

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.

MaS45 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
ANTE01	ALS Environmental - Fort Collins, CO	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
EULC01	EnergySolutions, LLC	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	PHE, CRCE Glasgow	MaS
HPAL01	Los Alamos National 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
JAEC99	Research Laboratories and Information Directorate	MaS
JLNN01	Jefferson Laboratory	MaS
LANL01	Los Alamos National Laboratory	MaS
LAWR01	LAWRENCE BERKELEY NATIONAL LABORATORY	MaS
LOCK03	Advanced Test Reactor (ATR) Complex Radioanalytical Laboratory	MaS
MART03	Radioactive Material Analysis Laboratory	MaS
MDPH01	MDPH-Radiation Control Program	MaS
NARL01	National Analytical Radiation Environmental Laboratory	MaS
NARL02	USEPA - NAREL - MERL	MaS
NESI01	BWXT-Radioisotope & Analytical Chemistry Laboratory	MaS
NJDH01	New Jersey Dept. of Health, PHEL, ECLS	MaS
NOCS99	National Oceanography Centre, Southampton	MaS
ODHL01	Ohio Department of Health Laboratory	MaS
ORIS01	ORISE/IEAV	MaS
OTLI01	Pace Analytical National Center for Testing & Innovation	MaS
QUAN02	Eurofins TestAmerica Knoxville	MaS

RAVR99	Radiactividad Ambiental y Vigilancia Radiologica	MaS
RJLG01	RJ Lee Group - Columbia Basin Analytical Laboratories (CBAL)	MaS
SANC99	RadioAnalysis, South Africa Nuclear Energy Corp.	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
UNEV01	University of Nevada, Reno	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
CORE02	Eurofins TestAmerica Denver	MaS
CSSL99	Chemistry Support Services	MaS
EMAX01	EMAX Laboratories, Inc	MaS
FSCL01	Forensic Science Center Lawrence Livermore Laboratory	MaS
MART01	Fluor B&W Ports Analytical Laboratory	MaS
MSDH01	Mississippi State Dept of Health	MaS
RPSC01	Radiation Protection Service	MaS

Study Reference Values

MAPEP-21-MaS45

Radiological Reference Date: 08/01/2021

Analyte	Ref Value	Ref Unc	Tot Mtl Ref Val	Tot Mtl Ref Unc
Units: (mg/kg)				
Inorganic				
Antimony	29.9	1.2	33.1	0.3
Arsenic	20.2	0.4	20.2	0.4
Barium	144	3	610	20
Beryllium	20.8	0.4	22.5	0.7
Cadmium	16.4	0.3	16.4	0.3
Chromium	53.3	1.0	76	5
Cobalt	149	3	154	3
Copper	197	4	207	4
Lead	72.0	1.3	78.7	1.5
Mercury	0.215	0.004	0.215	0.004
Nickel	124	2	143	5
Selenium	13.1	0.3	13.1	0.3
Silver	59.9	0.9	59.9	1.2
Technetium-99	0.00123	0.00003		
Thallium	30.1	0.6	30.3	0.6
Uranium-235	0.0391	0.0014		
Uranium-238	13.5	0.5		
Uranium-Total	13.6	0.5		
Vanadium	201	4	275	5
Zinc	317	11	373	13

Analyte	Ref Value	Ref Unc		
Units: (Bq/kg)				
Radiological				
Americium-241	98	2		
Cesium-134	1170	30		
Cesium-137	572	12		
Cobalt-60	722	18		
Iron-55	1020	30		
Manganese-54	410	10		
Nickel-63	1280	30		
Plutonium-238	59.8	1.1		
Plutonium-239/240	71.3	1.3		
Potassium-40	607	19		
Technetium-99	777	19		
Uranium-234	51.4	1.7		
Uranium-238	168	6		
Zinc-65	907	23		

Sample Statistical Summary

MAPEP-21-MaS45

Radiological Reference Date: 08/01/2021

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
Inorganic							Units: (mg/kg)
Antimony	12	9	27.5	3.5	29.9	1.2	20.9 - 38.9
Arsenic	13	10	17.1	1.8	20.2	0.4	14.1 - 26.3
Barium	12	11	145	19	144	3	101 - 187
Beryllium	13	12	20.4	1.8	20.8	0.4	14.6 - 27.0
Cadmium	12	11	15.4	0.7	16.4	0.3	11.5 - 21.3
Chromium	12	12	49.4	4.1	53.3	1.0	37.3 - 69.3
Cobalt	13	13	139	10	149	3	104 - 194
Copper	13	13	188	10	197	4	138 - 256
Lead	13	13	69.6	3.4	72.0	1.3	50.4 - 93.6
Mercury	11	10	0.217	0.022	0.215	0.004	0.151 - 0.280
Nickel	13	13	119	9	124	2	87 - 161
Selenium	13	11	11.7	1.3	13.1	0.3	9.2 - 17.0
Silver	11	10	52.9	6.3	59.9	0.9	41.9 - 77.9
Technetium-99	2	2			0.00123	0.00003	0.00086 - 0.00160
Thallium	13	13	29.1	2.6	30.1	0.6	21.1 - 39.1
Uranium-235	9	9	0.0397	0.0035	0.0391	0.0014	0.0274 - 0.0508
Uranium-238	10	10	13.9	1.2	13.5	0.5	9.5 - 17.6
Uranium-Total	13	13	13.2	1.5	13.6	0.5	9.5 - 17.7
Vanadium	12	11	185	22	201	4	141 - 261
Zinc	13	12	313	26	317	11	222 - 412

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
Radiological							Units: (Bq/kg)
Americium-241	37	36	91	9	98	2	69 - 127
Cesium-134	56	52	1118	99	1170	30	819 - 1521
Cesium-137	56	56	599	36	572	12	400 - 744
Cobalt-57	51	47					False Positive Test
Cobalt-60	56	56	724	55	722	18	505 - 939
Iron-55	9	8	932	160	1020	30	714 - 1326
Manganese-54	56	56	423	35	410	10	287 - 533
Nickel-63	13	10	1214	90	1280	30	896 - 1664
Plutonium-238	27	27	60.0	5.6	59.8	1.1	41.9 - 77.7
Plutonium-239/240	27	25	69.9	4.8	71.3	1.3	49.9 - 92.7
Potassium-40	56	54	615	61	607	19	425 - 789
Strontium-90	27	25					False Positive Test
Technetium-99	18	12	711	118	777	19	544 - 1010
Uranium-234	29	26	49.5	4.7	51.4	1.7	36.0 - 66.8
Uranium-238	30	30	161	16	168	6	118 - 218
Zinc-65	56	54	950	78	907	23	635 - 1179

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.....|Bias| <= 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-21-MaS45

Inorganic				
Analyte	A	W	RW	N
Antimony	8	1		3
Arsenic	8	2		3
Barium	9	2		1
Beryllium	12			1
Cadmium	11			1
Chromium	11	1		
Cobalt	13			
Copper	13			
Lead	13			
Mercury	10			1
Nickel	13			
Selenium	7	4		2
Silver	8	2		1
Thallium	13			
Uranium-Total	11	2		
Uranium-235	9			
Uranium-238	10			
Vanadium	10	1		1
Zinc	12			1
Technetium-99	2			

Radiological				
Analyte	A	W	RW	N
Americium-241	34	2		1
Cesium-134	48	4		2
Cesium-137	55	1		
Cobalt-57	47			8
Cobalt-60	54	2		
Iron-55	4	4		1
Manganese-54	53	3		
Nickel-63	10			3
Plutonium-238	26	1		
Plutonium-239/240	25			2
Potassium-40	51	3		2
Strontium-90	25			2
Technetium-99	7	5		6
Uranium-234	25	1		3
Uranium-238	27	3		
Zinc-65	51	3		2



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

Laboratory Results For MAPEP-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	114.5	98	A		16.8	69 - 127	4.175	A
Cesium-134	NR	1170	N	(25)		819 - 1521		
Cesium-137	592	572	A		3.5	400 - 744	16.95	A
Cobalt-57	NR		N	(11)		False Positive Test		
Cobalt-60	682	722	A		-5.5	505 - 939	12.825	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	514	410	W		25.4	287 - 533	18.8	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	467	607	W		-23.1	425 - 789	28.17	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	1085	907	A		19.6	635 - 1179	34.55	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	96.0	98	A		-2.0	69 - 127	5.0	A
Cesium-134	1095	1170	A		-6.4	819 - 1521	22	A
Cesium-137	546	572	A		-4.5	400 - 744	11	A
Cobalt-57	1.14		A			False Positive Test	0.76	
Cobalt-60	677	722	A		-6.2	505 - 939	14	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	379	410	A		-7.6	287 - 533	8	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	62.0	59.8	A		3.7	41.9 - 77.7	3.5	A
Plutonium-239/240	74.0	71.3	A		3.8	49.9 - 92.7	4.0	A
Potassium-40	532	607	A		-12.4	425 - 789	14	A
Strontium-90	16		A			False Positive Test	8	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	48.0	51.4	A		-6.6	36.0 - 66.8	3.0	A
Uranium-238	164	168	A		-2.4	118 - 218	7	A
Zinc-65	852	907	A		-6.1	635 - 1179	17	N

Radiological Reference Date: August 1, 2021

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

Laboratory Results For MAPEP-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	89.6	98	A		-8.6	69 - 127	3.5	A
Cesium-134	1096	1170	A		-6.3	819 - 1521	26	A
Cesium-137	575	572	A		0.5	400 - 744	15	A
Cobalt-57	0.33		A			False Positive Test	0.59	
Cobalt-60	656	722	A		-9.1	505 - 939	82	A
Iron-55	1230	1020	W		20.6	714 - 1326	110	A
Manganese-54	420	410	A		2.4	287 - 533	11	A
Nickel-63	736	1280	N		-42.5	896 - 1664	77	A
Plutonium-238	58.7	59.8	A		-1.8	41.9 - 77.7	2.9	A
Plutonium-239/240	65.9	71.3	A		-7.6	49.9 - 92.7	3.2	A
Potassium-40	611	607	A		0.7	425 - 789	26	A
Strontium-90	18		A			False Positive Test	15	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	583	777	W		-25.0	544 - 1010	68	A
Uranium-234	48.0	51.4	A		-6.6	36.0 - 66.8	1.7	A
Uranium-238	161.0	168	A		-4.2	118 - 218	4.5	A
Zinc-65	709	907	W		-21.8	635 - 1179	19	A

Radiological Reference Date: August 1, 2021

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:

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 - 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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (ANTE01) ALS Environmental - Fort Collins, CO
 225 Commerce Drive
 Fort Collins, CO 80524-1416

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	29.1	29.9	A		-2.7	20.9 - 38.9	1.019013	A
Arsenic	16.3	20.2	A		-19.3	14.1 - 26.3	0.675422	A
Barium	137	144	A		-4.9	101 - 187	4.814880	A
Beryllium	18.9	20.8	A		-9.1	14.6 - 27.0	0.532524	A
Cadmium	14.8	16.4	A		-9.8	11.5 - 21.3	0.463096	A
Chromium	47.4	53.3	A		-11.1	37.3 - 69.3	1.356140	A
Cobalt	140	149	A		-6.0	104 - 194	3.714490	A
Copper	191	197	A		-3.0	138 - 256	6.217055	A
Lead	65.9	72.0	A		-8.5	50.4 - 93.6	1.817935	A
Mercury	0.224	0.215	A		4.2	0.151 - 0.280	0.006287	A
Nickel	114	124	A		-8.1	87 - 161	3.952744	A
Selenium	10.2	13.1	W		-22.1	9.2 - 17.0	0.457599	A
Silver	55	59.9	A		-8.2	41.9 - 77.9	2.255453	A
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	28.7	30.1	A		-4.7	21.1 - 39.1	1.424542	A
Uranium-235	0.0368	0.0391	A		-5.9	0.0274 - 0.0508	0.004	A
Uranium-238	14.5	13.5	A		7.4	9.5 - 17.6	1.4	A
Uranium-Total	14.6	13.6	A		7.4	9.5 - 17.7	1.5	A
Vanadium	170	201	A		-15.4	141 - 261	4.142923	A
Zinc	296	317	A		-6.6	222 - 412	10.09978	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	79.8	98	A		-18.6	69 - 127	6.4	A
Cesium-134	1050	1170	A		-10.3	819 - 1521	62	A
Cesium-137	621	572	A		8.6	400 - 744	36	A
Cobalt-57	1.71		A			False Positive Test	1.71	
Cobalt-60	729	722	A		1.0	505 - 939	43	A
Iron-55	NR	1020	N	(28)		714 - 1326		
Manganese-54	412	410	A		0.5	287 - 533	25	A
Nickel-63	1310	1280	A		2.3	896 - 1664	170	A
Plutonium-238	59.3	59.8	A		-0.8	41.9 - 77.7	5.1	A
Plutonium-239/240	69.5	71.3	A		-2.5	49.9 - 92.7	5.9	A
Potassium-40	634	607	A		4.4	425 - 789	41	A
Strontium-90	3.91		A			False Positive Test	3.91	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	458	777	N		-41.1	544 - 1010	37	A
Uranium-234	53.5	51.4	A		4.1	36.0 - 66.8	4.4	A
Uranium-238	162	168	A		-3.6	118 - 218	13	A
Zinc-65	973	907	A		7.3	635 - 1179	58	A

Radiological Reference Date: August 1, 2021

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

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1180	1170	A		0.9	819 - 1521	106	A
Cesium-137	663	572	A		15.9	400 - 744	57	A
Cobalt-57	2.65		A			False Positive Test	2.65	
Cobalt-60	769	722	A		6.5	505 - 939	22	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	464	410	A		13.2	287 - 533	32	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	681	607	A		12.2	425 - 789	35	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	1070	907	A		18.0	635 - 1179	32	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	24.6	29.9	A		-17.7	20.9 - 38.9	0.252	N
Arsenic	17.8	20.2	A		-11.9	14.1 - 26.3	0.0586	N
Barium	106	144	W		-26.4	101 - 187	.047	N
Beryllium	19.1	20.8	A		-8.2	14.6 - 27.0	0.017	N
Cadmium	10.6	16.4	N		-35.4	11.5 - 21.3	0.0084	N
Chromium	44.9	53.3	A		-15.8	37.3 - 69.3	0.121	N
Cobalt	136	149	A		-8.7	104 - 194	0.161	N
Copper	195	197	A		-1.0	138 - 256	0.0351	N
Lead	74.4	72.0	A		3.3	50.4 - 93.6	0.0565	N
Mercury	0.195	0.215	A		-9.3	0.151 - 0.280	0.0023	N
Nickel	114	124	A		-8.1	87 - 161	0.086	N
Selenium	12.8	13.1	A		-2.3	9.2 - 17.0	0.112	N
Silver	43.3	59.9	W		-27.7	41.9 - 77.9	0.142	N
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	31.5	30.1	A		4.7	21.1 - 39.1	0.0278	N
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	13.2	13.6	A		-2.9	9.5 - 17.7	0.002	N
Vanadium	163	201	A		-18.9	141 - 261	0.0226	N
Zinc	311	317	A		-1.9	222 - 412	0.597	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	94.311	98	A		-3.8	69 - 127	7.833	A
Cesium-134	1018.5	1170	A		-12.9	819 - 1521	32.406	A
Cesium-137	594.84	572	A		4.0	400 - 744	12.527	A
Cobalt-57	0.672		A			False Positive Test	0.667	
Cobalt-60	713.49	722	A		-1.2	505 - 939	13.657	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	428.97	410	A		4.6	287 - 533	13.896	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	63.296	59.8	A		5.8	41.9 - 77.7	4.893	A
Plutonium-239/240	68.294	71.3	A		-4.2	49.9 - 92.7	5.181	A
Potassium-40	673.89	607	A		11.0	425 - 789	27.375	A
Strontium-90	-0.023		A			False Positive Test	3.695	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Techneium-99	747.241	777	A		-3.8	544 - 1010	92.825	A
Uranium-234	48.736	51.4	A		-5.2	36.0 - 66.8	3.674	A
Uranium-238	149.664	168	A		-10.9	118 - 218	9.925	A
Zinc-65	993.50	907	A		9.5	635 - 1179	32.159	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	NR	1170				819 - 1521		
Cesium-137	NR	572				400 - 744		
Cobalt-57	NR					False Positive Test		
Cobalt-60	NR	722				505 - 939		
Iron-55	NR	1020				714 - 1326		
Manganese-54	NR	410				287 - 533		
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	58.84	59.8	A		-1.6	41.9 - 77.7	2.52	A
Plutonium-239/240	72.69	71.3	A		2.0	49.9 - 92.7	2.80	A
Potassium-40	NR	607				425 - 789		
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	49.41	51.4	A		-3.9	36.0 - 66.8	8.66	W
Uranium-238	205.33	168	W		22.2	118 - 218	17.63	A
Zinc-65	NR	907				635 - 1179		

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	32.6	29.9	A		9.0	20.9 - 38.9	1.72	A
Arsenic	20.4	20.2	A		1.0	14.1 - 26.3	1.15	A
Barium	150	144	A		4.2	101 - 187	6.11	A
Beryllium	20.8	20.8	A		0.0	14.6 - 27.0	1.30	A
Cadmium	15.3	16.4	A		-6.7	11.5 - 21.3	0.926	A
Chromium	53.2	53.3	A		-0.2	37.3 - 69.3	1.68	A
Cobalt	138	149	A		-7.4	104 - 194	6.90	A
Copper	183	197	A		-7.1	138 - 256	7.54	A
Lead	68.7	72.0	A		-4.6	50.4 - 93.6	4.48	A
Mercury	0.209	0.215	A		-2.8	0.151 - 0.280	0.0218	A
Nickel	116	124	A		-6.5	87 - 161	5.73	A
Selenium	12.2	13.1	A		-6.9	9.2 - 17.0	0.622	A
Silver	51.0	59.9	A		-14.9	41.9 - 77.9	5.95	A
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	31.8	30.1	A		5.6	21.1 - 39.1	2.17	A
Uranium-235	0.041	0.0391	A		4.9	0.0274 - 0.0508	0.004	A
Uranium-238	13.04	13.5	A		-3.4	9.5 - 17.6	1.30	A
Uranium-Total	13.08	13.6	A		-3.8	9.5 - 17.7	1.31	A
Vanadium	200	201	A		-0.5	141 - 261	7.60	A
Zinc	301	317	A		-5.0	222 - 412	18.8	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	95.3	98	A		-2.8	69 - 127	17	W
Cesium-134	NR	1170		(6)		819 - 1521		
Cesium-137	627	572	A		9.6	400 - 744	48	A
Cobalt-57	0.348		A			False Positive Test	1.5	
Cobalt-60	768	722	A		6.4	505 - 939	59	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	435	410	A		6.1	287 - 533	70	W
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	70.3	59.8	A		17.6	41.9 - 77.7	14	W
Plutonium-239/240	77.3	71.3	A		8.4	49.9 - 92.7	15	W
Potassium-40	677	607	A		11.5	425 - 789	100	A
Strontium-90	24.9		A			False Positive Test	16	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	821	777	A		5.7	544 - 1010	91	A
Uranium-234	54.0	51.4	A		5.1	36.0 - 66.8	6.7	A
Uranium-238	149	168	A		-11.3	118 - 218	15	A
Zinc-65	1010	907	A		11.4	635 - 1179	140	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	92.64	98	A		-5.5	69 - 127	6.95	A
Cesium-134	NR	1170		(6)		819 - 1521		
Cesium-137	650	572	A		13.6	400 - 744	9.62	N
Cobalt-57	-0.041		A			False Positive Test	0.58	
Cobalt-60	910	722	W		26.0	505 - 939	10.8	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	476	410	A		16.1	287 - 533	6.92	N
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	61.74	59.8	A		3.2	41.9 - 77.7	4.4	A
Plutonium-239/240	69.67	71.3	A		-2.3	49.9 - 92.7	4.79	A
Potassium-40	734	607	W		20.9	425 - 789	18.2	A
Strontium-90	-0.28		A			False Positive Test	17.13	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	973	777	W		25.2	544 - 1010	34.41	A
Uranium-234	50.9	51.4	A		-1.0	36.0 - 66.8	3.12	A
Uranium-238	160	168	A		-4.8	118 - 218	6.5	A
Zinc-65	1120	907	W		23.5	635 - 1179	18.4	N

Radiological Reference Date: August 1, 2021

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

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	93.4	98	A		-4.7	69 - 127	2.04	A
Cesium-134	1172	1170	A		0.2	819 - 1521	23.0	N
Cesium-137	590	572	A		3.1	400 - 744	11.4	N
Cobalt-57	0.503		A			False Positive Test	0.442	
Cobalt-60	722	722	A		0.0	505 - 939	8.41	N
Iron-55	807	1020	W		-20.9	714 - 1326	51.3	A
Manganese-54	429	410	A		4.6	287 - 533	7.18	N
Nickel-63	1322	1280	A		3.3	896 - 1664	30.7	A
Plutonium-238	66.6	59.8	A		11.4	41.9 - 77.7	1.79	A
Plutonium-239/240	82.2	71.3	A		15.3	49.9 - 92.7	2.06	A
Potassium-40	640	607	A		5.4	425 - 789	15.1	A
Strontium-90	-2.76		A			False Positive Test	4.55	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	788	777	A		1.4	544 - 1010	29.7	A
Uranium-234	55.4	51.4	A		7.8	36.0 - 66.8	5.43	A
Uranium-238	161	168	A		-4.2	118 - 218	11.2	A
Zinc-65	908	907	A		0.1	635 - 1179	13.7	N

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	9.70E+01	98	A		-1.0	69 - 127	5.39	A
Cesium-134	1.13E+03	1170	A		-3.4	819 - 1521	3.82	A
Cesium-137	6.08E+02	572	A		6.3	400 - 744	4.33	A
Cobalt-57	-1.59E+00		A			False Positive Test	4.37	
Cobalt-60	7.49E+02	722	A		3.7	505 - 939	3.08	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	4.28E+02	410	A		4.4	287 - 533	2.76	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	6.09E+01	59.8	A		1.8	41.9 - 77.7	1.43	A
Plutonium-239/240	7.36E+01	71.3	A		3.2	49.9 - 92.7	1.63	A
Potassium-40	5.77E+02	607	A		-4.9	425 - 789	6.86	A
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	9.85E+02	907	A		8.6	635 - 1179	5.85	A

Radiological Reference Date: August 1, 2021

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
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- (28) = Not Reporting Previously Reported Analyte



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

Laboratory Results For MAPEP-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	83.455	98	A		-14.8	69 - 127	5.868	A
Cesium-134	1105.000	1170	A		-5.6	819 - 1521	56.750	A
Cesium-137	556.700	572	A		-2.7	400 - 744	28.650	A
Cobalt-57	1.271		N	(1)		False Positive Test	0.347	
Cobalt-60	689.100	722	A		-4.6	505 - 939	35.405	A
Iron-55	1034.367	1020	A		1.4	714 - 1326	30.080	A
Manganese-54	387.400	410	A		-5.5	287 - 533	19.935	A
Nickel-63	1296.667	1280	A		1.3	896 - 1664	28.440	A
Plutonium-238	54.790	59.8	A		-8.4	41.9 - 77.7	3.044	A
Plutonium-239/240	66.070	71.3	A		-7.3	49.9 - 92.7	3.588	A
Potassium-40	573.300	607	A		-5.6	425 - 789	30.565	A
Strontium-90	1.768		A			False Positive Test	1.768	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	431.2	777	N		-44.5	544 - 1010	9.73	A
Uranium-234	45.477	51.4	A		-11.5	36.0 - 66.8	1.897	A
Uranium-238	155.433	168	A		-7.5	118 - 218	5.985	A
Zinc-65	862.200	907	A		-4.9	635 - 1179	44.365	A

Radiological Reference Date: August 1, 2021

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:

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

Laboratory Results For MAPEP-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	0.223	0.215	A		3.7	0.151 - 0.280	0.0466	W
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	NR	1170				819 - 1521		
Cesium-137	NR	572				400 - 744		
Cobalt-57	NR					False Positive Test		
Cobalt-60	NR	722				505 - 939		
Iron-55	NR	1020				714 - 1326		
Manganese-54	NR	410				287 - 533		
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	NR	607				425 - 789		
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	NR	907				635 - 1179		

Radiological Reference Date: August 1, 2021

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:

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

Laboratory Results For MAPEP-21-MaS45
 (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	34.8	33.1	A	(5)	5.1	23.2 - 43.0	1.4	A
Arsenic	21.1	20.2	A	(5)	4.5	14.1 - 26.3	2.6	A
Barium	NR	144				101 - 187		
Beryllium	22.6	22.5	A	(5)	0.4	15.8 - 29.3	0.8	A
Cadmium	16.4	16.4	A	(5)	0.0	11.5 - 21.3	0.6	A
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	151	154	A	(5)	-1.9	108 - 200	5	A
Copper	203	207	A	(5)	-1.9	145 - 269	6	A
Lead	77.2	78.7	A	(5)	-1.9	55.1 - 102.3	2.3	A
Mercury	NR	0.215				0.151 - 0.280		
Nickel	135	143	A	(5)	-5.6	100 - 186	4	A
Selenium	12.6	13.1	A	(5)	-3.8	9.2 - 17.0	1.3	A
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	29.5	30.3	A	(5)	-2.6	21.2 - 39.4	1.8	A
Uranium-235	0.0451	0.0391	A		15.3	0.0274 - 0.0508	0.0018	A
Uranium-238	15.4	13.5	A		14.1	9.5 - 17.6	0.5	A
Uranium-Total	15.5	13.6	A		14.0	9.5 - 17.7	0.5	A
Vanadium	NR	201				141 - 261		
Zinc	328	373	A	(5)	-12.1	261 - 485	10	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	88.4	98	A		-9.8	69 - 127	4.0	A
Cesium-134	1440	1170	W		23.1	819 - 1521	10	N
Cesium-137	611	572	A		6.8	400 - 744	6	N
Cobalt-57	0.04		A			False Positive Test	0.38	
Cobalt-60	770	722	A		6.6	505 - 939	4	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	422	410	A		2.9	287 - 533	4	N
Nickel-63	1200	1280	A		-6.3	896 - 1664	190	W
Plutonium-238	65.9	59.8	A		10.2	41.9 - 77.7	3.4	A
Plutonium-239/240	70.7	71.3	A		-0.8	49.9 - 92.7	3.6	A
Potassium-40	699	607	A		15.2	425 - 789	9	N
Strontium-90	0.78		A			False Positive Test	0.40	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	629	777	A		-19.0	544 - 1010	94	A
Uranium-234	50.7	51.4	A		-1.4	36.0 - 66.8	2.6	A
Uranium-238	166	168	A		-1.2	118 - 218	6	A
Zinc-65	914	907	A		0.8	635 - 1179	9	N

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-21-MaS45

(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	7.377	29.9	N		-75.3	20.9 - 38.9	0.0006	N
Arsenic	2.315	20.2	N		-88.5	14.1 - 26.3	0.81	N
Barium	178.5	144	W		24.0	101 - 187	2.4	N
Beryllium	3.9	20.8	N		-81.3	14.6 - 27.0	0.32	A
Cadmium	15.5	16.4	A		-5.5	11.5 - 21.3	0.1	N
Chromium	55.1	53.3	A		3.4	37.3 - 69.3	1	N
Cobalt	133	149	A		-10.7	104 - 194	1.5	N
Copper	177.6	197	A		-9.8	138 - 256	1.9	N
Lead	71.7	72.0	A		-0.4	50.4 - 93.6	0.3	N
Mercury	NR	0.215				0.151 - 0.280		
Nickel	120.6	124	A		-2.7	87 - 161	1.6	N
Selenium	0.377	13.1	N		-97.1	9.2 - 17.0	0.002	N
Silver	27.9	59.9	N		-53.4	41.9 - 77.9	0.5	N
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	28.9	30.1	A		-4.0	21.1 - 39.1	0.25	N
Uranium-235	0.038	0.0391	A		-2.8	0.0274 - 0.0508	0.001	A
Uranium-238	13.49	13.5	A		-0.1	9.5 - 17.6	0.09	N
Uranium-Total	13.53	13.6	A		-0.5	9.5 - 17.7	0.1	N
Vanadium	9.95	201	N		-95.1	141 - 261	0.0006	N
Zinc	8.27	317	N		-97.4	222 - 412	0.0009	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	94.3	98	A		-3.8	69 - 127	1.9	A
Cesium-134	1179	1170	A		0.8	819 - 1521	44	A
Cesium-137	537	572	A		-6.1	400 - 744	20	A
Cobalt-57	0.489		N	(1)		False Positive Test	0.060	
Cobalt-60	652	722	A		-9.7	505 - 939	27	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	373	410	A		-9.0	287 - 533	13	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	54.1	59.8	A		-9.5	41.9 - 77.7	1.3	A
Plutonium-239/240	63.3	71.3	A		-11.2	49.9 - 92.7	1.4	A
Potassium-40	606	607	A		-0.2	425 - 789	31	A
Strontium-90	3.27		A			False Positive Test	3.96	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	55.3	51.4	A		7.6	36.0 - 66.8	2.1	A
Uranium-238	171.1	168	A		1.8	118 - 218	3.7	A
Zinc-65	837	907	A		-7.7	635 - 1179	33	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-21-MaS45

(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	21.98	29.9	W		-26.5	20.9 - 38.9	1.1	A
Arsenic	13.56	20.2	N		-32.9	14.1 - 26.3	1.23	A
Barium	155.0	144	A		7.6	101 - 187	9.6	A
Beryllium	20.06	20.8	A		-3.6	14.6 - 27.0	0.66	A
Cadmium	15.85	16.4	A		-3.4	11.5 - 21.3	0.70	A
Chromium	50.36	53.3	A		-5.5	37.3 - 69.3	3.2	A
Cobalt	164.5	149	A		10.4	104 - 194	18.6	A
Copper	199.7	197	A		1.4	138 - 256	11.6	A
Lead	64.36	72.0	A		-10.6	50.4 - 93.6	8.37	A
Mercury	0.2176	0.215	A		1.2	0.151 - 0.280	0.011	A
Nickel	132.4	124	A		6.8	87 - 161	4.4	A
Selenium	10.17	13.1	W		-22.4	9.2 - 17.0	1.11	A
Silver	42.07	59.9	W		-29.8	41.9 - 77.9	2.36	A
Technetium-99	0.001176	0.00123	A		-4.4	0.00086 - 0.00160	0.000059	A
Thallium	34.52	30.1	A		14.7	21.1 - 39.1	1.72	A
Uranium-235	0.0364	0.0391	A		-6.9	0.0274 - 0.0508	0.00018	N
Uranium-238	13.309	13.5	A		-1.4	9.5 - 17.6	0.66	A
Uranium-Total	13.312	13.6	A		-2.1	9.5 - 17.7	0.66	A
Vanadium	222.8	201	A		10.8	141 - 261	13.5	A
Zinc	366.3	317	A		15.6	222 - 412	23.1	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	NR	1170				819 - 1521		
Cesium-137	NR	572				400 - 744		
Cobalt-57	NR					False Positive Test		
Cobalt-60	NR	722				505 - 939		
Iron-55	NR	1020				714 - 1326		
Manganese-54	NR	410				287 - 533		
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	NR	607				425 - 789		
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777	N	(28)		544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	NR	907				635 - 1179		

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(EULC01) EnergySolutions, LLC

I-80, Exit 49

Clive, UT 84029

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	104.64	98	A		6.8	69 - 127	23.92	W
Cesium-134	1061.9	1170	A		-9.2	819 - 1521	58.39	A
Cesium-137	580.16	572	A		1.4	400 - 744	72.3	A
Cobalt-57	12.486			A		False Positive Test	10.2	
Cobalt-60	664.52	722	A		-8.0	505 - 939	40.57	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	401.82	410	A		-2.0	287 - 533	44.92	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	541.68	607	A		-10.8	425 - 789	73.85	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	885.04	907	A		-2.4	635 - 1179	79.99	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(FDHE01) Florida Dept of Health Environmental Laboratory

PO Box 680069

Orlando, FL 32868-0069

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	88.13	98	A		-10.1	69 - 127	3.49	A
Cesium-134	1152.05	1170	A		-1.5	819 - 1521	17.69	N
Cesium-137	553.85	572	A		-3.2	400 - 744	12.71	A
Cobalt-57	1.22		A			False Positive Test	2.70	
Cobalt-60	679.30	722	A		-5.9	505 - 939	11.01	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	404.87	410	A		-1.3	287 - 533	9.20	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	70.29	59.8	A		17.5	41.9 - 77.7	8.54	A
Plutonium-239/240	69.38	71.3	A		-2.7	49.9 - 92.7	8.71	A
Potassium-40	578.61	607	A		-4.7	425 - 789	21.45	A
Strontium-90	-19.76		A			False Positive Test	15.51	

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	48.95	51.4	A		-4.8	36.0 - 66.8	3.76	A
Uranium-238	153.89	168	A		-8.4	118 - 218	6.67	A
Zinc-65	913.99	907	A		0.8	635 - 1179	20.22	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(FDOH01) Florida Dept. of Health, Mobile Environmental Radiological Lab

PO Box 680069

Orlando, FL 32868-0069

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	90.09	98	A		-8.1	69 - 127	4.61	A
Cesium-134	1173.83	1170	A		0.3	819 - 1521	13.98	N
Cesium-137	553.85	572	A		-3.2	400 - 744	9.58	N
Cobalt-57	0.3		A			False Positive Test	2.54	
Cobalt-60	675.1	722	A		-6.5	505 - 939	9.31	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	400.1	410	A		-2.4	287 - 533	6.85	N
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	583.29	607	A		-3.9	425 - 789	16.04	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	144.09	168	A		-14.2	118 - 218	4.42	A
Zinc-65	903.7	907	A		-0.4	635 - 1179	18.17	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	10.3	29.9	N		-65.6	20.9 - 38.9	0.868	A
Arsenic	14.9	20.2	W		-26.2	14.1 - 26.3	0.999	A
Barium	131	144	A		-9.0	101 - 187	8.73	A
Beryllium	19.7	20.8	A		-5.3	14.6 - 27.0	1.33	A
Cadmium	14.2	16.4	A		-13.4	11.5 - 21.3	0.962	A
Chromium	46.8	53.3	A		-12.2	37.3 - 69.3	3.13	A
Cobalt	142	149	A		-4.7	104 - 194	9.48	A
Copper	178	197	A		-9.6	138 - 256	11.8	A
Lead	69.9	72.0	A		-2.9	50.4 - 93.6	4.69	A
Mercury	0.312	0.215	N		45.1	0.151 - 0.280	0.0333	A
Nickel	120	124	A		-3.2	87 - 161	8.01	A
Selenium	11.2	13.1	A		-14.5	9.2 - 17.0	0.757	A
Silver	53.1	59.9	A		-11.4	41.9 - 77.9	3.55	A
Technetium-99	0.00131	0.00123	A		6.5	0.00086 - 0.00160	7.59E-5	A
Thallium	25.9	30.1	A		-14.0	21.1 - 39.1	1.91	A
Uranium-235	0.0387	0.0391	A		-1.0	0.0274 - 0.0508	0.00129	A
Uranium-238	12.3	13.5	A		-8.9	9.5 - 17.6	0.194	N
Uranium-Total	12.34	13.6	A		-9.3	9.5 - 17.7	0.195	N
Vanadium	177	201	A		-11.9	141 - 261	11.8	A
Zinc	312	317	A		-1.6	222 - 412	20.9	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	106	98	A		8.2	69 - 127	5.76	A
Cesium-134	993	1170	A		-15.1	819 - 1521	45.5	A
Cesium-137	579	572	A		1.2	400 - 744	24.4	A
Cobalt-57	0.375		A			False Positive Test	0.393	
Cobalt-60	692	722	A		-4.2	505 - 939	34.1	A
Iron-55	994	1020	A		-2.5	714 - 1326	112	A
Manganese-54	412	410	A		0.5	287 - 533	19.0	A
Nickel-63	1170	1280	A		-8.6	896 - 1664	115	A
Plutonium-238	55.9	59.8	A		-6.5	41.9 - 77.7	3.78	A
Plutonium-239/240	66.3	71.3	A		-7.0	49.9 - 92.7	4.29	A
Potassium-40	612	607	A		0.8	425 - 789	32.7	A
Strontium-90	0.161		A			False Positive Test	1.41	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	747	777	A		-3.9	544 - 1010	55.4	A
Uranium-234	79.6	51.4	N		54.9	36.0 - 66.8	5.71	A
Uranium-238	177	168	A		5.4	118 - 218	10.8	A
Zinc-65	945	907	A		4.2	635 - 1179	40.6	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1168.3	1170	A		-0.1	819 - 1521	75.41	A
Cesium-137	574.29	572	A		0.4	400 - 744	41.85	A
Cobalt-57	1.31		A			False Positive Test	2.98	
Cobalt-60	693.38	722	A		-4.0	505 - 939	48.27	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	410.05	410	A		0.0	287 - 533	30.05	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	647.81	607	A		6.7	425 - 789	51.45	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	955.07	907	A		5.3	635 - 1179	68.71	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1288	1170	A		10.1	819 - 1521	53.74	A
Cesium-137	721.3	572	W		26.1	400 - 744	65.05	A
Cobalt-57	NR			(6)		False Positive Test		
Cobalt-60	868.7	722	W		20.3	505 - 939	51.27	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	518.6	410	W		26.5	287 - 533	50.64	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	768.6	607	W		26.6	425 - 789	69.67	A
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	1206	907	N		33.0	635 - 1179	105.2	A

