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Subject: Analytical Results of Sediments Collected From Selected Water Bodies Near the WIPP, New Mexico, 2009

The New Mexico Environment Department (NMED) DOE Oversight Bureau has compiled and assessed laboratory data for sediment collected from selected water bodies near the Waste Isolation Pilot Plant (WIPP), New Mexico, during 2009.

The accompanying data report includes results for sediment collected from eight surface water bodies, including seven livestock tanks near the WIPP, and a sample collected from the Pecos River near Carlsbad, with graphs for each analyte indicating results in mBq/g (milliBecquerels per gram) \pm 2TPU (Total Propagated Uncertainty) and a Table of Analytical Laboratory Results.

U-234 ranged from a minimum of 17.02 ± 4.07 mBq/g from Red Tank, to a maximum of 27.75 ± 5.92 mBq/g from Poker Tank 2, which served as a QA (Quality Assurance) duplicate. The results for U-238 showed a minimum of 17.76 ± 4.07 mBq/g from the Pecos River to a maximum of 28.86 ± 5.92 mBq/g from Poker Tank.

At all sampling locations, U-234 and U-238 exceeded both the sample MDC (Minimum Detectable Concentration) and the requested MDC. There were also detections of U-235 above the sample MDC and below the requested MDC, at all locations, with the exception of Noye Tank. Noye Tank's result was below the sample MDC.

All Uranium activities were within the historical range of results reported for soil around the WIPP site prior to waste emplacement (Waste Isolation Pilot Plant, 1999 Annual Site Environmental Report).

Am-241 exceeded both the sample MDC and the requested MDC at Hill Tank. At Poker Tank 2, Am-241 was above the sample MDC yet below the requested MDC. Am-241 was below the sample MDC at each of the remaining sites.

Am-241 ranged from a minimum of 0.00 mBq/g at Indian Tank and the Pecos River to a maximum from Hill Tank 2.59 ± 1.184 mBq/g. This activity of Am-241 significantly exceeded those activities detected by WRES (Washington Regulatory and Environmental Services) at the same site over the last five years, and exceeded the average levels of 0.37 mBq/g in surface soil (Argonne National Laboratory, Human Health Fact Sheet, August 2005), and was unexpected. Staff will re-sample.

Pu-239/240 exceeded the sample MDC and requested MDC in a single sample, which was collected from Poker Tank (Poker Tank 2). At three other sites, this analyte exceeded the sample MDC, but not the requested MDC. These three were Poker Tank 1, Hill Tank, and Indian Tank.

Pu-239/240 ranged from a minimum of $0.081 \pm .444$ mBq/g in sediment from the Pecos River, to a maximum of 1.924 ± 1.036 mBq/g in Poker Tank 2. These results were below the average Plutonium levels in surface soils from fallout range from about 0.37 to 3.7 mBq/g (Argonne National Laboratory, Human Health Fact Sheet, August 2005).

At one site, Poker Tank, Cs-137 was measured above the sample MDC but below the requested MDC, while its duplicate, Poker Tank 2, gave a result above both the sample MDC and the requested MDC. There were no detections above the sample MDC at any of the other sampling locations.

Cs-137 ranged from a minimum of 0.37 mBq/g to a maximum of 19.24 mBq/g at Poker Tank 2. These results lie within the range of the recognized concentration of Cs-137 in soil from atmospheric fallout, that is, 3.7 to 37 mBq/g (Argonne National Laboratories, Human Health Fact Sheet, August 2005).

For Sr-90, there were no detections above the sample MDC at any of the sampling locations.

Response

Questions and or comments may be addressed to Thomas Kesterson by phone at (575)-887-6851, by e-mail at thomasl.kesteron@state.nm.us, or to the address in the above letterhead.

- Enclosures:
1. Graph 1 – Am-241 in Sediment Collected From Selected Water Bodies Near the WIPP, 2009.
 2. Graph 2 – Cs-137 in Sediment Collected From Selected Water Bodies Near the WIPP, 2009.
 3. Graph 3 – Pu-238 in Sediment Collected From Selected Water Bodies Near the WIPP, 2009.
 4. Graph 4 – Pu-239/240 in Sediment Collected From Selected Water Bodies Near the WIPP, 2009.
 5. Graph 5 – Sr-90 in Sediment Collected From Selected Water Bodies Near the WIPP, 2009.
 6. Graph 6 – U-234 in Sediment Collected From Selected Water Bodies Near the WIPP, 2009.
 7. Graph 7 – U-235 in Sediment Collected From Selected Water Bodies Near the WIPP, 2009.
 8. Graph 8 – U-238 in Sediment Collected From Selected Water Bodies Near the WIPP, 2009.
 9. Table 1 – Analytical Laboratory Results. For Sediment Collected From Selected Water Bodies Near the WIPP, 2009.
 10. Definitions

