

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: December 28, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.1.1
 Sample ID: 386429010
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 30-NOV-15
 Collector: Client
 Moisture: 35.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		35.5						percent	CXC1	12/01/15	1152	1527019		1
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.233	+/-0.337	0.587	0.271	+/-0.355		pCi/g	RXF2	12/24/15	0637	1528025		2
Animony-125	U	-0.0034	+/-0.162	0.303	0.140	+/-0.162		pCi/g						
Bismuth-212	UI	0.00	+/-0.810	1.96	0.888	+/-1.13		pCi/g						
Bismuth-214		0.804	+/-0.236	0.182	0.0798	+/-0.246		pCi/g						
Cesium-137		1.66	+/-0.213	0.107	0.0471	+/-0.252	0.100	pCi/g						
Cobalt-60	U	-0.0244	+/-0.0723	0.134	0.056	+/-0.0732		pCi/g						
Europium-154	U	-0.0376	+/-0.171	0.331	0.136	+/-0.172		pCi/g						
Lead-212		1.18	+/-0.138	0.111	0.0508	+/-0.190		pCi/g						
Lead-214		0.919	+/-0.206	0.216	0.0998	+/-0.221		pCi/g						
Potassium-40		12.8	+/-2.38	1.44	0.611	+/-2.65		pCi/g						
Protactinium-231	UI	0.00	+/-0.953	1.20	0.555	+/-1.00		pCi/g						
Radium-226		0.804	+/-0.236	0.182	0.0798	+/-0.246		pCi/g						
Radium-228	UI	0.00	+/-0.597	0.875	0.408	+/-0.781		pCi/g						
Thallium-208		0.370	+/-0.104	0.114	0.0511	+/-0.109		pCi/g						
Tin-126	U	0.023	+/-0.123	0.125	0.0594	+/-0.124		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFP, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		11.5	+/-3.58	3.88	1.64	+/-4.22	4.00	pCi/g	JXB7	12/17/15	0848	1531239		3
Beta		22.3	+/-2.94	2.49	1.13	+/-4.31	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/01/15	1152	1527019

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4 5 2 3/Ga-01-R
3	EPA 900 0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.1.1
Sample ID: 386429010

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test												Batch ID	Recovery%	Acceptable Limits

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: March 9, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.A.R.1.2
 Sample ID: 392057015
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 25-FEB-16
 Collector: Client
 Moisture: 25.8%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gamma with Ingrowth "Dry Weight Corrected"

Actinium-227	U	0.031	+/-0.282	0.521	0.245	+/-0.282		pCi/g		MXR1	03/07/16	1207	1547922	1
Antimony-125	UI	0.00	+/-0.121	0.251	0.117	+/-0.142		pCi/g						
Bismuth-212	UI	0.00	+/-1.04	1.46	0.677	+/-1.17		pCi/g						
Bismuth-214		0.828	+/-0.208	0.160	0.0734	+/-0.220		pCi/g						
Cesium-137		0.725	+/-0.103	0.0804	0.0364	+/-0.120	0.100	pCi/g						
Cobalt-60	U	-0.0328	+/-0.0457	0.0784	0.033	+/-0.0481		pCi/g						
Europium-154	U	-0.0377	+/-0.155	0.287	0.127	+/-0.156		pCi/g						
Lead-212		1.12	+/-0.143	0.109	0.0512	+/-0.197		pCi/g						
Lead-214		0.967	+/-0.196	0.321	0.155	+/-0.212		pCi/g						
Potassium-40		14.2	+/-1.70	0.854	0.366	+/-2.19		pCi/g						
Protactinium-231	UI	0.00	+/-0.797	0.872	0.405	+/-0.850		pCi/g						
Radium-226		0.828	+/-0.208	0.160	0.0734	+/-0.220		pCi/g						
Radium-228		0.906	+/-0.392	0.335	0.151	+/-0.409		pCi/g						
Thallium-208		0.315	+/-0.0797	0.078	0.0356	+/-0.0841		pCi/g						
Tin-126	UI	0.00	+/-0.0797	0.0833	0.0395	+/-0.084		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Gross A.B. solid "Dry Weight Corrected"

Alpha		15.0	+/-4.66	3.83	1.50	+/-5.79	4.00	pCi/g		BXF1	03/05/16	1618	1549866	2
Beta		31.9	+/-3.80	2.44	1.06	+/-5.83	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/26/16	1436	1547873

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300.4.5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Report Date: March 9, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3.A.R.1.2
Sample ID: 392057015

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test												Batch ID	Recovery%	Acceptable Limits

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Report Date: December 28, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.1.4
 Sample ID: 386429011
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 30-NOV-15
 Collector: Client
 Moisture: 24.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Gravimetric Solids

ASTM D 2216 % Moisture "As Received"

Moisture		24.3						percent		CXC1	12/01/15	1152	1527019	1
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Rad Gamma Spec Analysis

Gammascpec. Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	-0.0917	+/-0.312	0.574	0.268	+/-0.315		pCi/g		RXF2	12/24/15	0637	1528025	2
Antimony-125	U	0.0848	+/-0.113	0.227	0.104	+/-0.120		pCi/g						
Bismuth-212	UI	0.00	+/-1.08	1.56	0.717	+/-1.17		pCi/g						
Bismuth-214		0.880	+/-0.180	0.152	0.0682	+/-0.196		pCi/g						
Cesium-137	UI	0.00	+/-0.0591	0.0741	0.0327	+/-0.0593	0.100	pCi/g						
Cobalt-60	U	-0.0424	+/-0.0483	0.0809	0.0335	+/-0.052		pCi/g						
Europium-154	U	0.116	+/-0.146	0.320	0.141	+/-0.155		pCi/g						
Lead-212		1.21	+/-0.144	0.119	0.0555	+/-0.174		pCi/g						
Lead-214		1.09	+/-0.232	0.177	0.0817	+/-0.250		pCi/g						
Potassium-40		17.1	+/-1.87	0.928	0.394	+/-2.36		pCi/g						
Protactinium-231	UI	0.00	+/-0.968	1.06	0.489	+/-0.988		pCi/g						
Radium-226		0.880	+/-0.180	0.152	0.0682	+/-0.196		pCi/g						
Radium-228		0.931	+/-0.368	0.324	0.143	+/-0.392		pCi/g						
Thallium-208		0.397	+/-0.0824	0.0837	0.0378	+/-0.0896		pCi/g						
Tin-126	UI	0.00	+/-0.138	0.167	0.0787	+/-0.140		pCi/g						

