

# 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: January 19, 2016

Client Sample ID: 5.1A.R.1.1  
 Sample ID: 387899010  
 Matrix: Soil  
 Collect Date: 16-DEC-15  
 Receive Date: 21-DEC-15  
 Collector: Client  
 Moisture: 17.6%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		17.6						percent		LYT1	12/22/15	1007	1532997	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.024	+/-0.0675	0.072	0.00	+/-0.0676	1.00	pCi/g		HAKB	01/11/16	0940	1533905	2
Plutonium-239/240		0.116	+/-0.138	0.201	0.0646	+/-0.139	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	0.0281	+/-0.074	0.133	0.0396	+/-0.0742	1.00	pCi/g		HAKB	01/11/16	1029	1533902	3
Uranium-233/234		0.367	+/-0.174	0.110	0.0251	+/-0.187	1.00	pCi/g						
Uranium-235/236		0.0397	+/-0.0681	0.0596	0.00	+/-0.0685	1.00	pCi/g						
Uranium-238		0.491	+/-0.198	0.095	0.0178	+/-0.217	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.172	+/-0.243	0.794	0.243	+/-0.243	1.00	pCi/g		HAKB	01/08/16	0854	1533904	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.560	+/-0.499	0.650	0.212	+/-0.511	1.00	pCi/g		HAKB	01/11/16	1350	1533901	5
Thorium-229	U	0.0443	+/-0.311	0.640	0.209	+/-0.312	1.00	pCi/g						
Thorium-230		0.427	+/-0.417	0.516	0.148	+/-0.423	1.00	pCi/g						
Thorium-232		0.423	+/-0.384	0.352	0.0659	+/-0.390	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241		0.0225	+/-0.0516	0.0819	0.0188	+/-0.0517	1.00	pCi/g		HAKB	01/11/16	1541	1533903	6
Curium-242		0.00	+/-0.0329	0.049	0.00	+/-0.033	1.00	pCi/g						
Curium-243/244		0.00	+/-0.0295	0.0438	0.00	+/-0.0295	1.00	pCi/g						
Curium-245/246	X	0.0508	+/-0.0668	0.0508	0.00	+/-0.0672	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	-0.763	+/-5.30	9.36	4.48	+/-5.30	15.0	pCi/g		HAKB	01/13/16	0754	1533906	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.052	+/-0.309	0.580	0.248	+/-0.310	1.00	pCi/g		MJH1	01/12/16	1553	1533089	8
<i>Gammaspac, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.19	+/-0.241	0.432	0.199	+/-0.257		pCi/g		RXF2	01/14/16	0908	1533152	9
Antimony-125	U	-0.0536	+/-0.102	0.179	0.0813	+/-0.105		pCi/g						
Bismuth-212	UI	0.00	+/-0.575	1.21	0.555	+/-0.645		pCi/g						
Bismuth-214		0.720	+/-0.167	0.145	0.0657	+/-0.179		pCi/g						
Cesium-137		0.315	+/-0.0922	0.0739	0.0332	+/-0.0965	0.100	pCi/g						
Cobalt-60	U	0.0146	+/-0.0429	0.0907	0.0392	+/-0.0434		pCi/g						
Europium-154	UI	0.00	+/-0.114	0.257	0.112	+/-0.128		pCi/g						
Lead-212		0.733	+/-0.120	0.110	0.0513	+/-0.138		pCi/g						
Lead-214		1.19	+/-0.215	0.135	0.062	+/-0.239		pCi/g						

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 Project: Soil Radioisotopes  
 Client Sample ID: 5.1A.R.1.1  
 Sample ID: 387899010

