

Cover Page

Order ID : P4397

Project ID : Amtrak Sawtooth Bridges 2024

Client : Portal Partners Tri-Venture

Lab Sample Number

P4397-01
P4397-02
P4397-04
P4397-05
P4397-06

Client Sample Number

WB-301-TOP
WB-301-BOT
WB-301-SW
TB-10102024
WB-301-BOT

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Signature : _____

Date: 10/29/2024

NYDOH CERTIFICATION NO - 11376

NJDEP CERTIFICATION NO - 20012

DATA REPORTING QUALIFIERS- INORGANIC

For reporting results, the following “ Results Qualifiers” are used:

J	Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).
U	Indicates the analyte was analyzed for, but not detected.
ND	Indicates the analyte was analyzed for, but not detected
E	Indicates the reported value is estimated because of the presence of interference
M	Indicates Duplicate injection precision not met.
N	Indicates the spiked sample recovery is not within control limits.
S	Indicates the reported value was determined by the Method of Standard Addition (MSA).
*	Indicates that the duplicate analysis is not within control limits.
+	Indicates the correlation coefficient for the MSA is less than 0.995.
D	Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
M	Method qualifiers “P” for ICP instrument “PM” for ICP when Microwave Digestion is used “CV” for Manual Cold Vapor AA “AV” for automated Cold Vapor AA “CA” for MIDI-Distillation Spectrophotometric “AS” for Semi -Automated Spectrophotometric “C” for Manual Spectrophotometric “T” for Titrimetric “NR” for analyte not required to be analyzed
OR	Indicates the analyte’s concentration exceeds the calibrated range of the instrument for that specific analysis.
Q	Indicates the LCS did not meet the control limits requirements
H	Sample Analysis Out Of Hold Time

APPENDIX A

QA REVIEW GENERAL DOCUMENTATION

Project #: P4397

Completed

For thorough review, the report must have the following:

GENERAL:

Are all original paperwork present (chain of custody, record of communication,airbill, sample management lab chronicle, login page)

✓

Check chain-of-custody for proper relinquish/return of samples

✓

Is the chain of custody signed and complete

✓

Check internal chain-of-custody for proper relinquish/return of samples /sample extracts

✓

Collect information for each project id from server. Were all requirements followed

✓

COVER PAGE:

Do numbers of samples correspond to the number of samples in the Chain of Custody on login page

✓

Do lab numbers and client Ids on cover page agree with the Chain of Custody

✓

CHAIN OF CUSTODY:

Do requested analyses on Chain of Custody agree with form I results

✓

Do requested analyses on Chain of Custody agree with the log-in page

✓

Were the correct method log-in for analysis according to the Analytical Request and Chain of Castody

✓

Were the samples received within hold time

✓

Were any problems found with the samples at arrival recorded in the Sample Management Laboratory Chronicle

✓

ANALYTICAL:

Was method requirement followed?

✓

Was client requirement followed?

✓

Does the case narrative summarize all QC failure?

✓

All runlogs and manual integration are reviewed for requirements

✓

All manual calculations and /or hand notations verified

✓

QA Review Signature: PATEL VAISHALI

Date: 10/29/2024

LAB CHRONICLE

OrderID:	P4397	OrderDate:	10/11/2024 3:19:00 PM
Client:	Portal Partners Tri-Venture	Project:	Amtrak Sawtooth Bridges 2024
Contact:	Joseph Krupansky	Location:	K32,VOA Ref. #2 Soil,VOA Ref. #3 Water

LabID	ClientID	Matrix	Test	Method	Sample Date	Prep Date	Anal Date	Received
P4397-06	WB-301-BOT	TCLP	TCLP ICP Metals	6010D	10/10/24	10/21/24	10/23/24	10/11/24
			TCLP Mercury	7470A		10/22/24	10/23/24	



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Hit Summary Sheet
SW-846

SDG No.: P4397

Order ID: P4397

Client: Portal Partners Tri-Venture

Project ID: Amtrak Sawtooth Bridges 2024

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	RDL	Units
Client ID : WB-301-BOT								
P4397-06	WB-301-BOT	TCLP	Arsenic	275		34.8	100	ug/L
P4397-06	WB-301-BOT	TCLP	Barium	335	J	62.8	500	ug/L
P4397-06	WB-301-BOT	TCLP	Cadmium	1.32	J	0.94	30.0	ug/L
P4397-06	WB-301-BOT	TCLP	Chromium	491		6.60	50.0	ug/L
P4397-06	WB-301-BOT	TCLP	Lead	43.0	J	35.1	60.0	ug/L



SAMPLE DATA

Report of Analysis

Client:	Portal Partners Tri-Venture	Date Collected:	10/10/24
Project:	Amtrak Sawtooth Bridges 2024	Date Received:	10/11/24
Client Sample ID:	WB-301-BOT	SDG No.:	P4397
Lab Sample ID:	P4397-06	Matrix:	TCLP
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7440-38-2	Arsenic	275		1	34.8	100	ug/L	10/21/24 11:45	10/23/24 16:59	SW6010	SW3050
7440-39-3	Barium	335	J	1	62.8	500	ug/L	10/21/24 11:45	10/23/24 16:59	SW6010	SW3050
7440-43-9	Cadmium	1.32	J	1	0.94	30.0	ug/L	10/21/24 11:45	10/23/24 16:59	SW6010	SW3050
7440-47-3	Chromium	491		1	6.60	50.0	ug/L	10/21/24 11:45	10/23/24 16:59	SW6010	SW3050
7439-92-1	Lead	43.0	J	1	35.1	60.0	ug/L	10/21/24 11:45	10/23/24 16:59	SW6010	SW3050
7439-97-6	Mercury	0.81	U	1	0.81	2.00	ug/L	10/22/24 11:50	10/23/24 10:10	SW7470A	
7782-49-2	Selenium	58.8	U	1	58.8	100	ug/L	10/21/24 11:45	10/23/24 16:59	SW6010	SW3050
7440-22-4	Silver	5.80	U	1	5.80	50.0	ug/L	10/21/24 11:45	10/23/24 16:59	SW6010	SW3050

Color Before:	Colorless	Clarity Before:	Clear	Texture:
Color After:	Colorless	Clarity After:	Clear	Artifacts:
Comments:	TCLP-FULL			

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N = Spiked sample recovery not within control limits



METAL CALIBRATION DATA

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Portal Partners Tri-Venture **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397
Initial Calibration Source: EPA
Continuing Calibration Source: PLASMA-PURE

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV48	Mercury	3.96	4.0	99	90 - 110	CV	10/23/2024	09:44	LB133065

Metals

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Portal Partners Tri-Venture **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397
Initial Calibration Source: EPA
Continuing Calibration Source: PLASMA-PURE

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV56	Mercury	5.02	5.0	100	90 - 110	CV	10/23/2024	09:48	LB133065
CCV57	Mercury	5.31	5.0	106	90 - 110	CV	10/23/2024	10:22	LB133065
CCV58	Mercury	5.43	5.0	109	90 - 110	CV	10/23/2024	10:49	LB133065
CCV59	Mercury	5.31	5.0	106	90 - 110	CV	10/23/2024	11:16	LB133065

Metals

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Portal Partners Tri-Venture **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397
Initial Calibration Source: EPA
Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV01	Arsenic	998	1000	100	90 - 110	P	10/23/2024	14:59	LB133086
	Barium	501	520	96	90 - 110	P	10/23/2024	14:59	LB133086
	Cadmium	506	510	99	90 - 110	P	10/23/2024	14:59	LB133086
	Chromium	538	520	103	90 - 110	P	10/23/2024	14:59	LB133086
	Lead	1010	1000	101	90 - 110	P	10/23/2024	14:59	LB133086
	Selenium	1020	1000	102	90 - 110	P	10/23/2024	14:59	LB133086
	Silver	256	250	102	90 - 110	P	10/23/2024	14:59	LB133086

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Portal Partners Tri-Venture **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397
Initial Calibration Source: EPA
Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
LLICV01	Arsenic	18.8	20.0	94	80 - 120	P	10/23/2024	15:11	LB133086
	Barium	93.0	100	93	80 - 120	P	10/23/2024	15:11	LB133086
	Cadmium	5.79	6.0	96	80 - 120	P	10/23/2024	15:11	LB133086
	Chromium	10.1	10.0	101	80 - 120	P	10/23/2024	15:11	LB133086
	Lead	11.9	12.0	99	80 - 120	P	10/23/2024	15:11	LB133086
	Selenium	20.9	20.0	105	80 - 120	P	10/23/2024	15:11	LB133086
	Silver	10.3	10.0	103	80 - 120	P	10/23/2024	15:11	LB133086

Metals

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Portal Partners Tri-Venture **SDG No.:** P4397

Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV01	Arsenic	5090	5000	102	90 - 110	P	10/23/2024	15:57	LB133086
	Barium	9630	10000	96	90 - 110	P	10/23/2024	15:57	LB133086
	Cadmium	2520	2500	101	90 - 110	P	10/23/2024	15:57	LB133086
	Chromium	1010	1000	101	90 - 110	P	10/23/2024	15:57	LB133086
	Lead	5020	5000	100	90 - 110	P	10/23/2024	15:57	LB133086
	Selenium	5060	5000	101	90 - 110	P	10/23/2024	15:57	LB133086
	Silver	1250	1250	100	90 - 110	P	10/23/2024	15:57	LB133086
CCV02	Arsenic	4840	5000	97	90 - 110	P	10/23/2024	16:48	LB133086
	Barium	9150	10000	92	90 - 110	P	10/23/2024	16:48	LB133086
	Cadmium	2410	2500	96	90 - 110	P	10/23/2024	16:48	LB133086
	Chromium	969	1000	97	90 - 110	P	10/23/2024	16:48	LB133086
	Lead	4810	5000	96	90 - 110	P	10/23/2024	16:48	LB133086
	Selenium	4860	5000	97	90 - 110	P	10/23/2024	16:48	LB133086
	Silver	1200	1250	96	90 - 110	P	10/23/2024	16:48	LB133086
CCV03	Arsenic	4880	5000	98	90 - 110	P	10/23/2024	17:42	LB133086
	Barium	9030	10000	90	90 - 110	P	10/23/2024	17:42	LB133086
	Cadmium	2440	2500	97	90 - 110	P	10/23/2024	17:42	LB133086
	Chromium	992	1000	99	90 - 110	P	10/23/2024	17:42	LB133086
	Lead	4850	5000	97	90 - 110	P	10/23/2024	17:42	LB133086
	Selenium	4880	5000	98	90 - 110	P	10/23/2024	17:42	LB133086
	Silver	1230	1250	98	90 - 110	P	10/23/2024	17:42	LB133086
CCV04	Arsenic	5070	5000	101	90 - 110	P	10/23/2024	18:32	LB133086
	Barium	9310	10000	93	90 - 110	P	10/23/2024	18:32	LB133086
	Cadmium	2540	2500	102	90 - 110	P	10/23/2024	18:32	LB133086
	Chromium	1020	1000	102	90 - 110	P	10/23/2024	18:32	LB133086
	Lead	5080	5000	102	90 - 110	P	10/23/2024	18:32	LB133086
	Selenium	5090	5000	102	90 - 110	P	10/23/2024	18:32	LB133086
	Silver	1250	1250	100	90 - 110	P	10/23/2024	18:32	LB133086
CCV05	Arsenic	4920	5000	98	90 - 110	P	10/23/2024	19:23	LB133086
	Barium	9250	10000	92	90 - 110	P	10/23/2024	19:23	LB133086
	Cadmium	2460	2500	99	90 - 110	P	10/23/2024	19:23	LB133086
	Chromium	984	1000	98	90 - 110	P	10/23/2024	19:23	LB133086
	Lead	4910	5000	98	90 - 110	P	10/23/2024	19:23	LB133086
	Selenium	4910	5000	98	90 - 110	P	10/23/2024	19:23	LB133086

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Portal Partners Tri-Venture **SDG No.:** P4397

Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397

Initial Calibration Source: EPA

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV05	Silver	1210	1250	97	90 - 110	P	10/23/2024	19:23	LB133086
CCV06	Arsenic	4890	5000	98	90 - 110	P	10/23/2024	20:15	LB133086
	Barium	9330	10000	93	90 - 110	P	10/23/2024	20:15	LB133086
	Cadmium	2470	2500	99	90 - 110	P	10/23/2024	20:15	LB133086
	Chromium	989	1000	99	90 - 110	P	10/23/2024	20:15	LB133086
	Lead	4910	5000	98	90 - 110	P	10/23/2024	20:15	LB133086
	Selenium	4870	5000	97	90 - 110	P	10/23/2024	20:15	LB133086
	Silver	1220	1250	98	90 - 110	P	10/23/2024	20:15	LB133086
CCV07	Arsenic	4820	5000	96	90 - 110	P	10/23/2024	21:28	LB133086
	Barium	9500	10000	95	90 - 110	P	10/23/2024	21:28	LB133086
	Cadmium	2420	2500	97	90 - 110	P	10/23/2024	21:28	LB133086
	Chromium	952	1000	95	90 - 110	P	10/23/2024	21:28	LB133086
	Lead	4820	5000	96	90 - 110	P	10/23/2024	21:28	LB133086
	Selenium	4830	5000	97	90 - 110	P	10/23/2024	21:28	LB133086
	Silver	1170	1250	94	90 - 110	P	10/23/2024	21:28	LB133086
CCV08	Arsenic	4800	5000	96	90 - 110	P	10/23/2024	22:20	LB133086
	Barium	9320	10000	93	90 - 110	P	10/23/2024	22:20	LB133086
	Cadmium	2510	2500	100	90 - 110	P	10/23/2024	22:20	LB133086
	Chromium	1010	1000	101	90 - 110	P	10/23/2024	22:20	LB133086
	Lead	4980	5000	100	90 - 110	P	10/23/2024	22:20	LB133086
	Selenium	4770	5000	96	90 - 110	P	10/23/2024	22:20	LB133086
	Silver	1220	1250	97	90 - 110	P	10/23/2024	22:20	LB133086



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Metals

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CRDL STANDARD FOR AA & ICP

Client: Portal Partners Tri-Venture **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397
Initial Calibration Source: _____
Continuing Calibration Source: _____

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CRA	Mercury	0.22	0.2	109	40 - 160	CV	10/23/2024	09:53	LB133065
CRI01	Arsenic	19.7	20.0	99	40 - 160	P	10/23/2024	15:22	LB133086
	Barium	92.7	100	93	40 - 160	P	10/23/2024	15:22	LB133086
	Cadmium	5.38	6.0	90	40 - 160	P	10/23/2024	15:22	LB133086
	Chromium	10.0	10.0	100	40 - 160	P	10/23/2024	15:22	LB133086
	Lead	11.1	12.0	92	40 - 160	P	10/23/2024	15:22	LB133086
	Selenium	17.6	20.0	88	40 - 160	P	10/23/2024	15:22	LB133086
	Silver	10.1	10.0	101	40 - 160	P	10/23/2024	15:22	LB133086



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Metals

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client:	Portal Partners Tri-Venture				SDG No.:	P4397			
Contract:	PORT06	Lab Code:	CHEM		Case No.:	P4397		SAS No.:	P4397
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
ICB48	Mercury	0.20	+/-0.20	U	0.20	CV	10/23/2024	09:46	LB133065

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Portal Partners Tri-Venture

SDG No.: P4397

Contract: PORT06

Lab Code: CHEM

Case No.: P4397

SAS No.: P4397

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB56	Mercury	0.20	+/-0.20	U	0.20	CV	10/23/2024	09:51	LB133065
CCB57	Mercury	0.20	+/-0.20	U	0.20	CV	10/23/2024	10:24	LB133065
CCB58	Mercury	0.20	+/-0.20	U	0.20	CV	10/23/2024	10:51	LB133065
CCB59	Mercury	0.20	+/-0.20	U	0.20	CV	10/23/2024	11:18	LB133065

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Portal Partners Tri-Venture

SDG No.: P4397

Contract: PORT06

Lab Code: CHEM

Case No.: P4397

SAS No.: P4397

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
ICB01	Arsenic	20.0	+/-20.0	U	20.0	P	10/23/2024	15:16	LB133086
	Barium	100	+/-100	U	100	P	10/23/2024	15:16	LB133086
	Cadmium	6.00	+/-6.00	U	6.00	P	10/23/2024	15:16	LB133086
	Chromium	10.0	+/-10.0	U	10.0	P	10/23/2024	15:16	LB133086
	Lead	12.0	+/-12.0	U	12.0	P	10/23/2024	15:16	LB133086
	Selenium	20.0	+/-20.0	U	20.0	P	10/23/2024	15:16	LB133086
	Silver	10.0	+/-10.0	U	10.0	P	10/23/2024	15:16	LB133086

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Portal Partners Tri-Venture		SDG No.: P4397							
Contract: PORT06	Lab Code: CHEM	Case No.: P4397	SAS No.: P4397						
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB01	Arsenic	20.0	+/-20.0	U	20.0	P	10/23/2024	16:02	LB133086
	Barium	100	+/-100	U	100	P	10/23/2024	16:02	LB133086
	Cadmium	1.78	+/-6.00	J	6.00	P	10/23/2024	16:02	LB133086
	Chromium	10.0	+/-10.0	U	10.0	P	10/23/2024	16:02	LB133086
	Lead	12.0	+/-12.0	U	12.0	P	10/23/2024	16:02	LB133086
	Selenium	20.0	+/-20.0	U	20.0	P	10/23/2024	16:02	LB133086
	Silver	1.20	+/-10.0	J	10.0	P	10/23/2024	16:02	LB133086
CCB02	Arsenic	20.0	+/-20.0	U	20.0	P	10/23/2024	16:52	LB133086
	Barium	100	+/-100	U	100	P	10/23/2024	16:52	LB133086
	Cadmium	6.00	+/-6.00	U	6.00	P	10/23/2024	16:52	LB133086
	Chromium	10.0	+/-10.0	U	10.0	P	10/23/2024	16:52	LB133086
	Lead	12.0	+/-12.0	U	12.0	P	10/23/2024	16:52	LB133086
	Selenium	20.0	+/-20.0	U	20.0	P	10/23/2024	16:52	LB133086
	Silver	10.0	+/-10.0	U	10.0	P	10/23/2024	16:52	LB133086
CCB03	Arsenic	20.0	+/-20.0	U	20.0	P	10/23/2024	17:46	LB133086
	Barium	100	+/-100	U	100	P	10/23/2024	17:46	LB133086
	Cadmium	6.00	+/-6.00	U	6.00	P	10/23/2024	17:46	LB133086
	Chromium	10.0	+/-10.0	U	10.0	P	10/23/2024	17:46	LB133086
	Lead	12.0	+/-12.0	U	12.0	P	10/23/2024	17:46	LB133086
	Selenium	20.0	+/-20.0	U	20.0	P	10/23/2024	17:46	LB133086
	Silver	10.0	+/-10.0	U	10.0	P	10/23/2024	17:46	LB133086
CCB04	Arsenic	20.0	+/-20.0	U	20.0	P	10/23/2024	18:36	LB133086
	Barium	100	+/-100	U	100	P	10/23/2024	18:36	LB133086
	Cadmium	6.00	+/-6.00	U	6.00	P	10/23/2024	18:36	LB133086
	Chromium	10.0	+/-10.0	U	10.0	P	10/23/2024	18:36	LB133086
	Lead	12.0	+/-12.0	U	12.0	P	10/23/2024	18:36	LB133086
	Selenium	20.0	+/-20.0	U	20.0	P	10/23/2024	18:36	LB133086
	Silver	10.0	+/-10.0	U	10.0	P	10/23/2024	18:36	LB133086
CCB05	Arsenic	20.0	+/-20.0	U	20.0	P	10/23/2024	19:28	LB133086
	Barium	100	+/-100	U	100	P	10/23/2024	19:28	LB133086
	Cadmium	6.00	+/-6.00	U	6.00	P	10/23/2024	19:28	LB133086
	Chromium	10.0	+/-10.0	U	10.0	P	10/23/2024	19:28	LB133086
	Lead	12.0	+/-12.0	U	12.0	P	10/23/2024	19:28	LB133086
	Selenium	20.0	+/-20.0	U	20.0	P	10/23/2024	19:28	LB133086
	Silver	10.0	+/-10.0	U	10.0	P	10/23/2024	19:28	LB133086
CCB06	Arsenic	20.0	+/-20.0	U	20.0	P	10/23/2024	20:21	LB133086
	Barium	100	+/-100	U	100	P	10/23/2024	20:21	LB133086
	Cadmium	6.00	+/-6.00	U	6.00	P	10/23/2024	20:21	LB133086
	Chromium	10.0	+/-10.0	U	10.0	P	10/23/2024	20:21	LB133086

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Portal Partners Tri-Venture		SDG No.: P4397							
Contract: PORT06	Lab Code: CHEM	Case No.: P4397	SAS No.: P4397						
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB06	Lead	12.0	+/-12.0	U	12.0	P	10/23/2024	20:21	LB133086
	Selenium	20.0	+/-20.0	U	20.0	P	10/23/2024	20:21	LB133086
	Silver	10.0	+/-10.0	U	10.0	P	10/23/2024	20:21	LB133086
CCB07	Arsenic	20.0	+/-20.0	U	20.0	P	10/23/2024	21:34	LB133086
	Barium	100	+/-100	U	100	P	10/23/2024	21:34	LB133086
	Cadmium	6.00	+/-6.00	U	6.00	P	10/23/2024	21:34	LB133086
	Chromium	10.0	+/-10.0	U	10.0	P	10/23/2024	21:34	LB133086
	Lead	12.0	+/-12.0	U	12.0	P	10/23/2024	21:34	LB133086
	Selenium	20.0	+/-20.0	U	20.0	P	10/23/2024	21:34	LB133086
	Silver	10.0	+/-10.0	U	10.0	P	10/23/2024	21:34	LB133086
CCB08	Arsenic	20.0	+/-20.0	U	20.0	P	10/23/2024	22:25	LB133086
	Barium	100	+/-100	U	100	P	10/23/2024	22:25	LB133086
	Cadmium	6.00	+/-6.00	U	6.00	P	10/23/2024	22:25	LB133086
	Chromium	10.0	+/-10.0	U	10.0	P	10/23/2024	22:25	LB133086
	Lead	12.0	+/-12.0	U	12.0	P	10/23/2024	22:25	LB133086
	Selenium	20.0	+/-20.0	U	20.0	P	10/23/2024	22:25	LB133086
	Silver	10.0	+/-10.0	U	10.0	P	10/23/2024	22:25	LB133086

Metals
- 3b -
PREPARATION BLANK SUMMARY

Client: Portal Partners Tri-Venture

SDG No.: P4397

Instrument: CV1

Sample ID	Analyte	Result (ug/L)	Acceptance Limit	Conc Qual	CRQL ug/L	M	Analysis Date	Analysis Time	Run
PB164261TB		WATER		Batch Number:	PB164306		Prep Date:	10/22/2024	
	Mercury	2.00	<2.00	U	2.00	CV	10/23/2024	11:02	LB133065
Sample ID	Analyte	Result (ug/L)	Acceptance Limit	Conc Qual	CRQL ug/L	M	Analysis Date	Analysis Time	Run
PB164306BL		WATER		Batch Number:	PB164306		Prep Date:	10/22/2024	
	Mercury	0.20	<0.20	U	0.20	CV	10/23/2024	10:06	LB133065

Metals
- 3b -
PREPARATION BLANK SUMMARY

Client: Portal Partners Tri-Venture

SDG No.: P4397

Instrument: P4

Sample ID	Analyte	Result (ug/L)	Acceptance Limit	Conc Qual	CRQL ug/L	M	Analysis Date	Analysis Time	Run
PB164261TB		WATER		Batch Number:	PB164298		Prep Date:	10/21/2024	
	Arsenic	100	<100	U	100	P	10/23/2024	17:29	LB133086
	Barium	500	<500	U	500	P	10/23/2024	17:29	LB133086
	Cadmium	30.0	<30.0	U	30.0	P	10/23/2024	17:29	LB133086
	Chromium	8.79	<50.0	J	50.0	P	10/23/2024	17:29	LB133086
	Lead	60.0	<60.0	U	60.0	P	10/23/2024	17:29	LB133086
	Selenium	100	<100	U	100	P	10/23/2024	17:29	LB133086
	Silver	50.0	<50.0	U	50.0	P	10/23/2024	17:29	LB133086
Sample ID	Analyte	Result (ug/L)	Acceptance Limit	Conc Qual	CRQL ug/L	M	Analysis Date	Analysis Time	Run
PB164298BL		WATER		Batch Number:	PB164298		Prep Date:	10/21/2024	
	Arsenic	100	<100	U	100	P	10/23/2024	17:34	LB133086
	Barium	500	<500	U	500	P	10/23/2024	17:34	LB133086
	Cadmium	30.0	<30.0	U	30.0	P	10/23/2024	17:34	LB133086
	Chromium	50.0	<50.0	U	50.0	P	10/23/2024	17:34	LB133086
	Lead	60.0	<60.0	U	60.0	P	10/23/2024	17:34	LB133086
	Selenium	100	<100	U	100	P	10/23/2024	17:34	LB133086
	Silver	50.0	<50.0	U	50.0	P	10/23/2024	17:34	LB133086

Metals

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INTERFERENCE CHECK SAMPLE

Client: Portal Partners Tri-Venture **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397
ICS Source: EPA **Instrument ID:** P4

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Low Limit (ug/L)	High Limit (ug/L)	Analysis Date	Analysis Time	Run Number
ICSA01	Arsenic	6.17			-20	20	10/23/2024	15:26	LB133086
	Barium	4.64	6.0	77	-94	106	10/23/2024	15:26	LB133086
	Cadmium	5.24	1.0	524	-5	7	10/23/2024	15:26	LB133086
	Chromium	58.7	52.0	113	42	62	10/23/2024	15:26	LB133086
	Lead	7.85			-12	12	10/23/2024	15:26	LB133086
	Selenium	-14.6			-20	20	10/23/2024	15:26	LB133086
	Silver	0.40			-10	10	10/23/2024	15:26	LB133086
ICSAB01	Arsenic	109	104	105	88.4	120	10/23/2024	15:32	LB133086
	Barium	477	537	89	437	637	10/23/2024	15:32	LB133086
	Cadmium	987	972	102	826	1120	10/23/2024	15:32	LB133086
	Chromium	574	542	106	460	624	10/23/2024	15:32	LB133086
	Lead	55.0	49.0	112	37	61	10/23/2024	15:32	LB133086
	Selenium	32.1	46.0	70	26	66	10/23/2024	15:32	LB133086
	Silver	206	201	102	170	232	10/23/2024	15:32	LB133086



METAL

QC

DATA

metals
- 5a -
MATRIX SPIKE SUMMARY

client: <u>Portal Partners Tri-Venture</u>	level: <u>low</u>	sdg no.: <u>P4397</u>
contract: <u>PORT06</u>	lab code: <u>CHEM</u>	case no.: <u>P4397</u> sas no.: <u>P4397</u>
matrix: <u>Water</u>	sample id: <u>P4460-04</u>	client id: <u>WB-303-BOTMS</u>
Percent Solids for Sample: <u>NA</u>	Spiked ID: <u>P4460-04MS</u>	Percent Solids for Spike Sample: <u>NA</u>

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	ug/L	75 - 125	3750		100	U	4000	94		P
Barium	ug/L	75 - 125	1240		360	J	1000	88		P
Cadmium	ug/L	75 - 125	911		30.0	U	1000	91		P
Chromium	ug/L	75 - 125	2000		10.6	J	2000	99		P
Lead	ug/L	75 - 125	4340		45.4	J	5000	86		P
Mercury	ug/L	75 - 125	32.3		2.00	U	40.0	81		CV
Selenium	ug/L	75 - 125	9110		100	U	10000	91		P
Silver	ug/L	75 - 125	376		50.0	U	380	99		P

metals
- 5a -
MATRIX SPIKE DUPLICATE SUMMARY

client: <u>Portal Partners Tri-Venture</u>	level: <u>low</u>	sdg no.: <u>P4397</u>
contract: <u>PORT06</u>	lab code: <u>CHEM</u>	case no.: <u>P4397</u> sas no.: <u>P4397</u>
matrix: <u>Water</u>	sample id: <u>P4460-04</u>	client id: <u>WB-303-BOTMSD</u>
Percent Solids for Sample: <u>NA</u>	Spiked ID: <u>P4460-04MSD</u>	Percent Solids for Spike Sample: <u>NA</u>

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	ug/L	75 - 125	3830		100	U	4000	96		P
Barium	ug/L	75 - 125	1260		360	J	1000	90		P
Cadmium	ug/L	75 - 125	927		30.0	U	1000	93		P
Chromium	ug/L	75 - 125	2030		10.6	J	2000	101		P
Lead	ug/L	75 - 125	4420		45.4	J	5000	88		P
Mercury	ug/L	75 - 125	38.3		2.00	U	40.0	96		CV
Selenium	ug/L	75 - 125	9330		100	U	10000	93		P
Silver	ug/L	75 - 125	379		50.0	U	380	100		P

Metals
- 5b -

Client: Portal Partners Tri-Venture **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397
Matrix: **Level:** LOW **Client ID:**
Sample ID: **Spiked ID:**

Analyte	Units	Acceptance Limit %R	C	Sample Result	C	Spike Added	% Recovery	Qual	M
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Metals

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DUPLICATE SAMPLE SUMMARY

Client: Portal Partners Tri-Venture **Level:** LOW **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397
Matrix: Water **Sample ID:** P4460-04 **Client ID:** WB-303-BOTDUP
Percent Solids for Sample: NA **Duplicate ID** P4460-04DUP **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	ug/L	20	100	U	100	U			P
Barium	ug/L	20	360	J	357	J	1		P
Cadmium	ug/L	20	30.0	U	30.0	U			P
Chromium	ug/L	20	10.6	J	10.1	J	5		P
Lead	ug/L	20	45.4	J	49.1	J	8		P
Mercury	ug/L	20	2.00	U	2.00	U			CV
Selenium	ug/L	20	100	U	100	U			P
Silver	ug/L	20	50.0	U	50.0	U			P

Metals

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DUPLICATE SAMPLE SUMMARY

Client: Portal Partners Tri-Venture **Level:** LOW **SDG No.:** P4397

Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397

Matrix: Water **Sample ID:** P4460-04MS **Client ID:** WB-303-BOTMSD

Percent Solids for Sample: NA **Duplicate ID** P4460-04MSD **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	ug/L	20	3750		3830		2		P
Barium	ug/L	20	1240		1260		2		P
Cadmium	ug/L	20	911		927		2		P
Chromium	ug/L	20	2000		2030		1		P
Lead	ug/L	20	4340		4420		2		P
Mercury	ug/L	20	32.3		38.3		17		CV
Selenium	ug/L	20	9110		9330		2		P
Silver	ug/L	20	376		379		1		P

Metals

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Portal Partners Tri-Venture **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
PB164298BS							
Arsenic	ug/L	4000	3630		91	80 - 120	P
Barium	ug/L	1000	924		92	80 - 120	P
Cadmium	ug/L	1000	885		88	80 - 120	P
Chromium	ug/L	2000	2070		104	80 - 120	P
Lead	ug/L	5000	4410		88	80 - 120	P
Selenium	ug/L	10000	8700		87	80 - 120	P
Silver	ug/L	380	360		95	80 - 120	P

Metals

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Portal Partners Tri-Venture

SDG No.: P4397

Contract: PORT06

Lab Code: CHEM

Case No.: P4397

SAS No.: P4397

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
PB164306BS Mercury	ug/L	4.0	3.52		88	80 - 120	CV

Metals
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ICP SERIAL DILUTIONS

SAMPLE NO.

