

## **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.

## GrW46 Participating Laboratories

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
ADEM01	Alabama Department of Environmental Management	GrW
AFOH01	USAFSAM/OEA	GrW
ARGO01	Idaho National Laboratory	GrW
ARPL01	Analytical Support Operations - Radiochemical Processing Lab	GrW
ARSL01	ARS Aleut Analytical, LLC	GrW
AY1201	Consolidated Nuclear Security, LLC, ACO Laboratory	GrW
CDHS01	California Department of Public Health	GrW
CESL01	Lawrence Livermore National Laboratory - EMRL	GrW
CMRC01	Carlsbad Environmental Monitoring and Research Center	GrW
DLEA01	DLE Associates	GrW
ELIW01	Energy Laboratories, Inc.	GrW
ERCL01	Washington State Public Health Laboratories	GrW
ERHD99	National Monitoring Section, Radiation Protection Bureau, Health Canada	GrW
FDHE01	Florida Dept of Health Environmental Laboratory	GrW
GENE01	GEL Laboratories, LLC	GrW
GPCL01	Georgia Power Company Environmental Laboratory	GrW
HCAL01	Lawrence Livermore National Laboratory	GrW
HECR01	SC Dept. Health and Environmental Control Radiological Laboratory	GrW
HPAC99	PHE, CRCE Glasgow	GrW
IEMA01	Illinois Emergency Management Agency Radiochemistry Laboratory	GrW
ISUE01	ISU Environmental Monitoring Laboratory	GrW
ISUP01	ISU - Department of Physics/Health Physics/EAL	GrW
LZCA01	ACZ Laboratories, Inc	GrW
MART03	Radioactive Material Analysis Laboratory	GrW
MNDH01	Minnesota Department of Health, Public Health Lab. Division	GrW
NARL01	National Analytical Radiation Environmental Laboratory	GrW
NESI01	BWXT-Radioisotope & Analytical Chemistry Laboratory	GrW
NJDH01	New Jersey Dept. of Health, ECLS	GrW
ODHL01	Ohio Department of Health Laboratory	GrW
ORIS01	ORISE/IEAV	GrW
RPSC01	Radiation Protection Service	GrW
SEML01	SRS Environmental Monitoring Laboratory	GrW
SMER01	State of Michigan EGLE Radiological Lab	GrW
SOUT01	Southwest Research Institute	GrW
TDHL01	Texas Department of State Health Services Laboratory	GrW
TELE02	ATI Environmental, Inc., Midwest Lab	GrW
TMAO01	EBERLINE Analytical Corporation	GrW
TNUT01	St. Louis USACE FUSRAP Laboratory	GrW
UNEV01	University of Nevada, Reno	GrW
WSHL01	Wisconsin State Laboratory of Hygiene	GrW

## Laboratories Not Reporting

<b>Lab Code</b>	<b>Lab Name</b>	<b>Matrix Code</b>
DEHS01	Department of Environmental Health & Safety	GrW
LAWR01	LAWRENCE BERKELEY NATIONAL LABORATORY	GrW
SRPD01	Sandia National Laboratories, Radiation Protection Sample Diagnostics	GrW

## Study Reference Values

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MAPEP-22-GrW46

*Radiological Reference Date: 02/01/2022*

<b>Analyte</b>	<b>Ref Value</b>	<b>Ref Unc</b>
Radiological	Units: (Bq/L)	
Gross alpha	0.574	0.015
Gross beta	7.25	0.07

## Sample Statistical Summary

MAPEP-22-GrW46

Radiological Reference Date: 02/01/2022

Analyte	T(1)	A(2)	Grand(3) Mean	Std Dev	Ref Value	Ref Unc	Acceptance Range
Radiological							Units: (Bq/L)
Gross alpha	40	36	0.592	0.157	0.574	0.015	0.172 - 0.976
Gross beta	40	40	7.40	0.89	7.25	0.07	3.63 - 10.88

- 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).

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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

## Flag Summary Report

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MAPEP-22-GrW46

### Radiological

Analyte	A	W	RW	N
Gross alpha	36			4
Gross beta	40			



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

Laboratory Results For MAPEP-22-GrW46  
 (ADEM01) Alabama Department of Environmental Management  
 1350 Coliseum Blvd.  
 Montgomery, AL 36110

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	5.4168	0.574	N		843.7	0.172 - 0.976	1	W
Gross beta	7.6109	7.25	A		5.0	3.63 - 10.88	2	W

Radiological Reference Date: February 1, 2022

**Gross Alpha Flags:**

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

*Laboratory Results For MAPEP-22-GrW46*

(AFOH01) USAFSAM/OEA

2510 Fifth Street, Area B

Wright-Patterson AFB, OH 45433-7913

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.77	0.574	A		34.1	0.172 - 0.976	0.10	A
Gross beta	7.50	7.25	A		3.4	3.63 - 10.88	0.19	A

*Radiological Reference Date: February 1, 2022*

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

Laboratory Results For MAPEP-22-GrW46

(ARGO01) Idaho National Laboratory

INL, Materials and Fuels Complex

Idaho Falls, ID 83415

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	1.07	0.574	N		86.4	0.172 - 0.976	0.093	A
Gross beta	7.51	7.25	A		3.6	3.63 - 10.88	0.107	N

Radiological Reference Date: February 1, 2022

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

*Laboratory Results For MAPEP-22-GrW46*

(ARPL01) Analytical Support Operations - Radiochemical Processing Lab

PO Box 999

Richland, WA 99354

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	.467	0.574	A		-18.6	0.172 - 0.976	.055	A
Gross beta	7.08	7.25	A		-2.3	3.63 - 10.88	.22	A

