

RESL CUSTOMER EXPORT CONTROL AGREEMENT

It is the Radiological and Environmental Sciences Laboratory's (RESL) policy to conduct business in accordance with all applicable U.S. export control laws and regulations. It is also RESL's policy that its Customers comply with U.S. export control laws and regulations. Therefore, Customer agrees to the following:

1. Because products, technical data, and technical assistance (i.e., services) provided to Customer by RESL may be subject to U.S. export control laws and regulations, (i) transactions with certain persons and companies and (ii) the export or reexport of certain types and levels of products, technical data, and services are prohibited or restricted.
2. Customer acknowledges that it is responsible for its own compliance with U.S. export control laws and regulations. Customer further agrees that it assumes the responsibility to obtain all necessary U.S. export licenses or other U.S. governmental authorizations, as well as all liability for the failure to do so.
3. Customer acknowledges that export control requirements may change and that the export or reexport of RESL products, technical data, and services without an export license or other appropriate governmental authorization may result in criminal and/or civil liability.
4. The obligations and requirements described herein shall survive the expiration or termination of any agreement or contract between RESL and Customer.

MaS48 Participating Laboratories

Lab Code	Lab Name	Matrix Code
ADEM01	Alabama Department of Environmental Management	MaS
AFOH01	USAFSAM/OEA	MaS
AMEC99	Jacobs Clean Energy Limited - Analytical Services	MaS
ARGO01	Idaho National Laboratory	MaS
ARSL01	ARS Aleut Analytical, LLC	MaS
ASUK99	AWE (Aldermaston)	MaS
AY1201	Consolidated Nuclear Security, LLC, ACO Laboratory	MaS
BY1201	Consolidated Nuclear Security, LLC, ACO, Production Laboratory	MaS
CDHS01	California Department of Public Health	MaS
CESL01	Lawrence Livermore National Laboratory - EMRL	MaS
DINL99	Departamento Ingeniería Energética	MaS
EFGS01	Eurofins Frontier Global Sciences, LLC.	MaS
ERCL01	Washington State Public Health Laboratories	MaS
ERHD99	National Monitoring Section, Radiation Protection Bureau, Health Canada	MaS
ETTP01	MCLinc	MaS
FDHE01	Florida Dept of Health Environmental Laboratory	MaS
FDOH01	Florida Dept. of Health, Mobile Environmental Radiological Lab	MaS
GENE01	GEL Laboratories, LLC	MaS
GPCL01	Georgia Power Company Environmental Laboratory	MaS
HECR01	SC Dept. Health and Environmental Control Radiological Laboratory	MaS
HPAC99	UKHSA, RCE Glasgow	MaS
HPAL01	Los Alamos National Laboratory	MaS
IAEA20	IAEA Marine Environment Laboratories, Radiometrics Laboratory	MaS
IAEA99	International Atomic Energy Agency	MaS
IEMA01	Illinois Emergency Management Agency Radiochemistry Laboratory	MaS
ISUE01	ISU Environmental Monitoring Laboratory	MaS
ISUP01	ISU - Department of Physics/Health Physics/EAL	MaS
JLNN01	Jefferson Laboratory	MaS
JNRC99	Energy and Mineral Regulatory Commission	MaS
LOCK03	Advanced Test Reactor (ATR) Complex Radioanalytical Laboratory	MaS
MART01	Fluor-BWXT Portsmouth LLC, Analytical Laboratory	MaS
MART03	Radioactive Material Analysis Laboratory	MaS
MDPH01	MDPH-Radiation Control Program	MaS
MSDH01	Mississippi State Dept of Health	MaS
NARL01	National Analytical Radiation Environmental Laboratory	MaS
NESI01	BWXT-Radioisotope & Analytical Chemistry Laboratory	MaS
NJDH01	New Jersey Dept. of Health, ECLS	MaS
NOCS99	National Oceanography Centre, Southampton	MaS
NRLL99	Environmental Radioactivity - National Centre for Radiation Science	MaS
ODHL01	Ohio Department of Health Laboratory	MaS
OTLI01	Pace Analytical National Center for Testing & Innovation	MaS
RAVR99	Radiactividad Ambiental y Vigilancia Radiologica	MaS
RJLG01	RJ Lee Group - Columbia Basin Analytical Laboratories (CBAL)	MaS
SEML01	SRS Environmental Monitoring Laboratory	MaS

SLAC01	SLAC DOE National Accelerator Laboratory	MaS
SOUT01	Southwest Research Institute	MaS
SRPD01	Sandia National Laboratories, Radiation Protection Sample Diagnostics	MaS
TDHL01	Texas Department of State Health Services Laboratory	MaS
TELE01	Teledyne Brown Engineering - Environmental Services	MaS
TELE02	ATI Environmental, Inc., Midwest Lab	MaS
TMAO01	EBERLINE Analytical Corporation	MaS
TNUT01	St. Louis USACE FUSRAP Laboratory	MaS
UNTE01	UniTech-235	MaS
WEST04	PACE ANALYTICAL SERVICES, PITTSBURGH	MaS
WIPH01	WI, DPH, Radiation Protection Section	MaS
WIPP01	WIPP Laboratories	MaS
WSHL01	Wisconsin State Laboratory of Hygiene	MaS
YPGA01	US Army Yuma Proving Ground / Material Analysis Lab	MaS

Laboratories Not Reporting

Lab Code	Lab Name	Matrix Code
CMRC01	Carlsbad Environmental Monitoring and Research Center	MaS
COPS99	Health Canada Radiation Protection Bureau	MaS
LAWR01	LAWRENCE BERKELEY NATIONAL LABORATORY	MaS
UNEV01	University of Nevada, Reno	MaS

Study Reference Values

MAPEP-23-MaS48

Radiological Reference Date: 02/01/2023

Analyte	Ref Value	Ref Unc	Tot Mtl Ref Val	Tot Mtl Ref Unc
Units: (mg/kg)				
Inorganic				
Antimony	6.4	0.2	8.4	0.2
Arsenic	8.4	0.4	9.0	0.5
Barium	300	10	866	16
Beryllium	18.3	0.3	19.5	0.4
Cadmium	3.53	0.07	3.54	0.07
Chromium	43.4	1.5	92	4
Cobalt	39.4	0.7	43.4	0.9
Copper	83.9	1.7	89.8	1.8
Lead	20.5	0.6	28.0	0.8
Mercury	0.0174	0.0010	0.0174	0.0010
Nickel	84.5	1.7	98	2
Selenium	5.76	0.12	6.10	0.15
Silver	19.6	0.4	19.7	0.4
Technetium-99	0.00174	0.00003		
Thallium	0.19	0.02	0.55	0.04
Uranium-235	0.055	0.002		
Uranium-238	20.8	0.7		
Uranium-Total	20.8	0.7		
Vanadium	85	2	133.5	1.9
Zinc	96	4	120	4

Analyte	Ref Value	Ref Unc		
Units: (Bq/kg)				
Radiological				
Americium-241	0.9	0.2		
Cobalt-57	698	14		
Cobalt-60	795	12		
Manganese-54	1230	30		
Nickel-63	1130	20		
Plutonium-238	0.52	0.15		
Plutonium-239/240	101	2		
Plutonium-241				
Potassium-40	574	19		
Strontium-90	920	18		
Technetium-99	1100	20		
Thorium-228	43.3	1.5		
Thorium-230	40.0	1.1		
Thorium-232	43.3	0.7		
Uranium-234	64	2		
Uranium-238	258	9		
Zinc-65	990	20		

Sample Statistical Summary

MAPEP-23-MaS48

Radiological Reference Date: 02/01/2023

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
Inorganic							Units: (mg/kg)
Antimony	10	7	6.4	1.1	6.4	0.2	4.5 - 8.3
Arsenic	11	10	8.0	0.9	8.4	0.4	5.9 - 10.9
Barium	9	9	311	24	300	10	210 - 390
Beryllium	11	11	18.4	0.9	18.3	0.3	12.8 - 23.8
Cadmium	11	11	3.47	0.29	3.53	0.07	2.47 - 4.59
Chromium	11	10	44.2	4.7	43.4	1.5	30.4 - 56.4
Cobalt	11	11	38.3	3.4	39.4	0.7	27.6 - 51.2
Copper	11	11	80.2	5.7	83.9	1.7	58.7 - 109.1
Lead	11	11	21.2	1.9	20.5	0.6	14.4 - 26.7
Mercury	9	8	0.0331	0.0393	0.0174	0.0010	Sensitivity Evaluation
Nickel	11	10	81.8	5.3	84.5	1.7	59.2 - 109.9
Selenium	8	6	5.66	1.26	5.76	0.12	4.03 - 7.49
Silver	9	8	18.8	1.8	19.6	0.4	13.7 - 25.5
Technetium-99	3	3			0.00174	0.00003	0.00122 - 0.00226
Thallium	10	10	0.19	0.24	0.19	0.02	Sensitivity Evaluation
Uranium-235	9	9	0.054	0.006	0.055	0.002	0.039 - 0.072
Uranium-238	11	11	20.4	2.0	20.8	0.7	14.6 - 27.0
Uranium-Total	13	13	20.0	2.3	20.8	0.7	14.6 - 27.0
Vanadium	11	11	84	7	85	2	60 - 111
Zinc	11	11	104	13	96	4	67 - 125

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
Radiological							Units: (Bq/kg)
Americium-241	37	32	1.6	3.8	0.9	0.2	Sensitivity Evaluation
Cesium-134	47	43					False Positive Test
Cesium-137	47	47					False Positive Test
Cobalt-57	51	48	704	57	698	14	489 - 907
Cobalt-60	51	48	798	46	795	12	557 - 1034
Iron-55	6	5					False Positive Test
Manganese-54	51	49	1277	95	1230	30	861 - 1599
Nickel-63	11	7	1217	137	1130	20	791 - 1469
Plutonium-238	27	27	0.80	0.81	0.52	0.15	Sensitivity Evaluation
Plutonium-239/240	27	26	101	9	101	2	71 - 131
Plutonium-241	1						
Potassium-40	51	49	564	54	574	19	402 - 746
Strontium-90	24	24	833	90	920	18	644 - 1196
Technetium-99	16	16	971	81	1100	20	770 - 1430
Thorium-228	13	13	45.1	4.6	43.3	1.5	30.3 - 56.3
Thorium-230	14	13	40.1	6.1	40.0	1.1	28.0 - 52.0
Thorium-232	14	14	42.8	2.9	43.3	0.7	30.3 - 56.3
Uranium-234	28	25	61	8	64	2	45 - 83
Uranium-238	29	29	244	19	258	9	181 - 335
Zinc-65	51	48	1051	85	990	20	693 - 1287

- Note:** (1) T = Total number of laboratories reporting analyte.
(2) A = Number of laboratories with 'Acceptable' performance.
(3) Mean excludes values derived as total metals and values indicated as "Not Acceptable".

Results Flags:

- A = Result acceptable..... $|\text{Bias}| \leq 20\%$
- W = Result acceptable with warning..... $20\% < |\text{Bias}| \leq 30\%$
- N = Result not acceptable..... $|\text{Bias}| > 30\%$
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE..... $\text{RP} < 2\%$
 - ACCEPTABLE..... $2\% \leq \text{RP} \leq 15\%$
 - ACCEPTABLE WITH WARNING..... $15\% < \text{RP} \leq 30\%$
 - NOT ACCEPTABLE..... $\text{RP} > 30\%$
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Flag Summary Report

MAPEP-23-MaS48

Inorganic				
Analyte	A	W	RW	N
Antimony	5	2		3
Arsenic	9	1		1
Barium	9			
Beryllium	11			
Cadmium	11			
Chromium	10			1
Cobalt	11			
Copper	11			
Lead	11			
Mercury	8			1
Nickel	10			1
Selenium	3	3		2
Silver	8			1
Thallium	10			
Uranium-Total	13			
Uranium-235	9			
Uranium-238	11			
Vanadium	11			
Zinc	9	2		
Technetium-99	3			
Radiological				
Analyte	A	W	RW	N
Americium-241	32			5
Cesium-134	43			6
Cesium-137	47			4
Cobalt-57	47	1		3
Cobalt-60	48			3
Iron-55	5			2
Manganese-54	47	2		2
Nickel-63	6	1		4
Plutonium-238	27			
Plutonium-239/240	25	1		1
Potassium-40	48	1		2
Strontium-90	20	4		
Technetium-99	14	2		
Thorium-228	13			
Thorium-230	11	2		1
Thorium-232	14			
Uranium-234	21	4		3
Uranium-238	29			
Zinc-65	46	2		3



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(ADEM01) Alabama Department of Environmental Management
1350 Coliseum Blvd.
Montgomery, AL 36110

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9	N	(18)		Sensitivity Evaluation		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	695.0000	698	A		-0.4	489 - 907	13.0	N
Cobalt-60	768.0000	795	A		-3.4	557 - 1034	11.9	N
Iron-55	NR					False Positive Test		
Manganese-54	1280.0000	1230	A		4.1	861 - 1599	28.0	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	542.0000	574	A		-5.6	402 - 746	15.9	A
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1050.0000	990	A		6.1	693 - 1287	25.2	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(AFOH01) USAFSAM/OEA

2510 Fifth Street, Area B

Wright-Patterson AFB, OH 45433-7913

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.9	0.9	A	(17)		Sensitivity Evaluation	0.5	
Cesium-134	-2		A			False Positive Test	1	
Cesium-137	-0.4		A			False Positive Test	1.0	
Cobalt-57	680	698	A		-2.6	489 - 907	20	A
Cobalt-60	751	795	A		-5.5	557 - 1034	16	A
Iron-55	NR					False Positive Test		
Manganese-54	1150	1230	A		-6.5	861 - 1599	26	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.7	0.52	A	(17)		Sensitivity Evaluation	0.5	
Plutonium-239/240	99.8	101	A		-1.2	71 - 131	6.1	A
Potassium-40	489	574	A		-14.8	402 - 746	19	A
Strontium-90	873	920	A		-5.1	644 - 1196	38	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	51.1	43.3	A		18.0	30.3 - 56.3	3.5	A
Thorium-230	42.4	40.0	A		6.0	28.0 - 52.0	3.1	A
Thorium-232	45.0	43.3	A		3.9	30.3 - 56.3	3.2	A
Uranium-234	62.6	64	A		-2.2	45 - 83	4.6	A
Uranium-238	250	258	A		-3.1	181 - 335	12	A
Zinc-65	975	990	A		-1.5	693 - 1287	20	A

Radiological Reference Date: February 1, 2023

Results Flags:

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- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(AMEC99) Jacobs Clean Energy Limited - Analytical Services

612 Faraday Street

Birchwood Park, Warrington WA3 6GN

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.15	0.9	A	(17)		Sensitivity Evaluation	0.81	
Cesium-134	2.5		A			False Positive Test	2.5	
Cesium-137	2.6		A			False Positive Test	2.6	
Cobalt-57	714	698	A		2.3	489 - 907	23	A
Cobalt-60	795	795	A		0.0	557 - 1034	22	A
Iron-55	152.43		A			False Positive Test	200	
Manganese-54	1236	1230	A		0.5	861 - 1599	36	A
Nickel-63	1396	1130	W		23.5	791 - 1469	94	A
Plutonium-238	0.39	0.52	A	(17)		Sensitivity Evaluation	0.46	
Plutonium-239/240	100.9	101	A		-0.1	71 - 131	3.5	A
Potassium-40	558	574	A		-2.8	402 - 746	26	A
Strontium-90	788	920	A		-14.3	644 - 1196	44	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	1000	1100	A		-9.1	770 - 1430	120	A
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	62.9	64	A		-1.7	45 - 83	1.9	A
Uranium-238	246.7	258	A		-4.4	181 - 335	6.5	A
Zinc-65	1017	990	A		2.7	693 - 1287	31	A

Radiological Reference Date: February 1, 2023

Results Flags:

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- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
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- (17) = NOT DETECTED - reported a statistically zero result
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- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(ARGO01) Idaho National Laboratory

INL, Materials and Fuels Complex

Idaho Falls, ID 83415

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	6.17	0.9	A	(17)		Sensitivity Evaluation	6.17	
Cesium-134	6.17		A			False Positive Test	6.17	
Cesium-137	6.17		A			False Positive Test	6.17	
Cobalt-57	842	698	W		20.6	489 - 907	25	A
Cobalt-60	897	795	A		12.8	557 - 1034	27	A
Iron-55	NR					False Positive Test		
Manganese-54	1523	1230	W		23.8	861 - 1599	46	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	616	574	A		7.3	402 - 746	86	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1277	990	W		29.0	693 - 1287	38	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(ARSL01) ARS Aleut Analytical, LLC

2609 North River Road

Port Allen, LA 70767

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	7.07	6.4	A		10.5	4.5 - 8.3	0.052	N
Arsenic	7.07	8.4	A		-15.8	5.9 - 10.9	0.052	N
Barium	306	300	A		2.0	210 - 390	6.07	N
Beryllium	18.1	18.3	A		-1.1	12.8 - 23.8	0.062	N
Cadmium	3.65	3.53	A		3.4	2.47 - 4.59	0.062	N
Chromium	47.8	43.4	A		10.1	30.4 - 56.4	0.058	N
Cobalt	45.7	39.4	A		16.0	27.6 - 51.2	0.007	N
Copper	81.7	83.9	A		-2.6	58.7 - 109.1	0.058	N
Lead	21.8	20.5	A		6.3	14.4 - 26.7	0.057	N
Mercury	0.0239	0.0174	A	(17)		Sensitivity Evaluation	0.188	
Nickel	131	84.5	N		55.0	59.2 - 109.9	0.146	N
Selenium	0.0450	5.76	N		-99.2	4.03 - 7.49	0.145	N
Silver	22.4	19.6	A		14.3	13.7 - 25.5	1.22	A
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	0.215	0.19	A	(17)		Sensitivity Evaluation	0.117	
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	16.8	20.8	A		-19.2	14.6 - 27.0	0.0125	N
Vanadium	88.4	85	A		4.0	60 - 111	0.056	N
Zinc	120	96	W		25.0	67 - 125	2.0	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	2.427	0.9	A	(17)		Sensitivity Evaluation	1.401	
Cesium-134	-0.389		A			False Positive Test	2.378	
Cesium-137	-2.551		A			False Positive Test	1.853	
Cobalt-57	664.970	698	A		-4.7	489 - 907	22.608	A
Cobalt-60	787.190	795	A		-1.0	557 - 1034	14.834	N
Iron-55	NR					False Positive Test		
Manganese-54	1249.600	1230	A		1.6	861 - 1599	40.094	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.638	0.52	A	(17)		Sensitivity Evaluation	1.193	
Plutonium-239/240	111.580	101	A		10.5	71 - 131	9.207	A
Potassium-40	571.520	574	A		-0.4	402 - 746	23.016	A
Strontium-90	858.472	920	A		-6.7	644 - 1196	66.665	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	47.369	64	W		-26.0	45 - 83	4.584	A
Uranium-238	240.010	258	A		-7.0	181 - 335	16.669	A
Zinc-65	1079.100	990	A		9.0	693 - 1287	34.789	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(ASUK99) AWE (Aldermaston)

A38.1 AWE

Reading, Berkshire RG7 4PR

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	NR					False Positive Test		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	698				489 - 907		
Cobalt-60	NR	795				557 - 1034		
Iron-55	NR					False Positive Test		
Manganese-54	NR	1230				861 - 1599		
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.5205	0.52	A	(17)		Sensitivity Evaluation	0.2194	
Plutonium-239/240	99.0296	101	A		-2.0	71 - 131	14.0208	A
Potassium-40	NR	574				402 - 746		
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	49.0401	64	W		-23.4	45 - 83	13.1328	W
Uranium-238	231.7434	258	A		-10.2	181 - 335	31.2398	A
Zinc-65	NR	990				693 - 1287		

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(AY1201) Consolidated Nuclear Security, LLC, ACO Laboratory

Y12, NSC, Bldg. 9995, Rm 142

Oak Ridge, TN 37831-8189

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	8.73	6.4	N		36.4	4.5 - 8.3	.461	A
Arsenic	7.43	8.4	A		-11.5	5.9 - 10.9	.982	A
Barium	328	300	A		9.3	210 - 390	33.2	A
Beryllium	17.7	18.3	A		-3.3	12.8 - 23.8	2.52	A
Cadmium	3.45	3.53	A		-2.3	2.47 - 4.59	.384	A
Chromium	50.3	43.4	A		15.9	30.4 - 56.4	5.6	A
Cobalt	37.9	39.4	A		-3.8	27.6 - 51.2	3.78	A
Copper	81.8	83.9	A		-2.5	58.7 - 109.1	10.1	A
Lead	23.8	20.5	A		16.1	14.4 - 26.7	2.33	A
Mercury	0.0179	0.0174	A			Sensitivity Evaluation	.0019	
Nickel	82.5	84.5	A		-2.4	59.2 - 109.9	8.18	A
Selenium	7.12	5.76	W		23.6	4.03 - 7.49	1.16	W
Silver	18.7	19.6	A		-4.6	13.7 - 25.5	1.91	A
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	0.265	0.19	A			Sensitivity Evaluation	0.033	
Uranium-235	0.054	0.055	A		-1.8	0.039 - 0.072	0.0054	A
Uranium-238	18.93	20.8	A		-9.0	14.6 - 27.0	0.5	A
Uranium-Total	19.0	20.8	A		-8.7	14.6 - 27.0	0.5	A
Vanadium	90.0	85	A		5.9	60 - 111	3.42	A
Zinc	99.9	96	A		4.1	67 - 125	16	W

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.725	0.9	A	(17)		Sensitivity Evaluation	0.79	
Cesium-134	NR			(6)		False Positive Test		
Cesium-137	1.37		A			False Positive Test	2.3	
Cobalt-57	801	698	A		14.8	489 - 907	20	A
Cobalt-60	856	795	A		7.7	557 - 1034	25	A
Iron-55	NR					False Positive Test		
Manganese-54	1380	1230	A		12.2	861 - 1599	45	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.603	0.52	A	(17)		Sensitivity Evaluation	0.60	
Plutonium-239/240	96.4	101	A		-4.6	71 - 131	6.4	A
Potassium-40	598	574	A		4.2	402 - 746	34	A
Strontium-90	942	920	A		2.4	644 - 1196	24	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	925	1100	A		-15.9	770 - 1430	22	A
Thorium-228	39.8	43.3	A		-8.1	30.3 - 56.3	2.8	A
Thorium-230	33.2	40.0	A		-17.0	28.0 - 52.0	2.4	A
Thorium-232	42.2	43.3	A		-2.5	30.3 - 56.3	2.9	A
Uranium-234	70.9	64	A		10.8	45 - 83	5.2	A
Uranium-238	263	258	A		1.9	181 - 335	17	A
Zinc-65	1130	990	A		14.1	693 - 1287	36	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(BY1201) Consolidated Nuclear Security, LLC, ACO, Production Laboratory
Y12, NSC, Bldg. 9995, Rm 142
Oak Ridge, TN 37831-8189

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.714	0.9	A	(17)		Sensitivity Evaluation	1.145	
Cesium-134	NR			(6)		False Positive Test		
Cesium-137	0.93		A			False Positive Test	1.09	
Cobalt-57	778	698	A		11.5	489 - 907	7.47	N
Cobalt-60	797	795	A		0.3	557 - 1034	8.90	N
Iron-55	NR					False Positive Test		
Manganese-54	1355	1230	A		10.2	861 - 1599	17.65	N
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	-0.21	0.52	A	(17)		Sensitivity Evaluation	0.875	
Plutonium-239/240	102	101	A		1.0	71 - 131	7.1	A
Potassium-40	620	574	A		8.0	402 - 746	17.1	A
Strontium-90	766.36	920	A		-16.7	644 - 1196	26.36	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	914	1100	A		-16.9	770 - 1430	30.06	A
Thorium-228	41.1	43.3	A		-5.1	30.3 - 56.3	5.55	A
Thorium-230	37.0	40.0	A		-7.5	28.0 - 52.0	5.25	A
Thorium-232	41.2	43.3	A		-4.9	30.3 - 56.3	5.65	A
Uranium-234	60.3	64	A		-5.8	45 - 83	3.49	A
Uranium-238	239	258	A		-7.4	181 - 335	8.7	A
Zinc-65	1135	990	A		14.6	693 - 1287	17.93	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (CDHS01) California Department of Public Health
 Drinking Water & Radiation Lab.
 Richmond, CA 94804-6403

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.904	0.9	A			Sensitivity Evaluation	0.242	
Cesium-134	0.389		A			False Positive Test	0.574	
Cesium-137	0.507		A			False Positive Test	0.592	
Cobalt-57	760	698	A		8.9	489 - 907	13.4	N
Cobalt-60	855	795	A		7.5	557 - 1034	11.6	N
Iron-55	-18.4		A			False Positive Test	37.2	
Manganese-54	1386	1230	A		12.7	861 - 1599	26.3	N
Nickel-63	1276	1130	A		12.9	791 - 1469	35.6	A
Plutonium-238	0.783	0.52	A			Sensitivity Evaluation	0.173	
Plutonium-239/240	99.9	101	A		-1.1	71 - 131	2.12	A
Potassium-40	636	574	A		10.8	402 - 746	16.0	A
Strontium-90	843	920	A		-8.4	644 - 1196	7.07	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	981	1100	A		-10.8	770 - 1430	20.0	A
Thorium-228	49.9	43.3	A		15.2	30.3 - 56.3	1.62	A
Thorium-230	54.8	40.0	N		37.0	28.0 - 52.0	1.71	A
Thorium-232	46.3	43.3	A		6.9	30.3 - 56.3	1.49	A
Uranium-234	65.4	64	A		2.2	45 - 83	4.06	A
Uranium-238	240	258	A		-7.0	181 - 335	10.7	A
Zinc-65	1074	990	A		8.5	693 - 1287	19.8	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(CESL01) Lawrence Livermore National Laboratory - EMRL

7000 East Avenue

Livermore, CA 94551

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	6.62E-01	0.9	A	(17)		Sensitivity Evaluation	4.14E-01	
Cesium-134	-9.31E+00		A			False Positive Test	9.31	
Cesium-137	2.27E+00		A			False Positive Test	4.82	
Cobalt-57	7.53E+02	698	A		7.9	489 - 907	1.78	A
Cobalt-60	8.22E+02	795	A		3.4	557 - 1034	1.75	A
Iron-55	NR					False Positive Test		
Manganese-54	1.28E+03	1230	A		4.1	861 - 1599	3.83	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	1.06E+00	0.52	A	(17)		Sensitivity Evaluation	6.11E-01	
Plutonium-239/240	9.15E+01	101	A		-9.4	71 - 131	7.05	A
Potassium-40	5.66E+02	574	A		-1.4	402 - 746	3.86	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1.04E+03	990	A		5.1	693 - 1287	3.29	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (DINL99) Departamento Ingeniería Energética
 Escuela de Ingeniería de Bilbao
 Bilbao, Vizcaya 48013

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	18.71	20.8	A		-10.0	14.6 - 27.0	0.644	A
Uranium-Total	18.71	20.8	A		-10.0	14.6 - 27.0	0.644	A
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.6844	0.9	A			Sensitivity Evaluation	0.1208	
Cesium-134	499.9		N	(1)		False Positive Test	25.61	
Cesium-137	1.68		A			False Positive Test	1.68	
Cobalt-57	456.6	698	N		-34.6	489 - 907	23.37	A
Cobalt-60	1.17	795	N		-99.9	557 - 1034	1.17	N
Iron-55	20.20		A			False Positive Test	20.20	
Manganese-54	543.9	1230	N		-55.8	861 - 1599	27.87	A
Nickel-63	1347	1130	A		19.2	791 - 1469	20.54	N
Plutonium-238	0.6678	0.52	A			Sensitivity Evaluation	0.1235	
Plutonium-239/240	131.3	101	W		30.0	71 - 131	6.53	A
Potassium-40	518.8	574	A		-9.6	402 - 746	28.23	A
Strontium-90	821.8	920	A		-10.7	644 - 1196	35.80	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	1004	1100	A		-8.7	770 - 1430	26	A
Thorium-228	42.78	43.3	A		-1.2	30.3 - 56.3	1.688	A
Thorium-230	33.92	40.0	A		-15.2	28.0 - 52.0	1.36	A
Thorium-232	42.54	43.3	A		-1.8	30.3 - 56.3	1.678	A
Uranium-234	57.64	64	A		-9.9	45 - 83	2.074	A
Uranium-238	232.7	258	A		-9.8	181 - 335	8.01	A
Zinc-65	672.4	990	N		-32.1	693 - 1287	34.55	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (EFGS01) Eurofins Frontier Global Sciences, LLC.
 5755 8th St. E
 Tacoma, WA 98424

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	0.014	0.0174	A			Sensitivity Evaluation	0.000871	
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	NR					False Positive Test		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	698				489 - 907		
Cobalt-60	NR	795				557 - 1034		
Iron-55	NR					False Positive Test		
Manganese-54	NR	1230				861 - 1599		
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	NR	574				402 - 746		
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	NR	990				693 - 1287		

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (ERCL01) Washington State Public Health Laboratories
 1610 N.E. 150th Street
 Shoreline, WA 98155-9701

Inorganic								Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Antimony	7.10	8.4	A	(5)	-15.5	5.9 - 10.9	0.66	A	
Arsenic	7.3	9.0	A	(5)	-18.9	6.3 - 11.7	2.6	N	
Barium	NR	300				210 - 390			
Beryllium	21.3	19.5	A	(5)	9.2	13.7 - 25.4	1.1	A	
Cadmium	3.65	3.54	A	(5)	3.1	2.48 - 4.60	0.20	A	
Chromium	84.0	92	A	(5)	-8.7	64.4 - 119.6	5.6	A	
Cobalt	43.3	43.4	A	(5)	-0.2	30.4 - 56.4	1.8	A	
Copper	89.3	89.8	A	(5)	-0.6	62.9 - 116.7	4.0	A	
Lead	27.4	28.0	A	(5)	-2.1	19.6 - 36.4	1.0	A	
Mercury	NR	0.0174				Sensitivity Evaluation			
Nickel	93.9	98	A	(5)	-4.2	68.6 - 127.4	4.1	A	
Selenium	NR	5.76				4.03 - 7.49			
Silver	NR	19.6				13.7 - 25.5			
Technetium-99	NR	0.00174				0.00122 - 0.00226			
Thallium	0.390	0.55	A	(5)		Sensitivity Evaluation	0.051		
Uranium-235	0.0620	0.055	A		12.7	0.039 - 0.072	0.0056	A	
Uranium-238	22.9	20.8	A		10.1	14.6 - 27.0	1.7	A	
Uranium-Total	23.0	20.8	A		10.6	14.6 - 27.0	1.7	A	
Vanadium	143	133.5	A	(5)	7.1	93 - 174	7	A	
Zinc	102	120	A	(5)	-15.0	84 - 156	8	A	

Radiological								Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag	
Americium-241	1.59	0.9	A	(17)		Sensitivity Evaluation	0.55		
Cesium-134	1.59		A			False Positive Test	0.72		
Cesium-137	0.96		A			False Positive Test	0.64		
Cobalt-57	784	698	A		12.3	489 - 907	6	N	
Cobalt-60	862	795	A		8.4	557 - 1034	4	N	
Iron-55	NR					False Positive Test			
Manganese-54	1320	1230	A		7.3	861 - 1599	50	A	
Nickel-63	1200	1130	A		6.2	791 - 1469	180	A	
Plutonium-238	0.04	0.52	A	(17)		Sensitivity Evaluation	0.43		
Plutonium-239/240	102	101	A		1.0	71 - 131	4	A	
Potassium-40	673	574	A		17.2	402 - 746	9	N	
Strontium-90	925	920	A		0.5	644 - 1196	26	A	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	810	1100	W		-26.4	770 - 1430	120	A
Thorium-228	47.0	43.3	A		8.5	30.3 - 56.3	2.1	A
Thorium-230	42.5	40.0	A		6.3	28.0 - 52.0	1.9	A
Thorium-232	45.5	43.3	A		5.1	30.3 - 56.3	1.9	A
Uranium-234	54.8	64	A		-14.4	45 - 83	3.0	A
Uranium-238	249	258	A		-3.5	181 - 335	9	A
Zinc-65	1060	990	A		7.1	693 - 1287	10	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(ERHD99) National Monitoring Section, Radiation Protection Bureau, Health Canada

775 Brookfield Road AL6302D1

Ottawa, Ontario K1A 1C1

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	0.155	6.4	N		-97.6	4.5 - 8.3	0.03	W
Arsenic	5.3	8.4	N		-36.9	5.9 - 10.9	2	N
Barium	NR	300				210 - 390		
Beryllium	18.1	18.3	A		-1.1	12.8 - 23.8	0.4	A
Cadmium	3.5	3.53	A		-0.9	2.47 - 4.59	0.1	A
Chromium	62.5	43.4	N		44.0	30.4 - 56.4	0.7	N
Cobalt	38.2	39.4	A		-3.0	27.6 - 51.2	1	A
Copper	77.8	83.9	A		-7.3	58.7 - 109.1	1	N
Lead	21.5	20.5	A		4.9	14.4 - 26.7	1.05	A
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	84.4	84.5	A		-0.1	59.2 - 109.9	2.3	A
Selenium	NR	5.76				4.03 - 7.49		
Silver	17.3	19.6	A		-11.7	13.7 - 25.5	0.6	A
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	-0.08	0.19	A	(17)		Sensitivity Evaluation	1	
Uranium-235	0.049	0.055	A		-10.9	0.039 - 0.072	0.005	A
Uranium-238	20.32	20.8	A		-2.3	14.6 - 27.0	0.255	N
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	95.6	85	A		12.5	60 - 111	1.1	N
Zinc	107.6	96	A		12.1	67 - 125	2.3	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.44	0.9	A	(17)		Sensitivity Evaluation	0.51	
Cesium-134	0.75		A			False Positive Test	1.2	
Cesium-137	0.81		A			False Positive Test	1.35	
Cobalt-57	675	698	A		-3.3	489 - 907	53	A
Cobalt-60	720	795	A		-9.4	557 - 1034	59	A
Iron-55	NR					False Positive Test		
Manganese-54	1130	1230	A		-8.1	861 - 1599	79	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.70	0.52	A	(17)		Sensitivity Evaluation	0.41	
Plutonium-239/240	109.5	101	A		8.4	71 - 131	2.4	A
Potassium-40	483	574	A		-15.9	402 - 746	44	A
Strontium-90	930	920	A		1.1	644 - 1196	23	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	75.7	64	A		18.3	45 - 83	2.3	A
Uranium-238	303.5	258	A		17.6	181 - 335	4.6	N
Zinc-65	938	990	A		-5.3	693 - 1287	73	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(ETTP01) MCLinc

161 Mitchell Road

Oak Ridge, Tennessee 37830

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	1.2	6.4	N		-81.3	4.5 - 8.3	2.5	N
Arsenic	6.537	8.4	W		-22.2	5.9 - 10.9	0.60	A
Barium	284.49	300	A		-5.2	210 - 390	17.58	A
Beryllium	18.132	18.3	A		-0.9	12.8 - 23.8	0.59	A
Cadmium	3.346	3.53	A		-5.2	2.47 - 4.59	0.15	A
Chromium	38.436	43.4	A		-11.4	30.4 - 56.4	2.44	A
Cobalt	34.78	39.4	A		-11.7	27.6 - 51.2	3.93	A
Copper	67.24	83.9	A		-19.9	58.7 - 109.1	3.91	A
Lead	18.422	20.5	A		-10.1	14.4 - 26.7	2.39	A
Mercury	0.024	0.0174	A	(17)		Sensitivity Evaluation	0.5	
Nickel	74.626	84.5	A		-11.7	59.2 - 109.9	2.5	A
Selenium	16.733	5.76	N		190.5	4.03 - 7.49	1.82	A
Silver	13.535	19.6	N		-30.9	13.7 - 25.5	0.76	A
Technetium-99	0.001509	0.00174	A		-13.3	0.00122 - 0.00226	0.000084	A
Thallium	0.184	0.19	A			Sensitivity Evaluation	0.01	
Uranium-235	0.0624	0.055	A		13.5	0.039 - 0.072	0.00312	A
Uranium-238	23.77	20.8	A		14.3	14.6 - 27.0	1.1885	A
Uranium-Total	23.83	20.8	A		14.6	14.6 - 27.0	1.1915	A
Vanadium	70.739	85	A		-16.8	60 - 111	4.28	A
Zinc	85.029	96	A		-11.4	67 - 125	5.4	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	NR					False Positive Test		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	698				489 - 907		
Cobalt-60	NR	795				557 - 1034		
Iron-55	NR					False Positive Test		
Manganese-54	NR	1230				861 - 1599		
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	NR	574				402 - 746		
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	944	1100	A		-14.2	770 - 1430	47.2	A
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	NR	990				693 - 1287		