Radiological Reference Date: August 1, 2021

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

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result 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-21-MaS45

(HPAC99) PHE, CRCE 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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	97	98	A		-1.0	69 - 127	7	A
Cesium-134	1170	1170	A		0.0	819 - 1521	70	A
Cesium-137	611	572	A		6.8	400 - 744	40	A
Cobalt-57	2			A		False Positive Test	2	
Cobalt-60	721	722	A		-0.1	505 - 939	45	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	417	410	A		1.7	287 - 533	25	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	542	607	A		-10.7	425 - 789	40	A
Strontium-90	10			A		False Positive Test	10	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	891	907	A		-1.8	635 - 1179	55	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (HPAL01) Los Alamos National Laboratory
 Milan Gadd, 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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	85.79	98	A		-12.5	69 - 127	5.49	A
Cesium-134	1036.30	1170	A		-11.4	819 - 1521	38.50	A
Cesium-137	565.40	572	A		-1.2	400 - 744	20.41	A
Cobalt-57	-0.09		A			False Positive Test	1.99	
Cobalt-60	686.30	722	A		-4.9	505 - 939	23.04	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	410.40	410	A		0.1	287 - 533	16.11	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	563.10	607	A		-7.2	425 - 789	43.33	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	-538.97	51.4	N		-1148.6	36.0 - 66.8	1070.20	N
Uranium-238	123.14	168	W		-26.7	118 - 218	23.57	W
Zinc-65	937.60	907	A		3.4	635 - 1179	34.77	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	99.9	98	A		1.9	69 - 127	3.9	A
Cesium-134	1130	1170	A		-3.4	819 - 1521	40	A
Cesium-137	592	572	A		3.5	400 - 744	20	A
Cobalt-57	-4.8		A			False Positive Test	4.8	
Cobalt-60	714	722	A		-1.1	505 - 939	27	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	415	410	A		1.2	287 - 533	14	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	579	607	A		-4.6	425 - 789	24	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	929	907	A		2.4	635 - 1179	33	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	87.45	98	A		-10.8	69 - 127	4.69	A
Cesium-134	1220.0	1170	A		4.3	819 - 1521	25.3	A
Cesium-137	628.0	572	A		9.8	400 - 744	20.6	A
Cobalt-57	.2		A			False Positive Test	1.2	
Cobalt-60	766.0	722	A		6.1	505 - 939	15.5	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	442.0	410	A		7.8	287 - 533	13.4	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	60.00	59.8	A		0.3	41.9 - 77.7	2.60	A
Plutonium-239/240	68.50	71.3	A		-3.9	49.9 - 92.7	2.85	A
Potassium-40	620.0	607	A		2.1	425 - 789	39.6	A
Strontium-90	0.93		A			False Positive Test	15	

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	41.67	51.4	A		-18.9	36.0 - 66.8	1.88	A
Uranium-238	128.9	168	W		-23.3	118 - 218	4.3	A
Zinc-65	993.0	907	A		9.5	635 - 1179	29.8	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1073.6	1170	A		-8.2	819 - 1521	29.6	A
Cesium-137	593.5	572	A		3.8	400 - 744	36.4	A
Cobalt-57	2.57		A			False Positive Test	1.35	
Cobalt-60	667.0	722	A		-7.6	505 - 939	19.8	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	410.8	410	A		0.2	287 - 533	22.1	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	571.6	607	A		-5.8	425 - 789	37.3	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	914.0	907	A		0.8	635 - 1179	40.3	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1090.0	1170	A		-6.8	819 - 1521	50.3	A
Cesium-137	632.0	572	A		10.5	400 - 744	29.1	A
Cobalt-57	0.01		A			False Positive Test	0.02	
Cobalt-60	778.0	722	A		7.8	505 - 939	35.8	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	455.0	410	A		11.0	287 - 533	20.9	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	693.0	607	A		14.2	425 - 789	31.9	A
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	1030.0	907	A		13.6	635 - 1179	47.5	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(JAEC99) Research Laboratories and Information Directorate

Jordan Atomic Energy Commission

Amman, Jordan 70 (11934)

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	16.32	20.2	A	(5)	-19.2	14.1 - 26.3	1.77	A
Barium	312.5	610	N	(5)	-48.8	427 - 793	33.67	A
Beryllium	20.44	22.5	A	(5)	-9.2	15.8 - 29.3	1.97	A
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	76.98	76	A	(5)	1.3	53.2 - 98.8	5.3	A
Cobalt	143.27	154	A	(5)	-7.0	108 - 200	16.22	A
Copper	187.87	207	A	(5)	-9.2	145 - 269	20.56	A
Lead	85.76	78.7	A	(5)	9.0	55.1 - 102.3	10.83	A
Mercury	NR	0.215				0.151 - 0.280		
Nickel	123.58	143	A	(5)	-13.6	100 - 186	13.75	A
Selenium	16.03	13.1	W	(5)	22.4	9.2 - 17.0	3.16	W
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	31.49	30.3	A	(5)	3.9	21.2 - 39.4	3.15	A
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	15.56	13.5	A		15.3	9.5 - 17.6	1.27	A
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	251.9	275	A	(5)	-8.4	193 - 358	33.65	A
Zinc	312.8	373	A	(5)	-16.1	261 - 485	26.84	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1203.9	1170	A		2.9	819 - 1521	5.6	N
Cesium-137	616.9	572	A		7.9	400 - 744	5.4	N
Cobalt-57	NR		N	(11)		False Positive Test		
Cobalt-60	715.5	722	A		-0.9	505 - 939	4.2	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	441.0	410	A		7.6	287 - 533	3.3	N
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	675.6	607	A		11.3	425 - 789	14.4	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	41.579	51.4	A		-19.1	36.0 - 66.8	3.027	A
Uranium-238	138.315	168	A		-17.7	118 - 218	7.262	A
Zinc-65	996.3	907	A		9.8	635 - 1179	7.6	N

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	95.88	98	A		-2.2	69 - 127	3.155	A
Cesium-134	111.3	1170	N		-90.5	819 - 1521	11.18	A
Cesium-137	601.2	572	A		5.1	400 - 744	15.39	A
Cobalt-57	1.021		N	(1)		False Positive Test	0.2589	
Cobalt-60	736.8	722	A		2.1	505 - 939	12.52	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	428.3	410	A		4.5	287 - 533	9.707	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	623.8	607	A		2.8	425 - 789	17.25	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	989.4	907	A		9.1	635 - 1179	23.69	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (LANL01) Los Alamos National Laboratory
 P. O. Box 1663
 Los Alamos, NM 87545

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1020	1170	A		-12.8	819 - 1521	47	A
Cesium-137	619	572	A		8.2	400 - 744	29	A
Cobalt-57	NR		N	(11)		False Positive Test		
Cobalt-60	716	722	A		-0.8	505 - 939	35	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	436	410	A		6.3	287 - 533	21	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	NR	607	N	(25)		425 - 789		
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	845	907	A		-6.8	635 - 1179	42	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(LAWR01) LAWRENCE BERKELEY NATIONAL LABORATORY
1 CYCLOTRON RD.
BERKELEY, CA 94720

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1077	1170	A		-7.9	819 - 1521	57.1	A
Cesium-137	583.8	572	A		2.1	400 - 744	31.34	A
Cobalt-57	-0.1665		A			False Positive Test	1.665	
Cobalt-60	703.1	722	A		-2.6	505 - 939	38.17	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	397.4	410	A		-3.1	287 - 533	21.76	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	565.8	607	A		-6.8	425 - 789	43.62	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	935.6	907	A		3.2	635 - 1179	51.89	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1213.33	1170	A		3.7	819 - 1521	60.00	A
Cesium-137	646.67	572	A		13.1	400 - 744	33.67	A
Cobalt-57	1.05		A			False Positive Test	0.74	
Cobalt-60	785.00	722	A		8.7	505 - 939	41.00	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	455.67	410	A		11.1	287 - 533	23.33	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	642.33	607	A		5.8	425 - 789	37.67	A
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	1016.67	907	A		12.1	635 - 1179	53.33	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1177	1170	A		0.6	819 - 1521	11	N
Cesium-137	609.3	572	A		6.5	400 - 744	9.2	N
Cobalt-57	-0.3		A			False Positive Test	1.3	
Cobalt-60	754.3	722	A		4.5	505 - 939	8.2	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	407.9	410	A		-0.5	287 - 533	6.1	N
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	615	607	A		1.3	425 - 789	18	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	880	907	A		-3.0	635 - 1179	14	N

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (MDPH01) MDPH-Radiation Control Program
 MERL-Room 002
 Jamaica Plain, MA 02130-3597

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	95.09	98	A		-3.0	69 - 127	3.95	A
Cesium-134	1107.53	1170	A		-5.3	819 - 1521	27.12	A
Cesium-137	590.77	572	A		3.3	400 - 744	14.96	A
Cobalt-57	NR		N	(11)		False Positive Test		
Cobalt-60	719.03	722	A		-0.4	505 - 939	20.40	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	411.93	410	A		0.5	287 - 533	10.15	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	631.47	607	A		4.0	425 - 789	23.24	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	939.80	907	A		3.6	635 - 1179	22.58	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	96.6	98	A		-1.4	69 - 127	5.67	A
Cesium-134	1140	1170	A		-2.6	819 - 1521	62.4	A
Cesium-137	589	572	A		3.0	400 - 744	32.2	A
Cobalt-57	0.668		A			False Positive Test	0.387	
Cobalt-60	698	722	A		-3.3	505 - 939	37.5	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	420	410	A		2.4	287 - 533	22.9	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	61.9	59.8	A		3.5	41.9 - 77.7	3.76	A
Plutonium-239/240	68.9	71.3	A		-3.4	49.9 - 92.7	4.08	A
Potassium-40	633	607	A		4.3	425 - 789	35.1	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	48.0	51.4	A		-6.6	36.0 - 66.8	3.71	A
Uranium-238	171	168	A		1.8	118 - 218	10.3	A
Zinc-65	957	907	A		5.5	635 - 1179	52.2	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(NARL02) USEPA - NAREL - MERL

540 S Morris Ave

Montgomery, AL 36115

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1270	1170	A		8.5	819 - 1521	17.0	N
Cesium-137	623	572	A		8.9	400 - 744	15.0	A
Cobalt-57	0.371			A		False Positive Test	0.750	
Cobalt-60	756	722	A		4.7	505 - 939	11.0	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	428	410	A		4.4	287 - 533	9.90	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	591	607	A		-2.6	425 - 789	16.0	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	946	907	A		4.3	635 - 1179	20.0	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	24.8	29.9	A		-17.1	20.9 - 38.9	0.84	A
Arsenic	7.26	20.2	N		-64.1	14.1 - 26.3	4.40	N
Barium	159	144	A		10.4	101 - 187	2.50	N
Beryllium	22.1	20.8	A		6.3	14.6 - 27.0	0.88	A
Cadmium	16.0	16.4	A		-2.4	11.5 - 21.3	1.31	A
Chromium	53.3	53.3	A		0.0	37.3 - 69.3	1.23	A
Cobalt	141	149	A		-5.4	104 - 194	2.24	N
Copper	192	197	A		-2.5	138 - 256	2.89	N
Lead	75.4	72.0	A		4.7	50.4 - 93.6	1.57	A
Mercury	0.195	0.215	A		-9.3	0.151 - 0.280	0.014	A
Nickel	133	124	A		7.3	87 - 161	2.08	N
Selenium	5.87	13.1	N		-55.2	9.2 - 17.0	3.86	N
Silver	59.7	59.9	A		-0.3	41.9 - 77.9	2.16	A
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	28.4	30.1	A		-5.6	21.1 - 39.1	2.47	A
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	209	201	A		4.0	141 - 261	2.97	N
Zinc	329	317	A		3.8	222 - 412	4.79	N

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	90.2	98	A		-8.0	69 - 127	7.75	A
Cesium-134	1097	1170	A		-6.2	819 - 1521	44.9	A
Cesium-137	624	572	A		9.1	400 - 744	26.5	A
Cobalt-57	1.14		A			False Positive Test	0.934	
Cobalt-60	772	722	A		6.9	505 - 939	32.6	A
Iron-55	768	1020	W		-24.7	714 - 1326	168	W
Manganese-54	448	410	A		9.3	287 - 533	19.0	A
Nickel-63	1080	1280	A		-15.6	896 - 1664	108	A
Plutonium-238	52.4	59.8	A		-12.4	41.9 - 77.7	5.52	A
Plutonium-239/240	64.8	71.3	A		-9.1	49.9 - 92.7	5.84	A
Potassium-40	645	607	A		6.3	425 - 789	29.3	A
Strontium-90	-15.0		A			False Positive Test	83.6	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	576	777	W		-25.9	544 - 1010	50.6	A
Uranium-234	61.5	51.4	A		19.7	36.0 - 66.8	6.84	A
Uranium-238	163	168	A		-3.0	118 - 218	11.6	A
Zinc-65	1039	907	A		14.6	635 - 1179	42.9	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (NJDH01) New Jersey Dept. of Health, PHEL, ECLS
 3 Schwarzkopf Drive
 West Trenton, NJ 08628

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1100	1170	A		-6.0	819 - 1521	51	A
Cesium-137	630	572	A		10.1	400 - 744	28	A
Cobalt-57	2.4		A			False Positive Test	1.4	
Cobalt-60	760	722	A		5.3	505 - 939	31	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	424	410	A		3.4	287 - 533	14	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	658	607	A		8.4	425 - 789	28	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	945	907	A		4.2	635 - 1179	35	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	80	98	A		-18.4	69 - 127	6	A
Cesium-134	1150	1170	A		-1.7	819 - 1521	30	A
Cesium-137	570	572	A		-0.4	400 - 744	10	N
Cobalt-57	2		A			False Positive Test	9	
Cobalt-60	720	722	A		-0.3	505 - 939	20	A
Iron-55	970	1020	A		-4.9	714 - 1326	50	A
Manganese-54	392	410	A		-4.4	287 - 533	9	A
Nickel-63	1060	1280	A		-17.2	896 - 1664	50	A
Plutonium-238	57	59.8	A		-4.7	41.9 - 77.7	3	A
Plutonium-239/240	64	71.3	A		-10.2	49.9 - 92.7	4	A
Potassium-40	570	607	A		-6.1	425 - 789	20	A
Strontium-90	20		A			False Positive Test	120	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	600	777	W		-22.8	544 - 1010	30	A
Uranium-234	49	51.4	A		-4.7	36.0 - 66.8	3	A
Uranium-238	159	168	A		-5.4	118 - 218	9	A
Zinc-65	870	907	A		-4.1	635 - 1179	20	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1147.5	1170	A		-1.9	819 - 1521	32.575	A
Cesium-137	567.75	572	A		-0.7	400 - 744	34.2	A
Cobalt-57	0.7457175		A			False Positive Test	0.6265	
Cobalt-60	688	722	A		-4.7	505 - 939	19.55	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	391.25	410	A		-4.6	287 - 533	23.6	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	534	607	A		-12.0	425 - 789	23.875	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	862	907	A		-5.0	635 - 1179	37.55	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(ORIS01) ORISE/IEAV

PO Box 117

Oak Ridge, TN 37831-0117

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	85.6	98	A		-12.7	69 - 127	4.6	A
Cesium-134	1175	1170	A		0.4	819 - 1521	63	A
Cesium-137	597	572	A		4.4	400 - 744	35	A
Cobalt-57	0.95			A		False Positive Test	0.96	
Cobalt-60	725	722	A		0.4	505 - 939	23	A
Iron-55	897	1020	A		-12.1	714 - 1326	45	A
Manganese-54	417	410	A		1.7	287 - 533	22	A
Nickel-63	1246	1280	A		-2.7	896 - 1664	37	A
Plutonium-238	58.1	59.8	A		-2.8	41.9 - 77.7	3.5	A
Plutonium-239/240	67.4	71.3	A		-5.5	49.9 - 92.7	4.0	A
Potassium-40	614	607	A		1.2	425 - 789	33	A
Strontium-90	-4.3			A		False Positive Test	3.6	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	746	777	A		-4.0	544 - 1010	30	A
Uranium-234	47.8	51.4	A		-7.0	36.0 - 66.8	3.7	A
Uranium-238	160	168	A		-4.8	118 - 218	11	A
Zinc-65	938	907	A		3.4	635 - 1179	32	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	12.4	29.9	N		-58.5	20.9 - 38.9	3	W
Arsenic	15.1	20.2	W		-25.2	14.1 - 26.3	1	A
Barium	151	144	A		4.9	101 - 187	2.5	N
Beryllium	18.2	20.8	A		-12.5	14.6 - 27.0	2.5	A
Cadmium	15.7	16.4	A		-4.3	11.5 - 21.3	1	A
Chromium	42.3	53.3	W		-20.6	37.3 - 69.3	5	A
Cobalt	125	149	A		-16.1	104 - 194	1	N
Copper	186	197	A		-5.6	138 - 256	5	A
Lead	70.8	72.0	A		-1.7	50.4 - 93.6	2	A
Mercury	0.197	0.215	A		-8.4	0.151 - 0.280	0.04	W
Nickel	105	124	A		-15.3	87 - 161	2.5	A
Selenium	13.1	13.1	A		0.0	9.2 - 17.0	2.5	W
Silver	56.9	59.9	A		-5.0	41.9 - 77.9	0.5	N
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	27.8	30.1	A		-7.6	21.1 - 39.1	2	A
Uranium-235	0.0356	0.0391	A		-9.0	0.0274 - 0.0508	0.0002	N
Uranium-238	12.7	13.5	A		-5.9	9.5 - 17.6	0.23	N
Uranium-Total	14.4	13.6	A		5.9	9.5 - 17.7	0.1	N
Vanadium	158	201	W		-21.4	141 - 261	2.5	N
Zinc	283	317	A		-10.7	222 - 412	25	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	74.6	98	W		-23.9	69 - 127	7.26	A
Cesium-134	1000	1170	A		-14.5	819 - 1521	63.4	A
Cesium-137	588	572	A		2.8	400 - 744	38.7	A
Cobalt-57	0.839		A			False Positive Test	3.75	
Cobalt-60	708	722	A		-1.9	505 - 939	39.7	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	433	410	A		5.6	287 - 533	28.4	A
Nickel-63	824	1280	N		-35.6	896 - 1664	55.1	A
Plutonium-238	57.0	59.8	A		-4.7	41.9 - 77.7	4.34	A
Plutonium-239/240	61.4	71.3	A		-13.9	49.9 - 92.7	5.48	A
Potassium-40	638	607	A		5.1	425 - 789	54.9	A
Strontium-90	0.42		A			False Positive Test	2.0	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	610	777	W		-21.5	544 - 1010	23.1	A
Uranium-234	38.7	51.4	W		-24.7	36.0 - 66.8	8.8	W
Uranium-238	178	168	A		6.0	118 - 218	16.5	A
Zinc-65	977	907	A		7.7	635 - 1179	60.7	A

Radiological Reference Date: August 1, 2021

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

(5) = Total Metal

(6) = Not Evaluated

(11) = False Positive Test, Result 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-21-MaS45
 (QUAN02) Eurofins TestAmerica Knoxville
 5815 Middlebrook Pike
 Knoxville, TN 37921-

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	27.2	29.9	A		-9.0	20.9 - 38.9	0.90667	A
Arsenic	18.1	20.2	A		-10.4	14.1 - 26.3	0.60333	A
Barium	132.0	144	A		-8.3	101 - 187	4.40000	A
Beryllium	19.1	20.8	A		-8.2	14.6 - 27.0	0.63667	A
Cadmium	14.4	16.4	A		-12.2	11.5 - 21.3	0.48000	A
Chromium	48.7	53.3	A		-8.6	37.3 - 69.3	1.62333	A
Cobalt	131.0	149	A		-12.1	104 - 194	4.36667	A
Copper	175.0	197	A		-11.2	138 - 256	5.83333	A
Lead	66.4	72.0	A		-7.8	50.4 - 93.6	2.21333	A
Mercury	0.25600	0.215	A		19.1	0.151 - 0.280	0.00853	A
Nickel	111.0	124	A		-10.5	87 - 161	3.70000	A
Selenium	10.2	13.1	W		-22.1	9.2 - 17.0	0.34000	A
Silver	50.7	59.9	A		-15.4	41.9 - 77.9	1.69000	A
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	27.8	30.1	A		-7.6	21.1 - 39.1	0.92667	A
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	169.0	201	A		-15.9	141 - 261	5.63333	A
Zinc	281.0	317	A		-11.4	222 - 412	11.70833	A

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	NR	1170				819 - 1521		
Cesium-137	NR	572				400 - 744		
Cobalt-57	NR					False Positive Test		
Cobalt-60	NR	722				505 - 939		
Iron-55	NR	1020				714 - 1326		
Manganese-54	NR	410				287 - 533		
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	NR	607				425 - 789		
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	NR	907				635 - 1179		

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	10.6	13.6	W		-22.1	9.5 - 17.7	0.3	A
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	85.9	98	A		-12.3	69 - 127	4.3	A
Cesium-134	917	1170	W		-21.6	819 - 1521	47	A
Cesium-137	536	572	A		-6.3	400 - 744	21	A
Cobalt-57	2.5		A			False Positive Test	4.0	
Cobalt-60	656	722	A		-9.1	505 - 939	16	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	385	410	A		-6.1	287 - 533	12	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	43.4	59.8	W		-27.4	41.9 - 77.7	1.4	A
Plutonium-239/240	49.6	71.3	N		-30.4	49.9 - 92.7	1.6	A
Potassium-40	586	607	A		-3.5	425 - 789	30	A
Strontium-90	0.06		A			False Positive Test	0.17	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	46.5	51.4	A		-9.5	36.0 - 66.8	2.9	A
Uranium-238	155.7	168	A		-7.3	118 - 218	4.7	A
Zinc-65	888	907	A		-2.1	635 - 1179	27	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	30.7	29.9	A		2.7	20.9 - 38.9	4.11	A
Arsenic	17.2	20.2	A		-14.9	14.1 - 26.3	1.91	A
Barium	144	144	A		0.0	101 - 187	12.0	A
Beryllium	23.9	20.8	A		14.9	14.6 - 27.0	2.72	A
Cadmium	16.2	16.4	A		-1.2	11.5 - 21.3	1.17	A
Chromium	47.2	53.3	A		-11.4	37.3 - 69.3	5.53	A
Cobalt	141	149	A		-5.4	104 - 194	17.3	A
Copper	183	197	A		-7.1	138 - 256	18.9	A
Lead	67.8	72.0	A		-5.8	50.4 - 93.6	5.60	A
Mercury	0.207	0.215	A		-3.7	0.151 - 0.280	0.026	A
Nickel	115	124	A		-7.3	87 - 161	11.9	A
Selenium	12.6	13.1	A		-3.8	9.2 - 17.0	1.25	A
Silver	59.8	59.9	A		-0.2	41.9 - 77.9	6.62	A
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	29.1	30.1	A		-3.3	21.1 - 39.1	2.33	A
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	11.7	13.6	A		-14.0	9.5 - 17.7	1.13	A
Vanadium	184	201	A		-8.5	141 - 261	26.4	A
Zinc	340	317	A		7.3	222 - 412	57.1	W

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	NR	1170				819 - 1521		
Cesium-137	NR	572				400 - 744		
Cobalt-57	NR					False Positive Test		
Cobalt-60	NR	722				505 - 939		
Iron-55	NR	1020				714 - 1326		
Manganese-54	NR	410				287 - 533		
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	NR	607				425 - 789		
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	NR	907				635 - 1179		

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(SANC99) RadioAnalysis, South Africa Nuclear Energy Corp.

Sample Receipt Gate 1

Pretoria, Gauteng 0001

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	10.79	13.6	W		-20.7	9.5 - 17.7	0.47	A
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1041	1170	A		-11.0	819 - 1521	36.1	A
Cesium-137	576.70	572	A		0.8	400 - 744	21.02	A
Cobalt-57	3.99		A			False Positive Test	3.99	
Cobalt-60	646.70	722	A		-10.4	505 - 939	27.38	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	389.30	410	A		-5.0	287 - 533	14.86	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	503.60	607	A		-17.0	425 - 789	45.02	A
Strontium-90	14.985		N	(1)		False Positive Test	3.385	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	832.70	907	A		-8.2	635 - 1179	35.96	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	87.2	98	A		-11.0	69 - 127	5.7	A
Cesium-134	1236	1170	A		5.6	819 - 1521	67	A
Cesium-137	598	572	A		4.5	400 - 744	39	A
Cobalt-57	1.55		A			False Positive Test	0.89	
Cobalt-60	736	722	A		1.9	505 - 939	42	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	429	410	A		4.6	287 - 533	30	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	60.2	59.8	A		0.7	41.9 - 77.7	4.5	A
Plutonium-239/240	69.4	71.3	A		-2.7	49.9 - 92.7	5.2	A
Potassium-40	620	607	A		2.1	425 - 789	43	A
Strontium-90	5.5		A			False Positive Test	5.9	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	52.3	51.4	A		1.8	36.0 - 66.8	4.0	A
Uranium-238	174	168	A		3.6	118 - 218	12	A
Zinc-65	982	907	A		8.3	635 - 1179	65	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	868.56	1170	W		-25.8	819 - 1521	86.86	A
Cesium-137	529.76	572	A		-7.4	400 - 744	52.98	A
Cobalt-57	1.06		A			False Positive Test	1.06	
Cobalt-60	602.54	722	A		-16.5	505 - 939	60.25	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	291.85	410	W		-28.8	287 - 533	29.18	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	501.16	607	A		-17.4	425 - 789	50.12	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	599.45	907	N		-33.9	635 - 1179	59.94	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(SOUT01) Southwest Research Institute

6220 Culebra Rd.

San Antonio, TX 78228-0510

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	28.8	29.9	A		-3.7	20.9 - 38.9	5.38	W
Arsenic	16.6	20.2	A		-17.8	14.1 - 26.3	2.86	W
Barium	152	144	A		5.6	101 - 187	24.3	W
Beryllium	22.4	20.8	A		7.7	14.6 - 27.0	3.62	W
Cadmium	16.2	16.4	A		-1.2	11.5 - 21.3	2.65	W
Chromium	53.6	53.3	A		0.6	37.3 - 69.3	8.59	W
Cobalt	141	149	A		-5.4	104 - 194	22.6	W
Copper	207	197	A		5.1	138 - 256	33.1	W
Lead	69.9	72.0	A		-2.9	50.4 - 93.6	11.2	W
Mercury	0.250	0.215	A		16.3	0.151 - 0.280	0.0441	W
Nickel	126	124	A		1.6	87 - 161	20.2	W
Selenium	13.0	13.1	A		-0.8	9.2 - 17.0	2.34	W
Silver	57.9	59.9	A		-3.3	41.9 - 77.9	9.33	W
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	25.5	30.1	A		-15.3	21.1 - 39.1	4.22	W
Uranium-235	0.0408	0.0391	A		4.3	0.0274 - 0.0508	0.00855	W
Uranium-238	13.4	13.5	A		-0.7	9.5 - 17.6	2.14	W
Uranium-Total	13.4	13.6	A		-1.5	9.5 - 17.7	2.14	W
Vanadium	199	201	A		-1.0	141 - 261	31.8	W
Zinc	314	317	A		-0.9	222 - 412	50.2	W

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	95.9	98	A		-2.1	69 - 127	8.19	A
Cesium-134	1137	1170	A		-2.8	819 - 1521	37.8	A
Cesium-137	652	572	A		14.0	400 - 744	21.1	A
Cobalt-57	0.214		A			False Positive Test	1.15	
Cobalt-60	815	722	A		12.9	505 - 939	20.2	A
Iron-55	759	1020	W		-25.6	714 - 1326	147	W
Manganese-54	474	410	A		15.6	287 - 533	16.6	A
Nickel-63	1230	1280	A		-3.9	896 - 1664	88.5	A
Plutonium-238	66.7	59.8	A		11.5	41.9 - 77.7	5.15	A
Plutonium-239/240	73.7	71.3	A		3.4	49.9 - 92.7	5.63	A
Potassium-40	726	607	A		19.6	425 - 789	33.8	A
Strontium-90	-0.911		A			False Positive Test	1.79	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	456	777	N		-41.3	544 - 1010	26.4	A
Uranium-234	52.6	51.4	A		2.3	36.0 - 66.8	4.30	A
Uranium-238	166	168	A		-1.2	118 - 218	12.3	A
Zinc-65	1115	907	W		22.9	635 - 1179	38.1	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1.10e+3	1170	A		-6.0	819 - 1521	7.07e+1	A
Cesium-137	5.50e+2	572	A		-3.8	400 - 744	3.32e+1	A
Cobalt-57	-1.08e+0			A		False Positive Test	1.12e+0	
Cobalt-60	6.77e+2	722	A		-6.2	505 - 939	2.72e+1	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	3.87e+2	410	A		-5.6	287 - 533	2.33e+1	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	5.37e+2	607	A		-11.5	425 - 789	2.36e+1	A
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	8.27e+2	907	A		-8.8	635 - 1179	3.70e+1	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	83.3	98	A		-15.0	69 - 127	7.6	A
Cesium-134	1028	1170	A		-12.1	819 - 1521	17	N
Cesium-137	541	572	A		-5.4	400 - 744	17	A
Cobalt-57	0.8		A			False Positive Test	4.5	
Cobalt-60	654	722	A		-9.4	505 - 939	13	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	391	410	A		-4.6	287 - 533	12	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	61.8	59.8	A		3.3	41.9 - 77.7	8.1	A
Plutonium-239/240	94	71.3	N		31.8	49.9 - 92.7	11	A
Potassium-40	560	607	A		-7.7	425 - 789	32	A
Strontium-90	1.8		A			False Positive Test	3.4	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	51.2	51.4	A		-0.4	36.0 - 66.8	5.6	A
Uranium-238	176	168	A		4.8	118 - 218	15	A
Zinc-65	921	907	A		1.5	635 - 1179	29	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	NR	1170				819 - 1521		
Cesium-137	NR	572				400 - 744		
Cobalt-57	NR					False Positive Test		
Cobalt-60	NR	722				505 - 939		
Iron-55	NR	1020				714 - 1326		
Manganese-54	NR	410				287 - 533		
Nickel-63	546	1280	N		-57.3	896 - 1664	79.7	A
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	NR	607				425 - 789		
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	453	777	N		-41.7	544 - 1010	43.3	A
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	NR	907				635 - 1179		

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1035.19	1170	A		-11.5	819 - 1521	10.37	N
Cesium-137	627.78	572	A		9.8	400 - 744	10.56	N
Cobalt-57	-0.11		A			False Positive Test	1.26	
Cobalt-60	720.37	722	A		-0.2	505 - 939	7.41	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	455.56	410	A		11.1	287 - 533	11.11	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	662.96	607	A		9.2	425 - 789	50.0	A
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	1001.85	907	A		10.5	635 - 1179	22.04	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	89.294	98	A		-8.9	69 - 127	16.527	W
Cesium-134	989.134	1170	A		-15.5	819 - 1521	47.360	A
Cesium-137	573.501	572	A		0.3	400 - 744	53.280	A
Cobalt-57	-0.290		A			False Positive Test	5.705	
Cobalt-60	675.867	722	A		-6.4	505 - 939	42.797	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	398.367	410	A		-2.8	287 - 533	38.233	A
Nickel-63	1221.525	1280	A		-4.6	896 - 1664	42.716	A
Plutonium-238	58.695	59.8	A		-1.8	41.9 - 77.7	14.830	W
Plutonium-239/240	76.766	71.3	A		7.7	49.9 - 92.7	17.494	W
Potassium-40	583.367	607	A		-3.9	425 - 789	71.675	A
Strontium-90	1.216		A			False Positive Test	11.199	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Techneium-99	716.241	777	A		-7.8	544 - 1010	30.620	A
Uranium-234	92.074	51.4	N		79.1	36.0 - 66.8	13.225	A
Uranium-238	181.192	168	A		7.9	118 - 218	20.939	A
Zinc-65	905.268	907	A		-0.2	635 - 1179	79.550	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	89.199	98	A		-9.0	69 - 127	3.726	A
Cesium-134	935.346	1170	W		-20.1	819 - 1521	11.496	N
Cesium-137	579.92	572	A		1.4	400 - 744	16.091	A
Cobalt-57	.714		A			False Positive Test	.52	
Cobalt-60	711.254	722	A		-1.5	505 - 939	12.854	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	423.522	410	A		3.3	287 - 533	10.16	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	640.868	607	A		5.6	425 - 789	19.898	A
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	50.528	51.4	A		-1.7	36.0 - 66.8	7.309	A
Uranium-238	166.312	168	A		-1.0	118 - 218	15.493	A
Zinc-65	979.516	907	A		8.0	635 - 1179	24.572	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(UNEV01) University of Nevada, Reno

1664 North Virginia St, MS 328

Reno, NV 89557

Inorganic							Units: (mg/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Antimony	NR	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	97.918	98	A		-0.1	69 - 127	3.779	A
Cesium-134	1108.774	1170	A		-5.2	819 - 1521	13.483	N
Cesium-137	618.469	572	A		8.1	400 - 744	21.055	A
Cobalt-57	NR		N	(11)		False Positive Test		
Cobalt-60	753.861	722	A		4.4	505 - 939	14.647	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	446.927	410	A		9.0	287 - 533	12.882	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	656.260	607	A		8.1	425 - 789	20.802	A
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	1029.576	907	A		13.5	635 - 1179	27.670	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1046.73	1170	A		-10.5	819 - 1521	35.72	A
Cesium-137	624.56	572	A		9.2	400 - 744	34.89	A
Cobalt-57	.01		A			False Positive Test	.01	
Cobalt-60	758.87	722	A		5.1	505 - 939	28.35	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	445.85	410	A		8.7	287 - 533	21.87	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	700.78	607	A		15.5	425 - 789	48.88	A
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	1017.5	907	A		12.2	635 - 1179	50.95	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98	N	(28)		69 - 127		
Cesium-134	1214.7	1170	A		3.8	819 - 1521	161.61	A
Cesium-137	616.23	572	A		7.7	400 - 744	82.216	A
Cobalt-57	0.335		A			False Positive Test	0.726	
Cobalt-60	773.57	722	A		7.1	505 - 939	101.45	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	465.25	410	A		13.5	287 - 533	61.926	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	58.46	59.8	A		-2.2	41.9 - 77.7	10.10	W
Plutonium-239/240	70.30	71.3	A		-1.4	49.9 - 92.7	11.84	W
Potassium-40	662.42	607	A		9.1	425 - 789	89.148	A
Strontium-90	30.93		N	(1)		False Positive Test	6.81	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777	N	(28)		544 - 1010		
Uranium-234	50.69	51.4	A		-1.4	36.0 - 66.8	11.10	W
Uranium-238	153.55	168	A		-8.6	118 - 218	26.60	W
Zinc-65	1048.1	907	A		15.6	635 - 1179	137.74	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	70.8733	98	W		-27.7	69 - 127	12.3639	W
Cesium-134	1172.9022	1170	A		0.2	819 - 1521	11.9559	N
Cesium-137	640.578	572	A		12.0	400 - 744	16.0187	A
Cobalt-57	1.0560		A			False Positive Test	0.6618	
Cobalt-60	777.1598	722	A		7.6	505 - 939	12.7894	N
Iron-55	NR	1020				714 - 1326		
Manganese-54	461.7519	410	A		12.6	287 - 533	10.3984	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	NR	607	N	(28)		425 - 789		
Strontium-90	NR					False Positive Test		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	1027.7739	907	A		13.3	635 - 1179	24.4393	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	8.16E+01	98	A		-16.7	69 - 127	1.52	W
Cesium-134	1.22E+03	1170	A		4.3	819 - 1521	2.93	A
Cesium-137	6.25E+02	572	A		9.3	400 - 744	1.40	A
Cobalt-57	2.44E-01			A		False Positive Test	5.10E-01	
Cobalt-60	7.74E+02	722	A		7.2	505 - 939	1.65	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	4.37E+02	410	A		6.6	287 - 533	9.12	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	6.07E+01	59.8	A		1.5	41.9 - 77.7	1.77	W
Plutonium-239/240	7.40E+01	71.3	A		3.8	49.9 - 92.7	2.20	W
Potassium-40	6.29E+02	607	A		3.6	425 - 789	2.83	A
Strontium-90	3.79E+00			A		False Positive Test	8.35	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	4.63E+01	51.4	A		-9.9	36.0 - 66.8	1.12	W
Uranium-238	1.46E+02	168	A		-13.1	118 - 218	3.44	W
Zinc-65	9.76E+02	907	A		7.6	635 - 1179	2.01	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result 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-21-MaS45
 (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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	NR	0.0391				0.0274 - 0.0508		
Uranium-238	NR	13.5				9.5 - 17.6		
Uranium-Total	NR	13.6				9.5 - 17.7		
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	1190	1170	A		1.7	819 - 1521	21.4	N
Cesium-137	624	572	A		9.1	400 - 744	17.5	A
Cobalt-57	0.971		A			False Positive Test	0.752	
Cobalt-60	759	722	A		5.1	505 - 939	41.8	A
Iron-55	NR	1020				714 - 1326		
Manganese-54	436	410	A		6.3	287 - 533	18.2	A
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	600	607	A		-1.2	425 - 789	48.6	A
Strontium-90	17.9		A			False Positive Test	7.14	