*Radiological Reference Date: February 1, 2022*

**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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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-22-GrW46**

(ARSL01) ARS Aleut Analytical, LLC

2609 North River Road

Port Allen, LA 70767

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.544	0.574	A		-5.2	0.172 - 0.976	0.079	A
Gross beta	6.782	7.25	A		-6.5	3.63 - 10.88	0.811	A

*Radiological Reference Date: February 1, 2022*

**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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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-22-GrW46  
 (AY1201) Consolidated Nuclear Security, LLC, ACO Laboratory  
 Y12, NSC, Bldg. 9995, Rm 142  
 Oak Ridge, TN 37831-8189

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.805	0.574	A		40.2	0.172 - 0.976	0.18	W
Gross beta	7.71	7.25	A		6.3	3.63 - 10.88	0.44	A

Radiological Reference Date: February 1, 2022

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

Laboratory Results For MAPEP-22-GrW46  
 (CDHS01) California Department of Public Health  
 Drinking Water & Radiation Lab.  
 Richmond, CA 94804-6403

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.702	0.574	A		22.3	0.172 - 0.976	0.0512	A
Gross beta	8.02	7.25	A		10.6	3.63 - 10.88	0.0798	N

Radiological Reference Date: February 1, 2022

**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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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-22-GrW46  
 (CESL01) Lawrence Livermore National Laboratory - EMRL  
 7000 East Avenue  
 Livermore, CA 94551

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	3.67E-01	0.574	A		-36.1	0.172 - 0.976	1.07E-01	W
Gross beta	6.03E+00	7.25	A		-16.8	3.63 - 10.88	2.19E-01	A

Radiological Reference Date: February 1, 2022

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

Laboratory Results For MAPEP-22-GrW46  
 (CMRC01) Carlsbad Environmental Monitoring and Research Center  
 1400 University Dr.  
 Carlsbad, NM 88220

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.828	0.574	A		44.3	0.172 - 0.976	0.246	W
Gross beta	7.697	7.25	A		6.2	3.63 - 10.88	0.708	A

Radiological Reference Date: February 1, 2022

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

*Laboratory Results For MAPEP-22-GrW46*

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

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.55	0.574	A		-4.2	0.172 - 0.976	0.10	W
Gross beta	8.28	7.25	A		14.2	3.63 - 10.88	0.26	A

*Radiological Reference Date: February 1, 2022*

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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-22-GrW46

(ELIW01) Energy Laboratories, Inc.

2393 Salt Creek HWY

Casper, Wy 82601

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.9	0.574	A		56.8	0.172 - 0.976	0.1	A
Gross beta	9.2	7.25	A		26.9	3.63 - 10.88	0.45	A

Radiological Reference Date: February 1, 2022

**Gross Alpha Flags:**

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

Laboratory Results For MAPEP-22-GrW46  
 (ERCL01) Washington State Public Health Laboratories  
 1610 N.E. 150th Street  
 Shoreline, WA 98155-9701

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.707	0.574	A		23.2	0.172 - 0.976	0.083	A
Gross beta	7.77	7.25	A		7.2	3.63 - 10.88	0.26	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46**

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

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.433	0.574	A		-24.6	0.172 - 0.976	0.08	W
Gross beta	7.570	7.25	A		4.4	3.63 - 10.88	1.805	W

*Radiological Reference Date: February 1, 2022*

**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-22-GrW46

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

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.474	0.574	A		-17.4	0.172 - 0.976	0.159	N
Gross beta	7.6325	7.25	A		5.3	3.63 - 10.88	0.3345	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46

(GENE01) GEL Laboratories, LLC

2040 Savage Road

Charleston, SC 29407

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.603	0.574	A		5.1	0.172 - 0.976	0.077	A
Gross beta	6.52	7.25	A		-10.1	3.63 - 10.88	0.557	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (GPCL01) Georgia Power Company Environmental Laboratory  
 2480 Maner Road  
 Atlanta, GA 30339

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.59	0.574	A		2.8	0.172 - 0.976	0.11	W
Gross beta	9.1	7.25	A		25.5	3.63 - 10.88	0.62	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (HCAL01) Lawrence Livermore National Laboratory  
 Analytical Services and Instrumentation Analytical Lab  
 Livermore, CA 94550

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.60	0.574	A		4.5	0.172 - 0.976	0.08	A
Gross beta	6.92	7.25	A		-4.6	3.63 - 10.88	0.39	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46**

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

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.588	0.574	A		2.4	0.172 - 0.976	0.136	W
Gross beta	7.14	7.25	A		-1.5	3.63 - 10.88	0.262	A

*Radiological Reference Date: February 1, 2022*

**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-22-GrW46*

(HPAC99) PHE, CRCE Glasgow

155 Hardgate Road

Glasgow, Scotland G51 4LS

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.552	0.574	A		-3.8	0.172 - 0.976	0.087	W
Gross beta	6.684	7.25	A		-7.8	3.63 - 10.88	0.309	A

*Radiological Reference Date: February 1, 2022*

**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-22-GrW46

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

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.360	0.574	A		-37.3	0.172 - 0.976	0.043	A
Gross beta	7.650	7.25	A		5.5	3.63 - 10.88	0.097	N

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (ISUE01) ISU Environmental Monitoring Laboratory  
 785 5th 8th Ave Rm B107  
 Pocatello, Idaho 83209

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.57	0.574	A		-0.7	0.172 - 0.976	0.04	A
Gross beta	9.1	7.25	A		25.5	3.63 - 10.88	0.07	N

