

Appendix G –
Sub-Area 3.2 – COA

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: December 4, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 3.2.1.R.1
Sample ID: 385070020
Matrix: Soil
Collect Date: 16-OCT-15 15:05
Receive Date: 05-NOV-15
Collector: Client
Moisture: 26.1%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		26.1				percent		CXC1	11/10/15	1319	1521842	1
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Actinium-227	U	-0.125	+/-0.289	0.536		pCi/g		RXF2	12/03/15	1307	1522383	2
Antimony-125	U	0.0292	+/-0.120	0.229		pCi/g						
Cesium-137		0.468	+/-0.126	0.0895	0.100	pCi/g						
Cobalt-60	U	0.00212	+/-0.0502	0.099		pCi/g						
Europium-154	U	-0.00831	+/-0.157	0.300		pCi/g						
Protactinium-231	U	0.568	+/-0.585	1.19		pCi/g						
Radium-226		0.641	+/-0.190	0.166		pCi/g						
Radium-228		0.856	+/-0.261	0.377		pCi/g						
Tin-126	U	0.106	+/-0.177	0.189		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, solid "Dry Weight Corrected"												
Alpha		14.7	+/-4.11	3.45	4.00	pCi/g		KXB2	12/02/15	1125	1525757	3
Beta		22.9	+/-3.59	3.73	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	11/10/15	1319	1521842

The following Analytical Methods were performed:

Method	Description	Analyst Comments
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	

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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2040 Savage Road Charleston SC 29407 - (843) 558-8171 - 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

Report Date: December 17, 2015

Client Sample ID: 3.2.1.R.1
Sample ID: 385070020
Matrix: Soil
Collect Date: 16-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 26.1%

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		26.1						percent		CXC1	11/10/15	1319	1521842	1
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.125	+/-0.289	0.536	0.248	+/-0.295		pCi/g		RXF2	12/03/15	1307	1522383	2
Antimony-125	U	0.0292	+/-0.120	0.229	0.105	+/-0.121		pCi/g						
Bismuth-212	U	0.723	+/-1.05	1.65	0.759	+/-1.10		pCi/g						
Bismuth-214		0.641	+/-0.190	0.166	0.0747	+/-0.198		pCi/g						
Cesium-137		0.468	+/-0.126	0.0895	0.0401	+/-0.132	0.100	pCi/g						
Cobalt-60	U	0.00212	+/-0.0502	0.099	0.0421	+/-0.0502		pCi/g						
Europium-154	U	-0.00831	+/-0.157	0.300	0.130	+/-0.157		pCi/g						
Lead-212		1.21	+/-0.144	0.126	0.0589	+/-0.175		pCi/g						
Lead-214		0.983	+/-0.215	0.173	0.0796	+/-0.231		pCi/g						
Potassium-40		14.3	+/-1.80	0.609	0.231	+/-2.18		pCi/g						
Protactinium-231	UI	0.00	+/-0.585	1.19	0.556	+/-0.651		pCi/g						
Radium-226		0.641	+/-0.190	0.166	0.0747	+/-0.198		pCi/g						
Radium-228		0.856	+/-0.261	0.377	0.168	+/-0.286		pCi/g						
Thallium-208		0.343	+/-0.109	0.074	0.0328	+/-0.113		pCi/g						
Tin-126	UI	0.00	+/-0.177	0.189	0.0899	+/-0.178		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		14.7	+/-4.11	3.45	1.34	+/-5.00	4.00	pCi/g		KXB2	12/02/15	1125	1525757	3
Beta		22.9	+/-3.59	3.73	1.72	+/-4.84	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	11/10/15	1319	1521842

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 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.1.R.1
Sample ID: 385070020

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test													

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
Contact: Ms. Laurie Losey
Project: Soil Radionuclides

Report Date: December 17, 2015

Client Sample ID: 3.2.1.R.1
Sample ID: 385070020
Matrix: Soil
Collect Date: 16-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 26.1%

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		26.1						percent		CXC1	11/10/15	1319	1521842	1
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.125	+/-0.289	0.536	0.248	+/-0.295		pCi/g		RXF2	12/03/15	1307	1522383	2
Antimony-125	U	0.0292	+/-0.120	0.229	0.105	+/-0.121		pCi/g						
Bismuth-212	U	0.723	+/-1.05	1.65	0.759	+/-1.10		pCi/g						
Bismuth-214		0.641	+/-0.190	0.166	0.0747	+/-0.198		pCi/g						
Cesium-137		0.468	+/-0.126	0.0895	0.0401	+/-0.132	0.100	pCi/g						
Cobalt-60	U	0.00212	+/-0.0502	0.099	0.0421	+/-0.0502		pCi/g						
Europium-154	U	-0.00831	+/-0.157	0.300	0.130	+/-0.157		pCi/g						
Lead-212		1.21	+/-0.144	0.126	0.0589	+/-0.175		pCi/g						
Lead-214		0.983	+/-0.215	0.173	0.0796	+/-0.231		pCi/g						
Potassium-40		14.3	+/-1.80	0.609	0.231	+/-2.18		pCi/g						
Protactinium-231	UI	0.00	+/-0.585	1.19	0.556	+/-0.651		pCi/g						
Radium-226		0.641	+/-0.190	0.166	0.0747	+/-0.198		pCi/g						
Radium-228		0.856	+/-0.261	0.377	0.168	+/-0.286		pCi/g						
Thallium-208		0.343	+/-0.109	0.074	0.0328	+/-0.113		pCi/g						
Tin-126	UI	0.00	+/-0.177	0.189	0.0899	+/-0.178		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A-B, solid "Dry Weight Corrected"</i>														
Alpha		14.7	+/-4.11	3.45	1.34	+/-5.00	4.00	pCi/g		KXB2	12/02/15	1125	1525757	3
Beta		22.9	+/-3.59	3.73	1.72	+/-4.84	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	11/10/15	1319	1521842

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

Report Date: December 17, 2015

Client Sample ID: 3.2.1.R.1
Sample ID: 385070020

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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Report Date: December 4, 2015