WB-303-BOTL

Lab Name: Chemtech Consulting Group **Contract:** PORT06
Lab Code: CHEM **Lb No.:** lb133086 **Lab Sample ID :** P4460-04L **SDG No.:** P4397
Matrix (soil/water): Water **Level (low/med):** LOW
Concentration Units: ug/L

Analyte	Initial Sample Result (I)		Serial Dilution Result (S)		% Differ- ence		Q	M
		C		C				
Arsenic	100	U	500	U				P
Barium	360	J	372	J	3			P
Cadmium	30.0	U	150	U				P
Chromium	10.6	J	250	U	100.0			P
Lead	45.4	J	300	U	100.0			P
Mercury	2.00	U	10.0	U				CV
Selenium	100	U	500	U				P
Silver	50.0	U	250	U				P



METAL PREPARATION & INSTRUMENT DATA

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Portal Partners Tri-Venture **SDG No.:** P4397
Contract: PORT06 **Lab Code:** CHEM **Case No.:** P4397 **SAS No.:** P4397
Instrument ID: _____ **Date:** _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Al	Ca	Fe	Mg	Ag
Arsenic	193.759	0.0000000	0.0000000	-0.0000440	0.0000000	0.0000000
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000000	0.0000930	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.353	-0.0000920	0.0000000	0.0000380	0.0000000	0.0000000
Selenium	196.090	0.0000000	0.0000000	-0.0001440	0.0000000	0.0000000
Silver	328.068	0.0000000	0.0000000	-0.0001490	0.0000000	0.0000000

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Portal Partners Tri-Venture

SDG No.: P4397

Contract: PORT06

Lab Code: CHEM

Case No.: P4397

SAS No.: P4397

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		As	Ba	Be	Cd	Co
Arsenic	193.759	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000000	0.0000000	0.0000000	0.0002870
Chromium	267.716	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.353	0.0000000	0.0003170	0.0000000	0.0000000	0.0000000
Selenium	196.090	0.0000000	0.0000000	0.0000000	0.0000000	-0.0003570
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Portal Partners Tri-Venture

SDG No.: P4397

Contract: PORT06

Lab Code: CHEM

Case No.: P4397

SAS No.: P4397

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Cr	Cu	K	Mn	Mo
Arsenic	193.759	-0.0029000	0.0000000	0.0000000	0.0000000	0.0004900
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000070	0.0002200	0.0000000
Lead	220.353	0.0000000	0.0000000	0.0000000	0.0001400	-0.0008600
Selenium	196.090	0.0000000	0.0000000	0.0000000	0.0007460	0.0000000
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	-0.0000120

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Portal Partners Tri-Venture

SDG No.: P4397

Contract: PORT06

Lab Code: CHEM

Case No.: P4397

SAS No.: P4397

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Na	Ni	Pb	Sb	Se
Arsenic	193.759	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.353	0.0000000	0.0006580	0.0000000	0.0000000	0.0001290
Selenium	196.090	0.0000000	0.0000000	0.0003330	0.0000000	0.0000000
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Portal Partners Tri-Venture

SDG No.: P4397

Contract: PORT06

Lab Code: CHEM

Case No.: P4397

SAS No.: P4397

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Sn	Ti	Tl	V	Zn
Arsenic	193.759	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.409	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000630	0.0001280	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000000	0.0001110	0.0000000
Lead	220.353	0.0000000	-0.0003610	0.0000000	0.0000000	0.0000000
Selenium	196.090	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.068	0.0000000	-0.0007420	0.0000000	0.0000000	0.0000000



METAL PREPARATION & ANALYICAL SUMMARY

Metals

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SAMPLE PREPARATION SUMMARY

Client:	<u>Portal Partners Tri-Venture</u>	SDG No.:	<u>P4397</u>
Contract:	<u>PORT06</u>	Lab Code:	<u>CHEM</u>
		Method:	<u></u>
		Case No.:	<u>P4397</u>
		SAS No.:	<u>P4397</u>

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: PB164298							
P4397-06	WB-301-BOT	SAM	WATER	10/21/2024	5.0	25.0	
P4460-04DUP	WB-303-BOTDUP	DUP	WATER	10/21/2024	5.0	25.0	
P4460-04MS	WB-303-BOTMS	MS	WATER	10/21/2024	5.0	25.0	
P4460-04MSD	WB-303-BOTMSD	MSD	WATER	10/21/2024	5.0	25.0	
PB164261TB	PB164261TB	MB	WATER	10/21/2024	5.0	25.0	
PB164298BL	PB164298BL	MB	WATER	10/21/2024	5.0	25.0	
PB164298BS	PB164298BS	LCS	WATER	10/21/2024	5.0	25.0	

Metals

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SAMPLE PREPARATION SUMMARY

Client:	<u>Portal Partners Tri-Venture</u>	SDG No.:	<u>P4397</u>
Contract:	<u>PORT06</u>	Lab Code:	<u>CHEM</u>
		Method:	<u></u>
		Case No.:	<u>P4397</u>
		SAS No.:	<u>P4397</u>

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: PB164306							
P4397-06	WB-301-BOT	SAM	WATER	10/22/2024	3.0	30.0	
P4460-04DUP	WB-303-BOTDUP	DUP	WATER	10/22/2024	3.0	30.0	
P4460-04MS	WB-303-BOTMS	MS	WATER	10/22/2024	3.0	30.0	
P4460-04MSD	WB-303-BOTMSD	MSD	WATER	10/22/2024	3.0	30.0	
PB164261TB	PB164261TB	MB	WATER	10/22/2024	3.0	30.0	
PB164306BL	PB164306BL	MB	WATER	10/22/2024	30.0	30.0	
PB164306BS	PB164306BS	LCS	WATER	10/22/2024	30.0	30.0	

metals
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ANALYSIS RUN LOG

Client: Portal Partners Tri-Venture **Contract:** PORT06

Lab code: CHEM **Case no.:** P4397 **Sas no.:** P4397 **Sdg no.:** P4397

Instrument id number: **Method:** **Run number:** LB133065

Start date: 10/23/2024 **End date:** 10/23/2024

Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	0926	HG
S0.2	S0.2	1	0929	HG
S2.5	S2.5	1	0931	HG
S5	S5	1	0933	HG
S7.5	S7.5	1	0935	HG
S10	S10	1	0940	HG
ICV48	ICV48	1	0944	HG
ICB48	ICB48	1	0946	HG
CCV56	CCV56	1	0948	HG
CCB56	CCB56	1	0951	HG
CRA	CRA	1	0953	HG
PB164306BL	PB164306BL	1	1006	HG
PB164306BS	PB164306BS	1	1008	HG
P4397-06	WB-301-BOT	1	1010	HG
CCV57	CCV57	1	1022	HG
CCB57	CCB57	1	1024	HG
P4460-04DUP	WB-303-BOTDUP	1	1026	HG
P4460-04MS	WB-303-BOTMS	1	1028	HG
P4460-04MSD	WB-303-BOTMSD	1	1031	HG
CCV58	CCV58	1	1049	HG
CCB58	CCB58	1	1051	HG
PB164261TB	PB164261TB	1	1102	HG
P4460-04L	WB-303-BOTL	5	1107	HG
CCV59	CCV59	1	1116	HG
CCB59	CCB59	1	1118	HG

metals
- 14 -
ANALYSIS RUN LOG

Client: Portal Partners Tri-Venture **Contract:** PORT06

Lab code: CHEM **Case no.:** P4397 **Sas no.:** P4397 **Sdg no.:** P4397

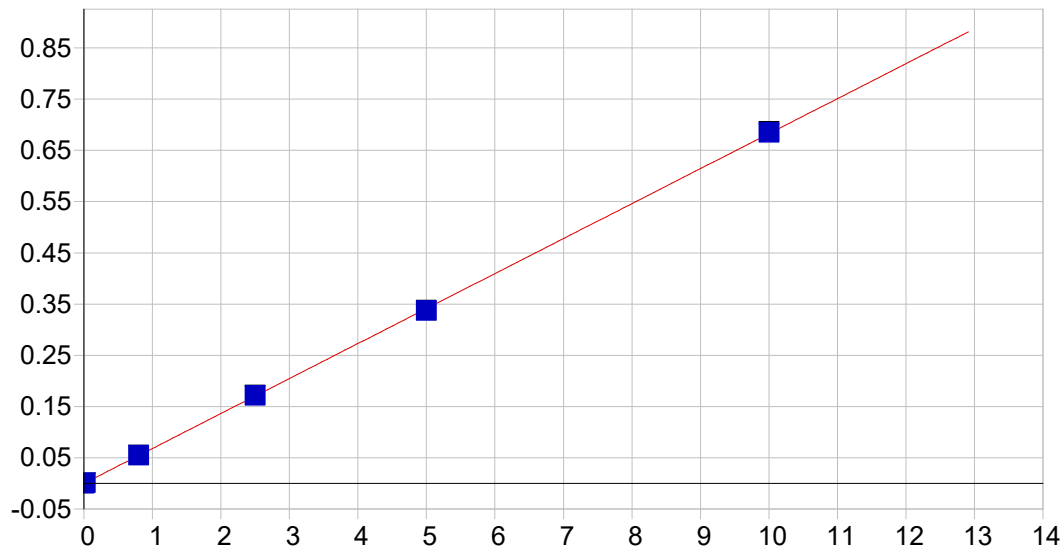
Instrument id number: **Method:** **Run number:** LB133086

Start date: 10/23/2024 **End date:** 10/23/2024

Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	1424	Ag,As,Ba,Cd,Cr,Pb,Se
S1	S1	1	1428	Ag,As,Ba,Cd,Cr,Pb,Se
S2	S2	1	1432	Ag,As,Ba,Cd,Cr,Pb,Se
S3	S3	1	1437	Ag,As,Ba,Cd,Cr,Pb,Se
S4	S4	1	1441	Ag,As,Ba,Cd,Cr,Pb,Se
S5	S5	1	1445	Ag,As,Ba,Cd,Cr,Pb,Se
ICV01	ICV01	1	1459	Ag,As,Ba,Cd,Cr,Pb,Se
LLICV01	LLICV01	1	1511	Ag,As,Ba,Cd,Cr,Pb,Se
ICB01	ICB01	1	1516	Ag,As,Ba,Cd,Cr,Pb,Se
CRI01	CRI01	1	1522	Ag,As,Ba,Cd,Cr,Pb,Se
ICSA01	ICSA01	1	1526	Ag,As,Ba,Cd,Cr,Pb,Se
ICSAB01	ICSAB01	1	1532	Ag,As,Ba,Cd,Cr,Pb,Se
CCV01	CCV01	1	1557	Ag,As,Ba,Cd,Cr,Pb,Se
CCB01	CCB01	1	1602	Ag,As,Ba,Cd,Cr,Pb,Se
CCV02	CCV02	1	1648	Ag,As,Ba,Cd,Cr,Pb,Se
CCB02	CCB02	1	1652	Ag,As,Ba,Cd,Cr,Pb,Se
P4397-06	WB-301-BOT	1	1659	Ag,As,Ba,Cd,Cr,Pb,Se
P4460-04DUP	WB-303-BOTDUP	1	1708	Ag,As,Ba,Cd,Cr,Pb,Se
P4460-04L	WB-303-BOTL	5	1712	Ag,As,Ba,Cd,Cr,Pb,Se
P4460-04MS	WB-303-BOTMS	1	1717	Ag,As,Ba,Cd,Cr,Pb,Se
P4460-04MSD	WB-303-BOTMSD	1	1721	Ag,As,Ba,Cd,Cr,Pb,Se
PB164261TB	PB164261TB	1	1729	Ag,As,Ba,Cd,Cr,Pb,Se
PB164298BL	PB164298BL	1	1734	Ag,As,Ba,Cd,Cr,Pb,Se
PB164298BS	PB164298BS	1	1738	Ag,As,Ba,Cd,Cr,Pb,Se
CCV03	CCV03	1	1742	Ag,As,Ba,Cd,Cr,Pb,Se
CCB03	CCB03	1	1746	Ag,As,Ba,Cd,Cr,Pb,Se
CCV04	CCV04	1	1832	Ag,As,Ba,Cd,Cr,Pb,Se
CCB04	CCB04	1	1836	Ag,As,Ba,Cd,Cr,Pb,Se
CCV05	CCV05	1	1923	Ag,As,Ba,Cd,Cr,Pb,Se
CCB05	CCB05	1	1928	Ag,As,Ba,Cd,Cr,Pb,Se
CCV06	CCV06	1	2015	Ag,As,Ba,Cd,Cr,Pb,Se
CCB06	CCB06	1	2021	Ag,As,Ba,Cd,Cr,Pb,Se
CCV07	CCV07	1	2128	Ag,As,Ba,Cd,Cr,Pb,Se
CCB07	CCB07	1	2134	Ag,As,Ba,Cd,Cr,Pb,Se
CCV08	CCV08	1	2220	Ag,As,Ba,Cd,Cr,Pb,Se
CCB08	CCB08	1	2225	Ag,As,Ba,Cd,Cr,Pb,Se



METAL RAW DATA

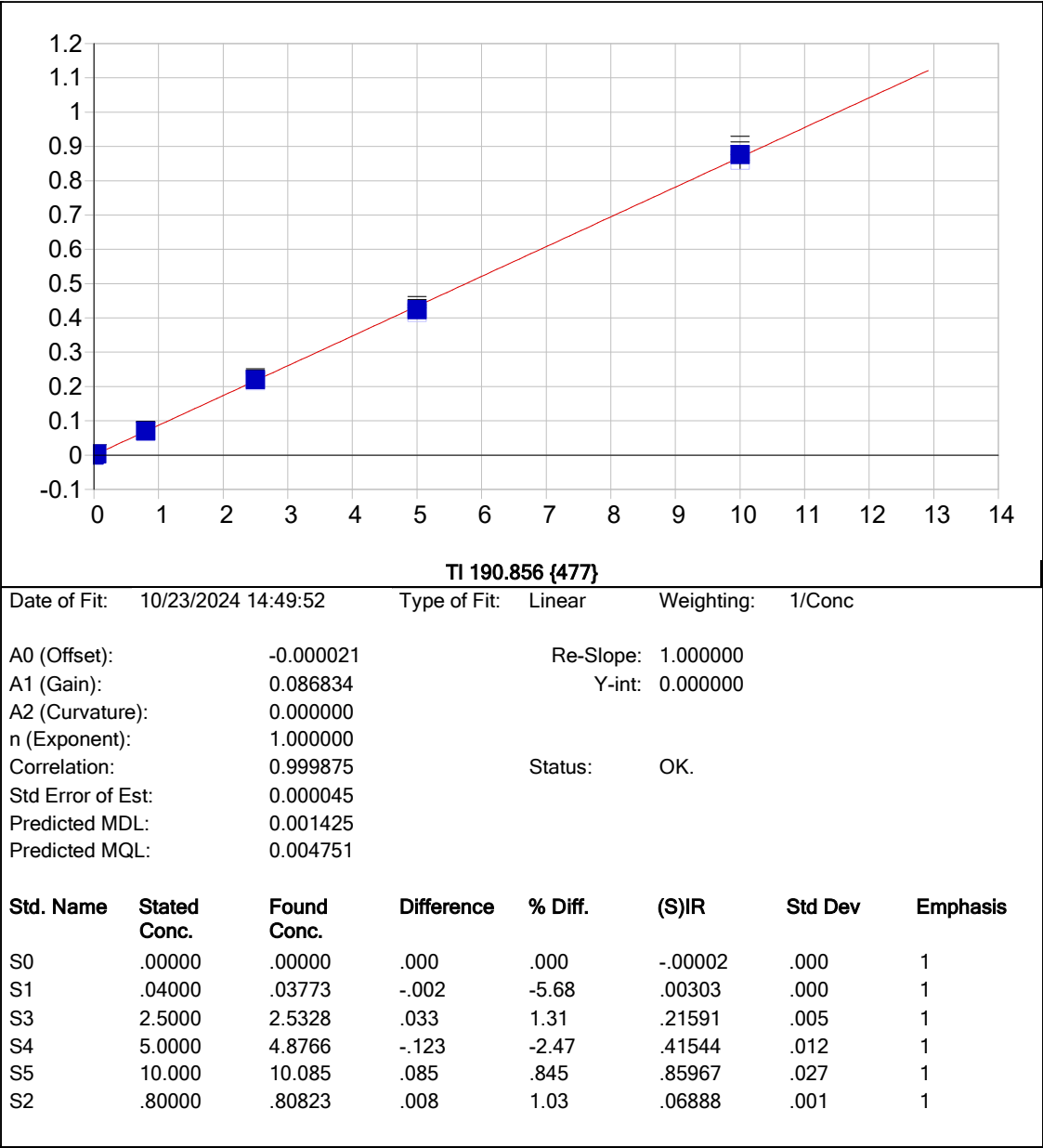


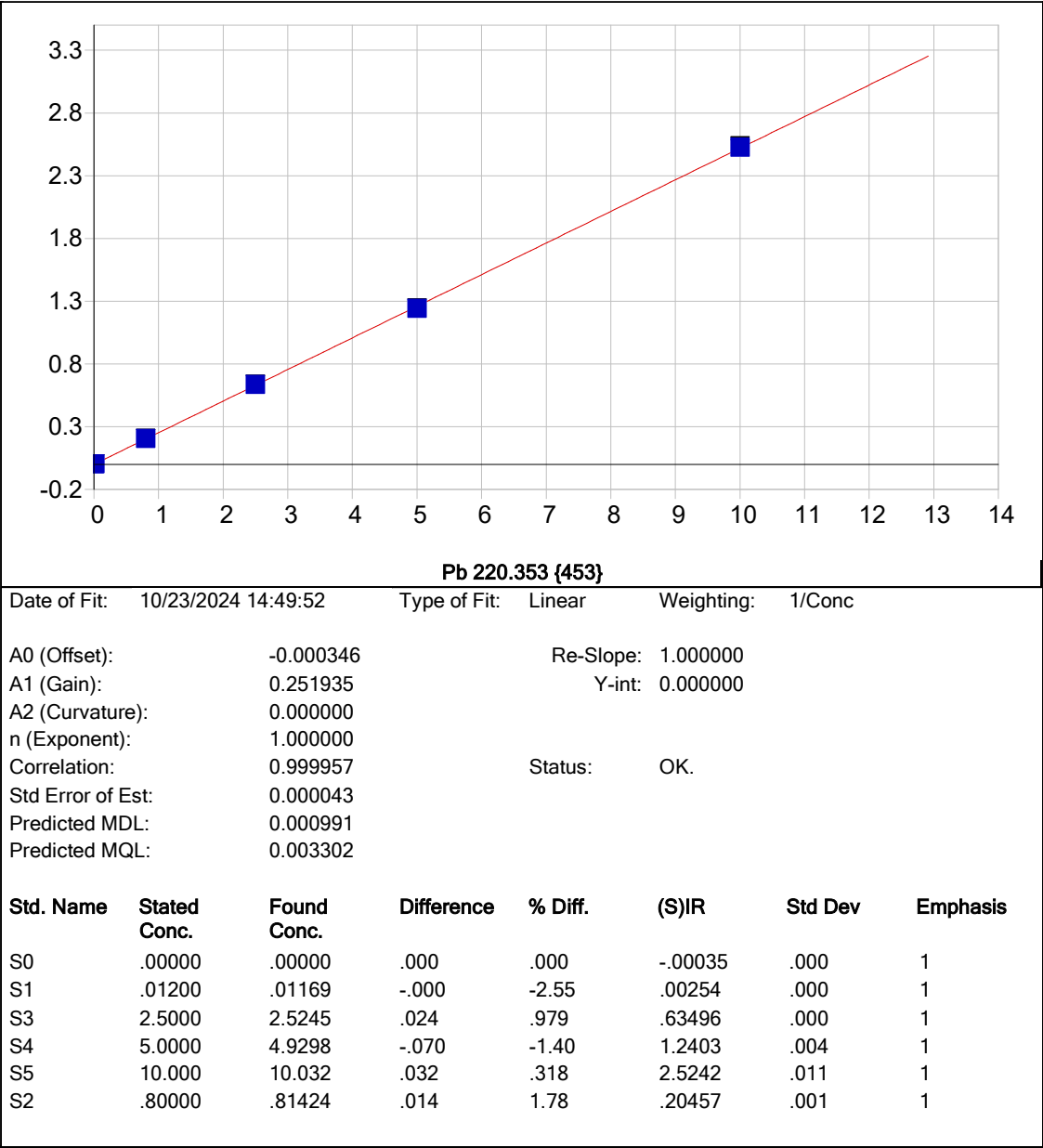
As 189.042 {479}

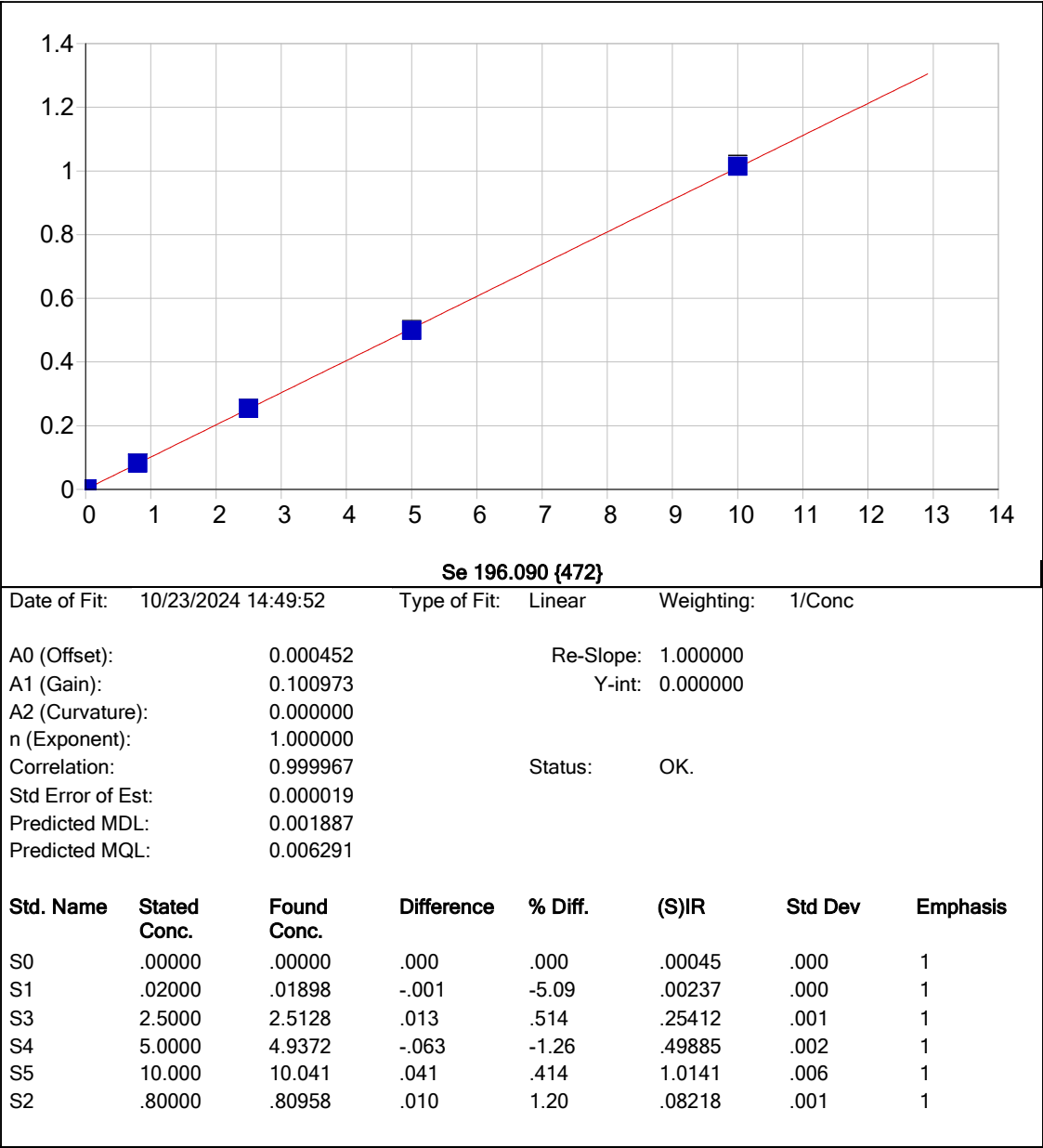
Date of Fit: 10/23/2024 14:49:52 Type of Fit: Linear Weighting: 1/Conc

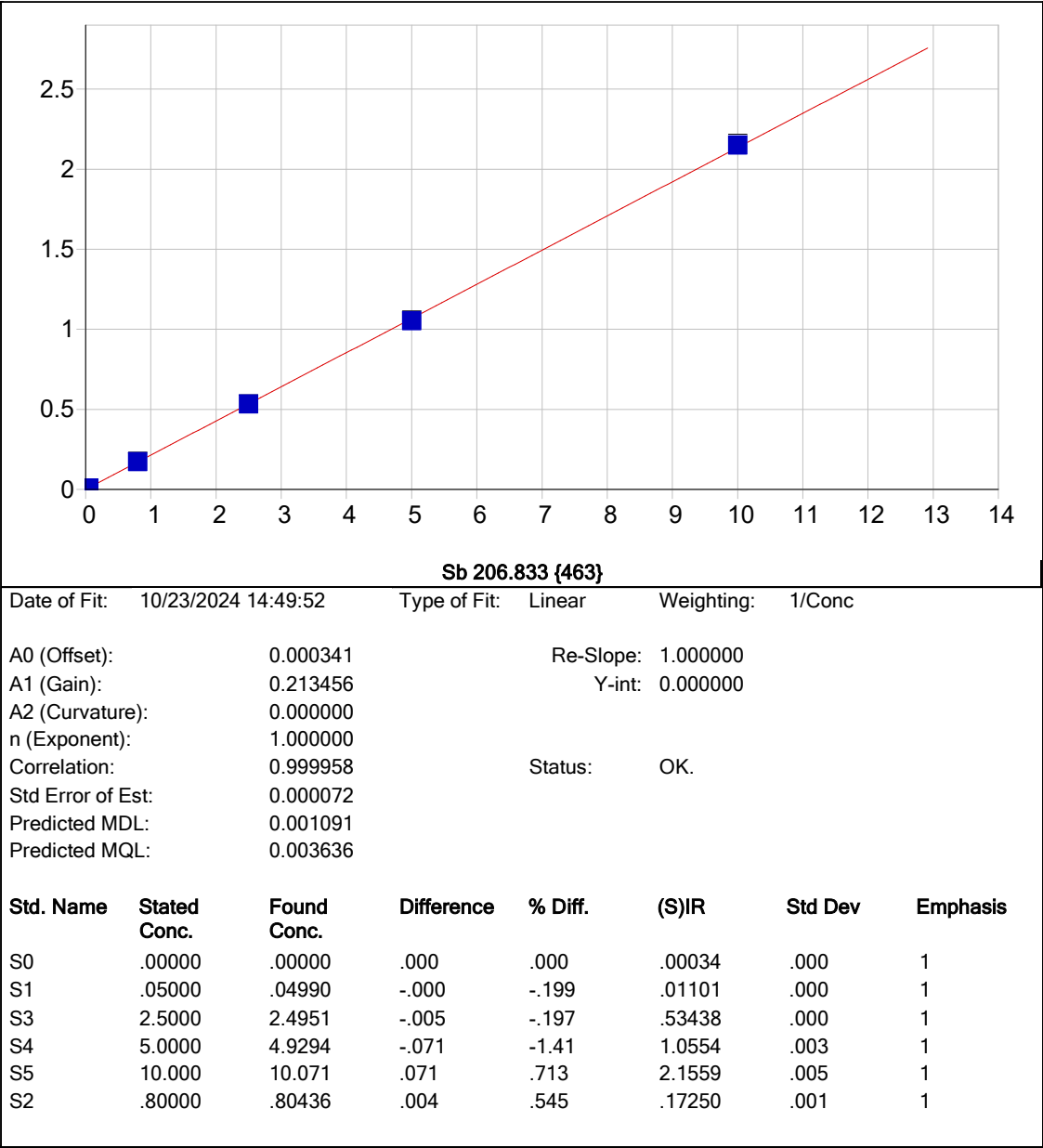
A0 (Offset): -0.000225 Re-Slope: 1.000000
A1 (Gain): 0.068290 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999976 Status: OK.
Std Error of Est: 0.000011
Predicted MDL: 0.002116
Predicted MQL: 0.007055

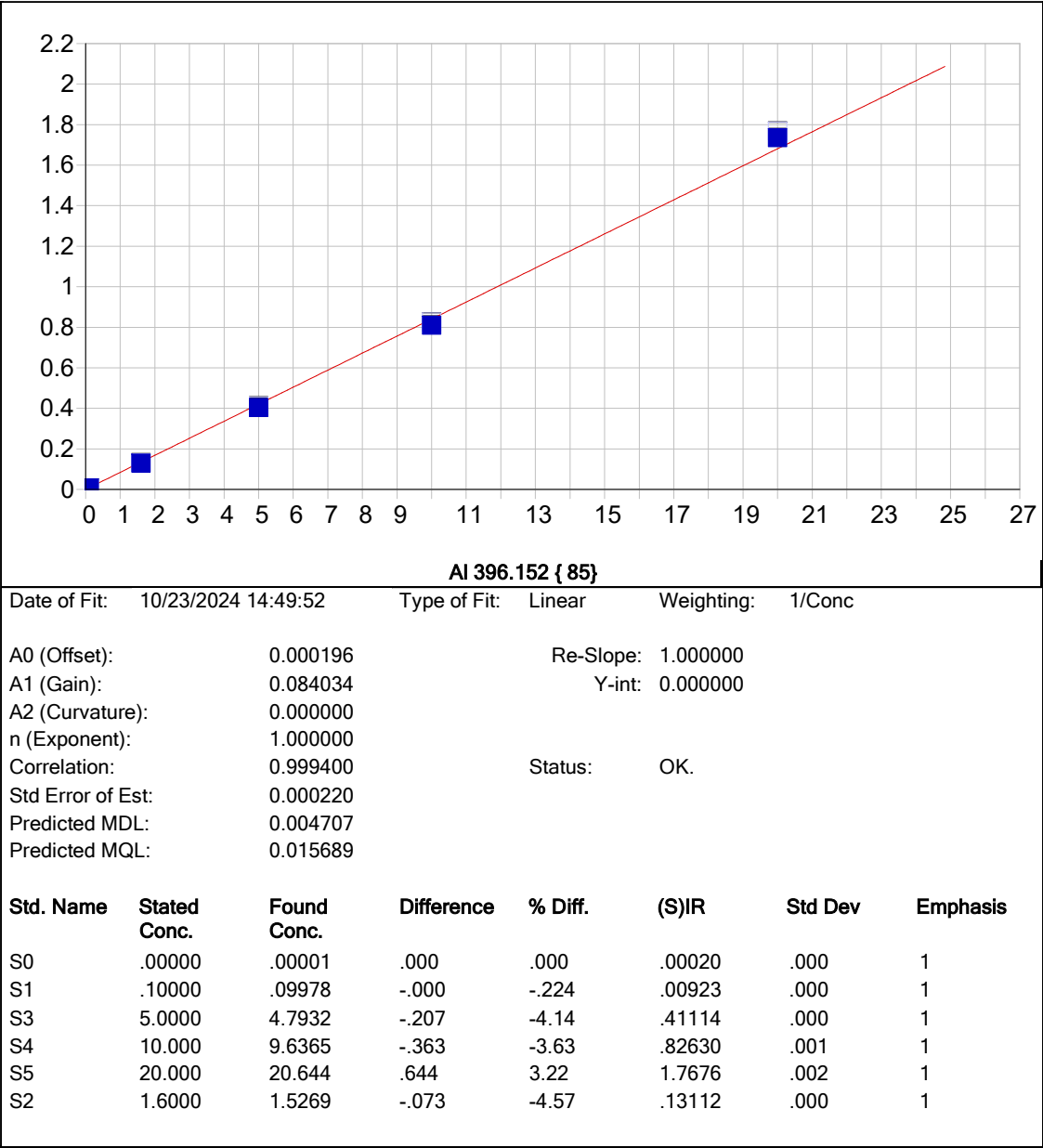
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00000	-.000	.000	-.00022	.000	1
S1	.02000	.02085	.001	4.27	.00119	.000	1
S3	2.5000	2.5138	.014	.552	.17126	.001	1
S4	5.0000	4.9451	-.055	-1.10	.33711	.001	1
S5	10.000	10.034	.034	.342	.68428	.002	1
S2	.80000	.80604	.006	.755	.05476	.000	1