Cc: Thomas Skibitski, Bureau Chief, NMED DOE OB
George Basabilvazo, DOE, CBFO

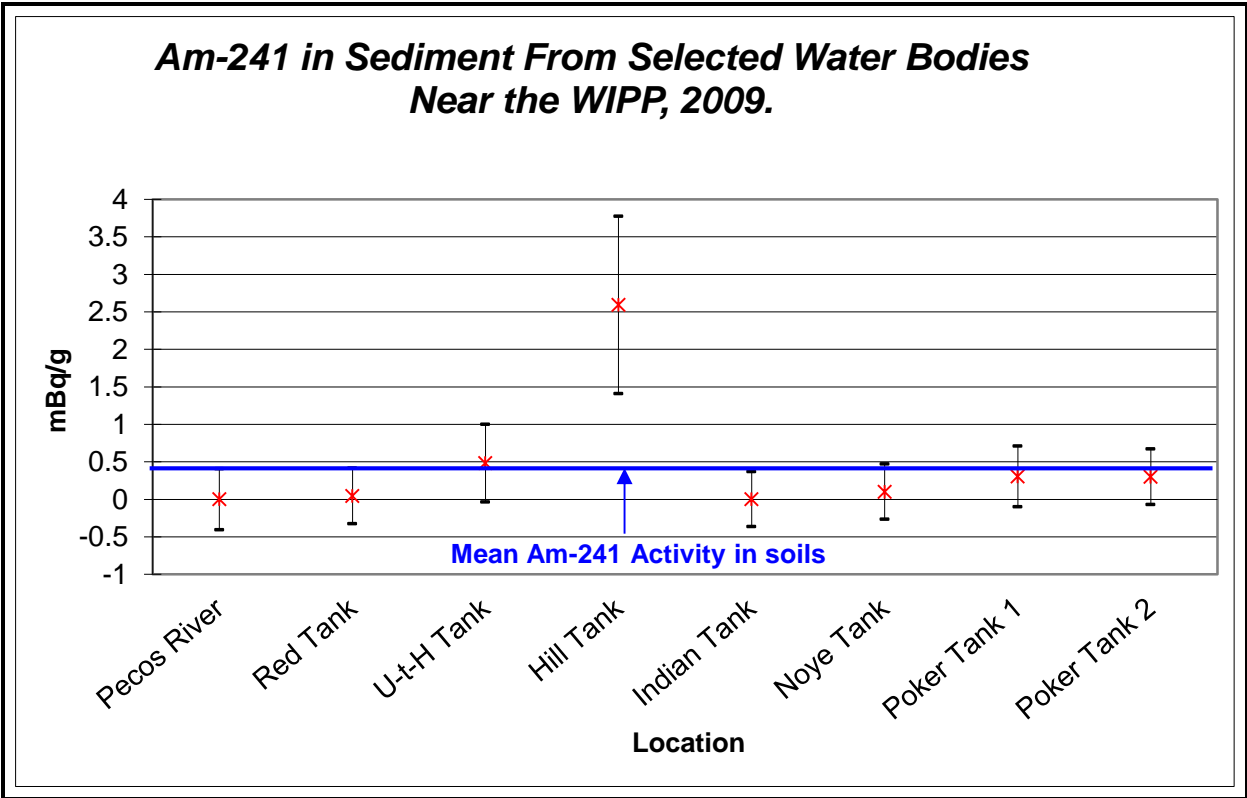


Figure 1: Am-241 in Sediment from Selected Water Bodies near the WIPP, 2009.