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

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.1.R.5
Sample ID: 385070021
Matrix: Soil
Collect Date: 16-OCT-15 14:05
Receive Date: 05-NOV-15
Collector: Client
Moisture: 26.1%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		26.1				percent		CXC1	11/10/15	1319	1521842	1
Rad Alpha Spec Analysis												
ASP Plutonium Isotopic, Solid "Dry Weight Corrected"												
Plutonium-238	U	0.0398	+/-0.0682	0.0597	1.00	pCi/g		HAKB	11/23/15	1501	1522577	2
Plutonium-239/240	U	-0.0223	+/-0.076	0.188	1.00	pCi/g						
ASP Uranium Isotopic, Solid "Dry Weight Corrected"												
Uranium-232	U	-0.0077	+/-0.0532	0.129	1.00	pci/g		HAKB	11/24/15	0851	1522580	3
Uranium-233/234		0.738	+/-0.260	0.126	1.00	pci/g						
Uranium-235/236		0.159	+/-0.127	0.0683	1.00	pci/g						
Uranium-238		1.09	+/-0.312	0.0681	1.00	pci/g						
Alphaspec Np237, Solid "Dry Weight Corrected"												
Neptunium-237	U	-0.083	+/-0.157	0.485	1.00	pCi/g		HAKB	11/23/15	1707	1522576	4
Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"												
Thorium-228		0.992	+/-0.587	0.663	1.00	pCi/g		HAKB	11/24/15	1014	1522579	5
Thorium-229	U	-0.0684	+/-0.279	0.659	1.00	pCi/g						
Thorium-230		1.16	+/-0.606	0.629	1.00	pCi/g						
Thorium-232		0.663	+/-0.431	0.349	1.00	pCi/g						
Am241, Cm Solid "Dry Weight Corrected"												
Americium-241	U	-0.0163	+/-0.0308	0.0951	1.00	pCi/g		HAKB	11/24/15	1042	1522571	6
Curium-242	U	-0.0152	+/-0.0351	0.104	1.00	pCi/g						
Curium-243/244	U	0.00697	+/-0.0387	0.0743	1.00	pCi/g						
Curium-245/246	X	0.0775	+/-0.0748	0.0465	1.00	pCi/g						
Liquid Scint Pu241, Solid "Dry Weight Corrected"												
Plutonium-241	U	-0.504	+/-6.04	10.5	15.0	pCi/g		HAKB	11/25/15	1132	1522578	7
Rad Gamma Spec Analysis												
Gamma 1129, Solid "Dry Weight Corrected"												
Iodine-129	U	-0.109	+/-0.287	0.447	1.00	pCi/g		MJH1	12/02/15	1441	1522374	8
Gammasspec, Gamma, Solid "Dry Weight Corrected"												
Actinium-227	U	-0.16	+/-0.283	0.488		pCi/g		RXF2	12/03/15	1307	1522383	9
Antimony-125	U	-0.00147	+/-0.105	0.198		pCi/g						
Cesium-137		0.543	+/-0.0972	0.0808	0.100	pCi/g						
Cobalt-60	U	0.0104	+/-0.0271	0.0653		pCi/g						
Europium-154	U	-0.0576	+/-0.136	0.242		pCi/g						
Protactinium-231	U	0.844	+/-0.607	1.10		pCi/g						

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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.1.R.5

Sample ID: 385070021

Project: MJWC00115

Client ID: MJWC001

Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Radium-226	0.886	+/-0.155	0.149	pCi/g	
Radium-228	0.664	+/-0.346	0.272	pCi/g	
Tin-126	U	0.064	+/-0.128	0.162	pCi/g

Rad Gas Flow Proportional Counting

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

Alpha	13.7	+/-4.03	3.88	4.00	pCi/g	JXB7	12/02/15	1221	1525762	10
Beta	22.9	+/-2.95	2.20	10.0	pCi/g					

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.702	+/-0.599	1.38	2.00	pCi/g	KSD1	12/02/15	1655	1525755	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	U	1.88	+/-2.06	3.43	6.00	pCi/g	TXJ1	12/02/15	1459	1522724	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	U	-0.282	+/-0.648	1.11	2.00	pCi/g	TXJ1	12/04/15	0155	1522716	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	U	1.88	+/-1.70	2.83	5.00	pCi/g	MYM1	11/29/15	1110	1522715	14
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The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	11/10/15	1319	1521842

GEL LABORATORIES LLC

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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.1.R.5

Sample ID: 385070021

Project: MJWC00115

Client ID: MJWC001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
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	
14	DOE EML HASL-300, Tc-02-RC Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			80.7	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			65.8	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			66.8	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"			90.3	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"			84.8	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"			90.8	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"			80.7	(15%-125%)
Strontium Carrier	Gf/PC, Sr90, solid "Dry Weight Corrected"			89.9	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"			98.1	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.1.R.5
Sample ID: 385070021
Matrix: Soil
Collect Date: 16-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 26.1%

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		26.1						percent		CXCI	11/10/15	1319	1521842	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.0398	+/-0.0682	0.0597	0.00	+/-0.0685	1.00	pCi/g		HAKB	11/23/15	1501	1522577	2
Plutonium-239/240	U	-0.0223	+/-0.076	0.188	0.0643	+/-0.0761	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.0077	+/-0.0532	0.129	0.0385	+/-0.0533	1.00	pCi/g		HAKB	11/24/15	0851	1522580	3
Uranium-233/234		0.738	+/-0.260	0.126	0.0288	+/-0.301	1.00	pCi/g						
Uranium-235/236		0.159	+/-0.127	0.0683	0.00	+/-0.131	1.00	pCi/g						
Uranium-238		1.09	+/-0.312	0.0681	0.00	+/-0.384	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.083	+/-0.157	0.485	0.139	+/-0.157	1.00	pCi/g		HAKB	11/23/15	1707	1522576	4
<i>Alphaspec Th229 - 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.992	+/-0.587	0.663	0.233	+/-0.609	1.00	pCi/g		HAKB	11/24/15	1014	1522579	5
Thorium-229	U	-0.0684	+/-0.279	0.659	0.234	+/-0.279	1.00	pCi/g						
Thorium-230		1.16	+/-0.606	0.629	0.220	+/-0.634	1.00	pCi/g						
Thorium-232		0.663	+/-0.431	0.349	0.0799	+/-0.444	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	-0.0163	+/-0.0308	0.0951	0.0272	+/-0.0309	1.00	pCi/g		HAKB	11/24/15	1042	1522571	6
Curium-242	U	-0.0152	+/-0.0351	0.104	0.0284	+/-0.0352	1.00	pCi/g						
Curium-243/244	U	0.00697	+/-0.0387	0.0743	0.017	+/-0.0388	1.00	pCi/g						
Curium-245/246	X	0.0775	+/-0.0748	0.0465	0.00	+/-0.0754	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-0.504	+/-6.04	10.5	5.08	+/-6.04	15.0	pCi/g		HAKB	11/25/15	1132	1522578	7
Rad Gamma Spec Analysis														
<i>Gamma 1129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.109	+/-0.287	0.447	0.204	+/-0.291	1.00	pCi/g		MJH1	12/02/15	1441	1522374	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.16	+/-0.283	0.488	0.228	+/-0.293		pCi/g		RXF2	12/03/15	1307	1522383	9
Antimony-125	U	-0.00147	+/-0.105	0.198	0.0914	+/-0.105		pCi/g						
Bismuth-212	UI	0.00	+/-0.889	1.48	0.694	+/-1.30		pCi/g						
Bismuth-214		0.886	+/-0.155	0.149	0.0683	+/-0.171		pCi/g						
Cesium-137		0.543	+/-0.0972	0.0808	0.0369	+/-0.106	0.100	pCi/g						
Cobalt-60	U	0.0104	+/-0.0271	0.0653	0.0273	+/-0.0271		pCi/g						
Europium-154	U	-0.0576	+/-0.136	0.242	0.107	+/-0.138		pCi/g						
Lead-212		0.986	+/-0.129	0.114	0.0539	+/-0.156		pCi/g						
Lead-214		0.997	+/-0.167	0.154	0.0715	+/-0.186		pCi/g						

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Certificate of Analysis

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

Report Date: December 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.1.R.5
Sample ID: 385070021

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		13.8	+/-1.49	0.603	0.248	+/-1.92		pCi/g						
Protactinium-231	UI	0.00	+/-0.607	1.10	0.517	+/-0.742		pCi/g						
Radium-226		0.886	+/-0.155	0.149	0.0683	+/-0.171		pCi/g						
Radium-228		0.664	+/-0.346	0.272	0.121	+/-0.358		pCi/g						
Thallium-208		0.303	+/-0.0876	0.0665	0.0301	+/-0.091		pCi/g						
Tin-126	U	0.064	+/-0.128	0.162	0.0778	+/-0.129		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		13.7	+/-4.03	3.88	1.58	+/-4.85	4.00	pCi/g		JXB7	12/02/15	1221	1525762	10
Beta		22.9	+/-2.95	2.20	0.984	+/-4.50	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.702	+/-0.599	1.38	0.602	+/-0.599	2.00	pCi/g		KSD1	12/02/15	1655	1525755	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium		1.88	+/-2.06	3.43	1.50	+/-2.06	6.00	pCi/g		TXJ1	12/02/15	1459	1522724	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.282	+/-0.648	1.11	0.548	+/-0.648	2.00	pCi/g		TXJ1	12/04/15	0155	1522716	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99		1.88	+/-1.70	2.83	1.36	+/-1.72	5.00	pCi/g		MYM	11/29/15	1110	1522715	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	11/10/15	1319	1521842