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(FDHE01) Florida Dept of Health Environmental Laboratory
 2100 All Childrens Way
 Orlando, FL 32818-5271

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-4.95	0.9	A	(17)		Sensitivity Evaluation	2.23	
Cesium-134	-0.54		A			False Positive Test	3.77	
Cesium-137	1.02		A			False Positive Test	1.63	
Cobalt-57	562	698	A		-19.5	489 - 907	16.97	A
Cobalt-60	721.17	795	A		-9.3	557 - 1034	14.08	N
Iron-55	NR					False Positive Test		
Manganese-54	1171.67	1230	A		-4.7	861 - 1599	30.8	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	3.23	0.52	A	(17)		Sensitivity Evaluation	2.87	
Plutonium-239/240	67.22	101	N		-33.4	71 - 131	15.09	W
Potassium-40	519	574	A		-9.6	402 - 746	19.34	A
Strontium-90	900.32	920	A		-2.1	644 - 1196	56.82	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	57.87	64	A		-9.6	45 - 83	17.23	W
Uranium-238	252.24	258	A		-2.2	181 - 335	78.44	N
Zinc-65	962.33	990	A		-2.8	693 - 1287	26.07	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(FDOH01) Florida Dept. of Health, Mobile Environmental Radiological Lab
2100 All Childrens Way
Orlando, FL 32818-5271

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.95	0.9	A	(17)		Sensitivity Evaluation	3.99	
Cesium-134	1.18		A			False Positive Test	2.65	
Cesium-137	1.2		A			False Positive Test	2.95	
Cobalt-57	614.53	698	A		-12.0	489 - 907	22	A
Cobalt-60	751.15	795	A		-5.5	557 - 1034	10.19	N
Iron-55	NR					False Positive Test		
Manganese-54	1209.42	1230	A		-1.7	861 - 1599	19.64	N
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	558.14	574	A		-2.8	402 - 746	12.85	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	256.02	258	A		-0.8	181 - 335	14.47	A
Zinc-65	1035.8	990	A		4.6	693 - 1287	16.96	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(GENE01) GEL Laboratories, LLC

2040 Savage Road

Charleston, SC 29407

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	4.86	6.4	W		-24.1	4.5 - 8.3	0.338	A
Arsenic	9.07	8.4	A		8.0	5.9 - 10.9	0.622	A
Barium	262	300	A		-12.7	210 - 390	17.5	A
Beryllium	17.3	18.3	A		-5.5	12.8 - 23.8	1.15	A
Cadmium	2.99	3.53	A		-15.3	2.47 - 4.59	0.201	A
Chromium	37.9	43.4	A		-12.7	30.4 - 56.4	2.52	A
Cobalt	33.4	39.4	A		-15.2	27.6 - 51.2	2.23	A
Copper	80.5	83.9	A		-4.1	58.7 - 109.1	5.37	A
Lead	18.5	20.5	A		-9.8	14.4 - 26.7	1.23	A
Mercury	0.0148	0.0174	A			Sensitivity Evaluation	0.00263	
Nickel	72.5	84.5	A		-14.2	59.2 - 109.9	4.83	A
Selenium	4.89	5.76	A		-15.1	4.03 - 7.49	0.346	A
Silver	17.7	19.6	A		-9.7	13.7 - 25.5	1.18	A
Technetium-99	0.00168	0.00174	A		-3.4	0.00122 - 0.00226	9.27E-5	A
Thallium	-0.189	0.19	A	(17)		Sensitivity Evaluation	0.146	
Uranium-235	0.0574	0.055	A		4.4	0.039 - 0.072	0.00332	A
Uranium-238	22.7	20.8	A		9.1	14.6 - 27.0	1.50	A
Uranium-Total	22.76	20.8	A		9.4	14.6 - 27.0	1.50	A
Vanadium	77.6	85	A		-8.7	60 - 111	5.17	A
Zinc	85.3	96	A		-11.1	67 - 125	5.69	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	4.14	0.9	N	(4)		Sensitivity Evaluation	0.881	
Cesium-134	2.67		A			False Positive Test	1.23	
Cesium-137	1.07		A			False Positive Test	0.952	
Cobalt-57	802	698	A		14.9	489 - 907	31.0	A
Cobalt-60	808	795	A		1.6	557 - 1034	44.6	A
Iron-55	-53.2		A			False Positive Test	214	
Manganese-54	1340	1230	A		8.9	861 - 1599	64.1	A
Nickel-63	1030	1130	A		-8.9	791 - 1469	120	A
Plutonium-238	1.02	0.52	A	(17)		Sensitivity Evaluation	0.393	
Plutonium-239/240	100	101	A		-1.0	71 - 131	4.71	A
Plutonium-241	-85.5						94.2	N
Potassium-40	594	574	A		3.5	402 - 746	34.5	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Strontium-90	953	920	A		3.6	644 - 1196	88.4	A
Technetium-99	1050	1100	A		-4.5	770 - 1430	70.0	A
Thorium-228	46.8	43.3	A		8.1	30.3 - 56.3	4.46	A
Thorium-230	45.5	40.0	A		13.8	28.0 - 52.0	4.26	A
Thorium-232	45.0	43.3	A		3.9	30.3 - 56.3	4.10	A
Uranium-234	60.4	64	A		-5.6	45 - 83	3.85	A
Uranium-238	264	258	A		2.3	181 - 335	13.4	A
Zinc-65	1120	990	A		13.1	693 - 1287	48.0	A

Radiological Reference Date: February 1, 2023

Results Flags:

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- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (GPCL01) Georgia Power Company Environmental Laboratory
 2480 Maner Road
 Atlanta, GA 30339

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	-0.04		A			False Positive Test	3.89	
Cesium-137	0.63		A			False Positive Test	3.71	
Cobalt-57	720.01	698	A		3.2	489 - 907	63.96	A
Cobalt-60	818.96	795	A		3.0	557 - 1034	56.73	A
Iron-55	NR					False Positive Test		
Manganese-54	1357.26	1230	A		10.3	861 - 1599	97.71	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	648.69	574	A		13.0	402 - 746	51.49	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1155.51	990	A		16.7	693 - 1287	82.65	A

Radiological Reference Date: February 1, 2023

Results Flags:

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- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(HECR01) SC Dept. Health and Environmental Control Radiological Laboratory

8231 Parklane Road

Columbia, SC 29223

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	1.387		A			False Positive Test	1.464	
Cesium-137	-0.9112		A			False Positive Test	2.546	
Cobalt-57	675.7	698	A		-3.2	489 - 907	36.13	A
Cobalt-60	773.9	795	A		-2.7	557 - 1034	44.85	A
Iron-55	NR					False Positive Test		
Manganese-54	1255	1230	A		2.0	861 - 1599	119.6	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	584.5	574	A		1.8	402 - 746	51.16	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	938.6	990	A		-5.2	693 - 1287	79.72	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(HPAC99) UKHSA, RCE Glasgow

155 Hardgate Road

Glasgow, Scotland G51 4LS

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	8.33	8.4	A		-0.8	5.9 - 10.9	0.54	A
Barium	332	300	A		10.7	210 - 390	33	A
Beryllium	18.8	18.3	A		2.7	12.8 - 23.8	1.8	A
Cadmium	3.74	3.53	A		5.9	2.47 - 4.59	0.24	A
Chromium	49	43.4	A		12.9	30.4 - 56.4	6.1	A
Cobalt	40.8	39.4	A		3.6	27.6 - 51.2	2.2	A
Copper	87.2	83.9	A		3.9	58.7 - 109.1	6.1	A
Lead	22.9	20.5	A		11.7	14.4 - 26.7	1.5	A
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	88	84.5	A		4.1	59.2 - 109.9	6.6	A
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	0.00172	0.00174	A		-1.1	0.00122 - 0.00226	0.00021	A
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	18.9	20.8	A		-9.1	14.6 - 27.0	1.9	A
Uranium-Total	18.9	20.8	A		-9.1	14.6 - 27.0	1.9	A
Vanadium	88.3	85	A		3.9	60 - 111	8	A
Zinc	104.1	96	A		8.4	67 - 125	8.9	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	2.64	0.9	N	(4)		Sensitivity Evaluation	0.46	
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	642	698	A		-8.0	489 - 907	30	A
Cobalt-60	788	795	A		-0.9	557 - 1034	36	A
Iron-55	NR					False Positive Test		
Manganese-54	1211	1230	A		-1.5	861 - 1599	55	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	1.19	0.52	A			Sensitivity Evaluation	0.21	
Plutonium-239/240	95	101	A		-5.9	71 - 131	4.04	A
Potassium-40	528	574	A		-8.0	402 - 746	26	A
Strontium-90	676	920	W		-26.5	644 - 1196	38	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	1074	1100	A		-2.4	770 - 1430	124	A
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	41.5	64	N		-35.2	45 - 83	2.7	A
Uranium-238	225	258	A		-12.8	181 - 335	11	A
Zinc-65	1004	990	A		1.4	693 - 1287	46	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (HPAL01) Los Alamos National Laboratory
 Josh Chandler, z338219 MS G761
 Los Alamos, NM 87545-1663

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-0.71	0.9	A	(17)		Sensitivity Evaluation	2.19	
Cesium-134	1.82		A			False Positive Test	3.11	
Cesium-137	-0.46		A			False Positive Test	2.79	
Cobalt-57	651.20	698	A		-6.7	489 - 907	40.15	A
Cobalt-60	743.60	795	A		-6.5	557 - 1034	25.05	A
Iron-55	NR					False Positive Test		
Manganese-54	1204.89	1230	A		-2.0	861 - 1599	47.76	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	544.07	574	A		-5.2	402 - 746	38.63	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	284.90	64	N		345.2	45 - 83	658.08	N
Uranium-238	224.51	258	A		-13.0	181 - 335	21.33	A
Zinc-65	1028.11	990	A		3.8	693 - 1287	38.60	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(IAEA20) IAEA Marine Environment Laboratories, Radiometrics Laboratory

4a, Quai Antoine 1er

Monaco, Monaco 98000

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.21E+00	0.9	A			Sensitivity Evaluation	3.71E-01	
Cesium-134	-0.01		A			False Positive Test	.5	
Cesium-137	9.48E-01		A			False Positive Test	3.60E-01	
Cobalt-57	6.94E+02	698	A		-0.6	489 - 907	2.99	A
Cobalt-60	7.80E+02	795	A		-1.9	557 - 1034	2.71	A
Iron-55	NR					False Positive Test		
Manganese-54	1.21E+03	1230	A		-1.6	861 - 1599	5.97	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	5.24E+02	574	A		-8.7	402 - 746	1.97	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1.01E+03	990	A		2.0	693 - 1287	4.00	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (IAEA99) International Atomic Energy Agency
 Agency's Laboratories Seibersdorf
 Seibersdorf, Austria A-2444

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.89	0.9	A	(17)		Sensitivity Evaluation	0.63	
Cesium-134	1.21		A			False Positive Test	0.67	
Cesium-137	0.74		A			False Positive Test	0.34	
Cobalt-57	677	698	A		-3.0	489 - 907	25	A
Cobalt-60	781	795	A		-1.8	557 - 1034	30	A
Iron-55	NR					False Positive Test		
Manganese-54	1211	1230	A		-1.5	861 - 1599	40	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	519	574	A		-9.6	402 - 746	20	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	996	990	A		0.6	693 - 1287	35	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(IEMA01) Illinois Emergency Management Agency Radiochemistry Laboratory

1301 Knotts St.

Springfield, IL 62703

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	-0.6	0.9	A	(17)		Sensitivity Evaluation	0.62	
Cesium-134	-0.8		A			False Positive Test	1.22	
Cesium-137	-1.3		A			False Positive Test	1.79	
Cobalt-57	663.0	698	A		-5.0	489 - 907	9.1	N
Cobalt-60	800.0	795	A		0.6	557 - 1034	7.8	N
Iron-55	NR					False Positive Test		
Manganese-54	1230.0	1230	A		0.0	861 - 1599	15.4	N
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.750	0.52	A	(17)		Sensitivity Evaluation	0.376	
Plutonium-239/240	100.20	101	A		-0.8	71 - 131	3.83	A
Potassium-40	550.0	574	A		-4.2	402 - 746	30.6	A
Strontium-90	729.5	920	W		-20.7	644 - 1196	47.2	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	35.66	43.3	A		-17.6	30.3 - 56.3	3.88	A
Thorium-230	51.62	40.0	W		29.1	28.0 - 52.0	5.04	A
Thorium-232	38.22	43.3	A		-11.7	30.3 - 56.3	4.01	A
Uranium-234	64.20	64	A		0.3	45 - 83	2.77	A
Uranium-238	240.80	258	A		-6.7	181 - 335	7.97	A
Zinc-65	1030.0	990	A		4.0	693 - 1287	15.8	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (ISUE01) ISU Environmental Monitoring Laboratory
 785 5th 8th Ave Rm B107
 Pocatello, Idaho 83209

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	3.1		A			False Positive Test	1.4	
Cesium-137	0.77		A			False Positive Test	1.26	
Cobalt-57	681.1	698	A		-2.4	489 - 907	48.6	A
Cobalt-60	732.9	795	A		-7.8	557 - 1034	20.9	A
Iron-55	NR					False Positive Test		
Manganese-54	1224.8	1230	A		-0.4	861 - 1599	62.7	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	535.3	574	A		-6.7	402 - 746	26.3	A
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1000.5	990	A		1.1	693 - 1287	40.6	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(ISUP01) ISU - Department of Physics/Health Physics/EAL

785 S. 8th Ave, Rm 120

Pocatello, ID 83209-8106

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	0.5		A			False Positive Test	0.6	
Cesium-137	0.3		A			False Positive Test	0.3	
Cobalt-57	702	698	A		0.6	489 - 907	15	A
Cobalt-60	807	795	A		1.5	557 - 1034	15	N
Iron-55	NR					False Positive Test		
Manganese-54	1310	1230	A		6.5	861 - 1599	31	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	592	574	A		3.1	402 - 746	18	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1100	990	A		11.1	693 - 1287	26	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(JLNN01) Jefferson Laboratory

111 Hadron Drive

Newport News, VA 23606

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	2.07	0.9	A	(17)		Sensitivity Evaluation	1.94	
Cesium-134	0.985		N	(1)		False Positive Test	0.287	
Cesium-137	0.19		A			False Positive Test	0.599	
Cobalt-57	757	698	A		8.5	489 - 907	15.5	A
Cobalt-60	838	795	A		5.4	557 - 1034	11.9	N
Iron-55	NR					False Positive Test		
Manganese-54	1353	1230	A		10.0	861 - 1599	17.5	N
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	608	574	A		5.9	402 - 746	12.1	N
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1133	990	A		14.4	693 - 1287	14.3	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (JNRC99) Energy and Mineral Regulatory Commission
 Radiological laboratories directorate
 Amman, Amman 11821

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	674	698	A		-3.4	489 - 907	9	N
Cobalt-60	752	795	A		-5.4	557 - 1034	3	N
Iron-55	NR					False Positive Test		
Manganese-54	1262	1230	A		2.6	861 - 1599	6	N
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	539	574	A		-6.1	402 - 746	.1	N
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1044	990	A		5.5	693 - 1287	7	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(LOCK03) Advanced Test Reactor (ATR) Complex Radioanalytical Laboratory

INL/Battelle Energy Alliance, LLC

Idaho Falls, ID 83415-7111

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	3.74		A			False Positive Test	2.83	
Cesium-137	2.31		A			False Positive Test	1.6	
Cobalt-57	731.67	698	A		4.8	489 - 907	17.65	A
Cobalt-60	861.67	795	A		8.4	557 - 1034	15.97	N
Iron-55	NR					False Positive Test		
Manganese-54	1376.67	1230	A		11.9	861 - 1599	28.38	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	575	574	A		0.2	402 - 746	37.18	A
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1136.67	990	A		14.8	693 - 1287	28.17	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(MART01) Fluor-BWXT Portsmouth LLC, Analytical Laboratory

COC, Bldg. X-705, Rm 106

Piketon, OH 45661

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	0.0465	0.055	A		-15.5	0.039 - 0.072	0.0066	A
Uranium-238	18.1	20.8	A		-13.0	14.6 - 27.0	2.11	A
Uranium-Total	18.2	20.8	A		-12.5	14.6 - 27.0	1.86	A
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.3309	0.9	A	(17)		Sensitivity Evaluation	0.1955	
Cesium-134	NR					False Positive Test		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	698				489 - 907		
Cobalt-60	NR	795				557 - 1034		
Iron-55	NR					False Positive Test		
Manganese-54	NR	1230				861 - 1599		
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.5043	0.52	A			Sensitivity Evaluation	0.1612	
Plutonium-239/240	94.86	101	A		-6.1	71 - 131	5.667	A
Potassium-40	NR	574				402 - 746		
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	1045	1100	A		-5.0	770 - 1430	13.73	N
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	56.96	64	A		-11.0	45 - 83	3.84	A
Uranium-238	233.5	258	A		-9.5	181 - 335	13.9	A
Zinc-65	NR	990				693 - 1287		

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (MART03) Radioactive Material Analysis Laboratory
 ORNL
 Oak Ridge, TN 37830

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	8.21	6.4	W		28.3	4.5 - 8.3	0.82	A
Arsenic	8.42	8.4	A		0.2	5.9 - 10.9	0.84	A
Barium	318	300	A		6.0	210 - 390	32	A
Beryllium	17.6	18.3	A		-3.8	12.8 - 23.8	1.8	A
Cadmium	3.57	3.53	A		1.1	2.47 - 4.59	0.36	A
Chromium	47.8	43.4	A		10.1	30.4 - 56.4	4.8	A
Cobalt	39.7	39.4	A		0.8	27.6 - 51.2	4.0	A
Copper	84.5	83.9	A		0.7	58.7 - 109.1	8.5	A
Lead	21.4	20.5	A		4.4	14.4 - 26.7	2.1	A
Mercury	0.13	0.0174	A	(17)		Sensitivity Evaluation	0.13	
Nickel	86.8	84.5	A		2.7	59.2 - 109.9	8.7	A
Selenium	5.06	5.76	A		-12.2	4.03 - 7.49	0.51	A
Silver	19.9	19.6	A		1.5	13.7 - 25.5	2.0	A
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	0.204	0.19	A			Sensitivity Evaluation	0.020	
Uranium-235	0.045	0.055	A		-18.2	0.039 - 0.072	0.004	A
Uranium-238	19.0	20.8	A		-8.7	14.6 - 27.0	1.9	A
Uranium-Total	19.0	20.8	A		-8.7	14.6 - 27.0	1.9	A
Vanadium	86.2	85	A		1.4	60 - 111	8.6	A
Zinc	103	96	A		7.3	67 - 125	10	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	5.2		A			False Positive Test	2.7	
Cesium-137	5.4		A			False Positive Test	2.8	
Cobalt-57	707.5	698	A		1.4	489 - 907	7.7	N
Cobalt-60	794.5	795	A		-0.1	557 - 1034	9.3	N
Iron-55	NR					False Positive Test		
Manganese-54	1152	1230	A		-6.3	861 - 1599	16	N
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	506	574	A		-11.8	402 - 746	14	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	933	990	A		-5.8	693 - 1287	16	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (MDPH01) MDPH-Radiation Control Program
 MERL-Room 362
 Jamaica Plain, MA 02130-3597

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9	N	(18)		Sensitivity Evaluation		
Cesium-134	NR		N	(11)		False Positive Test		
Cesium-137	NR		N	(11)		False Positive Test		
Cobalt-57	636.40	698	A		-8.8	489 - 907	24.03	A
Cobalt-60	751.10	795	A		-5.5	557 - 1034	20.05	A
Iron-55	NR					False Positive Test		
Manganese-54	1169.20	1230	A		-4.9	861 - 1599	27.97	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	NR	574	N	(25)		402 - 746		
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	976.80	990	A		-1.3	693 - 1287	23.27	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (MSDH01) Mississippi State Dept of Health
 Radiological Environmental Laboratory
 Jackson, MS 39216

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9	N	(18)		Sensitivity Evaluation		
Cesium-134	1.7407e-2		A			False Positive Test	1.395e-1	
Cesium-137	-5.3147e-2		A			False Positive Test	1.572e-1	
Cobalt-57	NR	698	N	(28)		489 - 907		
Cobalt-60	1.8491e+1	795	N		-97.7	557 - 1034	2.209e-1	N
Iron-55	NR					False Positive Test		
Manganese-54	2.7215e+1	1230	N		-97.8	861 - 1599	3.750e-1	N
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	1.2622e+1	574	N		-97.8	402 - 746	9.434e-1	A
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	2.1799e+1	990	N		-97.8	693 - 1287	5.761e-1	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(NARL01) National Analytical Radiation Environmental Laboratory

540 S. Morris Ave.

Montgomery, AL 36115-2601

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.51	0.9	A	(17)		Sensitivity Evaluation	0.51	
Cesium-134	0.985		A			False Positive Test	0.832	
Cesium-137	-0.334		A			False Positive Test	0.808	
Cobalt-57	677.0	698	A		-3.0	489 - 907	37.3	A
Cobalt-60	784.0	795	A		-1.4	557 - 1034	42.3	A
Iron-55	NR					False Positive Test		
Manganese-54	1270.0	1230	A		3.3	861 - 1599	69.3	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.977	0.52	A	(17)		Sensitivity Evaluation	0.348	
Plutonium-239/240	95.2	101	A		-5.7	71 - 131	5.27	A
Potassium-40	587.0	574	A		2.3	402 - 746	32.8	A
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	48.6	43.3	A		12.2	30.3 - 56.3	3.86	A
Thorium-230	42.6	40.0	A		6.5	28.0 - 52.0	3.57	A
Thorium-232	42.0	43.3	A		-3.0	30.3 - 56.3	3.46	A
Uranium-234	59.2	64	A		-7.5	45 - 83	3.57	A
Uranium-238	222.0	258	A		-14.0	181 - 335	11.1	A
Zinc-65	1120.0	990	A		13.1	693 - 1287	61.0	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(NESI01) BWXT-Radioisotope & Analytical Chemistry Laboratory

Lynchburg Technology Center

Lynchburg, VA 24504-5447

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	6.06	6.4	A		-5.3	4.5 - 8.3	0.432	A
Arsenic	8.31	8.4	A		-1.1	5.9 - 10.9	0.327	A
Barium	312	300	A		4.0	210 - 390	4.42	N
Beryllium	18.7	18.3	A		2.2	12.8 - 23.8	0.391	A
Cadmium	3.64	3.53	A		3.1	2.47 - 4.59	0.117	A
Chromium	40.8	43.4	A		-6.0	30.4 - 56.4	0.584	N
Cobalt	37.7	39.4	A		-4.3	27.6 - 51.2	0.558	N
Copper	79.4	83.9	A		-5.4	58.7 - 109.1	1.13	N
Lead	21.1	20.5	A		2.9	14.4 - 26.7	0.310	N
Mercury	0.018	0.0174	A			Sensitivity Evaluation	0.001	
Nickel	82.9	84.5	A		-1.9	59.2 - 109.9	1.18	N
Selenium	7.18	5.76	W		24.7	4.03 - 7.49	0.572	A
Silver	18.2	19.6	A		-7.1	13.7 - 25.5	0.272	N
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	0.664	0.19	A	(17)		Sensitivity Evaluation	2.47	
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	81.3	85	A		-4.4	60 - 111	1.16	N
Zinc	124	96	W		29.2	67 - 125	1.76	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.48	0.9	A	(17)		Sensitivity Evaluation	3.99	
Cesium-134	-2.75		A			False Positive Test	1.71	
Cesium-137	2.44		A			False Positive Test	2.33	
Cobalt-57	731	698	A		4.7	489 - 907	29.0	A
Cobalt-60	844	795	A		6.2	557 - 1034	36.2	A
Iron-55	145		A			False Positive Test	130	
Manganese-54	1311	1230	A		6.6	861 - 1599	55.6	A
Nickel-63	2392	1130	N		111.7	791 - 1469	241	A
Plutonium-238	0.490	0.52	A	(17)		Sensitivity Evaluation	2.57	
Plutonium-239/240	99.7	101	A		-1.3	71 - 131	8.16	A
Potassium-40	590	574	A		2.8	402 - 746	27.6	A
Strontium-90	718	920	W		-22.0	644 - 1196	57.8	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	1031	1100	A		-6.3	770 - 1430	52.3	A
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	78.0	64	W		21.9	45 - 83	6.25	A
Uranium-238	266	258	A		3.1	181 - 335	13.5	A
Zinc-65	1126	990	A		13.7	693 - 1287	48.6	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (NJDH01) New Jersey Dept. of Health, ECLS
 3 Schwarzkopf Drive
 Ewing, NJ 08628

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	-1.71		A			False Positive Test	1.5	
Cesium-137	1.46		A			False Positive Test	1.3	
Cobalt-57	710	698	A		1.7	489 - 907	71	A
Cobalt-60	800	795	A		0.6	557 - 1034	32	A
Iron-55	NR					False Positive Test		
Manganese-54	1290	1230	A		4.9	861 - 1599	77	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	520	574	A		-9.4	402 - 746	25	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1050	990	A		6.1	693 - 1287	43	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (NOCS99) National Oceanography Centre, Southampton
 GAU-Radioanalytical
 Southampton, Hampshire SO14 3ZH

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	20	0.9	A	(17)		Sensitivity Evaluation	200	
Cesium-134	5		A			False Positive Test	50	
Cesium-137	4		A			False Positive Test	40	
Cobalt-57	700	698	A		0.3	489 - 907	50	A
Cobalt-60	850	795	A		6.9	557 - 1034	20	A
Iron-55	NR		N	(11)		False Positive Test		
Manganese-54	1350	1230	A		9.8	861 - 1599	35	A
Nickel-63	NR	1130	N	(28)		791 - 1469		
Plutonium-238	0.5	0.52	A	(17)		Sensitivity Evaluation	5	
Plutonium-239/240	86	101	A		-14.9	71 - 131	5	A
Potassium-40	580	574	A		1.0	402 - 746	20	A
Strontium-90	796	920	A		-13.5	644 - 1196	50	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	1094	1100	A		-0.5	770 - 1430	40	A
Thorium-228	45	43.3	A		3.9	30.3 - 56.3	3	A
Thorium-230	39	40.0	A		-2.5	28.0 - 52.0	3	A
Thorium-232	42	43.3	A		-3.0	30.3 - 56.3	3	A
Uranium-234	55	64	A		-14.1	45 - 83	4	A
Uranium-238	233	258	A		-9.7	181 - 335	14	A
Zinc-65	1090	990	A		10.1	693 - 1287	30	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(NRL99) Environmental Radioactivity - National Centre for Radiation Science

PO Box 29181

Christchurch, Christchurch 8540

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.63	0.9	A	(17)		Sensitivity Evaluation	0.81	
Cesium-134	3.9		A			False Positive Test	1.9	
Cesium-137	3.3		A			False Positive Test	1.6	
Cobalt-57	741	698	A		6.2	489 - 907	48	A
Cobalt-60	816	795	A		2.6	557 - 1034	52	A
Iron-55	NR					False Positive Test		
Manganese-54	1257	1230	A		2.2	861 - 1599	76	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.91	0.52	A	(17)		Sensitivity Evaluation	0.32	
Plutonium-239/240	94.8	101	A		-6.1	71 - 131	4.6	A
Potassium-40	537	574	A		-6.4	402 - 746	37	A
Strontium-90	817	920	A		-11.2	644 - 1196	27	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	33.0	40.0	A		-17.5	28.0 - 52.0	1.9	A
Thorium-232	40.1	43.3	A		-7.4	30.3 - 56.3	2.1	A
Uranium-234	61.1	64	A		-4.5	45 - 83	2.9	A
Uranium-238	248.4	258	A		-3.7	181 - 335	7.8	A
Zinc-65	1042	990	A		5.3	693 - 1287	64	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (ODHL01) Ohio Department of Health Laboratory
 8995 E Main Street
 Reynoldsburg, OH 43068

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	0.420		A			False Positive Test	0.354	
Cesium-137	1.26		A			False Positive Test	1.24	
Cobalt-57	746	698	A		6.9	489 - 907	51.1	A
Cobalt-60	759	795	A		-4.5	557 - 1034	21.6	A
Iron-55	NR					False Positive Test		
Manganese-54	1190	1230	A		-3.3	861 - 1599	71.5	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	491	574	A		-14.5	402 - 746	21.3	A
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	951	990	A		-3.9	693 - 1287	41.4	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(OTLI01) Pace Analytical National Center for Testing & Innovation

12065 Lebanon Road

Mt. Juliet, TN 37122

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	16.9	20.8	A		-18.8	14.6 - 27.0	0.684	A
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.78	0.9	A	(17)		Sensitivity Evaluation	1.38	
Cesium-134	-1.14		A			False Positive Test	5.78	
Cesium-137	-0.234		A			False Positive Test	5.66	
Cobalt-57	733	698	A		5.0	489 - 907	45.9	A
Cobalt-60	862	795	A		8.4	557 - 1034	54.8	A
Iron-55	NR					False Positive Test		
Manganese-54	1320	1230	A		7.3	861 - 1599	86.1	A
Nickel-63	1057	1130	A		-6.5	791 - 1469	7.4	N
Plutonium-238	3.6	0.52	A	(17)		Sensitivity Evaluation	3.8	
Plutonium-239/240	119	101	A		17.8	71 - 131	16.5	A
Potassium-40	575	574	A		0.2	402 - 746	59.2	A
Strontium-90	774	920	A		-15.9	644 - 1196	11.7	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	975	1100	A		-11.4	770 - 1430	94.5	A
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	58.0	64	A		-9.4	45 - 83	9.9	W
Uranium-238	240	258	A		-7.0	181 - 335	20	A
Zinc-65	1120	990	A		13.1	693 - 1287	77	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(RAVR99) Radiactividad Ambiental y Vigilancia Radiologica

CIEMAT (Ed 70 P2 D11)

Madrid, Madrid 28040

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.527	0.9	A	(17)		Sensitivity Evaluation	0.867	
Cesium-134	0.01		A			False Positive Test	1	
Cesium-137	0.1		A			False Positive Test	1	
Cobalt-57	696	698	A		-0.3	489 - 907	35	A
Cobalt-60	799	795	A		0.5	557 - 1034	12	N
Iron-55	NR					False Positive Test		
Manganese-54	1244	1230	A		1.1	861 - 1599	32	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.25	0.52	A	(17)		Sensitivity Evaluation	0.23	
Plutonium-239/240	92.02	101	A		-8.9	71 - 131	3.32	A
Potassium-40	526	574	A		-8.4	402 - 746	19	A
Strontium-90	686.49	920	W		-25.4	644 - 1196	23.44	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	49.5	64	W		-22.7	45 - 83	3.8	A
Uranium-238	213.4	258	A		-17.3	181 - 335	6.0	A
Zinc-65	1021	990	A		3.1	693 - 1287	22	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(RJLG01) RJ Lee Group - Columbia Basin Analytical Laboratories (CBAL)

2710 North 20th Avenue

Pasco, WA 99301

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	6.05	6.4	A		-5.5	4.5 - 8.3	0.801	A
Arsenic	7.96	8.4	A		-5.2	5.9 - 10.9	0.809	A
Barium	336	300	A		12.0	210 - 390	26.5	A
Beryllium	19.8	18.3	A		8.2	12.8 - 23.8	2.43	A
Cadmium	3.85	3.53	A		9.1	2.47 - 4.59	0.283	A
Chromium	43.0	43.4	A		-0.9	30.4 - 56.4	4.42	A
Cobalt	36.7	39.4	A		-6.9	27.6 - 51.2	3.92	A
Copper	76.0	83.9	A		-9.4	58.7 - 109.1	8.12	A
Lead	22.8	20.5	A		11.2	14.4 - 26.7	2.08	A
Mercury	0.010	0.0174	N	(4)		Sensitivity Evaluation	0.0012	
Nickel	79.4	84.5	A		-6.0	59.2 - 109.9	7.20	A
Selenium	5.62	5.76	A		-2.4	4.03 - 7.49	0.490	A
Silver	19.6	19.6	A		0.0	13.7 - 25.5	2.06	A
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	0.236	0.19	A			Sensitivity Evaluation	0.0195	
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	21.1	20.8	A		1.4	14.6 - 27.0	2.18	A
Vanadium	81.7	85	A		-3.9	60 - 111	10.8	A
Zinc	107	96	A		11.5	67 - 125	15.4	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	NR					False Positive Test		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	698				489 - 907		
Cobalt-60	NR	795				557 - 1034		
Iron-55	NR					False Positive Test		
Manganese-54	NR	1230				861 - 1599		
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	NR	574				402 - 746		
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	NR	990				693 - 1287		

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (SEML01) SRS Environmental Monitoring Laboratory
 Bldg 735-B
 Aiken, SC 29808

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.88	0.9	A	(17)		Sensitivity Evaluation	0.31	
Cesium-134	0.22		A			False Positive Test	5.9	
Cesium-137	0.42		A			False Positive Test	2.3	
Cobalt-57	688	698	A		-1.4	489 - 907	29	A
Cobalt-60	801	795	A		0.8	557 - 1034	63	A
Iron-55	NR					False Positive Test		
Manganese-54	1290	1230	A		4.9	861 - 1599	128	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.40	0.52	A	(17)		Sensitivity Evaluation	0.18	
Plutonium-239/240	94.6	101	A		-6.3	71 - 131	5.0	A
Potassium-40	581	574	A		1.2	402 - 746	56	A
Strontium-90	847	920	A		-7.9	644 - 1196	47	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	46.6	43.3	A		7.6	30.3 - 56.3	3.1	A
Thorium-230	38.7	40.0	A		-3.3	28.0 - 52.0	2.8	A
Thorium-232	45.4	43.3	A		4.9	30.3 - 56.3	2.9	A
Uranium-234	59.3	64	A		-7.3	45 - 83	3.5	A
Uranium-238	235	258	A		-8.9	181 - 335	12	A
Zinc-65	1150	990	A		16.2	693 - 1287	102	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (SLAC01) SLAC DOE National Accelerator Laboratory
 2575 Sand Hill Road
 Menlo Park, CA 94025

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	2.36		A			False Positive Test	2.36	
Cesium-137	2.16		A			False Positive Test	2.16	
Cobalt-57	658.53	698	A		-5.7	489 - 907	65.85	A
Cobalt-60	748.5	795	A		-5.8	557 - 1034	74.85	A
Iron-55	NR					False Positive Test		
Manganese-54	1210.10	1230	A		-1.6	861 - 1599	121.01	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	523.42	574	A		-8.8	402 - 746	52.34	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	977.37	990	A		-1.3	693 - 1287	97.74	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(SOUT01) Southwest Research Institute

6220 Culebra Rd.

San Antonio, TX 78238-5166

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	6.13	6.4	A		-4.2	4.5 - 8.3	5.66	N
Arsenic	9.30	8.4	A		10.7	5.9 - 10.9	4.99	N
Barium	325	300	A		8.3	210 - 390	52.9	W
Beryllium	20.0	18.3	A		9.3	12.8 - 23.8	10.0	N
Cadmium	3.01	3.53	A		-14.7	2.47 - 4.59	1.07	N
Chromium	42.6	43.4	A		-1.8	30.4 - 56.4	11.7	W
Cobalt	38.0	39.4	A		-3.6	27.6 - 51.2	11.3	W
Copper	85.7	83.9	A		2.1	58.7 - 109.1	16.7	W
Lead	19.3	20.5	A		-5.9	14.4 - 26.7	3.40	W
Mercury	0.0223	0.0174	A	(17)		Sensitivity Evaluation	0.0183	
Nickel	85.4	84.5	A		1.1	59.2 - 109.9	16.7	W
Selenium	4.07	5.76	W		-29.3	4.03 - 7.49	4.81	N
Silver	16.9	19.6	A		-13.8	13.7 - 25.5	3.31	W
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	0.220	0.19	A	(17)		Sensitivity Evaluation	0.102	
Uranium-235	0.0539	0.055	A		-2.0	0.039 - 0.072	0.0103	W
Uranium-238	20.2	20.8	A		-2.9	14.6 - 27.0	3.23	W
Uranium-Total	20.2	20.8	A		-2.9	14.6 - 27.0	3.23	W
Vanadium	80.8	85	A		-4.9	60 - 111	16.1	W
Zinc	101	96	A		5.2	67 - 125	21.6	W