Rad Gas Flow Proportional Counting

GFPC. Gross A/B. solid "Dry Weight Corrected"

Alpha		10.6	+/-3.43	3.90	1.67	+/-4.02	4.00	pCi/g		JXB7	12/17/15	0844	1531239	3
Beta		23.5	+/-3.04	2.78	1.28	+/-4.48	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/01/15	1152	1527019

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4.5.2.3/Ga-01-R
3	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.1.4
Sample ID: 386429011

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test											Batch ID	Recovery%	Acceptable Limits

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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 Address : 15 Hazelwood Drive
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 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Report Date: December 28, 2015

Client Sample ID: 4.3A.R.1.5
 Sample ID: 386429001
 Matrix: Water
 Collect Date: 23-NOV-15
 Receive Date: 30-NOV-15
 Collector: Client

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Liquid (Standard List) "As Received"

Actinium-227	UI	0.00	+/-48.9	60.7	28.9	+/-53.1		pCi/L		MJH1	12/18/15	0708	1529228	1
Antimony-125	U	1.16	+/-10.6	19.8	9.22	+/-10.6		pCi/L						
Bismuth-212	UI	0.00	+/-11.7	125	58.0	+/-12.4		pCi/L						
Bismuth-214	U	-1.89	+/-14.4	21.0	9.93	+/-14.4		pCi/L						
Cesium-137	U	-5.77	+/-5.43	8.14	3.75	+/-6.04	10.0	pCi/L						
Cobalt-60	U	-1.84	+/-4.19	7.38	3.19	+/-4.27		pCi/L						
Europium-154	U	-9.36	+/-12.7	21.2	9.25	+/-13.4		pCi/L						
Lead-212	U	4.04	+/-12.2	14.8	7.10	+/-12.3		pCi/L						
Lead-214	U	0.717	+/-12.6	20.0	9.56	+/-12.6		pCi/L						
Potassium-40	UI	0.00	+/-82.5	79.4	34.7	+/-82.8		pCi/L						
Protactinium-231	U	-12.6	+/-61.1	106	50.1	+/-61.4		pCi/L						
Radium-228	U	-19.5	+/-21.5	34.7	16.0	+/-23.4		pCi/L						
Thallium-208	U	2.78	+/-7.17	8.41	3.91	+/-7.17		pCi/L						
Tin-126	U	4.70	+/-15.2	18.8	9.05	+/-15.4		pCi/L						

Rad Gas Flow Proportional Counting

GFPC, Gross A B, liquid "As Received"

Alpha	U	-1.5	+/-1.20	3.30	1.35	+/-1.20	5.00	pCi/L		KXB2	12/08/15	1216	1526940	2
Beta	U	-1.24	+/-2.09	4.05	1.86	+/-2.09	5.00	pCi/L						

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 900.0/SW846.9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Report Date: December 28, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.1.5
Sample ID: 386429001

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer	Recovery	Test											Batch ID	Recovery%	Acceptable Limits

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Company : MJW Corporation
 Address : 15 Hazelwood Drive
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Report Date: December 28, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.2.1
 Sample ID: 386429012
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 30-NOV-15
 Collector: Client
 Moisture: 33.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RI	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		33.3						percent		CXC1	12/01/15	1152	1527019	1
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.0212	+/-0.356	0.586	0.273	+/-0.356		pCi/g		RXF2	12/24/15	0643	1528025	2
Antimony-125	U	-0.0432	+/-0.135	0.240	0.110	+/-0.137		pCi/g						
Bismuth-212	UI	0.00	+/-0.550	1.70	0.785	+/-0.850		pCi/g						
Bismuth-214		0.788	+/-0.177	0.161	0.0724	+/-0.189		pCi/g						
Cesium-137		1.17	+/-0.130	0.0823	0.0366	+/-0.163	0.100	pCi/g						
Cobalt-60	U	0.0158	+/-0.0359	0.082	0.0339	+/-0.0366		pCi/g						
Europium-154	U	0.129	+/-0.141	0.299	0.130	+/-0.153		pCi/g						
Lead-212		1.17	+/-0.145	0.126	0.0588	+/-0.176		pCi/g						
Lead-214		0.860	+/-0.174	0.172	0.0791	+/-0.189		pCi/g						
Potassium-40		14.4	+/-1.69	0.732	0.295	+/-2.09		pCi/g						
Protactinium-231	UI	0.00	+/-1.14	1.01	0.464	+/-1.20		pCi/g						
Radium-226		0.788	+/-0.177	0.161	0.0724	+/-0.189		pCi/g						
Radium-228		0.844	+/-0.348	0.323	0.142	+/-0.370		pCi/g						
Thallium-208		0.314	+/-0.108	0.0797	0.0357	+/-0.111		pCi/g						
Tin-126	U	0.0682	+/-0.141	0.192	0.0914	+/-0.142		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		11.4	+/-3.52	3.99	1.71	+/-4.15	4.00	pCi/g		JXB7	12/17/15	0847	1531239	3
Beta		23.5	+/-2.93	2.75	1.27	+/-4.40	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/01/15	1152	1527019

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4.5.2 3/Ga-01-R
3	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.2.1
Sample ID: 386429012