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 FFERF C-01 Modified

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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

Report Date: December 17, 2015

Client Sample ID: 3.2.1.R.5
Sample ID: 385070021

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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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"	1522577	80.7	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	65.8	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	66.8	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1522576	90.3	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1522579	84.8	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1522571	90.8	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1522578	80.7	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1525755	89.9	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1522715	98.1	(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
Contact: Ms. Laurie Loscy
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.1.R.5
Sample ID: 385070021
Matrix: Soil
Collect Date: 16-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 26.1%

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		26.1						percent		CXCI	11/10/15	1319	1521842	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.0398	+/-0.0682	0.0597	0.00	+/-0.0685	1.00	pCi/g		HAKB	11/23/15	1501	1522377	2
Plutonium-239/240	U	-0.0223	+/-0.076	0.188	0.0643	+/-0.0761	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.0077	+/-0.0532	0.129	0.0385	+/-0.0533	1.00	pci/g		HAKB	11/24/15	0851	1522580	3
Uranium-233/234		0.738	+/-0.260	0.126	0.0288	+/-0.301	1.00	pci/g						
Uranium-235/236		0.159	+/-0.127	0.0683	0.00	+/-0.131	1.00	pci/g						
Uranium-238		1.09	+/-0.312	0.0681	0.00	+/-0.384	1.00	pci/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.083	+/-0.157	0.485	0.139	+/-0.157	1.00	pCi/g		HAKB	11/23/15	1707	1522576	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.992	+/-0.587	0.663	0.233	+/-0.609	1.00	pCi/g		HAKB	11/24/15	1014	1522579	5
Thorium-229	U	-0.0684	+/-0.279	0.659	0.234	+/-0.279	1.00	pCi/g						
Thorium-230		1.16	+/-0.606	0.629	0.220	+/-0.634	1.00	pCi/g						
Thorium-232		0.663	+/-0.431	0.349	0.0799	+/-0.444	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	-0.0163	+/-0.0308	0.0951	0.0272	+/-0.0309	1.00	pCi/g		HAKB	11/24/15	1042	1522571	6
Curium-242	U	-0.0152	+/-0.0351	0.104	0.0284	+/-0.0352	1.00	pCi/g						
Curium-243/244	U	0.00697	+/-0.0387	0.0743	0.017	+/-0.0388	1.00	pCi/g						
Curium-245/246	X	0.0775	+/-0.0748	0.0465	0.00	+/-0.0754	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-0.504	+/-6.04	10.5	5.08	+/-6.04	15.0	pCi/g		HAKB	11/25/15	1132	1522578	7
Rad Gamma Spec Analysis														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.109	+/-0.287	0.447	0.204	+/-0.291	1.00	pCi/g		MJH1	12/02/15	1441	1522374	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.16	+/-0.283	0.488	0.228	+/-0.293		pCi/g		RXF2	12/03/15	1307	1522383	9
Antimony-125	U	-0.00147	+/-0.105	0.198	0.0914	+/-0.105		pCi/g						
Bismuth-212	UI	0.00	+/-0.889	1.48	0.694	+/-1.30		pCi/g						
Bismuth-214		0.886	+/-0.155	0.149	0.0683	+/-0.171		pCi/g						
Cesium-137		0.543	+/-0.0972	0.0808	0.0369	+/-0.106	0.100	pCi/g						
Cobalt-60	U	0.0104	+/-0.0271	0.0653	0.0273	+/-0.0271		pCi/g						
Europium-154	U	-0.0576	+/-0.136	0.242	0.107	+/-0.138		pCi/g						
Lead-212		0.986	+/-0.129	0.114	0.0539	+/-0.156		pCi/g						
Lead-214		0.997	+/-0.167	0.154	0.0715	+/-0.186		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: 3.2.1.R.5
Sample ID: 385070021

Report Date: December 17, 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>Gamma spec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		13.8	+/-1.49	0.603	0.248	+/-1.92		pCi/g						
Protactinium-231	UI	0.00	+/-0.607	1.10	0.517	+/-0.742		pCi/g						
Radium-226		0.886	+/-0.155	0.149	0.0683	+/-0.171		pCi/g						
Radium-228		0.664	+/-0.346	0.272	0.121	+/-0.358		pCi/g						
Thallium-208		0.303	+/-0.0876	0.0665	0.0301	+/-0.091		pCi/g						
Tin-126	U	0.064	+/-0.128	0.162	0.0778	+/-0.129		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		13.7	+/-4.03	3.88	1.58	+/-4.85	4.00	pCi/g		JXB7	12/02/15	1221	1525762	10
Beta		22.9	+/-2.95	2.20	0.984	+/-4.50	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.702	+/-0.599	1.38	0.602	+/-0.599	2.00	pCi/g		KSDI	12/02/15	1655	1525755	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist. Solid "Dry Weight Corrected"</i>														
Tritium		1.88	+/-2.06	3.43	1.50	+/-2.06	6.00	pCi/g		TXJ1	12/02/15	1459	1522724	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.282	+/-0.648	1.11	0.548	+/-0.648	2.00	pCi/g		TXJ1	12/04/15	0155	1522716	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99		1.88	+/-1.70	2.83	1.36	+/-1.72	5.00	pCi/g		MYM	11/29/15	1110	1522715	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	11/10/15	1319	1521842

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

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 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.1.R.5
Sample ID: 385070021

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RI	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"	1522577	80.7	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	65.8	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	66.8	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1522576	90.3	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1522579	84.8	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1522571	90.8	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1522578	80.7	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1525755	89.9	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1522715	98.1	(15%-125%)

Notes:

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: December 4, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.1.R.6
Sample ID: 385070022
Matrix: Water
Collect Date: 16-OCT-15 15:52
Receive Date: 05-NOV-15
Collector: Client

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Liquid (Standard List) "As Received"												
Actinium-227	U	6.77	+/-23.6	43.6		pCi/L		MJH1	11/17/15	0712	1521915	1
Antimony-125	U	-4.08	+/-8.38	14.3		pCi/L						
Cesium-137	U	2.65	+/-3.72	7.33	10.0	pCi/L						
Cobalt-60	U	-2.49	+/-3.56	6.15		pCi/L						
Europium-154	U	-7.84	+/-11.2	16.2		pCi/L						
Protactinium-231	U	30.0	+/-57.5	80.4		pCi/L						
Radium-228	U	13.2	+/-23.9	31.1		pCi/L						
Tin-126	U	-6.92	+/-8.98	12.5		pCi/L						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, liquid "As Received"												
Alpha	U	-0.452	+/-1.39	3.15	5.00	pCi/L		JXB7	12/02/15	1307	1525771	2
Beta	U	2.79	+/-2.91	4.83	5.00	pCi/L						

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 901.1	
2	EPA 900.0/SW846 9310	

Notes:

Counting Uncertainty is 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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.1.R.6
Sample ID: 385070022
Matrix: Water
Collect Date: 16-OCT-15
Receive Date: 05-NOV-15
Collector: Client