Radiological Reference Date: February 1, 2022

**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-22-GrW46**

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

785 S. 8th Ave, Rm 120

Pocatello, ID 83209-8106

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.31	0.574	A		-46.0	0.172 - 0.976	0.03	A
Gross beta	4.82	7.25	A		-33.5	3.63 - 10.88	0.30	A

*Radiological Reference Date: February 1, 2022*

**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-22-GrW46

(LZCA01) ACZ Laboratories, Inc  
 2273 Downhill Drive  
 Steamboat Springs, CO 80487

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.477	0.574	A		-16.9	0.172 - 0.976	0.134	W
Gross beta	7.71	7.25	A		6.3	3.63 - 10.88	0.295	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (MART03) Radioactive Material Analysis Laboratory  
 ORNL  
 Oak Ridge, TN 37830

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.547	0.574	A		-4.7	0.172 - 0.976	0.049	A
Gross beta	7.35	7.25	A		1.4	3.63 - 10.88	0.14	N

Radiological Reference Date: February 1, 2022

**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-22-GrW46**

(MNDH01) Minnesota Department of Health, Public Health Lab. Division  
 601 Robert St. N.  
 St. Paul, MN 55155

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.61605	0.574	A		7.3	0.172 - 0.976	0.16021	W
Gross beta	5.82972	7.25	A		-19.6	3.63 - 10.88	0.2072	A

*Radiological Reference Date: February 1, 2022*

**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-22-GrW46*

(NARL01) National Analytical Radiation Environmental Laboratory  
 540 S. Morris Ave.  
 Montgomery, AL 36115-2601

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.641	0.574	A		11.7	0.172 - 0.976	0.139	W
Gross beta	7.80	7.25	A		7.6	3.63 - 10.88	0.424	A

*Radiological Reference Date: February 1, 2022*

**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-22-GrW46  
 (NESI01) BWXT-Radioisotope & Analytical Chemistry Laboratory  
 Lynchburg Technology Center  
 Lynchburg, VA 24504-5447

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.619	0.574	A		7.8	0.172 - 0.976	0.041	A
Gross beta	7.06	7.25	A		-2.6	3.63 - 10.88	0.089	N

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (NJDH01) New Jersey Dept. of Health, ECLS  
 3 Schwarzkopf Drive  
 Ewing, NJ 08628

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.577	0.574	A		0.5	0.172 - 0.976	0.045	A
Gross beta	7.51	7.25	A		3.6	3.63 - 10.88	0.27	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (ODHL01) Ohio Department of Health Laboratory  
 8995 E Main Street  
 Reynoldsburg, OH 43068

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.43	0.574	A		-25.1	0.172 - 0.976	0.07	W
Gross beta	6.91	7.25	A		-4.7	3.63 - 10.88	0.27	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46

(ORIS01) ORISE/IEAV  
 1299 Bethel Valley Road SC-10  
 Oak Ridge, TN 37830

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.681	0.574	A		18.6	0.172 - 0.976	0.053	A
Gross beta	7.448	7.25	A		2.7	3.63 - 10.88	0.092	N

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (RPSC01) Radiation Protection Service  
 Ontario Ministry of Labour, Training And Skills Development  
 Toronto, Ontario M9P 3T1

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.90	0.574	A		56.8	0.172 - 0.976	0.4	N
Gross beta	6.20	7.25	A		-14.5	3.63 - 10.88	2.0	N

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (SEML01) SRS Environmental Monitoring Laboratory  
 Bldg 735-B  
 Aiken, SC 29808

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.599	0.574	A		4.4	0.172 - 0.976	0.083	A
Gross beta	7.41	7.25	A		2.2	3.63 - 10.88	0.22	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (SMER01) State of Michigan EGLE Radiological Lab  
 815 Filley St.  
 Lansing, MI 48906

Radiological						Units: (Bq/L)		
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.99	0.574	N		72.5	0.172 - 0.976	0.2	W
Gross beta	7.84	7.25	A		8.1	3.63 - 10.88	0.3	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46**

(SOUT01) Southwest Research Institute

6220 Culebra Rd.

San Antonio, TX 78228-0510

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.900	0.574	A		56.8	0.172 - 0.976	0.637	N
Gross beta	9.41	7.25	A		29.8	3.63 - 10.88	1.79	W

*Radiological Reference Date: February 1, 2022*

**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-22-GrW46  
 (TDHL01) Texas Department of State Health Services Laboratory  
 1100 W 49th Street  
 Austin, TX 78756

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.655	0.574	A		14.1	0.172 - 0.976	0.056	A
Gross beta	7.15	7.25	A		-1.4	3.63 - 10.88	0.16	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (TELE02) ATI Environmental, Inc., Midwest Lab  
 700 Landwehr Road  
 Northbrook, IL 60062-

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.34	0.574	A		-40.8	0.172 - 0.976	0.04	A
Gross beta	6.61	7.25	A		-8.8	3.63 - 10.88	0.09	N

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (TMAO01) EBERLINE Analytical Corporation  
 601 A SCARBORO RD  
 OAK RIDGE, TN 37830-

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.369	0.574	A		-35.7	0.172 - 0.976	0.138	N
Gross beta	7.510	7.25	A		3.6	3.63 - 10.88	0.242	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46  
 (TNUT01) St. Louis USACE FUSRAP Laboratory  
 112 James S McDonnell Blvd  
 HAZELWOOD, MO 63042

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.07217	0.574	N		-87.4	0.172 - 0.976	0.1448	N
Gross beta	7.3006	7.25	A		0.7	3.63 - 10.88	0.2201	A

Radiological Reference Date: February 1, 2022

**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-22-GrW46**

(UNEV01) University of Nevada, Reno  
 1664 North Virginia St, MS 328  
 Reno, NV 89557

