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▸▸AUTHOR STEFFEN, DOUGLAS E. ▸▸TO MCCRACKEN, STEPHEN H. ▸▸DATE 6-14-99

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JUNE 14 1999

U.S. Department of Energy
Weldon Spring Site Remedial Action Project
ATTN: Mr. Stephen H. McCracken
DOE Project Director
7295 Highway 94 South
St. Charles, MO 63304

SUBJECT: Contract No. DE-AC05-86OR21548
WP-505J SOUTHEAST DRAINAGE ANALYTICAL DATA

Dear Mr. McCracken:

A summary of the analytical data from the WP-505J post-remediation Southeast Drainage sampling is attached (Table A). Characterization was completed in accordance with the *Engineering Soils Sampling Plan for Army and MDC Vicinity Properties: Addendum 5; Rev.1*, April, 1999. In total, nine samples were taken from Southeast Drainage Locations 60, 101, and 132. Each sample represented a depth interval of 0 to 6 in. For reference, we have also included the post-remediation data from 1998 (Table B).

We will await Argonne National Laboratories revised risk calculation to complete the closeout documentation for the drainage. If you have any questions or require additional information, please contact Eric Ripp at extension 3122.

Sincerely,

Douglas E. Steffen
Project Director

DES/glv/emr

Attachment

Cc: Pamela Thompson

REISSUED

Table A Southeast Drainage WP-505J Remediation Summary (09JUN99)

WSSRAP Sample ID #	Location	Date Sampled	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	Northing	Easting	Elevation
SO-499001-01	101& 132	4/19/99	5.34	< 0.98	39.0	8.41	1038956.71	756337.85	540.42
SO-499002-01	101	4/19/99	7.49	1.13	36.7	< 4.48	1038931.41	756334.05	541.25
SO-499003-01	101	4/19/99	3.11	< 0.92	15.9	3.45	1038928.23	756345.06	541.22
SO-499004-01	101	4/19/99	7.01	< 0.83	50.1	< 5.27	1038908.42	756337.26	540.20
SO-499005-02	60	4/29/99	11.1	< 1.08	44.5	9.17	1035523.74	757574.58	467.06
SO-499006-02	60	4/29/99	12.7	0.76	15.2	< 4.91	1035523.24	757590.73	468.29
SO-499007-01	60	4/29/99	18.0	< 1.32	107	< 6.88	1035527.78	757577.83	467.72
SO-499008-01	60	4/29/99	21.2	1.86	54.8	33.5	1035525.69	757562.94	467.96
SO-499009-01	60	4/29/99	30.8	1.79	76.9	23.8	1035519.23	757572.16	467.73

REISSUED

TABLE B

SOUTHEAST DRAINAGE POST-REMEDIATION DATA RESULTS

6-22-99

LOCATION[1]	PARAMETER	CONC[1]	DETECTION	UNITS
1	Radium-226	12.30	0.75	pCi/g
1	Radium-228	1.66	0.92	pCi/g
1	Thorium-230	4.72	0.62	pCi/g
1	Uranium-238	37.80	7.77	pCi/g
5	Radium-226	4.73	0.36	pCi/g
5	Radium-228	2.86	0.77	pCi/g
5	Thorium-230	22.90	0.62	pCi/g
5	Uranium-238	10.90	5.95	pCi/g
12	Radium-226	1.68	0.37	pCi/g
12	Radium-228	1.07	0.37	pCi/g
12	Thorium-230	2.19	0.62	pCi/g
12	Uranium-238	ND	4.32	pCi/g
25a	Radium-226	24.90	1.06	pCi/g
25b	Radium-226	3.55	0.33	pCi/g
25a	Radium-228	1.33	1.12	pCi/g
25b	Radium 228	1.25	0.49	pCi/g
25a	Thorium-230	29.10	0.62	pCi/g
25b	Thorium-230	5.64	0.62	pCi/g
25a	Uranium-238	142.00	12.5	pCi/g
25b	Uranium-238	5.46	2.70	pCi/g
27	Radium-226	23.00	1.14	pCi/g
27	Radium-228	6.55	1.62	pCi/g
27	Thorium-230	14.60	0.62	pCi/g
27	Uranium-238	26.70	9.67	pCi/g
25	Radium-226	11.30	0.40	pCi/g
25	Radium-228	ND	1.29	pCi/g
25	Thorium-230	3.20	0.62	pCi/g
25	Uranium-238	3.69	5.06	pCi/g
55	Radium-226	4.30	0.42	pCi/g
55	Radium-228	0.99	0.49	pCi/g
55	Thorium-230	5.63	0.62	pCi/g
55	Uranium-238	8.82	2.36	pCi/g
56	Radium-226	4.99	0.43	pCi/g
56	Radium-228	1.21	0.46	pCi/g
56	Thorium-230	2.91	0.62	pCi/g
56	Uranium-238	4.96	2.48	pCi/g
59	Radium-226	4.86	0.48	pCi/g
59	Radium-228	ND	1.40	pCi/g
59	Thorium-230	46.47	0.62	pCi/g
59	Uranium-238	10.42	5.30	pCi/g
60a	Radium-226	2.18	0.25	pCi/g
60b	Radium-226	239.00	3.03	pCi/g
60a	Radium-228	ND	0.81	pCi/g
60b	Radium-228	17.40	2.90	pCi/g
60a	Thorium-230	3.02	0.62	pCi/g
60b	Thorium-230	5090.00	0.62	pCi/g
60a	Uranium-238	7.54	2.56	pCi/g
60b	Uranium-238	150.00	19.3	pCi/g
61	Radium-226	26.90	0.70	pCi/g
61	Radium-228	0.99	0.81	pCi/g
61	Thorium-230	17.60	0.62	pCi/g
61	Uranium-238	70.20	6.86	pCi/g
62	Radium-226	1.25	0.25	pCi/g
62	Radium-228	1.06	0..36	pCi/g
62	Thorium-230	1.25	0.62	pCi/g
62	Uranium-238	ND	2.33	pCi/g
63	Radium-226	10.75	0.40	pCi/g
63	Radium-228	ND	1.46	pCi/g
63	Thorium-230	3.16	0.62	pCi/g
63	Uranium-238	6.05	4.68	pCi/g
64a	Radium-226	2.14	0.33	pCi/g
64b	Radium -226	3.56	0.34	pCi/g

