NEW MEXICO
ENVIRONMENT DEPARTMENT

DOE Oversight Bureau

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Lieutenant Governor

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Secretary

SARAH
COTTRELL
Deputy Director

July 19, 2010

Dan Ferguson
Department of Energy
Carlsbad Field Office
Carlsbad, NM 88220

Subject: Soil Sampling in the Vicinity of the Waste Isolation Pilot Plant Conducted by NMED/DOE OB, 2010

Mr. Ferguson,

This letter transmits the subject final report.

The monitoring results are provided to DOE for review and comment prior to their release as final to other State of New Mexico and federal agencies, the NMED website and interested members of the public. If you have any questions, or would like copies of the complete data set, please contact me at 575-887-6851.

Sincerely,

Thomas Kesterson
Environmental Specialist –O
WIPP Oversight Section

Enclosure: Draft data submittal entitled: "Soil Sampling in the Vicinity of the Waste Isolation Pilot Plant Conducted by NMED/DOE OB, 2010" with the following enclosures:

1. Figure 1 – Am-241 From Soil Collected in the Vicinity of the WIPP, 2010.
2. Figure 2 – Cs-137 From Soil Collected in the Vicinity of the WIPP, 2010.
3. Figure 3 – Pu-238 From Soil Collected in the Vicinity of the WIPP, 2010.
4. Figure 4 – Pu-239/240 From Soil Collected in the Vicinity of the WIPP, 2010.
5. Figure 5 – Sr-90 From Soil Collected in the Vicinity of the WIPP, 2010.
6. Figure 6 – U-234 From Soil Collected in the Vicinity of the WIPP, 2010.
7. Figure 7 – U-235 From Soil Collected in the Vicinity of the WIPP, 2010.
8. Figure 8 – U-238 From Soil Collected in the Vicinity of the WIPP, 2010.
9. Table 1 – Analytical Laboratory Results for Soils Collected from Mills Ranch, 2010.

10. Table 2 – Analytical Laboratory Results for Soils Collected from Smith Ranch, 2010.
11. Table 3 – Analytical Laboratory Results for Soils Collected from WIPP South, 2010.
12. Table 4 – Analytical Laboratory Results for Soils Collected from WIPP South, Duplicate, 2010
13. Table 5 – Analytical Laboratory Results for Soils Collected from WIPP East, 2010.
14. Figure 9 – Soil Sampling Locations Near the WIPP, 2010.
15. Definitions

Cc: Thomas Skibitski, Bureau Chief, New Mexico Environment Department, DOE OB
George Basabilvazo, Director, Office of Regulatory Compliance, CBFO

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Subject: Soil Sampling in the Vicinity of the Waste Isolation Pilot Plant Conducted by NMED/DOE OB, 2010

The New Mexico Environment Department (NMED) DOE Oversight Bureau has compiled and assessed laboratory data for soils collected during 2010. The accompanying data report includes results for soils collected from four sites in the vicinity of the Waste Isolation Pilot plant (WIPP).

The accompanying graphs for each analyte indicate the results in mBq/g, ± 2 TPU.

Soils were collected from four sites near the WIPP at three sampling depths. These were sent to ALS Laboratories for analysis of ^{241}Am, ^{137}Cs, ^{238}Pu, $^{239/240}$Pu, ^{90}Sr, ^{234}U, ^{235}U and ^{238}U. There were no findings of the radionuclides of interest above the requested minimum detectable concentration, except for Uranium, which is a common element in soil. There were no findings of ^{235}U above the minimum detection concentration. The results for ^{234}U ran from a minimum of 4.81 mBq/g at WIPP East (2 – 5 cm depth), to a maximum of 17.76 mBq/g at Smith Ranch (0 -2 cm depth). The results for ^{238}U showed a minimum of 5.55 mBq/g at both WIPP South Duplicate and WIPP East (both at the 2 – 5 cm depth) and a maximum of 19.24 mBq/g at Smith Ranch (0 - 2 cm depth).

All Uranium results were within the historical range of reported results around the WIPP site prior to emplacement of any waste (Waste Isolation Pilot Plant 1999 Site Environmental Report) and within the average range of Uranium found naturally in soils worldwide.

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

Enclosures:
1. Figure 1 – Am-241 From Soil Collected in the Vicinity of the WIPP, 2010.
2. Figure 2 – Cs-137 From Soil Collected in the Vicinity of the WIPP, 2010.
3. Figure 3 – Pu-238 From Soil Collected in the Vicinity of the WIPP, 2010.
4. Figure 4 – Pu-239/240 From Soil Collected in the Vicinity of the WIPP, 2010.
5. Figure 5 – Sr-90 From Soil Collected in the Vicinity of the WIPP, 2010.
6. Figure 6 – U-234 From Soil Collected in the Vicinity of the WIPP, 2010.
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15. Definitions

Distribution: Thomas Skibitski, Chief, New Mexico Environment Department, DOE-OB
George Basabilvazo, Director, Office of Regulatory Compliance, DOE CBFO
Dan Ferguson, Site Regulatory Specialist, DOE CBFO

Figure 1: Am-241 From Soils Collected in the Vicinity of the WIPP, 2010.