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.5965	0.574	A		3.9	0.172 - 0.976	0.0057	N
Gross beta	7.1018	7.25	A		-2.0	3.63 - 10.88	0.0222	N

*Radiological Reference Date: February 1, 2022*

**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-22-GrW46  
 (WSHL01) Wisconsin State Laboratory of Hygiene  
 2601 Agriculture Drive  
 Madison, WI 53718

Radiological							Units: (Bq/L)	
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Gross alpha	0.643	0.574	A		12.0	0.172 - 0.976	0.050	A
Gross beta	7.539	7.25	A		4.0	3.63 - 10.88	0.106	N

Radiological Reference Date: February 1, 2022

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

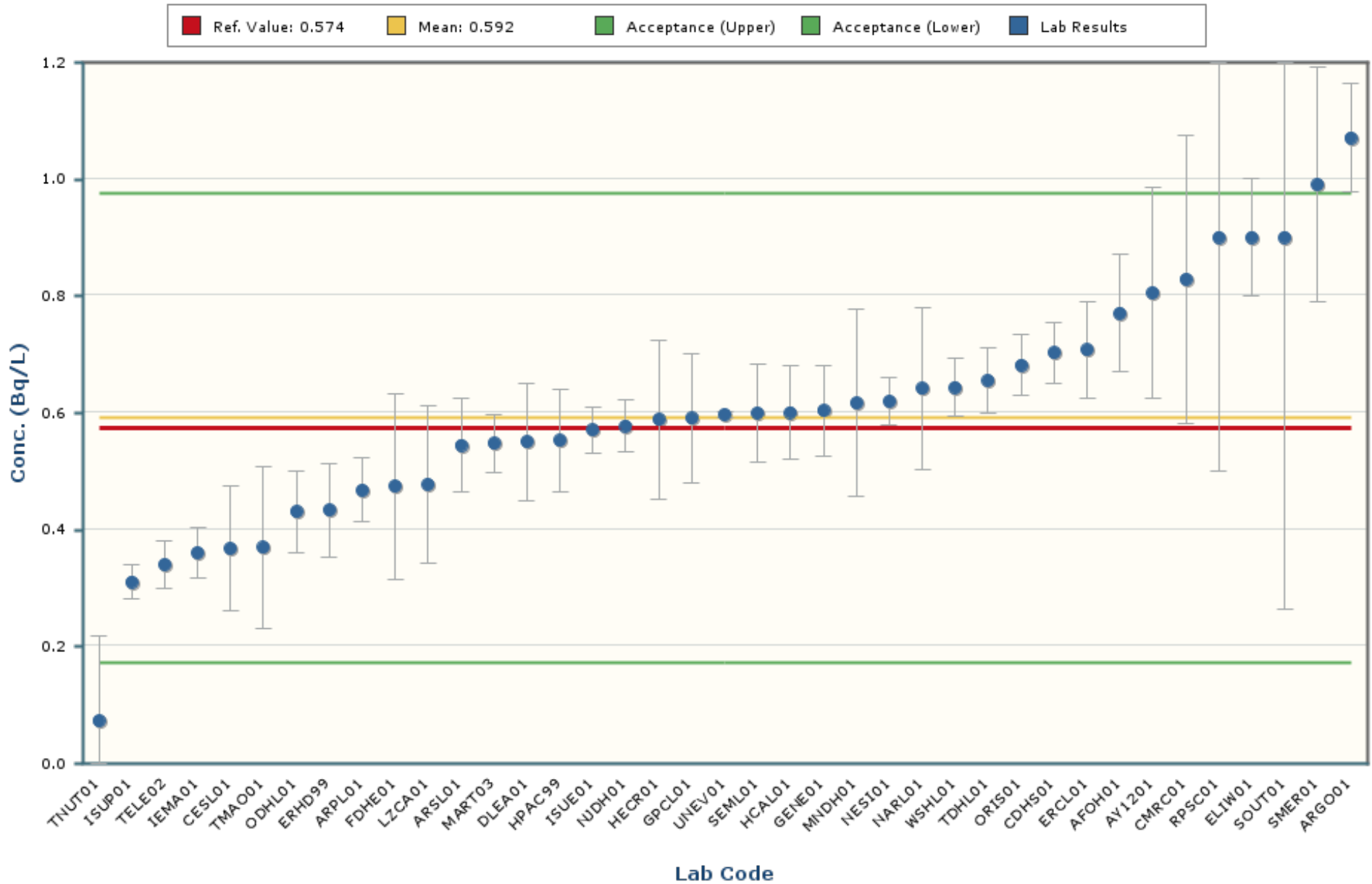
ACCEPTABLE WITH WARNING..... $15\% < RP \leq 30\%$