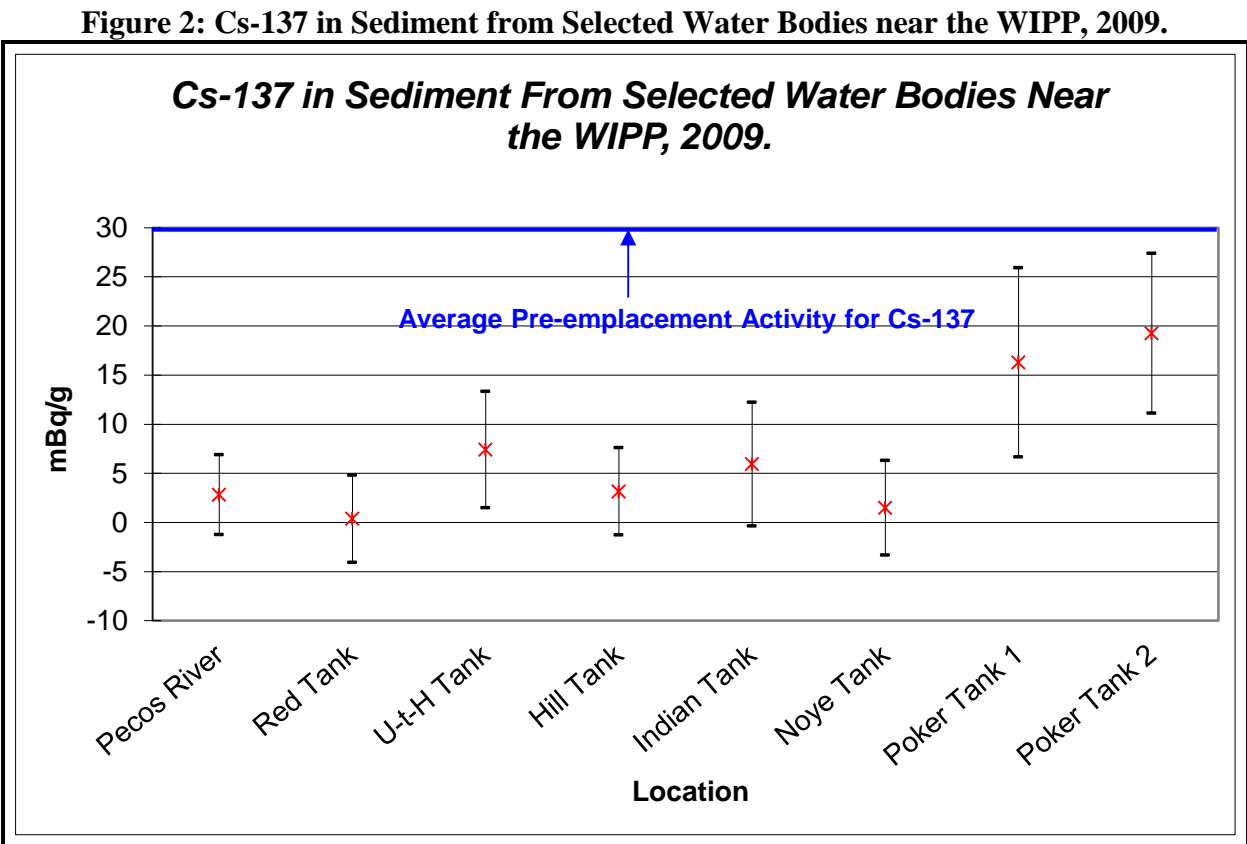


Figure 2: Cs-137 in Sediment from Selected Water Bodies near the WIPP, 2009.

