0.0052 * x + 2.4166E-004
R = 1.0000
DL = 0.02034
BEC = 0.04679

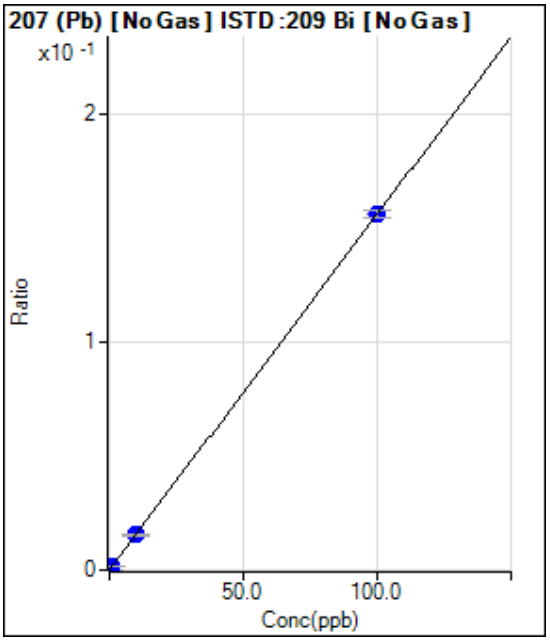
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	73.33	0.0000	P	34.1
2	☐	0.100	0.082	423.36	0.0002	P	24.2
3	☐	1.000	0.943	4210.80	0.0017	P	4.4
4	☐	10.000	9.662	43632.99	0.0168	P	2.1
5	☐	100.000	100.034	454803.78	0.1741	P	2.9

y = 0.0017 * x + 3.0125E-005
R = 1.0000
DL = 0.0177
BEC = 0.01731

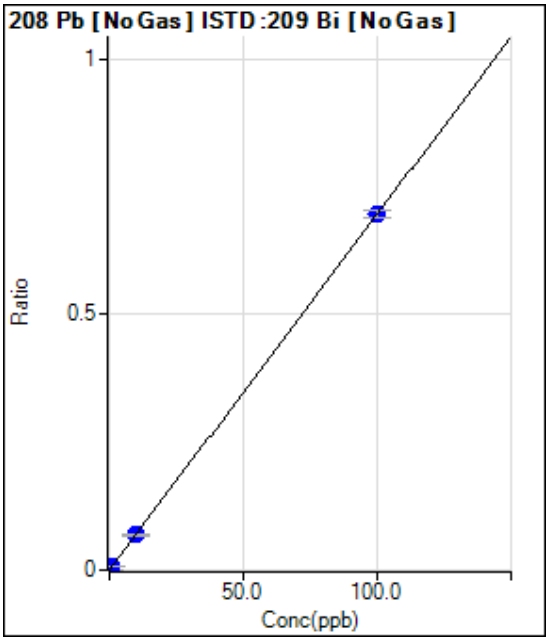
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	66.67	0.0000	P	21.5
2	☐	0.100	0.090	410.02	0.0002	P	17.8
3	☐	1.000	0.931	3717.34	0.0015	P	8.8
4	☐	10.000	9.819	39660.55	0.0153	P	2.9
5	☐	100.000	100.019	406753.65	0.1557	P	2.2

y = 0.0016 * x + 2.7364E-005
R = 1.0000
DL = 0.01135
BEC = 0.01758

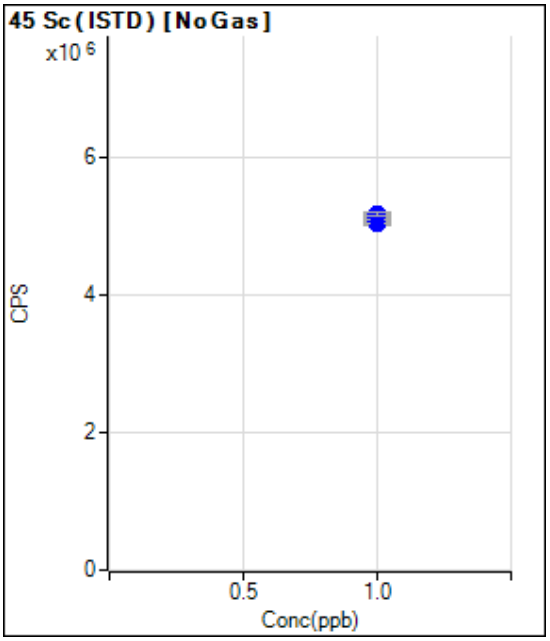
Weight: <None>
Min Conc: <None>



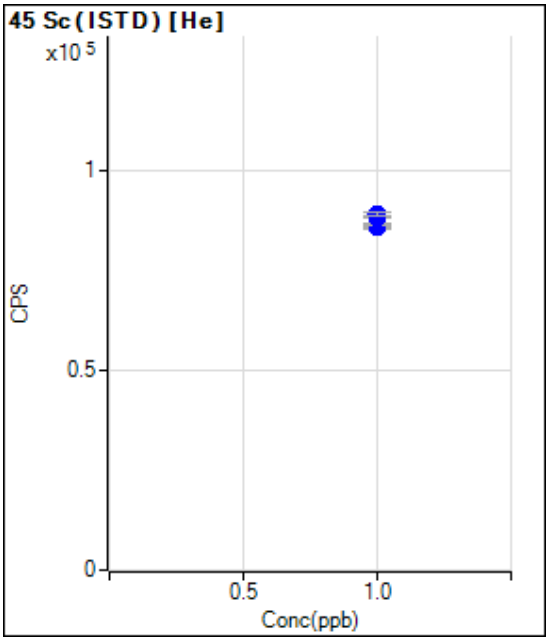
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	306.68	0.0001	P	21.8
2	☐	0.100	0.090	1843.45	0.0008	P	5.9
3	☐	1.000	0.950	16944.87	0.0067	P	3.6
4	☐	10.000	9.848	177667.55	0.0686	P	1.3
5	☐	100.000	100.016	1816434.40	0.6952	P	2.2

y = 0.0069 * x + 1.2589E-004
R = 1.0000
DL = 0.01186
BEC = 0.01812

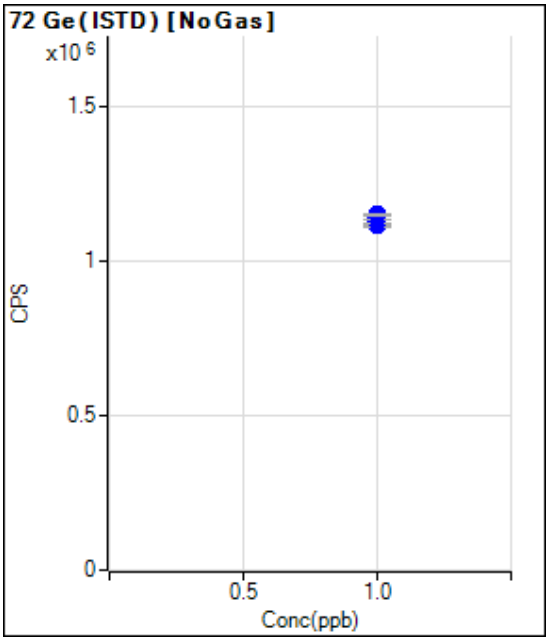
Weight: <None>
Min Conc: <None>



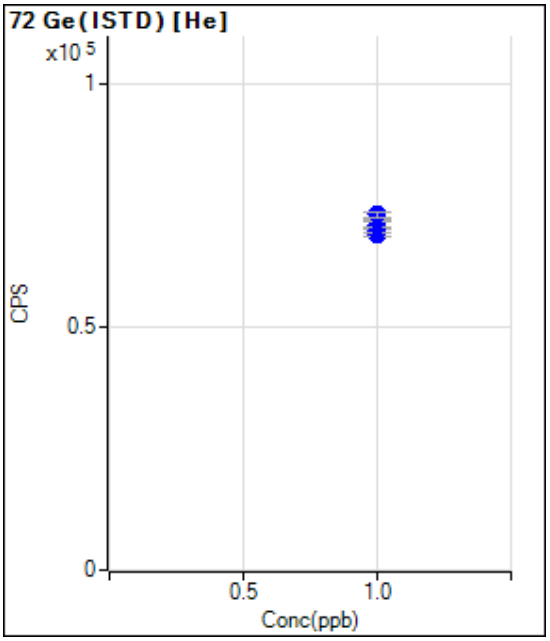
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5061380.49		P	0.7
2	☐	1.000		5043438.41		P	1.0
3	☐	1.000		5083634.66		P	1.2
4	☐	1.000		5137094.52		P	1.4
5	☐	1.000		5170851.46		P	1.1



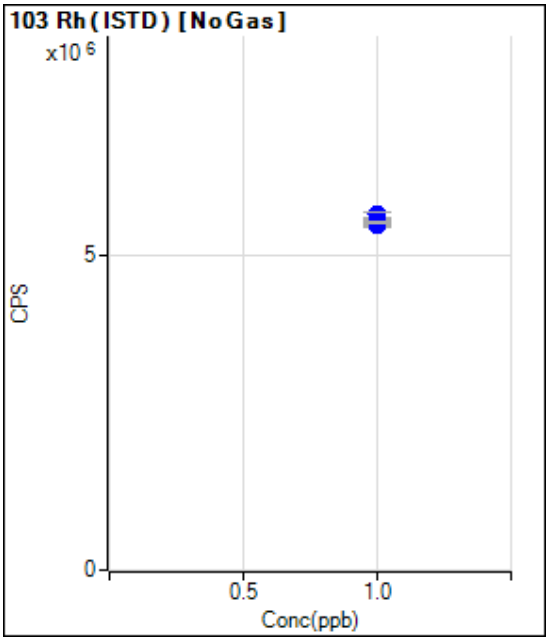
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		86332.28		P	0.4
2	☐	1.000		85552.64		P	0.2
3	☐	1.000		86448.87		P	0.7
4	☐	1.000		88155.66		P	0.4
5	☐	1.000		88906.98		P	1.0



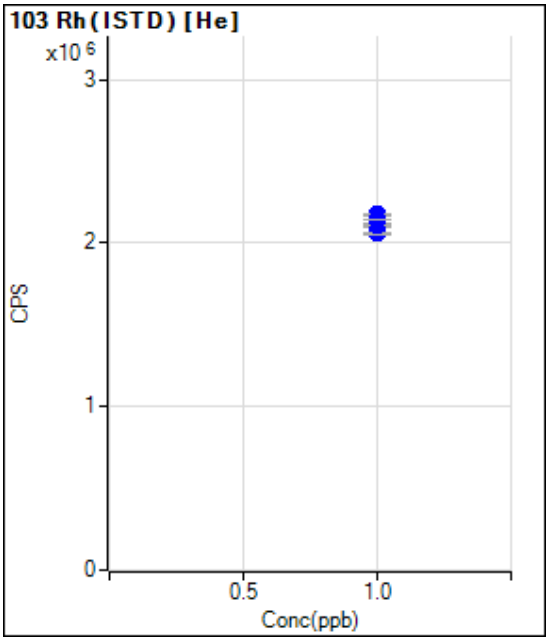
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1116846.21		P	1.2
2	☐	1.000		1112323.98		P	0.9
3	☐	1.000		1128395.34		P	1.2
4	☐	1.000		1140019.82		P	1.2
5	☐	1.000		1149198.46		P	0.8



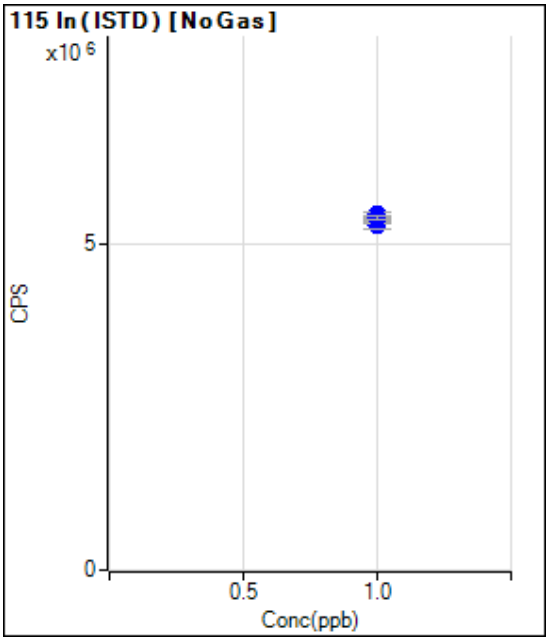
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		68942.69		P	1.0
2	☐	1.000		69788.66		P	0.8
3	☐	1.000		70996.74		P	1.6
4	☐	1.000		71933.67		P	0.9
5	☐	1.000		73129.40		P	1.7



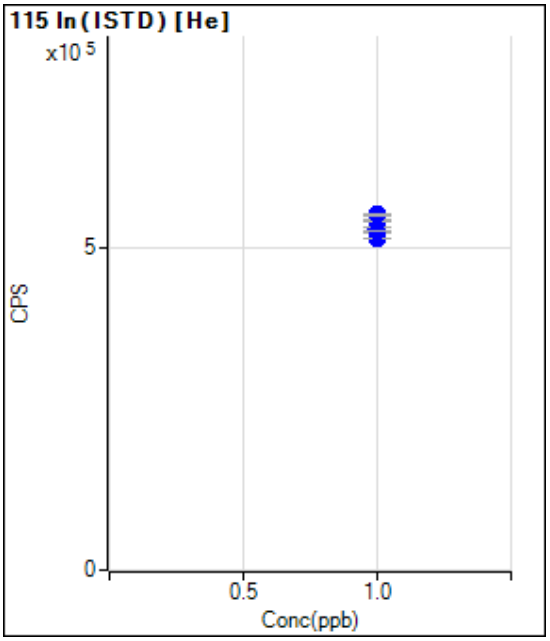
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5479027.00		P	0.9
2	☐	1.000		5525472.42		P	1.7
3	☐	1.000		5524642.00		P	1.4
4	☐	1.000		5662757.55		P	1.3
5	☐	1.000		5545086.17		P	0.7



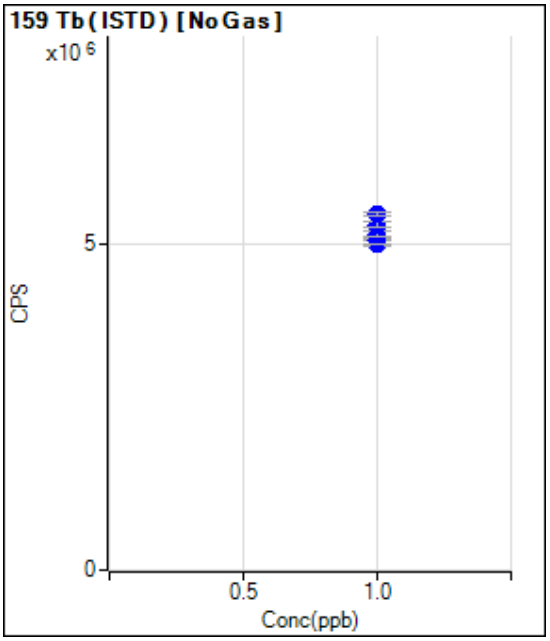
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2061162.14		P	0.4
2	☐	1.000		2106627.90		P	0.5
3	☐	1.000		2114295.40		P	0.7
4	☐	1.000		2174271.58		P	0.6
5	☐	1.000		2144434.84		P	0.4



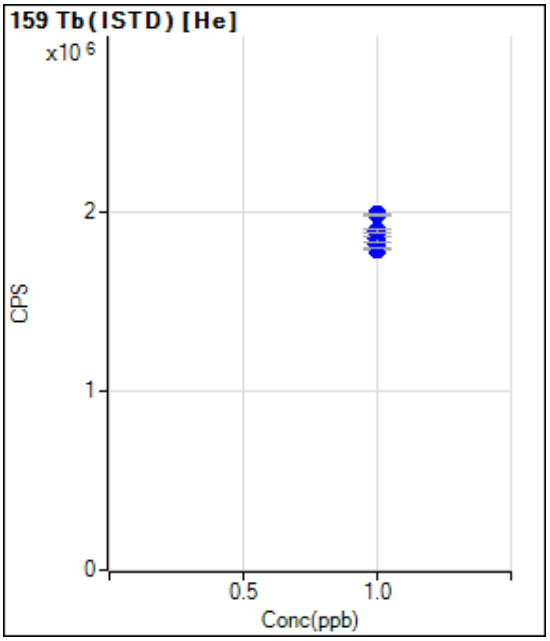
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5301929.89		P	2.2
2	☐	1.000		5294474.09		P	1.8
3	☐	1.000		5382763.40		P	1.9
4	☐	1.000		5459329.01		P	1.7
5	☐	1.000		5417680.32		P	1.3



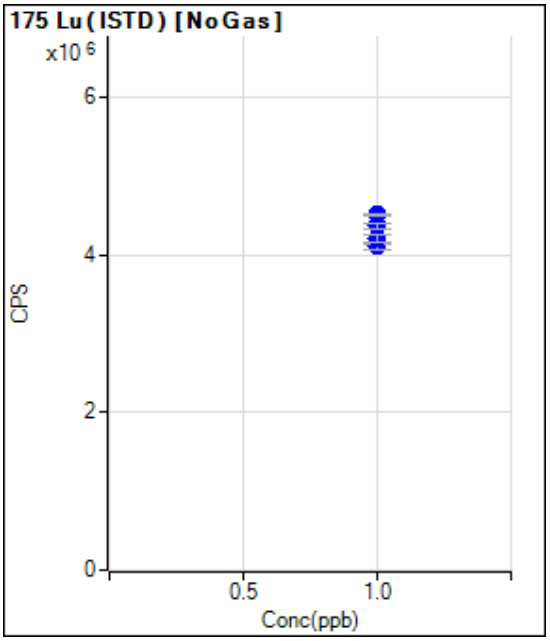
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		515120.94		P	0.2
2	☐	1.000		524898.84		P	0.7
3	☐	1.000		528836.72		P	1.3
4	☐	1.000		541829.72		P	0.6
5	☐	1.000		551621.76		P	0.5



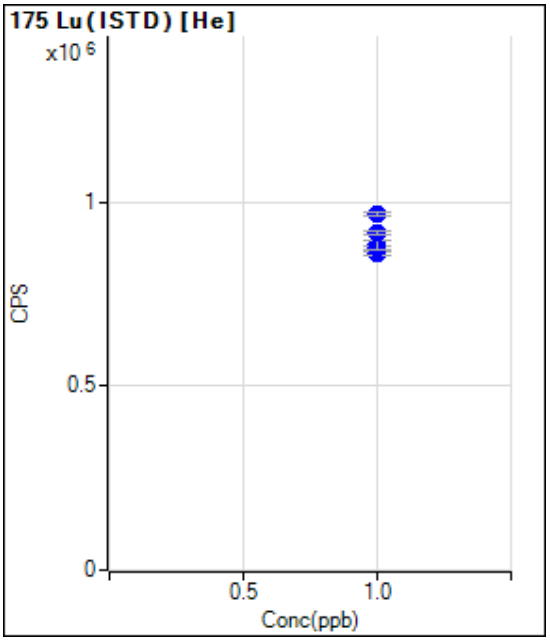
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		4997578.57		P	1.9
2	☐	1.000		5044445.76		P	1.6
3	☐	1.000		5147452.11		P	1.8
4	☐	1.000		5290425.65		P	1.9
5	☐	1.000		5440864.71		P	0.9



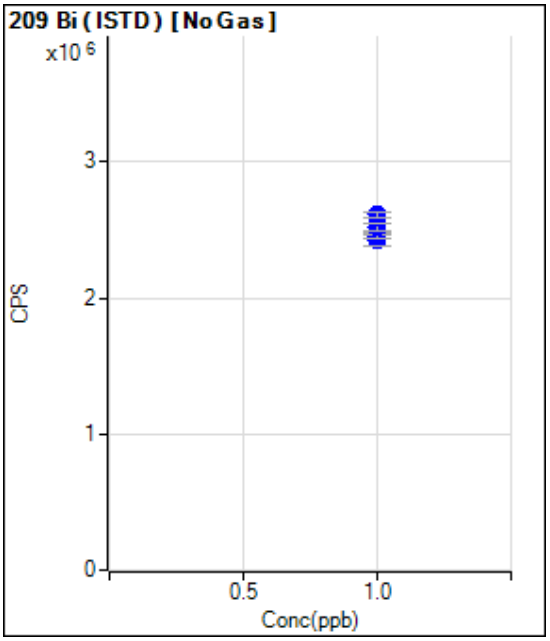
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1790396.85		P	0.7
2	☐	1.000		1812393.67		P	1.3
3	☐	1.000		1845793.04		P	1.8
4	☐	1.000		1892948.56		P	1.0
5	☐	1.000		1981999.03		P	0.5



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		4111004.52		P	2.4
2	☐	1.000		4100966.19		P	1.9
3	☐	1.000		4209545.56		P	2.3
4	☐	1.000		4361469.83		P	1.8
5	☐	1.000		4507163.79		P	0.8



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		860474.49		P	0.9
2	☐	1.000		875336.81		P	1.1
3	☐	1.000		884604.75		P	2.9
4	☐	1.000		916306.40		P	1.1
5	☐	1.000		965088.03		P	1.1



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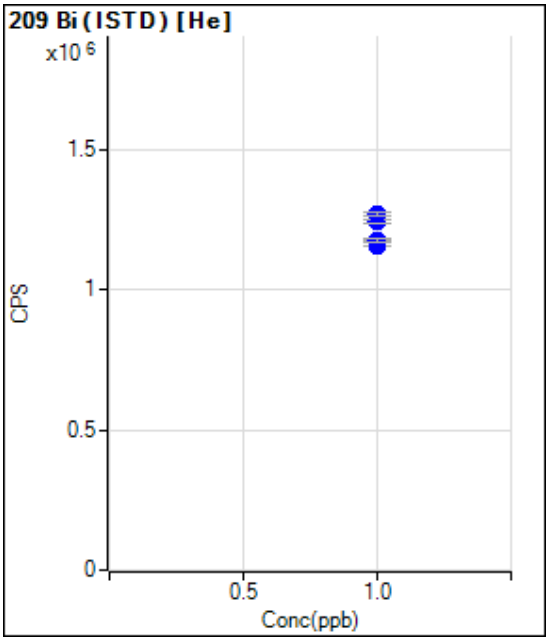
1	☐	1.000		2430541.58		P	4.1
2	☐	1.000		2449990.69		P	1.5
3	☐	1.000		2521012.57		P	2.7
4	☐	1.000		2591815.33		P	2.9
5	☐	1.000		2613428.56		P	1.8



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1156007.06		P	0.5
2	☐	1.000		1171143.53		P	0.7
3	☐	1.000		1177552.35		P	1.3
4	☐	1.000		1242914.67		P	1.0
5	☐	1.000		1268491.49		P	1.2

Metals

PrepSheets

3050B Metals Solid Preparation

ANALYST/ TECH		START DATE/TIME	12:18 8-22-19	END DATE/TIME	15:10	BATCH	642442

#	CLIENT	TYPE	CLIENT ID	GCAL ID	INITIAL WGT (g)	FINAL VOL (mL)	COMMENT	STANDARDS\ REAGENTS
1	QC	MB	MB 1841866	1841866	1.25	50		GCAL - 8 - 250uL 212918
2	QC	LCS	LCS 1841867	1841867	1.25	↓		
3	4838	SAMP	WIL01IS02	21808181302	1.25			Sb,Ag,Se SPIKE - 250uL 314.64-2
4	4838	SAMP	WIL04IS03	21808181304	1.33			
5	4838	SAMP	WIL04IS01	21808181305	1.35			Li,B,Zr SPIKE - 250uL 314.64-2
6	4838	SAMP	WIL04IS02	21808181306	1.32			
7	4612	SAMP	ADA-25X38-A03-SP07...	21808210501	1.32			Si SPIKE - 250uL 212775
8	QC	MS	WIL01IS02 MS	1842047	1.25	50		
9	QC	MSD	WIL01IS02 MSD	1842048	1.25	↓		HNO3 301 11-5
10								
11								H2O2 212997
12								
13								HCL N/A
14								
15								1:1 HNO3 224-20-2
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								Digestion Vessel Lot # 180513
28								
29								
30								

EQUIPMENT\CONDITIONS

DIGESTION BLOCK	B2	TEMPERATURE	95°	

NOTES

Matrix-Soil. 6020_S_EX

3050B Metals Solid Preparation

ANALYST/ TECH	JL	START DATE/TIME	8:15 9/25/18	END DATE/TIME	11:15	BATCH	642531

#	CLIENT	TYPE	CLIENT ID	GCAL ID	INITIAL WGT (g)	FINAL VOL (mL)	COMMENT
1	QC	MB	MB 1842310	1842310	1.13	50	
2	QC	LCS	LCS 1842311	1842311	1.25		
3	4957	SAMP	A013 D1 (0-1)	21808223401	1.33		
4	4957	SAMP	A013 D1 (1-2)	21808223402	1.25		
5	4957	SAMP	A013 D1 (2-3)	21808223403	1.44		
6	4838	SAMP	WIL03IS01	21808181301	1.35		
7	4838	SAMP	WIL03IS02	21808181308	1.28		
8	4838	SAMP	WIL02IS01	21808181401	1.25		
9	4838	MS	WIL02IS01 MS	21808181402	1.25		
10	4838	MSD	WIL02IS01 MSD	21808181403	1.25		
11	4838	SAMP	WIL02IS02	21808181404	1.31		
12	4838	SAMP	WIL01IS03	21808181405	1.40		
13	4838	SAMP	WIL01IS01	21808181406	1.26		
14	4838	SAMP	WIL02IS03	21808181407	1.34		
15	4838	SAMP	WIL03IS03	21808181307	1.26		
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

STANDARDS\ REAGENTS

GCAL - 8 - 250uL
TZL918

Sb,Ag,Se SPIKE - 250uL
316 WS-2

Li,B,Zr SPIKE - 250uL
316 WL-2

Si SPIKE - 250uL
TZL775

HNO3
301-11-16

H2O2
TZL997

HCL
N/A

1:1 HNO3
TZL 78-2

Digestion Vessel Lot #
180521

EQUIPMENT\CONDITIONS

DIGESTION BLOCK	A1	TEMPERATURE	94°	

NOTES

Matrix-Soil. 6020_S_EX

3010A Metals Water Preparation

ANALYST/ TECH		START DATE/TIME	11:30 8/7/18	END DATE/TIME	12:55	BATCH	642277

#	CLIENT	TYPE	CLIENT ID	GCAL ID	INITIAL VOL (mL)	FINAL VOL (mL)	COMMENT	STANDARDS\ REAGENTS
1	QC	MB	MB 1841052	1841052	80	90		GCAL - 8 - 250uL 726918
2	QC	LCS	LCS 1841053	1841053	↓			
3	4989	SAMP	#14	21808166103	5mL			Sb,Ag,Se SPIKE - 250uL 316-652
4	0042	SAMP	Nickel Catalyst #2...	21808173601	5mL			
5	QC	MS	Nickel Catalyst #2...MS	1841056				Li,B,Zr SPIKE - 250uL 316-666-2
6	QC	MSD	Nickel Catalyst #2...MSD	1841057	↓			
7	4629	SAMP	PMW-3A	21808180601	50mL			Si SPIKE - 250uL 726775
8	4629	SAMP	MW-65	21808180602				
9	4838	SAMP	WIL03IS00	21808181303				1:1 HNO3 726746
10	0176	SAMP	SARA Separator Eff...	21808201101				
11	0176	SAMP	SARA ACLA Sump	21808201102				1:1 HCL 726781
12	0176	SAMP	U31PS201G	21808201401	↓	↓		
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								Digestion Vessel Lot# 180516
28								
29								
30								

EQUIPMENT\CONDITIONS

DIGESTION BLOCK	A1	TEMPERATURE	94°	

NOTES

TCLPs are reduced in volume due to sample matrix. Matrix-Water. 6020_W_EX

GCAL

SOLIDS DATA SHEET

TS/TSS Oven Temp: 103 - 105 °C
TDS Oven Temp: 180 ± 2 °C
TVS/VSS Muffle Furnace Temp: 550 ± 5% (27) °C
Ash Muffle Furnace Temp: 800 ± 5% (40) °C

Test: DW

HBN: 642622

SOLI Batch Number: 300611

Initial Weight
Balance ID: BAL 15
Date/Time: 8-24-18 12:31
Analyst: CSS

Oven ID: O11
Date/Time IN: 8-24-18 12:31
Oven Temp °C IN: 104
Oven Temp °C OUT: 104
Date/Time OUT/Desiccator#: 8-26-18 D5 16:54
Analyst: LDH

TDS Oven ID: NA
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 1
Balance ID: BAL 15
Date/Time: 8-26-18 18:00
Analyst: LDH

Oven ID: NA
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 2
Balance ID:
Date/Time:
Analyst:

Oven ID:
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 3 (If needed):
Balance ID: NA
Date/Time:
Analyst:

Oven ID:
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 4 (If needed):
Balance ID:
Date/Time:
Analyst:

Comments:

Rev 005: 10/13/2017

Secondary Reviewer/Date: AJE 8/27/18

TOTAL SOLIDS AND MOISTURE ANALYSIS (SOLID MATRIX)

Method 2540G

HBN	642622			ANALYST:	CJS							DATE:	8/24/2018
SOLI	30061			REVIEW:	ADC 8/27/18							TIME:	12:01:00

Sample ID	Pan ID	Pan Mass (g)	Initial Mass (g) (Sample & Pan)	Final Wt. 1 (g) (Sample & Pan)	Final Wt. 2 (g) (Sample & Pan)	Diff (g)	Final Wt. 3 (g) (Sample & Pan)	Diff (g)	Initial Mass Less Pan (g)	Final Mass Less Pan (g)	Total Solid %	Totol Moisture %
21808240601	-1	1.0364	11.6121	10.0169					10.5757	8.9805	84.92	15.08
21808240603	-2	1.0268	11.6273	9.8877					10.6005	8.8609	83.59	16.41
21808181204	-3	1.0467	11.5980	8.5594					10.5513	7.5127	71.20	28.80
1842784	-4	1.0388	11.4495	8.2756					10.4107	7.2368	69.51	30.49
21808181205	[illegible]	1.0075	11.3943	8.3372					10.3868	7.3297	70.57	29.43
1842785	-6	1.0434	11.4668	8.6065					10.4234	7.5631	72.56	27.44
21808181206	-7	1.0470	11.7307	8.4978					10.6837	7.4508	69.74	30.26
21808181207	-7	1.0470	11.7307	8.4978					10.6837	7.4508	69.74	30.26
21808181208	-7	1.0470	11.7307	8.4978					10.6837	7.4508	69.74	30.26
21808181209	-8	1.0471	11.8269	8.6407					10.7798	7.5936	70.44	29.56
21808181210	-9	1.0313	11.7118	8.5359					10.6805	7.5046	70.26	29.74
21808181301	-10	1.0281	11.4999	10.3255					10.4718	9.2974	88.79	11.21
21808181302	-11	1.0283	11.0661	10.4217					10.0378	9.3934	93.58	6.42
21808181304	-12	1.0222	11.4997	11.2354					10.4775	10.2132	97.48	2.52
21808181305	-13	1.0428	11.1502	10.9159					10.1074	9.8731	97.68	2.32
21808181306	-14	1.0552	11.1740	10.9712					10.1188	9.9160	98.00	2.00
21808181307	-15	1.0707	11.1541	8.1628					10.0834	7.0921	70.33	29.67
21808181308	-16	1.0343	11.2408	10.4522					10.2065	9.4179	92.27	7.73

TS % = ((Final Sample Mass - Initial Sample Mass) x 100) / Initial Sample Mass

TM % = 100-TS%

Method 2540G

Total Solids Solid Spreadsheet, Version 2, 01/26/11

GCAL ANALYTICAL LABORATORIES, LLC

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

CHAIN OF CUSTODY RECORD

GCAL USE ONLY
Client ID: 4838 - AECOM
SDG: 218081813
PM: AEC

Report to:
Client: AECOM
Address: 12420 Milestone Center Dr, 150
Germantown, MD 20876
Contact: Jennifer Li
Phone: 301-820-3476
E-mail: jennifer.j.li@aecom.com

Bill to:
Client:
Address:
Same as "Report to:"
Contact:
Phone:
E-mail:

P.O. Number
Project Name/Number: Williston LTA, #60520956
Sampled By:

Analytical Requests & Method

GCAL use only:
Custody Seal used ☐ yes ☐ no
intact ☑ yes ☐ no EZT
Temperature °C 3,2,2,4,1.9
33,38,45 CPM

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Containers	Total Metals (6020B) Sb, Cu, Pb, Zn	Explosives (8330B)	Preservative
SOIL	8-14-18	1600	X		WIL03ISO1	1	X		-1
SOIL	8-14-18	1350	X		WIL01ISO2	1	X		-2
WATER	8-16-18	0820		X	WIL03ISO0	1	X		-3
SOIL	8-15-18	1610	X		WIL04ISO3	1	X		-4
SOIL	8-15-18	1600	X		WIL04ISO1	1	X		-5
SOIL	8-15-18	1605	X		WIL04ISO2	1	X		-6
SOIL	8-14-18	1610	X		WIL03ISO3	1	X		-7
SOIL	8-14-18	1605	X		WIL03ISO2	1	X		-8

Air Bill No: 7823-5315-3431

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☒ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	8/17/18	1100			
FedEx	8/18/18	1045		8/18/18	1045
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Note:

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

SAMPLE RECEIVING CHECKLIST

218081813

SAMPLE DELIVERY GROUP 218081813	
Client **PM** AEC 4838 - AECOM	**Transport Method** FEDEX
Profile Number 277537	**Received By** Savage, Tiffany R
Line Item(s) 1 - ISM- Explosives/Metals 3 - Water	**Receive Date(s)** 08/18/18

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by GCAL?	☐	☑

COOLERS

Airbill	Thermometer ID: E29	Temp °C
7823-5315-3431		3.2
		2.4
		1.9

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 09/07/2018

GCAL Report 218081814

Project Williston LTA, #60520956

Deliver To	***Additional Recipients***
Naoum Tavantzis AECOM 1600 Peremeter Park Drive Suite 400 Morrisville, NC 27560 919-461-1100	Jennifer Li, AECOM Laurie Stenberg, AECOM

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics **-** The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____

Authorized Signature
GCAL Report 218081814

Certifications

Certification	Certification Number
DOD ELAP	L14-243
Alabama	01955
Arkansas	12-060-0
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
USDA Soil Permit	P330-10-00117

Case Narrative

Client: AECOM **Report:** 218081814

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was completed in accordance with DOD QSM 5.1 as specified in the contract.

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

In the EPA 8330B analysis for prep batch 642680, the LCS/LCSD RPD is above the control limit for 4-Nitrotoluene. All recoveries are acceptable.

METALS

In the EPA 6020B analysis for prep batch 642531, the MS and/or MSD recovery is outside the control limits for Antimony. The LCS recovery is within control limits. This indicates the analysis is in control and the sample is affected by matrix interference or the element is non-homogeneous in the sample. A post-digestion spike was performed. The MS/MSD recoveries and RPD are not applicable for Copper and Lead because the sample concentration is greater than four times the spike concentration.

Q Flag Summary

Client Sample ID: **WIL02IS01** Lab Sample ID: **21808181401**

Method: **EPA 8330B** Analysis Date: **8/30/2018 5:41:00 PM**						
Analyte	**CAS**	**CCV OUL**	**LCS/LCSD OUL**	**SURROGATE OUL**	**IS OUL**	**CLCCV OUL**
4-Nitrotoluene	99-99-0		X			

Client Sample ID: **WIL02IS02** Lab Sample ID: **21808181404**

Method: **EPA 8330B** Analysis Date: **8/30/2018 6:40:20 PM**						
Analyte	**CAS**	**CCV OUL**	**LCS/LCSD OUL**	**SURROGATE OUL**	**IS OUL**	**CLCCV OUL**
4-Nitrotoluene	99-99-0		X			

Client Sample ID: **WIL02IS03** Lab Sample ID: **21808181407**

Method: **EPA 8330B** Analysis Date: **8/30/2018 7:00:07 PM**						
Analyte	**CAS**	**CCV OUL**	**LCS/LCSD OUL**	**SURROGATE OUL**	**IS OUL**	**CLCCV OUL**
4-Nitrotoluene	99-99-0		X			

CCV OUL=CCV out of limits
LCS/LCSD OUL=LCS/LCSD out of limits
SURROGATE OUL=Surrogate out of limits
IS OUL=Internal Standard out of limits
CLCCV OUL=Closing CCV out of limits

Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21808181401	WIL02IS01	Solid	08/15/2018 12:00	08/18/2018 10:45
21808181402	WIL02IS01 MS	Solid	08/15/2018 12:00	08/18/2018 10:45
21808181403	WIL02IS01 MSD	Solid	08/15/2018 12:00	08/18/2018 10:45
21808181404	WIL02IS02	Solid	08/15/2018 12:10	08/18/2018 10:45
21808181405	WIL01IS03	Solid	08/14/2018 14:00	08/18/2018 10:45
21808181406	WIL01IS01	Solid	08/14/2018 13:40	08/18/2018 10:45
21808181407	WIL02IS03	Solid	08/15/2018 12:20	08/18/2018 10:45

Test Summary

GCAL ID	Client ID	Matrix	Procedure
21808181401	WIL02IS01	S	EPA 6020B
21808181401	WIL02IS01	S	EPA 6020 ISM Prep
21808181401	WIL02IS01	S	EPA 8330B Solid
21808181401	WIL02IS01	S	EPA 8330B Prep Solid
21808181401	WIL02IS01	S	Dry Weight/Percent Moisture
21808181401	WIL02IS01	S	Incremental Sampling Method
21808181402	WIL02IS01 MS	S	EPA 6020B
21808181402	WIL02IS01 MS	S	EPA 6020 ISM Prep
21808181402	WIL02IS01 MS	S	EPA 8330B Solid
21808181402	WIL02IS01 MS	S	EPA 8330B Prep Solid
21808181402	WIL02IS01 MS	S	Dry Weight/Percent Moisture
21808181402	WIL02IS01 MS	S	Incremental Sampling Method
21808181403	WIL02IS01 MSD	S	EPA 6020B
21808181403	WIL02IS01 MSD	S	EPA 6020 ISM Prep
21808181403	WIL02IS01 MSD	S	EPA 8330B Solid
21808181403	WIL02IS01 MSD	S	EPA 8330B Prep Solid
21808181403	WIL02IS01 MSD	S	Dry Weight/Percent Moisture
21808181403	WIL02IS01 MSD	S	Incremental Sampling Method
21808181404	WIL02IS02	S	EPA 6020B
21808181404	WIL02IS02	S	EPA 6020 ISM Prep
21808181404	WIL02IS02	S	EPA 8330B Solid
21808181404	WIL02IS02	S	EPA 8330B Prep Solid
21808181404	WIL02IS02	S	Dry Weight/Percent Moisture
21808181404	WIL02IS02	S	Incremental Sampling Method
21808181405	WIL01IS03	S	EPA 6020B
21808181405	WIL01IS03	S	EPA 6020 ISM Prep
21808181405	WIL01IS03	S	Dry Weight/Percent Moisture
21808181405	WIL01IS03	S	Incremental Sampling Method
21808181406	WIL01IS01	S	EPA 6020B
21808181406	WIL01IS01	S	EPA 6020 ISM Prep
21808181406	WIL01IS01	S	Dry Weight/Percent Moisture
21808181406	WIL01IS01	S	Incremental Sampling Method
21808181407	WIL02IS03	S	EPA 6020B
21808181407	WIL02IS03	S	EPA 6020 ISM Prep
21808181407	WIL02IS03	S	EPA 8330B Solid
21808181407	WIL02IS03	S	EPA 8330B Prep Solid
21808181407	WIL02IS03	S	Dry Weight/Percent Moisture
21808181407	WIL02IS03	S	Incremental Sampling Method

Manual Integrations

Manual Integrations for LC and IC (if performed) are documented in the raw data.
No other manual integrations were performed by GCAL.

Summary of Compounds Detected

WIL02IS01	**Collect Date**	08/15/2018 12:00	**GCAL ID**	21808181401
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	38400	117	234	469	ug/Kg
7439-92-1	Lead	15900	117	234	469	ug/Kg
7440-66-6	Zinc	88500	2340	4690	9370	ug/Kg

WIL02IS02	**Collect Date**	08/15/2018 12:10	**GCAL ID**	21808181404
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	33900	113	227	453	ug/Kg
7439-92-1	Lead	15100	113	227	453	ug/Kg
7440-66-6	Zinc	77400	2270	4530	9060	ug/Kg

WIL01IS03	**Collect Date**	08/14/2018 14:00	**GCAL ID**	21808181405
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	24300	95.8	192	383	ug/Kg
7439-92-1	Lead	69100	95.8	192	383	ug/Kg
7440-66-6	Zinc	64500	1920	3830	7670	ug/Kg

WIL01IS01	**Collect Date**	08/14/2018 13:40	**GCAL ID**	21808181406
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	23800	105	211	422	ug/Kg
7439-92-1	Lead	46500	105	211	422	ug/Kg
7440-66-6	Zinc	67300	2110	4220	8440	ug/Kg

Summary of Compounds Detected

WIL02IS03				
	Collect Date	08/15/2018 12:20	**GCAL ID**	21808181407
	Receive Date	08/18/2018 10:45	**Matrix**	Solid

EPA 6020B

*Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-50-8	Copper	35600	117	234	468	ug/Kg
7439-92-1	Lead	15700	117	234	468	ug/Kg
7440-66-6	Zinc	81400	2340	4680	9360	ug/Kg

Metals

Form I

Sample Results

I

INORGANIC ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS01
Collect Date:	08/15/18 Time: 1200	GCAL Sample ID:	21808181401
Matrix:	Solid % Solids: 85.34	Instrument ID:	ICPMS2
Sample Amt:	1.25 g	Lab File ID:	2180828B_MS2.b\1843SMPL_2180828A_MS2.D
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1312
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	469	ug/kg	U	234	469	937
Copper	38400	ug/kg		117	234	469
Lead	15900	ug/kg		117	234	469
Zinc	88500	ug/kg		2340	4690	9370

FORM I - IN

Reference Sample Report

Sample Name	21808181401
File Name	1843SMPL_2180828A_MS2.D
Data Path Name	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
Acq Time	08/28/2018 13:12:09
Sample Type	AllRef
Total Dilution	400.0000
Comment	ICPMS-2,LWZ
ISTD Ref FileName	010CALB_2180828A_MS2.D
Sample QC Pass/Fial	Fail
ISTD QC Pass/Fail	Pass

QC Analyte Table

Name	Mass	ISTD	Tune Mode	Conc.	Conc. RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	14171.578	1.14	680652.99	500	
Be	9	45	No Gas	636.832	2.43	8455.06	1000	
B	11	45	No Gas	5878.003	0.97	51334.07	500	
Sr	88	72	No Gas	99316.850	0.81	7973125.92	1000	
Zr	90	72	No Gas	14575.977	1.48	723556.67	100	
Mo	95	115	No Gas	651.497	1.91	9176.35	1000	
Ag	107	115	No Gas	114.731	4.95	3780.53	100	
Cd	111	115	No Gas	391.001	2.43	2645.84	1000	
Sb	121	115	No Gas	5.634	45.02	1639.00	1000	
Ba	137	115	No Gas	111146.684	1.58	1040849.06	1000	
Tl	205	209	No Gas	161.269	9.15	4984.44	1000	
Pb	208	209	No Gas	13548.319	1.01	505368.37	1000	
Na	23	45	He	743968.527	1.48	580356.83	100000	
Mg	24	45	He	12302215.589	1.06	3710536.71	100000	
Al	27	45	He	8350058.880	0.72	576291.00	20000	>LDR
Si	29	45	He	-1209492.062	N/A	4446.69	10000	
K	39	45	He	1158291.921	2.24	303490.10	100000	
Ca	44	45	He	30262736.386	1.00	348841.57	500000	
Ti	47	45	He	114023.511	1.30	13032.06	1000	
V	51	72	He	27597.639	0.32	132438.19	1000	
Cr	52	72	He	20402.556	1.22	131975.41	1000	
Mn	55	72	He	498439.827	0.45	1111165.13	5000	
Fe	57	72	He	20553308.361	0.65	2249982.94	100000	
Co	59	72	He	10620.268	0.42	116622.04	1000	
Ni	60	72	He	34605.998	0.76	107632.77	2000	
Cu	63	72	He	32776.445	0.39	282400.93	1000	
Zn	66	72	He	75510.270	1.09	90630.11	20000	
As	75	72	He	5187.330	2.30	6407.42	1000	
Se	78	72	He	163.862	58.90	13.38	50	
Sn	120	115	He	854.555	3.39	3588.27	1000	

QC ISTD Table

Reference Sample Report

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	4990669.25	1.00	5061380.49333333	98.6	70	120	
Ge	72	No Gas	1072374.44	1.18	1116846.20666667	96.02	70	120	
Rh	103	No Gas	4979738.97	2.01	5479027.00333333	90.89	70	120	
In	115	No Gas	4876143.30	2.85	5301929.88666667	91.97	70	120	
Tb	159	No Gas	4433595.45	1.43	4997578.57333333	88.71	70	120	
Lu	175	No Gas	3580731.09	2.30	4111004.52	87.1	70	120	
Bi	209	No Gas	2145980.75	2.27	2430541.58	88.29	70	120	
Sc	45	He	87776.01	0.59	86332.2766666667	101.67	70	120	
Ge	72	He	69882.56	0.09	68942.6933333333	101.36	70	120	
Rh	103	He	1961086.80	0.73	2061162.14	95.14	70	120	
In	115	He	488786.95	1.48	515120.94	94.89	70	120	
Tb	159	He	1508417.43	0.56	1790396.84666667	84.25	70	120	
Lu	175	He	670291.81	0.27	860474.493333333	77.9	70	120	
Bi	209	He	1022084.41	0.38	1156007.06333333	88.42	70	120	

I

INORGANIC ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS01 MS
Collect Date:	08/15/18 Time: 1200	GCAL Sample ID:	21808181402
Matrix:	Solid % Solids: 85.34	Instrument ID:	ICPMS2
Sample Amt:	1.25 g	Lab File ID:	2180828B_MS2.b\1844SMPL_2180828A_MS2.D
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1315
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	RESULT	UNITS	Q	DL	LOD	LOQ
Antimony	315	ug/kg	J	234	469	937
Copper	40000	ug/kg		117	234	469
Lead	18400	ug/kg		117	234	469
Zinc	136000	ug/kg		2340	4690	9370

MS Report

Sample Name	21808181402	**Total Dilution**	400.0000
File Name	1844SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Data Path Name	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b	**ISTD Ref FileName**	010CALB_2180828A_MS2.D
Acq Time	08/28/2018 13:15:42	**Sample QC Pass/Fail**	Fail
Sample Type	MSSOIL	**ISTD QC Pass/Fail**	Pass

Analyte Table **Units : ppb**

Name	Mass	ISTD	Mode	MeasValue	FinalConc	RSD	CPS	Ref Conc	%Rec	QC Flag
Ag	107	115	No Gas	4.95133332908929	1980.533	2.56	62250.34	114.730906267821	93.2901212683947	
Al	27	45	He	24732.9185817121	9893167.433	0.40	683102.02	8350058.88011472	3857.77138142531	> +/- 20%
As	75	72	He	17.6310626747124	7052.425	0.29	8625.91	5187.32974133412	93.254766427542	
B	11	45	No Gas	35.9853844816322	14394.154	1.21	116961.72	5878.0026325957	85.1615116005719	
Ba	137	115	No Gas	279.255712313847	111702.285	1.59	1010653.12	111146.684468536	27.7800228501612	> +/- 20%
Be	9	45	No Gas	6.82529973317836	2730.120	0.54	35106.98	636.832002457495	104.664394540692	
Ca	44	45	He	75636.6396478083	30254655.859	0.40	348915.51	30262736.3864391	-0.80805273157768	> +/- 20%
Cd	111	115	No Gas	6.21165417114489	2484.662	2.67	16107.05	391.001034930369	104.683031676379	
Co	59	72	He	31.5747490079693	12629.900	0.16	137441.27	10620.2678849328	100.481585912749	
Cr	52	72	He	60.7924776485293	24316.991	0.73	155507.25	20402.5563398229	195.721735979439	> +/- 20%
Cu	63	72	He	85.3053686630282	34122.147	0.50	291354.57	32776.4451977491	67.285113373107	> +/- 20%
Fe	57	72	He	53003.3267547347	21201330.702	0.59	2300392.20	20553308.3608883	324.011170502776	> +/- 20%
K	39	45	He	3470.65072085041	1388260.288	0.95	361704.83	1158291.92082598	114.984183757093	
Li	7	45	No Gas	65.7148326530871	26285.933	1.29	1098774.85	14171.5782852394	121.143547759954	> +/- 20%
Mg	24	45	He	30876.1882853686	12350475.314	0.61	3726854.01	12302215.5885277	24.1298628098415	> +/- 20%
Mn	55	72	He	1225.05411841042	490021.647	0.31	1082713.50	498439.826636121	-420.908963597711	> +/- 20%
Mo	95	115	No Gas	5.81586576143502	2326.346	1.76	31106.13	651.497307159834	83.7424498707087	
Na	23	45	He	2325.92131362845	930368.525	0.53	724963.30	743968.527322056	93.1999990646621	
Ni	60	72	He	96.022552313239	38409.021	1.03	118370.85	34605.9975160119	95.0755852320935	
Pb	208	209	No Gas	39.342487771453	15736.995	2.54	561517.90	13548.3189070523	109.433810076443	
Sb	121	115	No Gas	0.671174398870149	268.470	3.68	8887.33	5.63356372658248	6.57090489553693	> +/- 20%
Se	78	72	He	1.47411867835469	589.647	22.22	35.78	163.862454152738	106.446254297285	
Si	29	45	He	-2096.58643536988	-838634.574	11.30	5424.35	-1209492.06176515	185.428743808598	> +/- 20%
Sn	120	115	He	2.68415634468467	1073.663	4.50	4322.93	854.554629327721	10.9553954273073	> +/- 20%
Sr	88	72	No Gas	248.30813772374	99323.255	0.66	7742101.76	99316.8500454276	0.320252203429845	> +/- 20%
Ti	47	45	He	378.194158573163	151277.663	1.16	17295.73	114023.511198567	1862.70761153493	> +/- 20%
Tl	205	209	No Gas	5.319036326666	2127.615	2.96	56920.25	161.269219415132	98.3172655625634	
V	51	72	He	83.7506522900272	33500.261	0.63	159309.45	27597.6387524209	295.131108179499	> +/- 20%
Zn	66	72	He	290.15311144657	116061.245	0.41	137451.20	75510.2700038778	101.377436436876	
Zr	90	72	No Gas	40.5247469993789	16209.899	1.46	781129.19	14575.9774038299	408.480348980406	> +/- 20%

QC ISTD Table **Recovery Limits: 70 - 120%**

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	987945.77	1156007.06333333	85.46	
Ge	72	He	69274.15	68942.6933333333	100.48	
In	115	He	483342.07	515120.94	93.83	

MS Report

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Lu	175	He	645847.74	860474.493333333	75.06	
Rh	103	He	1949472.28	2061162.14	94.58	
Sc	45	He	87818.06	86332.2766666667	101.72	
Tb	159	He	1422182.58	1790396.84666667	79.43	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2056474.71	2430541.58	84.61	
Ge	72	No Gas	1042298.78	1116846.20666667	93.33	
In	115	No Gas	4712893.65	5301929.88666667	88.89	
Lu	175	No Gas	3381431.51	4111004.52	82.25	
Rh	103	No Gas	4878304.81	5479027.00333333	89.04	
Sc	45	No Gas	4873419.67	5061380.49333333	96.29	
Tb	159	No Gas	4182137.96	4997578.57333333	83.68	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS01 MSD
Collect Date:	08/15/18 Time: 1200	GCAL Sample ID:	21808181403
Matrix:	Solid % Solids: 85.34	Instrument ID:	ICPMS2
Sample Amt:	1.25 g	Lab File ID:	2180828B_MS2.b\1845SMPL_2180828A_MS2.D
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1319
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	RESULT	UNITS	Q	DL	LOD	LOQ
Antimony	361	ug/kg	J	234	469	937
Copper	39900	ug/kg		117	234	469
Lead	17600	ug/kg		117	234	469
Zinc	133000	ug/kg		2340	4690	9370

Matrix Spike Duplicate (MSD) Sample Report

Sample Name	21808181403	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1845SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:19:15	**Total Dilution**	400.0000
Sample Type	MSDSOIL	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