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

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

# Gross alpha

MAPEP-22-GrW46

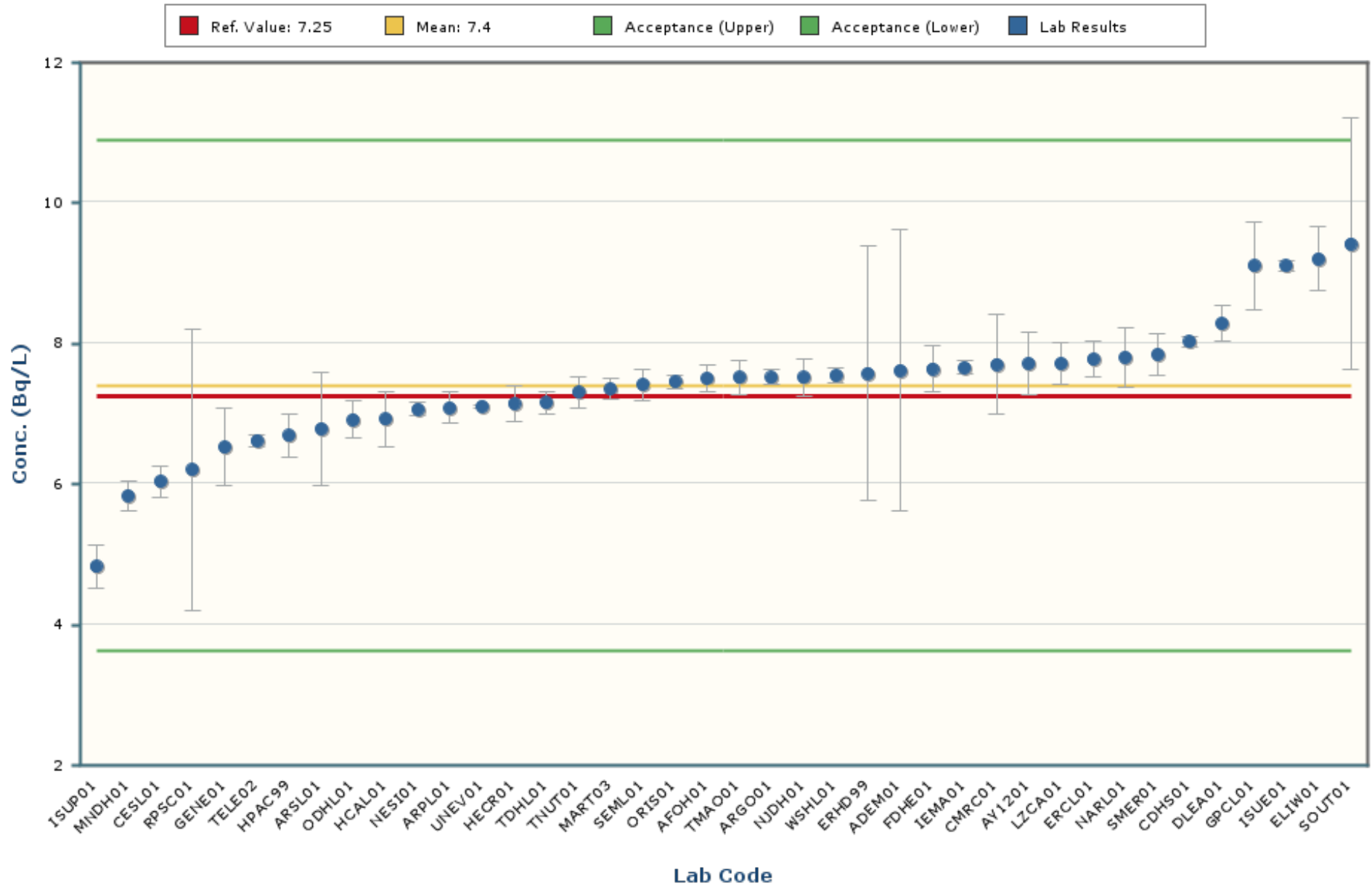


Notes:

The chart shows only data points with values between -0.192 and 1.376 ( $\pm 5$  Standard Deviations).

# Gross beta

## MAPEP-22-GrW46

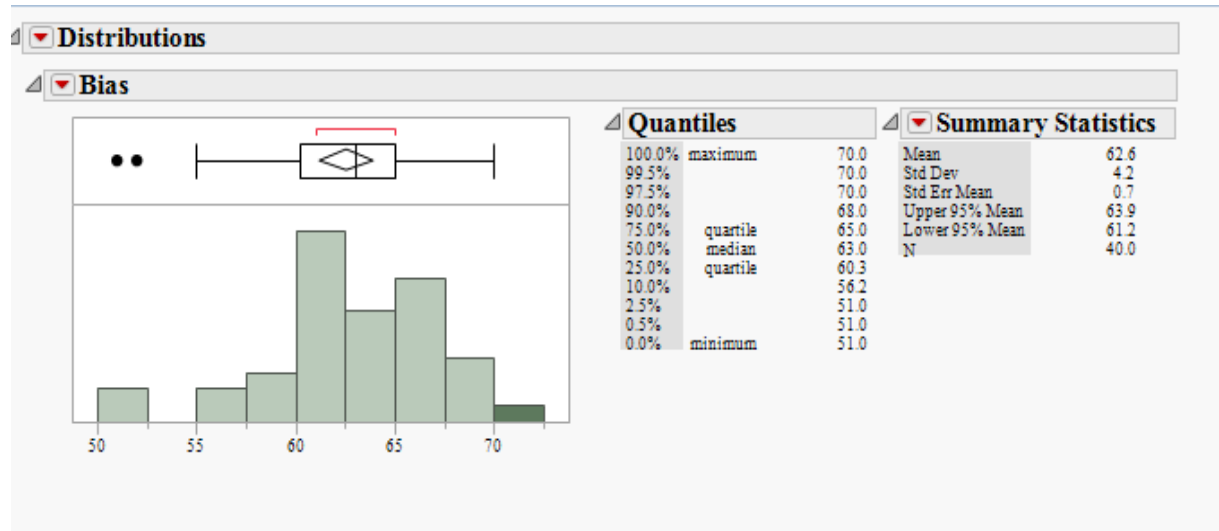


### Notes:

The chart shows only data points with values between 2.95 and 11.85 ( $\pm 5$  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.