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lo	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test												Batch ID	Recovery%	Acceptable Limits

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Company : MJW Technical Services
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Report Date: March 9, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.A.R.2.2
 Sample ID: 392057016
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 25-FEB-16
 Collector: Client
 Moisture: 22.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mid.
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Rad Gamma Spec Analysis

Gamma with Ingrowth "Dry Weight Corrected"

Actinium-227	U	-0.126	+/-0.282	0.458	0.214	+/-0.288		pCi/g		MXR1	03/07/16	1207	1547922	1
Antimony-125	U	0.0865	+/-0.127	0.201	0.0934	+/-0.133		pCi/g						
Bismuth-212	U	0.525	+/-0.621	1.14	0.526	+/-0.666		pCi/g						
Bismuth-214		0.753	+/-0.156	0.141	0.065	+/-0.169		pCi/g						
Cesium-137		0.346	+/-0.0711	0.0644	0.029	+/-0.077	0.100	pCi/g						
Cobalt-60	UI	-0.0319	+/-0.0409	0.0737	0.0318	+/-0.0434		pCi/g						
Europium-154	UI	0.00	+/-0.130	0.265	0.119	+/-0.147		pCi/g						
Lead-212		1.01	+/-0.126	0.122	0.0577	+/-0.159		pCi/g						
Lead-214		0.973	+/-0.199	0.128	0.0589	+/-0.217		pCi/g						
Potassium-40		12.6	+/-1.36	0.596	0.249	+/-1.74		pCi/g						
Protactinium-231	UI	0.00	+/-1.28	0.858	0.400	+/-1.29		pCi/g						
Radium-226		0.753	+/-0.156	0.141	0.065	+/-0.169		pCi/g						
Radium-228		0.979	+/-0.277	0.246	0.110	+/-0.315		pCi/g						
Thallium-208		0.286	+/-0.063	0.0736	0.0339	+/-0.0677		pCi/g						
Tin-126	UI	0.00	+/-0.109	0.127	0.0604	+/-0.110		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha		14.7	+/-4.40	3.80	1.47	+/-5.21	4.00	pCi/g		BXF1	03/05/16	1624	1549866	2
Beta		24.5	+/-3.43	2.56	1.12	+/-4.85	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/26/16	1436	1547873

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4.5.2.3/Ga-01-R
2	EPA 900.0/SW846.9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: March 9, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3.A.R.2.2
Sample ID: 392057016

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPC	RL	Units	DF	Analyst	Date Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test											Batch ID	Recovery%	Acceptable Limits

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: December 28, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.2.4
 Sample ID: 386429013
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 30-NOV-15
 Collector: Client
 Moisture: 24.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		24.5						percent		CXCI	12/01/15	1152	1527019	1
Rad Gamma Spec Analysis														
<i>Gammaspcc, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0555	+/-0.330	0.617	0.291	+/-0.331		pCi/g		RXF2	12/24/15	0651	1528025	2
Antimony-125	U	0.0275	+/-0.118	0.220	0.102	+/-0.119		pCi/g						
Bismuth-212	UI	0.00	+/-0.912	1.45	0.674	+/-1.07		pCi/g						
Bismuth-214		0.954	+/-0.198	0.102	0.0441	+/-0.216		pCi/g						
Cesium-137	U	0.0283	+/-0.0458	0.092	0.0421	+/-0.0476	0.100	pCi/g						
Cobalt-60	UI	0.00	+/-0.0491	0.108	0.0477	+/-0.0541		pCi/g						
Europium-154	U	-0.0262	+/-0.146	0.277	0.122	+/-0.147		pCi/g						
Lead-212		1.38	+/-0.152	0.122	0.0575	+/-0.199		pCi/g						
Lead-214		1.14	+/-0.219	0.152	0.0702	+/-0.242		pCi/g						
Potassium-40		17.5	+/-1.77	0.848	0.363	+/-2.32		pCi/g						
Protactinium-231	UI	0.00	+/-1.13	1.15	0.538	+/-1.14		pCi/g						
Radium-226		0.954	+/-0.198	0.102	0.0441	+/-0.216		pCi/g						
Radium-228		1.19	+/-0.297	0.295	0.131	+/-0.350		pCi/g						
Thallium-208		0.345	+/-0.0926	0.0765	0.0348	+/-0.0976		pCi/g						
Tin-126	UI	0.00	+/-0.180	0.228	0.110	+/-0.181		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		21.1	+/-5.07	3.80	1.49	+/-6.51	4.00	pCi/g		JXB7	12/17/15	0844	1531239	3
Beta		24.4	+/-3.37	2.84	1.28	+/-4.92	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXCI	12/01/15	1152	1527019

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4 5.2 3/Ga-01-R
3	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

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Certificate of Analysis

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite F12
Buffalo, New York 14228

Report Date: December 28, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.2.4
Sample ID: 386429013

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer Recovery	Test												Batch ID	Recovery%	Acceptable Limits