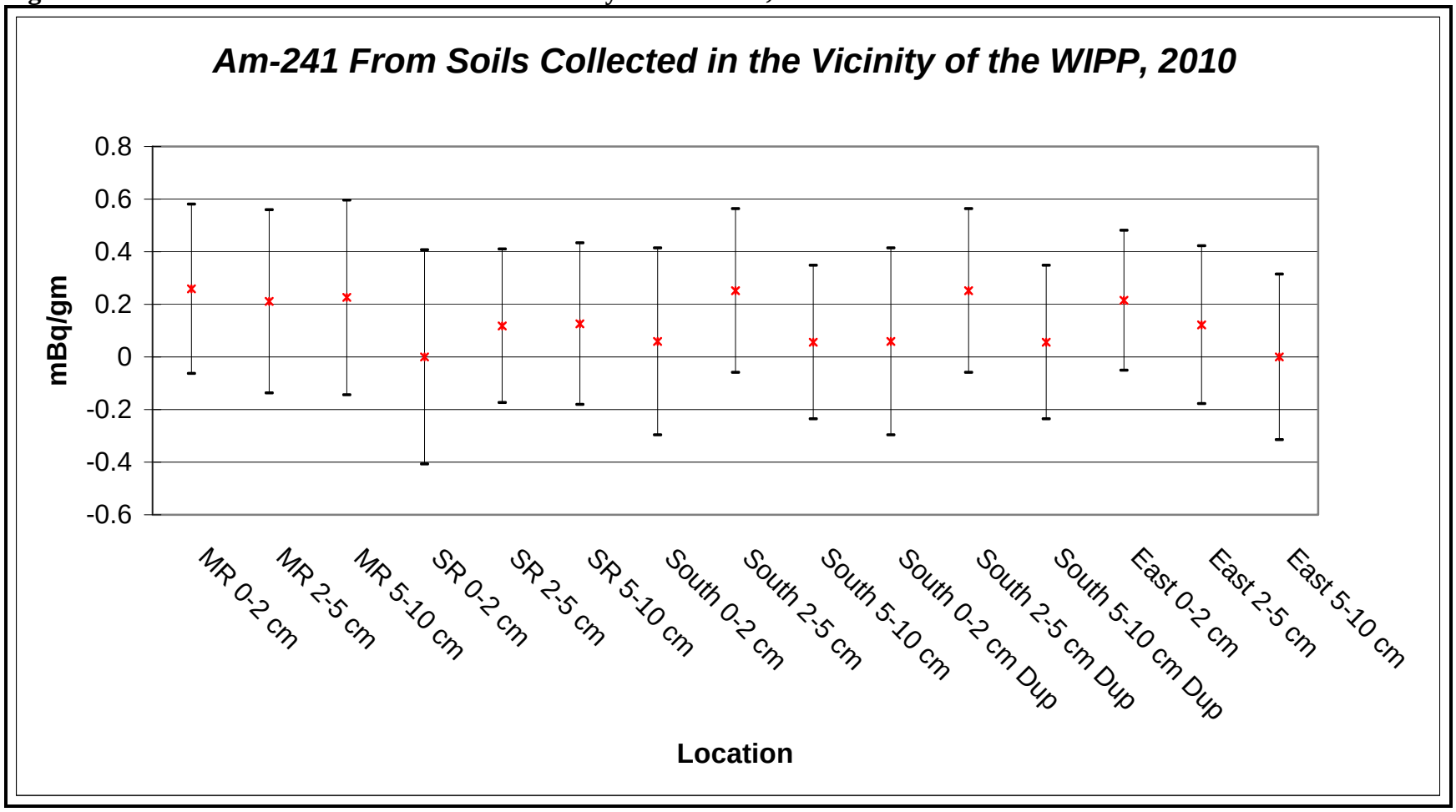

Figure 2: Cs-137 From Soils Collected in the Vicinity of the WIPP, 2010.