Report Date: January 19, 2016

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		9.49	+/-1.33	0.608	0.242	+/-1.56		pCi/g						
Protactinium-231	U	0.00	+/-0.690	0.947	0.440	+/-0.704		pCi/g						
Radium-226		0.720	+/-0.167	0.145	0.0657	+/-0.179		pCi/g						
Radium-228		0.572	+/-0.226	0.264	0.115	+/-0.244		pCi/g						
Thallium-208		0.247	+/-0.0822	0.0712	0.0322	+/-0.0851		pCi/g						
Tin-126	U	0.0205	+/-0.144	0.180	0.0856	+/-0.145		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		7.80	+/-1.69	2.17	1.02	+/-2.26	4.00	pCi/g		KXB2	01/11/16	1935	1534757	10
Beta		15.5	+/-1.75	2.37	1.16	+/-2.78	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.40	+/-0.451	1.00	0.436	+/-0.452	2.00	pCi/g		KSD1	01/11/16	0858	1534758	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	-0.908	+/-2.96	5.23	2.52	+/-2.96	6.00	pCi/g		TXJ1	01/08/16	0006	1534917	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.184	+/-0.741	1.28	0.626	+/-0.741	2.00	pCi/g		TXJ1	01/14/16	1542	1534934	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-1.45	+/-1.84	3.33	1.60	+/-1.84	5.00	pCi/g		MYM	01/12/16	0624	1534637	14

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/22/15	1007	1532997

**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-300.1-01 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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Sample ID: 387899010

Report Date: January 19, 2016

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"	1533905	67.5	(15%-125%)										
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	77.4	(15%-125%)										
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	73.3	(15%-125%)										
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"	1533904	68.7	(15%-125%)										
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1533901	68.7	(15%-125%)										
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"	1533903	101	(15%-125%)										
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"	1533906	67.5	(15%-125%)										
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"	1534758	78.2	(25%-125%)										
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"	1534637	95.7	(15%-125%)										

### Notes:

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

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Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 5.1A.R.1.4  
 Sample ID: 387899011  
 Matrix: Soil  
 Collect Date: 16-DEC-15  
 Receive Date: 21-DEC-15  
 Collector: Client  
 Moisture: 7.87%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		7.87						percent		LYT1	12/22/15	1007	1532997	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.0398	+/-0.0704	0.107	0.0271	+/-0.0706	1.00	pCi/g		HAKB	01/11/16	0940	1533905	2
Plutonium-239/240	U	-0.0119	+/-0.0536	0.135	0.0414	+/-0.0537	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.0216	+/-0.0833	0.193	0.0711	+/-0.0833	1.00	pCi/g		HAKB	01/11/16	1029	1533902	3
Uranium-233/234		0.579	+/-0.191	0.117	0.0359	+/-0.214	1.00	pCi/g						
Uranium-235/236		0.0915	+/-0.0855	0.0998	0.0272	+/-0.0869	1.00	pCi/g						
Uranium-238		0.446	+/-0.165	0.0837	0.0192	+/-0.181	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	0.0347	+/-0.193	0.370	0.0847	+/-0.193	1.00	pCi/g		HAKB	01/08/16	0854	1533904	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.481	+/-0.390	0.427	0.119	+/-0.400	1.00	pCi/g		HAKB	01/11/16	1350	1533901	5
Thorium-229	U	-0.00737	+/-0.264	0.582	0.199	+/-0.264	1.00	pCi/g						
Thorium-230		0.571	+/-0.424	0.475	0.146	+/-0.434	1.00	pCi/g						
Thorium-232		0.614	+/-0.420	0.403	0.110	+/-0.431	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	-0.0306	+/-0.0385	0.129	0.0405	+/-0.0386	1.00	pCi/g		HAKB	01/11/16	1541	1533903	6
Curium-242	U	-0.00422	+/-0.0364	0.0844	0.0158	+/-0.0365	1.00	pCi/g						
Curium-243/244	U	-0.0113	+/-0.0342	0.0962	0.0245	+/-0.0343	1.00	pCi/g						
Curium-245/246	U	-0.00876	+/-0.0387	0.101	0.0231	+/-0.0388	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241		3.56	+/-4.19	7.06	3.38	+/-4.26	15.0	pCi/g		HAKB	01/13/16	0841	1533906	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-0.0395	+/-0.241	0.404	0.165	+/-0.242	1.00	pCi/g		MJH11	01/12/16	1553	1533089	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.236	+/-0.283	0.532	0.250	+/-0.304		pCi/g		RXF2	01/14/16	1045	1533152	9
Antimony-125	U	-0.0167	+/-0.0904	0.170	0.0776	+/-0.0907		pCi/g						
Bismuth-212	UI	0.00	+/-0.758	1.15	0.526	+/-0.859		pCi/g						
Bismuth-214		0.680	+/-0.155	0.127	0.0575	+/-0.167		pCi/g						
Cesium-137	U	-0.0301	+/-0.0346	0.0611	0.027	+/-0.0372	0.100	pCi/g						
Cobalt-60	U	-0.0191	+/-0.0429	0.0658	0.0274	+/-0.0437		pCi/g						
Europium-154	U	0.0546	+/-0.125	0.228	0.0987	+/-0.128		pCi/g						
Lead-212		0.792	+/-0.124	0.111	0.052	+/-0.143		pCi/g						
Lead-214		0.799	+/-0.202	0.145	0.0669	+/-0.214		pCi/g						