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: December 28, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.3.1
 Sample ID: 386429014
 Matrix: Soil
 Collect Date: 20-NOV-15
 Receive Date: 30-NOV-15
 Collector: Client
 Moisture: 28.8%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RI	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		28.8						percent		CXC1	12/01/15	1152	1527019	1
Rad Gamma Spec Analysis														
<i>Gammaspac, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.210	+/-0.280	0.552	0.259	+/-0.298		pCi/g		RXF2	12/24/15	0656	1528025	2
Antimony-125	U	0.0105	+/-0.121	0.197	0.0901	+/-0.121		pCi/g						
Bismuth-212	UI	0.00	+/-0.690	1.48	0.684	+/-0.855		pCi/g						
Bismuth-214		0.818	+/-0.213	0.165	0.0754	+/-0.224		pCi/g						
Cesium-137		0.543	+/-0.0901	0.0821	0.037	+/-0.0999	0.100	pCi/g						
Cobalt-60	U	0.0186	+/-0.0315	0.0735	0.0305	+/-0.0326		pCi/g						
Europium-154	U	-0.0872	+/-0.136	0.236	0.101	+/-0.142		pCi/g						
Lead-212		1.12	+/-0.127	0.109	0.0507	+/-0.198		pCi/g						
Lead-214		1.12	+/-0.191	0.165	0.0769	+/-0.219		pCi/g						
Potassium-40		13.6	+/-1.66	0.749	0.311	+/-2.06		pCi/g						
Protactinium-231	UI	0.00	+/-0.745	0.891	0.411	+/-0.752		pCi/g						
Radium-226		0.818	+/-0.213	0.165	0.0754	+/-0.224		pCi/g						
Radium-228		1.06	+/-0.296	0.327	0.146	+/-0.339		pCi/g						
Thallium-208		0.364	+/-0.0975	0.0727	0.0327	+/-0.102		pCi/g						
Tin-126	UI	0.00	+/-0.0853	0.0932	0.044	+/-0.0892		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A B, solid "Dry Weight Corrected"</i>														
Alpha		13.9	+/-3.83	3.95	1.68	+/-4.73	4.00	pCi/g		JXB7	12/17/15	0847	1531239	3
Beta		25.6	+/-3.12	2.92	1.35	+/-4.90	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/01/15	1152	1527019

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300.4 5.2 3/Ga-01-R
3	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Certificate of Analysis

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: December 28, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.3.1
Sample ID: 386429014

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RI	Units	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer	Recovery	Test											Batch ID	Recovery%	Acceptable Limits

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: March 9, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.A.R.3.2
 Sample ID: 392057017
 Matrix: Soil
 Collect Date: 20-NOV-15
 Receive Date: 25-FEB-16
 Collector: Client
 Moisture: 22%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gamma with Ingrowth "Dry Weight Corrected"

Actinium-227	U	-0.123	+/-0.470	0.754	0.350	+/-0.474		pCi/g		MXR1	03/07/16	1207	1547922	1
Antimony-125	U	0.0282	+/-0.177	0.330	0.151	+/-0.177		pCi/g						
Bismuth-212	UI	0.00	+/-1.37	2.31	1.06	+/-1.63		pCi/g						
Bismuth-214		0.970	+/-0.265	0.217	0.0972	+/-0.277		pCi/g						
Cesium-137		0.247	+/-0.149	0.135	0.0611	+/-0.151	0.100	pCi/g						
Cobalt-60	U	-0.0472	+/-0.0617	0.102	0.0408	+/-0.0654		pCi/g						
Europium-154	U	-0.126	+/-0.210	0.367	0.155	+/-0.218		pCi/g						
Lead-212		1.38	+/-0.187	0.170	0.0792	+/-0.231		pCi/g						
Lead-214		1.52	+/-0.258	0.508	0.245	+/-0.287		pCi/g						
Potassium-40		14.1	+/-2.06	1.02	0.408	+/-2.38		pCi/g						
Protactinium-231	U	0.674	+/-0.812	1.58	0.736	+/-0.880		pCi/g						
Radium-226		0.970	+/-0.265	0.217	0.0972	+/-0.277		pCi/g						
Radium-228		0.992	+/-0.544	0.452	0.198	+/-0.554		pCi/g						
Thallium-208		0.315	+/-0.0973	0.0891	0.0386	+/-0.101		pCi/g						
Tin-126	UI	0.00	+/-0.155	0.151	0.0716	+/-0.155		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Gross A-B, solid "Dry Weight Corrected"

Alpha		15.9	+/-4.65	3.92	1.51	+/-5.58	4.00	pCi/g		BXF1	03/05/16	1624	1549866	2
Beta		23.9	+/-3.68	3.01	1.33	+/-4.97	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	02/26/16	1436	1547873

The following Analytical Methods were performed

Method	Description
1	DOE HASL 300, 4 5.2.3/Ga-01-R
2	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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GEL LABORATORIES LLC

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: March 9, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3.A.R.3.2
Sample ID: 392057017

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test										Batch ID	Recovery%	Acceptable Limits	

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: December 28, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.4.1
 Sample ID: 386429015
 Matrix: Soil
 Collect Date: 20-NOV-15
 Receive Date: 30-NOV-15
 Collector: Client
 Moisture: 27.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		27.4						percent		CXC1	12/01/15	1152	1527019	1
Rad Gamma Spec Analysis														
<i>Gammaspcc, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.188	+/-0.318	0.619	0.289	+/-0.330		pCi/g		RXF2	12/24/15	0659	1528025	2
Antimony-125	U	-0.0929	+/-0.127	0.226	0.103	+/-0.134		pCi/g						
Bismuth-212		1.35	+/-1.11	1.24	0.551	+/-1.12		pCi/g						
Bismuth-214		0.868	+/-0.190	0.182	0.0827	+/-0.203		pCi/g						
Cesium-137		0.768	+/-0.153	0.0994	0.0448	+/-0.165	0.100	pCi/g						
Cobalt-60	U	-0.00854	+/-0.062	0.119	0.0517	+/-0.0621		pCi/g						
Europium-154	U	-0.0702	+/-0.169	0.299	0.128	+/-0.172		pCi/g						
Lead-212		1.10	+/-0.148	0.126	0.0585	+/-0.177		pCi/g						
Lead-214		1.08	+/-0.186	0.182	0.0839	+/-0.208		pCi/g						
Potassium-40		13.4	+/-1.81	1.09	0.470	+/-2.15		pCi/g						
Protactinium-231	UI	0.00	+/-0.757	1.21	0.565	+/-0.769		pCi/g						
Radium-226		0.868	+/-0.190	0.182	0.0827	+/-0.203		pCi/g						
Radium-228		1.04	+/-0.325	0.340	0.149	+/-0.357		pCi/g						
Thallium-208		0.312	+/-0.105	0.108	0.0494	+/-0.108		pCi/g						
Tm-126	UI	0.00	+/-0.149	0.171	0.0809	+/-0.151		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		13.9	+/-3.68	3.96	1.72	+/-4.55	4.00	pCi/g		JXB7	12/17/15	0848	1531239	3
Beta		19.9	+/-2.55	2.10	0.953	+/-3.85	10.0	pCi/g						