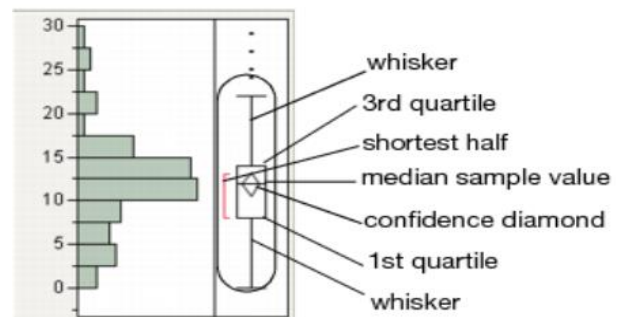


### Outlier Box Plot

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)

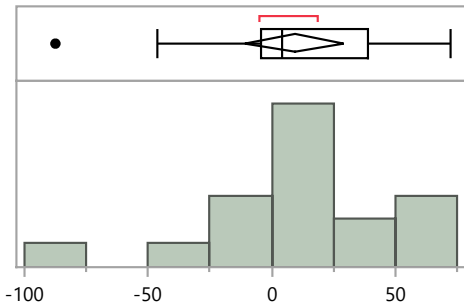


If the data points do not reach the computed ranges, then the whiskers are determined by the upper and lower data point values (not including outliers). The bracket outside of the box identifies the *shortest half*, which is the most dense 50% of the observations (Rousseuw and Leroy 1987).

**GrW Distribution by Detection Method**

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

**Bias**



**Quantiles**

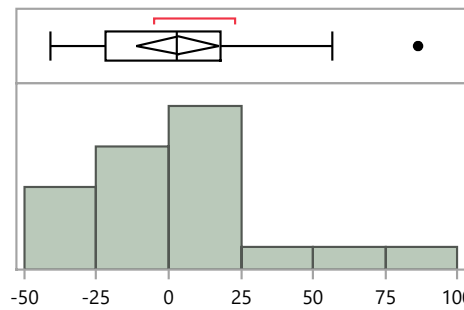
100.0%	maximum	72.5
99.5%		72.5
97.5%		72.5
90.0%		59.9
75.0%	quartile	39.2
50.0%	median	4.4
25.0%	quartile	-4.3
10.0%		-54.3
2.5%		-87.4
0.5%		-87.4
0.0%	minimum	-87.4

**Summary Statistics**

Mean	9.1
Std Dev	38.8
Std Err Mean	9.4
Upper 95% Mean	29.1
Lower 95% Mean	-10.8
N	17.0

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

**Bias**



**Quantiles**

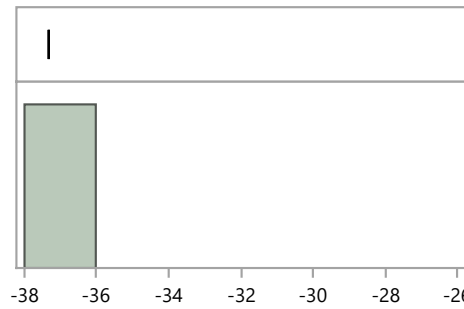
100.0%	maximum	86.4
99.5%		86.4
97.5%		86.4
90.0%		53.5
75.0%	quartile	18.2
50.0%	median	2.8
25.0%	quartile	-21.6
10.0%		-36.0
2.5%		-40.8
0.5%		-40.8
0.0%	minimum	-40.8

**Summary Statistics**

Mean	3.1
Std Dev	31.4
Std Err Mean	6.9
Upper 95% Mean	17.4
Lower 95% Mean	-11.2
N	21.0

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

**Bias**



**Quantiles**

100.0%	maximum	-37.3
99.5%		-37.3
97.5%		-37.3
90.0%		-37.3
75.0%	quartile	-37.3
50.0%	median	-37.3
25.0%	quartile	-37.3
10.0%		-37.3
2.5%		-37.3
0.5%		-37.3
0.0%	minimum	-37.3

**Summary Statistics**

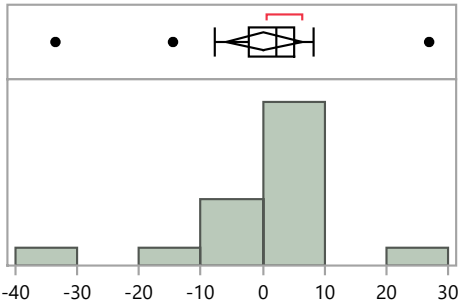
Mean	-37.3
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

GrW46 Distribution by Detection Method

**GrW Distribution by Detection Method**

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

**Bias**



**Quantiles**

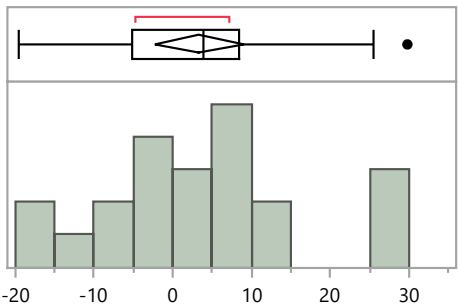
100.0%	maximum	26.9
99.5%		26.9
97.5%		26.9
90.0%		11.9
75.0%	quartile	5.1
50.0%	median	2.2
25.0%	quartile	-2.3
10.0%		-18.3
2.5%		-33.5
0.5%		-33.5
0.0%	minimum	-33.5

**Summary Statistics**

Mean	0.2
Std Dev	12.1
Std Err Mean	2.9
Upper 95% Mean	6.4
Lower 95% Mean	-6.0
N	17.0