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 Client Sample ID: 5.1A.R.1.4  
 Sample ID: 387899011

Report Date: January 19, 2016

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Le	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>Gammaspcc, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		12.6	+/-1.39	0.539	0.214	+/-1.76		pCi/g						
Protactinium-231	U	0.00	+/-0.827	0.892	0.413	+/-0.859		pCi/g						
Radium-226		0.680	+/-0.155	0.127	0.0575	+/-0.167		pCi/g						
Radium-228		0.844	+/-0.220	0.196	0.0829	+/-0.250		pCi/g						
Thallium-208		0.200	+/-0.0646	0.0631	0.0283	+/-0.067		pCi/g						
Tin-126	U	0.0574	+/-0.145	0.159	0.0753	+/-0.146		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		7.02	+/-1.59	1.98	0.918	+/-2.08	4.00	pCi/g		KXB2	01/11/16	1935	1534757	10
Beta		15.5	+/-1.47	1.81	0.880	+/-2.59	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.325	+/-0.506	1.05	0.465	+/-0.506	2.00	pCi/g		KSD1	01/11/16	0855	1534758	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	-1.64	+/-2.48	4.46	2.14	+/-2.48	6.00	pCi/g		TXJ1	01/08/16	0232	1534917	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.201	+/-0.668	1.16	0.565	+/-0.668	2.00	pCi/g		TXJ1	01/14/16	1643	1534934	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-1.78	+/-1.59	2.92	1.40	+/-1.59	5.00	pCi/g		MYM	01/12/16	0641	1534637	14

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/22/15	1007	1532997

**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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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"	1533905	85.2	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	97.1	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1533902	70.3	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1533904	100	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1533901	76.5	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1533903	96.6	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1533906	85.2	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1534758	77.1	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"	1534637	95.6	(15%-125%)