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/01/15	1152	1527019

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE HASL 300, 4 5.2 3/Ga-01-R
3	EPA 900.0/SW846 9310/SM 7110B Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
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Certificate of Analysis

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
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Report Date: December 28, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.4.1
Sample ID: 386429015

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test						Batch ID	Recovery%	Acceptable Limits				

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: December 28, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.4.2
 Sample ID: 386429016
 Matrix: Soil
 Collect Date: 20-NOV-15
 Receive Date: 30-NOV-15
 Collector: Client
 Moisture: 23.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		23.3						percent		CXC1	12/01/15	1152	1527019	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.0268	+/-0.0617	0.0978	0.0224	+/-0.0618	1.00	pCi/g		JXR1	12/21/15	1451	1527520	2
Plutonium-239/240	U	-0.00353	+/-0.053	0.124	0.0354	+/-0.053	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.00835	+/-0.0576	0.140	0.0417	+/-0.0577	1.00	pci/g		JXR1	12/21/15	0932	1527510	3
Uranium-233/234		0.764	+/-0.215	0.0929	0.0236	+/-0.253	1.00	pci/g						
Uranium-235/236		0.0311	+/-0.0619	0.100	0.0274	+/-0.0621	1.00	pci/g						
Uranium-238		0.780	+/-0.217	0.0929	0.0236	+/-0.256	1.00	pci/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	0.0624	+/-0.280	0.547	0.157	+/-0.280	1.00	pCi/g		JXR1	12/18/15	0923	1527516	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.725	+/-0.518	0.642	0.224	+/-0.532	1.00	pCi/g		JXR1	12/19/15	1025	1527505	5
Thorium-229	U	0.0378	+/-0.266	0.547	0.179	+/-0.266	1.00	pCi/g						
Thorium-230		0.520	+/-0.394	0.384	0.0977	+/-0.402	1.00	pCi/g						
Thorium-232		0.627	+/-0.408	0.188	0.00	+/-0.420	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.0815	+/-0.0991	0.133	0.0362	+/-0.0999	1.00	pCi/g		JXR1	12/21/15	1250	1527513	6
Curium-242		0.0227	+/-0.0639	0.0682	0.00	+/-0.064	1.00	pCi/g						
Curium-243/244		0.0949	+/-0.0966	0.0956	0.0179	+/-0.0977	1.00	pCi/g						
Curium-245/246	U	0.0175	+/-0.0658	0.111	0.0207	+/-0.0659	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	4.32	+/-6.50	11.0	5.32	+/-6.57	15.0	pCi/g		JXR1	12/24/15	1116	1527521	7
Rad Gamma Spec Analysis														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.0663	+/-0.211	0.472	0.191	+/-0.213	1.00	pCi/g		MJH1	12/21/15	1816	1528513	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.0497	+/-0.253	0.419	0.194	+/-0.255		pCi/g		RXF2	12/24/15	0700	1528025	9
Antimony-125	U	0.0422	+/-0.0975	0.189	0.0873	+/-0.0994		pCi/g						
Bismuth-212		1.10	+/-0.841	0.903	0.402	+/-0.848		pCi/g						
Bismuth-214		0.788	+/-0.200	0.133	0.0603	+/-0.211		pCi/g						
Cesium-137		0.272	+/-0.099	0.0769	0.0349	+/-0.102	0.100	pCi/g						
Cobalt-60	U	-0.00792	+/-0.0373	0.0719	0.0303	+/-0.0374		pCi/g						
Europium-154	U	-0.0761	+/-0.132	0.203	0.086	+/-0.136		pCi/g						
Lead-212		1.02	+/-0.151	0.114	0.0537	+/-0.176		pCi/g						
Lead-214		1.06	+/-0.187	0.328	0.159	+/-0.208		pCi/g						

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Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.3A.R.4.2
 Sample ID: 386429016

Report Date: December 28, 2015

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		13.5	+/-1.56	0.474	0.180	+/-1.96		pCi/g						
Protactinium-231	UI	0.00	+/-0.897	0.822	0.379	+/-0.909		pCi/g						
Radium-226		0.788	+/-0.200	0.133	0.0603	+/-0.211		pCi/g						
Radium-228		1.05	+/-0.355	0.260	0.114	+/-0.389		pCi/g						
Thallium-208		0.324	+/-0.0906	0.056	0.0248	+/-0.0946		pCi/g						
Tin-126	UI	0.00	+/-0.124	0.133	0.0632	+/-0.125		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A B, solid "Dry Weight Corrected"</i>														
Alpha		13.8	+/-4.01	3.94	1.62	+/-4.85	4.00	pCi/g		JXB7	12/17/15	0844	1531239	10
Beta		19.4	+/-2.90	2.59	1.17	+/-4.11	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.988	+/-0.741	1.70	0.750	+/-0.741	2.00	pCi/g		KSD1	12/18/15	1648	1531246	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium		3.55	+/-2.51	4.14	2.00	+/-2.51	6.00	pCi/g		TXJ1	12/18/15	2254	1529500	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14		1.32	+/-1.04	1.73	0.849	+/-1.04	2.00	pCi/g		TXJ1	12/19/15	0448	1529501	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-0.576	+/-1.49	2.80	1.29	+/-1.49	5.00	pCi/g		MYM	12/24/15	0904	1529498	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/01/15	1152	1527019

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1476-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300, I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 4.3A.R.4.2
Sample ID: 386429016