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

**Bias**



**Quantiles**

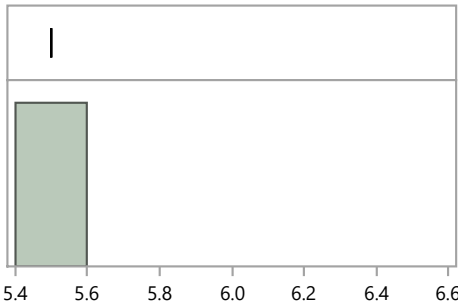
100.0%	maximum	29.8
99.5%		29.8
97.5%		29.8
90.0%		25.5
75.0%	quartile	8.4
50.0%	median	4.0
25.0%	quartile	-5.2
10.0%		-14.8
2.5%		-19.6
0.5%		-19.6
0.0%	minimum	-19.6

**Summary Statistics**

Mean	3.4
Std Dev	12.8
Std Err Mean	2.7
Upper 95% Mean	9.0
Lower 95% Mean	-2.3
N	22.0

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

**Bias**



**Quantiles**

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

**Summary Statistics**

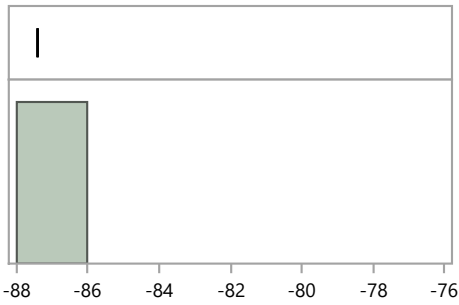
Mean	5.5
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0

GrW46 Distribution by Preparation Method

**GrW Distribution by Prep Method**

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

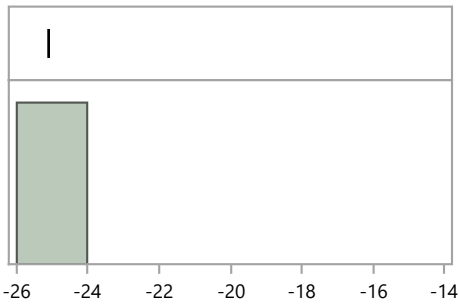
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	-87.4	Mean	-87.4
99.5%		-87.4	Std Dev	.
97.5%		-87.4	Std Err Mean	.
90.0%		-87.4	Upper 95% Mean	.
75.0%	quartile	-87.4	Lower 95% Mean	.
50.0%	median	-87.4	N	1.0
25.0%	quartile	-87.4		
10.0%		-87.4		
2.5%		-87.4		
0.5%		-87.4		
0.0%	minimum	-87.4		

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

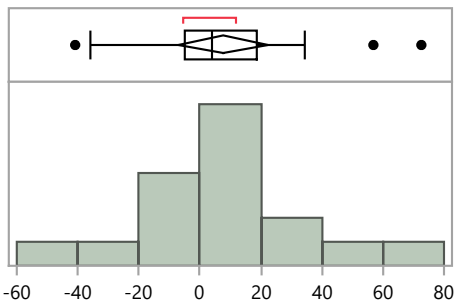
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	-25.1	Mean	-25.1
99.5%		-25.1	Std Dev	.
97.5%		-25.1	Std Err Mean	.
90.0%		-25.1	Upper 95% Mean	.
75.0%	quartile	-25.1	Lower 95% Mean	.
50.0%	median	-25.1	N	1.0
25.0%	quartile	-25.1		
10.0%		-25.1		
2.5%		-25.1		
0.5%		-25.1		
0.0%	minimum	-25.1		

**Distributions Analyte\_Method=Gross alpha EPA 900, Radioactivity, Gross Alpha/Beta Screening, 600/4-80-032**

**Bias**



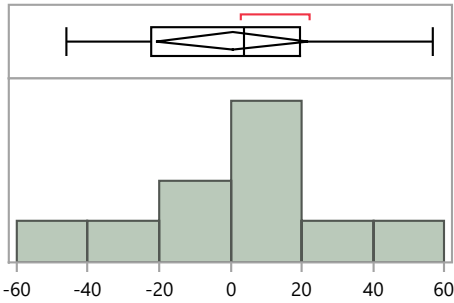
Quantiles			Summary Statistics	
100.0%	maximum	72.5	Mean	7.5
99.5%		72.5	Std Dev	28.4
97.5%		72.5	Std Err Mean	6.9
90.0%		59.9	Upper 95% Mean	22.2
75.0%	quartile	18.7	Lower 95% Mean	-7.1
50.0%	median	3.9	N	17.0
25.0%	quartile	-4.7		
10.0%		-36.7		
2.5%		-40.8		
0.5%		-40.8		
0.0%	minimum	-40.8		

GrW46 Distribution by Preparation Method

**GrW Distribution by Prep Method**

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

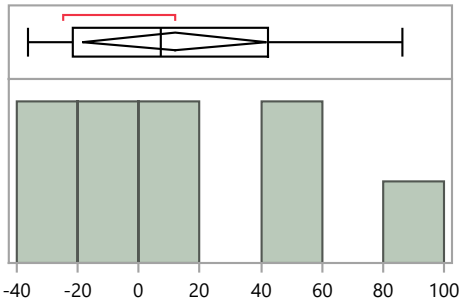
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	56.8	Mean	0.5
99.5%		56.8	Std Dev	29.7
97.5%		56.8	Std Err Mean	9.4
90.0%		53.4	Upper 95% Mean	21.7
75.0%	quartile	19.5	Lower 95% Mean	-20.8
50.0%	median	3.6	N	10.0
25.0%	quartile	-22.4		
10.0%		-45.1		
2.5%		-46.0		
0.5%		-46.0		
0.0%	minimum	-46.0		