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	971	907	A		7.1	635 - 1179	70.6	A

Radiological Reference Date: August 1, 2021

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
- (5) = Total Metal
- (6) = Not Evaluated
- (11) = False Positive Test, Result Not Reported
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Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-21-MaS45

(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	29.9				20.9 - 38.9		
Arsenic	NR	20.2				14.1 - 26.3		
Barium	NR	144				101 - 187		
Beryllium	NR	20.8				14.6 - 27.0		
Cadmium	NR	16.4				11.5 - 21.3		
Chromium	NR	53.3				37.3 - 69.3		
Cobalt	NR	149				104 - 194		
Copper	NR	197				138 - 256		
Lead	NR	72.0				50.4 - 93.6		
Mercury	NR	0.215				0.151 - 0.280		
Nickel	NR	124				87 - 161		
Selenium	NR	13.1				9.2 - 17.0		
Silver	NR	59.9				41.9 - 77.9		
Technetium-99	NR	0.00123				0.00086 - 0.00160		
Thallium	NR	30.1				21.1 - 39.1		
Uranium-235	0.045	0.0391	A		15.1	0.0274 - 0.0508	0.01	W
Uranium-238	15	13.5	A		11.1	9.5 - 17.6	1.1	A
Uranium-Total	15.0	13.6	A		10.3	9.5 - 17.7	1.1	A
Vanadium	NR	201				141 - 261		
Zinc	NR	317				222 - 412		

Radiological							Units: (Bq/kg)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	NR	98				69 - 127		
Cesium-134	NR	1170				819 - 1521		
Cesium-137	NR	572				400 - 744		
Cobalt-57	NR					False Positive Test		
Cobalt-60	NR	722				505 - 939		
Iron-55	NR	1020				714 - 1326		
Manganese-54	NR	410				287 - 533		
Nickel-63	NR	1280				896 - 1664		
Plutonium-238	NR	59.8				41.9 - 77.7		
Plutonium-239/240	NR	71.3				49.9 - 92.7		
Potassium-40	NR	607				425 - 789		
Strontium-90	NR					False Positive Test		

Radiological						Units: (Bq/kg)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	777				544 - 1010		
Uranium-234	NR	51.4				36.0 - 66.8		
Uranium-238	NR	168				118 - 218		
Zinc-65	NR	907				635 - 1179		

Radiological Reference Date: August 1, 2021

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:

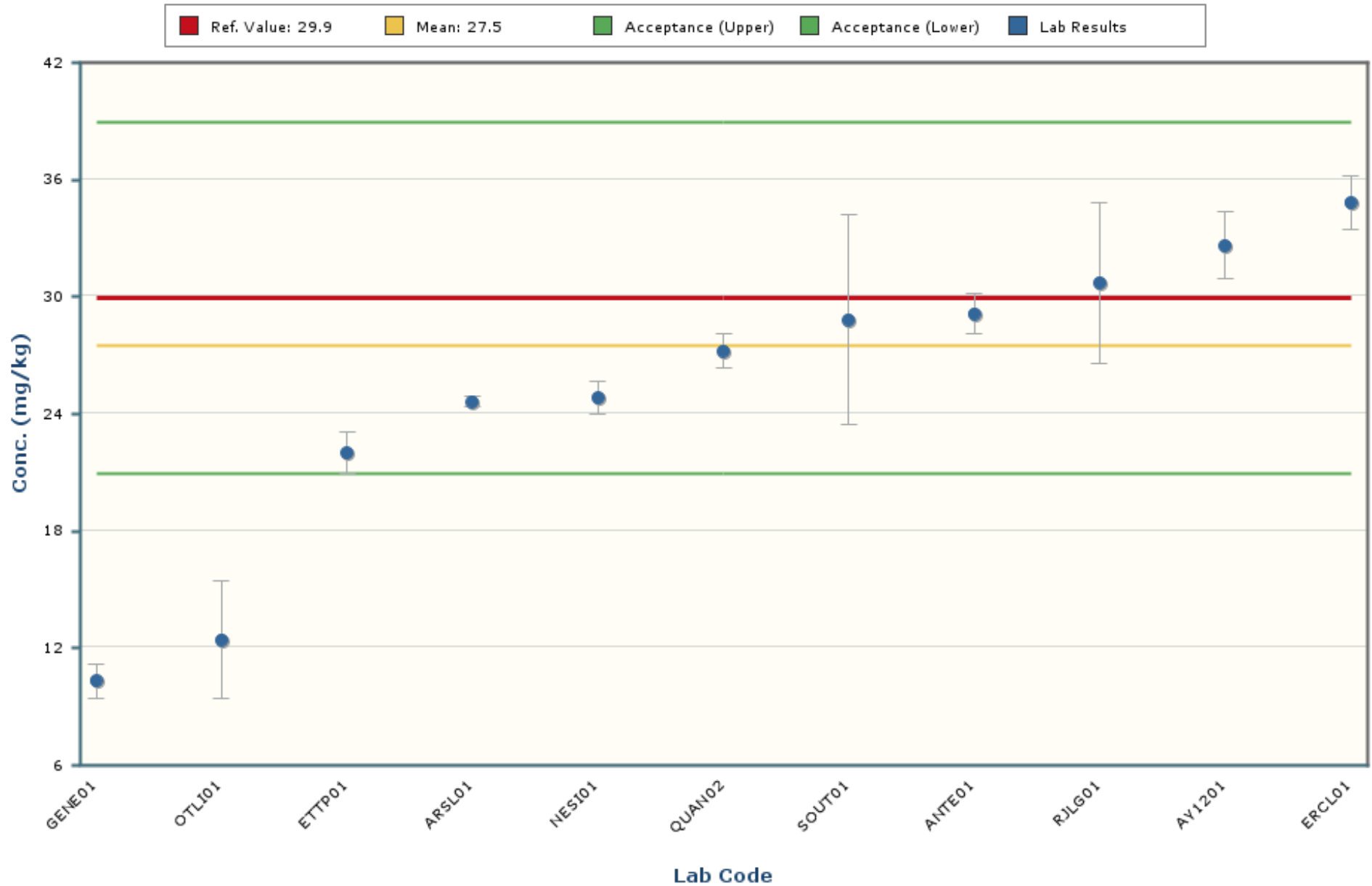
- NOT ACCEPTABLE.....RP < 2%
 - ACCEPTABLE.....2% <= RP <= 15%
 - ACCEPTABLE WITH WARNING.....15% < RP <= 30%
 - NOT ACCEPTABLE.....RP > 30%
- Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

Notes:

- (1) = False Positive
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Antimony

MAPEP-21-MaS45



Notes:

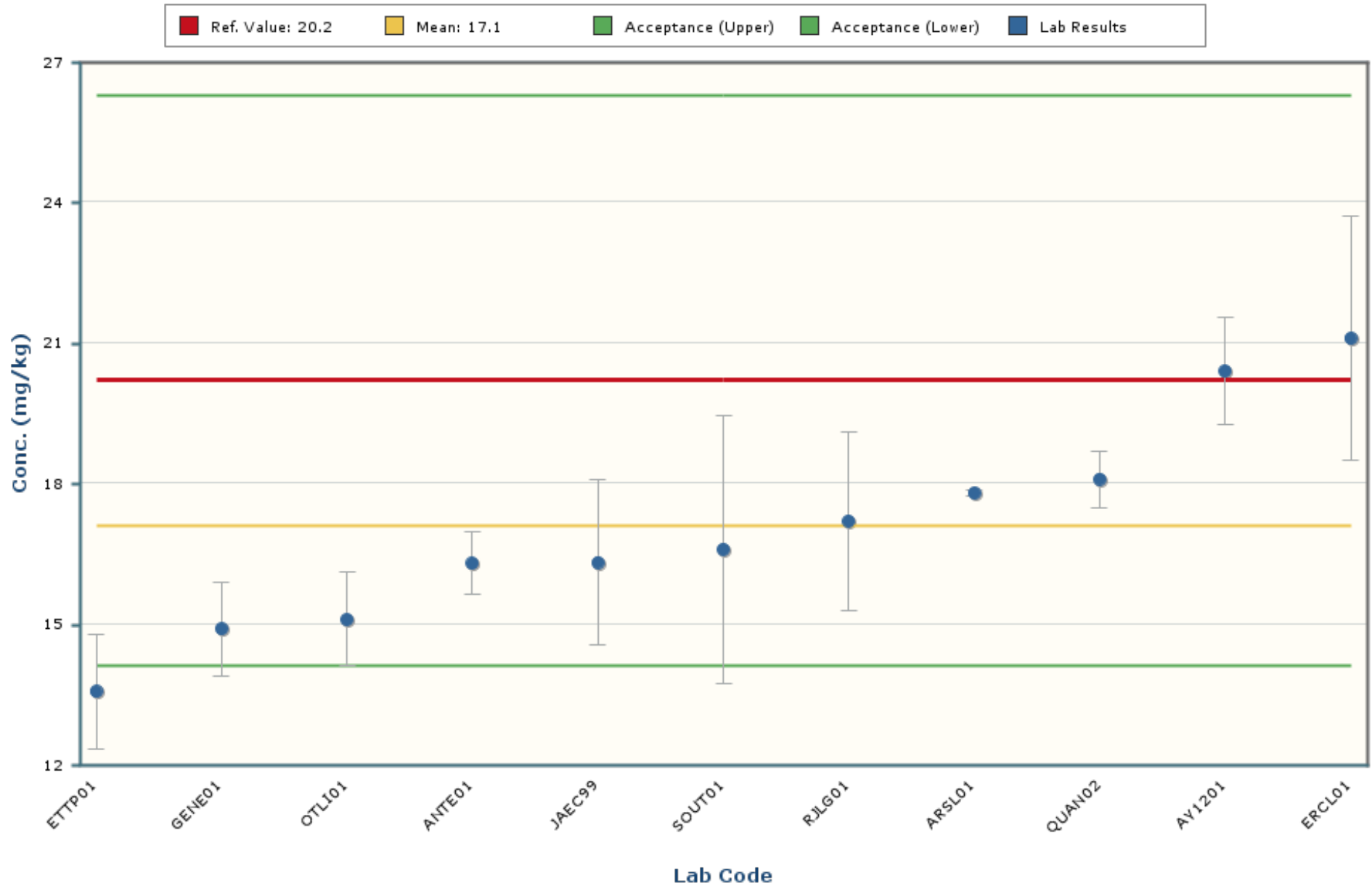
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 9.9 and 45.1 (± 5 Standard Deviations).

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

Arsenic

MAPEP-21-MaS45



Notes:

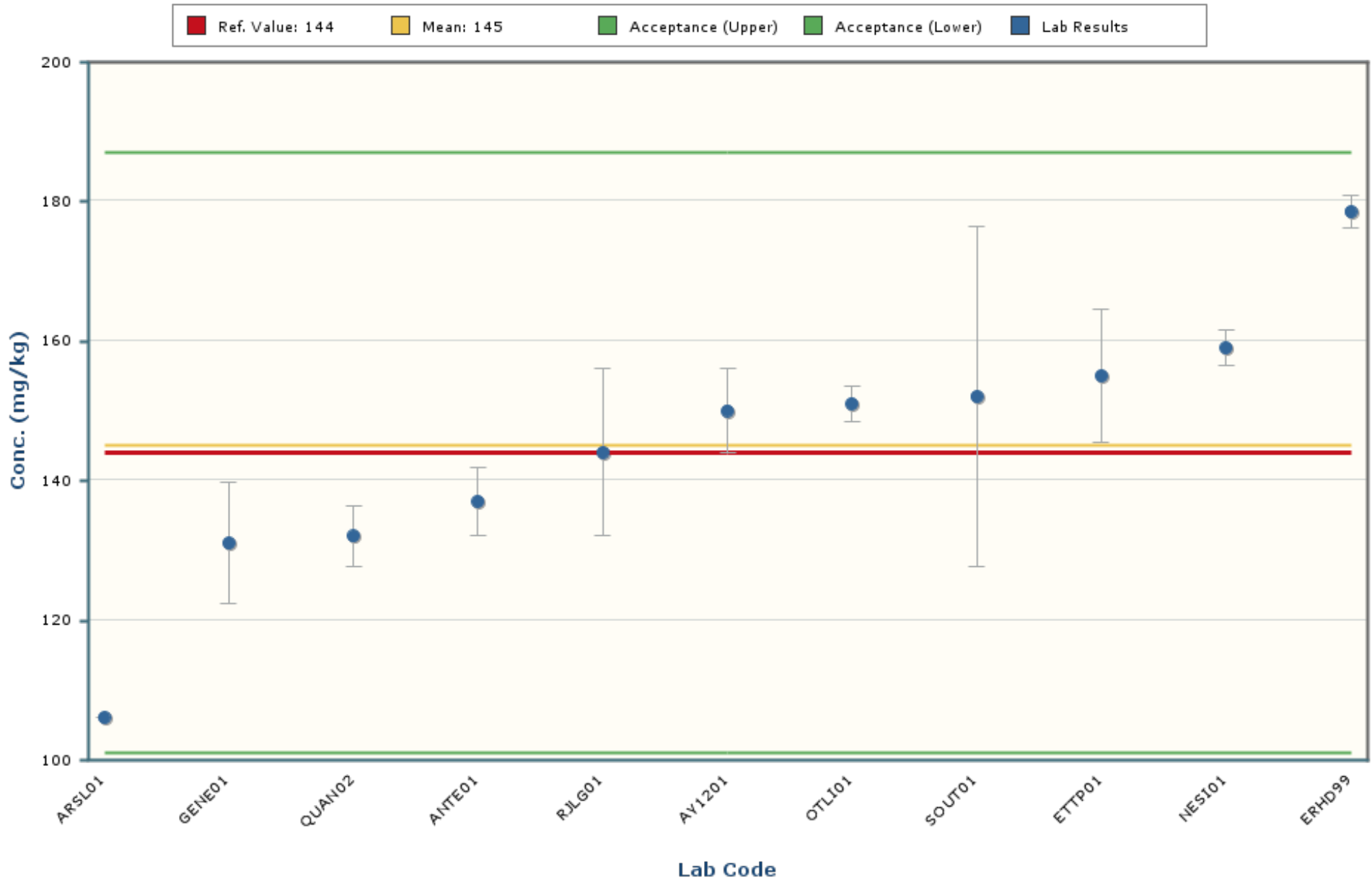
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 8.2 and 25.9 (± 5 Standard Deviations).

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

Barium

MAPEP-21-MaS45



Notes:

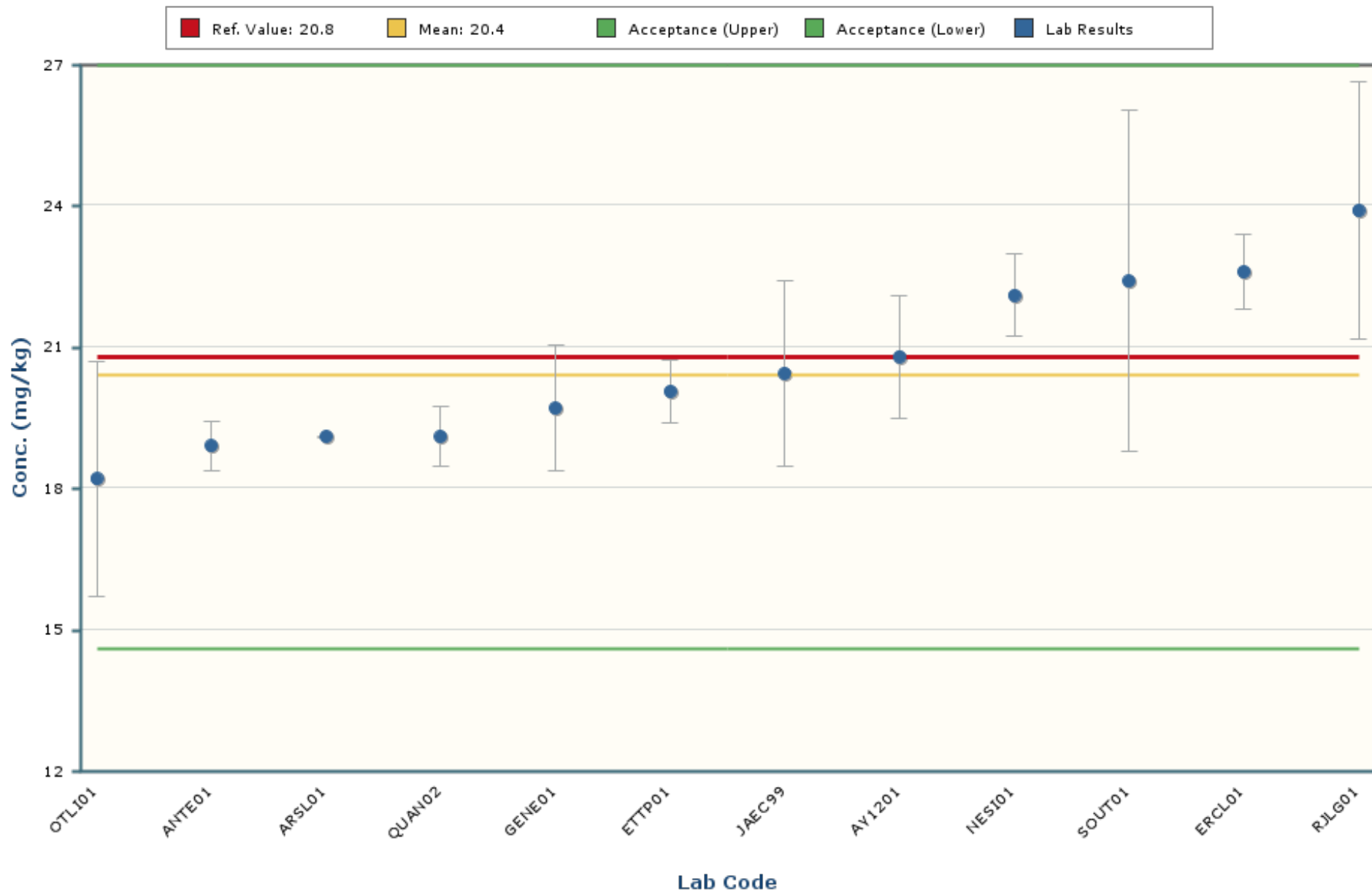
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 52 and 238 (± 5 Standard Deviations).

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

Beryllium

MAPEP-21-MaS45



Notes:

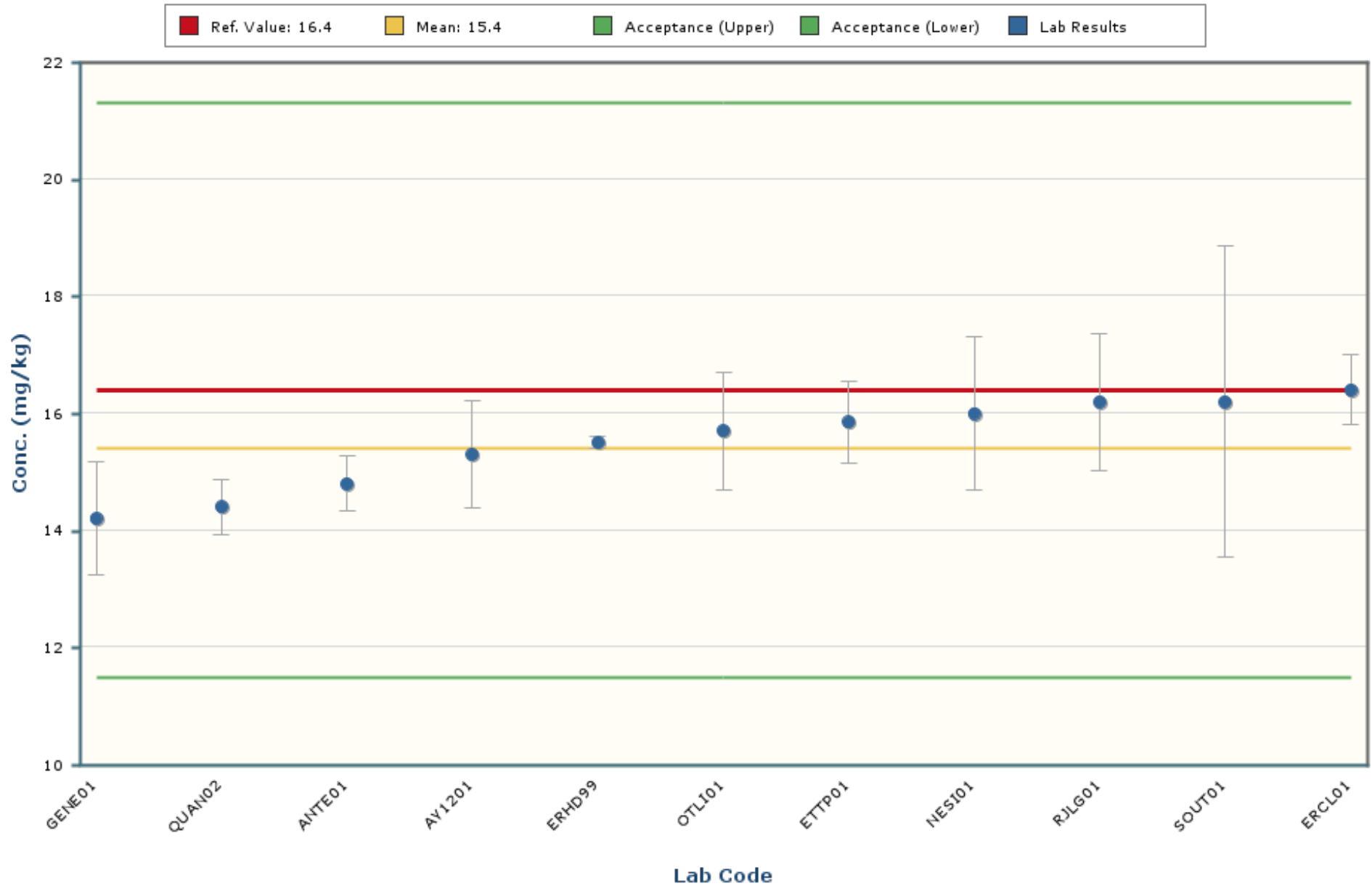
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 11.2 and 29.6 (± 5 Standard Deviations).

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

Cadmium

MAPEP-21-MaS45



Notes:

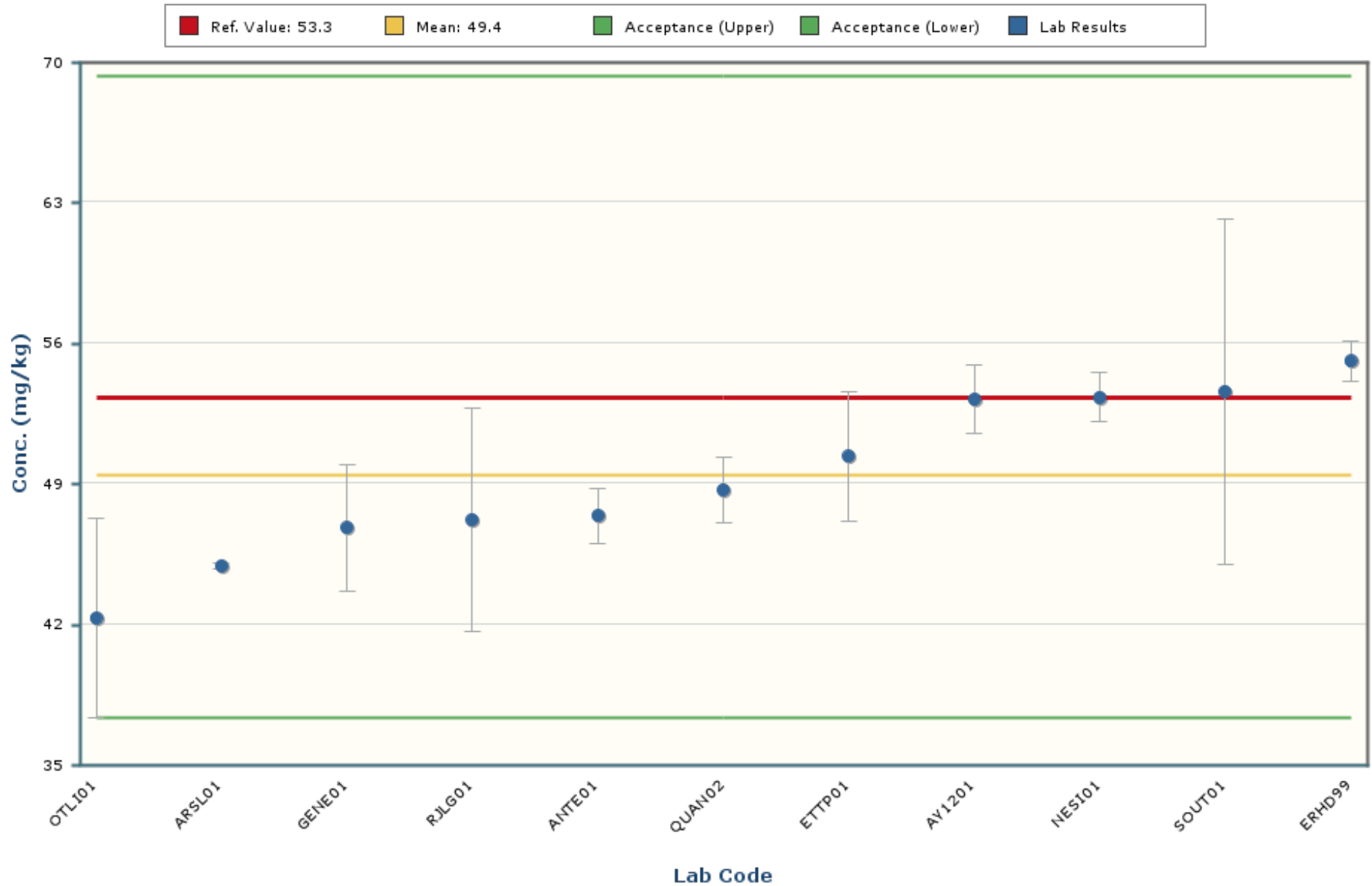
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 11.8 and 19.0 (± 5 Standard Deviations).

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

Chromium

MAPEP-21-MaS45



Notes:

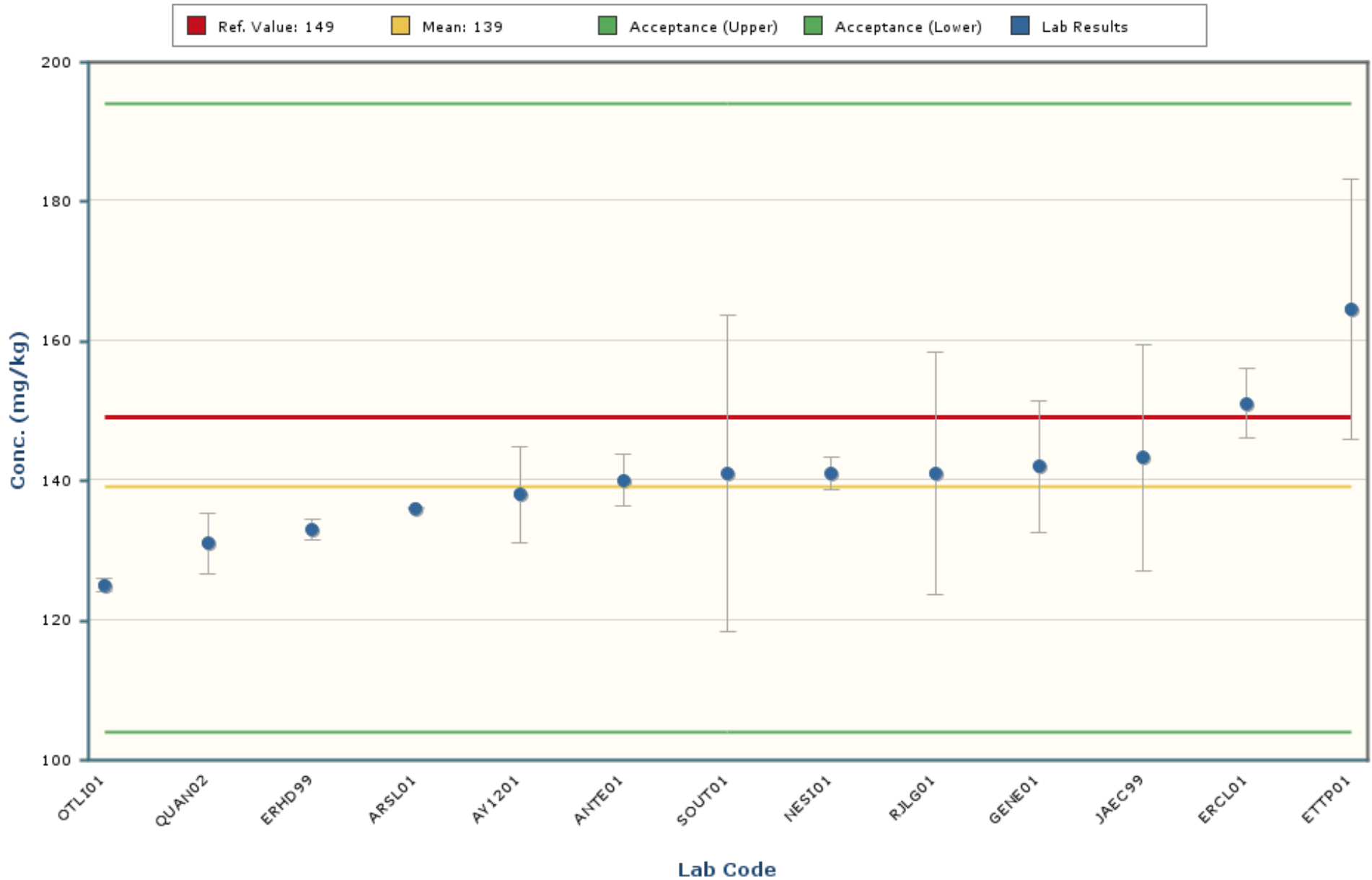
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 28.9 and 69.8 (± 5 Standard Deviations).

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

Cobalt

MAPEP-21-MaS45



Notes:

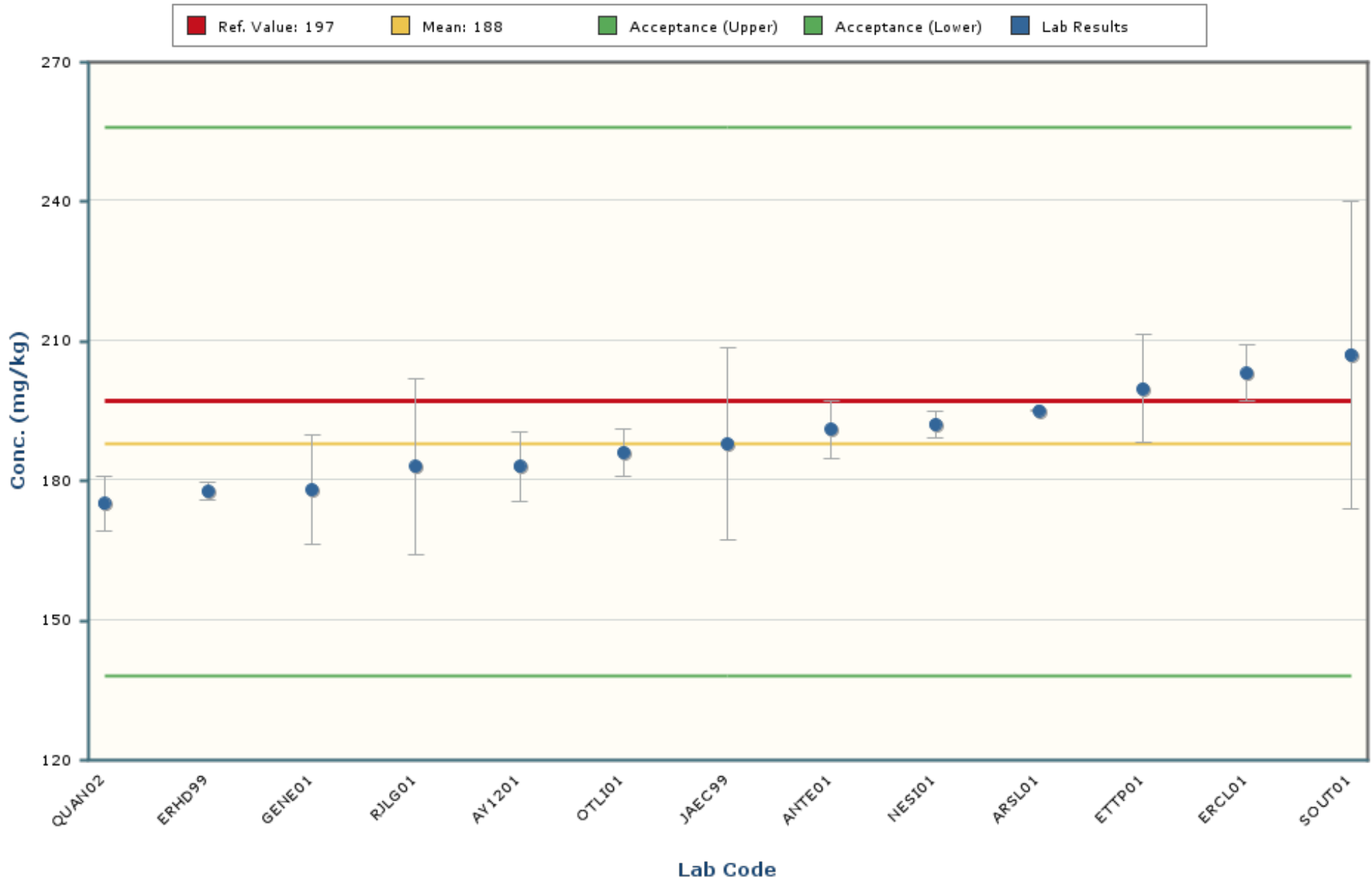
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 90 and 189 (± 5 Standard Deviations).