RPD Limits: 0-20%

Name	Mass	Mode	MeasValue	Final Conc	RSD	CPS	RefConc	RPD	Flag
Li	7	No Gas	63.6157132866735	25446.285	1.03	1089225.35	65.7148326530871	3.25	
Be	9	No Gas	6.60305346950146	2641.221	1.62	34630.57	6.82529973317836	3.31	
B	11	No Gas	34.2697344034771	13707.894	0.77	113734.60	35.9853844816322	4.88	
Sr	88	No Gas	241.970989884738	96788.396	0.17	7742869.88	248.30813772374	2.59	
Zr	90	No Gas	41.3853392723522	16554.136	1.96	818775.40	40.5247469993789	2.1	
Mo	95	No Gas	5.62560848623775	2250.243	1.79	30980.35	5.81586576143502	3.33	
Ag	107	No Gas	4.77322719297126	1909.291	1.18	61770.75	4.95133332908929	3.66	
Cd	111	No Gas	6.11178253996659	2444.713	1.43	16314.00	6.21165417114489	1.62	
Sb	121	No Gas	0.770096298392537	308.039	2.64	10278.30	0.671174398870149	13.73	
Ba	137	No Gas	275.41246064544	110164.984	1.31	1026435.72	279.255712313847	1.39	
Tl	205	No Gas	5.04255219383167	2017.021	4.85	56652.45	5.319036326666	5.34	
Pb	208	No Gas	37.6133839766583	15045.354	2.43	563402.79	39.342487771453	4.49	
Na	23	He	2342.97804640384	937191.219	1.21	728929.16	2325.92131362845	0.73	
Mg	24	He	30594.6910560172	12237876.422	1.15	3686290.26	30876.1882853686	0.92	
Al	27	He	24120.1807904681	9648072.316	0.46	664942.17	24732.9185817121	2.51	
Si	29	He	-1568.45988560071	-627383.954	5.22	5963.22	-2096.58643536988	-28.82	
K	39	He	3380.31759297389	1352127.037	0.74	351901.34	3470.65072085041	2.64	
Ca	44	He	74731.192859701	29892477.144	0.58	344096.02	75636.6396478083	1.2	
Ti	47	He	373.861939111228	149544.776	1.22	17063.46	378.194158573163	1.15	
V	51	He	82.5678913661614	33027.157	0.57	157095.35	83.7506522900272	1.42	
Cr	52	He	59.9746213579814	23989.849	0.65	153452.50	60.7924776485293	1.35	
Mn	55	He	1213.15656137984	485262.625	1.02	1072186.42	1225.05411841042	0.98	
Fe	57	He	53140.4030119883	21256161.205	0.83	2306362.36	53003.3267547347	0.26	
Co	59	He	31.8948962374304	12757.958	0.34	138851.44	31.5747490079693	1.01	
Ni	60	He	95.9796721903684	38391.869	1.11	118344.45	96.022552313239	0.04	
Cu	63	He	85.2240854263351	34089.634	0.22	291134.75	85.3053686630282	0.1	
Zn	66	He	283.980302954639	113592.121	0.86	134574.69	290.15311144657	2.15	
As	75	He	17.6514917990841	7060.597	1.40	8637.58	17.6310626747124	0.12	
Se	78	He	1.60493828070744	641.975	11.09	38.46	1.47411867835469	8.5	
Sn	120	He	2.79294340978845	1117.177	7.42	4499.66	2.68415634468467	3.97	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1010712.30	1156007.06333333	87.43	
Ge	72	He	69292.97	68942.6933333333	100.51	
In	115	He	486040.35	515120.94	94.35	
Lu	175	He	655175.73	860474.493333333	76.14	
Rh	103	He	1946760.06	2061162.14	94.45	
Sc	45	He	87658.39	86332.2766666667	101.54	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2154507.99	2430541.58	88.64	
Ge	72	No Gas	1068719.61	1116846.20666667	95.69	
In	115	No Gas	4850435.06	5301929.88666667	91.48	
Lu	175	No Gas	3505823.80	4111004.52	85.28	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1444299.51	1790396.84666667	80.67	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5005628.83	5479027.00333333	91.36	
Sc	45	No Gas	4964115.36	5061380.49333333	98.08	
Tb	159	No Gas	4366503.79	4997578.57333333	87.37	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS02
Collect Date:	08/15/18 Time: 1210	GCAL Sample ID:	21808181404
Matrix:	Solid % Solids: 84.25	Instrument ID:	ICPMS2
Sample Amt:	1.31 g	Lab File ID:	2180828B_MS2.b\1848SMPL_2180828A_MS2.D
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1329
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	453	ug/kg	U	227	453	906
Copper	33900	ug/kg		113	227	453
Lead	15100	ug/kg		113	227	453
Zinc	77400	ug/kg		2270	4530	9060

FORM I - IN

Sample Report

Sample Name	21808181404	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1848SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:29:58	**Total Dilution**	381.6794
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	33.5108254411992	12790.391	1.12	646999.98	500	
Be	9	45	No Gas	1.43315750538631	547.007	0.99	7555.90	1000	
B	11	45	No Gas	13.7086702629317	5232.317	2.20	47766.00	500	
Sr	88	72	No Gas	250.50363475703	95612.074	0.89	8032455.30	1000	
Zr	90	72	No Gas	40.9821698066453	15642.050	0.68	812461.23	100	
Mo	95	115	No Gas	1.73882232477018	663.673	3.35	9919.09	1000	
Ag	107	115	No Gas	0.266919419937036	101.878	4.55	3570.49	100	
Cd	111	115	No Gas	0.884657235712677	337.655	5.73	2429.12	1000	
Sb	121	115	No Gas	0.161126534160168	61.499	2.12	3376.00	1000	
Ba	137	115	No Gas	278.763701555309	106398.359	2.71	1058955.44	1000	
Tl	205	209	No Gas	0.355353121809854	135.631	4.04	4647.65	1000	
Pb	208	209	No Gas	33.3746057420812	12738.399	1.21	519488.79	1000	
Na	23	45	He	1651.14100768455	630206.491	0.38	507517.45	100000	
Mg	24	45	He	29343.0843747967	11199650.525	0.33	3483685.16	100000	
Al	27	45	He	18853.1855194819	7195872.336	0.50	512169.76	20000	
Si	29	45	He	-2534.24815540866	-967270.288	8.33	4880.82	10000	
K	39	45	He	2503.87030972304	955675.691	0.73	259752.82	100000	
Ca	44	45	He	73795.3850593174	28166177.504	0.65	334840.54	500000	
Ti	47	45	He	308.153935379252	117616.006	0.68	13861.81	1000	
V	51	72	He	67.2544359480842	25669.632	1.72	128252.69	1000	
Cr	52	72	He	47.5220427339183	18138.184	1.31	122289.83	1000	
Mn	55	72	He	1139.71864521254	435007.116	0.53	1009597.56	5000	
Fe	57	72	He	47986.8320556246	18315584.754	0.87	2087379.60	100000	
Co	59	72	He	25.6717091308034	9798.362	0.16	112019.76	1000	
Ni	60	72	He	84.6922269117699	32325.277	0.68	104675.51	2000	
Cu	63	72	He	74.9367049235174	28601.796	0.39	256581.16	1000	
Zn	66	72	He	170.95257011762	65249.073	0.10	81638.68	20000	
As	75	72	He	13.3445337222073	5093.333	1.04	6549.15	1000	
Se	78	72	He	0.186344005989922	71.124	115.87	8.54	50	
Sn	120	115	He	2.23779569021137	854.120	3.10	3782.77	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1058760.11	1156007.06333333	91.59	
Ge	72	He	69421.56	68942.6933333333	100.69	
In	115	He	495328.67	515120.94	96.16	
Lu	175	He	690850.88	860474.493333333	80.29	
Rh	103	He	1976087.00	2061162.14	95.87	
Sc	45	He	86375.72	86332.2766666667	100.05	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2238594.86	2430541.58	92.1	
Ge	72	No Gas	1071103.57	1116846.20666667	95.9	
In	115	No Gas	4943033.13	5301929.88666667	93.23	
Lu	175	No Gas	3666005.67	4111004.52	89.18	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1567340.86	1790396.84666667	87.54	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5108465.22	5479027.00333333	93.24	
Sc	45	No Gas	4950018.83	5061380.49333333	97.8	
Tb	159	No Gas	4567663.26	4997578.57333333	91.4	

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INORGANIC ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL01IS03
Collect Date:	08/14/18 Time: 1400	GCAL Sample ID:	21808181405
Matrix:	Solid % Solids: 93.16	Instrument ID:	ICPMS2
Sample Amt:	1.4 g	Lab File ID:	2180828B_MS2.b\1849SMPL_2180828A_MS2.D
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1333
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	RESULT	UNITS	Q	DL	LOD	LOQ
Antimony	383	ug/kg	U	192	383	767
Copper	24300	ug/kg		95.8	192	383
Lead	69100	ug/kg		95.8	192	383
Zinc	64500	ug/kg		1920	3830	7670

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Sample Report

Sample Name	21808181405	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1849SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:33:30	**Total Dilution**	357.1429
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	30.7896871298809	10996.317	1.47	605340.71	500	
Be	9	45	No Gas	1.22683285877022	438.155	2.65	6458.73	1000	
B	11	45	No Gas	10.7340476904792	3833.588	1.66	38138.91	500	
Sr	88	72	No Gas	183.005365380589	65359.059	1.23	5910438.46	1000	
Zr	90	72	No Gas	29.6510323088149	10589.654	1.80	592178.43	100	
Mo	95	115	No Gas	1.35288226889118	483.172	2.19	7792.20	1000	
Ag	107	115	No Gas	0.217998986317596	77.857	4.32	2932.55	100	
Cd	111	115	No Gas	0.756748333839235	270.267	5.47	2087.96	1000	
Sb	121	115	No Gas	0.286287238532576	102.245	4.05	4849.79	1000	
Ba	137	115	No Gas	370.13435096107	132190.840	1.59	1409722.86	1000	
Tl	205	209	No Gas	0.314256089581327	112.234	9.22	4050.76	1000	
Pb	208	209	No Gas	180.300264588486	64392.952	2.69	2719788.64	1000	
Na	23	45	He	1554.7447303139	555265.975	1.83	473120.70	100000	
Mg	24	45	He	30068.889900968	10738889.250	0.19	3531413.59	100000	
Al	27	45	He	19257.1543738293	6877555.134	0.67	517536.21	20000	
Si	29	45	He	303.735320858427	108476.900	6.07	7732.19	10000	
K	39	45	He	3067.52988413117	1095546.387	1.26	312311.56	100000	
Ca	44	45	He	72282.3837553992	25815137.055	0.66	324481.89	500000	
Ti	47	45	He	283.159585051019	101128.423	1.13	12604.09	1000	
V	51	72	He	68.214048370297	24362.160	0.63	127488.03	1000	
Cr	52	72	He	45.201567996251	16143.417	0.62	114097.11	1000	
Mn	55	72	He	1225.26942572007	437596.223	0.91	1063824.65	5000	
Fe	57	72	He	49778.1166977473	17777898.821	1.28	2122457.94	100000	
Co	59	72	He	25.1134551561385	8969.091	0.63	107395.22	1000	
Ni	60	72	He	77.9853540036581	27851.912	0.60	94475.34	2000	
Cu	63	72	He	63.2703505751993	22596.554	0.63	212355.49	1000	
Zn	66	72	He	168.176408692324	60063.003	0.99	78710.52	20000	
As	75	72	He	13.8953362222249	4962.620	1.48	6683.88	1000	
Se	78	72	He	0.57368519683029	204.888	35.68	16.44	50	
Sn	120	115	He	2.33055445566965	832.341	2.31	3843.91	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1027133.27	1156007.06333333	88.85	
Ge	72	He	68067.86	68942.6933333333	98.73	
In	115	He	486135.23	515120.94	94.37	
Lu	175	He	661088.43	860474.493333333	76.83	
Rh	103	He	1969295.55	2061162.14	95.54	
Sc	45	He	85479.43	86332.2766666667	99.01	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2170617.31	2430541.58	89.31	
Ge	72	No Gas	1078419.26	1116846.20666667	96.56	
In	115	No Gas	4957821.73	5301929.88666667	93.51	
Lu	175	No Gas	3604371.30	4111004.52	87.68	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1489714.20	1790396.84666667	83.21	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5056579.52	5479027.00333333	92.29	
Sc	45	No Gas	4932987.44	5061380.49333333	97.46	
Tb	159	No Gas	4482830.35	4997578.57333333	89.7	

I

INORGANIC ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL01IS01
Collect Date:	08/14/18 Time: 1340	GCAL Sample ID:	21808181406
Matrix:	Solid % Solids: 94.08	Instrument ID:	ICPMS2
Sample Amt:	1.26 g	Lab File ID:	2180828B_MS2.b\1852SMPL_2180828A_MS2.D
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1344
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	422	ug/kg	U	211	422	844
Copper	23800	ug/kg		105	211	422
Lead	46500	ug/kg		105	211	422
Zinc	67300	ug/kg		2110	4220	8440

FORM I - IN

Sample Report

Sample Name	21808181406	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1852SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:44:10	**Total Dilution**	396.8254
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	29.2581256608999	11610.367	1.14	587801.25	500	
Be	9	45	No Gas	1.18943072237346	471.996	3.67	6316.00	1000	
B	11	45	No Gas	10.3780513909768	4118.274	1.55	37306.59	500	
Sr	88	72	No Gas	179.678233366929	71300.886	2.28	5781502.00	1000	
Zr	90	72	No Gas	28.2545558057121	11212.125	3.03	562228.66	100	
Mo	95	115	No Gas	1.36382710231803	541.201	3.12	7785.51	1000	
Ag	107	115	No Gas	0.22192639942333	88.066	6.50	2961.46	100	
Cd	111	115	No Gas	0.801011876661284	317.862	4.88	2190.20	1000	
Sb	121	115	No Gas	0.163569524743128	64.909	2.14	3383.77	1000	
Ba	137	115	No Gas	415.898477798002	165039.078	2.77	1570835.63	1000	
Tl	205	209	No Gas	0.287860596193521	114.230	7.25	3727.34	1000	
Pb	208	209	No Gas	110.169426305117	43718.026	3.48	1650071.74	1000	
Na	23	45	He	1632.12503514431	647668.665	1.35	501116.45	100000	
Mg	24	45	He	29345.6784075683	11645110.479	0.82	3479447.97	100000	
Al	27	45	He	18297.5066553015	7260915.339	0.52	496434.32	20000	
Si	29	45	He	-2389.6537997296	-948275.317	8.34	5021.54	10000	
K	39	45	He	2942.64523592714	1167716.363	1.07	302953.11	100000	
Ca	44	45	He	69543.243519537	27596525.206	2.09	315196.09	500000	
Ti	47	45	He	253.81998893158	100722.218	0.78	11404.39	1000	
V	51	72	He	63.943551389358	25374.425	1.07	121922.44	1000	
Cr	52	72	He	43.31141709745	17187.070	1.25	111611.28	1000	
Mn	55	72	He	1168.43952437205	463666.478	0.57	1034868.75	5000	
Fe	57	72	He	46078.9920214432	18285314.294	0.98	2003992.36	100000	
Co	59	72	He	24.099892320863	9563.449	0.89	105143.79	1000	
Ni	60	72	He	73.3965343691772	29125.609	0.51	90731.61	2000	
Cu	63	72	He	56.3129556955642	22346.411	0.39	192850.99	1000	
Zn	66	72	He	159.596222922137	63331.834	0.38	76277.91	20000	
As	75	72	He	13.2176686743956	5245.107	1.15	6486.12	1000	
Se	78	72	He	0.246954406789957	97.998	26.13	9.85	50	
Sn	120	115	He	2.28793703632439	907.912	3.40	3891.69	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1028365.69	1156007.06333333	88.96	
Ge	72	He	69417.18	68942.6933333333	100.69	
In	115	He	500045.06	515120.94	97.07	
Lu	175	He	670127.18	860474.493333333	77.88	
Rh	103	He	2003583.67	2061162.14	97.21	
Sc	45	He	86277.20	86332.2766666667	99.94	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2154850.18	2430541.58	88.66	
Ge	72	No Gas	1074364.68	1116846.20666667	96.2	
In	115	No Gas	4915854.58	5301929.88666667	92.72	
Lu	175	No Gas	3564892.97	4111004.52	86.72	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1526842.27	1790396.84666667	85.28	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5056148.13	5479027.00333333	92.28	
Sc	45	No Gas	4973154.52	5061380.49333333	98.26	
Tb	159	No Gas	4470260.97	4997578.57333333	89.45	

I

INORGANIC ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS03
Collect Date:	08/15/18 Time: 1220	GCAL Sample ID:	21808181407
Matrix:	Solid % Solids: 79.69	Instrument ID:	ICPMS2
Sample Amt:	1.34 g	Lab File ID:	2180828B_MS2.b\1853SMPL_2180828A_MS2.D
Prep Vol.:	50 (mL)	Dilution Factor:	10 Analyst: LWZ
Prep Date:	08/25/18	Analysis Date:	08/28/18 Time: 1347
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	EPA 3050B \ ISM	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	468	ug/kg	U	234	468	936
Copper	35600	ug/kg		117	234	468
Lead	15700	ug/kg		117	234	468
Zinc	81400	ug/kg		2340	4680	9360

FORM I - IN

Sample Report

Sample Name	21808181407	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1853SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:47:43	**Total Dilution**	373.1343
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	32.5769390904813	12155.574	1.75	643033.99	500	
Be	9	45	No Gas	1.46461819990198	546.499	1.65	7836.72	1000	
B	11	45	No Gas	15.6522560551083	5840.394	1.21	54786.16	500	
Sr	88	72	No Gas	257.098250330991	95932.183	0.69	8406253.21	1000	
Zr	90	72	No Gas	42.4250955116369	15830.260	1.74	857616.61	100	
Mo	95	115	No Gas	1.84621889985173	688.888	2.14	10696.32	1000	
Ag	107	115	No Gas	0.257764096515324	96.181	5.35	3509.36	100	
Cd	111	115	No Gas	0.918705943280183	342.801	1.84	2562.49	1000	
Sb	121	115	No Gas	0.0948538117017401	35.393	3.91	2649.17	1000	
Ba	137	115	No Gas	277.827684029437	103667.046	3.58	1073495.55	1000	
Tl	205	209	No Gas	0.355895509710859	132.797	3.92	4564.29	1000	
Pb	208	209	No Gas	33.480131390564	12492.586	3.18	511209.14	1000	
Na	23	45	He	1829.00566268796	682464.800	1.00	571437.29	100000	
Mg	24	45	He	31366.8749403162	11704057.814	0.41	3788299.11	100000	
Al	27	45	He	19508.9299002849	7279451.455	0.59	539166.21	20000	
Si	29	45	He	-2172.05683260584	-810468.967	8.26	5341.65	10000	
K	39	45	He	2645.76106238238	987224.277	0.76	278541.38	100000	
Ca	44	45	He	79474.7296995264	29654749.888	0.42	366813.81	500000	
Ti	47	45	He	330.024642379502	123143.523	1.16	15100.68	1000	
V	51	72	He	67.9572131694608	25357.169	0.31	131222.08	1000	
Cr	52	72	He	47.6869832847494	17793.650	0.83	124257.43	1000	
Mn	55	72	He	1202.77853746874	448797.962	0.61	1078818.60	5000	
Fe	57	72	He	49101.1385057912	18321320.338	0.44	2162650.59	100000	
Co	59	72	He	26.0137149895315	9706.610	1.80	114923.77	1000	
Ni	60	72	He	84.6451051705383	31583.994	1.59	105943.99	2000	
Cu	63	72	He	76.1286477614492	28406.212	0.40	263945.57	1000	
Zn	66	72	He	173.926193644931	64897.833	0.43	84080.23	20000	
As	75	72	He	14.0383630392023	5238.195	1.34	6976.02	1000	
Se	78	72	He	0.1994350502886	74.416	36.20	8.96	50	
Sn	120	115	He	2.26877407252512	846.557	2.60	3907.25	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1089609.36	1156007.06333333	94.26	
Ge	72	He	70303.28	68942.6933333333	101.97	
In	115	He	505541.95	515120.94	98.14	
Lu	175	He	711173.30	860474.493333333	82.65	
Rh	103	He	2024201.52	2061162.14	98.21	
Sc	45	He	87877.84	86332.2766666667	101.79	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2196056.27	2430541.58	90.35	
Ge	72	No Gas	1091987.00	1116846.20666667	97.77	
In	115	No Gas	5027529.53	5301929.88666667	94.82	
Lu	175	No Gas	3689548.69	4111004.52	89.75	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1609544.82	1790396.84666667	89.9	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5134207.57	5479027.00333333	93.71	
Sc	45	No Gas	5024533.13	5061380.49333333	99.27	
Tb	159	No Gas	4620463.26	4997578.57333333	92.45	

Metals

Form II

Calibration Verifications

II

INITIAL CALIBRATION VERIFICATION (ICV) STANDARD

Report No:	218081814	GCAL QC ID:	1600
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\015_ICV_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1042	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	50.0	50.9	102		ug/L
Copper	50.0	51.6	103		ug/L
Lead	50.0	49.6	99		ug/L
Zinc	1000	1010	101		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Initial Calibration Verification (ICV) Report

Sample Name	1600	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	015_ICV_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 10:42:54	**Total Dilution**	1.0000
Sample Type	ICV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	267.084	0.96	4178653.38	250	106.83	
Be	9	45	No Gas	50.159	0.84	269902.82	50	100.32	
B	11	45	No Gas	278.532	2.39	921185.69	250	111.41	> +/- 10%
Sr	88	72	No Gas	50.262	1.22	1719658.00	50	100.52	
Zr	90	72	No Gas	49.423	2.55	1044821.80	50	98.85	
Mo	95	115	No Gas	49.186	3.00	302849.85	50	98.37	
Ag	107	115	No Gas	47.420	1.56	690003.26	50	94.84	
Cd	111	115	No Gas	48.946	1.41	146807.55	50	97.89	
Sb	121	115	No Gas	50.932	1.45	657006.03	50	101.86	
Ba	137	115	No Gas	48.693	1.53	204329.15	50	97.39	
Tl	205	209	No Gas	49.624	2.72	658400.61	50	99.25	
Pb	208	209	No Gas	49.620	2.61	885429.64	50	99.24	
Na	23	45	He	5113.313	0.79	1583034.93	5000	102.27	
Mg	24	45	He	5018.923	1.04	603955.59	5000	100.38	
Al	27	45	He	1008.151	0.87	27863.12	1000	100.82	
Si	29	45	He	4951.157	2.99	12778.80	5000	99.02	
K	39	45	He	5017.645	0.59	516227.22	5000	100.35	
Ca	44	45	He	25059.478	0.23	115465.98	25000	100.24	
Ti	47	45	He	50.394	1.20	2306.19	50	100.79	
V	51	72	He	49.637	0.89	98916.53	50	99.27	
Cr	52	72	He	50.567	1.37	135801.07	50	101.13	
Mn	55	72	He	49.170	2.63	45670.80	50	98.34	
Fe	57	72	He	5009.631	1.32	227878.01	5000	100.19	
Co	59	72	He	49.470	0.83	225443.00	50	98.94	
Ni	60	72	He	100.620	0.34	129878.01	100	100.62	
Cu	63	72	He	51.565	1.51	184546.07	50	103.13	
Zn	66	72	He	1007.295	1.00	496733.82	1000	100.73	
As	75	72	He	49.978	1.05	25562.65	50	99.96	
Se	78	72	He	24.727	1.85	551.96	25	98.91	
Sn	120	115	He	50.563	0.80	80787.08	50	101.13	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1253555.24	1156007.06333333	108.44	
Ge	72	He	72529.97	68942.6933333333	105.2	
In	115	He	543023.93	515120.94	105.42	
Lu	175	He	947743.42	860474.493333333	110.14	
Rh	103	He	2143845.26	2061162.14	104.01	
Sc	45	He	87536.50	86332.2766666667	101.39	
Tb	159	He	1922711.12	1790396.84666667	107.39	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2566854.28	2430541.58	105.61	
Ge	72	No Gas	1141938.53	1116846.20666667	102.25	
In	115	No Gas	5457328.24	5301929.88666667	102.93	
Lu	175	No Gas	4420505.45	4111004.52	107.53	
Rh	103	No Gas	5500197.84	5479027.00333333	100.39	
Sc	45	No Gas	5103707.85	5061380.49333333	100.84	
Tb	159	No Gas	5366762.21	4997578.57333333	107.39	

II

LOW LEVEL CONTINUING CALIBRATION VERIFICATION (LLCCV) STANDARD

Report No:	218081814	GCAL QC ID:	1803
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1811CCV1_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1100	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	2.00	1.91	95		ug/L
Copper	1.00	1.08	108		ug/L
Lead	1.00	0.980	98		ug/L
Zinc	20.0	19.1	95		ug/L

CONTROL LIMITS 80-120%

FORM II - IN

Low Level Continuing Calibration Verification(LLCCV) Report

Sample Name	1803	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1811CCV1_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 11:00:38	**Total Dilution**	1.0000
Sample Type	LLCCV1	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: Initial 6020A DOD 80-120% / 70-130% 6020A and 200.8

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	5.239	1.03	241717.47	5	104.79	
Be	9	45	No Gas	0.982	1.49	5354.97	1	98.17	
B	11	45	No Gas	9.732	1.41	36100.23	10	97.32	
Sr	88	72	No Gas	0.988	0.87	34315.16	1	98.8	
Zr	90	72	No Gas	0.866	3.33	18694.50	1	86.6	
Mo	95	115	No Gas	0.945	3.74	6041.33	1	94.46	
Ag	107	115	No Gas	0.991	3.39	14417.46	1	99.1	
Cd	111	115	No Gas	0.970	2.70	2925.89	1	97.03	
Sb	121	115	No Gas	1.907	2.22	26076.57	2	95.33	
Ba	137	115	No Gas	0.936	1.77	4069.53	1	93.56	
Tl	205	209	No Gas	0.934	1.37	13126.95	1	93.43	
Pb	208	209	No Gas	0.978	2.00	17938.80	1	97.82	
Na	23	45	He	99.424	3.09	34707.46	100	99.42	
Mg	24	45	He	101.667	1.90	12158.58	100	101.67	
Al	27	45	He	17.891	2.70	594.68	20	89.45	
Si	29	45	He	-837.769	6.75	6604.16	200	-418.88	> +/- 20%
K	39	45	He	101.441	1.29	21058.76	100	101.44	
Ca	44	45	He	507.546	3.23	2646.95	500	101.51	
Ti	47	45	He	0.923	11.54	52.00	1	92.32	
V	51	72	He	1.025	6.13	2087.95	1	102.48	
Cr	52	72	He	0.999	0.94	4618.54	1	99.9	
Mn	55	72	He	4.829	2.48	4500.73	5	96.59	
Fe	57	72	He	102.236	7.73	4747.60	100	102.24	
Co	59	72	He	1.020	2.78	4576.31	1	101.98	
Ni	60	72	He	2.089	0.73	2853.64	2	104.46	
Cu	63	72	He	1.078	4.04	4046.16	1	107.83	
Zn	66	72	He	19.059	0.66	10234.79	20	95.3	
As	75	72	He	0.990	5.53	512.34	1	98.96	
Se	78	72	He	0.939	17.77	24.82	1	93.91	
Sn	120	115	He	0.819	1.49	1862.36	1	81.92	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1224013.78	1156007.06333333	105.88	
Ge	72	He	70279.02	68942.6933333333	101.94	
In	115	He	532895.82	515120.94	103.45	
Lu	175	He	898085.58	860474.493333333	104.37	
Rh	103	He	2144609.71	2061162.14	104.05	
Sc	45	He	86007.71	86332.2766666667	99.62	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2591251.78	2430541.58	106.61	
Ge	72	No Gas	1126011.42	1116846.20666667	100.82	
In	115	No Gas	5434246.70	5301929.88666667	102.5	
Lu	175	No Gas	4286149.73	4111004.52	104.26	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1867646.95	1790396.84666667	104.31	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5573936.17	5479027.00333333	101.73	
Sc	45	No Gas	5095502.58	5061380.49333333	100.67	
Tb	159	No Gas	5252611.90	4997578.57333333	105.1	

II

LINEAR DYNAMIC RANGE (LDR) STANDARD

Report No:	218081814	GCAL QC ID:	2500
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1814_QC1_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1111	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	1000	955	96		ug/L
Copper	1000	950	95		ug/L
Lead	1000	972	97		ug/L
Zinc	20000	18900	94		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Linear Dynamic Range Check (LDR) Report

Sample Name	LDR	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1814_QC1_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 11:11:18	**Total Dilution**	1.0000
Sample Type	QC1	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Be	9	45	No Gas	1045.857	1.44	5388049.67	1000	104.59	
Sr	88	72	No Gas	961.512	1.03	32857590.34	1000	96.15	
Mo	95	115	No Gas	1000.862	3.25	6186529.89	1000	100.09	
Cd	111	115	No Gas	988.891	2.73	2979620.99	1000	98.89	
Sb	121	115	No Gas	955.020	0.26	12343244.79	1000	95.5	
Ba	137	115	No Gas	997.901	2.85	4204242.19	1000	99.79	
Tl	205	209	No Gas	946.783	2.56	13164688.97	1000	94.68	
Pb	208	209	No Gas	971.986	3.86	18193412.02	1000	97.2	
Na	23	45	He	98800.579	0.38	32351446.19	100000	98.8	
Mg	24	45	He	98387.525	0.25	12554190.64	100000	98.39	
Al	27	45	He	20363.163	0.63	594570.09	20000	101.82	
K	39	45	He	99676.582	0.37	10651679.01	100000	99.68	
Ca	44	45	He	516088.251	0.26	2514518.87	500000	103.22	
Ti	47	45	He	1000.795	0.70	48363.20	1000	100.08	
V	51	72	He	1004.969	0.47	2136018.04	1000	100.5	
Cr	52	72	He	987.507	0.62	2789942.80	1000	98.75	
Mn	55	72	He	4919.668	0.85	4861373.84	5000	98.39	
Fe	57	72	He	97193.076	0.65	4716300.35	100000	97.19	
Co	59	72	He	959.486	0.08	4667537.04	1000	95.95	
Ni	60	72	He	1923.114	0.47	2645756.49	2000	96.16	
Cu	63	72	He	949.645	0.81	3623100.83	1000	94.96	
Zn	66	72	He	18898.363	0.99	9928861.27	20000	94.49	
As	75	72	He	1008.028	0.06	550040.73	1000	100.8	
Sn	120	115	He	1055.324	0.98	1857359.23	1000	105.53	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1438697.37	1156007.06333333	124.45	<70% or >120%
Ge	72	He	77463.49	68942.6933333333	112.36	
In	115	He	602406.29	515120.94	116.94	
Lu	175	He	1139283.76	860474.493333333	132.4	<70% or >120%
Rh	103	He	2262698.59	2061162.14	109.78	
Sc	45	He	92835.14	86332.2766666667	107.53	
Tb	159	He	2248260.02	1790396.84666667	125.57	<70% or >120%

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2693872.46	2430541.58	110.83	
Ge	72	No Gas	1141259.02	1116846.20666667	102.19	
In	115	No Gas	5483042.28	5301929.88666667	103.42	
Lu	175	No Gas	4791864.93	4111004.52	116.56	
Rh	103	No Gas	5473343.12	5479027.00333333	99.9	
Sc	45	No Gas	4887352.86	5061380.49333333	96.56	
Tb	159	No Gas	5665825.75	4997578.57333333	113.37	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081814	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1834_CCV_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1240	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	20.1	100		ug/L
Copper	10.0	10.7	107		ug/L
Lead	10.0	9.83	98		ug/L
Zinc	200	205	102		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1834_CCV_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 12:40:10	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	57.009	1.21	967970.40	50	114.02	> +/- 10%
Be	9	45	No Gas	10.549	0.64	53901.11	10	105.49	
B	11	45	No Gas	50.893	2.44	162870.34	50	101.79	
Sr	88	72	No Gas	10.255	2.92	338174.86	10	102.55	
Zr	90	72	No Gas	10.474	0.38	213298.35	10	104.74	
Mo	95	115	No Gas	9.575	1.86	57364.64	10	95.75	
Ag	107	115	No Gas	9.912	2.91	139960.80	10	99.12	
Cd	111	115	No Gas	9.761	3.37	28425.28	10	97.61	
Sb	121	115	No Gas	20.077	3.06	252224.75	20	100.39	
Ba	137	115	No Gas	9.694	3.54	39596.47	10	96.94	
Tl	205	209	No Gas	9.796	3.35	128827.03	10	97.96	
Pb	208	209	No Gas	9.831	3.55	173508.05	10	98.31	
Na	23	45	He	1046.636	0.39	315657.23	1000	104.66	
Mg	24	45	He	1042.467	2.07	120958.20	1000	104.25	
Al	27	45	He	204.687	2.46	5535.71	200	102.34	
Si	29	45	He	1221.498	26.15	8537.92	2000	61.07	> +/- 10%
K	39	45	He	1018.657	1.28	109571.29	1000	101.87	
Ca	44	45	He	5043.575	1.22	22665.91	5000	100.87	
Ti	47	45	He	9.438	3.54	424.68	10	94.38	
V	51	72	He	9.915	3.14	18785.42	10	99.15	
Cr	52	72	He	10.317	1.00	27812.99	10	103.17	
Mn	55	72	He	51.315	2.82	45082.35	50	102.63	
Fe	57	72	He	1025.499	1.43	44321.36	1000	102.55	
Co	59	72	He	10.297	0.99	44458.35	10	102.97	
Ni	60	72	He	20.760	1.29	25540.12	20	103.8	
Cu	63	72	He	10.669	1.01	36372.93	10	106.69	
Zn	66	72	He	204.971	1.86	96543.02	200	102.49	
As	75	72	He	10.140	0.59	4924.51	10	101.4	
Se	78	72	He	9.787	3.84	209.50	10	97.87	
Sn	120	115	He	10.043	0.94	15861.25	10	100.43	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1244286.34	1156007.06333333	107.64	
Ge	72	He	68625.62	68942.6933333333	99.54	
In	115	He	521161.17	515120.94	101.17	
Lu	175	He	868828.58	860474.493333333	100.97	
Rh	103	He	2078752.28	2061162.14	100.85	
Sc	45	He	84319.36	86332.2766666667	97.67	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2535782.31	2430541.58	104.33	
Ge	72	No Gas	1098023.36	1116846.20666667	98.31	
In	115	No Gas	5294376.44	5301929.88666667	99.86	
Lu	175	No Gas	4220256.50	4111004.52	102.66	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1782875.08	1790396.84666667	99.58	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5355780.07	5479027.00333333	97.75	
Sc	45	No Gas	4842100.78	5061380.49333333	95.67	
Tb	159	No Gas	5072084.20	4997578.57333333	101.49	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081814	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1850_CCV_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1337	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	19.7	99		ug/L
Copper	10.0	10.6	106		ug/L
Lead	10.0	9.67	97		ug/L
Zinc	200	203	102		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1850_CCV_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:37:03	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	54.312	1.54	932462.43	50	108.62	
Be	9	45	No Gas	9.888	0.76	50684.52	10	98.88	
B	11	45	No Gas	48.229	1.13	155011.72	50	96.46	
Sr	88	72	No Gas	10.271	0.98	340201.44	10	102.71	
Zr	90	72	No Gas	10.188	0.52	208480.70	10	101.88	
Mo	95	115	No Gas	9.717	1.08	58403.04	10	97.17	
Ag	107	115	No Gas	10.016	0.83	141848.04	10	100.16	
Cd	111	115	No Gas	9.698	0.28	28320.63	10	96.98	
Sb	121	115	No Gas	19.746	2.29	248869.24	20	98.73	
Ba	137	115	No Gas	9.376	1.88	38406.45	10	93.76	
Tl	205	209	No Gas	9.492	0.48	117553.98	10	94.92	
Pb	208	209	No Gas	9.665	0.52	160585.44	10	96.65	
Na	23	45	He	1006.425	1.35	299297.68	1000	100.64	
Mg	24	45	He	1015.667	1.88	116123.73	1000	101.57	
Al	27	45	He	198.509	1.68	5293.63	200	99.25	
Si	29	45	He	-2045.718	7.86	5179.59	2000	-102.29	> +/- 10%
K	39	45	He	983.744	1.59	104638.11	1000	98.37	
Ca	44	45	He	4991.681	1.96	22108.42	5000	99.83	
Ti	47	45	He	10.007	6.46	443.01	10	100.07	
V	51	72	He	10.065	1.36	19051.24	10	100.65	
Cr	52	72	He	10.105	1.10	27266.39	10	101.05	
Mn	55	72	He	50.855	0.52	44656.60	50	101.71	
Fe	57	72	He	1030.378	0.36	44504.92	1000	103.04	
Co	59	72	He	10.509	1.26	45335.38	10	105.09	
Ni	60	72	He	20.985	0.52	25798.32	20	104.92	
Cu	63	72	He	10.640	1.71	36245.00	10	106.4	
Zn	66	72	He	203.447	3.02	95761.59	200	101.72	
As	75	72	He	10.077	1.95	4890.50	10	100.77	
Se	78	72	He	9.452	1.98	202.32	10	94.52	
Sn	120	115	He	9.890	1.36	15483.11	10	98.9	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1105422.53	1156007.06333333	95.62	
Ge	72	He	68570.64	68942.6933333333	99.46	
In	115	He	516329.97	515120.94	100.23	
Lu	175	He	696858.11	860474.493333333	80.99	
Rh	103	He	2078222.97	2061162.14	100.83	
Sc	45	He	83093.53	86332.2766666667	96.25	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2386321.99	2430541.58	98.18	
Ge	72	No Gas	1103202.63	1116846.20666667	98.78	
In	115	No Gas	5310676.21	5301929.88666667	100.16	
Lu	175	No Gas	3783985.67	4111004.52	92.05	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1606872.37	1790396.84666667	89.75	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5411690.76	5479027.00333333	98.77	
Sc	45	No Gas	4857940.78	5061380.49333333	95.98	
Tb	159	No Gas	4720913.06	4997578.57333333	94.46	

II

CONTINUING CALIBRATION VERIFICATION (CCV) STANDARD

Report No:	218081814	GCAL QC ID:	1800
Instrument ID:	ICPMS2	Lab File ID:	2180828C_MS2.b\002_CCV.d
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1358	Analytical Method:	EPA 6020B

ANALYTE	*TRUE*	*FOUND*	*%RECOVERY*	*Q*	*UNITS*
Antimony	20.0	20.2	101		ug/L
Copper	10.0	10.5	105		ug/L
Lead	10.0	9.64	96		ug/L
Zinc	200	203	102		ug/L

CONTROL LIMITS 90-110%

FORM II - IN

Continuing Calibration Verification (CCV) Report

Sample Name	1800	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	002_CCV.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:58:34	**Total Dilution**	1.0000
Sample Type	CCV	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Recovery Limits: 90-110%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	Rec	QC Flag
Li	7	45	No Gas	53.871	0.47	930141.50	50	107.74	
Be	9	45	No Gas	9.826	0.36	50595.52	10	98.26	
B	11	45	No Gas	47.924	0.91	154719.10	50	95.85	
Sr	88	72	No Gas	10.361	1.78	340855.67	10	103.61	
Zr	90	72	No Gas	10.143	0.98	206174.52	10	101.43	
Mo	95	115	No Gas	9.845	0.94	58876.18	10	98.45	
Ag	107	115	No Gas	10.182	1.02	143473.05	10	101.82	
Cd	111	115	No Gas	9.855	2.00	28639.21	10	98.55	
Sb	121	115	No Gas	20.235	1.52	253682.28	20	101.17	
Ba	137	115	No Gas	9.461	2.33	38567.89	10	94.61	
Tl	205	209	No Gas	9.562	3.20	116807.82	10	95.62	
Pb	208	209	No Gas	9.639	1.68	157975.77	10	96.39	
Na	23	45	He	995.089	1.57	299935.22	1000	99.51	
Mg	24	45	He	997.126	0.56	115539.12	1000	99.71	
Al	27	45	He	192.639	0.92	5209.60	200	96.32	
Si	29	45	He	-2328.871	8.44	4964.85	2000	-116.44	> +/- 10%
K	39	45	He	991.390	0.88	106781.94	1000	99.14	
Ca	44	45	He	5014.914	0.97	22508.93	5000	100.3	
Ti	47	45	He	9.627	2.15	432.34	10	96.27	
V	51	72	He	9.948	1.74	19393.97	10	99.48	
Cr	52	72	He	10.006	0.52	27825.21	10	100.06	
Mn	55	72	He	50.429	1.71	45611.64	50	100.86	
Fe	57	72	He	1018.543	1.86	45314.02	1000	101.85	
Co	59	72	He	10.296	2.81	45756.77	10	102.96	
Ni	60	72	He	20.656	2.23	26160.07	20	103.28	
Cu	63	72	He	10.543	2.38	36988.86	10	105.43	
Zn	66	72	He	203.403	1.01	98595.61	200	101.7	
As	75	72	He	10.074	0.63	5034.88	10	100.74	
Se	78	72	He	9.767	6.22	215.07	10	97.67	
Sn	120	115	He	9.854	0.38	15625.47	10	98.54	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1093711.47	1156007.06333333	94.61	
Ge	72	He	70623.65	68942.6933333333	102.44	
In	115	He	522949.11	515120.94	101.52	
Lu	175	He	688739.05	860474.493333333	80.04	
Rh	103	He	2088153.74	2061162.14	101.31	
Sc	45	He	84209.73	86332.2766666667	97.54	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2353990.75	2430541.58	96.85	
Ge	72	No Gas	1095485.27	1116846.20666667	98.09	
In	115	No Gas	5283551.03	5301929.88666667	99.65	
Lu	175	No Gas	3728778.18	4111004.52	90.7	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1575791.80	1790396.84666667	88.01	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5458338.12	5479027.00333333	99.62	
Sc	45	No Gas	4877437.45	5061380.49333333	96.37	
Tb	159	No Gas	4666497.33	4997578.57333333	93.38	

Metals

Form III

Blanks

III

INITIAL CALIBRATION BLANK

Report No:	218081814	Blank ID:	1700
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\017_ICB_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1050	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Initial Calibration Blank (ICB) Report

Sample Name	1700	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	017_ICB_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 10:50:00	**Total Dilution**	1.0000
Sample Type	ICB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	-0.079	1.54	160296.26	2.5	
Be	9	45	No Gas	-0.003	11.27	64.00	0.5	
B	11	45	No Gas	1.624	5.32	9356.48	5	
Sr	88	72	No Gas	-0.006	9.63	806.72	0.5	
Zr	90	72	No Gas	-0.001	3.94	634.46	0.5	
Mo	95	115	No Gas	-0.006	6.38	211.12	0.5	
Ag	107	115	No Gas	-0.001	22.05	40.00	0.5	
Cd	111	115	No Gas	0.000	33.08	26.67	0.5	
Sb	121	115	No Gas	-0.026	2.77	1285.63	1	
Ba	137	115	No Gas	0.006	6.35	184.45	0.5	
Tl	205	209	No Gas	-0.026	11.76	273.35	0.5	
Pb	208	209	No Gas	-0.007	11.74	196.67	0.5	
Na	23	45	He	-0.347	2.35	4480.81	50	
Mg	24	45	He	-0.062	11.46	133.33	50	
Al	27	45	He	-0.676	6.19	93.33	10	
Si	29	45	He	-653.915	7.45	6848.26	100	
K	39	45	He	2.334	4.71	11351.35	50	
Ca	44	45	He	11.783	10.14	413.34	250	
Ti	47	45	He	-0.097	48.24	6.33	0.5	
V	51	72	He	0.009	16.57	127.78	0.5	
Cr	52	72	He	0.003	5.73	2055.72	0.5	
Mn	55	72	He	0.014	5.88	182.22	2.5	
Fe	57	72	He	-1.364	12.60	183.34	50	
Co	59	72	He	-0.002	2.99	64.44	0.5	
Ni	60	72	He	0.012	25.61	260.01	1	
Cu	63	72	He	-0.011	12.91	273.34	0.5	
Zn	66	72	He	-0.023	5.27	1132.28	10	
As	75	72	He	-0.012	18.70	16.33	0.5	
Se	78	72	He	0.048	24.28	5.66	0.5	
Sn	120	115	He	0.010	5.93	595.57	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1194226.18	1156007.06333333	103.31	
Ge	72	He	69904.88	68942.6933333333	101.4	
In	115	He	526195.24	515120.94	102.15	
Lu	175	He	882958.92	860474.493333333	102.61	
Rh	103	He	2116807.21	2061162.14	102.7	
Sc	45	He	86694.13	86332.2766666667	100.42	
Tb	159	He	1838390.70	1790396.84666667	102.68	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2496468.97	2430541.58	102.71	
Ge	72	No Gas	1106945.20	1116846.20666667	99.11	
In	115	No Gas	5314768.67	5301929.88666667	100.24	
Lu	175	No Gas	4120318.27	4111004.52	100.23	
Rh	103	No Gas	5526451.86	5479027.00333333	100.87	
Sc	45	No Gas	5045383.97	5061380.49333333	99.68	
Tb	159	No Gas	5038610.97	4997578.57333333	100.82	

III

CONTINUING CALIBRATION BLANK

Report No:	218081814	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1835_CCB_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1243	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1835_CCB_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 12:43:44	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	0.736	1.29	165508.88	2.5	
Be	9	45	No Gas	-0.008	14.68	39.33	0.5	
B	11	45	No Gas	-0.513	10.11	2303.58	5	
Sr	88	72	No Gas	-0.005	9.43	803.38	0.5	
Zr	90	72	No Gas	0.006	7.98	747.81	0.5	
Mo	95	115	No Gas	-0.020	14.00	122.22	0.5	
Ag	107	115	No Gas	0.003	26.71	90.00	0.5	
Cd	111	115	No Gas	-0.003	26.96	18.89	0.5	
Sb	121	115	No Gas	0.000	2.25	1557.88	1	
Ba	137	115	No Gas	0.007	19.21	185.56	0.5	
Tl	205	209	No Gas	-0.036	32.74	140.01	0.5	
Pb	208	209	No Gas	-0.004	11.71	246.67	0.5	
Na	23	45	He	3.723	4.08	5404.49	50	
Mg	24	45	He	-0.203	27.27	110.00	50	
Al	27	45	He	-0.145	18.91	102.00	10	
Si	29	45	He	-2838.054	12.08	4332.65	100	
K	39	45	He	5.671	1.10	11024.38	50	
Ca	44	45	He	8.544	23.61	376.68	250	
Ti	47	45	He	-0.010	33.25	9.67	0.5	
V	51	72	He	-0.014	14.43	80.00	0.5	
Cr	52	72	He	0.000	6.05	1964.60	0.5	
Mn	55	72	He	-0.017	11.49	148.89	2.5	
Fe	57	72	He	-0.386	16.21	216.68	50	
Co	59	72	He	-0.003	36.83	58.89	0.5	
Ni	60	72	He	-0.003	14.27	230.00	1	
Cu	63	72	He	0.000	4.44	300.01	0.5	
Zn	66	72	He	0.053	3.89	1120.05	10	
As	75	72	He	-0.004	28.00	19.67	0.5	
Se	78	72	He	0.022	7.77	4.92	0.5	
Sn	120	115	He	0.002	9.03	558.91	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1164516.86	1156007.06333333	100.74	
Ge	72	He	67138.15	68942.6933333333	97.38	
In	115	He	503940.04	515120.94	97.83	
Lu	175	He	816667.72	860474.493333333	94.91	
Rh	103	He	2029086.72	2061162.14	98.44	
Sc	45	He	81827.20	86332.2766666667	94.78	
Tb	159	He	1722137.47	1790396.84666667	96.19	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2451501.89	2430541.58	100.86	
Ge	72	No Gas	1084649.37	1116846.20666667	97.12	
In	115	No Gas	5152461.53	5301929.88666667	97.18	
Lu	175	No Gas	4000779.31	4111004.52	97.32	
Rh	103	No Gas	5296808.12	5479027.00333333	96.67	
Sc	45	No Gas	4843807.31	5061380.49333333	95.7	
Tb	159	No Gas	4887757.01	4997578.57333333	97.8	

III

METHOD BLANK

Report No:	218081814	Blank ID:	MB1842310
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1836SMPL_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1247	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	40.0	ug/kg	U	20.0	40.0	80.0
Copper	20.0	ug/kg	U	10.0	20.0	40.0
Lead	20.0	ug/kg	U	10.0	20.0	40.0
Zinc	400	ug/kg	U	200	400	800

FORM III - IN

Method Blank (MB) Report

Sample Name	1842310	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1836SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 12:47:18	**Total Dilution**	40.0000
Sample Type	MBSOIL	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	36.039	2.41	171891.45	2.5	
Be	9	45	No Gas	-0.082	32.48	68.67	0.5	
B	11	45	No Gas	-2.750	10.52	3787.26	5	
Sr	88	72	No Gas	2.308	4.25	3023.76	0.5	
Zr	90	72	No Gas	43.770	3.43	23978.66	0.5	> 1/2 LOQ
Mo	95	115	No Gas	-0.294	13.15	215.56	0.5	
Ag	107	115	No Gas	0.044	29.37	75.56	0.5	
Cd	111	115	No Gas	-0.035	12.51	26.67	0.5	
Sb	121	115	No Gas	-0.828	0.47	1430.09	1	
Ba	137	115	No Gas	1.627	2.01	345.56	0.5	
Tl	205	209	No Gas	-1.177	4.17	240.01	0.5	
Pb	208	209	No Gas	0.015	8.90	343.35	0.5	
Na	23	45	He	373.188	0.79	8385.91	50	
Mg	24	45	He	587.114	2.15	2130.23	50	
Al	27	45	He	369.568	4.80	410.01	10	
Si	29	45	He	-129069.061	9.44	4714.77	100	
K	39	45	He	-295.840	2.27	11701.68	50	
Ca	44	45	He	5014.113	10.28	1048.39	250	
Ti	47	45	He	-4.266	43.30	6.67	0.5	
V	51	72	He	-1.629	18.18	36.67	0.5	
Cr	52	72	He	-6.960	4.34	1817.91	0.5	
Mn	55	72	He	11.753	9.89	488.90	2.5	
Fe	57	72	He	22.721	16.92	303.34	50	
Co	59	72	He	0.778	6.47	181.11	0.5	
Ni	60	72	He	-0.697	18.75	252.23	1	
Cu	63	72	He	6.682	3.37	1003.38	0.5	
Zn	66	72	He	54.292	5.36	2023.50	10	
As	75	72	He	-0.659	38.02	16.00	0.5	
Se	78	72	He	0.527	6.77	5.58	0.5	
Sn	120	115	He	-9.292	36.91	264.50	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1453122.27	1156007.06333333	125.7	<70% or >120%
Ge	72	He	79164.76	68942.6933333333	114.83	
In	115	He	624026.71	515120.94	121.14	<70% or >120%
Lu	175	He	1054076.08	860474.493333333	122.5	<70% or >120%
Rh	103	He	2354085.88	2061162.14	114.21	
Sc	45	He	97729.14	86332.2766666667	113.2	
Tb	159	He	2137930.23	1790396.84666667	119.41	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2677510.58	2430541.58	110.16	
Ge	72	No Gas	1151202.52	1116846.20666667	103.08	
In	115	No Gas	5625065.44	5301929.88666667	106.09	
Lu	175	No Gas	4445490.45	4111004.52	108.14	
Rh	103	No Gas	5698426.02	5479027.00333333	104	
Sc	45	No Gas	4959847.02	5061380.49333333	97.99	
Tb	159	No Gas	5366503.36	4997578.57333333	107.38	

III

CONTINUING CALIBRATION BLANK

Report No:	218081814	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180828B_MS2.b\1851_CCB_2180828A_MS2.D
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1340	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1851_CCB_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:40:36	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	0.778	0.98	163034.76	2.5	
Be	9	45	No Gas	-0.005	14.24	49.33	0.5	
B	11	45	No Gas	-0.436	4.85	2500.29	5	
Sr	88	72	No Gas	-0.001	7.50	936.72	0.5	
Zr	90	72	No Gas	0.021	22.02	1040.19	0.5	
Mo	95	115	No Gas	-0.022	11.36	111.11	0.5	
Ag	107	115	No Gas	0.002	2.34	82.22	0.5	
Cd	111	115	No Gas	-0.001	14.29	23.33	0.5	
Sb	121	115	No Gas	-0.019	5.35	1296.74	1	
Ba	137	115	No Gas	0.012	10.10	198.89	0.5	
Tl	205	209	No Gas	-0.033	32.13	156.67	0.5	
Pb	208	209	No Gas	-0.002	12.06	253.34	0.5	
Na	23	45	He	1.582	1.58	4790.91	50	
Mg	24	45	He	0.005	15.62	133.34	50	
Al	27	45	He	-0.222	13.86	100.00	10	
Si	29	45	He	-4168.056	15.42	3033.66	100	
K	39	45	He	-8.028	3.24	9750.15	50	
Ca	44	45	He	-7.334	4.95	308.34	250	
Ti	47	45	He	-0.011	36.33	9.67	0.5	
V	51	72	He	-0.029	24.17	52.22	0.5	
Cr	52	72	He	-0.016	2.75	1935.70	0.5	
Mn	55	72	He	0.023	3.64	183.34	2.5	
Fe	57	72	He	-0.498	18.94	213.34	50	
Co	59	72	He	-0.005	33.63	48.89	0.5	
Ni	60	72	He	-0.009	6.86	224.45	1	
Cu	63	72	He	-0.004	21.35	286.67	0.5	
Zn	66	72	He	-0.006	2.06	1098.94	10	
As	75	72	He	-0.011	21.50	16.33	0.5	
Se	78	72	He	-0.016	15.24	4.16	0.5	
Sn	120	115	He	0.008	6.06	562.24	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1041527.43	1156007.06333333	90.1	
Ge	72	He	67394.19	68942.6933333333	97.75	
In	115	He	499961.23	515120.94	97.06	
Lu	175	He	664922.15	860474.493333333	77.27	
Rh	103	He	2011190.34	2061162.14	97.58	
Sc	45	He	81917.19	86332.2766666667	94.89	
Tb	159	He	1527003.31	1790396.84666667	85.29	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2222331.32	2430541.58	91.43	
Ge	72	No Gas	1069798.36	1116846.20666667	95.79	
In	115	No Gas	5027461.27	5301929.88666667	94.82	
Lu	175	No Gas	3556572.86	4111004.52	86.51	
Rh	103	No Gas	5239280.49	5479027.00333333	95.62	
Sc	45	No Gas	4755255.64	5061380.49333333	93.95	
Tb	159	No Gas	4443307.75	4997578.57333333	88.91	