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

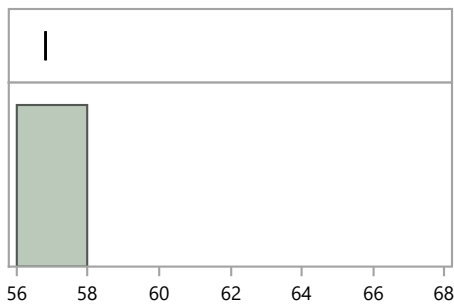
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	86.4	Mean	11.9
99.5%		86.4	Std Dev	39.1
97.5%		86.4	Std Err Mean	13.0
90.0%		86.4	Upper 95% Mean	41.9
75.0%	quartile	42.3	Lower 95% Mean	-18.2
50.0%	median	7.3	N	9.0
25.0%	quartile	-21.6		
10.0%		-36.1		
2.5%		-36.1		
0.5%		-36.1		
0.0%	minimum	-36.1		

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

**Bias**



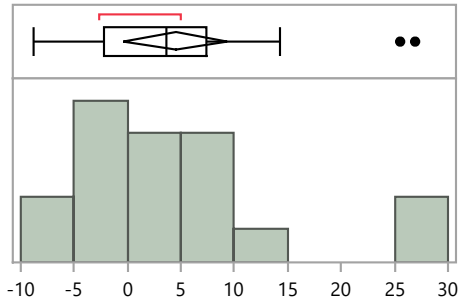
Quantiles			Summary Statistics	
100.0%	maximum	56.8	Mean	56.8
99.5%		56.8	Std Dev	.
97.5%		56.8	Std Err Mean	.
90.0%		56.8	Upper 95% Mean	.
75.0%	quartile	56.8	Lower 95% Mean	.
50.0%	median	56.8	N	1.0
25.0%	quartile	56.8		
10.0%		56.8		
2.5%		56.8		
0.5%		56.8		
0.0%	minimum	56.8		

GrW46 Distribution by Preparation Method

**GrW Distribution by Prep Method**

**Distributions Analyte\_Method=Gross beta EPA 900, Radioactivity, Gross Alpha/Beta Screening, 600/4-80-032**

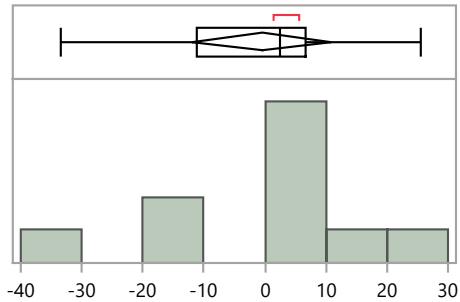
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	26.9	Mean	4.5
99.5%		26.9	Std Dev	9.7
97.5%		26.9	Std Err Mean	2.3
90.0%		25.6	Upper 95% Mean	9.3
75.0%	quartile	7.4	Lower 95% Mean	-0.4
50.0%	median	3.6	N	18.0
25.0%	quartile	-2.2		
10.0%		-6.7		
2.5%		-8.8		
0.5%		-8.8		
0.0%	minimum	-8.8		

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

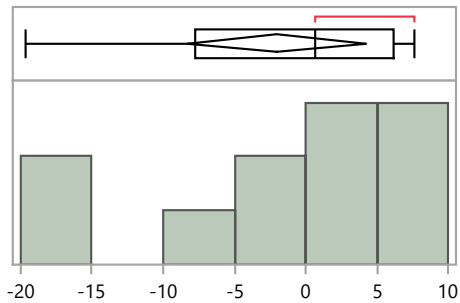
**Bias**



Quantiles			Summary Statistics	
100.0%	maximum	25.5	Mean	-0.5
99.5%		25.5	Std Dev	15.9
97.5%		25.5	Std Err Mean	5.0
90.0%		24.0	Upper 95% Mean	10.9
75.0%	quartile	6.8	Lower 95% Mean	-11.8
50.0%	median	2.5	N	10.0
25.0%	quartile	-11.2		
10.0%		-31.6		
2.5%		-33.5		
0.5%		-33.5		
0.0%	minimum	-33.5		

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

**Bias**



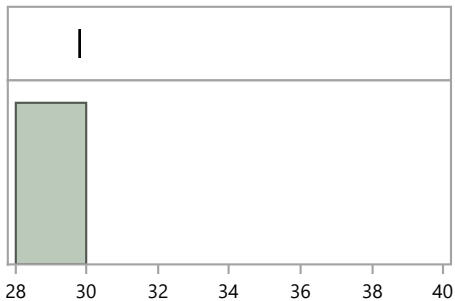
Quantiles			Summary Statistics	
100.0%	maximum	7.6	Mean	-2.0
99.5%		7.6	Std Dev	9.4
97.5%		7.6	Std Err Mean	2.8
90.0%		7.3	Upper 95% Mean	4.3
75.0%	quartile	6.2	Lower 95% Mean	-8.3
50.0%	median	0.7	N	11.0
25.0%	quartile	-7.8		
10.0%		-19.0		
2.5%		-19.6		
0.5%		-19.6		
0.0%	minimum	-19.6		

GrW46 Distribution by Preparation Method

**GrW Distribution by Prep Method**

Distributions Analyte\_Method=Gross beta Other

**Bias**



**Quantiles**

100.0%	maximum	29.8
99.5%		29.8
97.5%		29.8
90.0%		29.8
75.0%	quartile	29.8
50.0%	median	29.8
25.0%	quartile	29.8
10.0%		29.8
2.5%		29.8
0.5%		29.8
0.0%	minimum	29.8

**Summary Statistics**

Mean	29.8
Std Dev	.
Std Err Mean	.
Upper 95% Mean	.
Lower 95% Mean	.
N	1.0