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.863	0.9	A	(17)		Sensitivity Evaluation	0.293	
Cesium-134	-0.213		A			False Positive Test	2.60	
Cesium-137	-1.41		A			False Positive Test	2.33	
Cobalt-57	733	698	A		5.0	489 - 907	29.9	A
Cobalt-60	826	795	A		3.9	557 - 1034	28.9	A
Iron-55	146		N	(1)		False Positive Test	45.4	
Manganese-54	1319	1230	A		7.2	861 - 1599	45.2	A
Nickel-63	1215	1130	A		7.5	791 - 1469	74.1	A
Plutonium-238	0.385	0.52	A	(17)		Sensitivity Evaluation	0.215	
Plutonium-239/240	102	101	A		1.0	71 - 131	7.00	A
Potassium-40	622	574	A		8.4	402 - 746	28.6	A
Strontium-90	907	920	A		-1.4	644 - 1196	55.9	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	833	1100	W		-24.3	770 - 1430	46.7	A
Thorium-228	41.9	43.3	A		-3.2	30.3 - 56.3	3.03	A
Thorium-230	32.9	40.0	A		-17.8	28.0 - 52.0	2.44	A
Thorium-232	37.4	43.3	A		-13.6	30.3 - 56.3	2.70	A
Uranium-234	53.7	64	A		-16.1	45 - 83	3.85	A
Uranium-238	237	258	A		-8.1	181 - 335	15.9	A
Zinc-65	1137	990	A		14.8	693 - 1287	38.5	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(SRPD01) Sandia National Laboratories, Radiation Protection Sample Diagnostics

PO Box 5800, MS1103

Albuquerque, NM 87185-1103

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	1.47E+00		A			False Positive Test	1.13	
Cesium-137	9.72E-01		A			False Positive Test	1.34	
Cobalt-57	6.46E+02	698	A		-7.5	489 - 907	6.46	A
Cobalt-60	7.47E+02	795	A		-6.0	557 - 1034	3.01	A
Iron-55	NR					False Positive Test		
Manganese-54	1.15E+03	1230	A		-6.5	861 - 1599	6.94	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	4.79E+02	574	A		-16.6	402 - 746	2.12	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	9.32E+02	990	A		-5.9	693 - 1287	4.30	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(TDHL01) Texas Department of State Health Services Laboratory
 1100 W 49th Street
 Austin, TX 78756

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	5.7	0.9	A			Sensitivity Evaluation	1.8	
Cesium-134	19		A			False Positive Test	12	
Cesium-137	4.5		A			False Positive Test	4.6	
Cobalt-57	639	698	A		-8.5	489 - 907	14	A
Cobalt-60	746	795	A		-6.2	557 - 1034	15	A
Iron-55	NR					False Positive Test		
Manganese-54	1187	1230	A		-3.5	861 - 1599	31	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	0.70	0.52	A	(17)		Sensitivity Evaluation	0.55	
Plutonium-239/240	99	101	A		-2.0	71 - 131	10	A
Potassium-40	461	574	A		-19.7	402 - 746	30	A
Strontium-90	766	920	A		-16.7	644 - 1196	17	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	57.0	64	A		-10.9	45 - 83	5.8	A
Uranium-238	254	258	A		-1.6	181 - 335	20	A
Zinc-65	983	990	A		-0.7	693 - 1287	29	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(TELE01) Teledyne Brown Engineering - Environmental Services

2508 Quality Lane

Knoxville, TN 37931-6819

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	NR					False Positive Test		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	698				489 - 907		
Cobalt-60	NR	795				557 - 1034		
Iron-55	NR					False Positive Test		
Manganese-54	NR	1230				861 - 1599		
Nickel-63	294	1130	N		-74.0	791 - 1469	32.2	A
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	NR	574				402 - 746		
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	898	1100	A		-18.4	770 - 1430	78.8	A
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	NR	990				693 - 1287		

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (TELE02) ATI Environmental, Inc., Midwest Lab
 700 Landwehr Road
 Northbrook, IL 60062-

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	2.33		A			False Positive Test	2.77	
Cesium-137	1.22		A			False Positive Test	2.41	
Cobalt-57	585	698	A		-16.2	489 - 907	4	N
Cobalt-60	727	795	A		-8.6	557 - 1034	8	N
Iron-55	NR					False Positive Test		
Manganese-54	1180	1230	A		-4.1	861 - 1599	10	N
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	526	574	A		-8.4	402 - 746	23	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	846	990	A		-14.5	693 - 1287	11	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (TMAO01) EBERLINE Analytical Corporation
 601 A SCARBORO RD
 OAK RIDGE, TN 37830-

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.223	0.9	A	(17)		Sensitivity Evaluation	2.086	
Cesium-134	2.246		A			False Positive Test	6.529	
Cesium-137	-4.737		A			False Positive Test	10.216	
Cobalt-57	1050.263	698	N		50.5	489 - 907	62.487	A
Cobalt-60	1136.277	795	N		42.9	557 - 1034	66.060	A
Iron-55	NR					False Positive Test		
Manganese-54	1586.224	1230	W		29.0	861 - 1599	172.865	A
Nickel-63	629.256	1130	N		-44.3	791 - 1469	30.719	A
Plutonium-238	0.533	0.52	A	(17)		Sensitivity Evaluation	4.658	
Plutonium-239/240	104.435	101	A		3.4	71 - 131	14.580	A
Potassium-40	719.823	574	W		25.4	402 - 746	94.504	A
Strontium-90	1037.831	920	A		12.8	644 - 1196	29.966	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	959.162	1100	A		-12.8	770 - 1430	29.586	A
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	41.836	64	N		-34.6	45 - 83	7.120	W
Uranium-238	223.961	258	A		-13.2	181 - 335	21.337	A
Zinc-65	1346.850	990	N		36.0	693 - 1287	138.758	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (TNUT01) St. Louis USACE FUSRAP Laboratory
 112 James S McDonnell Blvd
 HAZELWOOD, MO 63042

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.173	0.9	A	(17)		Sensitivity Evaluation	0.995	
Cesium-134	1.97		A			False Positive Test	.945	
Cesium-137	0.654		A			False Positive Test	0.977	
Cobalt-57	687	698	A		-1.6	489 - 907	11.7	N
Cobalt-60	782	795	A		-1.6	557 - 1034	13.7	N
Iron-55	NR					False Positive Test		
Manganese-54	1280	1230	A		4.1	861 - 1599	29.0	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	590	574	A		2.8	402 - 746	18.3	A
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	50.1	43.3	A		15.7	30.3 - 56.3	4.89	A
Thorium-230	48.6	40.0	W		21.5	28.0 - 52.0	4.80	A
Thorium-232	46.0	43.3	A		6.2	30.3 - 56.3	4.63	A
Uranium-234	73.9	64	A		15.5	45 - 83	8.91	A
Uranium-238	222	258	A		-14.0	181 - 335	18.4	A
Zinc-65	1120	990	A		13.1	693 - 1287	28.7	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(UNTE01) UniTech-235

178 Aldo Drive

Barnwell, SC 29812

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	0.02		A			False Positive Test	0.01	
Cesium-137	0.01		A			False Positive Test	0.01	
Cobalt-57	797.72	698	A		14.3	489 - 907	38.85	A
Cobalt-60	909.83	795	A		14.4	557 - 1034	33.13	A
Iron-55	NR					False Positive Test		
Manganese-54	1475.19	1230	A		19.9	861 - 1599	69.86	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	676.25	574	A		17.8	402 - 746	45.89	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1257.26	990	W		27.0	693 - 1287	61.83	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (WEST04) PACE ANALYTICAL SERVICES, PITTSBURGH
 1638 Roseytown Road
 Greensburg, PA 15601

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	2.412		A			False Positive Test	2.623	
Cesium-137	0.87		A			False Positive Test	2.223	
Cobalt-57	739.98	698	A		6.0	489 - 907	99.212	A
Cobalt-60	831.22	795	A		4.6	557 - 1034	109.01	A
Iron-55	NR					False Positive Test		
Manganese-54	1369.6	1230	A		11.4	861 - 1599	181.96	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	604.82	574	A		5.4	402 - 746	81.239	A
Strontium-90	NR	920				644 - 1196		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	1101.2	990	A		11.2	693 - 1287	144.72	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (WIPH01) WI, DPH, Radiation Protection Section
 1 West Wilson Street
 Madison, WI 53701

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.7214	0.9	A	(17)		Sensitivity Evaluation	2.8435	
Cesium-134	2.215		A			False Positive Test	1.017	
Cesium-137	3.287		A			False Positive Test	1.099	
Cobalt-57	696.883	698	A		-0.2	489 - 907	49.856	A
Cobalt-60	828.752	795	A		4.2	557 - 1034	23.509	A
Iron-55	NR					False Positive Test		
Manganese-54	1215.538	1230	A		-1.2	861 - 1599	62.0683	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	510.284	574	A		-11.1	402 - 746	22.152	A
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	963.625	990	A		-2.7	693 - 1287	38.899	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(WIPP01) WIPP Laboratories

1400 University Drive

Carlsbad, NM 88220

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	8.51E-001	0.9	A	(17)		Sensitivity Evaluation	3.64E-	
Cesium-134	1.35E-001		A			False Positive Test	7.19E-	
Cesium-137	1.07E+000		A			False Positive Test	6.43E-	
Cobalt-57	7.76E+002	698	A		11.2	489 - 907	1.77	A
Cobalt-60	8.39E+002	795	A		5.5	557 - 1034	1.13	N
Iron-55	NR					False Positive Test		
Manganese-54	1.30E+003	1230	A		5.7	861 - 1599	1.40	N
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	3.58E-001	0.52	A	(17)		Sensitivity Evaluation	2.57E-	
Plutonium-239/240	1.05E+002	101	A		4.0	71 - 131	1.21	A
Potassium-40	5.77E+002	574	A		0.5	402 - 746	1.41	A
Strontium-90	8.15E+002	920	A		-11.4	644 - 1196	6.17	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	7.31E+001	64	A		14.2	45 - 83	9.80	A
Uranium-238	2.79E+002	258	A		8.1	181 - 335	3.54	A
Zinc-65	1.08E+003	990	A		9.1	693 - 1287	1.25	N

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48
 (WSHL01) Wisconsin State Laboratory of Hygiene
 2601 Agriculture Drive
 Madison, WI 53718

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	NR	0.055				0.039 - 0.072		
Uranium-238	NR	20.8				14.6 - 27.0		
Uranium-Total	NR	20.8				14.6 - 27.0		
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	1.42		A			False Positive Test	0.689	
Cesium-137	1.44		A			False Positive Test	0.481	
Cobalt-57	673	698	A		-3.6	489 - 907	14.59	A
Cobalt-60	770	795	A		-3.1	557 - 1034	42.35	A
Iron-55	NR					False Positive Test		
Manganese-54	1220	1230	A		-0.8	861 - 1599	50.87	A
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	542	574	A		-5.6	402 - 746	44.03	A
Strontium-90	814.08	920	A		-11.5	644 - 1196	48.63	A

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	997	990	A		0.7	693 - 1287	72.45	A

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-23-MaS48

(YPGA01) US Army Yuma Proving Ground / Material Analysis Lab

301 C. Street

Yuma, AZ 85365

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	6.4				4.5 - 8.3		
Arsenic	NR	8.4				5.9 - 10.9		
Barium	NR	300				210 - 390		
Beryllium	NR	18.3				12.8 - 23.8		
Cadmium	NR	3.53				2.47 - 4.59		
Chromium	NR	43.4				30.4 - 56.4		
Cobalt	NR	39.4				27.6 - 51.2		
Copper	NR	83.9				58.7 - 109.1		
Lead	NR	20.5				14.4 - 26.7		
Mercury	NR	0.0174				Sensitivity Evaluation		
Nickel	NR	84.5				59.2 - 109.9		
Selenium	NR	5.76				4.03 - 7.49		
Silver	NR	19.6				13.7 - 25.5		
Technetium-99	NR	0.00174				0.00122 - 0.00226		
Thallium	NR	0.19				Sensitivity Evaluation		
Uranium-235	0.059	0.055	A		7.3	0.039 - 0.072	0.01	W
Uranium-238	21.38	20.8	A		2.8	14.6 - 27.0	2	A
Uranium-Total	21.4	20.8	A		2.9	14.6 - 27.0	1.8	A
Vanadium	NR	85				60 - 111		
Zinc	NR	96				67 - 125		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	0.9				Sensitivity Evaluation		
Cesium-134	NR					False Positive Test		
Cesium-137	NR					False Positive Test		
Cobalt-57	NR	698				489 - 907		
Cobalt-60	NR	795				557 - 1034		
Iron-55	NR					False Positive Test		
Manganese-54	NR	1230				861 - 1599		
Nickel-63	NR	1130				791 - 1469		
Plutonium-238	NR	0.52				Sensitivity Evaluation		
Plutonium-239/240	NR	101				71 - 131		
Potassium-40	NR	574				402 - 746		
Strontium-90	NR	920				644 - 1196		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	1100				770 - 1430		
Thorium-228	NR	43.3				30.3 - 56.3		
Thorium-230	NR	40.0				28.0 - 52.0		
Thorium-232	NR	43.3				30.3 - 56.3		
Uranium-234	NR	64				45 - 83		
Uranium-238	NR	258				181 - 335		
Zinc-65	NR	990				693 - 1287		

Radiological Reference Date: February 1, 2023

Results Flags:

- A = Result acceptable..... |Bias| <= 20%
- W = Result acceptable with warning..... 20% < |Bias| <= 30%
- N = Result not acceptable..... |Bias| > 30%
- RW = Report Warning
- NR = Not Reported

Uncertainty Flags:

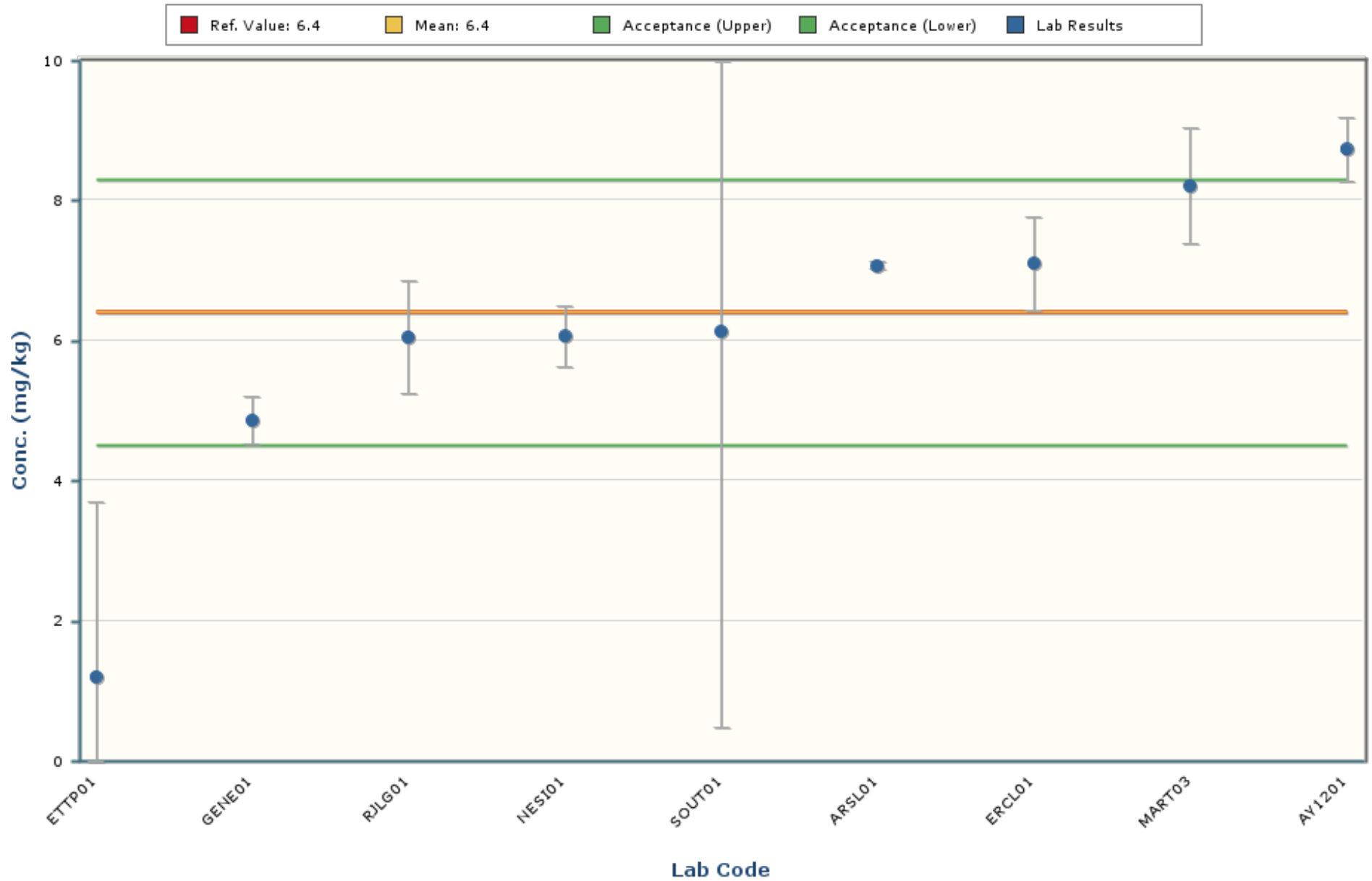
- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2% <= RP <= 15%
- ACCEPTABLE WITH WARNING.....15% < RP <= 30%
- NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
- (4) = Sensitivity Evaluation
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
- (17) = NOT DETECTED - reported a statistically zero result
- (18) = Sensitivity Evaluation, Value Not Reported
- (25) = Result not reported with other gamma results
- (28) = Not Reporting Previously Reported Analyte

Antimony

MAPEP-23-MaS48



Notes:

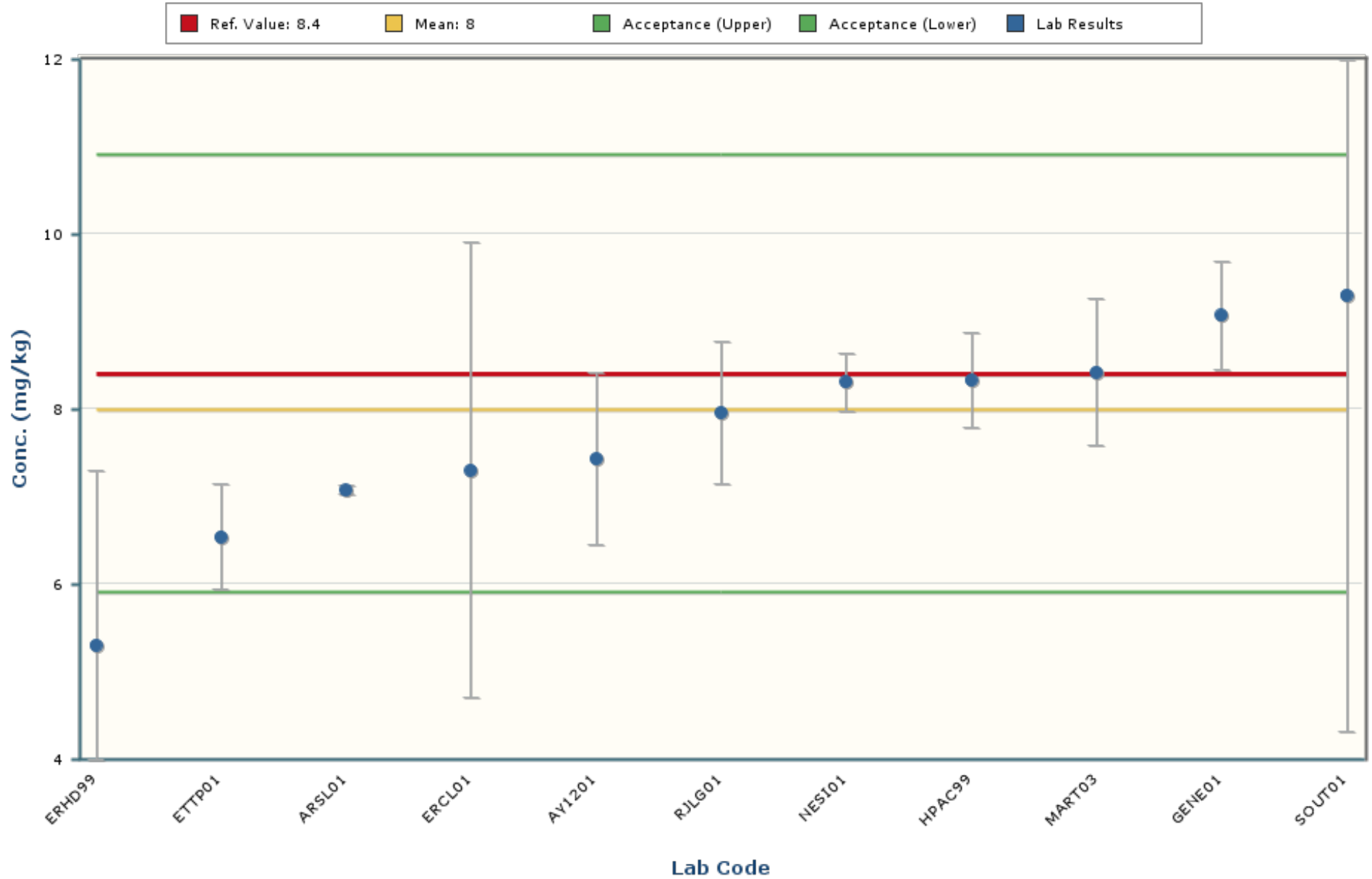
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 0.7 and 12.1 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Arsenic

MAPEP-23-MaS48



Notes:

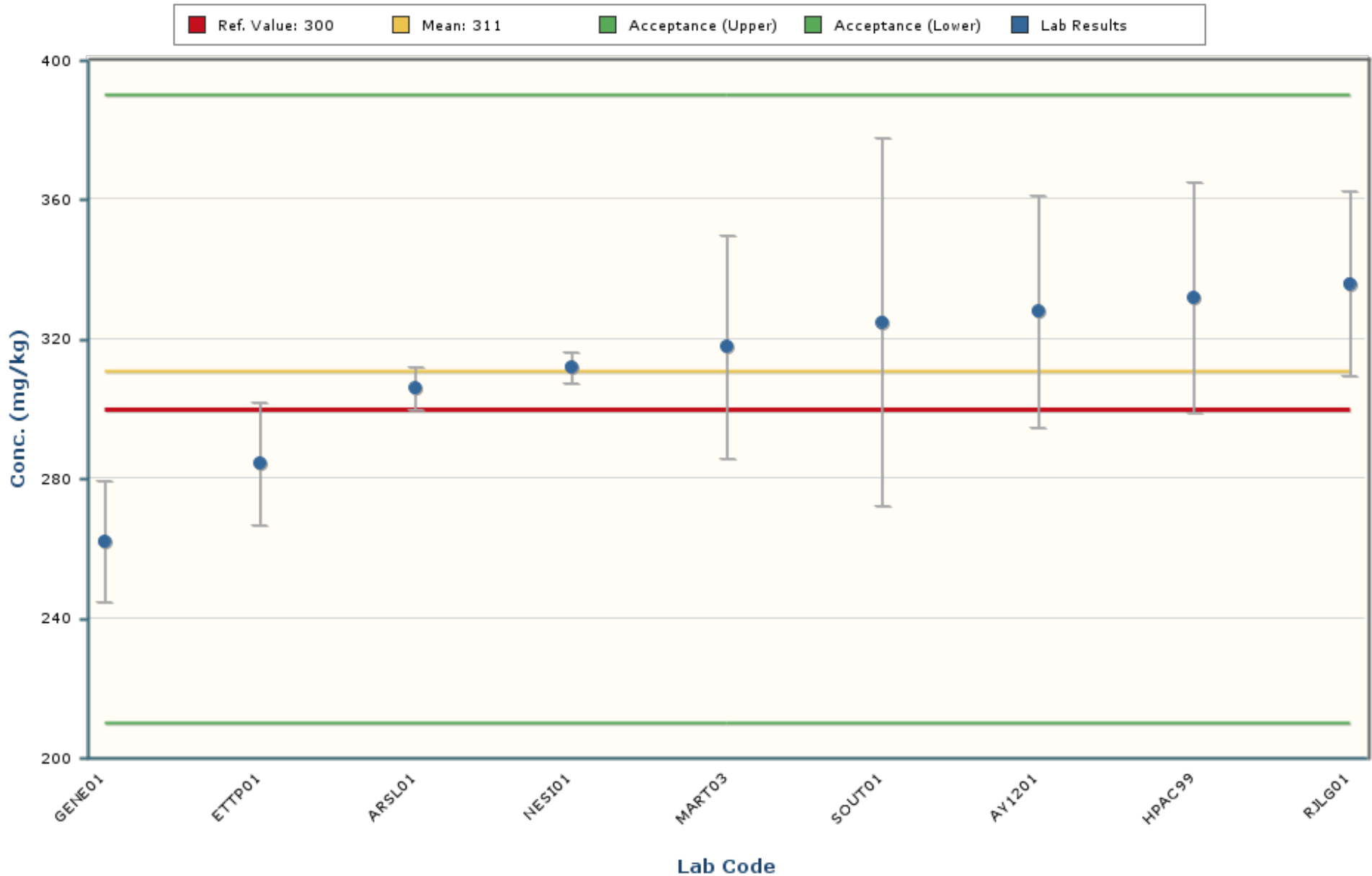
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 3.5 and 12.6 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Barium

MAPEP-23-MaS48



Notes:

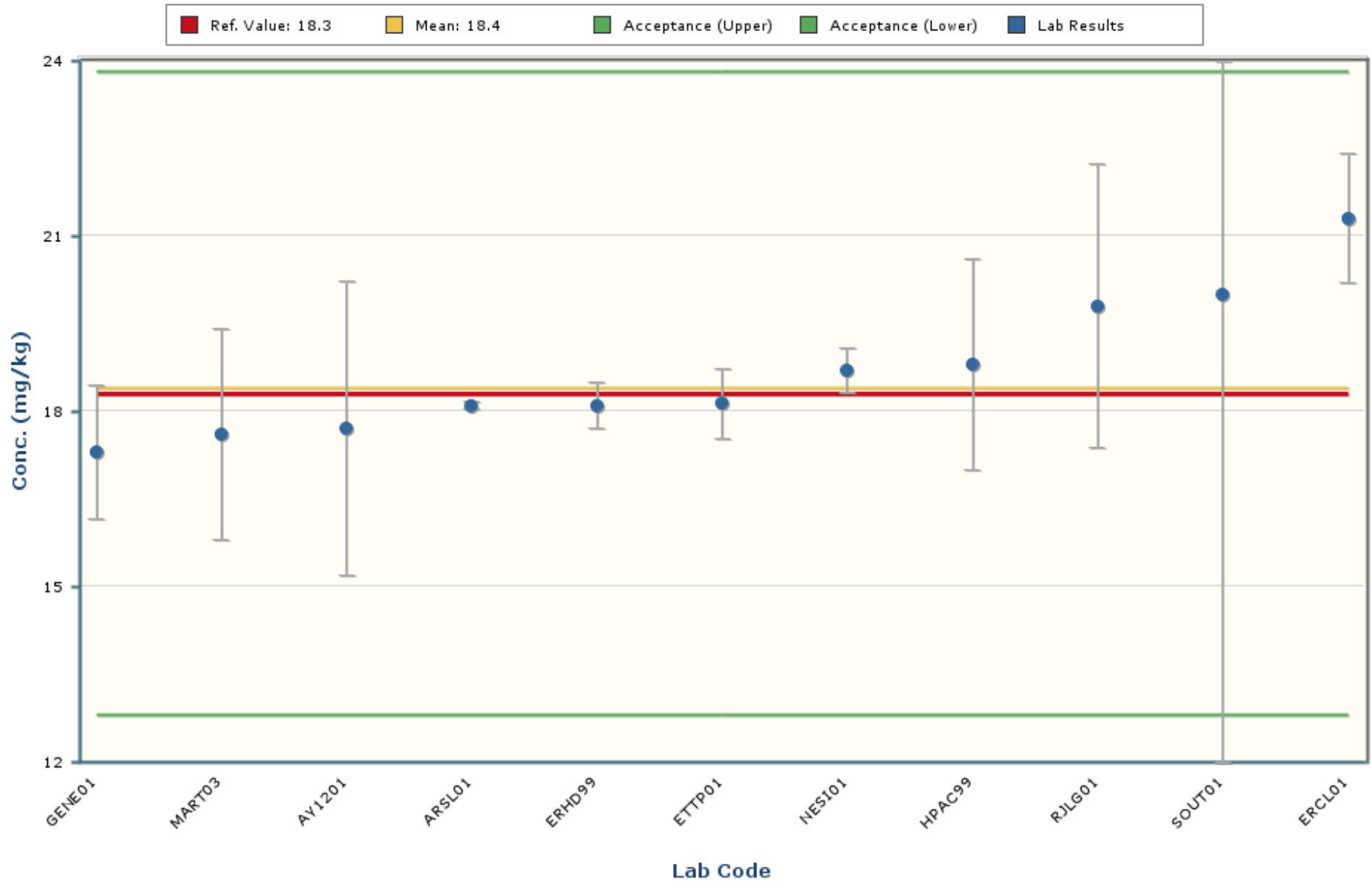
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 190 and 433 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Beryllium

MAPEP-23-MaS48



Notes:

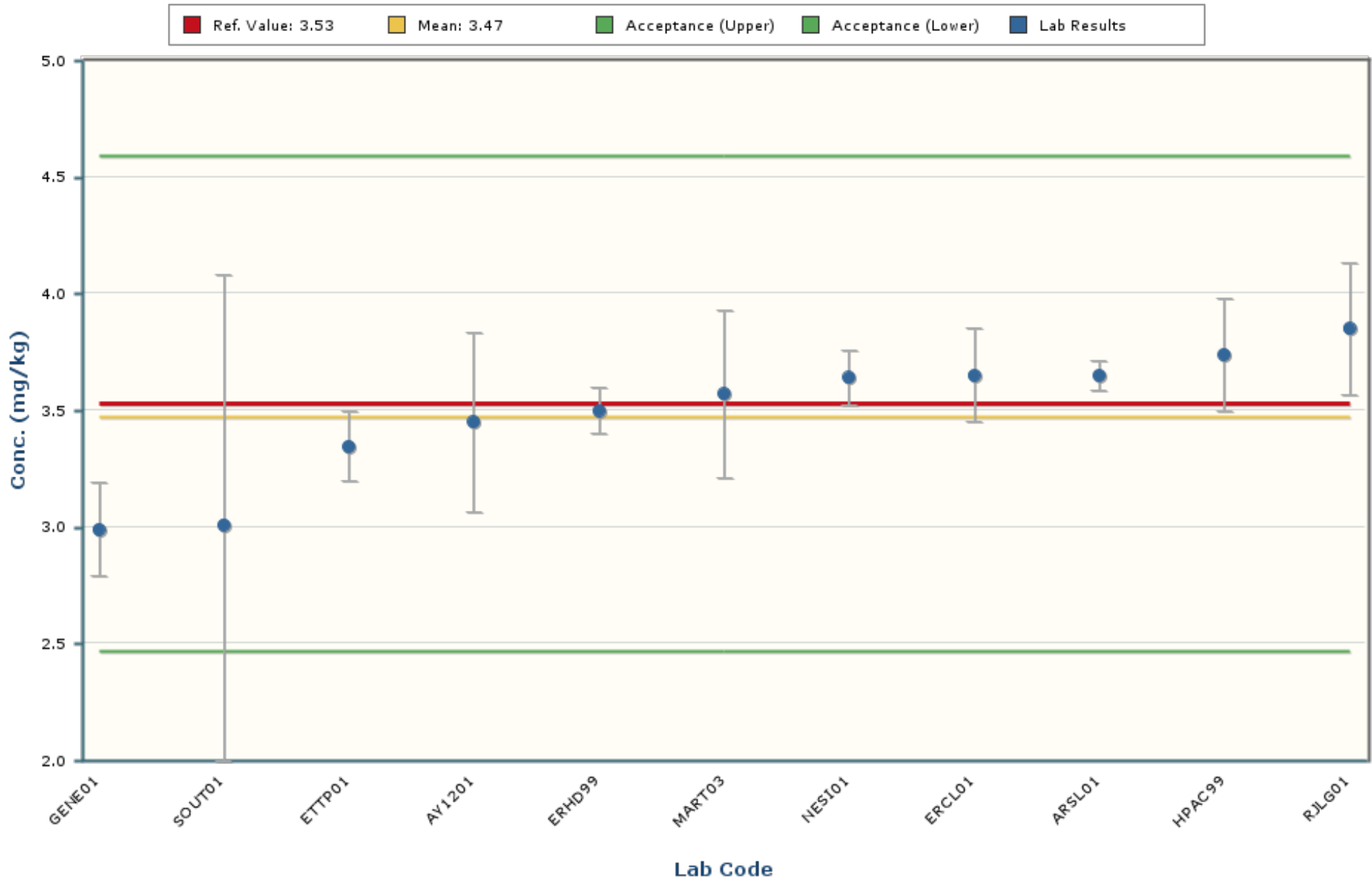
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 13.9 and 22.9 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Cadmium

MAPEP-23-MaS48



Notes:

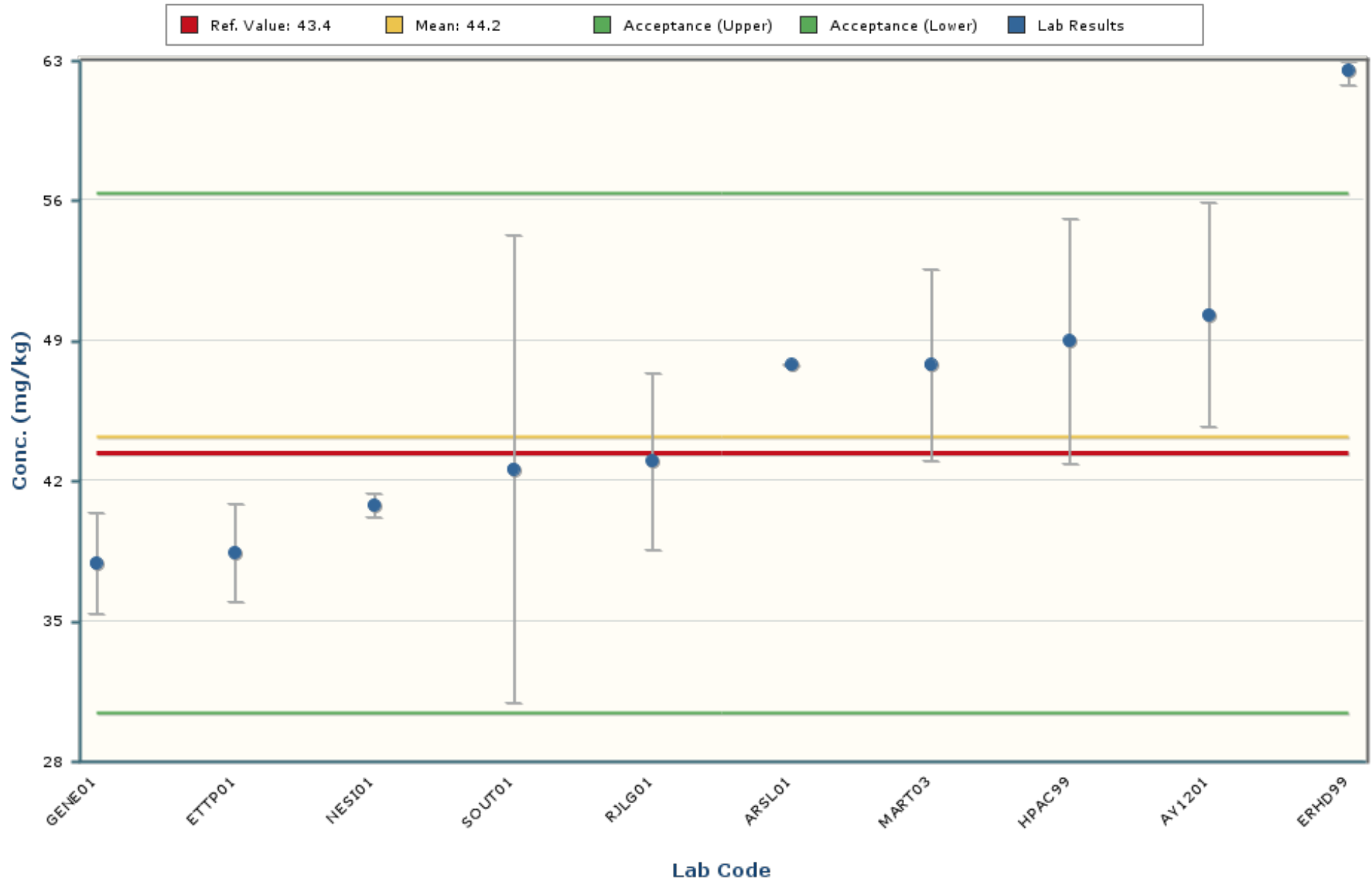
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 2.03 and 4.92 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Chromium