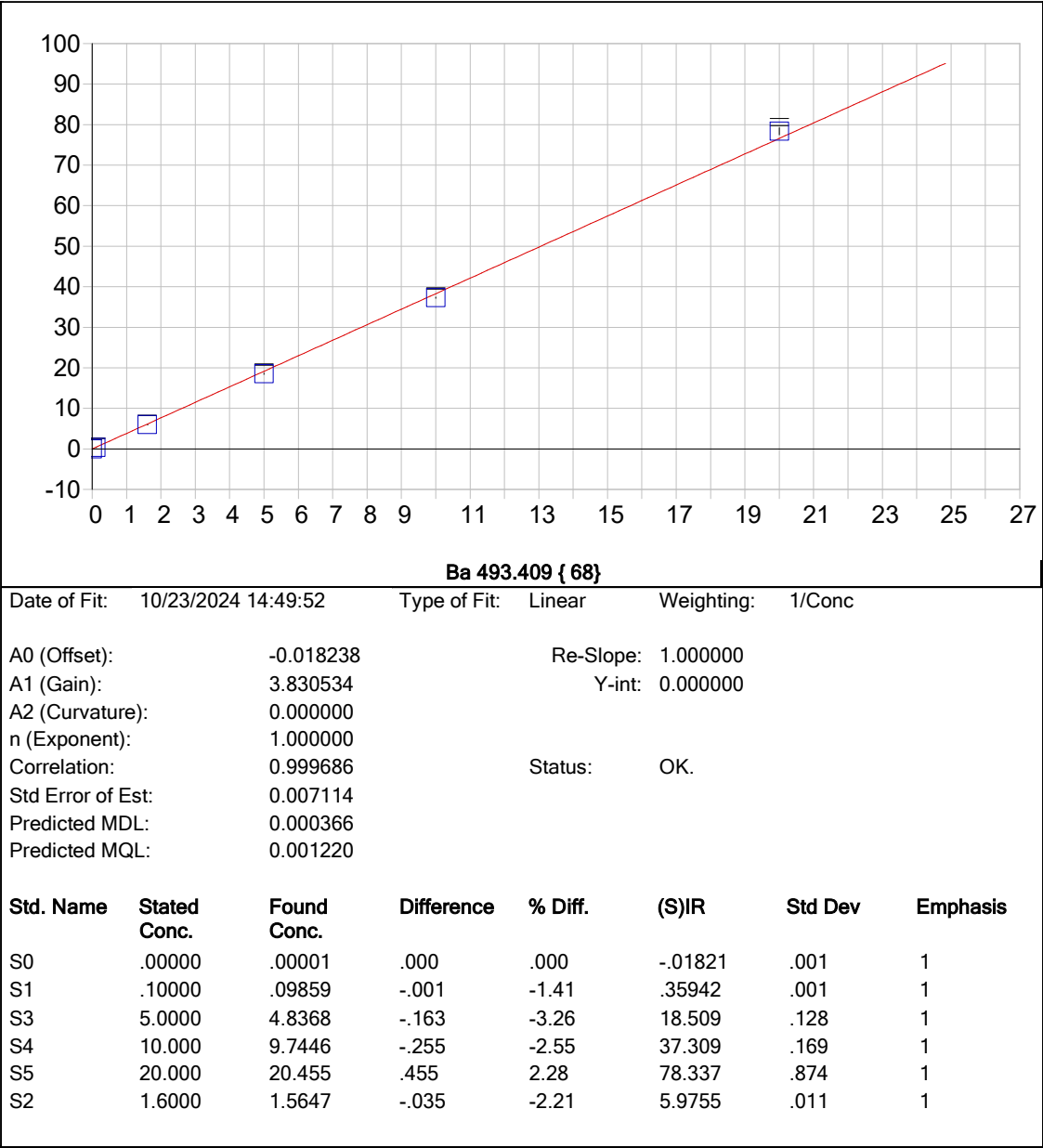


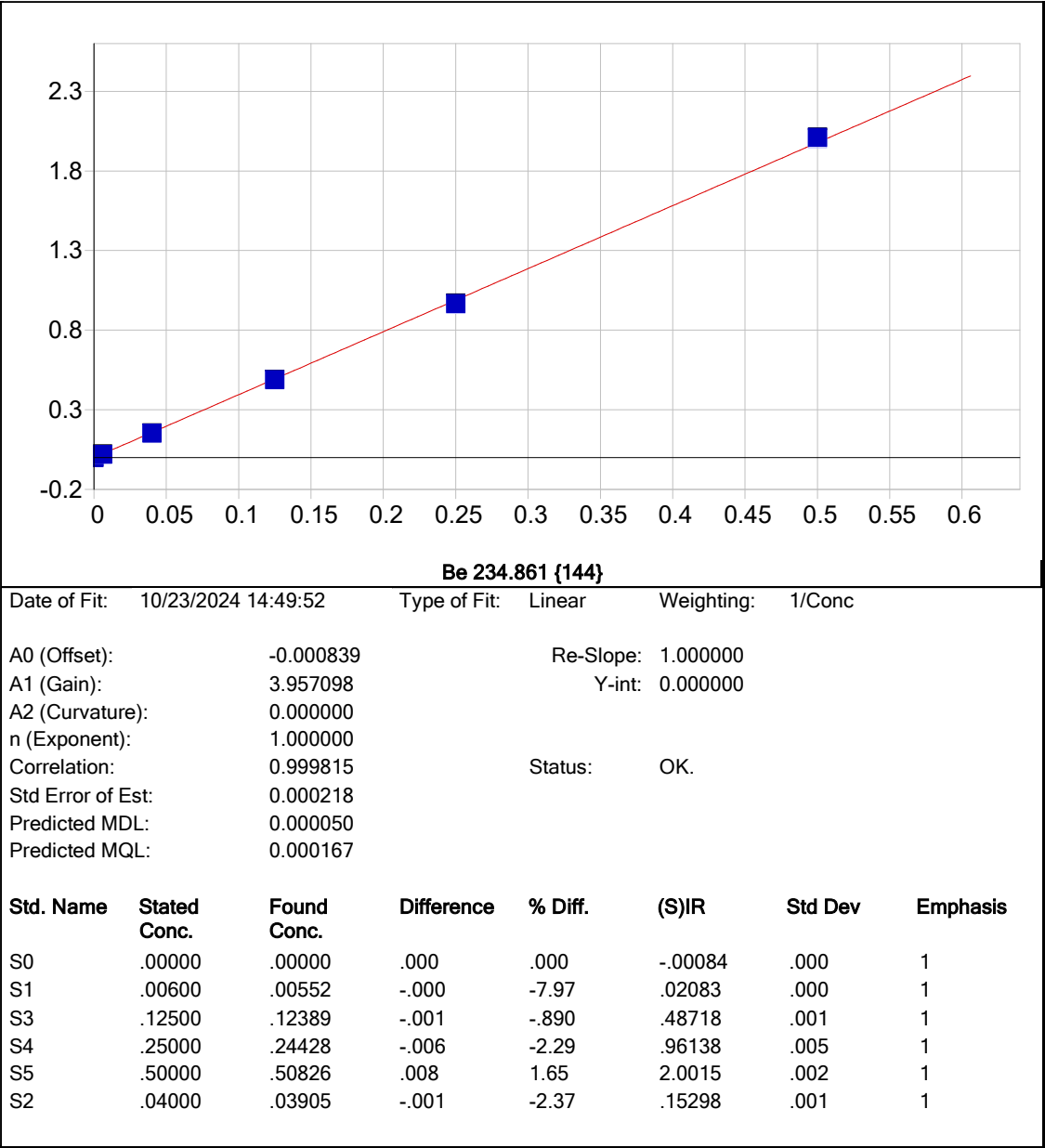


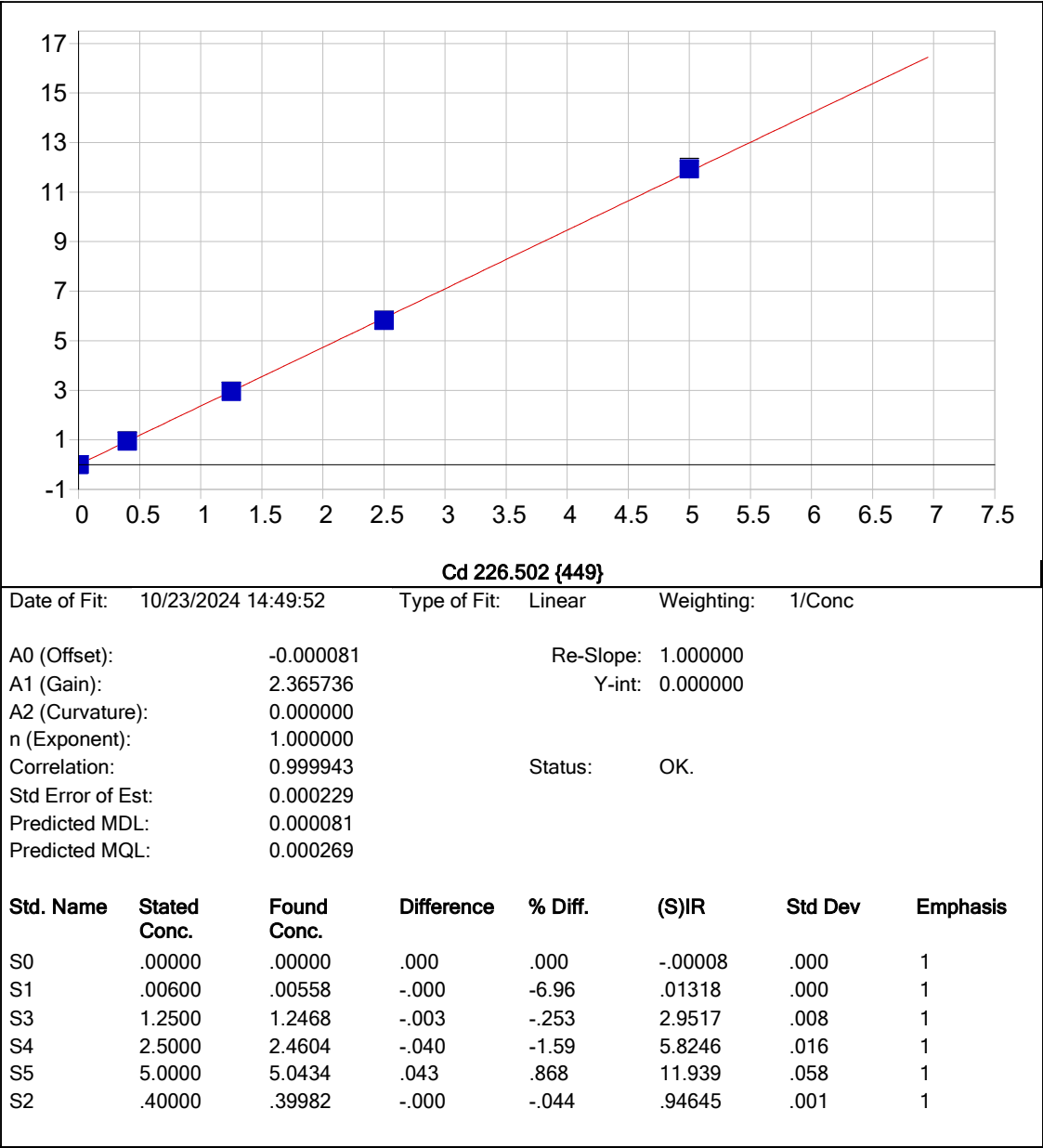


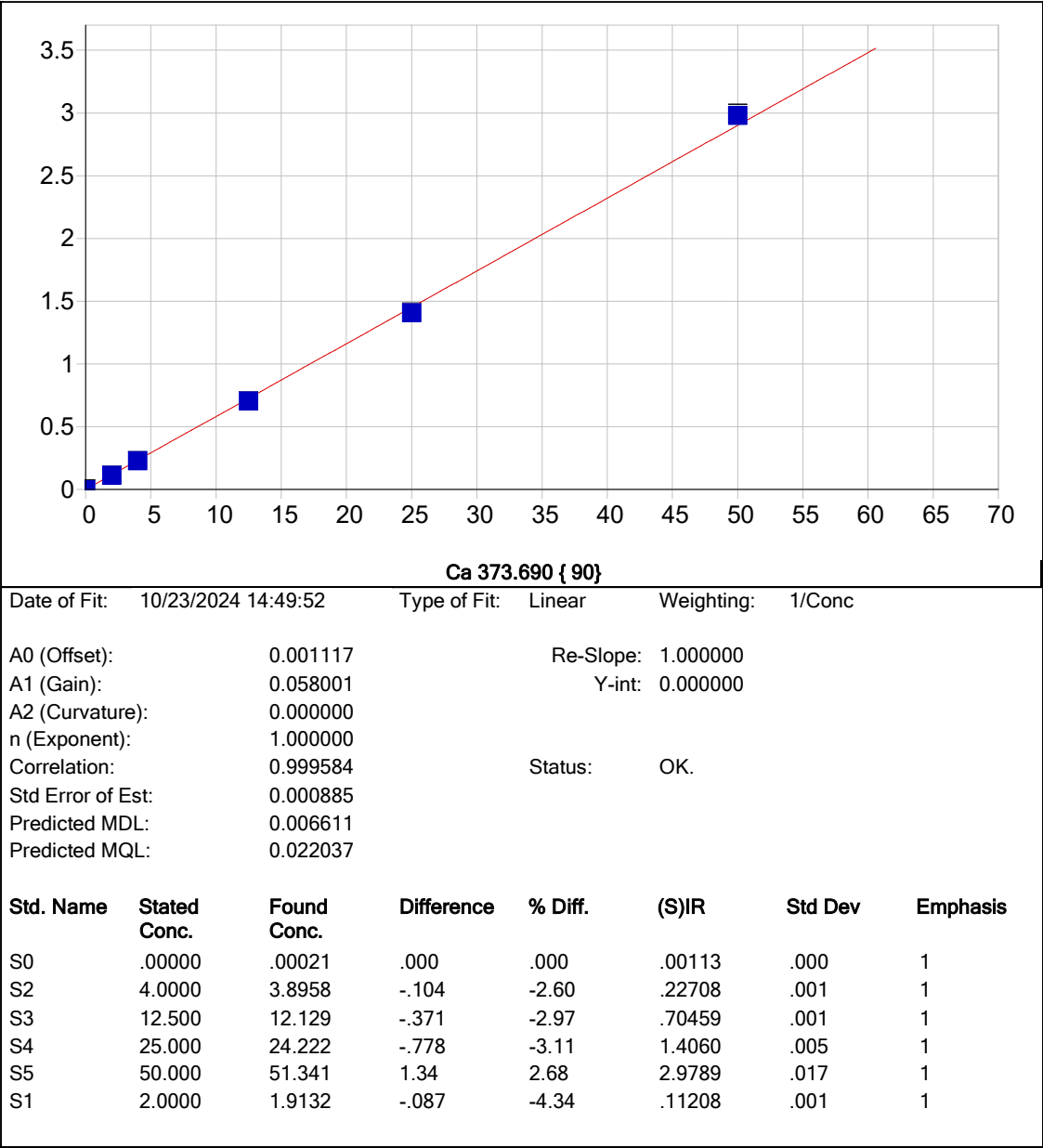


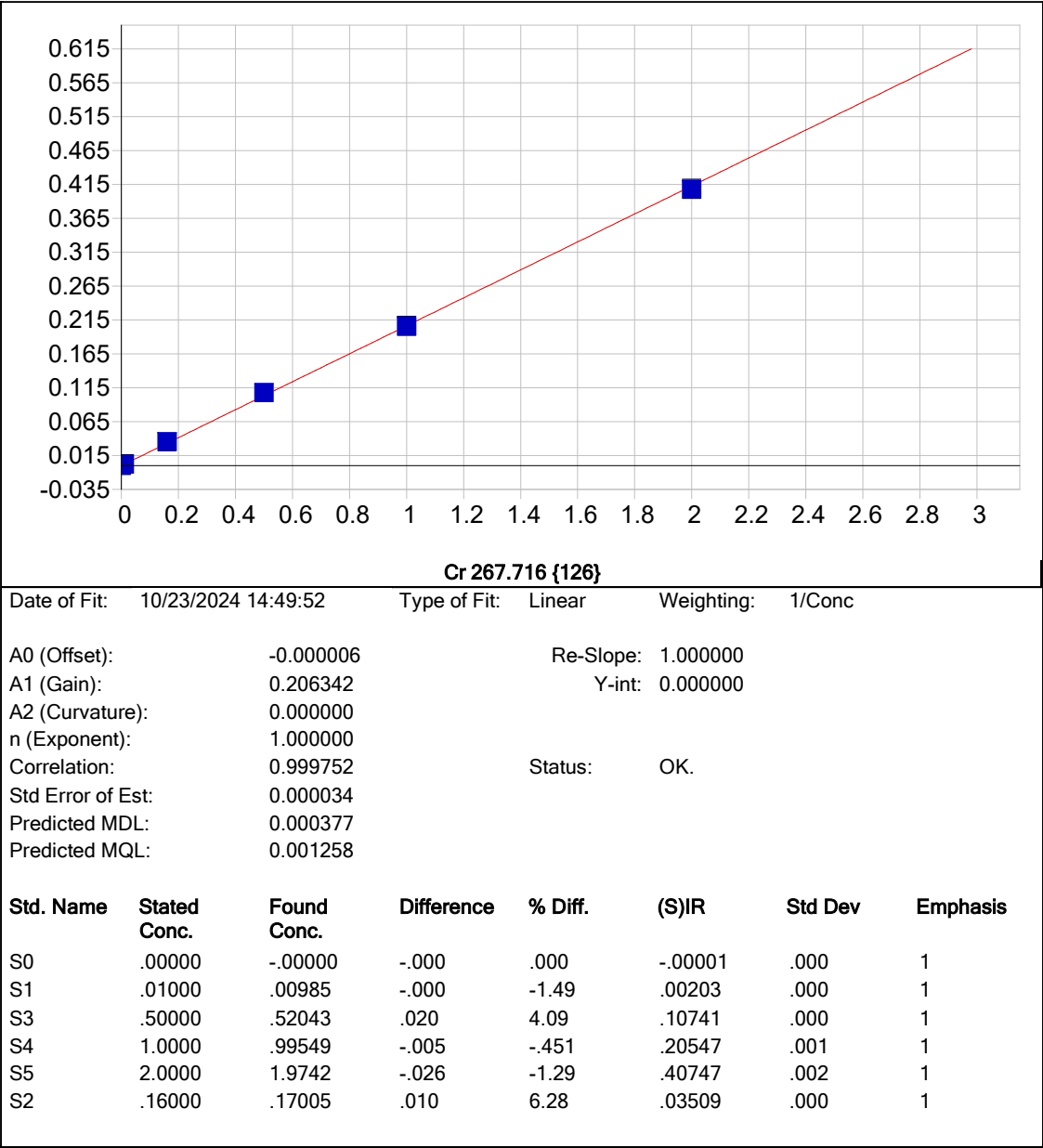


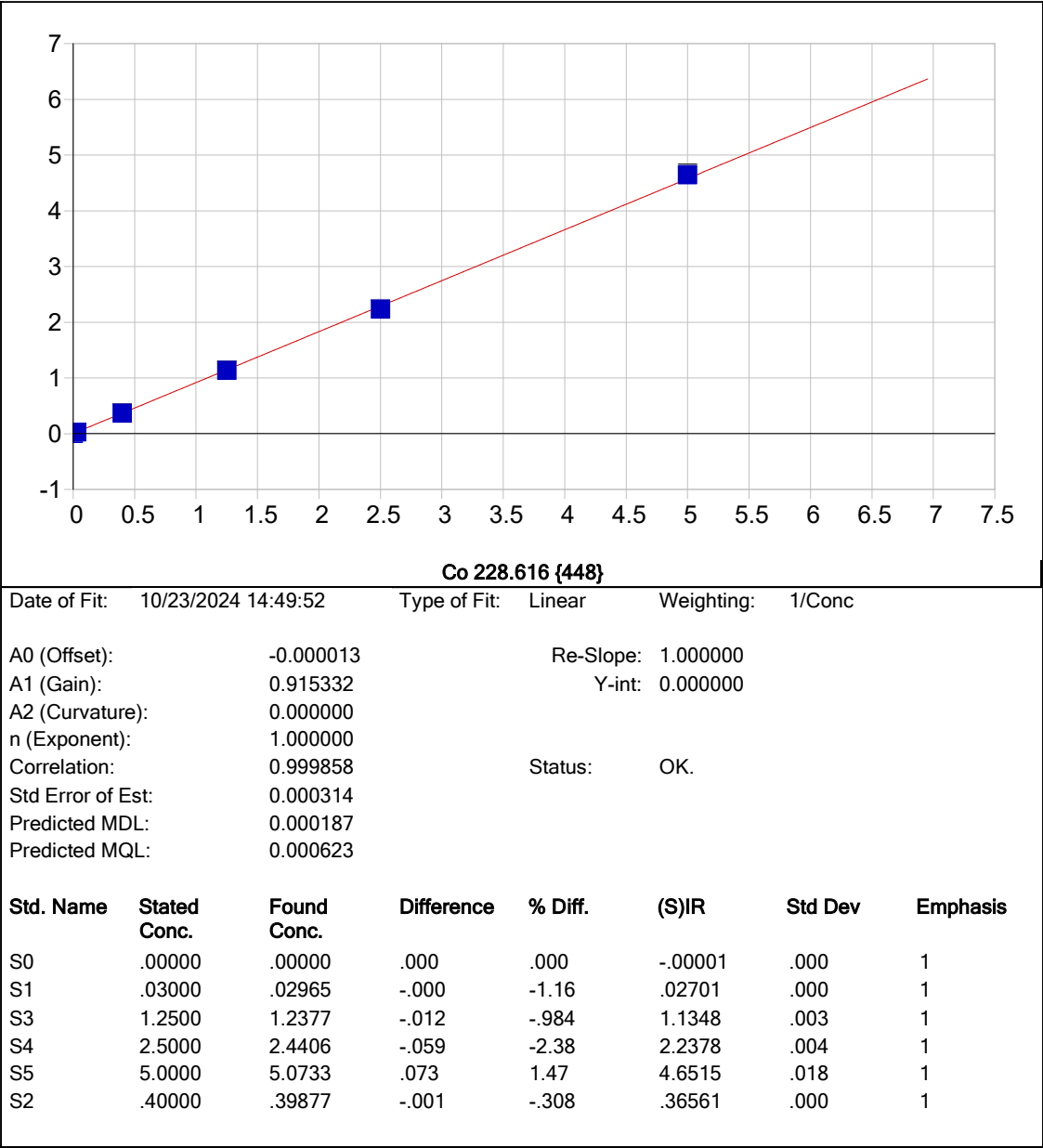


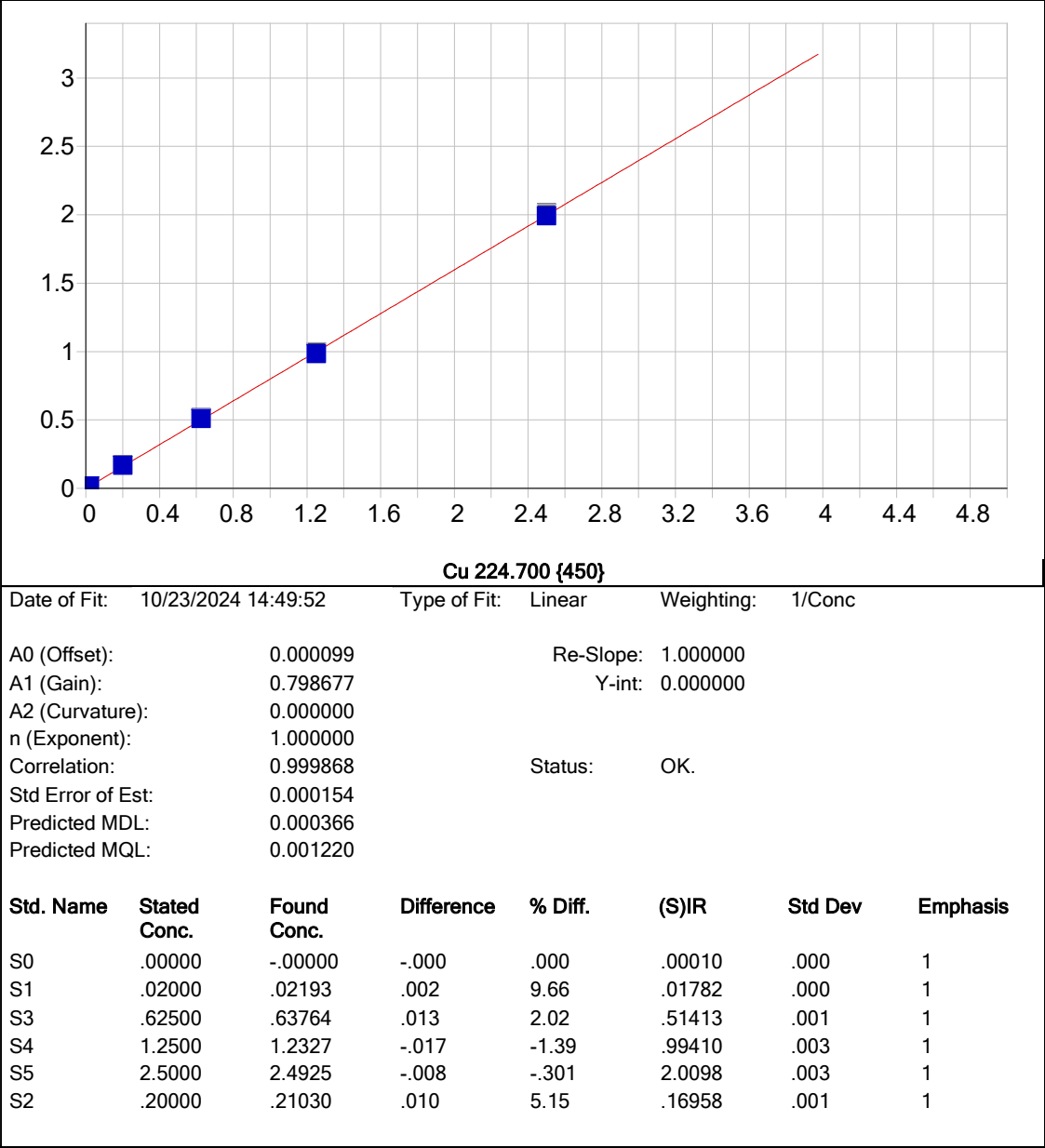


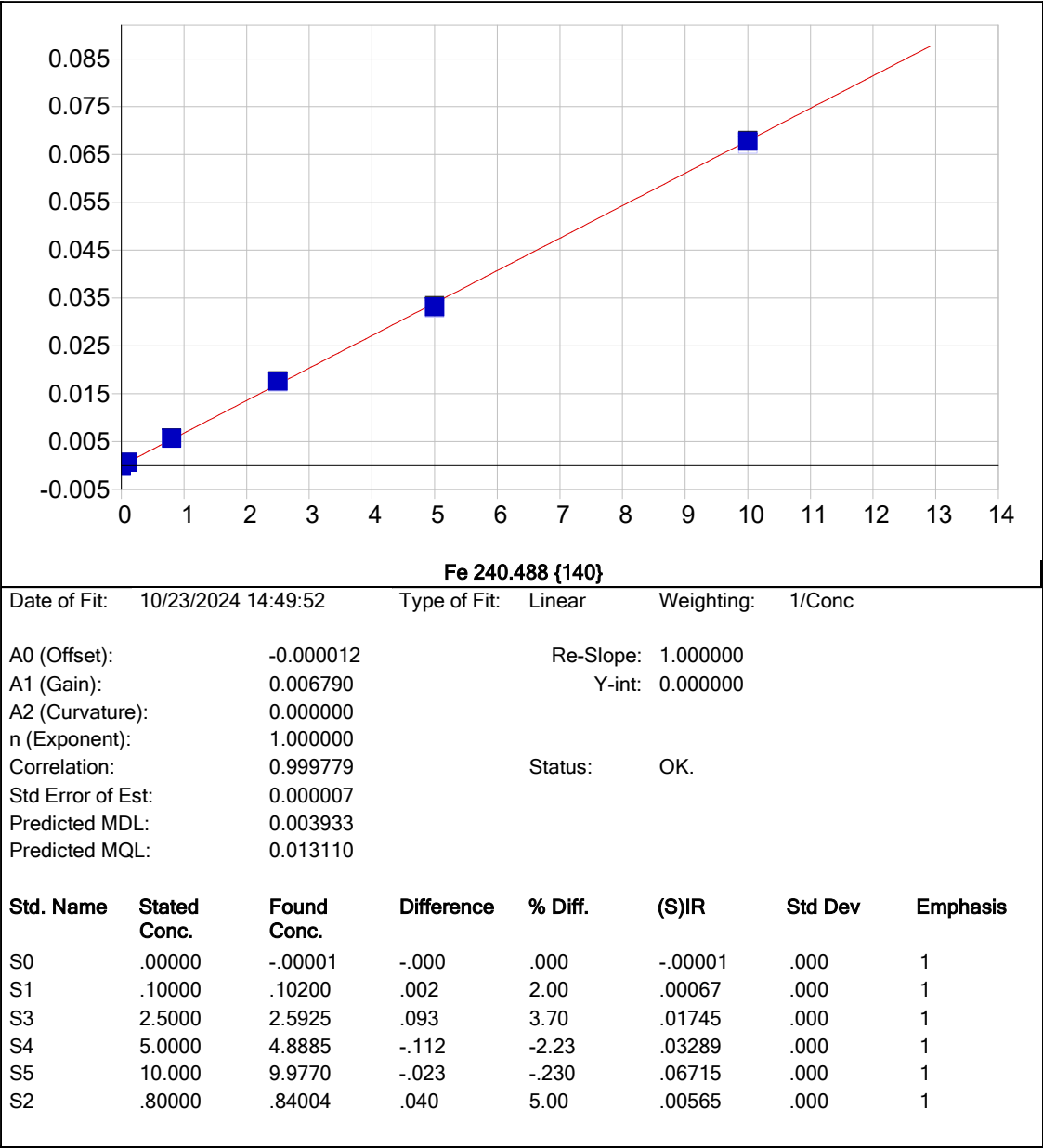


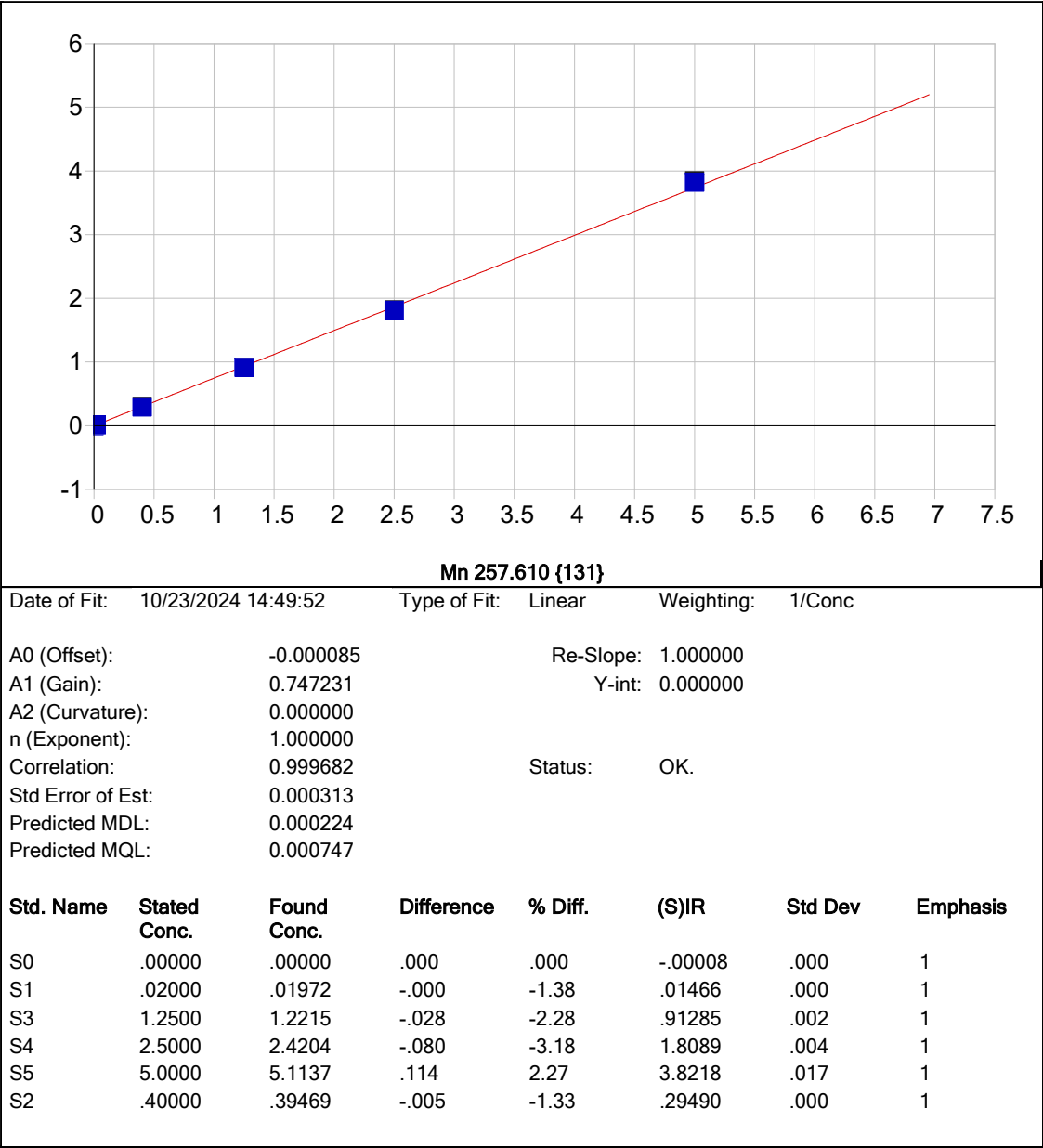


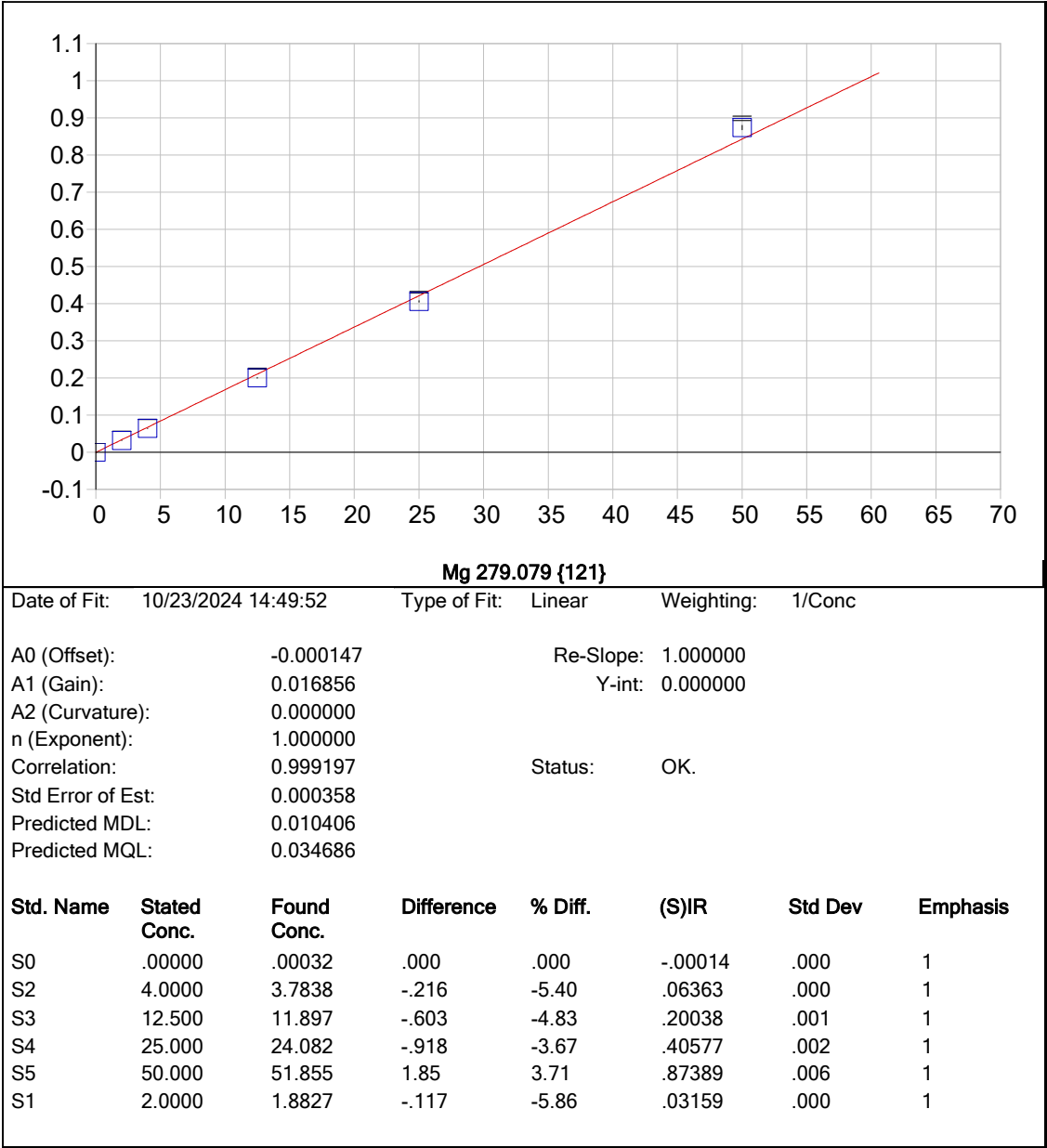


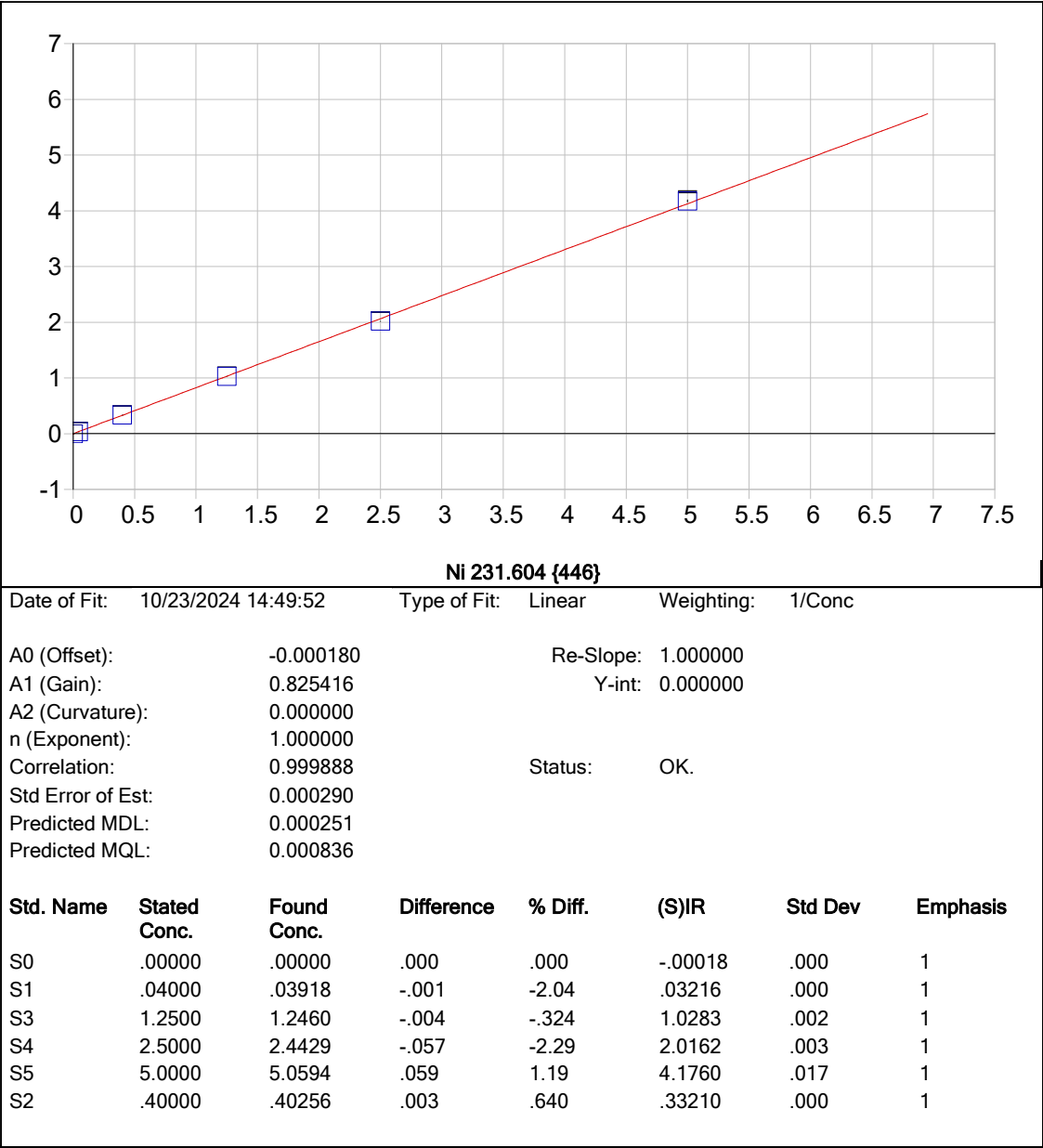


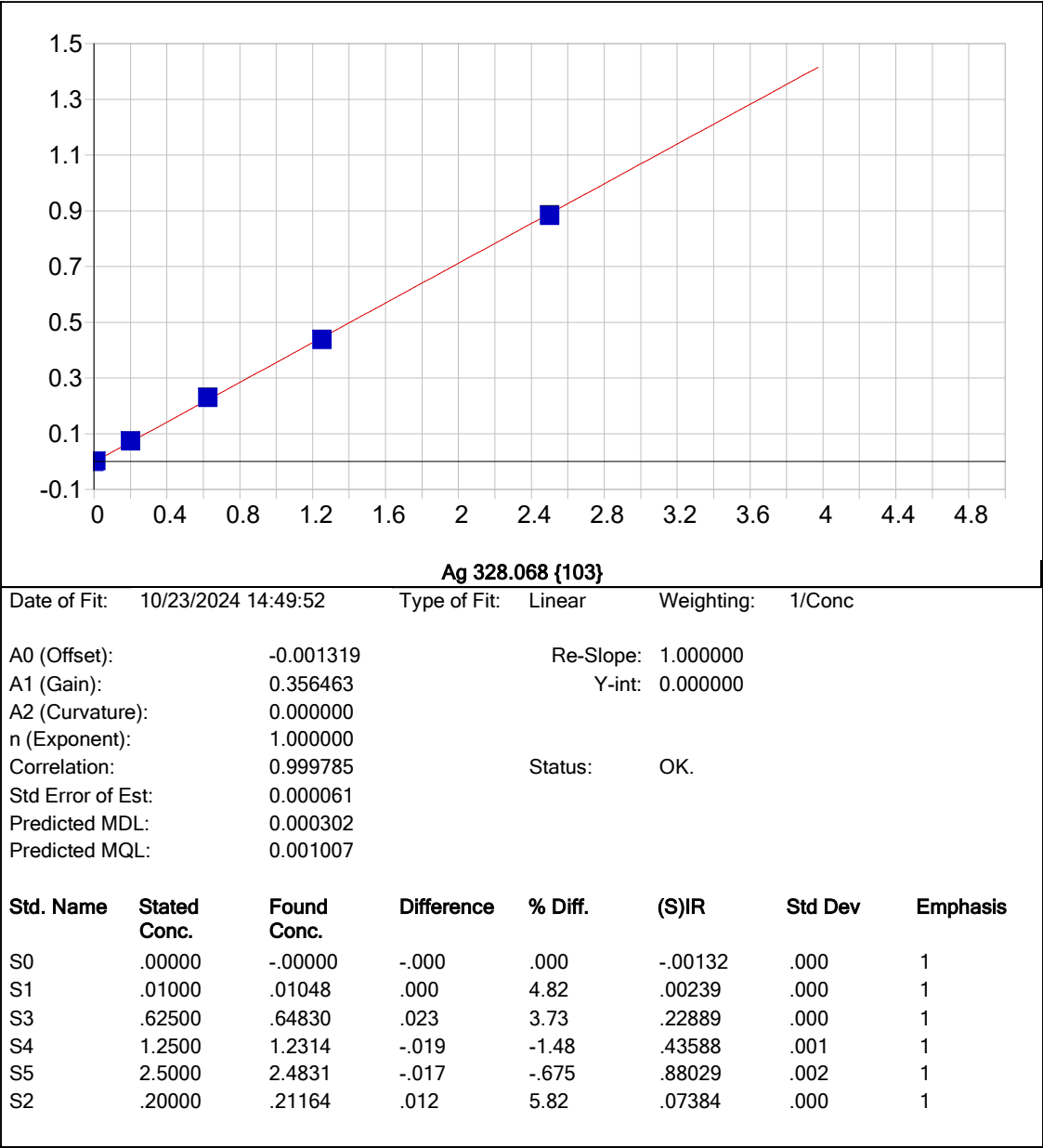


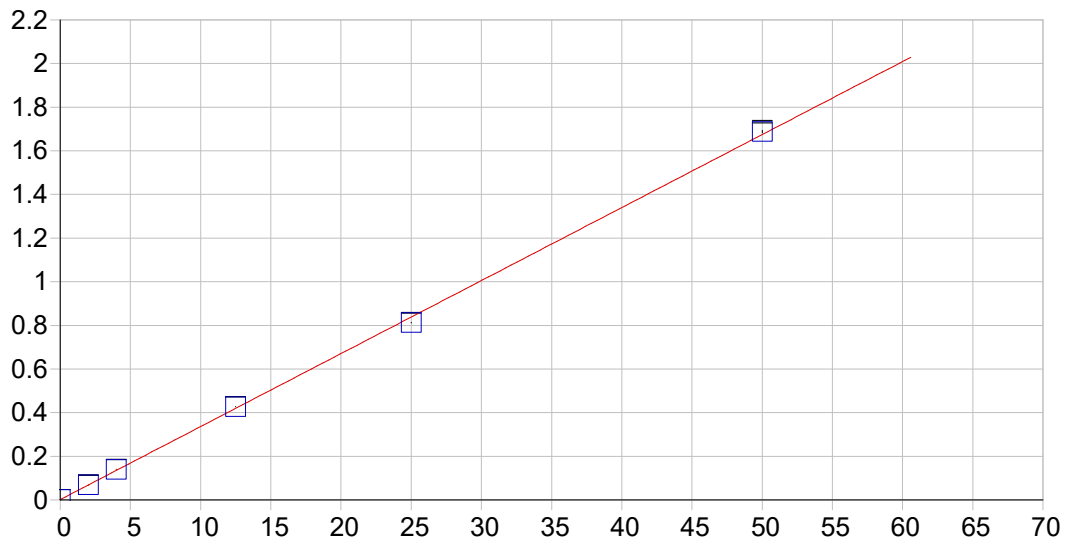










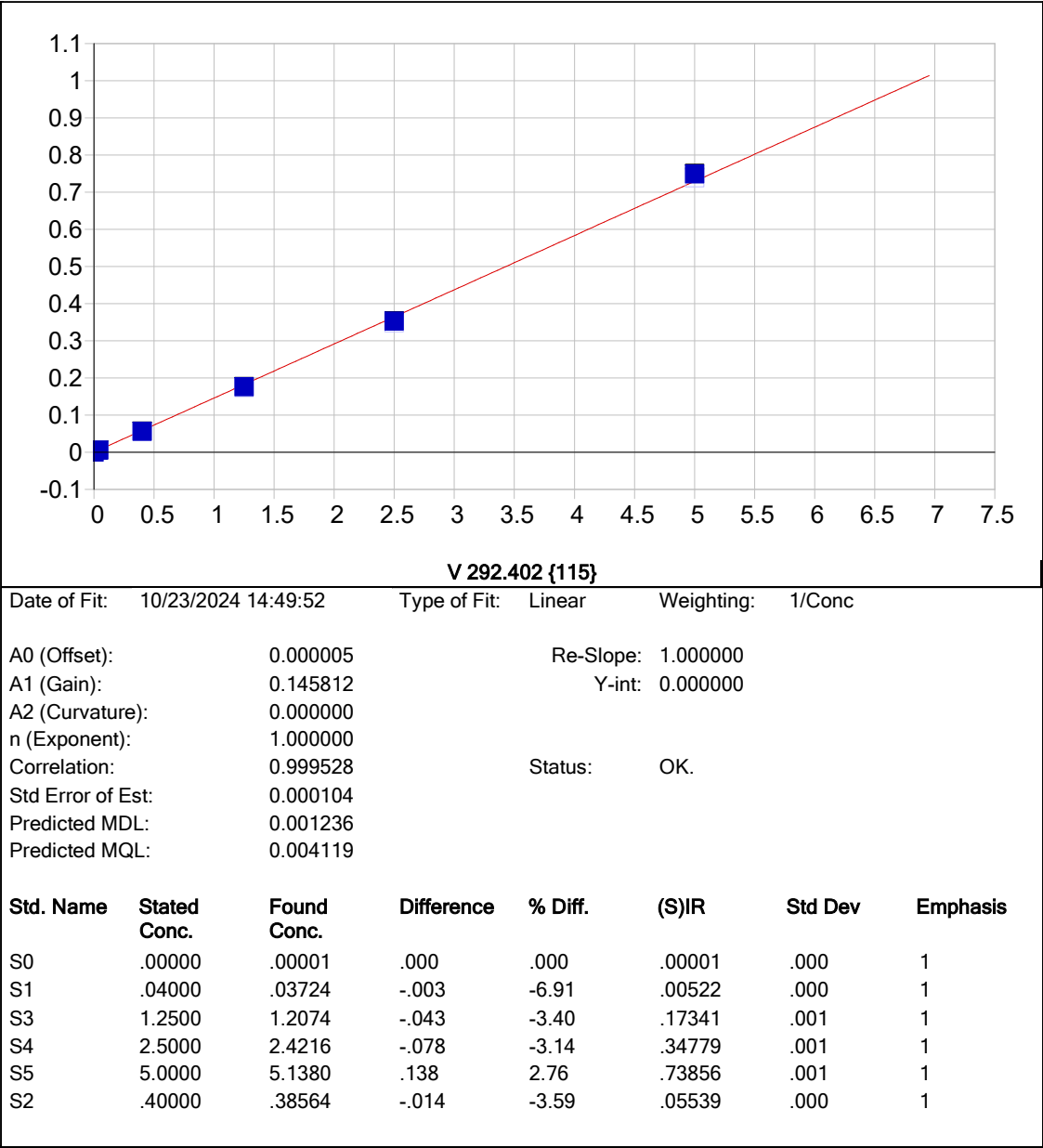


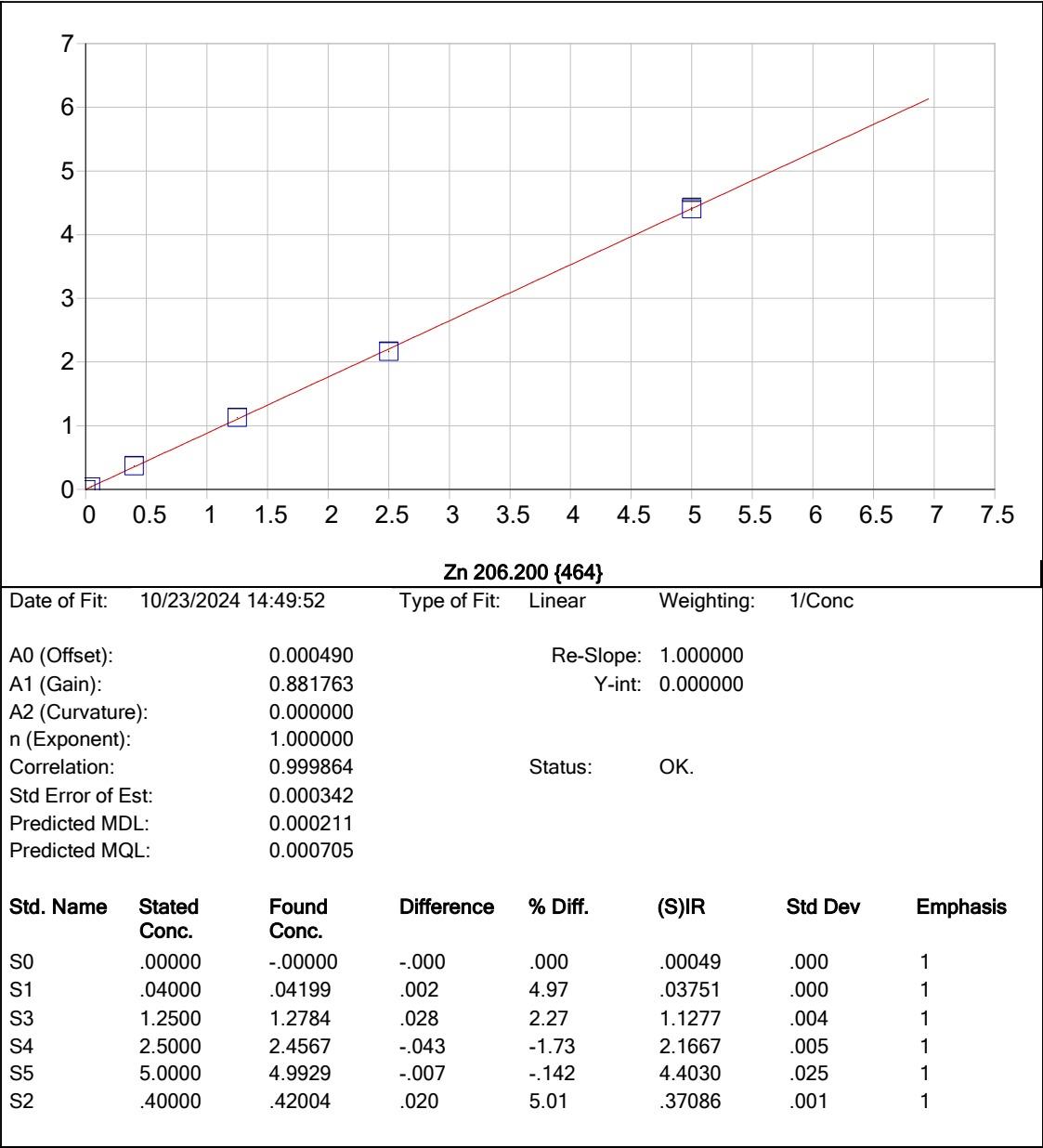
Na 589.592 { 57}

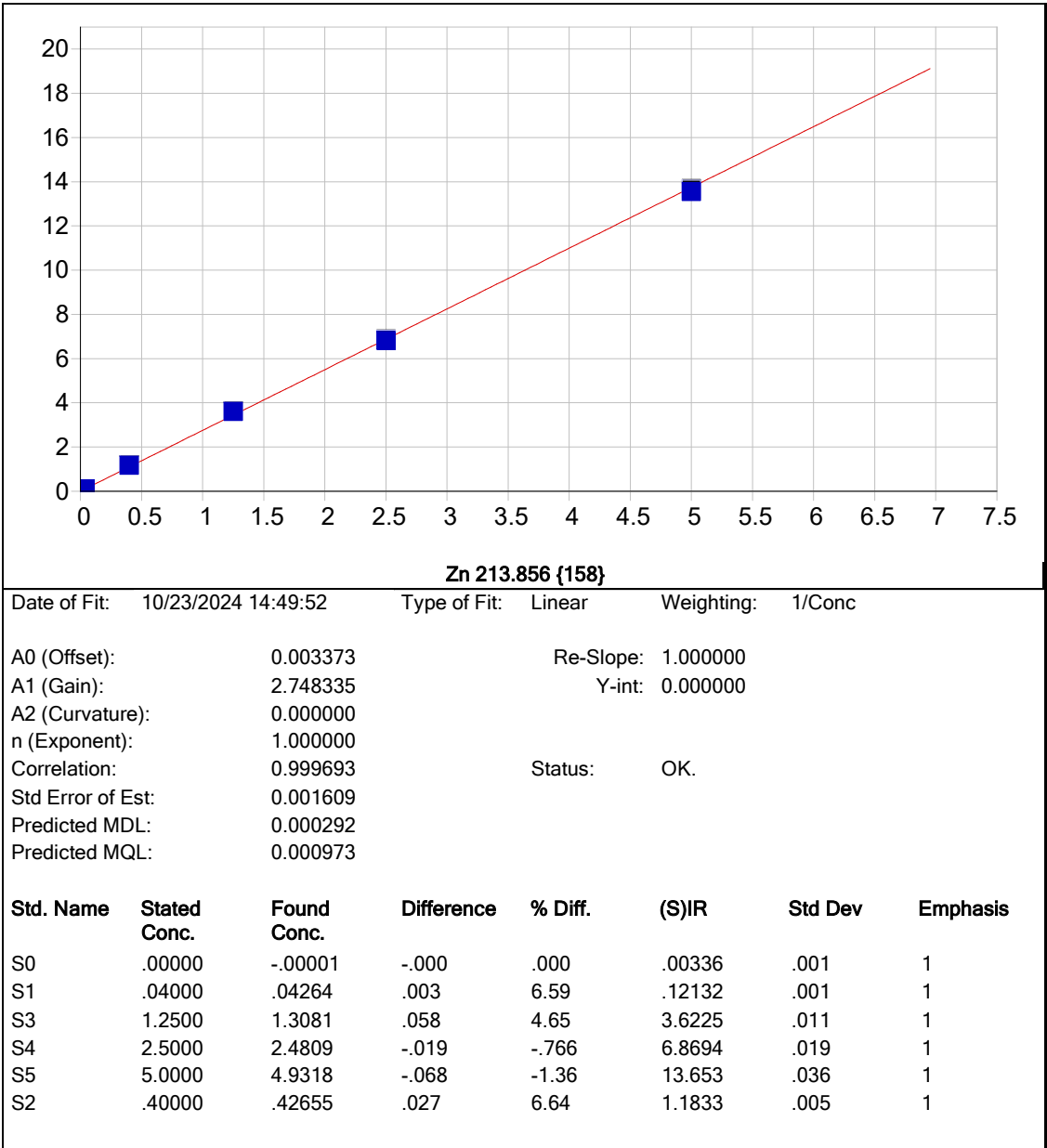
Date of Fit: 10/23/2024 14:49:52 Type of Fit: Linear Weighting: 1/Conc

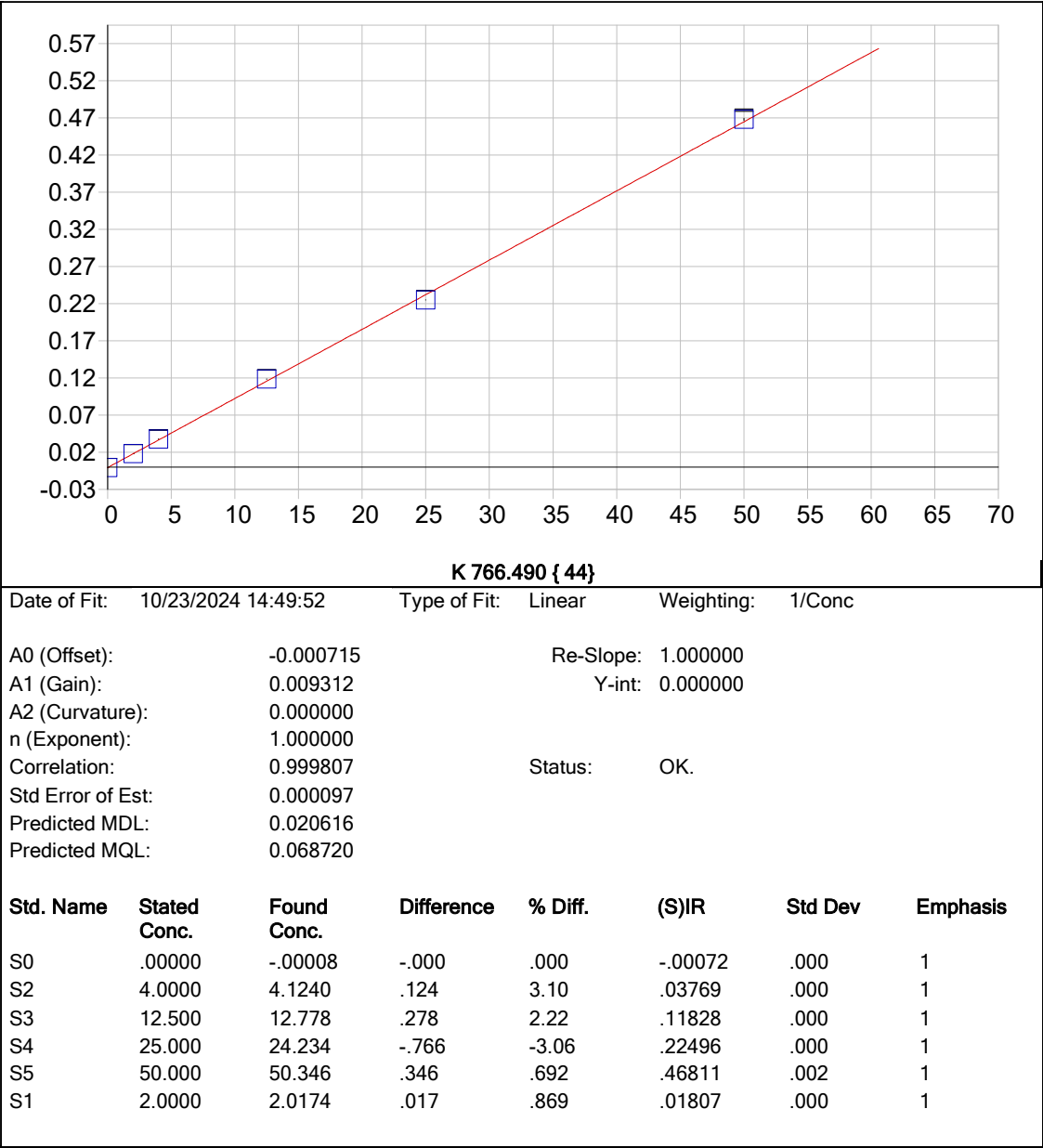
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A1 (Gain): 0.033455 Y-int: 0.000000
A2 (Curvature): 0.000000
n (Exponent): 1.000000
Correlation: 0.999812 Status: OK.
Std Error of Est: 0.000343
Predicted MDL: 0.004984
Predicted MQL: 0.016614