REISSUE

83926

TABLE B

SOUTHEAST DRAINAGE POST-REMEDIATION DATA RESULTS

6-22-99

LOCATION[a]	PARAMETER	CONC[b]	DETECTION	UNITS
64a	Radium-226	1.44	0.52	pCi/g
64b	Radium-226	1.10	0.52	pCi/g
64a	Thorium-230	3.96	0.62	pCi/g
64b	Thorium-230	5.43	0.62	pCi/g
64a	Uranium-238	7.48	4.44	pCi/g
64b	Uranium 238	12.80	3.36	pCi/g
65a	Radium-226	3.64	0.41	pCi/g
65b	Radium-226	19.60	0.65	pCi/g
65a	Raduim-228	1.25	0.64	pCi/g
65b	Radium-228	4.18	0.88	pCi/g
65a	Thorium-230	8.04	0.62	pCi/g
65b	Thorium-230	49.20	0.62	pCi/g
65a	Uranium 238	16.90	4.84	pCi/g
65b	Uranium 238	58.90	6.74	pCi/g
66	Radium-226	10.10	0.76	pCi/g
66	Radium-228	1.54	0.84	pCi/g
66	Thorium-230	70.40	0.62	pCi/g
66	Uranium-238	15.70	7.08	pCi/g
67	Radium-226	1.50	0.35	pCi/g
67	Radium-228	1.23	0.43	pCi/g
67	Thorium-230	1.34	0.62	pCi/g
67	Uranium-238	ND	3.94	pCi/g
68	Radium-226	1.54	0.24	pCi/g
68	Radium-228	1.23	0.32	pCi/g
68	Thorium-230	1.32	0.62	pCi/g
68	Uranium-238	2.08	1.87	pCi/g
72a	Radium-226	11.10	0.44	pCi/g
72b	Radium-226	11.60	0.74	pCi/g
72a	Radium-228	1.79	0.73	pCi/g
72b	Radium-228	1.85	1.04	pCi/g
72a	Thorium-230	16.30	0.62	pCi/g
72b	Thorium-230	16.80	0.62	pCi/g
72a	Uranium-238	19.00	4.10	pCi/g
72b	Uranium-238	15.80	7.22	pCi/g
92	Radium-226	5.43	0.36	pCi/g
92	Radium-228	1.53	0.61	pCi/g
92	Thorium-230	38.40	0.62	pCi/g
92	Uranium-238	80.00	5.31	pCi/g
93	Radium-226	1.95	0.45	pCi/g
93	Radium-228	1.24	0.68	pCi/g
93	Thorium-230	0.76	0.62	pCi/g
93	Uranium-238	76.30	5.69	pCi/g
94	Radium-226	3.80	0.34	pCi/g
94	Radium-228	1.20	0.58	pCi/g
94	Thorium-230	8.89	0.62	pCi/g
94	Uranium-238	17.40	3.65	pCi/g
98a	Radium-226	2.44	0.38	pCi/g
98b	Radium-226	2.51	0.31	pCi/g
98a	Radium-228	1.13	0.42	pCi/g
98b	Radium-228	1.07	0.48	pCi/g
98a	Thorium230	5.38	0.62	pCi/g
98b	Thorium-230	2.10	0.62	pCi/g
98a	Uranium-238	2.65	2.26	pCi/g
98b	Uranium-238	2.48	4.08	pCi/g
99	Radium-226	2.51	0.32	pCi/g
99	Radium-228	1.22	0.36	pCi/g
99	Thorium-230	2.53	0.62	pCi/g
99	Uranium-238	2.99	2.55	pCi/g
101	Radium-226	89.25	1.76	pCi/g
101	Radium-228	6.79	1.74	pCi/g
101	Thorium-230	1916.25	0.62	pCi/g
101	Uranium-238	18.93	12.8	pCi/g