III

CONTINUING CALIBRATION BLANK

Report No:	218081814	Blank ID:	1900
Instrument ID:	ICPMS2	Lab File ID:	2180828C_MS2.b\003_CCB.d
Analyst:	LWZ	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 1402	Analytical Method:	EPA 6020B

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOD*	*LOQ*
Antimony	1.00	ug/L	U	0.50	1.00	2.00
Copper	0.50	ug/L	U	0.25	0.50	1.00
Lead	0.50	ug/L	U	0.25	0.50	1.00
Zinc	10.0	ug/L	U	5.00	10.0	20.0

FORM III - IN

Continuing Calibration Blank (CCB) Report

Sample Name	1900	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	003_CCB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 14:02:08	**Total Dilution**	1.0000
Sample Type	CCB	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	Conc	RSD	CPS	Limit	QC Flag
Li	7	45	No Gas	0.419	1.26	159366.29	2.5	
Be	9	45	No Gas	-0.007	19.88	40.67	0.5	
B	11	45	No Gas	-0.585	10.97	2060.20	5	
Sr	88	72	No Gas	0.000	9.42	963.41	0.5	
Zr	90	72	No Gas	0.010	6.79	845.59	0.5	
Mo	95	115	No Gas	-0.027	15.39	86.67	0.5	
Ag	107	115	No Gas	0.001	25.59	65.55	0.5	
Cd	111	115	No Gas	-0.004	34.64	16.67	0.5	
Sb	121	115	No Gas	-0.036	3.90	1128.95	1	
Ba	137	115	No Gas	0.015	7.71	217.78	0.5	
Tl	205	209	No Gas	-0.034	37.12	150.01	0.5	
Pb	208	209	No Gas	-0.001	3.70	270.01	0.5	
Na	23	45	He	-1.031	3.91	4104.04	50	
Mg	24	45	He	0.016	30.47	136.67	50	
Al	27	45	He	-0.794	7.42	86.67	10	
Si	29	45	He	-4426.446	13.87	2826.96	100	
K	39	45	He	-7.988	4.38	9916.95	50	
Ca	44	45	He	6.746	6.93	375.01	250	
Ti	47	45	He	-0.069	31.49	7.33	0.5	
V	51	72	He	-0.029	3.54	54.44	0.5	
Cr	52	72	He	-0.032	3.59	1932.37	0.5	
Mn	55	72	He	0.000	6.93	166.67	2.5	
Fe	57	72	He	-0.835	20.47	203.34	50	
Co	59	72	He	-0.003	30.04	61.11	0.5	
Ni	60	72	He	-0.023	12.20	212.23	1	
Cu	63	72	He	0.008	4.06	332.23	0.5	
Zn	66	72	He	-0.001	3.00	1122.27	10	
As	75	72	He	-0.014	33.47	15.33	0.5	
Se	78	72	He	-0.039	34.75	3.75	0.5	
Sn	120	115	He	-0.006	13.68	557.79	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1081100.71	1156007.06333333	93.52	
Ge	72	He	68677.77	68942.6933333333	99.62	
In	115	He	514173.90	515120.94	99.82	
Lu	175	He	685517.59	860474.493333333	79.67	
Rh	103	He	2078208.39	2061162.14	100.83	
Sc	45	He	83311.33	86332.2766666667	96.5	
Tb	159	He	1578757.95	1790396.84666667	88.18	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2281802.10	2430541.58	93.88	
Ge	72	No Gas	1088622.38	1116846.20666667	97.47	
In	115	No Gas	5178462.46	5301929.88666667	97.67	
Lu	175	No Gas	3697559.94	4111004.52	89.94	
Rh	103	No Gas	5365108.68	5479027.00333333	97.92	
Sc	45	No Gas	4795057.45	5061380.49333333	94.74	
Tb	159	No Gas	4571952.64	4997578.57333333	91.48	

Metals

Form IV

Interference Checks

IV
ICPMS INTERFERENCE CHECKS

Report No:	218081814	ICSA \ AB ID:	2000 \ 2100
Instrument ID:	ICPMS2	Analytical Batch:	642829
Analyst:	LWZ	Analytical Method:	EPA 6020B
Lab File ID ICSA1:	2180828B_MS2.b\1812ICSA_2180828A_MS2.D	Lab File ID ICSAB1:	2180828B_MS2.b\1813ICSB_2180828A_MS2.D
Lab File ID ICSA2:	2180828C_MS2.b\070ICSA.d	Lab File ID ICSAB2:	2180828C_MS2.b\071ICSB.d

Concentration Units: ug/L

		Analyzed (A/AB):	08/28/18 1104	08/28/18 1107		08/28/18 1800	08/28/18 1804	
ANALYTE	***TRUE A***	***TRUE AB***	***ICSA1***	***ICSAB1***	***%R***	***ICSA2***	***ICSAB2***	***%R***
Aluminum	1000	1000	1020	1030	103	988	988	99
Antimony	0	0	-0.059	-0.057		-0.062	-0.069	
Arsenic	0	10.0	-0.0030	10.3	103	-0.018	10.1	101
Barium	0	0	-0.0040	0.014		0.0060	0.021	
Beryllium	0	0	-0.0070	-0.0060		-0.0080	-0.010	
Boron	0	20.0	-0.11	20.1	100	-0.71	18.5	92
Cadmium	0	10.0	0.014	9.83	98	0.0080	9.90	99
Calcium	3000	3000	2950	3030	101	2980	3010	100
Chromium	0	20.0	0.0010	20.4	102	-0.11	19.4	97
Cobalt	0	20.0	0.0070	20.8	104	0.0050	20.2	101
Copper	0	20.0	0.027	21.7	108	0.098	21.1	106
Iron	2500	2500	2550	2550	102	2430	2450	98
Lead	0	0	-0.0050	-0.0030		-0.0050	-0.0070	
Lithium	0	20.0	0.11	23.9	120	-0.24	22.7	114
Magnesium	1000	1000	1020	1040	104	981	980	98
Manganese	0	20.0	-0.010	20.4	102	-0.028	19.7	98
Molybdenum	20.0	20.0	19.4	19.1	96	19.7	19.5	98
Nickel	0	20.0	-0.0020	21.0	105	-0.030	20.3	102
Potassium	1000	1000	991	1020	102	992	985	98
Selenium	0	10.0	-0.020	9.83	98	-0.0070	9.48	95
Silicon	0	1000	-1200	-80	-8	-5500	-4500	-454
Silver	0	5.00	0.0040	5.00	100	0.0030	5.06	101
Sodium	2500	2500	2520	2590	104	2450	2470	99
Strontium	0	10.0	0.10	10.3	103	0.11	10.4	104
Thallium	0	0	-0.023	-0.025		-0.043	-0.041	
Tin	0	10.0	-0.028	9.84	98	0.0060	10.1	101
Titanium	20.0	20.0	19.4	20.3	102	19.7	20.0	100
Vanadium	0	20.0	-0.020	17.5	88	-0.026	16.9	84
Zinc	0	20.0	-0.92	19.5	98	-1.0	18.8	94
Zirconium	0	20.0	0.023	19.4	97	0.0060	19.3	96

FORM IV - IN

Interference Check Solution A (ICS-A) Report

Sample Name	2000	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1812ICSA_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 11:04:11	**Total Dilution**	1.0000
Sample Type	ICSA	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	0.110	1.10	164766.81	2.5	
Be	9	45	No Gas	-0.007	33.11	45.33	0.5	
B	11	45	No Gas	-0.107	5.18	3763.93	5	
Sr	88	72	No Gas	0.100	6.82	4420.83	0.5	
Zr	90	72	No Gas	0.023	4.08	1143.39	0.5	
Mo	95	115	No Gas	19.363	2.53	120401.32	20	
Ag	107	115	No Gas	0.004	20.22	112.22	0.5	
Cd	111	115	No Gas	0.014	31.21	71.11	0.5	
Sb	121	115	No Gas	-0.059	2.79	905.60	1	
Ba	137	115	No Gas	-0.004	6.67	150.00	0.5	
Tl	205	209	No Gas	-0.023	8.84	326.68	0.5	
Pb	208	209	No Gas	-0.005	23.27	236.67	0.5	
Na	23	45	He	2524.641	0.63	778978.55	2500	
Mg	24	45	He	1016.963	0.55	121704.48	1000	
Al	27	45	He	1023.524	0.75	28102.25	1000	
Si	29	45	He	-1180.972	8.10	6323.37	100	> LOD
K	39	45	He	990.753	0.68	110233.45	1000	
Ca	44	45	He	2949.459	1.90	13823.27	3000	
Ti	47	45	He	19.434	2.25	890.36	20	
V	51	72	He	-0.020	2.66	72.22	0.5	
Cr	52	72	He	0.001	0.28	2080.17	0.5	
Mn	55	72	He	-0.010	16.20	163.34	2.5	
Fe	57	72	He	2546.533	2.08	113350.21	2500	
Co	59	72	He	0.007	11.95	105.56	0.5	
Ni	60	72	He	-0.002	7.48	245.56	1	
Cu	63	72	He	0.027	6.75	411.12	0.5	
Zn	66	72	He	-0.922	4.33	715.58	10	
As	75	72	He	-0.003	31.23	21.00	0.5	
Se	78	72	He	-0.020	22.46	4.28	0.5	
Sn	120	115	He	-0.028	9.86	553.35	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1232174.30	1156007.06333333	106.59	
Ge	72	He	70890.74	68942.6933333333	102.83	
In	115	He	542602.91	515120.94	105.34	
Lu	175	He	923182.90	860474.493333333	107.29	
Rh	103	He	2131278.11	2061162.14	103.4	
Sc	45	He	86981.41	86332.2766666667	100.75	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2627806.37	2430541.58	108.12	
Ge	72	No Gas	1132831.87	1116846.20666667	101.43	
In	115	No Gas	5504665.56	5301929.88666667	103.82	
Lu	175	No Gas	4401779.93	4111004.52	107.07	

Interference Check Solution A (ICS-A) Report

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1910168.25	1790396.84666667	106.69	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5549255.75	5479027.00333333	101.28	
Sc	45	No Gas	5097944.24	5061380.49333333	100.72	
Tb	159	No Gas	5360244.50	4997578.57333333	107.26	

Interference Check Solution AB (ICS-AB) Report

Sample Name	2100	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1813ICSB_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 11:07:45	**Total Dilution**	1.0000
Sample Type	ICSB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	23.850	1.47	518954.91	20	
Be	9	45	No Gas	-0.006	33.10	50.67	0.5	
B	11	45	No Gas	20.050	2.02	69747.61	20	
Sr	88	72	No Gas	10.281	1.87	351067.06	10	
Zr	90	72	No Gas	19.443	2.68	409677.26	20	
Mo	95	115	No Gas	19.125	2.01	119736.41	20	
Ag	107	115	No Gas	4.997	2.83	73908.24	5	
Cd	111	115	No Gas	9.830	1.98	29968.47	10	
Sb	121	115	No Gas	-0.057	1.28	940.04	1	
Ba	137	115	No Gas	0.014	2.94	226.67	0.5	
Tl	205	209	No Gas	-0.025	20.28	300.02	0.5	
Pb	208	209	No Gas	-0.003	41.61	273.34	0.5	
Na	23	45	He	2590.338	1.18	788236.34	2500	
Mg	24	45	He	1042.921	1.48	123115.16	1000	
Al	27	45	He	1031.073	1.12	27925.94	1000	
Si	29	45	He	-79.952	7.53	7365.85	1000	> +/- 20%
K	39	45	He	1017.005	0.24	111325.19	1000	
Ca	44	45	He	3025.280	1.78	13975.11	3000	
Ti	47	45	He	20.326	4.30	918.03	20	
V	51	72	He	17.513	1.16	34395.69	20	
Cr	52	72	He	20.444	0.92	55240.85	20	
Mn	55	72	He	20.422	0.66	18756.51	20	
Fe	57	72	He	2550.010	0.60	114196.83	2500	
Co	59	72	He	20.766	1.64	93109.97	20	
Ni	60	72	He	21.036	1.23	26899.23	20	
Cu	63	72	He	21.721	1.24	76637.16	20	
Zn	66	72	He	19.481	2.45	10591.72	20	
As	75	72	He	10.300	1.95	5198.94	10	
Se	78	72	He	9.831	2.54	218.66	10	
Sn	120	115	He	9.836	1.80	16228.42	10	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1272625.94	1156007.06333333	110.09	
Ge	72	He	71323.83	68942.6933333333	103.45	
In	115	He	544054.76	515120.94	105.62	
Lu	175	He	949509.68	860474.493333333	110.35	
Rh	103	He	2175643.73	2061162.14	105.55	
Sc	45	He	85792.08	86332.2766666667	99.37	
Tb	159	He	1944761.27	1790396.84666667	108.62	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2647649.44	2430541.58	108.93	
Ge	72	No Gas	1137092.00	1116846.20666667	101.81	
In	115	No Gas	5542189.43	5301929.88666667	104.53	
Lu	175	No Gas	4414348.37	4111004.52	107.38	
Rh	103	No Gas	5607264.64	5479027.00333333	102.34	
Sc	45	No Gas	5075708.27	5061380.49333333	100.28	
Tb	159	No Gas	5353751.17	4997578.57333333	107.13	

Interference Check Solution A (ICS-A) Report

Sample Name	2000	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	070ICSA.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 18:00:33	**Total Dilution**	1.0000
Sample Type	ICSA	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	-0.245	0.61	152744.65	2.5	
Be	9	45	No Gas	-0.008	5.97	38.67	0.5	
B	11	45	No Gas	-0.711	10.11	1703.48	5	
Sr	88	72	No Gas	0.106	2.39	4610.91	0.5	
Zr	90	72	No Gas	0.006	9.09	793.36	0.5	
Mo	95	115	No Gas	19.656	0.82	120564.90	20	
Ag	107	115	No Gas	0.003	17.76	94.45	0.5	
Cd	111	115	No Gas	0.008	22.90	51.11	0.5	
Sb	121	115	No Gas	-0.062	6.78	853.37	1	
Ba	137	115	No Gas	0.006	24.98	188.89	0.5	
Tl	205	209	No Gas	-0.043	13.32	43.33	0.5	
Pb	208	209	No Gas	-0.005	8.70	230.00	0.5	
Na	23	45	He	2450.202	0.13	744449.18	2500	
Mg	24	45	He	980.970	1.51	115585.35	1000	
Al	27	45	He	987.895	1.06	26712.35	1000	
Si	29	45	He	-5540.305	24.65	1764.79	100	> LOD
K	39	45	He	991.617	1.20	108622.11	1000	
Ca	44	45	He	2983.205	2.02	13759.88	3000	
Ti	47	45	He	19.689	5.78	887.70	20	
V	51	72	He	-0.026	26.03	64.45	0.5	
Cr	52	72	He	-0.113	3.41	1845.69	0.5	
Mn	55	72	He	-0.028	8.29	152.23	2.5	
Fe	57	72	He	2427.375	1.27	111720.48	2500	
Co	59	72	He	0.005	12.35	102.22	0.5	
Ni	60	72	He	-0.030	26.03	217.78	1	
Cu	63	72	He	0.098	13.55	681.14	0.5	
Zn	66	72	He	-1.040	4.93	681.13	10	
As	75	72	He	-0.018	31.13	14.00	0.5	
Se	78	72	He	-0.007	13.62	4.70	0.5	
Sn	120	115	He	0.006	6.21	617.80	0.5	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1237451.54	1156007.06333333	107.05	
Ge	72	He	73293.58	68942.6933333333	106.31	
In	115	He	552273.71	515120.94	107.21	
Lu	175	He	824168.55	860474.493333333	95.78	
Rh	103	He	2172443.11	2061162.14	105.4	
Sc	45	He	85633.57	86332.2766666667	99.19	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2464347.47	2430541.58	101.39	
Ge	72	No Gas	1134928.84	1116846.20666667	101.62	
In	115	No Gas	5431865.32	5301929.88666667	102.45	
Lu	175	No Gas	4032664.31	4111004.52	98.09	

Interference Check Solution A (ICS-A) Report

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1825364.71	1790396.84666667	101.95	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5588667.83	5479027.00333333	102	
Sc	45	No Gas	4883391.33	5061380.49333333	96.48	
Tb	159	No Gas	5015424.20	4997578.57333333	100.36	

Interference Check Solution AB (ICS-AB) Report

Sample Name	2100	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	071ICSB.d	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 18:04:05	**Total Dilution**	1.0000
Sample Type	ICSB	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Spiked Element Recovery: 80-120%

Name	Mass	ISTD	Mode	Conc	RSD	CPS	ExpValue	QC Flag
Li	7	45	No Gas	22.673	1.00	477921.70	20	
Be	9	45	No Gas	-0.010	33.63	29.33	0.5	
B	11	45	No Gas	18.498	2.67	61638.94	20	
Sr	88	72	No Gas	10.376	1.63	351492.59	10	
Zr	90	72	No Gas	19.309	2.98	403663.07	20	
Mo	95	115	No Gas	19.523	2.04	119590.28	20	
Ag	107	115	No Gas	5.055	1.54	73130.14	5	
Cd	111	115	No Gas	9.900	1.72	29529.85	10	
Sb	121	115	No Gas	-0.069	2.86	763.36	1	
Ba	137	115	No Gas	0.021	10.73	251.12	0.5	
Tl	205	209	No Gas	-0.041	19.92	76.67	0.5	
Pb	208	209	No Gas	-0.007	25.78	183.34	0.5	
Na	23	45	He	2470.491	1.41	742275.90	2500	
Mg	24	45	He	979.651	2.15	114165.84	1000	
Al	27	45	He	988.233	1.39	26425.90	1000	
Si	29	45	He	-4538.181	16.96	2760.94	1000	> +/- 20%
K	39	45	He	984.892	0.67	106758.45	1000	
Ca	44	45	He	3014.573	3.35	13749.87	3000	
Ti	47	45	He	19.961	3.42	890.03	20	
V	51	72	He	16.949	1.68	34277.55	20	
Cr	52	72	He	19.439	0.79	54191.25	20	
Mn	55	72	He	19.738	2.08	18673.09	20	
Fe	57	72	He	2453.114	0.73	113128.90	2500	
Co	59	72	He	20.206	0.87	93291.26	20	
Ni	60	72	He	20.256	2.07	26681.00	20	
Cu	63	72	He	21.082	0.66	76600.13	20	
Zn	66	72	He	18.777	3.17	10554.99	20	
As	75	72	He	10.053	2.28	5224.95	10	
Se	78	72	He	9.477	3.14	217.24	10	
Sn	120	115	He	10.126	0.75	16905.83	10	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1221539.67	1156007.06333333	105.67	
Ge	72	He	73442.18	68942.6933333333	106.53	
In	115	He	551158.06	515120.94	107	
Lu	175	He	793659.94	860474.493333333	92.24	
Rh	103	He	2176518.32	2061162.14	105.6	
Sc	45	He	84684.52	86332.2766666667	98.09	
Tb	159	He	1781991.12	1790396.84666667	99.53	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2403353.87	2430541.58	98.88	
Ge	72	No Gas	1128092.49	1116846.20666667	101.01	
In	115	No Gas	5423014.31	5301929.88666667	102.28	
Lu	175	No Gas	3915633.17	4111004.52	95.25	
Rh	103	No Gas	5551746.59	5479027.00333333	101.33	
Sc	45	No Gas	4837856.75	5061380.49333333	95.58	
Tb	159	No Gas	4928378.78	4997578.57333333	98.62	

Metals

Form V1

Matrix Spikes

V1
MS/MSD RECOVERY

Report No:	218081814	Parent Sample ID:	WIL02IS01
Prep Method:	EPA 3050B \ ISM	Parent GCAL ID:	21808181401
Prep Date:	08/25/18 Time: 0815	Prep Batch:	642531
Analytical Method:	EPA 6020B	Analytical Batch:	642829

GCAL QC ID:	**21808181402 MS**	Instrument ID:	ICPMS2
Analyst:	LWZ	Lab File ID:	2180828B_MS2.b\1844SMPL_2180828A_MS2.D
Analysis Date:	08/28/18 1315	Dilution:	10

ANALYTE	UNITS	SPIKE ADDED	SAMPLE RESULT	MS RESULT	MS % REC	#	QC LIMITS
Antimony	ug/kg	4690	0	315	7	*	72 - 124
Copper	ug/kg	2340	38400	40000	67	*	84 - 119
Lead	ug/kg	2340	15800	18400	109		84 - 118
Zinc	ug/kg	46900	88500	136000	101		82 - 119

GCAL QC ID:	**21808181403 MSD**	Instrument ID:	ICPMS2
Analyst:	LWZ	Lab File ID:	2180828B_MS2.b\1845SMPL_2180828A_MS2.D
Analysis Date:	08/28/18 1319	Dilution:	10

ANALYTE	UNITS	SPIKE ADDED	MSD RESULT	MSD % REC	#	% RPD	#	QC LIMITS %REC	QC LIMITS RPD
Antimony	ug/kg	4690	361	8	*	14		72 - 124	0 - 20
Copper	ug/kg	2340	39900	66	*	0		84 - 119	0 - 20
Lead	ug/kg	2340	17600	75	*	4		84 - 118	0 - 20
Zinc	ug/kg	46900	133000	95		2		82 - 119	0 - 20

RPD : 0 out of 4 outside limits

Spike Recovery: 5 out of 8 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM V (PART 1) - IN

MS Report

Sample Name	21808181402	**Total Dilution**	400.0000
File Name	1844SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Data Path Name	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b	**ISTD Ref FileName**	010CALB_2180828A_MS2.D
Acq Time	08/28/2018 13:15:42	**Sample QC Pass/Fail**	Fail
Sample Type	MSSOIL	**ISTD QC Pass/Fail**	Pass

Analyte Table **Units : ppb**

Name	Mass	ISTD	Mode	MeasValue	FinalConc	RSD	CPS	Ref Conc	%Rec	QC Flag
Ag	107	115	No Gas	4.95133332908929	1980.533	2.56	62250.34	114.730906267821	93.2901212683947	
Al	27	45	He	24732.9185817121	9893167.433	0.40	683102.02	8350058.88011472	3857.77138142531	> +/- 20%
As	75	72	He	17.6310626747124	7052.425	0.29	8625.91	5187.32974133412	93.254766427542	
B	11	45	No Gas	35.9853844816322	14394.154	1.21	116961.72	5878.0026325957	85.1615116005719	
Ba	137	115	No Gas	279.255712313847	111702.285	1.59	1010653.12	111146.684468536	27.7800228501612	> +/- 20%
Be	9	45	No Gas	6.82529973317836	2730.120	0.54	35106.98	636.832002457495	104.664394540692	
Ca	44	45	He	75636.6396478083	30254655.859	0.40	348915.51	30262736.3864391	-0.80805273157768	> +/- 20%
Cd	111	115	No Gas	6.21165417114489	2484.662	2.67	16107.05	391.001034930369	104.683031676379	
Co	59	72	He	31.5747490079693	12629.900	0.16	137441.27	10620.2678849328	100.481585912749	
Cr	52	72	He	60.7924776485293	24316.991	0.73	155507.25	20402.5563398229	195.721735979439	> +/- 20%
Cu	63	72	He	85.3053686630282	34122.147	0.50	291354.57	32776.4451977491	67.285113373107	> +/- 20%
Fe	57	72	He	53003.3267547347	21201330.702	0.59	2300392.20	20553308.3608883	324.011170502776	> +/- 20%
K	39	45	He	3470.65072085041	1388260.288	0.95	361704.83	1158291.92082598	114.984183757093	
Li	7	45	No Gas	65.7148326530871	26285.933	1.29	1098774.85	14171.5782852394	121.143547759954	> +/- 20%
Mg	24	45	He	30876.1882853686	12350475.314	0.61	3726854.01	12302215.5885277	24.1298628098415	> +/- 20%
Mn	55	72	He	1225.05411841042	490021.647	0.31	1082713.50	498439.826636121	-420.908963597711	> +/- 20%
Mo	95	115	No Gas	5.81586576143502	2326.346	1.76	31106.13	651.497307159834	83.7424498707087	
Na	23	45	He	2325.92131362845	930368.525	0.53	724963.30	743968.527322056	93.1999990646621	
Ni	60	72	He	96.022552313239	38409.021	1.03	118370.85	34605.9975160119	95.0755852320935	
Pb	208	209	No Gas	39.342487771453	15736.995	2.54	561517.90	13548.3189070523	109.433810076443	
Sb	121	115	No Gas	0.671174398870149	268.470	3.68	8887.33	5.63356372658248	6.57090489553693	> +/- 20%
Se	78	72	He	1.47411867835469	589.647	22.22	35.78	163.862454152738	106.446254297285	
Si	29	45	He	-2096.58643536988	-838634.574	11.30	5424.35	-1209492.06176515	185.428743808598	> +/- 20%
Sn	120	115	He	2.68415634468467	1073.663	4.50	4322.93	854.554629327721	10.9553954273073	> +/- 20%
Sr	88	72	No Gas	248.30813772374	99323.255	0.66	7742101.76	99316.8500454276	0.320252203429845	> +/- 20%
Ti	47	45	He	378.194158573163	151277.663	1.16	17295.73	114023.511198567	1862.70761153493	> +/- 20%
Tl	205	209	No Gas	5.319036326666	2127.615	2.96	56920.25	161.269219415132	98.3172655625634	
V	51	72	He	83.7506522900272	33500.261	0.63	159309.45	27597.6387524209	295.131108179499	> +/- 20%
Zn	66	72	He	290.15311144657	116061.245	0.41	137451.20	75510.2700038778	101.377436436876	
Zr	90	72	No Gas	40.5247469993789	16209.899	1.46	781129.19	14575.9774038299	408.480348980406	> +/- 20%

QC ISTD Table **Recovery Limits: 70 - 120%**

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	987945.77	1156007.06333333	85.46	
Ge	72	He	69274.15	68942.6933333333	100.48	
In	115	He	483342.07	515120.94	93.83	

MS Report

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Lu	175	He	645847.74	860474.493333333	75.06	
Rh	103	He	1949472.28	2061162.14	94.58	
Sc	45	He	87818.06	86332.2766666667	101.72	
Tb	159	He	1422182.58	1790396.84666667	79.43	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2056474.71	2430541.58	84.61	
Ge	72	No Gas	1042298.78	1116846.20666667	93.33	
In	115	No Gas	4712893.65	5301929.88666667	88.89	
Lu	175	No Gas	3381431.51	4111004.52	82.25	
Rh	103	No Gas	4878304.81	5479027.00333333	89.04	
Sc	45	No Gas	4873419.67	5061380.49333333	96.29	
Tb	159	No Gas	4182137.96	4997578.57333333	83.68	

Matrix Spike Duplicate (MSD) Sample Report

Sample Name	21808181403	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1845SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:19:15	**Total Dilution**	400.0000
Sample Type	MSDSOIL	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

RPD Limits: 0-20%

Name	Mass	Mode	MeasValue	Final Conc	RSD	CPS	RefConc	RPD	Flag
Li	7	No Gas	63.6157132866735	25446.285	1.03	1089225.35	65.7148326530871	3.25	
Be	9	No Gas	6.60305346950146	2641.221	1.62	34630.57	6.82529973317836	3.31	
B	11	No Gas	34.2697344034771	13707.894	0.77	113734.60	35.9853844816322	4.88	
Sr	88	No Gas	241.970989884738	96788.396	0.17	7742869.88	248.30813772374	2.59	
Zr	90	No Gas	41.3853392723522	16554.136	1.96	818775.40	40.5247469993789	2.1	
Mo	95	No Gas	5.62560848623775	2250.243	1.79	30980.35	5.81586576143502	3.33	
Ag	107	No Gas	4.77322719297126	1909.291	1.18	61770.75	4.95133332908929	3.66	
Cd	111	No Gas	6.11178253996659	2444.713	1.43	16314.00	6.21165417114489	1.62	
Sb	121	No Gas	0.770096298392537	308.039	2.64	10278.30	0.671174398870149	13.73	
Ba	137	No Gas	275.41246064544	110164.984	1.31	1026435.72	279.255712313847	1.39	
Tl	205	No Gas	5.04255219383167	2017.021	4.85	56652.45	5.319036326666	5.34	
Pb	208	No Gas	37.6133839766583	15045.354	2.43	563402.79	39.342487771453	4.49	
Na	23	He	2342.97804640384	937191.219	1.21	728929.16	2325.92131362845	0.73	
Mg	24	He	30594.6910560172	12237876.422	1.15	3686290.26	30876.1882853686	0.92	
Al	27	He	24120.1807904681	9648072.316	0.46	664942.17	24732.9185817121	2.51	
Si	29	He	-1568.45988560071	-627383.954	5.22	5963.22	-2096.58643536988	-28.82	
K	39	He	3380.31759297389	1352127.037	0.74	351901.34	3470.65072085041	2.64	
Ca	44	He	74731.192859701	29892477.144	0.58	344096.02	75636.6396478083	1.2	
Ti	47	He	373.861939111228	149544.776	1.22	17063.46	378.194158573163	1.15	
V	51	He	82.5678913661614	33027.157	0.57	157095.35	83.7506522900272	1.42	
Cr	52	He	59.9746213579814	23989.849	0.65	153452.50	60.7924776485293	1.35	
Mn	55	He	1213.15656137984	485262.625	1.02	1072186.42	1225.05411841042	0.98	
Fe	57	He	53140.4030119883	21256161.205	0.83	2306362.36	53003.3267547347	0.26	
Co	59	He	31.8948962374304	12757.958	0.34	138851.44	31.5747490079693	1.01	
Ni	60	He	95.9796721903684	38391.869	1.11	118344.45	96.022552313239	0.04	
Cu	63	He	85.2240854263351	34089.634	0.22	291134.75	85.3053686630282	0.1	
Zn	66	He	283.980302954639	113592.121	0.86	134574.69	290.15311144657	2.15	
As	75	He	17.6514917990841	7060.597	1.40	8637.58	17.6310626747124	0.12	
Se	78	He	1.60493828070744	641.975	11.09	38.46	1.47411867835469	8.5	
Sn	120	He	2.79294340978845	1117.177	7.42	4499.66	2.68415634468467	3.97	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1010712.30	1156007.06333333	87.43	
Ge	72	He	69292.97	68942.6933333333	100.51	
In	115	He	486040.35	515120.94	94.35	
Lu	175	He	655175.73	860474.493333333	76.14	
Rh	103	He	1946760.06	2061162.14	94.45	
Sc	45	He	87658.39	86332.2766666667	101.54	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2154507.99	2430541.58	88.64	
Ge	72	No Gas	1068719.61	1116846.20666667	95.69	
In	115	No Gas	4850435.06	5301929.88666667	91.48	
Lu	175	No Gas	3505823.80	4111004.52	85.28	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1444299.51	1790396.84666667	80.67	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5005628.83	5479027.00333333	91.36	
Sc	45	No Gas	4964115.36	5061380.49333333	98.08	
Tb	159	No Gas	4366503.79	4997578.57333333	87.37	

Metals

Form V2

Post Digestion Spikes

V2

POST DIGEST SPIKE SAMPLE RECOVERY

Report No:	218081814	GCAL PDS ID:	1843727
Matrix:	Solid	Parent Sample ID:	WIL02IS01 (21808181401)
Analyst:	LWZ	Instrument ID:	ICPMS2
Analysis Date:	08/28/18 Time: 1322	Lab File ID:	2180828C_MS2.b\1846SMPL_2180828A_MS2.D
Analytical Method:	EPA 6020B	Analytical Batch:	642829

ANALYTE	UNITS	SPIKED SAMPLE RESULT	C	SAMPLE RESULT	C	SPIKE ADDED	% R	Q	LCL	UCL
Antimony	ug/kg	47000		0	U	46900	100		80	120
Copper	ug/kg	61200		38400		23400	97		80	120
Lead	ug/kg	38400		15800		23400	96		80	120
Zinc	ug/kg	553000		88500		469000	99		80	120

FORM V (PART 2) - IN

Post Digestion Spike (PDS) Report

Sample Name	1843727
File Name	1846SMPL_2180828A_MS2.D
Data Path Name	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
Acq Time	08/28/2018 13:22:49
Sample Type	PDS
Total Dilution	400.0000
Comment	ICPMS-2,LWZ
ISTD Ref FileName	010CALB_2180828A_MS2.D
Sample QC Pass/Fial	Fail
ISTD QC Pass/Fail	Pass
QC Ref File Name	1843SMPL_2180828A_MS2.D

QC Analyte Table

Name	Mass	Tune	Conc.	Conc. RSD	CPS	Reference Conc	Spk Amt	% Rec	%Low	%High	Flag
Li	7	No Gas	116667.741	1.41	4414629.21	35.4289457130986	250	102.19	75	125	
Be	9	No Gas	20323.554	1.01	265358.37	1.59208000614374	50	98.48	75	125	
B	11	No Gas	100423.870	1.26	806236.89	14.6950065814893	250	94.85	75	125	
Sr	88	No Gas	118005.508	1.88	9448524.44	248.292125113569	50	98.9	75	125	
Zr	90	No Gas	33988.616	1.62	1681957.33	36.4399435095748	10	182.97	75	125	> +/- 25%
Mo	95	No Gas	21363.417	1.12	295523.45	1.62874326789958	50	103.45	75	125	
Ag	107	No Gas	20557.186	0.72	672309.33	0.286827265669554	50	102.2	75	125	
Cd	111	No Gas	20436.036	0.34	137765.94	0.977502587325922	50	100.22	75	125	
Sb	121	No Gas	40092.560	0.31	1160960.37	0.0140839093164562	100	100.22	75	125	
Ba	137	No Gas	126536.283	1.50	1192799.47	277.866711171339	50	96.48	75	125	
Tl	205	No Gas	19592.683	0.67	552169.35	0.403173048537829	50	97.18	75	125	
Pb	208	No Gas	32794.557	0.62	1242680.95	33.8707972676309	50	97.75	75	125	
Na	23	He	2668689.777	0.71	2080575.02	1859.92131830514	5000	97.26	75	125	
Mg	24	He	13802350.526	0.84	4184655.46	30755.5389713193	5000	96.5	75	125	
Al	27	He	8462515.012	0.57	587059.52	20875.1472002868	1000	96.71	75	125	
Si	29	He	-1245525.034	N/A	4373.33	-3023.73015441287	5000	-157.56	75	125	> +/- 25%
K	39	He	3017123.578	0.83	776525.28	2895.72980206494	5000	95.53	75	125	
Ca	44	He	39290876.701	0.73	455137.64	75656.8409660977	25000	97.59	75	125	
Ti	47	He	133016.190	0.62	15279.19	285.058777996417	50	99.25	75	125	
V	51	He	48066.513	0.38	229585.06	68.9940968810523	50	100.99	75	125	
Cr	52	He	40230.859	1.15	257116.37	51.0063908495573	50	99.58	75	125	
Mn	55	He	509093.533	1.56	1129930.89	1246.0995665903	50	98.2	75	125	
Fe	57	He	22365937.692	1.74	2437644.28	51383.2709022208	5000	99.17	75	125	
Co	59	He	30718.946	0.50	335718.70	26.5506697123319	50	100.32	75	125	
Ni	60	He	74707.336	1.15	231063.75	86.5149937900297	100	100.14	75	125	
Cu	63	He	52190.048	1.47	447526.47	81.9411129943728	50	98.89	75	125	
Zn	66	He	472314.365	1.85	558430.41	188.775675009694	1000	99.33	75	125	
As	75	He	24970.527	0.60	30625.06	12.9683243533353	50	99.14	75	125	
Se	78	He	4093.460	2.42	221.90	0.409656135381845	10	98.31	75	125	
Sn	120	He	21926.652	0.66	80166.06	2.1363865733193	50	105.14	75	125	

QC ISTD Table

Post Digestion Spike (PDS) Report

Name	Mass	Tune Mode	CPS	CPS RSD	Ref CPS	% Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	4953776.19	1.74	5061380.49333333	97.87	70	120	
Ge	72	No Gas	1069794.71	2.16	1116846.20666667	95.79	70	120	
Rh	103	No Gas	4992022.30	1.54	5479027.00333333	91.11	70	120	
In	115	No Gas	4906022.62	2.14	5301929.88666667	92.53	70	120	
Tb	159	No Gas	4444975.66	2.86	4997578.57333333	88.94	70	120	
Lu	175	No Gas	3613294.63	2.31	4111004.52	87.89	70	120	
Bi	209	No Gas	2180365.28	2.91	2430541.58	89.71	70	120	
Sc	45	He	88225.98	0.82	86332.2766666667	102.19	70	120	
Ge	72	He	69578.96	0.40	68942.6933333333	100.92	70	120	
Rh	103	He	1966827.91	0.57	2061162.14	95.42	70	120	
In	115	He	497333.86	0.88	515120.94	96.55	70	120	
Tb	159	He	1507128.94	1.53	1790396.84666667	84.18	70	120	
Lu	175	He	680469.47	0.25	860474.493333333	79.08	70	120	
Bi	209	He	1039098.21	1.16	1156007.06333333	89.89	70	120	

Metals

Form VII

Lab Control Spikes

VII
LABORATORY CONTROL SAMPLE

Report No:	218081814	GCAL ID:	1842311 (LCS)
Matrix:	Solid	Instrument ID:	ICPMS2
Analyst:	LWZ	Lab File ID:	2180828B_MS2.b\1837SMPL_2180828A_MS2.D
Prep Date:	08/25/18 Time: 0815	Analysis Date:	08/28/18 Time: 1250
Prep Batch:	642531	Analytical Batch:	642829
Prep Method:	3050B	Analytical Method:	EPA 6020B

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% R*	*Q*	*LCL*	*UCL*
Antimony	ug/kg	4000	4190	105		72	124
Copper	ug/kg	2000	2010	101		84	119
Lead	ug/kg	2000	2030	102		84	118
Zinc	ug/kg	40000	40300	101		82	119

FORM VII - IN

Laboratory Control Sample (LCS) Report

Sample Name	1842311	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b
File Name	1837SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 12:50:50	**Total Dilution**	40.0000
Sample Type	LCS6020	**Sample Pass/Fail**	Fail
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Fail

Units : ppb

QC Analyte Table

Recovery Limits: 80-120% 6020A / 85-115% 200.8

Name	Mass	ISTD	Mode	Conc	RSD	CPS	SpkAmt	Rec	QC Flag
Li	7	45	No Gas	11358.595	2.12	4344675.98	250	113.59	
Be	9	45	No Gas	2191.553	2.14	288953.30	50	109.58	
B	11	45	No Gas	10495.144	1.67	850593.53	250	104.95	
Sr	88	72	No Gas	2150.065	3.49	1874851.01	50	107.5	
Zr	90	72	No Gas	440.540	1.34	237756.50	10	110.14	
Mo	95	115	No Gas	2076.028	1.59	334345.22	50	103.8	
Ag	107	115	No Gas	2015.802	3.02	767531.76	50	100.79	
Cd	111	115	No Gas	2013.628	2.28	158025.36	50	100.68	
Sb	121	115	No Gas	4191.750	2.43	1412973.42	100	104.79	
Ba	137	115	No Gas	2024.759	2.52	222309.18	50	101.24	
Tl	205	209	No Gas	2028.278	3.04	720232.80	50	101.41	
Pb	208	209	No Gas	2030.781	2.40	969675.65	50	101.54	
Na	23	45	He	206036.120	1.06	1809872.52	5000	103.02	
Mg	24	45	He	210455.826	0.40	718573.04	5000	105.23	
Al	27	45	He	42772.307	1.34	33531.93	1000	106.93	
Si	29	45	He	62030.611	3.99	10464.35	5000	31.02	LCS6020 Main CR1 Failed
K	39	45	He	206547.903	1.17	602564.59	5000	103.27	
Ca	44	45	He	1062846.235	0.30	138930.29	25000	106.28	
Ti	47	45	He	2007.191	1.58	2606.57	50	100.36	
V	51	72	He	2049.708	0.98	115279.07	50	102.49	
Cr	52	72	He	2038.453	0.97	154498.79	50	101.92	
Mn	55	72	He	2113.623	1.50	55398.11	50	105.68	
Fe	57	72	He	204900.724	0.85	263052.59	5000	102.45	
Co	59	72	He	2041.362	0.65	262553.12	50	102.07	
Ni	60	72	He	4043.034	0.40	147286.52	100	101.08	
Cu	63	72	He	2014.298	0.58	203478.70	50	100.71	
Zn	66	72	He	40312.589	0.37	561087.90	1000	100.78	
As	75	72	He	2019.639	0.83	29152.38	50	100.98	
Se	78	72	He	413.102	1.37	263.45	10	103.28	
Sn	120	115	He	2100.829	0.83	98997.85	50	105.04	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1500776.44	1156007.06333333	129.82	<70% or >120%
Ge	72	He	81880.94	68942.6933333333	118.77	
In	115	He	640896.07	515120.94	124.42	<70% or >120%
Lu	175	He	1099905.61	860474.493333333	127.83	<70% or >120%
Rh	103	He	2365792.62	2061162.14	114.78	
Sc	45	He	99344.87	86332.2766666667	115.07	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2747502.98	2430541.58	113.04	
Ge	72	No Gas	1164185.51	1116846.20666667	104.24	
In	115	No Gas	5711620.34	5301929.88666667	107.73	
Lu	175	No Gas	4594121.39	4111004.52	111.75	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	2243932.83	1790396.84666667	125.33	<70% or >120%

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5764564.91	5479027.00333333	105.21	
Sc	45	No Gas	5001880.63	5061380.49333333	98.82	
Tb	159	No Gas	5512546.80	4997578.57333333	110.3	

Metals

Form VIII

Tunes

VIII
ICP-MS TUNE

Report No:	218081814	GCAL QC ID:	1150
Instrument ID:	ICPMS2	Lab File ID:	2180828A_MS2.b\QCTune\2180828A_MS2-QCTu
Analyst:	AWG	Analytical Batch:	642829
Analysis Date:	08/28/18 Time: 0932	Analytical Method:	EPA 6020B

ELEMENT - MASS	***AVG MEASURED MASS (amu)***	***PEAK WIDTH AT 5% PEAK HEIGHT (amu)***	***%RSD***
Be-9	9	.785	.4858
Mg-24	24	.7864	.6731
Mg-25	25	.7931	1.2316
Mg-26	26	.7857	.6112
Co-59	59	.7733	.4029
In-115	115.05	.7179	.2559
Pb-206	206.05	.7639	1.0553
Pb-207	207.05	.744	.4899
Pb-208	208.05	.7747	.8738

FORM VIII - IN

US EPA Tune Check Sample Report

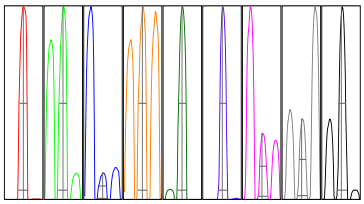
Batch Folder C:\Agilent\ICPMH\1\DATA\2180828A_MS2.b
Report Comment
Instrument Name G8403A JP14170244

[No Gas]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
9	13349	0.49	5.00	
24	46115	0.67	5.00	
25	6418	1.23	5.00	
26	7697	0.61	5.00	
59	117875	0.40	5.00	
115	67039	0.26	5.00	
206	8987	1.06	5.00	
207	8104	0.49	5.00	
208	19229	0.87	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	13341	13295	13395	13433	13280
24	46579	45761	46229	46060	45945
25	6338	6416	6340	6503	6491
26	7758	7640	7702	7662	7722
59	118187	118038	118258	117807	117083
115	67314	66872	66955	67086	66967
206	9116	9016	8868	9011	8924
207	8126	8070	8164	8079	8083
208	19281	19241	19197	18981	19447

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
9	2154	9.00	8.9 - 9.1		0.785	0.849	
24	7724	24.00	23.9 - 24.1		0.786	0.849	
25	1072	25.00	24.9 - 25.1		0.793	0.849	
26	1297	26.00	25.9 - 26.1		0.786	0.849	
59	20308	59.00	58.9 - 59.1		0.773	0.849	
115	13071	115.05	114.9 - 115.1		0.718	0.849	
206	1679	206.05	205.9 - 206.1		0.764	0.849	
207	1503	207.05	206.9 - 207.1		0.744	0.849	
208	3597	208.05	207.9 - 208.1		0.775	0.849	

X% = 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 235 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1550	W	Carrier Gas	0.90	L/min			
RF Matching	1.90	V	Option Gas	0.0	%			
Smpl Depth	8.0	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	℃						

Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	7.9	V			
Extract 2	-200.0	V	Cell Entrance	-30	V			
Omega Bias	-110	V	Cell Exit	-50	V			
Deflect	15.6	V						

Cell Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	200	V			
Energy Discrimination	4.0	V						

Metals

Form IX

Serial Dilutions

IX
SERIAL DILUTIONS

Report No:	218081814			GCAL SD ID:	1843728
Matrix:	Solid			Parent Sample ID:	WIL02IS01 (21808181401)
Analyst:	LWZ			Instrument ID:	ICPMS2
Analysis Date:	08/28/18	Time:	1326	Lab File ID:	2180828C_MS2.b\1847SMPL_2180828A_MS2.D
Analytical Method:	EPA 6020B			Analytical Batch:	642829

ANALYTE	UNITS	PARENT SAMPLE RESULT	C	SERIAL DILUTION RESULT	C	% DIFF	Q	LCL	UCL
Antimony	ug/kg	0	U	0	U				
Copper	ug/kg	38400		40100		4.4		0	10
Lead	ug/kg	15900		15900		0		0	10
Zinc	ug/kg	88500		88300		.2		0	10

FORM IX - IN

Sample Report

Sample Name	1843728	**Data Path Name**	C:\Agilent\ICPMH\1\DATA\2180828C_MS2.b
File Name	1847SMPL_2180828A_MS2.D	**Comment**	ICPMS-2,LWZ
Acq Time	08/28/2018 13:26:24	**Total Dilution**	2000.0000
Sample Type	Sample	**Sample Pass/Fail**	Pass
ISTD Ref FileName	010CALB_2180828A_MS2.D	**ISTD Pass/Fail**	Pass

Units : ppb

QC Analyte Table

Name	Mass	ISTD	Mode	MeasValue	Final Conc	RSD	CPS	LDR	QC Flag
Li	7	45	No Gas	8.93803995551486	17876.080	1.48	279814.87	500	
Be	9	45	No Gas	0.331047751595732	662.096	4.91	1751.44	1000	
B	11	45	No Gas	3.55180533828938	7103.611	1.60	14861.03	500	
Sr	88	72	No Gas	52.5155536098587	105031.107	1.75	1683803.67	1000	
Zr	90	72	No Gas	7.59494352347116	15189.887	1.97	150982.36	100	
Mo	95	115	No Gas	0.327917686853824	655.835	6.82	2081.28	1000	
Ag	107	115	No Gas	0.0634040146400212	126.808	1.34	896.71	100	
Cd	111	115	No Gas	0.185245888468267	370.492	6.40	534.46	1000	
Sb	121	115	No Gas	0.217494834553712	434.990	2.63	4076.19	1000	
Ba	137	115	No Gas	56.0210741882794	112042.148	0.67	215195.89	1000	
Tl	205	209	No Gas	0.0570458588430602	114.092	6.67	1200.10	1000	
Pb	208	209	No Gas	6.76844462457171	13536.889	2.37	105522.56	1000	
Na	23	45	He	388.005169461393	776010.339	0.40	118115.09	100000	
Mg	24	45	He	6503.9161669029	13007832.334	0.38	743084.21	100000	
Al	27	45	He	4375.57577512231	8751151.550	1.07	114465.73	20000	
Si	29	45	He	-3849.03623058839	-7698072.461	11.12	3393.74	10000	
K	39	45	He	603.406374690598	1206812.749	1.62	68310.19	100000	
Ca	44	45	He	15896.4883304041	31792976.661	0.45	69669.59	500000	
Ti	47	45	He	60.2039148085236	120407.830	2.10	2614.57	1000	
V	51	72	He	13.9514122924905	27902.825	1.84	26342.51	1000	
Cr	52	72	He	10.2674997365803	20534.999	0.76	27648.15	1000	
Mn	55	72	He	254.493938085775	508987.876	0.94	222611.94	5000	
Fe	57	72	He	10559.894923588	21119789.847	0.25	453520.06	100000	
Co	59	72	He	5.49448338848942	10988.967	1.39	23719.28	1000	
Ni	60	72	He	17.8081981787957	35616.396	1.25	21910.97	2000	
Cu	63	72	He	17.0936534575555	34187.307	0.68	57996.66	1000	
Zn	66	72	He	37.6596620042959	75319.324	1.52	18622.01	20000	
As	75	72	He	2.65617481784433	5312.350	1.99	1304.06	1000	
Se	78	72	He	0.0554267236594669	110.853	60.55	5.72	50	
Sn	120	115	He	2.39355215937903	4787.104	2.07	4041.74	1000	

QC ISTD Table

Recovery Limits: 30 - 120% DOD 6020A / 70-130% 6020A / 60-125% 200.8

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	He	1066650.35	1156007.06333333	92.27	
Ge	72	He	68512.71	68942.6933333333	99.38	
In	115	He	499426.47	515120.94	96.95	
Lu	175	He	683510.04	860474.493333333	79.43	
Rh	103	He	2004023.74	2061162.14	97.23	
Sc	45	He	83113.82	86332.2766666667	96.27	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Bi	209	No Gas	2237355.85	2430541.58	92.05	
Ge	72	No Gas	1070180.37	1116846.20666667	95.82	
In	115	No Gas	4996791.86	5301929.88666667	94.24	
Lu	175	No Gas	3641280.88	4111004.52	88.57	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Tb	159	He	1528218.31	1790396.84666667	85.36	

Name	Mass	Mode	CPS	Ref CPS	Rec	Flag
Rh	103	No Gas	5155668.27	5479027.00333333	94.1	
Sc	45	No Gas	4797214.53	5061380.49333333	94.78	
Tb	159	No Gas	4513877.12	4997578.57333333	90.32	

Metals

Form XIII

Preparation Logs

XIII
PREPARATION LOG

Report No: 218081814

Prep Method: EPA 3050B Prep Batch: 642531

CLIENT SAMPLE ID	*GCAL SAMPLE ID*	*PREP DATE*	*WEIGHT*	*UNITS*	*VOLUME*	*UNITS*
LCS1842311	1842311	08/25/18	1.25	g	50	mL
MB1842310	1842310	08/25/18	1.25	g	50	mL
WIL01IS01	21808181406	08/25/18	1.26	g	50	mL
WIL01IS03	21808181405	08/25/18	1.4	g	50	mL
WIL02IS01	21808181401	08/25/18	1.25	g	50	mL
WIL02IS01 MS	21808181402	08/25/18	1.25	g	50	mL
WIL02IS01 MSD	21808181403	08/25/18	1.25	g	50	mL
WIL02IS02	21808181404	08/25/18	1.31	g	50	mL
WIL02IS03	21808181407	08/25/18	1.34	g	50	mL

FORM XIII - IN

Metals

Form XIV

Run Logs

XIV

ANALYSIS RUN LOG

Report No: 218081814 Analytical Batch: 642829 Start Date: 08/28/18

Instrument ID: ICPMS2 Analytical Method: EPA 6020B End Date: 08/28/18

CLIENT SAMPLE ID	GCAL SAMPLE ID	PF	D/F	TIME	Analyte Symbols																																				
					Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	V	Zn	Zr
ITUNE	1150	*	1	0931		X									X		X																	X	
IICALB	1300	*	1	1024		X									X		X																	X	
IICAL2	1302	*	1	1028		X									X		X																	X	
IICAL4	1304	*	1	1031		X									X		X																	X	
IICAL5	1305	*	1	1035		X									X		X																	X	
IICAL6	1306	*	1	1039		X									X		X																	X	
ICV	1600	*	1	1042		X									X		X																	X	
ICB	1700	*	1	1050		X									X		X																	X	
LLCCV	1803	*	1	1100		X									X		X																	X	
ICSA	2000	*	1	1104		X									X		X																	X	
ICSAB	2100	*	1	1107		X									X		X																	X	
LDR	2500	*	1	1111		X									X		X																	X	
CCV	1800	*	1	1240		X									X		X																	X	
CCB	1900	*	1	1243		X									X		X																	X	
MB1842310	1842310	*	1	1247		X									X		X																	X	
LCS1842311	1842311	*	1	1250		X									X		X																	X	
WIL02IS01	21808181401	*	10	1312		X									X		X																	X	
WIL02IS01 MS	21808181402	*	10	1315		X									X		X																	X	
WIL02IS01 MSD	21808181403	*	10	1319		X									X		X																	X	
WIL02IS01PDS	1843727	*	10	1322		X									X		X																	X	
WIL02IS01SD	1843728	*	50	1326		X									X		X																	X	
WIL02IS02	21808181404	*	10	1329		X									X		X																	X	
WIL01IS03	21808181405	*	10	1333		X									X		X																	X	
CCV	1800	*	1	1337		X									X		X																	X	
CCB	1900	*	1	1340		X									X		X																	X	
WIL01IS01	21808181406	*	10	1344		X									X		X																	X	
WIL02IS03	21808181407	*	10	1347		X									X		X																	X	
CCV	1800	*	1	1358		X									X		X																	X	
CCB	1900	*	1	1402		X									X		X																	X	