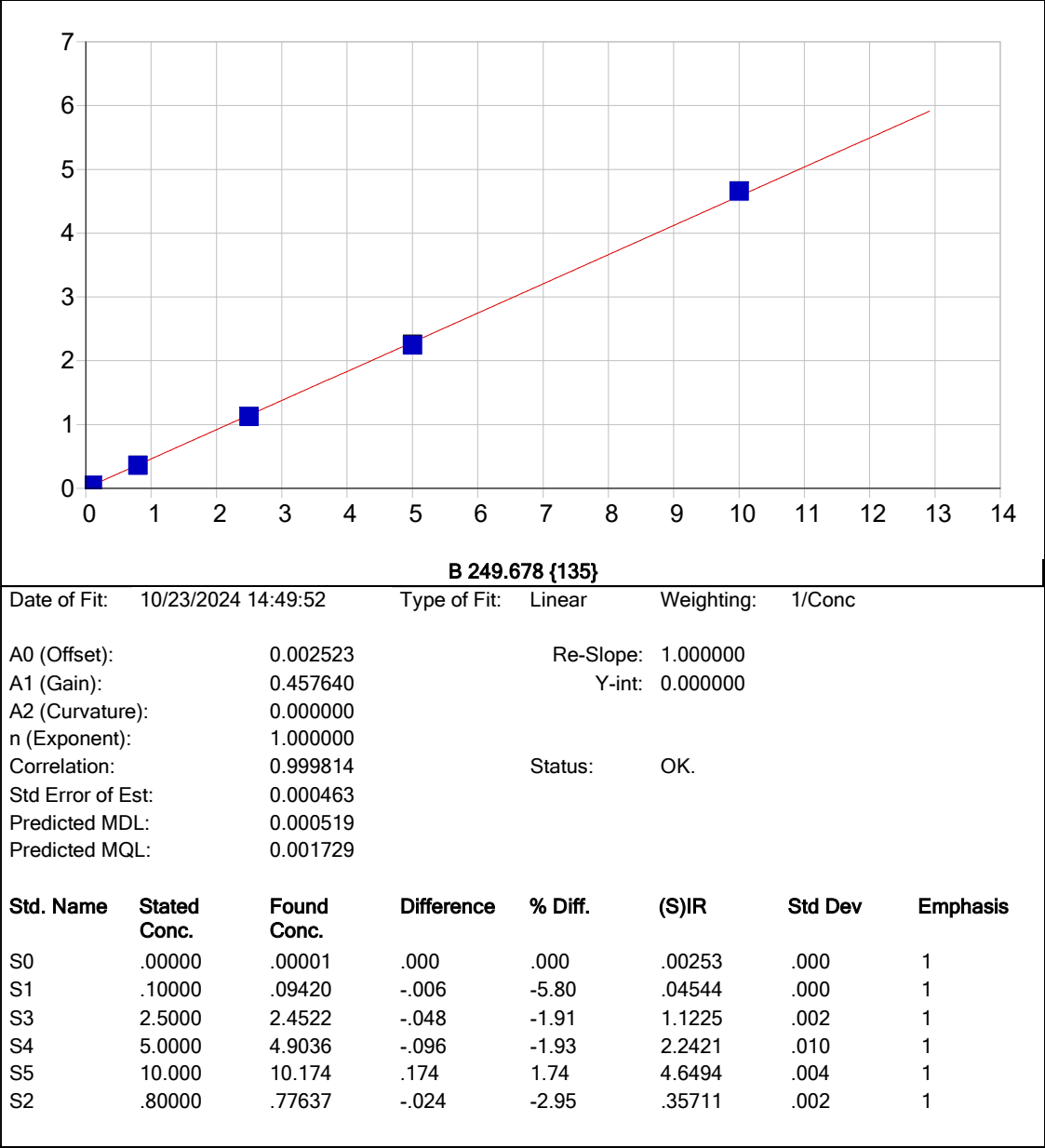
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
S0	.00000	-.00006	-.000	.000	.00163	.000	1
S2	4.0000	4.1293	.129	3.23	.13978	.001	1
S3	12.500	12.725	.225	1.80	.42736	.001	1
S4	25.000	24.234	-.766	-3.06	.81239	.002	1
S5	50.000	50.410	.410	.820	1.6881	.007	1
S1	2.0000	2.0017	.002	.084	.06860	.000	1