MAPEP-23-MaS48



Notes:

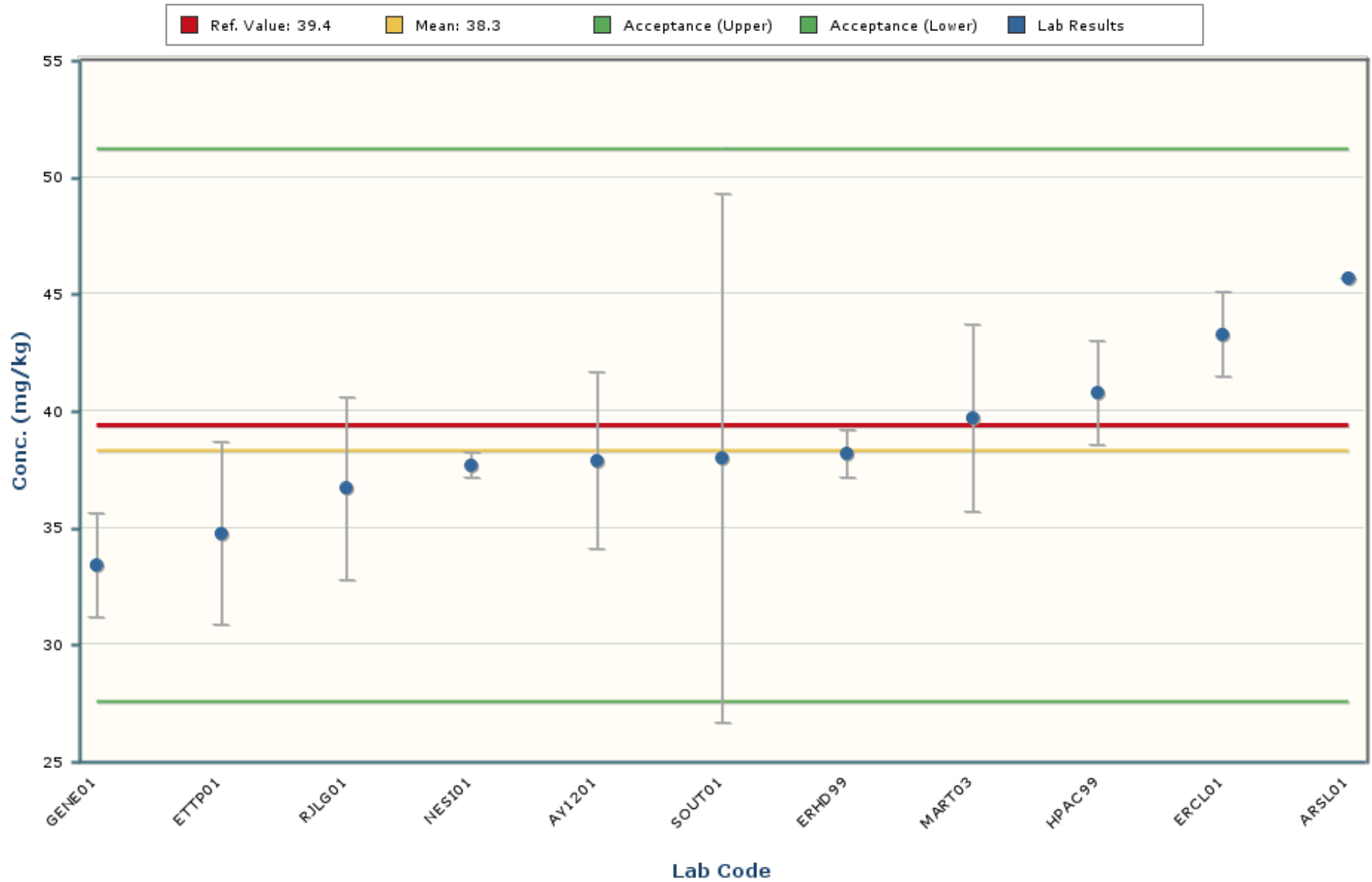
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 20.8 and 67.5 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Cobalt

MAPEP-23-MaS48



Notes:

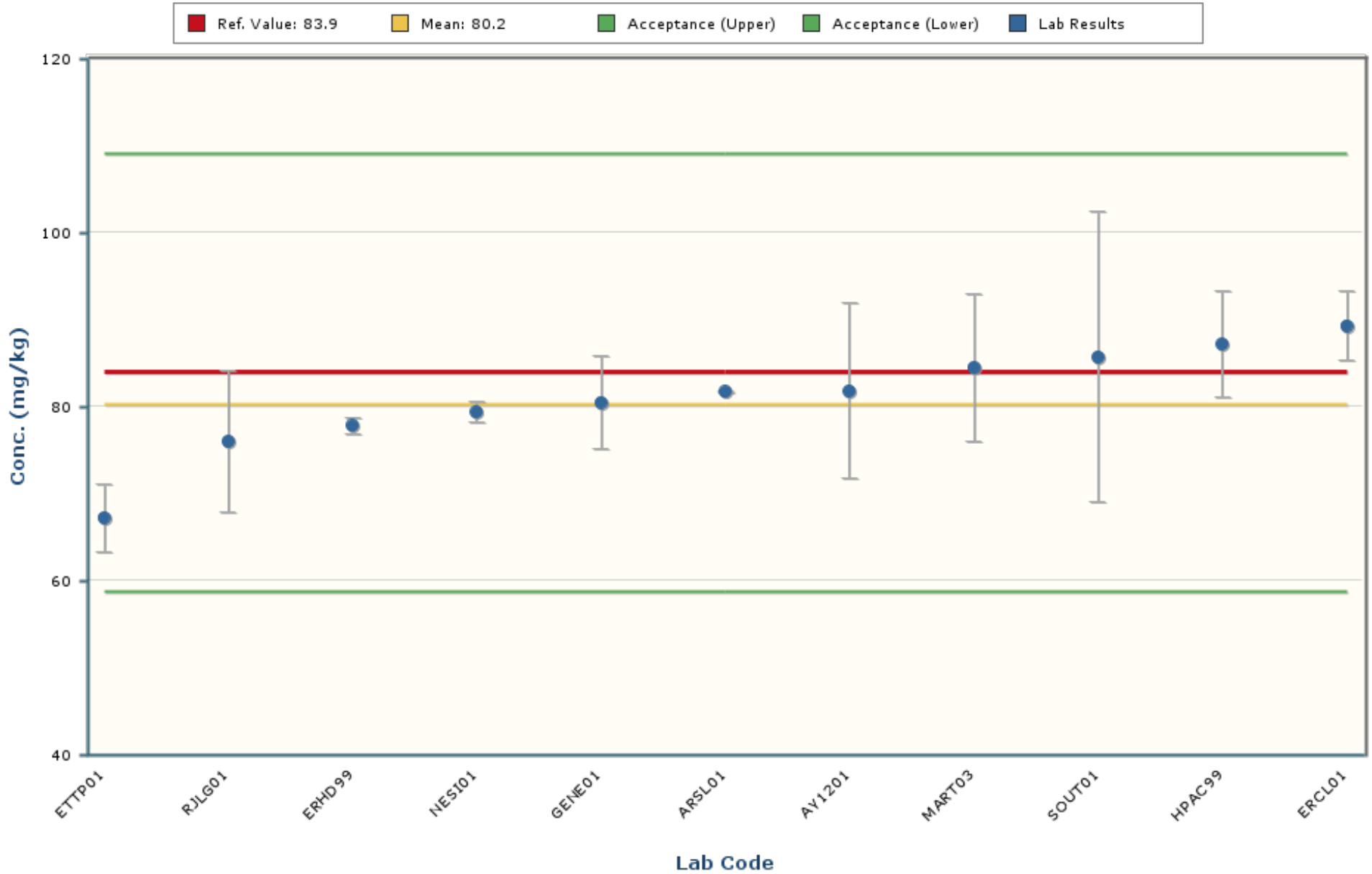
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 21.4 and 55.2 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Copper

MAPEP-23-MaS48



Notes:

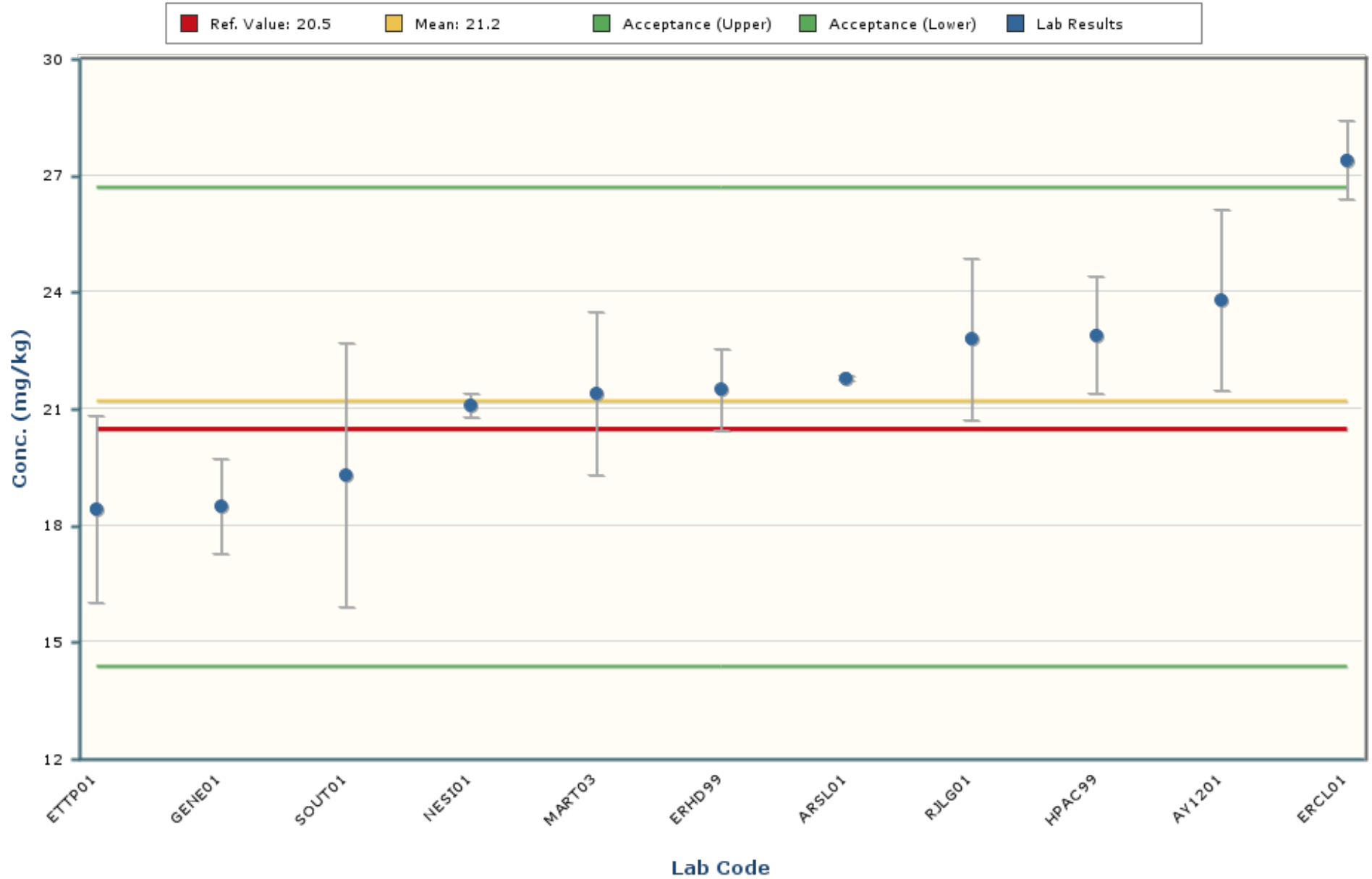
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 51.6 and 108.8 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Lead

MAPEP-23-MaS48



Notes:

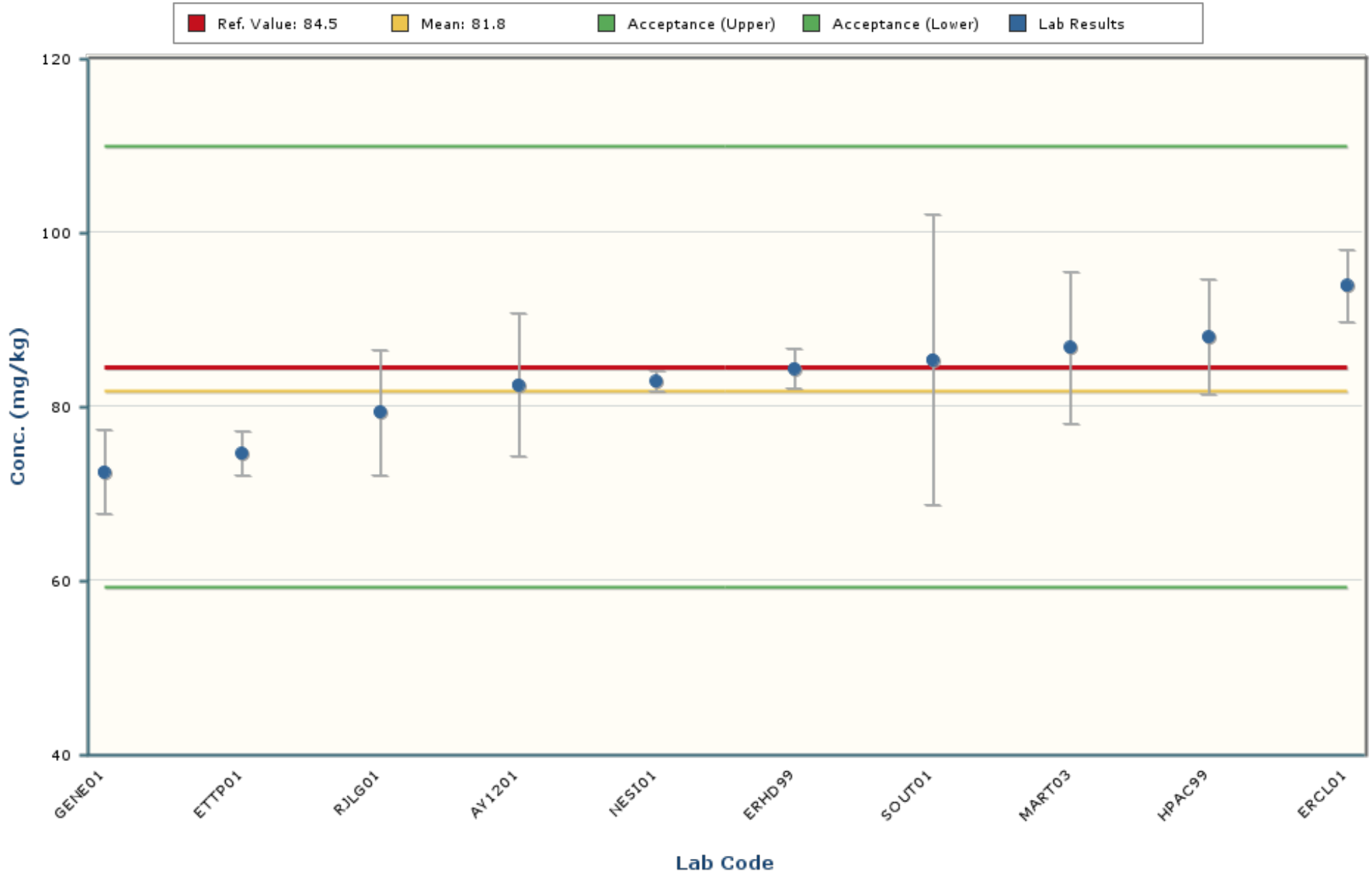
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 11.8 and 30.5 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Nickel

MAPEP-23-MaS48



Notes:

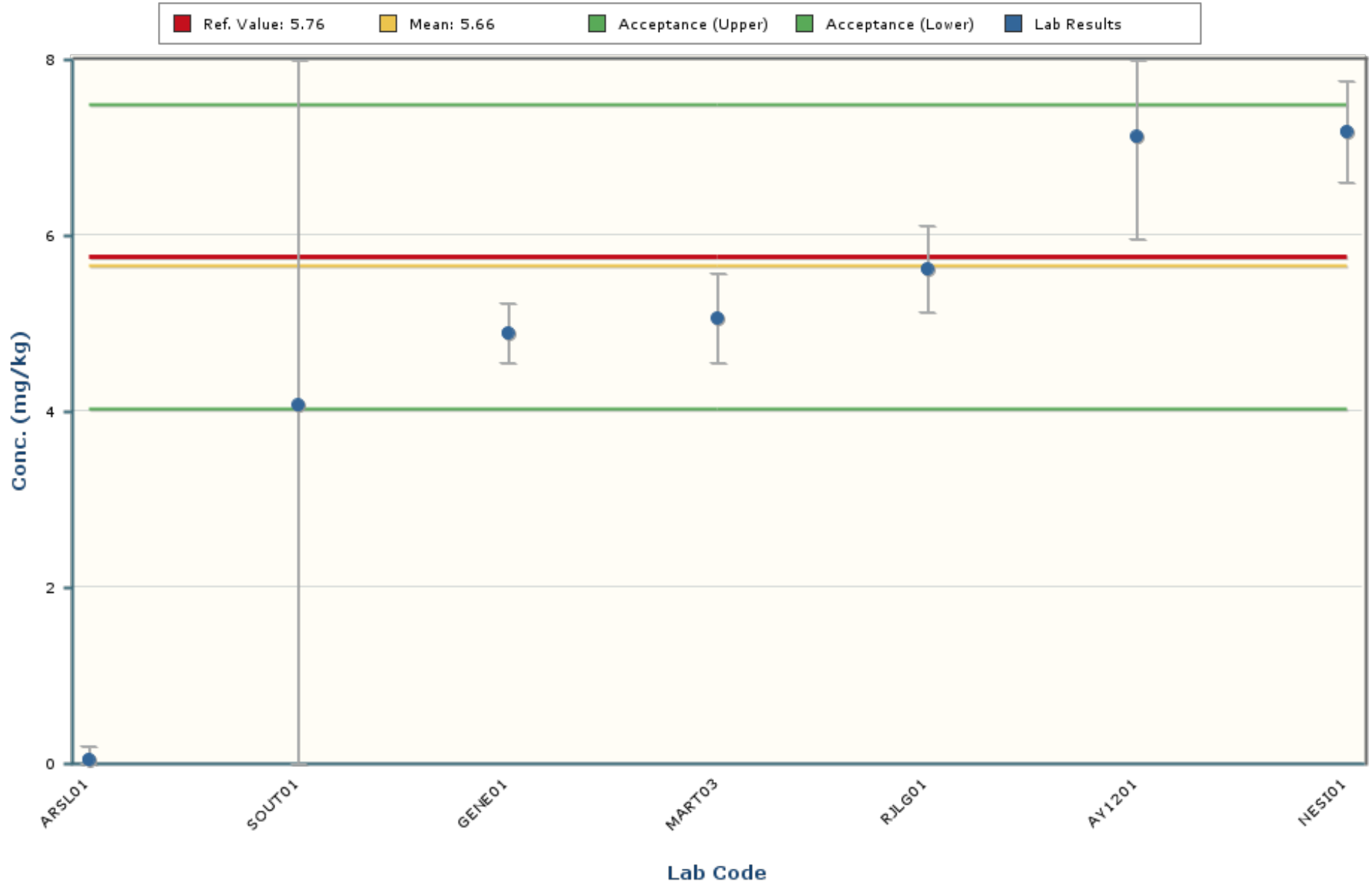
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 55.1 and 108.6 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Selenium

MAPEP-23-MaS48



Notes:

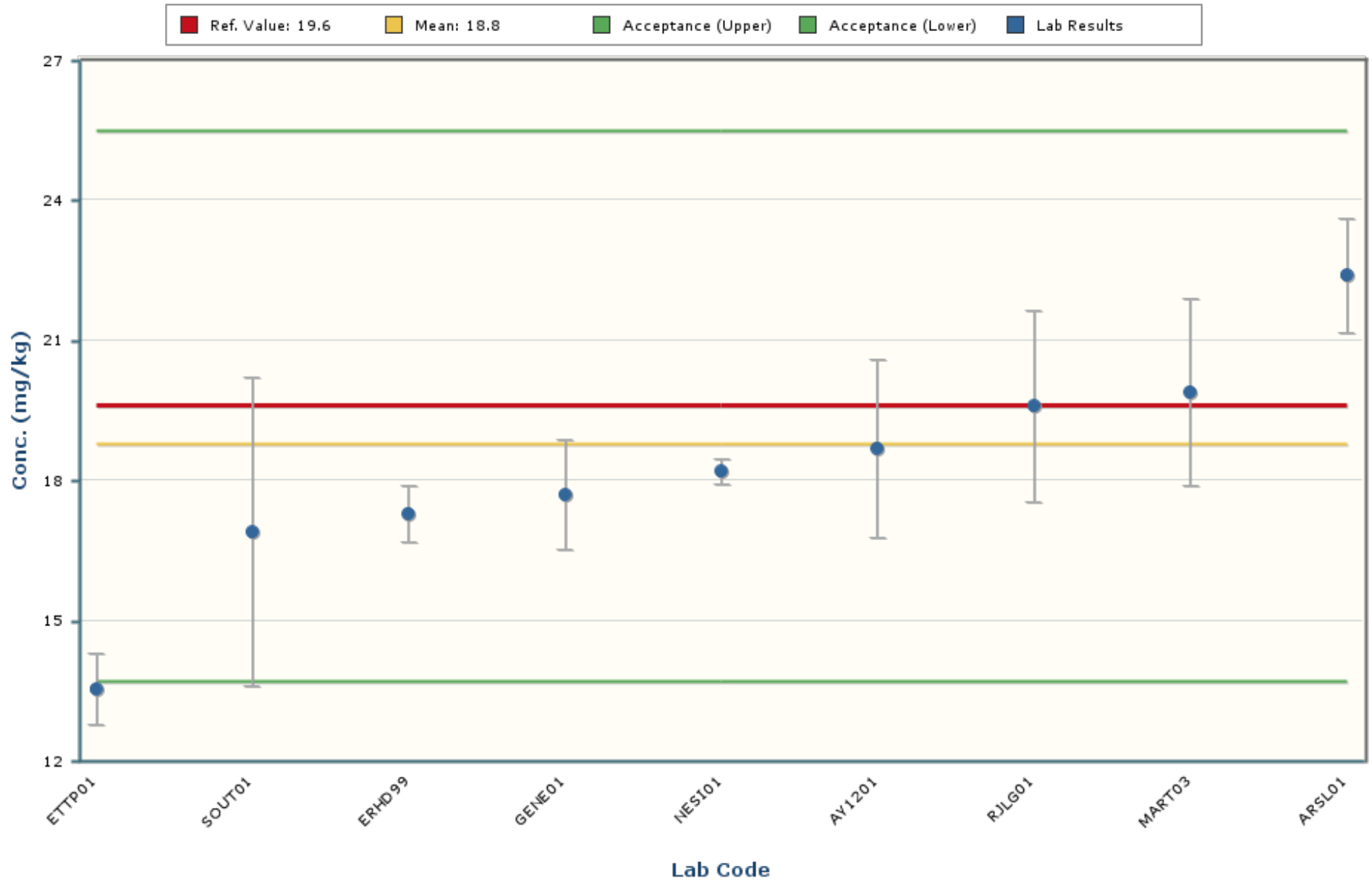
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between -0.64 and 11.95 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Silver

MAPEP-23-MaS48



Notes:

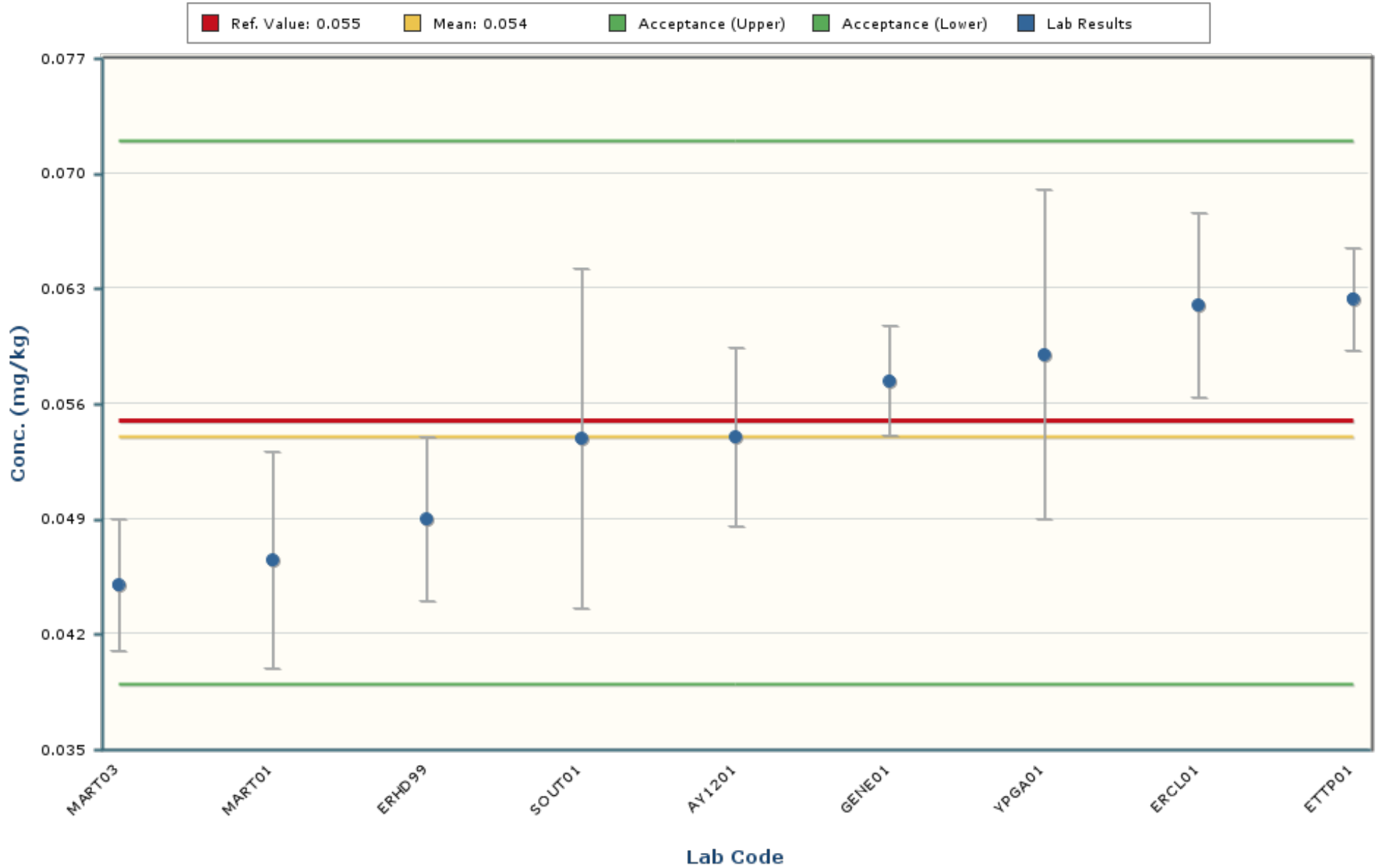
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 9.9 and 27.7 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Uranium-235

MAPEP-23-MaS48



Notes:

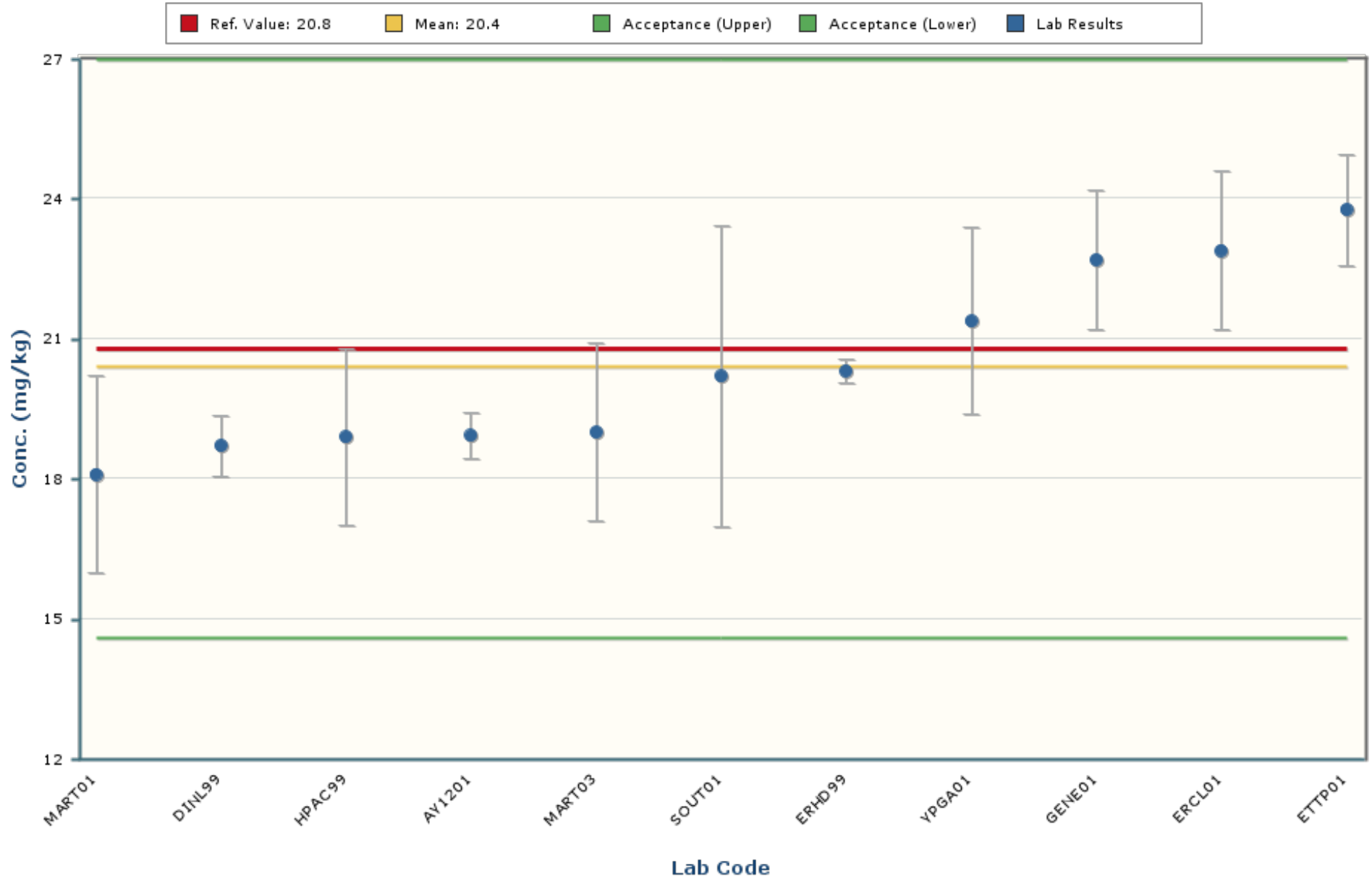
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 0.022 and 0.087 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Uranium-238

MAPEP-23-MaS48



Notes:

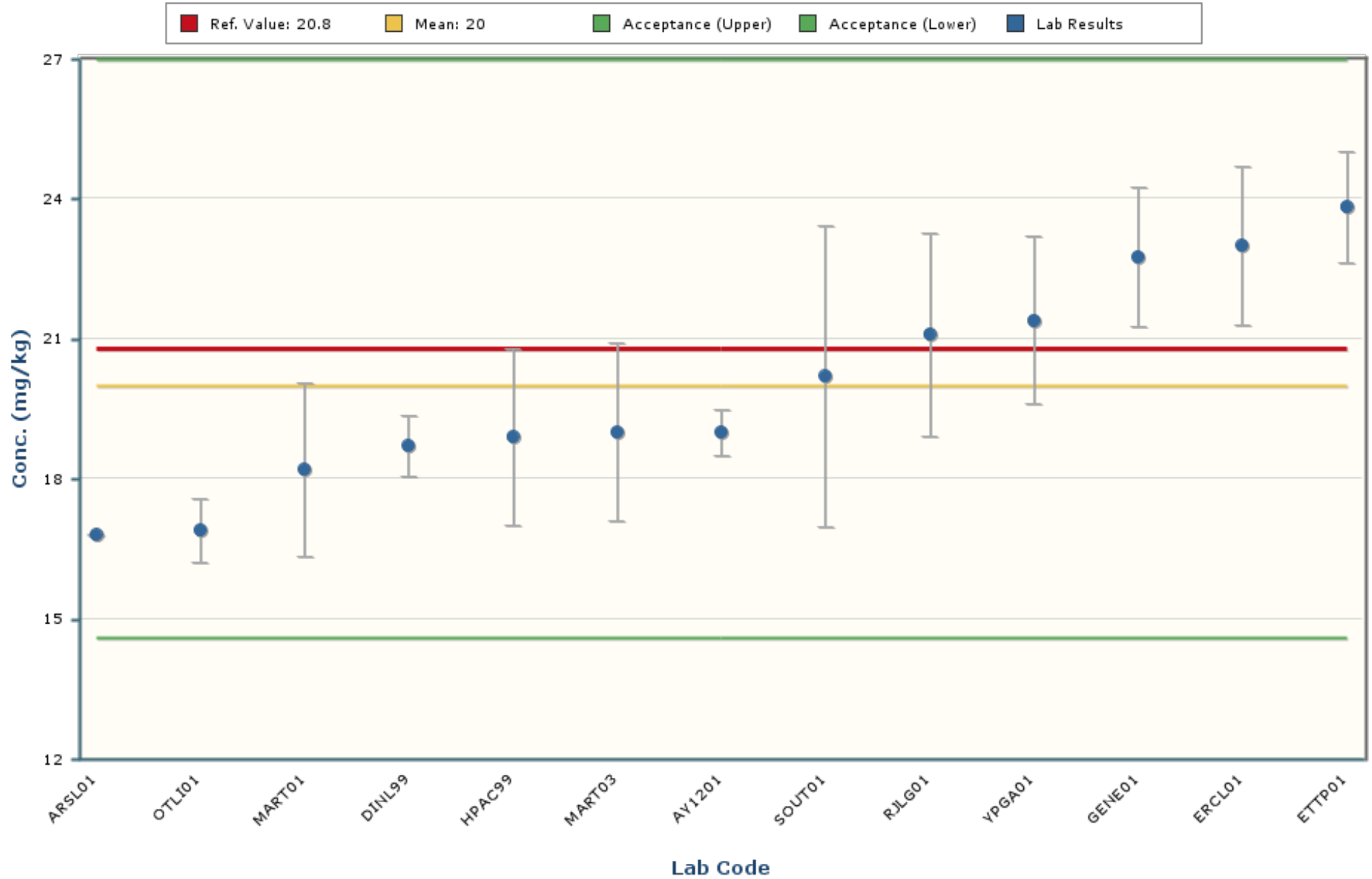
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 10.6 and 30.2 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Uranium-Total

