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## XrM49 Participating Laboratories

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
FDHE01	Florida Dept of Health Environmental Laboratory	XrM
FDOH01	Florida Dept. of Health, Mobile Environmental Radiological Lab	XrM
GENE01	GEL Laboratories, LLC	XrM
IEMA01	Illinois Emergency Management Agency Radiochemistry Laboratory	XrM
SEML01	SRS Environmental Monitoring Laboratory	XrM
SRPD01	Sandia National Laboratories, Radiation Protection Sample Diagnostics	XrM

## Laboratories Not Reporting

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
STRL01	South Texas Project Radiological Laboratory	XrM

## Study Reference Values

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MAPEP-23-XrM49

*Radiological Reference Date: 08/01/2023*

Analyte	Ref Value	Ref Unc
Radiological	Units: (Bq/sample)	
Cesium-134	0.546	0.014
Cesium-137	9.5	0.2
Cobalt-57	2.43	0.06
Cobalt-60	8.2	0.2
Hydrogen-3	17.3	0.5
Manganese-54	2.89	0.07
Zinc-65	2.16	0.05
Zirconium-95	2.89	0.05

**The XrM49 is a NRC Swipe sample matrix.**

## Sample Statistical Summary

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MAPEP-23-XrM49

Radiological Reference Date: 08/01/2023

Analyte	T(1)	Grand(2) Mean	Std Dev	Ref Value	Ref Unc
Radiological			Units: (Bq/sample)		
Cesium-134	6			0.546	0.014
Cesium-137	6			9.5	0.2
Cobalt-57	6			2.43	0.06
Cobalt-60	6	8.8	0.6	8.2	0.2
Hydrogen-3	1			17.3	0.5
Manganese-54	6	3.40	0.21	2.89	0.07
Zinc-65	6			2.16	0.05
Zirconium-95	6	3.22	0.40	2.89	0.05

**Note:** (1) T = Total number of laboratories reporting analyte.  
(2) Mean excludes values outside of a bias range of  $\pm 30\%$ .

**The XrM49 is a NRC Swipe sample matrix.**



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

*Laboratory Results For MAPEP-23-XrM49*

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

Radiological				
Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-23-XrM49	Cs-134	0.546 +/- 0.014 Bq/sample	0.401 +/- 0.017 Bq/sample	-26.6
MAPEP-23-XrM49	Cs-137	9.5 +/- 0.2 Bq/sample	9.445 +/- 0.187 Bq/sample	-0.6
MAPEP-23-XrM49	Co-57	2.43 +/- 0.06 Bq/sample	2.543 +/- 0.069 Bq/sample	4.7
MAPEP-23-XrM49	Co-60	8.2 +/- 0.2 Bq/sample	8.555 +/- 0.184 Bq/sample	4.3
MAPEP-23-XrM49	H-3	17.3 +/- 0.5 Bq/sample		
MAPEP-23-XrM49	Mn-54	2.89 +/- 0.07 Bq/sample	3.36 +/- 0.086 Bq/sample	16.3
MAPEP-23-XrM49	Nb-95		13.2 +/- 0.301 Bq/sample	
MAPEP-23-XrM49	Pu-238		0.369 +/- 0.12 Bq/sample	
MAPEP-23-XrM49	Pu-239		0.027 +/- 0.01 Bq/sample	
MAPEP-23-XrM49	Sr-89		0.07 +/- 0.05 Bq/sample	
MAPEP-23-XrM49	Sr-90		0.01 +/- 0.02 Bq/sample	
MAPEP-23-XrM49	U-234		0.009 +/- 0.04 Bq/sample	
MAPEP-23-XrM49	U-238		0.004 +/- 0.04 Bq/sample	
MAPEP-23-XrM49	Zn-65	2.16 +/- 0.05 Bq/sample	2.603 +/- 0.104 Bq/sample	20.5
MAPEP-23-XrM49	Zr-95	2.89 +/- 0.05 Bq/sample	3.345 +/- 0.106 Bq/sample	15.7

*Radiological Reference Date: August 1, 2023*



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

*Laboratory Results For MAPEP-23-XrM49*

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

2100 All Childrens Way

Orlando, FL 32818-5271

Radiological				
Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-23-XrM49	Cs-134	0.546 +/- 0.014 Bq/sample	0.38 +/- 0.03 Bq/sample	-30.4
MAPEP-23-XrM49	Cs-137	9.5 +/- 0.2 Bq/sample	9.55 +/- 0.23 Bq/sample	0.5
MAPEP-23-XrM49	Co-57	2.43 +/- 0.06 Bq/sample	2.6 +/- 0.054 Bq/sample	7.0
MAPEP-23-XrM49	Co-60	8.2 +/- 0.2 Bq/sample	8.63 +/- 0.12 Bq/sample	5.2
MAPEP-23-XrM49	H-3	17.3 +/- 0.5 Bq/sample		
MAPEP-23-XrM49	Mn-54	2.89 +/- 0.07 Bq/sample	3.4 +/- 0.13 Bq/sample	17.6
MAPEP-23-XrM49	Nb-95		12 +/- 0.41 Bq/sample	
MAPEP-23-XrM49	Zn-65	2.16 +/- 0.05 Bq/sample	2.84 +/- 0.06 Bq/sample	31.5
MAPEP-23-XrM49	Zr-95	2.89 +/- 0.05 Bq/sample	3.46 +/- 0.06 Bq/sample	19.7

*Radiological Reference Date: August 1, 2023*



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*Laboratory Results For MAPEP-23-XrM49*

(GENE01) GEL Laboratories, LLC

2040 Savage Road

Charleston, SC 29407

Radiological				
Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-23-XrM49	Cs-134	0.546 +/- 0.014 Bq/sample	0.795 +/- 0.272 Bq/sample	45.6
MAPEP-23-XrM49	Cs-137	9.5 +/- 0.2 Bq/sample	11.6 +/- 0.644 Bq/sample	22.1
MAPEP-23-XrM49	Co-57	2.43 +/- 0.06 Bq/sample	3.27 +/- 0.249 Bq/sample	34.6
MAPEP-23-XrM49	Co-60	8.2 +/- 0.2 Bq/sample	9.48 +/- 0.568 Bq/sample	15.6
MAPEP-23-XrM49	H-3	17.3 +/- 0.5 Bq/sample		
MAPEP-23-XrM49	Mn-54	2.89 +/- 0.07 Bq/sample	3.53 +/- 0.327 Bq/sample	22.1
MAPEP-23-XrM49	Nb-95		7.40 +/- 0.70 Bq/sample	
MAPEP-23-XrM49	K-40		10.6 +/- 3.52 Bq/sample	
MAPEP-23-XrM49	Zn-65	2.16 +/- 0.05 Bq/sample	2.46 +/- 0.539 Bq/sample	13.9
MAPEP-23-XrM49	Zr-95	2.89 +/- 0.05 Bq/sample	3.33 +/- 0.758 Bq/sample	15.2

*Radiological Reference Date: August 1, 2023*





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*Laboratory Results For MAPEP-23-XrM49*

(IEMA01) Illinois Emergency Management Agency Radiochemistry Laboratory

1301 Knotts St.

Springfield, IL 62703

Radiological				
Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-23-XrM49	Am-241		0.00051 +/- 0.00027 Bq/sample	
MAPEP-23-XrM49	Cs-134	0.546 +/- 0.014 Bq/sample	0.49 +/- 0.04 Bq/sample	-10.3
MAPEP-23-XrM49	Cs-137	9.5 +/- 0.2 Bq/sample	9.71 +/- 0.16 Bq/sample	2.2
MAPEP-23-XrM49	Co-57	2.43 +/- 0.06 Bq/sample	2.43 +/- 0.06 Bq/sample	0.0
MAPEP-23-XrM49	Co-60	8.2 +/- 0.2 Bq/sample	7.94 +/- 0.10 Bq/sample	-3.2
MAPEP-23-XrM49	H-3	17.3 +/- 0.5 Bq/sample		
MAPEP-23-XrM49	Mn-54	2.89 +/- 0.07 Bq/sample	3.03 +/- 0.10 Bq/sample	4.8
MAPEP-23-XrM49	Nb-95		7.96 +/- 0.65 Bq/sample	
MAPEP-23-XrM49	Pu-238		0.00051 +/- 0.00030 Bq/sample	
MAPEP-23-XrM49	Pu-239		0.00022 +/- 0.00016 Bq/sample	
MAPEP-23-XrM49	K-40		0.09 +/- 0.19 Bq/sample	
MAPEP-23-XrM49	Sr-90		0.0204 +/- 0.0349 Bq/sample	
MAPEP-23-XrM49	U-234		0.00109 +/- 0.00030 Bq/sample	
MAPEP-23-XrM49	U-235		0.00010 +/- 0.00013 Bq/sample	
MAPEP-23-XrM49	U-238		0.00068 +/- 0.00024 Bq/sample	
MAPEP-23-XrM49	Zn-65	2.16 +/- 0.05 Bq/sample	2.34 +/- 0.18 Bq/sample	8.3
MAPEP-23-XrM49	Zr-95	2.89 +/- 0.05 Bq/sample	3.47 +/- 0.19 Bq/sample	20.1

*Radiological Reference Date: August 1, 2023*



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*Laboratory Results For MAPEP-23-XrM49*  
 (SEML01) SRS Environmental Monitoring Laboratory  
 Bldg 735-B  
 Aiken, SC 29808

Radiological				
Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-23-XrM49	Ba-133		0.06 +/- 0.53 Bq/sample	
MAPEP-23-XrM49	Ce-139		-0.10 +/- 0.19 Bq/sample	
MAPEP-23-XrM49	Cs-134	0.546 +/- 0.014 Bq/sample	0.611 +/- 0.088 Bq/sample	11.9
MAPEP-23-XrM49	Cs-137	9.5 +/- 0.2 Bq/sample	10.80 +/- 0.85 Bq/sample	13.7
MAPEP-23-XrM49	Co-57	2.43 +/- 0.06 Bq/sample	2.66 +/- 0.25 Bq/sample	9.5
MAPEP-23-XrM49	Co-58		-0.21 +/- 0.39 Bq/sample	
MAPEP-23-XrM49	Co-60	8.2 +/- 0.2 Bq/sample	8.98 +/- 0.65 Bq/sample	9.5
MAPEP-23-XrM49	H-3	17.3 +/- 0.5 Bq/sample	33.3 +/- 3.3 Bq/sample	92.5
MAPEP-23-XrM49	Mn-54	2.89 +/- 0.07 Bq/sample	3.41 +/- 0.34 Bq/sample	18.0
MAPEP-23-XrM49	Nb-95		5.0 +/- 0.5 Bq/sample	
MAPEP-23-XrM49	K-40		-0.96 +/- 1.08 Bq/sample	
MAPEP-23-XrM49	Zn-65	2.16 +/- 0.05 Bq/sample	2.57 +/- 0.16 Bq/sample	19.0
MAPEP-23-XrM49	Zr-95	2.89 +/- 0.05 Bq/sample	3.32 +/- 0.49 Bq/sample	14.9

*Radiological Reference Date: August 1, 2023*



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

*Laboratory Results For MAPEP-23-XrM49*

(SRPD01) Sandia National Laboratories, Radiation Protection Sample Diagnostics

PO Box 5800, MS1103

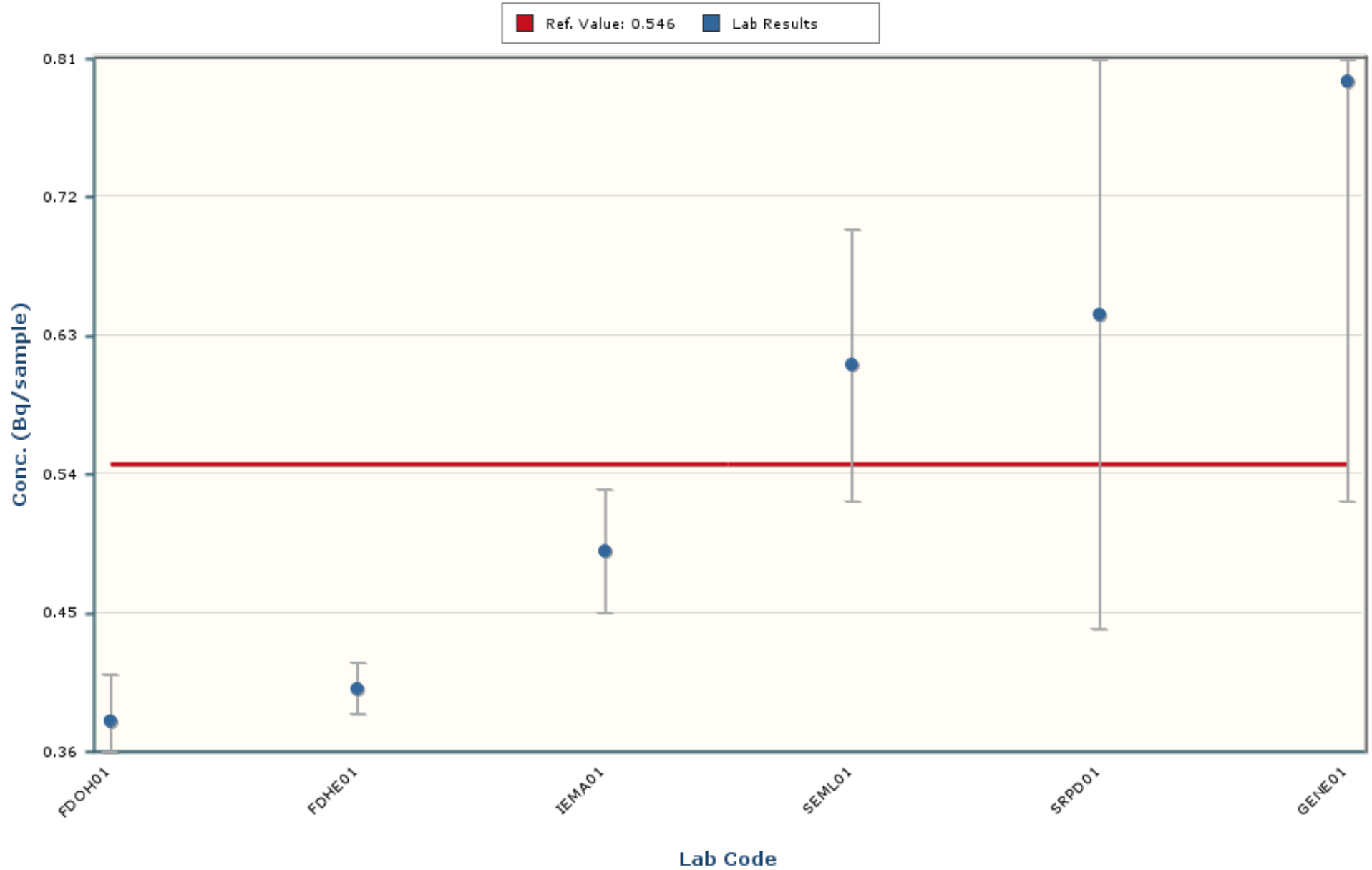
Albuquerque, NM 87185-1103

Radiological				
Sample ID	Nuclide	Known Activity	Experimental Activity	Bias (%)
MAPEP-23-XrM49	Cs-134	0.546 +/- 0.014 Bq/sample	6.44E-01 +/- 2.04E-01 Bq/sample	17.9
MAPEP-23-XrM49	Cs-137	9.5 +/- 0.2 Bq/sample	1.25E+01 +/- 7.62E-01 Bq/sample	31.6
MAPEP-23-XrM49	Co-57	2.43 +/- 0.06 Bq/sample	2.82E+00 +/- 2.87E-01 Bq/sample	16.0
MAPEP-23-XrM49	Co-60	8.2 +/- 0.2 Bq/sample	9.41E+00 +/- 4.15E-01 Bq/sample	14.8
MAPEP-23-XrM49	H-3	17.3 +/- 0.5 Bq/sample		
MAPEP-23-XrM49	Mn-54	2.89 +/- 0.07 Bq/sample	3.64E+00 +/- 2.68E-01 Bq/sample	26.0
MAPEP-23-XrM49	Nb-95		1.50E+01 +/- 1.05E+00 Bq/sample	
MAPEP-23-XrM49	K-40		6.90E+00 +/- 6.33E-01 Bq/sample	
MAPEP-23-XrM49	Zn-65	2.16 +/- 0.05 Bq/sample	1.64E+00 +/- 2.00E-01 Bq/sample	-24.1
MAPEP-23-XrM49	Zr-95	2.89 +/- 0.05 Bq/sample	2.41E+00 +/- 3.17E-01 Bq/sample	-16.6

*Radiological Reference Date: August 1, 2023*

# Cesium-134

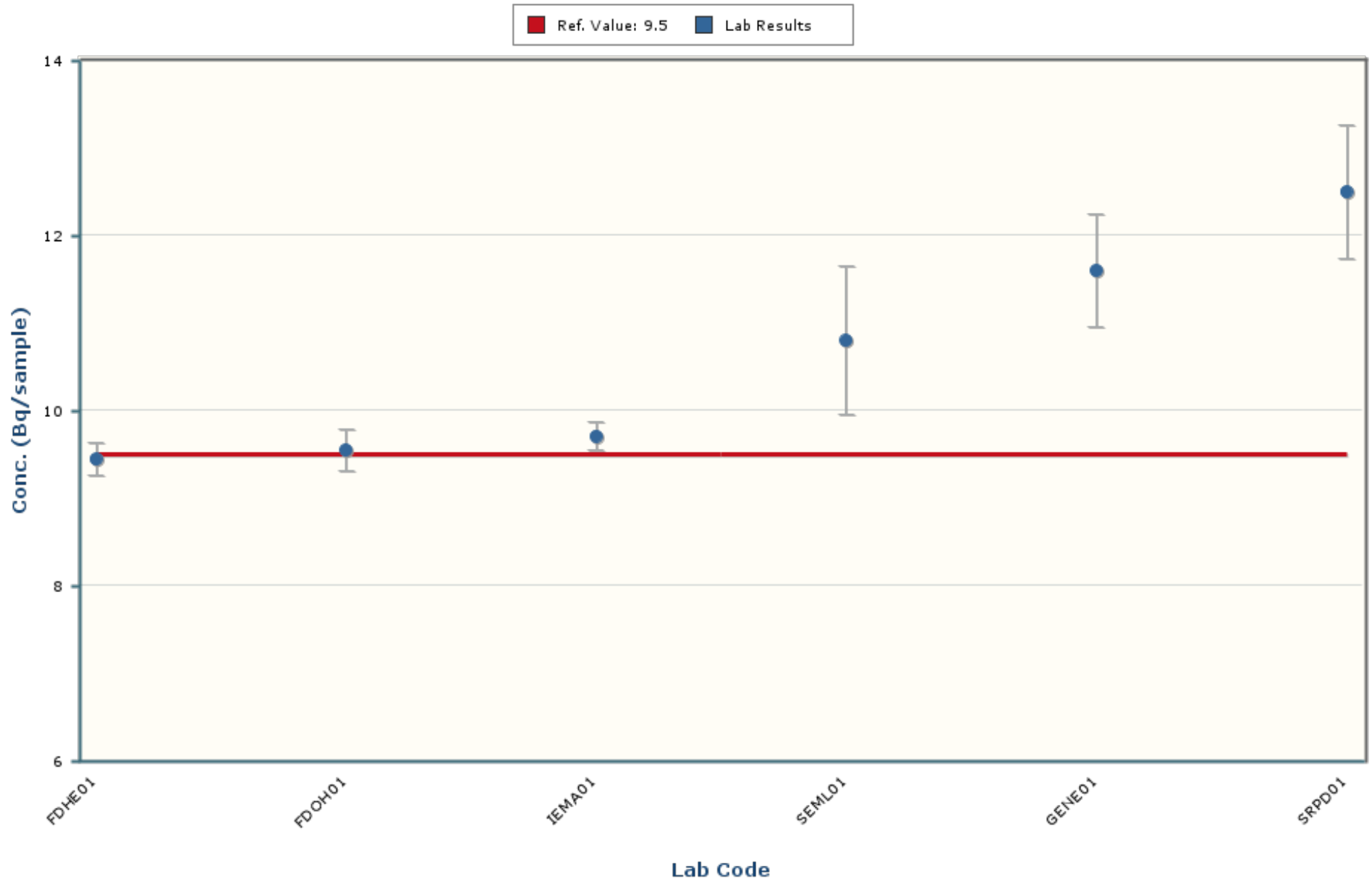
## MAPEP-23-XrM49



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

# Cesium-137

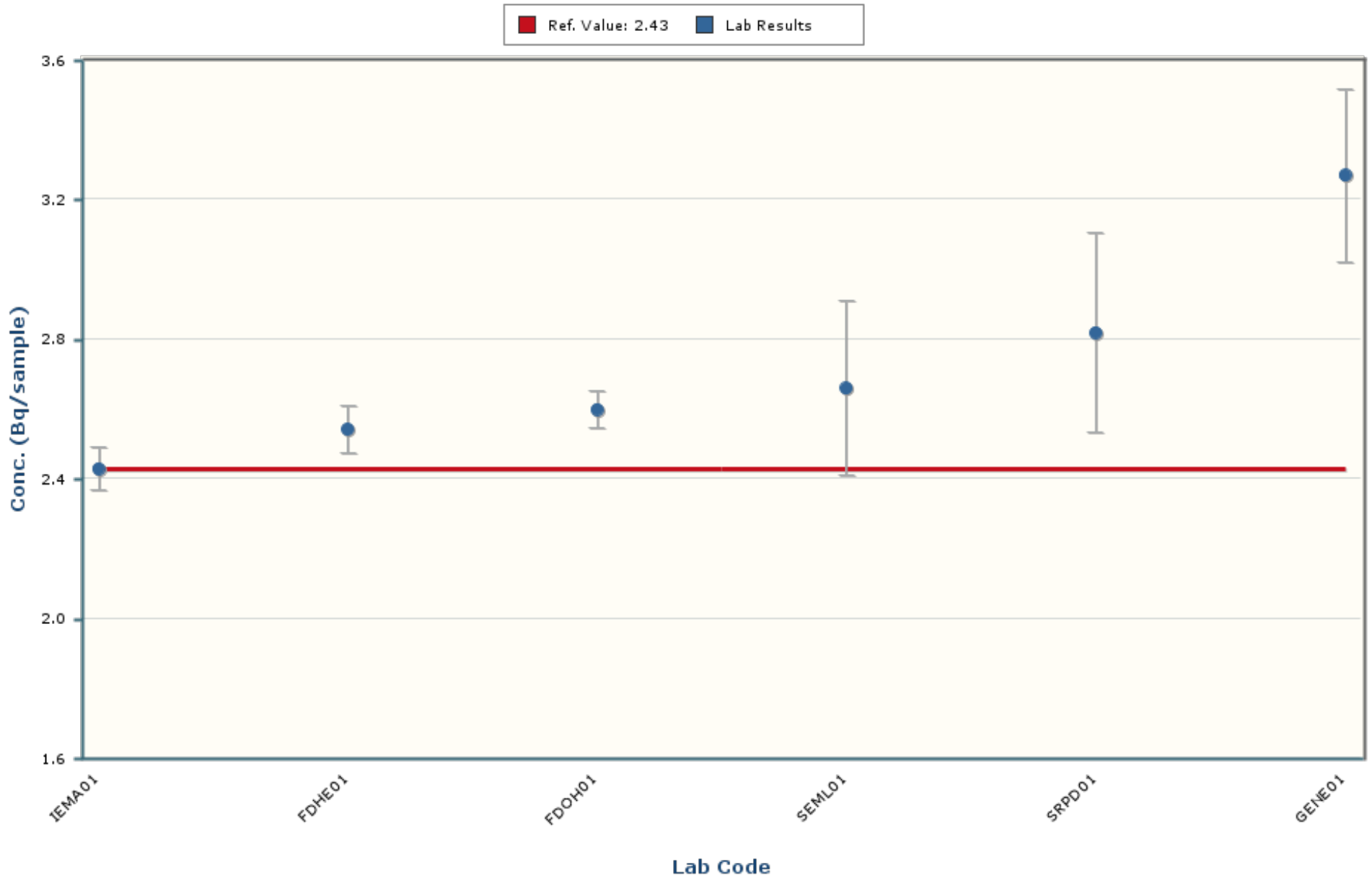
## MAPEP-23-XrM49



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

# Cobalt-57

## MAPEP-23-XrM49

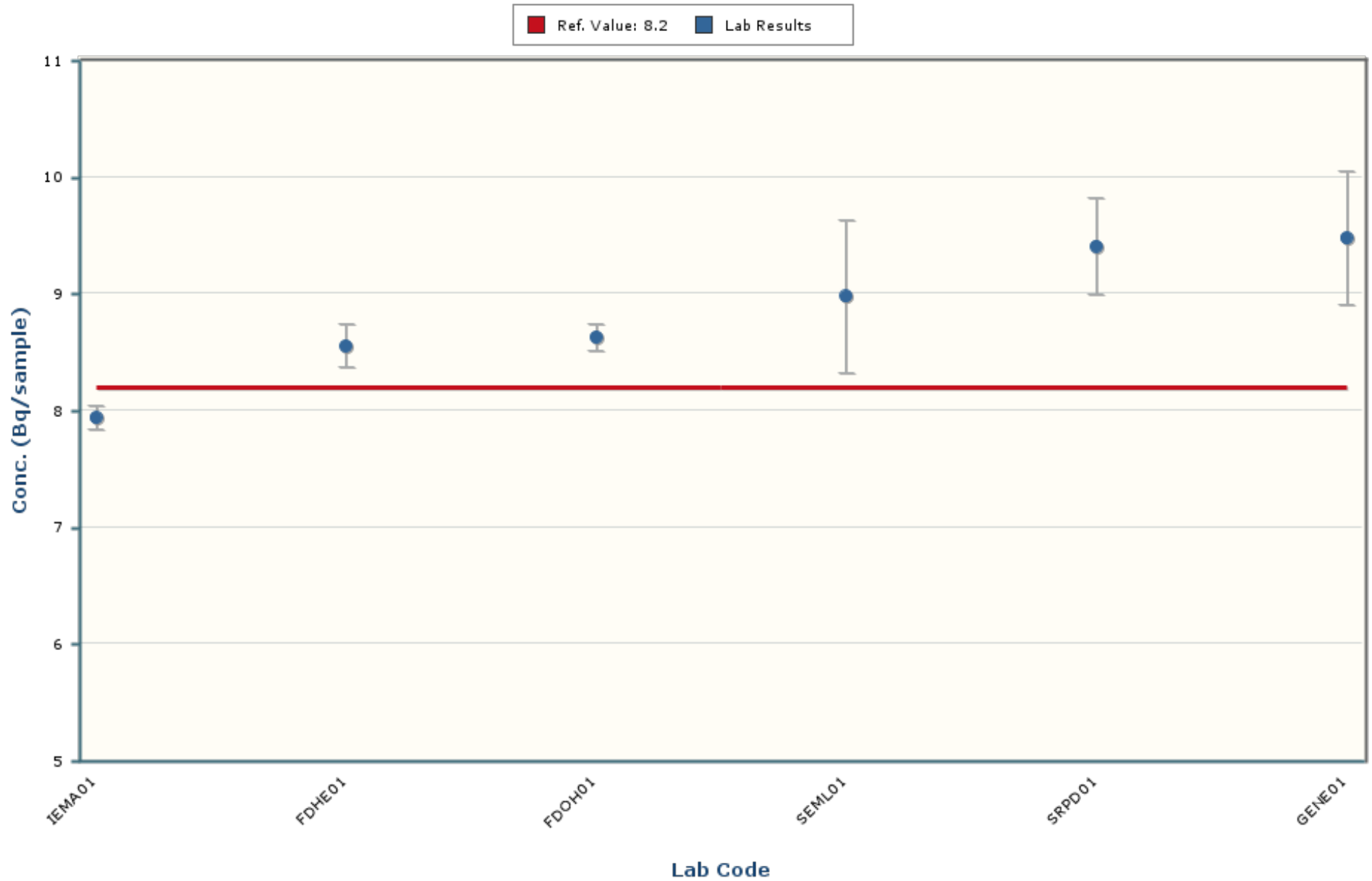


Notes:

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

# Cobalt-60

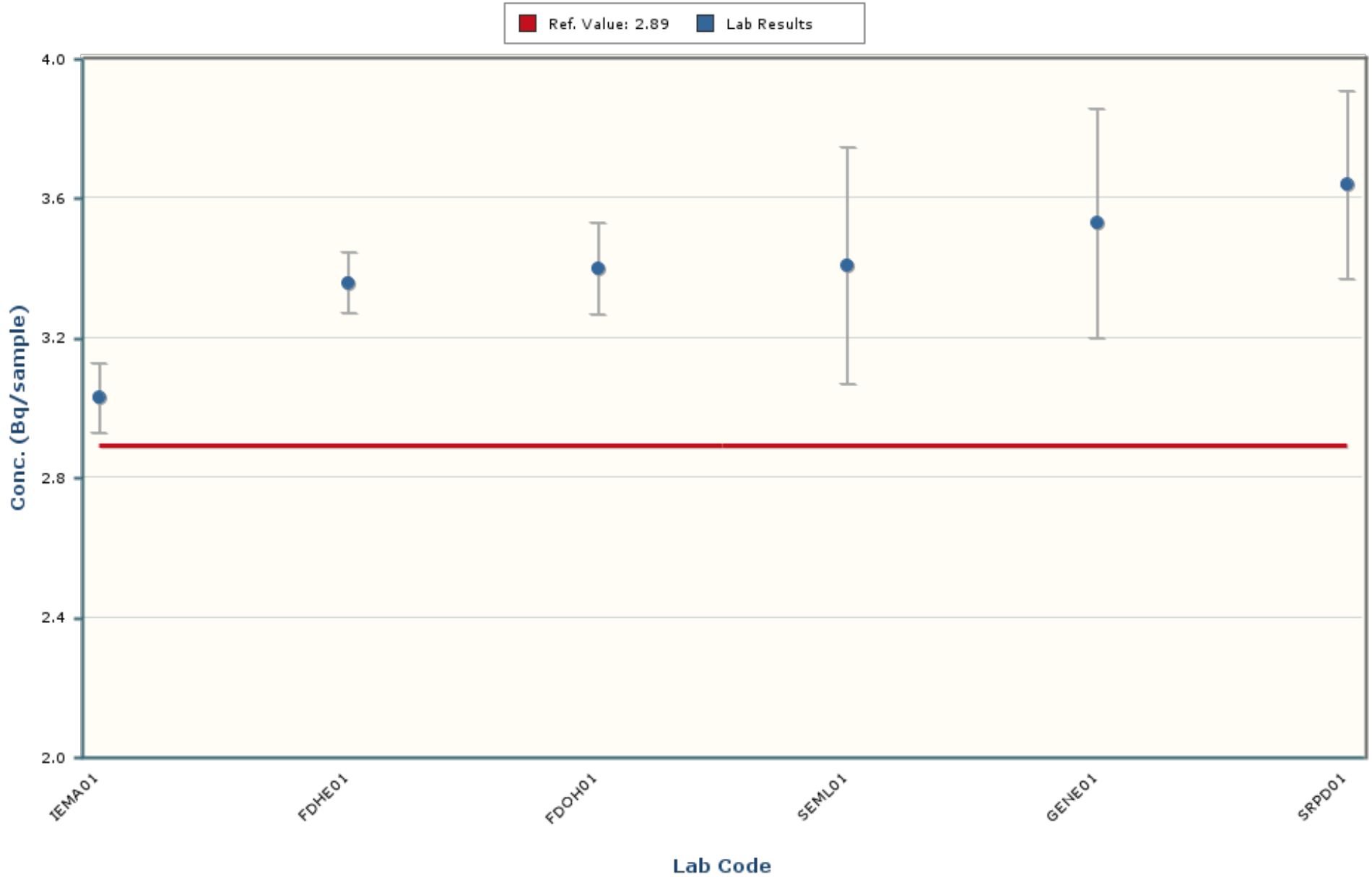
## MAPEP-23-XrM49



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

# Manganese-54

## MAPEP-23-XrM49



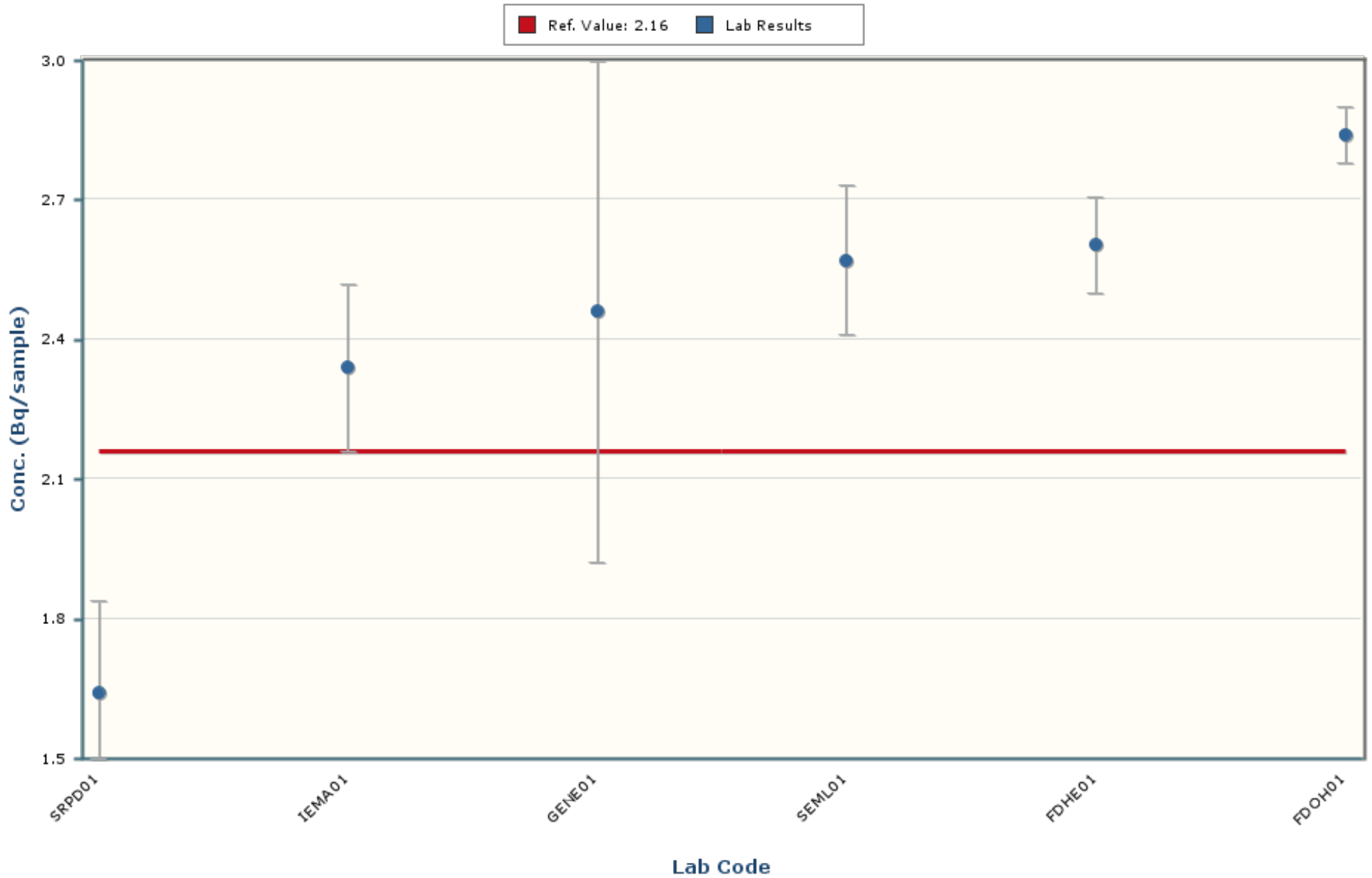
Notes:

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



# Zinc-65

## MAPEP-23-XrM49

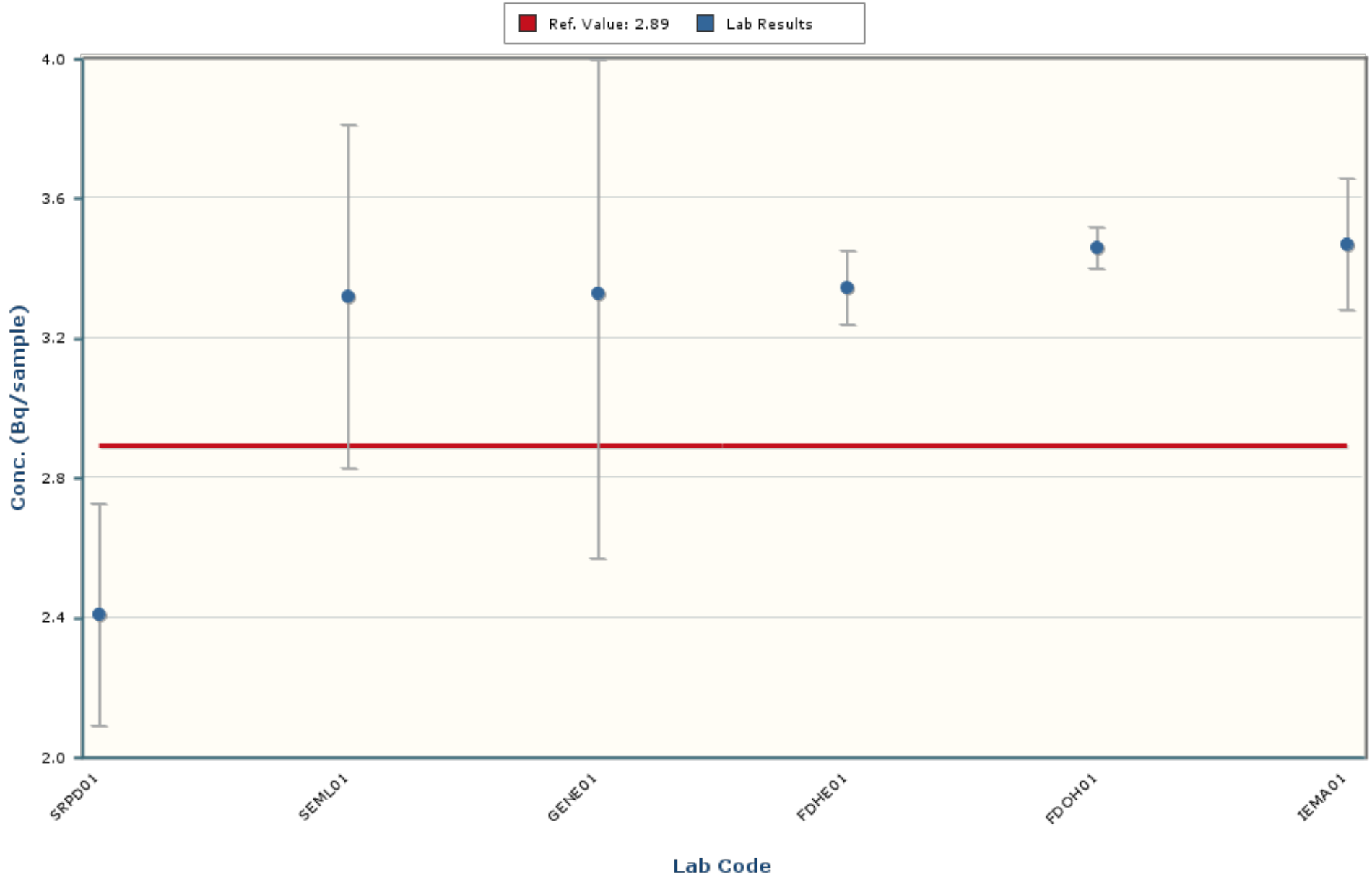


Notes:

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

# Zirconium-95

## MAPEP-23-XrM49



Notes:

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