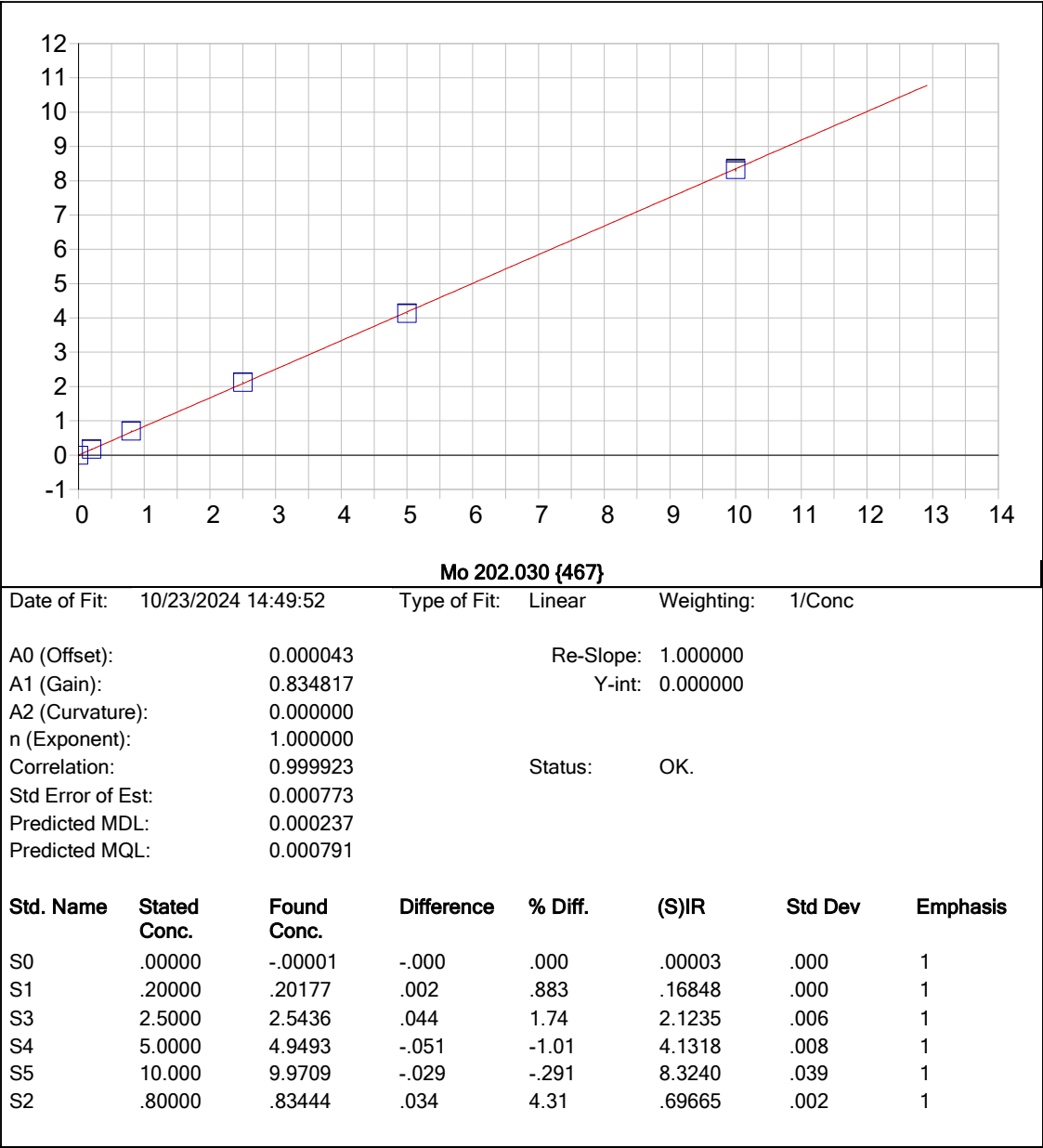


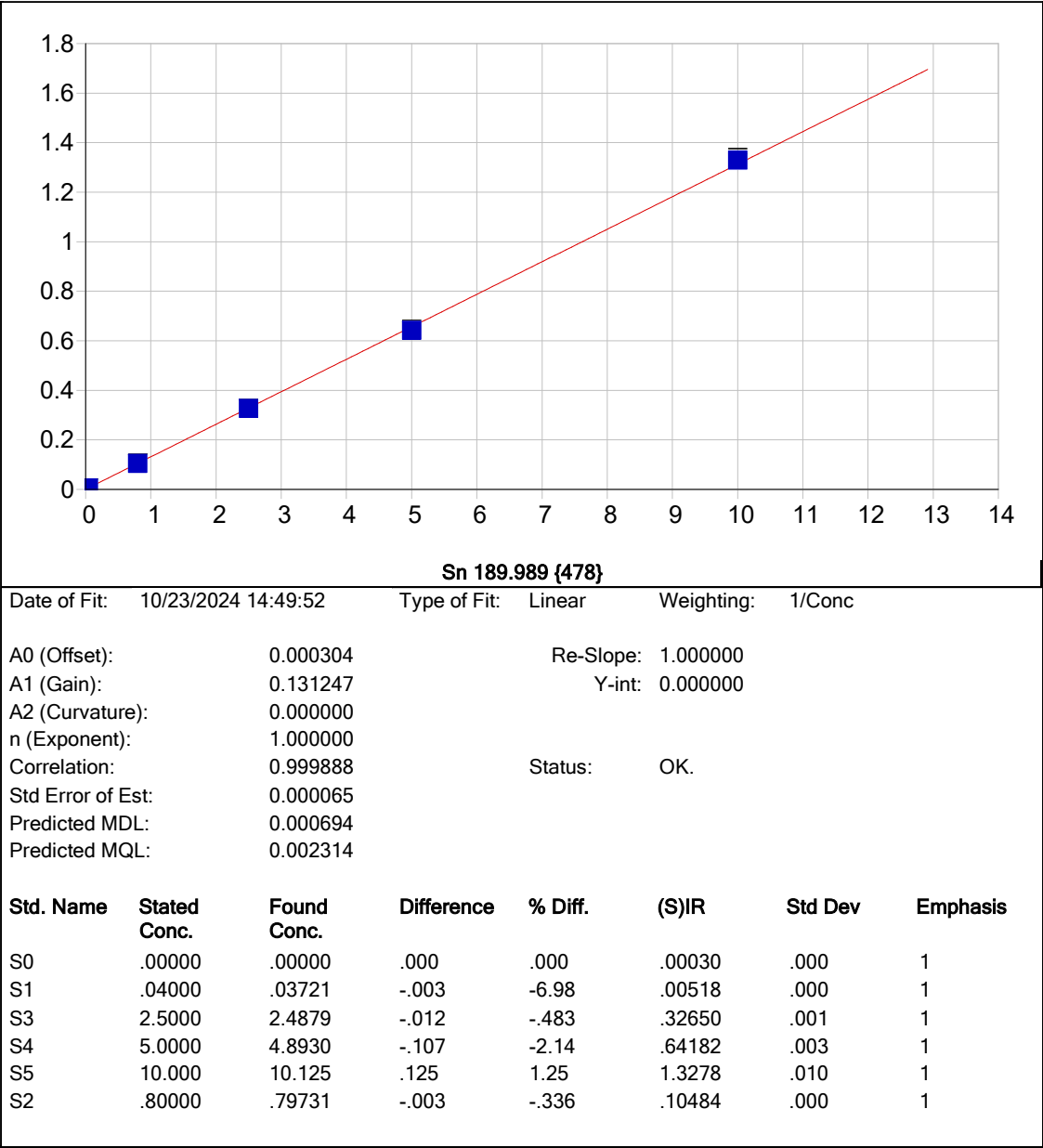


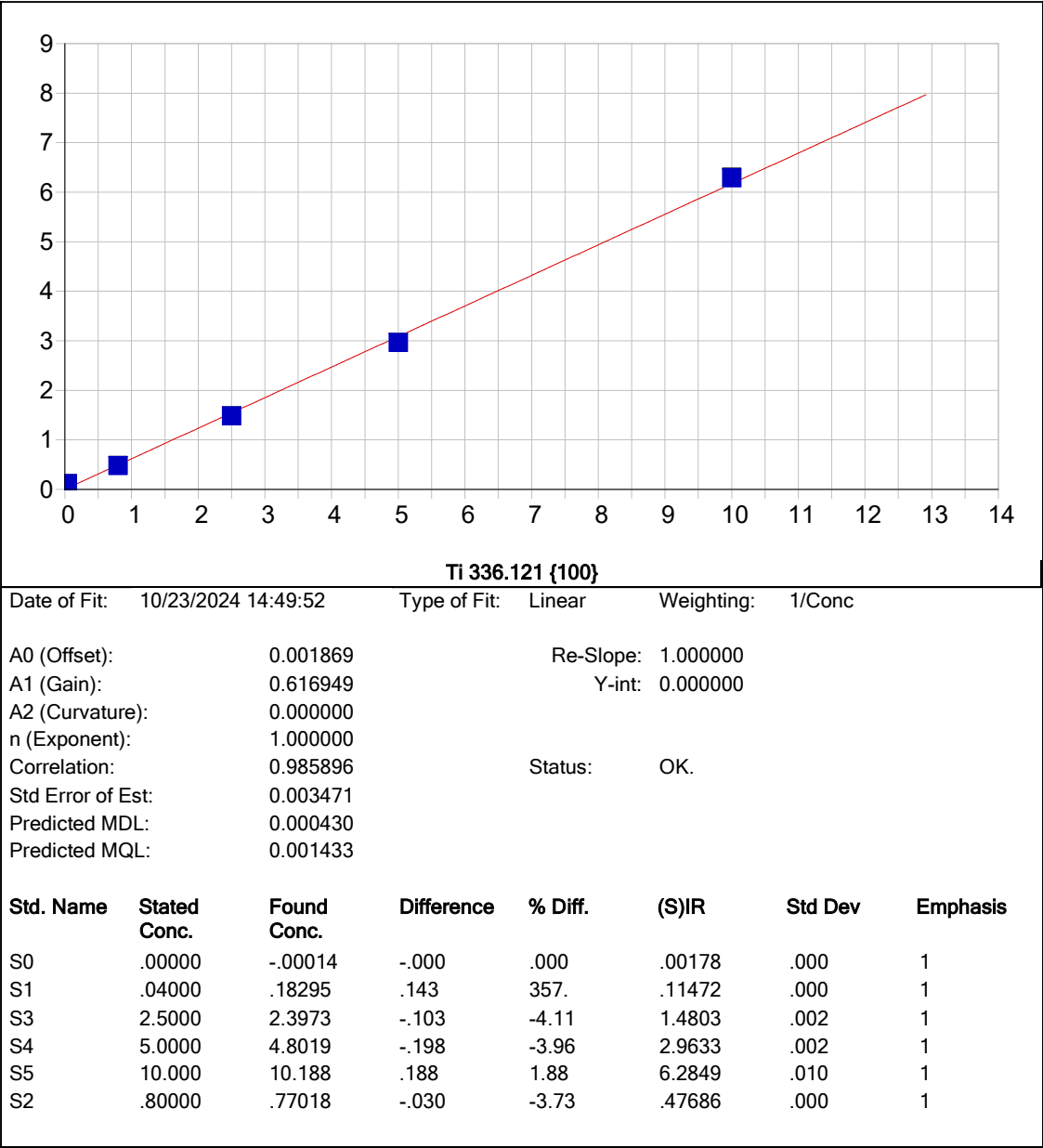


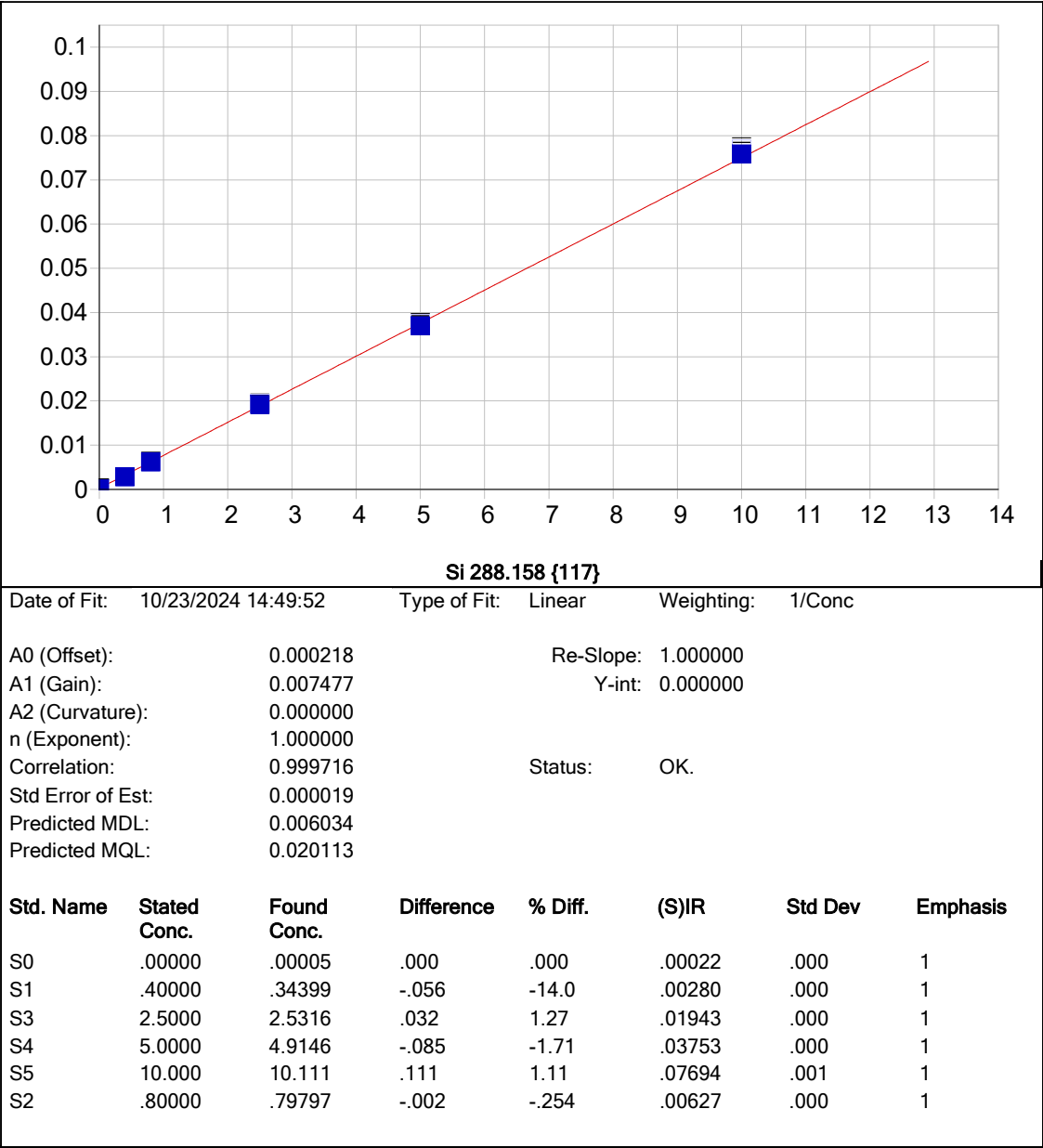


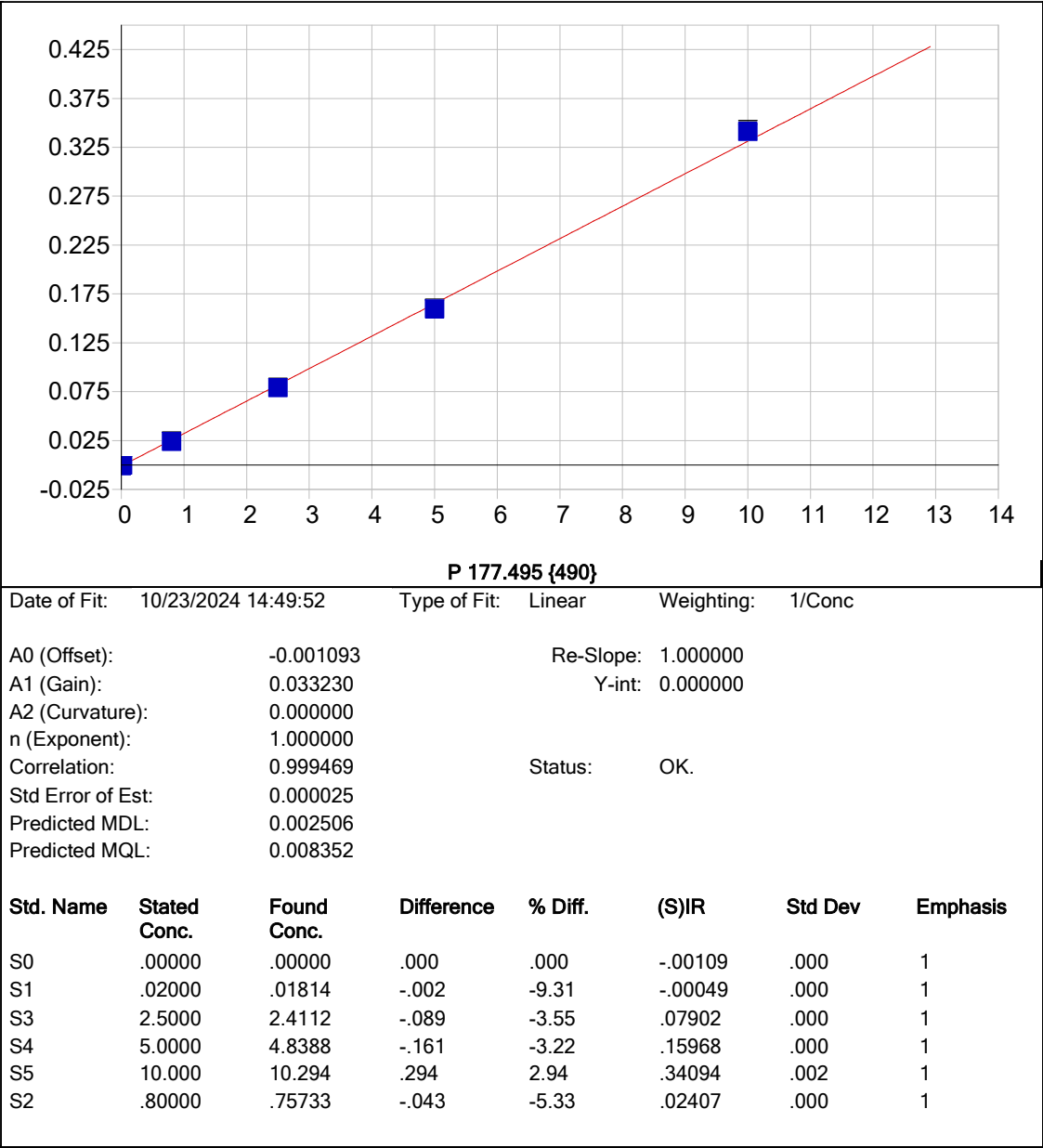


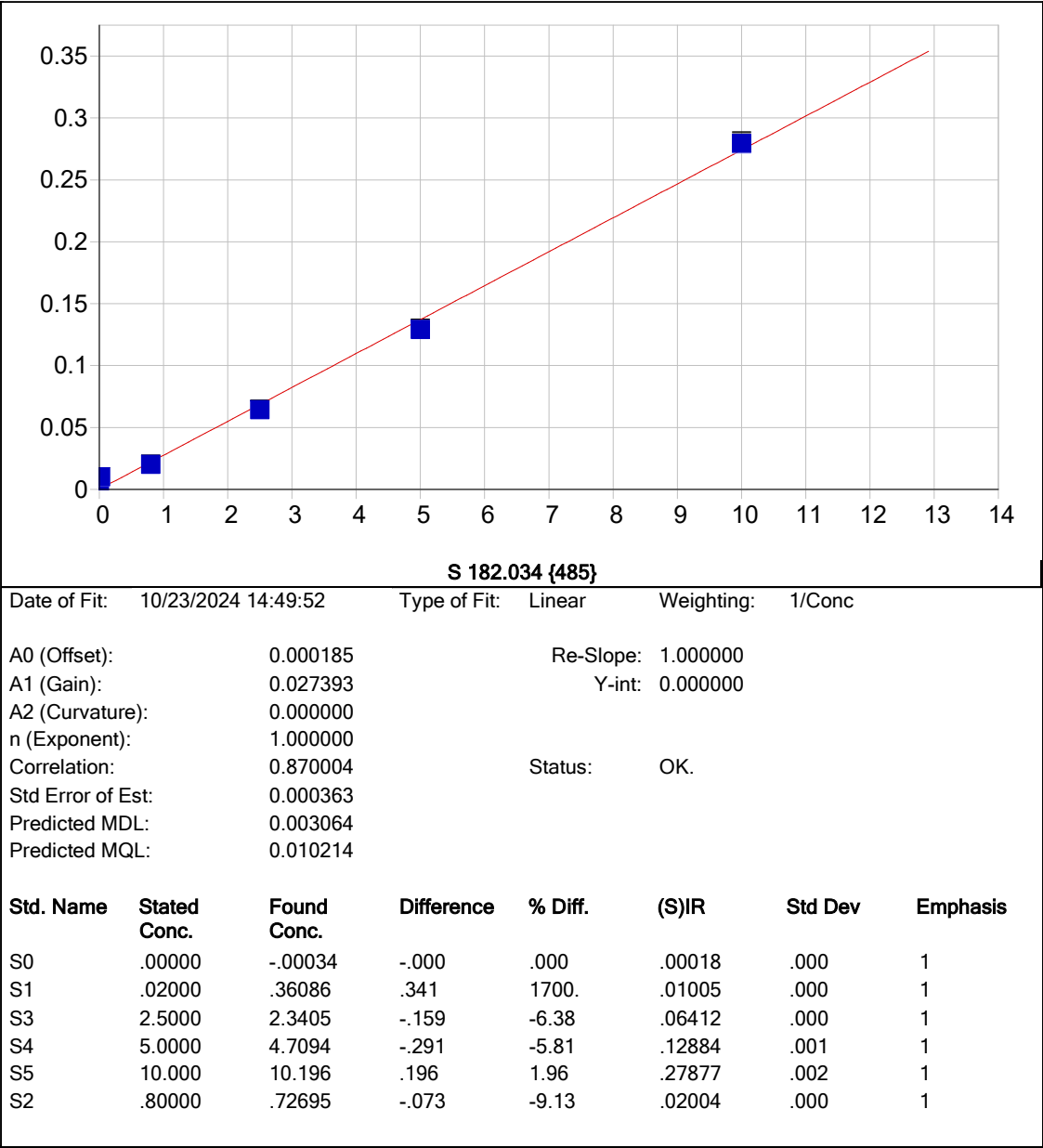


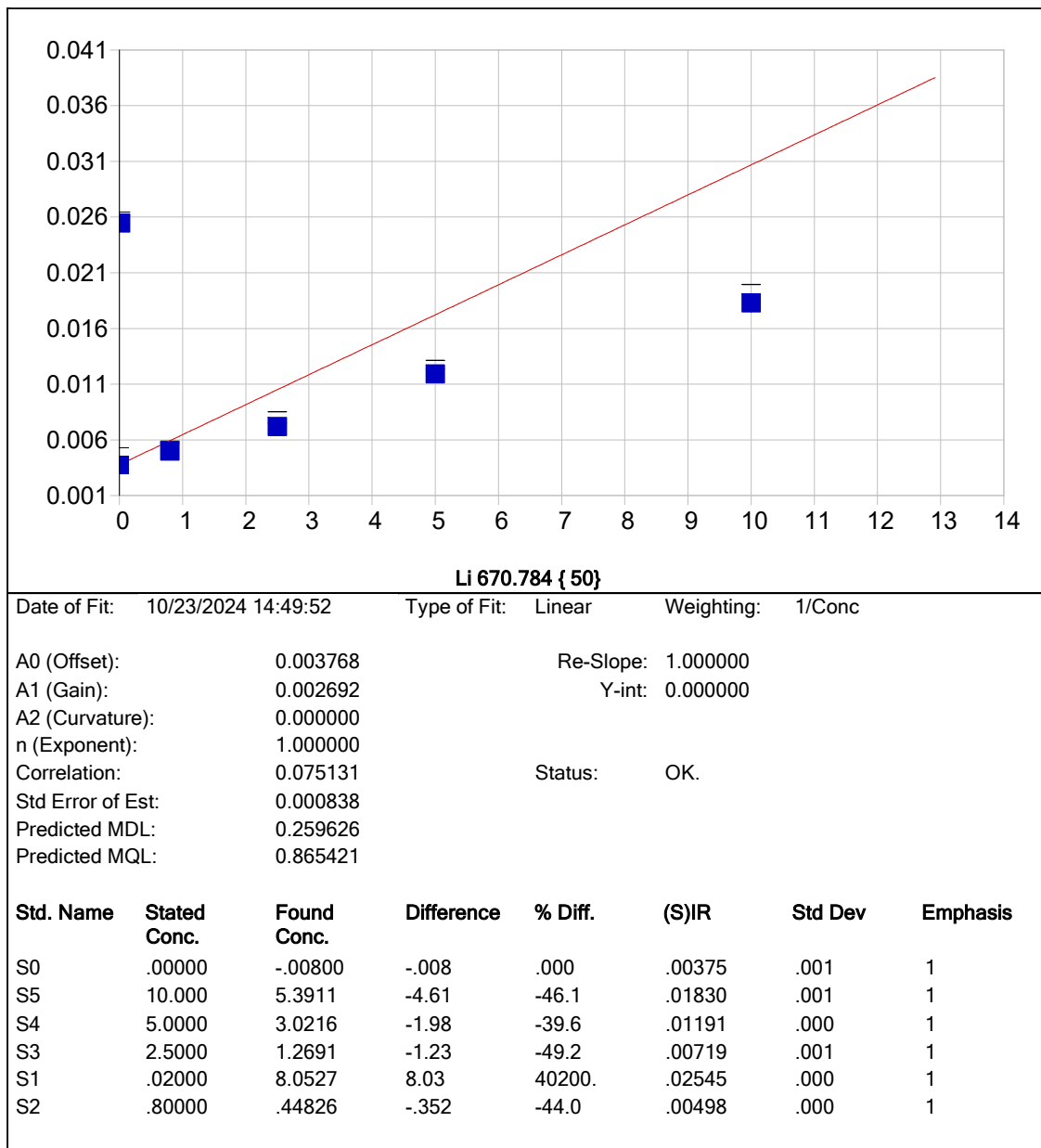


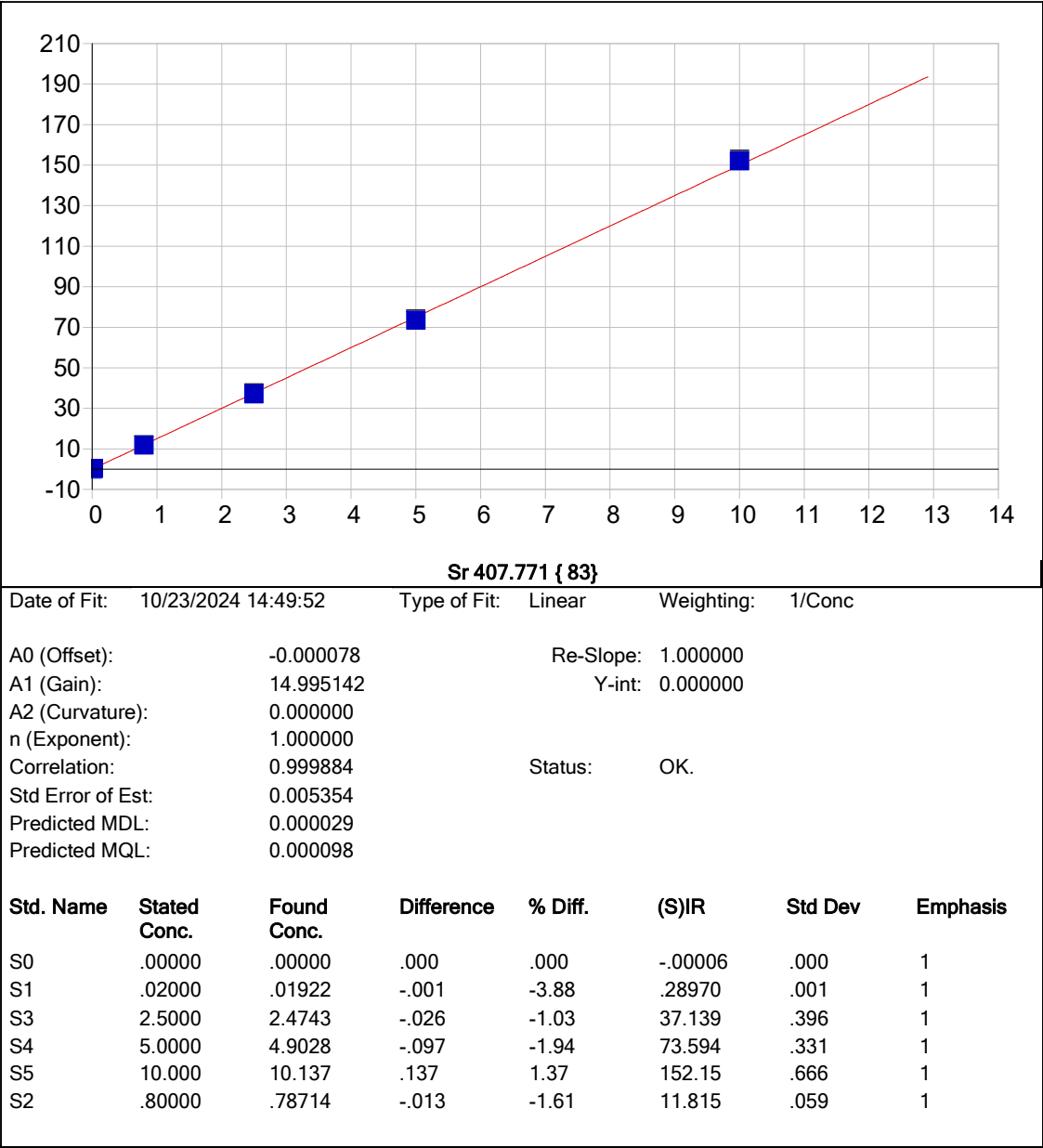


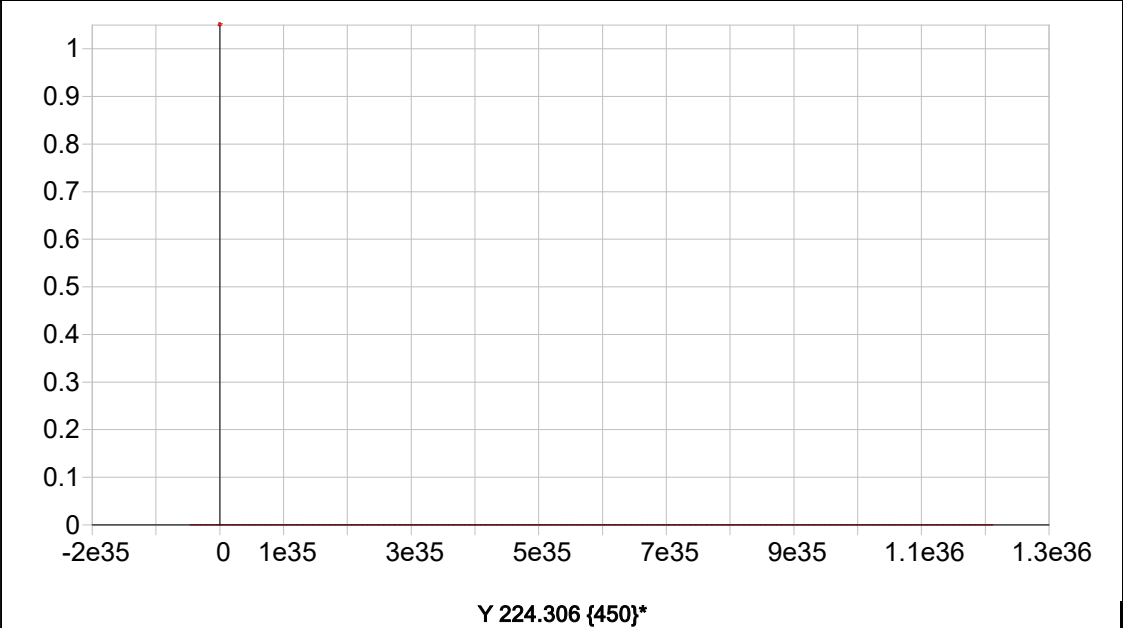






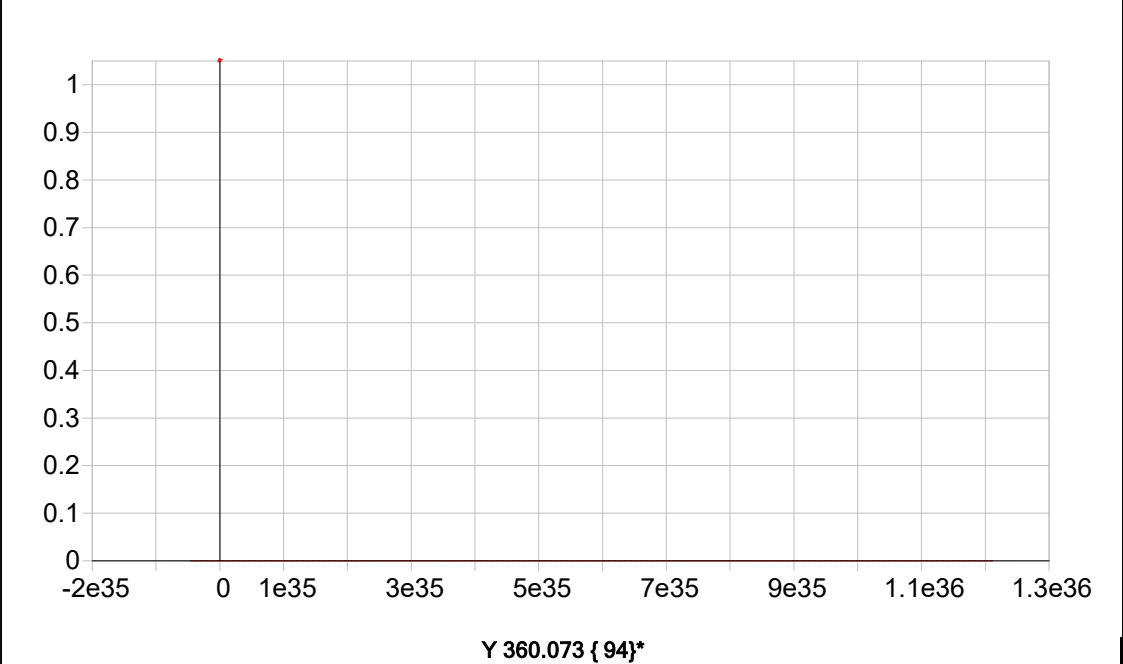




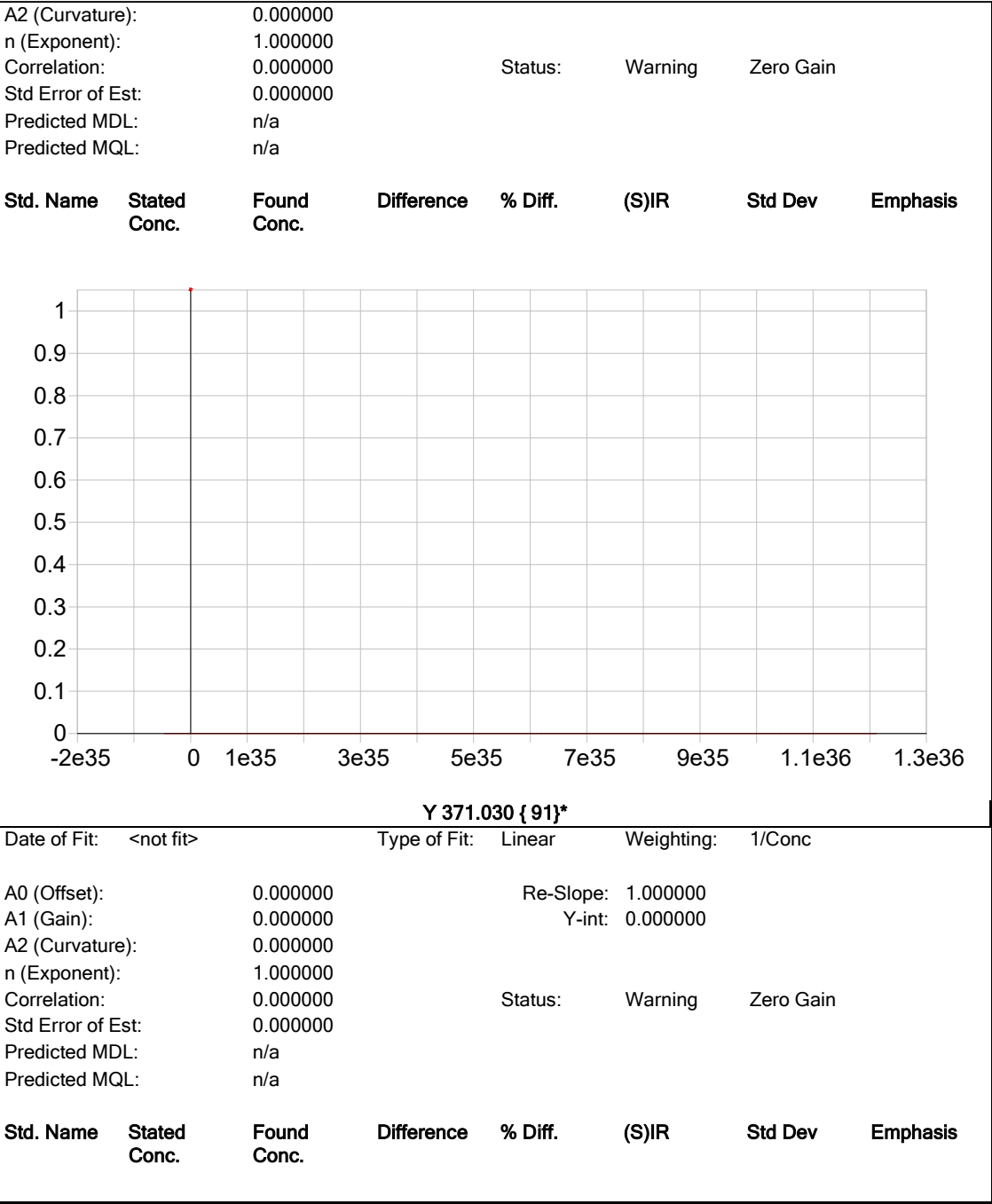


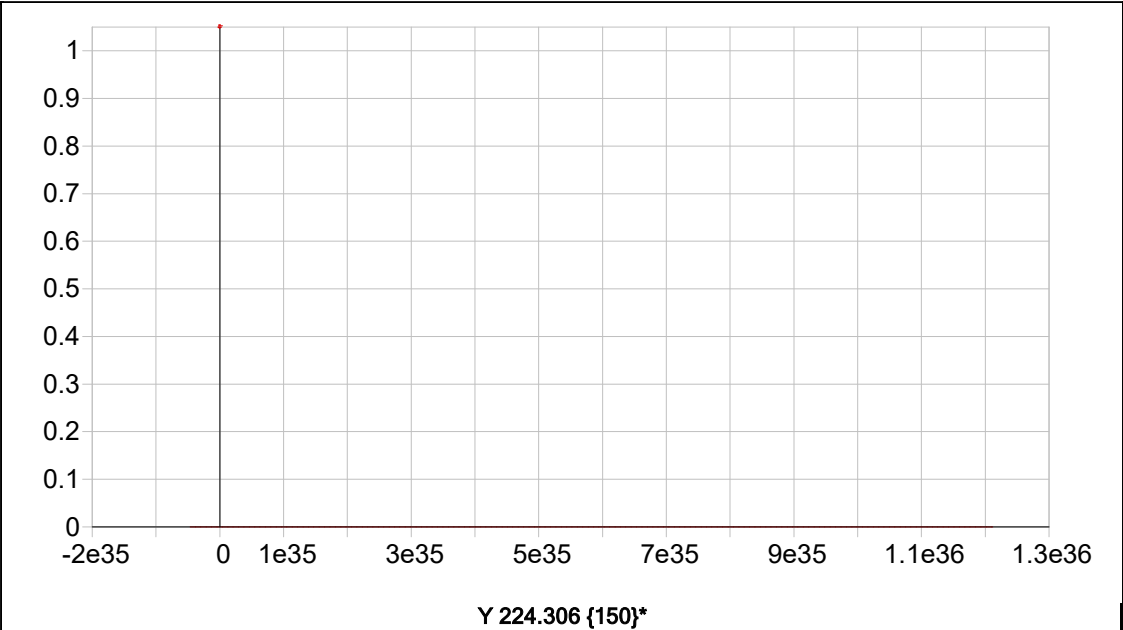
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A1 (Gain):	0.000000	Y-int:	0.000000		
A2 (Curvature):	0.000000				
n (Exponent):	1.000000				
Correlation:	0.000000	Status:	Warning	Zero Gain	
Std Error of Est:	0.000000				
Predicted MDL:	n/a				
Predicted MQL:	n/a				

Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis
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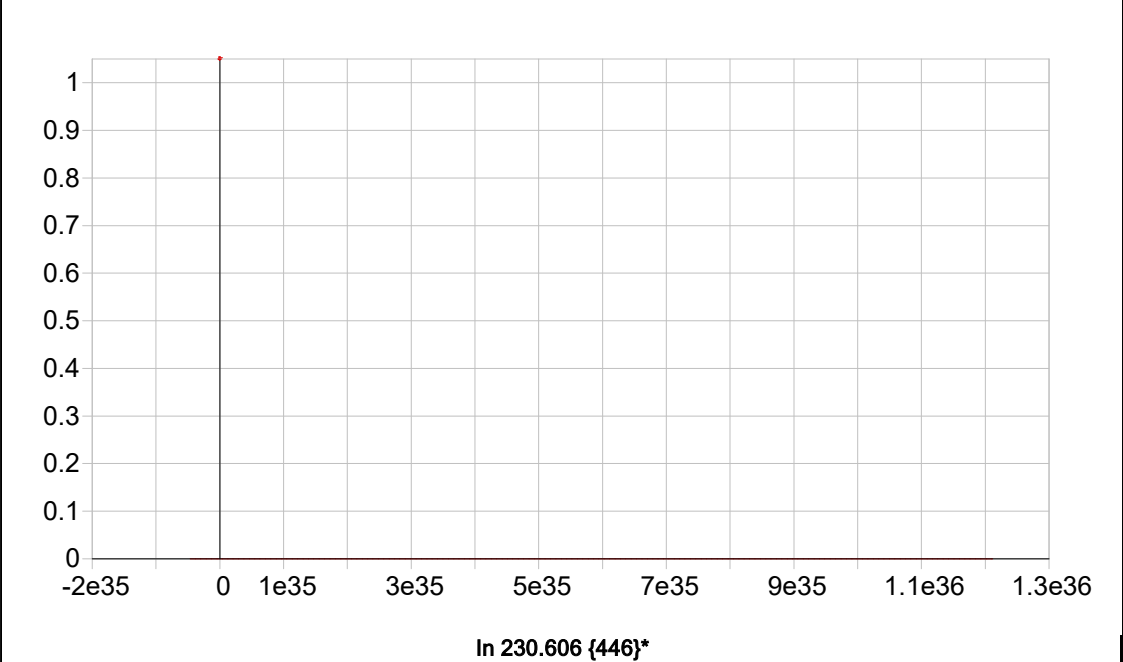


Date of Fit:	<not fit>	Type of Fit:	Linear	Weighting:	1/Conc
A0 (Offset):	0.000000	Re-Slope:	1.000000		
A1 (Gain):	0.000000	Y-int:	0.000000		





Date of Fit:		<not fit>	Type of Fit:	Linear	Weighting:	1/Conc	
A0 (Offset):		0.000000	Re-Slope:		1.000000		
A1 (Gain):		0.000000	Y-int:		0.000000		
A2 (Curvature):		0.000000					
n (Exponent):		1.000000					
Correlation:		0.000000	Status:	Warning	Zero Gain		
Std Error of Est:		0.000000					
Predicted MDL:		n/a					
Predicted MQL:		n/a					
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis



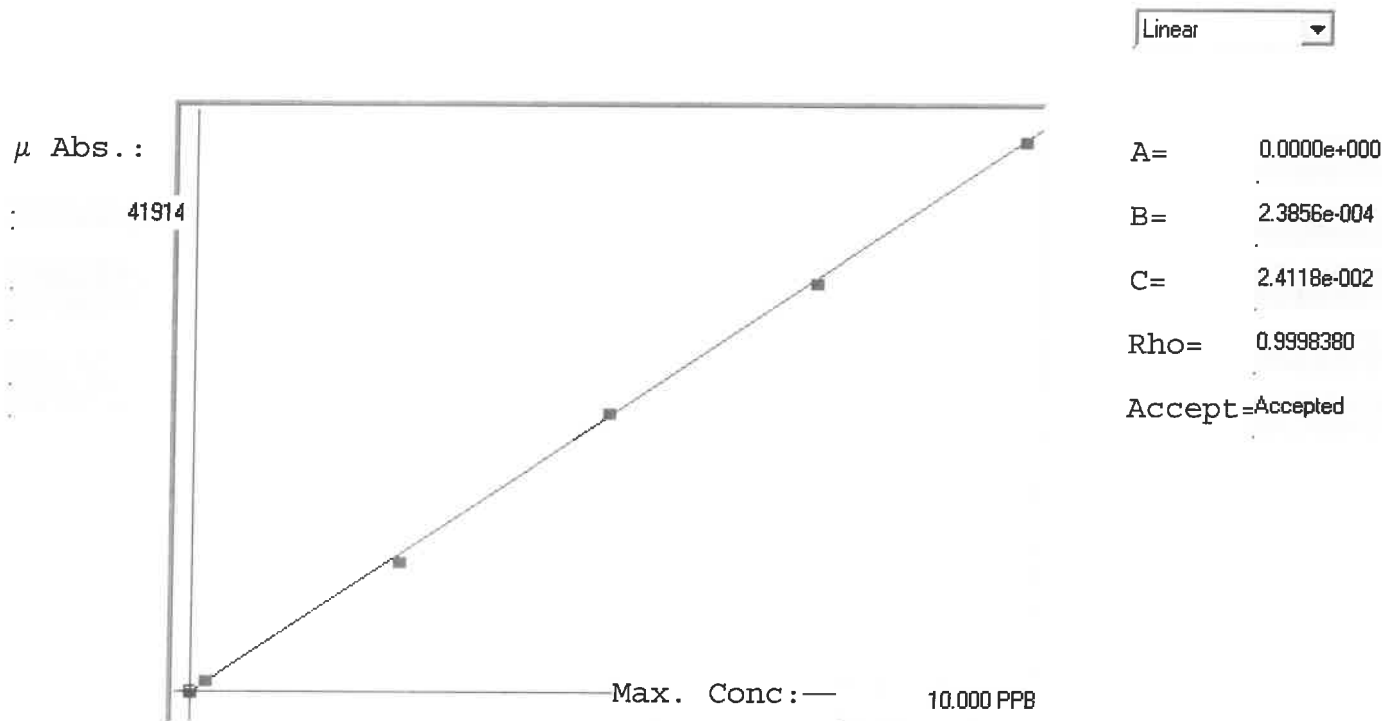
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A1 (Gain):	0.000000	Y-int: 0.000000			

A2 (Curvature):		0.000000		Status:	Warning	Zero Gain	
n (Exponent):		1.000000					
Correlation:		0.000000					
Std Error of Est:		0.000000					
Predicted MDL:		n/a					
Predicted MQL:		n/a					
Std. Name	Stated Conc.	Found Conc.	Difference	% Diff.	(S)IR	Std Dev	Emphasis

LB133065

7470A

INSTRUMENT ID: CV1



Std ID	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	%D
0.0	0.000	0.019	0.019	-21	0.000	-21	0				22
0.2	0.200	0.243	0.043	916	0.0 %	916					5
2.5	2.500	2.383	-0.117	9889	0.0 %	9889					2
5.0	5.000	5.085	0.085	21216	0.0 %	21216					1
7.5	7.500	7.447	-0.053	31115	0.0 %	31115					0
10.0	10.000	10.023	0.023	41914	0.0 %	41914					

LB133065 INSTRUMENT ID : CV1

Method: 7470A

Operator: Admin

Date of Analysis: 23 Oct 2024 08:54:43

Sample ID	Extended ID	μ Abs.	Conc.	Std Conc	Method	Units	Date	Type	Type
0.0 - 1	50	-21	-	0.0000	7470A	PPB	23 Oct 2024 09:26:45	S	Std
0.2 - 1	50.2	916	-	0.2000	7470A	PPB	23 Oct 2024 09:29:02	S	Std
2.5 - 1	52.5	9889	-	2.5000	7470A	PPB	23 Oct 2024 09:31:19	S	Std
5.0 - 1	55	21216	-	5.0000	7470A	PPB	23 Oct 2024 09:33:36	S	Std
7.5 - 1	57.5	31115	-	7.5000	7470A	PPB	23 Oct 2024 09:35:51	S	Std
10.0 - 1	510	41914	-	10.0000	7470A	PPB	23 Oct 2024 09:40:51	S	Std
ICV48 - 1	ICV48	16495	3.9591	-	7470A	PPB	23 Oct 2024 09:44:25	U	SMPL
ICB48 - 1	ICB48	-363	-0.0625	-	7470A	PPB	23 Oct 2024 09:46:40	U	SMPL
CCV56 - 1	CCV56	20937	5.0188	-	7470A	PPB	23 Oct 2024 09:48:56	U	SMPL
CCB56 - 1	CCB56	-317	-0.0515	-	7470A	PPB	23 Oct 2024 09:51:11	U	SMPL
CRA - 1	CRA	810	0.2173	-	7470A	PPB	23 Oct 2024 09:53:27	U	SMPL
HighStd - 1	HighStd	42281	10.1105	-	7470A	PPB	23 Oct 2024 09:55:42	U	SMPL
ChkStd - 1	ChkStd	29304	7.0148	-	7470A	PPB	23 Oct 2024 10:03:45	U	SMPL
PB164306BL - 1	PB164306BL	-365	-0.0630	-	7470A	PPB	23 Oct 2024 10:06:01	U	SMPL
PB164306BS - 1	PB164306BS	14663	3.5221	-	7470A	PPB	23 Oct 2024 10:08:18	U	SMPL
P4397-06 - 1	WB-301-BOT	-211	-0.0262	-	7470A	PPB	23 Oct 2024 10:10:34	U	SMPL
P4443-05 - 1	OG-315-HR-502-COMP-29	-117	-0.0038	-	7470A	PPB	23 Oct 2024 10:12:52	U	SMPL
P4443-10 - 1	OG-315-HR-502-COMP-30	-3	0.0234	-	7470A	PPB	23 Oct 2024 10:15:08	U	SMPL
P4458-02 - 1	280517	-43	0.0139	-	7470A	PPB	23 Oct 2024 10:17:28	U	SMPL
P4460-04 - 1	WB-303-BOT	-90	0.0026	-	7470A	PPB	23 Oct 2024 10:19:46	U	SMPL
CCV57 - 1	CCV57	22150	5.3081	-	7470A	PPB	23 Oct 2024 10:22:01	U	SMPL
CCB57 - 1	CCB57	-386	-0.0680	-	7470A	PPB	23 Oct 2024 10:24:16	U	SMPL
P4460-04DUP - 1	WB-303-BOTDUP	-94	0.0017	-	7470A	PPB	23 Oct 2024 10:26:33	U	SMPL
P4460-04MS - 1	WB-303-BOTMS	13457	3.2344	-	7470A	PPB	23 Oct 2024 10:28:48	U	SMPL
P4460-04MSD - 1	WB-303-BOTMSD	16951	3.8293	-	7470A	PPB	23 Oct 2024 10:31:03	U	SMPL
PB164321BL - 1	PB164321BL	-344	-0.0579	-	7470A	PPB	23 Oct 2024 10:33:20	U	SMPL
PB164321BS - 1	PB164321BS	16147	3.8761	-	7470A	PPB	23 Oct 2024 10:35:38	U	SMPL
P4467-04 - 1	TP-1	-260	-0.0379	-	7470A	PPB	23 Oct 2024 10:37:54	U	SMPL
P4468-02 - 1	ETGI-331	-83	0.0043	-	7470A	PPB	23 Oct 2024 10:40:12	U	SMPL
P4468-04 - 1	ETGI-329	-75	0.0062	-	7470A	PPB	23 Oct 2024 10:42:29	U	SMPL
P4468-06 - 1	ETGI-345	2	0.0246	-	7470A	PPB	23 Oct 2024 10:44:45	U	SMPL
P4472-04 - 1	BP-F-28	-27	0.0177	-	7470A	PPB	23 Oct 2024 10:47:01	U	SMPL
CCV58 - 1	CCV58	22679	5.4343	-	7470A	PPB	23 Oct 2024 10:49:16	U	SMPL
CCB58 - 1	CCB58	-316	-0.0513	-	7470A	PPB	23 Oct 2024 10:51:32	U	SMPL
P4472-08 - 1	BP-F-6	-30	0.0170	-	7470A	PPB	23 Oct 2024 10:53:49	U	SMPL
P4472-08DUP - 1	BP-F-6DUP	-6	0.0227	-	7470A	PPB	23 Oct 2024 10:56:04	U	SMPL
P4472-08MS - 1	BP-F-6MS	14646	3.5180	-	7470A	PPB	23 Oct 2024 10:58:20	U	SMPL
P4472-08MSD - 1	BP-F-6MSD	14059	3.3780	-	7470A	PPB	23 Oct 2024 11:00:35	U	SMPL
PB164261TB - 1	PB164261TB	-352	-0.0599	-	7470A	PPB	23 Oct 2024 11:02:53	U	SMPL
PB164301TB - 1	PB164301TB	-66	0.0084	-	7470A	PPB	23 Oct 2024 11:05:15	U	SMPL
P4460-04LX5 - 1		31	0.0315	-	7470A	PPB	23 Oct 2024 11:07:32	U	SMPL
P4460-04A - 1		16402	3.9369	-	7470A	PPB	23 Oct 2024 11:09:48	U	SMPL