Report Date: December 28, 2015

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
14	DOE EML HASL-300, Tc-02-RC Modified													
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1527520	80	(15%-125%)				
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1527510	72.3	(15%-125%)				
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1527510	75	(15%-125%)				
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"							1527516	86.9	(15%-125%)				
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1527505	77.5	(15%-125%)				
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"							1527513	67.9	(15%-125%)				
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"							1527521	80	(15%-125%)				
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"							1531246	81.4	(25%-125%)				
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"							1529498	94.9	(15%-125%)				

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: December 29, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.4.5
 Sample ID: 386555002
 Matrix: Soil
 Collect Date: 20-NOV-15
 Receive Date: 02-DEC-15
 Collector: Client
 Moisture: 26.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPC	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		26.7						percent		CXC1	12/02/15	1419	1527878	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	-0.0222	+/-0.0504	0.137	0.045	+/-0.0504	1.00	pCi/g		JXR1	12/21/15	0933	1527520	2
Plutonium-239/240		0.0722	+/-0.0844	0.117	0.0348	+/-0.085	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.00975	+/-0.0542	0.104	0.0238	+/-0.0543	1.00	pCi/g		JXR1	12/21/15	0932	1527510	3
Uranium-233/234		0.883	+/-0.257	0.114	0.029	+/-0.303	1.00	pCi/g						
Uranium-235/236		0.0285	+/-0.0654	0.104	0.0238	+/-0.0656	1.00	pCi/g						
Uranium-238		1.04	+/-0.280	0.138	0.0411	+/-0.337	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	0.0222	+/-0.232	0.484	0.123	+/-0.232	1.00	pCi/g		JXR1	12/18/15	0923	1527516	4
<i>Alphaspec Th229 - 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.39	+/-0.652	0.528	0.161	+/-0.693	1.00	pCi/g		JXR1	12/19/15	1025	1527505	5
Thorium-229	U	-0.0485	+/-0.146	0.411	0.105	+/-0.147	1.00	pCi/g						
Thorium-230		1.18	+/-0.576	0.372	0.0852	+/-0.607	1.00	pCi/g						
Thorium-232		0.535	+/-0.395	0.201	0.00	+/-0.404	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	0.0102	+/-0.0568	0.109	0.0249	+/-0.0568	1.00	pCi/g		JXR1	12/21/15	1251	1527513	6
Curium-242	U	-0.00531	+/-0.0458	0.106	0.0199	+/-0.0459	1.00	pCi/g						
Curium-243/244		0.0489	+/-0.0777	0.108	0.0246	+/-0.0781	1.00	pCi/g						
Curium-245/246		0.045	+/-0.077	0.0674	0.00	+/-0.0773	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	5.81	+/-7.33	12.4	5.97	+/-7.43	15.0	pCi/g		JXR1	12/24/15	1858	1527521	7
Rad Gamma Spec Analysis														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.0534	+/-0.301	0.712	0.266	+/-0.302	1.00	pCi/g		MJH1	12/22/15	0651	1528513	8
<i>Gammaspac, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.111	+/-0.351	0.658	0.305	+/-0.355		pCi/g		RXF2	12/24/15	0605	1528387	9
Antimony-125	U	0.0469	+/-0.139	0.271	0.124	+/-0.141		pCi/g						
Bismuth-212	UI	0.00	+/-1.30	1.99	0.915	+/-1.61		pCi/g						
Bismuth-214		0.833	+/-0.223	0.207	0.0933	+/-0.234		pCi/g						
Cesium-137		0.898	+/-0.132	0.093	0.0408	+/-0.151	0.100	pCi/g						
Cobalt-60	U	-0.0082	+/-0.056	0.109	0.0456	+/-0.0561		pCi/g						
Europium-154	U	-0.0535	+/-0.168	0.314	0.133	+/-0.170		pCi/g						
Lead-212		1.08	+/-0.170	0.157	0.0733	+/-0.200		pCi/g						
Lead-214		1.08	+/-0.260	0.185	0.0841	+/-0.275		pCi/g						

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Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.3A.R.4.5
 Sample ID: 386555002

Report Date: December 29, 2015

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		12.2	+/-2.00	0.994	0.409	+/-2.25		pCi/g						
Protactinium-231	UI	0.00	+/-0.813	0.674	0.289	+/-0.881		pCi/g						
Radium-226		0.833	+/-0.223	0.207	0.0933	+/-0.234		pCi/g						
Radium-228		1.14	+/-0.341	0.382	0.166	+/-0.364		pCi/g						
Thallium-208		0.279	+/-0.121	0.103	0.0462	+/-0.123		pCi/g						
Tm-126	UI	0.00	+/-0.139	0.139	0.066	+/-0.141		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A B, solid "Dry Weight Corrected"</i>														
Alpha		14.0	+/-3.86	3.96	1.68	+/-4.74	4.00	pCi/g		JXB7	12/17/15	1527	1531243	10
Beta		20.1	+/-3.01	2.92	1.34	+/-4.15	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.604	+/-0.911	1.85	0.830	+/-0.911	2.00	pCi/g		KSD1	12/18/15	1649	1531246	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	1.71	+/-2.65	4.50	2.17	+/-2.65	6.00	pCi/g		TXJ1	12/19/15	2112	1529500	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.393	+/-1.02	1.76	0.865	+/-1.02	2.00	pCi/g		TXJ1	12/19/15	1515	1529501	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-2.53	+/-1.74	3.35	1.59	+/-1.74	5.00	pCi/g		MYM	12/28/15	0803	1529498	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/02/15	1419	1527878

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1476-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300, I-01 Modified
9	DOE HASL 300, 4.5 2 3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified

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Report Date: December 29, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.4.5
 Sample ID: 386555002