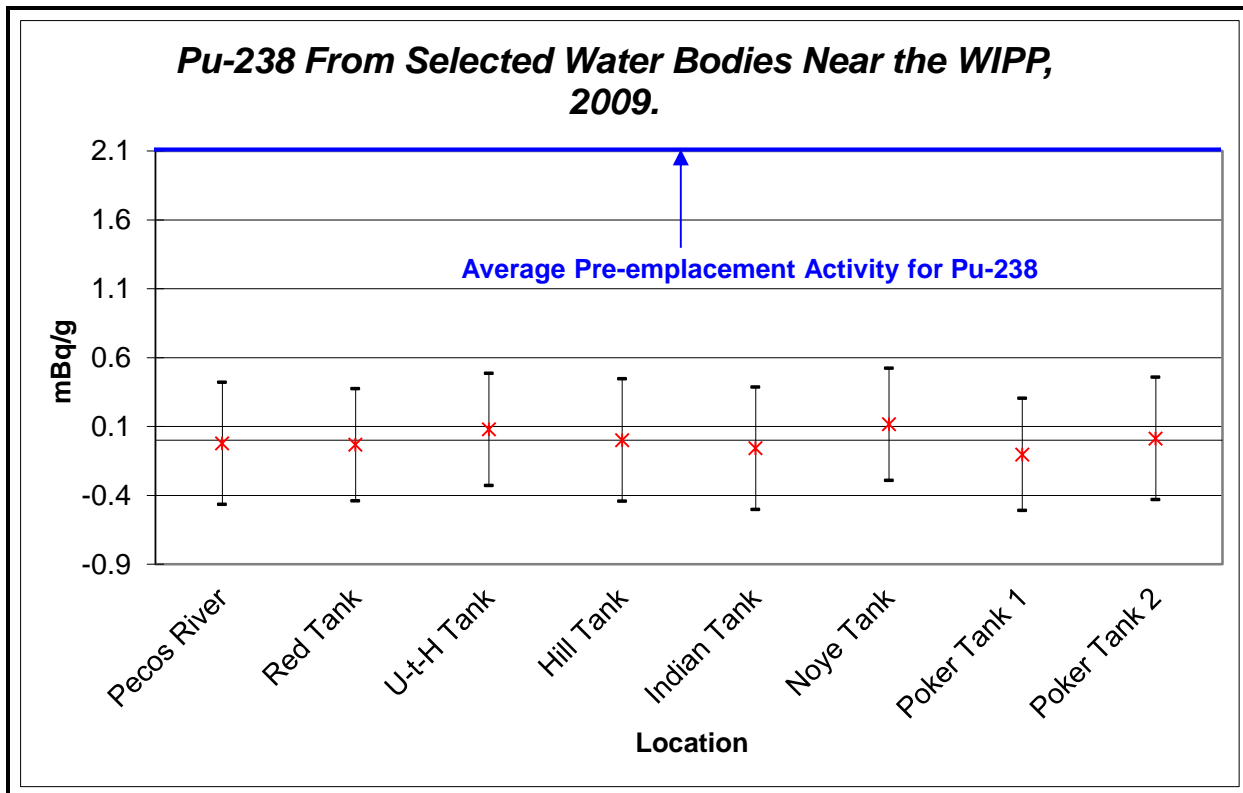
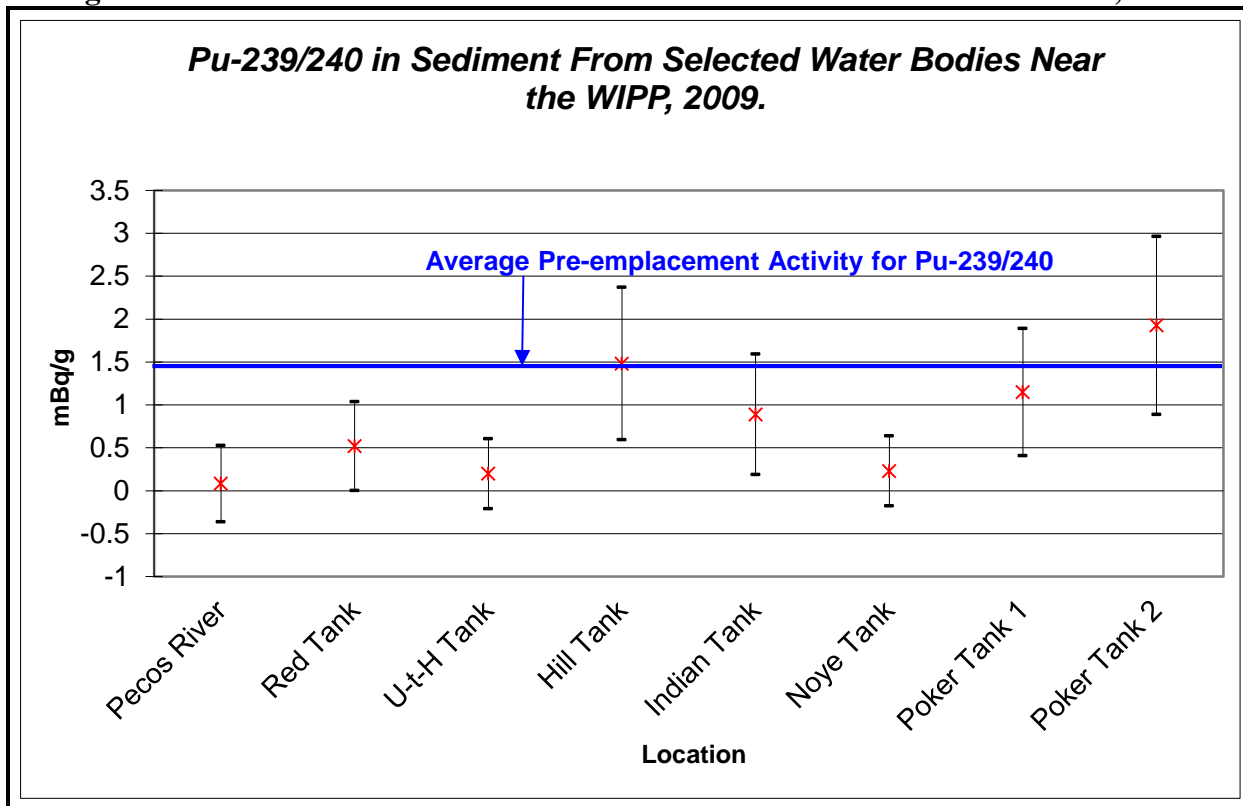


Figure 3: Pu-238 in Sediment from Selected Water Bodies near the WIPP, 2009.

Figure 4: Pu-239/240 in Sediment from Selected Water Bodies near the WIPP, 2009.