MAPEP-23-MaS48



Notes:

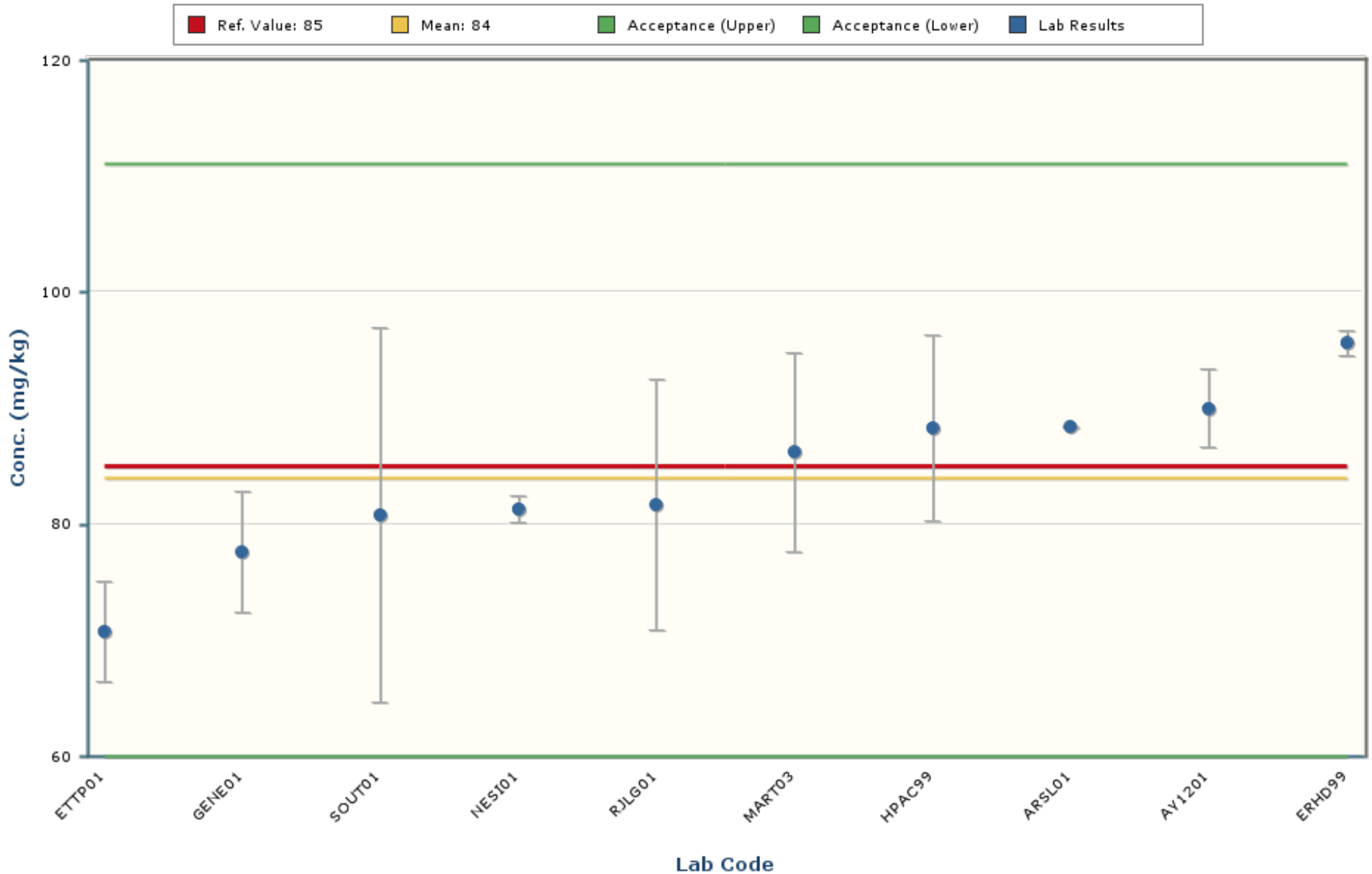
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 8.6 and 31.4 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Vanadium

MAPEP-23-MaS48



Notes:

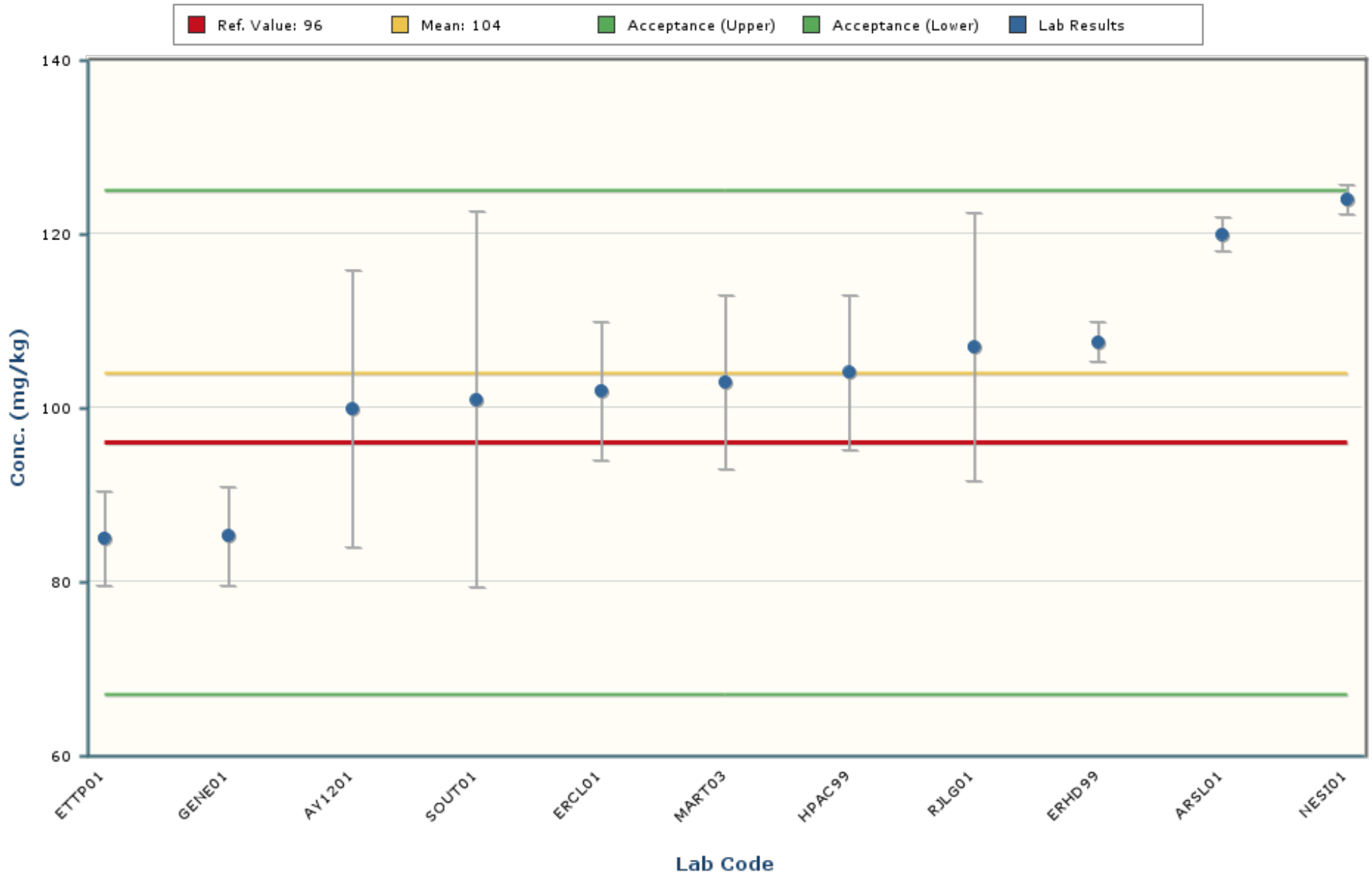
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 49 and 120 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Zinc

MAPEP-23-MaS48



Notes:

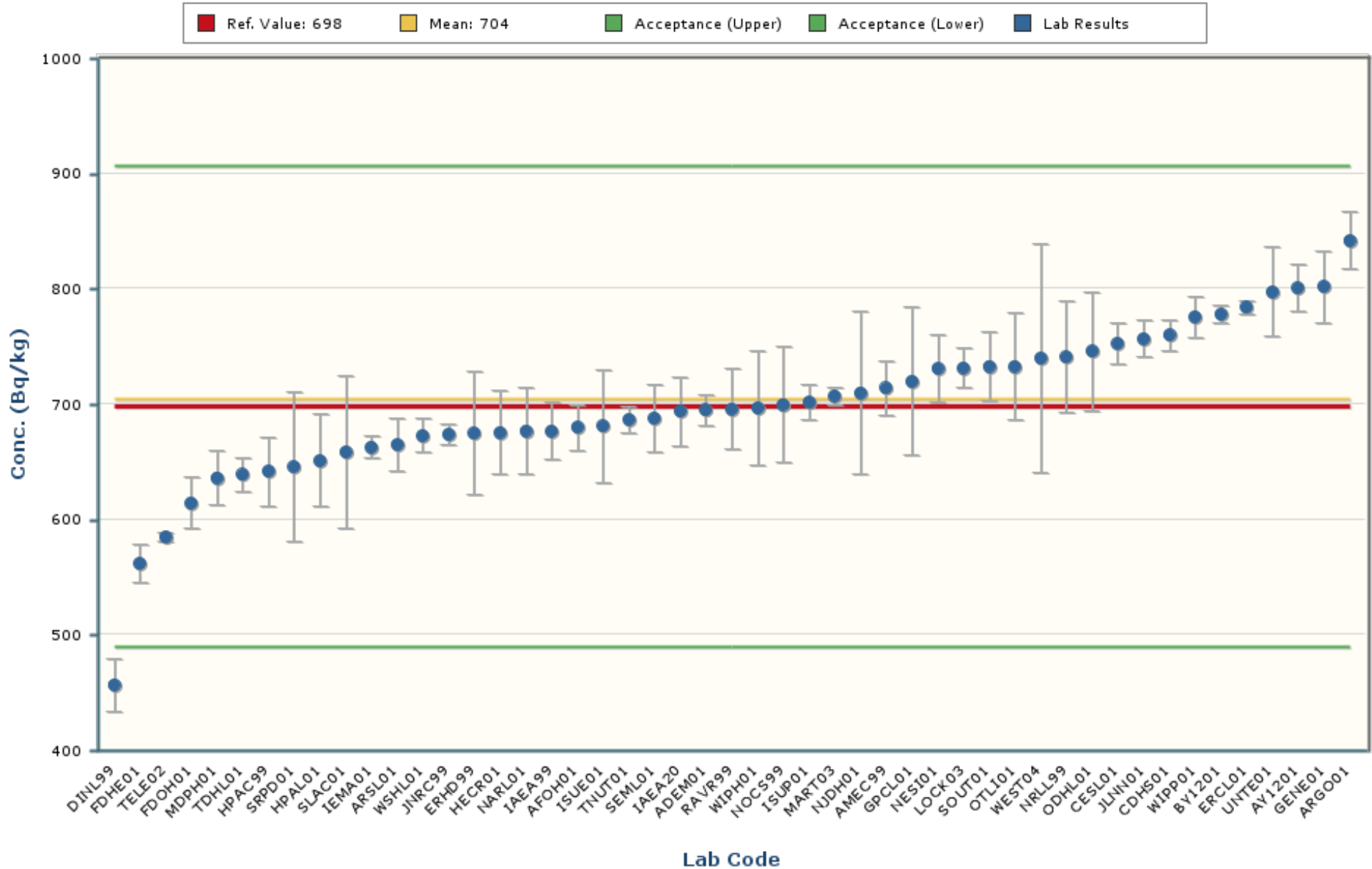
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 41 and 166 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Cobalt-57

MAPEP-23-MaS48



Notes:

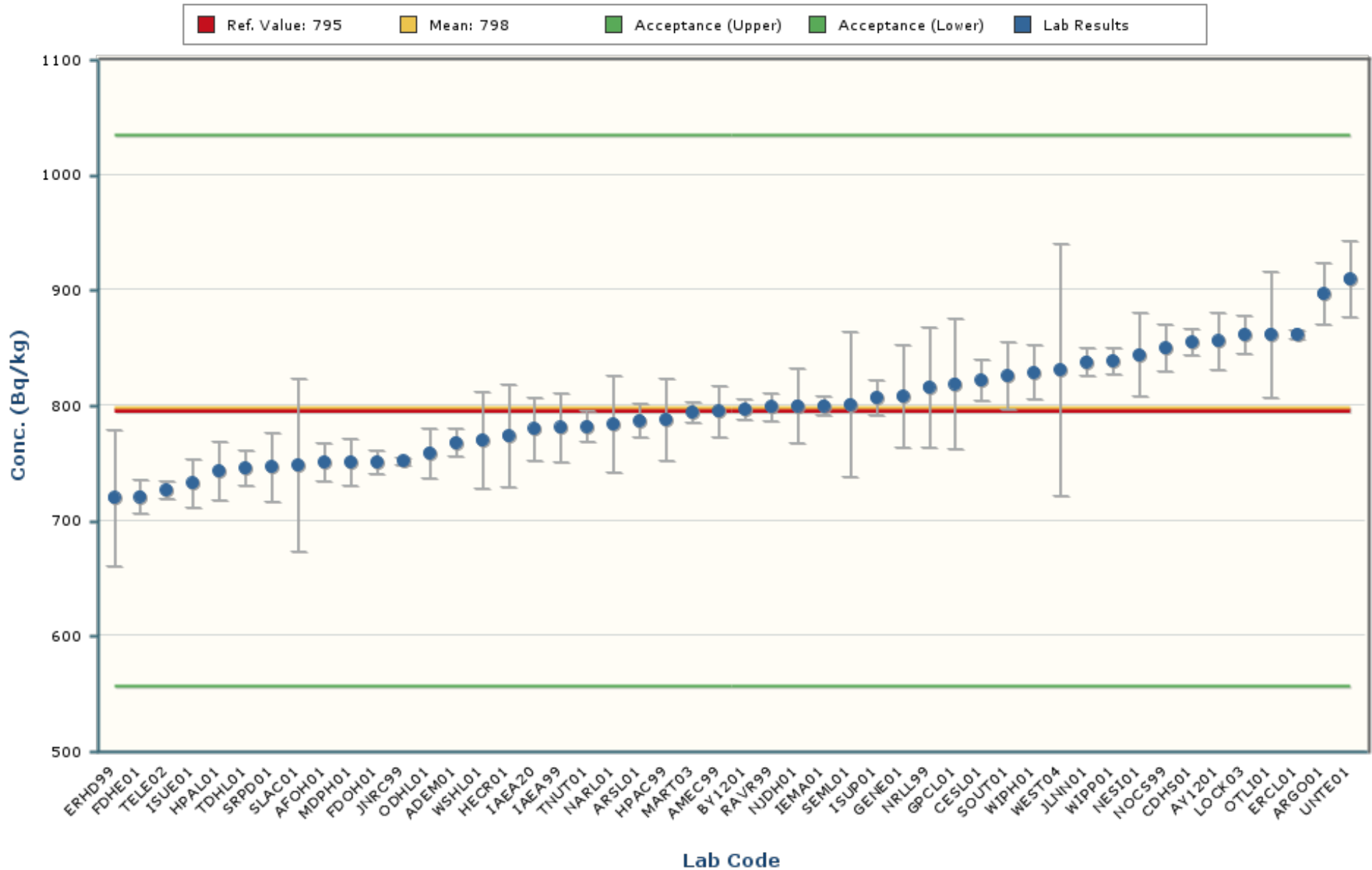
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 418 and 990 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Cobalt-60

MAPEP-23-MaS48



Notes:

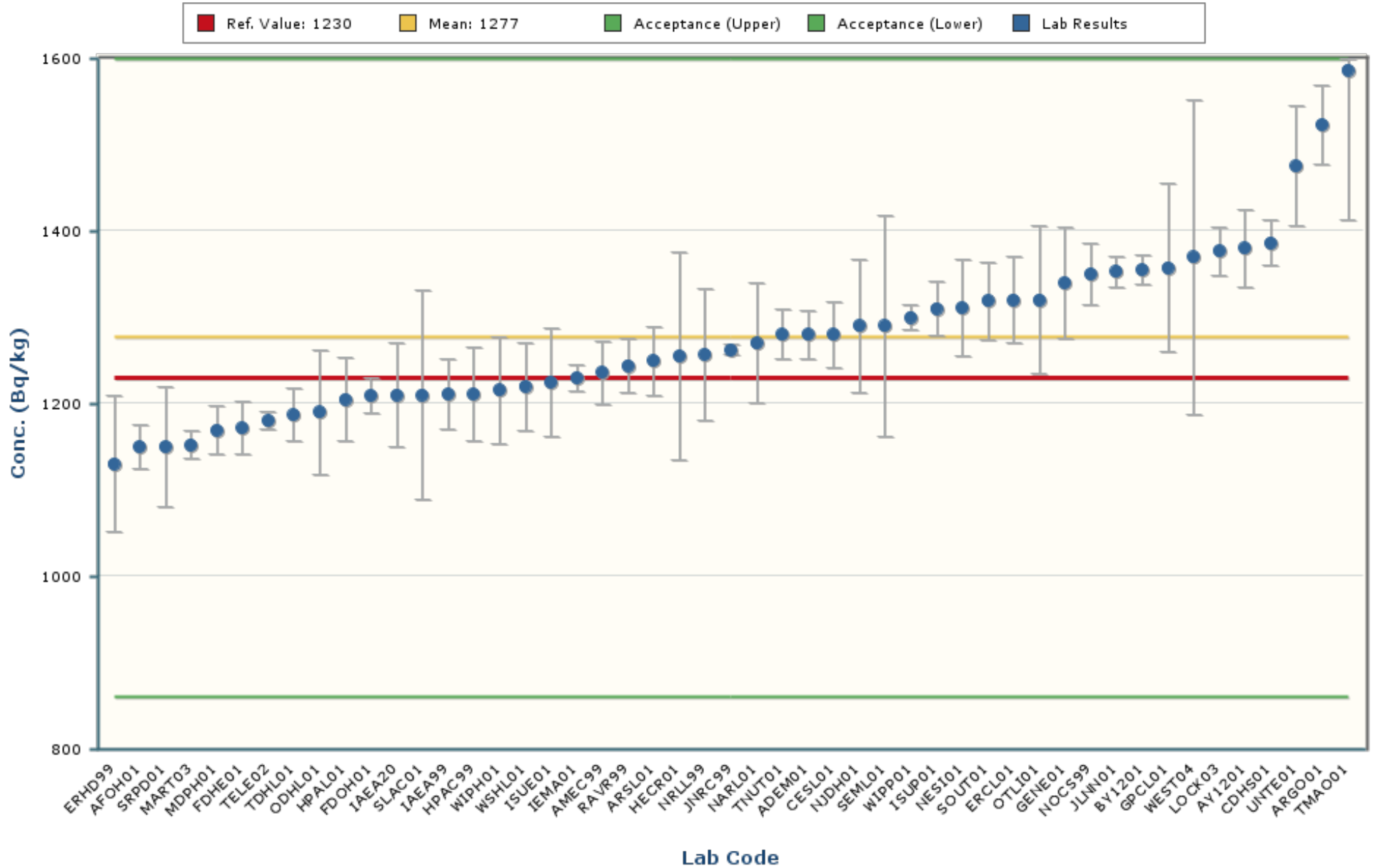
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 568 and 1028 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Manganese-54

MAPEP-23-MaS48



Notes:

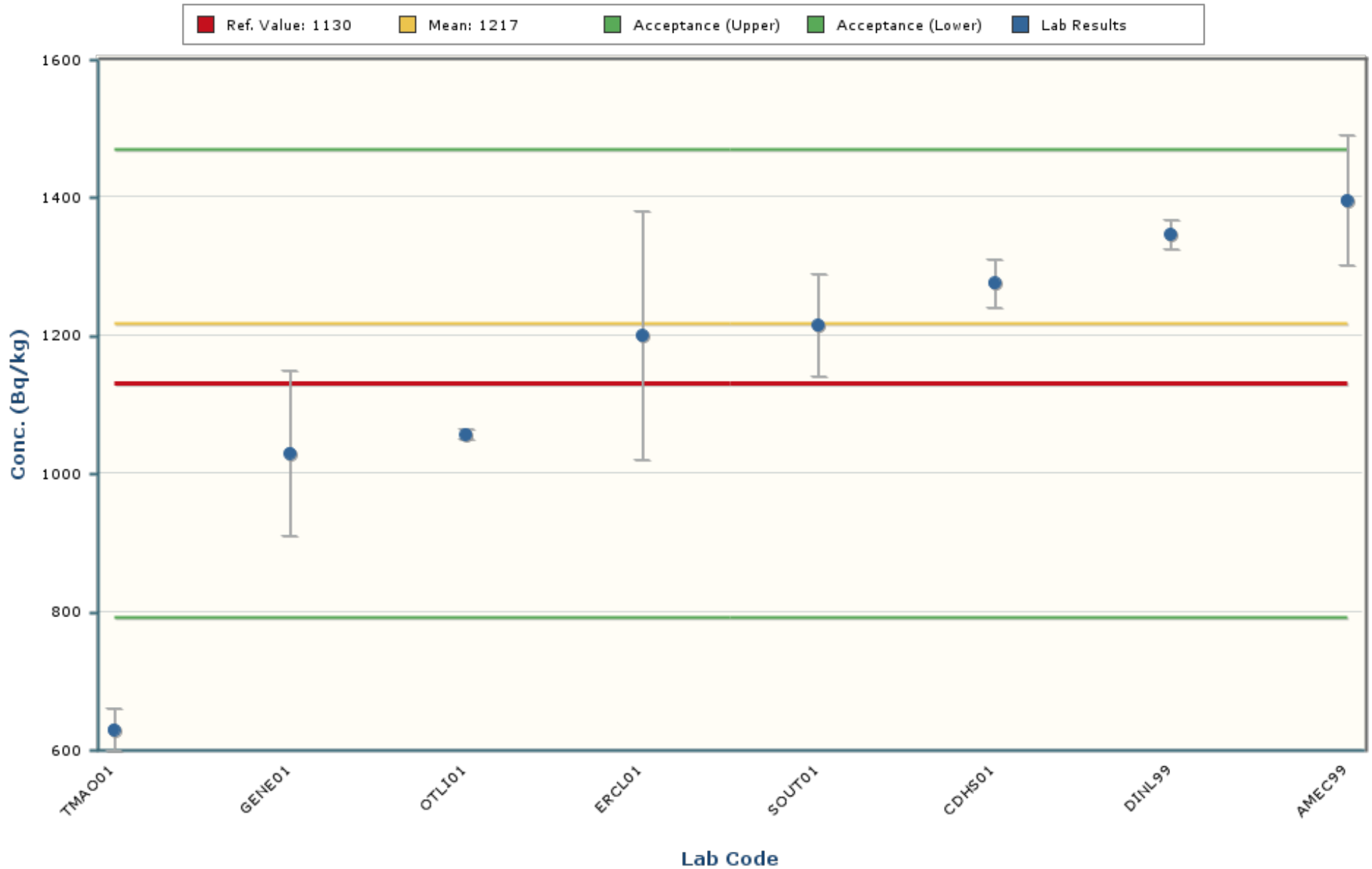
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 801 and 1752 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Nickel-63

MAPEP-23-MaS48



Notes:

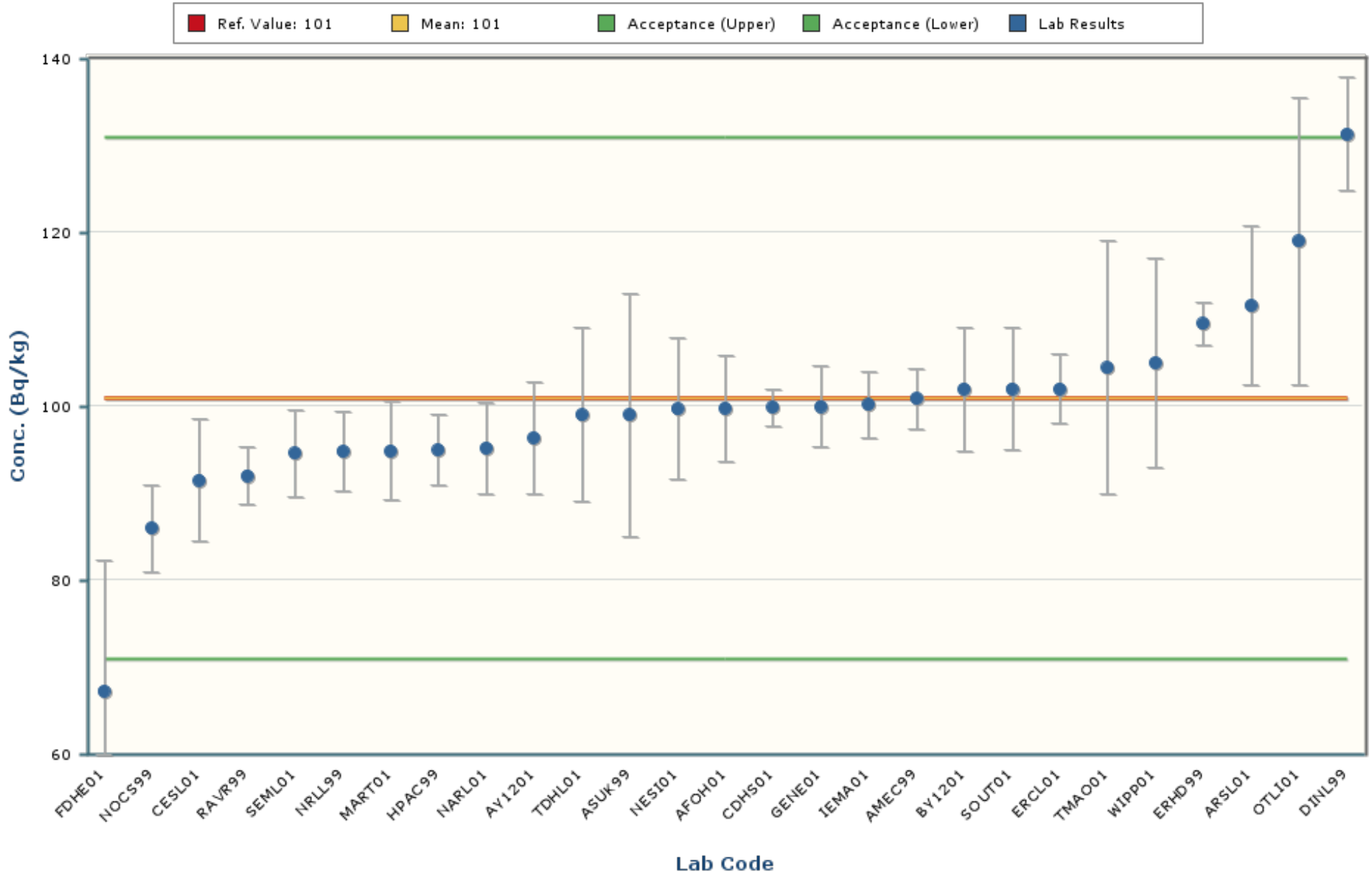
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 530 and 1904 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Plutonium-239/240

MAPEP-23-MaS48



Notes:

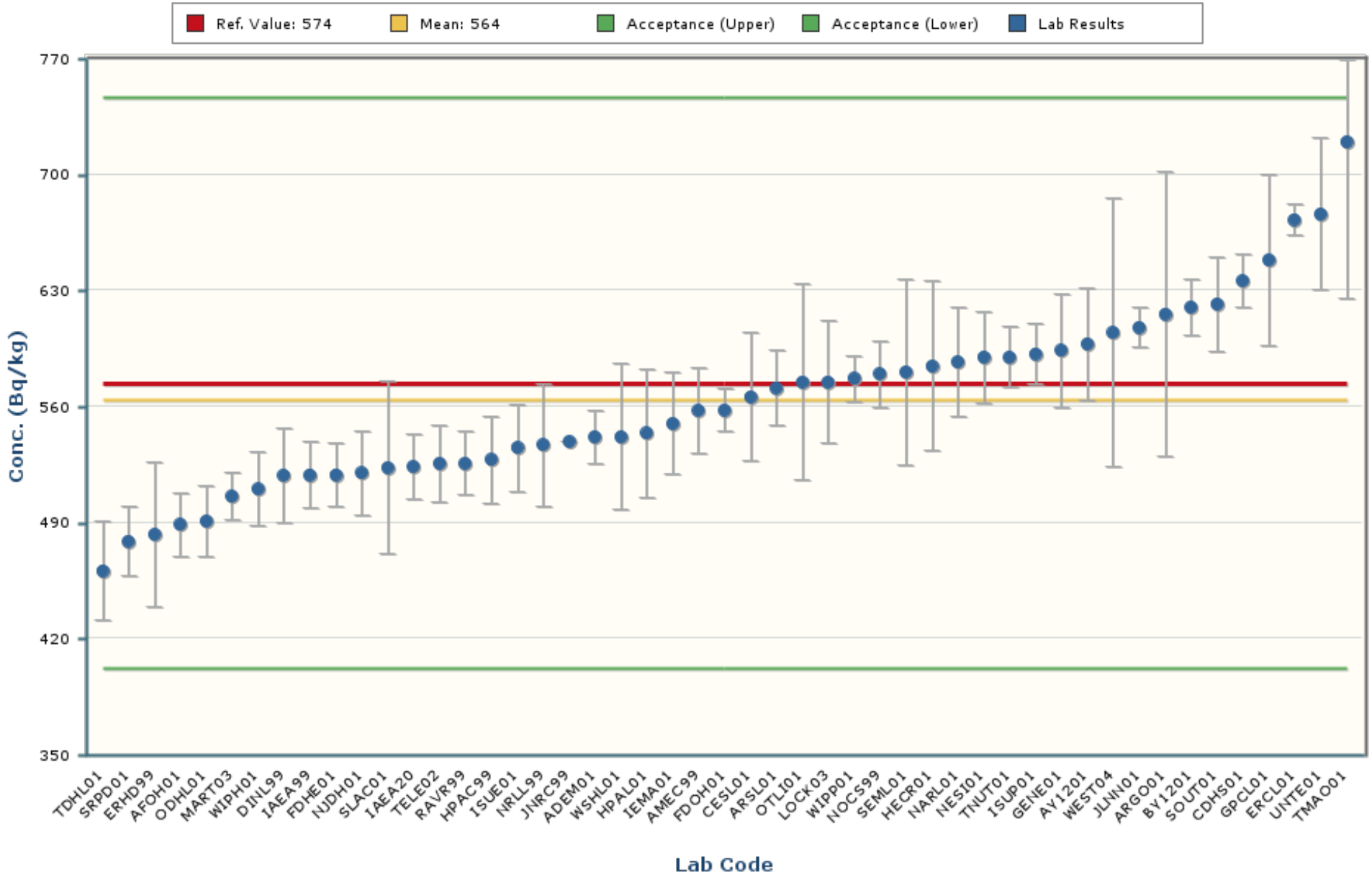
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 55 and 147 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Potassium-40

MAPEP-23-MaS48



Notes:

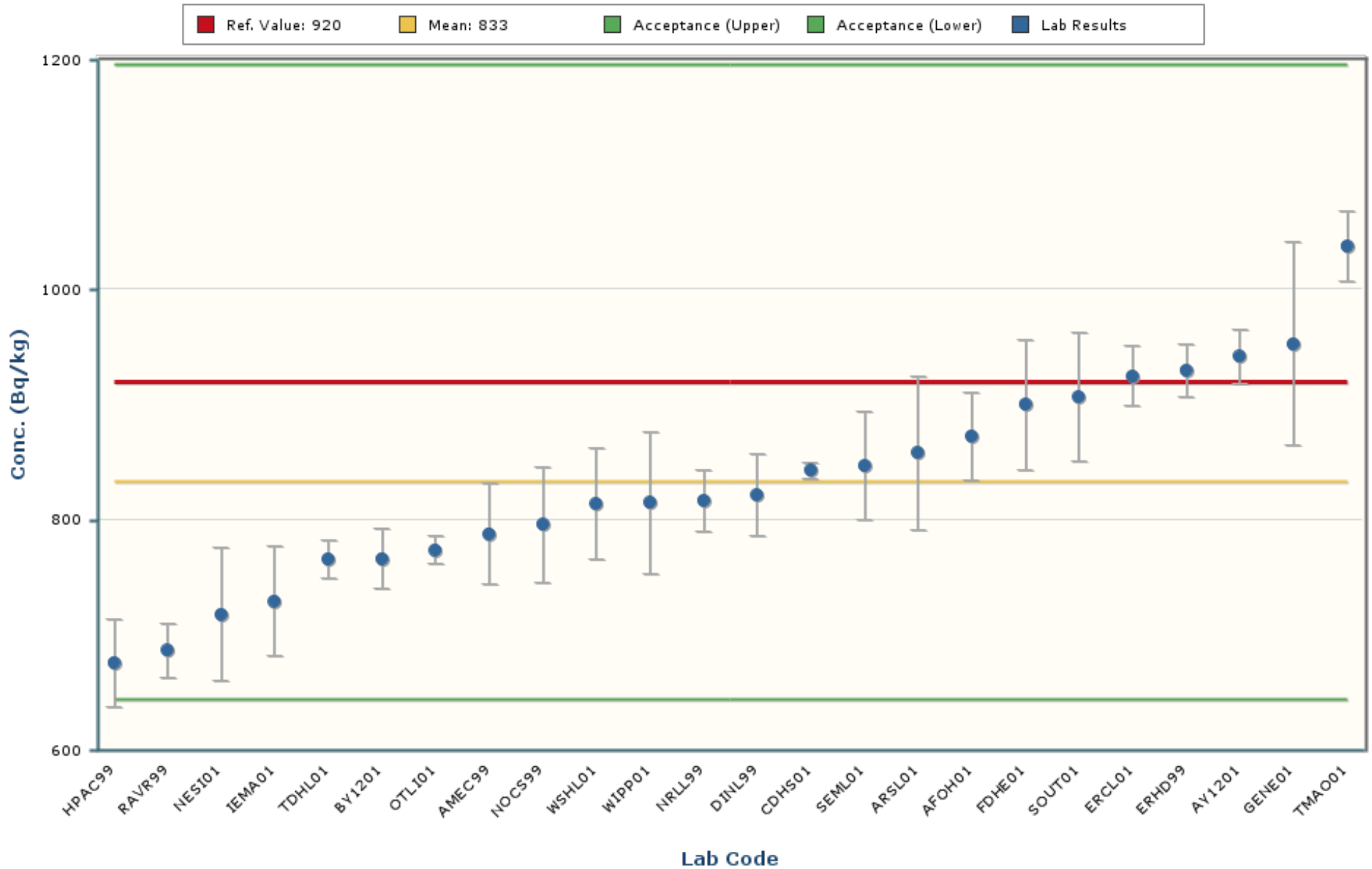
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 293 and 834 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Strontium-90

MAPEP-23-MaS48



Notes:

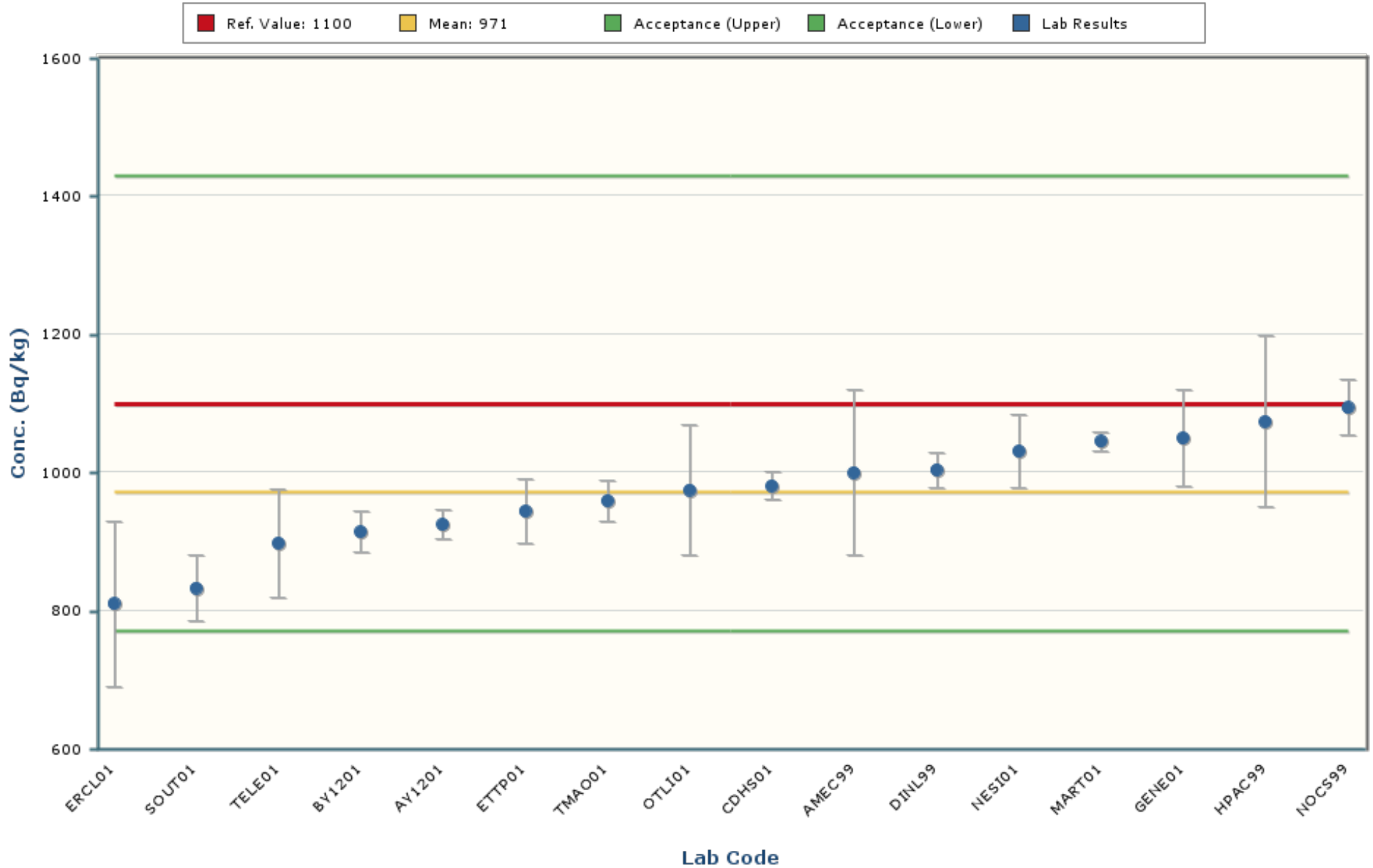
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 384 and 1282 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Technetium-99

MAPEP-23-MaS48



Notes:

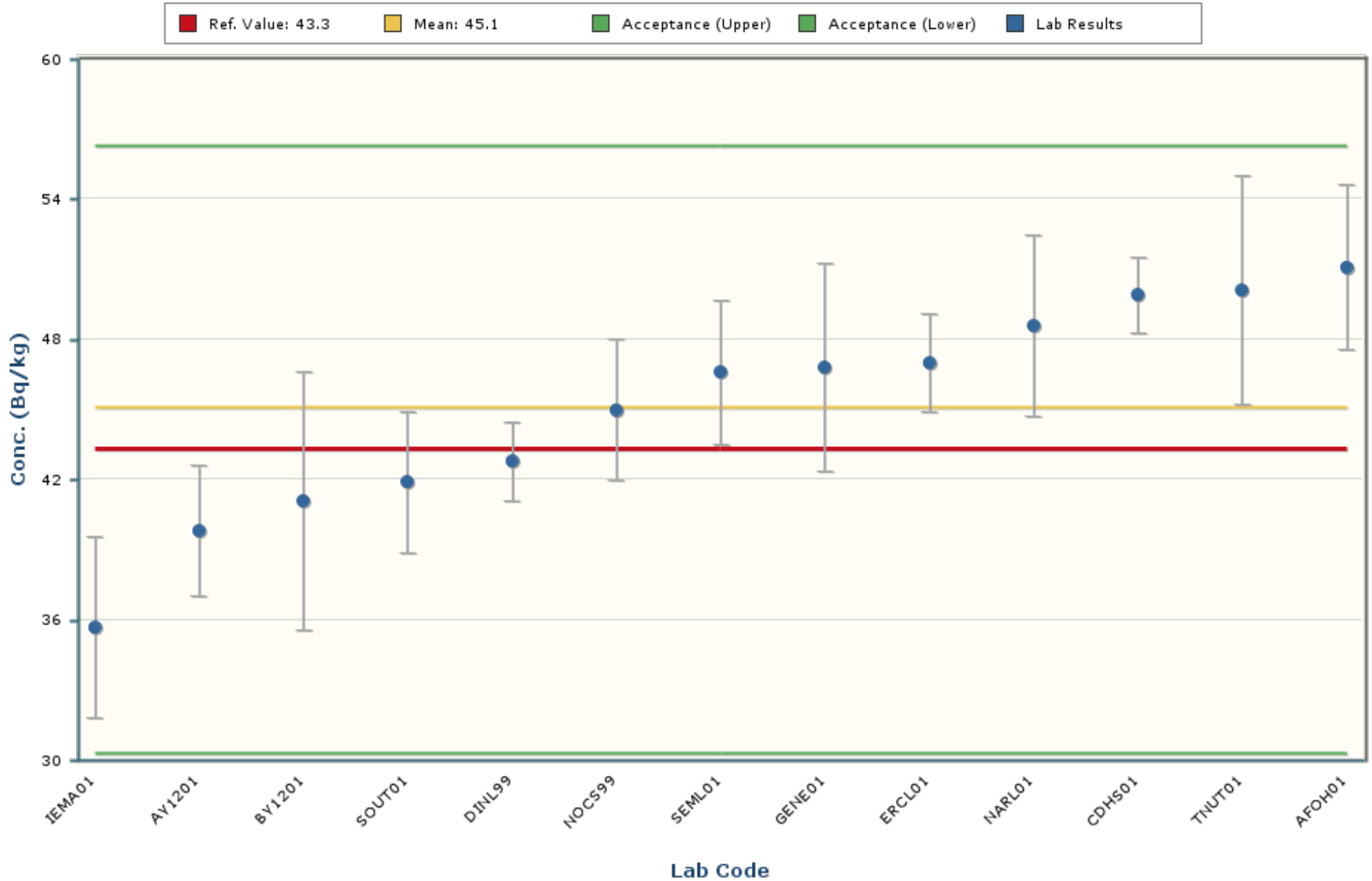
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 564 and 1379 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Thorium-228

MAPEP-23-MaS48



Notes:

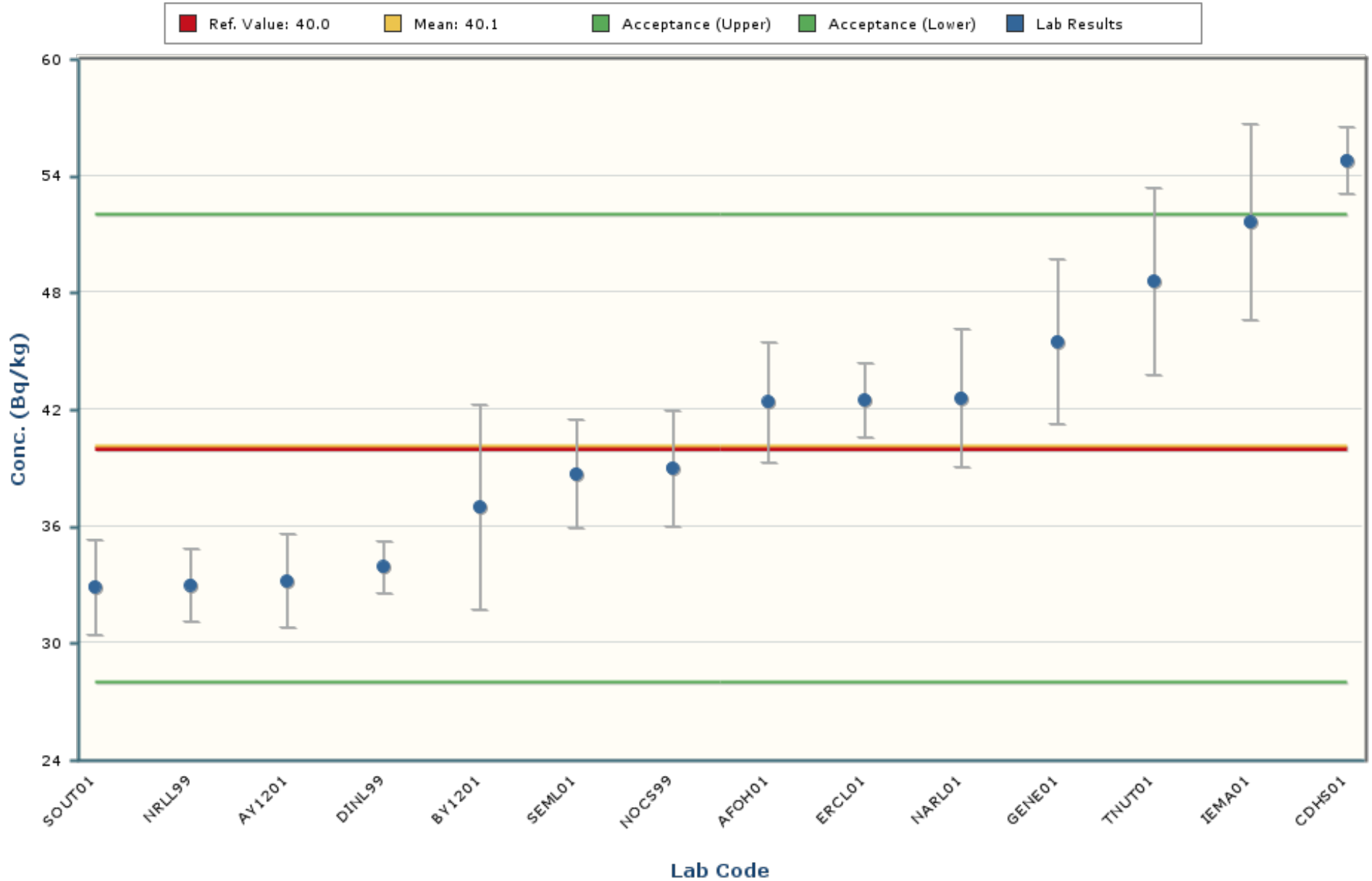
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 22.1 and 68.1 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

Thorium-230

MAPEP-23-MaS48



Notes:

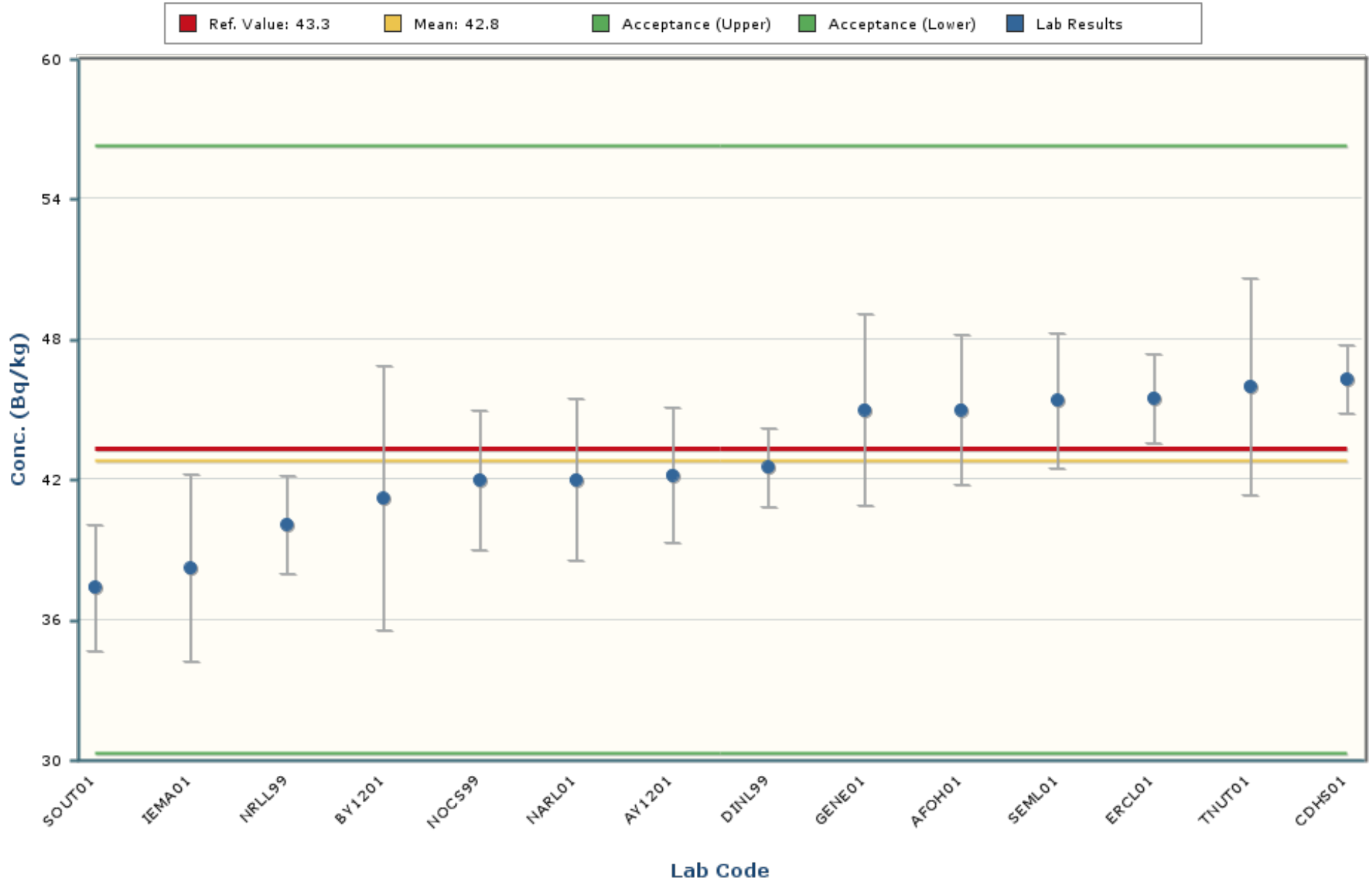
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 9.4 and 70.8 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Thorium-232

MAPEP-23-MaS48



Notes:

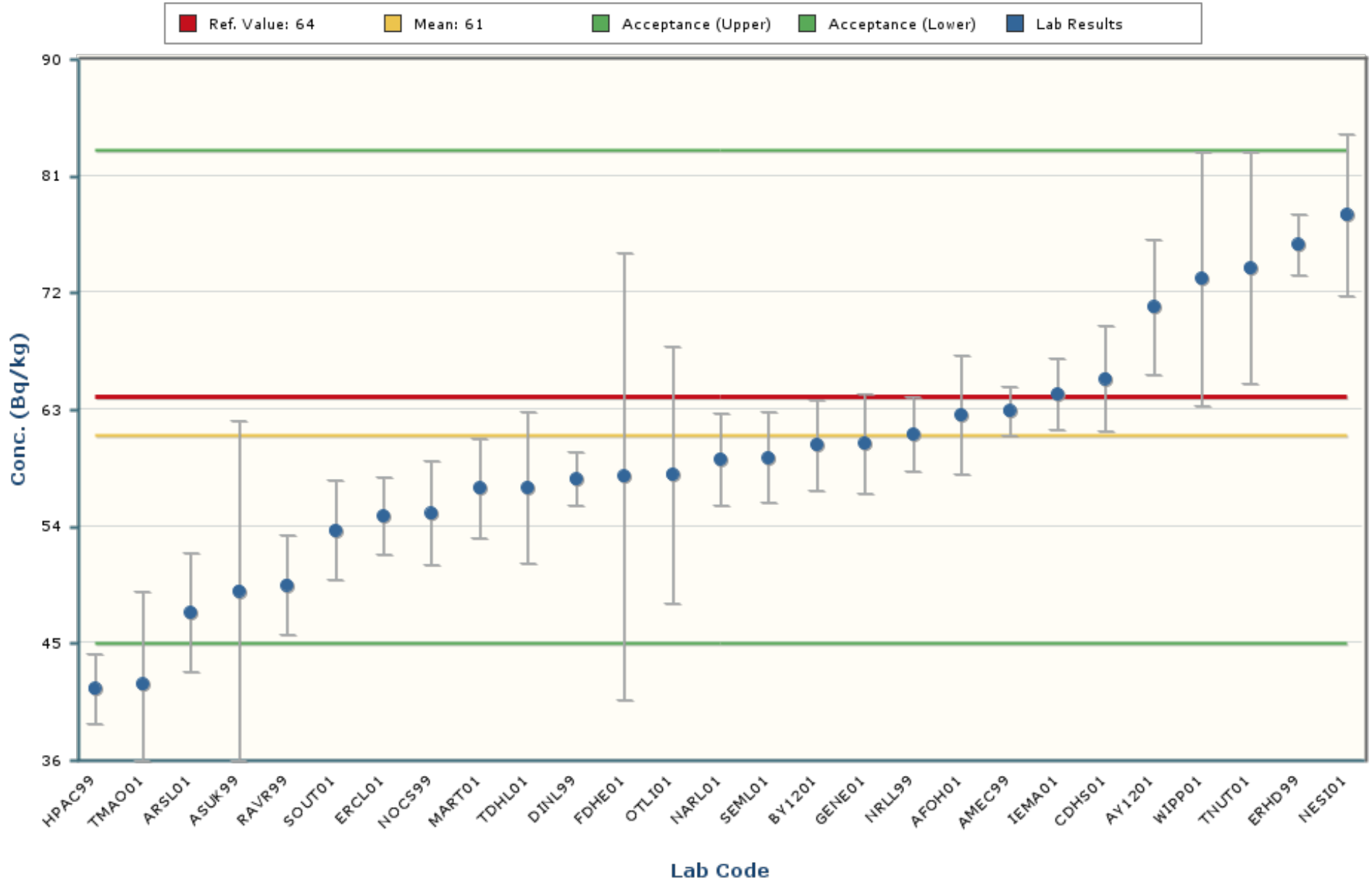
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 28.4 and 57.2 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Uranium-234

MAPEP-23-MaS48



Notes:

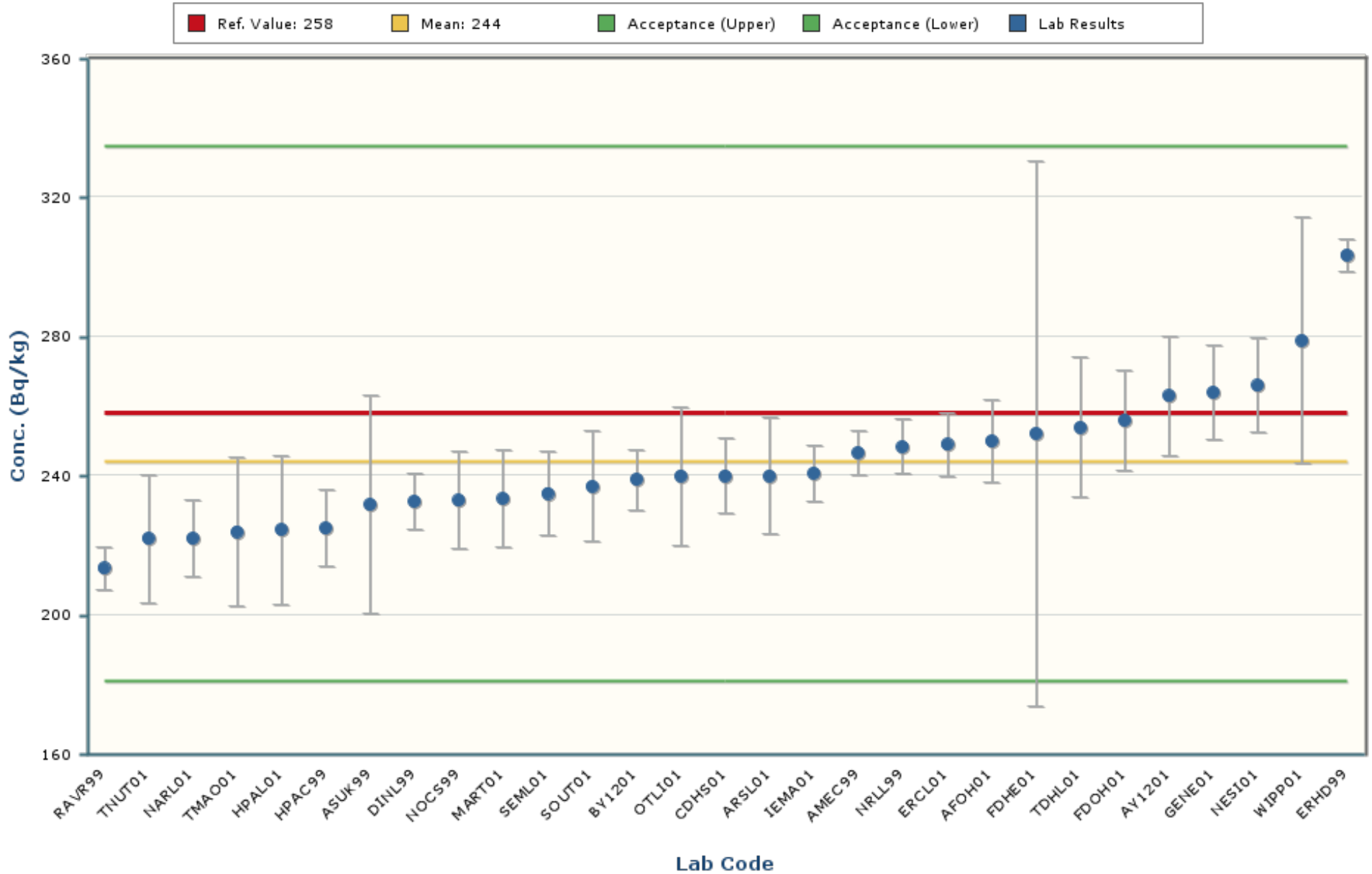
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 20 and 102 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Uranium-238

MAPEP-23-MaS48



Notes:

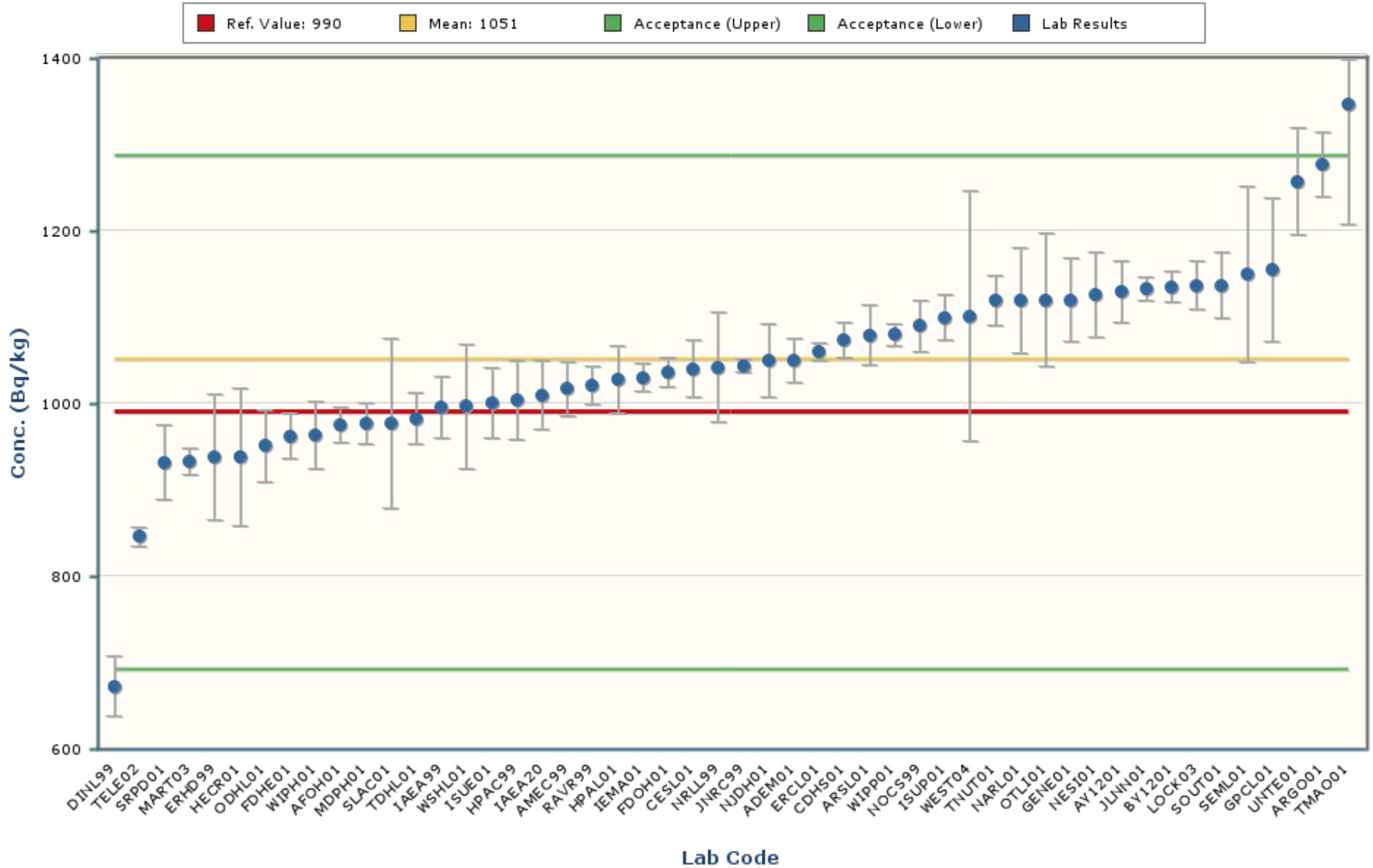
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 148 and 339 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at ± 1 standard deviation.

Zinc-65

MAPEP-23-MaS48



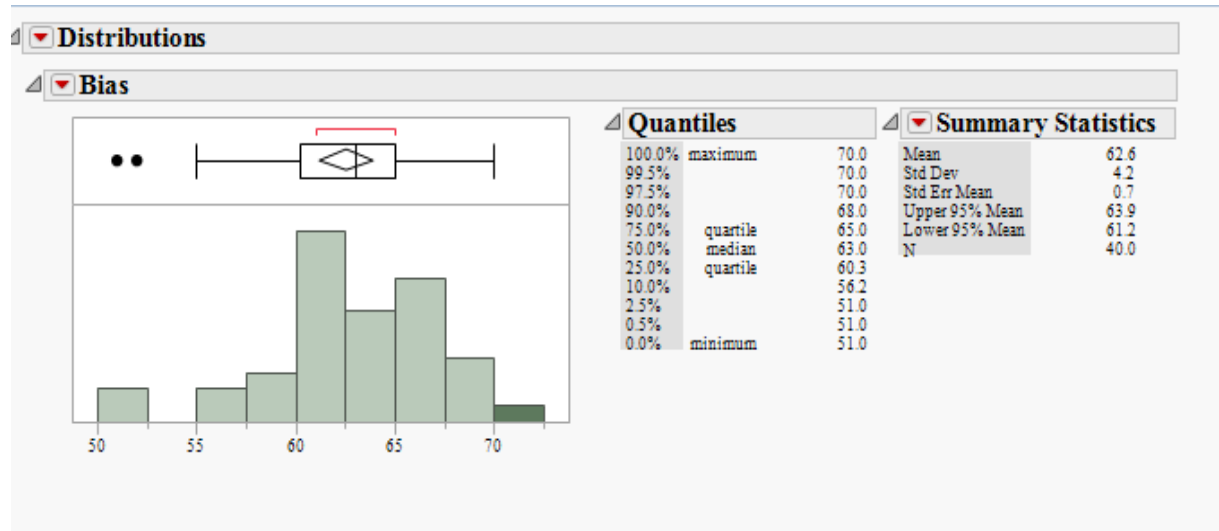
Notes:

The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 625 and 1477 (± 5 Standard Deviations).

The error bars encompassing each result are plotted at \pm one standard deviation.

The intent of the distribution graphs contained within this report is to graphically demonstrate to users how % Bias data within the current MAPEP Series appears when examined by matrix, by analyte, by method of sample preparation or by method of detection. Biases greater than +/- 100% have been screened from the data. The box plot of the bias data points and the mean visually illustrate the breadth of the distribution and where potential outliers in the distribution might lie. The statistics for the distribution plot are provided adjacent to the Bias plot. In some cases, N becomes very small and thus developed statistics may not accurately reflect estimates of the population if N were a significantly larger value.

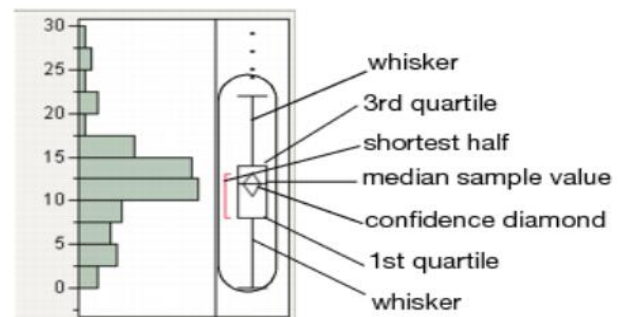


Outlier Box Plot

The BLACK small vertical line inside the small rectangle at the top of the data distribution graph is the median of the population of the bias shown for that analyte in the matrix. The confidence diamond contains the mean and the upper and lower 95% of the mean. If you drew a line through the middle of the diamond, you would have the mean. The top and bottom points of the diamond represent the upper and lower 95% of the mean. The ends of the box represent the 25th and 75th quantiles, also expressed as 1st and 3rd quartile. The difference between the 1st and 3rd quartiles is called the interquartile range. Each box has lines that extend from each end, sometimes called whiskers. The whiskers extend from the ends of the box to the outermost data point that falls within the distances computed as follows:

3rd quartile + 1.5*(interquartile range)

1st quartile - 1.5*(interquartile range)

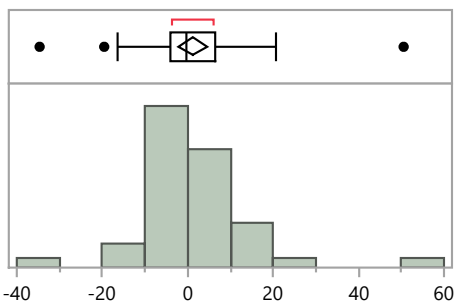


If the data points do not reach the computed ranges, then the whiskers are determined by the upper and lower data point values (not including outliers). The bracket outside of the box identifies the *shortest half*, which is the most dense 50% of the observations (Rousseuw and Leroy 1987).