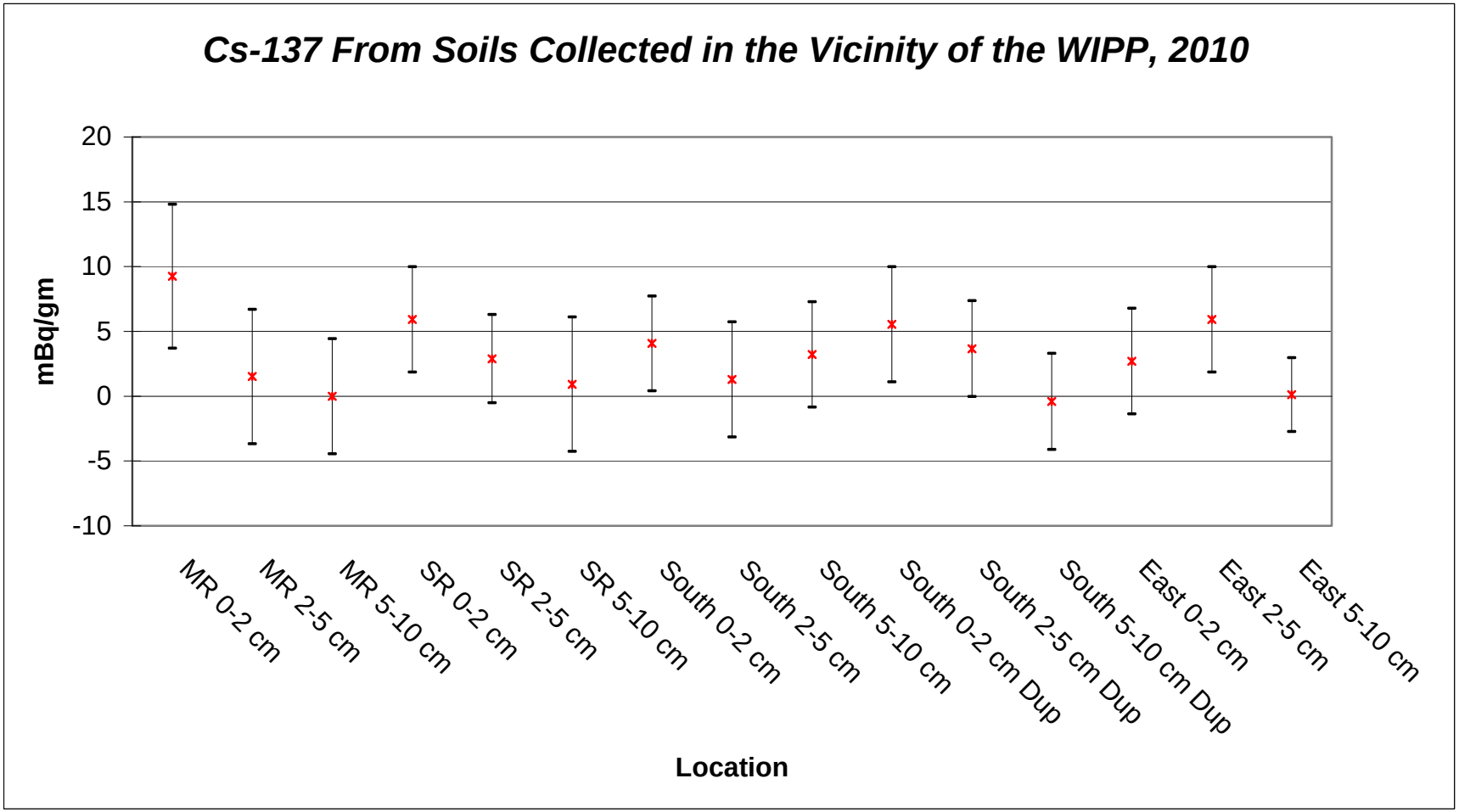

Figure 3: Pu-238 From Soils Collected in the Vicinity of the WIPP, 2010.

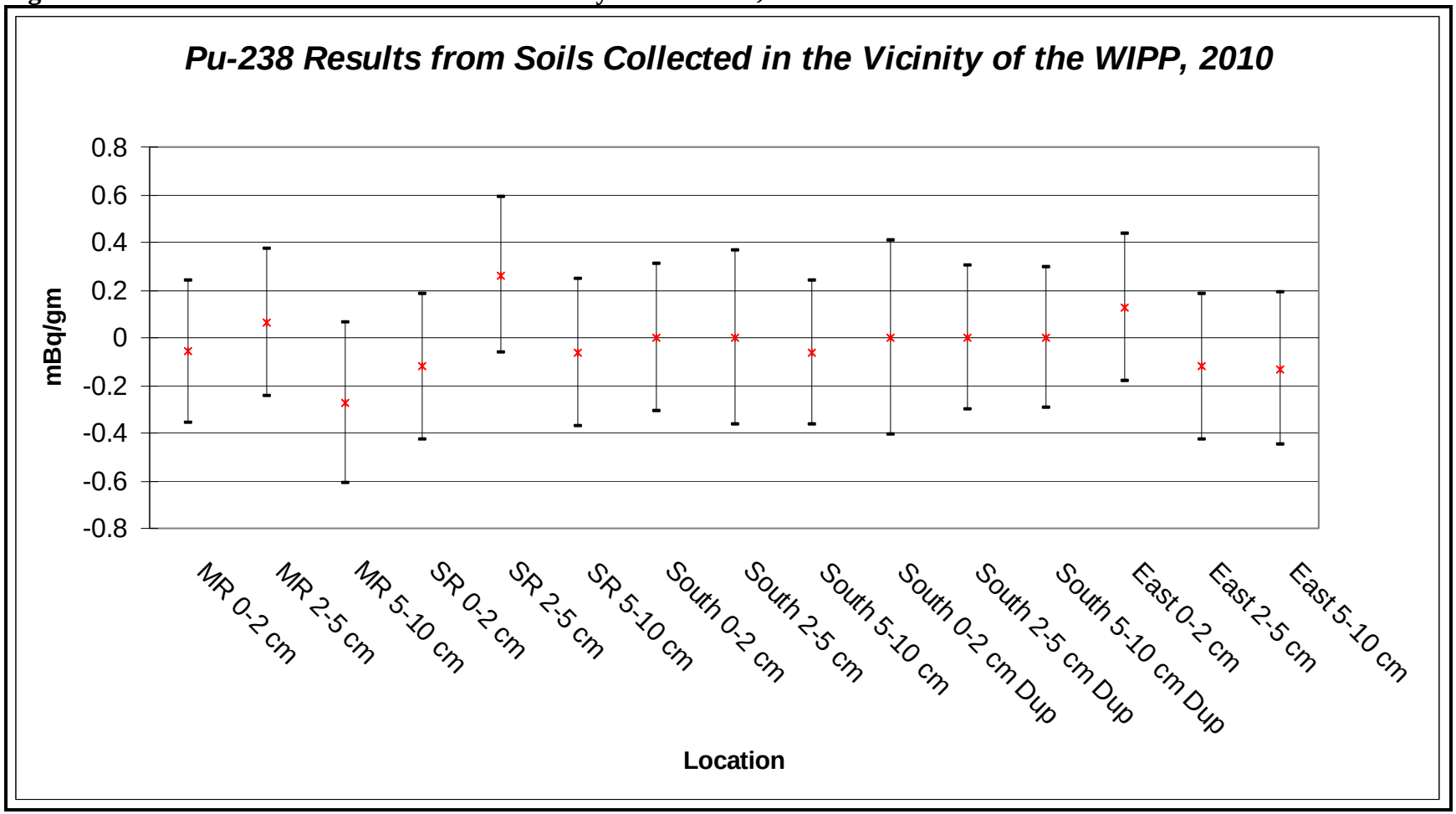

Figure 4: Pu-239/240 From Soils Collected in the Vicinity of the WIPP, 2010.