### Notes:

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 Collect Date: 16-DEC-15  
 Receive Date: 21-DEC-15  
 Collector: Client  
 Moisture: 18.4%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		18.4						percent		LYT1	12/22/15	1007	1532997	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238		0.0481	+/-0.0945	0.131	0.0245	+/-0.0948	1.00	pCi/g		HAKB	01/11/16	0940	1533905	2
Plutonium-239/240	U	0.036	+/-0.113	0.211	0.0648	+/-0.113	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.0378	+/-0.107	0.253	0.0943	+/-0.107	1.00	pCi/g		HAKB	01/11/16	1029	1533902	3
Uranium-233/234		0.696	+/-0.291	0.191	0.052	+/-0.325	1.00	pCi/g						
Uranium-235/236		0.0872	+/-0.115	0.0872	0.00	+/-0.116	1.00	pCi/g						
Uranium-238		0.414	+/-0.229	0.177	0.045	+/-0.244	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	-0.0369	+/-0.255	0.621	0.184	+/-0.255	1.00	pCi/g		HAKB	01/08/16	0854	1533904	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.934	+/-0.737	0.949	0.327	+/-0.764	1.00	pCi/g		HAKB	01/11/16	1350	1533901	5
Thorium-229	U	0.0768	+/-0.344	0.674	0.193	+/-0.345	1.00	pCi/g						
Thorium-230		0.606	+/-0.578	0.742	0.227	+/-0.590	1.00	pCi/g						
Thorium-232		0.504	+/-0.503	0.584	0.148	+/-0.513	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	-0.00725	+/-0.0321	0.0837	0.0192	+/-0.0321	1.00	pCi/g		HAKB	01/11/16	1541	1533903	6
Curium-242	U	-0.004	+/-0.0345	0.0799	0.015	+/-0.0346	1.00	pCi/g						
Curium-243/244	U	-0.00716	+/-0.0317	0.0826	0.0189	+/-0.0317	1.00	pCi/g						
Curium-245/246		0.00	+/-0.0348	0.0519	0.00	+/-0.0349	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241		5.28	+/-5.70	9.57	4.66	+/-5.84	15.0	pCi/g		HAKB	01/13/16	2237	1533906	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	0.0848	+/-0.286	0.695	0.265	+/-0.289	1.00	pCi/g		MJH1	01/12/16	1554	1533089	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	0.0154	+/-0.209	0.409	0.191	+/-0.209		pCi/g		RXF2	01/14/16	1045	1533152	9
Antimony-125	U	0.0353	+/-0.0818	0.162	0.0744	+/-0.0834		pCi/g						
Bismuth-212	U	0.00	+/-0.644	1.06	0.485	+/-0.789		pCi/g						
Bismuth-214		0.825	+/-0.151	0.119	0.0541	+/-0.166		pCi/g						
Cesium-137		0.415	+/-0.0799	0.0715	0.0326	+/-0.0864	0.100	pCi/g						
Cobalt-60	U	-0.0274	+/-0.045	0.064	0.0272	+/-0.0467		pCi/g						
Europium-154	U	0.0664	+/-0.106	0.226	0.100	+/-0.111		pCi/g						
Lead-212		0.805	+/-0.105	0.0842	0.0393	+/-0.151		pCi/g						
Lead-214		1.03	+/-0.169	0.127	0.0591	+/-0.196		pCi/g						

# 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. Lauric Losey  
 Project: Soil Radioisotopes

Client Sample ID: 5.1A.R.1.5  
 Sample ID: 387899012

Report Date: January 19, 2016

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>GammaSpec, Gamma, Solid "Dry Weight Corrected"</i>														
Potassium-40		10.4	+/-1.31	0.702	0.303	+/-1.60		pCi/g						
Protactinium-231	UI	0.00	+/-0.507	0.657	0.301	+/-0.529		pCi/g						
Radium-226		0.825	+/-0.151	0.119	0.0541	+/-0.166		pCi/g						
Radium-228		0.791	+/-0.188	0.175	0.0742	+/-0.224		pCi/g						
Thallium-208		0.138	+/-0.0721	0.0563	0.0254	+/-0.073		pCi/g						
Tin-126	UI	0.00	+/-0.0495	0.100	0.0481	+/-0.0544		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		9.12	+/-1.73	2.09	0.975	+/-2.46	4.00	pCi/g		KXB2	01/11/16	1935	1534757	10
Beta		17.6	+/-1.61	1.91	0.925	+/-2.93	10.0	pCi/g						
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>														
Strontium-90	U	-0.0991	+/-0.503	1.00	0.436	+/-0.503	2.00	pCi/g		KSD1	01/11/16	0853	1534758	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>														
Tritium	U	0.612	+/-3.31	5.73	2.75	+/-3.31	6.00	pCi/g		TXJ1	01/08/16	0344	1534917	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>														
Carbon-14	U	0.290	+/-0.772	1.31	0.641	+/-0.772	2.00	pCi/g		TXJ1	01/14/16	1744	1534934	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-1.37	+/-1.71	3.09	1.48	+/-1.71	5.00	pCi/g		MYM	01/12/16	0657	1534637	14

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/22/15	1007	1532997

**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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## 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: 5.1A.R.1.5  
Sample ID: 387899012

Report Date: January 19, 2016

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"						1533905	52	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1533902	51.3	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1533902	67.5	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1533904	81	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1533901	58.4	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1533903	96.1	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1533906	52	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1534758	72.8	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1534637	96.1	(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