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

Copper

MAPEP-21-MaS45



Notes:

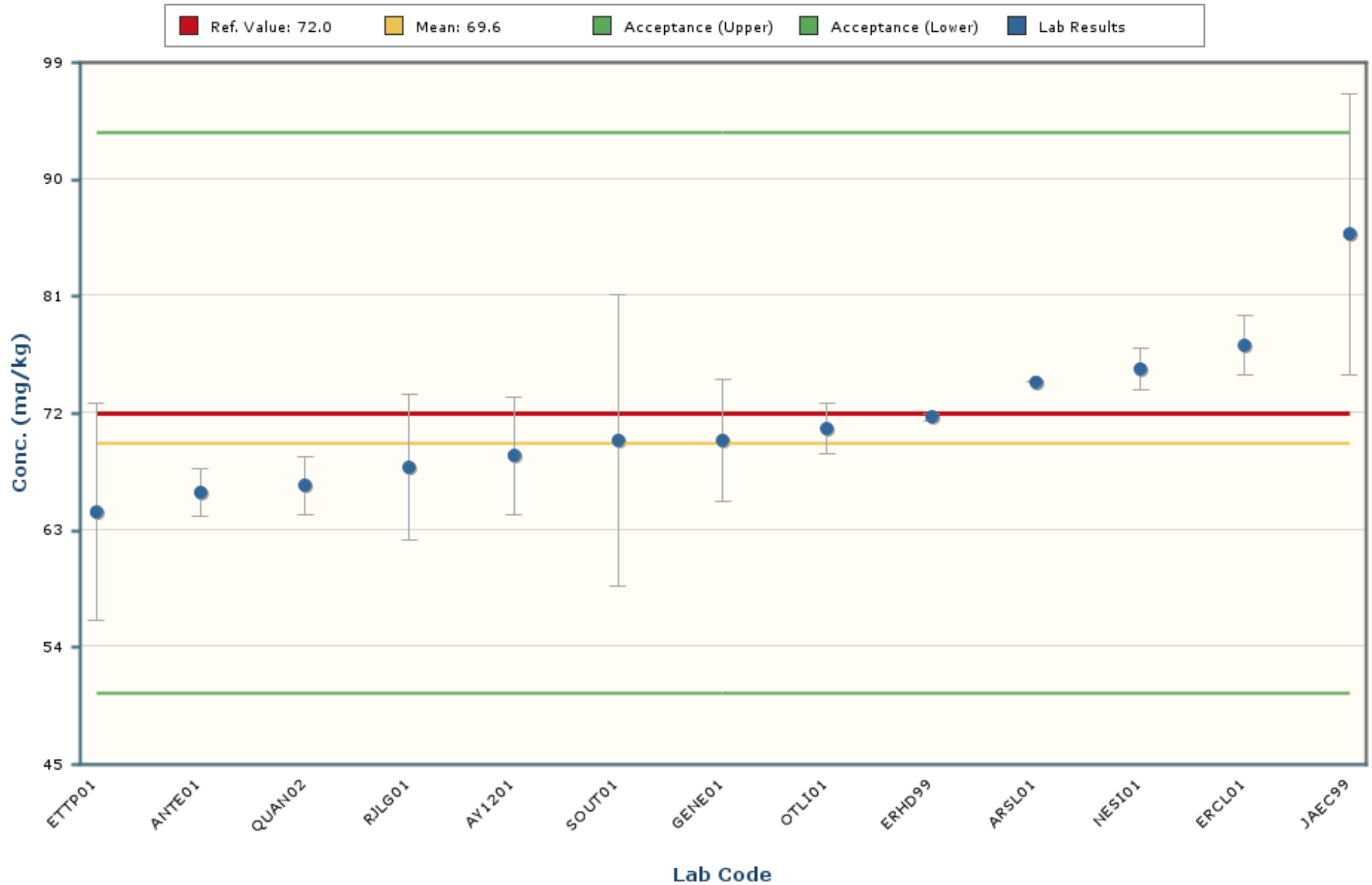
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 138 and 238 (± 5 Standard Deviations).

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

Lead

MAPEP-21-MaS45



Notes:

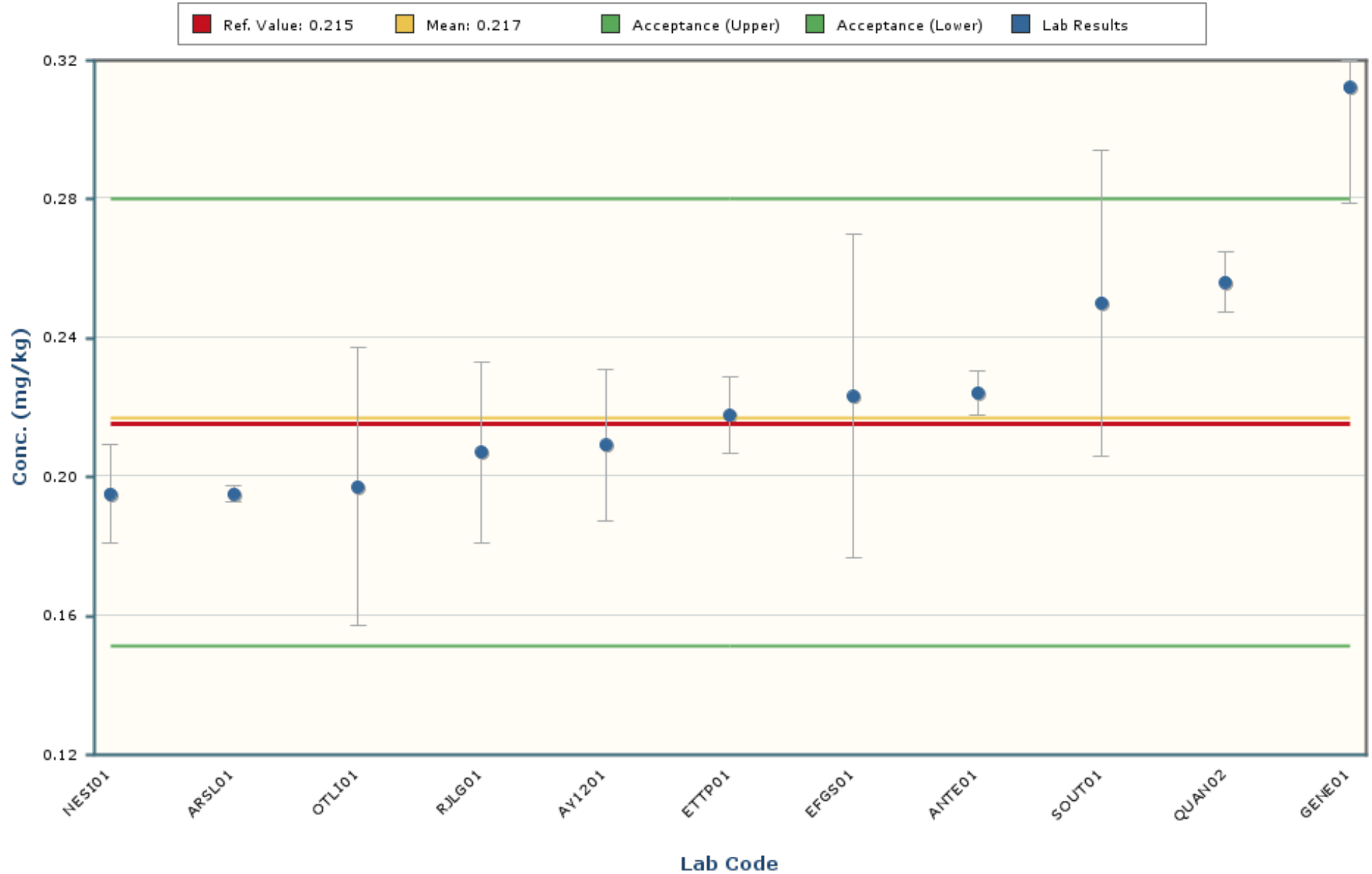
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 52.4 and 86.8 (± 5 Standard Deviations).

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

Mercury

MAPEP-21-MaS45



Notes:

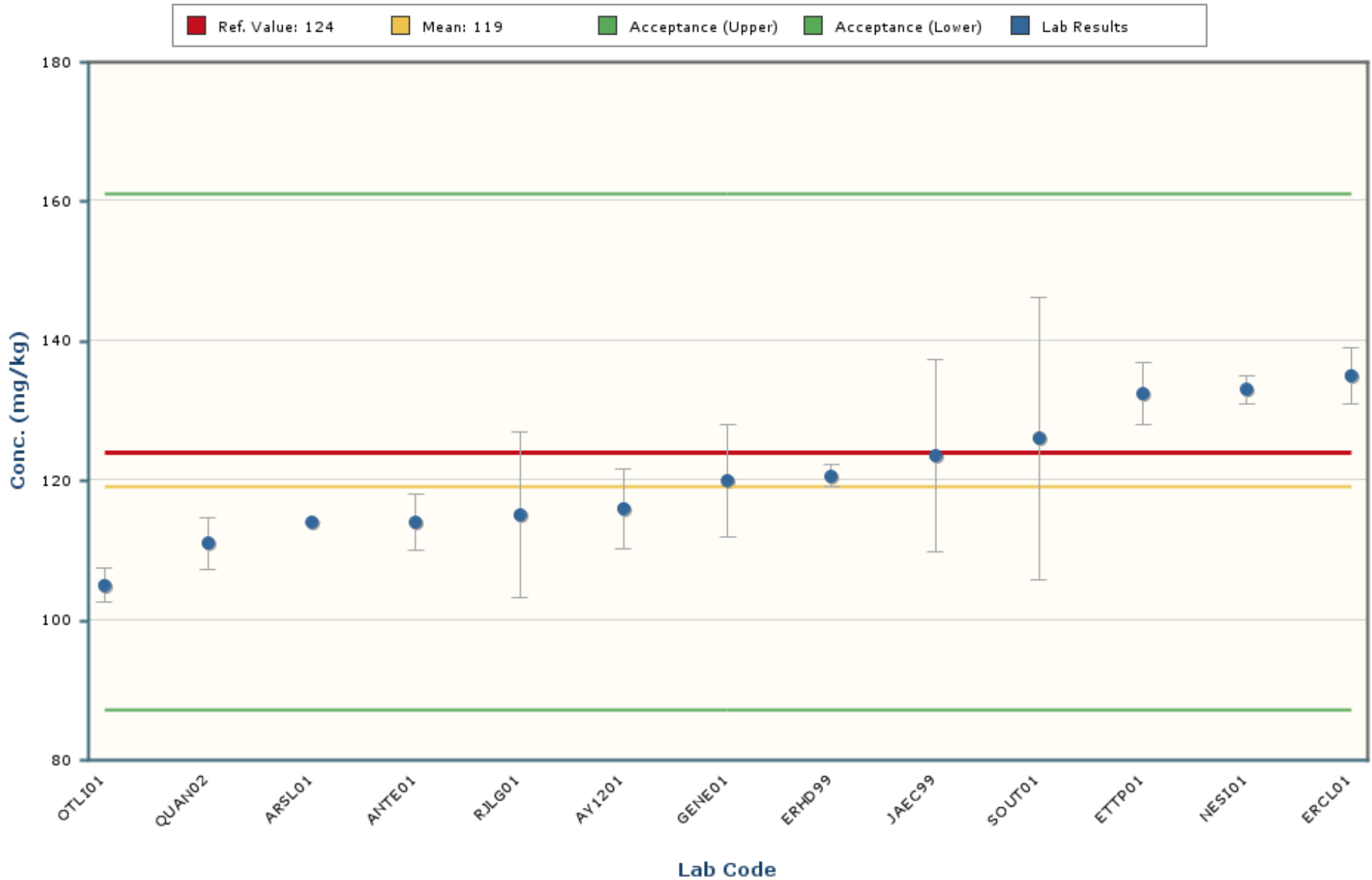
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 0.109 and 0.326 (± 5 Standard Deviations).

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

Nickel

MAPEP-21-MaS45



Notes:

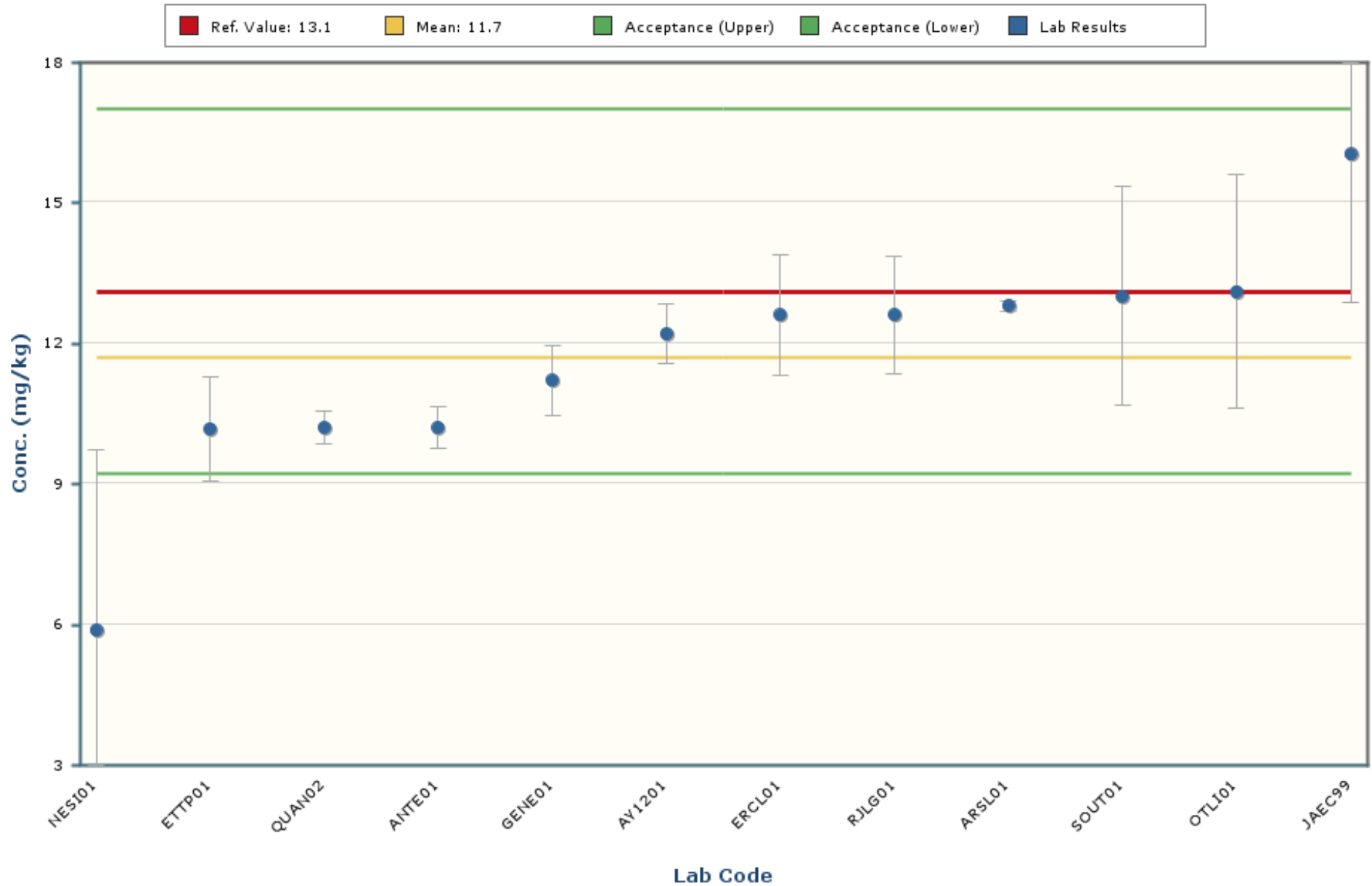
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 75 and 162 (± 5 Standard Deviations).

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

Selenium

MAPEP-21-MaS45



Notes:

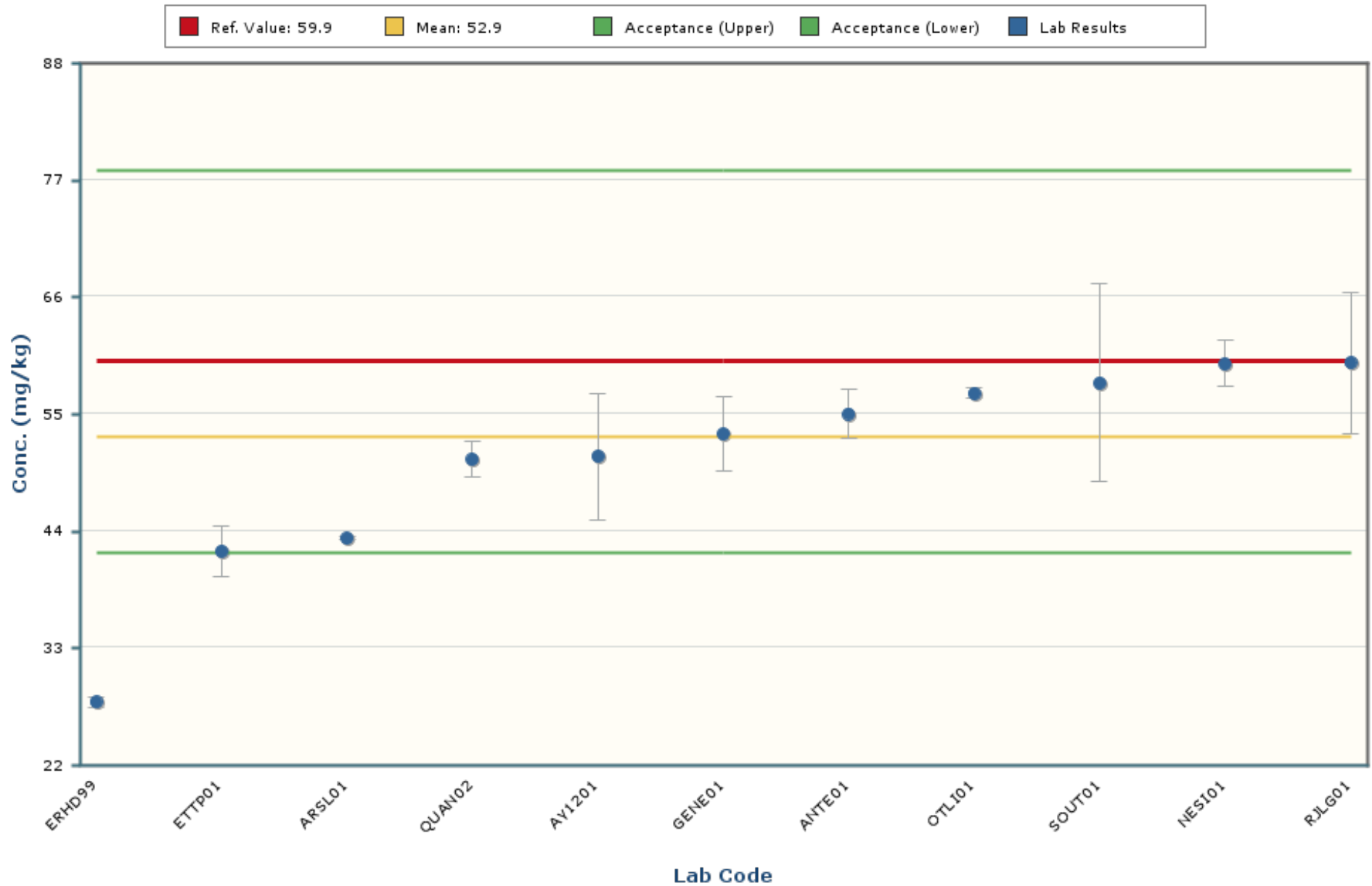
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 5.3 and 18.1 (± 5 Standard Deviations).

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

Silver

MAPEP-21-MaS45



Notes:

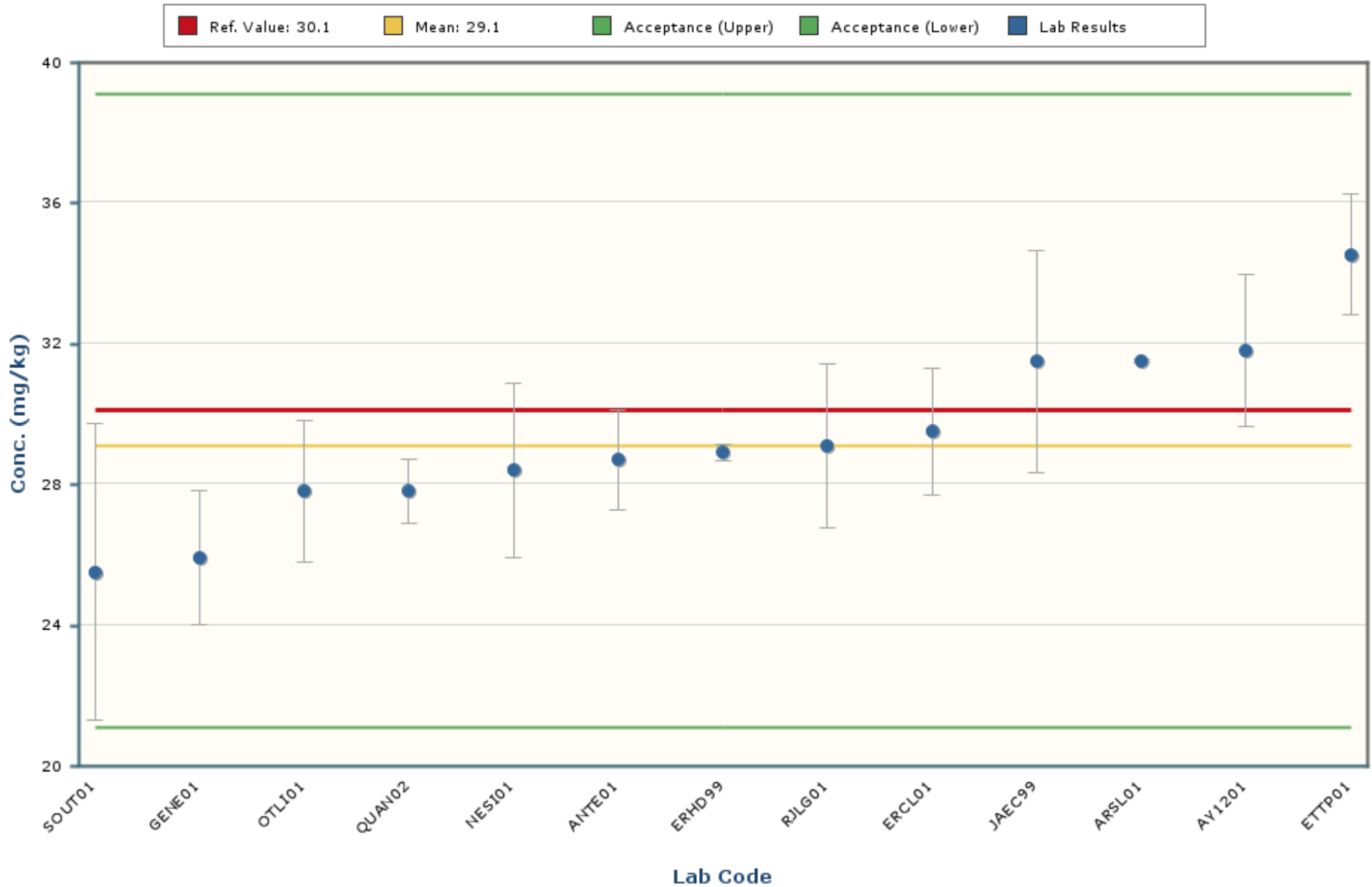
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 21.4 and 84.4 (± 5 Standard Deviations).

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

Thallium

MAPEP-21-MaS45



Notes:

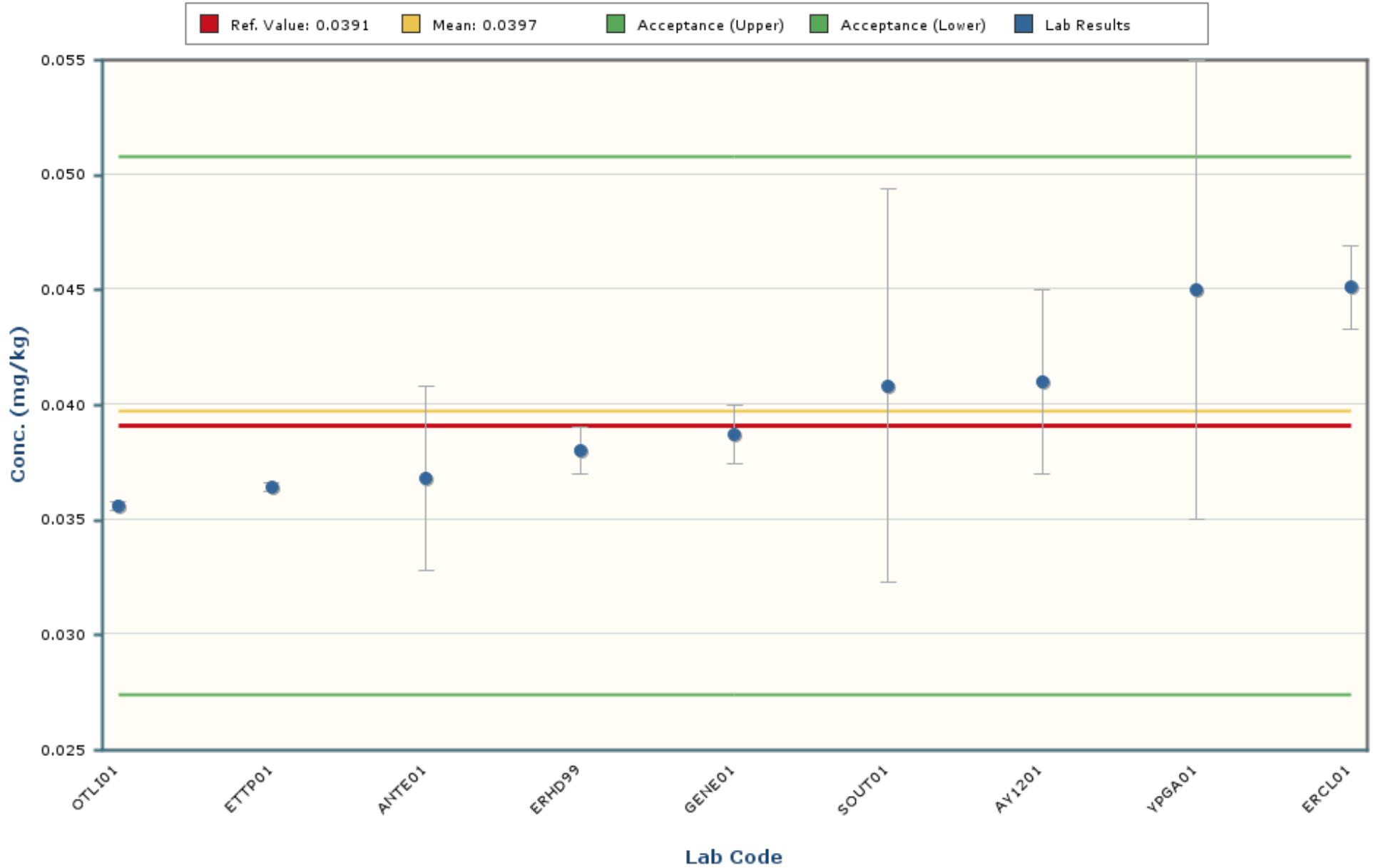
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 15.9 and 42.3 (± 5 Standard Deviations).

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

Uranium-235

MAPEP-21-MaS45



Notes:

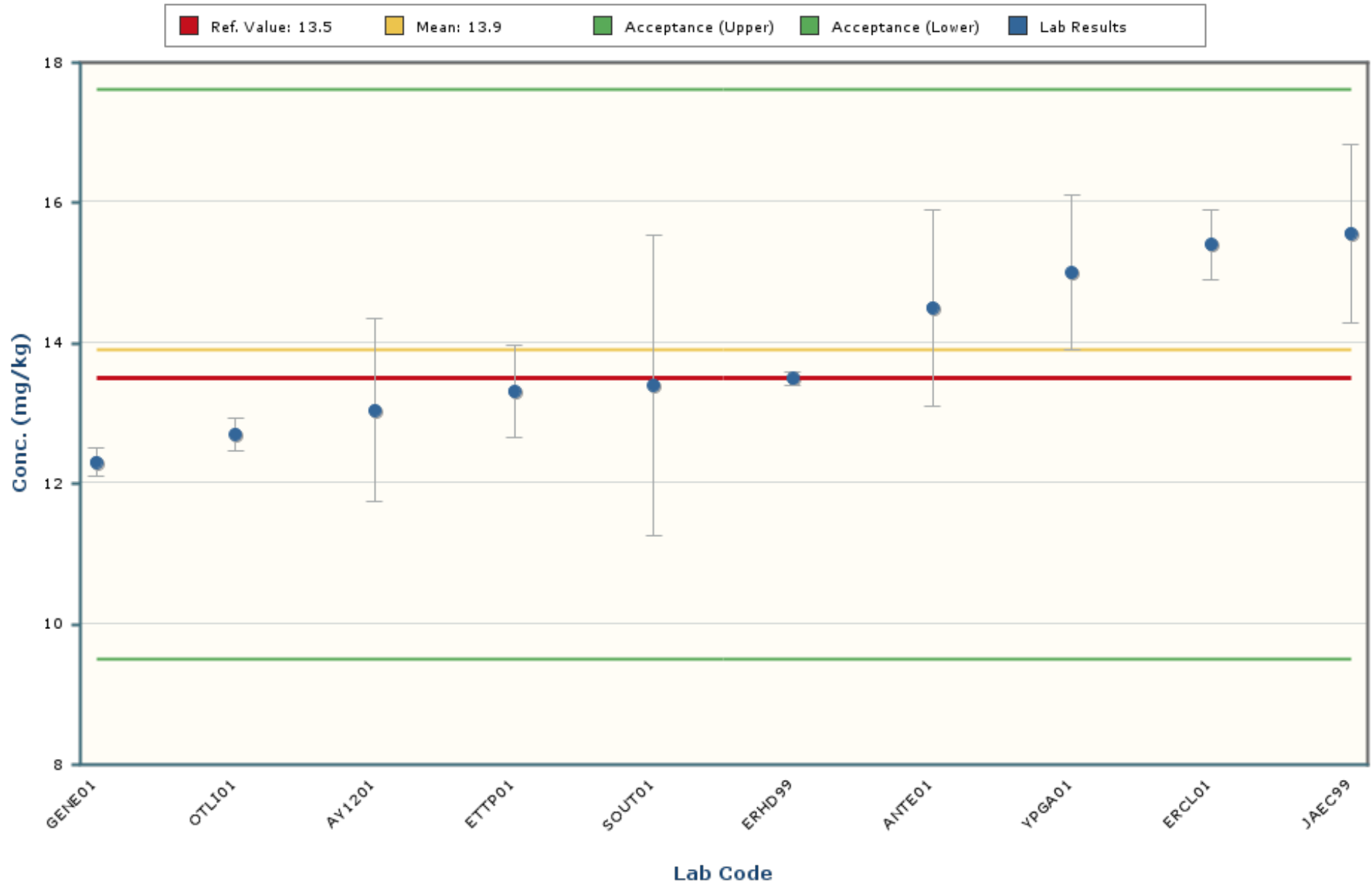
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 0.0220 and 0.0574 (± 5 Standard Deviations).

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

Uranium-238

MAPEP-21-MaS45



Notes:

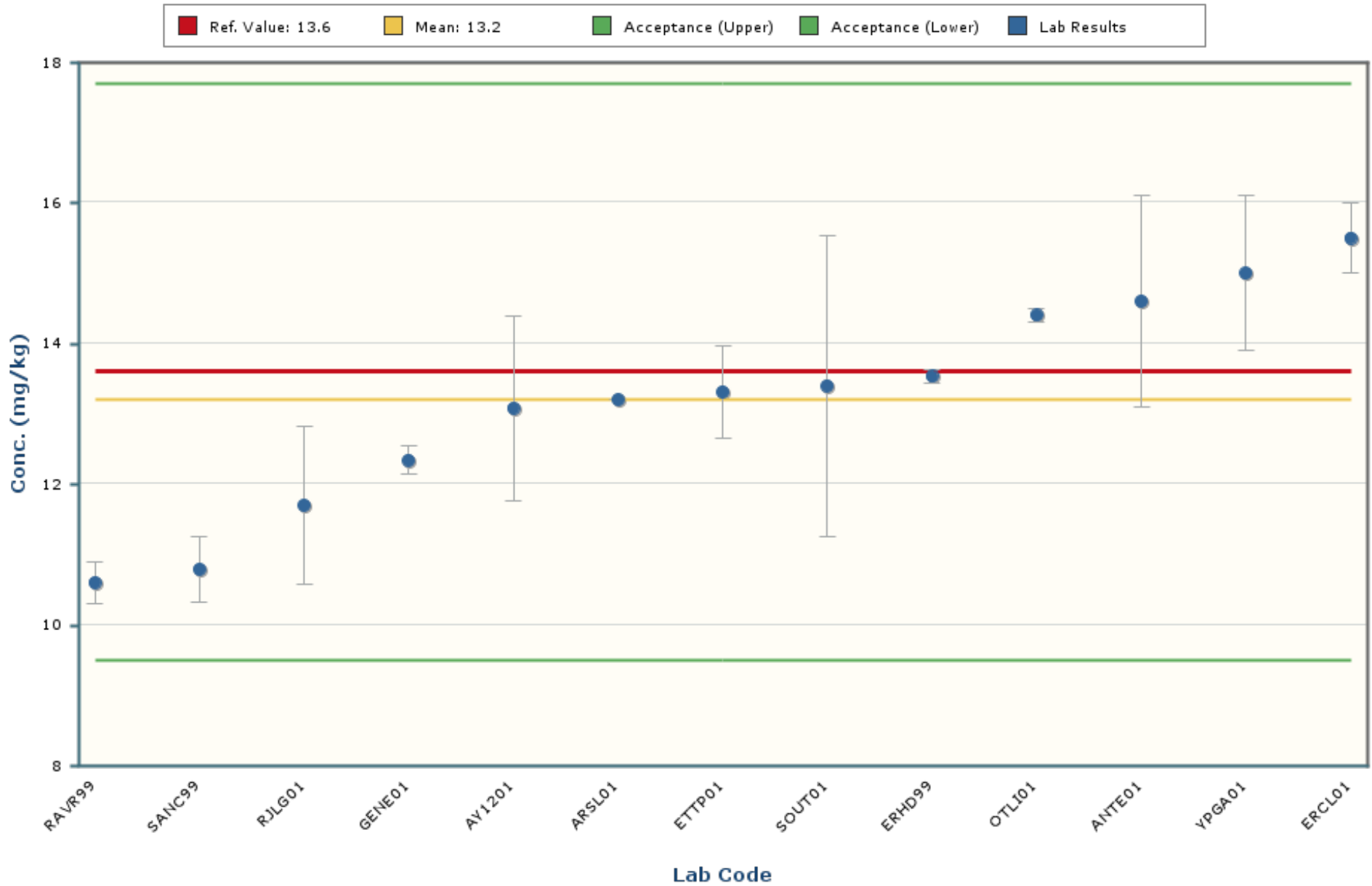
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 8.1 and 19.7 (± 5 Standard Deviations).

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

Uranium-Total

MAPEP-21-MaS45



Notes:

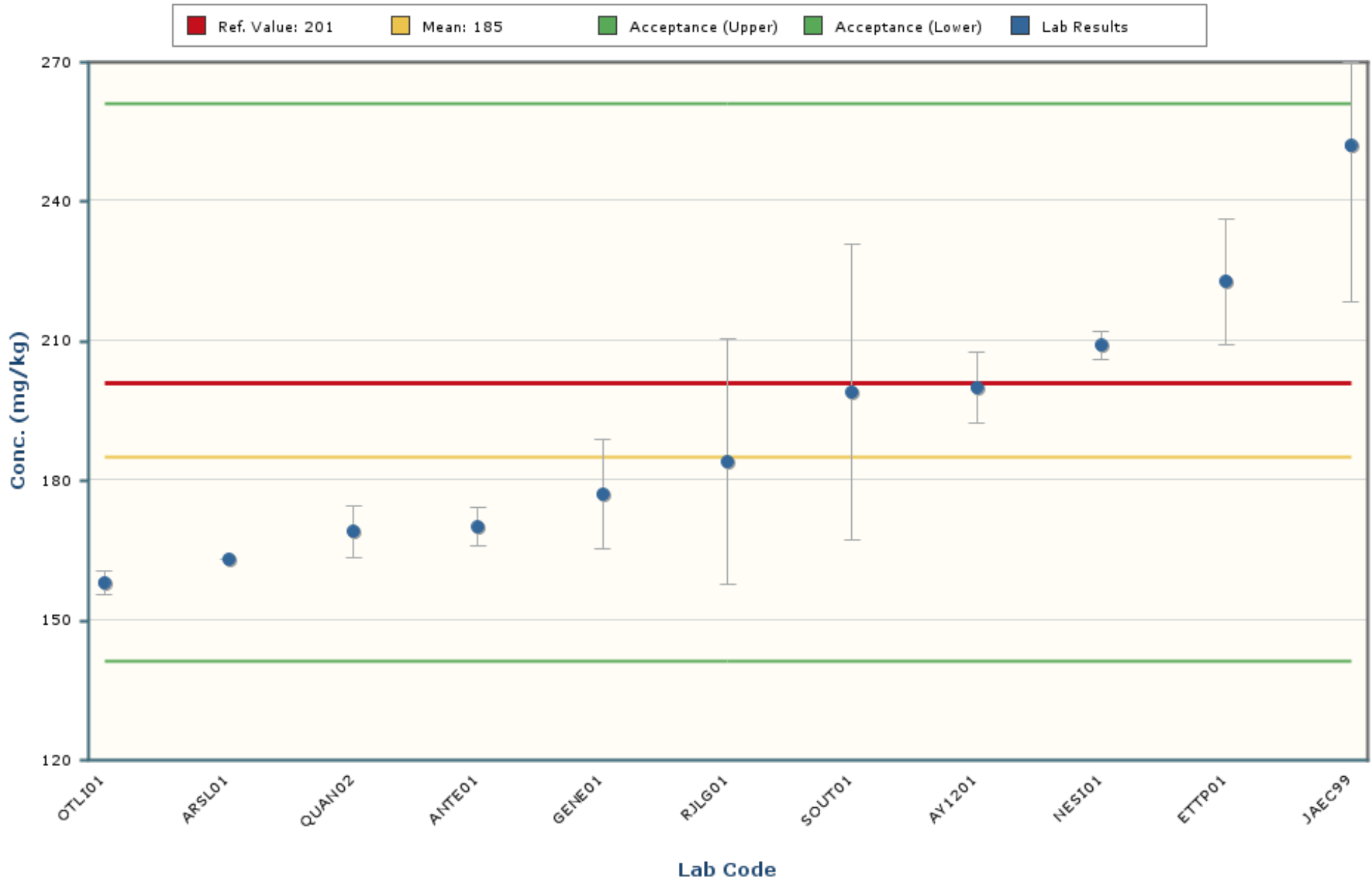
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 5.6 and 20.8 (± 5 Standard Deviations).