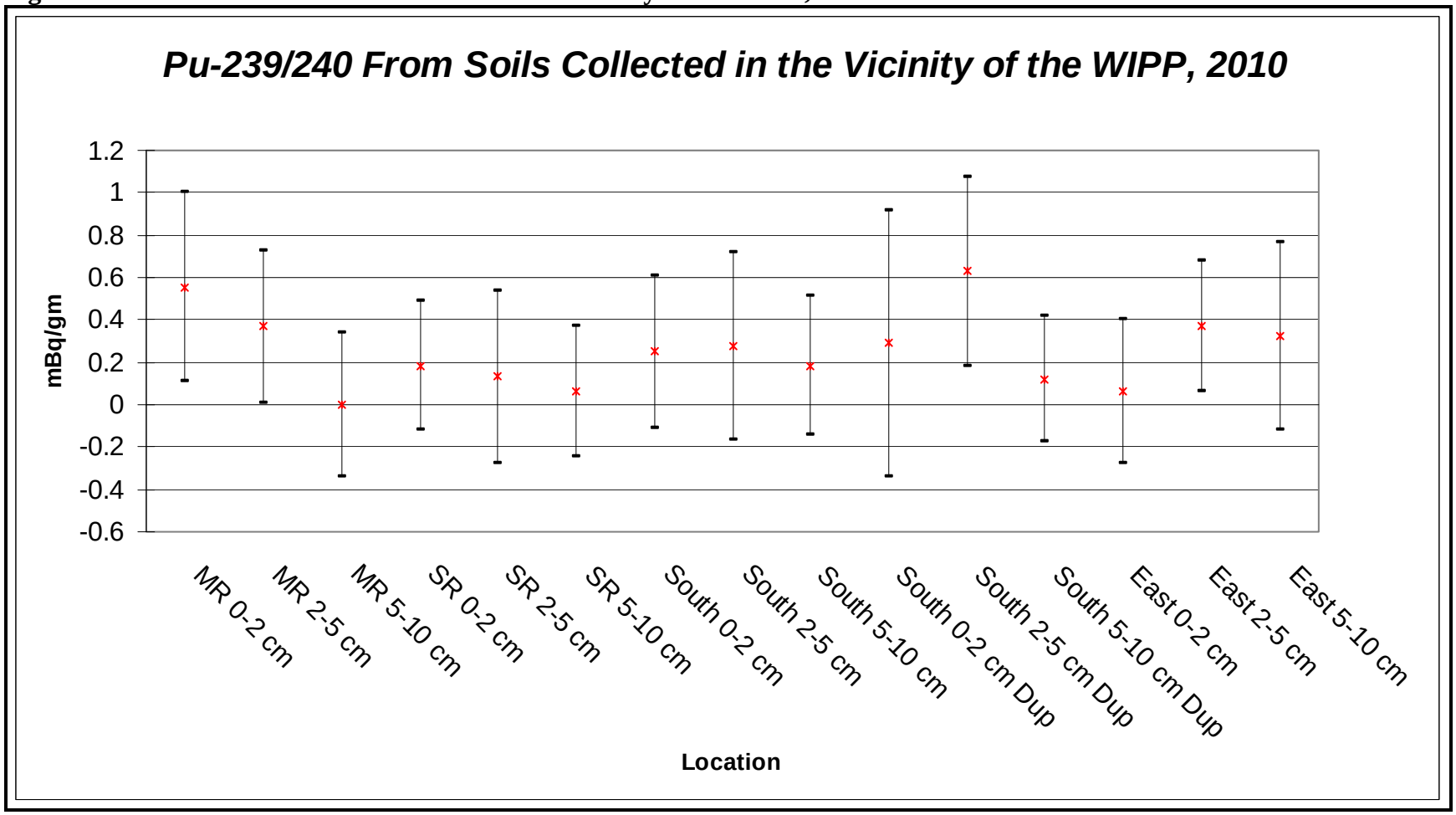

Figure 5: Sr-90 From Soils Collected in the Vicinity of the WIPP, 2010.

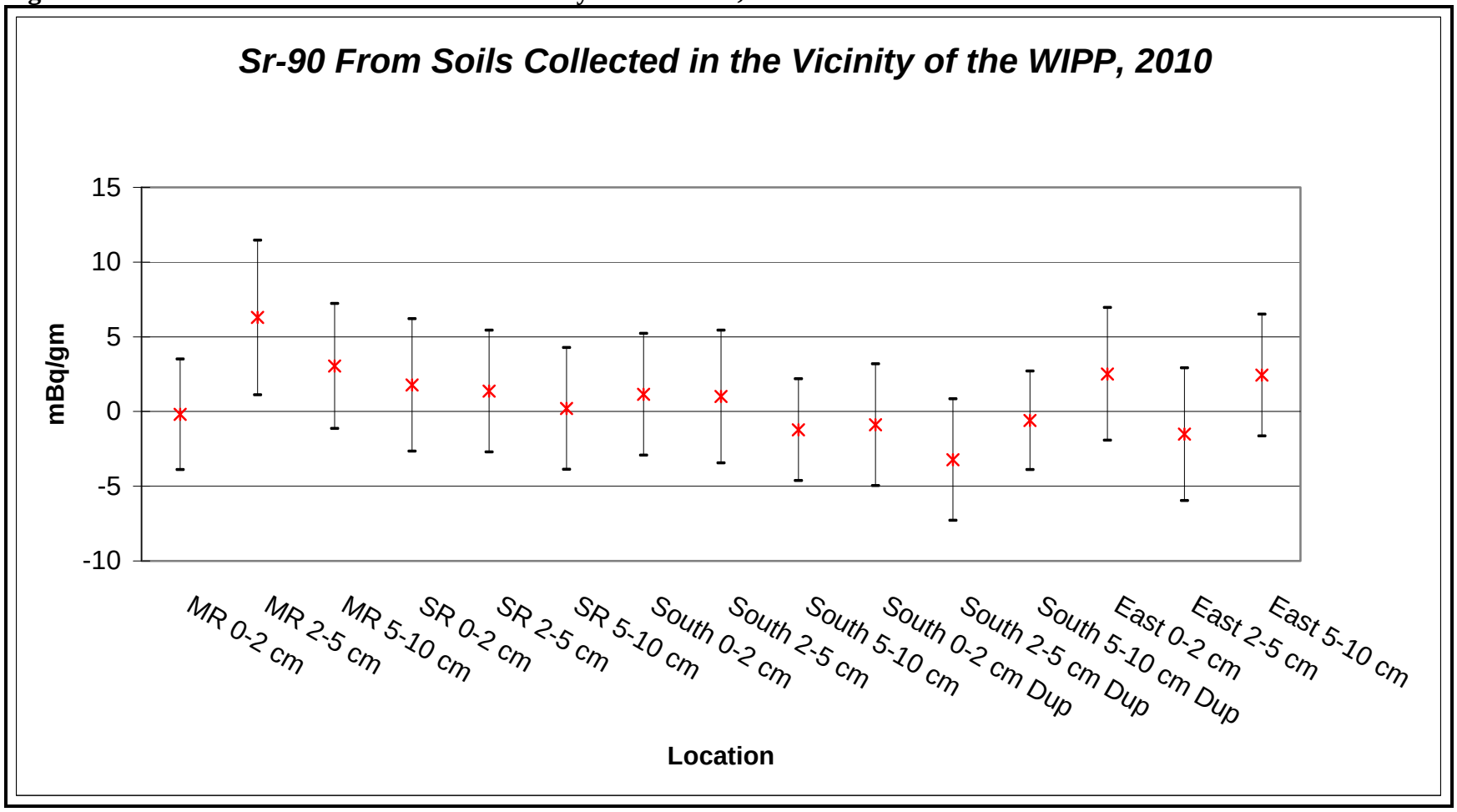

Figure 6: U-234 From Soils Collected in the Vicinity of the WIPP, 2010.