FORM XIV - IN

XIV

ANALYSIS RUN LOG

Report No: 218081814 Analytical Batch: 642829 Start Date: 08/28/18

Instrument ID: ICPMS2 Analytical Method: EPA 6020B End Date: 08/28/18

CLIENT SAMPLE ID	GCAL SAMPLE ID	PF	D/F	TIME	Analyte Symbols																														
					Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo	Ni	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	V	Zn	Zr
ICSA	2000	*	1	1800		X									X		X																X	
ICSAB	2100	*	1	1804		X									X		X																X	

FORM XIV - IN

Metals

Form XV

Internal Standards

XV (He)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081814	Start Date:	08/28/18
Instrument ID:	ICPMS2	End Date:	08/28/18
Analytical Method	EPA 6020B	Analytical Batch:	642829

			Internal Standards %RI For:													
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD1***	***Q***	***ISTD2***	***Q***	***ISTD3***	***Q***	***ISTD4***	***Q***	***ISTD5***	***Q***	***ISTD6***	***Q***	***ISTD7***	***Q***
MB1842310	1842310	1247	126		115		121		122		114		113		119	
LCS1842311	1842311	1250	130		119		124		128		115		115		125	
WIL02IS01	21808181401	1312	88		101		95		78		95		102		84	
WIL02IS01 MS	21808181402	1315	85		100		94		75		95		102		79	
WIL02IS01 MSD	21808181403	1319	87		101		94		76		94		102		81	
WIL02IS01PDS	1843727	1322	90		101		97		79		95		102		84	
WIL02IS01SD	1843728	1326	92		99		97		79		97		96		85	
WIL02IS02	21808181404	1329	92		101		96		80		96		100		88	
WIL01IS03	21808181405	1333	89		99		94		77		96		99		83	
WIL01IS01	21808181406	1344	89		101		97		78		97		100		85	
WIL02IS03	21808181407	1347	94		102		98		83		98		102		90	

ISTD 1: Bismuth (He)
ISTD 2: Germanium (He)
ISTD 3: Indium (He)
ISTD 4: Lutetium (He)
ISTD 5: Rhodium (He)
ISTD 6: Scandium (He)
ISTD 7: Terbium (He)

FORM XV - IN

XV (No Gas)

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Report No:	218081814	Start Date:	08/28/18
Instrument ID:	ICPMS2	End Date:	08/28/18
Analytical Method	EPA 6020B	Analytical Batch:	642829

			Internal Standards %RI For:															
CLIENT SAMPLE ID	***GCAL SAMPLE ID***	***TIME***	***ISTD8***	***Q***	***ISTD9***	***Q***	***ISTD10***	***Q***	***ISTD11***	***Q***	***ISTD12***	***Q***	***ISTD13***	***Q***	***ISTD14***	***Q***
MB1842310	1842310	1247	110		103		106		108		104		98		107	
LCS1842311	1842311	1250	113		104		108		112		105		99		110	
WIL02IS01	21808181401	1312	88		96		92		87		91		99		89	
WIL02IS01 MS	21808181402	1315	85		93		89		82		89		96		84	
WIL02IS01 MSD	21808181403	1319	89		96		91		85		91		98		87	
WIL02IS01PDS	1843727	1322	90		96		93		88		91		98		89	
WIL02IS01SD	1843728	1326	92		96		94		89		94		95		90	
WIL02IS02	21808181404	1329	92		96		93		89		93		98		91	
WIL01IS03	21808181405	1333	89		97		94		88		92		97		90	
WIL01IS01	21808181406	1344	89		96		93		87		92		98		89	
WIL02IS03	21808181407	1347	90		98		95		90		94		99		92	

ISTD 8: Bismuth (No Gas)
ISTD 9: Germanium (No Gas)
ISTD 10 Indium (No Gas)
ISTD 11 Lutetium (No Gas)
ISTD 12 Rhodium (No Gas)
ISTD 13 Scandium (No Gas)
ISTD 14 Terbium (No Gas)

FORM XV - IN

Metals

ICPMS ICAL

GCAL ANALYTICAL LABORATORIES, LLC

BATCH COVERSHEET

ANALYST AWG

DATE 08/28/18

ICP/MS Metals Analysis

HBN **642829**

STANDARDS

ICAL Standard	316-66-17
ICV Standard	316-66-16
ICSA Standard	316-66-18
ICSAB Standard	316-66-15
Internal Standard	316-66-12
Tune	316-63-4
P/A	316-56-9

ADDITIONAL STANDARDS

LDR Standard	316-66-19
	ICVB 316-66-13

ACID MATRIX

2% HNO3 \ 0.5% HCL Solution	317-49-10
5% HNO3 \ 2% HCL Solution	317-49-12

ICPMS DATA FILE

Reference File 2180828B_MS2

GCAL QC LIMITS

200.8 Correlation Coefficient (R) =0.998

6020B Correlation Coefficient (R) =0.995

ICV Recovery 90-110%

LLCCV Recovery 80-120%

ICSA \ ICSAB Recovery 80-120%

CCV Recovery 90-110%

Data File	Acq. Date-Time	Type	Sample Name	Dilution	Vial Number	Comment
009SMPL_2180828A_MS2.D	8/28/2018 10:20	Sample	Blank	1	1107	
010CALB_2180828A_MS2.D	8/28/2018 10:24	CalBlk	1300	1	1107	
011CALS_2180828A_MS2.D	8/28/2018 10:28	CalStd	1302	1	1105	
012CALS_2180828A_MS2.D	8/28/2018 10:31	CalStd	1304	1	1103	
013CALS_2180828A_MS2.D	8/28/2018 10:35	CalStd	1305	1	1102	
014CALS_2180828A_MS2.D	8/28/2018 10:39	CalStd	1306	1	1101	
015_ICV_2180828A_MS2.D	8/28/2018 10:42	ICV	1600	1	1201	
016_ICV_2180828A_MS2.D	8/28/2018 10:46	ICV	1600 B	1	1203	
017_ICB_2180828A_MS2.D	8/28/2018 10:50	ICB	1700	1	1107	
0180.1_2180828A_MS2.D	8/28/2018 10:53	LLCCV0.1	1804	1	1105	
1810.5_2180828A_MS2.D	8/28/2018 10:57	LLCCV0.5	1804	1	1104	
1811CCV1_2180828A_MS2.D	8/28/2018 11:00	LLCCV1	1803	1	1103	
1812ICSA_2180828A_MS2.D	8/28/2018 11:04	ICSA	2000	1	1205	
1813ICSB_2180828A_MS2.D	8/28/2018 11:07	ICSB	2100	1	1206	
1814_QC1_2180828A_MS2.D	8/28/2018 11:11	QC1	LDR	1	1204	
1815SMPL_2180828A_MS2.D	8/28/2018 11:14	Sample	2500	1	3	
1816SMPL_2180828A_MS2.D	8/28/2018 11:20	Sample	1843437	1	2101	
1817SMPL_2180828A_MS2.D	8/28/2018 11:24	LCS6020	1843438	1	2102	
1818SMPL_2180828A_MS2.D	8/28/2018 11:27	LCS6020	1843439	1	2103	
1819SMPL_2180828A_MS2.D	8/28/2018 11:31	MBWATER	1843437	1	2101	
1820SMPL_2180828A_MS2.D	8/28/2018 11:34	Sample	21808271301	10	2104	
1821SMPL_2180828A_MS2.D	8/28/2018 11:38	Sample	21808271401	10	2105	
1822SMPL_2180828A_MS2.D	8/28/2018 11:41	MBWATER	1843088	1	2111	
1823SMPL_2180828A_MS2.D	8/28/2018 11:45	LCS6020	1843089	1	2112	
1824SMPL_2180828A_MS2.D	8/28/2018 11:49	AllRef	21808246101	100	2304	
1825SMPL_2180828A_MS2.D	8/28/2018 11:52	MS10XP	1843294	100	2305	
1826SMPL_2180828A_MS2.D	8/28/2018 11:56	MSD10XP	1843295	100	2306	
1827SMPL_2180828A_MS2.D	8/28/2018 11:59	PDS	1843725	100	2307	
1828SMPL_2180828A_MS2.D	8/28/2018 12:03	Sample	1843726	500	2308	
1829SMPL_2180828A_MS2.D	8/28/2018 12:06	Sample	21808250901	10	2309	
1830SMPL_2180828A_MS2.D	8/28/2018 12:10	Sample	21808271301	5	2505	
1831SMPL_2180828A_MS2.D	8/28/2018 12:13	Sample	21808271401	5	2506	
1832SMPL_2180828A_MS2.D	8/28/2018 12:17	Sample	TBLK	100	2310	
1833SMPL_2180828A_MS2.D	8/28/2018 12:20	Sample	TBLK	100	2311	
1834_CCV_2180828A_MS2.D	8/28/2018 12:40	CCV	1800	1	1102	
1835_CCB_2180828A_MS2.D	8/28/2018 12:43	CCB	1900	1	1107	
1836SMPL_2180828A_MS2.D	8/28/2018 12:47	MBSOIL	1842310	40	2312	
1837SMPL_2180828A_MS2.D	8/28/2018 12:50	LCS6020	1842311	40	2401	
1838SMPL_2180828A_MS2.D	8/28/2018 12:54	Sample	21808223401	3759.3985	2402	
1839SMPL_2180828A_MS2.D	8/28/2018 12:57	Sample	21808223402	4000	2403	
1840SMPL_2180828A_MS2.D	8/28/2018 13:01	Sample	21808223403	3424.6575	2404	
1841SMPL_2180828A_MS2.D	8/28/2018 13:05	Sample	21808181301	370.3704	2405	
1842SMPL_2180828A_MS2.D	8/28/2018 13:08	Sample	21808181308	390.625	2406	
1843SMPL_2180828A_MS2.D	8/28/2018 13:12	AllRef	21808181401	400	2407	
1844SMPL_2180828A_MS2.D	8/28/2018 13:15	MSSOIL	21808181402	400	2408	
1845SMPL_2180828A_MS2.D	8/28/2018 13:19	MSDSOIL	21808181403	400	2409	
1846SMPL_2180828A_MS2.D	8/28/2018 13:22	PDS	1843727	400	2410	
1847SMPL_2180828A_MS2.D	8/28/2018 13:26	Sample	1843728	2000	2411	

1848SMPL_2180828A_MS2.D	8/28/2018 13:29	Sample	21808181404	381.6794	2412	
1849SMPL_2180828A_MS2.D	8/28/2018 13:33	Sample	21808181405	357.1429	2501	
1850_CCV_2180828A_MS2.D	8/28/2018 13:37	CCV	1800	1	1102	
1851_CCB_2180828A_MS2.D	8/28/2018 13:40	CCB	1900	1	1107	
1852SMPL_2180828A_MS2.D	8/28/2018 13:44	Sample	21808181406	396.8254	2502	
1853SMPL_2180828A_MS2.D	8/28/2018 13:47	Sample	21808181407	373.1343	2503	
001SMPL_2180828C_MS2.D	8/28/2018 13:55	Sample	21808181307	396.8254	2504	
002_CCV_2180828C_MS2.D	8/28/2018 13:58	CCV	1800	1	1102	
003_CCB_2180828C_MS2.D	8/28/2018 14:02	CCB	1900	1	1107	
004SMPL_2180828C_MS2.D	8/28/2018 14:05	Sample	21808223401	7518.797	2402	
005SMPL_2180828C_MS2.D	8/28/2018 14:09	Sample	21808223402	8000	2403	
006SMPL_2180828C_MS2.D	8/28/2018 14:12	AllRef	21808223401 SPLP	1	3101	
007SMPL_2180828C_MS2.D	8/28/2018 14:16	MS	1842818	1	3102	
008SMPL_2180828C_MS2.D	8/28/2018 14:19	MSD	1842819	1	3103	
009SMPL_2180828C_MS2.D	8/28/2018 14:23	PDS	1843753	1	3104	
010SMPL_2180828C_MS2.D	8/28/2018 14:27	Sample	1843754	5	3105	
011SMPL_2180828C_MS2.D	8/28/2018 14:30	MBSOIL	1843299	40	4106	
012SMPL_2180828C_MS2.D	8/28/2018 14:34	LCS6020	1843300	40	4107	
013SMPL_2180828C_MS2.D	8/28/2018 14:37	AllRef	21808241101	400	4108	
014SMPL_2180828C_MS2.D	8/28/2018 14:41	MSSOIL	1843599	400	4109	
015SMPL_2180828C_MS2.D	8/28/2018 14:44	MSDSOIL	1843600	400	4110	
016SMPL_2180828C_MS2.D	8/28/2018 14:48	PDS	1843761	400	4111	
017SMPL_2180828C_MS2.D	8/28/2018 14:51	Sample	1843762	2000	4112	
018SMPL_2180828C_MS2.D	8/28/2018 14:55	Sample	21808223401	7518.797	2507	
019SMPL_2180828C_MS2.D	8/28/2018 14:59	Sample	21808223402	8000	2508	
020_CCV_2180828C_MS2.D	8/28/2018 15:02	CCV	1800	1	1102	
021_CCB_2180828C_MS2.D	8/28/2018 15:06	CCB	1900	1	1107	
022SMPL_2180828C_MS2.D	8/28/2018 15:09	Sample	21808210203	5	3306	
023SMPL_2180828C_MS2.D	8/28/2018 15:13	Sample	21808210204	5	3307	
024SMPL_2180828C_MS2.D	8/28/2018 15:16	Sample	21808210205	5	3308	
025SMPL_2180828C_MS2.D	8/28/2018 15:20	Sample	21808210208	5	3309	
026SMPL_2180828C_MS2.D	8/28/2018 15:23	Sample	21808230501	1	3310	
027SMPL_2180828C_MS2.D	8/28/2018 15:27	Sample	21808230502	1	3311	
028SMPL_2180828C_MS2.D	8/28/2018 15:31	MBWATER	1841841	1	3505	
029SMPL_2180828C_MS2.D	8/28/2018 15:34	LCS6020	1841842	1	3506	
030SMPL_2180828C_MS2.D	8/28/2018 15:38	Sample	21808210203 D	5	3507	
031SMPL_2180828C_MS2.D	8/28/2018 15:41	Sample	1842727	5	3508	
032SMPL_2180828C_MS2.D	8/28/2018 15:45	Sample	1842728	5	3509	
033SMPL_2180828C_MS2.D	8/28/2018 15:48	Sample	1842883	25	3510	
034SMPL_2180828C_MS2.D	8/28/2018 15:52	Sample	21808210204 D 100X	100	3511	
035SMPL_2180828C_MS2.D	8/28/2018 15:55	Sample	21808210204 D	5	3512	
036_CCV_2180828C_MS2.D	8/28/2018 15:59	CCV	1800	1	1102	
037_CCB_2180828C_MS2.D	8/28/2018 16:03	CCB	1900	1	1107	
038SMPL_2180828C_MS2.D	8/28/2018 16:06	Sample	21808210205 D 100X	100	4101	
039SMPL_2180828C_MS2.D	8/28/2018 16:10	Sample	21808210205 D	5	4102	
040SMPL_2180828C_MS2.D	8/28/2018 16:13	Sample	21808210206 D	5	4103	
041SMPL_2180828C_MS2.D	8/28/2018 16:17	Sample	21808210207 D	5	4104	
042SMPL_2180828C_MS2.D	8/28/2018 16:20	Sample	21808210208 D	5	4105	
043SMPL_2180828C_MS2.D	8/28/2018 16:24	MBSOIL	1842501	40	3312	
044SMPL_2180828C_MS2.D	8/28/2018 16:28	LCS6020	1842502	40	3401	

045SMPL_2180828C_MS2.D	8/28/2018 16:31	Sample	21808230901	787.4016	3402	
046SMPL_2180828C_MS2.D	8/28/2018 16:35	Sample	21808230902	769.2308	3403	
047SMPL_2180828C_MS2.D	8/28/2018 16:38	Sample	21808230903	800	3404	
048SMPL_2180828C_MS2.D	8/28/2018 16:42	AllRef	21808230904	800	3405	
049SMPL_2180828C_MS2.D	8/28/2018 16:45	MSSOIL	1842503	800	3406	
050SMPL_2180828C_MS2.D	8/28/2018 16:49	MSDSOIL	1842504	800	3407	
051SMPL_2180828C_MS2.D	8/28/2018 16:52	PDS	1842886	800	3408	
052SMPL_2180828C_MS2.D	8/28/2018 16:56	Sample	1842887	4000	3409	
053SMPL_2180828C_MS2.D	8/28/2018 17:00	Sample	21808230905	657.8947	3410	
054_CCV_2180828C_MS2.D	8/28/2018 17:03	CCV	1800	1	1102	
055_CCB_2180828C_MS2.D	8/28/2018 17:07	CCB	1900	1	1107	
056SMPL_2180828C_MS2.D	8/28/2018 17:10	Sample	21808230906	735.2941	3411	
057SMPL_2180828C_MS2.D	8/28/2018 17:14	Sample	21808230907	793.6508	3412	
058SMPL_2180828C_MS2.D	8/28/2018 17:17	Sample	21808230908	781.25	3501	
059SMPL_2180828C_MS2.D	8/28/2018 17:21	Sample	21808230909	787.4016	3502	
060SMPL_2180828C_MS2.D	8/28/2018 17:24	Sample	21808230910	757.5758	3503	
061SMPL_2180828C_MS2.D	8/28/2018 17:28	Sample	21808230911	793.6508	3504	
062SMPL_2180828C_MS2.D	8/28/2018 17:32	MBSOIL	1843090	40	4201	
063SMPL_2180828C_MS2.D	8/28/2018 17:35	LCS6020	1843091	40	4202	
064SMPL_2180828C_MS2.D	8/28/2018 17:39	Sample	21808244401	357.1429	4203	
065SMPL_2180828C_MS2.D	8/28/2018 17:42	Sample	21808244501	384.6154	4204	
066SMPL_2180828C_MS2.D	8/28/2018 17:46	Sample	21808244601	396.8254	4205	
067SMPL_2180828C_MS2.D	8/28/2018 17:49	Sample	21808244701	387.5969	4206	
068_CCV_2180828C_MS2.D	8/28/2018 17:53	CCV	1800	1	1102	
069_CCB_2180828C_MS2.D	8/28/2018 17:57	CCB	1900	1	1107	
070ICSA_2180828C_MS2.D	8/28/2018 18:00	ICSA	2000	1	1205	
071ICSB_2180828C_MS2.D	8/28/2018 18:04	ICSB	2100	1	1206	
072SMPL_2180828C_MS2.D	8/28/2018 18:07	Sample	21808244801	354.6099	4207	
073SMPL_2180828C_MS2.D	8/28/2018 18:11	Sample	21808244901	375.9398	4208	
074SMPL_2180828C_MS2.D	8/28/2018 18:14	Sample	21808245001	400	4209	
075SMPL_2180828C_MS2.D	8/28/2018 18:18	Sample	21808245101	396.8254	4210	
076SMPL_2180828C_MS2.D	8/28/2018 18:21	Sample	21808245301	381.6794	4211	
077SMPL_2180828C_MS2.D	8/28/2018 18:25	AllRef	21808240511	800	4212	
078SMPL_2180828C_MS2.D	8/28/2018 18:29	MSSOIL	1843107	800	4301	
079SMPL_2180828C_MS2.D	8/28/2018 18:32	MSDSOIL	1843108	800	4302	
080SMPL_2180828C_MS2.D	8/28/2018 18:36	PDS	1843827	800	4303	
081SMPL_2180828C_MS2.D	8/28/2018 18:39	Sample	1843828	4000	4304	
082SMPL_2180828C_MS2.D	8/28/2018 18:43	Sample	21808240512	781.25	4305	
083SMPL_2180828C_MS2.D	8/28/2018 18:46	Sample	21808240513	757.5758	4306	
084SMPL_2180828C_MS2.D	8/28/2018 18:50	Sample	21808240514	787.4016	4307	
085SMPL_2180828C_MS2.D	8/28/2018 18:54	Sample	21808240515	757.5758	4308	
086_CCV_2180828C_MS2.D	8/28/2018 18:57	CCV	1800	1	1102	
087_CCB_2180828C_MS2.D	8/28/2018 19:01	CCB	1900	1	1107	
088SMPL_2180828C_MS2.D	8/28/2018 19:04	Sample	21808243808	10	2201	
089SMPL_2180828C_MS2.D	8/28/2018 19:08	Sample	21808243809	10	2202	
090SMPL_2180828C_MS2.D	8/28/2018 19:11	Sample	21808243810	10	2203	
091SMPL_2180828C_MS2.D	8/28/2018 19:15	Sample	21808243811	10	2204	
092SMPL_2180828C_MS2.D	8/28/2018 19:18	Sample	21808243812	10	2205	
093SMPL_2180828C_MS2.D	8/28/2018 19:22	Sample	21808243813	10	2206	
094SMPL_2180828C_MS2.D	8/28/2018 19:25	Sample	21808243814	10	2207	

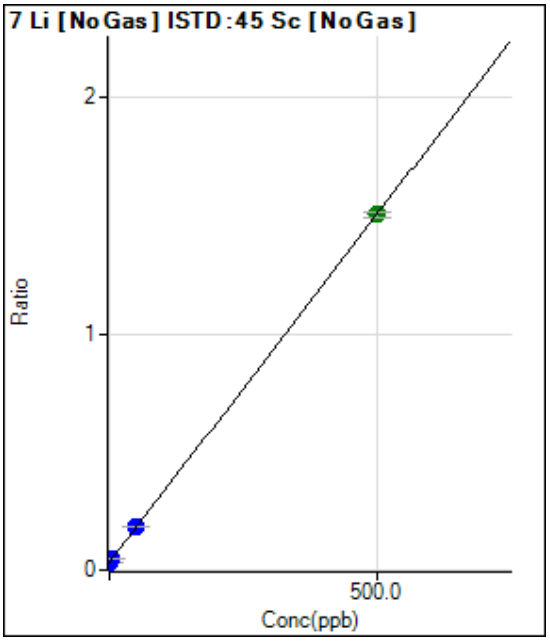
095SMPL_2180828C_MS2.D	8/28/2018 19:29	Sample	21808224601	100	2208	
096SMPL_2180828C_MS2.D	8/28/2018 19:33	AllRef	21808234301	100	2209	
097SMPL_2180828C_MS2.D	8/28/2018 19:36	MS10XP	1843293	100	2210	
098SMPL_2180828C_MS2.D	8/28/2018 19:40	Sample	21808240701	100	2211	
099_CCV_2180828C_MS2.D	8/28/2018 19:43	CCV	1800	1	1302	
100_CCB_2180828C_MS2.D	8/28/2018 19:47	CCB	1900	1	1307	
101SMPL_2180828C_MS2.D	8/28/2018 19:50	Sample	21808240702	100	2212	
102SMPL_2180828C_MS2.D	8/28/2018 19:54	Sample	21808242301	100	2301	
103SMPL_2180828C_MS2.D	8/28/2018 19:57	Sample	21808242302	100	2302	
104SMPL_2180828C_MS2.D	8/28/2018 20:01	Sample	21808242303	100	2303	
105SMPL_2180828C_MS2.D	8/28/2018 20:04	Sample	21808272201 200X	200	2106	
106SMPL_2180828C_MS2.D	8/28/2018 20:08	Sample	21808272201	2	2107	
107SMPL_2180828C_MS2.D	8/28/2018 20:12	Sample	21808272202	2	2108	
108SMPL_2180828C_MS2.D	8/28/2018 20:15	Sample	21808272101	100	2109	
109SMPL_2180828C_MS2.D	8/28/2018 20:19	Sample	21808272701	5	2110	
110_CCV_2180828C_MS2.D	8/28/2018 20:22	CCV	1800	1	1302	
111_CCB_2180828C_MS2.D	8/28/2018 20:26	CCB	1900	1	1307	
112SMPL_2180828C_MS2.D	8/28/2018 20:29	Sample	21808232801	100	3106	
113SMPL_2180828C_MS2.D	8/28/2018 20:33	Sample	21808241001	1	3107	
114SMPL_2180828C_MS2.D	8/28/2018 20:36	Sample	21808241201	1	3108	
115SMPL_2180828C_MS2.D	8/28/2018 20:40	Sample	21808241202	1	3109	
116SMPL_2180828C_MS2.D	8/28/2018 20:44	Sample	21808241203	1	3110	
117SMPL_2180828C_MS2.D	8/28/2018 20:47	Sample	21808241204	1	3111	
118SMPL_2180828C_MS2.D	8/28/2018 20:51	Sample	21808240401	1	3112	
119SMPL_2180828C_MS2.D	8/28/2018 20:54	Sample	21808240402	1	3201	
120SMPL_2180828C_MS2.D	8/28/2018 20:58	Sample	21808243101	1	3202	
121SMPL_2180828C_MS2.D	8/28/2018 21:01	Sample	21808243102	1	3203	
122_CCV_2180828C_MS2.D	8/28/2018 21:05	CCV	1800	1	1302	
123_CCB_2180828C_MS2.D	8/28/2018 21:08	CCB	1900	1	1307	
124SMPL_2180828C_MS2.D	8/28/2018 21:12	Sample	21808243103	1	3204	
125SMPL_2180828C_MS2.D	8/28/2018 21:16	Sample	21808243104	1	3205	
126SMPL_2180828C_MS2.D	8/28/2018 21:19	Sample	21808243107	1	3206	
127SMPL_2180828C_MS2.D	8/28/2018 21:23	Sample	21808243301	100	3207	
128SMPL_2180828C_MS2.D	8/28/2018 21:26	Sample	21808243401	100	3208	
129SMPL_2180828C_MS2.D	8/28/2018 21:30	Sample	21808233501	1	3209	
130SMPL_2180828C_MS2.D	8/28/2018 21:33	MBWATER	1842723	1	3210	
131SMPL_2180828C_MS2.D	8/28/2018 21:37	LCS200.8	1842724	1	3211	
132SMPL_2180828C_MS2.D	8/28/2018 21:40	Sample	21808234102	300	3212	
133SMPL_2180828C_MS2.D	8/28/2018 21:44	Sample	21808234103	300	3301	
134SMPL_2180828C_MS2.D	8/28/2018 21:48	Sample	21808234104	300	3302	
135SMPL_2180828C_MS2.D	8/28/2018 21:51	Sample	21808234105	300	3303	
136_CCV_2180828C_MS2.D	8/28/2018 21:55	CCV	1800	1	1302	
137_CCB_2180828C_MS2.D	8/28/2018 21:58	CCB	1900	1	1307	
138SMPL_2180828C_MS2.D	8/28/2018 22:02	Sample	21808234106	300	3304	
139SMPL_2180828C_MS2.D	8/28/2018 22:05	Sample	21808234107	300	3305	
140SMPL_2180828C_MS2.D	8/28/2018 22:09	MBWATER	1843085	1	4405	
141SMPL_2180828C_MS2.D	8/28/2018 22:12	LCS6020	1843086	1	4406	
142SMPL_2180828C_MS2.D	8/28/2018 22:16	AllRef	21808243808 D	10	4407	
143SMPL_2180828C_MS2.D	8/28/2018 22:20	MS10XP	1843838	10	4408	
144SMPL_2180828C_MS2.D	8/28/2018 22:23	MSD10XP	1848839	10	4409	

145SMPL_2180828C_MS2.D	8/28/2018 22:27	Sample	1848841	50	4410	
146SMPL_2180828C_MS2.D	8/28/2018 22:30	Sample	21808243809 D	10	4411	
147SMPL_2180828C_MS2.D	8/28/2018 22:34	Sample	21808243810 D	10	4412	
148SMPL_2180828C_MS2.D	8/28/2018 22:37	Sample	21808243811 D	10	4501	
149SMPL_2180828C_MS2.D	8/28/2018 22:41	Sample	21808243812 D	10	4502	
150SMPL_2180828C_MS2.D	8/28/2018 22:45	Sample	21808243813 D	10	4503	
151SMPL_2180828C_MS2.D	8/28/2018 22:48	Sample	21808243814 D	10	4504	
152_CCV_2180828C_MS2.D	8/28/2018 22:52	CCV	1800	1	1302	
153_CCB_2180828C_MS2.D	8/28/2018 22:55	CCB	1900	1	1307	
154SMPL_2180828C_MS2.D	8/28/2018 22:59	MBWATER	1843344	1	4309	
155SMPL_2180828C_MS2.D	8/28/2018 23:02	LCS200.8	1843345	1	4310	
156SMPL_2180828C_MS2.D	8/28/2018 23:06	Sample	21808245901	1	4311	
157SMPL_2180828C_MS2.D	8/28/2018 23:10	Sample	21808250401	2	4312	
158SMPL_2180828C_MS2.D	8/28/2018 23:13	AllRef	21808270701	10	4401	
159SMPL_2180828C_MS2.D	8/28/2018 23:17	MS	1843346	10	4402	
160SMPL_2180828C_MS2.D	8/28/2018 23:20	MSD	1843347	10	4403	
161SMPL_2180828C_MS2.D	8/28/2018 23:24	Sample	21808270801	10	4404	
162_CCV_2180828C_MS2.D	8/28/2018 23:27	CCV	1800	1	1302	
163_CCB_2180828C_MS2.D	8/28/2018 23:31	CCB	1900	1	1307	

Tune Step	Mass	Name	R	a	b (blank)	DL	BEC	Units
1	7	Li	0.999988316	0.002946055	0.032002022	0.680566694	10.8626695	ppb
1	9	Be	0.99999994	0.001054065	1.61E-05	0.001101963	0.015244322	ppb
1	11	B	0.999997645	0.00064507	0.000807008	0.123025448	1.251038678	ppb
2	23	Na	0.999999425	0.003526625	0.052908202	0.718085611	15.00250433	ppb
2	24	Mg	0.999997771	0.001374471	0.001621931	1.76778553	1.180040121	ppb
2	27	Al	0.999999217	0.000314458	0.001289566	1.6818286	4.100919054	ppb
2	29	Si	0.998672894	1.19E-05	0.086798955	848.2781896	7263.750645	ppb
2	39	K	0.999999818	0.001149826	0.128243729	7.007423934	111.5331925	ppb
2	44	Ca	0.99999967	5.25E-05	0.00414986	37.70231149	79.0817727	ppb
2	47	Ti	0.999981742	0.000520426	0.000123704	0.370964313	0.237697262	ppb
2	51	V	0.999998745	0.027445466	0.001580455	0.018424861	0.057585293	ppb
2	52	Cr	0.999999861	0.036450887	0.02930402	0.101951838	0.80393159	ppb
2	55	Mn	0.999999538	0.012758201	0.002432323	0.053091043	0.190647767	ppb
2	57	Fe	0.999998719	0.000626529	0.003480694	2.030385283	5.555521678	ppb
2	59	Co	0.999999174	0.062814473	0.001065301	0.012751213	0.016959476	ppb
2	60	Ni	0.999995183	0.017762169	0.003496268	0.027114868	0.196837909	ppb
2	63	Cu	0.99998964	0.049262545	0.004449484	0.019848612	0.090321847	ppb
2	66	Zn	0.99999904	0.006783435	0.016345595	0.244415282	2.409633953	ppb
2	75	As	0.999998853	0.007045683	0.00031862	0.033094755	0.045222062	ppb
2	78	Se	0.999995527	0.00030512	6.64E-05	0.090028369	0.217761332	ppb
1	88	Sr	0.999999919	0.029942888	0.000898586	0.006508973	0.03000999	ppb
1	90	Zr	0.999996749	0.018498842	0.000584262	0.006123952	0.031583732	ppb
1	95	Mo	0.999996789	0.001127149	4.67E-05	0.013556557	0.041447161	ppb
1	107	Ag	0.999999764	0.002666067	1.05E-05	0.000161042	0.003929646	ppb
1	111	Cd	0.999998459	0.000549509	5.22E-06	0.006651607	0.009504514	ppb
1	118	(Sn)	0.999996065	0.001494111	0.000559082	0.044574224	0.3741903	ppb
2	118	(Sn)	0.999991596	0.002060545	0.000778743	0.068083648	0.377930662	ppb
2	120	Sn	0.999996358	0.002920547	0.001102357	0.127019674	0.37744887	ppb
1	121	Sb	0.999999059	0.002357811	0.000303191	0.015844343	0.128590184	ppb
1	137	Ba	0.999997834	0.000768315	3.02E-05	0.010671838	0.039317577	ppb
2	156	[Se]						ppb
1	205	Tl	0.999998116	0.005164717	0.000241655	0.020339063	0.046789603	ppb
1	206	(Pb)	0.999994715	0.00173989	3.01E-05	0.01770027	0.017314566	ppb
1	207	(Pb)	0.999998529	0.001556227	2.74E-05	0.01135061	0.017583516	ppb
1	208	Pb	0.999998967	0.006949569	0.000125892	0.011864927	0.018115036	ppb
1	45	Sc						ppb
2	45	Sc						ppb
1	72	Ge						ppb
2	72	Ge						ppb
1	103	Rh						ppb
2	103	Rh						ppb
1	115	In						ppb
2	115	In						ppb
1	159	Tb						ppb
2	159	Tb						ppb
1	175	Lu						ppb
2	175	Lu						ppb
1	209	Bi						ppb
2	209	Bi						ppb

Batch Folder: C:\Agilent\ICPMH\1\DATA\2180828B_MS2.b\
Analysis File: 2180828B_MS2.batch.bin
DA Date-Time: 08/28/2018 14:04:01
Calibration Title: EPA6020
Calibration Method: External Calibration
VIS Interpolation Fit:

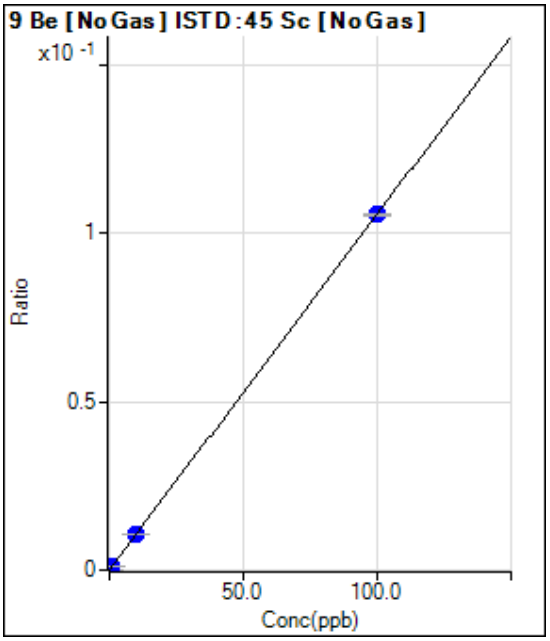
Level	Standard Data File	Sample Name	Acq. Date-Time
1	010CALB_2180828A_MS2.D	1300	08/28/2018 10:24:22
2	011CALS_2180828A_MS2.D	1302	08/28/2018 10:28:05
3	012CALS_2180828A_MS2.D	1304	08/28/2018 10:31:48
4	013CALS_2180828A_MS2.D	1305	08/28/2018 10:35:30
5	014CALS_2180828A_MS2.D	1306	08/28/2018 10:39:12



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	161961.69	0.0320	P	2.1
2	☐	0.500	0.572	169900.51	0.0337	P	1.8
3	☐	5.000	5.179	240225.39	0.0473	P	2.3
4	☐	50.000	52.434	957877.51	0.1865	P	0.7
5	☐	500.000	499.755	7777655.30	1.5043	A	1.6

y = 0.0029 * x + 0.0320
R = 1.0000
DL = 0.6806
BEC = 10.86

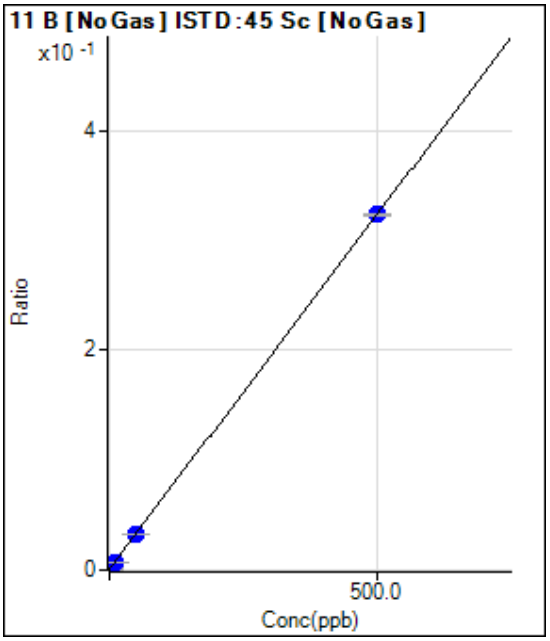
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	81.33	0.0000	P	2.4
2	☐	0.100	0.094	580.01	0.0001	P	7.9
3	☐	1.000	0.982	5340.29	0.0011	P	2.8
4	☐	10.000	9.962	54021.91	0.0105	P	1.3
5	☐	100.000	100.004	545136.85	0.1054	P	0.3

y = 0.0011 * x + 1.6069E-005
R = 1.0000
DL = 0.001102
BEC = 0.01524

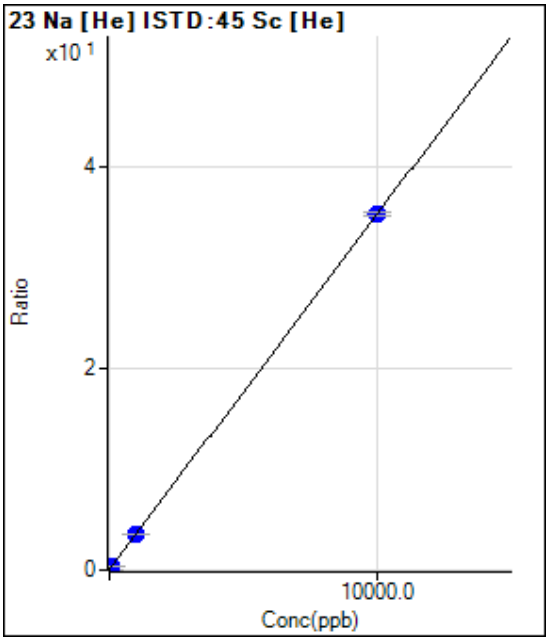
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4084.03	0.0008	P	3.3
2	☐	1.000	0.682	6288.16	0.0012	P	5.0
3	☐	10.000	9.445	35077.90	0.0069	P	1.4
4	☐	50.000	48.778	165772.44	0.0323	P	1.0
5	☐	500.000	500.134	1672437.06	0.3234	P	0.3

y = 6.4507E-004 * x + 8.0701E-004
R = 1.0000
DL = 0.123
BEC = 1.251

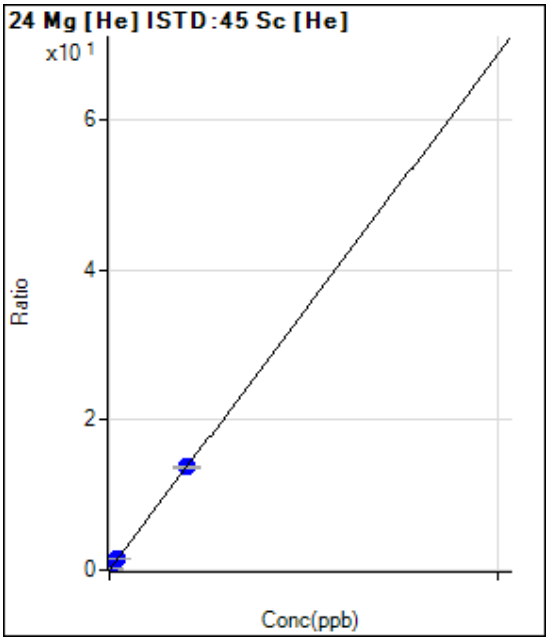
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4567.52	0.0529	P	1.6
2	☐	10.000	8.957	7228.63	0.0845	P	3.7
3	☐	100.000	100.064	35078.37	0.4058	P	1.5
4	☐	1000.000	1010.163	318705.90	3.6154	P	1.4
5	☐	10000.000	9998.984	3139566.72	35.3156	P	1.2

y = 0.0035 * x + 0.0529
R = 1.0000
DL = 0.7181
BEC = 15

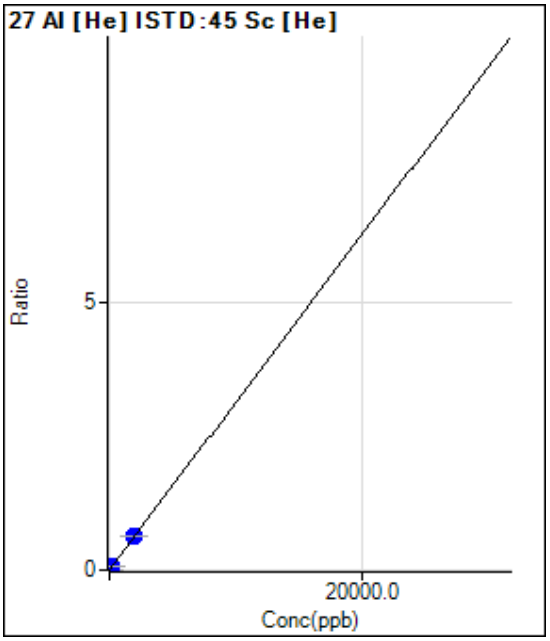
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	140.01	0.0016	P	49.9
2	☐	10.000	9.678	1276.77	0.0149	P	4.5
3	☐	100.000	105.007	12619.03	0.1460	P	3.3
4	☐	1000.000	1021.493	123908.48	1.4056	P	1.9
5	☐	10000.000	9997.801	1221709.64	13.7433	P	2.1

y = 0.0014 * x + 0.0016
R = 1.0000
DL = 1.768
BEC = 1.18

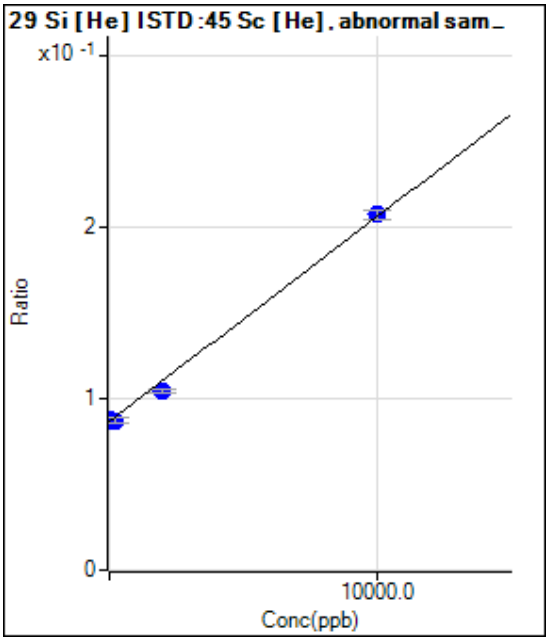
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	111.33	0.0013	P	13.7
2	☐	2.000	-0.434	98.67	0.0012	P	21.8
3	☐	20.000	19.534	642.69	0.0074	P	6.2
4	☐	200.000	197.780	5596.40	0.0635	P	1.5
5	☐	2000.000	2000.229	56027.77	0.6303	P	2.3

y = 3.1446E-004 * x + 0.0013
R = 1.0000
DL = 1.682
BEC = 4.101

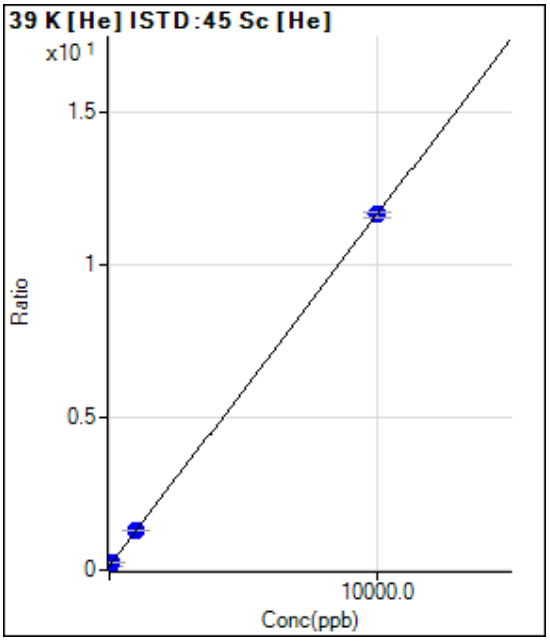
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	7493.91	0.0868	P	3.9
2	☐	20.000	68.875	7495.90	0.0876	P	4.1
3	☐	200.000	50.831	7555.28	0.0874	P	3.4
4	☐	2000.000	1515.148	9248.22	0.1049	P	1.9
5	☐	10000.000	10099.856	18444.03	0.2075	P	2.9

y = 1.1950E-005 * x + 0.0868
R = 0.9987
DL = 848.3
BEC = 7264

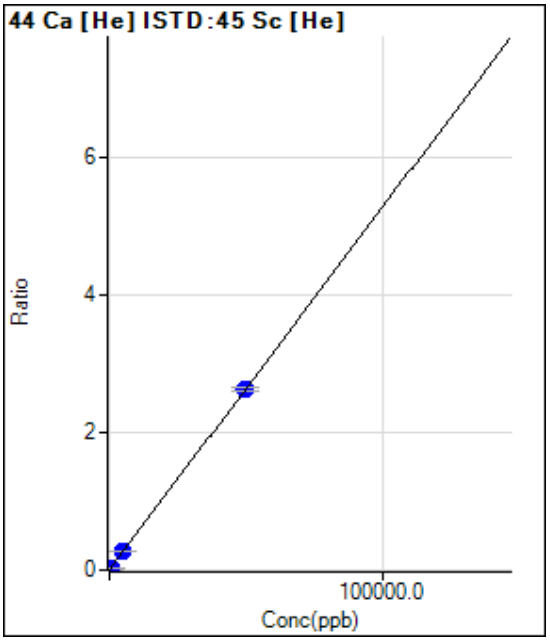
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	11071.14	0.1282	P	2.1
2	☐	10.000	11.660	12118.69	0.1417	P	1.2
3	☐	100.000	98.323	20858.47	0.2413	P	2.7
4	☐	1000.000	994.724	112134.65	1.2720	P	0.2
5	☐	10000.000	10000.543	1033652.48	11.6271	P	1.4

y = 0.0011 * x + 0.1282
R = 1.0000
DL = 7.007
BEC = 111.5

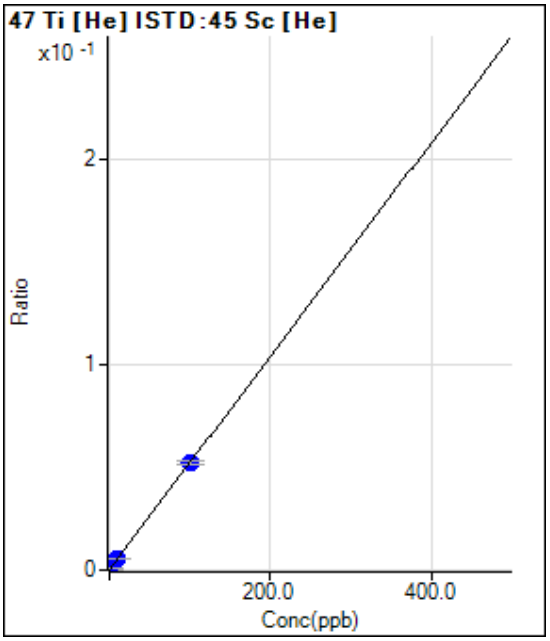
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	358.34	0.0041	P	15.9
2	☐	50.000	27.092	476.68	0.0056	P	8.3
3	☐	500.000	458.829	2440.25	0.0282	P	2.8
4	☐	5000.000	4958.590	23303.57	0.2644	P	2.4
5	☐	50000.000	50004.576	233642.06	2.6282	P	1.4

y = 5.2476E-005 * x + 0.0041
R = 1.0000
DL = 37.7
BEC = 79.08

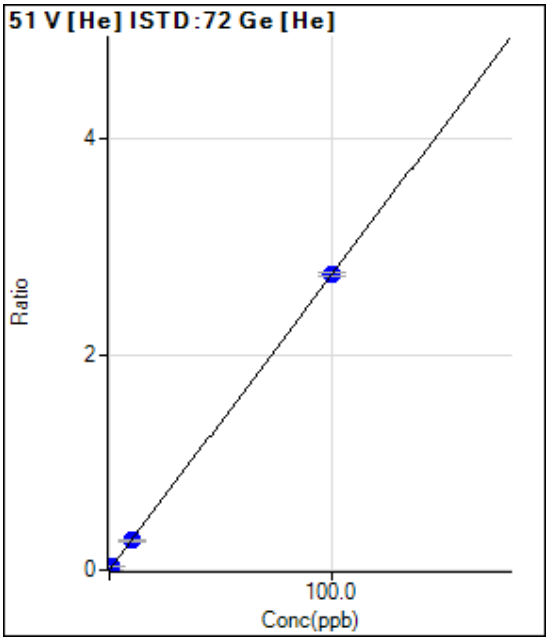
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10.67	0.0001	P	52.0
2	☐	0.100	-0.006	10.33	0.0001	P	11.0
3	☐	1.000	0.799	46.67	0.0005	P	12.2
4	☐	10.000	10.479	491.68	0.0056	P	2.8
5	☐	100.000	99.954	4635.40	0.0521	P	2.6

y = 5.2043E-004 * x + 1.2370E-004
R = 1.0000
DL = 0.371
BEC = 0.2377

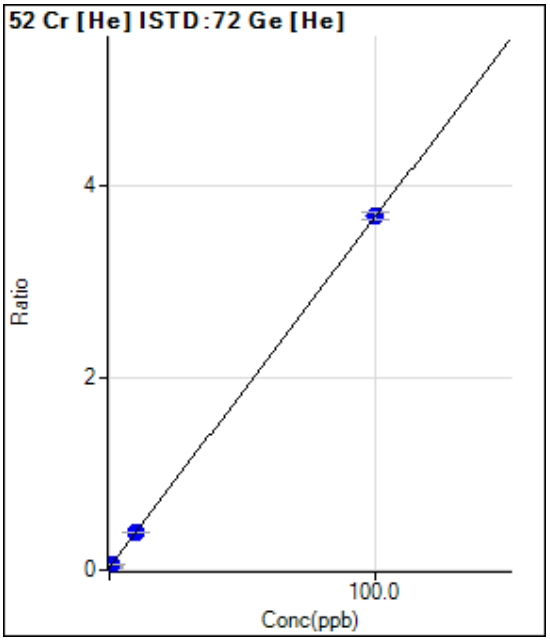
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	108.89	0.0016	P	10.7
2	☐	0.100	0.112	325.56	0.0047	P	5.5
3	☐	1.000	0.991	2042.39	0.0288	P	8.5
4	☐	10.000	9.847	19551.93	0.2718	P	1.6
5	☐	100.000	100.015	200821.09	2.7465	P	1.5

y = 0.0274 * x + 0.0016
R = 1.0000
DL = 0.01842
BEC = 0.05759

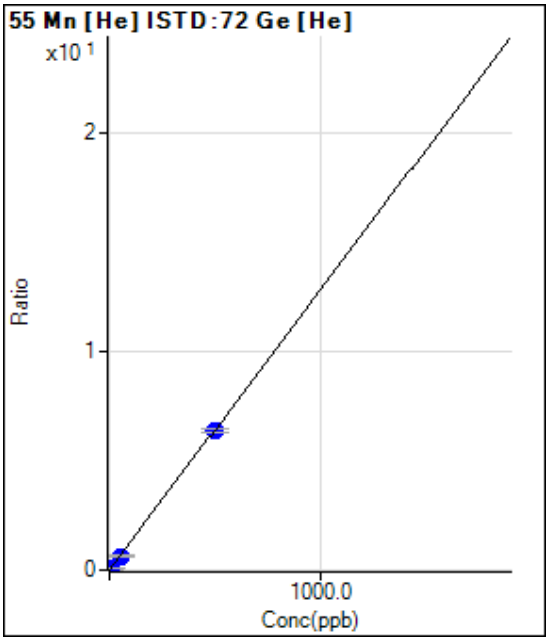
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2020.16	0.0293	P	4.2
2	☐	0.100	0.101	2302.43	0.0330	P	2.8
3	☐	1.000	1.017	4714.13	0.0664	P	3.6
4	☐	10.000	9.956	28213.74	0.3922	P	0.8
5	☐	100.000	100.004	268662.05	3.6745	P	2.1