Project: MJWC00115
Client ID: MJWC001

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

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

Actinium-227	U	6.77	+/-23.6	43.6	20.6	+/-23.9		pCi/L		MJH1	11/17/15	0712	1521915	1
Antimony-125	U	-4.08	+/-8.38	14.3	6.59	+/-8.58		pCi/L						
Bismuth-212	U	8.13	+/-46.7	88.3	40.3	+/-46.8		pCi/L						
Bismuth-214	UI	0.00	+/-12.9	12.1	5.54	+/-13.0		pCi/L						
Cesium-137	U	2.65	+/-3.72	7.33	3.39	+/-3.92	10.0	pCi/L						
Cobalt-60	U	-2.49	+/-3.56	6.15	2.65	+/-3.74		pCi/L						
Europium-154	U	-7.84	+/-11.2	16.2	6.94	+/-11.8		pCi/L						
Lead-212	U	4.34	+/-9.59	11.8	5.66	+/-9.79		pCi/L						
Lead-214	UI	0.00	+/-12.2	15.3	7.26	+/-13.2		pCi/L						
Potassium-40	U	-25	+/-44.4	79.5	35.5	+/-45.9		pCi/L						
Protactinium-231	U	30.0	+/-57.5	80.4	37.8	+/-57.9		pCi/L						
Radium-228	U	13.2	+/-23.9	31.1	14.4	+/-24.7		pCi/L						
Thallium-208	UI	0.00	+/-4.65	5.82	2.65	+/-4.66		pCi/L						
Tin-126	U	-6.92	+/-8.98	12.5	5.93	+/-9.53		pCi/L						

Rad Gas Flow Proportional Counting

GFPC, Gross A-B, liquid "As Received"

Alpha	U	-0.452	+/-1.39	3.15	1.27	+/-1.39	5.00	pCi/L		JXB7	12/02/15	1307	1525771	2
Beta		2.79	+/-2.91	4.83	2.22	+/-2.95	5.00	pCi/L						

The following Analytical Methods were performed

Method	Description
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1	EPA 901.1
2	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test
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Batch ID	Recovery%	Acceptable Limits
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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 : MIW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: December 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.1.R.6
Sample ID: 385070022
Matrix: Water
Collect Date: 16-OCT-15
Receive Date: 05-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	U	6.77	+/-23.6	43.6	20.6	+/-23.9		pCi/L		MJH1	11/17/15	0712	1521915	1
Antimony-125	U	-4.08	+/-8.38	14.3	6.59	+/-8.58		pCi/L						
Bismuth-212	U	8.13	+/-46.7	88.3	40.3	+/-46.8		pCi/L						
Bismuth-214	UI	0.00	+/-12.9	12.1	5.54	+/-13.0		pCi/L						
Cesium-137	U	2.65	+/-3.72	7.33	3.39	+/-3.92	10.0	pCi/L						
Cobalt-60	U	-2.49	+/-3.56	6.15	2.65	+/-3.74		pCi/L						
Europium-154	U	-7.84	+/-11.2	16.2	6.94	+/-11.8		pCi/L						
Lead-212	U	4.34	+/-9.59	11.8	5.66	+/-9.79		pCi/L						
Lead-214	UI	0.00	+/-12.2	15.3	7.26	+/-13.2		pCi/L						
Potassium-40	U	-25	+/-44.4	79.5	35.5	+/-45.9		pCi/L						
Protactinium-231	U	30.0	+/-57.5	80.4	37.8	+/-57.9		pCi/L						
Radium-228	U	13.2	+/-23.9	31.1	14.4	+/-24.7		pCi/L						
Thallium-208	UI	0.00	+/-4.65	5.82	2.65	+/-4.66		pCi/L						
Tin-126	U	-6.92	+/-8.98	12.5	5.93	+/-9.53		pCi/L						

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, liquid "As Received"

Alpha	U	-0.452	+/-1.39	3.15	1.27	+/-1.39	5.00	pCi/L		JXB7	12/02/15	1307	1525771	2
Beta		2.79	+/-2.91	4.83	2.22	+/-2.95	5.00	pCi/L						

The following Analytical Methods were performed

Method	Description
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1	EPA 901.1
2	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test
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Batch ID	Recovery%	Acceptable Limits
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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

Report Date: December 4, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.2.R.1

Project: MJWC00115

Sample ID: 385070023

Client ID: MJWC001

Matrix: Soil

Collect Date: 16-OCT-15 11:30

Receive Date: 05-NOV-15

Collector: Client

Moisture: 24.3%

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Gravimetric Solids

ASTM D 2216 % Moisture "As Received"

Moisture		24.3				percent	CXC1	11/10/15	1319	1521842		1
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	0.128	+/-0.281	0.532		pCi/g	RXF2	12/03/15	1308	1522383		2
Antimony-125	U	0.0566	+/-0.112	0.219		pCi/g						
Cesium-137		0.597	+/-0.0934	0.0888	0.100	pCi/g						
Cobalt-60	U	-0.0062	+/-0.0496	0.0942		pCi/g						
Europium-154	U	0.0739	+/-0.163	0.327		pCi/g						
Protactinium-231	U	0.560	+/-0.728	0.939		pCi/g						
Radium-226		0.964	+/-0.175	0.136		pCi/g						
Radium-228		1.00	+/-0.332	0.293		pCi/g						
Tin-126	U	0.00	+/-0.171	0.122		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		12.6	+/-3.79	3.83	3.00	pCi/g	JXB7	12/02/15	1215	1525762		3
Beta		18.5	+/-2.88	2.64	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	11/10/15	1319	1521842

The following Analytical Methods were performed:

Method	Description	Analyst Comments
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	

Notes:

Counting Uncertainty is 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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.2.R.1
Sample ID: 385070023
Matrix: Soil
Collect Date: 16-OCT-15
Receive Date: 05-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.
Gravimetric Solids														
ASTM D 2216 % Moisture "As Received"														
Moisture		24.3						percent		CXC1	11/10/15	1319	1521842	1
Rad Gamma Spec Analysis														
GammaSpec, Gamma, Solid "Dry Weight Corrected"														
Actinium-227	U	0.128	+/-0.281	0.532	0.251	+/-0.288		pCi/g		RXF2	12/03/15	1308	1522383	2
Antimony-125	U	0.0566	+/-0.112	0.219	0.102	+/-0.115		pCi/g						
Bismuth-212	UI	0.00	+/-1.30	1.38	0.636	+/-1.36		pCi/g						
Bismuth-214		0.964	+/-0.175	0.136	0.0612	+/-0.194		pCi/g						
Cesium-137		0.597	+/-0.0934	0.0888	0.0406	+/-0.106	0.100	pCi/g						
Cobalt-60	U	-0.0062	+/-0.0496	0.0942	0.041	+/-0.0497		pCi/g						
Europium-154	U	0.0739	+/-0.163	0.327	0.147	+/-0.166		pCi/g						
Lead-212		0.992	+/-0.161	0.158	0.0759	+/-0.201		pCi/g						
Lead-214		1.13	+/-0.191	0.165	0.0773	+/-0.214		pCi/g						
Potassium-40		14.5	+/-1.67	0.518	0.198	+/-2.19		pCi/g						
Protactinium-231	UI	0.00	+/-0.728	0.939	0.439	+/-0.739		pCi/g						
Radium-226		0.964	+/-0.175	0.136	0.0612	+/-0.194		pCi/g						
Radium-228		1.00	+/-0.332	0.293	0.130	+/-0.357		pCi/g						
Thallium-208		0.301	+/-0.105	0.0761	0.0346	+/-0.108		pCi/g						
Tin-126	UI	0.00	+/-0.171	0.122	0.0588	+/-0.173		pCi/g						
Rad Gas Flow Proportional Counting														
GFPC, Gross A-B, solid "Dry Weight Corrected"														
Alpha		12.6	+/-3.79	3.83	1.59	+/-4.55	4.00	pCi/g		JXB7	12/02/15	1215	1525762	3
Beta		18.5	+/-2.88	2.64	1.19	+/-3.89	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	11/10/15	1319	1521842