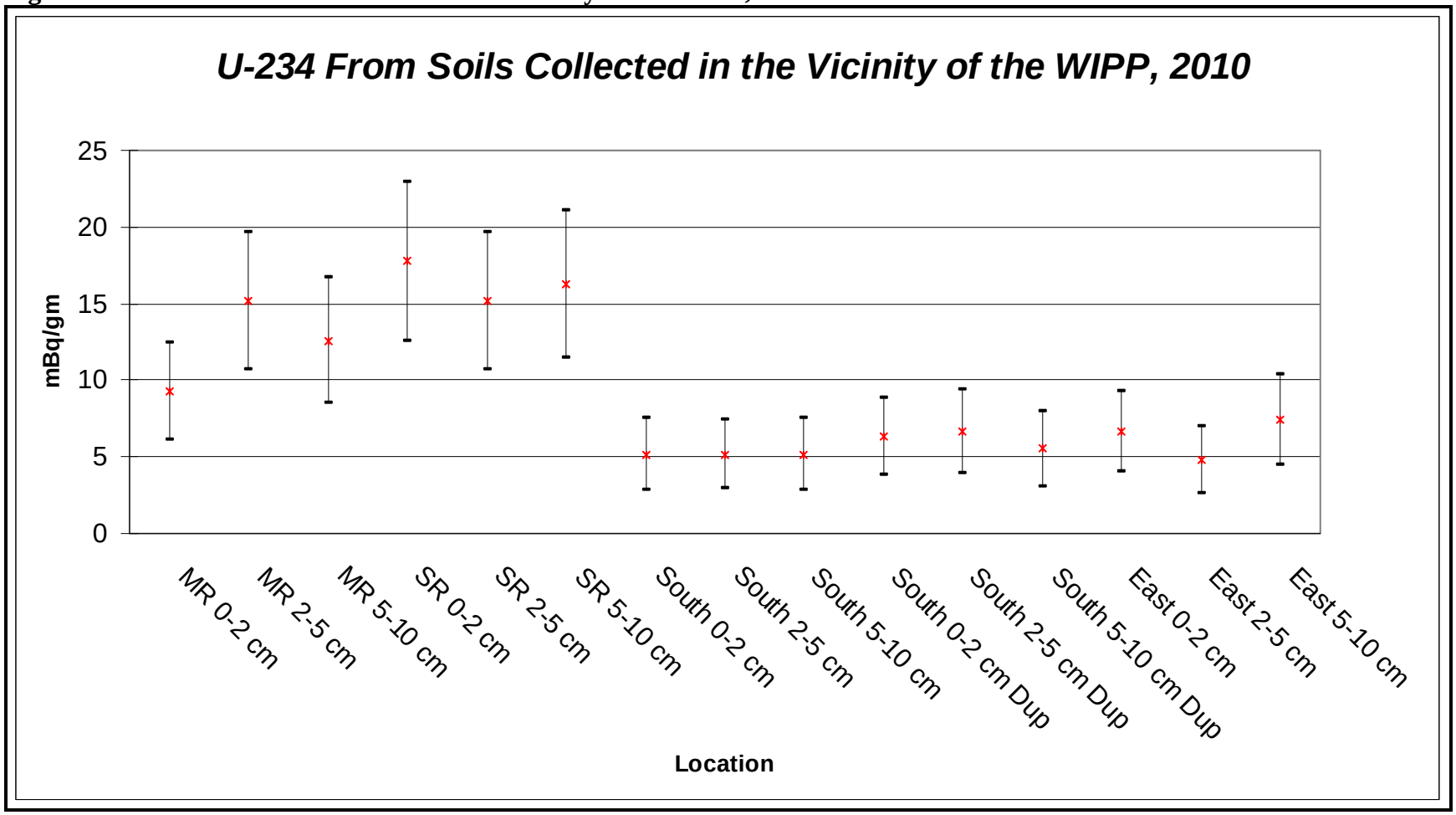

Figure 7: U-235 From Soils Collected in the Vicinity of the WIPP, 2010.