y = 0.0365 * x + 0.0293
R = 1.0000
DL = 0.102
BEC = 0.8039

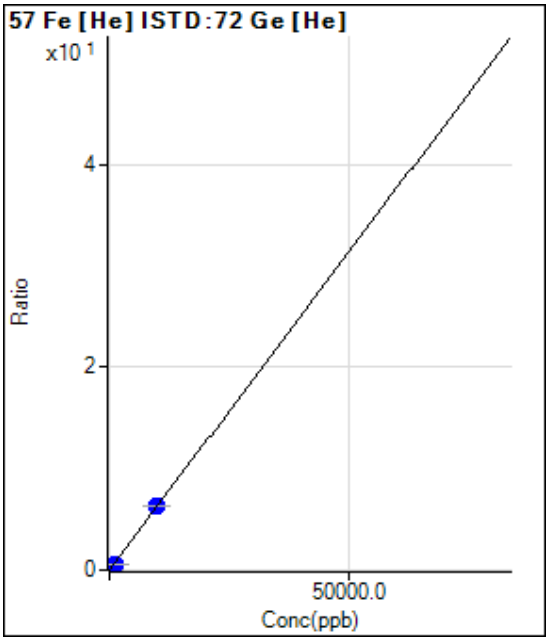
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	167.78	0.0024	P	9.3
2	☐	0.500	0.583	688.91	0.0099	P	8.7
3	☐	5.000	4.844	4558.53	0.0642	P	4.4
4	☐	50.000	50.408	46437.65	0.6456	P	0.4
5	☐	500.000	499.961	466543.89	6.3810	P	1.9

y = 0.0128 * x + 0.0024
R = 1.0000
DL = 0.05309
BEC = 0.1906

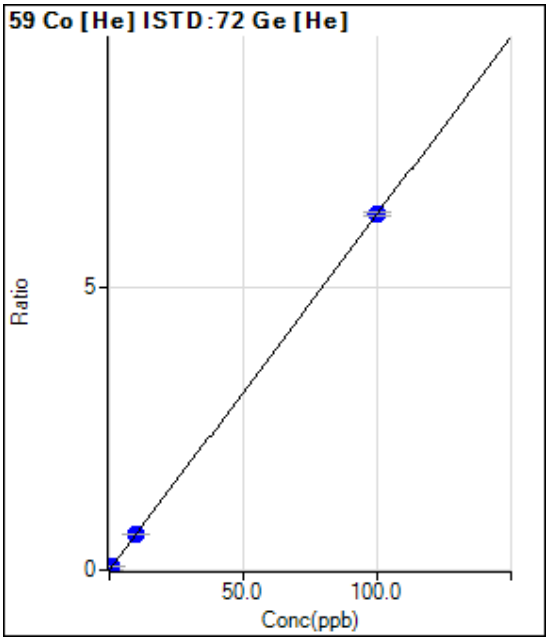
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	240.01	0.0035	P	12.2
2	☐	10.000	10.542	703.37	0.0101	P	13.7
3	☐	100.000	99.953	4694.23	0.0661	P	3.4
4	☐	1000.000	1015.810	46029.48	0.6399	P	0.8
5	☐	10000.000	9998.419	458317.71	6.2678	P	0.8

y = 6.2653E-004 * x + 0.0035
R = 1.0000
DL = 2.03
BEC = 5.556

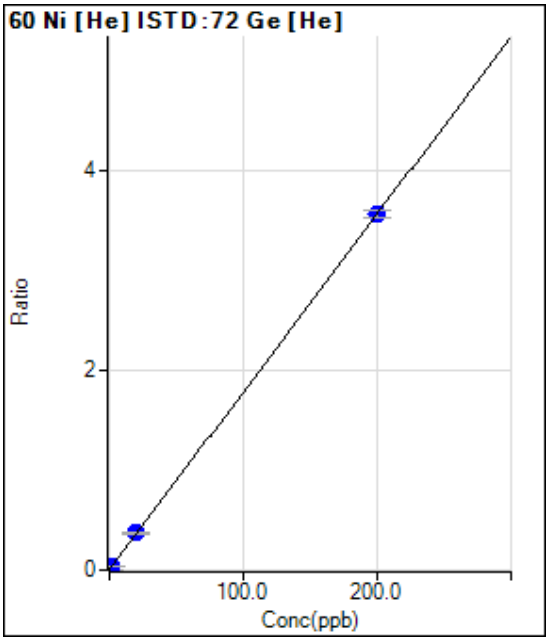
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	73.33	0.0011	P	25.1
2	☐	0.100	0.106	540.02	0.0077	P	6.6
3	☐	1.000	1.025	4645.23	0.0654	P	1.0
4	☐	10.000	10.133	45859.20	0.6376	P	2.6
5	☐	100.000	99.986	459317.79	6.2817	P	1.1

y = 0.0628 * x + 0.0011
R = 1.0000
DL = 0.01275
BEC = 0.01696

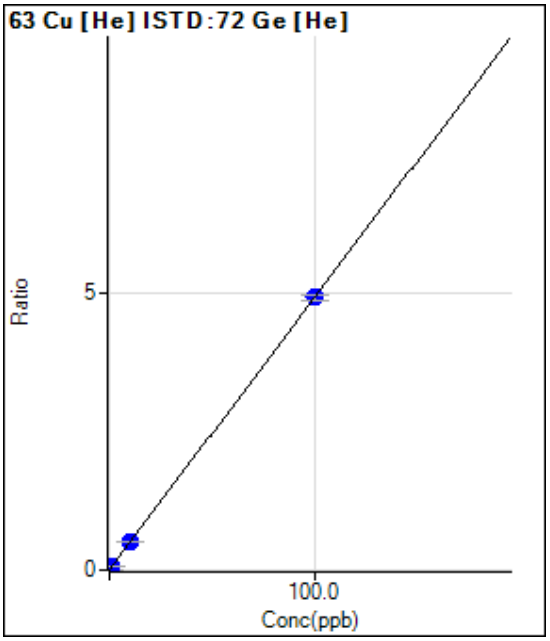
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	241.12	0.0035	P	4.6
2	☐	0.200	0.226	524.46	0.0075	P	14.4
3	☐	2.000	1.964	2724.73	0.0384	P	1.8
4	☐	20.000	20.603	26573.03	0.3694	P	2.3
5	☐	200.000	199.940	259900.78	3.5549	P	2.2

y = 0.0178 * x + 0.0035
R = 1.0000
DL = 0.02711
BEC = 0.1968

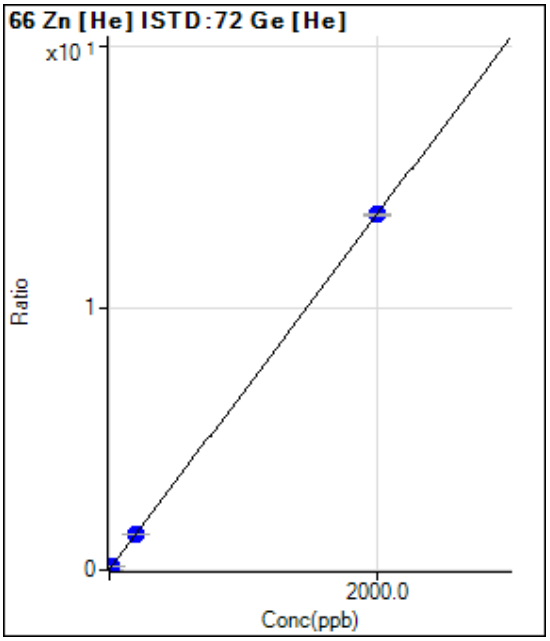
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	306.67	0.0044	P	7.3
2	☐	0.100	0.110	687.80	0.0099	P	1.5
3	☐	1.000	1.075	4075.06	0.0574	P	0.4
4	☐	10.000	10.465	37404.46	0.5200	P	1.0
5	☐	100.000	99.953	360313.90	4.9284	P	2.5

y = 0.0493 * x + 0.0044
R = 1.0000
DL = 0.01985
BEC = 0.09032

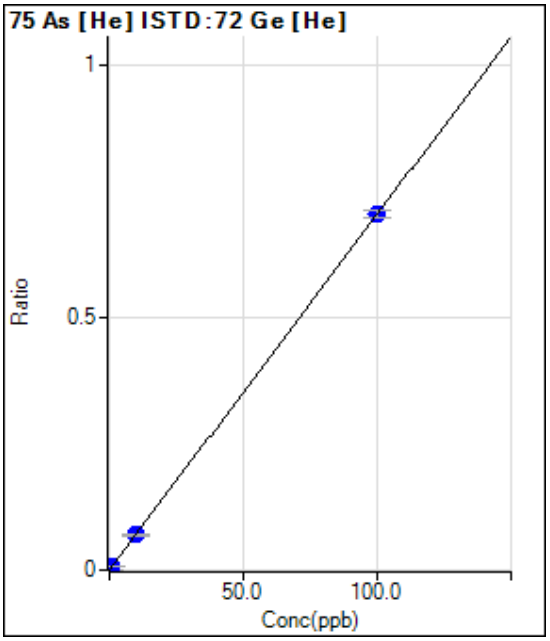
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1126.72	0.0163	P	3.4
2	☐	2.000	0.473	1364.52	0.0196	P	5.4
3	☐	20.000	18.914	10270.35	0.1446	P	1.1
4	☐	200.000	201.633	99557.70	1.3841	P	1.4
5	☐	2000.000	1999.849	993201.14	13.5822	P	0.5

y = 0.0068 * x + 0.0163
R = 1.0000
DL = 0.2444
BEC = 2.41

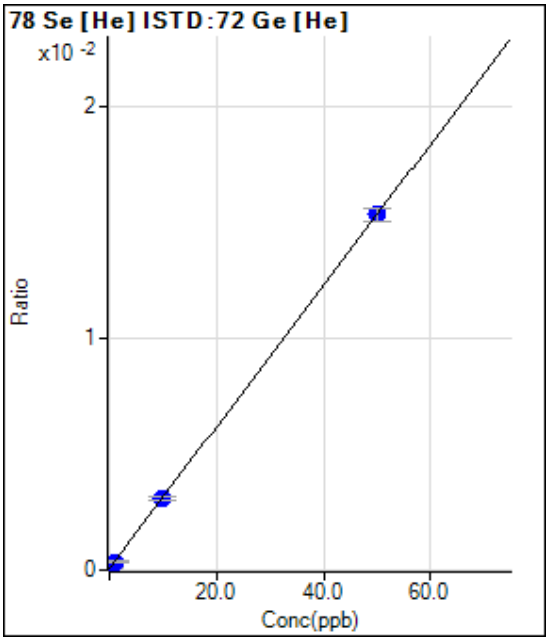
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	22.00	0.0003	P	24.4
2	☐	0.100	0.101	71.67	0.0010	P	17.6
3	☐	1.000	0.988	516.68	0.0073	P	2.5
4	☐	10.000	9.849	5014.20	0.0697	P	1.8
5	☐	100.000	100.015	51543.59	0.7050	P	2.1

y = 0.0070 * x + 3.1862E-004
R = 1.0000
DL = 0.03309
BEC = 0.04522

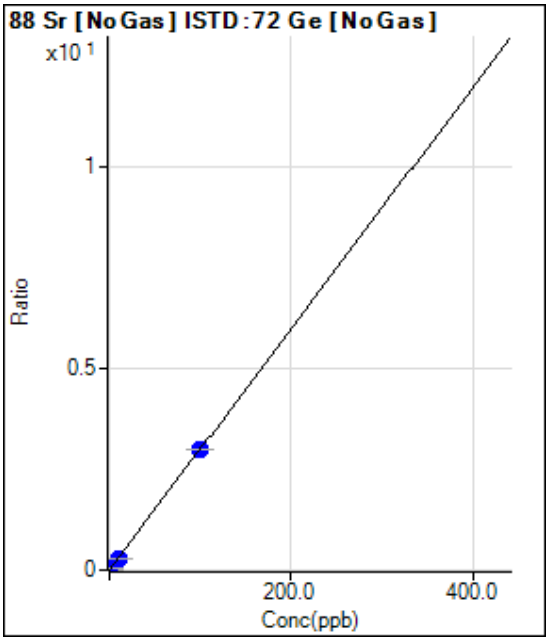
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4.58	0.0001	P	13.8
2	☐	0.100	0.107	6.92	0.0001	P	8.6
3	☐	1.000	0.868	23.57	0.0003	P	22.6
4	☐	10.000	9.898	222.08	0.0031	P	4.2
5	☐	50.000	50.023	1120.64	0.0153	P	3.5

y = 3.0512E-004 * x + 6.6443E-005
R = 1.0000
DL = 0.09003
BEC = 0.2178

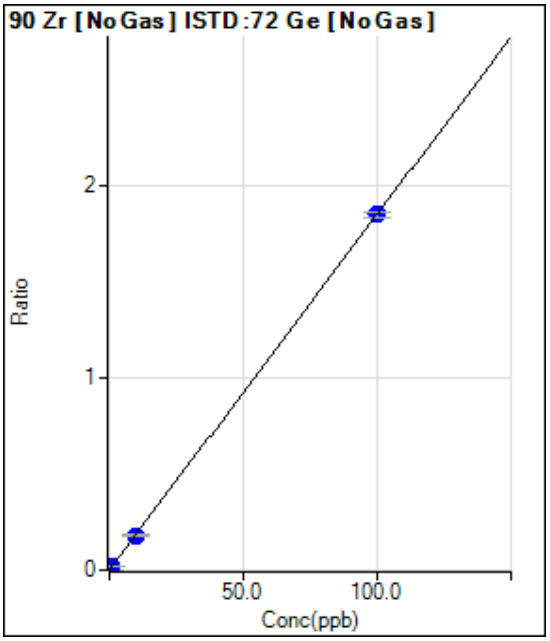
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1003.40	0.0009	P	7.2
2	☐	0.100	0.093	4100.71	0.0037	P	11.3
3	☐	1.000	0.996	34672.79	0.0307	P	0.6
4	☐	10.000	10.036	343610.98	0.3014	P	1.3
5	☐	100.000	99.996	3442006.41	2.9951	P	0.4

y = 0.0299 * x + 8.9859E-004
R = 1.0000
DL = 0.006509
BEC = 0.03001

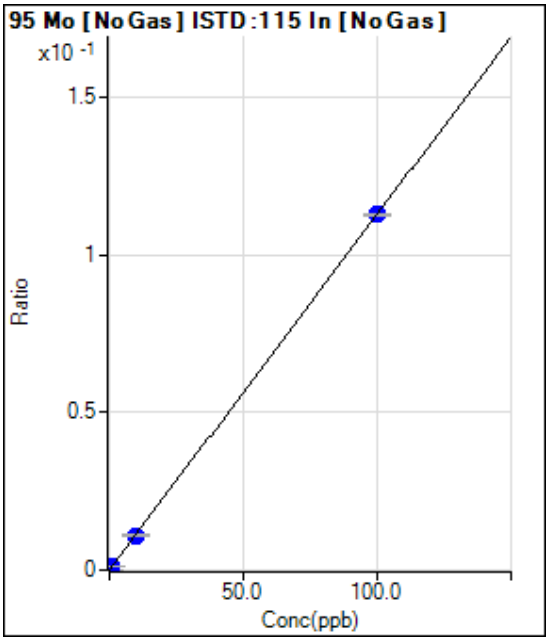
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	652.24	0.0006	P	6.5
2	☐	0.100	0.098	2671.39	0.0024	P	4.6
3	☐	1.000	0.824	17867.92	0.0158	P	1.0
4	☐	10.000	9.756	206394.19	0.1811	P	2.4
5	☐	100.000	100.026	2127197.83	1.8510	P	1.3

y = 0.0185 * x + 5.8426E-004
R = 1.0000
DL = 0.006124
BEC = 0.03158

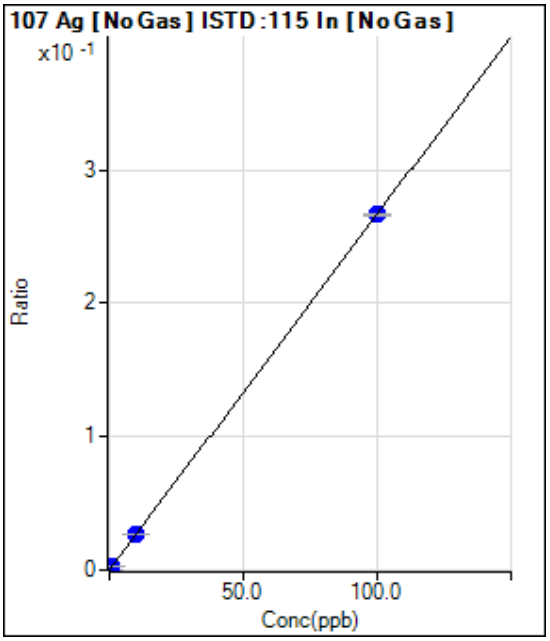
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	247.78	0.0000	P	10.9
2	☐	0.100	0.084	747.81	0.0001	P	3.6
3	☐	1.000	0.928	5881.27	0.0011	P	3.1
4	☐	10.000	9.733	60138.09	0.0110	P	1.3
5	☐	100.000	100.027	611078.76	0.1128	P	0.3

y = 0.0011 * x + 4.6717E-005
R = 1.0000
DL = 0.01356
BEC = 0.04145

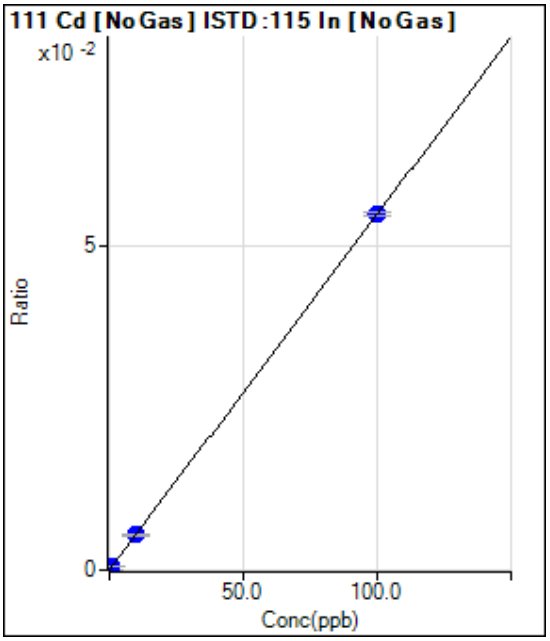
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	55.56	0.0000	P	1.4
2	☐	0.100	0.096	1412.31	0.0003	P	1.7
3	☐	1.000	0.984	14169.41	0.0026	P	2.1
4	☐	10.000	10.060	146472.03	0.0268	P	0.4
5	☐	100.000	99.994	1444410.29	0.2666	P	0.5

y = 0.0027 * x + 1.0477E-005
R = 1.0000
DL = 0.000161
BEC = 0.00393

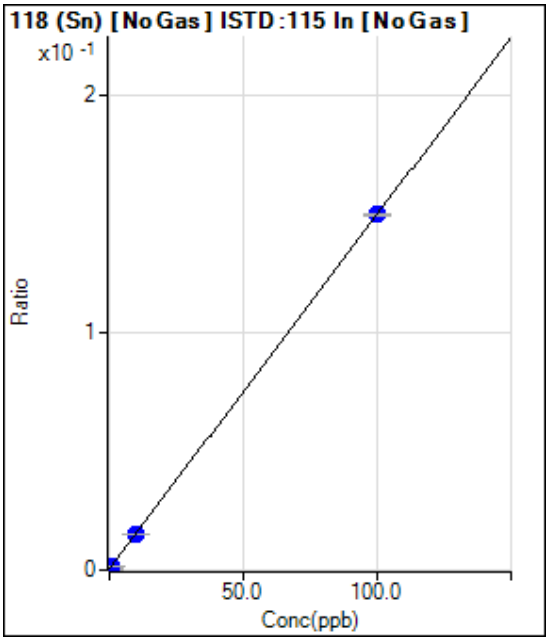
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	27.78	0.0000	P	23.3
2	☐	0.100	0.097	311.12	0.0001	P	8.9
3	☐	1.000	0.953	2846.98	0.0005	P	3.2
4	☐	10.000	9.818	29485.33	0.0054	P	1.4
5	☐	100.000	100.019	297815.91	0.0550	P	1.0

y = 5.4951E-004 * x + 5.2228E-006
R = 1.0000
DL = 0.006652
BEC = 0.009505

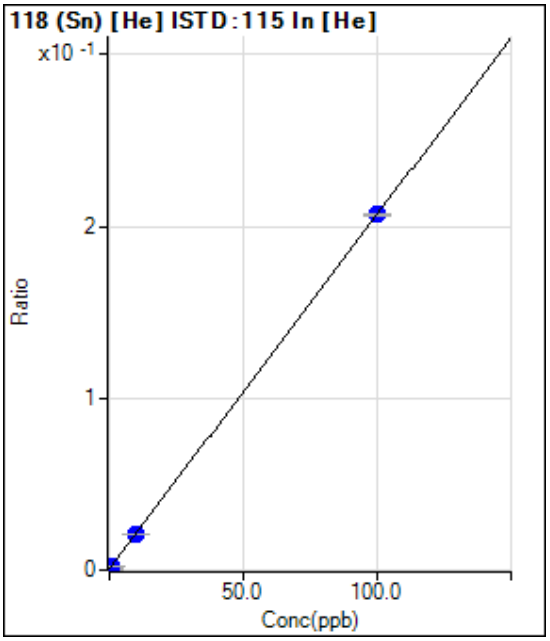
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2962.57	0.0006	P	4.0
2	☐	0.100	-0.110	2092.41	0.0004	P	6.8
3	☐	1.000	0.748	9027.44	0.0017	P	0.3
4	☐	10.000	9.691	82105.85	0.0150	P	0.9
5	☐	100.000	100.034	812805.45	0.1500	P	0.7

y = 0.0015 * x + 5.5908E-004
R = 1.0000
DL = 0.04457
BEC = 0.3742

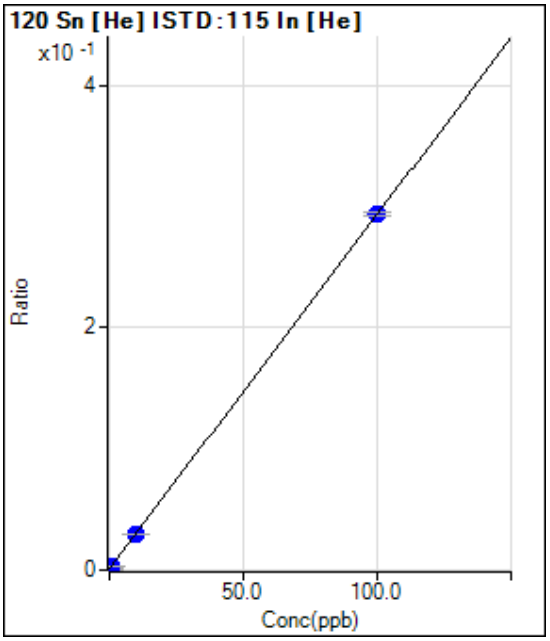
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	401.12	0.0008	P	6.0
2	☐	0.100	-0.122	276.67	0.0005	P	14.4
3	☐	1.000	0.669	1141.17	0.0022	P	4.4
4	☐	10.000	9.536	11068.91	0.0204	P	1.2
5	☐	100.000	100.050	114148.47	0.2069	P	0.6

y = 0.0021 * x + 7.7874E-004
R = 1.0000
DL = 0.06808
BEC = 0.3779

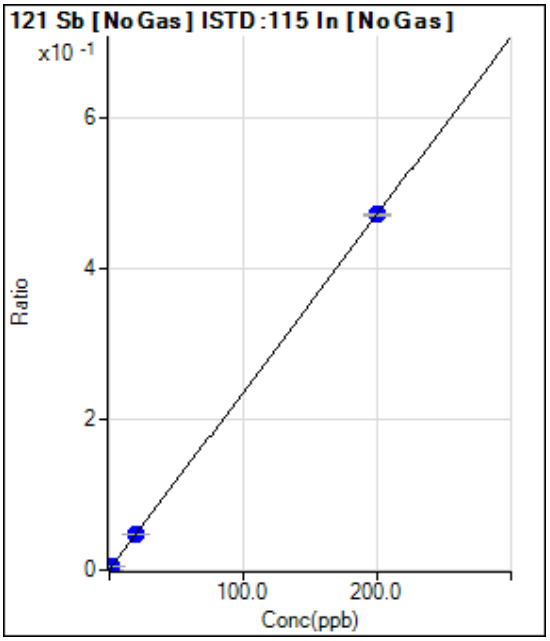
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	567.80	0.0011	P	11.2
2	☐	0.100	-0.114	404.46	0.0008	P	1.4
3	☐	1.000	0.730	1710.13	0.0032	P	4.9
4	☐	10.000	9.720	15978.10	0.0295	P	1.1
5	☐	100.000	100.031	161759.64	0.2932	P	1.1

y = 0.0029 * x + 0.0011
R = 1.0000
DL = 0.127
BEC = 0.3774

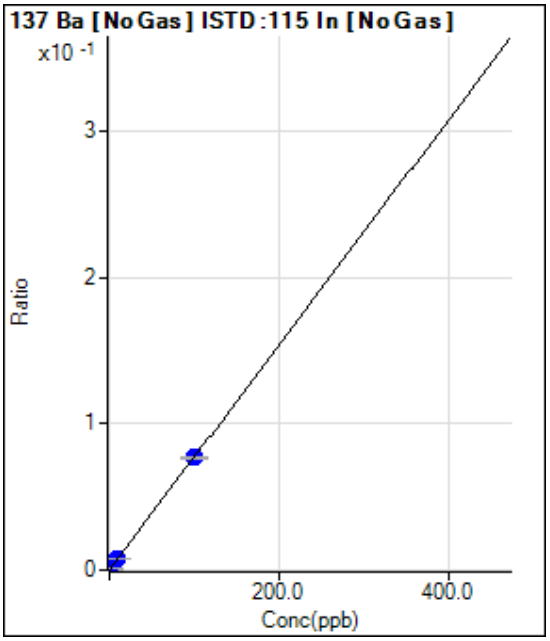
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1606.78	0.0003	P	4.1
2	☐	0.200	0.156	3558.27	0.0007	P	1.7
3	☐	2.000	1.925	26056.45	0.0048	P	0.8
4	☐	20.000	19.703	255243.63	0.0468	P	0.9
5	☐	200.000	200.031	2556847.40	0.4719	P	0.6

y = 0.0024 * x + 3.0319E-004
R = 1.0000
DL = 0.01584
BEC = 0.1286

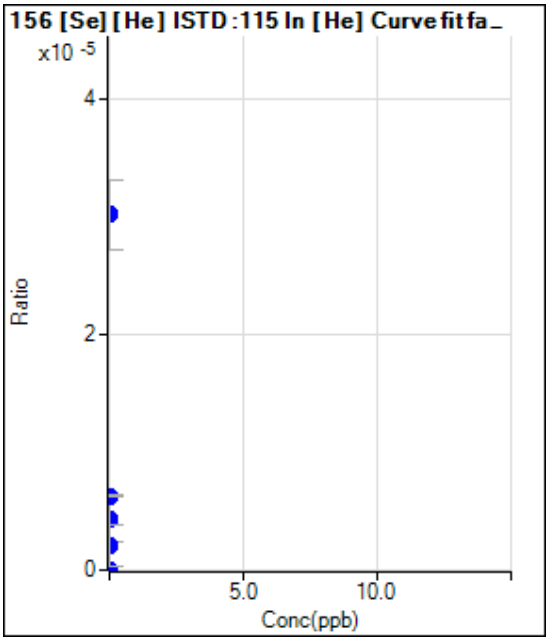
Weight: <None>
Min Conc: <None>



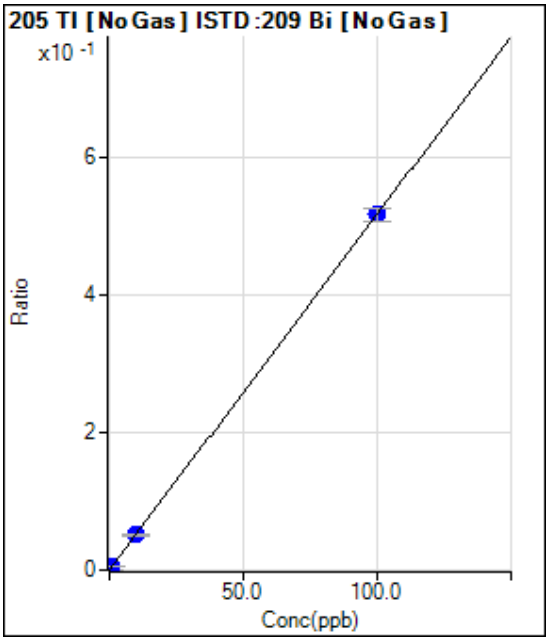
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	160.00	0.0000	P	9.0
2	☐	0.100	0.083	498.91	0.0001	P	8.8
3	☐	1.000	0.956	4115.10	0.0008	P	0.5
4	☐	10.000	9.781	41188.63	0.0075	P	1.1
5	☐	100.000	100.022	416494.71	0.0769	P	0.6

y = 7.6831E-004 * x + 3.0208E-005
R = 1.0000
DL = 0.01067
BEC = 0.03932

Weight: <None>
Min Conc: <None>



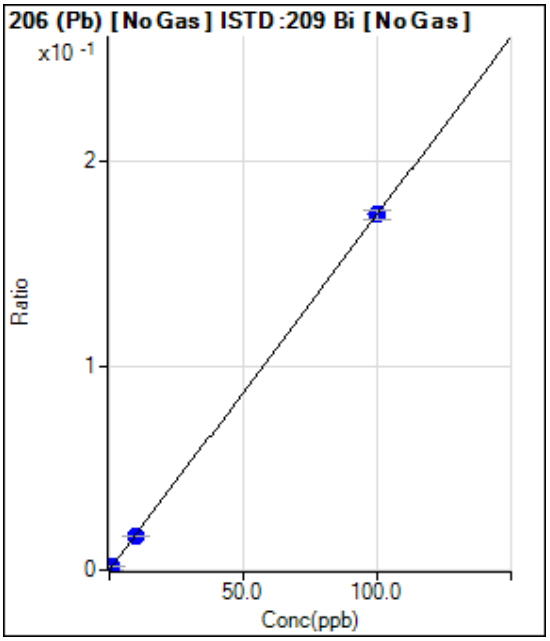
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000		2.22	0.0000	P	86.6
2	☐	0.000		0.00	0.0000	P	
3	☐	0.000		3.33	0.0000	P	1.3
4	☐	0.000		1.11	0.0000	P	173.2
5	☐	0.000		16.67	0.0000	P	19.8



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	586.70	0.0002	P	14.5
2	☐	0.100	0.098	1826.85	0.0007	P	5.2
3	☐	1.000	0.972	13257.19	0.0053	P	3.6
4	☐	10.000	9.802	131814.80	0.0509	P	1.3
5	☐	100.000	100.020	1350053.26	0.5168	P	4.0

y = 0.0052 * x + 2.4166E-004
R = 1.0000
DL = 0.02034
BEC = 0.04679

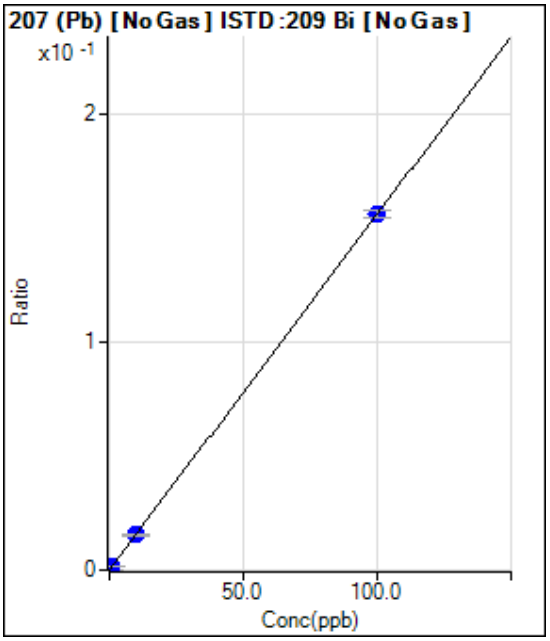
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	73.33	0.0000	P	34.1
2	☐	0.100	0.082	423.36	0.0002	P	24.2
3	☐	1.000	0.943	4210.80	0.0017	P	4.4
4	☐	10.000	9.662	43632.99	0.0168	P	2.1
5	☐	100.000	100.034	454803.78	0.1741	P	2.9

y = 0.0017 * x + 3.0125E-005
R = 1.0000
DL = 0.0177
BEC = 0.01731

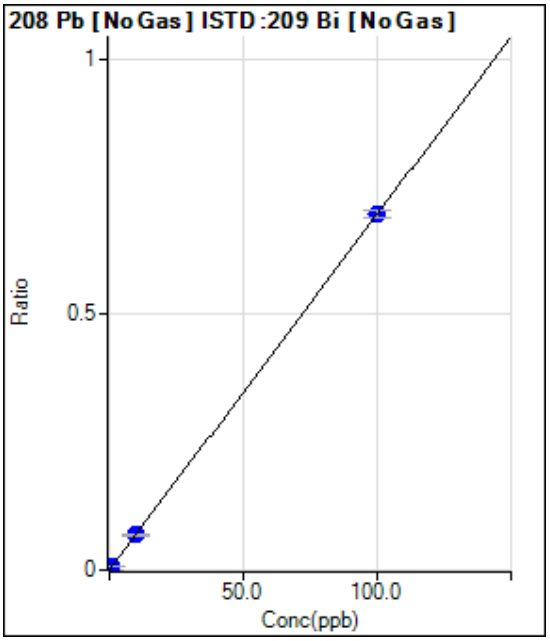
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	66.67	0.0000	P	21.5
2	☐	0.100	0.090	410.02	0.0002	P	17.8
3	☐	1.000	0.931	3717.34	0.0015	P	8.8
4	☐	10.000	9.819	39660.55	0.0153	P	2.9
5	☐	100.000	100.019	406753.65	0.1557	P	2.2

y = 0.0016 * x + 2.7364E-005
R = 1.0000
DL = 0.01135
BEC = 0.01758

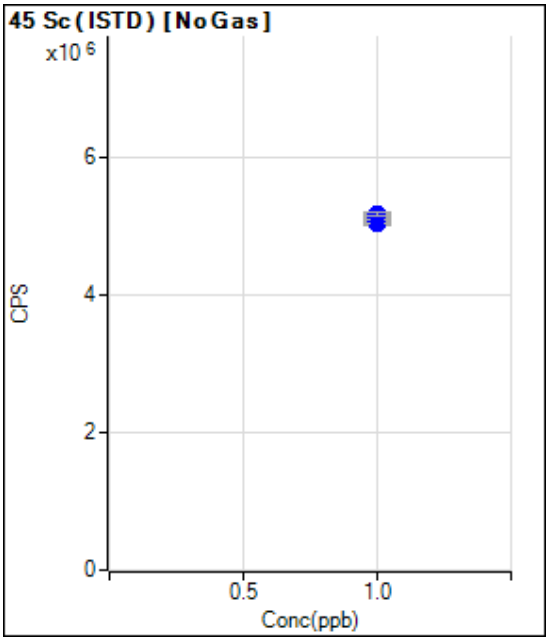
Weight: <None>
Min Conc: <None>



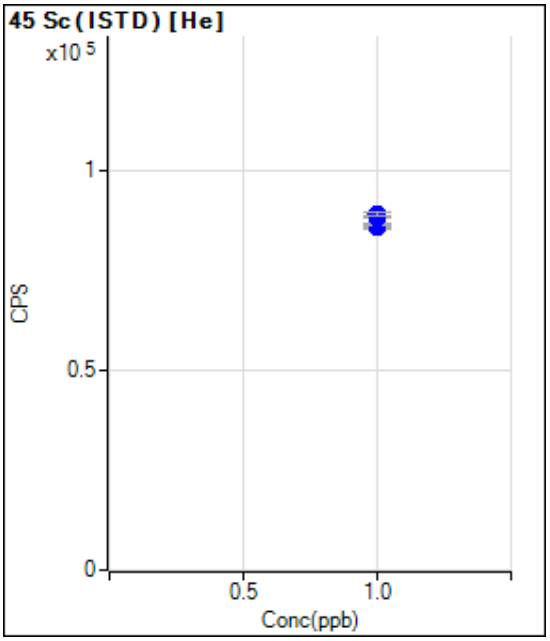
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	306.68	0.0001	P	21.8
2	☐	0.100	0.090	1843.45	0.0008	P	5.9
3	☐	1.000	0.950	16944.87	0.0067	P	3.6
4	☐	10.000	9.848	177667.55	0.0686	P	1.3
5	☐	100.000	100.016	1816434.40	0.6952	P	2.2

y = 0.0069 * x + 1.2589E-004
R = 1.0000
DL = 0.01186
BEC = 0.01812

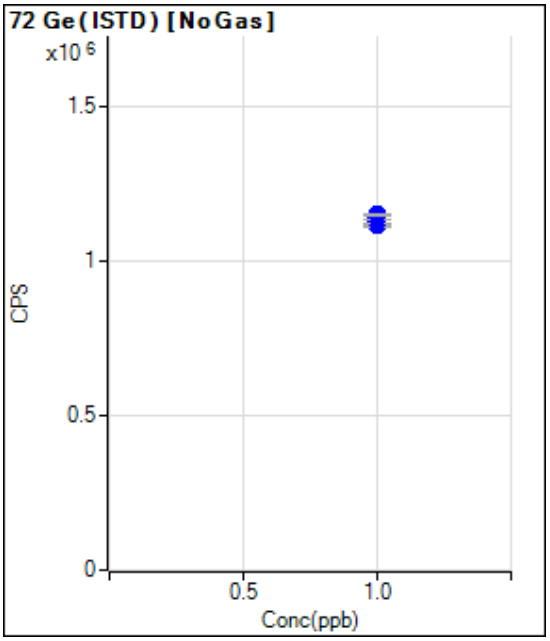
Weight: <None>
Min Conc: <None>



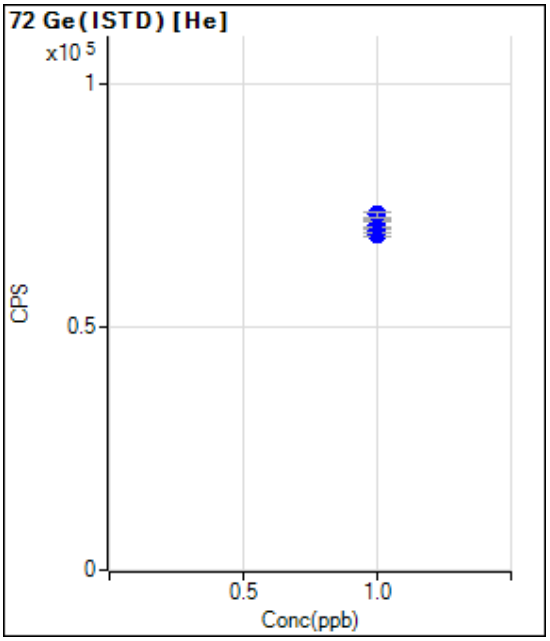
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5061380.49		P	0.7
2	☐	1.000		5043438.41		P	1.0
3	☐	1.000		5083634.66		P	1.2
4	☐	1.000		5137094.52		P	1.4
5	☐	1.000		5170851.46		P	1.1



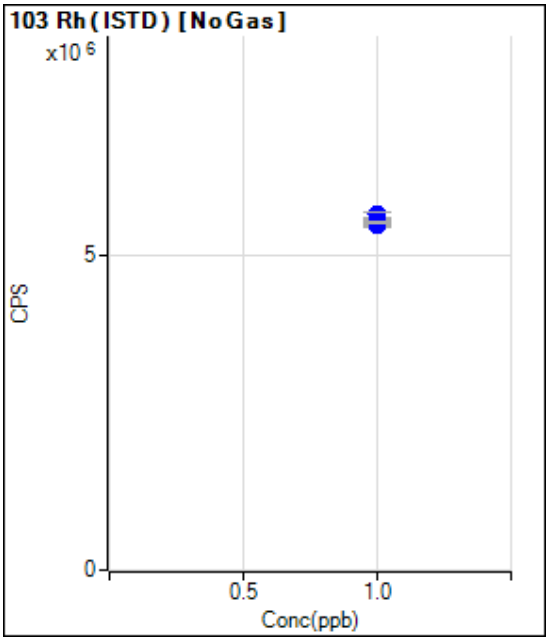
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		86332.28		P	0.4
2	☐	1.000		85552.64		P	0.2
3	☐	1.000		86448.87		P	0.7
4	☐	1.000		88155.66		P	0.4
5	☐	1.000		88906.98		P	1.0



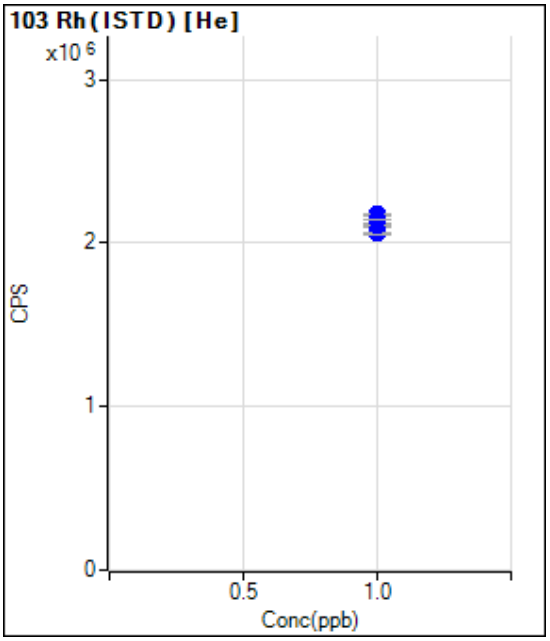
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1116846.21		P	1.2
2	☐	1.000		1112323.98		P	0.9
3	☐	1.000		1128395.34		P	1.2
4	☐	1.000		1140019.82		P	1.2
5	☐	1.000		1149198.46		P	0.8



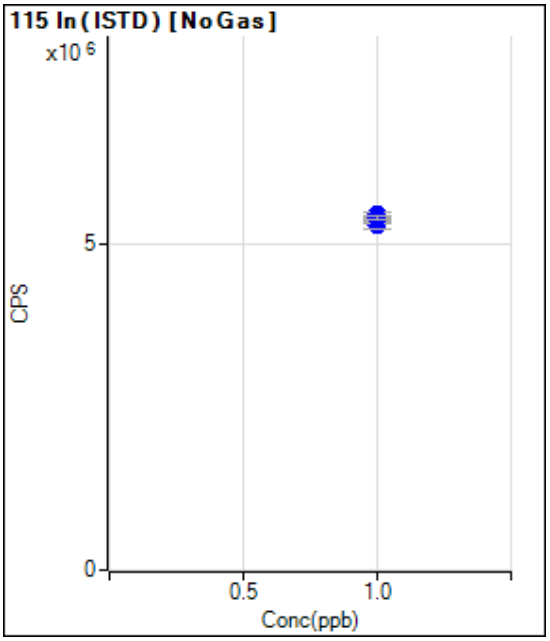
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		68942.69		P	1.0
2	☐	1.000		69788.66		P	0.8
3	☐	1.000		70996.74		P	1.6
4	☐	1.000		71933.67		P	0.9
5	☐	1.000		73129.40		P	1.7



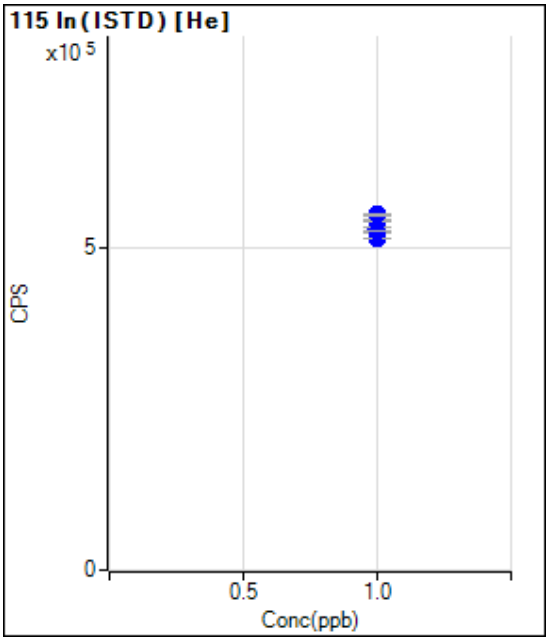
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5479027.00		P	0.9
2	☐	1.000		5525472.42		P	1.7
3	☐	1.000		5524642.00		P	1.4
4	☐	1.000		5662757.55		P	1.3
5	☐	1.000		5545086.17		P	0.7



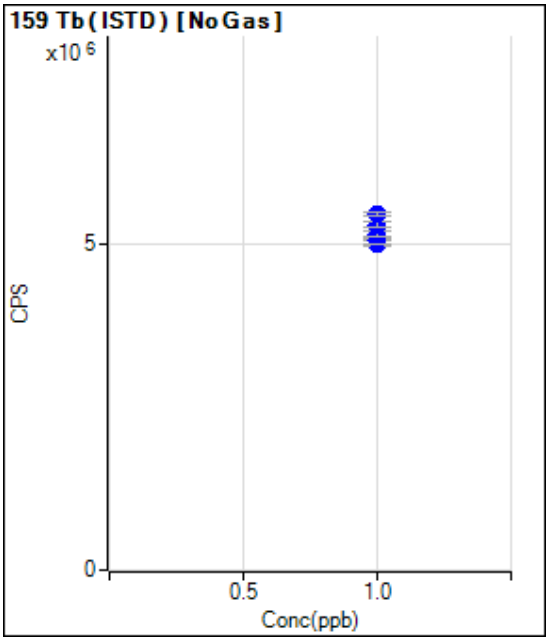
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2061162.14		P	0.4
2	☐	1.000		2106627.90		P	0.5
3	☐	1.000		2114295.40		P	0.7
4	☐	1.000		2174271.58		P	0.6
5	☐	1.000		2144434.84		P	0.4



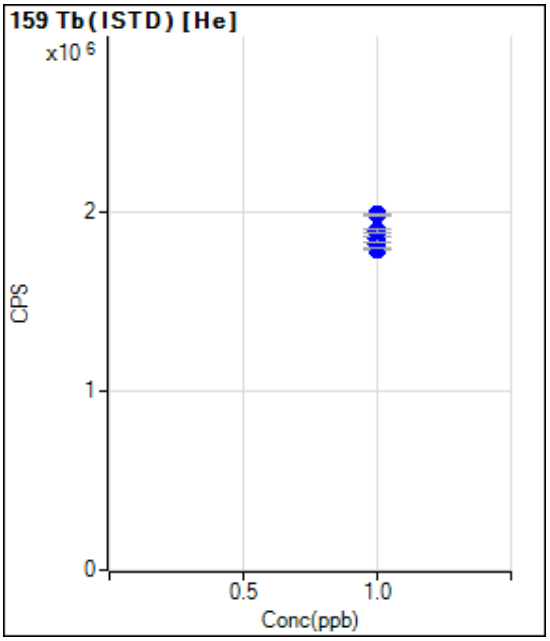
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		5301929.89		P	2.2
2	☐	1.000		5294474.09		P	1.8
3	☐	1.000		5382763.40		P	1.9
4	☐	1.000		5459329.01		P	1.7
5	☐	1.000		5417680.32		P	1.3



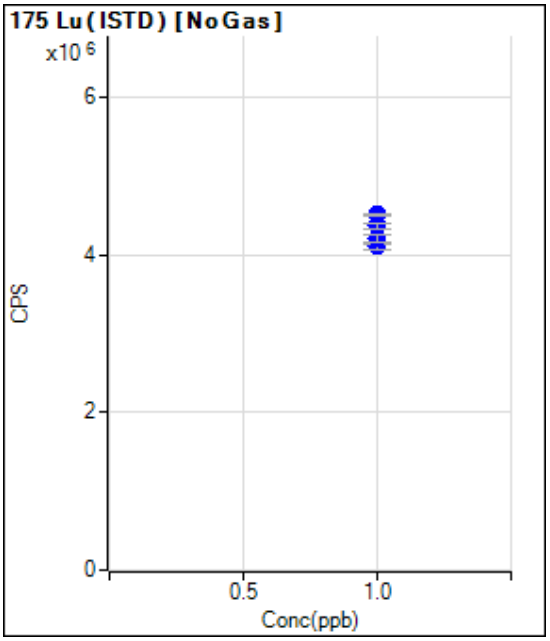
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		515120.94		P	0.2
2	☐	1.000		524898.84		P	0.7
3	☐	1.000		528836.72		P	1.3
4	☐	1.000		541829.72		P	0.6
5	☐	1.000		551621.76		P	0.5



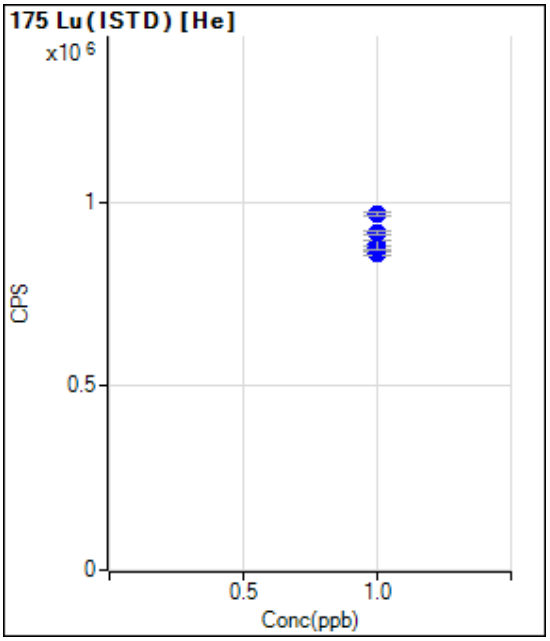
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		4997578.57		P	1.9
2	☐	1.000		5044445.76		P	1.6
3	☐	1.000		5147452.11		P	1.8
4	☐	1.000		5290425.65		P	1.9
5	☐	1.000		5440864.71		P	0.9



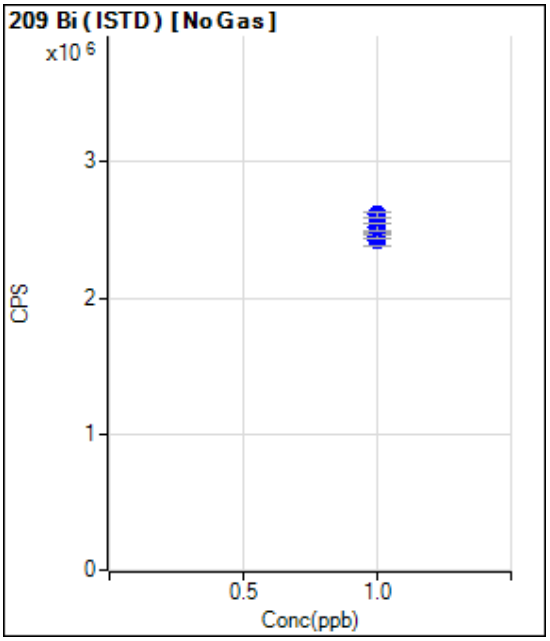
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1790396.85		P	0.7
2	☐	1.000		1812393.67		P	1.3
3	☐	1.000		1845793.04		P	1.8
4	☐	1.000		1892948.56		P	1.0
5	☐	1.000		1981999.03		P	0.5



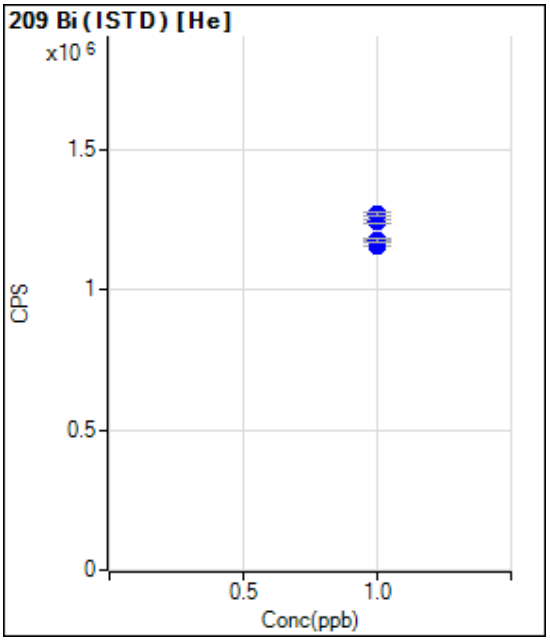
	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		4111004.52		P	2.4
2	☐	1.000		4100966.19		P	1.9
3	☐	1.000		4209545.56		P	2.3
4	☐	1.000		4361469.83		P	1.8
5	☐	1.000		4507163.79		P	0.8



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		860474.49		P	0.9
2	☐	1.000		875336.81		P	1.1
3	☐	1.000		884604.75		P	2.9
4	☐	1.000		916306.40		P	1.1
5	☐	1.000		965088.03		P	1.1



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		2430541.58		P	4.1
2	☐	1.000		2449990.69		P	1.5
3	☐	1.000		2521012.57		P	2.7
4	☐	1.000		2591815.33		P	2.9
5	☐	1.000		2613428.56		P	1.8