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

Vanadium

MAPEP-21-MaS45



Notes:

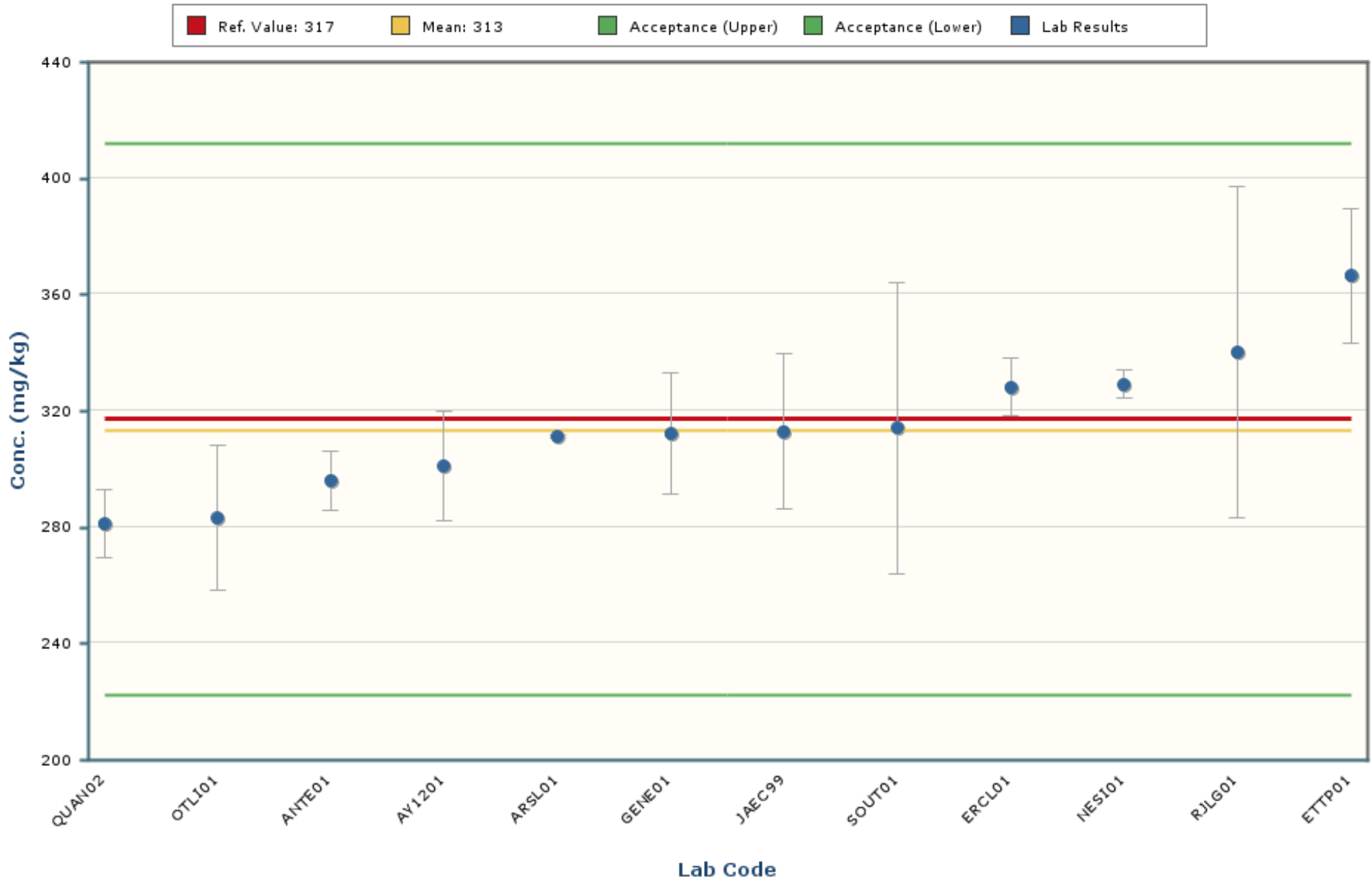
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 77 and 293 (± 5 Standard Deviations).

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

Zinc

MAPEP-21-MaS45



Notes:

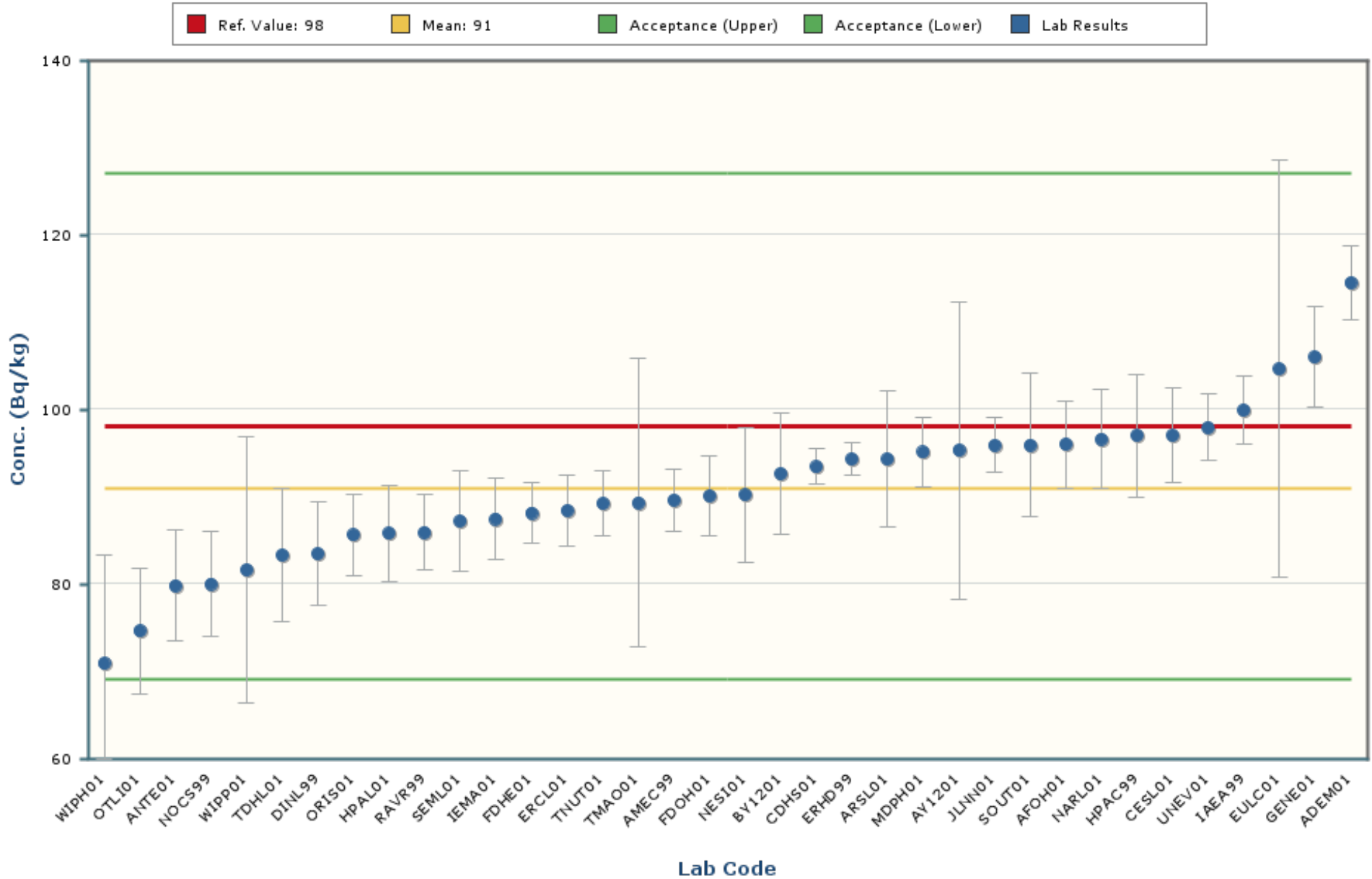
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 182 and 444 (± 5 Standard Deviations).

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

Americium-241

MAPEP-21-MaS45



Notes:

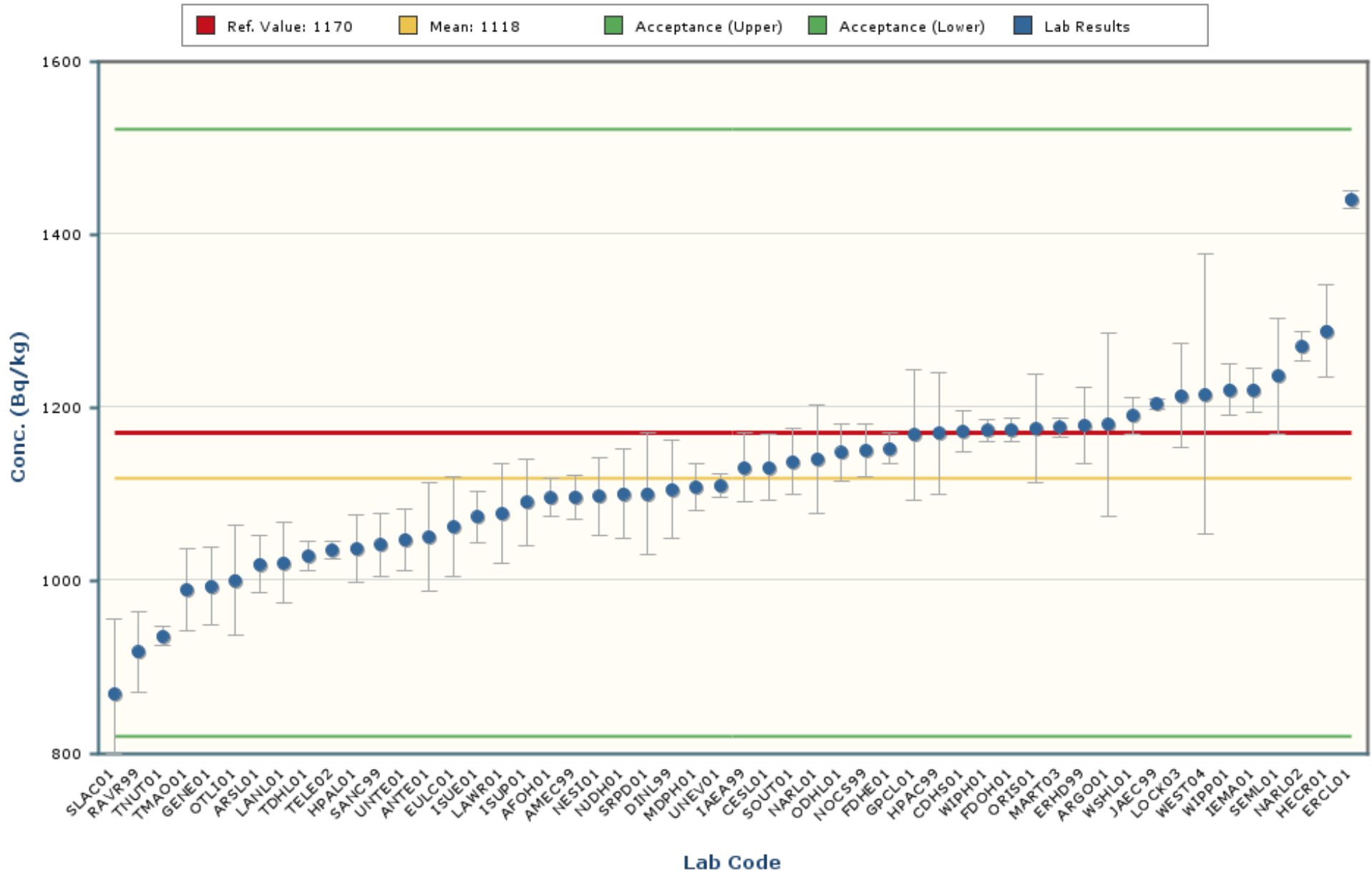
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 48 and 134 (± 5 Standard Deviations).

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

Cesium-134

MAPEP-21-MaS45



Notes:

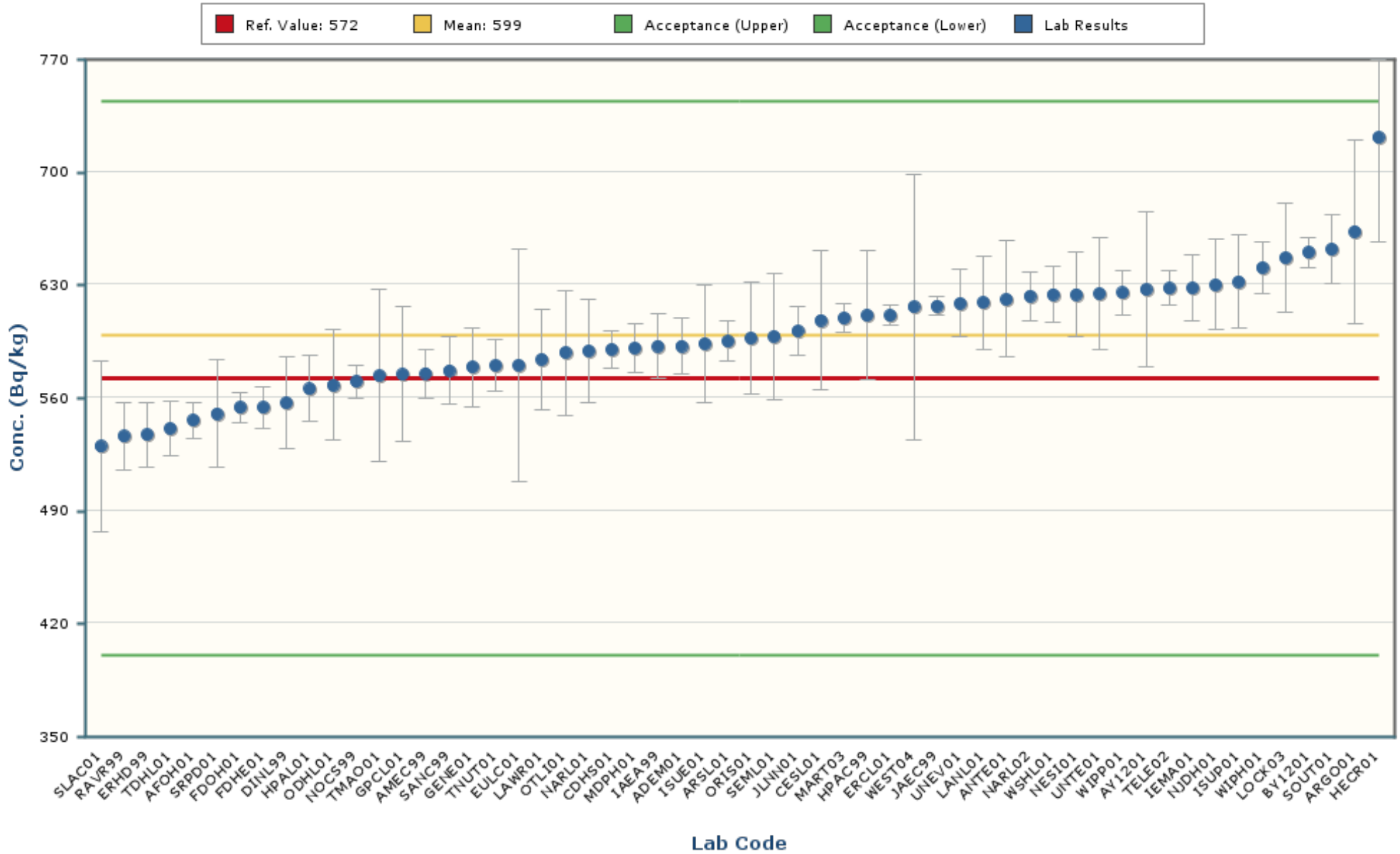
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 621 and 1615 (± 5 Standard Deviations).

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

Cesium-137

MAPEP-21-MaS45



Notes:

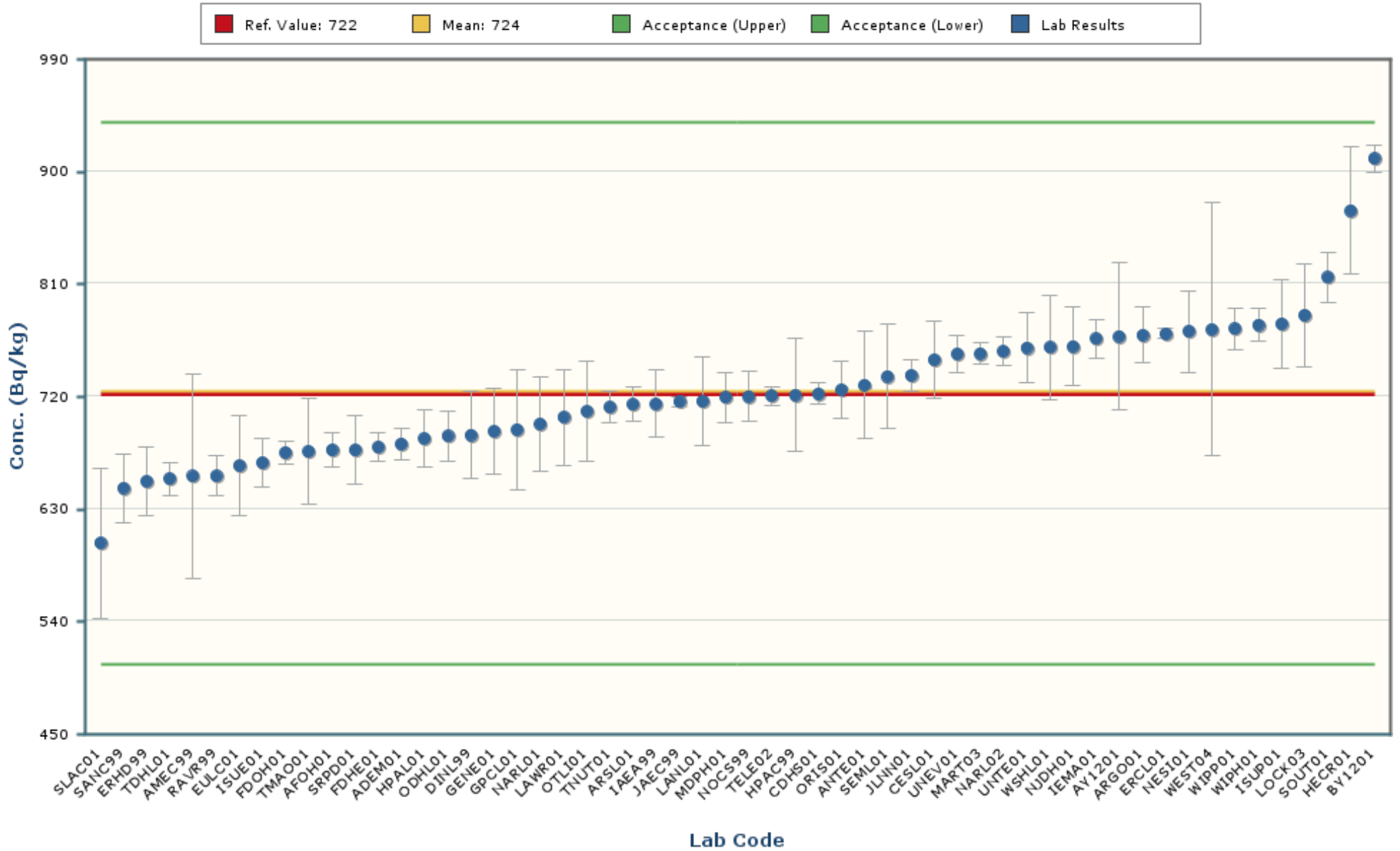
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 417 and 780 (± 5 Standard Deviations).

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

Cobalt-60

MAPEP-21-MaS45



Notes:

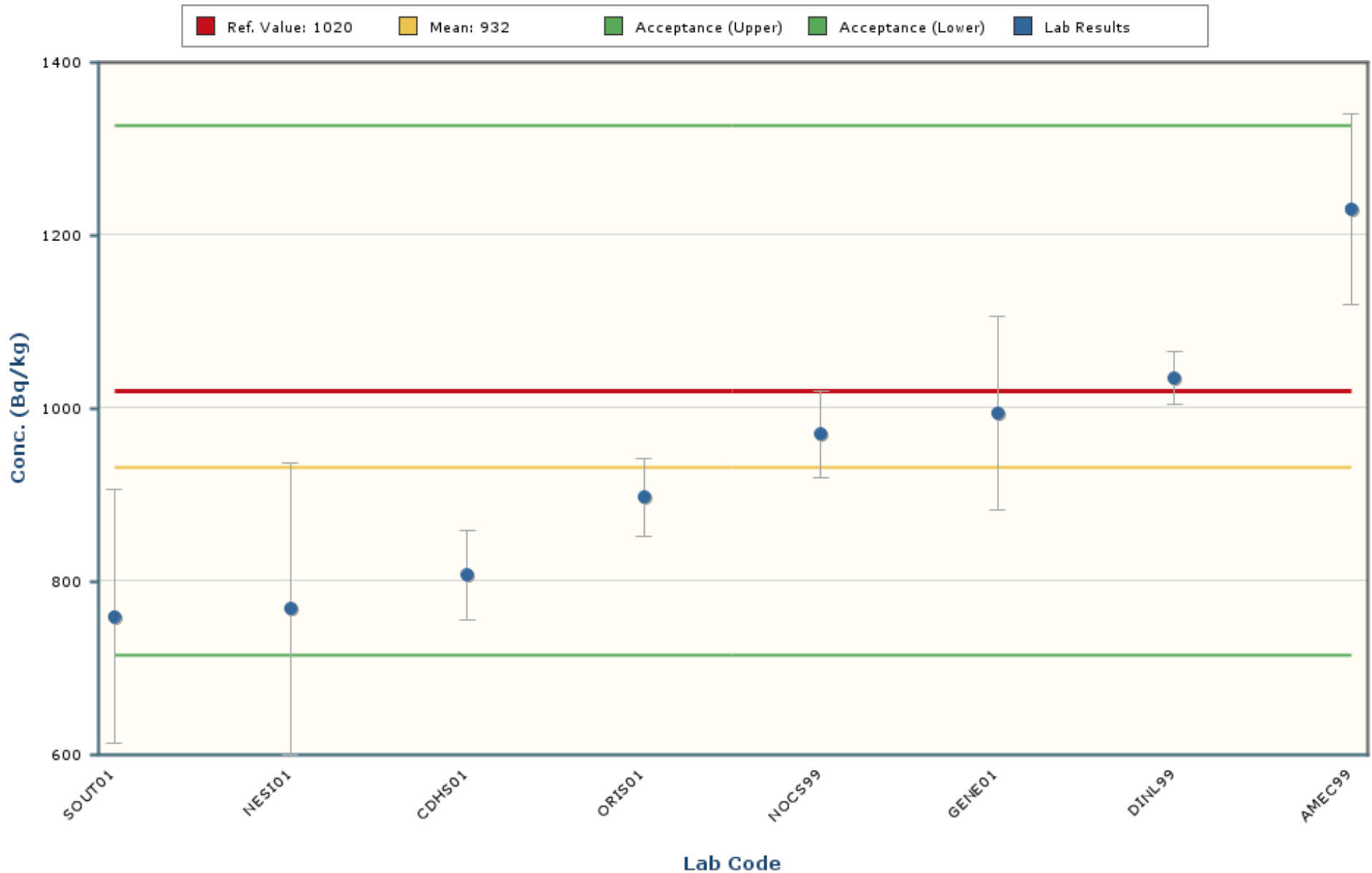
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 451 and 997 (± 5 Standard Deviations).

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

Iron-55

MAPEP-21-MaS45



Notes:

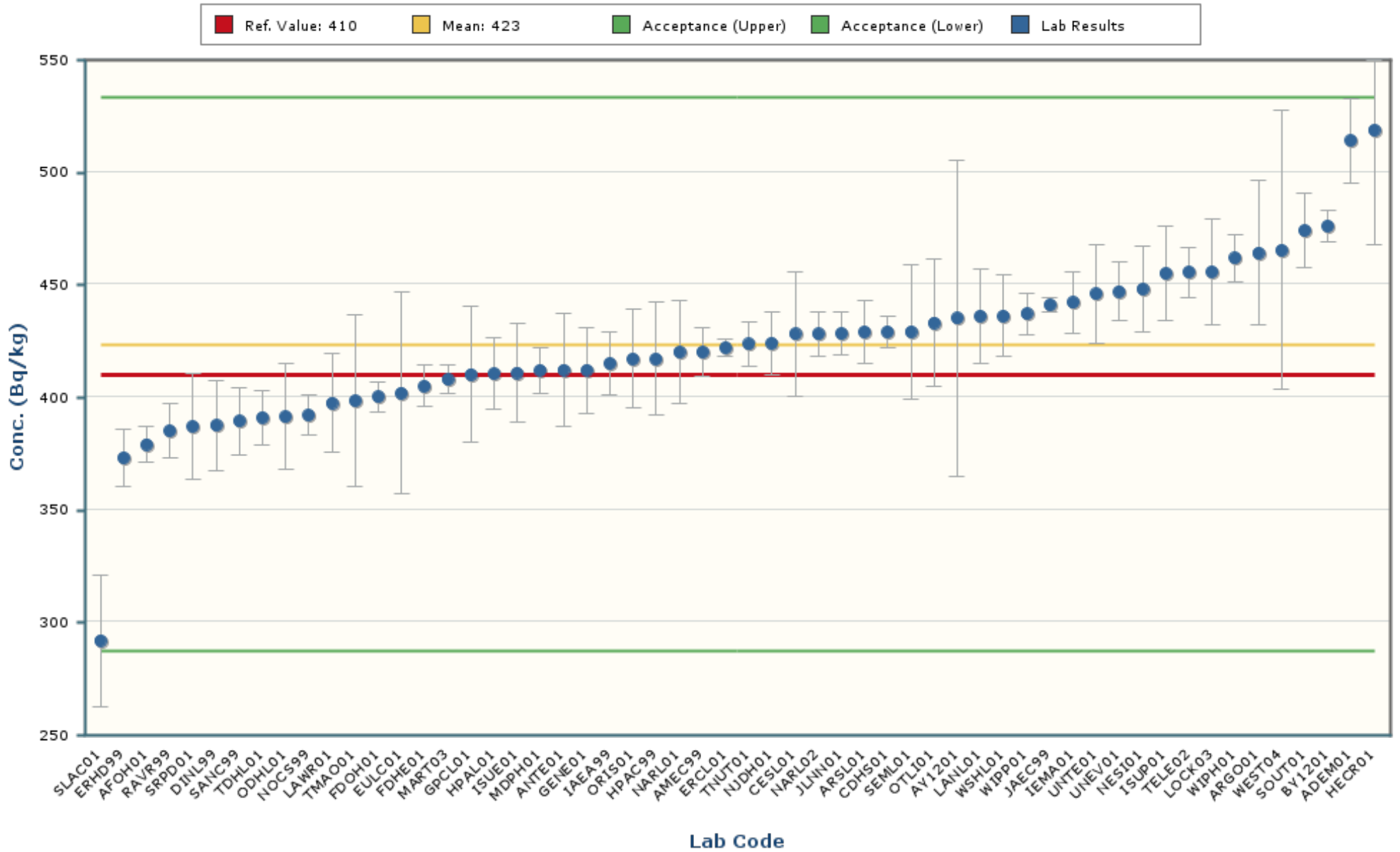
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 135 and 1730 (± 5 Standard Deviations).

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

Manganese-54

MAPEP-21-MaS45



Notes:

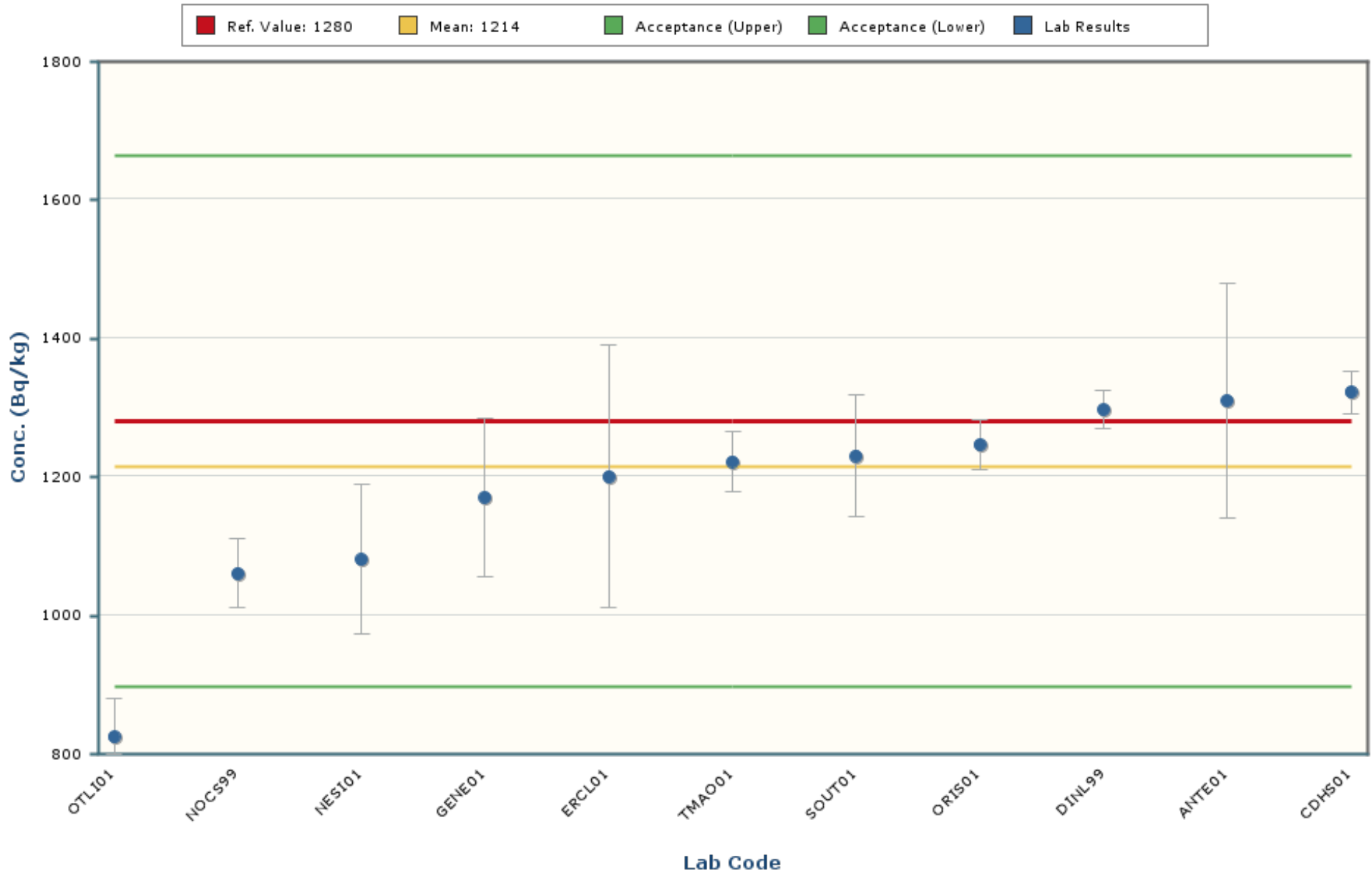
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 248 and 599 (± 5 Standard Deviations).

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

Nickel-63

MAPEP-21-MaS45



Notes:

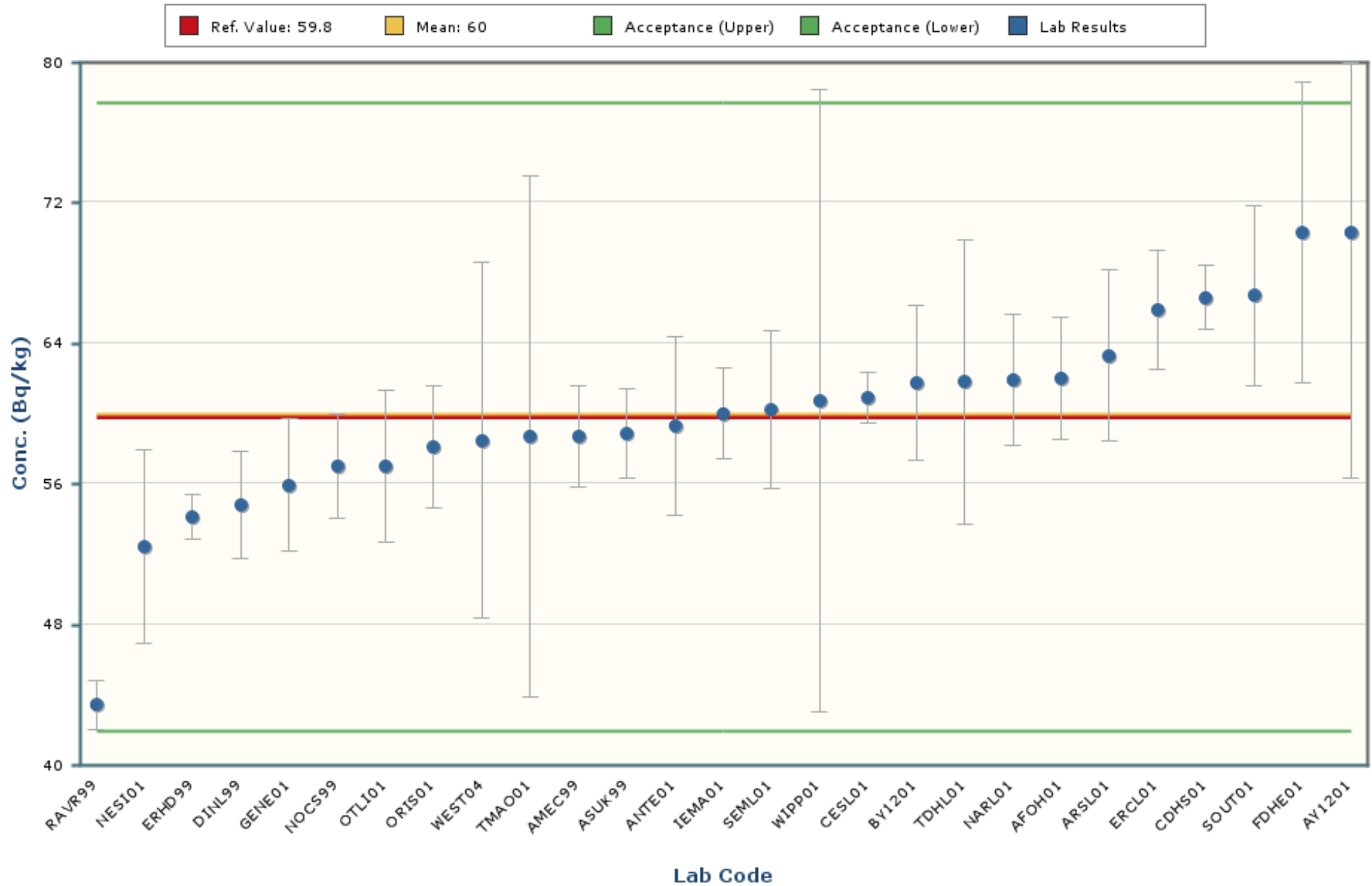
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 764 and 1663 (± 5 Standard Deviations).