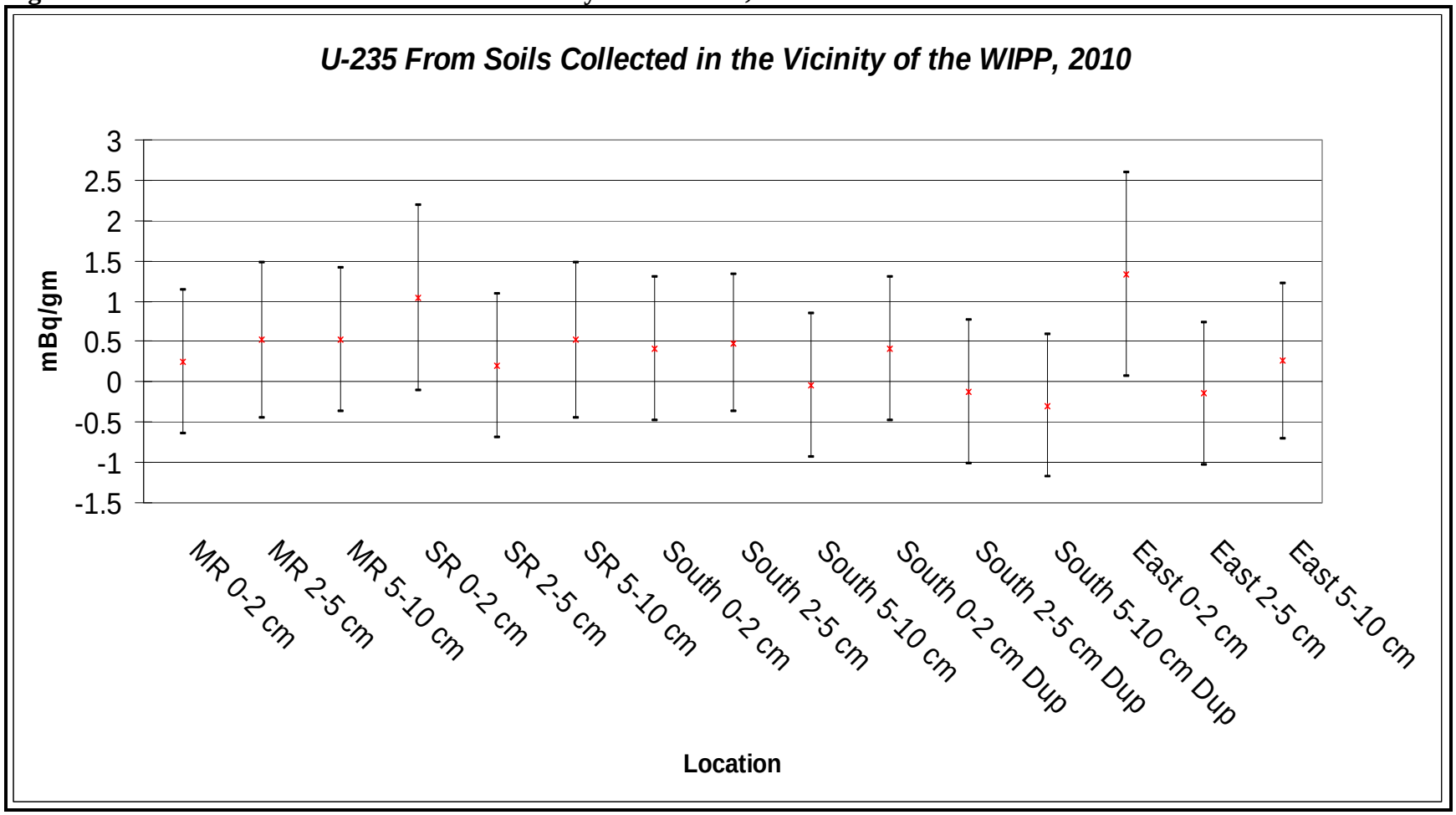

Figure 8: U-238 From Soils Collected in the Vicinity of the WIPP, 2010.

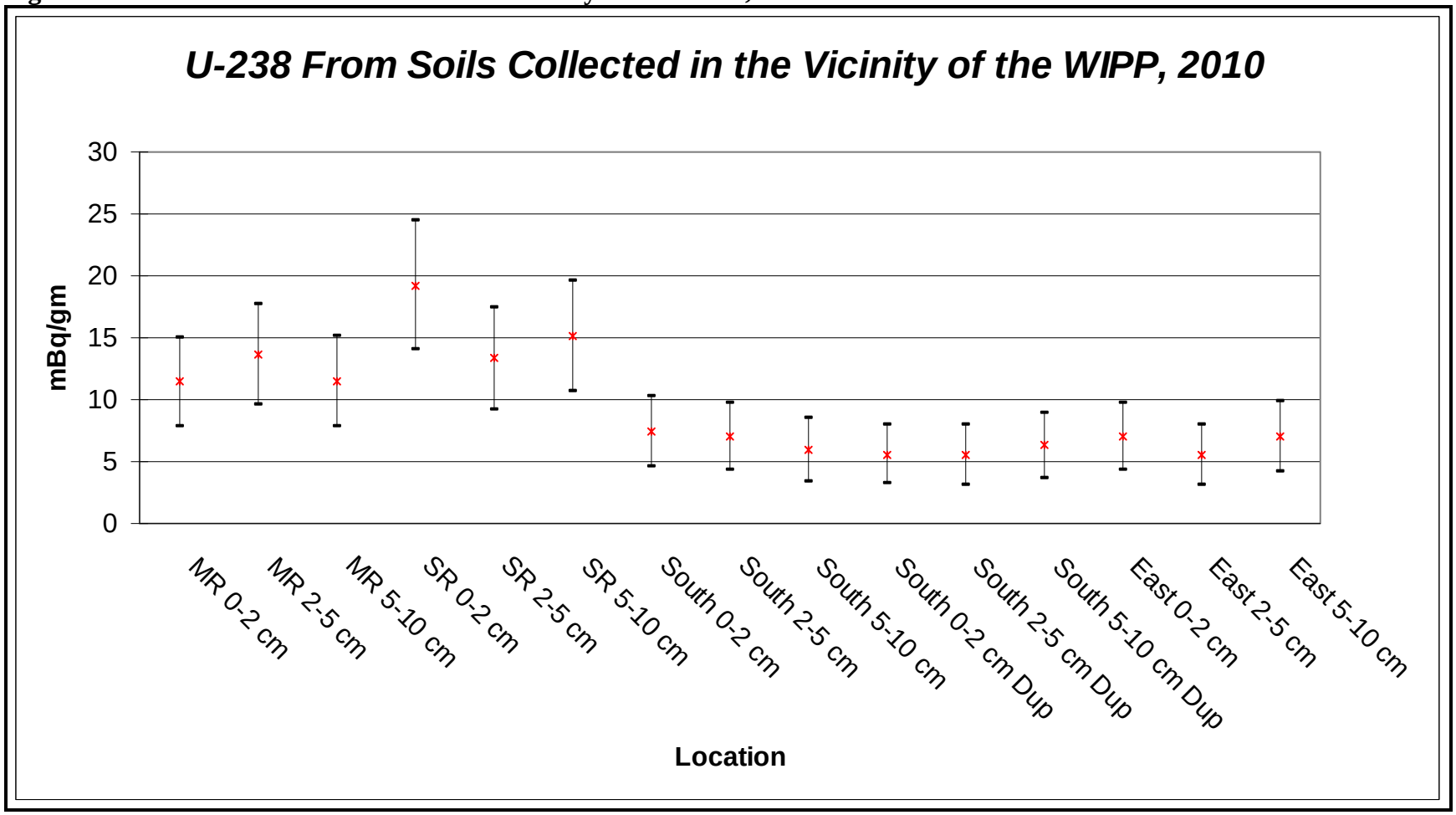

Table 1 - Analytical Laboratory Results for Soils Collected from Mills Ranch, 2010.