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1156007.06		P	0.5
2	☐	1.000		1171143.53		P	0.7
3	☐	1.000		1177552.35		P	1.3
4	☐	1.000		1242914.67		P	1.0
5	☐	1.000		1268491.49		P	1.2

Metals

PrepSheets

GCAL ANALYTICAL LABORATORIES, LLC

3050B Metals Solid Preparation

642531

ANALYST/ TECH	JL	START DATE/TIME	8:15 6/25/18	END DATE/TIME	11:15	BATCH	642531

#	CLIENT	TYPE	CLIENT ID	GCAL ID	INITIAL WGT (g)	FINAL VOL (mL)	COMMENT	STANDARDS\ REAGENTS
1	QC	MB	MB 1842310	1842310	1.13	50		GCAL - 8 - 250uL TZL9.18
2	QC	LCS	LCS 1842311	1842311	1.25			Sb,Ag,Se SPIKE - 250uL 316 MS-2
3	4957	SAMP	A013 D1 (0-1)	21808223401	1.33			Li,B,Zr SPIKE - 250uL 316 MS-2
4	4957	SAMP	A013 D1 (1-2)	21808223402	1.25			Si SPIKE - 250uL TZL7.7S
5	4957	SAMP	A013 D1 (2-3)	21808223403	1.44			HNO3 301-11-16
6	4838	SAMP	WIL03IS01	21808181301	1.35			H2O2 TZL997
7	4838	SAMP	WIL03IS02	21808181308	1.28			HCL N/A
8	4838	SAMP	WIL02IS01	21808181401	1.25			1:1 HNO3 TZL 7B-2
9	4838	MS	WIL02IS01 MS	21808181402	1.25			
10	4838	MSD	WIL02IS01 MSD	21808181403	1.25			
11	4838	SAMP	WIL02IS02	21808181404	1.31			
12	4838	SAMP	WIL01IS03	21808181405	1.40			
13	4838	SAMP	WIL01IS01	21808181406	1.26			
14	4838	SAMP	WIL02IS03	21808181407	1.34			
15	4838	SAMP	WIL03IS03	21808181307	1.26			
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								Digestion Vessel Lot # 180521
28								
29								
30								

EQUIPMENT\CONDITIONS

DIGESTION BLOCK	A1	TEMPERATURE	94°	

NOTES

Matrix-Soil. 6020_S_EX

EPA 8330B

Form 1D

Results

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS01
Collect Date:	08/15/18 Time: 1200	GCAL Sample ID:	21808181401
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.1 g	Lab File ID:	2180830\A22
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1741
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	99.0	U	41.6	99.0	198
99-65-0	1,3-Dinitrobenzene	99.0	U	76.2	99.0	198
118-96-7	2,4,6-Trinitrotoluene	99.0	U	50.5	99.0	198
121-14-2	2,4-Dinitrotoluene	99.0	U	98.0	99.0	198
606-20-2	2,6-Dinitrotoluene	99.0	U	60.4	99.0	198
35572-78-2	2-Amino-4,6-dinitrotoluene	99.0	U	97.0	99.0	198
88-72-2	2-Nitrotoluene	99.0	U	63.4	99.0	198
618-87-1	3,5-Dinitroaniline	99.0	U	82.2	99.0	198
99-08-1	3-Nitrotoluene	149	U	124	149	198
19406-51-0	4-Amino-2,6-dinitrotoluene	99.0	U	76.2	99.0	198
99-99-0	4-Nitrotoluene	99.0	UQ	76.2	99.0	198
2691-41-0	HMX	99.0	U	25.7	99.0	198
98-95-3	Nitrobenzene	99.0	U	35.6	99.0	198
55-63-0	Nitroglycerin	99.0	U	73.3	99.0	198
78-11-5	Pentaerythritol Tetranitrate	149	U	121	149	198
121-82-4	RDX	99.0	U	17.8	99.0	198
479-45-8	Tetryl	99.0	U	40.6	99.0	198

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000022.D
Sample Name: 21808181401

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  22
Acq. Instrument : HPLC3                         Location : P2-B-09
Injection Date  : 8/30/2018 5:41:00 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:41:53 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
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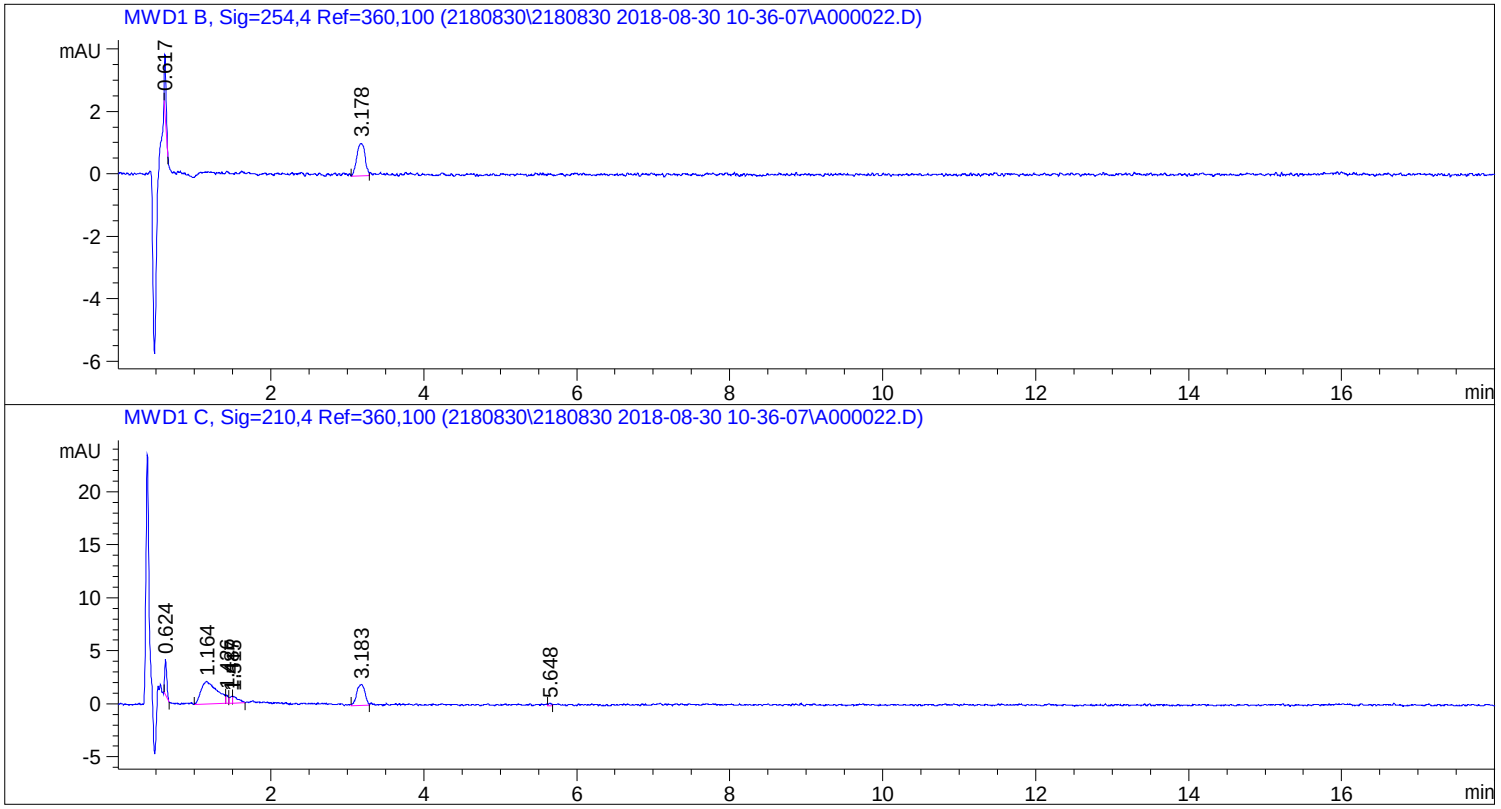


```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:41:56 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.940	1		-	-	-		HMX
1.650	1		-	-	-		RDX
2.600	2		-	-	-		1,3,5-TNB
3.183	2	VV	14.69788	17.58403	258.44789		1,2-DNB
3.400	1		-	-	-		1,3-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000022.D
Sample Name: 21808181401

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.900	2		-	-	-		3,5-DNA
4.400	1		-	-	-		NB
4.700	2		-	-	-		NG
5.400	1		-	-	-		TETRYL
5.900	1		-	-	-		2,4,6-TNT
6.400	1		-	-	-		2-A-4,6-DNT
6.650	1		-	-	-		4-A-2,6-DNT
7.300	1		-	-	-		2,4-DNT
7.550	1		-	-	-		2,6-DNT
10.200	2		-	-	-		2-NT
11.100	2		-	-	-		4-NT
12.000	2		-	-	-		3-NT
12.700	2		-	-	-		PETN

Totals : 258.44789

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS01 MS
Collect Date:	08/15/18 Time: 1200	GCAL Sample ID:	21808181402
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.1 g	Lab File ID:	2180830\A23
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1800
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	975		41.6	99.0	198
99-65-0	1,3-Dinitrobenzene	916		76.2	99.0	198
118-96-7	2,4,6-Trinitrotoluene	908		50.5	99.0	198
121-14-2	2,4-Dinitrotoluene	863		98.0	99.0	198
606-20-2	2,6-Dinitrotoluene	991		60.4	99.0	198
35572-78-2	2-Amino-4,6-dinitrotoluene	895		97.0	99.0	198
88-72-2	2-Nitrotoluene	909		63.4	99.0	198
618-87-1	3,5-Dinitroaniline	889		82.2	99.0	198
99-08-1	3-Nitrotoluene	871		124	149	198
19406-51-0	4-Amino-2,6-dinitrotoluene	898		76.2	99.0	198
99-99-0	4-Nitrotoluene	976		76.2	99.0	198
2691-41-0	HMX	834		25.7	99.0	198
98-95-3	Nitrobenzene	1030		35.6	99.0	198
55-63-0	Nitroglycerin	904		73.3	99.0	198
78-11-5	Pentaerythritol Tetranitrate	986		121	149	198
121-82-4	RDX	891		17.8	99.0	198
479-45-8	Tetryl	720		40.6	99.0	198

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000023.D
Sample Name: 21808181402

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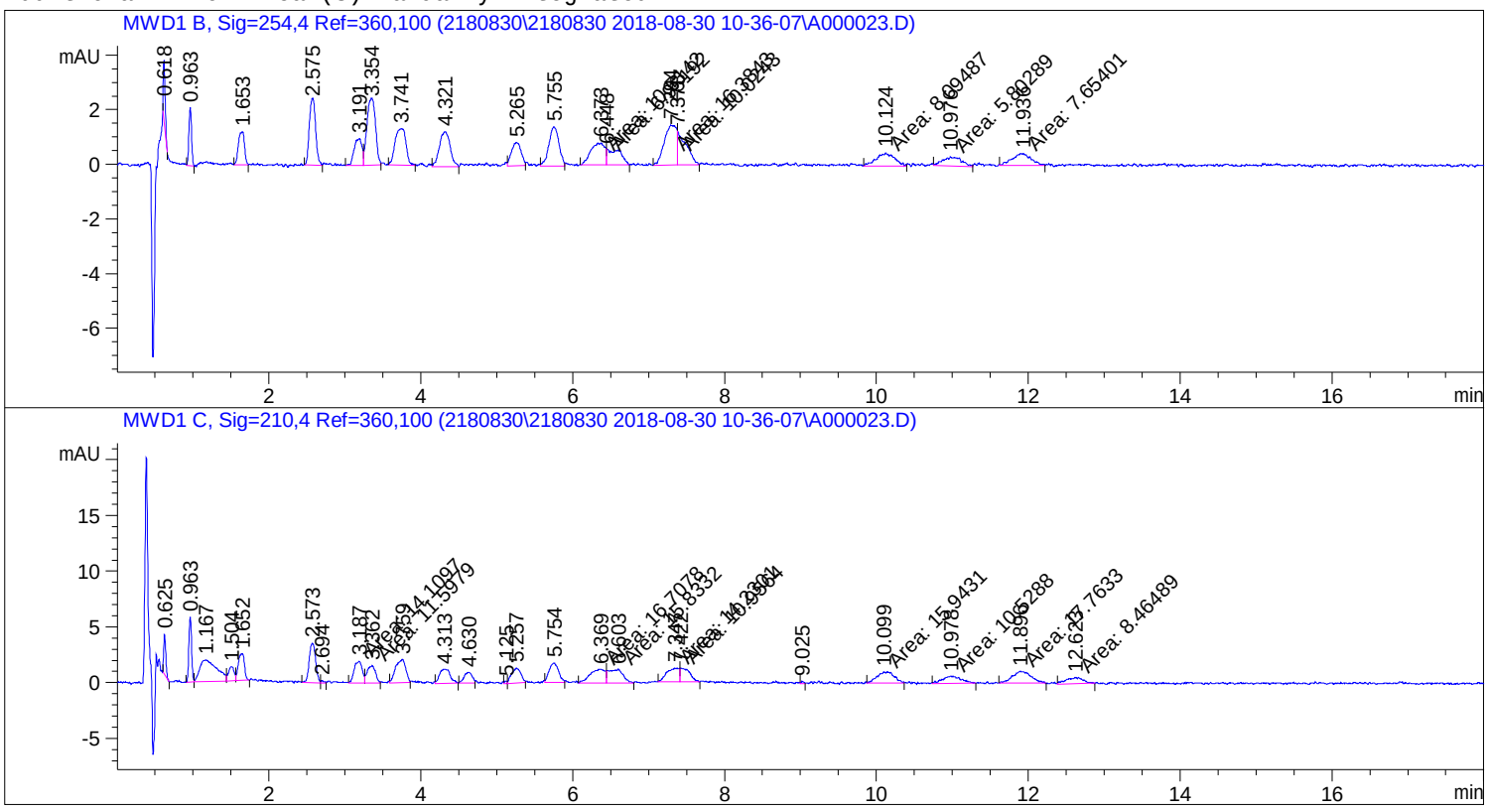
Acq. Operator   : MEG                          Seq. Line :  23
Acq. Instrument : HPLC3                         Location : P2-C-01
Injection Date  : 8/30/2018 6:00:48 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:41:53 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```

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==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:41:56 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.963	1	VB	5.06741	41.55880	210.59531		HMX
1.653	1	VV	6.84195	32.88013	224.96410		RDX
2.573	2	BV	20.86826	11.79190	246.07648		1,3,5-TNB
3.187	2	MF	14.10972	17.58403	248.10571		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000023.D
Sample Name: 21808181402

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.354	1	VV	19.13680	12.08328	231.23529		1,3-DNB
3.759	2	VV	19.49508	11.51055	224.39912		3,5-DNA
4.321	1	VB	12.63972	20.54823	259.72392		NB
4.630	2	BV	7.06520	32.32469	228.38052		NG
5.265	1	VV	7.53309	24.14035	181.85132		TETRYL
5.755	1	VV	13.10663	17.49447	229.29360		2,4,6-TNT
6.373	1	MF	10.51418	21.50419	226.09899		2-A-4,6-DNT
6.448	1	FM	6.95192	32.60655	226.67817		4-A-2,6-DNT
7.294	1	MF	16.38428	13.30050	217.91921		2,4-DNT
7.378	1	FM	10.02428	24.95418	250.14766		2,6-DNT
10.099	2	MM	15.94311	14.40165	229.60706		2-NT
10.978	2	MM	10.52875	23.40253	246.39946		4-NT
11.896	2	MM	17.76334	12.38296	219.96270		3-NT
12.623	2	MM	8.46489	29.39954	248.86401		PETN

Totals : 4150.30262

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS01 MSD
Collect Date:	08/15/18 Time: 1200	GCAL Sample ID:	21808181403
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A24
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1820
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

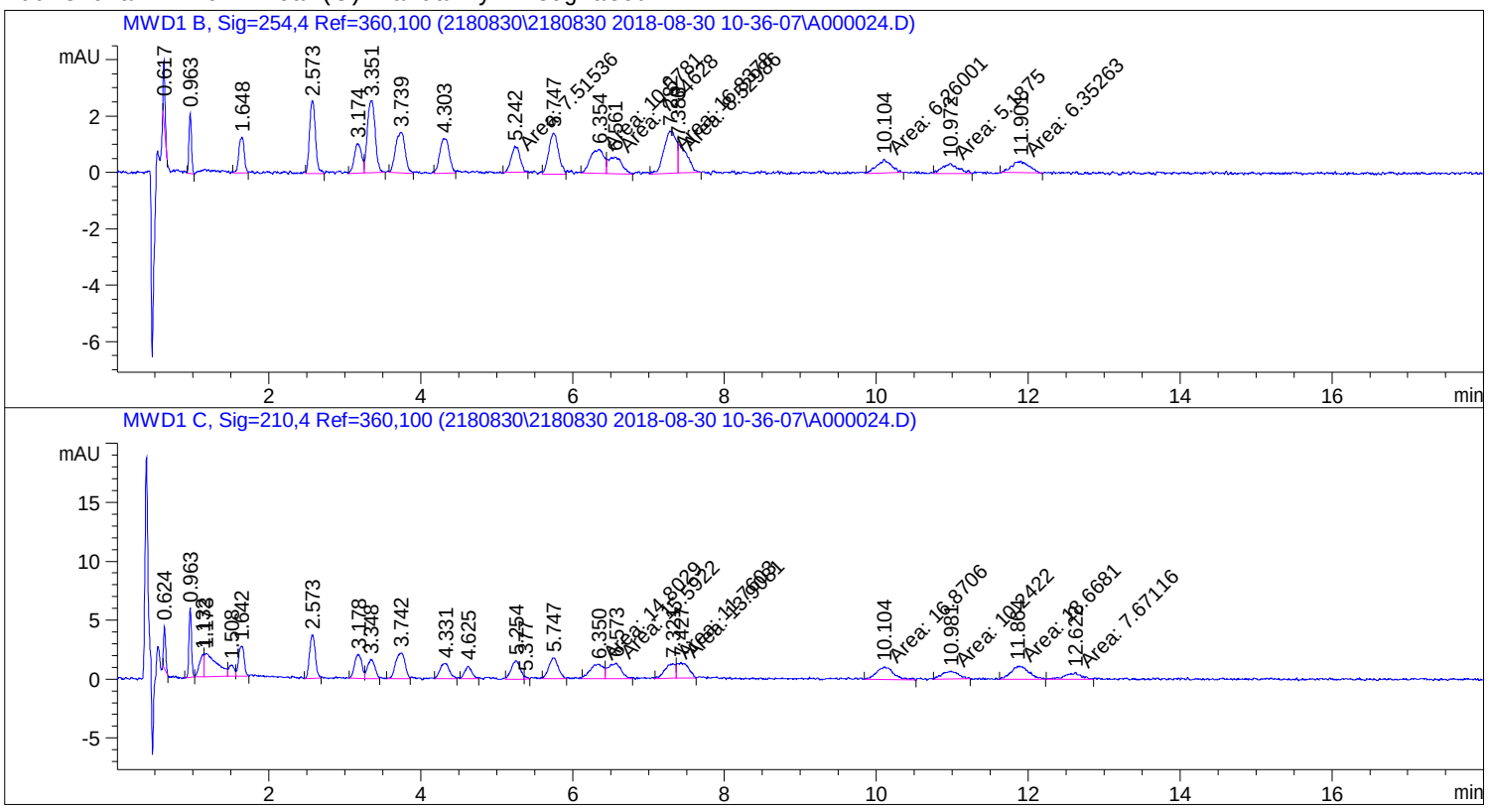
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	922		42.0	100	200
99-65-0	1,3-Dinitrobenzene	887		77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	903		51.0	100	200
121-14-2	2,4-Dinitrotoluene	896		99.0	100	200
606-20-2	2,6-Dinitrotoluene	851		61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	910		98.0	100	200
88-72-2	2-Nitrotoluene	972		64.0	100	200
618-87-1	3,5-Dinitroaniline	872		83.0	100	200
99-08-1	3-Nitrotoluene	925		125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	958		77.0	100	200
99-99-0	4-Nitrotoluene	959		77.0	100	200
2691-41-0	HMX	798		26.0	100	200
98-95-3	Nitrobenzene	872		36.0	100	200
55-63-0	Nitroglycerin	879		74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	902		122	150	200
121-82-4	RDX	847		18.0	100	200
479-45-8	Tetryl	726		41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000024.D
Sample Name: 21808181403

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  24
Acq. Instrument : HPLC3                         Location : P2-C-02
Injection Date  : 8/30/2018 6:20:34 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:50:34 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```

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==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:50:35 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.963	1	VB	4.80098	41.55880	199.52316		HMX
1.648	1	VV	6.44024	32.88013	211.75601		RDX
2.573	2	BV	19.54168	11.79190	230.43353		1,3,5-TNB
3.178	2	BV	13.55763	17.58403	238.39765		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000024.D
Sample Name: 21808181403

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.351	1	VB	18.35045	12.08328	221.73356		1,3-DNB
3.742	2	BV	18.94958	11.51055	218.12014		3,5-DNA
4.303	1	VV	10.60913	20.54823	217.99879		NB
4.625	2	BV	6.79501	32.32469	219.64666		NG
5.242	1	MM	7.51536	24.14035	181.42332		TETRYL
5.747	1	VV	12.89805	17.49447	225.64458		2,4,6-TNT
6.354	1	MF	10.57814	21.50419	227.47436		2-A-4,6-DNT
6.561	1	FM	7.34628	32.60655	239.53700		4-A-2,6-DNT
7.282	1	MF	16.83777	13.30050	223.95082		2,4-DNT
7.386	1	FM	8.52986	24.95418	212.85561		2,6-DNT
10.104	2	MM	16.87062	14.40165	242.96475		2-NT
10.981	2	MM	10.24219	23.40253	239.69307		4-NT
11.864	2	MM	18.66805	12.38296	231.16572		3-NT
12.622	2	MM	7.67116	29.39954	225.52847		PETN

Totals : 4007.84722

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS02
Collect Date:	08/15/18 Time: 1210	GCAL Sample ID:	21808181404
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10.5 g	Lab File ID:	2180830\A25
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1840
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

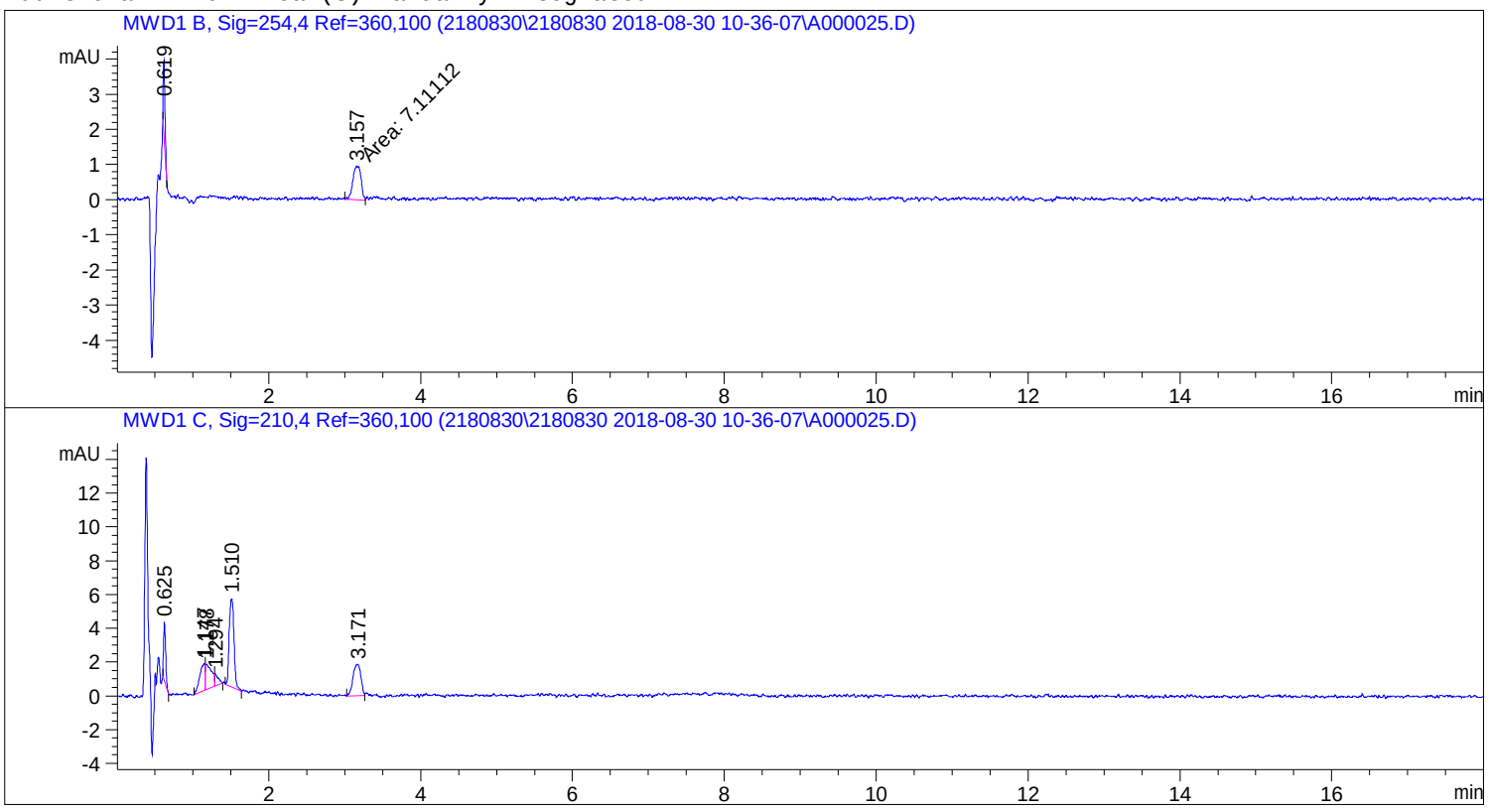
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	95.2	U	40.0	95.2	190
99-65-0	1,3-Dinitrobenzene	95.2	U	73.3	95.2	190
118-96-7	2,4,6-Trinitrotoluene	95.2	U	48.6	95.2	190
121-14-2	2,4-Dinitrotoluene	95.2	U	94.3	95.2	190
606-20-2	2,6-Dinitrotoluene	95.2	U	58.1	95.2	190
35572-78-2	2-Amino-4,6-dinitrotoluene	95.2	U	93.3	95.2	190
88-72-2	2-Nitrotoluene	95.2	U	61.0	95.2	190
618-87-1	3,5-Dinitroaniline	95.2	U	79.0	95.2	190
99-08-1	3-Nitrotoluene	143	U	119	143	190
19406-51-0	4-Amino-2,6-dinitrotoluene	95.2	U	73.3	95.2	190
99-99-0	4-Nitrotoluene	95.2	UQ	73.3	95.2	190
2691-41-0	HMX	95.2	U	24.8	95.2	190
98-95-3	Nitrobenzene	95.2	U	34.3	95.2	190
55-63-0	Nitroglycerin	95.2	U	70.5	95.2	190
78-11-5	Pentaerythritol Tetranitrate	143	U	116	143	190
121-82-4	RDX	95.2	U	17.1	95.2	190
479-45-8	Tetryl	95.2	U	39.0	95.2	190

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000025.D
Sample Name: 21808181404

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  25
Acq. Instrument : HPLC3                         Location : P2-C-03
Injection Date  : 8/30/2018 6:40:20 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:50:34 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```

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==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:50:35 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.940	1		-	-	-		HMX
1.650	1		-	-	-		RDX
2.600	2		-	-	-		1,3,5-TNB
3.171	2	BV	13.40021	17.58403	235.62959		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000025.D
Sample Name: 21808181404

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.350	1		-	-	-		1,3-DNB
3.750	2		-	-	-		3,5-DNA
4.300	1		-	-	-		NB
4.600	2		-	-	-		NG
5.250	1		-	-	-		TETRYL
5.750	1		-	-	-		2,4,6-TNT
6.300	1		-	-	-		2-A-4,6-DNT
6.600	1		-	-	-		4-A-2,6-DNT
7.250	1		-	-	-		2,4-DNT
7.500	1		-	-	-		2,6-DNT
10.100	2		-	-	-		2-NT
11.000	2		-	-	-		4-NT
11.900	2		-	-	-		3-NT
12.600	2		-	-	-		PETN

Totals : 235.62959

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS03
Collect Date:	08/15/18 Time: 1220	GCAL Sample ID:	21808181407
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A26
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1900
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

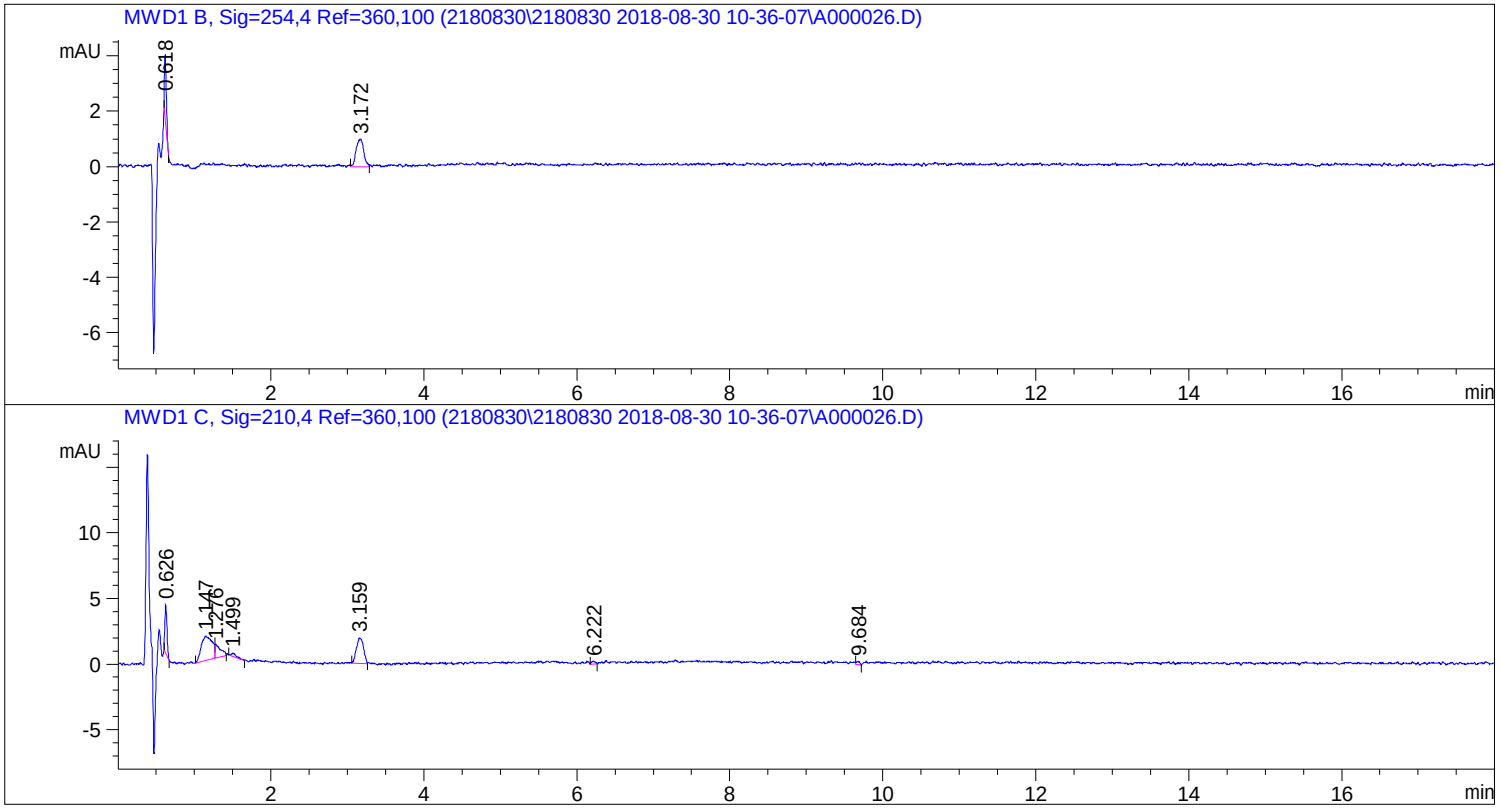
CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	UQ	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000026.D
Sample Name: 21808181407

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  26
Acq. Instrument : HPLC3                         Location : P2-C-04
Injection Date  : 8/30/2018 7:00:07 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:50:34 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```

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                      External Standard Report
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Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:50:35 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.940	1		-	-	-		HMX
1.650	1		-	-	-		RDX
2.600	2		-	-	-		1,3,5-TNB
3.159	2	BV	12.64017	17.58403	222.26512		1,2-DNB
3.350	1		-	-	-		1,3-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000026.D
Sample Name: 21808181407

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.750	2		-	-	-		3,5-DNA
4.300	1		-	-	-		NB
4.600	2		-	-	-		NG
5.250	1		-	-	-		TETRYL
5.750	1		-	-	-		2,4,6-TNT
6.300	1		-	-	-		2-A-4,6-DNT
6.600	1		-	-	-		4-A-2,6-DNT
7.250	1		-	-	-		2,4-DNT
7.500	1		-	-	-		2,6-DNT
10.100	2		-	-	-		2-NT
11.000	2		-	-	-		4-NT
11.900	2		-	-	-		3-NT
12.600	2		-	-	-		PETN

Totals : 222.26512

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	MB1843101
Collect Date:	NA Time: NA	GCAL Sample ID:	1843101
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A19
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1641
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

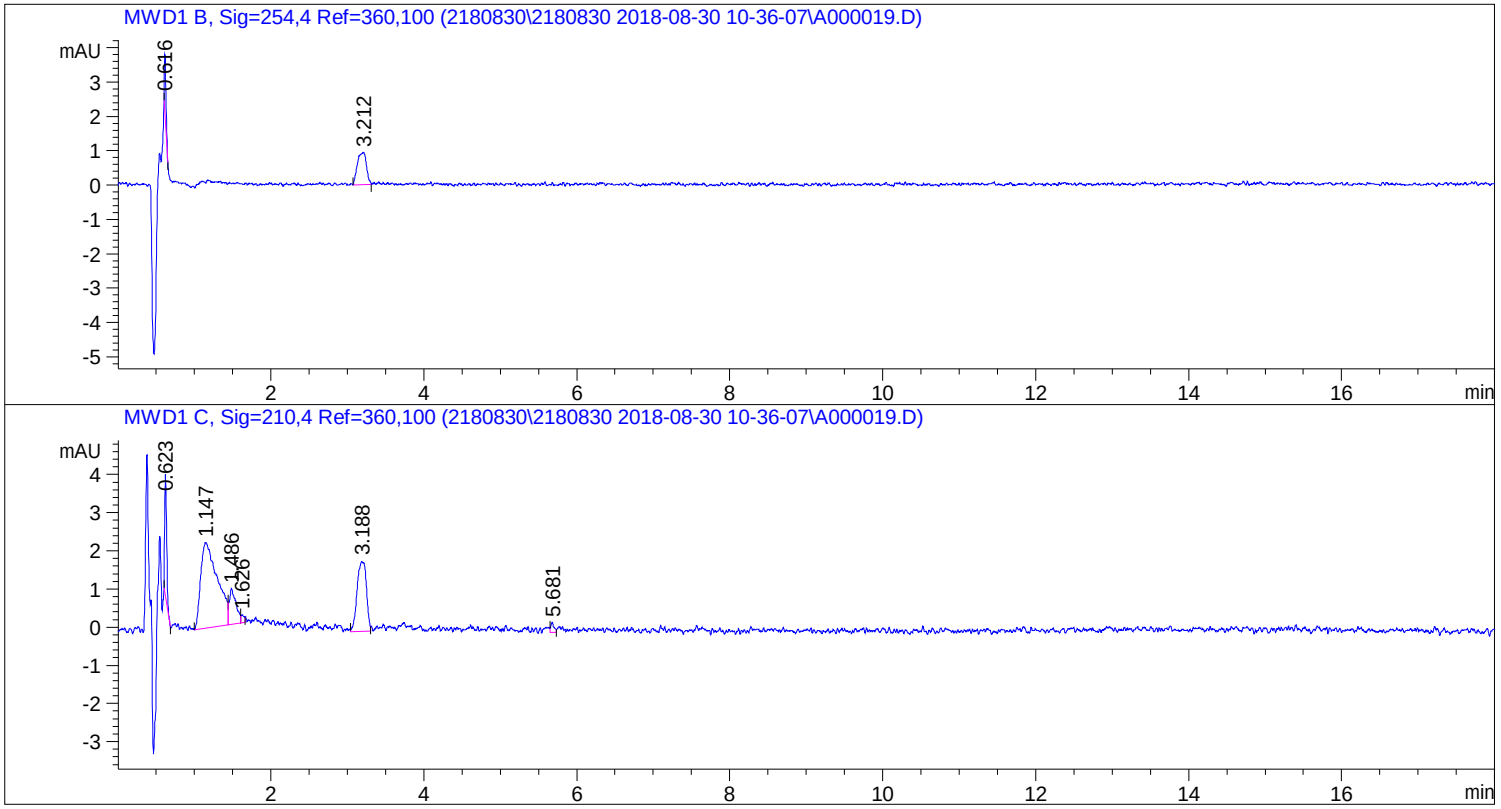
CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000019.D
Sample Name: 1843101

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  19
Acq. Instrument : HPLC3                         Location : P2-B-06
Injection Date  : 8/30/2018 4:41:42 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:33:06 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:33:08 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100

RetTime Sig Type     Area     Amt/Area    Amount    Grp   Name
 [min]             [mAU*s]
-------|--|------|----------|----------|----------|--|---------------
  0.940  1            -          -          -         HMX
  1.650  1            -          -          -         RDX
  2.600  2            -          -          -         1,3,5-TNB
  3.188  2 VV       15.60133   17.58403  274.33411    1,2-DNB
  3.400  1            -          -          -         1,3-DNB
```

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000019.D
Sample Name: 1843101

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.900	2		-	-	-		3,5-DNA
4.400	1		-	-	-		NB
4.700	2		-	-	-		NG
5.400	1		-	-	-		TETRYL
5.900	1		-	-	-		2,4,6-TNT
6.500	1		-	-	-		2-A-4,6-DNT
6.850	1		-	-	-		4-A-2,6-DNT
7.400	1		-	-	-		2,4-DNT
7.700	1		-	-	-		2,6-DNT
10.400	2		-	-	-		2-NT
11.300	2		-	-	-		4-NT
12.200	2		-	-	-		3-NT
12.750	2		-	-	-		PETN

Totals : 274.33411

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS03DUP
Collect Date:	08/15/18 Time: 1220	GCAL Sample ID:	1843104
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A28
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1939
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

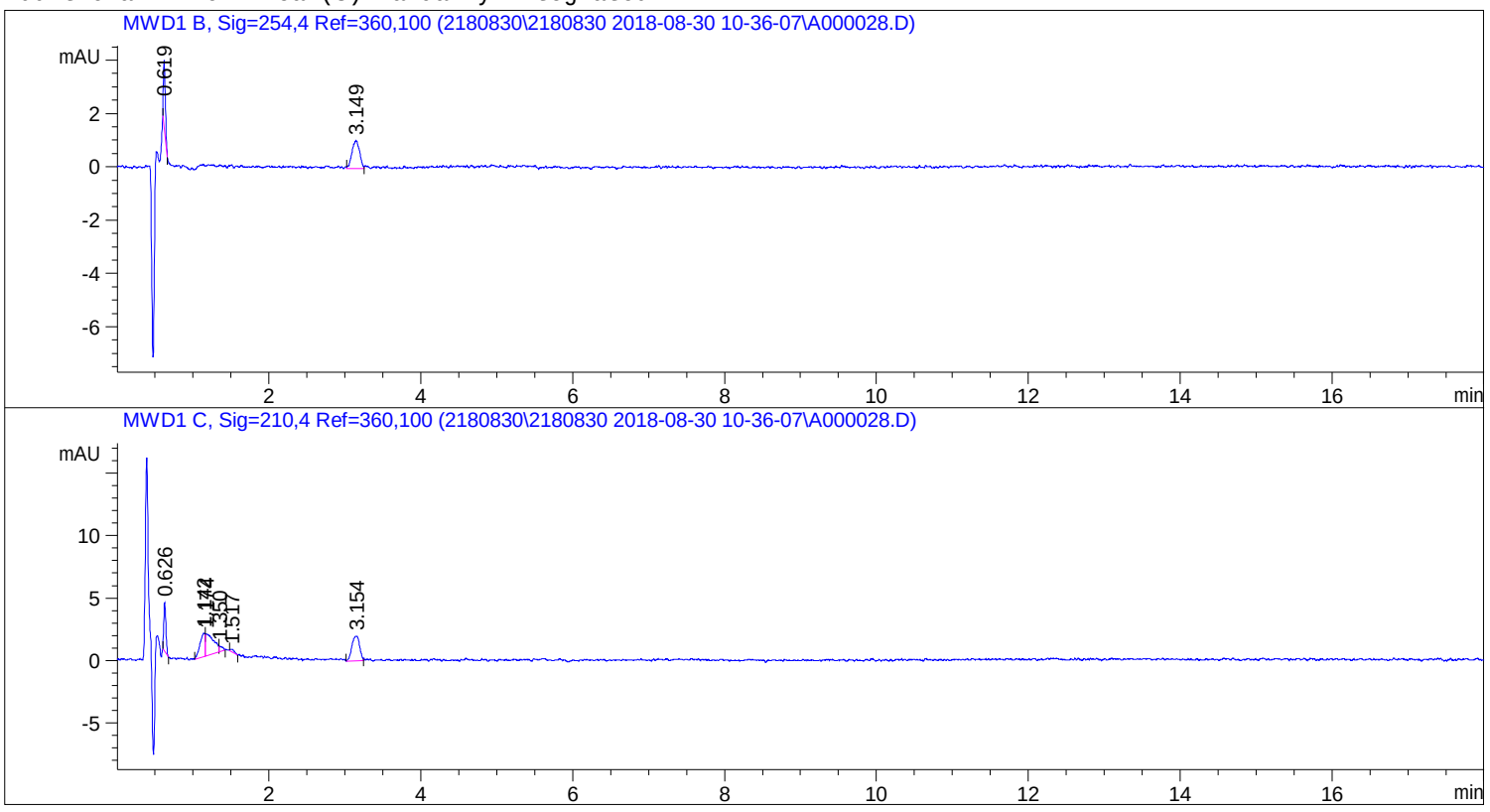
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000028.D
Sample Name: 1843104

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  28
Acq. Instrument : HPLC3                         Location : P2-C-06
Injection Date  : 8/30/2018 7:39:39 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:50:34 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:50:35 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.940	1		-	-	-		HMX
1.650	1		-	-	-		RDX
2.600	2		-	-	-		1,3,5-TNB
3.154	2	BV	13.76448	17.58403	242.03503		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000028.D
Sample Name: 1843104

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.350	1		-	-	-		1,3-DNB
3.750	2		-	-	-		3,5-DNA
4.300	1		-	-	-		NB
4.600	2		-	-	-		NG
5.250	1		-	-	-		TETRYL
5.750	1		-	-	-		2,4,6-TNT
6.300	1		-	-	-		2-A-4,6-DNT
6.600	1		-	-	-		4-A-2,6-DNT
7.250	1		-	-	-		2,4-DNT
7.500	1		-	-	-		2,6-DNT
10.100	2		-	-	-		2-NT
11.000	2		-	-	-		4-NT
11.900	2		-	-	-		3-NT
12.600	2		-	-	-		PETN

Totals : 242.03503

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	WIL02IS03DUP
Collect Date:	08/15/18 Time: 1220	GCAL Sample ID:	1843105
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A27
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1919
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

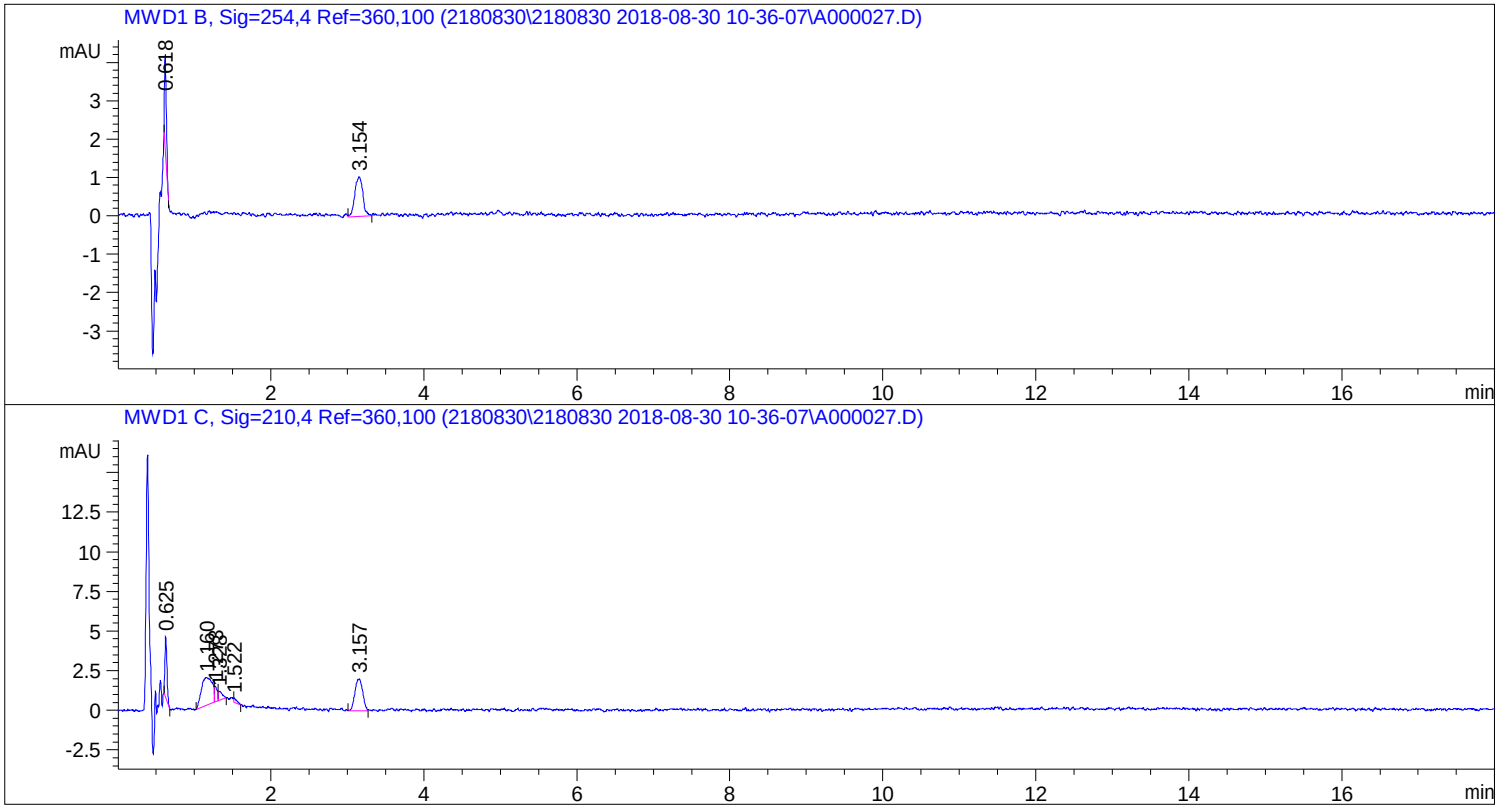
CONCENTRATION UNITS: ug/kg

CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000027.D
Sample Name: 1843105

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  27
Acq. Instrument : HPLC3                         Location : P2-C-05
Injection Date  : 8/30/2018 7:19:51 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:50:34 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:50:35 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.940	1		-	-	-		HMX
1.650	1		-	-	-		RDX
2.600	2		-	-	-		1,3,5-TNB
3.157	2	BV	14.35986	17.58403	252.50417		1,2-DNB
3.350	1		-	-	-		1,3-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000027.D
Sample Name: 1843105

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.750	2		-	-	-		3,5-DNA
4.300	1		-	-	-		NB
4.600	2		-	-	-		NG
5.250	1		-	-	-		TETRYL
5.750	1		-	-	-		2,4,6-TNT
6.300	1		-	-	-		2-A-4,6-DNT
6.600	1		-	-	-		4-A-2,6-DNT
7.250	1		-	-	-		2,4-DNT
7.500	1		-	-	-		2,6-DNT
10.100	2		-	-	-		2-NT
11.000	2		-	-	-		4-NT
11.900	2		-	-	-		3-NT
12.600	2		-	-	-		PETN

Totals : 252.50417

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	GRBLK for HBN 642680 [EXTO/549
Collect Date:	NA Time: NA	GCAL Sample ID:	1843106
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A29
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1959
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

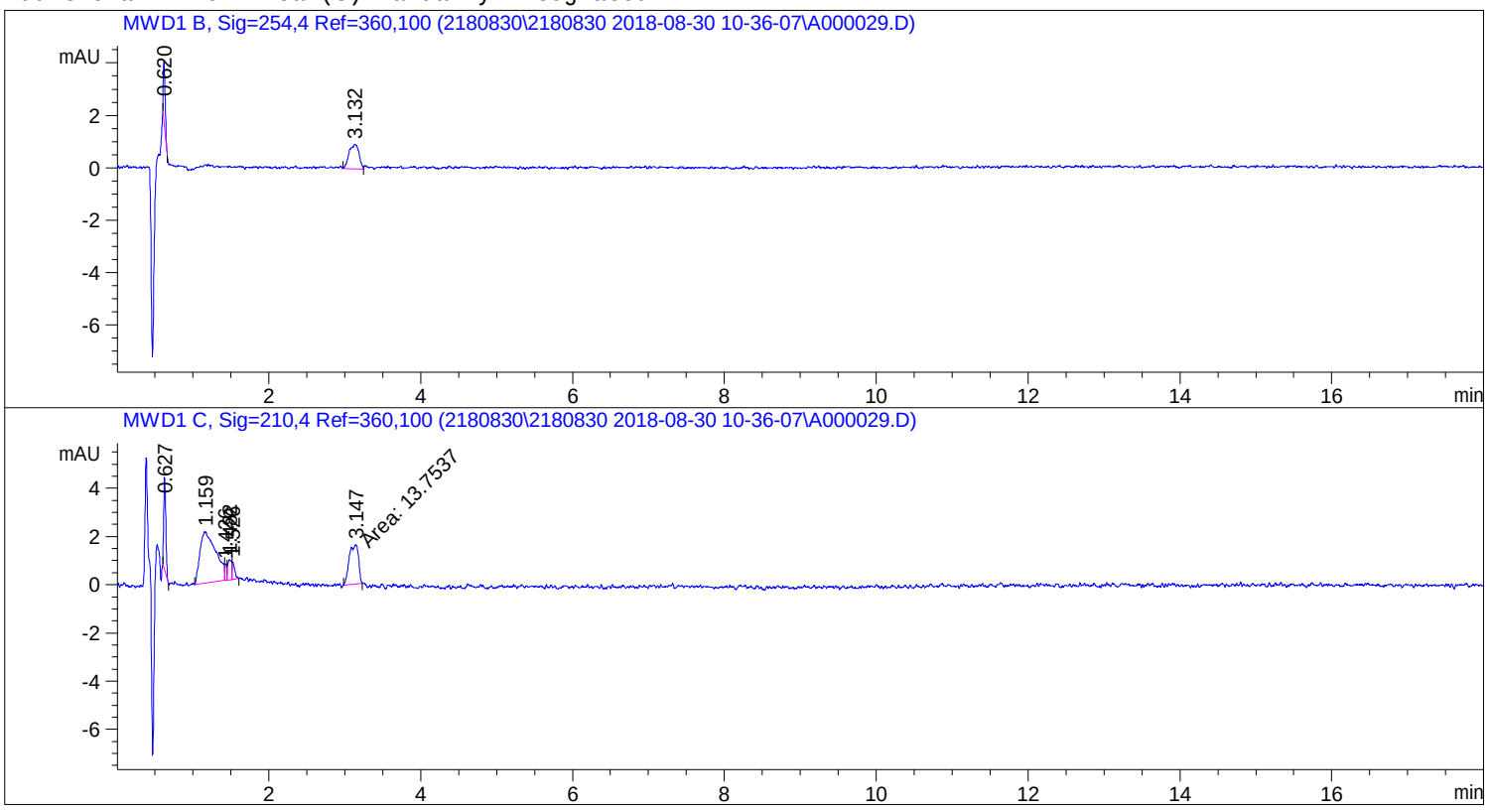
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	100	U	42.0	100	200
99-65-0	1,3-Dinitrobenzene	100	U	77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	100	U	51.0	100	200
121-14-2	2,4-Dinitrotoluene	100	U	99.0	100	200
606-20-2	2,6-Dinitrotoluene	100	U	61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	100	U	98.0	100	200
88-72-2	2-Nitrotoluene	100	U	64.0	100	200
618-87-1	3,5-Dinitroaniline	100	U	83.0	100	200
99-08-1	3-Nitrotoluene	150	U	125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	100	U	77.0	100	200
99-99-0	4-Nitrotoluene	100	U	77.0	100	200
2691-41-0	HMX	100	U	26.0	100	200
98-95-3	Nitrobenzene	100	U	36.0	100	200
55-63-0	Nitroglycerin	100	U	74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	150	U	122	150	200
121-82-4	RDX	100	U	18.0	100	200
479-45-8	Tetryl	100	U	41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000029.D
Sample Name: 1843106