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

Plutonium-238

MAPEP-21-MaS45



Notes:

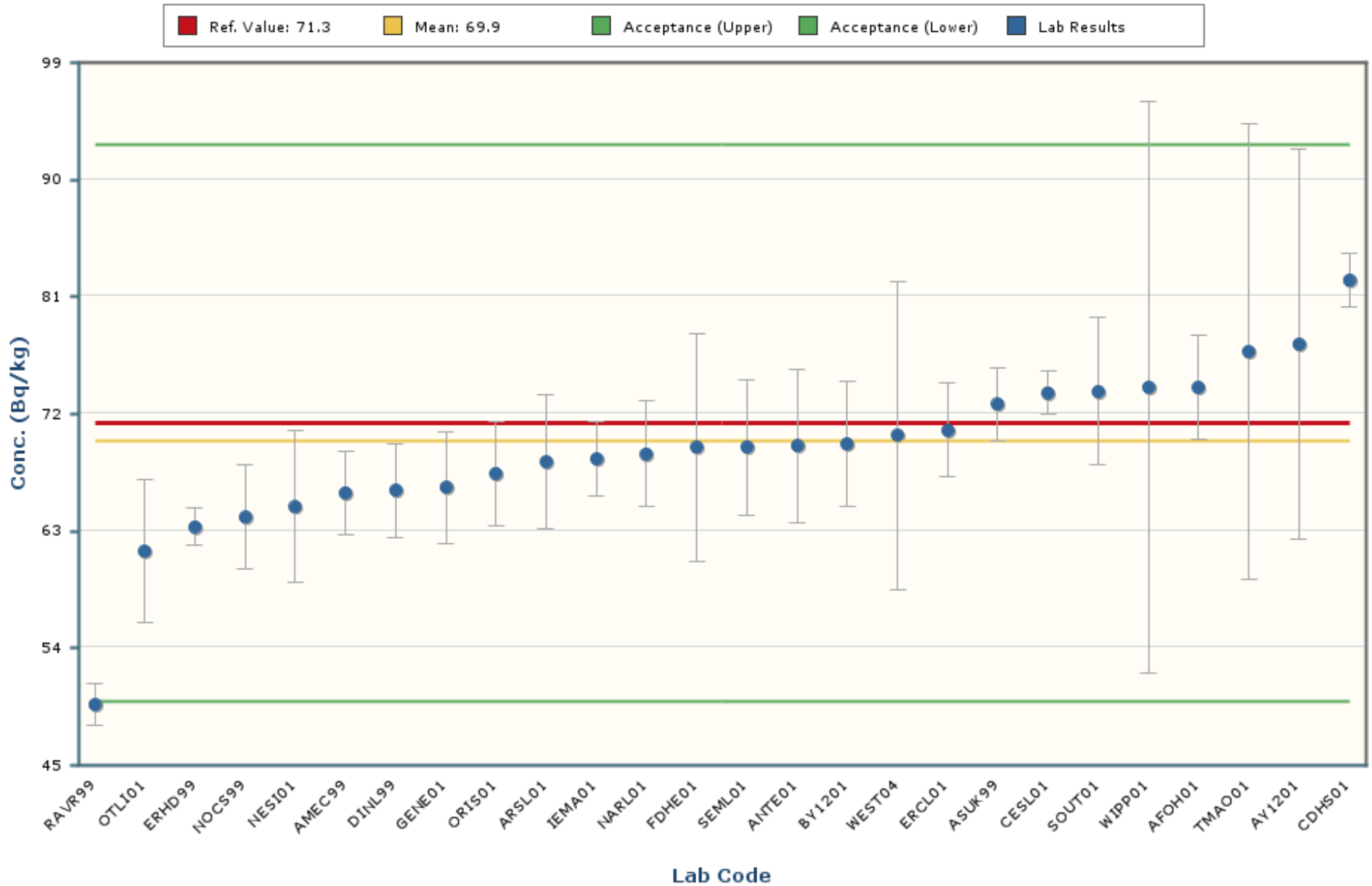
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 32.2 and 87.7 (± 5 Standard Deviations).

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

Plutonium-239/240

MAPEP-21-MaS45



Notes:

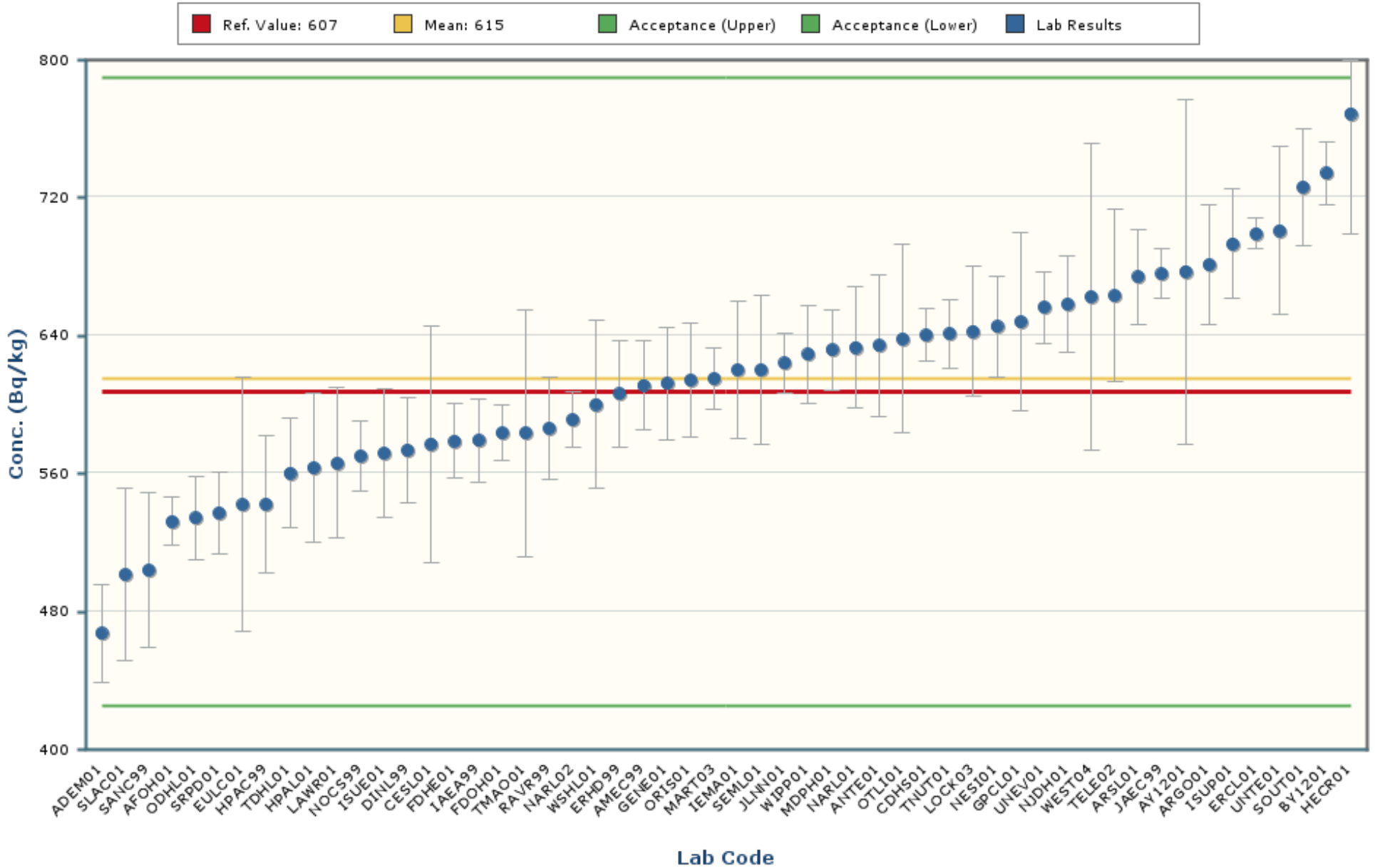
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 45.9 and 94.0 (± 5 Standard Deviations).

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

Potassium-40

MAPEP-21-MaS45



Notes:

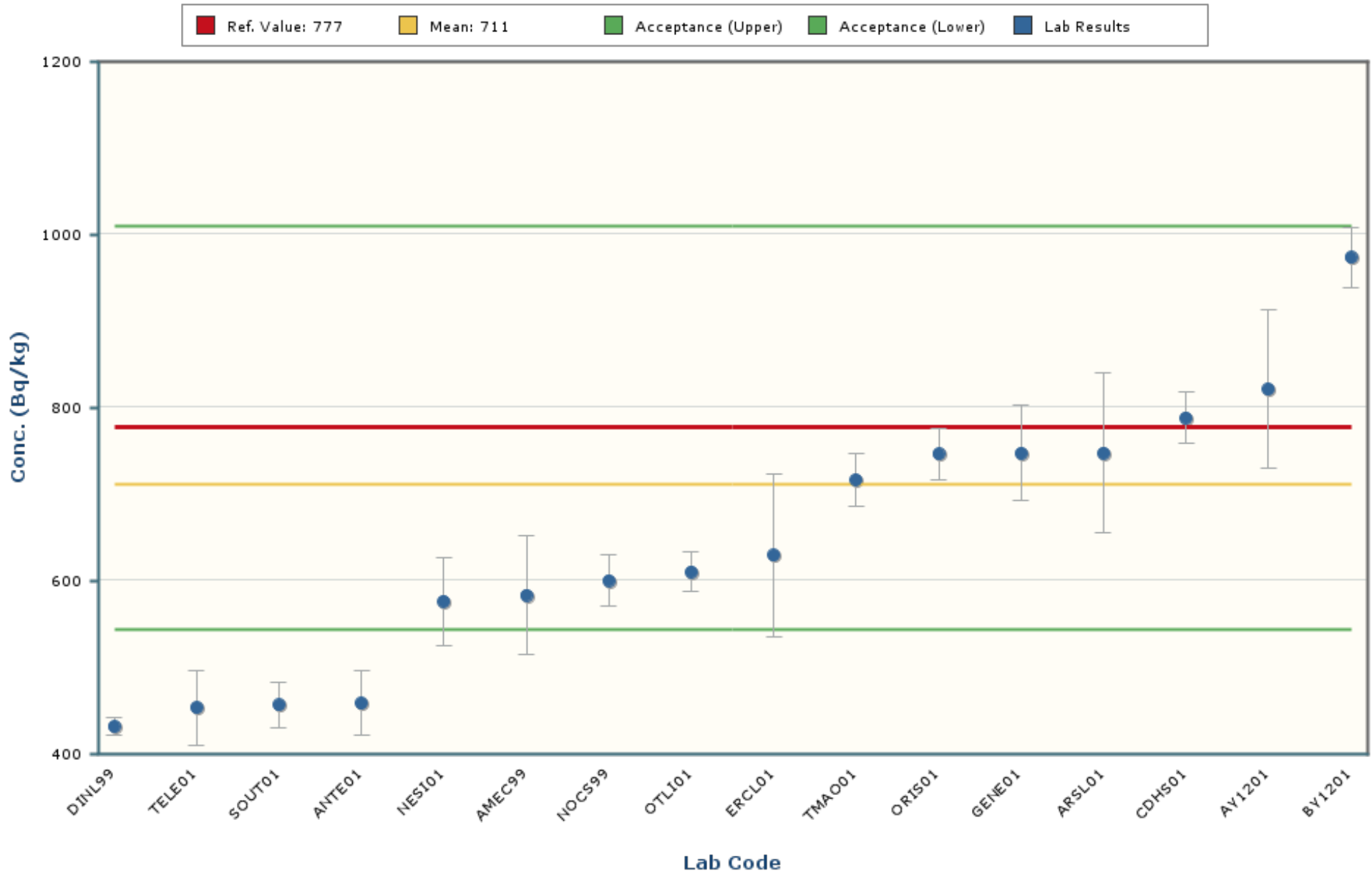
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 309 and 921 (± 5 Standard Deviations).

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

Technetium-99

MAPEP-21-MaS45



Notes:

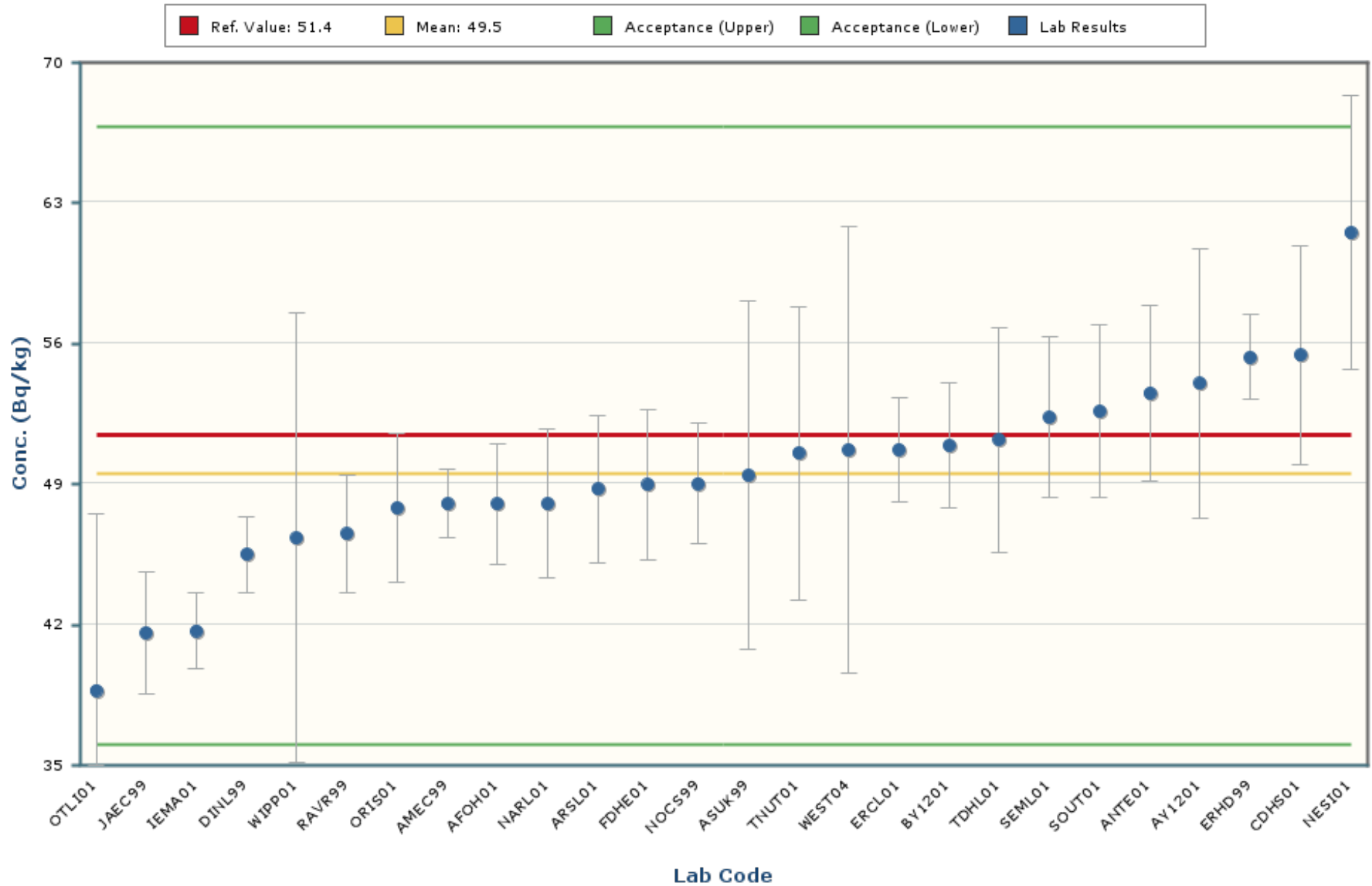
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 119 and 1304 (± 5 Standard Deviations).

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

Uranium-234

MAPEP-21-MaS45



Notes:

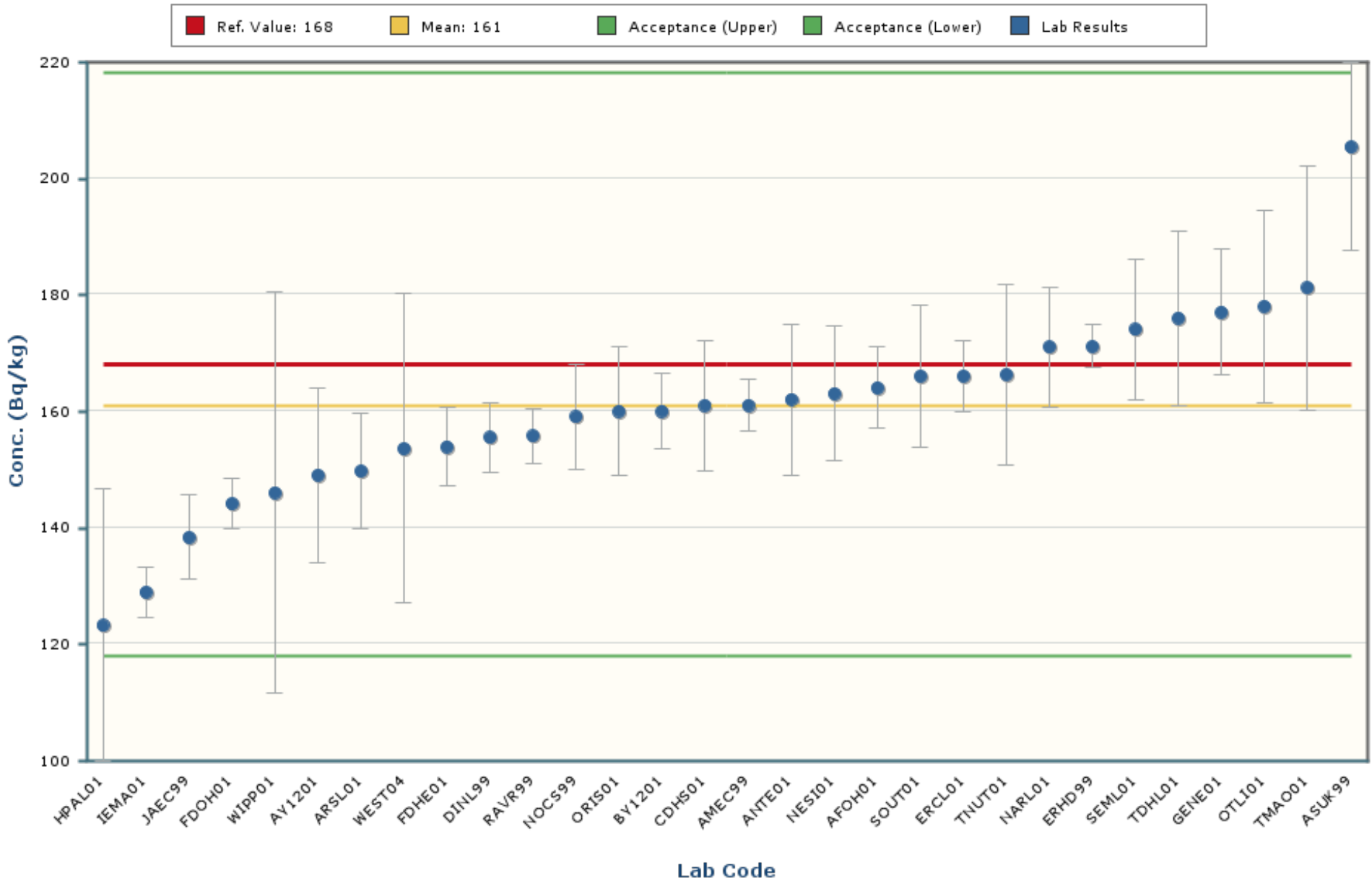
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 25.8 and 73.2 (± 5 Standard Deviations).

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

Uranium-238

MAPEP-21-MaS45



Notes:

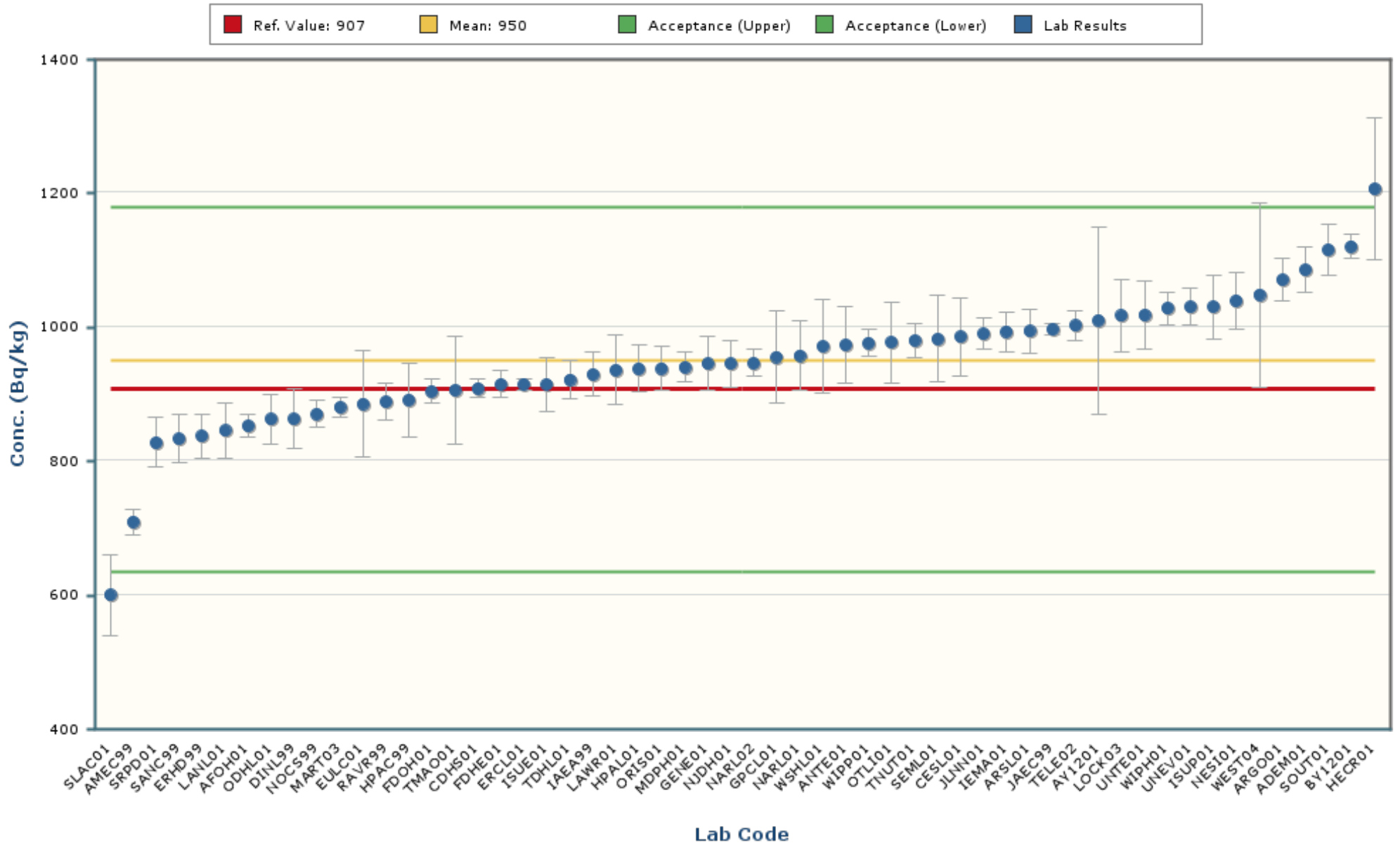
The chart mean excludes values outside of a bias range of $\pm 30\%$.

The chart shows only data points with values between 80 and 241 (± 5 Standard Deviations).

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

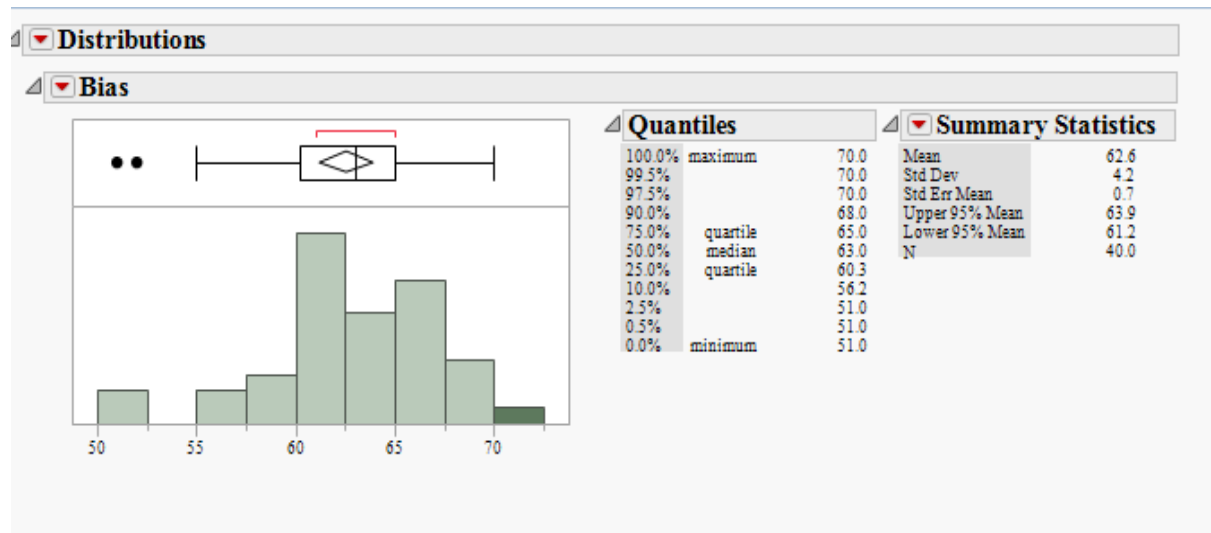
Zinc-65

MAPEP-21-MaS45



Notes:
The chart mean excludes values outside of a bias range of $\pm 30\%$.
The chart shows only data points with values between 559 and 1340 (± 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.

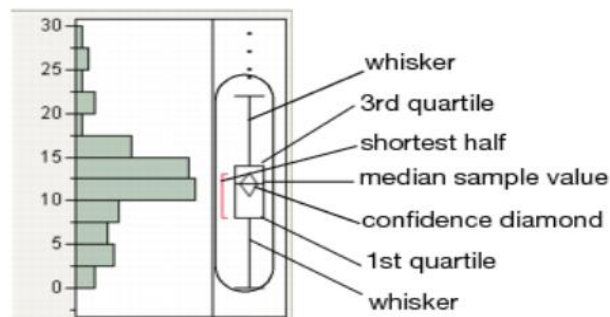


Outlier Box Plot

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)



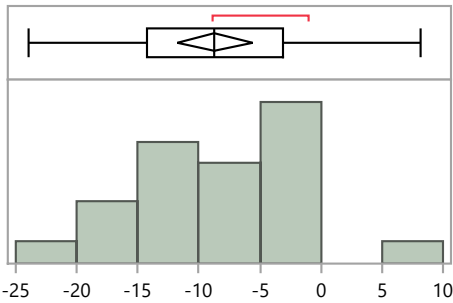
If the data points do not reach the computed ranges, then the whiskers are determined by the upper and lower data point values (not including outliers). The bracket outside of the box identifies the *shortest half*, which is the most dense 50% of the observations (Rousseuw and Leroy 1987).

MaS45 Distribution by Detection Method

MaS Distribution by Detection Method

Distributions Analyte_Detection=Americium-241 Alpha Spectrometry

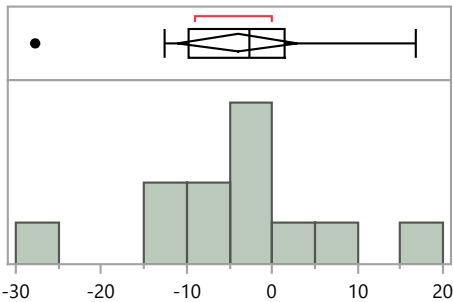
Bias



Quantiles		Summary Statistics		
100.0%	maximum	8.2	Mean	-8.7
99.5%		8.2	Std Dev	7.2
97.5%		8.2	Std Err Mean	1.5
90.0%		-1.2	Upper 95% Mean	-5.6
75.0%	quartile	-3.1	Lower 95% Mean	-11.7
50.0%	median	-8.8	N	24.0
25.0%	quartile	-14.3		
10.0%		-18.5		
2.5%		-23.9		
0.5%		-23.9		
0.0%	minimum	-23.9		

Distributions Analyte_Detection=Americium-241 Gamma Spectrometry

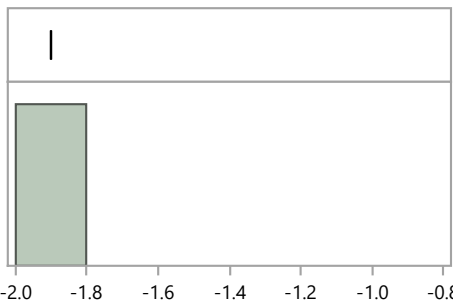
Bias



Quantiles		Summary Statistics		
100.0%	maximum	16.8	Mean	-4.0
99.5%		16.8	Std Dev	11.0
97.5%		16.8	Std Err Mean	3.2
90.0%		13.8	Upper 95% Mean	3.0
75.0%	quartile	1.4	Lower 95% Mean	-11.0
50.0%	median	-2.6	N	12.0
25.0%	quartile	-9.8		
10.0%		-23.1		
2.5%		-27.7		
0.5%		-27.7		
0.0%	minimum	-27.7		

Distributions Analyte_Detection=Cesium-134 Alpha Spectrometry

Bias

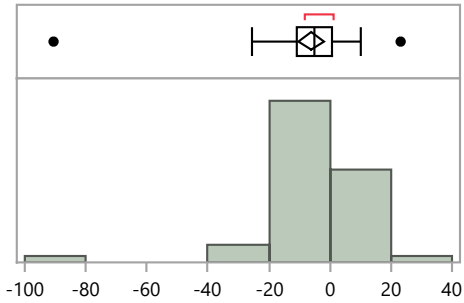


Quantiles		Summary Statistics		
100.0%	maximum	-1.9	Mean	-1.9
99.5%		-1.9	Std Dev	.
97.5%		-1.9	Std Err Mean	.
90.0%		-1.9	Upper 95% Mean	.
75.0%	quartile	-1.9	Lower 95% Mean	.
50.0%	median	-1.9	N	1.0
25.0%	quartile	-1.9		
10.0%		-1.9		
2.5%		-1.9		
0.5%		-1.9		
0.0%	minimum	-1.9		

MaS Distribution by Detection Method

Distributions Analyte_Detection=Cesium-134 Gamma Spectrometry

Bias



Quantiles

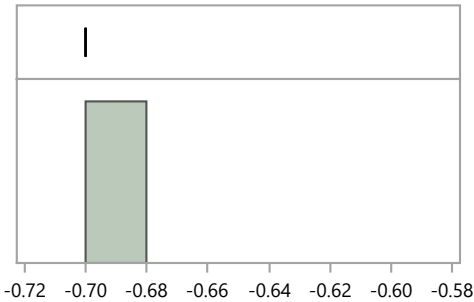
100.0%	maximum	23.1
99.5%		23.1
97.5%		18.9
90.0%		4.3
75.0%	quartile	0.6
50.0%	median	-5.3
25.0%	quartile	-10.9
10.0%		-15.4
2.5%		-69.5
0.5%		-90.5
0.0%	minimum	-90.5

Summary Statistics

Mean	-6.1
Std Dev	14.6
Std Err Mean	2.0
Upper 95% Mean	-2.1
Lower 95% Mean	-10.2
N	52.0

Distributions Analyte_Detection=Cesium-137 Alpha Spectrometry

Bias



Quantiles

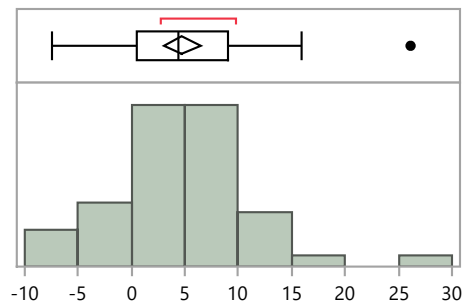
100.0%	maximum	-0.7
99.5%		-0.7
97.5%		-0.7
90.0%		-0.7
75.0%	quartile	-0.7
50.0%	median	-0.7
25.0%	quartile	-0.7
10.0%		-0.7
2.5%		-0.7
0.5%		-0.7
0.0%	minimum	-0.7

Summary Statistics

Mean	-0.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Detection=Cesium-137 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	26.1
99.5%		26.1
97.5%		22.0
90.0%		12.4
75.0%	quartile	9.1
50.0%	median	4.4
25.0%	quartile	0.5
10.0%		-4.1
2.5%		-7.0
0.5%		-7.4
0.0%	minimum	-7.4

Summary Statistics

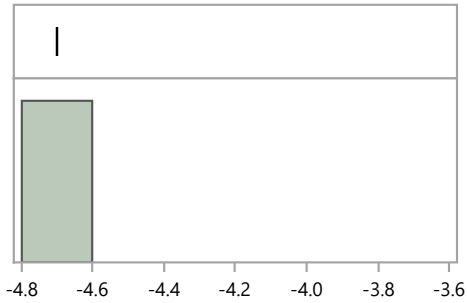
Mean	4.8
Std Dev	6.4
Std Err Mean	0.9
Upper 95% Mean	6.5
Lower 95% Mean	3.0
N	55.0

MaS45 Distribution by Detection Method

MaS Distribution by Detection Method

Distributions Analyte_Detection=Cobalt-60 Alpha Spectrometry

Bias



Quantiles

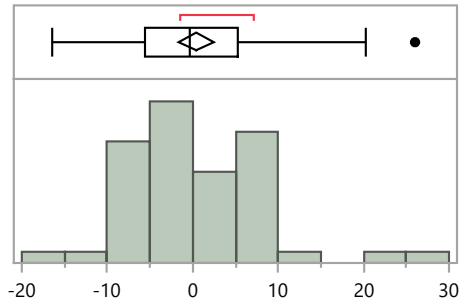
100.0%	maximum	-4.7
99.5%		-4.7
97.5%		-4.7
90.0%		-4.7
75.0%	quartile	-4.7
50.0%	median	-4.7
25.0%	quartile	-4.7
10.0%		-4.7
2.5%		-4.7
0.5%		-4.7
0.0%	minimum	-4.7

Summary Statistics

Mean	-4.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Detection=Cobalt-60 Gamma Spectrometry

Bias



Quantiles

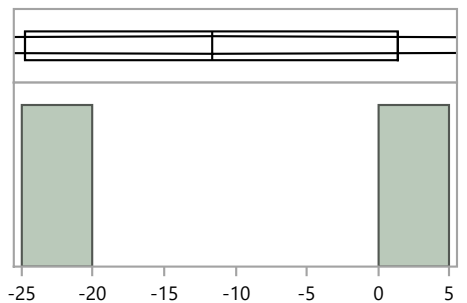
100.0%	maximum	26.0
99.5%		26.0
97.5%		23.7
90.0%		7.7
75.0%	quartile	5.3
50.0%	median	-0.3
25.0%	quartile	-5.5
10.0%		-9.1
2.5%		-14.1
0.5%		-16.5
0.0%	minimum	-16.5

Summary Statistics

Mean	0.4
Std Dev	7.6
Std Err Mean	1.0
Upper 95% Mean	2.4
Lower 95% Mean	-1.7
N	55.0

Distributions Analyte_Detection=Iron-55 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	1.4
99.5%		1.4
97.5%		1.4
90.0%		1.4
75.0%	quartile	1.4
50.0%	median	-11.7
25.0%	quartile	-24.7
10.0%		-24.7
2.5%		-24.7
0.5%		-24.7
0.0%	minimum	-24.7

Summary Statistics

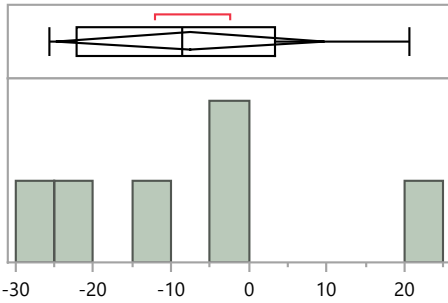
Mean	-11.7
Std Dev	18.5
Std Err Mean	13.1
Upper 95% Mean	154.2
Lower 95% Mean	-177.5
N	2.0

MaS45 Distribution by Detection Method

MaS Distribution by Detection Method

Distributions Analyte_Detection=Iron-55 Liquid Scintillation Counter

Bias



Quantiles

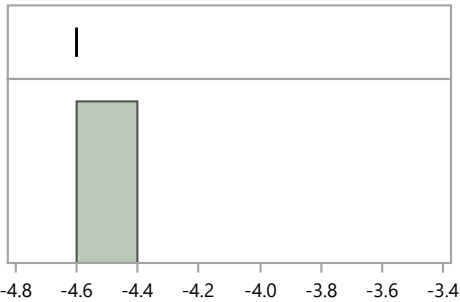
100.0%	maximum	20.6
99.5%		20.6
97.5%		20.6
90.0%		20.6
75.0%	quartile	3.3
50.0%	median	-8.5
25.0%	quartile	-22.1
10.0%		-25.6
2.5%		-25.6
0.5%		-25.6
0.0%	minimum	-25.6

Summary Statistics

Mean	-7.6
Std Dev	16.4
Std Err Mean	6.7
Upper 95% Mean	9.7
Lower 95% Mean	-24.8
N	6.0