P4472-08LX5 - 1		-256	-0.0370	-	7470A	PPB	23 Oct 2024 11:12:05	U	SMPL
P4472-08A - 1		17250	4.1392	-	7470A	PPB	23 Oct 2024 11:14:22	U	SMPL
CCV59 - 1	CCV59	22140	5.3057	-	7470A	PPB	23 Oct 2024 11:16:37	U	SMPL
CCB59 - 1	CCB59	-458	-0.0851	-	7470A	PPB	23 Oct 2024 11:18:54	U	SMPL

SOP ID : M3010A-Digestion-17

SDG No : N/A

Matrix : WATER

Pipette ID: ICP A

Balance ID : N/A

Filter paper ID : N/A

pH Strip ID : M6069

Hood ID : #3

Block ID: 1. HOT BLOCK #1 2. N/A

Start Digest Date: 10/21/2024 Time : 11:45 Temp : 95 °C

End Digest Date: 10/21/2024 Time : 14:55 Temp : 96 °C

Digestion tube ID: M5595

Block thermometer ID: MET-DIG. #1

Dig Technician Signature: *JGP*

Supervisor Signature: *[Signature]*

Temp : 1. 95°C 2. N/A

Standard Name	MLS USED	STD REF. # FROM LOG
LFS-1	0.25	M6000
LFS-2	0.25	M6009
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE USED	Lot Number
Conc. HNO3	3.00	M6093
1:1 HCL	5.00	MP82127
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Extraction Conformance/Non-Conformance Comments:

Hot Block # 1 Cell # 50 Temp: 95 C

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
10/21/24 15:00	<i>JGP Metdig.</i> Preparation Group	<i>[Signature] (metals Lab)</i> Analysis Group

Lab Sample ID	Client Sample ID	pH	Initial Vol (ml)	Final Vol (ml)	Color Before	Color After	Clarity Before	Clarity After	Comment	Prep Pos
P4397-06	WB-301-BOT	<2	5	25	Colorless	Colorless	Clear	Clear	N/A	11
P4443-05	OG-315-HR-502-COMP-29	<2	5	25	Colorless	Colorless	Clear	Clear	N/A	12
P4443-10	OG-315-HR-502-COMP-30	<2	5	25	Colorless	Colorless	Clear	Clear	N/A	13
P4458-02	280517	<2	5	25	Colorless	Colorless	Clear	Clear	N/A	14
P4460-04	WB-303-BOT	<2	5	25	Colorless	Colorless	Clear	Clear	N/A	15
P4460-04MS	WB-303-BOTMS	<2	5	25	Colorless	Colorless	Clear	Clear	M6000,M6009	17
P4460-04MSD	WB-303-BOTMSD	<2	5	25	Colorless	Colorless	Clear	Clear	M6000,M6009	18
P4460-04DUP	WB-303-BOTDUP	<2	5	25	Colorless	Colorless	Clear	Clear	N/A	16
PB164261TB	PB164261TB	<2	5	25	Colorless	Colorless	Clear	Clear	N/A	19
PB164298BL	PBW298	<2	5	25	Colorless	Colorless	Clear	Clear	N/A	20
PB164298BS	LCS298	<2	5	25	Colorless	Colorless	Clear	Clear	M6000,M6009	21

Sample ID	ClientID	TCLP Vessel ID	Sample Wt (g)	Volume Extraction Fluid #1 (mL)	Multi phasic	Phase Miscible	Phases Combined	Final Leachate PH	Metals Leachate Adj. PH	Prep Pos
P4397-06	WB-301-BOT	01	100.03	2000	N/A	N/A	N/A	5.6	1.5	T-1
P4443-05	OG-315-HR-502-COMP-29	02	100.02	2000	N/A	N/A	N/A	5.5	1.0	T-1
P4443-10	OG-315-HR-502-COMP-30	03	100.03	2000	N/A	N/A	N/A	4.5	1.5	T-1
P4458-02	280517	04	100.02	2000	N/A	N/A	N/A	5.6	1.0	T-1
P4460-04	WB-303-BOT	05	100.03	2000	N/A	N/A	N/A	6.0	1.5	T-1
PB164261TB	LEB261	06	N/A	2000	N/A	N/A	N/A	4.93	1.0	T-1

SOP ID : M7470A-Mercury-19

SDG No : NA

Matrix : WATER

Pipette ID: HG A

Balance ID : M SC-3

Filter paper ID : NA

pH Strip ID : M4909

Hood ID : #1

Block ID: 1. HG HOT BLOCK#3 2. N/A

Start Digest Date: 10/22/2024 Time : 11:50 Temp : 94 °C

End Digest Date: 10/22/2024 Time : 13:50 Temp : 95 °C

Digestion tube ID: M5595

Block thermometer ID: HG-DIG#3

Dig Technician Signature: [Signature]

Supervisor Signature: [Signature]

Temp : 1. 94°C 2. N/A

Standard Name	MLS USED	STD REF. # FROM LOG
ICV	30mL	MP82873
CCV	30mL	MP82875
CRA	30mL	MP82877
Blank Spike	0.48mL	MP82865
Matrix Spike	0.48mL	MP82865

Chemical Used	ML/SAMPLE USED	Lot Number
HNO3/H2SO4(1:2)	2.5mL	MP82651
KMnO4 (5%)	4.5mL	MP82652
K2S2O8 (5%)	2.5mL	MP82653
Hydroxylamine HCL (12%)	2.0mL	MP82654
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

LAB SAMPLE ID	CLIENT SAMPLE ID	Wt(g)/Vol(ml)	Comment
0.0 ppb	S0	30mL	MP82866
0.05 ppb	S0.05	N/A	N/A
0.2 ppb	S0.2	30mL	MP82868
2.5 ppb	S2.5	30mL	MP82869
5.0 ppb	S5.0	30mL	MP82870
7.5 ppb	S7.5	30mL	MP82871
10.0 ppb	S10.0	30mL	MP82872
ICV	ICV	30mL	MP82873
ICB	ICB	30mL	MP82874
CCV	CCV	30mL	MP82875
CCB	CCB	30mL	MP82876
CRI	CRI	30mL	MP82877
CHK STD	CHK STD	30mL	MP82883

Extraction Conformance/Non-Conformance Comments:

N/A		
Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
10/22/24 @ 14:30	[Signature]	[Signature]
	Preparation Group	Analysis Group

Lab Sample ID	Client Sample ID	Initial Vol (ml)	Final Vol (ml)	pH	Comment	Prep Pos
P4397-06	WB-301-BOT	3	30	<2	N/A	3-1
P4443-05	OG-315-HR-502-COMP-29	3	30	<2	N/A	2
P4443-10	OG-315-HR-502-COMP-30	3	30	<2	N/A	3
P4458-02	280517	3	30	<2	N/A	4
P4460-04	WB-303-BOT	3	30	<2	N/A	5
P4460-04DUP	WB-303-BOTDUP	3	30	<2	N/A	6
P4460-04MS	WB-303-BOTMS	3	30	<2	MP82865	7
P4460-04MSD	WB-303-BOTMSD	3	30	<2	MP82865	8
PB164261TB	PB164261TB	3	30	<2	N/A	9
PB164306BL	PBS306	30	30	<2	N/A	10
PB164306BS	LCS306	30	30	<2	MP82865	11

SOP ID : M1311-TCLP-15
SDG No : N/A
Weigh By : JP
Balance ID : WC SC-4
pH Meter ID : WC PH METER-1
Extraction By : JP
Filter By : JP
Pipette ID : WC
Tumbler ID : T-1
TCLP Filter ID : 114771

Start Prep Date : 10/18/2024 Time : 17:00
End Prep Date : 10/19/2024 Time : 10:15
Combination Ratio : 20
ZHE Cleaning Batch : N/A
Initial Room Temperature: 23 °C
Final Room Temperature: 22 °C
TCLP Technician Signature : *JP*
Supervisor By : *12*

Standard Name	MLS USED	STD REF. # FROM LOG
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE U	Lot Number
TCLP-FLUID-1	N/A	WP108622
HCL-TCLP,1N	N/A	WP108584
HNO3-TCLP,1N	N/A	WP108585
pH Strips	N/A	W1931,W1934,W2350,W2755
pH Strips	N/A	N/A
1 Liter Amber	N/A	23091
120ml Plastic bottle	N/A	21029
1:1 HNO3	MP81119	N/A

Extraction Conformance/Non-Conformance Comments:

Matrix spikes are added after filtration and before preservation. Tumbler T-1 CHECKED,30 RPM. Particle size reduction is not required. p4460-04 is used for MS-MSD.