REISSUE

TABLE B

SOUTHEAST DRAINAGE POST-REMEDIATION DATA RESULTS

6-22-99

LOCATION[a]	PARAMETER	CONC[b]	DETECTION	UNITS
102.1	Radium-226	1.40	0.22	pCi/g
102	Radium-226	2.76	0.31	pCi/g
102.1	Radium-228	1.40	0.43	pCi/g
102	Radium-228	1.26	0.35	pCi/g
102.1	Thorium-230	1.69	0.62	pCi/g
102	Thorium-230	6.35	0.62	pCi/g
102.1	Uranium-238	ND	3.65	pCi/g
102	Uranium-238	9.93	2.58	pCi/g
103	Radium-226	1.33	0.35	pCi/g
103	Radium-226	0.77	0.44	pCi/g
103	Thorium-230	1.51	0.62	pCi/g
103	Uranium-238	ND	2.72	pCi/g
104a	Radium-226	2.17	0.40	pCi/g
104b	Radium-226	6.05	0.44	pCi/g
104a	Radium-228	0.93	0.60	pCi/g
104b	Radium-228	1.15	0.49	pCi/g
104a	Thorium-230	1.48	0.62	pCi/g
104b	Thorium-230	17.40	0.62	pCi/g
104a	Uranium-238	6.72	3.47	pCi/g
104b	Uranium-238	15.40	3.24	pCi/g
105	Radium-226	16.20	0.81	pCi/g
105	Radium-228	0.82	0.82	pCi/g
105	Thorium-230	3.57	0.62	pCi/g
105	Uranium-238	29.30	7.71	pCi/g
106	Radium-226	1.26	0.27	pCi/g
106	Radium-228	1.29	0.37	pCi/g
106	Thorium-230	1.33	0.62	pCi/g
106	Uranium-238	ND	2.91	pCi/g
107	Radium-226	33.87	1.14	pCi/g
107	Radium-228	1.83	1.36	pCi/g
107	Thorium-230	44.50	0.62	pCi/g
107	Uranium-238	40.10	8.23	pCi/g
108.1	Radium-226	7.05	0.40	pCi/g
108	Radium-226	5.29	0.41	pCi/g
108.1	Radium-228	0.98	1.13	pCi/g
108	Radium-228	1.06	0.52	pCi/g
108.1	Thorium-230	3.33	0.62	pCi/g
108	Thorium-230	4.74	0.62	pCi/g
108.1	Uranium-238	9.64	7.37	pCi/g
108	Uranium-238	10.70	3.00	pCi/g
110	Radium-226	4.26	0.39	pCi/g
110.1	Radium-226	1.82	0.39	pCi/g
110	Radium-228	1.15	0.55	pCi/g
110.1	Radium-228	ND	1.19	pCi/g
110	Thorium-230	2.85	0.62	pCi/g
110.1	Thorium-230	2.07	0.62	pCi/g
110	Uranium-238	24.00	3.36	pCi/g
110.1	Uranium-238	5.55	3.17	pCi/g
111a	Radium-226	7.43	0.44	pCi/g
111b	Radium-226	1.74	0.28	pCi/g
111a	Radium-228	0.92	0.55	pCi/g
111b	Radium-228	1.46	0.61	pCi/g
111a	Thorium-230	42.10	0.62	pCi/g
111b	Thorium-230	1.55	0.62	pCi/g
111a	Uranium-238	29.40	4.41	pCi/g
111b	Uranium-238	ND	4.13	pCi/g
112	Radium-226	11.20	0.50	pCi/g
112	Radium-228	ND	0.95	pCi/g
112	Thorium-230	10.30	0.62	pCi/g
112	Uranium-238	9.13	4.33	pCi/g
113	Radium-226	36.20	1.12	pCi/g
113	Radium-228	0.96	1.30	pCi/g