Distributions Analyte_Detection=Manganese-54 Alpha Spectrometry

Bias



Quantiles

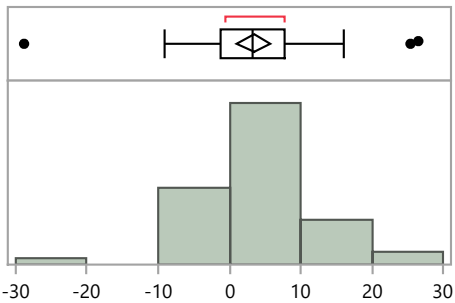
100.0%	maximum	-4.6
99.5%		-4.6
97.5%		-4.6
90.0%		-4.6
75.0%	quartile	-4.6
50.0%	median	-4.6
25.0%	quartile	-4.6
10.0%		-4.6
2.5%		-4.6
0.5%		-4.6
0.0%	minimum	-4.6

Summary Statistics

Mean	-4.6
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Detection=Manganese-54 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	26.5
99.5%		26.5
97.5%		26.1
90.0%		13.3
75.0%	quartile	7.8
50.0%	median	3.3
25.0%	quartile	-1.3
10.0%		-5.5
2.5%		-20.9
0.5%		-28.8
0.0%	minimum	-28.8

Summary Statistics

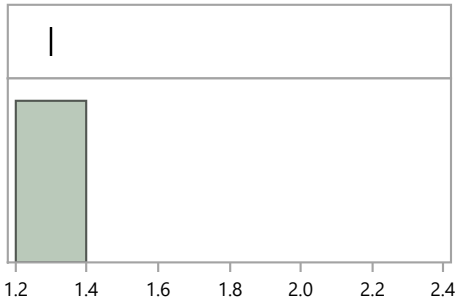
Mean	3.4
Std Dev	8.6
Std Err Mean	1.2
Upper 95% Mean	5.7
Lower 95% Mean	1.1
N	55.0

MaS45 Distribution by Detection Method

MaS Distribution by Detection Method

Distributions Analyte_Detection=Nickel-63 Gamma Spectrometry

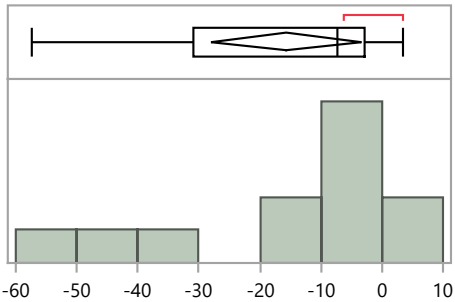
Bias



Quantiles		Summary Statistics		
100.0%	maximum	1.3	Mean	1.3
99.5%		1.3	Std Dev	.
97.5%		1.3	Std Err Mean	.
90.0%		1.3	Upper 95% Mean	.
75.0%	quartile	1.3	Lower 95% Mean	.
50.0%	median	1.3	N	1.0
25.0%	quartile	1.3		
10.0%		1.3		
2.5%		1.3		
0.5%		1.3		
0.0%	minimum	1.3		

Distributions Analyte_Detection=Nickel-63 Liquid Scintillation Counter

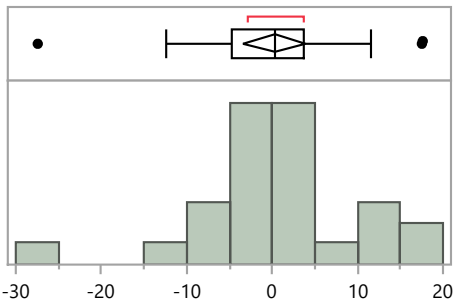
Bias



Quantiles		Summary Statistics		
100.0%	maximum	3.3	Mean	-15.7
99.5%		3.3	Std Dev	19.3
97.5%		3.3	Std Err Mean	5.6
90.0%		3.0	Upper 95% Mean	-3.5
75.0%	quartile	-3.0	Lower 95% Mean	-28.0
50.0%	median	-7.5	N	12.0
25.0%	quartile	-31.0		
10.0%		-52.9		
2.5%		-57.3		
0.5%		-57.3		
0.0%	minimum	-57.3		

Distributions Analyte_Detection=Plutonium-238 Alpha Spectrometry

Bias

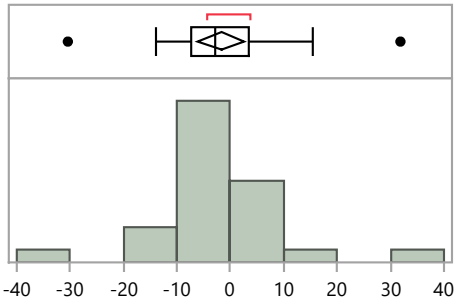


Quantiles		Summary Statistics		
100.0%	maximum	17.6	Mean	0.3
99.5%		17.6	Std Dev	9.3
97.5%		17.6	Std Err Mean	1.8
90.0%		12.7	Upper 95% Mean	3.9
75.0%	quartile	3.7	Lower 95% Mean	-3.4
50.0%	median	0.3	N	27.0
25.0%	quartile	-4.7		
10.0%		-10.1		
2.5%		-27.4		
0.5%		-27.4		
0.0%	minimum	-27.4		

MaS Distribution by Detection Method

Distributions Analyte_Detection=Plutonium-239/240 Alpha Spectrometry

Bias



Quantiles

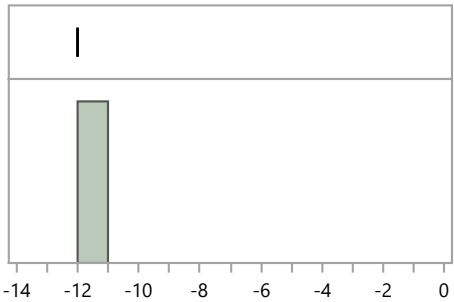
100.0%	maximum	31.8
99.5%		31.8
97.5%		31.8
90.0%		9.8
75.0%	quartile	3.4
50.0%	median	-2.7
25.0%	quartile	-7.3
10.0%		-11.7
2.5%		-30.4
0.5%		-30.4
0.0%	minimum	-30.4

Summary Statistics

Mean	-1.7
Std Dev	10.8
Std Err Mean	2.1
Upper 95% Mean	2.5
Lower 95% Mean	-6.0
N	27.0

Distributions Analyte_Detection=Potassium-40 Alpha Spectrometry

Bias



Quantiles

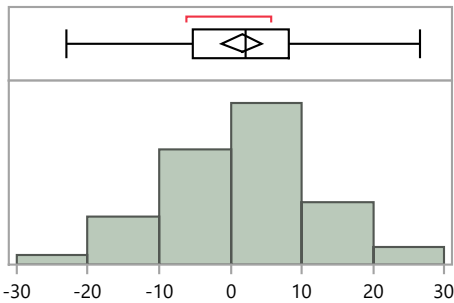
100.0%	maximum	-12.0
99.5%		-12.0
97.5%		-12.0
90.0%		-12.0
75.0%	quartile	-12.0
50.0%	median	-12.0
25.0%	quartile	-12.0
10.0%		-12.0
2.5%		-12.0
0.5%		-12.0
0.0%	minimum	-12.0

Summary Statistics

Mean	-12.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Detection=Potassium-40 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	26.6
99.5%		26.6
97.5%		24.6
90.0%		14.8
75.0%	quartile	8.3
50.0%	median	2.1
25.0%	quartile	-5.3
10.0%		-11.2
2.5%		-21.1
0.5%		-23.1
0.0%	minimum	-23.1

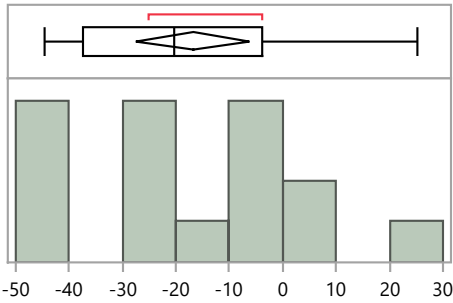
Summary Statistics

Mean	1.6
Std Dev	10.0
Std Err Mean	1.4
Upper 95% Mean	4.3
Lower 95% Mean	-1.2
N	53.0

MaS Distribution by Detection Method

Distributions Analyte_Detection=Technetium-99 Liquid Scintillation Counter

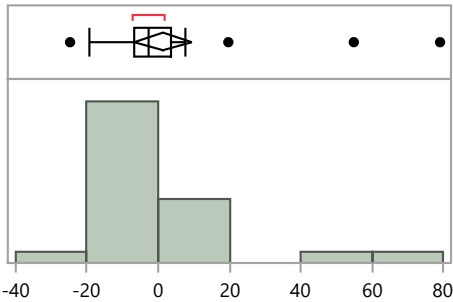
Bias



Quantiles		Summary Statistics		
100.0%	maximum	25.2	Mean	-16.9
99.5%		25.2	Std Dev	20.0
97.5%		25.2	Std Err Mean	5.0
90.0%		11.6	Upper 95% Mean	-6.2
75.0%	quartile	-3.8	Lower 95% Mean	-27.5
50.0%	median	-20.3	N	16.0
25.0%	quartile	-37.3		
10.0%		-42.5		
2.5%		-44.5		
0.5%		-44.5		
0.0%	minimum	-44.5		

Distributions Analyte_Detection=Uranium-234 Alpha Spectrometry

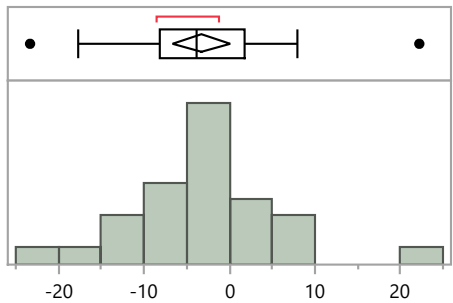
Bias



Quantiles		Summary Statistics		
100.0%	maximum	79.1	Mean	1.3
99.5%		79.1	Std Dev	20.8
97.5%		79.1	Std Err Mean	3.9
90.0%		23.2	Upper 95% Mean	9.4
75.0%	quartile	3.7	Lower 95% Mean	-6.7
50.0%	median	-2.8	N	28.0
25.0%	quartile	-6.9		
10.0%		-18.9		
2.5%		-24.7		
0.5%		-24.7		
0.0%	minimum	-24.7		

Distributions Analyte_Detection=Uranium-238 Alpha Spectrometry

Bias



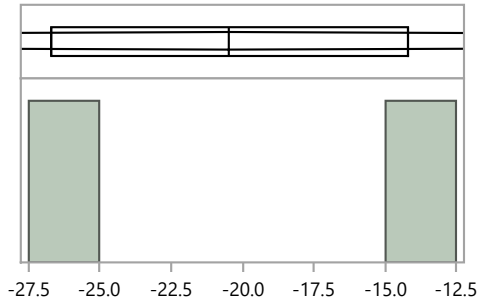
Quantiles		Summary Statistics		
100.0%	maximum	22.2	Mean	-3.2
99.5%		22.2	Std Dev	8.7
97.5%		22.2	Std Err Mean	1.6
90.0%		6.2	Upper 95% Mean	0.1
75.0%	quartile	1.8	Lower 95% Mean	-6.6
50.0%	median	-3.9	N	28.0
25.0%	quartile	-8.2		
10.0%		-13.6		
2.5%		-23.3		
0.5%		-23.3		
0.0%	minimum	-23.3		

MaS45 Distribution by Detection Method

MaS Distribution by Detection Method

Distributions Analyte_Detection=Uranium-238 Gamma Spectrometry

Bias



Quantiles

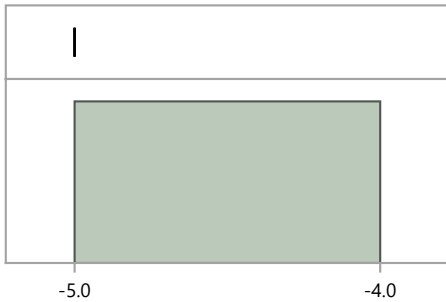
100.0%	maximum	-14.2
99.5%		-14.2
97.5%		-14.2
90.0%		-14.2
75.0%	quartile	-14.2
50.0%	median	-20.5
25.0%	quartile	-26.7
10.0%		-26.7
2.5%		-26.7
0.5%		-26.7
0.0%	minimum	-26.7

Summary Statistics

Mean	-20.5
Std Dev	8.8
Std Err Mean	6.3
Upper 95% Mean	59.0
Lower 95% Mean	-99.9
N	2.0

Distributions Analyte_Detection=Zinc-65 Alpha Spectrometry

Bias



Quantiles

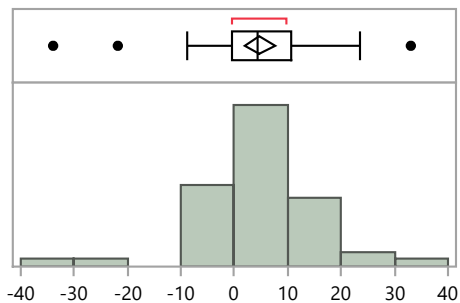
100.0%	maximum	-5.0
99.5%		-5.0
97.5%		-5.0
90.0%		-5.0
75.0%	quartile	-5.0
50.0%	median	-5.0
25.0%	quartile	-5.0
10.0%		-5.0
2.5%		-5.0
0.5%		-5.0
0.0%	minimum	-5.0

Summary Statistics

Mean	-5.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Detection=Zinc-65 Gamma Spectrometry

Bias



Quantiles

100.0%	maximum	33.0
99.5%		33.0
97.5%		29.2
90.0%		16.6
75.0%	quartile	10.5
50.0%	median	4.3
25.0%	quartile	-0.4
10.0%		-7.2
2.5%		-29.1
0.5%		-33.9
0.0%	minimum	-33.9

Summary Statistics

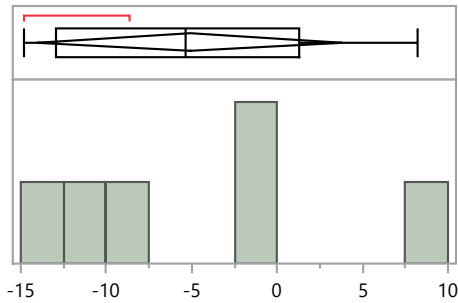
Mean	4.7
Std Dev	10.7
Std Err Mean	1.4
Upper 95% Mean	7.6
Lower 95% Mean	1.8
N	55.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Americium-241 Acid dissolution with hydrofluoric acid

Bias



Quantiles

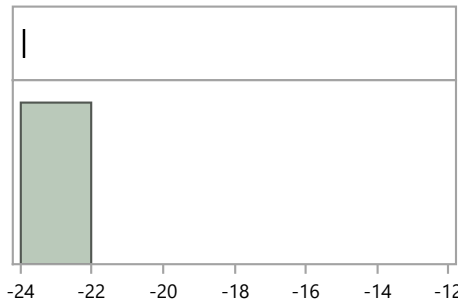
100.0%	maximum	8.2
99.5%		8.2
97.5%		8.2
90.0%		8.2
75.0%	quartile	1.3
50.0%	median	-5.4
25.0%	quartile	-12.9
10.0%		-14.8
2.5%		-14.8
0.5%		-14.8
0.0%	minimum	-14.8

Summary Statistics

Mean	-5.1
Std Dev	8.5
Std Err Mean	3.5
Upper 95% Mean	3.8
Lower 95% Mean	-14.0
N	6.0

Distributions Analyte_Method=Americium-241 Acid leaching without hydrofluoric acid

Bias



Quantiles

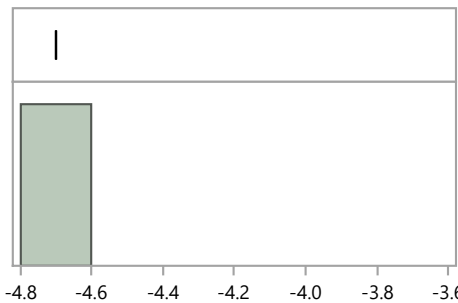
100.0%	maximum	-23.9
99.5%		-23.9
97.5%		-23.9
90.0%		-23.9
75.0%	quartile	-23.9
50.0%	median	-23.9
25.0%	quartile	-23.9
10.0%		-23.9
2.5%		-23.9
0.5%		-23.9
0.0%	minimum	-23.9

Summary Statistics

Mean	-23.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Americium-241 Coprecipitation, acidified

Bias



Quantiles

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

Summary Statistics

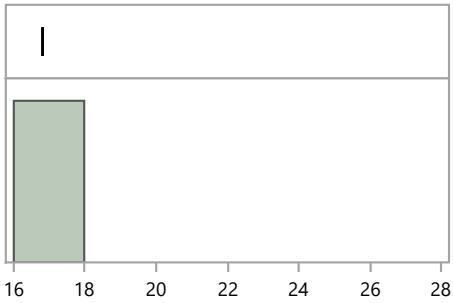
Mean	-4.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Americium-241 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias



Quantiles

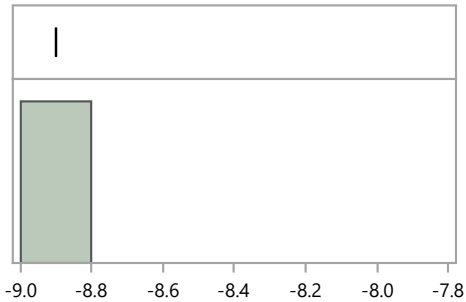
100.0%	maximum	16.8
99.5%		16.8
97.5%		16.8
90.0%		16.8
75.0%	quartile	16.8
50.0%	median	16.8
25.0%	quartile	16.8
10.0%		16.8
2.5%		16.8
0.5%		16.8
0.0%	minimum	16.8

Summary Statistics

Mean	16.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Americium-241 EPA 907, Actinide Elements, 600/4/80-032

Bias



Quantiles

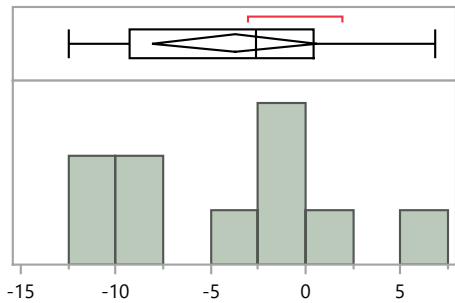
100.0%	maximum	-8.9
99.5%		-8.9
97.5%		-8.9
90.0%		-8.9
75.0%	quartile	-8.9
50.0%	median	-8.9
25.0%	quartile	-8.9
10.0%		-8.9
2.5%		-8.9
0.5%		-8.9
0.0%	minimum	-8.9

Summary Statistics

Mean	-8.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Americium-241 No preparation - analyzed as received

Bias



Quantiles

100.0%	maximum	6.8
99.5%		6.8
97.5%		6.8
90.0%		6.3
75.0%	quartile	0.4
50.0%	median	-2.6
25.0%	quartile	-9.3
10.0%		-12.3
2.5%		-12.5
0.5%		-12.5
0.0%	minimum	-12.5

Summary Statistics

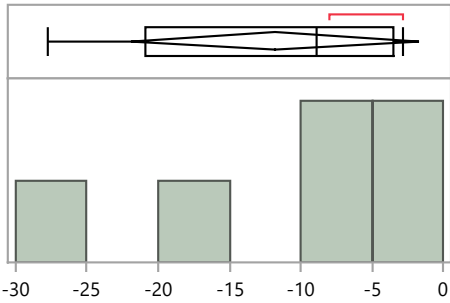
Mean	-3.7
Std Dev	6.1
Std Err Mean	1.9
Upper 95% Mean	0.6
Lower 95% Mean	-8.1
N	10.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Americium-241 Other

Bias



Quantiles

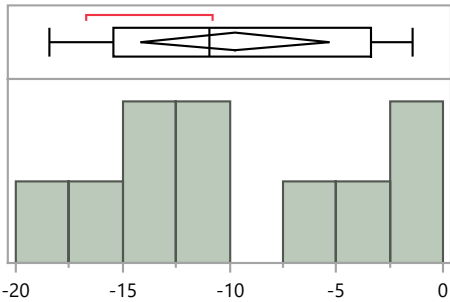
100.0%	maximum	-2.8
99.5%		-2.8
97.5%		-2.8
90.0%		-2.8
75.0%	quartile	-3.6
50.0%	median	-8.9
25.0%	quartile	-20.9
10.0%		-27.7
2.5%		-27.7
0.5%		-27.7
0.0%	minimum	-27.7

Summary Statistics

Mean	-11.8
Std Dev	9.6
Std Err Mean	3.9
Upper 95% Mean	-1.7
Lower 95% Mean	-21.9
N	6.0

Distributions Analyte_Method=Americium-241 Total dissolution by fusion

Bias



Quantiles

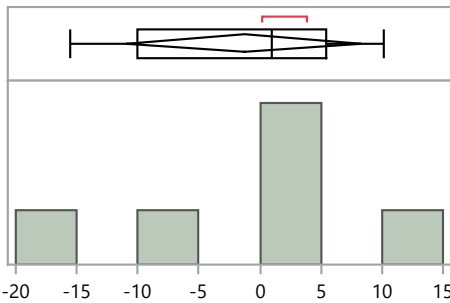
100.0%	maximum	-1.4
99.5%		-1.4
97.5%		-1.4
90.0%		-1.5
75.0%	quartile	-3.4
50.0%	median	-10.9
25.0%	quartile	-15.4
10.0%		-18.2
2.5%		-18.4
0.5%		-18.4
0.0%	minimum	-18.4

Summary Statistics

Mean	-9.7
Std Dev	6.2
Std Err Mean	2.0
Upper 95% Mean	-5.3
Lower 95% Mean	-14.2
N	10.0

Distributions Analyte_Method=Cesium-134 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias



Quantiles

100.0%	maximum	10.1
99.5%		10.1
97.5%		10.1
90.0%		10.1
75.0%	quartile	5.4
50.0%	median	1.0
25.0%	quartile	-10.0
10.0%		-15.5
2.5%		-15.5
0.5%		-15.5
0.0%	minimum	-15.5

Summary Statistics

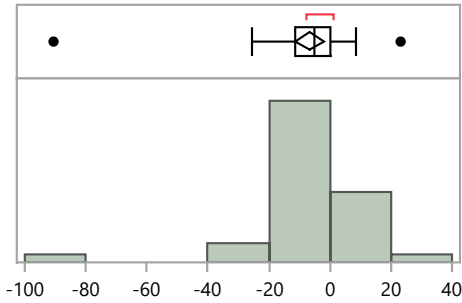
Mean	-1.3
Std Dev	9.1
Std Err Mean	3.7
Upper 95% Mean	8.3
Lower 95% Mean	-10.9
N	6.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Cesium-134 No preparation - analyzed as received

Bias



Quantiles

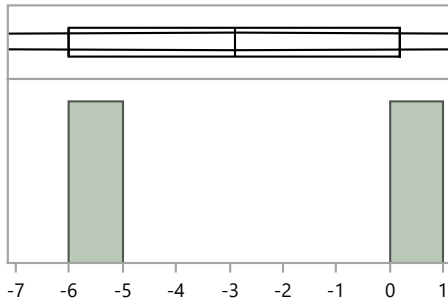
100.0%	maximum	23.1
99.5%		23.1
97.5%		20.9
90.0%		4.3
75.0%	quartile	0.4
50.0%	median	-5.3
25.0%	quartile	-11.2
10.0%		-17.1
2.5%		-80.8
0.5%		-90.5
0.0%	minimum	-90.5

Summary Statistics

Mean	-6.8
Std Dev	15.3
Std Err Mean	2.3
Upper 95% Mean	-2.2
Lower 95% Mean	-11.4
N	45.0

Distributions Analyte_Method=Cesium-134 Other

Bias



Quantiles

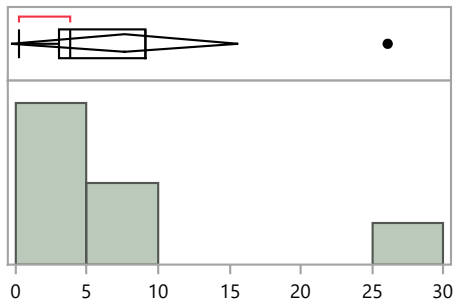
100.0%	maximum	0.2
99.5%		0.2
97.5%		0.2
90.0%		0.2
75.0%	quartile	0.2
50.0%	median	-2.9
25.0%	quartile	-6.0
10.0%		-6.0
2.5%		-6.0
0.5%		-6.0
0.0%	minimum	-6.0

Summary Statistics

Mean	-2.9
Std Dev	4.4
Std Err Mean	3.1
Upper 95% Mean	36.5
Lower 95% Mean	-42.3
N	2.0

Distributions Analyte_Method=Cesium-137 EPA 901.1, Gamma Emitting, 600/4-80-032

Bias



Quantiles

100.0%	maximum	26.1
99.5%		26.1
97.5%		26.1
90.0%		26.1
75.0%	quartile	9.1
50.0%	median	3.8
25.0%	quartile	3.1
10.0%		0.3
2.5%		0.3
0.5%		0.3
0.0%	minimum	0.3

Summary Statistics

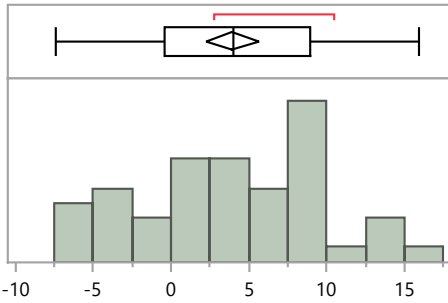
Mean	7.7
Std Dev	8.7
Std Err Mean	3.3
Upper 95% Mean	15.7
Lower 95% Mean	-0.3
N	7.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Cesium-137 No preparation - analyzed as received

Bias



Quantiles

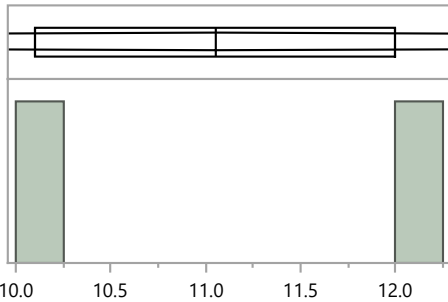
100.0%	maximum	15.9
99.5%		15.9
97.5%		15.5
90.0%		11.0
75.0%	quartile	8.9
50.0%	median	4.0
25.0%	quartile	-0.4
10.0%		-4.7
2.5%		-7.2
0.5%		-7.4
0.0%	minimum	-7.4

Summary Statistics

Mean	3.9
Std Dev	5.9
Std Err Mean	0.9
Upper 95% Mean	5.7
Lower 95% Mean	2.2
N	47.0

Distributions Analyte_Method=Cesium-137 Other

Bias



Quantiles

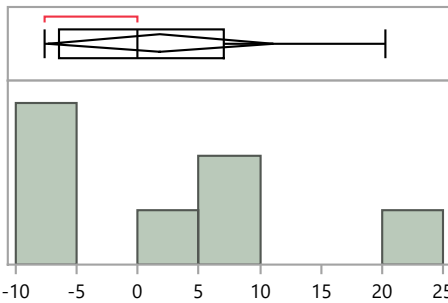
100.0%	maximum	12.0
99.5%		12.0
97.5%		12.0
90.0%		12.0
75.0%	quartile	12.0
50.0%	median	11.1
25.0%	quartile	10.1
10.0%		10.1
2.5%		10.1
0.5%		10.1
0.0%	minimum	10.1

Summary Statistics

Mean	11.1
Std Dev	1.3
Std Err Mean	1.0
Upper 95% Mean	23.1
Lower 95% Mean	-1.0
N	2.0

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

Bias



Quantiles

100.0%	maximum	20.3
99.5%		20.3
97.5%		20.3
90.0%		20.3
75.0%	quartile	7.1
50.0%	median	0.0
25.0%	quartile	-6.4
10.0%		-7.6
2.5%		-7.6
0.5%		-7.6
0.0%	minimum	-7.6

Summary Statistics

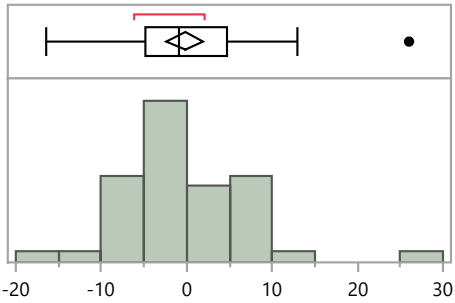
Mean	1.9
Std Dev	9.9
Std Err Mean	3.8
Upper 95% Mean	11.1
Lower 95% Mean	-7.3
N	7.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

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

Bias



Quantiles

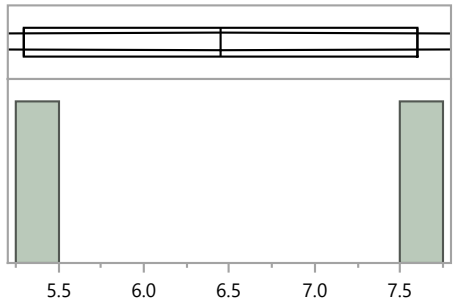
100.0%	maximum	26.0
99.5%		26.0
97.5%		23.4
90.0%		7.3
75.0%	quartile	4.7
50.0%	median	-0.8
25.0%	quartile	-4.9
10.0%		-9.2
2.5%		-15.3
0.5%		-16.5
0.0%	minimum	-16.5

Summary Statistics

Mean	-0.2
Std Dev	7.3
Std Err Mean	1.1
Upper 95% Mean	1.9
Lower 95% Mean	-2.4
N	47.0

Distributions Analyte_Method=Cobalt-60 Other

Bias



Quantiles

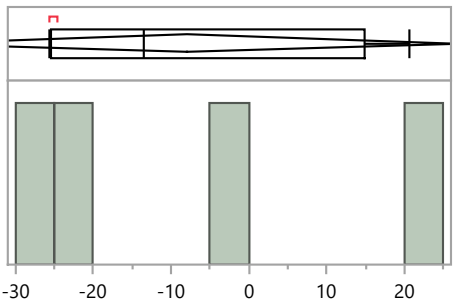
100.0%	maximum	7.6
99.5%		7.6
97.5%		7.6
90.0%		7.6
75.0%	quartile	7.6
50.0%	median	6.5
25.0%	quartile	5.3
10.0%		5.3
2.5%		5.3
0.5%		5.3
0.0%	minimum	5.3

Summary Statistics

Mean	6.5
Std Dev	1.6
Std Err Mean	1.2
Upper 95% Mean	21.1
Lower 95% Mean	-8.2
N	2.0

Distributions Analyte_Method=Iron-55 Acid dissolution with hydrofluoric acid

Bias



Quantiles

100.0%	maximum	20.6
99.5%		20.6
97.5%		20.6
90.0%		20.6
75.0%	quartile	14.8
50.0%	median	-13.6
25.0%	quartile	-25.4
10.0%		-25.6
2.5%		-25.6
0.5%		-25.6
0.0%	minimum	-25.6

Summary Statistics

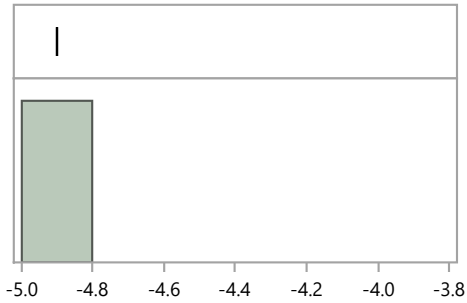
Mean	-8.1
Std Dev	21.9
Std Err Mean	10.9
Upper 95% Mean	26.8
Lower 95% Mean	-42.9
N	4.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Iron-55 Acid leaching without hydrofluoric acid

Bias



Quantiles

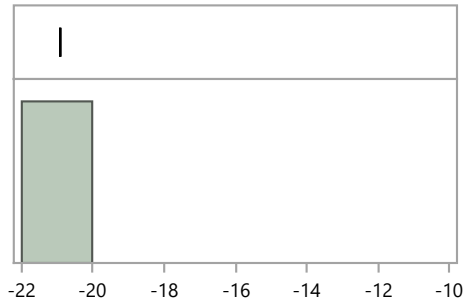
100.0%	maximum	-4.9
99.5%		-4.9
97.5%		-4.9
90.0%		-4.9
75.0%	quartile	-4.9
50.0%	median	-4.9
25.0%	quartile	-4.9
10.0%		-4.9
2.5%		-4.9
0.5%		-4.9
0.0%	minimum	-4.9

Summary Statistics

Mean	-4.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Iron-55 Coprecipitation, acidified

Bias



Quantiles

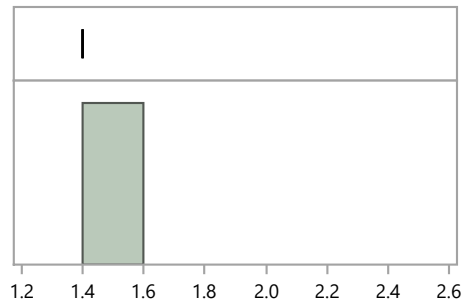
100.0%	maximum	-20.9
99.5%		-20.9
97.5%		-20.9
90.0%		-20.9
75.0%	quartile	-20.9
50.0%	median	-20.9
25.0%	quartile	-20.9
10.0%		-20.9
2.5%		-20.9
0.5%		-20.9
0.0%	minimum	-20.9

Summary Statistics

Mean	-20.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Iron-55 No preparation - analyzed as received

Bias



Quantiles

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

Summary Statistics

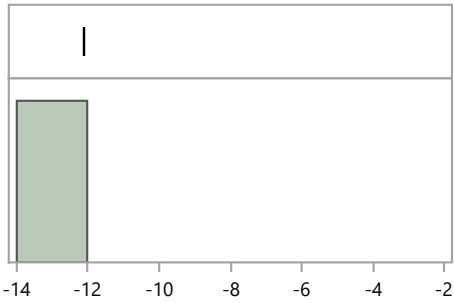
Mean	1.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Iron-55 Total dissolution by fusion

Bias



Quantiles

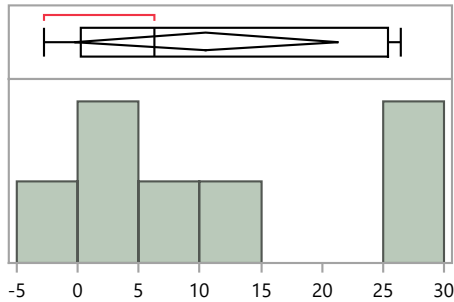
100.0%	maximum	-12.1
99.5%		-12.1
97.5%		-12.1
90.0%		-12.1
75.0%	quartile	-12.1
50.0%	median	-12.1
25.0%	quartile	-12.1
10.0%		-12.1
2.5%		-12.1
0.5%		-12.1
0.0%	minimum	-12.1

Summary Statistics

Mean	-12.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

Bias



Quantiles

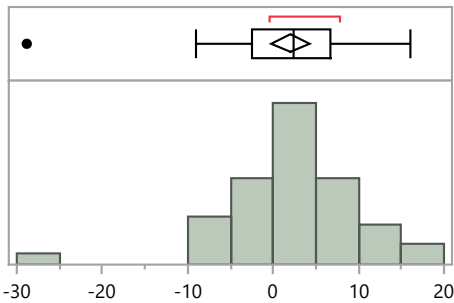
100.0%	maximum	26.5
99.5%		26.5
97.5%		26.5
90.0%		26.5
75.0%	quartile	25.4
50.0%	median	6.3
25.0%	quartile	0.2
10.0%		-2.8
2.5%		-2.8
0.5%		-2.8
0.0%	minimum	-2.8

Summary Statistics

Mean	10.5
Std Dev	11.7
Std Err Mean	4.4
Upper 95% Mean	21.4
Lower 95% Mean	-0.3
N	7.0

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

Bias



Quantiles

100.0%	maximum	16.1
99.5%		16.1
97.5%		16.0
90.0%		11.1
75.0%	quartile	6.6
50.0%	median	2.4
25.0%	quartile	-2.4
10.0%		-5.7
2.5%		-24.8
0.5%		-28.8
0.0%	minimum	-28.8

Summary Statistics

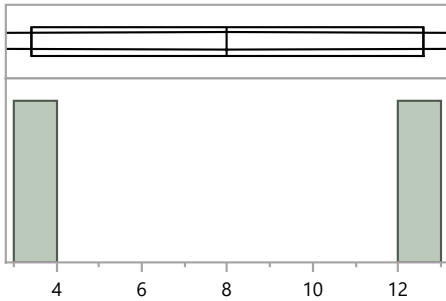
Mean	2.0
Std Dev	7.6
Std Err Mean	1.1
Upper 95% Mean	4.2
Lower 95% Mean	-0.2
N	47.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Manganese-54 Other

Bias



Quantiles

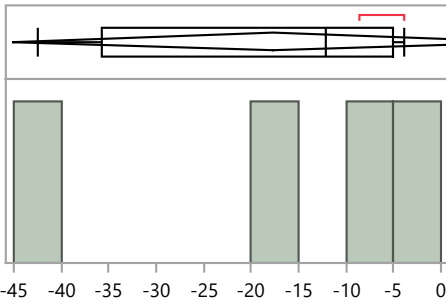
100.0%	maximum	12.6
99.5%		12.6
97.5%		12.6
90.0%		12.6
75.0%	quartile	12.6
50.0%	median	8.0
25.0%	quartile	3.4
10.0%		3.4
2.5%		3.4
0.5%		3.4
0.0%	minimum	3.4

Summary Statistics

Mean	8.0
Std Dev	6.5
Std Err Mean	4.6
Upper 95% Mean	66.4
Lower 95% Mean	-50.4
N	2.0

Distributions Analyte_Method=Nickel-63 Acid dissolution with hydrofluoric acid

Bias



Quantiles

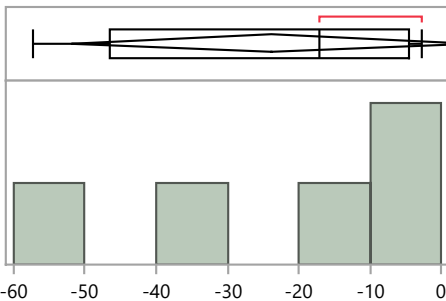
100.0%	maximum	-3.9
99.5%		-3.9
97.5%		-3.9
90.0%		-3.9
75.0%	quartile	-5.1
50.0%	median	-12.1
25.0%	quartile	-35.8
10.0%		-42.5
2.5%		-42.5
0.5%		-42.5
0.0%	minimum	-42.5

Summary Statistics

Mean	-17.7
Std Dev	17.3
Std Err Mean	8.6
Upper 95% Mean	9.8
Lower 95% Mean	-45.1
N	4.0

Distributions Analyte_Method=Nickel-63 Acid leaching without hydrofluoric acid

Bias



Quantiles

100.0%	maximum	-2.7
99.5%		-2.7
97.5%		-2.7
90.0%		-2.7
75.0%	quartile	-4.5
50.0%	median	-17.2
25.0%	quartile	-46.5
10.0%		-57.3
2.5%		-57.3
0.5%		-57.3
0.0%	minimum	-57.3

Summary Statistics

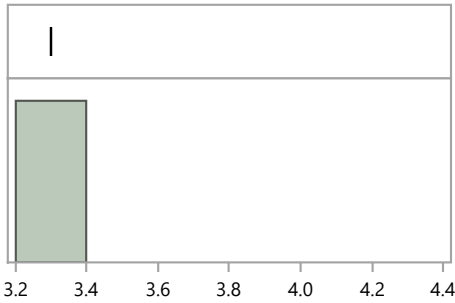
Mean	-23.8
Std Dev	22.7
Std Err Mean	10.1
Upper 95% Mean	4.3
Lower 95% Mean	-52.0
N	5.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Nickel-63 Coprecipitation, acidified

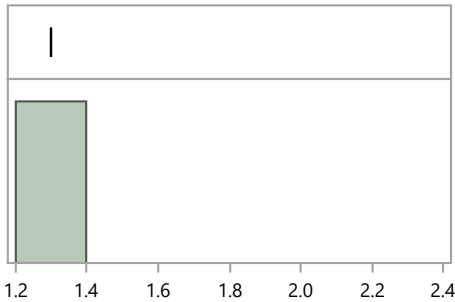
Bias



Quantiles			Summary Statistics	
100.0%	maximum	3.3	Mean	3.3
99.5%		3.3	Std Dev	.
97.5%		3.3	Std Err Mean	.
90.0%		3.3	Upper 95% Mean	.
75.0%	quartile	3.3	Lower 95% Mean	.
50.0%	median	3.3	N	1.0
25.0%	quartile	3.3		
10.0%		3.3		
2.5%		3.3		
0.5%		3.3		
0.0%	minimum	3.3		

Distributions Analyte_Method=Nickel-63 No preparation - analyzed as received

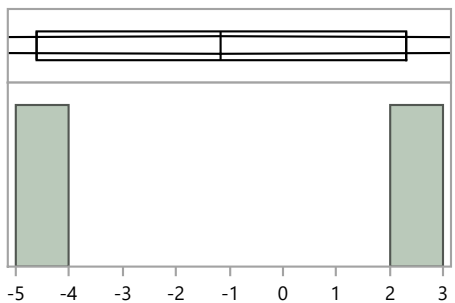
Bias



Quantiles			Summary Statistics	
100.0%	maximum	1.3	Mean	1.3
99.5%		1.3	Std Dev	.
97.5%		1.3	Std Err Mean	.
90.0%		1.3	Upper 95% Mean	.
75.0%	quartile	1.3	Lower 95% Mean	.
50.0%	median	1.3	N	1.0
25.0%	quartile	1.3		
10.0%		1.3		
2.5%		1.3		
0.5%		1.3		
0.0%	minimum	1.3		

Distributions Analyte_Method=Nickel-63 Other

Bias



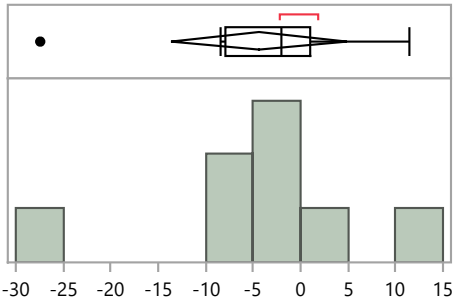
Quantiles			Summary Statistics	
100.0%	maximum	2.3	Mean	-1.2
99.5%		2.3	Std Dev	4.9
97.5%		2.3	Std Err Mean	3.5
90.0%		2.3	Upper 95% Mean	42.7
75.0%	quartile	2.3	Lower 95% Mean	-45.0
50.0%	median	-1.2	N	2.0
25.0%	quartile	-4.6		
10.0%		-4.6		
2.5%		-4.6		
0.5%		-4.6		
0.0%	minimum	-4.6		

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Plutonium-238 Acid dissolution with hydrofluoric acid

Bias



Quantiles

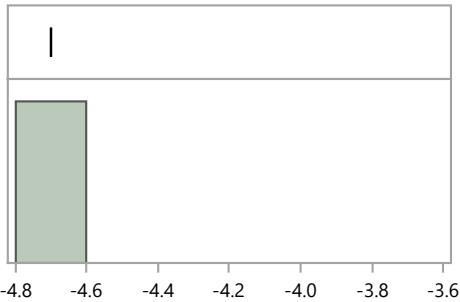
100.0%	maximum	11.5
99.5%		11.5
97.5%		11.5
90.0%		11.5
75.0%	quartile	1.0
50.0%	median	-2.0
25.0%	quartile	-7.9
10.0%		-27.4
2.5%		-27.4
0.5%		-27.4
0.0%	minimum	-27.4

Summary Statistics

Mean	-4.3
Std Dev	11.1
Std Err Mean	3.9
Upper 95% Mean	4.9
Lower 95% Mean	-13.6
N	8.0

Distributions Analyte_Method=Plutonium-238 Acid leaching without hydrofluoric acid

Bias



Quantiles

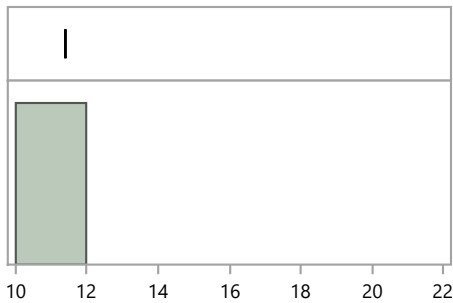
100.0%	maximum	-4.7
99.5%		-4.7
97.5%		-4.7
90.0%		-4.7
75.0%	quartile	-4.7
50.0%	median	-4.7
25.0%	quartile	-4.7
10.0%		-4.7
2.5%		-4.7
0.5%		-4.7
0.0%	minimum	-4.7

Summary Statistics

Mean	-4.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Plutonium-238 Coprecipitation, acidified

Bias



Quantiles

100.0%	maximum	11.4
99.5%		11.4
97.5%		11.4
90.0%		11.4
75.0%	quartile	11.4
50.0%	median	11.4
25.0%	quartile	11.4
10.0%		11.4
2.5%		11.4
0.5%		11.4
0.0%	minimum	11.4

Summary Statistics

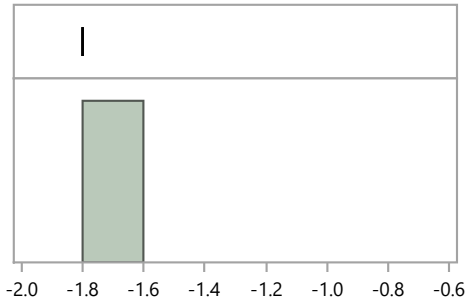
Mean	11.4
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Plutonium-238 EPA 907, Actinide Elements, 600/4/80-032

Bias



Quantiles

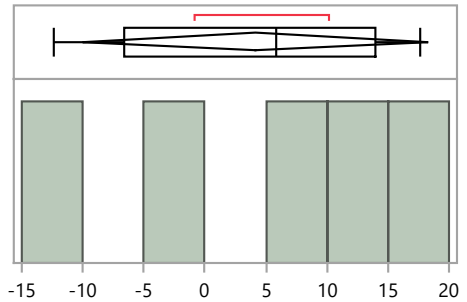
100.0%	maximum	-1.8
99.5%		-1.8
97.5%		-1.8
90.0%		-1.8
75.0%	quartile	-1.8
50.0%	median	-1.8
25.0%	quartile	-1.8
10.0%		-1.8
2.5%		-1.8
0.5%		-1.8
0.0%	minimum	-1.8

Summary Statistics

Mean	-1.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Plutonium-238 Other

Bias



Quantiles

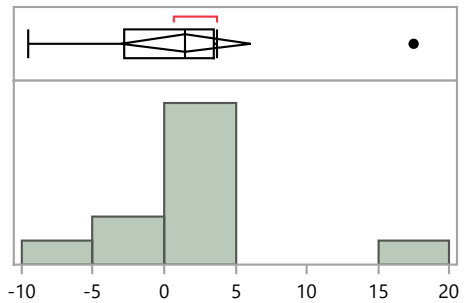
100.0%	maximum	17.6
99.5%		17.6
97.5%		17.6
90.0%		17.6
75.0%	quartile	13.9
50.0%	median	5.8
25.0%	quartile	-6.6
10.0%		-12.4
2.5%		-12.4
0.5%		-12.4
0.0%	minimum	-12.4

Summary Statistics

Mean	4.1
Std Dev	11.4
Std Err Mean	5.1
Upper 95% Mean	18.2
Lower 95% Mean	-10.1
N	5.0

Distributions Analyte_Method=Plutonium-238 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	17.5
99.5%		17.5
97.5%		17.5
90.0%		14.7
75.0%	quartile	3.5
50.0%	median	1.5
25.0%	quartile	-2.8
10.0%		-8.5
2.5%		-9.5
0.5%		-9.5
0.0%	minimum	-9.5

Summary Statistics

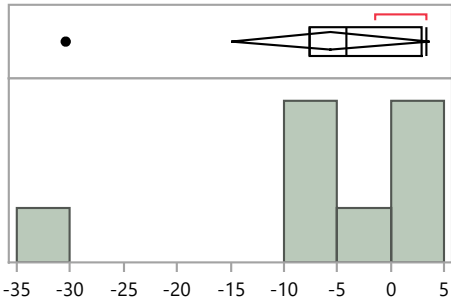
Mean	1.5
Std Dev	6.7
Std Err Mean	2.0
Upper 95% Mean	6.0
Lower 95% Mean	-3.0
N	11.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

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

Bias



Quantiles

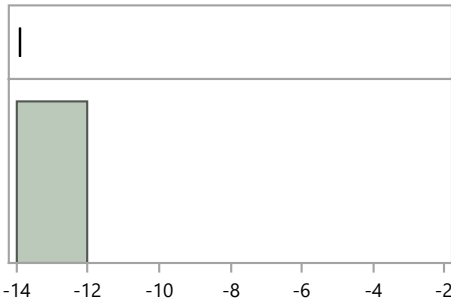
100.0%	maximum	3.4
99.5%		3.4
97.5%		3.4
90.0%		3.4
75.0%	quartile	2.9
50.0%	median	-4.2
25.0%	quartile	-7.5
10.0%		-30.4
2.5%		-30.4
0.5%		-30.4
0.0%	minimum	-30.4

Summary Statistics

Mean	-5.6
Std Dev	11.1
Std Err Mean	3.9
Upper 95% Mean	3.6
Lower 95% Mean	-14.9
N	8.0

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

Bias



Quantiles

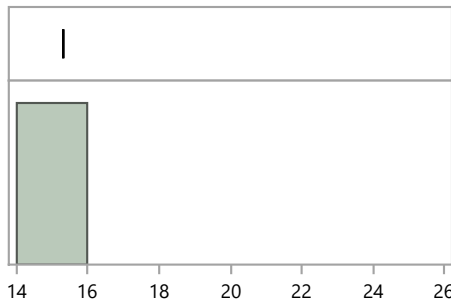
100.0%	maximum	-13.9
99.5%		-13.9
97.5%		-13.9
90.0%		-13.9
75.0%	quartile	-13.9
50.0%	median	-13.9
25.0%	quartile	-13.9
10.0%		-13.9
2.5%		-13.9
0.5%		-13.9
0.0%	minimum	-13.9

Summary Statistics

Mean	-13.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Plutonium-239/240 Coprecipitation, acidified

Bias



Quantiles

100.0%	maximum	15.3
99.5%		15.3
97.5%		15.3
90.0%		15.3
75.0%	quartile	15.3
50.0%	median	15.3
25.0%	quartile	15.3
10.0%		15.3
2.5%		15.3
0.5%		15.3
0.0%	minimum	15.3

Summary Statistics

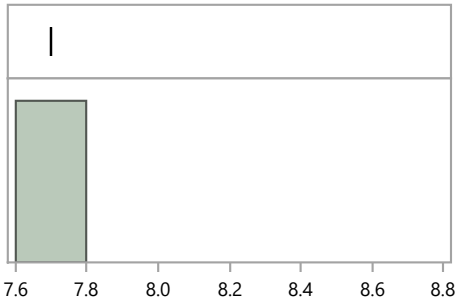
Mean	15.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

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

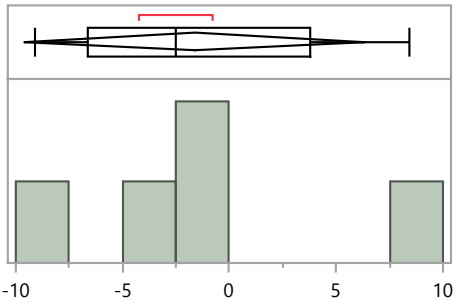
Bias



Quantiles		Summary Statistics		
100.0%	maximum	7.7	Mean	7.7
99.5%		7.7	Std Dev	.
97.5%		7.7	Std Err Mean	.
90.0%		7.7	Upper 95% Mean	.
75.0%	quartile	7.7	Lower 95% Mean	.
50.0%	median	7.7	N	1.0
25.0%	quartile	7.7		
10.0%		7.7		
2.5%		7.7		
0.5%		7.7		
0.0%	minimum	7.7		

Distributions Analyte_Method=Plutonium-239/240 Other

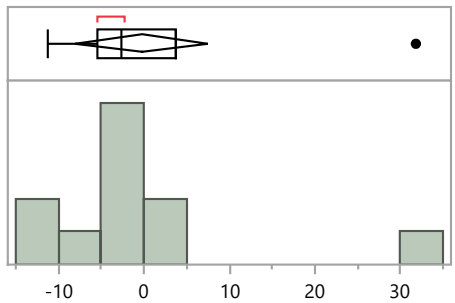
Bias



Quantiles		Summary Statistics		
100.0%	maximum	8.4	Mean	-1.6
99.5%		8.4	Std Dev	6.4
97.5%		8.4	Std Err Mean	2.9
90.0%		8.4	Upper 95% Mean	6.3
75.0%	quartile	3.8	Lower 95% Mean	-9.6
50.0%	median	-2.5	N	5.0
25.0%	quartile	-6.7		
10.0%		-9.1		
2.5%		-9.1		
0.5%		-9.1		
0.0%	minimum	-9.1		

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

Bias



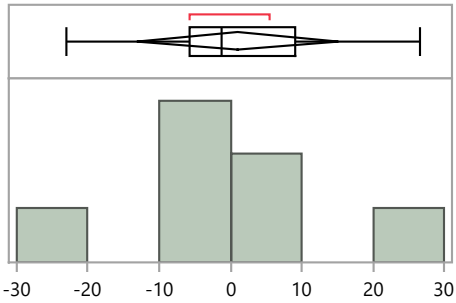
Quantiles		Summary Statistics		
100.0%	maximum	31.8	Mean	-0.2
99.5%		31.8	Std Dev	11.6
97.5%		31.8	Std Err Mean	3.5
90.0%		26.2	Upper 95% Mean	7.6
75.0%	quartile	3.8	Lower 95% Mean	-8.0
50.0%	median	-2.7	N	11.0
25.0%	quartile	-5.5		
10.0%		-11.0		
2.5%		-11.2		
0.5%		-11.2		
0.0%	minimum	-11.2		

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

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

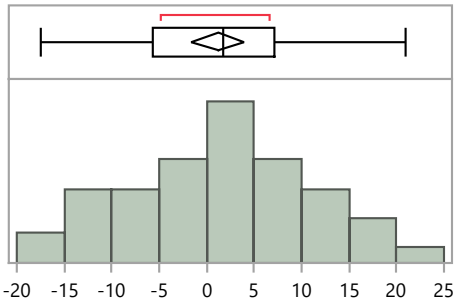
Bias



Quantiles			Summary Statistics	
100.0%	maximum	26.6	Mean	1.0
99.5%		26.6	Std Dev	15.3
97.5%		26.6	Std Err Mean	5.8
90.0%		26.6	Upper 95% Mean	15.1
75.0%	quartile	9.1	Lower 95% Mean	-13.1
50.0%	median	-1.2	N	7.0
25.0%	quartile	-5.8		
10.0%		-23.1		
2.5%		-23.1		
0.5%		-23.1		
0.0%	minimum	-23.1		

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

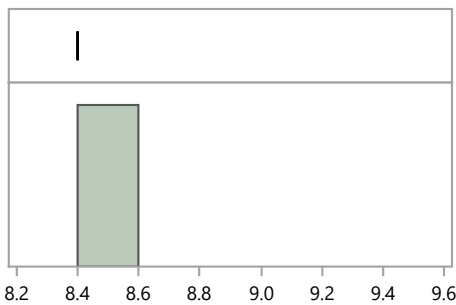
Bias



Quantiles			Summary Statistics	
100.0%	maximum	20.9	Mean	1.2
99.5%		20.9	Std Dev	9.4
97.5%		20.7	Std Err Mean	1.4
90.0%		14.5	Upper 95% Mean	4.0
75.0%	quartile	7.1	Lower 95% Mean	-1.6
50.0%	median	1.7	N	46.0
25.0%	quartile	-5.7		
10.0%		-11.7		
2.5%		-17.3		
0.5%		-17.4		
0.0%	minimum	-17.4		

Distributions Analyte_Method=Potassium-40 Other

Bias



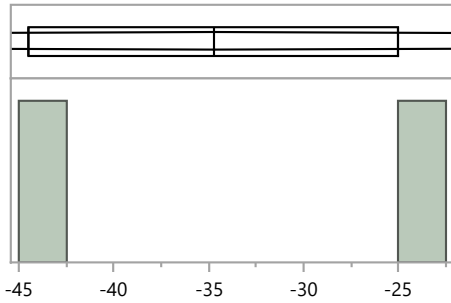
Quantiles			Summary Statistics	
100.0%	maximum	8.4	Mean	8.4
99.5%		8.4	Std Dev	.
97.5%		8.4	Std Err Mean	.
90.0%		8.4	Upper 95% Mean	.
75.0%	quartile	8.4	Lower 95% Mean	.
50.0%	median	8.4	N	1.0
25.0%	quartile	8.4		
10.0%		8.4		
2.5%		8.4		
0.5%		8.4		
0.0%	minimum	8.4		

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Technetium-99 Acid dissolution with hydrofluoric acid

Bias



Quantiles

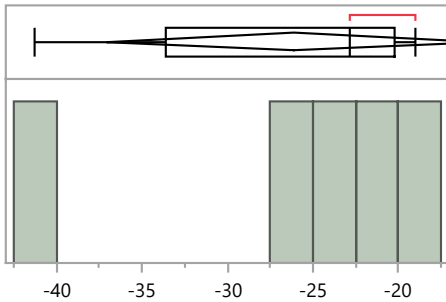
100.0%	maximum	-25.0
99.5%		-25.0
97.5%		-25.0
90.0%		-25.0
75.0%	quartile	-25.0
50.0%	median	-34.8
25.0%	quartile	-44.5
10.0%		-44.5
2.5%		-44.5
0.5%		-44.5
0.0%	minimum	-44.5

Summary Statistics

Mean	-34.8
Std Dev	13.8
Std Err Mean	9.8
Upper 95% Mean	89.1
Lower 95% Mean	-158.6
N	2.0

Distributions Analyte_Method=Technetium-99 Acid leaching without hydrofluoric acid

Bias



Quantiles

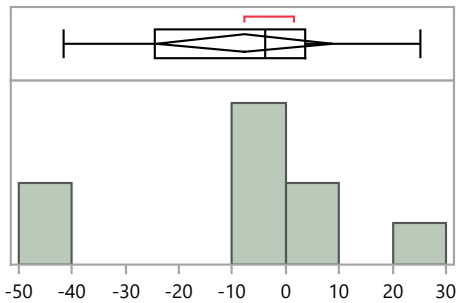
100.0%	maximum	-19.0
99.5%		-19.0
97.5%		-19.0
90.0%		-19.0
75.0%	quartile	-20.3
50.0%	median	-22.8
25.0%	quartile	-33.6
10.0%		-41.3
2.5%		-41.3
0.5%		-41.3
0.0%	minimum	-41.3

Summary Statistics

Mean	-26.1
Std Dev	8.9
Std Err Mean	4.0
Upper 95% Mean	-15.1
Lower 95% Mean	-37.1
N	5.0

Distributions Analyte_Method=Technetium-99 Other

Bias



Quantiles

100.0%	maximum	25.2
99.5%		25.2
97.5%		25.2
90.0%		25.2
75.0%	quartile	3.6
50.0%	median	-3.9
25.0%	quartile	-24.5
10.0%		-41.7
2.5%		-41.7
0.5%		-41.7
0.0%	minimum	-41.7

Summary Statistics

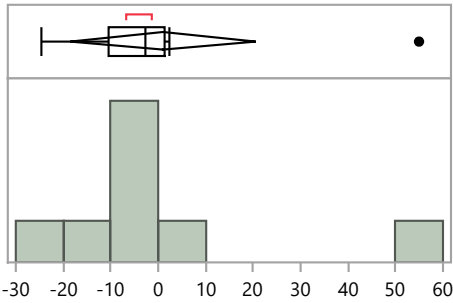
Mean	-7.8
Std Dev	21.4
Std Err Mean	7.1
Upper 95% Mean	8.7
Lower 95% Mean	-24.2
N	9.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Uranium-234 Acid dissolution with hydrofluoric acid

Bias



Quantiles

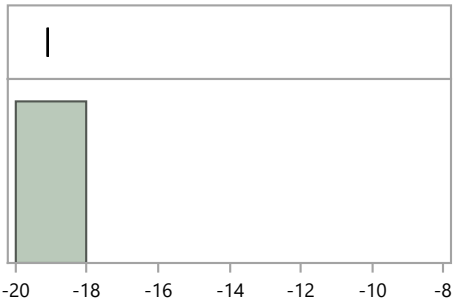
100.0%	maximum	54.9
99.5%		54.9
97.5%		54.9
90.0%		54.9
75.0%	quartile	1.4
50.0%	median	-2.8
25.0%	quartile	-10.3
10.0%		-24.7
2.5%		-24.7
0.5%		-24.7
0.0%	minimum	-24.7

Summary Statistics

Mean	0.9
Std Dev	23.4
Std Err Mean	8.3
Upper 95% Mean	20.5
Lower 95% Mean	-18.6
N	8.0

Distributions Analyte_Method=Uranium-234 EPA 00-07 - Radiochemistry Procedures Manual

Bias



Quantiles

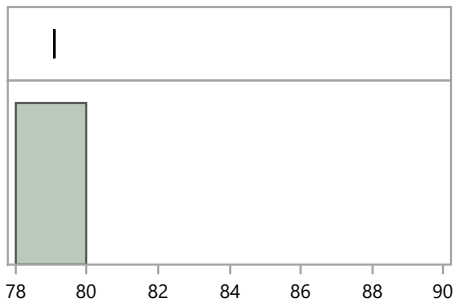
100.0%	maximum	-19.1
99.5%		-19.1
97.5%		-19.1
90.0%		-19.1
75.0%	quartile	-19.1
50.0%	median	-19.1
25.0%	quartile	-19.1
10.0%		-19.1
2.5%		-19.1
0.5%		-19.1
0.0%	minimum	-19.1

Summary Statistics

Mean	-19.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

Bias



Quantiles

100.0%	maximum	79.1
99.5%		79.1
97.5%		79.1
90.0%		79.1
75.0%	quartile	79.1
50.0%	median	79.1
25.0%	quartile	79.1
10.0%		79.1
2.5%		79.1
0.5%		79.1
0.0%	minimum	79.1

Summary Statistics

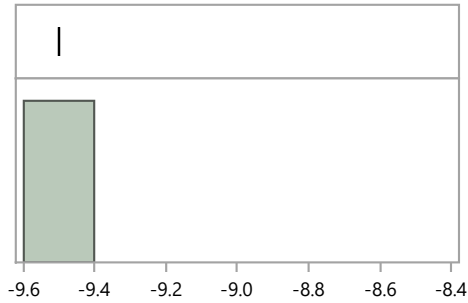
Mean	79.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Uranium-234 No preparation - analyzed as received

Bias



Quantiles

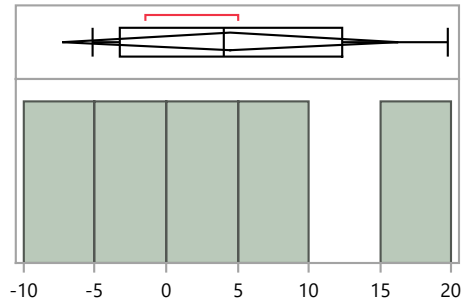
100.0%	maximum	-9.5
99.5%		-9.5
97.5%		-9.5
90.0%		-9.5
75.0%	quartile	-9.5
50.0%	median	-9.5
25.0%	quartile	-9.5
10.0%		-9.5
2.5%		-9.5
0.5%		-9.5
0.0%	minimum	-9.5

Summary Statistics

Mean	-9.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Uranium-234 Other

Bias



Quantiles

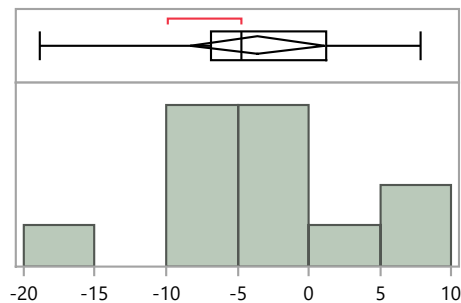
100.0%	maximum	19.7
99.5%		19.7
97.5%		19.7
90.0%		19.7
75.0%	quartile	12.4
50.0%	median	4.1
25.0%	quartile	-3.3
10.0%		-5.2
2.5%		-5.2
0.5%		-5.2
0.0%	minimum	-5.2

Summary Statistics

Mean	4.5
Std Dev	9.5
Std Err Mean	4.2
Upper 95% Mean	16.2
Lower 95% Mean	-7.3
N	5.0

Distributions Analyte_Method=Uranium-234 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	7.8
99.5%		7.8
97.5%		7.8
90.0%		7.7
75.0%	quartile	1.3
50.0%	median	-4.8
25.0%	quartile	-6.9
10.0%		-16.2
2.5%		-18.9
0.5%		-18.9
0.0%	minimum	-18.9

Summary Statistics

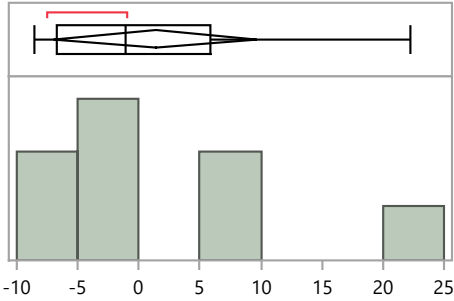
Mean	-3.6
Std Dev	7.4
Std Err Mean	2.1
Upper 95% Mean	1.2
Lower 95% Mean	-8.3
N	12.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

Distributions Analyte_Method=Uranium-238 Acid dissolution with hydrofluoric acid

Bias



Quantiles

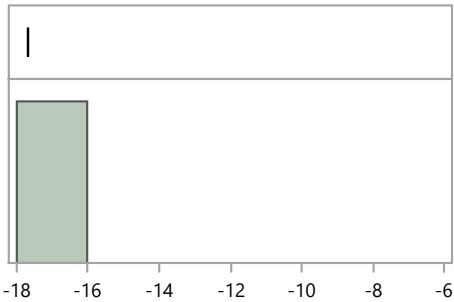
100.0%	maximum	22.2
99.5%		22.2
97.5%		22.2
90.0%		22.2
75.0%	quartile	5.9
50.0%	median	-1.1
25.0%	quartile	-6.7
10.0%		-8.6
2.5%		-8.6
0.5%		-8.6
0.0%	minimum	-8.6

Summary Statistics

Mean	1.4
Std Dev	9.9
Std Err Mean	3.5
Upper 95% Mean	9.7
Lower 95% Mean	-6.9
N	8.0

Distributions Analyte_Method=Uranium-238 EPA 00-07 - Radiochemistry Procedures Manual

Bias



Quantiles

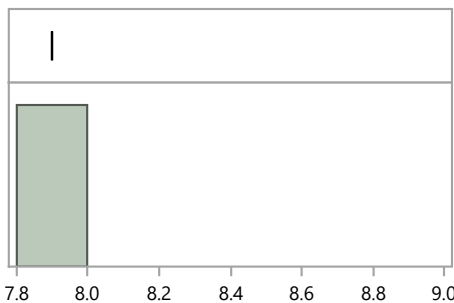
100.0%	maximum	-17.7
99.5%		-17.7
97.5%		-17.7
90.0%		-17.7
75.0%	quartile	-17.7
50.0%	median	-17.7
25.0%	quartile	-17.7
10.0%		-17.7
2.5%		-17.7
0.5%		-17.7
0.0%	minimum	-17.7

Summary Statistics

Mean	-17.7
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

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

Bias



Quantiles

100.0%	maximum	7.9
99.5%		7.9
97.5%		7.9
90.0%		7.9
75.0%	quartile	7.9
50.0%	median	7.9
25.0%	quartile	7.9
10.0%		7.9
2.5%		7.9
0.5%		7.9
0.0%	minimum	7.9

Summary Statistics

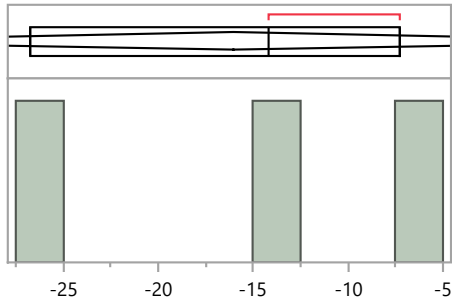
Mean	7.9
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

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

Bias



Quantiles

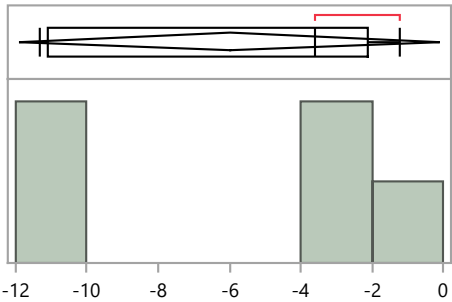
100.0%	maximum	-7.3
99.5%		-7.3
97.5%		-7.3
90.0%		-7.3
75.0%	quartile	-7.3
50.0%	median	-14.2
25.0%	quartile	-26.7
10.0%		-26.7
2.5%		-26.7
0.5%		-26.7
0.0%	minimum	-26.7

Summary Statistics

Mean	-16.1
Std Dev	9.8
Std Err Mean	5.7
Upper 95% Mean	8.4
Lower 95% Mean	-40.5
N	3.0

Distributions Analyte_Method=Uranium-238 Other

Bias



Quantiles

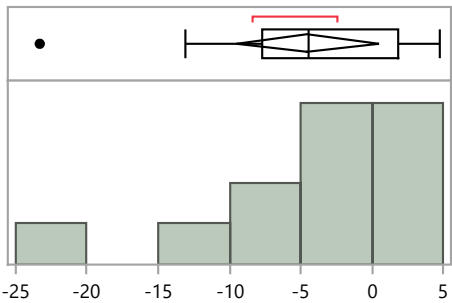
100.0%	maximum	-1.2
99.5%		-1.2
97.5%		-1.2
90.0%		-1.2
75.0%	quartile	-2.1
50.0%	median	-3.6
25.0%	quartile	-11.1
10.0%		-11.3
2.5%		-11.3
0.5%		-11.3
0.0%	minimum	-11.3

Summary Statistics

Mean	-6.0
Std Dev	4.7
Std Err Mean	2.1
Upper 95% Mean	-0.1
Lower 95% Mean	-11.9
N	5.0

Distributions Analyte_Method=Uranium-238 Total dissolution by fusion

Bias



Quantiles

100.0%	maximum	4.8
99.5%		4.8
97.5%		4.8
90.0%		4.4
75.0%	quartile	1.8
50.0%	median	-4.5
25.0%	quartile	-7.7
10.0%		-20.2
2.5%		-23.3
0.5%		-23.3
0.0%	minimum	-23.3

Summary Statistics

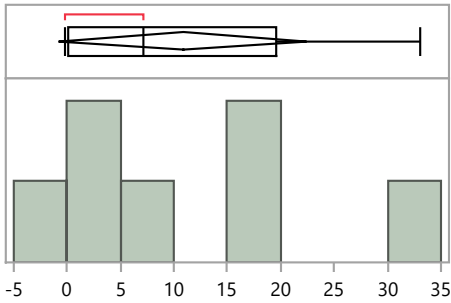
Mean	-4.5
Std Dev	7.9
Std Err Mean	2.3
Upper 95% Mean	0.5
Lower 95% Mean	-9.5
N	12.0

MaS45 Distribution by Preparation Method

MaS Distribution by Prep Method

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

Bias



Quantiles

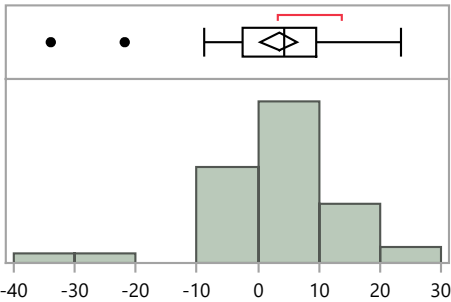
100.0%	maximum	33.0
99.5%		33.0
97.5%		33.0
90.0%		33.0
75.0%	quartile	19.6
50.0%	median	7.1
25.0%	quartile	0.1
10.0%		-0.2
2.5%		-0.2
0.5%		-0.2
0.0%	minimum	-0.2

Summary Statistics

Mean	10.9
Std Dev	12.5
Std Err Mean	4.7
Upper 95% Mean	22.4
Lower 95% Mean	-0.7
N	7.0

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

Bias



Quantiles

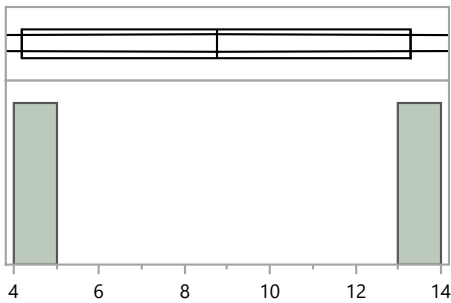
100.0%	maximum	23.5
99.5%		23.5
97.5%		23.4
90.0%		13.8
75.0%	quartile	9.5
50.0%	median	4.2
25.0%	quartile	-2.4
10.0%		-7.8
2.5%		-31.5
0.5%		-33.9
0.0%	minimum	-33.9

Summary Statistics

Mean	3.4
Std Dev	10.3
Std Err Mean	1.5
Upper 95% Mean	6.4
Lower 95% Mean	0.4
N	47.0

Distributions Analyte_Method=Zinc-65 Other

Bias



Quantiles

100.0%	maximum	13.3
99.5%		13.3
97.5%		13.3
90.0%		13.3
75.0%	quartile	13.3
50.0%	median	8.8
25.0%	quartile	4.2
10.0%		4.2
2.5%		4.2
0.5%		4.2
0.0%	minimum	4.2

Summary Statistics

Mean	8.8
Std Dev	6.4
Std Err Mean	4.6
Upper 95% Mean	66.6
Lower 95% Mean	-49.1
N	2.0