Report Date: January 19, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes  
 Client Sample ID: 5.1A.R.1.6  
 Sample ID: 387899013  
 Matrix: Soil  
 Collect Date: 10-DEC-15  
 Receive Date: 21-DEC-15  
 Collector: Client  
 Moisture: 7.86%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		7.86						percent		LYT1	12/22/15	1007	1532997	1
<b>Rad Alpha Spec Analysis</b>														
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>														
Plutonium-238	U	0.0377	+/-0.0744	0.126	0.0385	+/-0.0745	1.00	pCi/g		HAKB	01/11/16	1903	1533905	2
Plutonium-239/240	U	0.00454	+/-0.0475	0.0991	0.0252	+/-0.0475	1.00	pCi/g						
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>														
Uranium-232	U	-0.0409	+/-0.0454	0.138	0.0491	+/-0.0454	1.00	pCi/g		HAKB	01/11/16	1029	1533902	3
Uranium-233/234		0.488	+/-0.195	0.0585	0.00	+/-0.213	1.00	pCi/g						
Uranium-235/236		0.0196	+/-0.055	0.0587	0.00	+/-0.0551	1.00	pCi/g						
Uranium-238		0.639	+/-0.223	0.0935	0.0175	+/-0.250	1.00	pCi/g						
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>														
Neptunium-237	U	0.073	+/-0.471	0.964	0.286	+/-0.471	1.00	pCi/g		HAKB	01/08/16	0854	1533904	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>														
Thorium-228		0.394	+/-0.434	0.636	0.215	+/-0.441	1.00	pCi/g		HAKB	01/11/16	1350	1533901	5
Thorium-229	U	-0.0425	+/-0.250	0.594	0.198	+/-0.250	1.00	pCi/g						
Thorium-230		0.334	+/-0.350	0.436	0.119	+/-0.354	1.00	pCi/g						
Thorium-232		0.430	+/-0.370	0.366	0.0838	+/-0.376	1.00	pCi/g						
<i>Am241, Cm Solid "Dry Weight Corrected"</i>														
Americium-241	U	0.0247	+/-0.0651	0.117	0.0348	+/-0.0652	1.00	pCi/g		HAKB	01/11/16	1543	1533903	6
Curium-242		0.00	+/-0.0361	0.0538	0.00	+/-0.0362	1.00	pCi/g						
Curium-243/244	U	0.020	+/-0.0552	0.0956	0.0243	+/-0.0552	1.00	pCi/g						
Curium-245/246	U	0.0232	+/-0.0638	0.111	0.0282	+/-0.0639	1.00	pCi/g						
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>														
Plutonium-241	U	0.999	+/-4.99	8.65	4.15	+/-4.99	15.0	pCi/g		HAKB	01/13/16	0927	1533906	7
<b>Rad Gamma Spec Analysis</b>														
<i>Gamma I129, Solid "Dry Weight Corrected"</i>														
Iodine-129	U	-7.29E-05	+/-0.332	0.587	0.267	+/-0.332	1.00	pCi/g		MJH1	01/12/16	1707	1533089	8
<i>Gammasp. Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	UI	0.00	+/-0.185	0.379	0.180	+/-0.206		pCi/g		RXF2	01/14/16	1045	1533152	9
Antimony-125	U	0.0451	+/-0.067	0.135	0.0635	+/-0.0701		pCi/g						
Bismuth-212	U	0.346	+/-0.616	0.779	0.364	+/-0.636		pCi/g						
Bismuth-214		0.739	+/-0.129	0.0954	0.0444	+/-0.143		pCi/g						
Cesium-137	UI	0.00	+/-0.0243	0.0517	0.024	+/-0.0278	0.100	pCi/g						
Cobalt-60	U	-0.0278	+/-0.0291	0.0489	0.0218	+/-0.0317		pCi/g						
Europium-154	U	0.0536	+/-0.102	0.177	0.0813	+/-0.104		pCi/g						
Lead-212		0.846	+/-0.102	0.0868	0.0414	+/-0.122		pCi/g						
Lead-214		0.966	+/-0.143	0.095	0.0445	+/-0.164		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: 5.1A.R.1.6  
 Sample ID: 387899013