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
14	DOE EML HASL-300, Tc-02-RC Modified													
Surrogate/Tracer	Recovery	Test												
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1527520	72.8	(15%-125%)									
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	62.4	(15%-125%)									
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	75.2	(15%-125%)									
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1527516	88.8	(15%-125%)									
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1527505	71	(15%-125%)									
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1527513	71.8	(15%-125%)									
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1527521	72.8	(15%-125%)									
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1531246	76	(25%-125%)									
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"	1529498	93.3	(15%-125%)									

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: December 29, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.4.5
 Sample ID: 386555002
 Matrix: Soil
 Collect Date: 20-NOV-15
 Receive Date: 02-DEC-15
 Collector: Client
 Moisture: 26.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		26.7						percent		CXC1	12/02/15	1419	1527878	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	-0.0222	+/-0.0504	0.137	0.045	+/-0.0504	1.00	pCi/g		JXR1	12/21/15	0933	1527520	2
Plutonium-239/240		0.0722	+/-0.0844	0.117	0.0348	+/-0.085	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.00975	+/-0.0542	0.104	0.0238	+/-0.0543	1.00	pCi/g		JXR1	12/21/15	0932	1527510	3
Uranium-233/234		0.883	+/-0.257	0.114	0.029	+/-0.303	1.00	pCi/g						
Uranium-235/236		0.0285	+/-0.0654	0.104	0.0238	+/-0.0656	1.00	pCi/g						
Uranium-238		1.04	+/-0.280	0.138	0.0411	+/-0.337	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	0.0222	+/-0.232	0.484	0.123	+/-0.232	1.00	pCi/g		JXR1	12/18/15	0923	1527516	4
<i>Alphaspec Th229 - 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.39	+/-0.652	0.528	0.161	+/-0.693	1.00	pCi/g		JXR1	12/19/15	1025	1527505	5
Thorium-229	U	-0.0485	+/-0.146	0.411	0.105	+/-0.147	1.00	pCi/g						
Thorium-230		1.18	+/-0.576	0.372	0.0852	+/-0.607	1.00	pCi/g						
Thorium-232		0.535	+/-0.395	0.201	0.00	+/-0.404	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	0.0102	+/-0.0568	0.109	0.0249	+/-0.0568	1.00	pCi/g		JXR1	12/21/15	1251	1527513	6
Curium-242	U	-0.00531	+/-0.0458	0.106	0.0199	+/-0.0459	1.00	pCi/g						
Curium-243/244		0.0489	+/-0.0777	0.108	0.0246	+/-0.0781	1.00	pCi/g						
Curium-245/246		0.045	+/-0.077	0.0674	0.00	+/-0.0773	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	5.81	+/-7.33	12.4	5.97	+/-7.43	15.0	pCi/g		JXR1	12/24/15	1858	1527521	7
Rad Gamma Spec Analysis														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.0534	+/-0.301	0.712	0.266	+/-0.302	1.00	pCi/g		MJH1	12/22/15	0651	1528513	8
<i>Gammaspac, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.111	+/-0.351	0.658	0.305	+/-0.355		pCi/g		RXF2	12/24/15	0605	1528387	9
Antimony-125	U	0.0469	+/-0.139	0.271	0.124	+/-0.141		pCi/g						
Bismuth-212	UI	0.00	+/-1.30	1.99	0.915	+/-1.61		pCi/g						
Bismuth-214		0.833	+/-0.223	0.207	0.0933	+/-0.234		pCi/g						
Cesium-137		0.898	+/-0.132	0.093	0.0408	+/-0.151	0.100	pCi/g						
Cobalt-60	U	-0.0082	+/-0.056	0.109	0.0456	+/-0.0561		pCi/g						
Europium-154	U	-0.0535	+/-0.168	0.314	0.133	+/-0.170		pCi/g						
Lead-212		1.08	+/-0.170	0.157	0.0733	+/-0.200		pCi/g						
Lead-214		1.08	+/-0.260	0.185	0.0841	+/-0.275		pCi/g						

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Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
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 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.3A.R.4.5
 Sample ID: 386555002

Report Date: December 29, 2015

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>Gammasp. Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		12.2	+/-2.00	0.994	0.409	+/-2.25		pCi/g						
Protactinium-231	UI	0.00	+/-0.813	0.674	0.289	+/-0.881		pCi/g						
Radium-226		0.833	+/-0.223	0.207	0.0933	+/-0.234		pCi/g						
Radium-228		1.14	+/-0.341	0.382	0.166	+/-0.364		pCi/g						
Thallium-208		0.279	+/-0.121	0.103	0.0462	+/-0.123		pCi/g						
Tin-126	UI	0.00	+/-0.139	0.139	0.066	+/-0.141		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		14.0	+/-3.86	3.96	1.68	+/-4.74	4.00	pCi/g		JXB7	12/17/15	1527	1531243	10
Beta		20.1	+/-3.01	2.92	1.34	+/-4.15	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.604	+/-0.911	1.85	0.830	+/-0.911	2.00	pCi/g		KSD1	12/18/15	1649	1531246	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	1.71	+/-2.65	4.50	2.17	+/-2.65	6.00	pCi/g		TXJ1	12/19/15	2112	1529500	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.393	+/-1.02	1.76	0.865	+/-1.02	2.00	pCi/g		TXJ1	12/19/15	1515	1529501	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-2.53	+/-1.74	3.35	1.59	+/-1.74	5.00	pCi/g		MYM	12/28/15	0803	1529498	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/02/15	1419	1527878

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1476-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300, I-01 Modified
9	DOE HASL 300, 4 5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified

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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 4.3A.R.4.5
Sample ID: 386555002

Report Date: December 29, 2015

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
14	DOE EML HASL-300, Te-02-RC Modified													
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1527520	72.8	(15%-125%)				
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1527510	62.4	(15%-125%)				
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1527510	75.2	(15%-125%)				
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"							1527516	88.8	(15%-125%)				
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1527505	71	(15%-125%)				
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"							1527513	71.8	(15%-125%)				
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"							1527521	72.8	(15%-125%)				
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"							1531246	76	(25%-125%)				
Technetium-99m Tracer	Liquid Scint Te99, Solid "Dry Weight Corrected"							1529498	93.3	(15%-125%)				