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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.2.R.1
Sample ID: 385070023

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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Certificate of Analysis

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.2.R.1
Sample ID: 385070023
Matrix: Soil
Collect Date: 16-OCT-15
Receive Date: 05-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.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		24.3						percent		CXC1	11/10/15	1319	1521842	1
Rad Gamma Spec Analysis														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.128	+/-0.281	0.532	0.251	+/-0.288		pCi/g		RXF2	12/03/15	1308	1522383	2
Antimony-125	U	0.0566	+/-0.112	0.219	0.102	+/-0.115		pCi/g						
Bismuth-212	UI	0.00	+/-1.30	1.38	0.636	+/-1.36		pCi/g						
Bismuth-214		0.964	+/-0.175	0.136	0.0612	+/-0.194		pCi/g						
Cesium-137		0.597	+/-0.0934	0.0888	0.0406	+/-0.106	0.100	pCi/g						
Cobalt-60	U	-0.0062	+/-0.0496	0.0942	0.041	+/-0.0497		pCi/g						
Europium-154	U	0.0739	+/-0.163	0.327	0.147	+/-0.166		pCi/g						
Lead-212		0.992	+/-0.161	0.158	0.0759	+/-0.201		pCi/g						
Lead-214		1.13	+/-0.191	0.165	0.0773	+/-0.214		pCi/g						
Potassium-40		14.5	+/-1.67	0.518	0.198	+/-2.19		pCi/g						
Protactinium-231	UI	0.00	+/-0.728	0.939	0.439	+/-0.739		pCi/g						
Radium-226		0.964	+/-0.175	0.136	0.0612	+/-0.194		pCi/g						
Radium-228		1.00	+/-0.332	0.293	0.130	+/-0.357		pCi/g						
Thallium-208		0.301	+/-0.105	0.0761	0.0346	+/-0.108		pCi/g						
Tin-126	UI	0.00	+/-0.171	0.122	0.0588	+/-0.173		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		12.6	+/-3.79	3.83	1.59	+/-4.55	4.00	pCi/g		JXB7	12/02/15	1215	1525762	3
Beta		18.5	+/-2.88	2.64	1.19	+/-3.89	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	11/10/15	1319	1521842

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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.2.R.1
Sample ID: 385070023

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

Report Date: December 4, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.3.R.1
Sample ID: 385070024
Matrix: Soil
Collect Date: 16-OCT-15 12:00
Receive Date: 05-NOV-15
Collector: Client
Moisture: 27.1%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		27.1				percent		CXC1	11/10/15	1328	1521844	1
Rad Gamma Spec Analysis												
GammaSpec, Gamma, Solid "Dry Weight Corrected"												
Actinium-227	U	0.0642	+/-0.286	0.546		pCi/g		RXF2	12/03/15	0720	1522386	2
Antimony-125	U	-0.0231	+/-0.109	0.196		pCi/g						
Cesium-137		0.527	+/-0.0938	0.0788	0.100	pCi/g						
Cobalt-60	U	0.00422	+/-0.0399	0.0806		pCi/g						
Europium-154	U	-0.0114	+/-0.112	0.219		pCi/g						
Protactinium-231	U	0.639	+/-0.815	0.933		pCi/g						
Radium-226		0.780	+/-0.148	0.152		pCi/g						
Radium-228		0.886	+/-0.277	0.315		pCi/g						
Tin-126	U	0.0727	+/-0.102	0.127		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, solid "Dry Weight Corrected"												
Alpha		15.1	+/-4.45	3.90	4.00	pCi/g		JXB7	12/02/15	1223	1525762	3
Beta		15.0	+/-3.82	4.91	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	11/10/15	1328	1521844

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
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		

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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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

Report Date: December 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.3.R.1
Sample ID: 385070024
Matrix: Soil
Collect Date: 16-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 27.1%

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		27.1						percent		CXC1	11/10/15	1328	1521844	1
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Rad Gamma Spec Analysis

GammaSpec. Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	0.0642	+/-0.286	0.546	0.256	+/-0.288		pCi/g		RXF2	12/03/15	0720	1522386	2
Antimony-125	U	-0.0231	+/-0.109	0.196	0.090	+/-0.109		pCi/g						
Bismuth-212	UI	0.00	+/-1.09	1.52	0.706	+/-1.26		pCi/g						
Bismuth-214		0.780	+/-0.148	0.152	0.0693	+/-0.161		pCi/g						
Cesium-137		0.527	+/-0.0938	0.0788	0.0356	+/-0.103	0.100	pCi/g						
Cobalt-60	U	0.00422	+/-0.0399	0.0806	0.0345	+/-0.0399		pCi/g						
Europium-154	U	-0.0114	+/-0.112	0.219	0.0934	+/-0.112		pCi/g						
Lead-212		1.07	+/-0.125	0.109	0.0512	+/-0.154		pCi/g						
Lead-214		0.898	+/-0.165	0.141	0.0647	+/-0.181		pCi/g						
Potassium-40		14.1	+/-1.50	0.488	0.186	+/-1.93		pCi/g						
Protactinium-231	UI	0.00	+/-0.815	0.933	0.433	+/-0.828		pCi/g						
Radium-226		0.780	+/-0.148	0.152	0.0693	+/-0.161		pCi/g						
Radium-228		0.886	+/-0.277	0.315	0.141	+/-0.305		pCi/g						
Thallium-208		0.276	+/-0.0868	0.0744	0.0338	+/-0.0896		pCi/g						
Tin-126	UI	0.00	+/-0.102	0.127	0.0602	+/-0.103		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		15.1	+/-4.45	3.90	1.53	+/-5.32	4.00	pCi/g		JXB7	12/02/15	1223	1525762	3
Beta		15.0	+/-3.82	4.91	2.28	+/-4.43	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	11/10/15	1328	1521844

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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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 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.3.R.1
Sample ID: 385070024

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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.3.R.1
Sample ID: 385070024
Matrix: Soil
Collect Date: 16-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 27.1%

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		27.1						percent		CXC1	11/10/15	1328	1521844	1
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	0.0642	+/-0.286	0.546	0.256	+/-0.288		pCi/g		RXF2	12/03/15	0720	1522386	2
Antimony-125	U	-0.0231	+/-0.109	0.196	0.090	+/-0.109		pCi/g						
Bismuth-212	UI	0.00	+/-1.09	1.52	0.706	+/-1.26		pCi/g						
Bismuth-214		0.780	+/-0.148	0.152	0.0693	+/-0.161		pCi/g						
Cesium-137		0.527	+/-0.0938	0.0788	0.0356	+/-0.103	0.100	pCi/g						
Cobalt-60	U	0.00422	+/-0.0399	0.0806	0.0345	+/-0.0399		pCi/g						
Europium-154	U	-0.0114	+/-0.112	0.219	0.0934	+/-0.112		pCi/g						
Lead-212		1.07	+/-0.125	0.109	0.0512	+/-0.154		pCi/g						
Lead-214		0.898	+/-0.165	0.141	0.0647	+/-0.181		pCi/g						
Potassium-40		14.1	+/-1.50	0.488	0.186	+/-1.93		pCi/g						
Protactinium-231	UI	0.00	+/-0.815	0.933	0.433	+/-0.828		pCi/g						
Radium-226		0.780	+/-0.148	0.152	0.0693	+/-0.161		pCi/g						
Radium-228		0.886	+/-0.277	0.315	0.141	+/-0.305		pCi/g						
Thallium-208		0.276	+/-0.0868	0.0744	0.0338	+/-0.0896		pCi/g						
Tin-126	UI	0.00	+/-0.102	0.127	0.0602	+/-0.103		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		15.1	+/-4.45	3.90	1.53	+/-5.32	4.00	pCi/g		JXB7	12/02/15	1223	1525762	3
Beta		15.0	+/-3.82	4.91	2.28	+/-4.43	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	11/10/15	1328	1521844