MaS Distribution by Detection Method

Distributions Analyte_Detection=Cobalt-57 Gamma Spectrometry

Bias



Quantiles

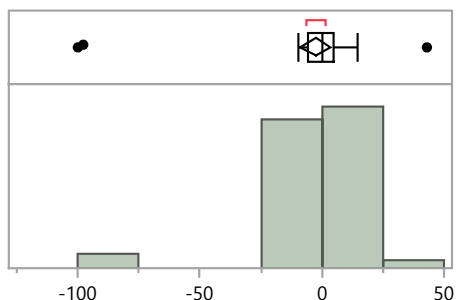
100.0%	maximum	50.5
99.5%		50.5
97.5%		42.3
90.0%		14.1
75.0%	quartile	6.4
50.0%	median	-0.3
25.0%	quartile	-3.9
10.0%		-8.8
2.5%		-30.4
0.5%		-34.6
0.0%	minimum	-34.6

Summary Statistics

Mean	1.1
Std Dev	11.8
Std Err Mean	1.7
Upper 95% Mean	4.5
Lower 95% Mean	-2.2
N	50.0

Distributions Analyte_Detection=Cobalt-60 Gamma Spectrometry

Bias



Quantiles

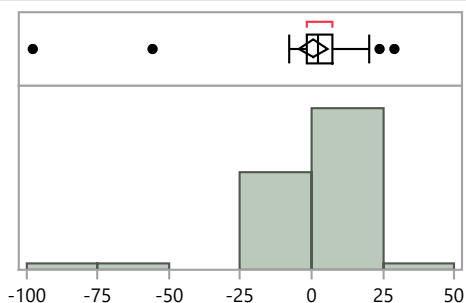
100.0%	maximum	42.9
99.5%		42.9
97.5%		34.3
90.0%		8.4
75.0%	quartile	4.6
50.0%	median	0.0
25.0%	quartile	-5.5
10.0%		-8.4
2.5%		-99.2
0.5%		-99.9
0.0%	minimum	-99.9

Summary Statistics

Mean	-2.7
Std Dev	21.2
Std Err Mean	3.0
Upper 95% Mean	3.2
Lower 95% Mean	-8.7
N	51.0

Distributions Analyte_Detection=Manganese-54 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	29.0
99.5%		29.0
97.5%		27.4
90.0%		12.1
75.0%	quartile	7.3
50.0%	median	2.2
25.0%	quartile	-1.7
10.0%		-6.5
2.5%		-85.2
0.5%		-97.8
0.0%	minimum	-97.8

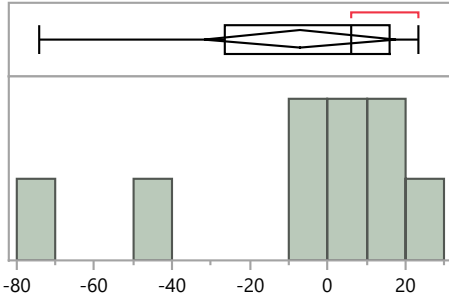
Summary Statistics

Mean	0.6
Std Dev	18.0
Std Err Mean	2.5
Upper 95% Mean	5.7
Lower 95% Mean	-4.4
N	51.0

MaS Distribution by Detection Method

Distributions Analyte_Detection=Nickel-63 Liquid Scintillation Counter

Bias



Quantiles

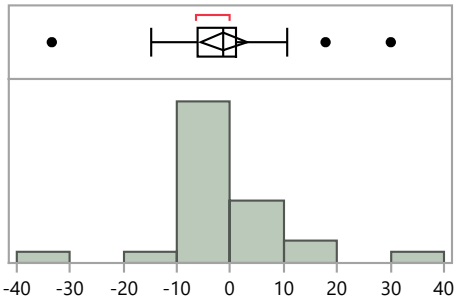
100.0%	maximum	23.5
99.5%		23.5
97.5%		23.5
90.0%		23.5
75.0%	quartile	16.1
50.0%	median	6.2
25.0%	quartile	-26.6
10.0%		-74.0
2.5%		-74.0
0.5%		-74.0
0.0%	minimum	-74.0

Summary Statistics

Mean	-7.2
Std Dev	32.2
Std Err Mean	10.7
Upper 95% Mean	17.6
Lower 95% Mean	-31.9
N	9.0

Distributions Analyte_Detection=Plutonium-239/240 Alpha Spectrometry

Bias



Quantiles

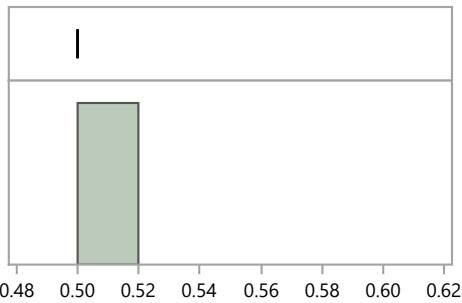
100.0%	maximum	30.0
99.5%		30.0
97.5%		30.0
90.0%		12.0
75.0%	quartile	1.0
50.0%	median	-1.2
25.0%	quartile	-6.1
10.0%		-10.5
2.5%		-33.4
0.5%		-33.4
0.0%	minimum	-33.4

Summary Statistics

Mean	-1.2
Std Dev	10.9
Std Err Mean	2.1
Upper 95% Mean	3.1
Lower 95% Mean	-5.6
N	27.0

Distributions Analyte_Detection=Potassium-40 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	0.5
99.5%		0.5
97.5%		0.5
90.0%		0.5
75.0%	quartile	0.5
50.0%	median	0.5
25.0%	quartile	0.5
10.0%		0.5
2.5%		0.5
0.5%		0.5
0.0%	minimum	0.5

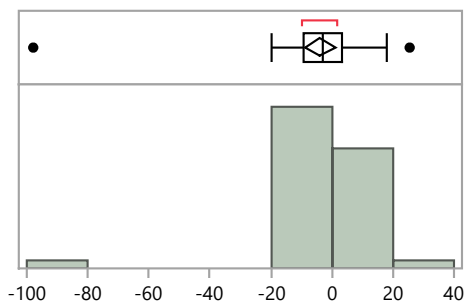
Summary Statistics

Mean	0.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS Distribution by Detection Method

Distributions Analyte_Detection=Potassium-40 Gamma Spectrometry

Bias



Quantiles

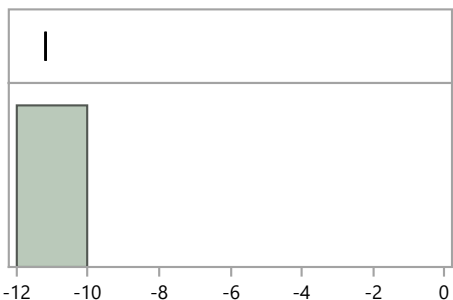
100.0%	maximum	25.4
99.5%		25.4
97.5%		23.5
90.0%		10.8
75.0%	quartile	3.3
50.0%	median	-2.8
25.0%	quartile	-9.1
10.0%		-14.8
2.5%		-78.3
0.5%		-97.8
0.0%	minimum	-97.8

Summary Statistics

Mean	-3.8
Std Dev	16.6
Std Err Mean	2.4
Upper 95% Mean	1.0
Lower 95% Mean	-8.6
N	49.0

Distributions Analyte_Detection=Strontium-90 Alpha Spectrometry

Bias



Quantiles

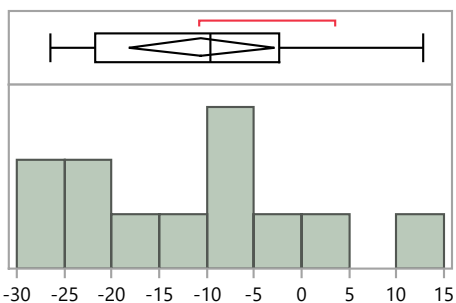
100.0%	maximum	-11.2
99.5%		-11.2
97.5%		-11.2
90.0%		-11.2
75.0%	quartile	-11.2
50.0%	median	-11.2
25.0%	quartile	-11.2
10.0%		-11.2
2.5%		-11.2
0.5%		-11.2
0.0%	minimum	-11.2

Summary Statistics

Mean	-11.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Detection=Strontium-90 Gas Flow Proportional Counter

Bias



Quantiles

100.0%	maximum	12.8
99.5%		12.8
97.5%		12.8
90.0%		10.0
75.0%	quartile	-2.3
50.0%	median	-9.6
25.0%	quartile	-21.7
10.0%		-26.2
2.5%		-26.5
0.5%		-26.5
0.0%	minimum	-26.5

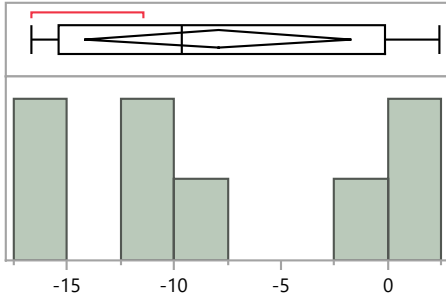
Summary Statistics

Mean	-10.5
Std Dev	12.1
Std Err Mean	3.5
Upper 95% Mean	-2.8
Lower 95% Mean	-18.2
N	12.0

MaS Distribution by Detection Method

Distributions Analyte_Detection=Strontium-90 Gross Alpha/Beta - 2 pi gas flow proportional counter

Bias



Quantiles

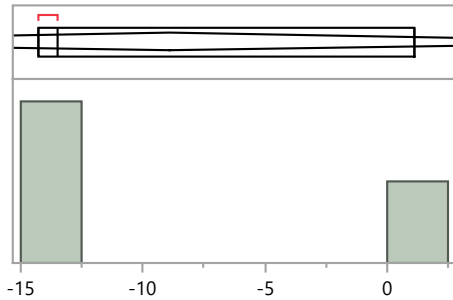
100.0%	maximum	2.4
99.5%		2.4
97.5%		2.4
90.0%		2.4
75.0%	quartile	-0.2
50.0%	median	-9.7
25.0%	quartile	-15.4
10.0%		-16.7
2.5%		-16.7
0.5%		-16.7
0.0%	minimum	-16.7

Summary Statistics

Mean	-7.9
Std Dev	7.5
Std Err Mean	2.6
Upper 95% Mean	-1.7
Lower 95% Mean	-14.2
N	8.0

Distributions Analyte_Detection=Strontium-90 Liquid Scintillation Counter

Bias



Quantiles

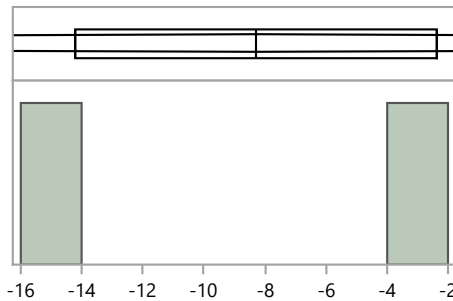
100.0%	maximum	1.1
99.5%		1.1
97.5%		1.1
90.0%		1.1
75.0%	quartile	1.1
50.0%	median	-13.5
25.0%	quartile	-14.3
10.0%		-14.3
2.5%		-14.3
0.5%		-14.3
0.0%	minimum	-14.3

Summary Statistics

Mean	-8.9
Std Dev	8.7
Std Err Mean	5.0
Upper 95% Mean	12.6
Lower 95% Mean	-30.4
N	3.0

Distributions Analyte_Detection=Technetium-99 Inductively Coupled Plasma Mass Spectrometry

Bias



Quantiles

100.0%	maximum	-2.4
99.5%		-2.4
97.5%		-2.4
90.0%		-2.4
75.0%	quartile	-2.4
50.0%	median	-8.3
25.0%	quartile	-14.2
10.0%		-14.2
2.5%		-14.2
0.5%		-14.2
0.0%	minimum	-14.2

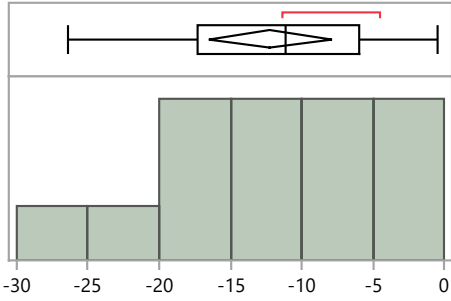
Summary Statistics

Mean	-8.3
Std Dev	8.3
Std Err Mean	5.9
Upper 95% Mean	66.7
Lower 95% Mean	-83.3
N	2.0

MaS Distribution by Detection Method

Distributions Analyte_Detection=Technetium-99 Liquid Scintillation Counter

Bias



Quantiles

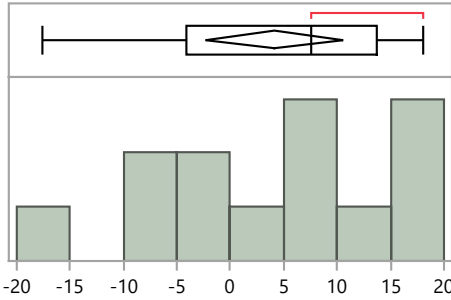
100.0%	maximum	-0.5
99.5%		-0.5
97.5%		-0.5
90.0%		-2.5
75.0%	quartile	-6.0
50.0%	median	-11.1
25.0%	quartile	-17.3
10.0%		-25.4
2.5%		-26.4
0.5%		-26.4
0.0%	minimum	-26.4

Summary Statistics

Mean	-12.2
Std Dev	7.5
Std Err Mean	2.0
Upper 95% Mean	-7.9
Lower 95% Mean	-16.5
N	14.0

Distributions Analyte_Detection=Thorium-228 Alpha Spectrometry

Bias



Quantiles

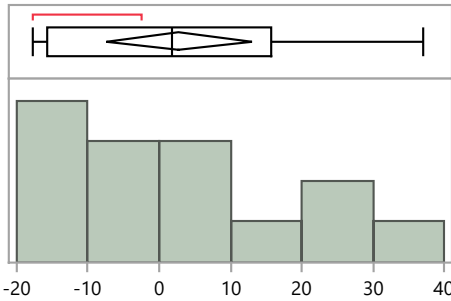
100.0%	maximum	18.0
99.5%		18.0
97.5%		18.0
90.0%		17.1
75.0%	quartile	13.7
50.0%	median	7.6
25.0%	quartile	-4.2
10.0%		-13.8
2.5%		-17.6
0.5%		-17.6
0.0%	minimum	-17.6

Summary Statistics

Mean	4.2
Std Dev	10.6
Std Err Mean	2.9
Upper 95% Mean	10.6
Lower 95% Mean	-2.3
N	13.0

Distributions Analyte_Detection=Thorium-230 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	37.0
99.5%		37.0
97.5%		37.0
90.0%		33.1
75.0%	quartile	15.7
50.0%	median	1.8
25.0%	quartile	-15.7
10.0%		-17.7
2.5%		-17.8
0.5%		-17.8
0.0%	minimum	-17.8

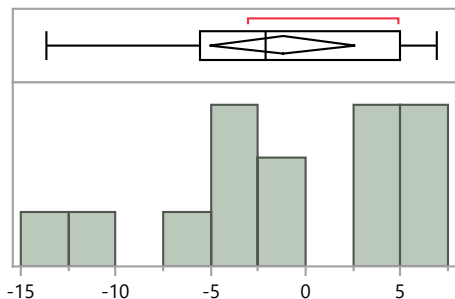
Summary Statistics

Mean	2.8
Std Dev	17.7
Std Err Mean	4.7
Upper 95% Mean	13.1
Lower 95% Mean	-7.4
N	14.0

MaS Distribution by Detection Method

Distributions Analyte_Detection=Thorium-232 Alpha Spectrometry

Bias



Quantiles

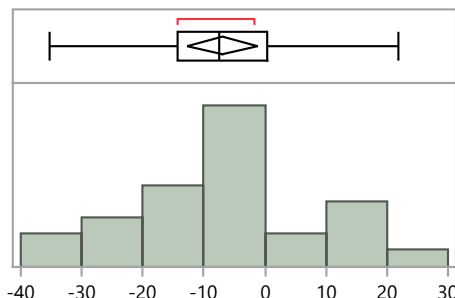
100.0%	maximum	6.9
99.5%		6.9
97.5%		6.9
90.0%		6.6
75.0%	quartile	5.0
50.0%	median	-2.2
25.0%	quartile	-5.5
10.0%		-12.7
2.5%		-13.6
0.5%		-13.6
0.0%	minimum	-13.6

Summary Statistics

Mean	-1.2
Std Dev	6.6
Std Err Mean	1.8
Upper 95% Mean	2.6
Lower 95% Mean	-5.1
N	14.0

Distributions Analyte_Detection=Uranium-234 Alpha Spectrometry

Bias



Quantiles

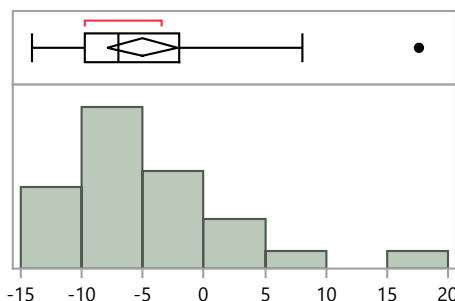
100.0%	maximum	21.9
99.5%		21.9
97.5%		21.9
90.0%		16.1
75.0%	quartile	0.3
50.0%	median	-7.5
25.0%	quartile	-14.4
10.0%		-27.7
2.5%		-35.2
0.5%		-35.2
0.0%	minimum	-35.2

Summary Statistics

Mean	-7.0
Std Dev	14.7
Std Err Mean	2.8
Upper 95% Mean	-1.2
Lower 95% Mean	-12.8
N	27.0

Distributions Analyte_Detection=Uranium-238 Alpha Spectrometry

Bias



Quantiles

100.0%	maximum	17.6
99.5%		17.6
97.5%		17.6
90.0%		4.6
75.0%	quartile	-2.1
50.0%	median	-7.0
25.0%	quartile	-9.7
10.0%		-13.4
2.5%		-14.0
0.5%		-14.0
0.0%	minimum	-14.0

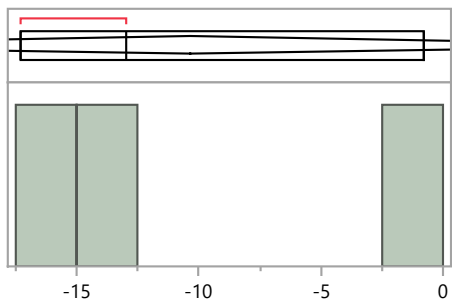
Summary Statistics

Mean	-5.0
Std Dev	7.2
Std Err Mean	1.4
Upper 95% Mean	-2.1
Lower 95% Mean	-7.9
N	26.0

MaS Distribution by Detection Method

Distributions Analyte_Detection=Uranium-238 Gamma Spectrometry

Bias



Quantiles

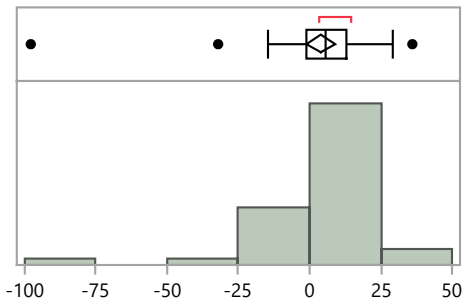
100.0%	maximum	-0.8
99.5%		-0.8
97.5%		-0.8
90.0%		-0.8
75.0%	quartile	-0.8
50.0%	median	-13.0
25.0%	quartile	-17.3
10.0%		-17.3
2.5%		-17.3
0.5%		-17.3
0.0%	minimum	-17.3

Summary Statistics

Mean	-10.4
Std Dev	8.6
Std Err Mean	4.9
Upper 95% Mean	10.9
Lower 95% Mean	-31.6
N	3.0

Distributions Analyte_Detection=Zinc-65 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	36.0
99.5%		36.0
97.5%		33.9
90.0%		15.9
75.0%	quartile	13.1
50.0%	median	5.3
25.0%	quartile	-1.3
10.0%		-5.7
2.5%		-78.1
0.5%		-97.8
0.0%	minimum	-97.8

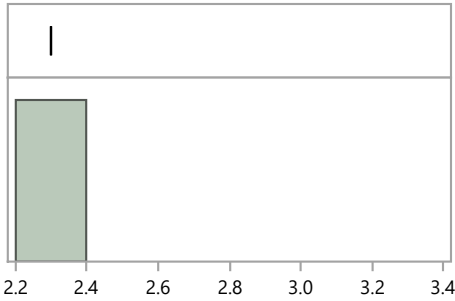
Summary Statistics

Mean	3.9
Std Dev	18.1
Std Err Mean	2.5
Upper 95% Mean	9.0
Lower 95% Mean	-1.1
N	51.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Cobalt-57 Acid dissolution with hydrofluoric acid

Bias



Quantiles

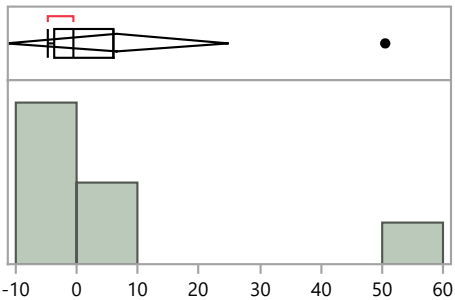
100.0%	maximum	2.3
99.5%		2.3
97.5%		2.3
90.0%		2.3
75.0%	quartile	2.3
50.0%	median	2.3
25.0%	quartile	2.3
10.0%		2.3
2.5%		2.3
0.5%		2.3
0.0%	minimum	2.3

Summary Statistics

Mean	2.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Cobalt-57 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias



Quantiles

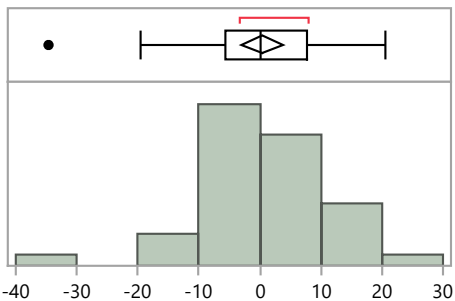
100.0%	maximum	50.5
99.5%		50.5
97.5%		50.5
90.0%		50.5
75.0%	quartile	6.0
50.0%	median	-0.4
25.0%	quartile	-3.6
10.0%		-4.7
2.5%		-4.7
0.5%		-4.7
0.0%	minimum	-4.7

Summary Statistics

Mean	6.6
Std Dev	19.7
Std Err Mean	7.4
Upper 95% Mean	24.8
Lower 95% Mean	-11.6
N	7.0

Distributions Analyte_Method=Cobalt-57 No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	20.6
99.5%		20.6
97.5%		20.5
90.0%		14.1
75.0%	quartile	7.7
50.0%	median	0.0
25.0%	quartile	-5.5
10.0%		-11.7
2.5%		-34.2
0.5%		-34.6
0.0%	minimum	-34.6

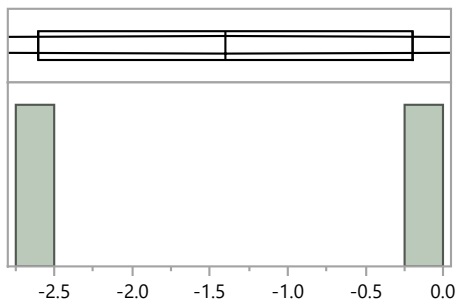
Summary Statistics

Mean	0.3
Std Dev	10.5
Std Err Mean	1.7
Upper 95% Mean	3.6
Lower 95% Mean	-3.1
N	40.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Cobalt-57 Other

Bias



Quantiles

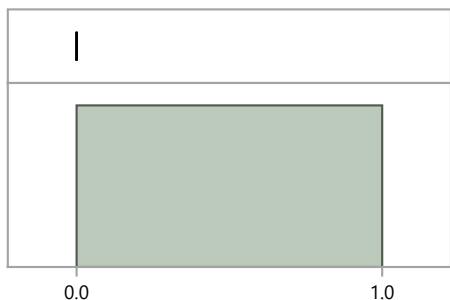
100.0%	maximum	-0.2
99.5%		-0.2
97.5%		-0.2
90.0%		-0.2
75.0%	quartile	-0.2
50.0%	median	-1.4
25.0%	quartile	-2.6
10.0%		-2.6
2.5%		-2.6
0.5%		-2.6
0.0%	minimum	-2.6

Summary Statistics

Mean	-1.4
Std Dev	1.7
Std Err Mean	1.2
Upper 95% Mean	13.8
Lower 95% Mean	-16.6
N	2.0

Distributions Analyte_Method=Cobalt-60 Acid dissolution with hydrofluoric acid

Bias



Quantiles

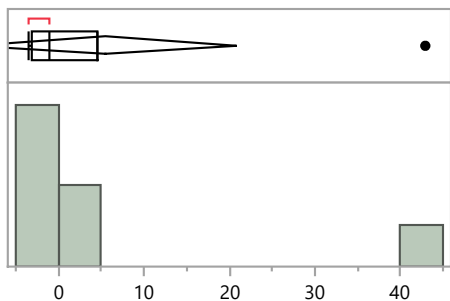
100.0%	maximum	0.0
99.5%		0.0
97.5%		0.0
90.0%		0.0
75.0%	quartile	0.0
50.0%	median	0.0
25.0%	quartile	0.0
10.0%		0.0
2.5%		0.0
0.5%		0.0
0.0%	minimum	0.0

Summary Statistics

Mean	0.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Cobalt-60 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias



Quantiles

100.0%	maximum	42.9
99.5%		42.9
97.5%		42.9
90.0%		42.9
75.0%	quartile	4.6
50.0%	median	-1.0
25.0%	quartile	-3.1
10.0%		-3.4
2.5%		-3.4
0.5%		-3.4
0.0%	minimum	-3.4

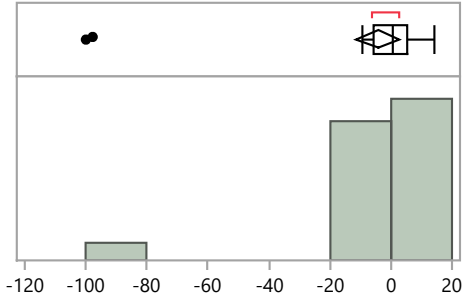
Summary Statistics

Mean	5.4
Std Dev	16.8
Std Err Mean	6.3
Upper 95% Mean	20.9
Lower 95% Mean	-10.1
N	7.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Cobalt-60 No preparation - analyzed as received

Bias



Quantiles

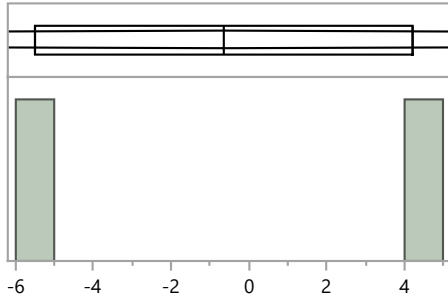
100.0%	maximum	14.4
99.5%		14.4
97.5%		14.3
90.0%		8.4
75.0%	quartile	5.5
50.0%	median	0.3
25.0%	quartile	-5.7
10.0%		-9.2
2.5%		-99.8
0.5%		-99.9
0.0%	minimum	-99.9

Summary Statistics

Mean	-4.3
Std Dev	22.5
Std Err Mean	3.5
Upper 95% Mean	2.8
Lower 95% Mean	-11.4
N	41.0

Distributions Analyte_Method=Cobalt-60 Other

Bias



Quantiles

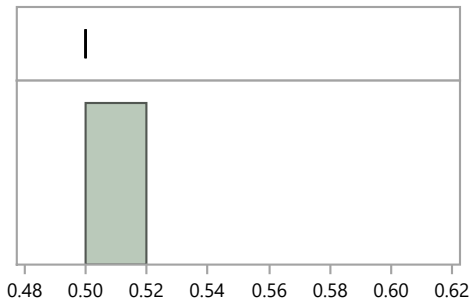
100.0%	maximum	4.2
99.5%		4.2
97.5%		4.2
90.0%		4.2
75.0%	quartile	4.2
50.0%	median	-0.7
25.0%	quartile	-5.5
10.0%		-5.5
2.5%		-5.5
0.5%		-5.5
0.0%	minimum	-5.5

Summary Statistics

Mean	-0.7
Std Dev	6.9
Std Err Mean	4.9
Upper 95% Mean	61.0
Lower 95% Mean	-62.3
N	2.0

Distributions Analyte_Method=Manganese-54 Acid dissolution with hydrofluoric acid

Bias



Quantiles

100.0%	maximum	0.5
99.5%		0.5
97.5%		0.5
90.0%		0.5
75.0%	quartile	0.5
50.0%	median	0.5
25.0%	quartile	0.5
10.0%		0.5
2.5%		0.5
0.5%		0.5
0.0%	minimum	0.5

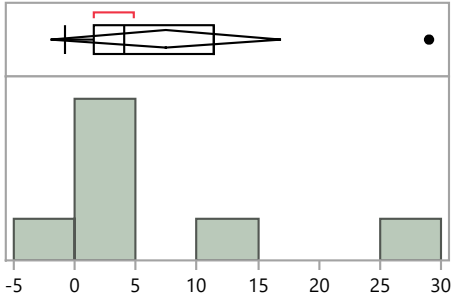
Summary Statistics

Mean	0.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Manganese-54 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias



Quantiles

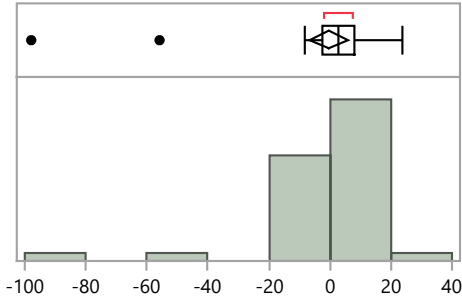
100.0%	maximum	29.0
99.5%		29.0
97.5%		29.0
90.0%		29.0
75.0%	quartile	11.4
50.0%	median	4.1
25.0%	quartile	1.6
10.0%		-0.8
2.5%		-0.8
0.5%		-0.8
0.0%	minimum	-0.8

Summary Statistics

Mean	7.5
Std Dev	10.2
Std Err Mean	3.9
Upper 95% Mean	16.9
Lower 95% Mean	-2.0
N	7.0

Distributions Analyte_Method=Manganese-54 No preparation - analyzed as received

Bias



Quantiles

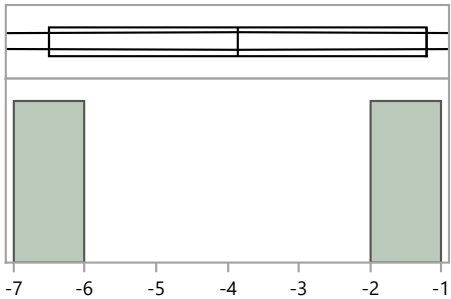
100.0%	maximum	23.8
99.5%		23.8
97.5%		23.6
90.0%		12.1
75.0%	quartile	8.1
50.0%	median	2.6
25.0%	quartile	-2.7
10.0%		-6.5
2.5%		-95.7
0.5%		-97.8
0.0%	minimum	-97.8

Summary Statistics

Mean	-0.3
Std Dev	19.5
Std Err Mean	3.0
Upper 95% Mean	5.8
Lower 95% Mean	-6.5
N	41.0

Distributions Analyte_Method=Manganese-54 Other

Bias



Quantiles

100.0%	maximum	-1.2
99.5%		-1.2
97.5%		-1.2
90.0%		-1.2
75.0%	quartile	-1.2
50.0%	median	-3.9
25.0%	quartile	-6.5
10.0%		-6.5
2.5%		-6.5
0.5%		-6.5
0.0%	minimum	-6.5

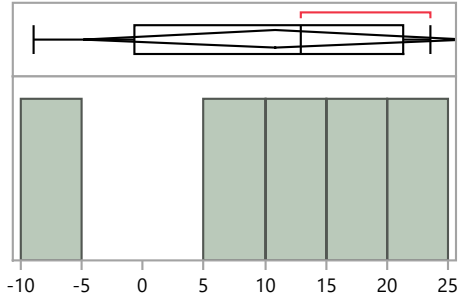
Summary Statistics

Mean	-3.9
Std Dev	3.7
Std Err Mean	2.7
Upper 95% Mean	29.8
Lower 95% Mean	-37.5
N	2.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Nickel-63 Acid dissolution with hydrofluoric acid

Bias



Quantiles

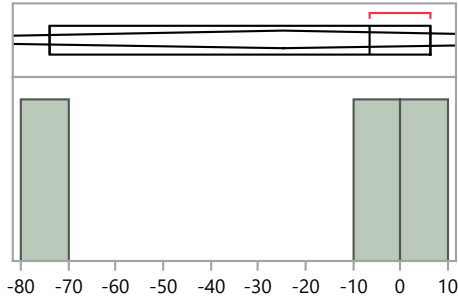
100.0%	maximum	23.5
99.5%		23.5
97.5%		23.5
90.0%		23.5
75.0%	quartile	21.4
50.0%	median	12.9
25.0%	quartile	-0.7
10.0%		-8.9
2.5%		-8.9
0.5%		-8.9
0.0%	minimum	-8.9

Summary Statistics

Mean	10.8
Std Dev	12.6
Std Err Mean	5.6
Upper 95% Mean	26.5
Lower 95% Mean	-4.8
N	5.0

Distributions Analyte_Method=Nickel-63 Acid leaching without hydrofluoric acid

Bias



Quantiles

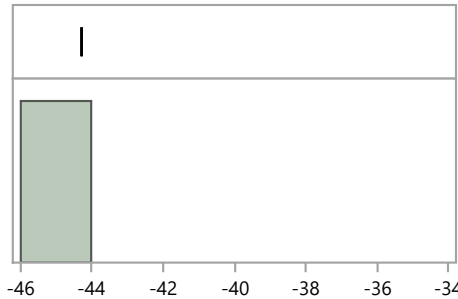
100.0%	maximum	6.2
99.5%		6.2
97.5%		6.2
90.0%		6.2
75.0%	quartile	6.2
50.0%	median	-6.5
25.0%	quartile	-74.0
10.0%		-74.0
2.5%		-74.0
0.5%		-74.0
0.0%	minimum	-74.0

Summary Statistics

Mean	-24.8
Std Dev	43.1
Std Err Mean	24.9
Upper 95% Mean	82.3
Lower 95% Mean	-131.9
N	3.0

Distributions Analyte_Method=Nickel-63 EPA 907, Actinide Elements, 600/4/80-032

Bias



Quantiles

100.0%	maximum	-44.3
99.5%		-44.3
97.5%		-44.3
90.0%		-44.3
75.0%	quartile	-44.3
50.0%	median	-44.3
25.0%	quartile	-44.3
10.0%		-44.3
2.5%		-44.3
0.5%		-44.3
0.0%	minimum	-44.3

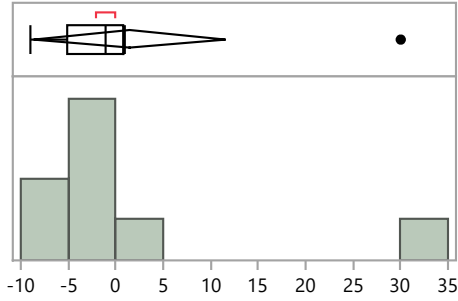
Summary Statistics

Mean	-44.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Plutonium-239/240 Acid dissolution with hydrofluoric acid

Bias



Quantiles

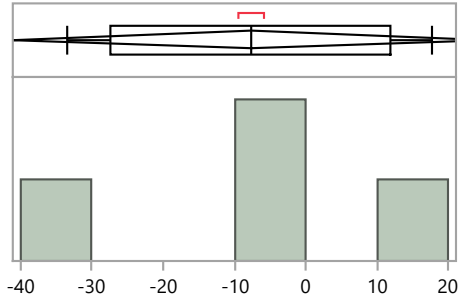
100.0%	maximum	30.0
99.5%		30.0
97.5%		30.0
90.0%		30.0
75.0%	quartile	0.7
50.0%	median	-1.1
25.0%	quartile	-5.1
10.0%		-8.9
2.5%		-8.9
0.5%		-8.9
0.0%	minimum	-8.9

Summary Statistics

Mean	1.5
Std Dev	12.0
Std Err Mean	4.2
Upper 95% Mean	11.5
Lower 95% Mean	-8.5
N	8.0

Distributions Analyte_Method=Plutonium-239/240 Acid leaching without hydrofluoric acid

Bias



Quantiles

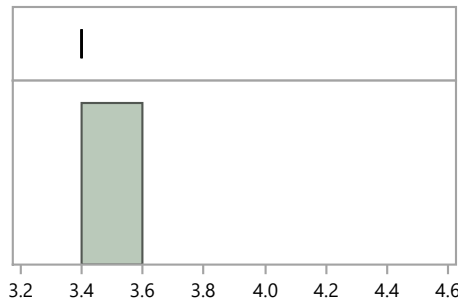
100.0%	maximum	17.8
99.5%		17.8
97.5%		17.8
90.0%		17.8
75.0%	quartile	11.9
50.0%	median	-7.7
25.0%	quartile	-27.4
10.0%		-33.4
2.5%		-33.4
0.5%		-33.4
0.0%	minimum	-33.4

Summary Statistics

Mean	-7.7
Std Dev	21.0
Std Err Mean	10.5
Upper 95% Mean	25.6
Lower 95% Mean	-41.1
N	4.0

Distributions Analyte_Method=Plutonium-239/240 EPA 907, Actinide Elements, 600/4/80-032

Bias



Quantiles

100.0%	maximum	3.4
99.5%		3.4
97.5%		3.4
90.0%		3.4
75.0%	quartile	3.4
50.0%	median	3.4
25.0%	quartile	3.4
10.0%		3.4
2.5%		3.4
0.5%		3.4
0.0%	minimum	3.4

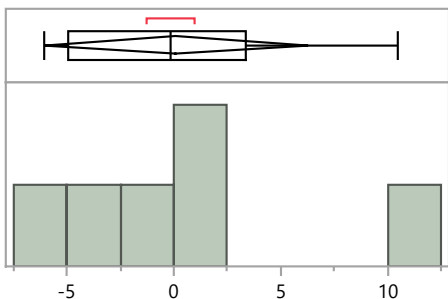
Summary Statistics

Mean	3.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Plutonium-239/240 Other

Bias



Quantiles

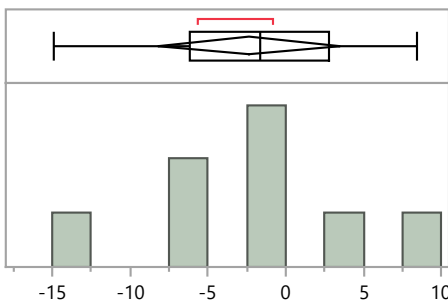
100.0%	maximum	10.5
99.5%		10.5
97.5%		10.5
90.0%		10.5
75.0%	quartile	3.4
50.0%	median	-0.2
25.0%	quartile	-5.0
10.0%		-6.1
2.5%		-6.1
0.5%		-6.1
0.0%	minimum	-6.1

Summary Statistics

Mean	0.1
Std Dev	5.9
Std Err Mean	2.4
Upper 95% Mean	6.2
Lower 95% Mean	-6.1
N	6.0

Distributions Analyte_Method=Plutonium-239/240 Total dissolution by fusion

Bias



Quantiles

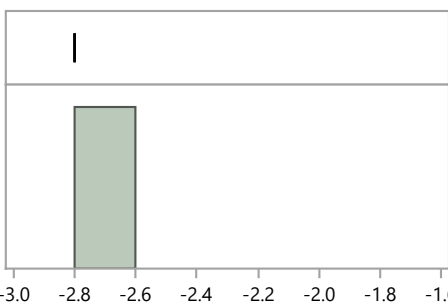
100.0%	maximum	8.4
99.5%		8.4
97.5%		8.4
90.0%		8.4
75.0%	quartile	2.8
50.0%	median	-1.6
25.0%	quartile	-6.2
10.0%		-14.9
2.5%		-14.9
0.5%		-14.9
0.0%	minimum	-14.9

Summary Statistics

Mean	-2.3
Std Dev	7.0
Std Err Mean	2.5
Upper 95% Mean	3.5
Lower 95% Mean	-8.2
N	8.0

Distributions Analyte_Method=Potassium-40 Acid dissolution with hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-2.8
99.5%		-2.8
97.5%		-2.8
90.0%		-2.8
75.0%	quartile	-2.8
50.0%	median	-2.8
25.0%	quartile	-2.8
10.0%		-2.8
2.5%		-2.8
0.5%		-2.8
0.0%	minimum	-2.8

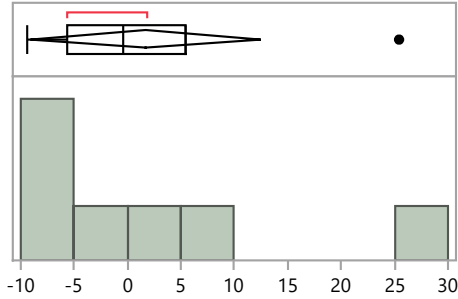
Summary Statistics

Mean	-2.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Potassium-40 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias



Quantiles

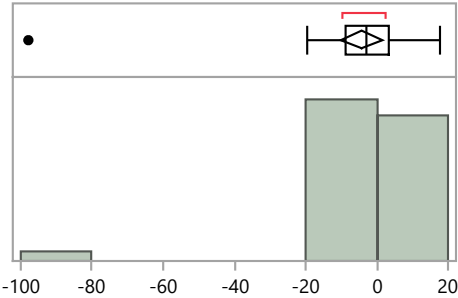
100.0%	maximum	25.4
99.5%		25.4
97.5%		25.4
90.0%		25.4
75.0%	quartile	5.4
50.0%	median	-0.4
25.0%	quartile	-5.6
10.0%		-9.4
2.5%		-9.4
0.5%		-9.4
0.0%	minimum	-9.4

Summary Statistics

Mean	1.7
Std Dev	11.6
Std Err Mean	4.4
Upper 95% Mean	12.4
Lower 95% Mean	-9.1
N	7.0

Distributions Analyte_Method=Potassium-40 No preparation - analyzed as received

Bias



Quantiles

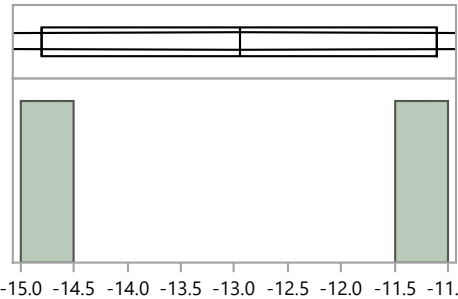
100.0%	maximum	17.8
99.5%		17.8
97.5%		17.8
90.0%		10.8
75.0%	quartile	3.5
50.0%	median	-2.8
25.0%	quartile	-8.8
10.0%		-15.9
2.5%		-97.8
0.5%		-97.8
0.0%	minimum	-97.8

Summary Statistics

Mean	-4.4
Std Dev	17.8
Std Err Mean	2.9
Upper 95% Mean	1.4
Lower 95% Mean	-10.2
N	39.0

Distributions Analyte_Method=Potassium-40 Other

Bias



Quantiles

100.0%	maximum	-11.1
99.5%		-11.1
97.5%		-11.1
90.0%		-11.1
75.0%	quartile	-11.1
50.0%	median	-13.0
25.0%	quartile	-14.8
10.0%		-14.8
2.5%		-14.8
0.5%		-14.8
0.0%	minimum	-14.8

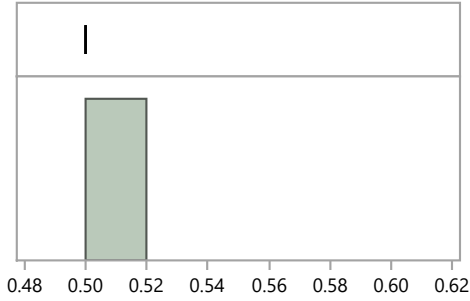
Summary Statistics

Mean	-13.0
Std Dev	2.6
Std Err Mean	1.9
Upper 95% Mean	10.6
Lower 95% Mean	-36.5
N	2.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Potassium-40 Total dissolution by fusion

Bias



Quantiles

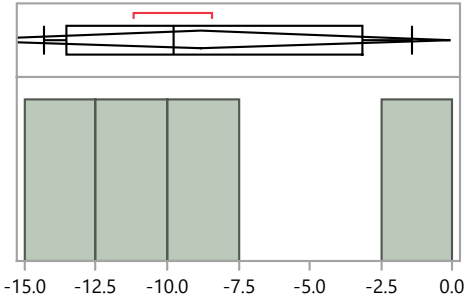
100.0%	maximum	0.5
99.5%		0.5
97.5%		0.5
90.0%		0.5
75.0%	quartile	0.5
50.0%	median	0.5
25.0%	quartile	0.5
10.0%		0.5
2.5%		0.5
0.5%		0.5
0.0%	minimum	0.5

Summary Statistics

Mean	0.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Strontium-90 Acid dissolution with hydrofluoric acid

Bias



Quantiles

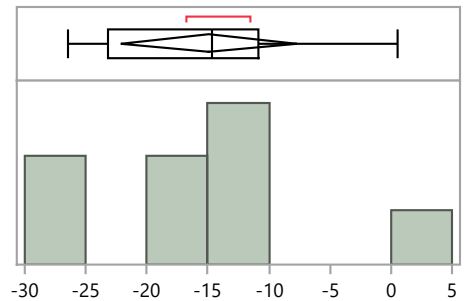
100.0%	maximum	-1.4
99.5%		-1.4
97.5%		-1.4
90.0%		-1.4
75.0%	quartile	-3.2
50.0%	median	-9.8
25.0%	quartile	-13.5
10.0%		-14.3
2.5%		-14.3
0.5%		-14.3
0.0%	minimum	-14.3

Summary Statistics

Mean	-8.8
Std Dev	5.5
Std Err Mean	2.8
Upper 95% Mean	-0.1
Lower 95% Mean	-17.6
N	4.0

Distributions Analyte_Method=Strontium-90 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	0.5
99.5%		0.5
97.5%		0.5
90.0%		0.5
75.0%	quartile	-10.9
50.0%	median	-14.7
25.0%	quartile	-23.2
10.0%		-26.5
2.5%		-26.5
0.5%		-26.5
0.0%	minimum	-26.5

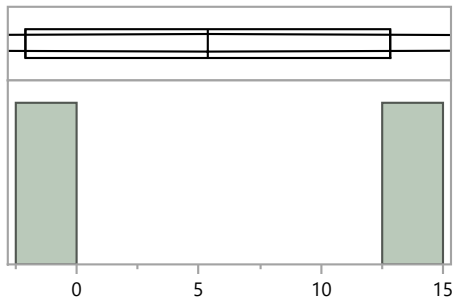
Summary Statistics

Mean	-15.0
Std Dev	8.6
Std Err Mean	3.0
Upper 95% Mean	-7.8
Lower 95% Mean	-22.1
N	8.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Strontium-90 EPA 905, Radioactive Strontium, 600/4-80-032

Bias



Quantiles

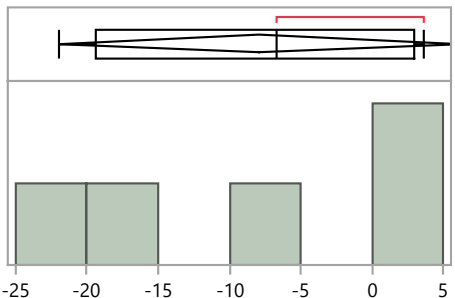
100.0%	maximum	12.8
99.5%		12.8
97.5%		12.8
90.0%		12.8
75.0%	quartile	12.8
50.0%	median	5.4
25.0%	quartile	-2.1
10.0%		-2.1
2.5%		-2.1
0.5%		-2.1
0.0%	minimum	-2.1

Summary Statistics

Mean	5.4
Std Dev	10.5
Std Err Mean	7.5
Upper 95% Mean	100.0
Lower 95% Mean	-89.3
N	2.0

Distributions Analyte_Method=Strontium-90 Other

Bias



Quantiles

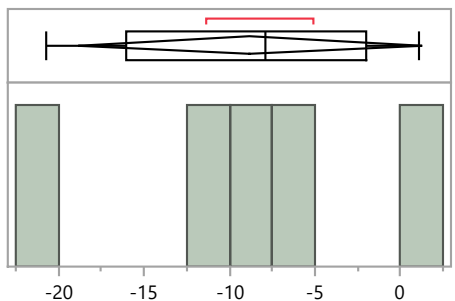
100.0%	maximum	3.6
99.5%		3.6
97.5%		3.6
90.0%		3.6
75.0%	quartile	3.0
50.0%	median	-6.7
25.0%	quartile	-19.4
10.0%		-22.0
2.5%		-22.0
0.5%		-22.0
0.0%	minimum	-22.0

Summary Statistics

Mean	-7.9
Std Dev	11.4
Std Err Mean	5.1
Upper 95% Mean	6.2
Lower 95% Mean	-22.0
N	5.0

Distributions Analyte_Method=Strontium-90 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	1.1
99.5%		1.1
97.5%		1.1
90.0%		1.1
75.0%	quartile	-2.0
50.0%	median	-7.9
25.0%	quartile	-16.1
10.0%		-20.7
2.5%		-20.7
0.5%		-20.7
0.0%	minimum	-20.7

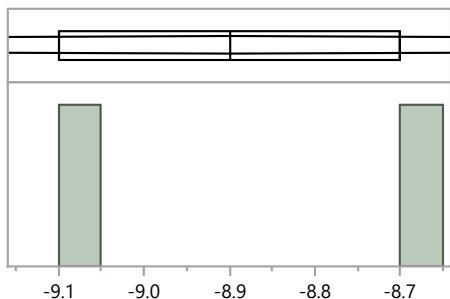
Summary Statistics

Mean	-8.8
Std Dev	8.1
Std Err Mean	3.6
Upper 95% Mean	1.2
Lower 95% Mean	-18.8
N	5.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Technetium-99 Acid dissolution with hydrofluoric acid

Bias



Quantiles

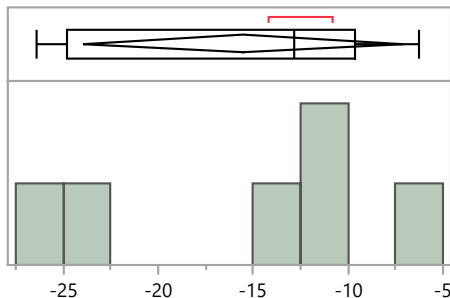
100.0%	maximum	-8.7
99.5%		-8.7
97.5%		-8.7
90.0%		-8.7
75.0%	quartile	-8.7
50.0%	median	-8.9
25.0%	quartile	-9.1
10.0%		-9.1
2.5%		-9.1
0.5%		-9.1
0.0%	minimum	-9.1

Summary Statistics

Mean	-8.9
Std Dev	0.3
Std Err Mean	0.2
Upper 95% Mean	-6.4
Lower 95% Mean	-11.4
N	2.0

Distributions Analyte_Method=Technetium-99 Acid leaching without hydrofluoric acid

Bias



Quantiles

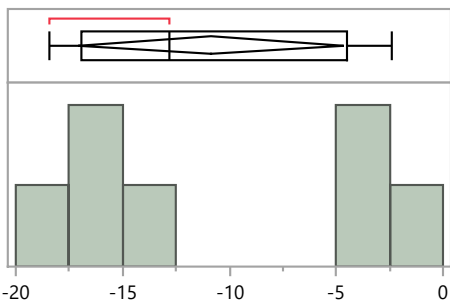
100.0%	maximum	-6.3
99.5%		-6.3
97.5%		-6.3
90.0%		-6.3
75.0%	quartile	-9.7
50.0%	median	-12.8
25.0%	quartile	-24.8
10.0%		-26.4
2.5%		-26.4
0.5%		-26.4
0.0%	minimum	-26.4

Summary Statistics

Mean	-15.6
Std Dev	8.0
Std Err Mean	3.3
Upper 95% Mean	-7.2
Lower 95% Mean	-24.0
N	6.0

Distributions Analyte_Method=Technetium-99 Other

Bias



Quantiles

100.0%	maximum	-2.4
99.5%		-2.4
97.5%		-2.4
90.0%		-2.4
75.0%	quartile	-4.5
50.0%	median	-12.8
25.0%	quartile	-16.9
10.0%		-18.4
2.5%		-18.4
0.5%		-18.4
0.0%	minimum	-18.4

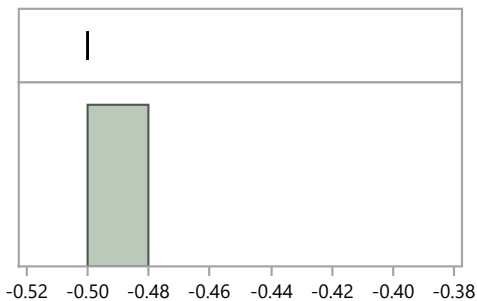
Summary Statistics

Mean	-10.8
Std Dev	6.7
Std Err Mean	2.5
Upper 95% Mean	-4.7
Lower 95% Mean	-17.0
N	7.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Technetium-99 Total dissolution by fusion

Bias



Quantiles

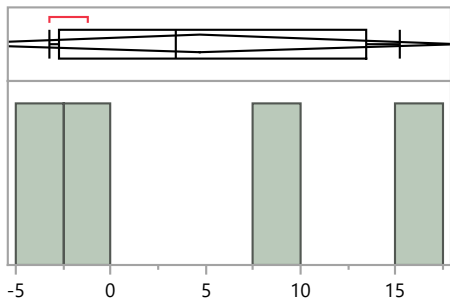
100.0%	maximum	-0.5
99.5%		-0.5
97.5%		-0.5
90.0%		-0.5
75.0%	quartile	-0.5
50.0%	median	-0.5
25.0%	quartile	-0.5
10.0%		-0.5
2.5%		-0.5
0.5%		-0.5
0.0%	minimum	-0.5

Summary Statistics

Mean	-0.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Thorium-228 Acid dissolution with hydrofluoric acid

Bias



Quantiles

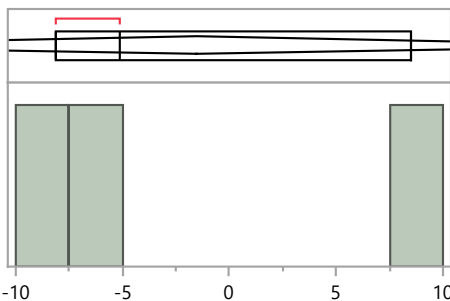
100.0%	maximum	15.2
99.5%		15.2
97.5%		15.2
90.0%		15.2
75.0%	quartile	13.4
50.0%	median	3.5
25.0%	quartile	-2.7
10.0%		-3.2
2.5%		-3.2
0.5%		-3.2
0.0%	minimum	-3.2

Summary Statistics

Mean	4.7
Std Dev	8.5
Std Err Mean	4.3
Upper 95% Mean	18.3
Lower 95% Mean	-8.9
N	4.0

Distributions Analyte_Method=Thorium-228 Other

Bias



Quantiles

100.0%	maximum	8.5
99.5%		8.5
97.5%		8.5
90.0%		8.5
75.0%	quartile	8.5
50.0%	median	-5.1
25.0%	quartile	-8.1
10.0%		-8.1
2.5%		-8.1
0.5%		-8.1
0.0%	minimum	-8.1

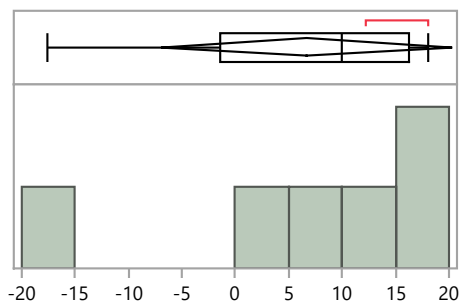
Summary Statistics

Mean	-1.6
Std Dev	8.8
Std Err Mean	5.1
Upper 95% Mean	20.4
Lower 95% Mean	-23.5
N	3.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Thorium-228 Total dissolution by fusion

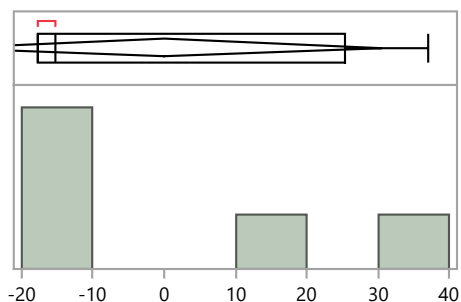
Bias



Quantiles			Summary Statistics	
100.0%	maximum	18.0	Mean	6.6
99.5%		18.0	Std Dev	12.9
97.5%		18.0	Std Err Mean	5.3
90.0%		18.0	Upper 95% Mean	20.2
75.0%	quartile	16.3	Lower 95% Mean	-7.0
50.0%	median	9.9	N	6.0
25.0%	quartile	-1.5		
10.0%		-17.6		
2.5%		-17.6		
0.5%		-17.6		
0.0%	minimum	-17.6		

Distributions Analyte_Method=Thorium-230 Acid dissolution with hydrofluoric acid

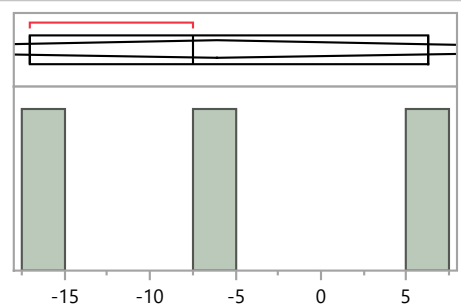
Bias



Quantiles			Summary Statistics	
100.0%	maximum	37.0	Mean	0.1
99.5%		37.0	Std Dev	24.6
97.5%		37.0	Std Err Mean	11.0
90.0%		37.0	Upper 95% Mean	30.6
75.0%	quartile	25.4	Lower 95% Mean	-30.4
50.0%	median	-15.2	N	5.0
25.0%	quartile	-17.7		
10.0%		-17.8		
2.5%		-17.8		
0.5%		-17.8		
0.0%	minimum	-17.8		

Distributions Analyte_Method=Thorium-230 Other

Bias

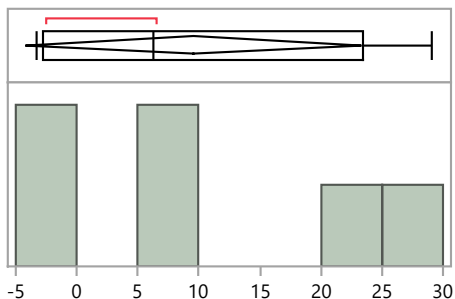


Quantiles			Summary Statistics	
100.0%	maximum	6.3	Mean	-6.1
99.5%		6.3	Std Dev	11.7
97.5%		6.3	Std Err Mean	6.8
90.0%		6.3	Upper 95% Mean	23.0
75.0%	quartile	6.3	Lower 95% Mean	-35.2
50.0%	median	-7.5	N	3.0
25.0%	quartile	-17.0		
10.0%		-17.0		
2.5%		-17.0		
0.5%		-17.0		
0.0%	minimum	-17.0		

MaS Distribution by Preparation Method

Distributions Analyte_Method=Thorium-230 Total dissolution by fusion

Bias



Quantiles

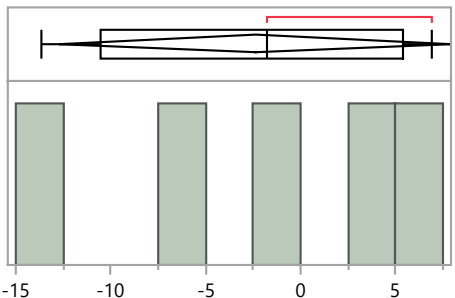
100.0%	maximum	29.1
99.5%		29.1
97.5%		29.1
90.0%		29.1
75.0%	quartile	23.4
50.0%	median	6.3
25.0%	quartile	-2.7
10.0%		-3.3
2.5%		-3.3
0.5%		-3.3
0.0%	minimum	-3.3

Summary Statistics

Mean	9.6
Std Dev	13.1
Std Err Mean	5.3
Upper 95% Mean	23.3
Lower 95% Mean	-4.2
N	6.0

Distributions Analyte_Method=Thorium-232 Acid dissolution with hydrofluoric acid

Bias



Quantiles

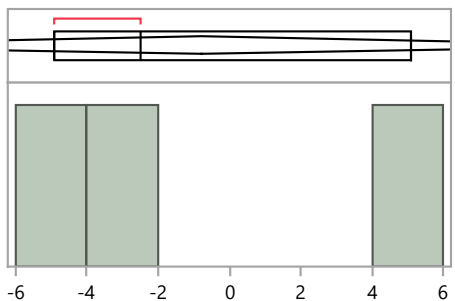
100.0%	maximum	6.9
99.5%		6.9
97.5%		6.9
90.0%		6.9
75.0%	quartile	5.4
50.0%	median	-1.8
25.0%	quartile	-10.5
10.0%		-13.6
2.5%		-13.6
0.5%		-13.6
0.0%	minimum	-13.6

Summary Statistics

Mean	-2.4
Std Dev	8.3
Std Err Mean	3.7
Upper 95% Mean	7.9
Lower 95% Mean	-12.7
N	5.0

Distributions Analyte_Method=Thorium-232 Other

Bias



Quantiles

100.0%	maximum	5.1
99.5%		5.1
97.5%		5.1
90.0%		5.1
75.0%	quartile	5.1
50.0%	median	-2.5
25.0%	quartile	-4.9
10.0%		-4.9
2.5%		-4.9
0.5%		-4.9
0.0%	minimum	-4.9

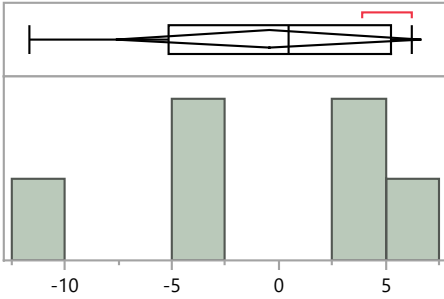
Summary Statistics

Mean	-0.8
Std Dev	5.2
Std Err Mean	3.0
Upper 95% Mean	12.2
Lower 95% Mean	-13.7
N	3.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Thorium-232 Total dissolution by fusion

Bias



Quantiles

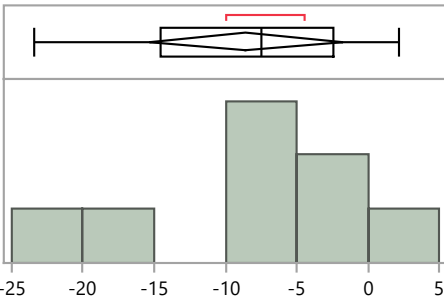
100.0%	maximum	6.2
99.5%		6.2
97.5%		6.2
90.0%		6.2
75.0%	quartile	5.2
50.0%	median	0.5
25.0%	quartile	-5.2
10.0%		-11.7
2.5%		-11.7
0.5%		-11.7
0.0%	minimum	-11.7

Summary Statistics

Mean	-0.4
Std Dev	6.8
Std Err Mean	2.8
Upper 95% Mean	6.7
Lower 95% Mean	-7.6
N	6.0

Distributions Analyte_Method=Uranium-234 Acid dissolution with hydrofluoric acid

Bias



Quantiles

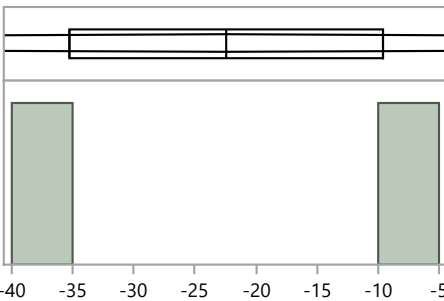
100.0%	maximum	2.2
99.5%		2.2
97.5%		2.2
90.0%		2.2
75.0%	quartile	-2.4
50.0%	median	-7.5
25.0%	quartile	-14.6
10.0%		-23.4
2.5%		-23.4
0.5%		-23.4
0.0%	minimum	-23.4

Summary Statistics

Mean	-8.6
Std Dev	8.2
Std Err Mean	2.9
Upper 95% Mean	-1.7
Lower 95% Mean	-15.4
N	8.0

Distributions Analyte_Method=Uranium-234 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-9.6
99.5%		-9.6
97.5%		-9.6
90.0%		-9.6
75.0%	quartile	-9.6
50.0%	median	-22.4
25.0%	quartile	-35.2
10.0%		-35.2
2.5%		-35.2
0.5%		-35.2
0.0%	minimum	-35.2

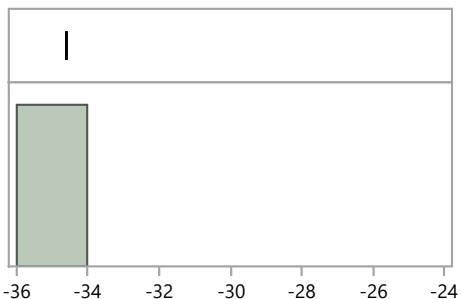
Summary Statistics

Mean	-22.4
Std Dev	18.1
Std Err Mean	12.8
Upper 95% Mean	140.2
Lower 95% Mean	-185.0
N	2.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Uranium-234 EPA 908, Uranium-Radiochemical Method, 600/4/80-032

Bias



Quantiles

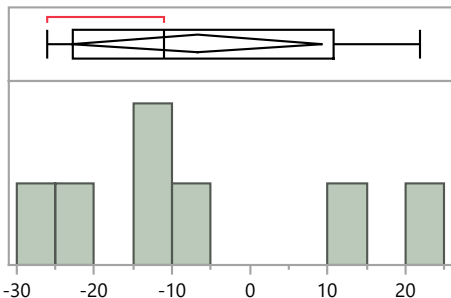
100.0%	maximum	-34.6
99.5%		-34.6
97.5%		-34.6
90.0%		-34.6
75.0%	quartile	-34.6
50.0%	median	-34.6
25.0%	quartile	-34.6
10.0%		-34.6
2.5%		-34.6
0.5%		-34.6
0.0%	minimum	-34.6

Summary Statistics

Mean	-34.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Uranium-234 Other

Bias



Quantiles

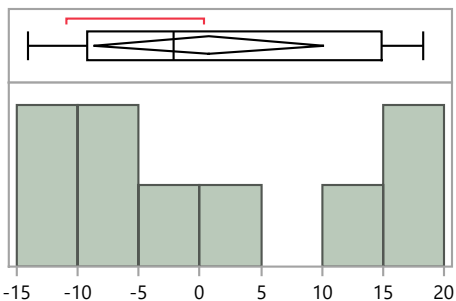
100.0%	maximum	21.9
99.5%		21.9
97.5%		21.9
90.0%		21.9
75.0%	quartile	10.8
50.0%	median	-11.0
25.0%	quartile	-22.7
10.0%		-26.0
2.5%		-26.0
0.5%		-26.0
0.0%	minimum	-26.0

Summary Statistics

Mean	-6.7
Std Dev	17.5
Std Err Mean	6.6
Upper 95% Mean	9.4
Lower 95% Mean	-22.9
N	7.0

Distributions Analyte_Method=Uranium-234 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	18.3
99.5%		18.3
97.5%		18.3
90.0%		18.3
75.0%	quartile	14.9
50.0%	median	-2.2
25.0%	quartile	-9.2
10.0%		-14.1
2.5%		-14.1
0.5%		-14.1
0.0%	minimum	-14.1

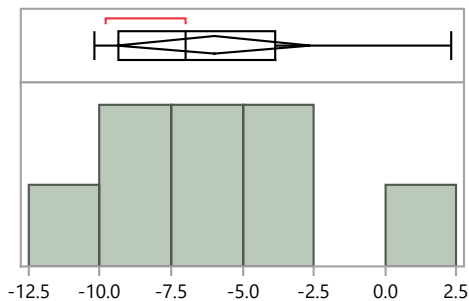
Summary Statistics

Mean	0.7
Std Dev	12.3
Std Err Mean	4.1
Upper 95% Mean	10.1
Lower 95% Mean	-8.7
N	9.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Uranium-238 Acid dissolution with hydrofluoric acid

Bias



Quantiles

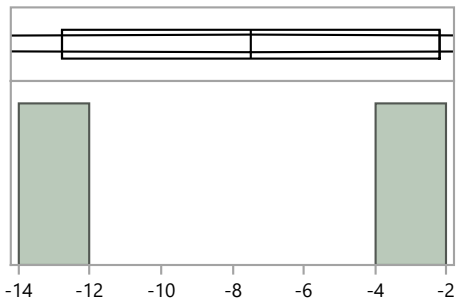
100.0%	maximum	2.3
99.5%		2.3
97.5%		2.3
90.0%		2.3
75.0%	quartile	-3.9
50.0%	median	-7.0
25.0%	quartile	-9.4
10.0%		-10.2
2.5%		-10.2
0.5%		-10.2
0.0%	minimum	-10.2

Summary Statistics

Mean	-6.0
Std Dev	4.1
Std Err Mean	1.4
Upper 95% Mean	-2.6
Lower 95% Mean	-9.4
N	8.0

Distributions Analyte_Method=Uranium-238 Acid leaching without hydrofluoric acid

Bias



Quantiles

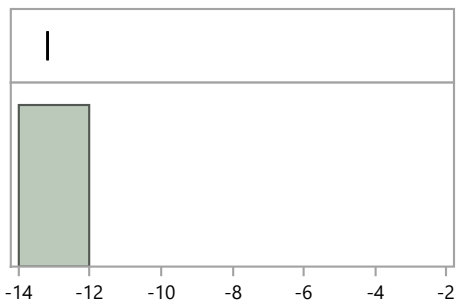
100.0%	maximum	-2.2
99.5%		-2.2
97.5%		-2.2
90.0%		-2.2
75.0%	quartile	-2.2
50.0%	median	-7.5
25.0%	quartile	-12.8
10.0%		-12.8
2.5%		-12.8
0.5%		-12.8
0.0%	minimum	-12.8

Summary Statistics

Mean	-7.5
Std Dev	7.5
Std Err Mean	5.3
Upper 95% Mean	59.8
Lower 95% Mean	-74.8
N	2.0

Distributions Analyte_Method=Uranium-238 EPA 908, Uranium-Radiochemical Method, 600/4/80-032

Bias



Quantiles

100.0%	maximum	-13.2
99.5%		-13.2
97.5%		-13.2
90.0%		-13.2
75.0%	quartile	-13.2
50.0%	median	-13.2
25.0%	quartile	-13.2
10.0%		-13.2
2.5%		-13.2
0.5%		-13.2
0.0%	minimum	-13.2

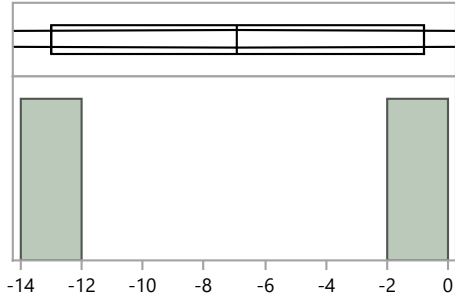
Summary Statistics

Mean	-13.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Uranium-238 No preparation - analyzed as received

Bias



Quantiles

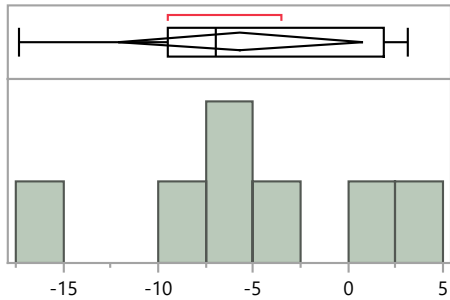
100.0%	maximum	-0.8
99.5%		-0.8
97.5%		-0.8
90.0%		-0.8
75.0%	quartile	-0.8
50.0%	median	-6.9
25.0%	quartile	-13.0
10.0%		-13.0
2.5%		-13.0
0.5%		-13.0
0.0%	minimum	-13.0

Summary Statistics

Mean	-6.9
Std Dev	8.6
Std Err Mean	6.1
Upper 95% Mean	70.6
Lower 95% Mean	-84.4
N	2.0

Distributions Analyte_Method=Uranium-238 Other

Bias



Quantiles

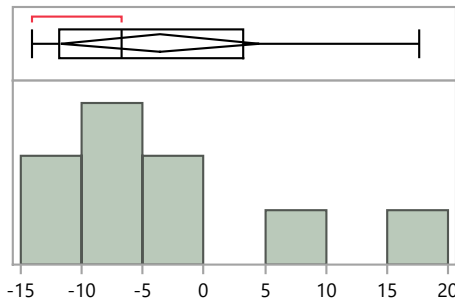
100.0%	maximum	3.1
99.5%		3.1
97.5%		3.1
90.0%		3.1
75.0%	quartile	1.9
50.0%	median	-7.0
25.0%	quartile	-9.5
10.0%		-17.3
2.5%		-17.3
0.5%		-17.3
0.0%	minimum	-17.3

Summary Statistics

Mean	-5.7
Std Dev	7.0
Std Err Mean	2.6
Upper 95% Mean	0.8
Lower 95% Mean	-12.1
N	7.0

Distributions Analyte_Method=Uranium-238 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	17.6
99.5%		17.6
97.5%		17.6
90.0%		17.6
75.0%	quartile	3.3
50.0%	median	-6.7
25.0%	quartile	-11.9
10.0%		-14.0
2.5%		-14.0
0.5%		-14.0
0.0%	minimum	-14.0

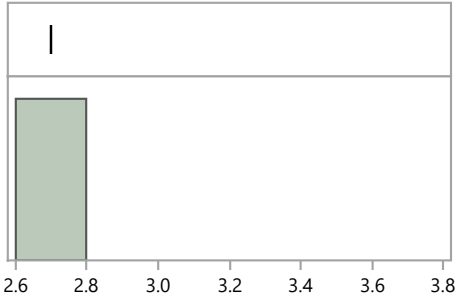
Summary Statistics

Mean	-3.6
Std Dev	10.5
Std Err Mean	3.5
Upper 95% Mean	4.5
Lower 95% Mean	-11.7
N	9.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Zinc-65 Acid dissolution with hydrofluoric acid

Bias



Quantiles

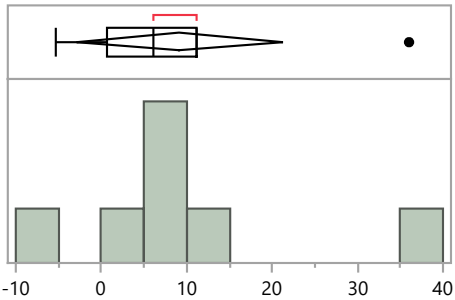
100.0%	maximum	2.7
99.5%		2.7
97.5%		2.7
90.0%		2.7
75.0%	quartile	2.7
50.0%	median	2.7
25.0%	quartile	2.7
10.0%		2.7
2.5%		2.7
0.5%		2.7
0.0%	minimum	2.7

Summary Statistics

Mean	2.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Zinc-65 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias



Quantiles

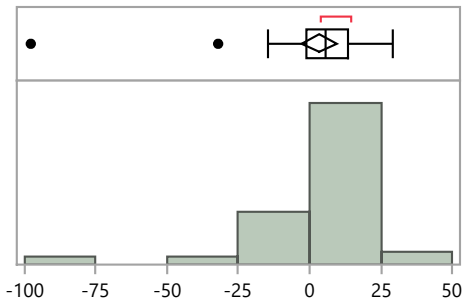
100.0%	maximum	36.0
99.5%		36.0
97.5%		36.0
90.0%		36.0
75.0%	quartile	11.2
50.0%	median	6.1
25.0%	quartile	0.7
10.0%		-5.2
2.5%		-5.2
0.5%		-5.2
0.0%	minimum	-5.2

Summary Statistics

Mean	9.1
Std Dev	13.0
Std Err Mean	4.9
Upper 95% Mean	21.2
Lower 95% Mean	-2.9
N	7.0

Distributions Analyte_Method=Zinc-65 No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	29.0
99.5%		29.0
97.5%		28.9
90.0%		15.9
75.0%	quartile	13.4
50.0%	median	5.3
25.0%	quartile	-1.0
10.0%		-5.9
2.5%		-94.5
0.5%		-97.8
0.0%	minimum	-97.8

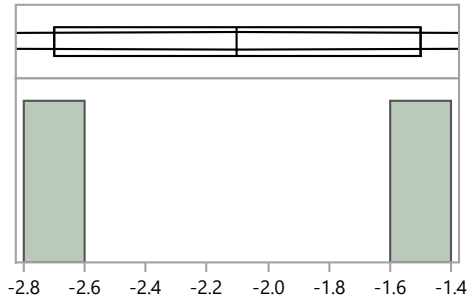
Summary Statistics

Mean	3.4
Std Dev	19.4
Std Err Mean	3.0
Upper 95% Mean	9.5
Lower 95% Mean	-2.7
N	41.0

MaS Distribution by Preparation Method

Distributions Analyte_Method=Zinc-65 Other

Bias



Quantiles

Quantile	Value
100.0% maximum	-1.5
99.5%	-1.5
97.5%	-1.5
90.0%	-1.5
75.0% quartile	-1.5
50.0% median	-2.1
25.0% quartile	-2.7
10.0%	-2.7
2.5%	-2.7
0.5%	-2.7
0.0% minimum	-2.7

Summary Statistics

Mean	-2.1
Std Dev	0.8
Std Err Mean	0.6
Upper 95% Mean	5.5
Lower 95% Mean	-9.7
N	2.0