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : MJW Corporation
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: December 28, 2015

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.4.6
 Sample ID: 386429017
 Matrix: Soil
 Collect Date: 20-NOV-15
 Receive Date: 30-NOV-15
 Collector: Client
 Moisture: 23.2%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPI	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		23.2						percent		CXC1	12/01/15	1152	1527019	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.0207	+/-0.0476	0.0755	0.0173	+/-0.0477	1.00	pCi/g		JXR1	12/21/15	0933	1527520	2
Plutonium-239/240	U	-0.00981	+/-0.0296	0.0833	0.0212	+/-0.0297	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.0129	+/-0.0484	0.0815	0.0152	+/-0.0485	1.00	pci/g		JXR1	12/21/15	0932	1527510	3
Uranium-233/234		0.904	+/-0.279	0.148	0.0424	+/-0.325	1.00	pci/g						
Uranium-235/236	U	0.0271	+/-0.0746	0.129	0.0329	+/-0.0748	1.00	pci/g						
Uranium-238		1.00	+/-0.290	0.117	0.0268	+/-0.345	1.00	pci/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.0174	+/-0.150	0.347	0.0649	+/-0.150	1.00	pCi/g		JXR1	12/18/15	0923	1527516	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		1.06	+/-0.704	0.692	0.198	+/-0.734	1.00	pCi/g		JXR1	12/19/15	1025	1527505	5
Thorium-229	U	-0.0925	+/-0.214	0.635	0.173	+/-0.215	1.00	pCi/g						
Thorium-230		0.769	+/-0.567	0.288	0.00	+/-0.585	1.00	pCi/g						
Thorium-232		1.15	+/-0.679	0.287	0.00	+/-0.712	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.0313	+/-0.0715	0.113	0.0257	+/-0.0717	1.00	pCi/g		JXR1	12/22/15	1039	1527513	6
Curium-242	U	-0.00547	+/-0.0479	0.111	0.0206	+/-0.048	1.00	pCi/g						
Curium-243/244	U	-0.0143	+/-0.0439	0.123	0.0312	+/-0.044	1.00	pCi/g						
Curium-245/246		0.0469	+/-0.0804	0.0704	0.00	+/-0.0807	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	3.71	+/-6.53	11.1	5.36	+/-6.57	15.0	pCi/g		JXR1	12/24/15	1202	1527521	7
Rad Gamma Spec Analysis														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.334	+/-0.602	0.998	0.436	+/-0.622	1.00	pCi/g		MJH1	12/22/15	0603	1528513	8
<i>Gammasp. Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.154	+/-0.335	0.584	0.273	+/-0.343		pCi/g		RXF2	12/24/15	0704	1528025	9
Antimony-125	U	0.00237	+/-0.113	0.218	0.0998	+/-0.113		pCi/g						
Bismuth-212	UI	0.00	+/-1.11	1.51	0.695	+/-1.36		pCi/g						
Bismuth-214		0.806	+/-0.193	0.154	0.0693	+/-0.205		pCi/g						
Cesium-137		0.374	+/-0.0845	0.0965	0.044	+/-0.0904	0.100	pCi/g						
Cobalt-60	U	-0.0161	+/-0.0422	0.0771	0.0317	+/-0.0428		pCi/g						
Europium-154	U	-0.0448	+/-0.168	0.305	0.134	+/-0.169		pCi/g						
Lead-212		0.714	+/-0.154	0.153	0.0727	+/-0.169		pCi/g						
Lead-214		0.982	+/-0.231	0.378	0.183	+/-0.248		pCi/g						

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 Client Sample ID: 4.3A.R.4.6
 Sample ID: 386429017

Report Date: December 28, 2015

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		12.2	+/-1.90	1.15	0.508	+/-2.17		pCi/g						
Protactinium-231	UI	0.00	+/-0.820	0.997	0.460	+/-0.854		pCi/g						
Radium-226		0.806	+/-0.193	0.154	0.0693	+/-0.205		pCi/g						
Radium-228		0.849	+/-0.300	0.264	0.114	+/-0.323		pCi/g						
Thallium-208		0.249	+/-0.101	0.0904	0.0413	+/-0.103		pCi/g						
Tin-126	UI	0.00	+/-0.149	0.172	0.082	+/-0.151		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		15.9	+/-4.17	3.92	1.63	+/-5.17	4.00	pCi/g		JXB7	12/17/15	0848	1531239	10
Beta		20.7	+/-2.89	2.66	1.22	+/-4.16	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.73	+/-0.879	1.87	0.827	+/-0.879	2.00	pCi/g		KSD1	12/18/15	1648	1531246	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium		4.30	+/-2.65	4.33	2.09	+/-2.65	6.00	pCi/g		TXJ1	12/19/15	0027	1529500	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	0.460	+/-0.986	1.67	0.820	+/-0.986	2.00	pCi/g		TXJ1	12/19/15	0551	1529501	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-0.219	+/-1.78	3.28	1.51	+/-1.78	5.00	pCi/g		MYM	12/24/15	0921	1529498	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/01/15	1152	1527019

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1476-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300, I-01 Modified
9	DOE HASL 300, 4.5 2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified

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Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
14	DOE EML HASL-300, Te-02-RC Modified													

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1527520	82.8	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	51.3	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1527510	82.9	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1527516	89.3	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1527505	65.2	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1527513	55.3	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1527521	82.8	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1531246	80.3	(25%-125%)
Technetium-99m Tracer		Liquid Scint Te99, Solid "Dry Weight Corrected"	1529498	96.8	(15%-125%)

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).