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83926

TABLE B

SOUTHEAST DRAINAGE POST-REMEDIATION DATA RESULTS

6-22-99

LOCATION[a]	PARAMETER	CONC[b]	DETECTION	UNITS
113	Thorium-230	11.40	0.62	pCi/g
113	Uranium-238	11.40	9.43	pCi/g
114a	Radium-226	1.36	0.24	pCi/g
114b	Radium-226	2.99	0.43	pCi/g
114c	Radium-226	3.75	0.40	pCi/g
114a	Radium-228	ND	0.71	pCi/g
114b	Radium-228	0.86	0.35	pCi/g
114c	Radium-228	1.23	0.48	pCi/g
114a	Thorium-230	1.40	0.62	pCi/g
114b	Thorium-230	2.33	0.62	pCi/g
114c	Thorium-230	2.38	0.62	pCi/g
114a	Uranium-238	10.40	2.26	pCi/g
114b	Uranium-238	6.31	3.58	pCi/g
114c	Uranium-238	12.10	2.89	pCi/g
115	Radium-226	4.64	0.49	pCi/g
115	Radium-228	0.93	0.64	pCi/g
115	Thorium-230	7.25	0.62	pCi/g
115	Uranium-238	7.26	4.33	pCi/g
116	Radium-226	2.15	0.22	pCi/g
116	Radium-228	1.35	0.47	pCi/g
116	Thorium-230	1.78	0.62	pCi/g
116	Uranium-238	5.29	2.07	pCi/g
117a	Radium-226	17.50	0.71	pCi/g
117b	Radium-226	1.04	0.22	pCi/g
117a	Radium-228	4.57	1.23	pCi/g
117b	Radium-228	ND	0.74	pCi/g
117a	Thorium-230	23.00	0.62	pCi/g
117b	Thorium-230	1.04	0.62	pCi/g
117a	Uranium-238	18.90	7.56	pCi/g
117b	Uranium-238	1.16	1.71	pCi/g
118	Radium-226	17.10	0.87	pCi/g
118	Radium-228	6.66	1.45	pCi/g
118	Thorium-230	60.00	0.62	pCi/g
118	Uranium-238	69.50	9.91	pCi/g
119	Radium-226	1.52	0.38	pCi/g
119	Radium-228	0.99	0.57	pCi/g
119	Thorium-230	0.69	0.62	pCi/g
119	Uranium-238	10.60	3.99	pCi/g
120	Radium-226	6.78	0.66	pCi/g
120	Radium-228	0.62	0.71	pCi/g
120	Thorium-230	2.37	0.62	pCi/g
120	Uranium-238	ND	5.67	pCi/g
121	Radium-226	14.85	0.47	pCi/g
121	Radium-228	1.06	0.64	pCi/g
121	Thorium-230	7.80	0.62	pCi/g
121	Uranium-238	10.60	3.72	pCi/g
122	Radium-226	1.56	0.25	pCi/g
122	Radium-228	1.40	0.42	pCi/g
122	Thorium-230	1.10	0.62	pCi/g
122	Uranium-238	2.66	2.47	pCi/g
123	Radium-226	5.04	0.36	pCi/g
123	Radium-228	1.11	0.54	pCi/g
123	Thorium-230	7.10	0.62	pCi/g
123	Uranium-238	3.81	3.16	pCi/g
124	Radium-226	6.70	0.45	pCi/g
124	Radium-228	1.56	0.55	pCi/g
124	Thorium-230	12.40	0.62	pCi/g
124	Uranium-238	9.38	3.72	pCi/g
132	Radium-226	65.30	1.51	pCi/g
132	Radium-228	ND	2.57	pCi/g
132	Thorium-230	124.00	0.62	pCi/g
132	Uranium-238	14.70	9.88	pCi/g

REISSUED

TABLE B

SOUTHEAST DRAINAGE POST-REMEDIATION DATA RESULTS

6-22-99

LOCATION[a]	PARAMETER	CONC[b]	DETECTION	UNITS
141	Radium-226	2.14	0.31	pCi/g
141	Radium-228	0.92	0.40	pCi/g
141	Thorium-230	4.89	0.62	pCi/g
141	Uranium-238	2.91	2.59	pCi/g
149	Radium-226	10.40	0.55	pCi/g
149	Radium-228	1.39	0.99	pCi/g
149	Thorium-230	18.20	0.62	pCi/g
149	Uranium-238	34.20	5.78	pCi/g
153	Radium-226	7.27	0.39	pCi/g
153	Radium-228	1.23	0.55	pCi/g
153	Thorium-230	3.47	0.62	pCi/g
153	Uranium-238	6.41	3.26	pCi/g
154	Radium-226	5.08	0.38	pCi/g
154	Radium-228	1.70	0.44	pCi/g
154	Thorium-230	8.58	0.62	pCi/g
154	Uranium-238	8.33	4.10	pCi/g

a Locations include several sub-locations for sampling due to size of area. Locations also mirror original sampling locations shown in the EE/CA.

b Risk levels are 13 pCi/g for Radium-226, 13 pCi/g for Radium-228, 290 pCi/g for Uranium-238, and 350 pCi/g for Thorium-230.

REISSUED