Sr-90 in Sediment From Selected Water Bodies Near the WIPP, 2009

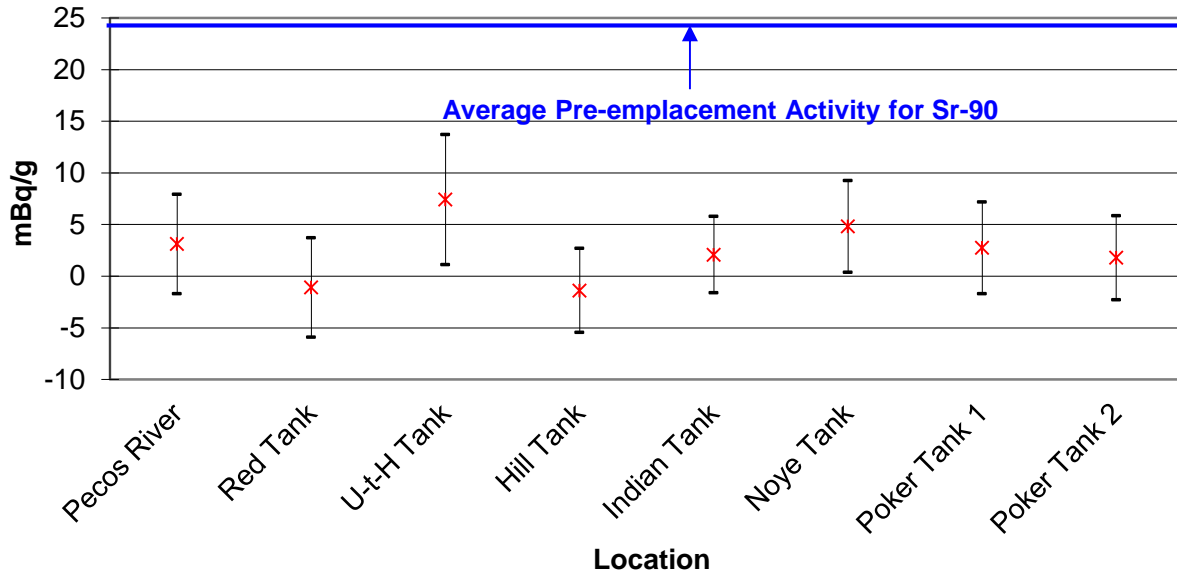
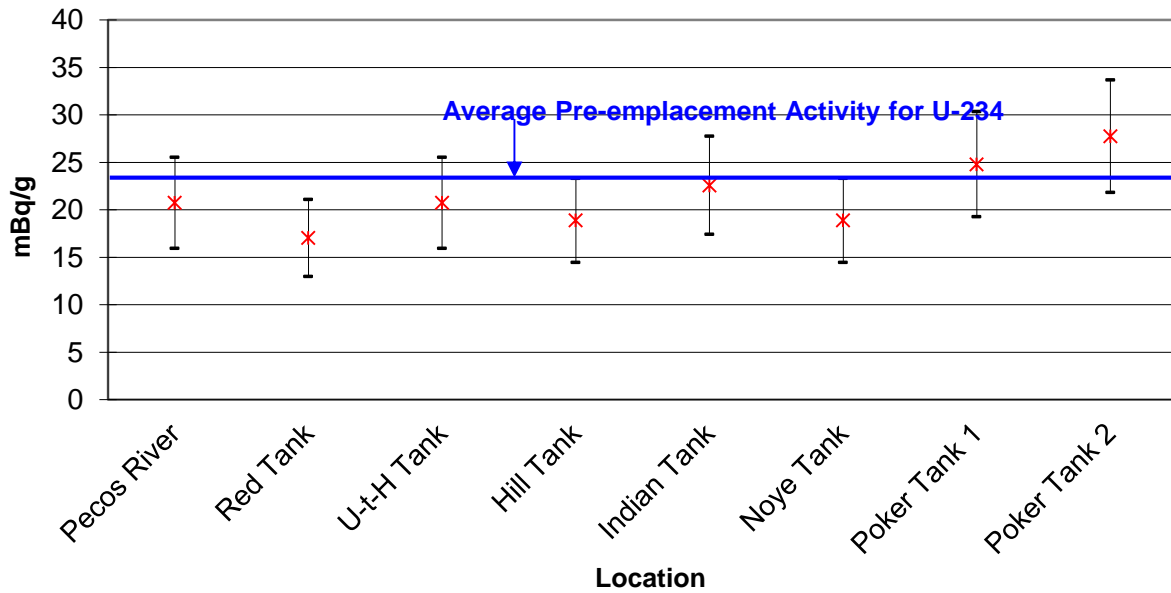


Figure 5: Sr-90 in Sediment from Selected Water Bodies near the WIPP, 2009.

