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XrM41 Participating Laboratories

Lab Code	Lab Name	Matrix Code
AFOH01	USAFSAM/OEA	XrM
CMRC01	Carlsbad Environmental Monitoring and Research Center	XrM
DINL99	Departamento Ingeniería Nuclear y Mecánica de Fluidos	XrM
EULC01	EnergySolutions, LLC	XrM
FDHE01	Florida Dept of Health Environmental Laboratory	XrM
FDOH01	Florida Dept. of Health, Mobile Environmental Radiological Lab	XrM
FMEC99	Foods and Water Laboratories Center	XrM
GENE01	GEL Laboratories, LLC	XrM
IAEA99	International Atomic Energy Agency	XrM
IEMA01	Illinois Emergency Management Agency Radiochemistry Laboratory	XrM
LAWR01	LAWRENCE BERKELEY NATIONAL LABORATORY	XrM
NARL02	USEPA - NAREL - MERL	XrM
NOCS99	National Oceanography Centre, Southampton	XrM
NRLL99	Environmental Radioactivity - National Centre for Radiation Science	XrM
ODHL01	Ohio Department of Health Laboratory	XrM
RAVR99	Radiactividad Ambiental y Vigilancia Radiologica	XrM
SANC99	RadioAnalysis, South Africa Nuclear Energy Corp.	XrM
SEML01	SRS Environmental Monitoring Laboratory	XrM
SRPD01	Sandia National Laboratories, Radiation Protection Sample Diagnostics	XrM
WSTP99	Cavendish Nuclear Limited	XrM

Laboratories Not Reporting

Lab Code	Lab Name	Matrix Code
ADFC99	Abu Dhabi Quality and Conformity Council-Central Testing Lab	XrM
ASUK99	AWE (Aldermaston)	XrM
COPS99	Health Canada Radiation Protection Bureau	XrM
CSSL99	Chemistry Support Services	XrM
HPAC99	PHE, CRCE Glasgow	XrM
JAEC99	Research Laboratories and Information Directorate	XrM
JLNN01	Jefferson Laboratory	XrM
LDRA99	Laboratori de Radiologia Ambiental-Universitat de Barcelona	XrM
MART03	Radioactive Material Analysis Laboratory	XrM
NARL01	National Analytical Radiation Environmental Laboratory	XrM
RPSC01	Radiation Protection Service	XrM
SOUT01	Southwest Research Institute	XrM
TELE02	ATI Environmental, Inc., Midwest Lab	XrM

MAPEP Mixed Analyte Performance Evaluation Program

Study Reference Values

MAPEP-19-XrM41

Radiological Reference Date: 08/01/2019

Analyte	Ref Value	Ref Unc
Mass	Units: (ug/sample)	
Uranium-235	0.0276	0.0017
Uranium-238	9.0	0.2
Uranium-Total	9.1	0.2

Analyte	Ref Value	Ref Unc
Radiological	Units: (Bq/sample)	
Americium-241	0.086	0.002
Cesium-134	0.391	0.008
Curium-244	0.0731	0.0011
Plutonium-238	0.067	0.002
Plutonium-239/240	0.087	0.002
Radium-226	0.474	0.010
Ruthenium-106	0.290	0.003
Strontium-90	0.493	0.012
Technetium-99	0.832	0.019
Uranium-234	0.040	0.002
Uranium-238	0.112	0.003

The XrM41 is a sheetrock sample matrix.

MAPEP Mixed Analyte Performance Evaluation Program

Sample Statistical Summary

MAPEP-19-XrM41

Radiological Reference Date: 08/01/2019

Analyte	T(1)	Grand(2) Mean	Std Dev	Ref Value	Ref Unc
Mass				Units: (ug/sample)	
Uranium-235	1			0.0276	0.0017
Uranium-238	1			9.0	0.2
Uranium-Total	1			9.1	0.2

Analyte	T(1)	Grand(2) Mean	Std Dev	Ref Value	Ref Unc
Radiological				Units: (Bq/sample)	
Americium-241	13	0.082	0.011	0.086	0.002
Cesium-134	18	0.376	0.044	0.391	0.008
Curium-244	6			0.0731	0.0011
Plutonium-238	9	0.070	0.008	0.067	0.002
Plutonium-239/240	9	0.090	0.011	0.087	0.002
Radium-226	4			0.474	0.010
Ruthenium-106	2			0.290	0.003
Strontium-90	6			0.493	0.012
Technetium-99	1			0.832	0.019
Uranium-234	9	0.035	0.004	0.040	0.002
Uranium-238	10	0.106	0.015	0.112	0.003

Note: (1) T = Total number of laboratories reporting analyte.
(2) Mean excludes values outside of a bias range of +/- 30%.

The XrM41 is a sheetrock sample matrix.

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41
(AFOH01) USAFSAM/OEA
2510 Fifth Street, Area B
Wright-Patterson AFB, OH 45433-7913

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.0692 +/- 0.0076 Bq/sample	-19.5
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.377 +/- 0.027 Bq/sample	-3.6
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample	0.0651 +/- 0.0073 Bq/sample	-10.9
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample	0.0725 +/- 0.0092 Bq/sample	8.2
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample	0.104 +/- 0.012 Bq/sample	19.5
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample	0.699 +/- 0.069 Bq/sample	47.5
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample	0.0313 +/- 0.0047 Bq/sample	-21.8
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	0.093 +/- 0.010 Bq/sample	-17.0

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41
(CMRC01) Carlsbad Environmental Monitoring and Research Center
1400 University Dr.
Carlsbad, NM 88220

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	7.60E-02 +/- 7.09E-03	-11.6
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	3.86E-01 +/- 3.20E-02	-1.3
MAPEP-19-XrM41	Cs-137		3.68E-01 +/- 4.60E-02	
MAPEP-19-XrM41	Co-57		5.28E-01 +/- 2.60E-02	
MAPEP-19-XrM41	Co-60		3.11E-01 +/- 1.10E-02	
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample	3.57E-02 +/- 3.72E-03	-51.2
MAPEP-19-XrM41	Mn-54		2.78E-01 +/- 3.10E-02	
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample	1.02E-01 +/- 6.43E-03	52.2
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample	1.15E-01 +/- 5.79E-03	32.2
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	Th-228		1.65E-02 +/- 1.10E-02	
MAPEP-19-XrM41	Th-230		3.65E-02 +/- 2.50E-03	
MAPEP-19-XrM41	Th-232		2.11E-02 +/- 3.20E-03	
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample	3.86E-02 +/- 4.01E-03	-3.5
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	1.15E-01 +/- 1.02E-02	2.7
MAPEP-19-XrM41	Zn-65		2.64E-01 +/- 1.10E-02	

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41

(DINL99) Departamento Ingeniería Nuclear y Mecánica de Fluidos
Escuela de Ingeniería de Bilbao
Bilbao, Vizcaya 48013

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.073 +/- .0031 Bq/sample	-15.1
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	.40 +/- .027 Bq/sample	2.3
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample	0.066 +/- 0.0028 Bq/sample	-9.7
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample	0.080 +/- 0.0035 Bq/sample	19.4
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample	0.10 +/- 0.0043 Bq/sample	14.9
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample	0.41 +/- .023 Bq/sample	-16.8
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample	.0398 +/- .0021 Bq/sample	-0.5
MAPEP-19-XrM41	U-235		.0027 +/- .00047 Bq/sample	
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	.12 +/- .0050 Bq/sample	7.1

Radiological Reference Date: August 1, 2019

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

Laboratory Results For MAPEP-19-XrM41
(EULC01) EnergySolutions, LLC
I-80, Exit 49
Clive, UT 84029

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Ac-228		.6142 +/- .38 Bq/sample	
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample		
MAPEP-19-XrM41	Cs-137		.33596 +/- .13 Bq/sample	
MAPEP-19-XrM41	Co-60		1.01 +/- .16 Bq/sample	
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	K-40		7.03 +/- 2.01 Bq/sample	
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41

(FDHE01) Florida Dept of Health Environmental Laboratory
PO Box 680069
Orlando, FL 32868-0069

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.06 +/- 0.18 Bq/sample	-30.2
MAPEP-19-XrM41	Cd-109		0.36 +/- 0.25 Bq/sample	
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.30 +/- 0.01 Bq/sample	-23.3
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample	0.064 +/- 0.005 Bq/sample	-4.5
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample	0.088 +/- 0.006 Bq/sample	1.1
MAPEP-19-XrM41	K-40		-0.26 +/- 0.56 Bq/sample	
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample	0.23 +/- 0.02 Bq/sample	-51.5
MAPEP-19-XrM41	Ra-228		0.11 +/- 0.18 Bq/sample	
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample	0.123 +/- 0.030 Bq/sample	-75.1
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample	0.03567 +/- 0.0046 Bq/sample	-10.8
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	0.1023 +/- 0.0080 Bq/sample	-8.7

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41

(FDOH01) Florida Dept. of Health, Mobile Environmental Radiological Lab
PO Box 680069
Orlando, FL 32868-0069

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.08 +/- 0.01 Bq/sample	-7.0
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.29 +/- 0.01 Bq/sample	-25.8
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample	0.19 +/- 0.04 Bq/sample	-59.9
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample	0.21 +/- 0.07 Bq/sample	-27.6
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	0.09 +/- 0.02 Bq/sample	-19.6

Radiological Reference Date: August 1, 2019

Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-19-XrM41
(FMEC99) Foods and Water Laboratories Center
Ministry of Regional Municpalities and Water Resources
Muscat, seeb 111

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample		
MAPEP-19-XrM41	Cs-137		2.06 +/- 0.17 Bq/sample	
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41
(GENE01) GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.378 +/- 0.0452 Bq/sample	-3.3
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41
(IAEA99) International Atomic Energy Agency
Agency's Laboratories Seibersdorf
Seibersdorf, Austria A-2444

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.121 +/- 0.013 Bq/sample	40.7
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.410 +/- 0.043 Bq/sample	4.9
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41

(IEMA01) Illinois Emergency Management Agency Radiochemistry Laboratory
1301 Knotts St.
Springfield, IL 62703

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.0823 +/- 0.0083 Bq/sample	-4.3
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.387 +/- 0.034 Bq/sample	-1.0
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample	0.0759 +/- 0.0082 Bq/sample	13.3
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample	0.0873 +/- 0.0089 Bq/sample	0.3
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample	0.0403 +/- 0.0051 Bq/sample	0.8
MAPEP-19-XrM41	U-235		0.0013 +/- 0.0011 Bq/sample	
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	0.1070 +/- 0.0092 Bq/sample	-4.5

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41
(LAWR01) LAWRENCE BERKELEY NATIONAL LABORATORY
1 CYCLOTRON RD.
BERKELEY, CA 94720

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	.5239 +/- .09981 Bq/sample	34.0
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41
(NARL02) USEPA - NAREL - MERL
540 S Morris Ave
Montgomery, AL 36115

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	65.5 +/- 6.50 Bq/sample	16651.9
MAPEP-19-XrM41	Cs-137		-2.17 +/- 7.10 Bq/sample	
MAPEP-19-XrM41	Co-57		-2.11 +/- 3.70 Bq/sample	
MAPEP-19-XrM41	Co-60		-3.48 +/- 6.20 Bq/sample	
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Mn-54		0.921 +/- 5.20 Bq/sample	
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	K-40		156 +/- 49.0 Bq/sample	
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-19-XrM41
(NOCS99) National Oceanography Centre, Southampton
GAU-Radioanalytical
Southampton, Hampshire SO14 3ZH

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.083 +/- 0.006 Bq/sample	-3.5
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.36 +/- 0.01 Bq/sample	-7.9
MAPEP-19-XrM41	Cs-137		0.02 +/- 0.1 Bq/sample	
MAPEP-19-XrM41	Co-60		0.04 +/- 0.2 Bq/sample	
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample	0.049 +/- 0.004 Bq/sample	-33.0
MAPEP-19-XrM41	Fe-55		1.14 +/- 0.10 Bq/sample	
MAPEP-19-XrM41	Ni-63		0.03 +/- 0.03 Bq/sample	
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample	0.057 +/- 0.003 Bq/sample	-14.9
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample	0.077 +/- 0.004 Bq/sample	-11.5
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample	0.32 +/- 0.04 Bq/sample	-35.1
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample	0.029 +/- 0.002 Bq/sample	-27.5
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	0.090 +/- 0.005 Bq/sample	-19.6

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41

(NRLL99) Environmental Radioactivity - National Centre for Radiation Science
PO Box 29181
Christchurch, Christchurch 8540

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.0886 +/- 0.0069 Bq/sample	3.0
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.386 +/- 0.025 Bq/sample	-1.3
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample	0.276 +/- 0.039 Bq/sample	-4.8
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41

(ODHL01) Ohio Department of Health Laboratory
8995 E Main Street
Reynoldsburg, OH 43068

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.366 +/- 0.0187 Bq/sample	-6.4
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

Mixed Analyte Performance Evaluation Program
Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP-19-XrM41
(RAVR99) Radiactividad Ambiental y Vigilancia Radiologica
CIEMAT (Ed 70 P2 D11)
Madrid, Madrid 28040

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.0391 +/- 0.0020 Bq/sample	-54.5
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	68 +/- 11 Bq/sample	17291.3
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample	0.0327 +/- 0.0018 Bq/sample	-55.3
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample	0.0311 +/- 0.0022 Bq/sample	-53.6
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample	0.0501 +/- 0.0029 Bq/sample	-42.4
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample	0.16 +/- 0.01 Bq/sample	-67.5
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample	0.080 +/- 0.016 Bq/sample	100.0
MAPEP-19-XrM41	U-235		0.0056 +/- 0.0039 Bq/sample	
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	0.136 +/- 0.018 Bq/sample	21.4

Radiological Reference Date: August 1, 2019

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

Laboratory Results For MAPEP-19-XrM41
(SANC99) RadioAnalysis, South Africa Nuclear Energy Corp.
Sample Receipt Gate 1
Pretoria, Gauteng 0001

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.0838 +/- 0.0094 Bq/sample	-2.6
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.377 +/- 0.016 Bq/sample	-3.6
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	K-40		0.091 +/- 0.043 Bq/sample	
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample	0.514 +/- 0.083 Bq/sample	8.4
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	Th-228		0.0194 +/- 0.0028 Bq/sample	
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41
(SEML01) SRS Environmental Monitoring Laboratory
Bldg 735-B
Aiken, SC 29808

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.0759 +/- 0.0070 Bq/sample	-11.7
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.358 +/- 0.065 Bq/sample	-8.4
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample	0.0665 +/- 0.0062 Bq/sample	-9.0
MAPEP-19-XrM41	Np-237		0.0019 +/- 0.0009 Bq/sample	
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample	0.0684 +/- 0.0089 Bq/sample	2.1
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample	0.081 +/- 0.011 Bq/sample	-6.9
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample	0.524 +/- 0.067 Bq/sample	6.3
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample	0.0319 +/- 0.0035 Bq/sample	-20.3
MAPEP-19-XrM41	U-235		0.0020 +/- 0.0028 Bq/sample	
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	0.1023 +/- 0.0085 Bq/sample	-8.7

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41

(SRPD01) Sandia National Laboratories, Radiation Protection Sample Diagnostics
PO Box 5800, MS1103
Albuquerque, NM 87185-1103

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample		
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample		
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample		

Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.389 +/- 0.0670 Bq/sample	-0.5
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample		
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample		
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample		
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample		

Radiological Reference Date: August 1, 2019

MAPEP Mixed Analyte Performance Evaluation Program

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

Laboratory Results For MAPEP-19-XrM41
(WSTP99) Cavendish Nuclear Limited
Greeson Court
Cumbria, UK CA24 3HZ

Mass

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	U-235	0.0276 +/- 0.0017 ug/sample	0.028 +/- 0.001 ug/sample	1.4
MAPEP-19-XrM41	U-238	9.0 +/- 0.2 ug/sample	8.13 +/- 0.26 ug/sample	-9.7
MAPEP-19-XrM41	U-Total	9.1 +/- 0.2 ug/sample	8.32 +/- 0.27 ug/sample	-8.6

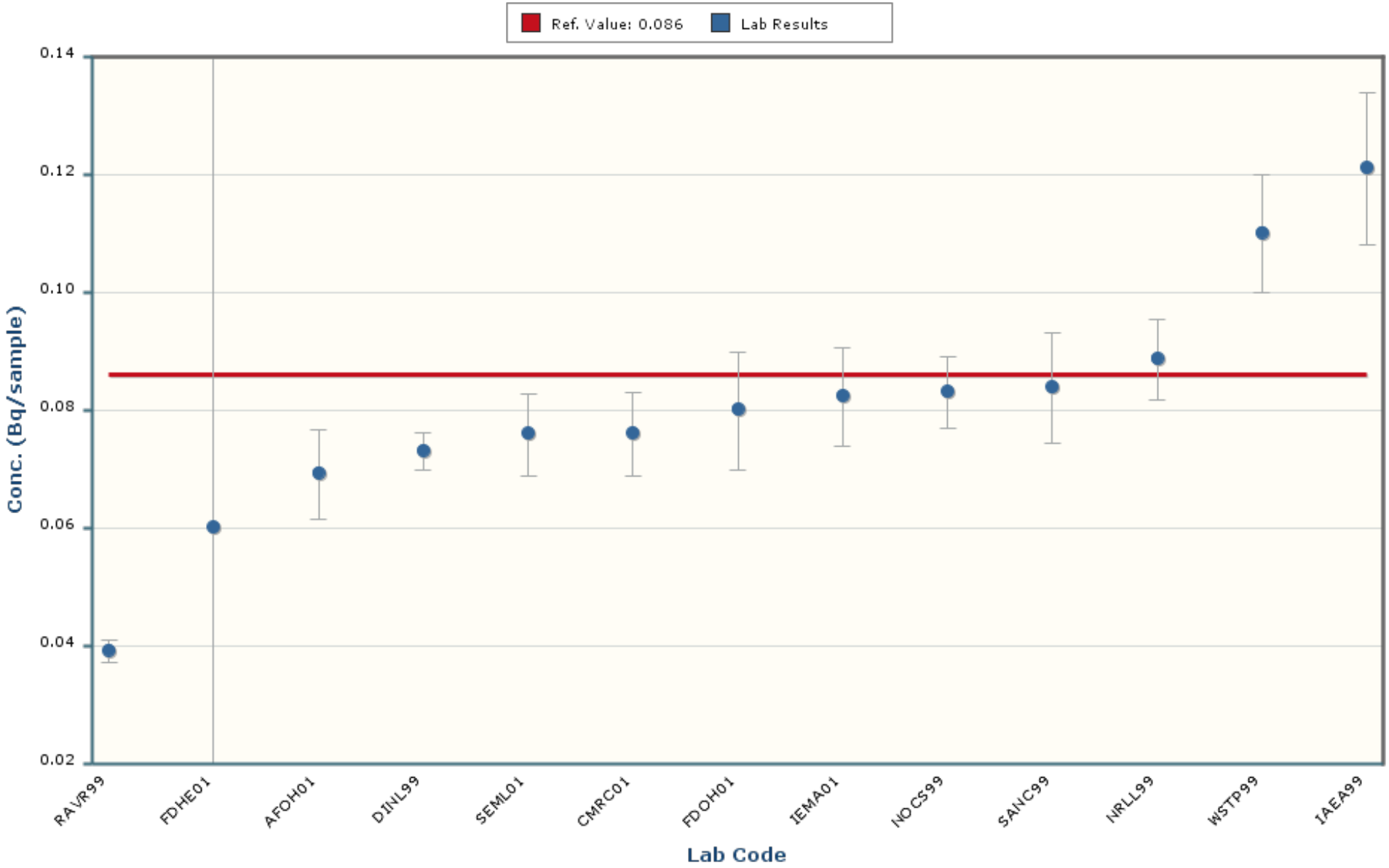
Radiological

Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-19-XrM41	Am-241	0.086 +/- 0.002 Bq/sample	0.11 +/- 0.01 Bq/sample	27.9
MAPEP-19-XrM41	Cs-134	0.391 +/- 0.008 Bq/sample	0.48 +/- 0.08 Bq/sample	22.8
MAPEP-19-XrM41	Cm-244	0.0731 +/- 0.0011 Bq/sample		
MAPEP-19-XrM41	Pu-238	0.067 +/- 0.002 Bq/sample	0.02 +/- 0.04 Bq/sample	-70.1
MAPEP-19-XrM41	Pu-239	0.087 +/- 0.002 Bq/sample	0.02 +/- 0.004 Bq/sample	-77.0
MAPEP-19-XrM41	Ra-226	0.474 +/- 0.010 Bq/sample		
MAPEP-19-XrM41	Ru-106	0.290 +/- 0.003 Bq/sample		
MAPEP-19-XrM41	Sr-90	0.493 +/- 0.012 Bq/sample	0.18 +/- 0.03 Bq/sample	-63.5
MAPEP-19-XrM41	Tc-99	0.832 +/- 0.019 Bq/sample	0.57 +/- 0.09 Bq/sample	-31.5
MAPEP-19-XrM41	U-234	0.040 +/- 0.002 Bq/sample	0.033 +/- 0.002 Bq/sample	-17.5
MAPEP-19-XrM41	U-238	0.112 +/- 0.003 Bq/sample	0.101 +/- 0.004 Bq/sample	-9.8

Radiological Reference Date: August 1, 2019

Americium-241

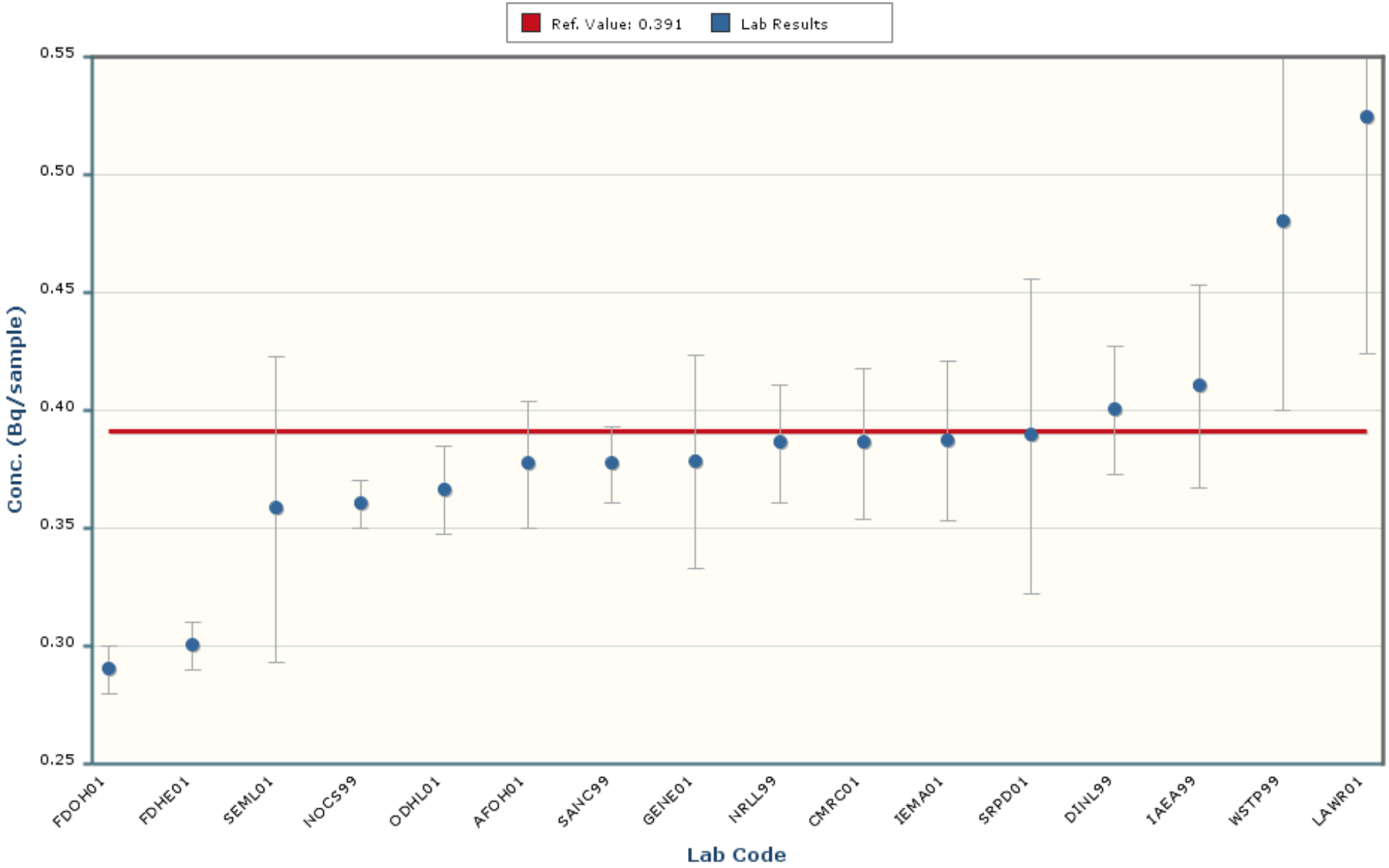
MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± one standard deviation.

Cesium-134

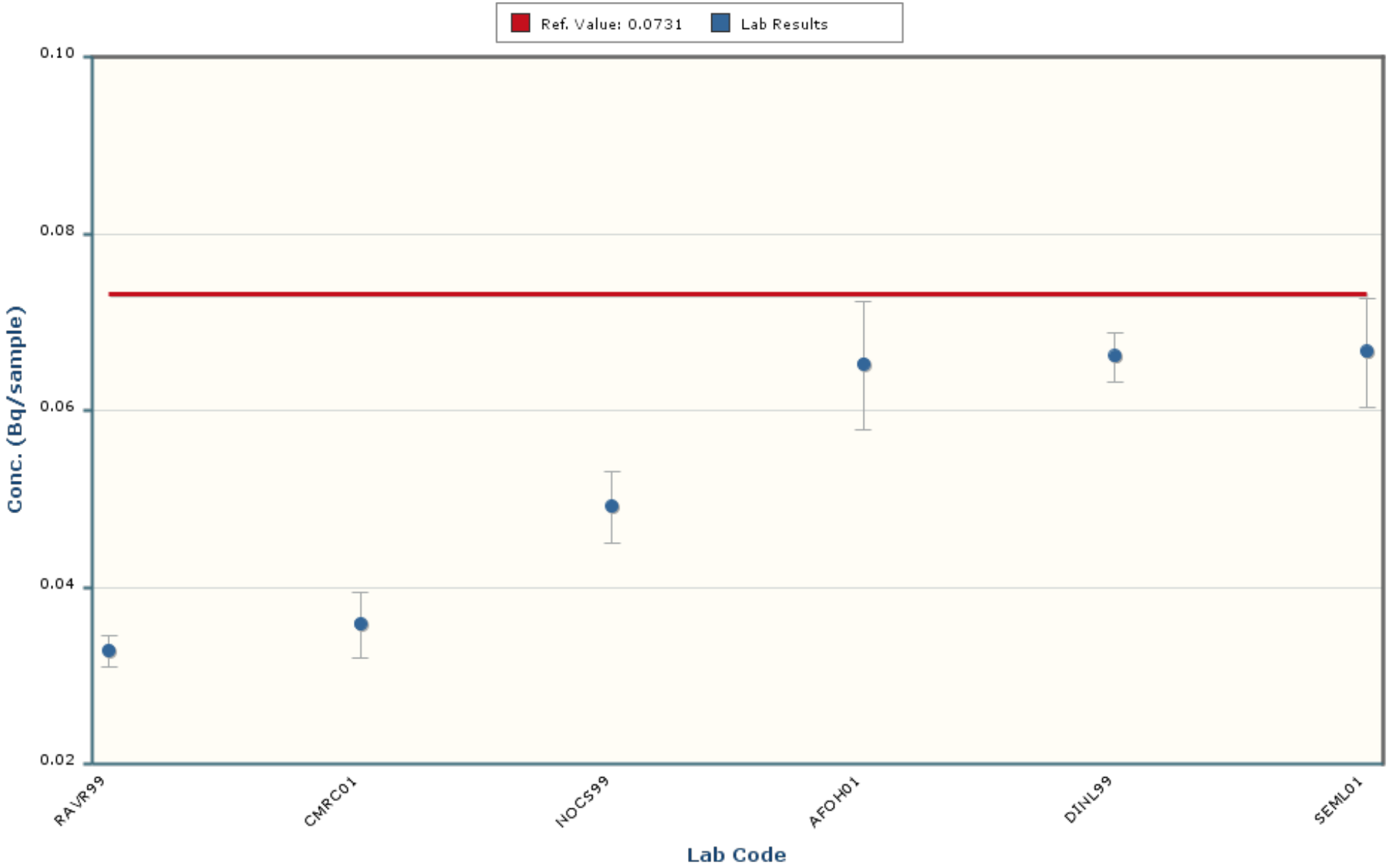
MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± one standard deviation.

Curium-244

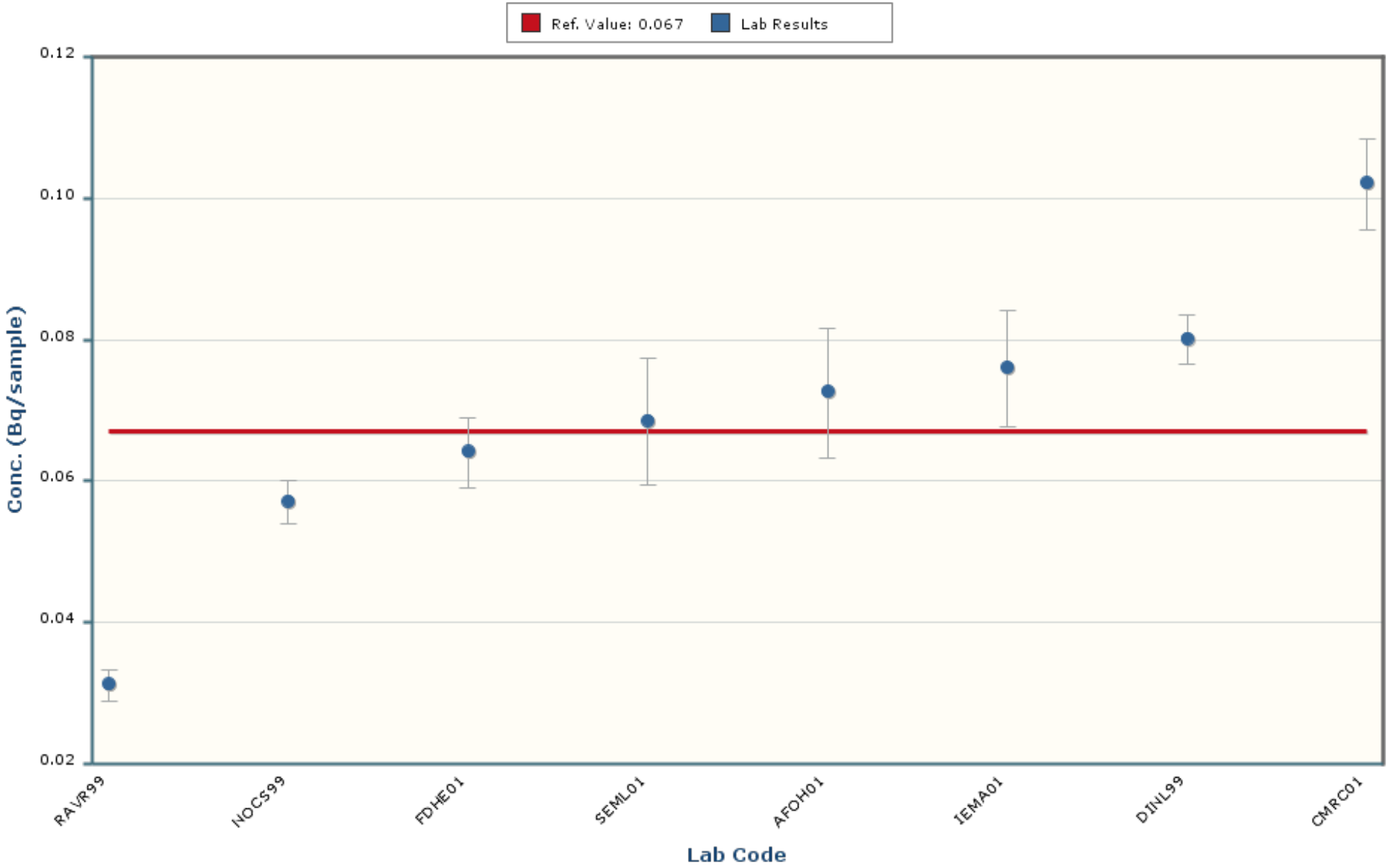
MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± one standard deviation.

Plutonium-238

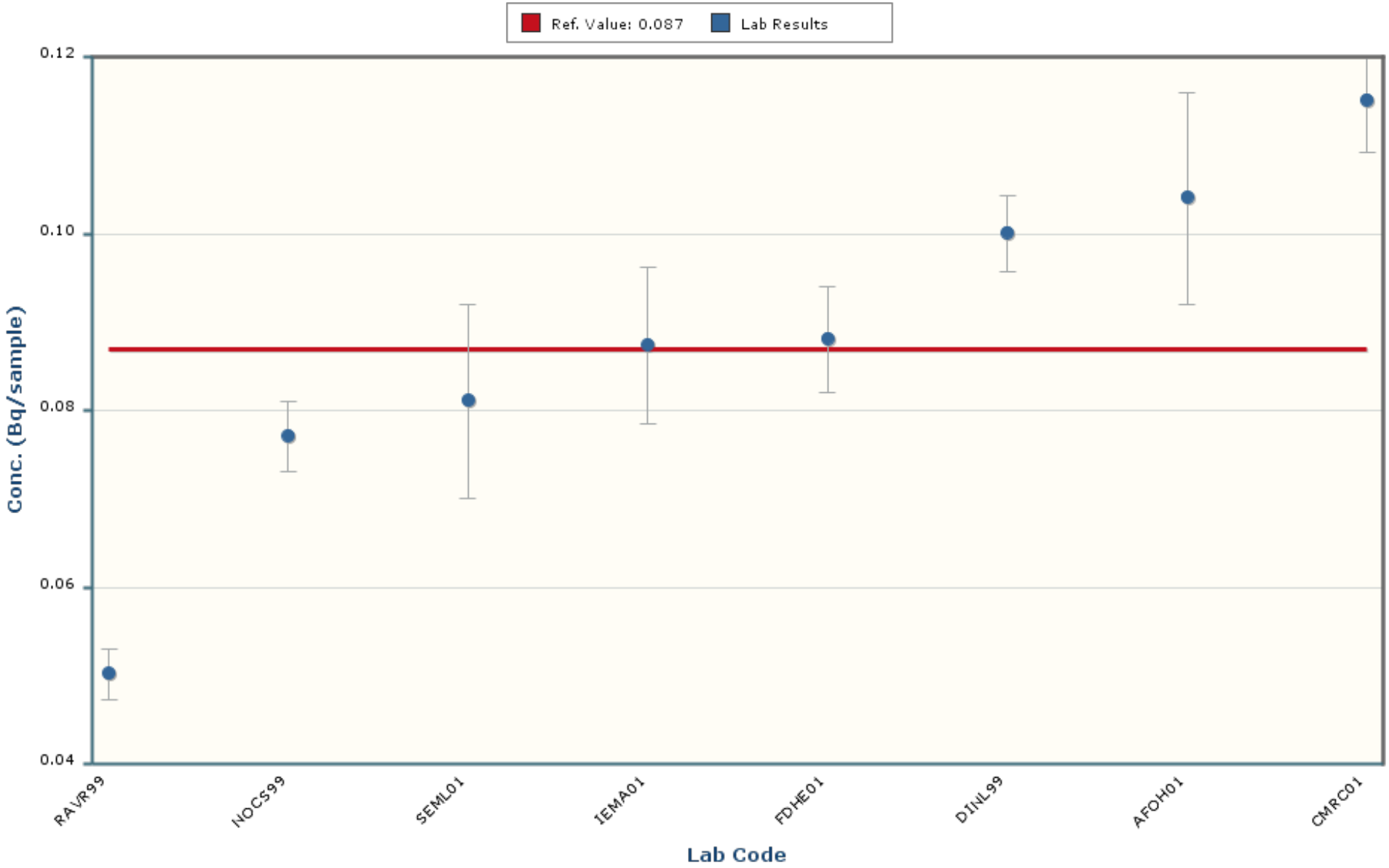
MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± one standard deviation.

Plutonium-239/240

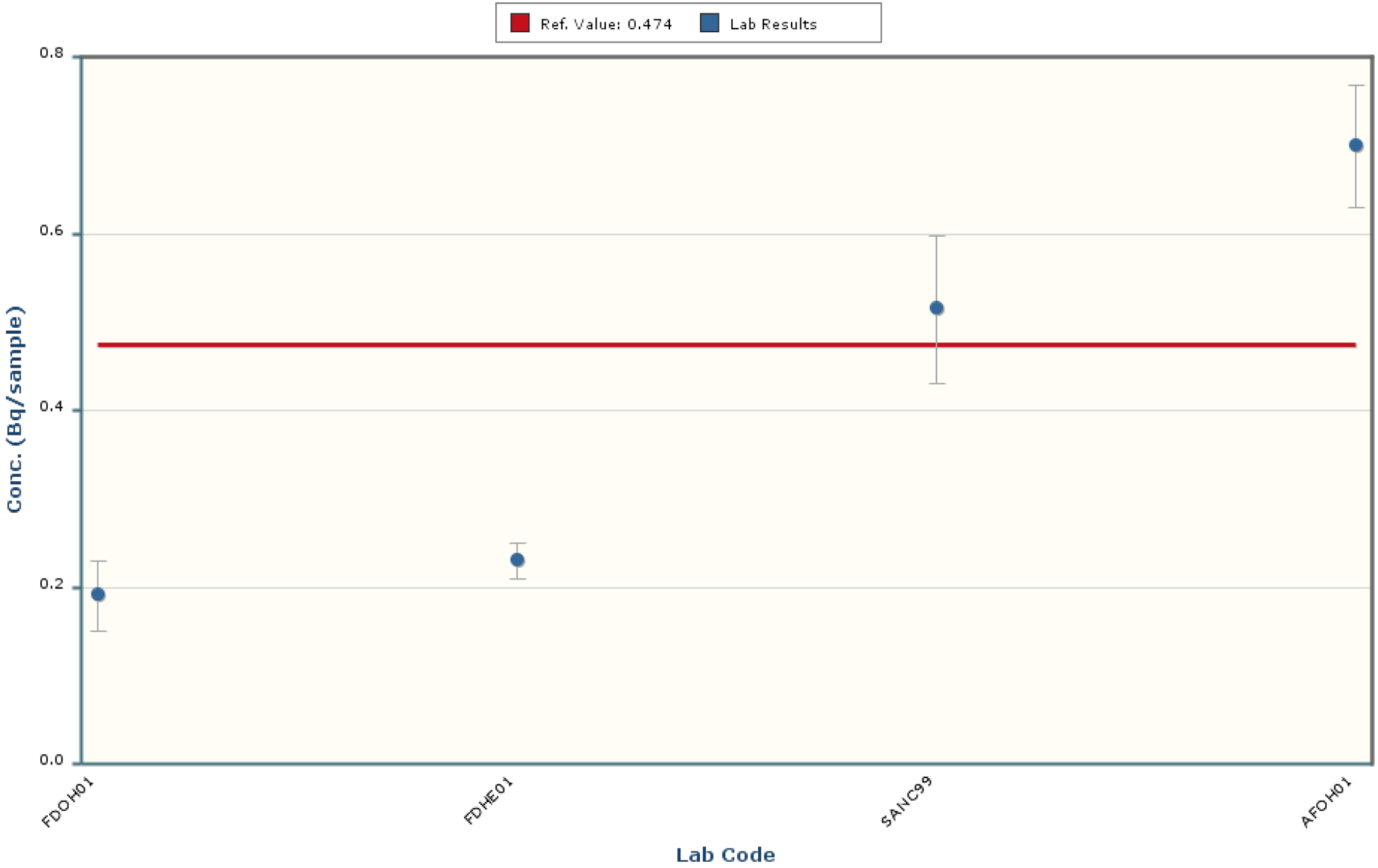
MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± one standard deviation.

Radium-226

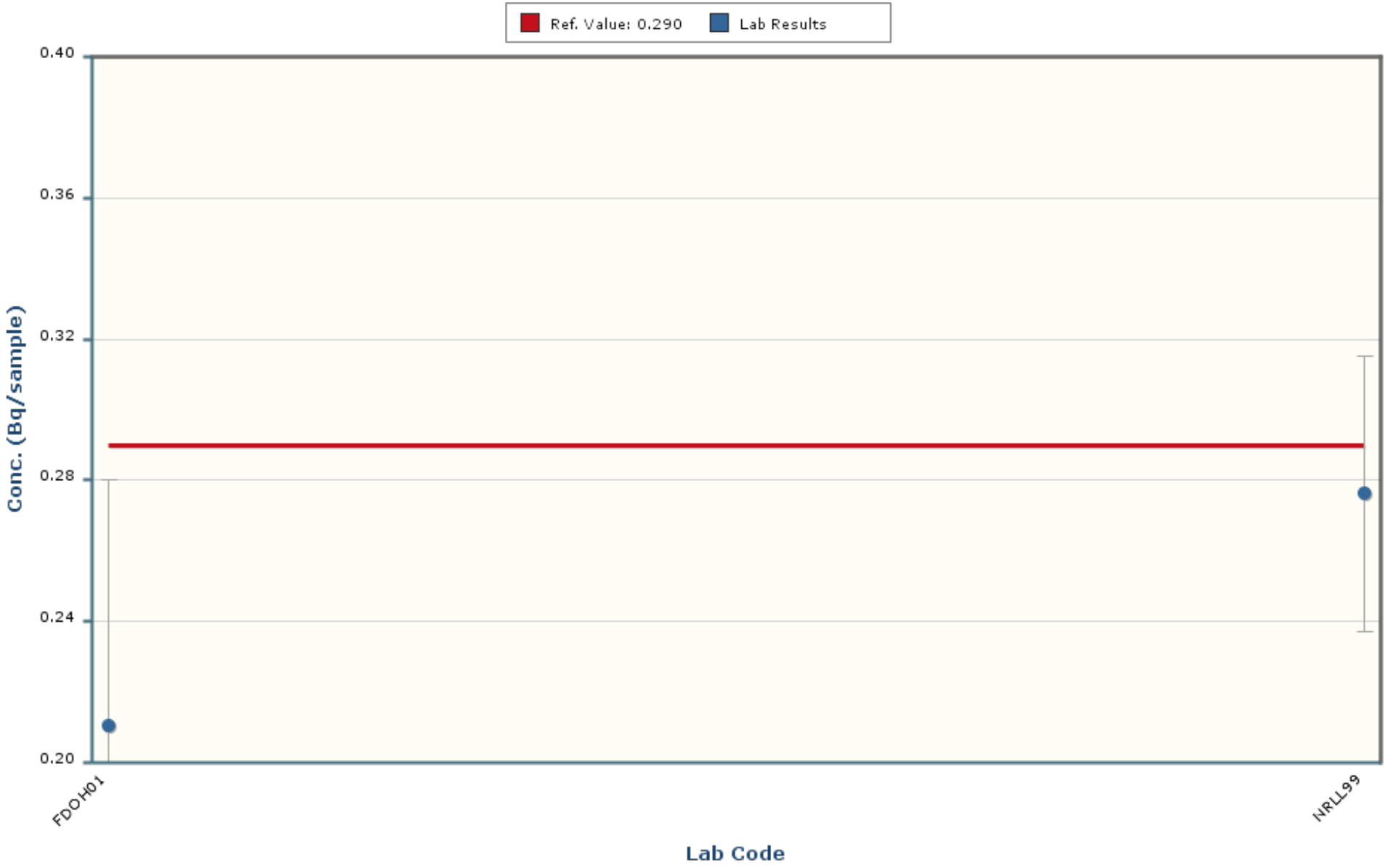
MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± one standard deviation.

Ruthenium-106

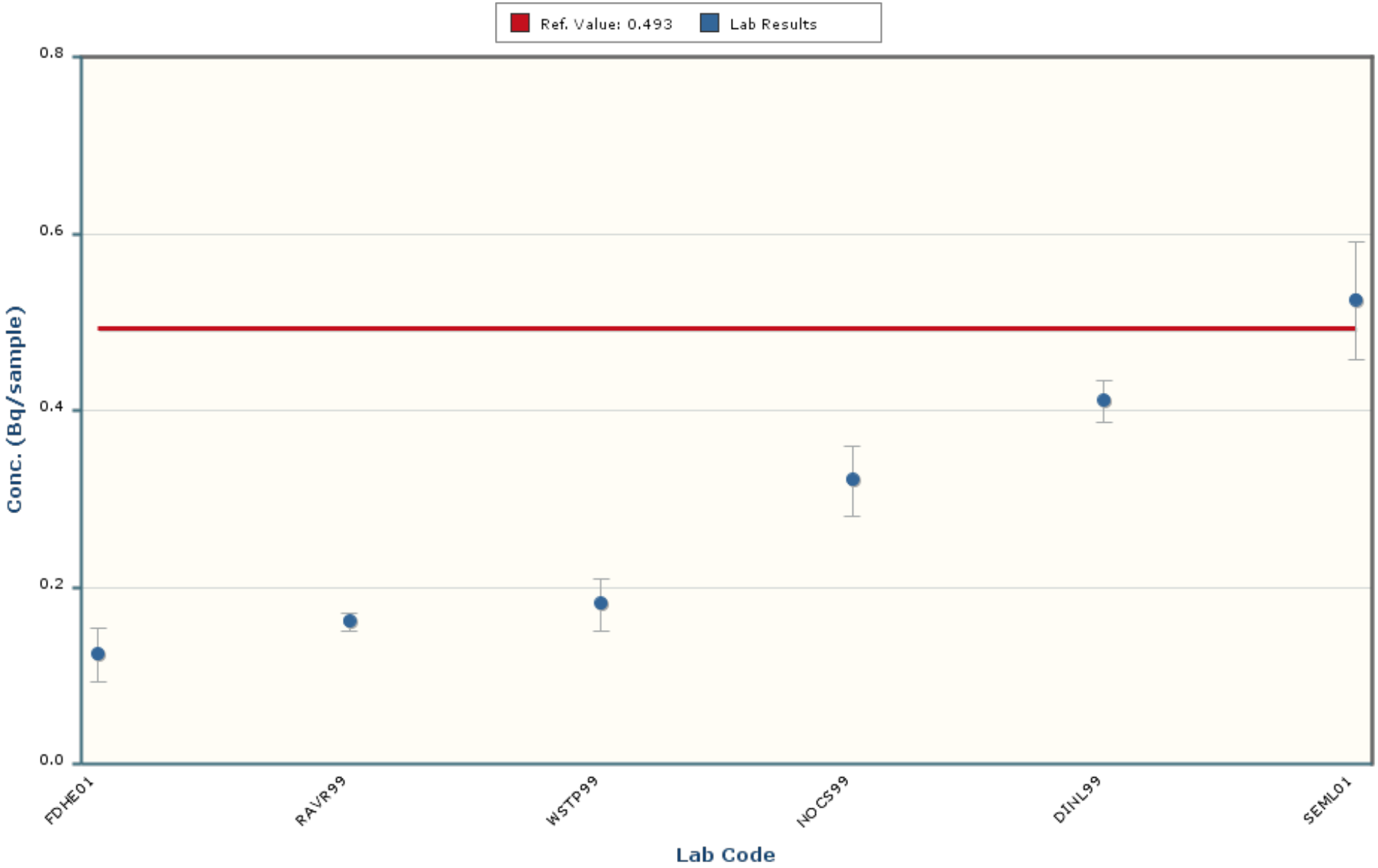
MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± one standard deviation.

Strontium-90

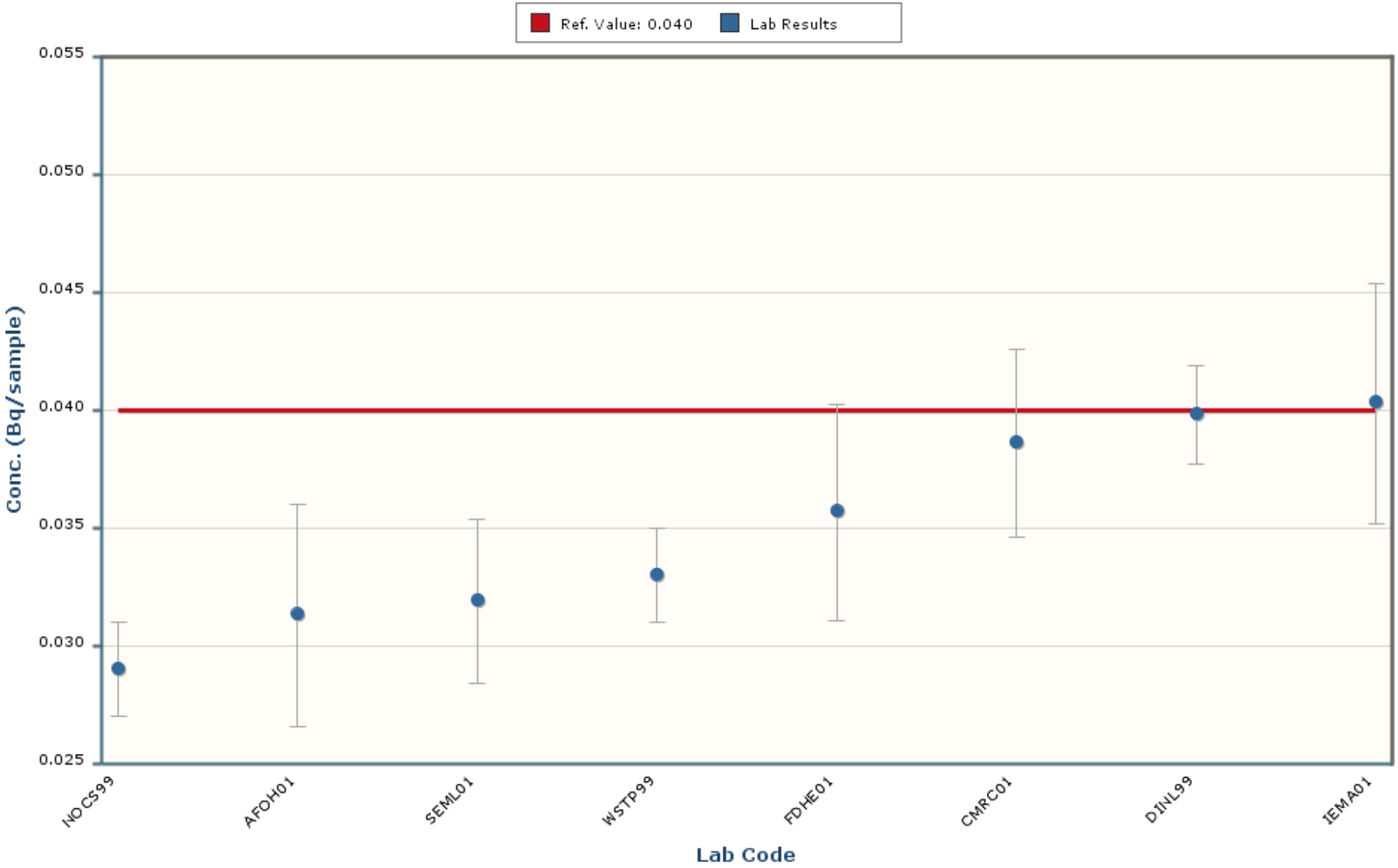
MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± one standard deviation.

Uranium-234

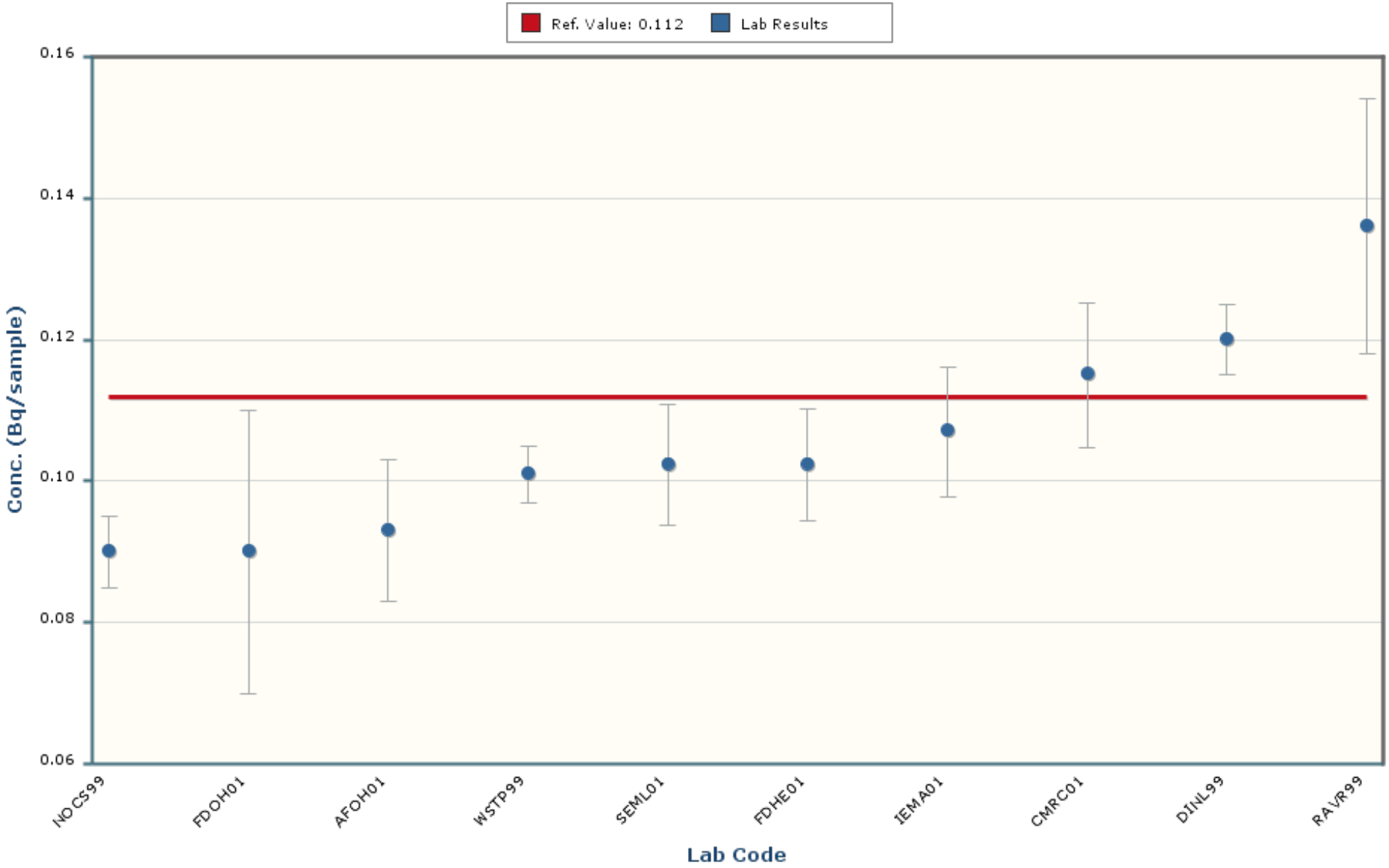
MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± one standard deviation.

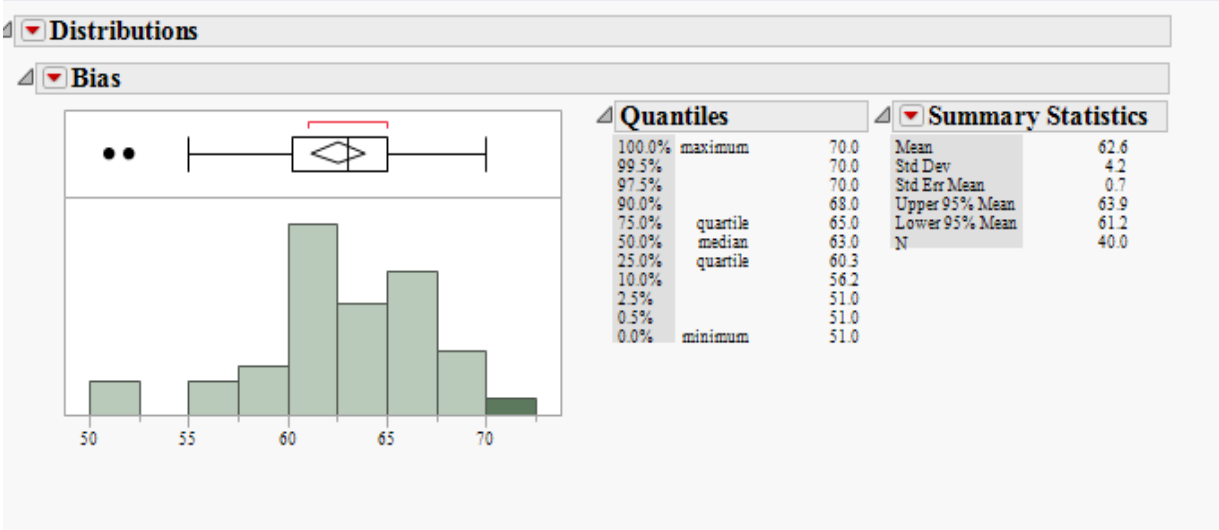
Uranium-238

MAPEP-19-XrM41



Notes:
The error bars encompassing each result are plotted at ± 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.

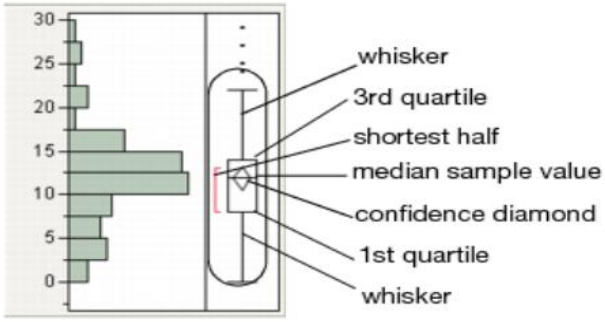


Outlier Box Plot

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)



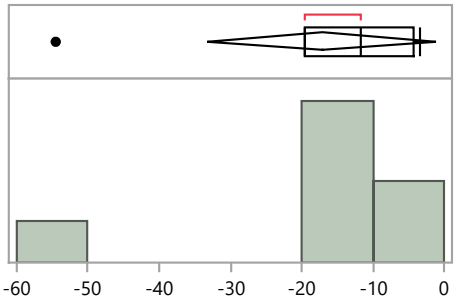
If the data points do not reach the computed ranges, then the whiskers are determined by the upper and lower data point values (not including outliers). The bracket outside of the box identifies the *shortest half*, which is the most dense 50% of the observations (Rousseuw and Leroy 1987).

Ref. "SAS Institute Inc. 2016. JMP® 13 Basic Analysis. Cary, NC: SAS Institute Inc."

XrM Distribution by Detection Method

Distributions Analyte_Detection=Americium-241 Alpha Spectrometry

Bias

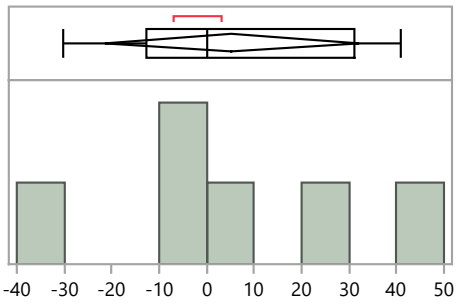


Quantiles		
100.0%	maximum	-3.5
99.5%		-3.5
97.5%		-3.5
90.0%		-3.5
75.0%	quartile	-4.3
50.0%	median	-11.7
25.0%	quartile	-19.5
10.0%		-54.5
2.5%		-54.5
0.5%		-54.5
0.0%	minimum	-54.5

Summary Statistics	
Mean	-17.2
Std Dev	17.4
Std Err Mean	6.6
Upper 95% Mean	-1.1
Lower 95% Mean	-33.3
N	7.0

Distributions Analyte_Detection=Americium-241 Gamma Spectrometry

Bias

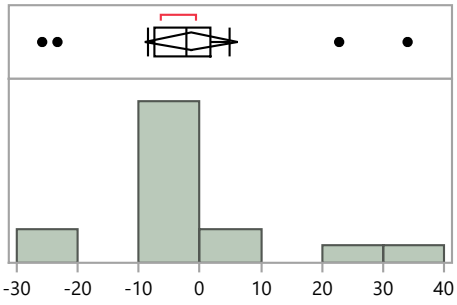


Quantiles		
100.0%	maximum	40.7
99.5%		40.7
97.5%		40.7
90.0%		40.7
75.0%	quartile	31.1
50.0%	median	0.2
25.0%	quartile	-12.8
10.0%		-30.2
2.5%		-30.2
0.5%		-30.2
0.0%	minimum	-30.2

Summary Statistics	
Mean	5.3
Std Dev	25.5
Std Err Mean	10.4
Upper 95% Mean	32.0
Lower 95% Mean	-21.4
N	6.0

Distributions Analyte_Detection=Cesium-134 Gamma Spectrometry

Bias



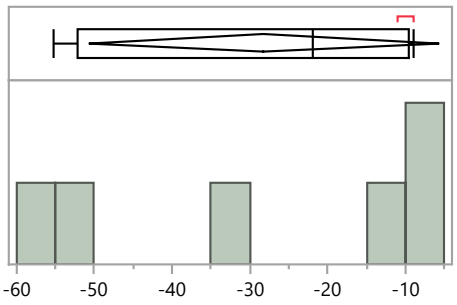
Quantiles		
100.0%	maximum	34.0
99.5%		34.0
97.5%		34.0
90.0%		26.2
75.0%	quartile	1.6
50.0%	median	-2.3
25.0%	quartile	-7.5
10.0%		-24.1
2.5%		-25.8
0.5%		-25.8
0.0%	minimum	-25.8

Summary Statistics	
Mean	-1.4
Std Dev	14.4
Std Err Mean	3.6
Upper 95% Mean	6.3
Lower 95% Mean	-9.1
N	16.0

XrM Distribution by Detection Method

Distributions Analyte_Detection=Curium-244 Alpha Spectrometry

Bias

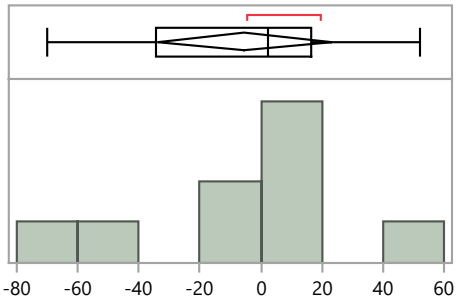


Quantiles		
100.0%	maximum	-9.0
99.5%		-9.0
97.5%		-9.0
90.0%		-9.0
75.0%	quartile	-9.5
50.0%	median	-22.0
25.0%	quartile	-52.2
10.0%		-55.3
2.5%		-55.3
0.5%		-55.3
0.0%	minimum	-55.3

Summary Statistics	
Mean	-28.2
Std Dev	21.4
Std Err Mean	8.7
Upper 95% Mean	-5.7
Lower 95% Mean	-50.7
N	6.0

Distributions Analyte_Detection=Plutonium-238 Alpha Spectrometry

Bias

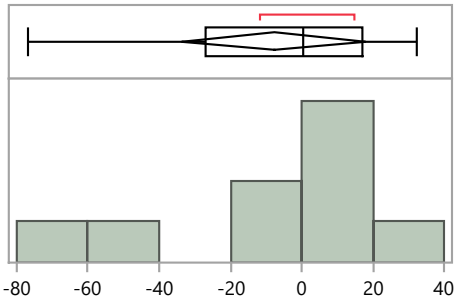


Quantiles		
100.0%	maximum	52.2
99.5%		52.2
97.5%		52.2
90.0%		52.2
75.0%	quartile	16.4
50.0%	median	2.1
25.0%	quartile	-34.3
10.0%		-70.1
2.5%		-70.1
0.5%		-70.1
0.0%	minimum	-70.1

Summary Statistics	
Mean	-5.3
Std Dev	37.3
Std Err Mean	12.4
Upper 95% Mean	23.3
Lower 95% Mean	-34.0
N	9.0

Distributions Analyte_Detection=Plutonium-239/240 Alpha Spectrometry

Bias



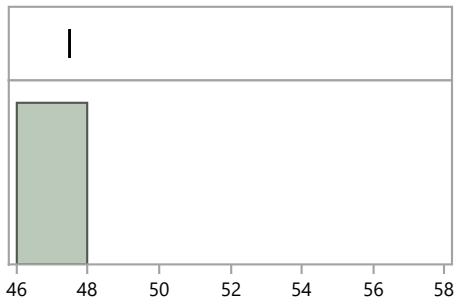
Quantiles		
100.0%	maximum	32.2
99.5%		32.2
97.5%		32.2
90.0%		32.2
75.0%	quartile	17.2
50.0%	median	0.3
25.0%	quartile	-27.0
10.0%		-77.0
2.5%		-77.0
0.5%		-77.0
0.0%	minimum	-77.0

Summary Statistics	
Mean	-7.8
Std Dev	33.6
Std Err Mean	11.2
Upper 95% Mean	18.0
Lower 95% Mean	-33.5
N	9.0

XrM Distribution by Detection Method

Distributions Analyte_Detection=Radium-226 Alpha Spectrometry

Bias

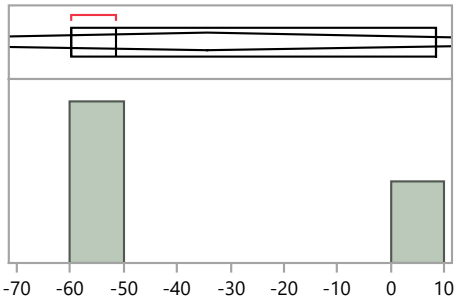


Quantiles		
100.0%	maximum	47.5
99.5%		47.5
97.5%		47.5
90.0%		47.5
75.0%	quartile	47.5
50.0%	median	47.5
25.0%	quartile	47.5
10.0%		47.5
2.5%		47.5
0.5%		47.5
0.0%	minimum	47.5

Summary Statistics	
Mean	47.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Detection=Radium-226 Gamma Spectrometry

Bias

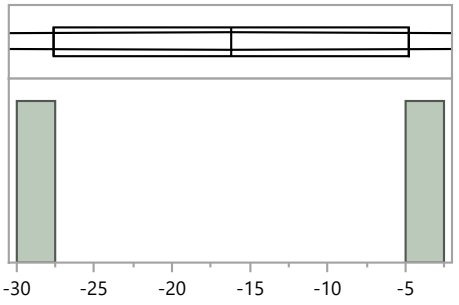


Quantiles		
100.0%	maximum	8.4
99.5%		8.4
97.5%		8.4
90.0%		8.4
75.0%	quartile	8.4
50.0%	median	-51.5
25.0%	quartile	-59.9
10.0%		-59.9
2.5%		-59.9
0.5%		-59.9
0.0%	minimum	-59.9

Summary Statistics	
Mean	-34.3
Std Dev	37.2
Std Err Mean	21.5
Upper 95% Mean	58.2
Lower 95% Mean	-126.9
N	3.0

Distributions Analyte_Detection=Ruthenium-106 Gamma Spectrometry

Bias



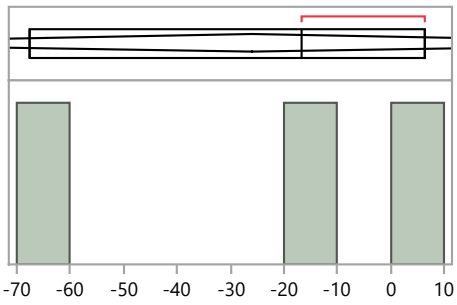
Quantiles		
100.0%	maximum	-4.8
99.5%		-4.8
97.5%		-4.8
90.0%		-4.8
75.0%	quartile	-4.8
50.0%	median	-16.2
25.0%	quartile	-27.6
10.0%		-27.6
2.5%		-27.6
0.5%		-27.6
0.0%	minimum	-27.6

Summary Statistics	
Mean	-16.2
Std Dev	16.1
Std Err Mean	11.4
Upper 95% Mean	128.7
Lower 95% Mean	-161.1
N	2.0

XrM Distribution by Detection Method

Distributions Analyte_Detection=Strontium-90 Beta Counting - 2 pi gas flow proportional counter

Bias

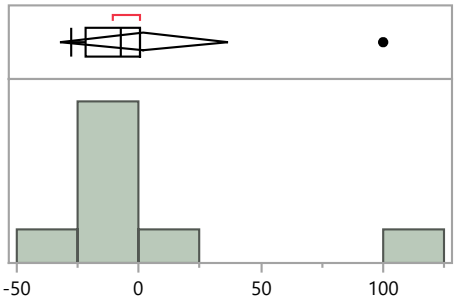


Quantiles		
100.0%	maximum	6.3
99.5%		6.3
97.5%		6.3
90.0%		6.3
75.0%	quartile	6.3
50.0%	median	-16.8
25.0%	quartile	-67.5
10.0%		-67.5
2.5%		-67.5
0.5%		-67.5
0.0%	minimum	-67.5

Summary Statistics	
Mean	-26.0
Std Dev	37.8
Std Err Mean	21.8
Upper 95% Mean	67.8
Lower 95% Mean	-119.8
N	3.0

Distributions Analyte_Detection=Uranium-234 Alpha Spectrometry

Bias

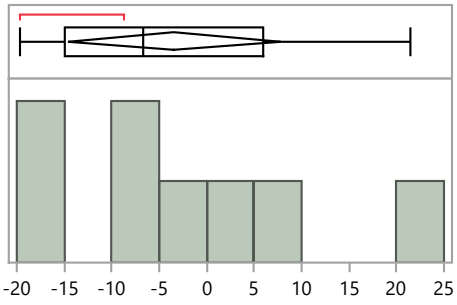


Quantiles		
100.0%	maximum	100.0
99.5%		100.0
97.5%		100.0
90.0%		100.0
75.0%	quartile	0.5
50.0%	median	-7.2
25.0%	quartile	-21.4
10.0%		-27.5
2.5%		-27.5
0.5%		-27.5
0.0%	minimum	-27.5

Summary Statistics	
Mean	2.0
Std Dev	41.0
Std Err Mean	14.5
Upper 95% Mean	36.3
Lower 95% Mean	-32.2
N	8.0

Distributions Analyte_Detection=Uranium-238 Alpha Spectrometry

Bias



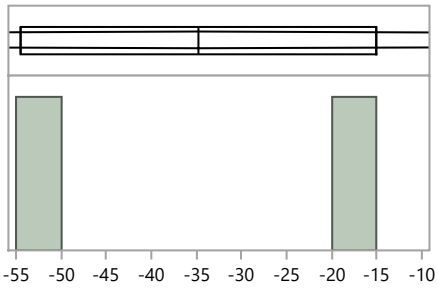
Quantiles		
100.0%	maximum	21.4
99.5%		21.4
97.5%		21.4
90.0%		21.4
75.0%	quartile	6.0
50.0%	median	-6.6
25.0%	quartile	-14.9
10.0%		-19.6
2.5%		-19.6
0.5%		-19.6
0.0%	minimum	-19.6

Summary Statistics	
Mean	-3.4
Std Dev	13.5
Std Err Mean	4.8
Upper 95% Mean	7.8
Lower 95% Mean	-14.7
N	8.0

XrM Distribution by Prep Method

Distributions Analyte_Method=Americium-241 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias

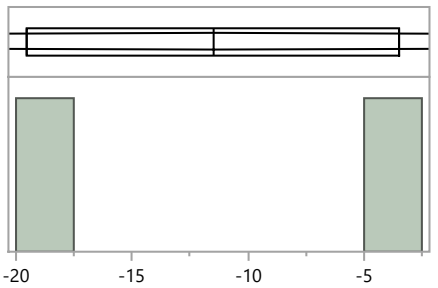


Quantiles		
100.0%	maximum	-15.1
99.5%		-15.1
97.5%		-15.1
90.0%		-15.1
75.0%	quartile	-15.1
50.0%	median	-34.8
25.0%	quartile	-54.5
10.0%		-54.5
2.5%		-54.5
0.5%		-54.5
0.0%	minimum	-54.5

Summary Statistics	
Mean	-34.8
Std Dev	27.9
Std Err Mean	19.7
Upper 95% Mean	215.5
Lower 95% Mean	-285.1
N	2.0

Distributions Analyte_Method=Americium-241 Acid leaching without hydrofluoric acid

Bias

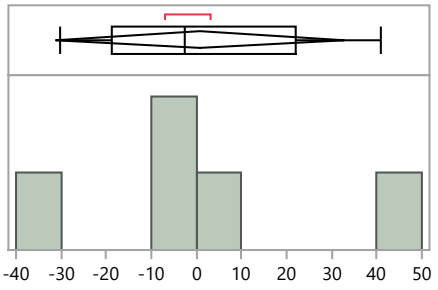


Quantiles		
100.0%	maximum	-3.5
99.5%		-3.5
97.5%		-3.5
90.0%		-3.5
75.0%	quartile	-3.5
50.0%	median	-11.5
25.0%	quartile	-19.5
10.0%		-19.5
2.5%		-19.5
0.5%		-19.5
0.0%	minimum	-19.5

Summary Statistics	
Mean	-11.5
Std Dev	11.3
Std Err Mean	8.0
Upper 95% Mean	90.1
Lower 95% Mean	-113.1
N	2.0

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

Bias

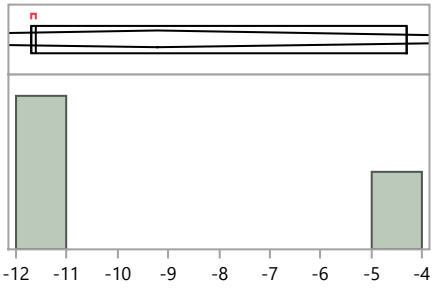


Quantiles		
100.0%	maximum	40.7
99.5%		40.7
97.5%		40.7
90.0%		40.7
75.0%	quartile	21.9
50.0%	median	-2.6
25.0%	quartile	-18.6
10.0%		-30.2
2.5%		-30.2
0.5%		-30.2
0.0%	minimum	-30.2

Summary Statistics	
Mean	0.8
Std Dev	25.6
Std Err Mean	11.5
Upper 95% Mean	32.6
Lower 95% Mean	-31.1
N	5.0

Distributions Analyte_Method=Americium-241 Total dissolution by fusion

Bias



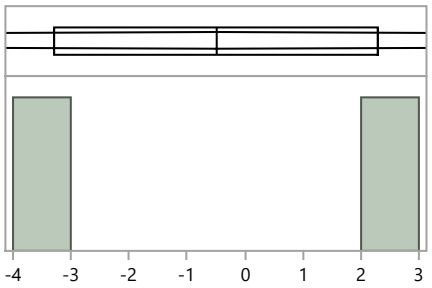
Quantiles		
100.0%	maximum	-4.3
99.5%		-4.3
97.5%		-4.3
90.0%		-4.3
75.0%	quartile	-4.3
50.0%	median	-11.6
25.0%	quartile	-11.7
10.0%		-11.7
2.5%		-11.7
0.5%		-11.7
0.0%	minimum	-11.7

Summary Statistics	
Mean	-9.2
Std Dev	4.2
Std Err Mean	2.5
Upper 95% Mean	1.3
Lower 95% Mean	-19.7
N	3.0

XrM Distribution by Prep Method

Distributions Analyte_Method=Cesium-134 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias

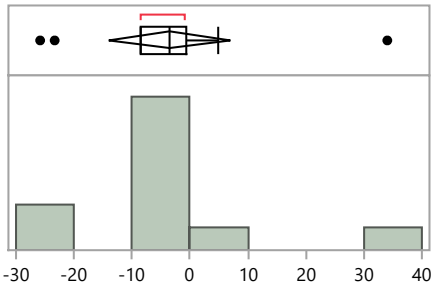


Quantiles		
100.0%	maximum	2.3
99.5%		2.3
97.5%		2.3
90.0%		2.3
75.0%	quartile	2.3
50.0%	median	-0.5
25.0%	quartile	-3.3
10.0%		-3.3
2.5%		-3.3
0.5%		-3.3
0.0%	minimum	-3.3

Summary Statistics	
Mean	-0.5
Std Dev	4.0
Std Err Mean	2.8
Upper 95% Mean	35.1
Lower 95% Mean	-36.1
N	2.0

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

Bias

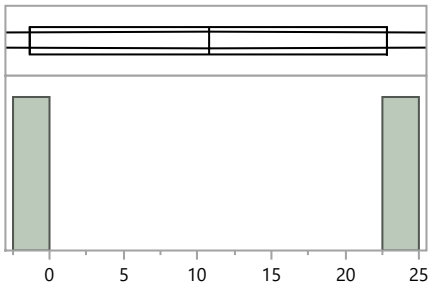


Quantiles		
100.0%	maximum	34.0
99.5%		34.0
97.5%		34.0
90.0%		28.2
75.0%	quartile	-0.5
50.0%	median	-3.6
25.0%	quartile	-8.4
10.0%		-25.3
2.5%		-25.8
0.5%		-25.8
0.0%	minimum	-25.8

Summary Statistics	
Mean	-3.6
Std Dev	15.6
Std Err Mean	4.7
Upper 95% Mean	6.9
Lower 95% Mean	-14.1
N	11.0

Distributions Analyte_Method=Cesium-134 Other

Bias

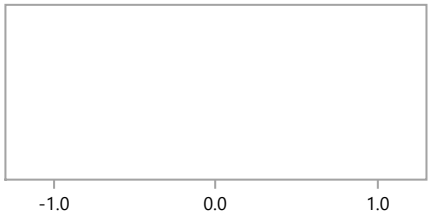


Quantiles		
100.0%	maximum	22.8
99.5%		22.8
97.5%		22.8
90.0%		22.8
75.0%	quartile	22.8
50.0%	median	10.8
25.0%	quartile	-1.3
10.0%		-1.3
2.5%		-1.3
0.5%		-1.3
0.0%	minimum	-1.3

Summary Statistics	
Mean	10.8
Std Dev	17.0
Std Err Mean	12.1
Upper 95% Mean	163.9
Lower 95% Mean	-142.4
N	2.0

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

Bias



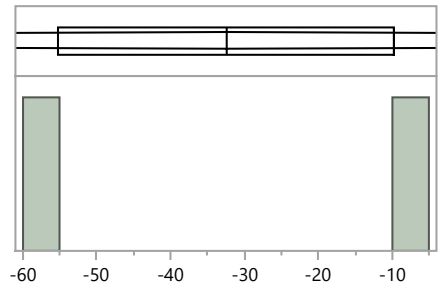
Quantiles

Summary Statistics	
Mean	.
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	0.0

XrM Distribution by Prep Method

Distributions Analyte_Method=Curium-244 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias

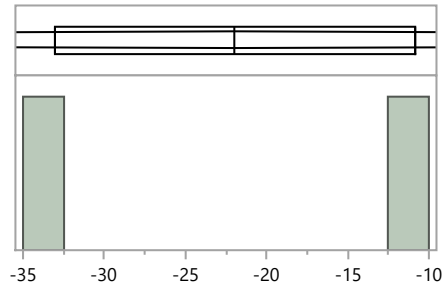


Quantiles		
100.0%	maximum	-9.7
99.5%		-9.7
97.5%		-9.7
90.0%		-9.7
75.0%	quartile	-9.7
50.0%	median	-32.5
25.0%	quartile	-55.3
10.0%		-55.3
2.5%		-55.3
0.5%		-55.3
0.0%	minimum	-55.3

Summary Statistics	
Mean	-32.5
Std Dev	32.2
Std Err Mean	22.8
Upper 95% Mean	257.2
Lower 95% Mean	-322.2
N	2.0

Distributions Analyte_Method=Curium-244 Acid leaching without hydrofluoric acid

Bias

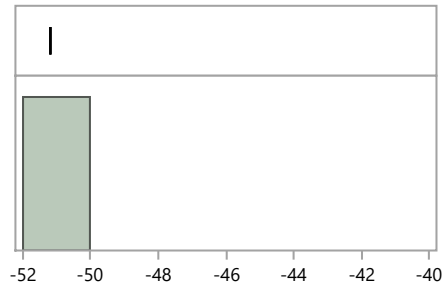


Quantiles		
100.0%	maximum	-10.9
99.5%		-10.9
97.5%		-10.9
90.0%		-10.9
75.0%	quartile	-10.9
50.0%	median	-22.0
25.0%	quartile	-33.0
10.0%		-33.0
2.5%		-33.0
0.5%		-33.0
0.0%	minimum	-33.0

Summary Statistics	
Mean	-22.0
Std Dev	15.6
Std Err Mean	11.1
Upper 95% Mean	118.5
Lower 95% Mean	-162.4
N	2.0

Distributions Analyte_Method=Curium-244 Other

Bias

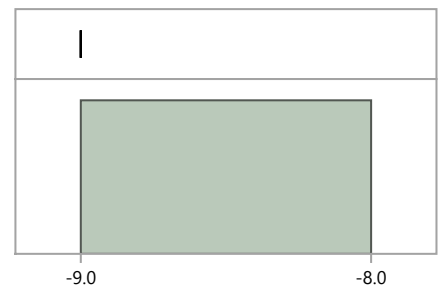


Quantiles		
100.0%	maximum	-51.2
99.5%		-51.2
97.5%		-51.2
90.0%		-51.2
75.0%	quartile	-51.2
50.0%	median	-51.2
25.0%	quartile	-51.2
10.0%		-51.2
2.5%		-51.2
0.5%		-51.2
0.0%	minimum	-51.2

Summary Statistics	
Mean	-51.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Curium-244 Total dissolution by fusion

Bias



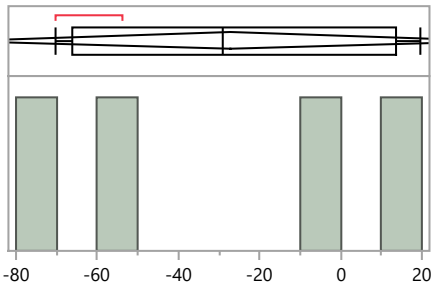
Quantiles		
100.0%	maximum	-9.0
99.5%		-9.0
97.5%		-9.0
90.0%		-9.0
75.0%	quartile	-9.0
50.0%	median	-9.0
25.0%	quartile	-9.0
10.0%		-9.0
2.5%		-9.0
0.5%		-9.0
0.0%	minimum	-9.0

Summary Statistics	
Mean	-9.0
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

XrM Distribution by Prep Method

Distributions Analyte_Method=Plutonium-238 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias

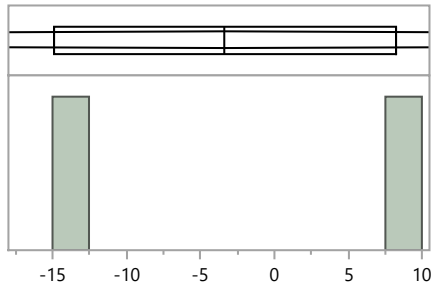


Quantiles		
100.0%	maximum	19.4
99.5%		19.4
97.5%		19.4
90.0%		19.4
75.0%	quartile	13.4
50.0%	median	-29.1
25.0%	quartile	-66.0
10.0%		-70.1
2.5%		-70.1
0.5%		-70.1
0.0%	minimum	-70.1

Summary Statistics	
Mean	-27.2
Std Dev	41.7
Std Err Mean	20.9
Upper 95% Mean	39.2
Lower 95% Mean	-93.6
N	4.0

Distributions Analyte_Method=Plutonium-238 Acid leaching without hydrofluoric acid

Bias

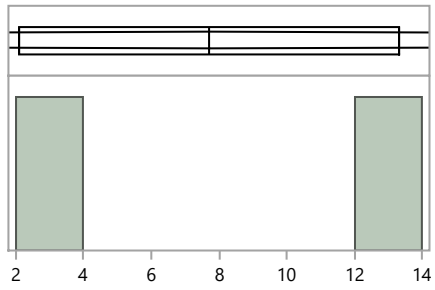


Quantiles		
100.0%	maximum	8.2
99.5%		8.2
97.5%		8.2
90.0%		8.2
75.0%	quartile	8.2
50.0%	median	-3.4
25.0%	quartile	-14.9
10.0%		-14.9
2.5%		-14.9
0.5%		-14.9
0.0%	minimum	-14.9

Summary Statistics	
Mean	-3.4
Std Dev	16.3
Std Err Mean	11.6
Upper 95% Mean	143.4
Lower 95% Mean	-150.1
N	2.0

Distributions Analyte_Method=Plutonium-238 Total dissolution by fusion

Bias

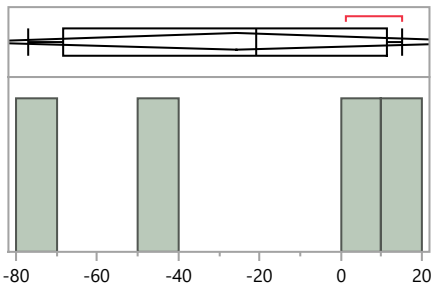


Quantiles		
100.0%	maximum	13.3
99.5%		13.3
97.5%		13.3
90.0%		13.3
75.0%	quartile	13.3
50.0%	median	7.7
25.0%	quartile	2.1
10.0%		2.1
2.5%		2.1
0.5%		2.1
0.0%	minimum	2.1

Summary Statistics	
Mean	7.7
Std Dev	7.9
Std Err Mean	5.6
Upper 95% Mean	78.9
Lower 95% Mean	-63.5
N	2.0

Distributions Analyte_Method=Plutonium-239/240 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



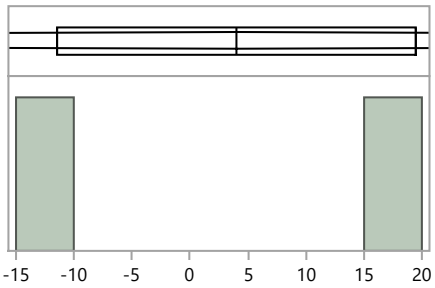
Quantiles		
100.0%	maximum	14.9
99.5%		14.9
97.5%		14.9
90.0%		14.9
75.0%	quartile	11.5
50.0%	median	-20.7
25.0%	quartile	-68.4
10.0%		-77.0
2.5%		-77.0
0.5%		-77.0
0.0%	minimum	-77.0

Summary Statistics	
Mean	-25.9
Std Dev	41.9
Std Err Mean	21.0
Upper 95% Mean	40.9
Lower 95% Mean	-92.6
N	4.0

XrM Distribution by Prep Method

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

Bias

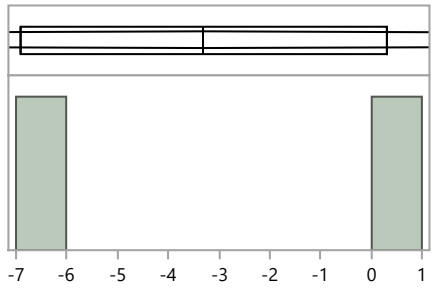


Quantiles		
100.0%	maximum	19.5
99.5%		19.5
97.5%		19.5
90.0%		19.5
75.0%	quartile	19.5
50.0%	median	4.0
25.0%	quartile	-11.5
10.0%		-11.5
2.5%		-11.5
0.5%		-11.5
0.0%	minimum	-11.5

Summary Statistics	
Mean	4.0
Std Dev	21.9
Std Err Mean	15.5
Upper 95% Mean	200.9
Lower 95% Mean	-192.9
N	2.0

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

Bias

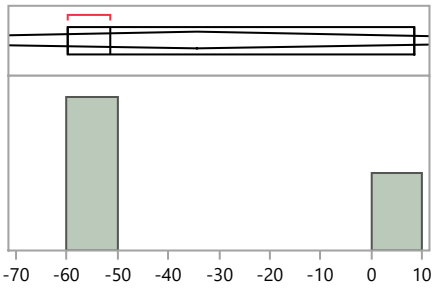


Quantiles		
100.0%	maximum	0.3
99.5%		0.3
97.5%		0.3
90.0%		0.3
75.0%	quartile	0.3
50.0%	median	-3.3
25.0%	quartile	-6.9
10.0%		-6.9
2.5%		-6.9
0.5%		-6.9
0.0%	minimum	-6.9

Summary Statistics	
Mean	-3.3
Std Dev	5.1
Std Err Mean	3.6
Upper 95% Mean	42.4
Lower 95% Mean	-49.0
N	2.0

Distributions Analyte_Method=Radium-226 No preparation - analyzed as received

Bias

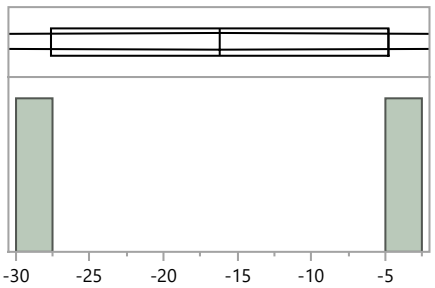


Quantiles		
100.0%	maximum	8.4
99.5%		8.4
97.5%		8.4
90.0%		8.4
75.0%	quartile	8.4
50.0%	median	-51.5
25.0%	quartile	-59.9
10.0%		-59.9
2.5%		-59.9
0.5%		-59.9
0.0%	minimum	-59.9

Summary Statistics	
Mean	-34.3
Std Dev	37.2
Std Err Mean	21.5
Upper 95% Mean	58.2
Lower 95% Mean	-126.9
N	3.0

Distributions Analyte_Method=Ruthenium-106 No preparation - analyzed as received

Bias



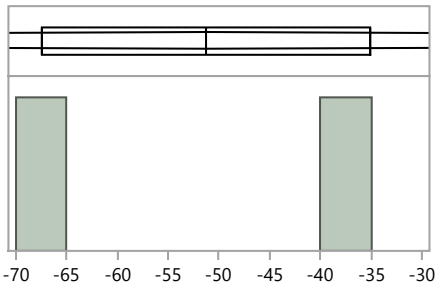
Quantiles		
100.0%	maximum	-4.8
99.5%		-4.8
97.5%		-4.8
90.0%		-4.8
75.0%	quartile	-4.8
50.0%	median	-16.2
25.0%	quartile	-27.6
10.0%		-27.6
2.5%		-27.6
0.5%		-27.6
0.0%	minimum	-27.6

Summary Statistics	
Mean	-16.2
Std Dev	16.1
Std Err Mean	11.4
Upper 95% Mean	128.7
Lower 95% Mean	-161.1
N	2.0

XrM Distribution by Prep Method

Distributions Analyte_Method=Strontium-90 Acid leaching without hydrofluoric acid

Bias



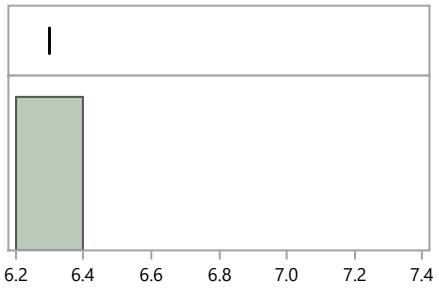
Quantiles		
100.0%	maximum	-35.1
99.5%		-35.1
97.5%		-35.1
90.0%		-35.1
75.0%	quartile	-35.1
50.0%	median	-51.3
25.0%	quartile	-67.5
10.0%		-67.5
2.5%		-67.5
0.5%		-67.5
0.0%	minimum	-67.5

Summary Statistics	
Mean	-51.3
Std Dev	22.9
Std Err Mean	16.2
Upper 95% Mean	154.5
Lower 95% Mean	-257.1
N	2.0

Distributions Analyte_Method=Strontium-90 Other

Distributions Analyte_Method=Strontium-90 Total dissolution by fusion

Bias

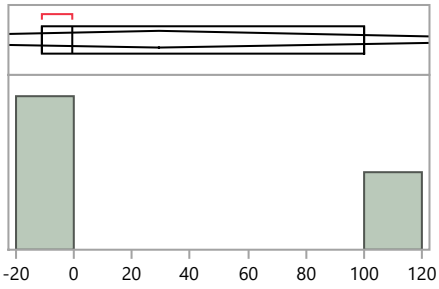


Quantiles		
100.0%	maximum	6.3
99.5%		6.3
97.5%		6.3
90.0%		6.3
75.0%	quartile	6.3
50.0%	median	6.3
25.0%	quartile	6.3
10.0%		6.3
2.5%		6.3
0.5%		6.3
0.0%	minimum	6.3

Summary Statistics	
Mean	6.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

Distributions Analyte_Method=Uranium-234 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias



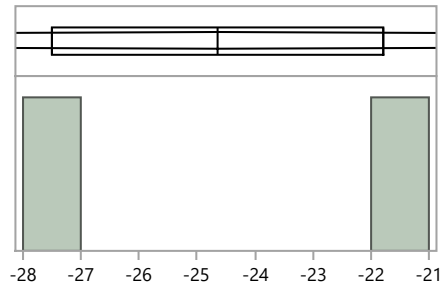
Quantiles		
100.0%	maximum	100.0
99.5%		100.0
97.5%		100.0
90.0%		100.0
75.0%	quartile	100.0
50.0%	median	-0.5
25.0%	quartile	-10.8
10.0%		-10.8
2.5%		-10.8
0.5%		-10.8
0.0%	minimum	-10.8

Summary Statistics	
Mean	29.6
Std Dev	61.2
Std Err Mean	35.3
Upper 95% Mean	181.6
Lower 95% Mean	-122.5
N	3.0

XrM Distribution by Prep Method

Distributions Analyte_Method=Uranium-234 Acid leaching without hydrofluoric acid

Bias

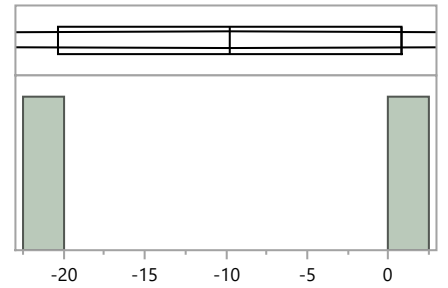


Quantiles		
100.0%	maximum	-21.8
99.5%		-21.8
97.5%		-21.8
90.0%		-21.8
75.0%	quartile	-21.8
50.0%	median	-24.7
25.0%	quartile	-27.5
10.0%		-27.5
2.5%		-27.5
0.5%		-27.5
0.0%	minimum	-27.5

Summary Statistics	
Mean	-24.7
Std Dev	4.0
Std Err Mean	2.9
Upper 95% Mean	11.6
Lower 95% Mean	-60.9
N	2.0

Distributions Analyte_Method=Uranium-234 Total dissolution by fusion

Bias

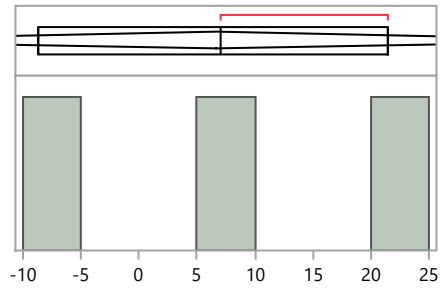


Quantiles		
100.0%	maximum	0.8
99.5%		0.8
97.5%		0.8
90.0%		0.8
75.0%	quartile	0.8
50.0%	median	-9.8
25.0%	quartile	-20.3
10.0%		-20.3
2.5%		-20.3
0.5%		-20.3
0.0%	minimum	-20.3

Summary Statistics	
Mean	-9.8
Std Dev	14.9
Std Err Mean	10.6
Upper 95% Mean	124.3
Lower 95% Mean	-143.8
N	2.0

Distributions Analyte_Method=Uranium-238 Acid dissolution by strong Aqua Reqia, hydrofluoric acid, etc.

Bias

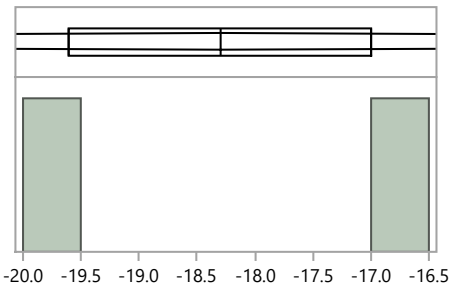


Quantiles		
100.0%	maximum	21.4
99.5%		21.4
97.5%		21.4
90.0%		21.4
75.0%	quartile	21.4
50.0%	median	7.1
25.0%	quartile	-8.7
10.0%		-8.7
2.5%		-8.7
0.5%		-8.7
0.0%	minimum	-8.7

Summary Statistics	
Mean	6.6
Std Dev	15.1
Std Err Mean	8.7
Upper 95% Mean	44.0
Lower 95% Mean	-30.8
N	3.0

Distributions Analyte_Method=Uranium-238 Acid leaching without hydrofluoric acid

Bias



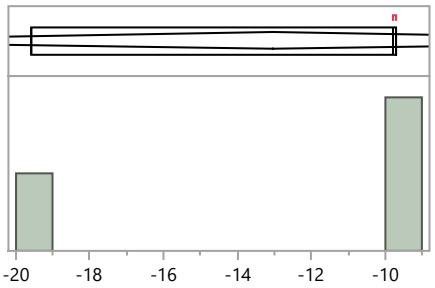
Quantiles		
100.0%	maximum	-17.0
99.5%		-17.0
97.5%		-17.0
90.0%		-17.0
75.0%	quartile	-17.0
50.0%	median	-18.3
25.0%	quartile	-19.6
10.0%		-19.6
2.5%		-19.6
0.5%		-19.6
0.0%	minimum	-19.6

Summary Statistics	
Mean	-18.3
Std Dev	1.8
Std Err Mean	1.3
Upper 95% Mean	-1.8
Lower 95% Mean	-34.8
N	2.0

XrM Distribution by Prep Method

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

Bias

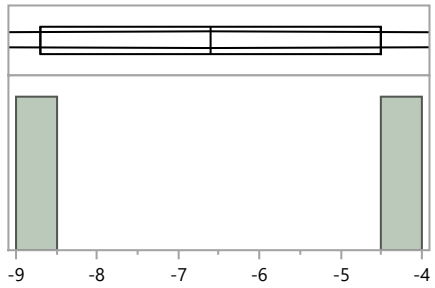


Quantiles		
100.0%	maximum	-9.7
99.5%		-9.7
97.5%		-9.7
90.0%		-9.7
75.0%	quartile	-9.7
50.0%	median	-9.8
25.0%	quartile	-19.6
10.0%		-19.6
2.5%		-19.6
0.5%		-19.6
0.0%	minimum	-19.6

Summary Statistics	
Mean	-13.0
Std Dev	5.7
Std Err Mean	3.3
Upper 95% Mean	1.1
Lower 95% Mean	-27.2
N	3.0

Distributions Analyte_Method=Uranium-238 Total dissolution by fusion

Bias



Quantiles		
100.0%	maximum	-4.5
99.5%		-4.5
97.5%		-4.5
90.0%		-4.5
75.0%	quartile	-4.5
50.0%	median	-6.6
25.0%	quartile	-8.7
10.0%		-8.7
2.5%		-8.7
0.5%		-8.7
0.0%	minimum	-8.7

Summary Statistics	
Mean	-6.6
Std Dev	3.0
Std Err Mean	2.1
Upper 95% Mean	20.1
Lower 95% Mean	-33.3
N	2.0