Report Date: January 19, 2016

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec. Gamma. Solid "Dry Weight Corrected"</i>														
Potassium-40		12.5	+/-1.08	0.301	0.124	+/-1.53		pCi/g						
Protactinium-231	U	0.00	+/-0.670	0.662	0.312	+/-0.677		pCi/g						
Radium-226		0.739	+/-0.129	0.0954	0.0444	+/-0.143		pCi/g						
Radium-228		0.818	+/-0.258	0.199	0.0916	+/-0.290		pCi/g						
Thallium-208		0.260	+/-0.0575	0.044	0.0203	+/-0.0615		pCi/g						
Tin-126	U	0.00	+/-0.106	0.111	0.0532	+/-0.107		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC. Gross A/B. solid "Dry Weight Corrected"</i>														
Alpha		8.95	+/-2.23	3.13	1.48	+/-2.83	4.00	pCi/g		KXB2	01/11/16	1935	1534757	10
Beta		17.2	+/-1.74	2.22	1.08	+/-2.99	10.0	pCi/g						
<i>GFPC. Sr90. solid "Dry Weight Corrected"</i>														
Strontium-90	U	0.0865	+/-1.01	1.83	0.842	+/-1.01	2.00	pCi/g		KSD1	01/11/16	1208	1534758	11
<b>Rad Liquid Scintillation Analysis</b>														
<i>LSC. Tritium Dist. Solid "Dry Weight Corrected"</i>														
Tritium	U	-1.1	+/-2.48	4.42	2.12	+/-2.48	6.00	pCi/g		TXJ1	01/08/16	0654	1534917	12
<i>Liquid Scint C14. Solid "Dry Weight Corrected"</i>														
Carbon-14	U	-0.375	+/-0.672	1.17	0.573	+/-0.672	2.00	pCi/g		TXJ1	01/14/16	1846	1534934	13
<i>Liquid Scint Te99. Solid "Dry Weight Corrected"</i>														
Technetium-99	U	-1.31	+/-1.37	2.49	1.20	+/-1.37	5.00	pCi/g		MYM	01/12/16	0714	1534637	14

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	12/22/15	1007	1532997

**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 S 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 EERFC-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  
Client Sample ID: 5.1A.R.1.6  
Sample ID: 387899013

Report Date: January 19, 2016

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"							1533905	70.9	(15%-125%)			
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1533902	74.1	(15%-125%)			
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1533902	83.7	(15%-125%)			
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"							1533904	51.6	(15%-125%)			
Actinium-227 Tracer	Alphaspec Th229 + 228.230,232 Solid "Dry Weight Corrected"							1533901	75.1	(15%-125%)			
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"							1533903	89.7	(15%-125%)			
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"							1533906	70.9	(15%-125%)			
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"							1534758	71.7	(25%-125%)			
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"							1534637	95.7	(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

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

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Report Date: January 19, 2016

Client Sample ID: 5.1A.R.1.7  
 Sample ID: 387899003  
 Matrix: Water  
 Collect Date: 16-DEC-15  
 Receive Date: 21-DEC-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	-7.05	+/-24.1	41.0	19.3	+/-24.3		pCi/L		MJH1	01/08/16	1548	1532831	1
Antimony-125	U	-0.935	+/-10.3	16.3	7.57	+/-10.3		pCi/L						
Bismuth-212	U	3.96	+/-49.8	93.7	43.1	+/-49.8		pCi/L						
Bismuth-214	UI	0.00	+/-12.4	10.9	4.96	+/-12.5		pCi/L						
Cesium-137	U	-1.25	+/-3.31	5.69	2.58	+/-3.36	10.0	pCi/L						
Cobalt-60	U	-0.359	+/-3.77	7.16	3.17	+/-3.77		pCi/L						
Europium-154	U	7.26	+/-9.32	20.1	8.92	+/-9.90		pCi/L						
Lead-212	UI	0.00	+/-9.37	12.0	5.76	+/-10.1		pCi/L						
Lead-214	U	1.87	+/-7.65	12.6	5.91	+/-7.69		pCi/L						
Potassium-40	UI	0.00	+/-79.3	70.1	30.9	+/-79.4		pCi/L						
Protactinium-231	U	-25.4	+/-47.0	77.5	36.3	+/-48.7		pCi/L						
Radium-228	UI	0.00	+/-20.0	25.1	11.4	+/-21.7		pCi/L						
Thallium-208	U	-0.334	+/-4.12	6.67	3.08	+/-4.12		pCi/L						
Tin-126	U	-6.77	+/-8.12	12.6	5.99	+/-8.70		pCi/L						

**Rad Gas Flow Proportional Counting**

*GFPC, Gross A.B, liquid "As Received"*

Alpha	U	0.729	+/-1.59	2.94	1.17	+/-1.59	5.00	pCi/L		JXB7	01/05/16	1147	1533798	2
Beta	U	0.790	+/-2.70	4.75	2.18	+/-2.70	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

**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: January 18, 2016

Client Sample ID: 5.1A.R.2.1  
 Sample ID: 387853016  
 Matrix: Soil  
 Collect Date: 14-DEC-15  
 Receive Date: 18-DEC-15  
 Collector: Client  
 Moisture: 24.8%

Project: MJWC00115  
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Gravimetric Solids</b>														
<i>ASTM D 2216 % Moisture "As Received"</i>														
Moisture		24.8						percent		CXC1	12/21/15	1527	1532956	1
<b>Rad Gamma Spec Analysis</b>														
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>														
Actinium-227	U	-0.138	+/-0.303	0.546	0.254	+/-0.310		pCi/g		RXF2	01/13/16	0841	1532995	2
Antimony-125	U	-0.0402	+/-0.109	0.202	0.0927	+/-0.110		pCi/g						
Bismuth-212		1.05	+/-0.919	1.29	0.588	+/-0.925		pCi/g						
Bismuth-214		0.913	+/-0.177	0.166	0.0761	+/-0.194		pCi/g						
Cesium-137		0.564	+/-0.117	0.0914	0.0416	+/-0.127	0.100	pCi/g						
Cobalt-60	U	-0.0241	+/-0.0322	0.0531	0.0201	+/-0.0341		pCi/g						
Europium-154	U	-0.0601	+/-0.155	0.278	0.121	+/-0.157		pCi/g						
Lead-212		0.776	+/-0.131	0.132	0.0623	+/-0.151		pCi/g						
Lead-214		1.42	+/-0.259	0.399	0.193	+/-0.290		pCi/g						
Potassium-40		10.3	+/-1.46	0.742	0.306	+/-1.71		pCi/g						
Protactinium-231	UI	0.00	+/-0.819	1.06	0.494	+/-0.857		pCi/g						
Radium-226		0.913	+/-0.177	0.166	0.0761	+/-0.194		pCi/g						
Radium-228		0.758	+/-0.272	0.319	0.142	+/-0.292		pCi/g						
Thallium-208		0.194	+/-0.0766	0.0679	0.0303	+/-0.0784		pCi/g						
Tin-126	UI	0.00	+/-0.158	0.188	0.0898	+/-0.160		pCi/g						
<b>Rad Gas Flow Proportional Counting</b>														
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>														
Alpha		13.3	+/-3.96	3.28	1.25	+/-4.75	4.00	pCi/g		JXB7	01/11/16	1334	1534754	3
Beta		21.0	+/-3.69	4.20	1.95	+/-4.77	10.0	pCi/g						

**Solid Preparation**

*Laboratory Composite "As Received"*

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	12/21/15	1527	1532956

**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
4	GEL Prep Method

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

Report Date: January 18, 2016

Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes

Client Sample ID: 5.1A.R.2.1  
Sample ID: 387853016

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

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

## Certificate of Analysis

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

Report Date: March 8, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 5.1.A.R.2.2  
 Sample ID: 392043012  
 Matrix: Soil  
 Collect Date: 14-DEC-15  
 Receive Date: 25-FEB-16  
 Collector: Client  
 Moisture: 16.5%

