

August 9, 2005

Mr. Mike McCann
U.S. Nuclear Regulatory Commission
Region III
2443 Warrenville Road
Lisle, IL 60532-4351

**SUBJECT: ANALYTICAL RESULTS FOR FOUR SOIL SAMPLES AND 12 WATER
SAMPLES FROM THE BATTELLE WEST JEFFERSON SITE,
COLUMBUS, OHIO
[TAC NO. 070-00008/2005-002] (RFTA NO. 05-001)**

Dear Mr. McCann:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) received four soil samples and 12 water samples on July 1, 2005 that were collected at the Battelle West Jefferson Site in Columbus, Ohio on June 28 and June 29, 2005. The soil and water samples were prepared (Procedure SP3, Revision 4) and analyzed by gamma spectroscopy (Procedure CP1, Revision 15). Additionally, the water samples were analyzed for gross alpha and beta and total strontium by gas-flow proportional counting (Procedures AP1, Revision 14; AP4, Revision 13; and Procedure CP3, Revision 2), and alpha spectroscopy (Procedures AP11, Revision 3 and CP2, Revision 12). The gamma spectroscopy results for the soil samples are presented in Table 1. The data for the water analyses by gamma spectroscopy, gross alpha and beta, total strontium, and alpha spectroscopy are presented in Tables 2-5.

The request for analysis listed the minimum detectable concentration for Americium-241 (Am-241) as 1.0 pCi/L by gamma spectroscopy. This detection sensitivity could not be obtained under routine counting conditions by the requested method. In order to meet the requested detection limit, the Am-241 concentrations were obtained by alpha spectroscopy.

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Mr. Mike McCann

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ESSAP's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request.

If you have any questions, please call me at (865) 241-3242 or Wade Ivey at (865) 576-9184.

Sincerely,



Dale Condra
Laboratory Manager
Environmental Survey and
Site Assessment Program

RDC:WPI:ar

Enclosures

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Distribution approval and concurrence:	Initials
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ORISE TABLE 1

**CONCENTRATIONS OF SELECTED GAMMA EMITTING RADIONUCLIDES
IN SOIL SAMPLES
BY SAMPLE PREPARATION SP3, REVISION 4
GAMMA SPECTROSCOPY CP1, REVISION 15
BATTELLE WEST JEFFERSON
COLUMBUS, OHIO**

ESSAP Sample ID	NRC Region III Sample ID	Radionuclide Concentrations (pCi/g dry weight) ^a				
		Co-60	Cs-137	U-235	U-238 by Th-234	Am-241
1659S0001	27 SW1	0.04 ± 0.02 ^b	1.15 ± 0.07	0.14 ± 0.11	1.29 ± 0.55	0.08 ± 0.05
1659S0002	27 SW2	0.02 ± 0.02	3.05 ± 0.14	0.14 ± 0.14	1.44 ± 0.45	0.22 ± 0.05
1659S0003	30 NW1	0.04 ± 0.03	1.59 ± 0.10	0.12 ± 0.13	1.54 ± 0.49	0.03 ± 0.05
1659S0004	30 NW2	0.01 ± 0.02	2.38 ± 0.11	0.08 ± 0.08	1.16 ± 0.41	0.05 ± 0.04

^aThe average MDCs for a one hour count of soil in a 0.5L Marinelli for these data range from 0.03 pCi/g for Cs-137 to 0.49 pCi/g for U-238.

^bUncertainties represent the 95% confidence level, based on total propagated uncertainties.