Figure 6: U-234 in Sediment from Selected Water Bodies near the WIPP, 2009.

U-234 in Sediment From Selected Water Bodies Near the WIPP, 2009.



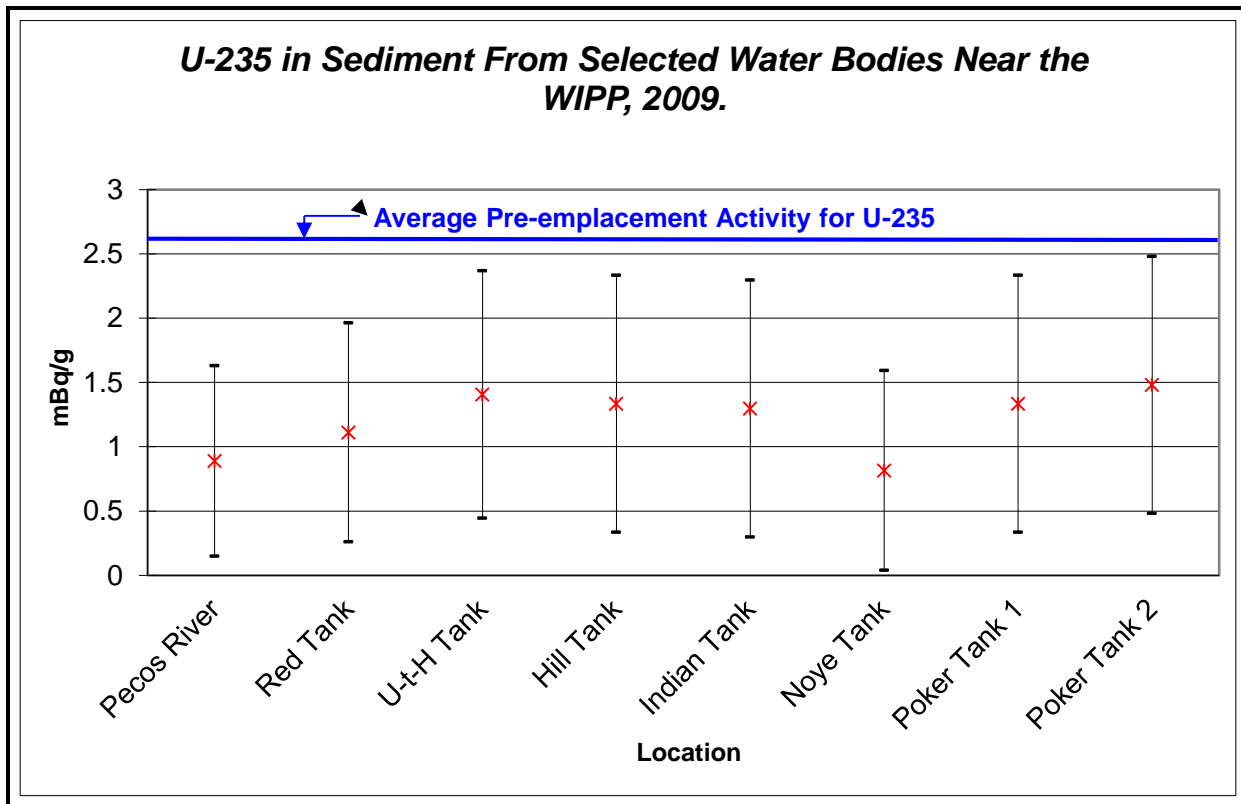


Figure 7: U-235 in Sediment from Selected Water Bodies near the WIPP, 2009.

Figure 8: U-238 in Sediment from Selected Water Bodies near the WIPP, 2009.