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  29
Acq. Instrument : HPLC3                         Location : P2-C-07
Injection Date  : 8/30/2018 7:59:27 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:50:34 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:50:35 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.940	1		-	-	-		HMX
1.650	1		-	-	-		RDX
2.600	2		-	-	-		1,3,5-TNB
3.147	2	MM	13.75365	17.58403	241.84461		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000029.D
Sample Name: 1843106

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.350	1		-	-	-		1,3-DNB
3.750	2		-	-	-		3,5-DNA
4.300	1		-	-	-		NB
4.600	2		-	-	-		NG
5.250	1		-	-	-		TETRYL
5.750	1		-	-	-		2,4,6-TNT
6.300	1		-	-	-		2-A-4,6-DNT
6.600	1		-	-	-		4-A-2,6-DNT
7.250	1		-	-	-		2,4-DNT
7.500	1		-	-	-		2,6-DNT
10.100	2		-	-	-		2-NT
11.000	2		-	-	-		4-NT
11.900	2		-	-	-		3-NT
12.600	2		-	-	-		PETN

Totals : 241.84461

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	LCS1843214
Collect Date:	NA Time: NA	GCAL Sample ID:	1843214
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A30
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 2019
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

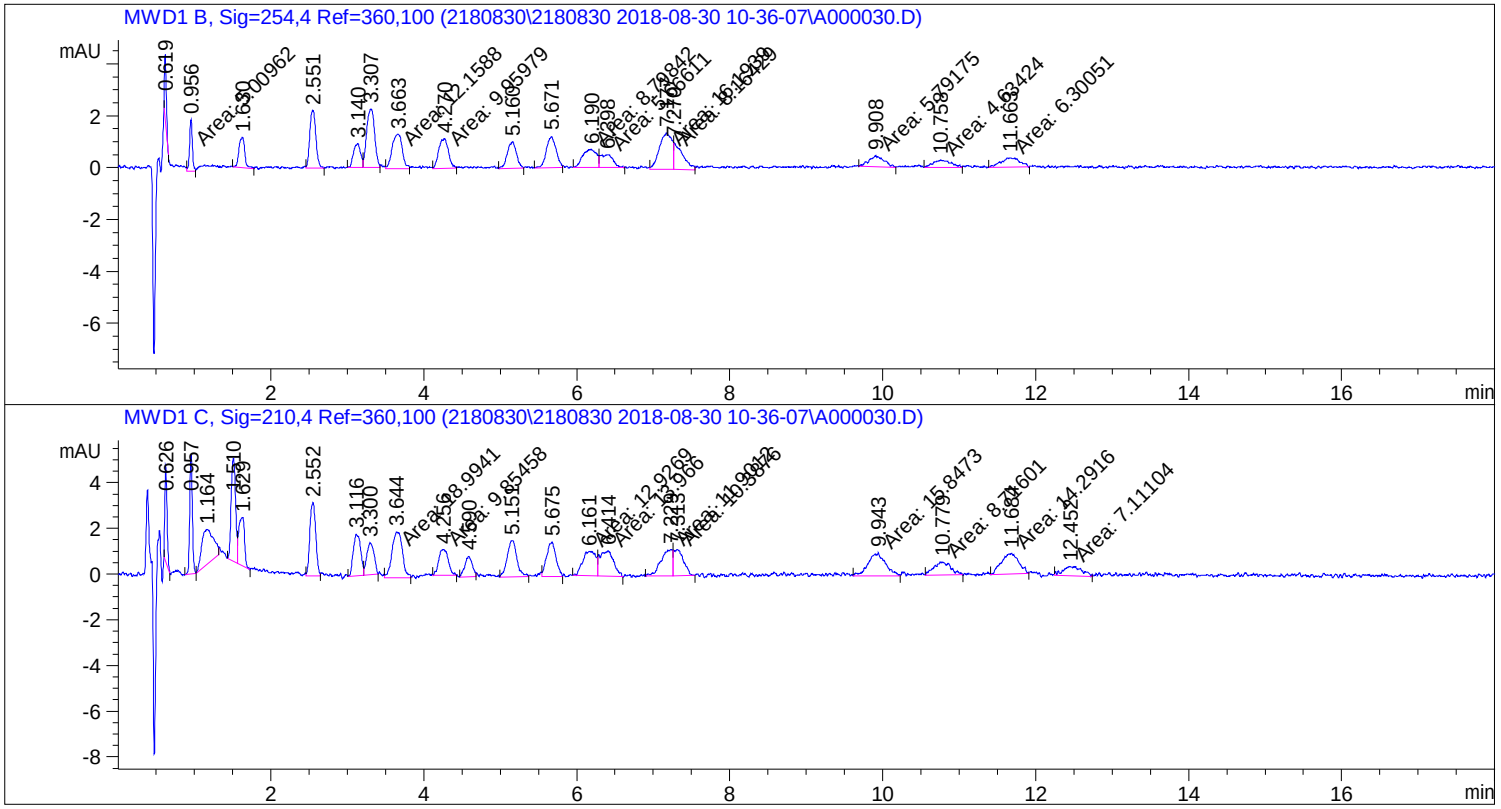
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	807		42.0	100	200
99-65-0	1,3-Dinitrobenzene	787		77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	747		51.0	100	200
121-14-2	2,4-Dinitrotoluene	862		99.0	100	200
606-20-2	2,6-Dinitrotoluene	815		61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	757		98.0	100	200
88-72-2	2-Nitrotoluene	913		64.0	100	200
618-87-1	3,5-Dinitroaniline	875		83.0	100	200
99-08-1	3-Nitrotoluene	708		125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	739		77.0	100	200
99-99-0	4-Nitrotoluene	816		77.0	100	200
2691-41-0	HMX	833		26.0	100	200
98-95-3	Nitrobenzene	819		36.0	100	200
55-63-0	Nitroglycerin	782		74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	836		122	150	200
121-82-4	RDX	822		18.0	100	200
479-45-8	Tetryl	827		41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000030.D
Sample Name: 1843214

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  30
Acq. Instrument : HPLC3                         Location : P2-C-08
Injection Date  : 8/30/2018 8:19:15 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 1:41:02 PM by MEG
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                        External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:54:56 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.956	1	MM	5.00962	41.55880	208.19360		HMX
1.630	1	BV	6.25026	32.88013	205.50944		RDX
2.552	2	VV	17.10143	11.79190	201.65834		1,3,5-TNB
3.116	2	BV	12.21645	17.58403	214.81439		1,2-DNB
3.307	1	VV	16.28097	12.08328	196.72746		1,3-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000030.D
Sample Name: 1843214

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.644	2	MM	18.99407	11.51055	218.63227		3,5-DNA
4.270	1	MM	9.95979	20.54823	204.65613		NB
4.590	2	BV	6.05070	32.32469	195.58713		NG
5.160	1	BV	8.55987	24.14035	206.63834		TETRYL
5.671	1	BV	10.67889	17.49447	186.82161		2,4,6-TNT
6.190	1	MF	8.79842	21.50419	189.20285		2-A-4,6-DNT
6.398	1	FM	5.66611	32.60655	184.75227		4-A-2,6-DNT
7.177	1	MF	16.19386	13.30050	215.38650		2,4-DNT
7.270	1	FM	8.16429	24.95418	203.73304		2,6-DNT
9.943	2	MM	15.84732	14.40165	228.22756		2-NT
10.779	2	MM	8.71601	23.40253	203.97660		4-NT
11.684	2	MM	14.29161	12.38296	176.97245		3-NT
12.452	2	MM	7.11104	29.39954	209.06144		PETN
Totals :					3650.55143		

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

1D

ORGANICS ANALYSIS DATA SHEET

Report No:	218081814	Client Sample ID:	LCSD1843215
Collect Date:	NA Time: NA	GCAL Sample ID:	1843215
Matrix:	Solid % Moisture: NA	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A31
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 2039
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

CONCENTRATION UNITS: ug/kg

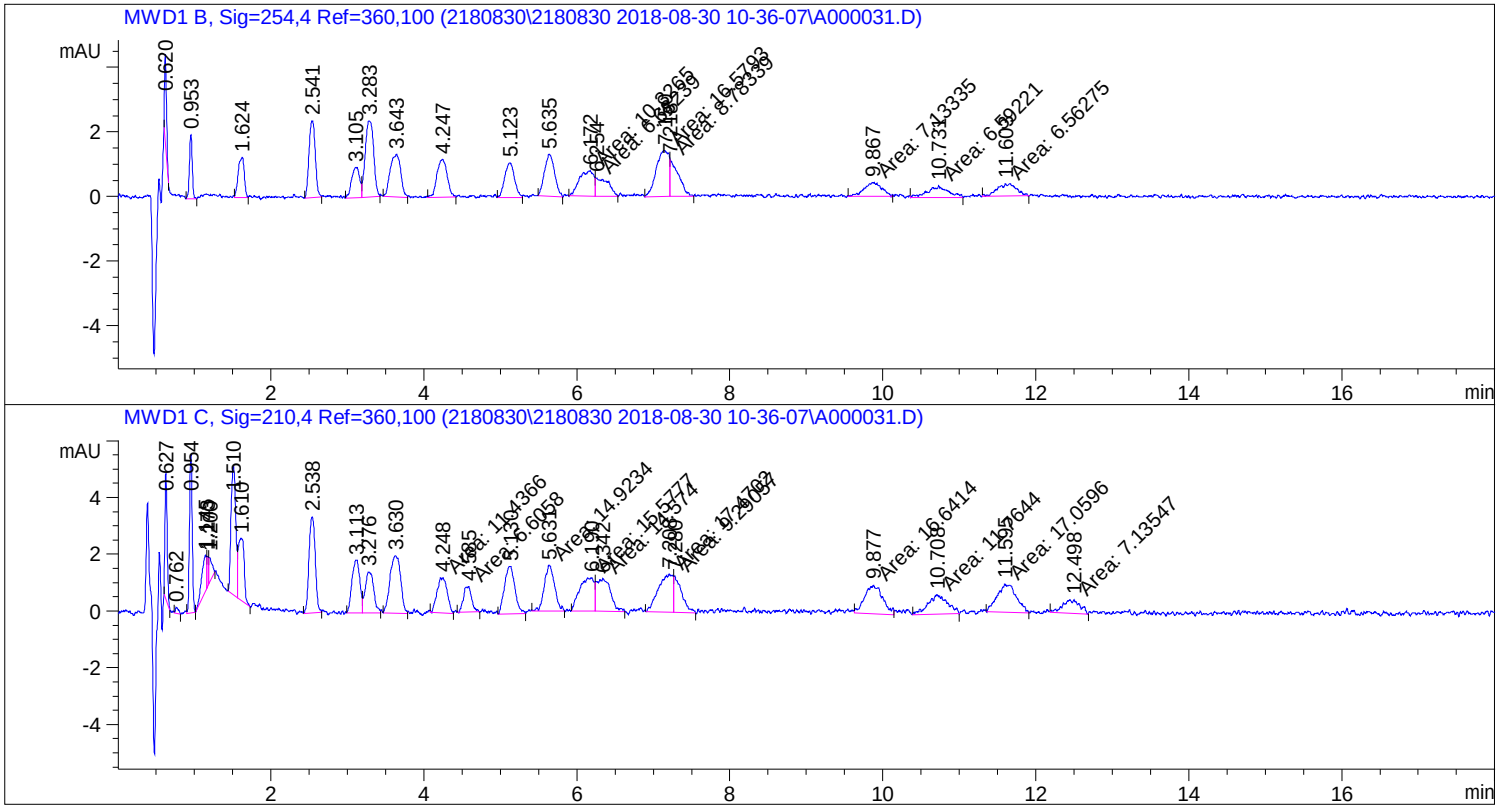
CAS	ANALYTE	RESULT	Q	DL	LOD	LOQ
99-35-4	1,3,5-Trinitrobenzene	910		42.0	100	200
99-65-0	1,3-Dinitrobenzene	872		77.0	100	200
118-96-7	2,4,6-Trinitrotoluene	842		51.0	100	200
121-14-2	2,4-Dinitrotoluene	882		99.0	100	200
606-20-2	2,6-Dinitrotoluene	877		61.0	100	200
35572-78-2	2-Amino-4,6-dinitrotoluene	888		98.0	100	200
88-72-2	2-Nitrotoluene	959		64.0	100	200
618-87-1	3,5-Dinitroaniline	902		83.0	100	200
99-08-1	3-Nitrotoluene	845		125	150	200
19406-51-0	4-Amino-2,6-dinitrotoluene	872		77.0	100	200
99-99-0	4-Nitrotoluene	1100		77.0	100	200
2691-41-0	HMX	829		26.0	100	200
98-95-3	Nitrobenzene	904		36.0	100	200
55-63-0	Nitroglycerin	854		74.0	100	200
78-11-5	Pentaerythritol Tetranitrate	839		122	150	200
121-82-4	RDX	909		18.0	100	200
479-45-8	Tetryl	916		41.0	100	200

FORM I ORG-1

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000031.D
Sample Name: 1843215

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  31
Acq. Instrument : HPLC3                         Location : P2-C-09
Injection Date  : 8/30/2018 8:39:02 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 1:41:02 PM by MEG
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:54:56 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.953	1	BB	4.98753	41.55880	207.27559		HMX
1.624	1	VV	6.91375	32.88013	227.32500		RDX
2.538	2	BV	19.29036	11.79190	227.47006		1,3,5-TNB
3.113	2	BV	13.40182	17.58403	235.65799		1,2-DNB
3.283	1	VV	18.04916	12.08328	218.09307		1,3-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000031.D
Sample Name: 1843215

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.630	2	BV	19.59031	11.51055	225.49538		3,5-DNA
4.247	1	VV	10.99476	20.54823	225.92294		NB
4.585	2	MM	6.60580	32.32469	213.53050		NG
5.123	1	BV	9.48290	24.14035	228.92042		TETRYL
5.635	1	BB	12.03504	17.49447	210.54657		2,4,6-TNT
6.172	1	MF	10.32654	21.50419	222.06392		2-A-4,6-DNT
6.254	1	FM	6.68239	32.60655	217.88959		4-A-2,6-DNT
7.150	1	MF	16.57930	13.30050	220.51303		2,4-DNT
7.218	1	FM	8.78339	24.95418	219.18235		2,6-DNT
9.877	2	MM	16.64137	14.40165	239.66320		2-NT
10.708	2	MM	11.76438	23.40253	275.31628		4-NT
11.595	2	MM	17.05957	12.38296	211.24788		3-NT
12.498	2	MM	7.13547	29.39954	209.77948		PETN
Totals :					4035.89326		

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

EPA 8330B REPLICATE SUMMARY

Report No:	218081814	Parent Sample ID:	WIL02IS03
Prep Method:	EPA 8330B	Parent GCAL ID:	21808181407
Prep Date:	8/24/2018 6:00:00 PM	Prep Batch:	642680
Analytical Method:	EPA 8330B		

ANALYTE	*CAS*	*UNITS*	*PARENT RESULT*	*REP #1 RESULT (1843104)*	*REP #2 RESULT (1843105)*	*%RSD*	*#*
1,3,5-Trinitrobenzene	99-35-4	ug/Kg	0	0	0	0	
1,3-Dinitrobenzene	99-65-0	ug/Kg	0	0	0	0	
2,4,6-Trinitrotoluene	118-96-7	ug/Kg	0	0	0	0	
2,4-Dinitrotoluene	121-14-2	ug/Kg	0	0	0	0	
2,6-Dinitrotoluene	606-20-2	ug/Kg	0	0	0	0	
2-Amino-4,6-dinitrotoluene	35572-78-2	ug/Kg	0	0	0	0	
2-Nitrotoluene	88-72-2	ug/Kg	0	0	0	0	
3,5-Dinitroaniline	618-87-1	ug/Kg	0	0	0	0	
3-Nitrotoluene	99-08-1	ug/Kg	0	0	0	0	
4-Amino-2,6-dinitrotoluene	19406-51-0	ug/Kg	0	0	0	0	
4-Nitrotoluene	99-99-0	ug/Kg	0	0	0	0	
HMX	2691-41-0	ug/Kg	0	0	0	0	
Nitrobenzene	98-95-3	ug/Kg	0	0	0	0	
Nitroglycerin	55-63-0	ug/Kg	0	0	0	0	
Pentaerythritol Tetranitrate	78-11-5	ug/Kg	0	0	0	0	
RDX	121-82-4	ug/Kg	0	0	0	0	
Tetryl	479-45-8	ug/Kg	0	0	0	0	

*** - RSD greater than 20%**

EPA 8330B

Form 2F

Surrogates

2F

ORGANIC SURROGATE RECOVERY

Report No: 218081814 Analytical Method: EPA 8330B

Client Sample ID	*GCALSample ID*	*SMC1*	#	*SMC2*	#	*SMC3*	#	*SMC4*	#	*TOT OUT*
WIL02IS01	21808181401	103								0
WIL02IS01 MS	21808181402	99								0
WIL02IS01 MSD	21808181403	95								0
WIL02IS02	21808181404	94								0
WIL02IS03	21808181407	89								0
MB1843101	1843101	110								0
WIL02IS03DUP	1843104	97								0
WIL02IS03DUP	1843105	101								0
GRBLK for HBN 642680 [EXTO/549	1843106	97								0
LCS1843214	1843214	86								0
LCSD1843215	1843215	94								0

QC LIMITS

SMC 1 :	1,2-Dinitrobenzene	50	150	# Column to be used to flag recovery limits
SMC 2 :				* Value outside of QC limits
SMC 3 :				D Surrogate diluted out
SMC 4 :				

FORM II ORG-2

EPA 8330B

Form 3F

Spikes

3F

SOIL ORGANICS MS/MSD RECOVERY

Report No:	218081814	Parent Sample ID:	WIL02IS01
Prep Method:	8330B	Prep Batch:	642680
Analytical Method:	EPA 8330B	Analytical Batch:	643050

GCAL QC ID: 21808181402

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*MS RESULT*	*MS % REC*	#	*QC LIMITS*
1,3,5-Trinitrobenzene	ug/kg	990	0	975	98		80 - 116
1,3-Dinitrobenzene	ug/kg	990	0	916	92		73 - 119
2,4,6-Trinitrotoluene	ug/kg	990	0	908	92		71 - 120
2,4-Dinitrotoluene	ug/kg	990	0	863	87		75 - 121
2,6-Dinitrotoluene	ug/kg	990	0	991	100		79 - 117
2-Amino-4,6-dinitrotoluene	ug/kg	990	0	895	90		71 - 123
2-Nitrotoluene	ug/kg	990	0	909	92		84 - 120
3,5-Dinitroaniline	ug/kg	990	0	889	90		86 - 118
3-Nitrotoluene	ug/kg	990	0	871	88		67 - 129
4-Amino-2,6-dinitrotoluene	ug/kg	990	0	898	91		64 - 127
4-Nitrotoluene	ug/kg	990	0	976	99		71 - 124
HMX	ug/kg	990	0	834	84		74 - 124
Nitrobenzene	ug/kg	990	0	1030	104		80 - 128
Nitroglycerin	ug/kg	990	0	904	91		73 - 124
Pentaerythritol Tetranitrate	ug/kg	990	0	986	100		72 - 128
RDX	ug/kg	990	0	891	90		67 - 129
Tetryl	ug/kg	990	0	720	73		68 - 135

RPD : 0 out of 17 outside limits

Spike Recovery: 0 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS MS/MSD RECOVERY

Report No:	218081814	Parent Sample ID:	WIL02IS01
Prep Method:	8330B	Prep Batch:	642680
Analytical Method:	EPA 8330B	Analytical Batch:	643050

GCAL QC ID: 21808181403

ANALYTE	UNITS	SPIKE ADDED	MSD RESULT	MSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
1,3,5-Trinitrobenzene	ug/kg	1000	922	92		6		80 - 116	0 - 20
1,3-Dinitrobenzene	ug/kg	1000	887	89		3		73 - 119	0 - 20
2,4,6-Trinitrotoluene	ug/kg	1000	903	90		.6		71 - 120	0 - 20
2,4-Dinitrotoluene	ug/kg	1000	896	90		4		75 - 121	0 - 20
2,6-Dinitrotoluene	ug/kg	1000	851	85		15		79 - 117	0 - 20
2-Amino-4,6-dinitrotoluene	ug/kg	1000	910	91		2		71 - 123	0 - 20
2-Nitrotoluene	ug/kg	1000	972	97		7		84 - 120	0 - 20
3,5-Dinitroaniline	ug/kg	1000	872	87		2		86 - 118	0 - 20
3-Nitrotoluene	ug/kg	1000	925	92		6		67 - 129	0 - 20
4-Amino-2,6-dinitrotoluene	ug/kg	1000	958	96		7		64 - 127	0 - 20
4-Nitrotoluene	ug/kg	1000	959	96		2		71 - 124	0 - 20
HMX	ug/kg	1000	798	80		4		74 - 124	0 - 20
Nitrobenzene	ug/kg	1000	872	87		16		80 - 128	0 - 20
Nitroglycerin	ug/kg	1000	879	88		3		73 - 124	0 - 20
Pentaerythritol Tetranitrate	ug/kg	1000	902	90		9		72 - 128	0 - 20
RDX	ug/kg	1000	847	85		5		67 - 129	0 - 20
Tetryl	ug/kg	1000	726	73		.8		68 - 135	0 - 20

RPD : 0 out of 17 outside limits

Spike Recovery: 0 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS LCS/LCSD RECOVERY

Report No: 218081814

Prep Method: 8330B | Prep Batch: 642680

Analytical Method: EPA 8330B | Analytical Batch: 643050

GCAL QC ID: 1843214

ANALYTE	*UNITS*	*SPIKE ADDED*	*SAMPLE RESULT*	*LCS RESULT*	*LCS % REC*	#	*QC LIMITS*
1,3,5-Trinitrobenzene	ug/kg	1000	0	807	81		80 - 116
1,3-Dinitrobenzene	ug/kg	1000	0	787	79		73 - 119
2,4,6-Trinitrotoluene	ug/kg	1000	0	747	75		71 - 120
2,4-Dinitrotoluene	ug/kg	1000	0	862	86		75 - 121
2,6-Dinitrotoluene	ug/kg	1000	0	815	81		79 - 117
2-Amino-4,6-dinitrotoluene	ug/kg	1000	0	757	76		71 - 123
2-Nitrotoluene	ug/kg	1000	0	913	91		84 - 120
3,5-Dinitroaniline	ug/kg	1000	0	875	87		86 - 118
3-Nitrotoluene	ug/kg	1000	0	708	71		67 - 129
4-Amino-2,6-dinitrotoluene	ug/kg	1000	0	739	74		64 - 127
4-Nitrotoluene	ug/kg	1000	0	816	82		71 - 124
HMX	ug/kg	1000	0	833	83		74 - 124
Nitrobenzene	ug/kg	1000	0	819	82		80 - 128
Nitroglycerin	ug/kg	1000	0	782	78		73 - 124
Pentaerythritol Tetranitrate	ug/kg	1000	0	836	84		72 - 128
RDX	ug/kg	1000	0	822	82		67 - 129
Tetryl	ug/kg	1000	0	827	83		68 - 135

RPD : 1 out of 17 outside limits

Spike Recovery: 0 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

3F

SOIL ORGANICS LCS/LCSD RECOVERY

Report No: 218081814

Prep Method: 8330B | Prep Batch: 642680

Analytical Method: EPA 8330B | Analytical Batch: 643050

GCAL QC ID: 1843215

ANALYTE	UNITS	SPIKE ADDED	LCSD RESULT	LCSD % REC	#	% RPD	#	QC LIMITS REC	QC LIMITS RPD
1,3,5-Trinitrobenzene	ug/kg	1000	910	91		12		80 - 116	0 - 20
1,3-Dinitrobenzene	ug/kg	1000	872	87		10		73 - 119	0 - 20
2,4,6-Trinitrotoluene	ug/kg	1000	842	84		12		71 - 120	0 - 20
2,4-Dinitrotoluene	ug/kg	1000	882	88		2		75 - 121	0 - 20
2,6-Dinitrotoluene	ug/kg	1000	877	88		7		79 - 117	0 - 20
2-Amino-4,6-dinitrotoluene	ug/kg	1000	888	89		16		71 - 123	0 - 20
2-Nitrotoluene	ug/kg	1000	959	96		5		84 - 120	0 - 20
3,5-Dinitroaniline	ug/kg	1000	902	90		3		86 - 118	0 - 20
3-Nitrotoluene	ug/kg	1000	845	84		18		67 - 129	0 - 20
4-Amino-2,6-dinitrotoluene	ug/kg	1000	872	87		16		64 - 127	0 - 20
4-Nitrotoluene	ug/kg	1000	1100	110		30	*	71 - 124	0 - 20
HMX	ug/kg	1000	829	83		.4		74 - 124	0 - 20
Nitrobenzene	ug/kg	1000	904	90		10		80 - 128	0 - 20
Nitroglycerin	ug/kg	1000	854	85		9		73 - 124	0 - 20
Pentaerythritol Tetranitrate	ug/kg	1000	839	84		.3		72 - 128	0 - 20
RDX	ug/kg	1000	909	91		10		67 - 129	0 - 20
Tetryl	ug/kg	1000	916	92		10		68 - 135	0 - 20

RPD : 1 out of 17 outside limits

Spike Recovery: 0 out of 34 outside limits

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

FORM III ORG-1

EPA 8330B

Form 4C

Method Blanks

4C

ORGANIC METHOD BLANK SUMMARY

Report No:	218081814	Method Blank ID:	1843101
Matrix:	Solid	Instrument ID:	HPLC3
Sample Amt:	10 g	Lab File ID:	2180830\A19
Injection Vol.:	1.0 (µL)	GC Column:	ARC18 ID 3 (mm)
Prep Final Vol.:	40000 (µL)	Dilution Factor:	1 Analyst: MEG
Prep Date:	08/24/18	Analysis Date:	08/30/18 Time: 1641
Prep Batch:	642680	Analytical Batch:	643050
Prep Method:	8330B	Analytical Method:	EPA 8330B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD

	CLIENT SAMPLE ID	GCAL SAMPLE ID	DATE ANALYZED	TIME ANALYZED	INSTRUMENT ID
1 .	WIL02IS01	21808181401	08/30/18	1741	HPLC3
2 .	WIL02IS01 MS	21808181402	08/30/18	1800	HPLC3
3 .	WIL02IS01 MSD	21808181403	08/30/18	1820	HPLC3
4 .	WIL02IS02	21808181404	08/30/18	1840	HPLC3
5 .	WIL02IS03	21808181407	08/30/18	1900	HPLC3
6 .	WIL02IS03DUP	1843105	08/30/18	1919	HPLC3
7 .	WIL02IS03DUP	1843104	08/30/18	1939	HPLC3
8 .	GRBLK for HBN 642680 [EXTO/549	1843106	08/30/18	1959	HPLC3
9 .	LCS1843214	1843214	08/30/18	2019	HPLC3
10 .	LCSD1843215	1843215	08/30/18	2039	HPLC3

EPA 8330B

Form 6E

Calibrations

6E

ORGANICS INITIAL CALIBRATION DATA

					GCALID - FileID - Conc	1201 ~ 2180724\A09 ~ 50	
Report No:	218081814		Instrument ID:	HPLC3	1202 ~ 2180724\A08 ~ 125	1203 ~ 2180724\A07 ~ 250	
GC Column:	ID (mm)		Analyst:	MEG	1204 ~ 2180724\A06 ~ 500	1205 ~ 2180724\A05 ~ 1000	
Calib. Date 1:	07/24/18	Time 1: 1355	Analytical Batch:	640653	1206 ~ 2180724\A04 ~ 1250	1207 ~ 2180724\A03 ~ 2500	
Calib. Date 2:	07/24/18	Time 2: 1552	Analytical Method:	EPA 8330B			

ANALYTE	*1201*	*1202*	*1203*	*1204*	*1205*	*1206*	*1207*	*1208*	*1209*	*$\overline{RF}$ / b / A*	*m / B*	*C*	*FIT*	*TYPE*
1,2-Dinitrobenzene	16.7	16.6	16.5	17.4	18.6	18.5	17.5			17.8			11.78	A
1,3,5-Trinitrobenzene	10.9	11.5	11.4	11.1	12.4	12.4	11.9			11.9			11.66	A
1,3-Dinitrobenzene	11.5	12.0	11.4	10.7	12.8	12.7	12.5			12.2			12.12	A
2,4,6-Trinitrotoluene	17.2	16.3	16.4	16.5	18.2	18.1	17.9			17.6			10.85	A
2,4-Dinitrotoluene	12.1	12.0	12.2	13.6	14.1	14.0	13.6			13.5			12.38	A
2,6-Dinitrotoluene	22.7	25.0	25.1	21.1	26.4	26.8	27.1			25.3			13.72	A
2-Amino-4,6-dinitrotoluene	19.0	20.9	20.4	18.9	23.5	23.4	23.2			21.9			14.61	A
2-Nitrotoluene	13.3	13.1	13.5	14.0	15.1	15.1	15.3			14.6			11.90	A
3,5-Dinitroaniline	11.1	10.7	10.7	11.2	11.9	11.8	11.8			11.6			10.28	A
3-Nitrotoluene	11.7	11.5	11.4	12.0	13.0	12.7	13.1			12.5			10.60	A
4-Amino-2,6-dinitrotoluene	28.6	32.3	30.0	35.0	33.3	33.1	33.0			32.9			11.12	A
4-Nitrotoluene	21.1	23.5	24.3	22.2	23.0	23.7	23.8			23.6			10.02	A
HMX	36.9	37.6	39.7	40.7	44.2	43.6	43.9			42.1			12.44	A
Nitrobenzene	18.3	19.7	19.6	19.8	21.6	21.6	21.5			20.8			11.95	A
Nitroglycerin	29.6	29.3	30.7	31.0	34.1	34.1	34.4			32.7			12.34	A
Pentaerythritol Tetranitrate	26.2	27.6	27.5	28.4	30.3	30.6	32.0			29.7			11.85	A
RDX	29.5	30.1	31.0	32.0	34.6	34.6	35.0			33.3			12.36	A
Tetryl	21.6	23.2	23.6	23.3	25.6	25.8	25.5			24.4			12.87	A

FIT = %RSD For Average Curve And Calibration Coefficent For Linear And Quadratic

Curve Types: A - Averged, L - Linear Regression, W - Weighted Linear, Q - Quadratic

For curve types L and Q, the RRF and RSP (Response) are shown on separate lines to allow for evaluation against minimum RRF

$\overline{RF}$ = Mean Response Factor For Average Curve

m,b = Slope and Intercept For Linear Curve

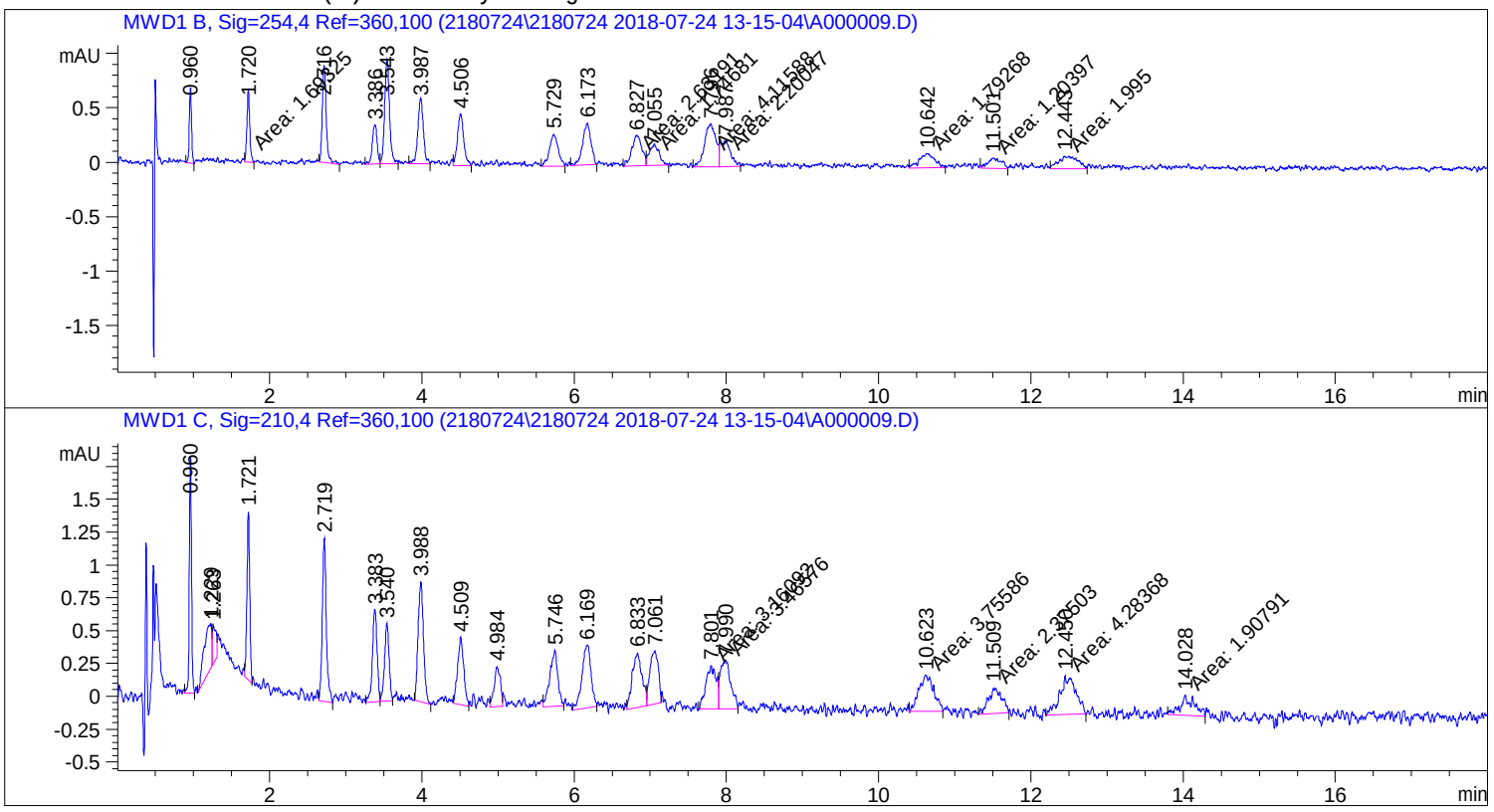
A,B,C = Coefficents For Quadratic Curve

FORM V I SVOA

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000009.D
Sample Name: 1201*50

```
==========================================================================
Acq. Operator   : MEG                              Seq. Line :   9
Acq. Instrument : HPLC3                             Location : P1-A-03
Injection Date  : 7/24/2018 3:52:40 PM                   Inj :   1
                                                  Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 2.500 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 3:51:18 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.960	1	BB	1.35531	43.28142	58.65993		HMX
1.720	1	MM	1.69325	34.17624	57.86886		RDX
2.719	2	VB	4.58750	11.40094	52.30188		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000009.D
Sample Name: 1201*50

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.383	2	BV	2.99621	17.09373	51.21648		1,2-DNB
3.543	1	VV	4.33286	12.16929	52.72788		1,3-DNB
3.988	2	BB	4.51660	11.61752	52.47169		3,5-DNA
4.506	1	VV	2.73563	20.86415	57.07666		NB
4.984	2	VV	1.69013	33.42634	56.49481		NG
5.729	1	BV	2.31638	23.56085	54.57586		TETRYL
6.173	1	VB	2.90180	17.18879	49.87844		2,4,6-TNT
6.827	1	MF	2.63191	22.30068	58.69328		2-A-4,6-DNT
7.055	1	FM	1.74681	31.52164	55.06242		4-A-2,6-DNT
7.796	1	MF	4.11588	13.61872	56.05307		2,4-DNT
7.987	1	FM	2.20047	25.17563	55.39810		2,6-DNT
10.623	2	MM	3.75586	14.98143	56.26820		2-NT
11.509	2	MM	2.37503	22.61455	53.71032		4-NT
12.450	2	MM	4.28368	12.66263	54.24265		3-NT
14.028	2	MM	1.90791	29.48171	56.24844		PETN

Totals : 988.94897

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

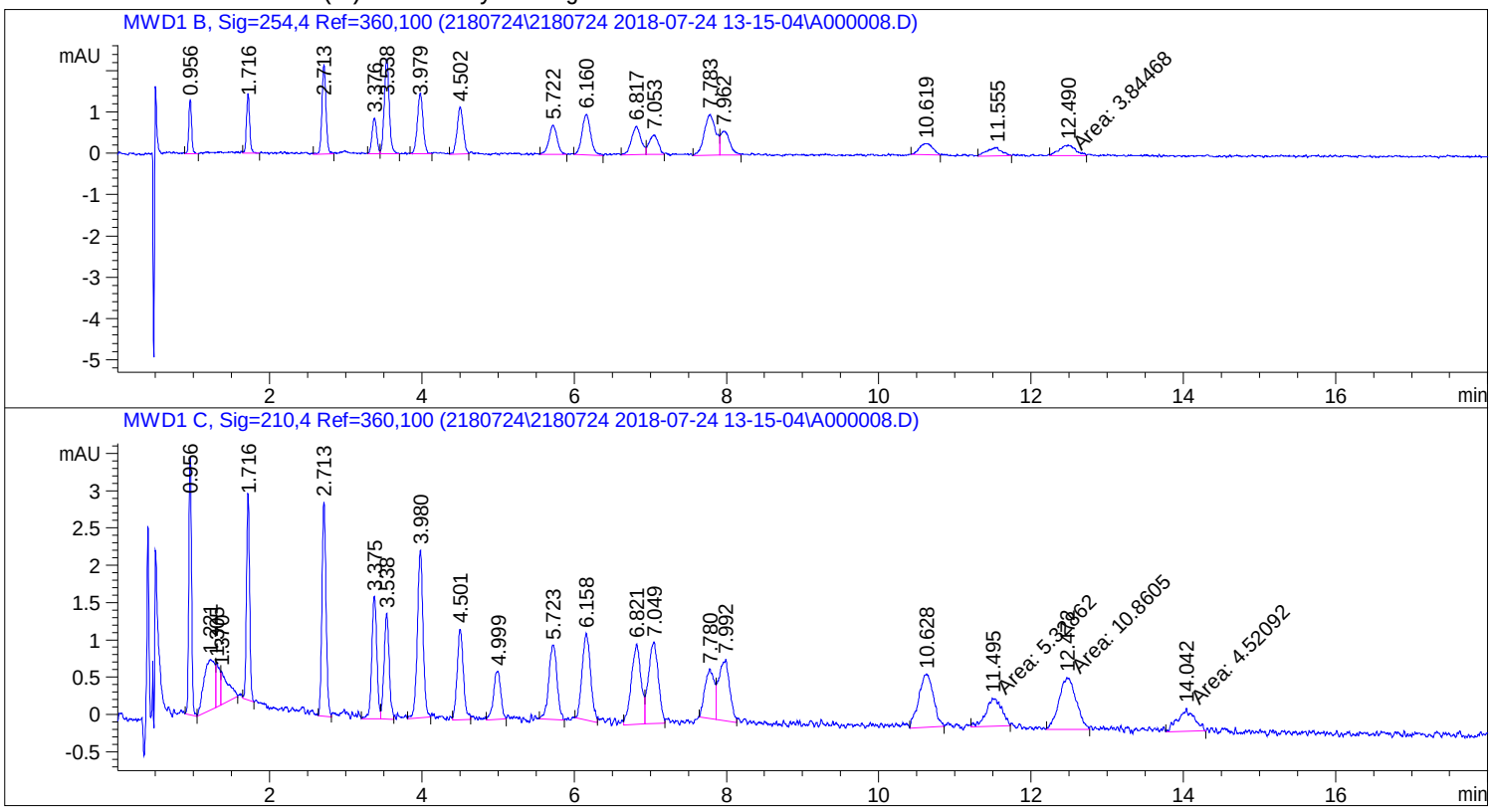
==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000008.D
Sample Name: 1202*125

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   8
Acq. Instrument : HPLC3                         Location : P1-A-03
Injection Date  : 7/24/2018 3:33:19 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 6.250 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 3:31:49 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```

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==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.956	1	VB	3.32248	43.28142	143.80173		HMX
1.716	1	VB	4.14600	34.17624	141.69456		RDX
2.713	2	BV	10.82306	11.40094	123.39309		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000008.D
Sample Name: 1202*125

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.375	2	BV	7.54769	17.09373	129.01815		1,2-DNB
3.538	1	VB	10.46008	12.16929	127.29171		1,3-DNB
3.980	2	BB	11.63497	11.61752	135.16942		3,5-DNA
4.502	1	BV	6.35121	20.86415	132.51253		NB
4.999	2	VV	4.27213	33.42634	142.80163		NG
5.722	1	BB	5.37763	23.56085	126.70146		TETRYL
6.160	1	BB	7.67269	17.18879	131.88421		2,4,6-TNT
6.817	1	BV	5.98759	22.30068	133.52721		2-A-4,6-DNT
7.053	1	VV	3.87154	31.52164	122.03742		4-A-2,6-DNT
7.783	1	BV	10.40961	13.61872	141.76551		2,4-DNT
7.962	1	VB	4.99924	25.17563	125.85908		2,6-DNT
10.628	2	BB	9.52387	14.98143	142.68120		2-NT
11.495	2	MM	5.32862	22.61455	120.50440		4-NT
12.472	2	MM	10.86049	12.66263	137.52230		3-NT
14.042	2	MM	4.52092	29.48171	133.28454		PETN

Totals : 2391.45016

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

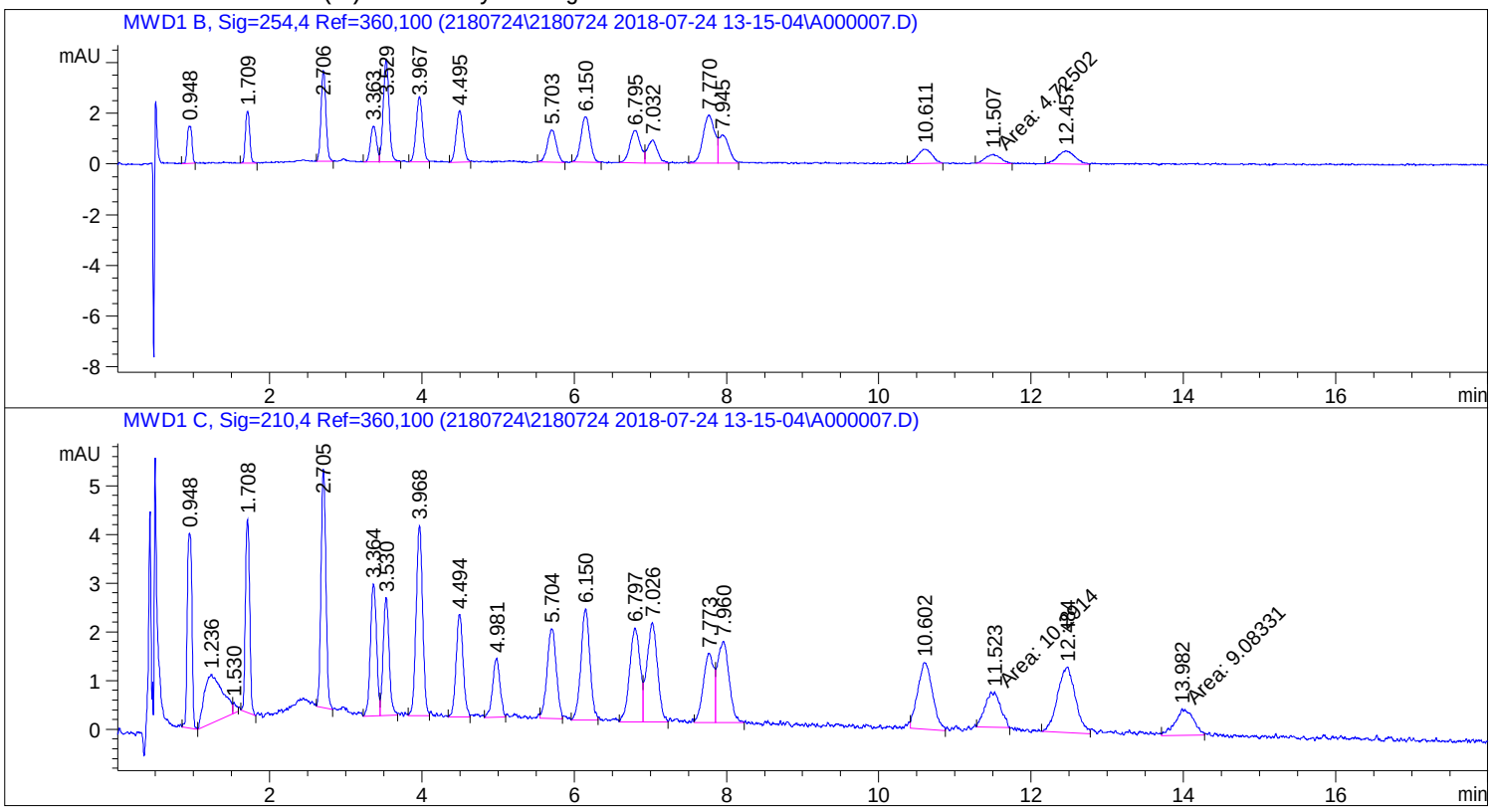
==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000007.D
Sample Name: 1203*250

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   7
Acq. Instrument : HPLC3                         Location : P1-A-03
Injection Date  : 7/24/2018 3:13:49 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 12.500 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 3:12:11 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.948	1	VV	6.30158	43.28142	272.74143		HMX
1.709	1	VV	8.07662	34.17624	276.02871		RDX
2.705	2	BV	21.89115	11.40094	249.57983		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000007.D
Sample Name: 1203*250

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.364	2	BV	15.18353	17.09373	259.54311		1,2-DNB
3.529	1	VV	21.92476	12.16929	266.80874		1,3-DNB
3.968	2	VV	23.33715	11.61752	271.11976		3,5-DNA
4.495	1	BV	12.77829	20.86415	266.60816		NB
4.981	2	BV	8.14934	33.42634	272.40264		NG
5.703	1	BV	10.57367	23.56085	249.12477		TETRYL
6.150	1	BV	15.22820	17.18879	261.75432		2,4,6-TNT
6.795	1	BV	12.26246	22.30068	273.46116		2-A-4,6-DNT
7.032	1	VB	8.33874	31.52164	262.85069		4-A-2,6-DNT
7.770	1	BV	20.47220	13.61872	278.80520		2,4-DNT
7.945	1	VV	9.95350	25.17563	250.58574		2,6-DNT
10.602	2	VV	18.53687	14.98143	277.70892		2-NT
11.523	2	MM	10.29138	22.61455	232.73497		4-NT
12.484	2	BV	21.84314	12.66263	276.59152		3-NT
13.982	2	MM	9.08331	29.48171	267.79162		PETN

Totals : 4766.24130

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

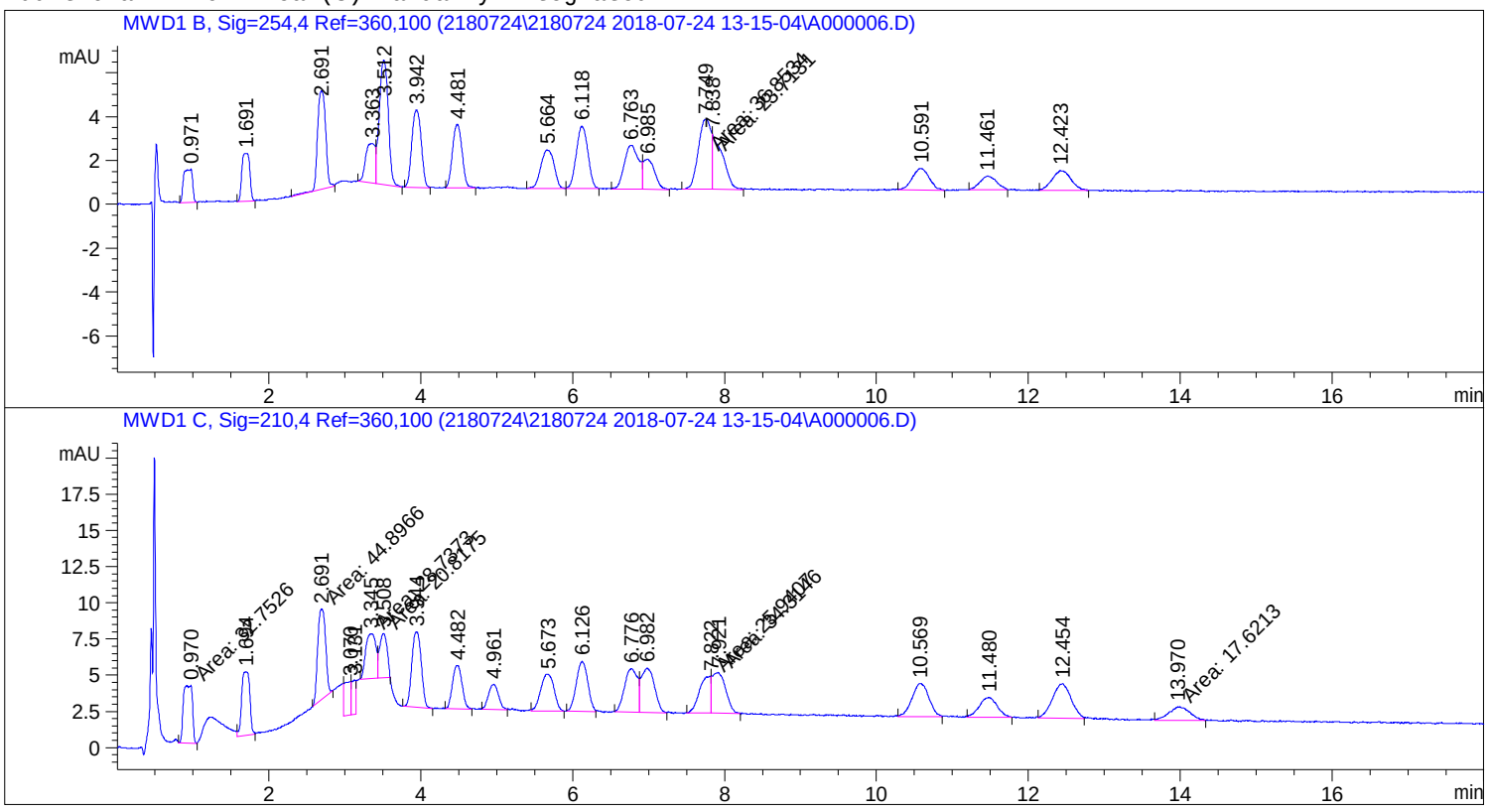
==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000006.D
Sample Name: 1204*500

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   6
Acq. Instrument : HPLC3                         Location : P1-A-03
Injection Date  : 7/24/2018 2:54:11 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 2:52:33 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100

RetTime Sig Type     Area      Amt/Area    Amount    Grp   Name
 [min]             [mAU*s]
-------|--|------|----------|----------|----------|--|---------------
  0.971  1 BB       12.28218   43.28142  531.59027    HMX
  1.691  1 BB       15.60504   34.17624  533.32182    RDX
  2.691  2 MM       44.89665   11.40094  511.86421    1,3,5-TNB
  3.345  2 MF       28.73733   17.09373  491.22805    1,2-DNB
```

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000006.D
Sample Name: 1204*500

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.512	1	VB	46.85833	12.16929	570.23268		1,3-DNB
3.944	2	BB	44.74712	11.61752	519.85042		3,5-DNA
4.481	1	VB	25.21857	20.86415	526.16417		NB
4.961	2	VV	16.12783	33.42634	539.09423		NG
5.664	1	BV	21.48870	23.56085	506.29197		TETRYL
6.118	1	VV	30.23722	17.18879	519.74137		2,4,6-TNT
6.763	1	BV	26.51565	22.30068	591.31690		2-A-4,6-DNT
6.985	1	VV	14.27866	31.52164	450.08684		4-A-2,6-DNT
7.749	1	MF	36.85341	13.61872	501.89628		2,4-DNT
7.838	1	FM	23.71310	25.17563	596.99227		2,6-DNT
10.569	2	VV	35.74021	14.98143	535.43959		2-NT
11.480	2	VB	22.52265	22.61455	509.33969		4-NT
12.454	2	VV	41.60176	12.66263	526.78771		3-NT
13.970	2	MM	17.62127	29.48171	519.50531		PETN
Totals :					9480.74378		