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
10/21/24 08:00	<i>JP</i> / TCLP Room	<i>JP</i> / 15A
	Preparation Group	Analysis Group <i>10/21/24</i>

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB133065

Review By	jaswal	Review On	10/23/2024 11:18:30 PM
Supervise By	mohan	Supervise On	10/23/2024 11:33:40 PM

STD. NAME	STD REF.#
ICAL Standard	MP82866,MP82868,MP82869,MP82870,MP82871,MP82872
ICV Standard	MP82873
CCV Standard	MP82875
ICSA Standard	
CRI Standard	MP82877
LCS Standard	
Chk Standard	MP82874,MP82876,MP82883,MP82885

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	10/23/24 09:26		Mohan	OK
2	S0.2	S0.2	CAL2	10/23/24 09:29		Mohan	OK
3	S2.5	S2.5	CAL3	10/23/24 09:31		Mohan	OK
4	S5	S5	CAL4	10/23/24 09:33		Mohan	OK
5	S7.5	S7.5	CAL5	10/23/24 09:35		Mohan	OK
6	S10	S10	CAL6	10/23/24 09:40		Mohan	OK
7	ICV48	ICV48	ICV	10/23/24 09:44		Mohan	OK
8	ICB48	ICB48	ICB	10/23/24 09:46		Mohan	OK
9	CCV56	CCV56	CCV	10/23/24 09:48		Mohan	OK
10	CCB56	CCB56	CCB	10/23/24 09:51		Mohan	OK
11	CRA	CRA	CRDL	10/23/24 09:53		Mohan	OK
12	HighStd	HighStd	HIGH STD	10/23/24 09:55		Mohan	OK
13	ChkStd	ChkStd	SAM	10/23/24 10:03		Mohan	OK
14	PB164306BL	PB164306BL	MB	10/23/24 10:06		Mohan	OK
15	PB164306BS	PB164306BS	LCS	10/23/24 10:08		Mohan	OK
16	P4397-06	WB-301-BOT	SAM	10/23/24 10:10		Mohan	OK
17	P4443-05	OG-315-HR-502-COM	SAM	10/23/24 10:12		Mohan	OK
18	P4443-10	OG-315-HR-502-COM	SAM	10/23/24 10:15		Mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB133065

Review By	jaswal	Review On	10/23/2024 11:18:30 PM
Supervise By	mohan	Supervise On	10/23/2024 11:33:40 PM

STD. NAME	STD REF.#
ICAL Standard	MP82866,MP82868,MP82869,MP82870,MP82871,MP82872
ICV Standard	MP82873
CCV Standard	MP82875
ICSA Standard	
CRI Standard	MP82877
LCS Standard	
Chk Standard	MP82874,MP82876,MP82883,MP82885

19	P4458-02	280517	SAM	10/23/24 10:17		Mohan	OK
20	P4460-04	WB-303-BOT	SAM	10/23/24 10:19		Mohan	OK
21	CCV57	CCV57	CCV	10/23/24 10:22		Mohan	OK
22	CCB57	CCB57	CCB	10/23/24 10:24		Mohan	OK
23	P4460-04DUP	WB-303-BOTDUP	DUP	10/23/24 10:26		Mohan	OK
24	P4460-04MS	WB-303-BOTMS	MS	10/23/24 10:28		Mohan	OK
25	P4460-04MSD	WB-303-BOTMSD	MSD	10/23/24 10:31		Mohan	OK
26	PB164321BL	PB164321BL	MB	10/23/24 10:33		Mohan	OK
27	PB164321BS	PB164321BS	LCS	10/23/24 10:35		Mohan	OK
28	P4467-04	TP-1	SAM	10/23/24 10:37		Mohan	OK
29	P4468-02	ETGI-331	SAM	10/23/24 10:40		Mohan	OK
30	P4468-04	ETGI-329	SAM	10/23/24 10:42		Mohan	OK
31	P4468-06	ETGI-345	SAM	10/23/24 10:44		Mohan	OK
32	P4472-04	BP-F-28	SAM	10/23/24 10:47		Mohan	OK
33	CCV58	CCV58	CCV	10/23/24 10:49		Mohan	OK
34	CCB58	CCB58	CCB	10/23/24 10:51		Mohan	OK
35	P4472-08	BP-F-6	SAM	10/23/24 10:53		Mohan	OK
36	P4472-08DUP	BP-F-6DUP	DUP	10/23/24 10:56		Mohan	OK
37	P4472-08MS	BP-F-6MS	MS	10/23/24 10:58		Mohan	OK
38	P4472-08MSD	BP-F-6MSD	MSD	10/23/24 11:00		Mohan	OK

Instrument ID: CV1

Daily Analysis Runlog For Sequence/QC Batch ID # LB133065

Review By	jaswal	Review On	10/23/2024 11:18:30 PM
Supervise By	mohan	Supervise On	10/23/2024 11:33:40 PM
STD. NAME	STD REF.#		
ICAL Standard	MP82866,MP82868,MP82869,MP82870,MP82871,MP82872		
ICV Standard	MP82873		
CCV Standard	MP82875		
ICSA Standard			
CRI Standard	MP82877		
LCS Standard			
Chk Standard	MP82874,MP82876,MP82883,MP82885		

39	PB164261TB	PB164261TB	MB	10/23/24 11:02		Mohan	OK
40	PB164301TB	PB164301TB	MB	10/23/24 11:05		Mohan	OK
41	P4460-04L	WB-303-BOTL	SD	10/23/24 11:07		Mohan	OK
42	P4460-04A	WB-303-BOTA	PS	10/23/24 11:09		Mohan	OK
43	P4472-08L	BP-F-6L	SD	10/23/24 11:12		Mohan	OK
44	P4472-08A	BP-F-6A	PS	10/23/24 11:14		Mohan	OK
45	CCV59	CCV59	CCV	10/23/24 11:16		Mohan	OK
46	CCB59	CCB59	CCB	10/23/24 11:18		Mohan	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB133086

Review By	kareem	Review On	10/25/2024 3:10:26 PM
Supervise By	jaswal	Supervise On	10/26/2024 8:07:20 AM

STD. NAME	STD REF.#
ICAL Standard	MP82441 MP82476 MP82477 MP82478 MP82479 MP82712
ICV Standard	mp82485
CCV Standard	MP82488
ICSA Standard	MP82486 MP82487
CRI Standard	MP82712
LCS Standard	
Chk Standard	MP82491 MP82492

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	S0	S0	CAL1	10/23/24 14:24		Kareem	OK
2	S1	S1	CAL2	10/23/24 14:28		Kareem	OK
3	S2	S2	CAL3	10/23/24 14:32		Kareem	OK
4	S3	S3	CAL4	10/23/24 14:37		Kareem	OK
5	S4	S4	CAL5	10/23/24 14:41		Kareem	OK
6	S5	S5	CAL6	10/23/24 14:45		Kareem	OK
7	ICV01	ICV01	ICV	10/23/24 14:59		Kareem	OK
8	LLICV01	LLICV01	LLICV	10/23/24 15:11		Kareem	OK
9	ICB01	ICB01	ICB	10/23/24 15:16		Kareem	OK
10	CRI01	CRI01	CRDL	10/23/24 15:22		Kareem	OK
11	ICSA01	ICSA01	ICSA	10/23/24 15:26		Kareem	OK
12	ICSAB01	ICSAB01	ICSAB	10/23/24 15:32		Kareem	OK
13	ICSADL	ICSADL	ICSA	10/23/24 15:36		Kareem	OK
14	ICSABDL	ICSABDL	ICSAB	10/23/24 15:40		Kareem	OK
15	CCV01	CCV01	CCV	10/23/24 15:57		Kareem	OK
16	CCB01	CCB01	CCB	10/23/24 16:02		Kareem	OK
17	P4458-02	280517	SAM	10/23/24 16:06		Kareem	OK
18	P4458-01	280517	SAM	10/23/24 16:10		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB133086

Review By	kareem	Review On	10/25/2024 3:10:26 PM
Supervise By	jaswal	Supervise On	10/26/2024 8:07:20 AM

STD. NAME	STD REF.#
ICAL Standard	MP82441 MP82476 MP82477 MP82478 MP82479 MP82712
ICV Standard	mp82485
CCV Standard	MP82488
ICSA Standard	MP82486 MP82487
CRI Standard	MP82712
LCS Standard	
Chk Standard	MP82491 MP82492

19	P4443-05	OG-315-HR-502-COM	SAM	10/23/24 16:15		Kareem	OK
20	P4443-10	OG-315-HR-502-COM	SAM	10/23/24 16:19		Kareem	OK
21	P4443-01	OG-315-HR-502-COM	SAM	10/23/24 16:23		Kareem	OK
22	P4443-06	OG-315-HR-502-COM	SAM	10/23/24 16:28		Kareem	OK
23	P4452-01	ETGI-285	SAM	10/23/24 16:32	Ca,Cr high	Kareem	Dilution
24	P4452-01DL	ETGI-285DL	SAM	10/23/24 16:44	5x for Ca,Cr	Kareem	Confirms
25	CCV02	CCV02	CCV	10/23/24 16:48		Kareem	OK
26	CCB02	CCB02	CCB	10/23/24 16:52		Kareem	OK
27	P4397-06	WB-301-BOT	SAM	10/23/24 16:59		Kareem	OK
28	P4460-04	WB-303-BOT	SAM	10/23/24 17:03		Kareem	OK
29	P4460-04DUP	WB-303-BOTDUP	DUP	10/23/24 17:08		Kareem	OK
30	P4460-04L	WB-303-BOTL	SD	10/23/24 17:12		Kareem	OK
31	P4460-04MS	WB-303-BOTMS	MS	10/23/24 17:17	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
32	P4460-04MSD	WB-303-BOTMSD	MSD	10/23/24 17:21	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
33	P4460-04A	WB-303-BOTA	PS	10/23/24 17:25	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
34	PB164261TB	PB164261TB	MB	10/23/24 17:29		Kareem	OK
35	PB164298BL	PB164298BL	MB	10/23/24 17:34		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB133086

Review By	kareem	Review On	10/25/2024 3:10:26 PM
Supervise By	jaswal	Supervise On	10/26/2024 8:07:20 AM

STD. NAME	STD REF.#
ICAL Standard	MP82441 MP82476 MP82477 MP82478 MP82479 MP82712
ICV Standard	mp82485
CCV Standard	MP82488
ICSA Standard	MP82486 MP82487
CRI Standard	MP82712
LCS Standard	
Chk Standard	MP82491 MP82492

36	PB164298BS	PB164298BS	LCS	10/23/24 17:38	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
37	CCV03	CCV03	CCV	10/23/24 17:42		Kareem	OK
38	CCB03	CCB03	CCB	10/23/24 17:46		Kareem	OK
39	P4456-01	PAD-10182024	SAM	10/23/24 17:51		Kareem	OK
40	P4460-02	WB-303-TOP	SAM	10/23/24 17:55		Kareem	OK
41	P4460-03	WB-303-BOT	SAM	10/23/24 17:59	MS-MSD Fail for more than 50% parameter	Kareem	OK
42	P4460-03DUP	WB-303-BOTDUP	DUP	10/23/24 18:04	MS-MSD Fail for more than 50% parameter	Kareem	OK
43	P4460-03L	WB-303-BOTL	SD	10/23/24 18:08	MS-MSD Fail for more than 50% parameter	Kareem	OK
44	P4460-03MS	WB-303-BOTMS	MS	10/23/24 18:12	MS-MSD Fail for more than 50% parameter	Kareem	OK
45	P4460-03MSD	WB-303-BOTMSD	MSD	10/23/24 18:16	MS-MSD Fail for more than 50% parameter	Kareem	OK
46	P4460-03A	WB-303-BOTA	PS	10/23/24 18:20	MS-MSD Fail for more than 50% parameter	Kareem	OK
47	PB164289BL	PB164289BL	MB	10/23/24 18:24	Fail for Al	Kareem	Not Ok
48	PB164289BS	PB164289BS	LCS	10/23/24 18:28	Fail for Al,Sb,As,Ba,Be,Cd,Pb,Mg, Mn,Se,Tl,V	Kareem	Not Ok
49	CCV04	CCV04	CCV	10/23/24 18:32		Kareem	OK
50	CCB04	CCB04	CCB	10/23/24 18:36		Kareem	OK
51	PB164244BL	PB164244BL	MB	10/23/24 18:41		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB133086

Review By	kareem	Review On	10/25/2024 3:10:26 PM
Supervise By	jaswal	Supervise On	10/26/2024 8:07:20 AM

STD. NAME	STD REF.#
ICAL Standard	MP82441 MP82476 MP82477 MP82478 MP82479 MP82712
ICV Standard	mp82485
CCV Standard	MP82488
ICSA Standard	MP82486 MP82487
CRI Standard	MP82712
LCS Standard	
Chk Standard	MP82491 MP82492

52	PB164244BS	PB164244BS	LCS	10/23/24 18:45	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
53	PB164195TB	PB164195TB	MB	10/23/24 18:49		Kareem	OK
54	PB164197TB	PB164197TB	MB	10/23/24 18:54		Kareem	OK
55	PB164248BL	PB164248BL	MB	10/23/24 18:58		Kareem	OK
56	PB164248BS	PB164248BS	LCS	10/23/24 19:03	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
57	PB164174BL	PB164174BL	MB	10/23/24 19:07		Kareem	OK
58	PB164174BS	PB164174BS	LCS	10/23/24 19:11	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
59	PB164221BL	PB164221BL	MB	10/23/24 19:15		Kareem	OK
60	PB164221BS	PB164221BS	LCS	10/23/24 19:19	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
61	CCV05	CCV05	CCV	10/23/24 19:23		Kareem	OK
62	CCB05	CCB05	CCB	10/23/24 19:28		Kareem	OK
63	PB164222BL	PB164222BL	MB	10/23/24 19:32		Kareem	OK
64	PB164222BS	PB164222BS	LCS	10/23/24 19:36	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
65	PB164220BL	PB164220BL	MB	10/23/24 19:40		Kareem	OK
66	PB164220BS	PB164220BS	LCS	10/23/24 19:45	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB133086

Review By	kareem	Review On	10/25/2024 3:10:26 PM
Supervise By	jaswal	Supervise On	10/26/2024 8:07:20 AM

STD. NAME	STD REF.#
ICAL Standard	MP82441 MP82476 MP82477 MP82478 MP82479 MP82712
ICV Standard	mp82485
CCV Standard	MP82488
ICSA Standard	MP82486 MP82487
CRI Standard	MP82712
LCS Standard	
Chk Standard	MP82491 MP82492

67	P4424-01	1-N-1	SAM	10/23/24 19:49		Kareem	OK
68	P4424-01DUP	1-N-1DUP	DUP	10/23/24 19:53		Kareem	OK
69	P4424-01L	1-N-1L	SD	10/23/24 19:58		Kareem	OK
70	P4424-01MS	1-N-1MS	MS	10/23/24 20:02	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
71	P4424-01MSD	1-N-1MSD	MSD	10/23/24 20:06	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
72	P4424-01A	1-N-1A	PS	10/23/24 20:11	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
73	CCV06	CCV06	CCV	10/23/24 20:15		Kareem	OK
74	CCB06	CCB06	CCB	10/23/24 20:21		Kareem	OK
75	P4424-02	1-S-1	SAM	10/23/24 20:25		Kareem	OK
76	P4424-03	1-B-1	SAM	10/23/24 20:30		Kareem	OK
77	P4397-04DL	WB-301-SWDL	SAM	10/23/24 20:47	Not Use	Kareem	Not Ok
78	P4397-04DUPDL	WB-301-SWDUPDL	DUP	10/23/24 20:51	Not Use	Kareem	Not Ok
79	P4397-04LDL	WB-301-SWLDL	SD	10/23/24 20:56	Not Use	Kareem	Not Ok
80	P4397-04MSDL	WB-301-SWMSDL	MS	10/23/24 21:00	Not Use	Kareem	Not Ok
81	P4397-04MSDDL	WB-301-SWMSDDL	MSD	10/23/24 21:05	Not Use	Kareem	Not Ok
82	LR1	LR1	HIGH STD	10/23/24 21:11		Kareem	OK
83	LR2	LR2	HIGH STD	10/23/24 21:16		Kareem	OK

Instrument ID: P4

Daily Analysis Runlog For Sequence/QC Batch ID # LB133086

Review By	kareem	Review On	10/25/2024 3:10:26 PM
Supervise By	jaswal	Supervise On	10/26/2024 8:07:20 AM
STD. NAME	STD REF.#		
ICAL Standard	MP82441 MP82476 MP82477 MP82478 MP82479 MP82712		
ICV Standard	mp82485		
CCV Standard	MP82488		
ICSA Standard	MP82486 MP82487		
CRI Standard	MP82712		
LCS Standard			
Chk Standard	MP82491 MP82492		

84	CCV07	CCV07	CCV	10/23/24 21:28		Kareem	OK
85	CCB07	CCB07	CCB	10/23/24 21:34		Kareem	OK
86	P4397-04ADL	WB-301-SWADL	PS	10/23/24 21:39	Not Use	Kareem	Not Ok
87	P4347-01	EFFLUENT-DAY-1-M	SAM	10/23/24 21:43		Kareem	OK
88	P4347-01DUP	EFFLUENT-DAY-1-M	DUP	10/23/24 21:47		Kareem	OK
89	P4347-01L	EFFLUENT-DAY-1-M	SD	10/23/24 21:52		Kareem	OK
90	P4347-01MS	EFFLUENT-DAY-1-M	MS	10/23/24 21:56	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
91	P4347-01MSD	EFFLUENT-DAY-1-M	MSD	10/23/24 22:04	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
92	P4347-01A	EFFLUENT-DAY-1-M	PS	10/23/24 22:08	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
93	PB164302BL	PB164302BL	MB	10/23/24 22:12		Kareem	OK
94	PB164302BS	PB164302BS	LCS	10/23/24 22:16	0.1 ML OF M6010 AND M6001 WERE ADDED TO 10ML OF THE SAMPLE	Kareem	OK
95	CCV08	CCV08	CCV	10/23/24 22:20		Kareem	OK
96	CCB08	CCB08	CCB	10/23/24 22:25		Kareem	OK

SOP ID :	M1311-TCLP-15	
SDG No :	N/A	Start Prep Date : 10/18/2024 Time : 17:00
Weigh By :	JP	End Prep Date : 10/19/2024 Time : 10:15
Balance ID :	WC SC-4	Combination Ratio : 20
pH Meter ID :	WC PH METER-1	ZHE Cleaning Batch : N/A
Extraction By :	JP	Initial Room Temperature: 23 °C
Filter By :	JP	Final Room Temperature: 22 °C
Pipette ID :	WC	TCLP Technician Signature : <i>JP</i>
Tumbler ID :	T-1	Supervisor By : <i>12</i>
TCLP Filter ID :	114771	

Standard Name	MLS USED	STD REF. # FROM LOG
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE U	Lot Number
TCLP-FLUID-1	N/A	WP108622
HCL-TCLP,1N	N/A	WP108584
HNO3-TCLP,1N	N/A	WP108585
pH Strips	N/A	W1931,W1934,W2350,W2755
pH Strips	N/A	N/A
1 Liter Amber	N/A	23091
120ml Plastic bottle	N/A	21029
1:1 HNO3	MP81119	N/A

Extraction Conformance/Non-Conformance Comments:

Matrix spikes are added after filtration and before preservation. Tumbler T-1 CHECKED,30 RPM. Particle size reduction is not required. p4460-04 is used for MS-MSD.

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
10/21/24 08:00	<i>JP</i> <i>TCLP Room</i>	<i>JP</i> <i>EXT</i>
	Preparation Group	Analysis Group <i>10/21/24</i>

Sample ID	ClientID	TCLP Vessel ID	Sample Wt (g)	Volume Extraction Fluid #1 (mL)	Multi phasic	Phase Miscible	Phases Combined	Final Leachate PH	Metals Leachate Adj. PH	Prep Pos
P4397-06	WB-301-BOT	01	100.03	2000	N/A	N/A	N/A	5.6	1.5	T-1
P4443-05	OG-315-HR-502-COMP-29	02	100.02	2000	N/A	N/A	N/A	5.5	1.0	T-1
P4443-10	OG-315-HR-502-COMP-30	03	100.03	2000	N/A	N/A	N/A	4.5	1.5	T-1
P4458-02	280517	04	100.02	2000	N/A	N/A	N/A	5.6	1.0	T-1
P4460-04	WB-303-BOT	05	100.03	2000	N/A	N/A	N/A	6.0	1.5	T-1
PB164261TB	LEB261	06	N/A	2000	N/A	N/A	N/A	4.93	1.0	T-1

SampleID	ClientID	Sample Weight (g)	Filter Weight (g)	Filtrate (mL)	Filter + Solid (After 100°C)	% solids	% Dry Solids
P4397-06	WB-301-BOT	N/A	N/A	N/A	N/A	100	N/A
P4443-05	OG-315-HR-502-COMP-29	N/A	N/A	N/A	N/A	100	N/A
P4443-10	OG-315-HR-502-COMP-30	N/A	N/A	N/A	N/A	100	N/A
P4458-02	280517	N/A	N/A	N/A	N/A	100	N/A
P4460-04	WB-303-BOT	N/A	N/A	N/A	N/A	100	N/A
PB164261TB	LEB261	N/A	N/A	N/A	N/A	N/A	N/A

Hot Block ID : WC S-1 /WC S-2

Thermometer ID : FLASHPOINT

SampleID	ClientID	Sample Weight (g)	Volume DI Water (mL)	PH after 5 min stir	PH after 10 min stir	Extraction Fluid 1 or 2	pH Extraction Fluid
P4397-06	WB-301-BOT	5.02	96.5	7.4	2.5	#1	4.93
P4443-05	OG-315-HR-502-COMP-29	5.03	96.5	7.6	2.5	#1	4.93
P4443-10	OG-315-HR-502-COMP-30	5.02	96.5	6.0	2.0	#1	4.93
P4458-02	280517	5.01	96.5	7.6	2.5	#1	4.93
P4460-04	WB-303-BOT	5.02	96.5	8.4	3.0	#1	4.93
PB164261TB	LEB261	N/A	N/A	N/A	N/A	#1	4.93

Prep Standard - Chemical Standard Summary

Order ID : P4397

Test : TCLP ICP Metals,TCLP Mercury

Prepbatch ID : PB164298,PB164306,

Sequence ID/Qc Batch ID: LB133065,LB133086,LB133086,

Standard ID :

MP82127,MP82865,MP82866,MP82868,MP82869,MP82870,MP82871,MP82872,MP82873,MP82874,MP82875,MP82876,MP82877,MP82883,MP82885,

Chemical ID :

M5062,M5882,M5953,M6000,M6009,M6040,M6093,M6096,W3112,

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
170	1:1HCL	MP82127	09/03/2024	02/08/2025	Janvi Patel	None	None	Sarabjit Jaswal
								09/03/2024

FROM 1250.00000ml of M6040 + 1250.00000ml of W3112 = Final Quantity: 2500.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
871	MERCURY INTERMEDIATE B 250PPB WORKING STD.	MP82865	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
								10/23/2024

FROM 1.00000ml of M6093 + 2.50000ml of M5062 + 96.50000ml of W3112 = Final Quantity: 100.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1340	Hg 0.00 PPB STD	MP82866	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
10/23/2024								

FROM 2.50000ml of M6093 + 247.50000ml of W3112 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1341	Hg 0.2 PPB STD	MP82868	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
10/23/2024								

FROM 2.50000ml of M6093 + 247.30000ml of W3112 + 0.20000ml of MP82865 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1342	Hg 2.5 PPB STD	MP82869	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
10/23/2024								

FROM 2.50000ml of M6093 + 245.00000ml of W3112 + 2.50000ml of MP82865 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1343	Hg 5.0 PPB STD	MP82870	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
10/23/2024								

FROM 2.50000ml of M6093 + 242.50000ml of W3112 + 5.00000ml of MP82865 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1344	Hg 7.5 PPB STD	MP82871	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
10/23/2024								

FROM 2.50000ml of M6093 + 240.00000ml of W3112 + 7.50000ml of MP82865 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1345	Hg 10.0 PPB STD	MP82872	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
10/23/2024								

FROM 2.50000ml of M6093 + 237.50000ml of W3112 + 10.00000ml of MP82865 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1346	Hg ICV SOLUTION	MP82873	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
10/23/2024								

FROM 2.50000ml of M5953 + 2.50000ml of M6093 + 245.00000ml of W3112 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1351	ICB (Hg 0.00 PPB SOLUTION)	MP82874	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
10/23/2024								

FROM 2.50000ml of M6093 + 247.50000ml of W3112 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1358	CCV (Hg 5.0 PPB SOLUTION)	MP82875	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
								10/23/2024

FROM 485.00000ml of W3112 + 5.00000ml of M6093 + 10.00000ml of MP82865 = Final Quantity: 500.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1352	CCB (Hg 0.00 PPB SOLUTION)	MP82876	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
								10/23/2024

FROM 495.00000ml of W3112 + 5.00000ml of M6093 = Final Quantity: 500.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1349	CRA/CRI (Hg 0.2 PPB SOLUTION)	MP82877	10/22/2024	10/23/2024	Mohan Bera	METALS_SCALE_3 (M SC-3)	None	Sarabjit Jaswal
								10/23/2024

FROM 2.50000ml of M6093 + 247.30000ml of W3112 + 0.20000ml of MP82865 = Final Quantity: 250.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1350	CHK STD (Hg 7.0 PPB SOLUTION)	MP82883	10/22/2024	10/23/2024	Mohan Bera	None	METALS_PIPETTE_5 (HGA)	Sarabjit Jaswal
								10/23/2024

FROM 2.50000ml of M6096 + 240.50000ml of W3112 + 7.00000ml of MP82865 = Final Quantity: 250.000 ml

Metals STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
68	STANNOUS CHLORIDE SOLUTION	MP82885	10/23/2024	10/24/2024	Mohan Bera	None	None	Sarabjit Jaswal 10/23/2024
<u>FROM</u>	450.00000ml of W3112 + 50.00000gram of M5882 + 50.00000ml of M6040 = Final Quantity: 500.000 ml							

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	MSHG-10PPM / MERCURY HCl 125mL 10ug/mL	S2-HG709270	09/22/2026	05/28/2022 / mohan	01/27/2022 / mohan	M5062

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-3980-01 / Stannous Chloride (cs/4x500g)	232820	08/31/2028	04/30/2024 / mohan	04/25/2024 / mohan	M5882

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	ICV-5 / ICV (HG) STOCK SOLN	ICV5-0415	01/01/2025	07/01/2024 / mohan	03/30/2023 / mohan	M5953

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	WW-LFS-1 / Laboratory Fortified Stock Solution 1, 125 ml	T2-MEB723367	08/30/2026	08/13/2024 / Jaswal	05/14/2024 / Jaswal	M6000

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	WW-LFS-2 / Laboratory Fortified Stock Solution 2, 125 ml	U2-MEB731108	03/17/2028	08/13/2024 / Jaswal	05/14/2024 / Jaswal	M6009

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9530-33 / Hydrochloric Acid, Instra-Analyzed (cs/6x2.5L)	24D1562005	02/08/2025	08/09/2024 /	08/01/2024 / Janvi	M6040

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9598-34 / Nitric Acid, Instra-Analyzed (cs/4x2.5L)	24D1062002	03/25/2029	10/21/2024 / Eman	09/10/2024 / Janvi	M6093

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9598-34 / Nitric Acid, Instra-Analyzed (cs/4x2.5L)	24D1062002	03/25/2029	10/22/2024 / Janvi	09/21/2024 / Janvi	M6096

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	DIW / DI Water	Daily Lab-Certified	07/03/2029	07/03/2024 / lwona	07/03/2024 / lwona	W3112

M5882
 M3

Certificate of Analysis

1 Reagent Lane
 Fair Lawn, NJ 07410
 201.796.7100 tel
 201.796.1329 fax

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System
 Standard ISO9001:2015 by SAI Global Certificate Number CERT – 0120633

This is to certify that units of the lot number below were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Thermo Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Products are for research use or further manufacturing. Not for direct administration to humans or animals. It is the responsibility of the final formulator and end user to determine suitability based upon the intended use of the end product. Products are tested to meet the analytical requirements of the noted grade. The following information is the actual analytical results obtained.

Catalog Number	T142	Quality Test / Release Date	08/17/2023
Lot Number	232820		
Description	STANNOUS CHLORIDE, DIHYDRATE CERTIFIED ACS (Suitable for Mercury Determination)		
Country of Origin	United States	Suggested Retest Date	Aug/2028
Chemical Origin	Inorganic-non animal		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		

N/A			
Result Name	Units	Specifications	Test Value
APPEARANCE		REPORT	Clear crystals
ASSAY	%	Inclusive Between 98 - 103	100.65
CALCIUM	%	<= 0.005	0.0017
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
IRON (Fe)	%	<= 0.003	0.0011
LEAD (Pb)	%	<= 0.01	0.0006
MERCURY (Hg)	ppm	<= 0.05	<0.05
POTASSIUM (K)	%	<= 0.005	0.0001
SODIUM (Na)	%	<= 0.01	<0.01
SOLUBILITY IN HCL	PASS/FAIL	= PASS TEST	PASS TEST
SULFATE (SO4)	PASS/FAIL	= P.T. (ABOUT 0.003%)	P.T. (ABOUT 0.003%)



Harout Sahagian - Quality Control Supervisor - Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of this catalog number listed above.

If there are any questions with this certificate, please call at (800) 227-6701.

*Based on suggested storage condition.