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

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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.3.R.1
Sample ID: 385070024

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).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: December 7, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 3.2.4.R.1
Sample ID: 385068001
Matrix: Soil
Collect Date: 19-OCT-15 10:00
Receive Date: 05-NOV-15
Collector: Client
Moisture: 25.8%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		25.8				percent		CXC1	11/10/15	1326	1521841	1
Rad Gamma Spec Analysis												
GammaSpec, Gamma, Solid "Dry Weight Corrected"												
Actinium-227	U	0.159	+/-0.229	0.438		pCi/g		RXF2	12/03/15	0704	1522393	2
Antimony-125	U	0.0132	+/-0.101	0.191		pCi/g						
Cesium-137		0.556	+/-0.0885	0.0692	0.100	pCi/g						
Cobalt-60	U	0.0158	+/-0.035	0.0737		pCi/g						
Europium-154	U	0.0443	+/-0.0665	0.187		pCi/g						
Protactinium-231	U	0.400	+/-0.647	0.953		pCi/g						
Radium-226		0.743	+/-0.148	0.112		pCi/g						
Radium-228		0.757	+/-0.237	0.288		pCi/g						
Tin-126	UI	0.00	+/-0.104	0.129		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, solid "Dry Weight Corrected"												
Alpha		10.3	+/-3.60	3.90	4.00	pCi/g		JXB7	12/02/15	1215	1525762	3
Beta		19.1	+/-3.10	2.93	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	11/10/15	1326	1521841

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
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		

Notes:

Counting Uncertainty is 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
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.4.R.1
Sample ID: 385068001
Matrix: Soil
Collect Date: 19-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 25.8%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		25.8						percent		CXC1	11/10/15	1326	1521841	1
Rad Gamma Spec Analysis														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.159	+/-0.229	0.438	0.204	+/-0.241		pCi/g		RXF2	12/03/15	0704	1522393	2
Antimony-125	U	0.0132	+/-0.101	0.191	0.0882	+/-0.101		pCi/g						
Bismuth-212	UI	0.00	+/-0.616	1.16	0.535	+/-0.839		pCi/g						
Bismuth-214		0.743	+/-0.148	0.112	0.0498	+/-0.160		pCi/g						
Cesium-137		0.556	+/-0.0885	0.0692	0.0312	+/-0.0988	0.100	pCi/g						
Cobalt-60	U	0.0158	+/-0.035	0.0737	0.0317	+/-0.0358		pCi/g						
Europium-154	U	0.0443	+/-0.0665	0.187	0.0793	+/-0.0696		pCi/g						
Lead-212		0.962	+/-0.118	0.0972	0.0455	+/-0.142		pCi/g						
Lead-214		0.896	+/-0.184	0.304	0.147	+/-0.197		pCi/g						
Potassium-40		12.4	+/-1.44	0.639	0.269	+/-1.83		pCi/g						
Protactinium-231	U	0.400	+/-0.647	0.953	0.447	+/-0.653		pCi/g						
Radium-226		0.743	+/-0.148	0.112	0.0498	+/-0.160		pCi/g						
Radium-228		0.757	+/-0.237	0.288	0.130	+/-0.259		pCi/g						
Thallium-208		0.233	+/-0.0763	0.0664	0.0302	+/-0.0787		pCi/g						
Tin-126	UI	0.00	+/-0.104	0.129	0.0612	+/-0.106		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		10.3	+/-3.60	3.90	1.60	+/-4.12	4.00	pCi/g		JXB7	12/02/15	1215	1525762	3
Beta		19.1	+/-3.10	2.93	1.32	+/-4.18	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	11/10/15	1326	1521841

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
Contact: Ms. Laurie Loscy
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.4.R.1
Sample ID: 385068001

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

Report Date: December 7, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 3.2.4.R.3
Sample ID: 385068002
Matrix: Soil
Collect Date: 19-OCT-15 10:35
Receive Date: 05-NOV-15
Collector: Client
Moisture: 18%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		18.0				percent		CXC1	11/10/15	1326	1521841	1
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Actinium-227	U	0.162	+/-0.331	0.667		pCi/g		RXF2	12/03/15	0707	1522393	2
Antimony-125	U	0.0327	+/-0.123	0.241		pCi/g						
Cesium-137		0.129	+/-0.0839	0.105	0.100	pCi/g						
Cobalt-60	U	-0.0185	+/-0.0575	0.108		pCi/g						
Europium-154	U	-0.000223	+/-0.173	0.342		pCi/g						
Protactinium-231	U	0.00	+/-0.901	1.16		pCi/g						
Radium-226		1.05	+/-0.214	0.129		pCi/g						
Radium-228		1.02	+/-0.350	0.334		pCi/g						
Tin-126	U	0.0598	+/-0.141	0.175		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, solid "Dry Weight Corrected"												
Alpha		11.5	+/-3.65	3.82	4.00	pCi/g		JXB7	12/02/15	1218	1525762	3
Beta		19.4	+/-3.13	3.13	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	11/10/15	1326	1521841

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
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		

Notes:

Counting Uncertainty is 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 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.4.R.3
Sample ID: 385068802
Matrix: Soil
Collect Date: 19-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 18%

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		18.0						percent		CXC1	11/10/15	1326	1521841	1
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Rad Gamma Spec Analysis

GammaSpec, Gamma, Solid "Dry Weight Corrected"

Actinium-227	U	0.162	+/-0.331	0.667	0.309	+/-0.340		pCi/g		RXF2	12/03/15	0707	1522393	2
Antimony-125	U	0.0327	+/-0.123	0.241	0.109	+/-0.124		pCi/g						
Bismuth-212	UI	0.00	+/-0.925	1.98	0.912	+/-1.18		pCi/g						
Bismuth-214		1.05	+/-0.214	0.129	0.0543	+/-0.231		pCi/g						
Cesium-137		0.129	+/-0.0839	0.105	0.0468	+/-0.0845	0.100	pCi/g						
Cobalt-60	U	-0.0185	+/-0.0575	0.108	0.0448	+/-0.0581		pCi/g						
Europium-154	U	-0.000223	+/-0.173	0.342	0.147	+/-0.173		pCi/g						
Lead-212		1.19	+/-0.174	0.129	0.0595	+/-0.209		pCi/g						
Lead-214		0.882	+/-0.221	0.215	0.099	+/-0.232		pCi/g						
Potassium-40		15.9	+/-1.99	0.950	0.386	+/-2.40		pCi/g						
Protactinium-231	UI	0.00	+/-0.901	1.16	0.531	+/-0.948		pCi/g						
Radium-226		1.05	+/-0.214	0.129	0.0543	+/-0.231		pCi/g						
Radium-228		1.02	+/-0.350	0.334	0.142	+/-0.367		pCi/g						
Thallium-208		0.321	+/-0.115	0.0949	0.0422	+/-0.118		pCi/g						
Tin-126	U	0.0598	+/-0.141	0.175	0.0842	+/-0.142		pCi/g						

Rad Gas Flow Proportional Counting

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

Alpha		11.5	+/-3.65	3.82	1.58	+/-4.26	4.00	pCi/g		JXB7	12/02/15	1218	1525762	3
Beta		19.4	+/-3.13	3.13	1.43	+/-4.16	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	11/10/15	1326	1521841

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
Contact: Ms. Laurie Loscy
Project: Soil Radioisotopes

Report Date: December 17, 2015

Client Sample ID: 3.2.4.R.3
Sample ID: 385068002

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

Report Date: December 7, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 3.2.4.R.4
Sample ID: 385068003
Matrix: Soil
Collect Date: 19-OCT-15 14:10
Receive Date: 05-NOV-15
Collector: Client
Moisture: 8.9%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		8.90				percent		CXC1	11/10/15	1326	1521841	1
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Actinium-227	U	0.0585	+/-0.289	0.545		pCi/g		RXF2	12/03/15	0707	1522393	2
Antimony-125	U	0.00225	+/-0.112	0.205		pCi/g						
Cesium-137	U	0.0806	+/-0.0521	0.0878	0.100	pCi/g						
Cobalt-60	U	-0.0334	+/-0.0537	0.0943		pCi/g						
Europium-154	U	0.0196	+/-0.152	0.298		pCi/g						
Protactinium-231	UI	0.00	+/-0.760	0.952		pCi/g						
Radium-226		0.774	+/-0.174	0.149		pCi/g						
Radium-228		0.644	+/-0.326	0.315		pCi/g						
Tin-126	U	0.144	+/-0.170	0.211		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, solid "Dry Weight Corrected"												
Alpha		7.79	+/-3.14	3.84	4.00	pCi/g		JXB7	12/02/15	1548	1525762	3
Beta		22.1	+/-3.13	3.06	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	11/10/15	1326	1521841

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
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		

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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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

Report Date: December 17, 2015

Client Sample ID: 3.2.4.R.4
Sample ID: 385068003
Matrix: Soil
Collect Date: 19-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 8.9%

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		8.90						percent		CXC1	11/10/15	1326	1521841	1
Rad Gamma Spec Analysis														
<i>Gamma spec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0585	+/-0.289	0.545	0.254	+/-0.290		pCi/g		RXF2	12/03/15	0707	1522393	2
Antimony-125	U	0.00225	+/-0.112	0.205	0.0937	+/-0.112		pCi/g						
Bismuth-212	UI	0.00	+/-0.754	1.46	0.674	+/-0.961		pCi/g						
Bismuth-214		0.774	+/-0.174	0.149	0.0674	+/-0.188		pCi/g						
Cesium-137		0.0806	+/-0.0521	0.0878	0.040	+/-0.0526	0.100	pCi/g						
Cobalt-60	U	-0.0334	+/-0.0537	0.0943	0.0409	+/-0.0559		pCi/g						
Europium-154	U	0.0196	+/-0.152	0.298	0.132	+/-0.152		pCi/g						
Lead-212		1.10	+/-0.143	0.128	0.0602	+/-0.176		pCi/g						
Lead-214		0.989	+/-0.206	0.171	0.0793	+/-0.224		pCi/g						
Potassium-40		15.5	+/-1.67	0.775	0.324	+/-2.13		pCi/g						
Protactinium-231	UI	0.00	+/-0.760	0.952	0.439	+/-0.832		pCi/g						
Radium-226		0.774	+/-0.174	0.149	0.0674	+/-0.188		pCi/g						
Radium-228		0.644	+/-0.326	0.315	0.140	+/-0.341		pCi/g						
Thallium-208		0.349	+/-0.0761	0.0697	0.0312	+/-0.0823		pCi/g						
Tin-126	UI	0.00	+/-0.170	0.211	0.101	+/-0.171		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A-B, solid "Dry Weight Corrected"</i>														
Alpha		7.79	+/-3.14	3.84	1.61	+/-3.48	4.00	pCi/g		JXB7	12/02/15	1548	1525762	3
Beta		22.1	+/-3.13	3.06	1.41	+/-4.42	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	11/10/15	1326	1521841

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 Hazekwood Drive
Suite 112
Buffalo, New York 14228

Report Date: December 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.4.R.4
Sample ID: 385068003

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

Report Date: December 7, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 3.2.4.R.5
Sample ID: 385068004
Matrix: Soil
Collect Date: 19-OCT-15 14:10
Receive Date: 05-NOV-15
Collector: Client
Moisture: 9.87%

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Gravimetric Solids												
ASTM D 2216 % Moisture "As Received"												
Moisture		9.87				percent		CXCI	11/10/15	1326	1521841	1
Rad Alpha Spec Analysis												
ASP Plutonium Isotopic, Solid "Dry Weight Corrected"												
Plutonium-238	U	-0.00459	+/-0.0396	0.0917	1.00	pCi/g		HAKB	11/23/15	1501	1522577	2
Plutonium-239/240	U	0.00153	+/-0.0702	0.154	1.00	pCi/g						
ASP Uranium Isotopic, Solid "Dry Weight Corrected"												
Uranium-232	U	0.0125	+/-0.0672	0.126	1.00	pCi/g		HAKB	11/24/15	0851	1522580	3
Uranium-233/234		0.940	+/-0.258	0.0991	1.00	pCi/g						
Uranium-235/236		0.0897	+/-0.0866	0.0538	1.00	pCi/g						
Uranium-238		0.769	+/-0.233	0.0537	1.00	pCi/g						
Alphaspec Np237, Solid "Dry Weight Corrected"												
Neptunium-237	U	-0.0331	+/-0.146	0.382	1.00	pCi/g		HAKB	11/23/15	1706	1522576	4
Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"												
Thorium-228	U	0.416	+/-0.459	0.725	1.00	pCi/g		HAKB	11/24/15	1014	1522579	5
Thorium-229	U	0.161	+/-0.261	0.421	1.00	pCi/g						
Thorium-230		0.796	+/-0.424	0.318	1.00	pCi/g						
Thorium-232		1.14	+/-0.501	0.342	1.00	pCi/g						
Am241, Cm Solid "Dry Weight Corrected"												
Americium-241	U	0.0114	+/-0.080	0.164	1.00	pCi/g		HAKB	11/24/15	1042	1522571	6
Curium-242	U	0.00	+/-0.044	0.0654	1.00	pCi/g						
Curium-243/244	U	0.021	+/-0.133	0.261	1.00	pCi/g						
Curium-245/246	U	0.0494	+/-0.0874	0.132	1.00	pCi/g						
Liquid Scint Pu241, Solid "Dry Weight Corrected"												
Plutonium-241	U	-1.12	+/-6.25	10.8	15.0	pCi/g		HAKB	11/25/15	0728	1522578	7
Rad Gamma Spec Analysis												
Gamma 1129, Solid "Dry Weight Corrected"												
Iodine-129	U	-0.0408	+/-0.283	0.496	1.00	pCi/g		MJH1	12/02/15	1341	1522374	8
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Actinium-227	U	-0.042	+/-0.264	0.500		pCi/g		RXF2	12/03/15	0707	1522393	9
Antimony-125	U	0.0101	+/-0.106	0.200		pCi/g						
Cesium-137		0.0821	+/-0.0612	0.0811	0.100	pCi/g						
Cobalt-60	U	0.0119	+/-0.0448	0.0924		pCi/g						
Europium-154	U	0.0149	+/-0.130	0.261		pCi/g						
Protactinium-231	U	0.675	+/-0.529	1.08		pCi/g						