Project: MJWC00115  
 Client ID: MJWC001

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

*Gamma with Ingrowth "Dry Weight Corrected"*

Actinium-227	U	-0.0343	+/-0.211	0.395	0.188	+/-0.211		pCi/g		MXR1	03/07/16	0911	1547791	1
Antimony-125	U	0.0223	+/-0.0749	0.146	0.0685	+/-0.0756		pCi/g						
Bismuth-212	UI	0.00	+/-0.505	0.887	0.417	+/-0.543		pCi/g						
Bismuth-214		0.777	+/-0.128	0.0925	0.0428	+/-0.144		pCi/g						
Cesium-137	U	0.0223	+/-0.0316	0.063	0.0295	+/-0.0332	0.100	pCi/g						
Cobalt-60	U	0.00462	+/-0.0289	0.0571	0.0255	+/-0.029		pCi/g						
Europium-154	U	-0.0454	+/-0.0988	0.174	0.0785	+/-0.101		pCi/g						
Lead-212		0.931	+/-0.114	0.0877	0.0417	+/-0.135		pCi/g						
Lead-214		1.12	+/-0.137	0.250	0.122	+/-0.162		pCi/g						
Potassium-40		12.3	+/-1.03	0.503	0.222	+/-1.47		pCi/g						
Protactinium-231	U	0.0675	+/-0.470	0.767	0.364	+/-0.471		pCi/g						
Radium-226		0.777	+/-0.128	0.0925	0.0428	+/-0.144		pCi/g						
Radium-228		1.01	+/-0.232	0.154	0.0686	+/-0.255		pCi/g						
Thallium-208		0.246	+/-0.0617	0.0489	0.0226	+/-0.0652		pCi/g						
Tin-126	U	0.00611	+/-0.113	0.142	0.0685	+/-0.114		pCi/g						

**Rad Gas Flow Proportional Counting**

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

Alpha		16.5	+/-3.99	3.81	1.61	+/-5.13	4.00	pCi/g		BXF1	03/04/16	0756	1547857	2
Beta		22.4	+/-3.27	3.69	1.73	+/-4.55	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	02/25/16	1523	1547783

**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

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

## Certificate of Analysis

Company : MJW Technical Services  
Address : 15 Hazelwood Drive  
Suite 112  
Buffalo, New York 14228  
Contact: Ms. Laurie Losey  
Project: Soil Radioisotopes  
Client Sample ID: 5.1.A.R.2.2  
Sample ID: 392043012

Report Date: March 8, 2016

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

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: January 19, 2016

Contact: Ms. Laurie Losey  
 Project: Soil Radioisotopes

Client Sample ID: 5.1A.R.2.5  
 Sample ID: 387899007  
 Matrix: Water  
 Collect Date: 14-DEC-15  
 Receive Date: 21-DEC-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	-19.5	+/-25.1	43.1	20.4	+/-26.8		pCi/L		MJH1	01/11/16	0659	1532831	1
Antimony-125	U	-0.882	+/-8.57	15.2	7.03	+/-8.58		pCi/L						
Bismuth-212	U	-16.3	+/-61.7	94.8	43.5	+/-62.1		pCi/L						
Bismuth-214	UI	0.00	+/-12.0	18.3	8.65	+/-15.9		pCi/L						
Cesium-137	U	-2.79	+/-3.23	5.49	2.47	+/-3.48	10.0	pCi/L						
Cobalt-60	U	1.13	+/-3.47	7.02	3.09	+/-3.51		pCi/L						
Europium-154	U	9.06	+/-10.4	22.2	9.92	+/-11.2		pCi/L						
Lead-212	U	0.991	+/-7.63	12.4	5.93	+/-7.64		pCi/L						
Lead-214	UI	0.00	+/-9.48	15.7	7.46	+/-10.2		pCi/L						
Potassium-40	U	-36.6	+/-52.4	82.8	37.2	+/-55.0		pCi/L						
Protactinium-231	U	8.85	+/-50.3	88.2	41.7	+/-50.5		pCi/L						
Radium-228	U	7.14	+/-15.5	29.5	13.6	+/-15.9		pCi/L						
Thallium-208	U	-5.29	+/-5.30	7.14	3.31	+/-5.83		pCi/L						
Tm-126	U	-4.82	+/-8.10	13.0	6.20	+/-8.40		pCi/L						

**Rad Gas Flow Proportional Counting**

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

Alpha	U	-0.877	+/-1.19	2.97	1.20	+/-1.19	5.00	pCi/L		JXB7	01/05/16	1313	1533798	2
Beta	U	0.560	+/-2.57	4.58	2.11	+/-2.57	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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**Notes:**

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