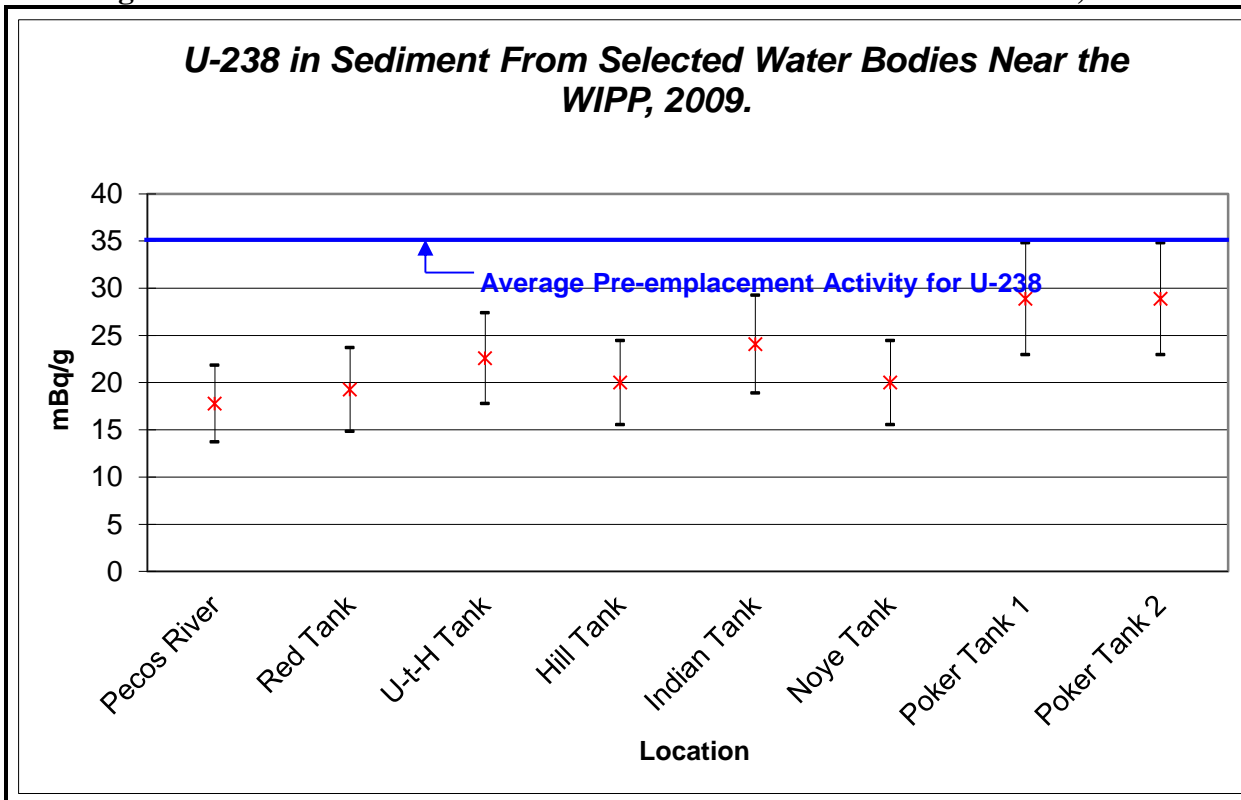


Table 1: Analytical Results for sediments Collected From Selected Water Bodies Near the WIPP, 2009.

<i>Pecos River 2009</i>					<i>Data Summaries</i>	
	Result	2 s TPU (\pm)	MDC	Lab Flag	Result	Uncertainty
					mBq/g	
Analyte	pCi/g					
Sr 90	0.0840	0.1300	0.2900	U	3.108	4.810
Pu-239/240	0.0022	0.0120	0.0170	U	0.081	0.444
Pu-238	-0.0006	0.0120	0.0250	U	-0.024	0.444
Am 241	0.0000	0.0110	0.0078	U	0.000	0.407
Cs 137	0.0760	0.11	0.18	U, G	2.812	4.070
U-234	0.5600	0.1300	0.0200		20.720	4.810
U-235	0.0240	0.0200	0.0110	LT	0.888	0.740
U-238	0.4800	0.1100	0.0200		17.760	4.070

<i>Red Tank 2009</i>					<i>Data Summaries</i>	
	Result	2 s TPU (\pm)	MDC	Lab Flag	Result	Uncertainty
					mBq/g	
Analyte	pCi/g					
Sr 90	-0.0300	0.1300	0.3100	U	-1.110	4.810
Pu-239/240	0.0140	0.0140	0.0160	U	0.518	0.518
Pu-238	-0.0009	0.0110	0.0160	U	-0.034	0.407
Am 241	0.0012	0.0100	0.0260	U	0.044	0.370
Cs 137	0.0100	0.12	0.22	U	0.370	4.440
U-234	0.4600	0.1100	0.0180		17.020	4.070
U-235	0.0300	0.0230	0.0110	LT	1.110	0.851
U-238	0.5200	0.1200	0.0180		19.240	4.440

<i>Under-the-Hill Tank 2009</i>					<i>Data Summaries</i>	
	Result	(2 s) TPU	MDC	Lab Flag	Result	Uncertainty
					mBq/g	
Analyte	pCi/g					
Sr 90	0.2000	0.1700	0.3400	U	7.400	6.290
Pu-239/240	0.0053	0.0110	0.0230	U	0.196	0.407
Pu-238	0.0021	0.0110	0.0150	U	0.078	0.407
Am 241	0.0130	0.0140	0.0210	U	0.481	0.518
Cs 137	0.2000	0.16	0.23	U, G	7.400	5.920
U-234	0.5600	0.1300	0.0180		20.720	4.810
U-235	0.0380	0.0260	0.0110	LT	1.406	0.962
U-238	0.6100	0.1300	0.0210		22.570	4.810

Table 1: Analytical Results for sediments Collected From Selected Water Bodies Near the WIPP, 2009.