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Certificate of Analysis

Report Date: December 7, 2015

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

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.4.R.5

Sample ID: 385068004

Project: MJWC00115

Client ID: MJWC001

Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Radium-226	0.650	+/-0.197	0.142	pCi/g
Radium-228	0.740	+/-0.344	0.254	pCi/g
Th-126	U 0.0509	+/-0.118	0.136	pCi/g

Rad Gas Flow Proportional Counting

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

Alpha	14.3	+/-4.06	3.97	4.00	pCi/g	JXB7	12/02/15	1218	1525762	10
Beta	22.3	+/-3.26	3.20	10.0	pCi/g					

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U -0.149	+/-0.410	0.857	2.00	pCi/g	KSD1	12/03/15	1125	1525755	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	U 1.83	+/-1.74	2.83	6.00	pCi/g	TXJ1	12/02/15	1149	1522724	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	U -0.897	+/-0.756	1.33	2.00	pCi/g	TXJ1	12/03/15	1828	1522716	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	U 1.61	+/-1.50	2.50	5.00	pCi/g	MYM1	11/29/15	0924	1522715	14
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The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	11/10/15	1326	1521841

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Certificate of Analysis

Report Date: December 7, 2015

Company : MJW Corporation
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.4.R.5

Sample ID: 385068004

Project: MJWC00115

Client ID: MJWC001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
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	
14	DOE EML HASL-300, Tc-02-RC Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			75.3	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			79.1	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"			78.3	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"			96.2	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"			102	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"			65.6	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"			75.3	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			91	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"			96.3	(15%-125%)

Notes:

Counting Uncertainty is 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 17, 2015

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.4.R.5
Sample ID: 385068004
Matrix: Soil
Collect Date: 19-OCT-15
Receive Date: 05-NOV-15
Collector: Client
Moisture: 9.87%

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		9.87						percent		CXC1	11/10/15	1326	1521841	1
Rad Alpha Spec Analysis														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	-0.00459	+/-0.0396	0.0917	0.0172	+/-0.0397	1.00	pCi/g		HAKB	11/23/15	1501	1522577	2
Plutonium-239/240	U	0.00153	+/-0.0702	0.154	0.0485	+/-0.0703	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.0125	+/-0.0672	0.126	0.0529	+/-0.0673	1.00	pCi/g		HAKB	11/24/15	0851	1522580	3
Uranium-233/234		0.940	+/-0.258	0.0991	0.0227	+/-0.311	1.00	pCi/g						
Uranium-235/236		0.0897	+/-0.0866	0.0538	0.00	+/-0.0881	1.00	pCi/g						
Uranium-238		0.769	+/-0.233	0.0537	0.00	+/-0.273	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.0331	+/-0.146	0.382	0.0874	+/-0.146	1.00	pCi/g		HAKB	11/23/15	1706	1522576	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.416	+/-0.459	0.725	0.282	+/-0.464	1.00	pCi/g		HAKB	11/24/15	1014	1522579	5
Thorium-229		0.161	+/-0.261	0.421	0.132	+/-0.262	1.00	pCi/g						
Thorium-230		0.796	+/-0.424	0.318	0.0809	+/-0.439	1.00	pCi/g						
Thorium-232		1.14	+/-0.501	0.342	0.0932	+/-0.528	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	0.0114	+/-0.080	0.164	0.0538	+/-0.080	1.00	pCi/g		HAKB	11/24/15	1042	1522571	6
Curium-242		0.00	+/-0.044	0.0654	0.00	+/-0.0441	1.00	pCi/g						
Curium-243/244	U	0.021	+/-0.133	0.261	0.102	+/-0.133	1.00	pCi/g						
Curium-245/246		0.0494	+/-0.0874	0.132	0.0337	+/-0.0877	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-1.12	+/-6.25	10.8	5.27	+/-6.25	15.0	pCi/g		HAKB	11/25/15	0728	1522578	7
Rad Gamma Spec Analysis														
<i>Gamma 1129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.0408	+/-0.283	0.496	0.228	+/-0.283	1.00	pCi/g		MJH1	12/02/15	1341	1522374	8
<i>Gamma spec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.042	+/-0.264	0.500	0.233	+/-0.264		pCi/g		RXP2	12/03/15	0707	1522393	9
Antimony-125	U	0.0101	+/-0.106	0.200	0.0919	+/-0.106		pCi/g						
Bismuth-212		1.93	+/-1.06	0.957	0.425	+/-1.08		pCi/g						
Bismuth-214		0.650	+/-0.197	0.142	0.0643	+/-0.205		pCi/g						
Cesium-137		0.0821	+/-0.0612	0.0811	0.0367	+/-0.0616	0.100	pCi/g						
Cobalt-60	U	0.0119	+/-0.0448	0.0924	0.0402	+/-0.0451		pCi/g						
Europium-154	U	0.0149	+/-0.130	0.261	0.114	+/-0.130		pCi/g						
Lead-212		1.13	+/-0.137	0.107	0.0496	+/-0.168		pCi/g						
Lead-214		0.999	+/-0.167	0.154	0.0713	+/-0.187		pCi/g						

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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 3.2.4.R.5
Sample ID: 385068004

Report Date: December 17, 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>Gamma spec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		14.5	+/-1.64	0.577	0.228	+/-2.07		pCi/g						
Protactinium-231	UI	0.00	+/-0.529	1.08	0.505	+/-0.629		pCi/g						
Radium-226		0.650	+/-0.197	0.142	0.0643	+/-0.205		pCi/g						
Radium-228		0.740	+/-0.344	0.254	0.111	+/-0.361		pCi/g						
Thallium-208		0.348	+/-0.080	0.064	0.0285	+/-0.0854		pCi/g						
Tin-126	U	0.0509	+/-0.118	0.136	0.064	+/-0.119		pCi/g						
Rad Gas Flow Proportional Counting														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		14.3	+/-4.06	3.97	1.65	+/-4.97	4.00	pCi/g		JXB7	12/02/15	1218	1525762	10
Beta		22.3	+/-3.26	3.20	1.47	+/-4.65	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.149	+/-0.410	0.857	0.367	+/-0.410	2.00	pCi/g		KSDI	12/03/15	1125	1525755	11
Rad Liquid Scintillation Analysis														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium		1.83	+/-1.74	2.83	1.23	+/-1.74	6.00	pCi/g		TXJ1	12/02/15	1149	1522724	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.897	+/-0.756	1.33	0.650	+/-0.756	2.00	pCi/g		TXJ1	12/03/15	1828	1522716	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99		1.61	+/-1.50	2.50	1.20	+/-1.51	5.00	pCi/g		MYM	11/29/15	0924	1522715	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	11/10/15	1326	1521841

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 17, 2015

Client Sample ID: 3.2.4.R.5
Sample ID: 385068004

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, Te-02-RC Modified												

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1522577	75.3	(15%-125%)
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	79.1	(15%-125%)
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1522580	78.3	(15%-125%)
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1522576	96.2	(15%-125%)
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1522579	102	(15%-125%)
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1522571	65.6	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1522578	75.3	(15%-125%)
Strontium Carrier	GPPC, Sr90, solid "Dry Weight Corrected"	1525755	91	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1522715	96.3	(15%-125%)

Notes:

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