Mills Ranch 2010 *0-2 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	-0.0520	0.10	0.24	0.5	U	-1.924	3.7
Pu-239/240	0.015	0.012	0.015	0.05	U	0.555	0.444
Pu-238	-0.0016	0.0080	0.018	0.05	U	-0.059	0.296
Am-241	0.0070	0.0087	0.013	0.05	U	0.259	0.322
Cs-137	0.25	0.15	0.19	0.5	LT	9.25	5.55
U-234	0.25	0.086	0.035	0.1		9.25	3.182
U-235	0.0066	0.024	0.018	0.1	U	0.244	0.888
U-238	0.31	0.097	0.029	0.1		11.47	3.589

Mills Ranch 2010 *2-5 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	0.17	0.14	0.27	0.5	U	6.29	5.18
Pu-239/240	0.010	0.0097	0.012	0.05	U	0.37	0.359
Pu-238	0.0017	0.0083	0.012	0.05	U	0.063	0.307
Am-241	0.0057	0.0094	0.0052	0.05	LT	0.211	0.348
Cs-137	0.041	0.14	0.25	0.5	U, G	1.517	5.18
U-234	0.41	0.12	0.043	0.1		15.17	4.44
U-235	0.014	0.026	0.019	0.1	U	0.518	0.962
U-238	0.37	0.11	0.032	0.1		13.69	4.07

Mills Ranch 2010 *5-10 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	0.082	0.13	0.27	0.5	U	3.034	4.81
Pu-239/240	0	0.0091	0.014	0.05	U	0	0.337
Pu-238	-0.0074	0.0092	0.022	0.05	U	-0.274	0.34
Am-241	0.0061	0.010	0.015	0.05	U	0.226	0.37
Cs-137	0	0.12	0.23	0.5	U, G	0	4.44
U-234	0.34	0.11	0.056	0.1		12.58	4.07
U-235	0.014	0.024	0.047	0.1	U	0.518	0.888
U-238	0.31	0.099	0.047	0.1		11.47	3.663

Table 2 – Analytical Results for Soils Collected from Smith Ranch, 2010.

Smith Ranch ***2010*** *0-2 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	0.048	0.12	0.28	0.5	U	1.776	4.44
Pu-239/240	0.0050	0.0082	0.012	0.05	U	0.185	0.303
Pu-238	-0.0033	0.0082	0.015	0.05	U	-0.122	0.303
Am-241	0	0.011	0.023	0.05	U	0	0.407
Cs-137	0.16	0.11	0.15	0.5	LT, TI	5.92	4.07
U-234	0.48	0.14	0.081	0.1		17.76	5.18
U-235	0.028	0.031	0.048	0.1	U	1.036	1.147
U-238	0.52	0.14	0.062	0.1		19.24	5.18

Smith Ranch ***2010*** *2-5 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	0.037	0.11	0.25	0.5	U	1.369	4.07
Pu-239/240	0.0036	0.011	0.021	0.05	U	0.133	0.407
Pu-238	0.0071	0.0088	0.013	0.05	U	0.263	0.326
Am-241	0.0032	0.0079	0.012	0.05	U	0.118	0.292
Cs-137	0.078	0.092	0.15	0.5	U, G	2.886	3.404
U-234	0.41	0.12	0.053	0.1		15.17	4.44
U-235	0.0053	0.024	0.052	0.1	U	0.196	0.888
U-238	0.36	0.11	0.056	0.1		13.32	4.07

Smith Ranch ***2010*** *5-10 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	0.0054	0.11	0.24	0.5	U	0.2	4.07
Pu-239/240	0.0017	0.0083	0.016	0.05	U	0.063	0.307
Pu-238	-0.0017	0.0083	0.012	0.05	U	-0.063	0.307
Am-241	0.0034	0.0083	0.012	0.05	U	0.126	0.307
Cs-137	0.025	0.14	0.26	0.5	U	0.925	5.18
U-234	0.44	0.13	0.038	0.1		16.28	4.81
U-235	0.014	0.026	0.019	0.1	U	0.518	0.962
U-238	0.41	0.12	0.047	0.1		15.17	4.44

Table 3 – Analytical Laboratory Results for Soils Collected from WIPP South.

WIPP South 2010 *0-2 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	0.031	0.11	0.25	0.5	U	1.147	4.07
Pu-239/240	0.0068	0.0097	0.016	0.05	U	0.252	0.359
Pu-238	0	0.0084	0.013	0.05	U	0	0.311
Am-241	0.0016	0.0096	0.019	0.05	U	0.059	0.355
Cs-137	0.11	0.099	0.15	0.5	U	4.07	3.663
U-234	0.14	0.063	0.044	0.1		5.18	2.331
U-235	0.011	0.024	0.035	0.1	U	0.407	0.888
U-238	0.20	0.076	0.035	0.1		7.4	2.812

WIPP South 2010 *2-5 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	0.027	0.12	0.27	0.5	U	0.999	4.44
Pu-239/240	0.0075	0.012	0.020	0.05	U	0.278	0.444
Pu-238	0	0.0092	0.017	0.05	U	0	0.340
Am-241	0.0068	0.0084	0.0046	0.05	LT	0.252	0.311
Cs-137	0.035	0.12	0.21	0.5	U	1.295	4.44
U-234	0.14	0.060	0.034	0.1		5.18	2.22
U-235	0.013	0.023	0.017	0.1	U	0.481	0.851
U-238	0.19	0.071	0.028	0.1		7.03	2.627