<i>Hill Tank 2009</i>	Result				<i>Data Summaries</i>	
		(2 s) TPU	MDC	Lab	Result	Uncertainty
		pCi/g			Flag	mBq/g
Sr 90	-0.0380	0.1100	0.2600	U	-1.406	4.070
Pu-239/240	0.0400	0.0240	0.0200	LT	1.480	0.888
Pu-238	0.0000	0.0120	0.0087	U	0.000	0.444
Am 241	0.0700	0.0320	0.0210		2.590	1.184
Cs 137	0.0850	0.12	0.19	U, G	3.145	4.440
U-234	0.5100	0.1200	0.0300		18.870	4.440
U-235	0.0360	0.0270	0.0290	LT	1.332	0.999
U-238	0.5400	0.1200	0.0180		19.980	4.440

<i>Indian Tank 2009</i>	Result				<i>Data Summaries</i>	
		(2 s) TPU	MDC	Lab	Result	Uncertainty
		pCi/g			Flag	mBq/g
Sr 90	0.0560	0.1000	0.2300	Y1, U	2.072	3.700
Pu-239/240	0.0240	0.0190	0.0200	LT	0.888	0.703
Pu-238	-0.0016	0.0120	0.0270	U	-0.059	0.444
Am 241	0.0000	0.0099	0.0071	U	0.000	0.366
Cs 137	0.1600	0.17	0.26	U, G	5.920	6.290
U-234	0.6100	0.1400	0.0290		22.570	5.180
U-235	0.0350	0.0270	0.0320	LT	1.295	0.999
U-238	0.6500	0.1400	0.0310		24.050	5.180

<i>Noye Tank 2009</i>	Result				<i>Data Summaries</i>	
		(2 s) TPU	MDC	Lab	Result	Uncertainty
		pCi/g			Flag	mBq/g
Sr 90	0.1300	0.1200	0.2600	U	4.810	4.440
Pu-239/240	0.0062	0.0110	0.0083	U	0.229	0.407
Pu-238	0.0031	0.0110	0.0083	U	0.115	0.407
Am 241	0.0027	0.0100	0.0073	U	0.100	0.370
Cs 137	0.0400	0.13	0.24	U	1.480	4.810
U-234	0.5100	0.1200	0.0240		18.870	4.440
U-235	0.0220	0.0210	0.0280	U	0.814	0.777
U-238	0.5400	0.1200	0.0300		19.980	4.440

Table 1: Analytical Results for sediments Collected From Selected Water Bodies Near the WIPP, 2009.

<i>Poker Tank 1, 2009</i>					<i>Data Summaries</i>	
					Result	(2 s) TPU
Analyte	pCi/g			Lab Flag	mBq/g	
Sr 90	0.0740	0.1200	0.2600	Y1, U	2.738	4.440
Pu-239/240	0.0310	0.0200	0.0083	LT	1.147	0.740
Pu-238	-0.0028	0.0110	0.0220	U	-0.104	0.407
Am 241	0.0082	0.0110	0.0180	U	0.303	0.407
Cs 137	0.4400	0.26	0.37	LT, G, T1	16.280	9.620
U-234	0.6700	0.1500	0.0250		24.790	5.550
U-235	0.0360	0.0270	0.0290	LT	1.332	0.999
U-238	0.7800	0.1600	0.0190		28.860	5.920
<i>Poker Tank 2, 2009</i>					<i>Data Summaries</i>	
					Result	(2 s) TPU
Analyte	pCi/g			Lab Flag	mBq/g	
Sr 90	0.0480	0.1100	0.2600	Y1, U	1.776	4.070
Pu-239/240	0.0520	0.0280	0.0170		1.924	1.036
Pu-238	0.0003	0.0120	0.0230	U	0.012	0.444
Am 241	0.0081	0.0100	0.0073	LT	0.300	0.370
Cs 137	0.5200	0.22	0.27	G	19.240	8.140
U-234	0.7500	0.1600	0.0360		27.750	5.920
U-235	0.0400	0.0270	0.0120	LT	1.480	0.999
U-238	0.7800	0.1600	0.0290		28.860	5.920

Definitions

U – Result is less than the sample specific MDC or less than the associated TPU.

Y1 – Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

G – Sample density differs by more than 15% of LCS density.

LT – Result is less than Requested MDC, greater than sample specific MDC

TPU – Total Propagated Uncertainty

MDC – Minimum Detectable Concentration