Refine your results. Redefine your industry.

RD:05/14/2024

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

P: 800-669-6799/540-585-3030

F: 540-585-3012

info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution
Catalog Number:	WW-LFS-1
Lot Number:	T2-MEB723367
Matrix:	5% (v/v) HNO ₃

Value / Analyte(s):	1 000 µg/mL ea:	
	Potassium,	
	600 µg/mL ea:	
	Phosphorus,	
	300 µg/mL ea:	
	Sodium,	Iron,
	200 µg/mL ea:	
	Magnesium,	Aluminum,
	Cerium,	Selenium,
	Thallium,	
	100 µg/mL ea:	
	Lead,	Calcium,
	80 µg/mL ea:	
	Arsenic,	
	70 µg/mL ea:	
	Mercury,	
	50 µg/mL ea:	
	Nickel,	
	40 µg/mL ea:	
	Chromium,	
	30 µg/mL ea:	
	Copper,	Boron,
	Vanadium,	
	20 µg/mL ea:	
	Zinc,	Strontium,
	Barium,	Beryllium,
	Cadmium,	Cobalt,
	Manganese,	Lithium,
	7.5 µg/mL ea:	
	Silver	

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	200.0 ± 0.7 µg/mL	Arsenic, As	80.0 ± 0.7 µg/mL
Barium, Ba	20.00 ± 0.09 µg/mL	Beryllium, Be	20.00 ± 0.13 µg/mL
Boron, B	30.00 ± 0.18 µg/mL	Cadmium, Cd	20.00 ± 0.09 µg/mL
Calcium, Ca	100.0 ± 0.4 µg/mL	Cerium, Ce	200.0 ± 0.8 µg/mL
Chromium, Cr	40.00 ± 0.30 µg/mL	Cobalt, Co	20.00 ± 0.10 µg/mL
Copper, Cu	30.00 ± 0.13 µg/mL	Iron, Fe	300.0 ± 1.3 µg/mL
Lead, Pb	100.0 ± 0.4 µg/mL	Lithium, Li	20.00 ± 0.08 µg/mL
Magnesium, Mg	200.0 ± 0.8 µg/mL	Manganese, Mn	20.00 ± 0.08 µg/mL
Mercury, Hg	70.0 ± 0.3 µg/mL	Nickel, Ni	50.00 ± 0.22 µg/mL
Phosphorus, P	600.0 ± 2.7 µg/mL	Potassium, K	1 000 ± 4 µg/mL
Selenium, Se	200.0 ± 1.3 µg/mL	Silver, Ag	7.50 ± 0.03 µg/mL
Sodium, Na	300.0 ± 1.4 µg/mL	Strontium, Sr	20.01 ± 0.08 µg/mL
Thallium, Tl	200.0 ± 1.4 µg/mL	Vanadium, V	30.00 ± 0.13 µg/mL
Zinc, Zn	20.00 ± 0.09 µg/mL		

Density: 1.034 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Ag	ICP Assay	3151	160729
Ag	Volhard	999c	999c
Ag	Calculated		See Sec. 4.2
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
As	ICP Assay	3103a	100818
B	ICP Assay	3107	190605
Ba	ICP Assay	3104a	140909
Ba	Gravimetric		See Sec. 4.2
Be	ICP Assay	3105a	090514
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Cd	ICP Assay	3108	130116
Cd	EDTA	928	928
Ce	ICP Assay	3110	090504
Ce	EDTA	928	928
Co	ICP Assay	3113	190630
Co	EDTA	928	928
Cr	ICP Assay	3112a	170630
Cu	ICP Assay	3114	121207
Cu	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
Hg	ICP Assay	3133	160921
Hg	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Li	ICP Assay	3129a	100714
Li	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mn	ICP Assay	3132	050429
Mn	EDTA	928	928
Na	ICP Assay	Traceable to 3152A	S2-NA700842
Na	Gravimetric		See Sec. 4.2
Ni	ICP Assay	3136	120619
Ni	EDTA	928	928
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
Pb	ICP Assay	3128	101026
Pb	EDTA	928	928
Se	ICP Assay	3149	100901
Sr	EDTA	928	928
Sr	ICP Assay	Traceable to 3153a	K2-SR650985
Tl	ICP Assay	3158	151215
V	IC Assay	3165	160906
V	EDTA	928	928
Zn	ICP Assay	3168a	120629
Zn	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{\text{CRM/RM}}$, where two or more methods of characterization are used is the weighted mean of the results:

$$X_{\text{CRM/RM}} = \sum (w_i) (X_i)$$

X_i = mean of Assay Method i with standard uncertainty $u_{\text{char } i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$$w_i = (1/u_{\text{char } i}^2) / (\sum (1/u_{\text{char } i}^2))$$

$$\text{CRM/RM Expanded Uncertainty (z)} = U_{\text{CRM/RM}} = k (u_{\text{char}}^2 + u_{\text{bb}}^2 + u_{\text{ts}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char}} = [\sum ((w_i)^2 (u_{\text{char } i}^2))]^{1/2}$ where $u_{\text{char } i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = (X_a) (u_{\text{char } a})$$

X_a = mean of Assay Method A with

$u_{\text{char } a}$ = the standard uncertainty of characterization Method A

$$\text{CRM/RM Expanded Uncertainty (z)} = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{ts}}^2 + u_{\text{ts}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char } a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

Low Silver Note: This solution contains "LOW" levels of Silver. Please store this entire bottle inside a sealed glass jar.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 30, 2022

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- August 30, 2026

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





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RD:05/14/2024

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

P: 800-669-6799/540-585-3030
F: 540-585-3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution
Catalog Number: WW-LFS-2
Lot Number: U2-MEB731108
Matrix: 5% (v/v) HNO₃
tr. HF
Value / Analyte(s):
200 µg/mL ea:
Silica,
80 µg/mL ea:
Antimony,
70 µg/mL ea:
Tin,
40 µg/mL ea:
Molybdenum,
20 µg/mL ea:
Titanium

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Antimony, Sb	80.1 ± 0.6 µg/mL	Molybdenum, Mo	40.03 ± 0.18 µg/mL
Silica, SiO ₂	200.2 ± 1.3 µg/mL	Tin, Sn	70.0 ± 0.4 µg/mL
Titanium, Ti	20.01 ± 0.13 µg/mL		

Density: 1.025 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Mo	ICP Assay	3134	130418
Mo	Calculated		See Sec. 4.2
Sb	ICP Assay	3102a	140911
SiO ₂	ICP Assay	3150	130912
Sn	ICP Assay	3161a	140917
Ti	ICP Assay	3162a	130925
Ti	Calculated		See Sec. 4.2

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{\text{CRM/RM}}$, where two or more methods of characterization are used is the weighted mean of the results:

$$X_{\text{CRM/RM}} = \sum (w_i) (X_i)$$

X_i = mean of Assay Method i with standard uncertainty $u_{\text{char } i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$$w_i = (1/u_{\text{char } i}^2) / (\sum (1/u_{\text{char } i}^2))$$

$$\text{CRM/RM Expanded Uncertainty } (z) = U_{\text{CRM/RM}} = k (u_{\text{char}}^2 + u_{\text{bb}}^2 + u_{\text{ITS}}^2 + u_{\text{TS}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char}} = [\sum (w_i)^2 (u_{\text{char } i}^2)]^{1/2}$ where $u_{\text{char } i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ITS} = long term stability standard uncertainty (storage)

u_{TS} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{\text{CRM/RM}}$, where one method of characterization is used is the mean of individual results:

$$X_{\text{CRM/RM}} = (X_a) (u_{\text{char } a})$$

X_a = mean of Assay Method A with

$u_{\text{char } a}$ = the standard uncertainty of characterization Method A

$$\text{CRM/RM Expanded Uncertainty } (z) = U_{\text{CRM/RM}} = k (u_{\text{char } a}^2 + u_{\text{bb}}^2 + u_{\text{ITS}}^2 + u_{\text{TS}}^2)^{1/2}$$

k = coverage factor = 2

$u_{\text{char } a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{ITS} = long term stability standard uncertainty (storage)

u_{TS} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

6.1 This standard is intended for the calibration of analytical instruments and validation of analytical methods as appropriate. This CRM may be used in connection with EPA Methods 6010, 6020 (all versions), Standard Methods 3120 B and USP <232> / ICH Q3D.

6.2 For products attaining traceability through Inorganic Ventures' Primary Certified Reference Materials (PCRM™) see the Limited License to Use PCRM™ in the Inorganic Ventures Terms and Conditions of Sale, <https://www.inorganicventures.com/terms-and-conditions-sale>. The Terms and Conditions contain information on the use of materials traceable to PCRM™ certified reference materials. This Limited License agreement is especially pertinent for laboratories accredited under ISO:17034.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; info@inorganicventures.com;

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 17, 2023

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 17, 2028**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Thomas Kozikowski
Manager, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



300 Technology Drive
 Christiansburg, VA 24073 USA
 inorganicventures.com

MS062
 MS063
 MB

P: 800-669-6799/540-585-3030
 F: 540-585-3012
 info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Single Analyte Mass Spec Solution
 Catalog Number: MSHG-10PPM
 Lot Number: S2-HG709270
 Matrix: 10% (v/v) HCl
 Value / Analyte(s): 10 µg/mL ea:
 Mercury
 Starting Material: Hg metal
 Starting Material Lot#: 1959
 Starting Material Purity: 99.9994%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10.001 ± 0.053 µg/mL
Density: 1.020 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Hg	ICP Assay	3133	160921
Hg	EDTA	928	928
Hg	Calculated		See Sec. 4.2

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$$X_{CRM/RM} = \sum (w_i) (X_i)$$

X_i = mean of Assay Method i with standard uncertainty $u_{char i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance.

$$w_i = (1/u_{char i}^2) / (\sum (1/u_{char i}^2))$$

$$CRM/RM \text{ Expanded Uncertainty } (z) = U_{CRM/RM} = k (u_{char}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = [\sum ((w_i)^2 (u_{char i})^2)]^{1/2}$ where $u_{char i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = (X_a) (u_{char a})$$

X_a = mean of Assay Method A with

$u_{char a}$ = the standard uncertainty of characterization Method A

$$CRM/RM \text{ Expanded Uncertainty } (z) = U_{CRM/RM} = k (u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag	0.000011	M	Eu	<	0.000201	O	Na	0.000004	M	Se	<	0.015915	O	Zn	<	0.001510
O	Al	0.000001	O	Fe		0.000001	M	Nb	<	0.000201	O	Si	0.000005	M	Zr	<	0.000201
M	As	<	0.000402	M	Ga	<	0.000201	M	Nd	<	0.000201	M	Sm	<	0.000201		
M	Au	<	0.003631	M	Gd	<	0.000201	M	Ni	<	0.000402	M	Sn	<	0.001007		
M	B	<	0.001208	M	Ge	<	0.000201	M	Os	<	0.000605	M	Sr	<	0.000201		
M	Ba	<	0.000201	M	Hf	<	0.000201	O	P	<	0.032370	M	Ta	<	0.000201		
M	Be	<	0.000201	s	Hg	<		M	Pb	<	0.000201	M	Tb	<	0.000201		
M	Bi	<	0.000201	M	Ho	<	0.000201	M	Pd	<	0.000403	M	Te	<	0.002216		
O	Ca	0.000007	M	In	<	0.000201	M	Pr	<	0.000201	M	Th	<	0.000201			
M	Cd	<	0.000201	M	Ir	<	0.000201	M	Pt	<	0.000402	M	Ti	<	0.000402		
M	Ce	<	0.000201	O	K	0.000020	M	Rb	<	0.000201	O	Tl	<	0.016508			
M	Co	<	0.000201	M	La	<	0.000201	M	Re	<	0.000201	M	Tm	<	0.000201		
O	Cr	<	0.003021	O	Li	<	0.000107	M	Rh	<	0.000201	M	U	<	0.008058		
M	Cs	<	0.001208	M	Lu	<	0.000201	M	Ru	<	0.000201	M	V	<	0.000201		
M	Cu	<	0.000402	O	Mg	0.000001	O	S	<	0.053950	M	W	<	0.000604			
M	Dy	<	0.000201	M	Mn	<	0.000604	M	Sb	<	0.001208	M	Y	<	0.000201		
M	Er	<	0.000201	M	Mo	0.000009	M	Sc	<	0.000201	M	Yb	<	0.000201			

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 200.59 +2 4 Hg(OH)(aq) 1+

Chemical Compatibility - Stable in HNO₃. Avoid basic media forming insoluble carbonate. The sulfide, basic carbonate, oxalate, phosphate, arsenite, arsenate and iodide are insoluble in water.

Stability - 2-100 ppb levels not stable in 1% HNO₃ / LDPE container, stable in 10% HNO₃ packaged in borosilicate glass. 1-100 ppm levels stable in 7% HNO₃ packaged in borosilicate glass. 1000-10,000 ppm solutions are chemically stable for years in 5-10% HNO₃ / LDPE container.

Hg Containing Samples (Preparation and Solution) - Metal (soluble in HNO₃); Oxide (Soluble in HNO₃); Ores and Organic based (The literature has more references to the preparation of Hg containing samples than any other element. Please consult the literature for your specific sample type, since such preparations are prone to error. Or e-mail our technical staff and we will contact you to discuss your particular sample preparation questions in further detail.).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 202 amu	9 ppt	n/a	186W16O
ICP-OES 184.950 nm	0.03 / 0.005 µg/mL	1	
ICP-OES 194.227 nm	0.03 / 0.005 µg/mL	1	V
ICP-OES 253.652 nm	0.1 / 0.03 µg/mL	1	Ta, Co, Th ,Rh , Fe, U

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va, 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 22, 2021

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 22, 2026**

- The date after which this CRM/RM should not be used.
- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Supervisor, Product Documentation



Certificate Approved By:

Michael Booth
Director, Quality Control



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director





QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

QATS LABORATORY INORGANIC REFERENCE MATERIAL
INITIAL CALIBRATION VERIFICATION SOLUTIONS
(ICV1, ICV5, AND ICV6)

NOTE: These instructions are for advisory purposes only. If any apparent conflict exists between these instructions and the analytical protocol or your contract, disregard these instructions.

APPLICATION: For use with the CLP SFAM01.0 SOW and revisions.

CAUTION: Read instructions carefully before opening bottle(s) and proceeding with the analyses.



M5528-32
M5953
3/30/23

(A) **SAMPLE DESCRIPTION**

Enclosed is a set of one (1) or more Aqueous Inorganic Reference Materials containing various analyte concentrations. ICV1 and ICV5 are in a matrix of dilute nitric acid. ICV6 is in a matrix of dilute basic solution. **For the reference material source in reporting ICVs use "USEPA". For the reference material lot number for the ICV1, ICV5, and ICV6 solutions use "ICV1-1014", "ICV5-0415", and "ICV6-0400", respectively.**

(B) **BREAKAGE OR MISSING ITEMS**

Check the contents of the shipment carefully for any broken, leaking, or missing items. Check that the seal is intact on each bottle. Refer to the enclosed chain of custody record. Report any problems to Mr. Keith Strout, APTIM Federal Services, LLC, at (702) 895-8722. If requested, return the chain-of-custody record with appropriate annotations and signatures to the address provided below.

QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
APTIM Federal Services, LLC
2700 Chandler Avenue - Building C
Las Vegas, NV 89120

(C) **ANALYSIS OF SAMPLES**

The Initial Calibration Verification Solutions (ICVs) are to be used to evaluate the accuracy of the initial calibrations of ICP, AA, and Cyanide colorimetric instruments, and are to be used with the CLP SOWs and revisions. The values for each element in the ICVs are listed below in µg/L (ppb) for the resulting solution(s) after the dilution of the concentrate(s) according to the following instructions. Use Class 'A' glassware to prepare the solution(s).

ICV1-1014 For ICP-AES analysis, use a 10-fold dilution by pipetting 10 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid.





QUALITY ASSURANCE TECHNICAL SUPPORT LABORATORY
"An ISO 9001:2015 Certified Program"

Instructions for QATS Reference Material: *Inorganic ICV Solutions*

ICV1-1014

For ICP-MS analysis, use a 50-fold dilution by pipetting 2 mL of the ICV1 concentrate into a 100 mL volumetric flask and dilute to volume with 1% (v/v) nitric acid.

ICV5-0415

For the cold vapor analysis of mercury by AA, use a 100-fold dilution by pipetting 1 mL of the ICV5 concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid. The ICV5 concentrate is prepared in 0.05% (w/v) $K_2Cr_2O_7$ and 5% (v/v) nitric acid.

ICV6-0400

For the analysis of cyanide, use a 100-fold dilution by pipetting 1 mL of the ICV6 concentrate into a 100 mL volumetric flask and dilute to volume with Type II water. Distill this solution along with the samples before analysis. The cyanide concentrate is prepared from $K_3Fe(CN)_6$, Type II water, and 0.1 % sodium hydroxide, and will decompose rapidly if exposed to light.

NOTE: USE TYPE II WATER AND HIGH-PURITY ACIDS FOR ALL DILUTIONS.

(D) CERTIFIED CONCENTRATIONS OF QATS ICV1, ICV5, AND ICV6 SOLUTIONS

ICV1-1014		
Element	Concentration ($\mu\text{g/L}$) (after 10-fold dilution)	Concentration ($\mu\text{g/L}$) (after 50-fold dilution)
Al	2500	500
Sb	1000	200
As	1000	200
Ba	520	100
Be	510	100
Cd	510	100
Ca	10000	2000
Cr	520	100
Co	520	100
Cu	510	100
Fe	10000	2000
Pb	1000	200
Mg	6000	1200
Mn	520	100
Ni	530	110
K	9900	2000
Se	1000	200
Ag	250	50
Na	10000	2000
Tl	1000	210
V	500	100
Zn	1000	200

ICV5-0415		ICV6-0400	
Element	Concentration ($\mu\text{g/L}$) (after 100-fold dilution)	Analyte	Concentration ($\mu\text{g/L}$) (after 100-fold dilution)
Hg	4.0	CN ⁻	99

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

 **avantor™**



Material No.: 9530-33
Batch No.: 24D1562005
Manufactured Date: 2024-03-18
Retest Date: 2029-03-17
Revision No.: 0

Received! — 08/01/2024
pater
m6039
m6040

Certificate of Analysis

Test	Specification	Result
ACS – Assay (as HCl) (by acid–base titrn)	36.5 – 38.0 %	37.6 %
ACS – Color (APHA)	≤ 10	5
ACS – Residue after Ignition	≤ 3 ppm	< 1 ppm
ACS – Specific Gravity at 60°/60°F	1.185 – 1.192	1.192
ACS – Bromide (Br)	≤ 0.005 %	< 0.005 %
ACS – Extractable Organic Substances	≤ 5 ppm	< 1 ppm
ACS – Free Chlorine (as Cl ₂)	≤ 0.5 ppm	< 0.5 ppm
Phosphate (PO ₄)	≤ 0.05 ppm	0.03 ppm
Sulfate (SO ₄)	≤ 0.5 ppm	< 0.3 ppm
Sulfite (SO ₃)	≤ 0.8 ppm	0.3 ppm
Ammonium (NH ₄)	≤ 3 ppm	< 1 ppm
Trace Impurities – Arsenic (As)	≤ 0.010 ppm	< 0.003 ppm
Trace Impurities – Aluminum (Al)	≤ 10.0 ppb	< 5.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 3.0 ppb
Trace Impurities – Barium (Ba)	≤ 1.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 1.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	≤ 10.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 20.0 ppb	2.2 ppb
Trace Impurities – Cadmium (Cd)	≤ 1.0 ppb	< 1.0 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	31.0 ppb
Trace Impurities – Chromium (Cr)	≤ 1.0 ppb	0.5 ppb
Trace Impurities – Cobalt (Co)	≤ 1.0 ppb	0.2 ppb
Trace Impurities – Copper (Cu)	≤ 1.0 ppb	< 0.1 ppb
Trace Impurities – Gallium (Ga)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Germanium (Ge)	≤ 3.0 ppb	< 2.0 ppb
Trace Impurities – Gold (Au)	≤ 4.0 ppb	< 0.2 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 50 ppb
Trace Impurities – Iron (Fe)	≤ 15 ppb	3 ppb

>>> Continued on page 2 >>>

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

 **avantorsm**



Material No.: 9530-33
Batch No.: 24D1562005

Test	Specification	Result
Trace Impurities – Lead (Pb)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Lithium (Li)	≤ 1.0 ppb	< 0.1 ppb
Trace Impurities – Magnesium (Mg)	≤ 10.0 ppb	2.2 ppb
Trace Impurities – Manganese (Mn)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Mercury (Hg)	≤ 0.5 ppb	< 0.1 ppb
Trace Impurities – Molybdenum (Mo)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Nickel (Ni)	≤ 4.0 ppb	0.2 ppb
Trace Impurities – Niobium (Nb)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Potassium (K)	≤ 9.0 ppb	< 1.0 ppb
Trace Impurities – Selenium (Se), For Information Only		< 1.0 ppb
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	< 10.0 ppb
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities – Sodium (Na)	≤ 100.0 ppb	2.0 ppb
Trace Impurities – Strontium (Sr)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Tantalum (Ta)	≤ 1.0 ppb	< 0.9 ppb
Trace Impurities – Thallium (Tl)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Tin (Sn)	≤ 5.0 ppb	< 0.4 ppb
Trace Impurities – Titanium (Ti)	≤ 1.0 ppb	0.2 ppb
Trace Impurities – Vanadium (V)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities – Zinc (Zn)	≤ 5.0 ppb	< 0.2 ppb
Trace Impurities – Zirconium (Zr)	≤ 1.0 ppb	< 0.1 ppb

>>> Continued on page 3 >>>

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

 **avantorsm**



Material No.: 9530-33
Batch No.: 24D1562005

Test	Specification	Result
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For Laboratory, Research, or Manufacturing Use
Product Information (not specifications):
Appearance (clear, fuming liquid)
Meets ACS Specifications
Storage Condition: Store below 25 °C.

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Croak
Director Quality Operations, Bioscience Production

Nitric Acid 69%
CMOS

avantor™



R: 9/10/24

Material No.: 9606-03
Batch No.: 24D1062002
Manufactured Date: 2024-03-26
Retest Date: 2029-03-25
Revision No.: 0

Certificate of Analysis

M6088, M6089, M6090, M6091, M6092, M6093

Test	Specification	Result
Assay (HNO ₃)	69.0 – 70.0 %	69.7 %
Appearance	Passes Test	Passes Test
Color (APHA)	≤ 10	5
Residue after Ignition	≤ 2 ppm	1 ppm
Chloride (Cl)	≤ 0.08 ppm	< 0.03 ppm
Phosphate (PO ₄)	≤ 0.10 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.2 ppm	< 0.2 ppm
Trace Impurities – Aluminum (Al)	≤ 40.0 ppb	< 1.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Barium (Ba)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 50 ppb	< 1 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	2.3 ppb
Trace Impurities – Chromium (Cr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Cobalt (Co)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Copper (Cu)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Gallium (Ga)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Germanium (Ge)	≤ 20 ppb	< 10 ppb
Trace Impurities – Gold (Au)	≤ 20 ppb	< 5 ppb
Heavy Metals (as Pb)	≤ 100 ppb	100 ppb
Trace Impurities – Iron (Fe)	≤ 40.0 ppb	< 1.0 ppb
Trace Impurities – Lead (Pb)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Lithium (Li)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Magnesium (Mg)	≤ 20 ppb	< 1 ppb
Trace Impurities – Manganese (Mn)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Nickel (Ni)	≤ 20.0 ppb	< 5.0 ppb

>>> Continued on page 2 >>>

Test	Specification	Result
Trace Impurities – Niobium (Nb)	≤ 50.0 ppb	< 1.0 ppb
Trace Impurities – Potassium (K)	≤ 50 ppb	16 ppb
Trace Impurities – Silicon (Si)	≤ 50 ppb	< 10 ppb
Trace Impurities – Silver (Ag)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Sodium (Na)	≤ 150.0 ppb	< 5.0 ppb
Trace Impurities – Strontium (Sr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Tantalum (Ta)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Thallium (Tl)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Tin (Sn)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Titanium (Ti)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Vanadium (V)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Zinc (Zn)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Zirconium (Zr)	≤ 10.0 ppb	< 1.0 ppb
Particle Count – 0.5 µm and greater	≤ 60 par/ml	10 par/ml
Particle Count – 1.0 µm and greater	≤ 10 par/ml	3 par/ml

>>> Continued on page 3 >>>

Nitric Acid 69%
CMOS



Material No.: 9606-03
Batch No.: 24D1062002

Test	Specification	Result
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For Microelectronic Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC

A handwritten signature in cursive script, appearing to read 'JCroak'.

Jamie Croak
Director Quality Operations, Bioscience Production

Nitric Acid 69%
CMOS

avantor™



M6096
M6097
M6098
M6099
M6100

Mut dir
9/21/24

Material No.: 9606-03
Batch No.: 24D1062002
Manufactured Date: 2024-03-26
Retest Date: 2029-03-25
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (HNO ₃)	69.0 – 70.0 %	69.7 %
Appearance	Passes Test	Passes Test
Color (APHA)	≤ 10	5
Residue after Ignition	≤ 2 ppm	1 ppm
Chloride (Cl)	≤ 0.08 ppm	< 0.03 ppm
Phosphate (PO ₄)	≤ 0.10 ppm	< 0.03 ppm
Sulfate (SO ₄)	≤ 0.2 ppm	< 0.2 ppm
Trace Impurities – Aluminum (Al)	≤ 40.0 ppb	< 1.0 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 2.0 ppb
Trace Impurities – Barium (Ba)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Beryllium (Be)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Bismuth (Bi)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Cadmium (Cd)	≤ 50 ppb	< 1 ppb
Trace Impurities – Calcium (Ca)	≤ 50.0 ppb	2.3 ppb
Trace Impurities – Chromium (Cr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Cobalt (Co)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Copper (Cu)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Gallium (Ga)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Germanium (Ge)	≤ 20 ppb	< 10 ppb
Trace Impurities – Gold (Au)	≤ 20 ppb	< 5 ppb
Heavy Metals (as Pb)	≤ 100 ppb	100 ppb
Trace Impurities – Iron (Fe)	≤ 40.0 ppb	< 1.0 ppb
Trace Impurities – Lead (Pb)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Lithium (Li)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Magnesium (Mg)	≤ 20 ppb	< 1 ppb
Trace Impurities – Manganese (Mn)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Nickel (Ni)	≤ 20.0 ppb	< 5.0 ppb

>>> Continued on page 2 >>>

Nitric Acid 69%
CMOS



Material No.: 9606-03
Batch No.: 24D1062002

Test	Specification	Result
Trace Impurities – Niobium (Nb)	≤ 50.0 ppb	< 1.0 ppb
Trace Impurities – Potassium (K)	≤ 50 ppb	16 ppb
Trace Impurities – Silicon (Si)	≤ 50 ppb	< 10 ppb
Trace Impurities – Silver (Ag)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Sodium (Na)	≤ 150.0 ppb	< 5.0 ppb
Trace Impurities – Strontium (Sr)	≤ 30.0 ppb	< 1.0 ppb
Trace Impurities – Tantalum (Ta)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Thallium (Tl)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities – Tin (Sn)	≤ 20.0 ppb	< 10.0 ppb
Trace Impurities – Titanium (Ti)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Vanadium (V)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities – Zinc (Zn)	≤ 20.0 ppb	< 1.0 ppb
Trace Impurities – Zirconium (Zr)	≤ 10.0 ppb	< 1.0 ppb
Particle Count – 0.5 µm and greater	≤ 60 par/ml	10 par/ml
Particle Count – 1.0 µm and greater	≤ 10 par/ml	3 par/ml

>>> Continued on page 3 >>>

Nitric Acid 69%
CMOS



Material No.: 9606-03
Batch No.: 24D1062002

Test	Specification	Result
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For Microelectronic Use
Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC


Jamie Croak
Director Quality Operations, Bioscience Production



SHIPPING DOCUMENTS

CHEMTECH

CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 • Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. **P4397**
QUOTE NO.
COC Number **2042048**

CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: **Gannett Fleming**
ADDRESS: **1010 Adam Avenue**
CITY: **Audobon** STATE: **PA** ZIP: **19403**
ATTENTION: **Joe Krupansky**
PHONE: **610-301-8362** FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: **Amtrak's replacement of SB**
PROJECT NO.: **950000818** LOCATION: **Kearny, NJ**
PROJECT MANAGER: **Joe Krupansky**
e-mail: **Q7AQC@bomsystems.com**
PHONE: **610-301-8362** FAX:

CLIENT BILLING INFORMATION

BILL TO: **Chemtech** PO#: **284 Sheffield St.**
ADDRESS: **284 Sheffield St.**
CITY: **Mountainside** STATE: **NJ** ZIP: **07092**
ATTENTION: **Samantha** PHONE: **908-788-3198**

ANALYSIS

DATA TURNAROUND INFORMATION

FAX (RUSH) _____ DAYS*
HARDCOPY (DATA PACKAGE): **10** DAYS*
EDD: **10** DAYS*
*TO BE APPROVED BY CHEMTECH
STANDARD HARDCOPY TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ Level 1 (Results Only) ☐ Level 4 (QC + Full Raw Data)
☐ Level 2 (Results + QC) ☒ NJ Reduced ☐ US EPA CLP
☐ Level 3 (Results + QC) ☐ NYS ASP A ☐ NYS ASP B
+ Raw Data ☐ Other _____
☐ EDD FORMAT **BEM EDD**

**100 VOC + 10
TCL PAH
PCB
TAX Metals
CADD, CALD
EPA**

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS
			COMP	GRAB	DATE	TIME		A	B	C	D	E	F	G	H	I	
1.	NB-301-70P	S	X		10/10	10:00	10	X	X	X	X	X	X				
2.	NB-301-BOT	S	X		10/10	12:15	10	X	X	X	X	X	X				
3.	NB-301-SW	GW	X		10/10	11:00	7	X	X	X	X	X					
4.	7B-10102024	W			10/10	LAB	2	X									
5.	Temp. Blank																
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER: 1. Meta Mursula	DATE/TIME: 3:05 PM 10/11/24	RECEIVED BY: 1. [Signature]	DATE/TIME: 10-11-24	Conditions of bottles or coolers at receipt: ☐ COMPLIANT ☐ NON COMPLIANT ☐ COOLER TEMP 3.5 °C
RELINQUISHED BY SAMPLER: 2. [Signature]	DATE/TIME:	RECEIVED BY: 2. [Signature]	DATE/TIME:	Comments:
RELINQUISHED BY SAMPLER: 3. [Signature]	DATE/TIME: 10-11-24	RECEIVED BY: 3. [Signature]	DATE/TIME:	CLIENT: ☐ Hand Delivered ☐ Other _____ CHEMTECH: ☐ Picked Up ☐ Field Sampling Shipment Complete ☐ YES ☐ NO

From: Vrunda Pujara <vpujara@yu-associates.com>
Sent: Thursday, October 17, 2024 4:58 PM
To: Yazmeen Gomez
Cc: Chengyu Hang; 'Jordan Hedvat'
Subject: Corrected COC
Attachments: Corrected COC.pdf

Hello Yazmeen,

For samples collected on 10.10.2024. The WB-301-Bot were to be additionally analyzed for Full TCLP, RCRA parameters and TOX. I have included the corrected scanned COC in the email. Kindly let me know if you have any additional questions.

Thanks,

Vrunda Pujara
Senior Staff Engineer

YU & Associates

611 River Drive, 3rd Floor* | Elmwood Park | NJ 07407
D: 201.791.0075 **F:** 201.791.4533



284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Laboratory Certification

Certified By	License No.
CAS EPA CLP Contract	68HERH20D0011
Connecticut	PH-0830
DOD ELAP (ANAB)	L2219
Maine	2024021
Maryland	296
New Hampshire	255424 Rev 1
New Jersey	20012
New York	11376
Pennsylvania	68-00548
Soil Permit	525-24-234-08441
Texas	T104704488