1 Warnings or Errors :

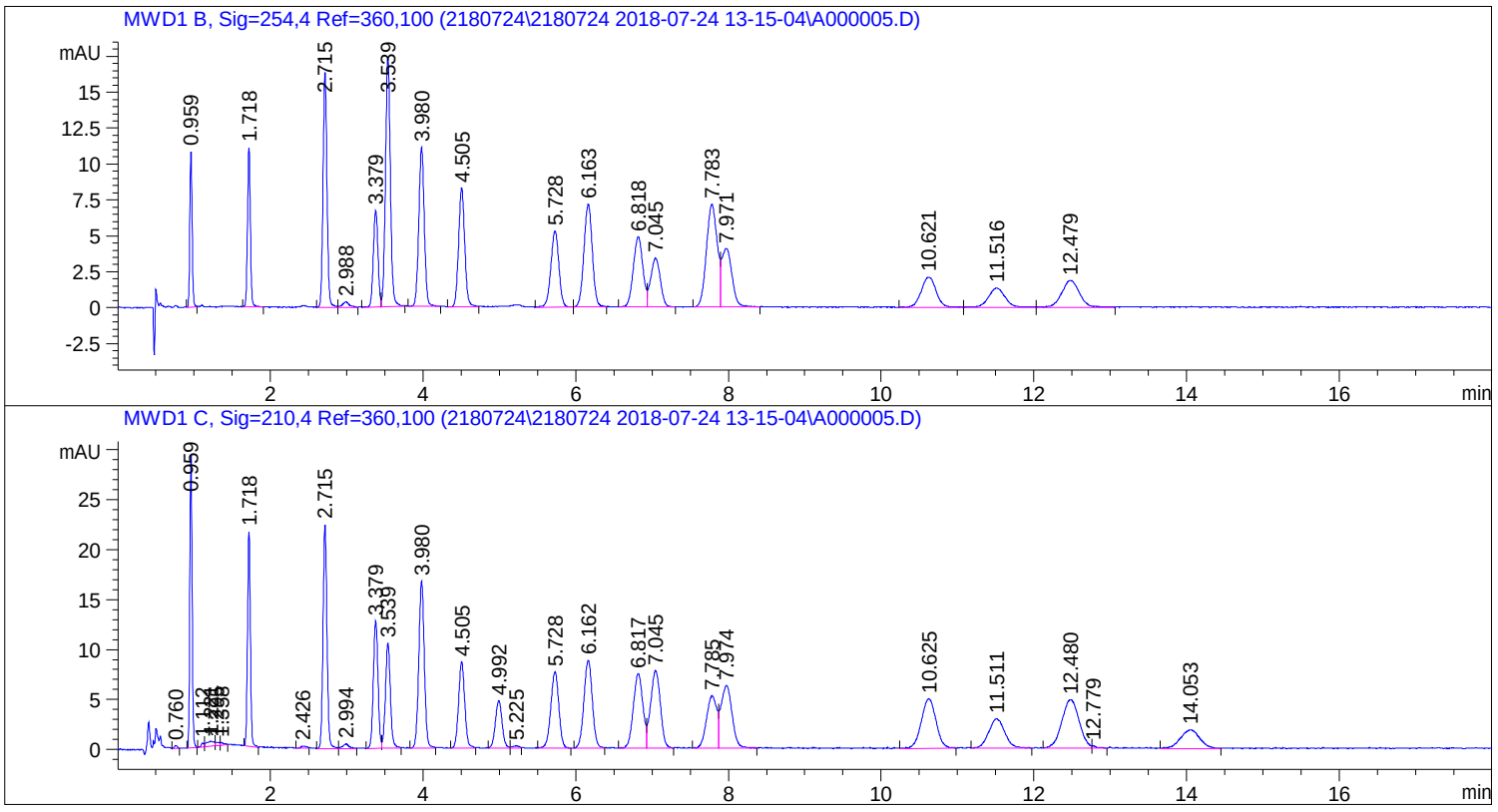
Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000005.D
Sample Name: 1205*1000

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   5
Acq. Instrument : HPLC3                         Location : P1-A-02
Injection Date  : 7/24/2018 2:34:34 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 2:33:10 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.959	1	VV	22.60220	43.28142	978.25546		HMX
1.718	1	VV	28.88193	34.17624	987.07589		RDX
2.715	2	BV	80.87807	11.40094	922.08638		1,3,5-TNB
3.379	2	BV	53.66630	17.09373	917.35707		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000005.D
Sample Name: 1205*1000

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.539	1	VV	78.24905	12.16929	952.23539		1,3-DNB
3.980	2	BV	84.35162	11.61752	979.95624		3,5-DNA
4.505	1	BV	46.39737	20.86415	968.04184		NB
4.992	2	BV	29.32183	33.42634	980.12133		NG
5.728	1	BV	38.98650	23.56085	918.55515		TETRYL
6.163	1	VV	54.90339	17.18879	943.72288		2,4,6-TNT
6.818	1	BV	42.63153	22.30068	950.71209		2-A-4,6-DNT
7.045	1	VB	29.99186	31.52164	945.39274		4-A-2,6-DNT
7.783	1	BV	71.08776	13.61872	968.12425		2,4-DNT
7.971	1	VB	37.89296	25.17563	953.97919		2,6-DNT
10.625	2	VB	66.42320	14.98143	995.11476		2-NT
11.511	2	BV	43.43806	22.61455	982.33248		4-NT
12.480	2	BV	76.79498	12.66263	972.42627		3-NT
14.053	2	VV	33.00681	29.48171	973.09715		PETN
Totals :			1.72886e4				

1 Warnings or Errors :

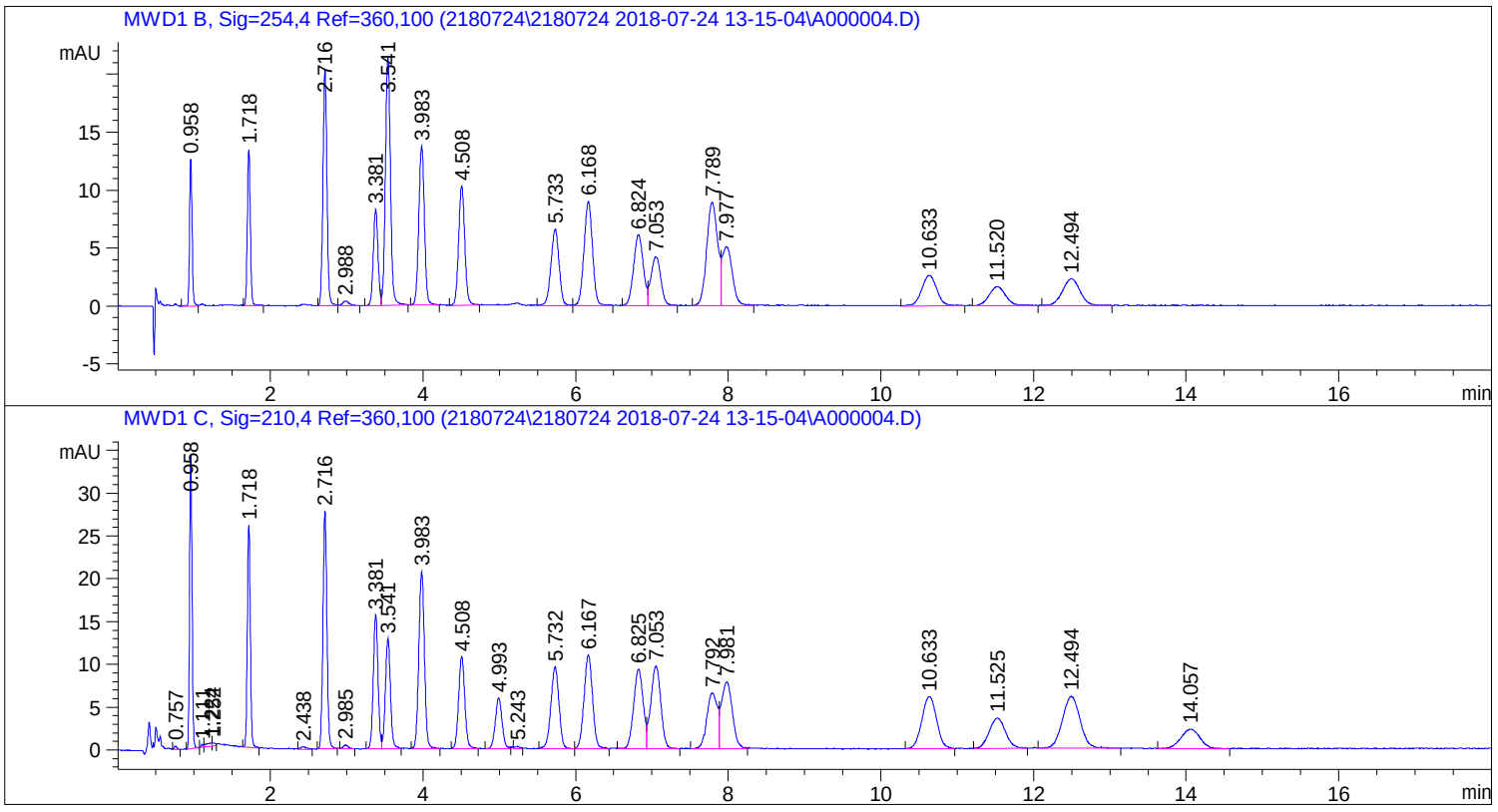
Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000004.D
Sample Name: 1206*1250

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   4
Acq. Instrument : HPLC3                         Location : P1-A-02
Injection Date  : 7/24/2018 2:15:09 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 6.250 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 2:13:39 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                    External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.958	1	BV	28.67828	43.28142	1241.23678		HMX
1.718	1	VB	36.10154	34.17624	1233.81519		RDX
2.716	2	BV	100.84308	11.40094	1149.70637		1,3,5-TNB
3.381	2	BV	67.67097	17.09373	1156.74920		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000004.D
Sample Name: 1206*1250

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.541	1	VB	98.36615	12.16929	1197.04627		1,3-DNB
3.983	2	VV	106.02518	11.61752	1231.74927		3,5-DNA
4.508	1	BV	57.85638	20.86415	1207.12449		NB
4.993	2	BV	36.70203	33.42634	1226.81442		NG
5.733	1	BB	48.37185	23.56085	1139.68198		TETRYL
6.168	1	BB	69.03387	17.18879	1186.60880		2,4,6-TNT
6.824	1	BV	53.52020	22.30068	1193.53668		2-A-4,6-DNT
7.053	1	VB	37.74605	31.52164	1189.81763		4-A-2,6-DNT
7.789	1	BV	89.49778	13.61872	1218.84513		2,4-DNT
7.977	1	VB	46.69450	25.17563	1175.56332		2,6-DNT
10.633	2	BV	82.82270	14.98143	1240.80274		2-NT
11.525	2	BV	52.75821	22.61455	1193.10340		4-NT
12.494	2	BB	98.73505	12.66263	1250.24525		3-NT
14.057	2	BB	40.90085	29.48171	1205.82706		PETN

Totals : 2.16383e4

1 Warnings or Errors :

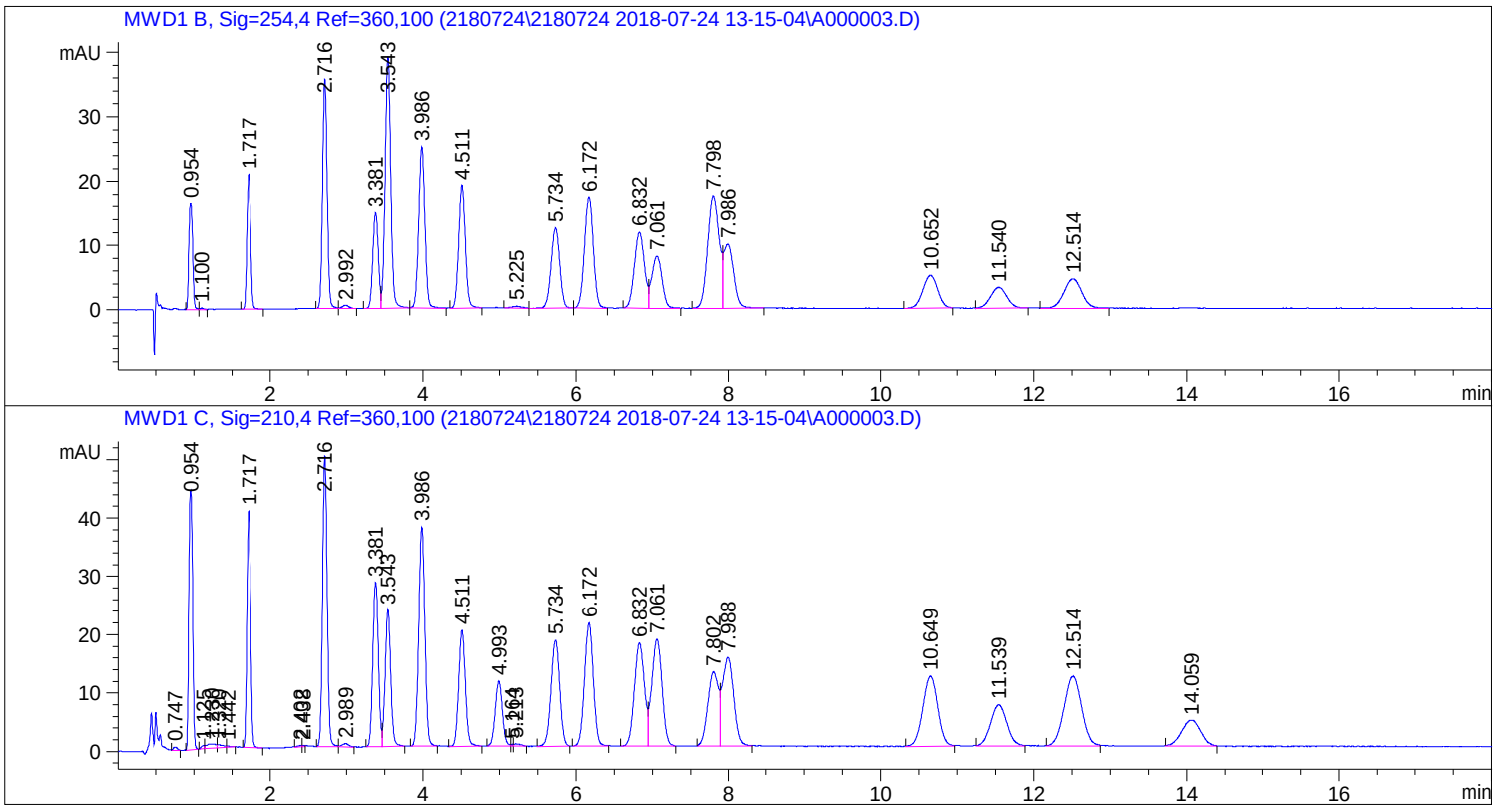
Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000003.D
Sample Name: 1207*2500

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :   3
Acq. Instrument : HPLC3                         Location : P1-A-02
Injection Date  : 7/24/2018 1:55:40 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 12.500 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 4/28/2018 12:48:13 PM by DLB
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 8:57:04 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 8:57:07 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.954	1	VV	56.88475	43.28142	2462.05314		HMX
1.717	1	VV	71.41743	34.17624	2440.77947		RDX
2.716	2	BV	209.45576	11.40094	2387.99361		1,3,5-TNB
3.381	2	BV	142.47247	17.09373	2435.38563		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000003.D
Sample Name: 1207*2500

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.543	1	VB	199.32970	12.16929	2425.70101		1,3-DNB
3.986	2	BV	211.35422	11.61752	2455.41098		3,5-DNA
4.511	1	VV	116.06274	20.86415	2421.55077		NB
4.993	2	BV	72.71998	33.42634	2430.76249		NG
5.734	1	BB	98.17678	23.56085	2313.12861		TETRYL
6.172	1	BV	139.89934	17.18879	2404.70066		2,4,6-TNT
6.832	1	BV	107.73643	22.30068	2402.59529		2-A-4,6-DNT
7.061	1	VB	75.78456	31.52164	2388.85401		4-A-2,6-DNT
7.798	1	BV	183.41721	13.61872	2497.90742		2,4-DNT
7.986	1	VV	92.08646	25.17563	2318.33447		2,6-DNT
10.649	2	VV	163.19543	14.98143	2444.90148		2-NT
11.539	2	VV	105.19282	22.61455	2378.88872		4-NT
12.514	2	VV	191.36002	12.66263	2423.12086		3-NT
14.059	2	VV	78.14223	29.48171	2303.76669		PETN

Totals : 4.33358e4

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

EPA 8330B

Form 6I

ICAL Verifications

6I

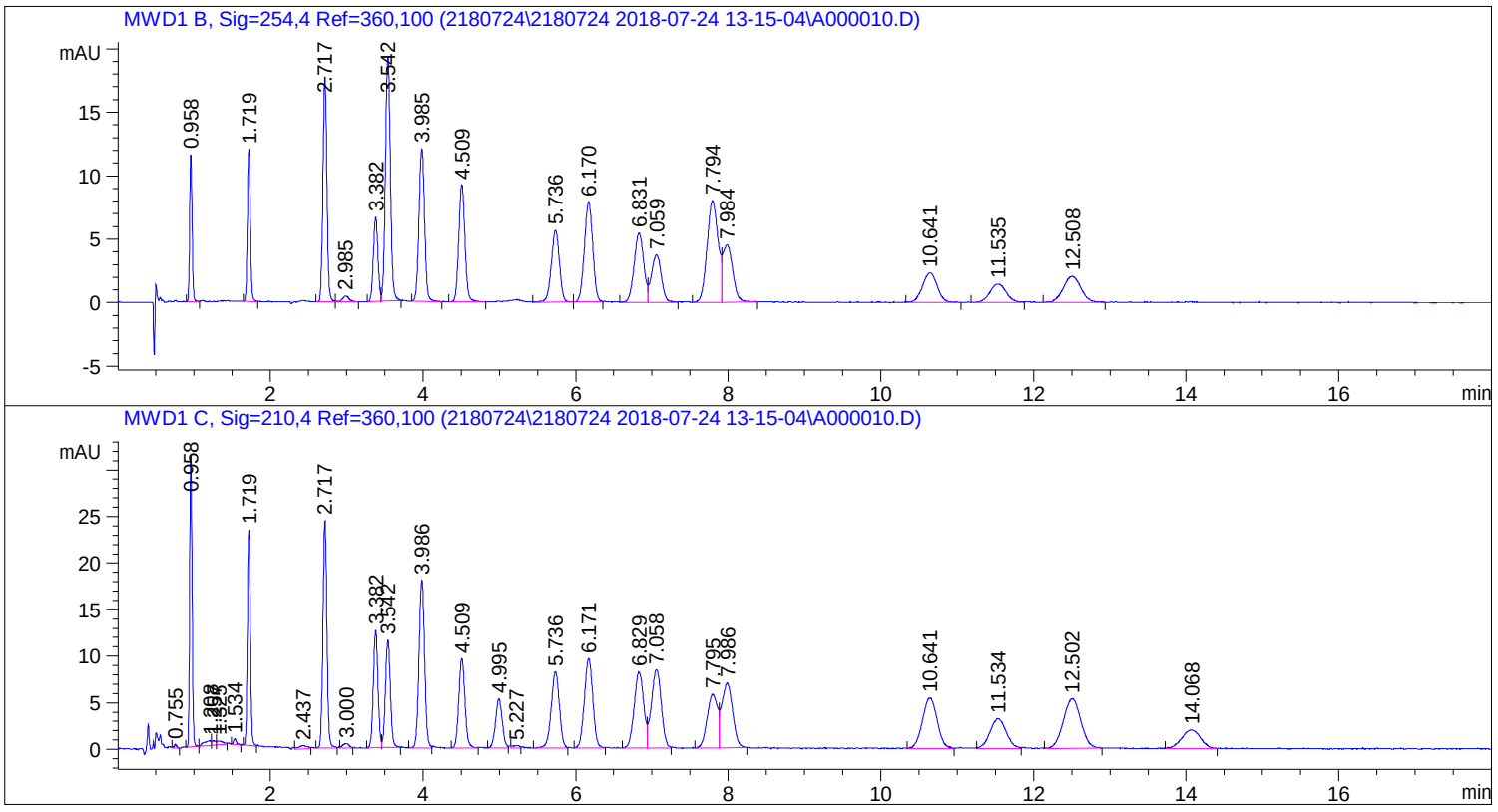
ORGANICS INITIAL CALIBRATION VERIFICATION

Report No:	218081814	Instrument ID:	HPLC3
Analysis Date:	07/24/18 1612	Lab File ID:	2180724\A10
Analytical Method:	EPA 8330B	Analytical Batch:	640653

ANALYTE	*UNITS*	*TRUE*	*FOUND*	*% REC*	*LCL*	*UCL*	*Q*
1,3,5-Trinitrobenzene	ug/L	1000	1060	106	80	120	
1,3-Dinitrobenzene	ug/L	1000	1050	105	80	120	
2,4,6-Trinitrotoluene	ug/L	1000	1060	106	80	120	
2,4-Dinitrotoluene	ug/L	1000	1070	107	80	120	
2,6-Dinitrotoluene	ug/L	1000	1050	105	80	120	
2-Amino-4,6-dinitrotoluene	ug/L	1000	1030	103	80	120	
2-Nitrotoluene	ug/L	1000	1060	106	80	120	
3,5-Dinitroaniline	ug/L	1000	1060	106	80	120	
3-Nitrotoluene	ug/L	1000	1060	106	80	120	
4-Amino-2,6-dinitrotoluene	ug/L	1000	1100	110	80	120	
4-Nitrotoluene	ug/L	1000	1100	110	80	120	
HMX	ug/L	1000	1070	107	80	120	
Nitrobenzene	ug/L	1000	1080	108	80	120	
Nitroglycerin	ug/L	1000	1050	105	80	120	
Pentaerythritol Tetranitrate	ug/L	1000	1030	103	80	120	
RDX	ug/L	1000	1050	105	80	120	
Tetryl	ug/L	1000	1010	101	80	120	

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000010.D
Sample Name: 1600*1000

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  10
Acq. Instrument : HPLC3                         Location : P1-A-04
Injection Date  : 7/24/2018 4:12:03 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\8330_ARC1.M
Last changed    : 7/24/2018 4:10:39 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180724\8330_ARC_2180724ICAL_0724.M
Last changed    : 7/25/2018 11:11:31 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      7/25/2018 9:35:27 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.958	1	VV	25.69548	41.55880	1067.87330		HMX
1.719	1	BV	32.06019	32.88013	1054.14340		RDX
2.717	2	BV	89.49841	11.79190	1055.35636		1,3,5-TNB
3.382	2	BV	53.92324	17.58403	948.18763		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180724\2180724 2018-07-24 13-15-04\A000010.D
Sample Name: 1600*1000

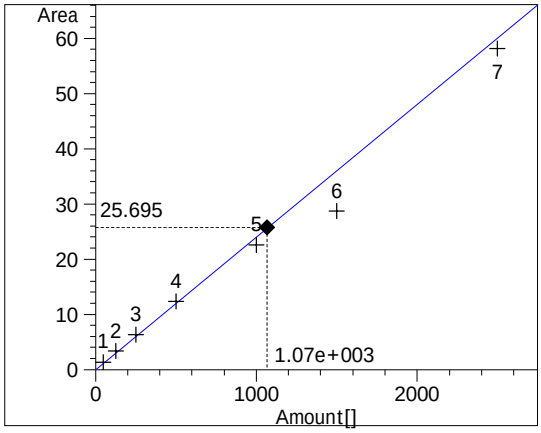
RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.542	1	VB	86.62687	12.08328	1046.73657		1,3-DNB
3.986	2	BV	91.69115	11.51055	1055.41601		3,5-DNA
4.509	1	BB	52.46961	20.54823	1078.15761		NB
4.995	2	BV	32.40728	32.32469	1047.55536		NG
5.736	1	BB	42.02353	24.14035	1014.46256		TETRYL
6.170	1	BV	60.48479	17.49447	1058.14941		2,4,6-TNT
6.831	1	BV	47.87838	21.50419	1029.58575		2-A-4,6-DNT
7.059	1	VV	33.73661	32.60655	1100.03446		4-A-2,6-DNT
7.794	1	BV	80.37498	13.30050	1069.02774		2,4-DNT
7.984	1	VB	42.00169	24.95418	1048.11775		2,6-DNT
10.641	2	VB	73.26495	14.40165	1055.13634		2-NT
11.534	2	BV	47.13138	23.40253	1102.99346		4-NT
12.502	2	VV	85.94993	12.38296	1064.31429		3-NT
14.068	2	BV	35.13242	29.39954	1032.87723		PETN

Totals : 1.89281e4

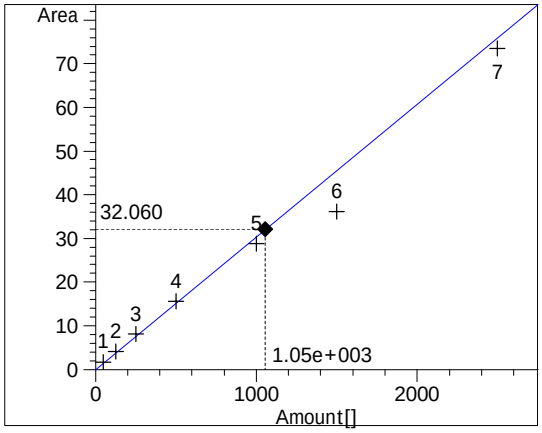
1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

Calibration Curves



HMX at exp. RT: 0.960
MWD1 B, Sig=254,4 Ref=360,100
Correlation: 0.99360
Residual Std. Dev.: 3.50499
Formula: y = mx
m: 2.40623e-2
x: Amount
y: Area



RDX at exp. RT: 1.720
MWD1 B, Sig=254,4 Ref=360,100
Correlation: 0.99328
Residual Std. Dev.: 4.47127
Formula: y = mx
m: 3.04135e-2
x: Amount
y: Area

EPA 8330B

Form 7B

CCAL Verifications

7E

ORGANICS CONTINUING CALIBRATION CHECK

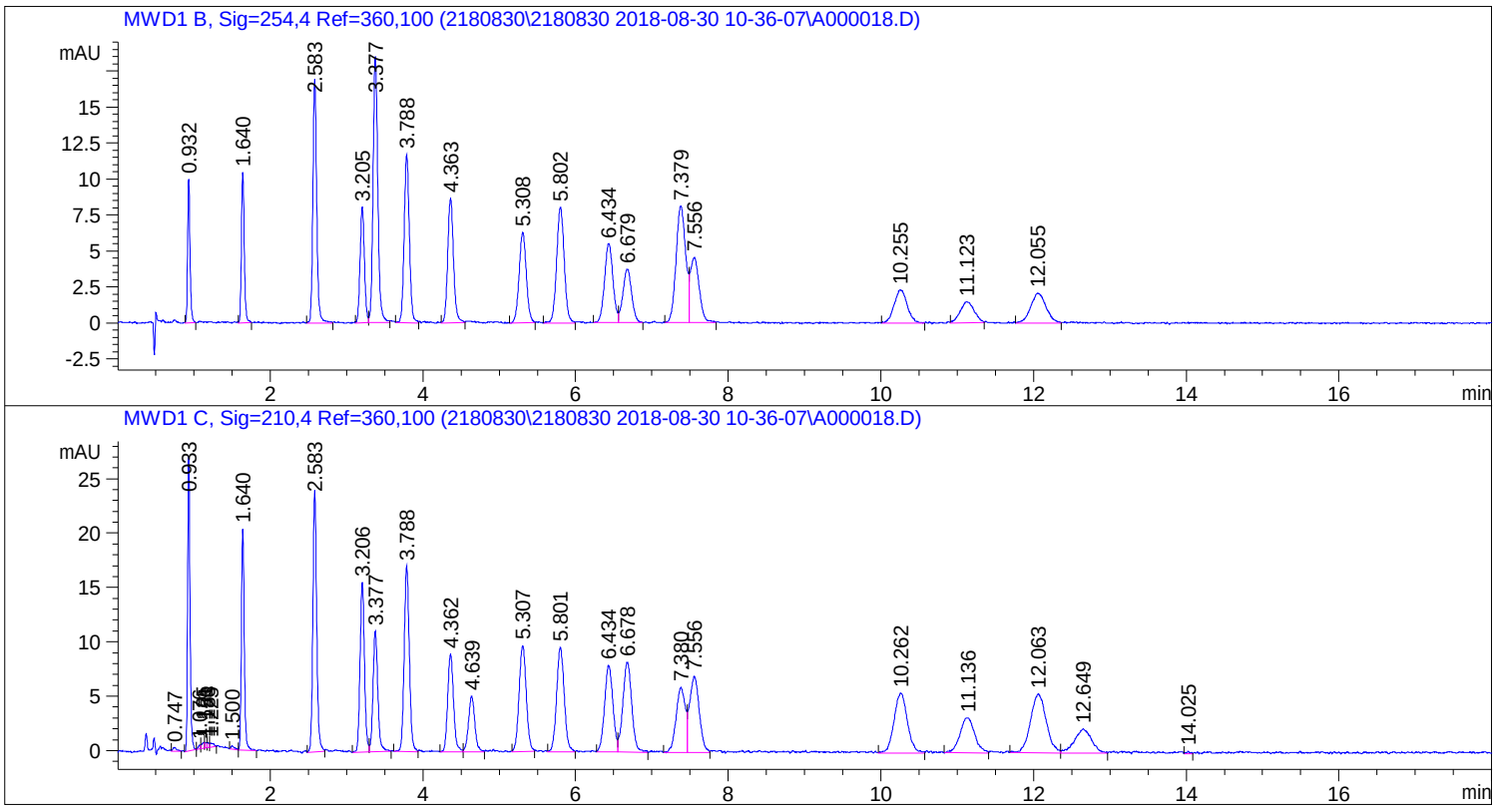
Report No:	218081814			CCAL ID:	1400
GC Column:	ARC18	ID	3 (mm)	Instrument ID:	HPLC3
Injection Vol.:	1.0		(µL)	Lab File ID:	2180830\A18
Init. Calib. Date 1:	07/24/18	Time 1:	1355	Analyst:	MEG
Init. Calib. Date 2:	07/24/18	Time 2:	1552	Analytical Batch:	643050
Analysis Date:	08/30/18	Time:	1622	Analytical Method:	EPA 8330B

ANALYTE	*TRUE*	*CONC*	*$\overline{RRF}$*	*RRF CCV*	*Min RRF*	*%D/%Drift*	*Max %D/ %Drift*	*TYPE*	*Q*
1,2-Dinitrobenzene	1000	1112	17.8	15.8	NA	-11.2	20	A	
1,3,5-Trinitrobenzene	1000	998.5	11.9	11.8	NA	-.8	20	A	
1,3-Dinitrobenzene	1000	957.2	12.2	12.6	NA	3.3	20	A	
2,4,6-Trinitrotoluene	1000	983.1	17.6	17.8	NA	1.1	20	A	
2,4-Dinitrotoluene	1000	938.4	13.5	14.2	NA	5.2	20	A	
2,6-Dinitrotoluene	1000	942.0	25.3	26.5	NA	4.7	20	A	
2-Amino-4,6-dinitrotoluene	1000	904.0	21.9	23.8	NA	8.7	20	A	
2-Nitrotoluene	1000	961.0	14.6	15.0	NA	2.7	20	A	
3,5-Dinitroaniline	1000	919.0	11.6	12.5	NA	7.8	20	A	
3-Nitrotoluene	1000	958.6	12.5	12.9	NA	3.2	20	A	
4-Amino-2,6-dinitrotoluene	1000	969.2	32.9	33.6	NA	2.1	20	A	
4-Nitrotoluene	1000	1014	23.6	23.1	NA	-2.1	20	A	
HMX	1000	916.4	42.1	45.3	NA	7.6	20	A	
Nitrobenzene	1000	937.6	20.8	21.9	NA	5.3	20	A	
Nitroglycerin	1000	941.9	32.7	34.3	NA	4.9	20	A	
Pentaerythritol Tetranitrate	1000	990.1	29.7	29.7	NA	0	20	A	
RDX	1000	901.8	33.3	36.5	NA	9.6	20	A	
Tetryl	1000	990.2	24.4	24.4	NA	0	20	A	

FORM V II SV

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000018.D
Sample Name: 1400*1000

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  18
Acq. Instrument : HPLC3                         Location : Vial 2
Injection Date  : 8/30/2018 4:22:05 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 3:01:24 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:33:06 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:33:08 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.932	1	VV	22.05092	41.55880	916.40993		HMX
1.640	1	VB	27.42544	32.88013	901.75200		RDX
2.583	2	VV	84.67825	11.79190	998.51760		1,3,5-TNB
3.206	2	BV	63.24171	17.58403	1112.04398		1,2-DNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000018.D
Sample Name: 1400*1000

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.377	1	VV	79.21719	12.08328	957.20331		1,3-DNB
3.788	2	BV	79.84002	11.51055	919.00287		3,5-DNA
4.363	1	VV	45.63094	20.54823	937.63508		NB
4.639	2	VB	29.13800	32.32469	941.87690		NG
5.308	1	BB	41.01838	24.14035	990.19780		TETRYL
5.802	1	BV	56.19458	17.49447	983.09445		2,4,6-TNT
6.434	1	BV	42.03727	21.50419	903.97726		2-A-4,6-DNT
6.679	1	VB	29.72286	32.60655	969.15998		4-A-2,6-DNT
7.379	1	BV	70.55128	13.30050	938.36759		2,4-DNT
7.556	1	VV	37.74738	24.95418	941.95483		2,6-DNT
10.262	2	VV	66.72885	14.40165	961.00568		2-NT
11.136	2	BV	43.34548	23.40253	1014.39374		4-NT
12.063	2	BV	77.41190	12.38296	958.58820		3-NT
12.649	2	VB	33.67876	29.39954	990.14032		PETN

Totals : 1.73353e4

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

7E

ORGANICS CONTINUING CALIBRATION CHECK

Report No:	218081814			CCAL ID:	1400
GC Column:	ARC18	ID	3 (mm)	Instrument ID:	HPLC3
Injection Vol.:	1.0		(µL)	Lab File ID:	2180830\A32
Init. Calib. Date 1:	07/24/18	Time 1:	1355	Analyst:	MEG
Init. Calib. Date 2:	07/24/18	Time 2:	1552	Analytical Batch:	643050
Analysis Date:	08/30/18	Time:	2058	Analytical Method:	EPA 8330B

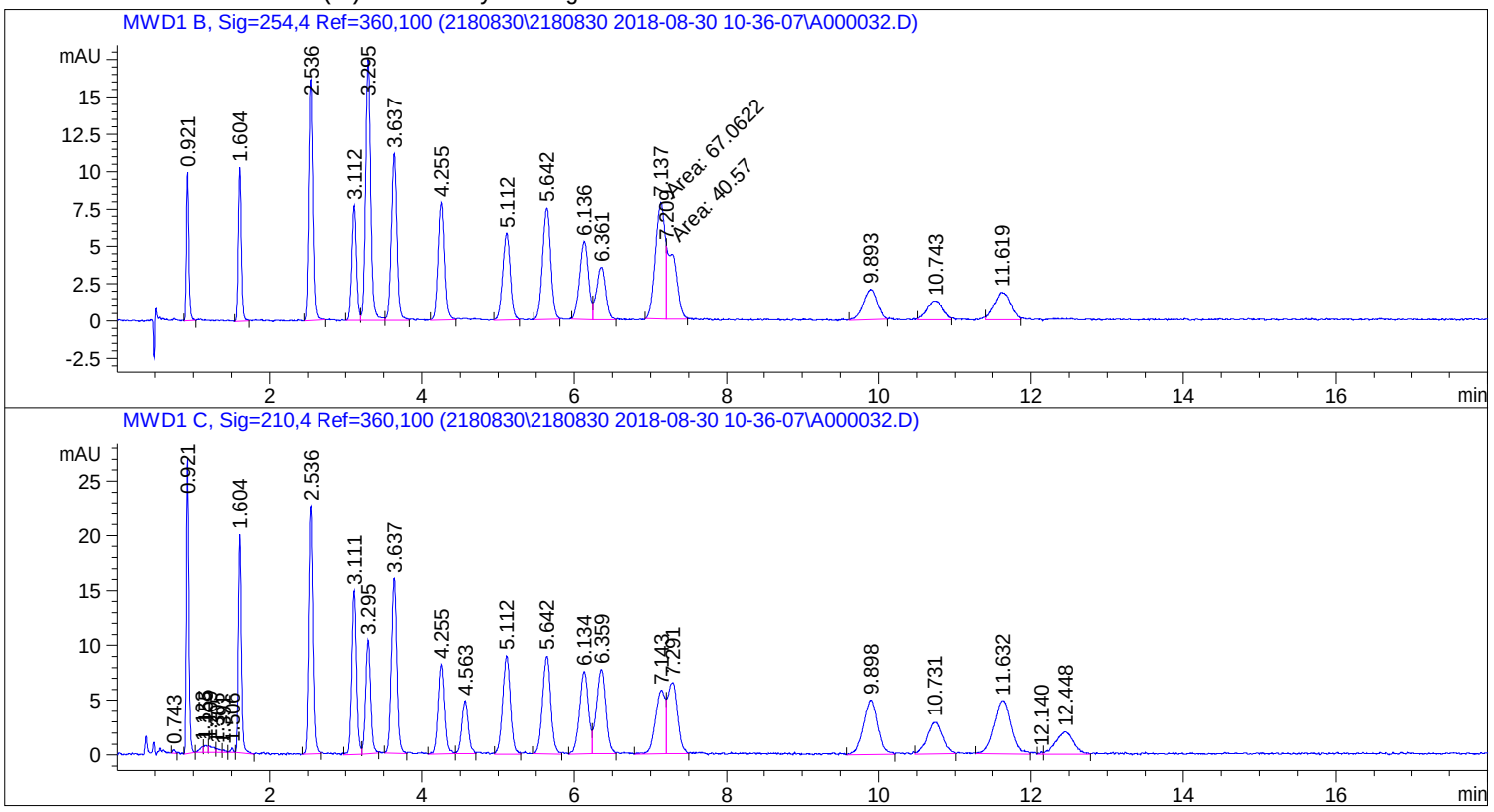
ANALYTE	*TRUE*	*CONC*	*$\overline{RRF}$*	*RRF CCV*	*Min RRF*	*%D/%Drift*	*Max %D/ %Drift*	*TYPE*	*Q*
1,2-Dinitrobenzene	1000	1141	17.8	15.4	NA	-13.5	20	A	
1,3,5-Trinitrobenzene	1000	1003	11.9	11.8	NA	-.8	20	A	
1,3-Dinitrobenzene	1000	979.0	12.2	12.3	NA	.8	20	A	
2,4,6-Trinitrotoluene	1000	976.1	17.6	17.9	NA	1.7	20	A	
2,4-Dinitrotoluene	1000	892.0	13.5	14.9	NA	10.4	20	A	
2,6-Dinitrotoluene	1000	1012	25.3	24.6	NA	-2.8	20	A	
2-Amino-4,6-dinitrotoluene	1000	919.1	21.9	23.4	NA	6.8	20	A	
2-Nitrotoluene	1000	937.8	14.6	15.4	NA	5.5	20	A	
3,5-Dinitroaniline	1000	925.7	11.6	12.4	NA	6.9	20	A	
3-Nitrotoluene	1000	925.8	12.5	13.4	NA	7.2	20	A	
4-Amino-2,6-dinitrotoluene	1000	969.1	32.9	33.6	NA	2.1	20	A	
4-Nitrotoluene	1000	963.8	23.6	24.3	NA	3	20	A	
HMX	1000	919.8	42.1	45.2	NA	7.4	20	A	
Nitrobenzene	1000	914.0	20.8	22.5	NA	8.2	20	A	
Nitroglycerin	1000	939.2	32.7	34.4	NA	5.2	20	A	
Pentaerythritol Tetranitrate	1000	958.4	29.7	30.7	NA	3.4	20	A	
RDX	1000	923.1	33.3	35.6	NA	6.9	20	A	
Tetryl	1000	981.3	24.4	24.6	NA	.8	20	A	

FORM V II SV

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000032.D
Sample Name: 1400*1000

```
==========================================================================
Acq. Operator   : MEG                          Seq. Line :  32
Acq. Instrument : HPLC3                         Location : Vial 2
Injection Date  : 8/30/2018 8:58:36 PM               Inj :   1
                                               Inj Volume : 25.000 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 5.000 µl
Acq. Method     : D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\8330_ARC1.M
Last changed    : 8/30/2018 4:40:04 PM by MEG
Analysis Method : D:\CHEMSTATION\2\DATA\2180830\8330_ARC_2180724ICAL_0830.M
Last changed    : 8/31/2018 9:54:55 AM by MEG
                  (modified after loading)
Method Info     : 8330 Raptor ARC-18

Additional Info : Peak(s) manually integrated
```




```
==========================================================================
                      External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      8/31/2018 9:54:56 AM
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: MWD1 B, Sig=254,4 Ref=360,100
Signal 2: MWD1 C, Sig=210,4 Ref=360,100
```

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
0.921	1	VB	22.13168	41.55880	919.76594		HMX
1.604	1	BV	28.07366	32.88013	923.06563		RDX
2.536	2	BV	85.07629	11.79190	1003.21126		1,3,5-TNB

Data File D:\CHEMSTATION\2\DATA\2180830\2180830 2018-08-30 10-36-07\A000032.D
Sample Name: 1400*1000

RetTime [min]	Sig	Type	Area [mAU*s]	Amt/Area	Amount	Grp	Name
3.111	2	VV	64.90883	17.58403	1141.35856		1,2-DNB
3.295	1	VV	81.01883	12.08328	978.97307		1,3-DNB
3.637	2	BV	80.41807	11.51055	925.65654		3,5-DNA
4.255	1	VV	44.48309	20.54823	914.04864		NB
4.563	2	VV	29.05413	32.32469	939.16571		NG
5.112	1	VV	40.64785	24.14035	981.25319		TETRYL
5.642	1	BV	55.79359	17.49447	976.07921		2,4,6-TNT
6.136	1	VV	42.74006	21.50419	919.09033		2-A-4,6-DNT
6.361	1	VV	29.71970	32.60655	969.05699		4-A-2,6-DNT
7.137	1	MF	67.06220	13.30050	891.96104		2,4-DNT
7.209	1	FM	40.57004	24.95418	1012.39196		2,6-DNT
9.898	2	BB	65.11871	14.40165	937.81703		2-NT
10.731	2	VB	41.18275	23.40253	963.78045		4-NT
11.632	2	BV	74.76206	12.38296	925.77542		3-NT
12.448	2	VV	32.59918	29.39954	958.40109		PETN
Totals :			1.72809e4				

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

==========

*** End of Report ***

EPA 8330B

RunLogs

Vial	Sample	Dilution	File Number
P1-A-02	1207*2500	1	A000003.D
P1-A-02	1206*1250	1	A000004.D
P1-A-02	1205*1000	1	A000005.D
P1-A-03	1204*500	1	A000006.D
P1-A-03	1203*250	1	A000007.D
P1-A-03	1202*125	1	A000008.D
P1-A-03	1201*50	1	A000009.D
P1-A-04	1600*1000	1	A000010.D
P1-E-07	21807123417	1	A000011.D
P1-E-08	1831319	1	A000012.D
P1-E-09	1831318	1	A000013.D
P1-F-02	21807123418	1	A000014.D
P1-F-03	21807123419	1	A000015.D
P1-F-04	21807123420	1	A000016.D
P1-F-05	21807123421	1	A000017.D
P1-F-06	21807123422	1	A000018.D
P1-F-07	1831320	1	A000019.D
P1-F-08	1831314	1	A000020.D
P1-F-09	1831315	1	A000021.D
P1-A-01	1400*1000	1	A000022.D
P2-A-01	1831831	1	A000023.D
P2-A-02	1831832	1	A000024.D
P2-A-03	1831833	1	A000025.D
P2-A-04	21807132408	1	A000026.D
P2-A-05	21807132410	1	A000027.D
P2-A-06	21807132411	1	A000028.D
P2-A-07	21807132412	1	A000029.D
P2-A-08	21807132413	1	A000030.D
P2-A-09	1831834	1	A000031.D
P2-B-01	1831835	1	A000032.D
P2-B-02	21807132414	1	A000033.D
P2-B-03	21807132415	1	A000034.D
P2-B-04	21807132416	1	A000035.D
P1-A-01	1400*1000	1	A000036.D
P2-B-05	21807132417	1	A000037.D
P2-B-06	1831836	1	A000038.D
P2-B-07	1831837	1	A000039.D
P2-B-08	21807132418	5	A000040.D
P2-B-09	21807132419	1	A000041.D
P2-C-01	21807132421	5	A000042.D
P2-C-02	1831838	1	A000043.D
P2-C-03	1831832	1	A000044.D
P2-C-04	1831833	1	A000045.D
P1-A-01	1400*1000	1	A000046.D

Analyst	MEG
Method	ARCI
CCV	005-45-6
RunDate	7/24/2018

Vial	Sample	Dilution	File Number
Vial 2	1400*1000	1	A000003.D
P2-A-01	1843189	1	A000004.D
P2-A-02	1843190	1	A000005.D
P2-A-03	1843191	1	A000006.D
P2-A-04	21808241101	1	A000007.D
P2-A-05	1843193	1	A000008.D
P2-A-06	1843192	1	A000009.D
P2-A-07	1843194	1	A000010.D
P2-A-08	1843195	1	A000011.D
P2-A-09	1843196	1	A000012.D
Vial 2	1400*1000	1	A000013.D
P2-B-01	21808172601	1	A000014.D
P2-B-02	21808172602	1	A000015.D
P2-B-03	21808172603	1	A000016.D
P2-B-04	21808172604	1	A000017.D
Vial 2	1400*1000	1	A000018.D
P2-B-06	1843101	1	A000019.D
P2-B-07	1843102	1	A000020.D
P2-B-08	1843103	1	A000021.D
P2-B-09	21808181401	1	A000022.D
P2-C-01	21808181402	1	A000023.D
P2-C-02	21808181403	1	A000024.D
P2-C-03	21808181404	1	A000025.D
P2-C-04	21808181407	1	A000026.D
P2-C-05	1843105	1	A000027.D
P2-C-06	1843104	1	A000028.D
P2-C-07	1843106	1	A000029.D
P2-C-08	1843214	1	A000030.D
P2-C-09	1843215	1	A000031.D
Vial 2	1400*1000	1	A000032.D

Analyst	MEG
Method	ARCI
CCV	005-49-4
RunDate	8/30/2018

EPA 8330B

PrepSheets

GCAL ANALYTICAL LABORATORIES, LLC

8330B Explosives Prep Solid

642680

ANALYST/ TECH	DMB	START DATE/TIME	8/24/18 1800	END DATE/TIME	8/25/18 1700	BATCH	642680

#	CLIENT	TYPE	CLIENT ID	GCAL ID	INITIAL WGT (g)	FINAL VOL (mL)	COMMENT	STANDARDS\ REAGENTS
1	QC	MB	MB 1843101	1843101	10.0	40		8330 Surrogate 4/10ug/ml / Volume 1.0ml 103-27-8
2	QC	LCS	SRM 1843102 ** Use SRM **	1843102	10.0	40		
3	QC	LCSD	SRMD 1843103 ** Use SRM **	1843103	10.0	40		8330 Spike 4/10ug/ml / Volume 1.0ml 103-23-1
4	4838	SAMP	WIL02IS01	21808181401	10.1	40		
5	4838	MS	WIL02IS01 MS	21808181402	10.1	40		Solid Reference Material 427150
6	4838	MSD	WIL02IS01 MSD	21808181403	10.0	40		
7	4838	SAMP	WIL02IS02	21808181404	10.5	40		HPLC Water 2126989
8	4838	SAMP	WIL02IS03	21808181407	10.0	40		
9	QC	DUP	DUP 1843105	1843105	10.0	40		Acetonitrile 127054
10	QC	DUP	DUP 1843104	1843104	10.0	40		
11	QC	GRBLK	GRBLK 1843106	1843106	10.0	40		Sand
12	QC	LCS	SRM 1843214 ** Use SRM **	1843214	10.0	40	spike	
13	QC	LCSD	SRMD 1843215 ** Use SRM **	1843215	10.0	40	spike	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

EQUIPMENT\CONDITIONS

BALANCE ID	03	GRINDER ID - PUCK 01	

NOTES

Matrix-Solid. Batch Batch Rule 8330B_S_EX.

GCAL

SOLIDS DATA SHEET

TS/TSS Oven Temp: 103 - 105 °C
TDS Oven Temp: 180 ± 2 °C
TVS/VSS Muffle Furnace Temp: 550 ± 5% (27) °C
Ash Muffle Furnace Temp: 800 ± 5% (40) °C

Test: DW

HBN: 642651

SOLI Batch Number: 30063

Initial Weight
Balance ID: BAL 15
Date/Time: 8-24-18 14:42
Analyst: CTS

Oven ID: 011
Date/Time IN: 8-24-18 14:42
Oven Temp °C IN: 104
Oven Temp °C OUT: 104
Date/Time OUT/Desiccator#: 8-26-18 DS 16:55
Analyst: LDH

TDS Oven ID: NA
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 1
Balance ID: BAL 15
Date/Time: 8-26-18 18:05
Analyst: LDH

Oven ID: NA
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 2
Balance ID:
Date/Time:
Analyst:

Oven ID:
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 3 (If needed):
Balance ID: NA
Date/Time:
Analyst:

Oven ID:
Date/Time IN:
Oven Temp °C IN:
Oven Temp °C OUT:
Date/Time OUT/Desiccator#:
Analyst:

Final Weight 4 (If needed):
Balance ID:
Date/Time:
Analyst:

Comments:

Rev 005: 10/13/2017

Secondary Reviewer/Date: AJE 8/27/18

TOTAL SOLIDS AND MOISTURE ANALYSIS (SOLID MATRIX)

Method 2540G

HBN	642651			ANALYST:	CJS							DATE:	8/24/2018
SOLI	30063			REVIEW:	AJE 8/27/18							TIME:	14:25:00

Sample ID	Pan ID	Pan Mass (g)	Initial Mass (g) (Sample & Pan)	Final Wt. 1 (g) (Sample & Pan)	Final Wt. 2 (g) (Sample & Pan)	Diff (g)	Final Wt. 3 (g) (Sample & Pan)	Diff (g)	Initial Mass Less Pan (g)	Final Mass Less Pan (g)	Total Solid %	Totol Moisture %
21808181401	-1	1.0523	11.4465	9.9234					10.3942	8.8711	85.35	14.65
21808181402	-1	1.0523	11.4465	9.9234					10.3942	8.8711	85.35	14.65
21808181403	-1	1.0523	11.4465	9.9234					10.3942	8.8711	85.35	14.65
21808181404	-2	1.0358	11.1510	9.5579					10.1152	8.5221	84.25	15.75
1842976	-3	1.0393	11.2272	9.8124					10.1879	8.7731	86.11	13.89
21808181405	-4	1.0169	11.2530	10.5530					10.2361	9.5361	93.16	6.84
21808181406	-5	1.0270	11.8426	11.2025					10.8156	10.1755	94.08	5.92
21808181407	-6	1.0450	11.1186	9.0731					10.0736	8.0281	79.69	20.31
21808221701	-7	1.0456	11.0537	8.4672					10.0081	7.4216	74.16	25.84
21808221702	-8	1.0577	11.0384	9.3808					9.9807	8.3231	83.39	16.61

TS % = ((Final Sample Mass - Initial Sample Mass) x 100) / Initial Sample Mass

TM % = 100-TS%

Method 2540G

Total Solids Solid Spreadsheet, Version 2, 01/26/11

GCAL ANALYTICAL LABORATORIES, LLC

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

CHAIN OF CUSTODY RECORD

Client ID: 4838 - AECOM
SDG: 218081814
PM: AEC

GCAL USE ONLY

Report to:	Bill to:
Client: AECOM	Client:
Address: 12420 Milestone Center Dr. St. 150, Germantown, MD 20876	Address: Same as "Report to:"
Contact: Jennifer Li	Contact:
Phone: 301-820-3476	Phone:
E-mail: Jennifer.j.li@aecom.com	E-mail:

P.O. Number:

Project Name/Number: Williston LTA, #60520456

Sampled By:

Analytical Requests & Method: Total Metals (6020B) Sb, Cu, Zn, Pb; Explosives (8330B)

GCAL use only:
Custody Seal used ☐ yes ☐ no intact ☐ yes ☐ no E29
Temperature °C 3,2,2,4,1,9
33,38,45 cpm

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Containers	Total Metals (6020B) Sb, Cu, Zn, Pb	Explosives (8330B)	Preservative
SOIL	8-15-18	1200	X		WIL02ISO1	1	X	X	MS/MSD extra volume -3
SOIL	8-15-18	1210	X		WIL02ISO2	1	X	X	-4
SOIL	8-14-18	1400	X		WIL01ISO3	1	X		-5
SOIL	8-14-18	1340	X		WIL01ISO1	1	X		-6
SOIL	8-15-18	1220	X		WIL02ISO3	1	X	X	-7

Air Bill No: 1523-5315-3431

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☒ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	8/17/18	1100			
Relinquished by: (Signature) FedEx	Date: 8/18/18	Time: 1045	Received by: (Signature)	Date: 8/18/18	Time: 1045
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Note: 1 of 4 sample coolers
MS/MSD from WIL02ISO1

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

SAMPLE RECEIVING CHECKLIST

218081814

SAMPLE DELIVERY GROUP 218081814	
Client **PM** AEC 4838 - AECOM	**Transport Method** FEDEX
Profile Number 277537	**Received By** Savage, Tiffany R
Line Item(s) 1 - ISM- Explosives/Metals	**Receive Date(s)** 08/18/18

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by GCAL?	☐	☑

COOLERS

Airbill	Thermometer ID: E29	Temp °C
7823-5315-3431		3.2
		2.4
		1.9

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES