

## 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.

## GrF50 Participating Laboratories

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
ADEM01	Alabama Department of Environmental Management	GrF
AFOH01	USAFSAM/OEA	GrF
ARGO01	Idaho National Laboratory	GrF
ARPL01	Analytical Support Operations - Radiochemical Processing Lab	GrF
ARSL01	ARS	GrF
ASUK99	AWE (Aldermaston)	GrF
CDHS01	California Department of Public Health	GrF
CMRC01	Carlsbad Environmental Monitoring and Research Center	GrF
DEHS01	Department of Environmental Health & Safety	GrF
DLEA01	DLE Associates	GrF
ERCL01	Washington State Public Health Laboratories	GrF
ERHD99	National Monitoring Section, Radiation Protection Bureau, Health Canada	GrF
FDHE01	Florida Dept of Health Environmental Laboratory	GrF
FDOH01	Florida Dept. of Health, Mobile Environmental Radiological Lab	GrF
GENE01	GEL Laboratories, LLC	GrF
HECR01	SC Dept. Health and Environmental Control Radiological Laboratory	GrF
HPAL01	Los Alamos National Laboratory	GrF
IEMA01	Illinois Emergency Management Agency Radiochemistry Laboratory	GrF
ISUE01	ISU Environmental Monitoring Laboratory	GrF
JLNN01	Jefferson Laboratory	GrF
MART03	Radioactive Material Analysis Laboratory	GrF
NESI01	BWXT-Radioisotope & Analytical Chemistry Laboratory	GrF
NOCS99	National Oceanography Centre, Southampton	GrF
NSPH01	Nevada State Public Health Laboratory	GrF
ODHL01	Ohio Department of Health Laboratory	GrF
RPSC01	Radiation Protection Service	GrF
SEML01	SRS Environmental Monitoring Laboratory	GrF
SMER01	State of Michigan EGLE Radiological Lab	GrF
SOUT01	Southwest Research Institute	GrF
SRPD01	Sandia National Laboratories, Radiation Protection Sample Diagnostics	GrF
STRL01	South Texas Project Radiological Laboratory	GrF
TDHL01	Texas Department of State Health Services Laboratory	GrF
TMAO01	EBERLINE Analytical Corporation	GrF
TNUT01	St. Louis USACE FUSRAP Laboratory	GrF
WSHL01	Wisconsin State Laboratory of Hygiene	GrF

## Laboratories Not Reporting

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
ISUP01	ISU - Department of Physics/Health Physics/EAL	GrF
LOCK03	Advanced Test Reactor (ATR) Complex Radioanalytical Laboratory	GrF
MDPH01	MDPH-Radiation Control Program	GrF
TELE02	Microbac Laboratories Inc. - Northbrook	GrF

## Study Reference Values

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MAPEP-24-GrF50

*Radiological Reference Date: 02/01/2024*

Analyte	Ref Value	Ref Unc
Radiological		Units: (Bq/sample)
Gross alpha	1.24	0.03
Gross beta	1.81	0.03

## Sample Statistical Summary

MAPEP-24-GrF50

Radiological Reference Date: 02/01/2024

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
							Units: (Bq/sample)
Gross alpha	33	28	1.22	0.40	1.24	0.03	0.37 - 2.11
Gross beta	35	32	1.85	0.19	1.81	0.03	0.91 - 2.72

- 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".

### Gross Alpha Flags:

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

### Gross Beta Flags:

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

### Uncertainty Flags:

NOT ACCEPTABLE.....RP  $< 2\%$

ACCEPTABLE..... $2\% \leq RP \leq 15\%$

ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$

NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

## Flag Summary Report

MAPEP-24-GrF50

### Radiological

Analyte	A	W	RW	N
Gross alpha	28			5
Gross beta	32			3



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

Laboratory Results For MAPEP-24-GrF50  
 (ADEM01) Alabama Department of Environmental Management  
 1350 Coliseum Blvd.  
 Montgomery, AL 36110

Radiological							Units: (Bq/sample)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	NR	1.24				0.37 - 2.11		
Gross beta	1.924	1.81	A		6.3	0.91 - 2.72	0.03737	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

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N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

*Laboratory Results For MAPEP-24-GrF50*

(AFOH01) USAFSAM/OEA

2510 Fifth Street, Area B

Wright-Patterson AFB, OH 45433-7913

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.7	1.24	A		37.1	0.37 - 2.11	0.2	A
Gross beta	1.88	1.81	A		3.9	0.91 - 2.72	0.08	A

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP  $< 2\%$

ACCEPTABLE..... $2\% \leq RP \leq 15\%$

ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$

NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100





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

Laboratory Results For MAPEP-24-GrF50  
 (ARGO01) Idaho National Laboratory  
 INL, Materials and Fuels Complex  
 Idaho Falls, ID 83415

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.573	1.24	A		-53.8	0.37 - 2.11	0.017	A
Gross beta	1.54	1.81	A		-14.9	0.91 - 2.72	0.046	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

*Laboratory Results For MAPEP-24-GrF50*

(ARPL01) Analytical Support Operations - Radiochemical Processing Lab

PO Box 999

Richland, WA 99354

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	2.26	1.24	N		82.3	0.37 - 2.11	0.41	W
Gross beta	1.72	1.81	A		-5.0	0.91 - 2.72	0.03	N

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP  $< 2\%$

ACCEPTABLE..... $2\% \leq RP \leq 15\%$

ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$

NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (ARSL01) ARS  
 2609 North River Road  
 Port Allen, LA 70767

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.183	1.24	A		-4.6	0.37 - 2.11	0.149	A
Gross beta	2.118	1.81	A		17.0	0.91 - 2.72	0.256	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2%  $\leq$  RP  $\leq$  15%
- ACCEPTABLE WITH WARNING.....15% < RP  $\leq$  30%
- NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50

(ASUK99) AWE (Aldermaston)

A38.1 AWE

Reading, Berkshire RG7 4PR

Radiological							Units: (Bq/sample)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	2.88	1.24	N		132.3	0.37 - 2.11	0.82	W
Gross beta	2.53	1.81	A		39.8	0.91 - 2.72	0.61	W

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

NOT ACCEPTABLE.....RP  $< 2\%$

ACCEPTABLE..... $2\% \leq RP \leq 15\%$

ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$

NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (CDHS01) California Department of Public Health  
 Drinking Water & Radiation Lab.  
 Richmond, CA 94804-6403

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.982	1.24	A		-20.8	0.37 - 2.11	0.0241	A
Gross beta	1.93	1.81	A		6.6	0.91 - 2.72	0.0210	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (CMRC01) Carlsbad Environmental Monitoring and Research Center  
 1400 University Dr.  
 Carlsbad, NM 88220

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.705	1.24	A		-43.1	0.37 - 2.11	0.007	N
Gross beta	2.087	1.81	A		15.3	0.91 - 2.72	0.003	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

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**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (DEHS01) Department of Environmental Health & Safety  
 North Carolina State Univ.  
 Raleigh, NC 27695-8007

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	NR	1.24				0.37 - 2.11		
Gross beta	1.65	1.81	A		-8.8	0.91 - 2.72	0.11	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

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A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

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**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

*Laboratory Results For MAPEP-24-GrF50*

(DLEA01) DLE Associates  
 730 Alfred Nobel Drive  
 Hercules, CA 94547

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.76	1.24	A		41.9	0.37 - 2.11	0.15	A
Gross beta	1.96	1.81	A		8.3	0.91 - 2.72	0.11	A

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

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N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

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- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100





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

Laboratory Results For MAPEP-24-GrF50  
 (ERCL01) Washington State Public Health Laboratories  
 1610 N.E. 150th Street  
 Shoreline, WA 98155-9701

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.759	1.24	A		-38.8	0.37 - 2.11	0.043	A
Gross beta	1.82	1.81	A		0.6	0.91 - 2.72	0.12	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

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N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

*Laboratory Results For MAPEP-24-GrF50*

(ERHD99) National Monitoring Section, Radiation Protection Bureau, Health Canada  
 775 Brookfield Road AL6302D1  
 Ottawa, Ontario K1A 1C1

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.52	1.24	A		22.6	0.37 - 2.11	0.06	A
Gross beta	1.47	1.81	A		-18.8	0.91 - 2.72	0.02	N

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2%  $\leq$  RP  $\leq$  15%
- ACCEPTABLE WITH WARNING.....15% < RP  $\leq$  30%
- NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

*Laboratory Results For MAPEP-24-GrF50*

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

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.4	1.24	A		12.9	0.37 - 2.11	0.05	A
Gross beta	1.92	1.81	A		6.1	0.91 - 2.72	0.03	N

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

**Laboratory Results For MAPEP-24-GrF50**

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

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.53	1.24	A		23.4	0.37 - 2.11	0.11	A
Gross beta	1.9	1.81	A		5.0	0.91 - 2.72	0.09	A

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (GENE01) GEL Laboratories, LLC  
 2040 Savage Road  
 Charleston, SC 29407

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	2.77	1.24	N		123.4	0.37 - 2.11	0.0928	A
Gross beta	1.84	1.81	A		1.7	0.91 - 2.72	0.0504	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

*Laboratory Results For MAPEP-24-GrF50*

(HECR01) SC Dept. Health and Environmental Control Radiological Laboratory  
 8231 Parklane Road  
 Columbia, SC 29223

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.766	1.24	A		-38.2	0.37 - 2.11	0.0698	A
Gross beta	1.86	1.81	A		2.8	0.91 - 2.72	0.0806	A

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (HPAL01) Los Alamos National Laboratory  
 Josh Chandler, z338219 MS G761  
 Los Alamos, NM 87545-1663

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.60	1.24	A		-51.6	0.37 - 2.11	0.16	W
Gross beta	1.78	1.81	A		-1.7	0.91 - 2.72	0.25	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

*Laboratory Results For MAPEP-24-GrF50*

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

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.50	1.24	A		21.0	0.37 - 2.11	0.03	A
Gross beta	1.99	1.81	A		9.9	0.91 - 2.72	0.02	N

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100





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

Laboratory Results For MAPEP-24-GrF50  
 (ISUE01) ISU Environmental Monitoring Laboratory  
 785 5th 8th Ave Rm B107  
 Pocatello, Idaho 83209

Radiological							Units: (Bq/sample)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	3.17	1.24	N		155.6	0.37 - 2.11	.55	W
Gross beta	1.69	1.81	A		-6.6	0.91 - 2.72	.03	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2%  $\leq$  RP  $\leq$  15%
- ACCEPTABLE WITH WARNING.....15% < RP  $\leq$  30%
- NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

*Laboratory Results For MAPEP-24-GrF50*

(JLNN01) Jefferson Laboratory  
 111 Hadron Drive  
 Newport News, VA 23606

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.94	1.24	A		-24.2	0.37 - 2.11	0.03	A
Gross beta	4.1	1.81	N		126.5	0.91 - 2.72	0.03	N

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (MART03) Radioactive Material Analysis Laboratory  
 ORNL  
 Oak Ridge, TN 37830

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.467	1.24	A		18.3	0.37 - 2.11	0.065	A
Gross beta	1.996	1.81	A		10.3	0.91 - 2.72	0.079	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (NESI01) BWXT-Radioisotope & Analytical Chemistry Laboratory  
 Lynchburg Technology Center  
 Lynchburg, VA 24504-5447

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.01	1.24	A		-18.5	0.37 - 2.11	0.03	A
Gross beta	1.77	1.81	A		-2.2	0.91 - 2.72	0.022	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (NOCS99) National Oceanography Centre, Southampton  
 GAU-Radioanalytical  
 Southampton, Hampshire SO14 3ZH

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	41	1.24	N		3206.5	0.37 - 2.11	2	A
Gross beta	54	1.81	N		2883.4	0.91 - 2.72	3	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (NSPH01) Nevada State Public Health Laboratory  
 1664 North Virginia Street, MS 328  
 Reno, NV 89557

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.14	1.24	A		-8.1	0.37 - 2.11	0.034	A
Gross beta	1.92	1.81	A		6.1	0.91 - 2.72	0.140	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (ODHL01) Ohio Department of Health Laboratory  
 8995 E Main Street  
 Reynoldsburg, OH 43068

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	2.044	1.24	A		64.8	0.37 - 2.11	0.075	A
Gross beta	1.637	1.81	A		-9.6	0.91 - 2.72	0.026	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2%  $\leq$  RP  $\leq$  15%
- ACCEPTABLE WITH WARNING.....15% < RP  $\leq$  30%
- NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (RPSC01) Radiation Protection Service  
 O. Ministry of Labour, Immigration, Training & Skills Development  
 Mississauga, Ontario L4V 1W8

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.50	1.24	A		21.0	0.37 - 2.11	0.17	A
Gross beta	1.78	1.81	A		-1.7	0.91 - 2.72	0.22	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100





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

Laboratory Results For MAPEP-24-GrF50  
 (SEML01) SRS Environmental Monitoring Laboratory  
 Bldg 735-B  
 Aiken, SC 29808

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.43	1.24	A		15.3	0.37 - 2.11	0.14	A
Gross beta	1.92	1.81	A		6.1	0.91 - 2.72	0.19	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2%  $\leq$  RP  $\leq$  15%
- ACCEPTABLE WITH WARNING.....15% < RP  $\leq$  30%
- NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (SMER01) State of Michigan EGLE Radiological Lab  
 815 Filley St.  
 Lansing, MI 48906

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.67	1.24	A		-46.0	0.37 - 2.11	0.04	A
Gross beta	1.76	1.81	A		-2.8	0.91 - 2.72	0.08	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (SOUT01) Southwest Research Institute  
 6220 Culebra Rd.  
 San Antonio, TX 78238-5166

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.752	1.24	A		-39.4	0.37 - 2.11	0.0600	A
Gross beta	1.95	1.81	A		7.7	0.91 - 2.72	0.121	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

**Laboratory Results For MAPEP-24-GrF50**

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

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.36E+00	1.24	A		9.7	0.37 - 2.11	1.82E-02	N
Gross beta	1.73E+00	1.81	A		-4.4	0.91 - 2.72	2.69E-02	N

*Radiological Reference Date: February 1, 2024*

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2%  $\leq$  RP  $\leq$  15%
- ACCEPTABLE WITH WARNING.....15% < RP  $\leq$  30%
- NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (STRL01) South Texas Project Radiological Laboratory  
 12090 FM 521  
 Wadsworth, Texas 77483

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.399	1.24	A		12.8	0.37 - 2.11	0.045	A
Gross beta	1.841	1.81	A		1.7	0.91 - 2.72	0.028	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP < 2%
- ACCEPTABLE.....2%  $\leq$  RP  $\leq$  15%
- ACCEPTABLE WITH WARNING.....15% < RP  $\leq$  30%
- NOT ACCEPTABLE.....RP > 30%

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (TDHL01) Texas Department of State Health Services Laboratory  
 1100 W 49th Street  
 Austin, TX 78756

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.484	1.24	A		19.7	0.37 - 2.11	0.034	A
Gross beta	1.744	1.81	A		-3.6	0.91 - 2.72	0.028	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (TMAO01) EBERLINE Analytical Corporation  
 601 A SCARBORO RD  
 OAK RIDGE, TN 37830-

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	.946	1.24	A		-23.7	0.37 - 2.11	.035	A
Gross beta	2.77	1.81	N		53.0	0.91 - 2.72	.047	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100



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

Laboratory Results For MAPEP-24-GrF50  
 (TNUT01) St. Louis USACE FUSRAP Laboratory  
 112 James S McDonnell Blvd  
 HAZELWOOD, MO 63042

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.34	1.24	A		8.1	0.37 - 2.11	0.060	A
Gross beta	1.94	1.81	A		7.2	0.91 - 2.72	0.0776	A

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100





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

Laboratory Results For MAPEP-24-GrF50  
 (WSHL01) Wisconsin State Laboratory of Hygiene  
 2601 Agriculture Drive  
 Madison, WI 53718

Radiological						Units: (Bq/sample)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.7492	1.24	A		41.1	0.37 - 2.11	0.0636	A
Gross beta	1.7454	1.81	A		-3.6	0.91 - 2.72	0.0266	N

Radiological Reference Date: February 1, 2024

**Gross Alpha Flags:**

A = Result acceptable, Bias  $\leq \pm 70\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 70\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

**Gross Beta Flags:**

A = Result acceptable, Bias  $\leq \pm 50\%$  with a statistically positive result at two standard deviations (Result/Uncertainty  $> 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, does not include zero).

N = Result not acceptable, Bias  $> \pm 50\%$  or the reported result is not statistically positive at two standard deviations (Result/Uncertainty  $\leq 2$ , i.e., the range encompassing the result, plus or minus the total uncertainty at two standard deviations, includes zero).

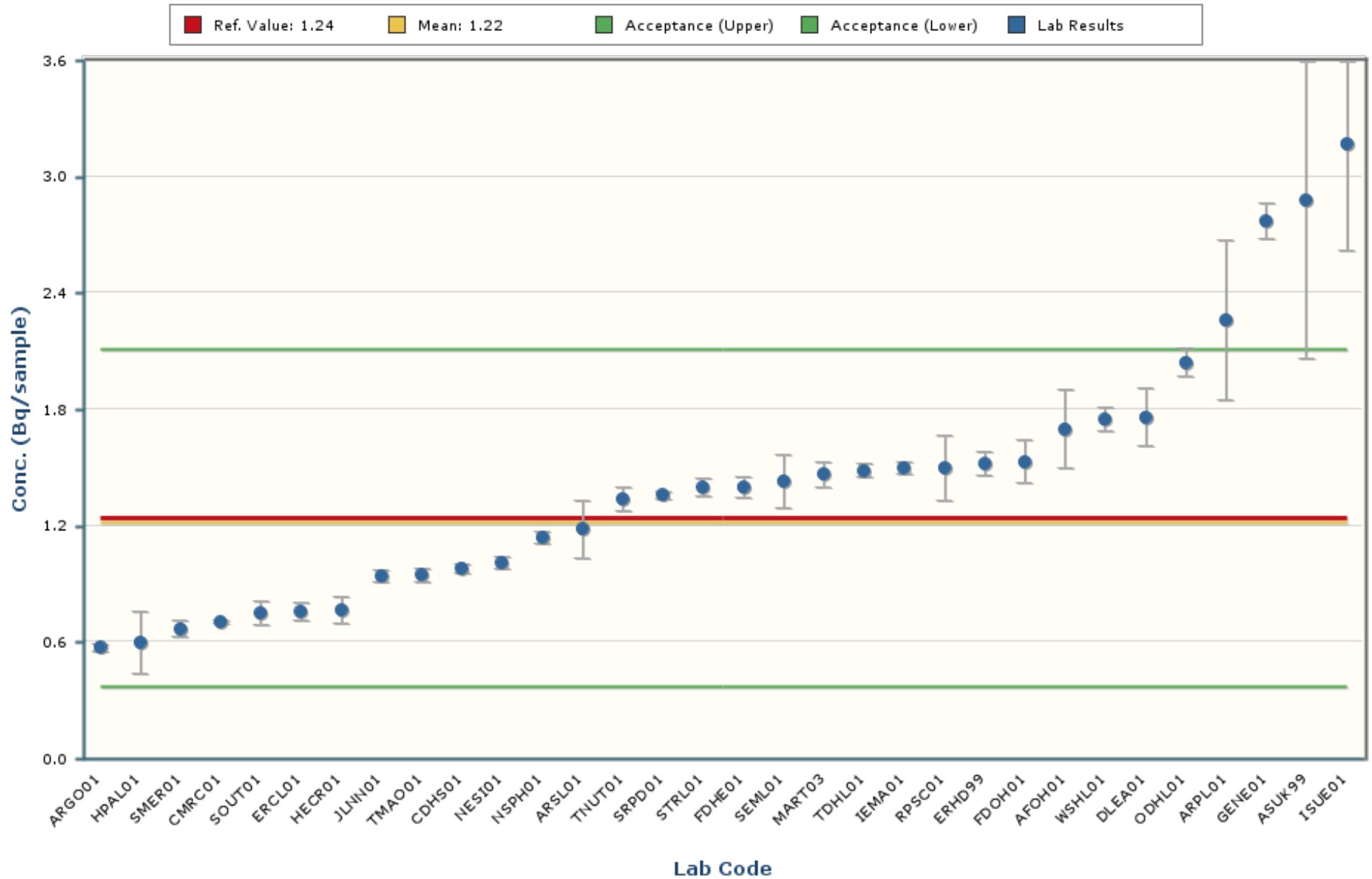
**Uncertainty Flags:**

- NOT ACCEPTABLE.....RP  $< 2\%$
- ACCEPTABLE..... $2\% \leq RP \leq 15\%$
- ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$
- NOT ACCEPTABLE.....RP  $> 30\%$

Relative Precision (RP) = (Reported Uncertainty / Reported Result) x 100

# Gross alpha

## MAPEP-24-GrF50

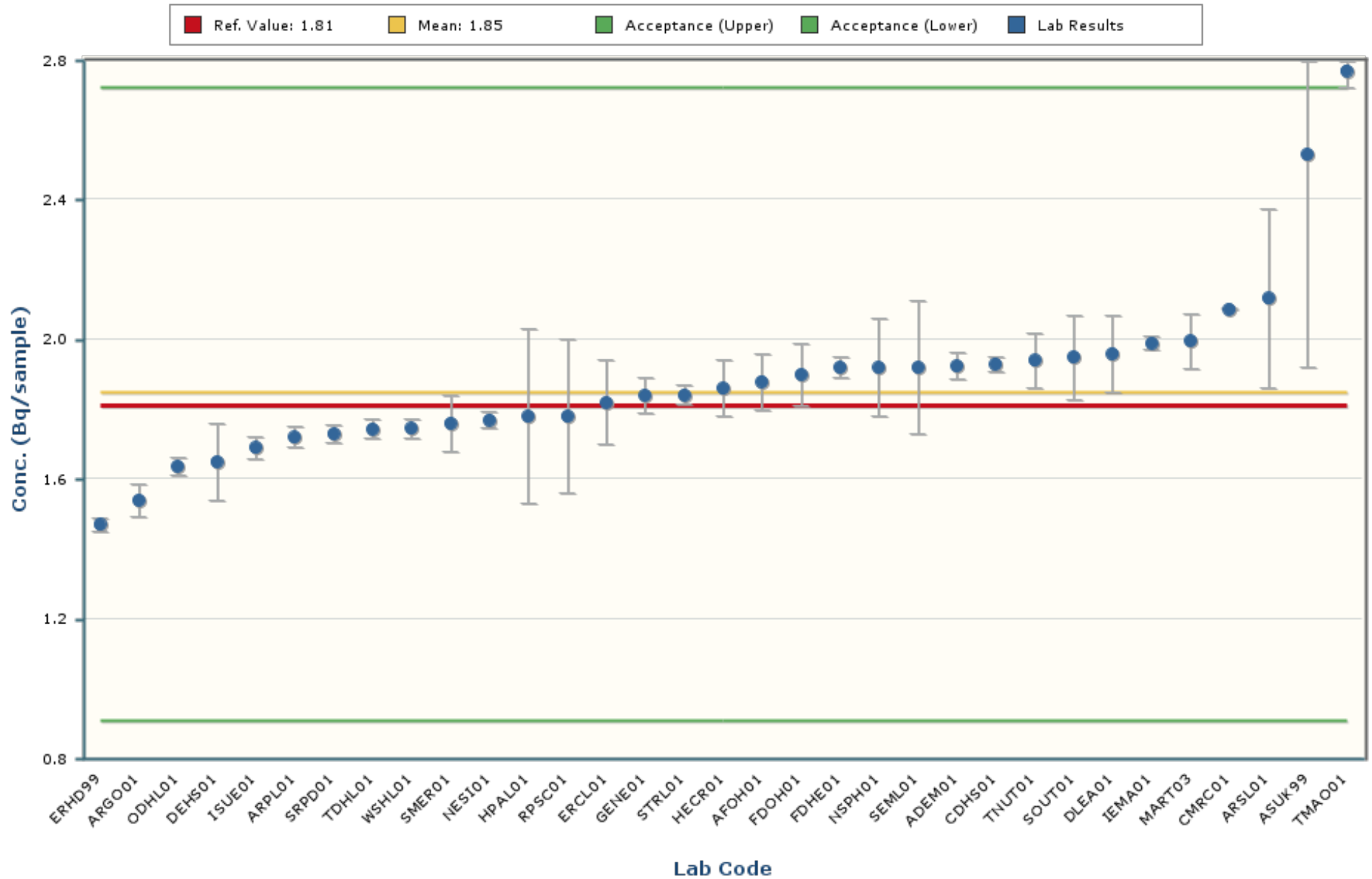


### Notes:

The chart shows only data points with values between -0.79 and 3.23 ( $\pm 5$  Standard Deviations).

# Gross beta

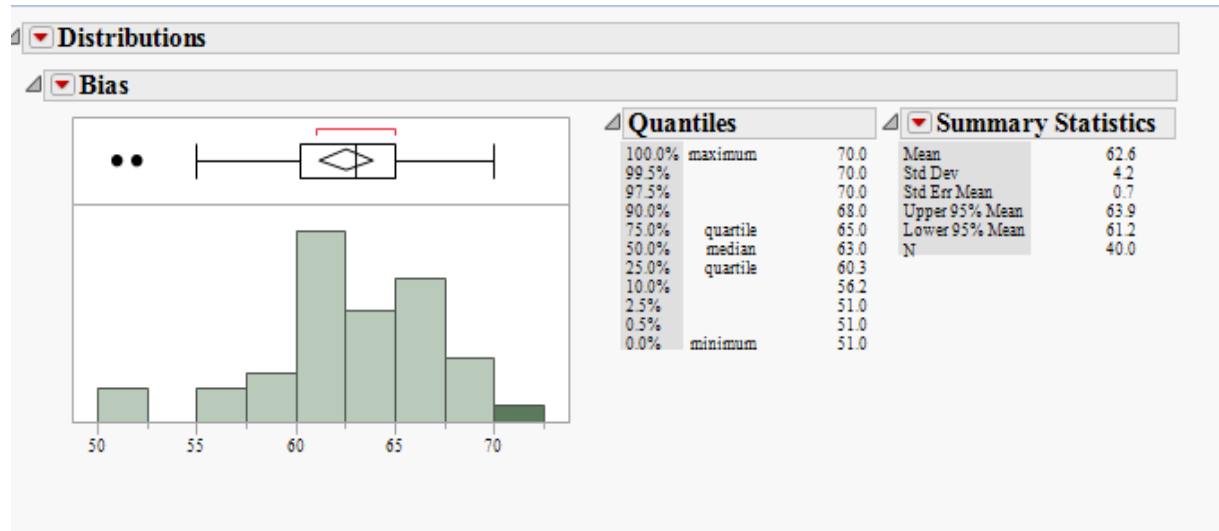
## MAPEP-24-GrF50



### Notes:

The chart shows only data points with values between 0.90 and 2.81 ( $\pm 5$  Standard Deviations).

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.

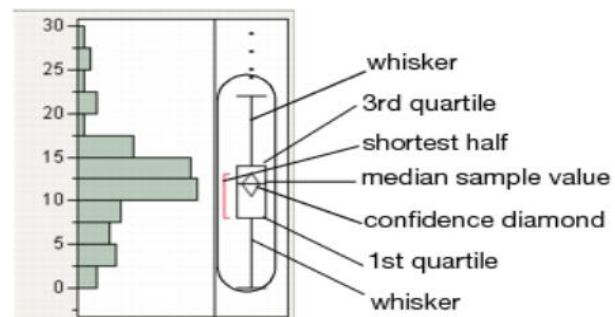


### Outlier Box Plot

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 1<sup>st</sup> and 3<sup>rd</sup> quartile. The difference between the 1<sup>st</sup> and 3<sup>rd</sup> 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)

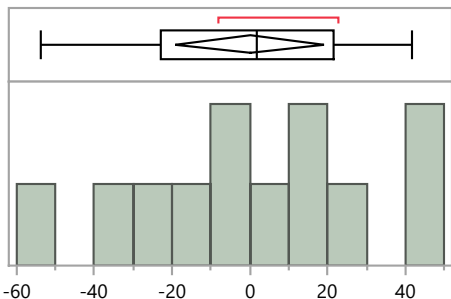


If the data points do not reach the computed ranges, then the whiskers are determined by the upper and lower data point values (not including outliers). The bracket outside of the box identifies the *shortest half*, which is the most dense 50% of the observations (Rousseuw and Leroy 1987).

**GrF50 Distribution by Detection Method**

**Distributions Analyte\_Detection=Gross alpha Gas Flow Proportional Counter**

**Bias**

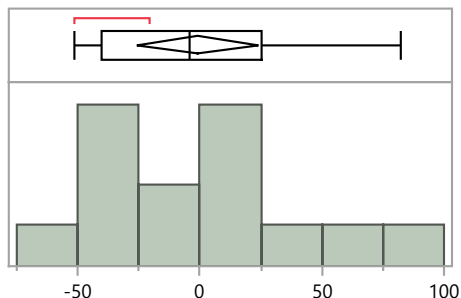


Quantiles		
100.0%	maximum	41.9
99.5%		41.9
97.5%		41.9
90.0%		41.7
75.0%	quartile	21.5
50.0%	median	1.8
25.0%	quartile	-22.8
10.0%		-49.1
2.5%		-53.8
0.5%		-53.8
0.0%	minimum	-53.8

Summary Statistics	
Mean	-0.0
Std Dev	30.1
Std Err Mean	8.7
Upper 95% Mean	19.1
Lower 95% Mean	-19.1
N	12.0

**Distributions Analyte\_Detection=Gross alpha Gross Alpha/Beta - 2 pi gas flow proportional counter**

**Bias**

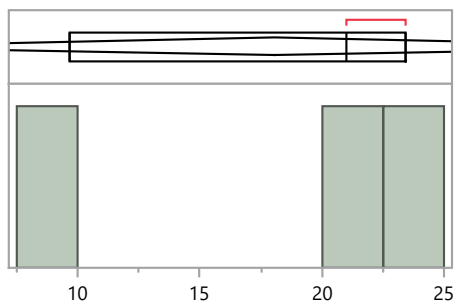


Quantiles		
100.0%	maximum	82.3
99.5%		82.3
97.5%		82.3
90.0%		73.6
75.0%	quartile	25.0
50.0%	median	-4.0
25.0%	quartile	-40.3
10.0%		-48.8
2.5%		-51.6
0.5%		-51.6
0.0%	minimum	-51.6

Summary Statistics	
Mean	-0.9
Std Dev	43.1
Std Err Mean	11.5
Upper 95% Mean	24.0
Lower 95% Mean	-25.8
N	14.0

**Distributions Analyte\_Detection=Gross alpha Liquid Scintillation Counter**

**Bias**



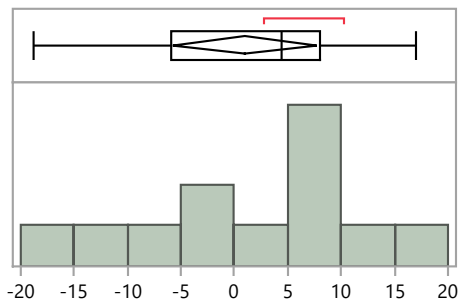
Quantiles		
100.0%	maximum	23.4
99.5%		23.4
97.5%		23.4
90.0%		23.4
75.0%	quartile	23.4
50.0%	median	21.0
25.0%	quartile	9.7
10.0%		9.7
2.5%		9.7
0.5%		9.7
0.0%	minimum	9.7

Summary Statistics	
Mean	18.0
Std Dev	7.3
Std Err Mean	4.2
Upper 95% Mean	36.2
Lower 95% Mean	-0.1
N	3.0

**GrF50 Distribution by Detection Method**

**Distributions Analyte\_Detection=Gross beta Gas Flow Proportional Counter**

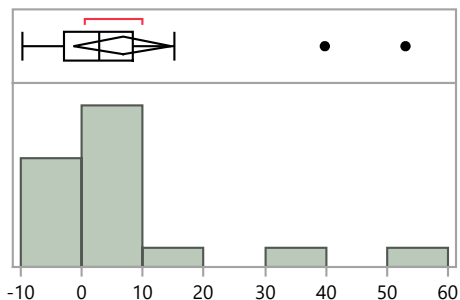
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	17.0	Mean	1.0
99.5%		17.0	Std Dev	10.5
97.5%		17.0	Std Err Mean	3.0
90.0%		15.0	Upper 95% Mean	7.7
75.0%	quartile	8.0	Lower 95% Mean	-5.7
50.0%	median	4.5	N	12.0
25.0%	quartile	-5.9		
10.0%		-17.6		
2.5%		-18.8		
0.5%		-18.8		
0.0%	minimum	-18.8		

**Distributions Analyte\_Detection=Gross beta Gross Alpha/Beta - 2 pi gas flow proportional counter**

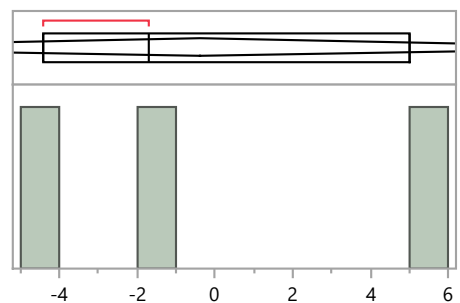
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	53.0	Mean	6.7
99.5%		53.0	Std Dev	16.0
97.5%		53.0	Std Err Mean	3.8
90.0%		41.1	Upper 95% Mean	14.7
75.0%	quartile	8.3	Lower 95% Mean	-1.2
50.0%	median	2.8	N	18.0
25.0%	quartile	-3.0		
10.0%		-8.9		
2.5%		-9.6		
0.5%		-9.6		
0.0%	minimum	-9.6		

**Distributions Analyte\_Detection=Gross beta Liquid Scintillation Counter**

**Bias**

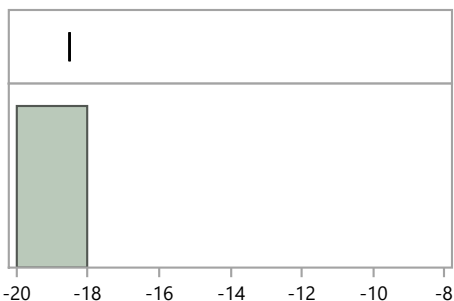


Quantiles			Summary Statistics	
100.0%	maximum	5.0	Mean	-0.4
99.5%		5.0	Std Dev	4.8
97.5%		5.0	Std Err Mean	2.8
90.0%		5.0	Upper 95% Mean	11.7
75.0%	quartile	5.0	Lower 95% Mean	-12.4
50.0%	median	-1.7	N	3.0
25.0%	quartile	-4.4		
10.0%		-4.4		
2.5%		-4.4		
0.5%		-4.4		
0.0%	minimum	-4.4		

**GrF50 Distribution by Preparation Method**

**Distributions Analyte\_Method=Gross alpha Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

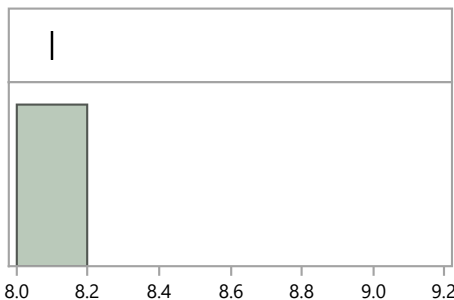
100.0%	maximum	-18.5
99.5%		-18.5
97.5%		-18.5
90.0%		-18.5
75.0%	quartile	-18.5
50.0%	median	-18.5
25.0%	quartile	-18.5
10.0%		-18.5
2.5%		-18.5
0.5%		-18.5
0.0%	minimum	-18.5

**Summary Statistics**

Mean	-18.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Gross alpha Coprecipitation, acidified**

**Bias**



**Quantiles**

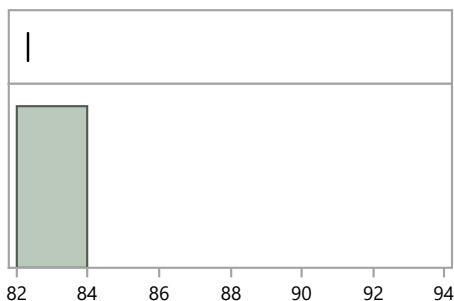
100.0%	maximum	8.1
99.5%		8.1
97.5%		8.1
90.0%		8.1
75.0%	quartile	8.1
50.0%	median	8.1
25.0%	quartile	8.1
10.0%		8.1
2.5%		8.1
0.5%		8.1
0.0%	minimum	8.1

**Summary Statistics**

Mean	8.1
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**Distributions Analyte\_Method=Gross alpha Evaporation, straight**

**Bias**



**Quantiles**

100.0%	maximum	82.3
99.5%		82.3
97.5%		82.3
90.0%		82.3
75.0%	quartile	82.3
50.0%	median	82.3
25.0%	quartile	82.3
10.0%		82.3
2.5%		82.3
0.5%		82.3
0.0%	minimum	82.3

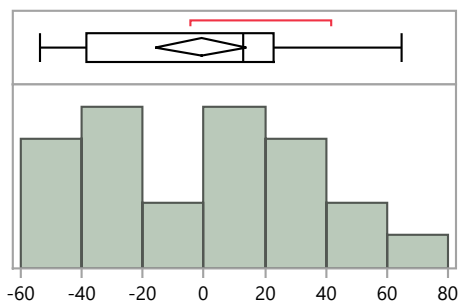
**Summary Statistics**

Mean	82.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

**GrF50 Distribution by Preparation Method**

**Distributions Analyte\_Method=Gross alpha No preparation - analyzed as received**

**Bias**



**Quantiles**

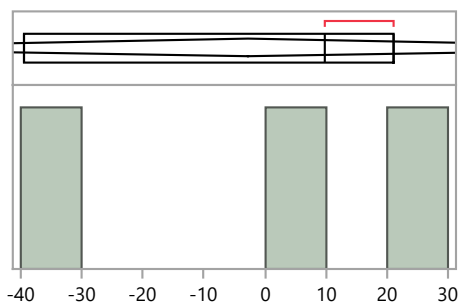
100.0%	maximum	64.8
99.5%		64.8
97.5%		64.8
90.0%		41.6
75.0%	quartile	22.6
50.0%	median	12.8
25.0%	quartile	-38.2
10.0%		-49.4
2.5%		-53.8
0.5%		-53.8
0.0%	minimum	-53.8

**Summary Statistics**

Mean	-1.0
Std Dev	34.3
Std Err Mean	7.2
Upper 95% Mean	13.9
Lower 95% Mean	-15.8
N	23.0

**Distributions Analyte\_Method=Gross alpha Other**

**Bias**



**Quantiles**

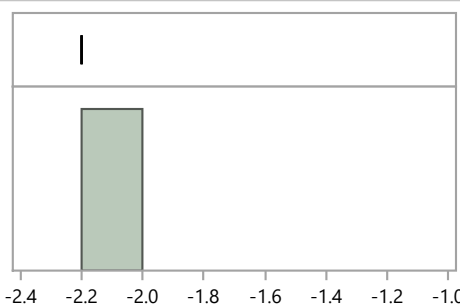
100.0%	maximum	21.0
99.5%		21.0
97.5%		21.0
90.0%		21.0
75.0%	quartile	21.0
50.0%	median	9.7
25.0%	quartile	-39.4
10.0%		-39.4
2.5%		-39.4
0.5%		-39.4
0.0%	minimum	-39.4

**Summary Statistics**

Mean	-2.9
Std Dev	32.1
Std Err Mean	18.5
Upper 95% Mean	76.9
Lower 95% Mean	-82.7
N	3.0

**Distributions Analyte\_Method=Gross beta Acid dissolution with hydrofluoric acid**

**Bias**



**Quantiles**

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

**Summary Statistics**

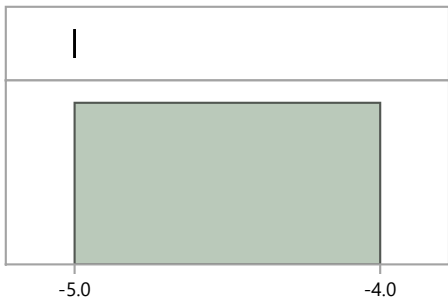
Mean	-2.2
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0



**GrF50 Distribution by Preparation Method**

**Distributions Analyte\_Method=Gross beta Evaporation, straight**

**Bias**

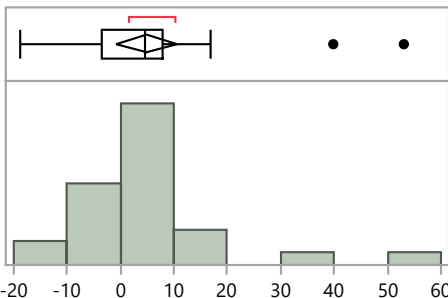


Quantiles		
100.0%	maximum	-5.0
99.5%		-5.0
97.5%		-5.0
90.0%		-5.0
75.0%	quartile	-5.0
50.0%	median	-5.0
25.0%	quartile	-5.0
10.0%		-5.0
2.5%		-5.0
0.5%		-5.0
0.0%	minimum	-5.0

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

**Distributions Analyte\_Method=Gross beta No preparation - analyzed as received**

**Bias**

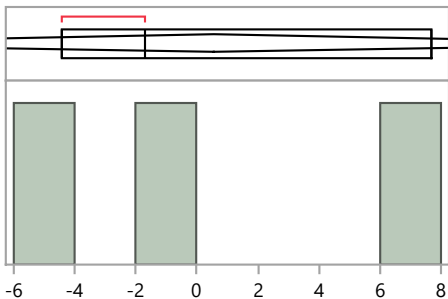


Quantiles		
100.0%	maximum	53.0
99.5%		53.0
97.5%		53.0
90.0%		19.3
75.0%	quartile	8.0
50.0%	median	4.5
25.0%	quartile	-3.4
10.0%		-10.1
2.5%		-18.8
0.5%		-18.8
0.0%	minimum	-18.8

Summary Statistics	
Mean	4.9
Std Dev	14.5
Std Err Mean	2.7
Upper 95% Mean	10.5
Lower 95% Mean	-0.7
N	28.0

**Distributions Analyte\_Method=Gross beta Other**

**Bias**



Quantiles		
100.0%	maximum	7.7
99.5%		7.7
97.5%		7.7
90.0%		7.7
75.0%	quartile	7.7
50.0%	median	-1.7
25.0%	quartile	-4.4
10.0%		-4.4
2.5%		-4.4
0.5%		-4.4
0.0%	minimum	-4.4

Summary Statistics	
Mean	0.5
Std Dev	6.4
Std Err Mean	3.7
Upper 95% Mean	16.3
Lower 95% Mean	-15.2
N	3.0