WIPP South 2010 *5-10 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	-0.033	0.092	0.21	0.5	U	-1.221	3.404
Pu-239/240	0.0050	0.0088	0.015	0.05	U	0.185	0.326
Pu-238	-0.0017	0.0082	0.012	0.05	U	-0.063	0.303
Am-241	0.0015	0.0079	0.016	0.05	U	0.056	0.292
Cs-137	0.087	0.11	0.18	0.5	U	3.219	4.07
U-234	0.14	0.063	0.051	0.1		5.180	2.331
U-235	-0.0013	0.024	0.052	0.1	U	-0.048	0.888
U-238	0.16	0.070	0.064	0.1		5.92	2.59

Table 4 – Analytical Laboratory Results for Soils Collected from WIPP South, Duplicate, 2010.

WIPP South Duplicate 2010 *0-2 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	-0.024	0.11	0.25	0.5	U	-0.888	4.07
Pu-239/240	0.0078	0.017	0.029	0.05	U	0.289	0.629
Pu-238	-0.0039	0.011	0.026	0.05	U	-0.1443	0.407
Am-241	0.0055	0.0097	0.017	0.05	U	0.204	0.359
Cs-137	0.15	0.12	0.17	0.5	U	5.55	4.44
U-234	0.17	0.068	0.041	0.1		6.29	2.516
U-235	0.011	0.024	0.035	0.1	U	0.407	0.888
U-238	0.15	0.064	0.036	0.1		5.6	2.368

WIPP South Duplicate 2010 *2-5 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	-0.087	0.11	0.27	0.5	U	-3.219	4.07
Pu-239/240	0.017	0.012	0.01	0.05	LT	0.629	0.444
Pu-238	0	0.0082	0.0046	0.05	U	0	0.303
Am-241	0.0023	0.011	0.017	0.05	LT	0.085	0.407
Cs-137	0.099	0.10	0.16	0.5	U	3.663	3.7
U-234	0.18	0.073	0.055	0.1		6.66	2.7
U-235	-0.0033	0.024	0.055	0.1	U	-0.122	0.888
U-238	0.15	0.067	0.058	0.1		5.55	2.479

WIPP South Duplicate 2010 *5-10 cm*						***Data Summaries***	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	-0.016	0.089	0.21	0.5	U	-0.592	3.293
Pu-239/240	0.0033	0.0080	0.012	0.05	U	0.122	0.296
Pu-238	0	0.0080	0.012	0.05	U	0	0.296
Am-241	0.0035	0.0085	0.016	0.05	U	0.13	0.315
Cs-137	-0.011	0.10	0.20	0.5	U	-0.407	3.7
U-234	0.15	0.066	0.054	0.1		5.55	2.442
U-235	-0.008	0.024	0.052	0.1	U	-0.296	0.888
U-238	0.17	0.072	0.061	0.1		6.29	2.66

Table 5 – Analytical Laboratory Results for Soils Collected from WIPP East, 2010.

WIPP East 2010 0-2 cm						Data Summaries	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	0.068	0.12	0.26	0.5	U	2.516	4.44
Pu-239/240	0.0017	0.0091	0.018	0.05	U	0.063	0.337
Pu-238	0.0034	0.0084	0.013	0.05	U	0.126	0.311
Am-241	0.0058	0.0072	0.0040	0.05	LT	0.215	0.266
Cs-137	0.073	0.11	0.18	0.5	U	2.701	4.07
U-234	0.18	0.072	0.044	0.1		6.66	2.664
U-235	0.036	0.034	0.042	0.1	U	1.332	1.258
U-238	0.19	0.073	0.040	0.1		7.03	2.701

WIPP East 2010 2-5 cm						Data Summaries	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	-0.041	0.12	0.27	0.5	U	-1.517	4.44
Pu-239/240	0.010	0.0083	0.0045	0.05	LT	0.37	0.307
Pu-238	-0.0033	0.0082	0.016	0.05	U	-0.122	0.303
Am-241	0.0033	0.0081	0.012	0.05	U	0.122	0.30
Cs-137	0.16	0.11	0.14	0.5	LT, TI	5.92	4.07
U-234	0.13	0.059	0.041	0.1		4.81	2.183
U-235	-0.004	0.024	0.042	0.1	U	-0.148	0.888
U-238	0.15	0.067	0.057	0.1		5.55	2.479

WIPP East 2010 5-10 cm						Data Summaries	
Analyte	Result	2 s TPU (±)	Sample MDC	Requested MDC	Lab Flag	Result	2 s TPU (±)
	pCi/g					mBq/g	
Sr-90	0.066	0.11	0.24	0.5	U	2.442	4.07
Pu-239/240	0.0087	0.012	0.019	0.05	U	0.322	0.444
Pu-238	-0.0035	0.0086	0.016	0.05	U	-0.13	0.318
Am-241	0	0.0085	0.016	0.05	U	0	0.315
Cs-137	0.0031	0.077	0.14	0.5	U	0.115	2.849
U-234	0.20	0.079	0.047	0.1		7.4	2.923
U-235	0.0070	0.026	0.019	0.1	U	0.259	0.962
U-238	0.19	0.075	0.038	0.1		7.03	2.775

Figure 9: Soil Sampling Locations Near the WIPP, 2010.

Definitions

On Graphs:
MR – Mills Ranch
WE – WIPP East
SR - Smith Ranch
WS – WIPP South
DUP – Field Duplicate

On Table:

Qualifiers/Flags
U – Result is less than the sample specific MDC.
Y1 – Chemical yield is in control at 100-110%. Quantitative yield is assumed.
TI – Nuclide identification is tentative.
LT – Result is less that the Requested MDC, greater than sample specific MDC.
MDC – Minimum Detectable Concentration.
TPU – Total Propagated Uncertainty.
G – Sample Density differs by more than 15% of LCS Density.