

**Bridgeton Landfill and West Lake Landfill  
Analytical Results for Stormwater  
Collected April 30, 2017**

**August 16, 2017** - During the historic rain event that occurred in the St. Louis area in late April and early May, the Department responded to stormwater overflow concerns near the Bridgeton Sanitary and West Lake landfills by assessing the situation and collecting a stormwater sample for analysis on April 30, 2017. The water was sampled where it flowed out of the fence on the northeast boundary of Operable Unit 1, Area 1 of the West Lake Landfill and into the ditch along St. Charles Rock Road. The sample was turbid, which means that the water was cloudy because it contained a lot of solid particles. The sample was sent to the Department's contract laboratory and analyzed for gross alpha, gross beta, isotopic Uranium, Radium-226, and Radium-228. Department staff provided a sampling container to Bridgeton Landfill LLC in order to provide them the opportunity to perform their own analyses from the observed outfall.

Although stormwater is not finished drinking water, the Department compared the stormwater sample results with state drinking water standards or Maximum Contaminant Levels (MCLs). The Department used MCLs as a screening tool to determine whether additional analyses were needed. Results indicated gross beta, total Uranium, and combined Radium were below these screening levels. Results for gross alpha, however, exceeded the screening level and could not be fully attributed to Radium and Uranium results. Therefore, analysis for isotopic Thorium was ordered. Due to the turbidity of the sample, isotopic Thorium was analyzed two different ways. One analysis included both the dissolved and suspended portions and the other included the suspended portion retained by filtering.

The results do not indicate that the radionuclides in the sample are radiologically impacted material from West Lake Landfill. This is based on the relatively low activity level of West Lake Landfill related radionuclides in the sample. Additionally, the activity levels of Thorium-230 compared with the other Thorium isotopes are similar, whereas a sample indicating the presence of radiologically impacted material would be expected to have higher relative Thorium-230 activity levels. Further monitoring and stormwater best management practices to reduce suspended solid discharges at this outfall are recommended.

**Bridgeton Landfill / West Lake Landfill Superfund Site  
Analytical Results for Radionuclides in Stormwater  
Sampled on April 30, 2017**

			Parent Sample			Laboratory Duplicate		
Radionuclide	MCL	Units	Result	Error	MDA	Result	Error	MDA
Gross Alpha	15	pCi/L	15.65 J	6.87	10.47	20.61	7.34	10.44
Gross Beta	50 <sup>A</sup>	pCi/L	27.45	6.28	10.10	22.22	5.98	9.92
Total Uranium <sup>B</sup>	30	µg/L	3.6	1.1	0.6	5.4	1.9	1.1
Uranium-234	-	pCi/L	1.15	.37	.13	2.03	.69	.33
Uranium-235	-	pCi/L	0.11 U	0.13	0.18	0.65 J	0.41	0.35
Uranium-238	-	pCi/L	1.18	0.37	0.16	1.71	0.62	0.30
Radium-226	5 <sup>C</sup>	pCi/L	0.73 U	1.72	3.34	2.10 J	1.9	2.38
Radium-228		pCi/L	1.49	0.49	0.88	0.28 U	0.46	0.95
Thorium-228	-	pCi/L	1.33	0.72	0.60	1.69	0.82	0.43
Thorium-230	-	pCi/L	2.55*	0.96	0.45	2.12*	0.90	0.39
Thorium-232	-	pCi/L	0.97 J	0.57	0.45	1.54	0.75	0.39
Thorium-228 (suspended)	-	pCi/L	0.84	0.40	0.23	0.97	0.45	0.27
Thorium-230 (suspended)	-	pCi/L	1.05	0.44	0.27	0.87	0.41	0.27
Thorium-232 (suspended)	-	pCi/L	0.75	0.37	0.21	1.06	0.45	0.23

<sup>A</sup> Drinking Water screening level indicating need for additional testing

<sup>B</sup> Total Uranium was computed from Isotopic Uranium analysis

<sup>C</sup> MCL is for combined Ra-226+228

\* Due to smaller aliquot volume, Th-229 Laboratory tracer likely interfered with the result, causing it to be biased higher than actual Th-230 activity by an approximated amount of 1.36 pCi/l

pCi/L = Pico Curies per Liter

µg/L = Microgram per Liter

MDA = Minimum Detectable Activity

MCL = Drinking Water Maximum Contaminant Level

U = Laboratory data qualifier: Radionuclide was not detected above the MDA

J = Laboratory data qualifier: Value is estimated

Analytical Methods-

Gross Alpha/Beta: EPA Method 900.0 Modified; Method 900.1 was considered, and found to be unnecessary due to isotopic Radium already being analyzed separately.

Radium-226: EPA Method 903.0 Modified

Radium-228: EPA Method 904.0 Modified

Isotopic Uranium: EPA Method 908.0 Modified

Isotopic Thorium total: EPA Method 907.0 Modified

Isotopic Thorium suspended fraction: EPA Method 907.0 Modified