ORISE TABLE 2

CONCENTRATIONS OF SELECTED GAMMA EMITTING RADIONUCLIDES
 IN WATER SAMPLES
 BY GAMMA SPECTROSCOPY CP1, REVISION 15
 BATTELLE WEST JEFFERSON
 COLUMBUS, OHIO

ESSAP Sample ID	NRC Region III Sample ID	Radionuclide Concentrations (pCi/L) ^a		
		Co-60	Cs-137	Am-241
1659W0001	Well #601	1.7 ± 2.4 ^b	2.5 ± 4.4	0.0 ^c ± 4.4
1659W0002	Well #118	0.3 ± 2.2	1.6 ± 2.1	1.5 ± 3.1
1659W0003	Well #118D	0.2 ± 1.7	0.8 ± 1.9	-2.2 ± 3.3
1659W0004	Well #C09	-0.8 ± 3.9	-1.5 ± 4.5	-0.5 ± 3.4
1659W0005	Well #168	5.2 ± 2.2	-2.9 ± 3.5	1.1 ± 4.3
1659W0006	Well #306	1.7 ± 3.1	0.9 ± 2.8	4.1 ± 3.8
1659W0007	Well #C16	-0.2 ± 2.4	2.7 ± 2.3	-2.4 ± 4.1
1659W0008	Well #206	0.1 ± 2.3	-0.6 ± 3.2	3.9 ± 4.1
1659W0009	Well #506	0.7 ± 3.0	-1.3 ± 4.7	2.3 ± 5.0
1659W0010	Well #100	-0.3 ± 2.7	1.0 ± 2.0	-1.8 ± 3.2
1659W0011	Well #100D	0.5 ± 2.5	-2.2 ± 2.3	-1.5 ± 4.1
1659W0012	Well #EW4	1.2 ± 3.6	-1.2 ± 4.3	4.6 ± 3.4

^aThe average MDCs for a 16 hour count of water in a 0.5L Marinelli for these data range from 4.5 pCi/L for Co-60 to 5.0 pCi/L for Am-241.

^bUncertainties represent the 95% confidence level, based on total propagated uncertainties.

^cZero values are due to rounding.

ORISE TABLE 3

**CONCENTRATIONS OF GROSS ALPHA AND GROSS BETA
IN WATER SAMPLES
BY LOW BACKGROUND ALPHA AND BETA COUNTING
AP1, REVISION 14; CP3, REVISION 2
BATTELLE WEST JEFFERSON
COLUMBUS, OHIO**

ESSAP Sample ID	NRC Region III Sample ID	Concentrations (pCi/L)	
		Gross Alpha ^a	Gross Beta ^b
1659W0001	Well #601	22 ± 11 ^c	46 ± 15
1659W0002	Well #118	2.3 ± 1.6	7.7 ± 1.7
1659W0003	Well #118D	5.6 ± 2.5	8.2 ± 2.9
1659W0004	Well #C09	1.1 ± 2.2	12.7 ± 3.7
1659W0005	Well #168	3.7 ± 1.8	76.0 ± 7.5
1659W0006	Well #306	5.5 ± 2.0	21.6 ± 3.0
1659W0007	Well #C16	1.2 ± 3.2	1.7 ± 4.8
1659W0008	Well #206	0.4 ± 1.9	3.0 ± 2.6
1659W0009	Well #506	2.2 ± 1.4	4.7 ± 1.5
1659W0010	Well #100	3.0 ± 2.5	4.9 ± 2.7
1659W0011	Well #100D	5.1 ± 2.9	4.4 ± 2.7
1659W0012	Well #EW4	1.02 ± 0.68	3.4 ± 1.4

^aThe average MDC for gross alpha for a 200 minute count for this sample set is 4.2 pCi/L.

^bThe average MDC for gross beta for a 200 minute count for this sample set is 5.3 pCi/L.

^cUncertainties represent the 95% confidence level, based on total propagated uncertainties.

ORISE TABLE 4

**CONCENTRATIONS OF TOTAL STRONTIUM
IN WATER SAMPLES
BY LOW BACKGROUND ALPHA AND BETA COUNTING
AP4, REVISION 13; CP3, REVISION 2
BATTELLE WEST JEFFERSON
COLUMBUS, OHIO**

ESSAP Sample ID	NRC Region III Sample ID	Total Sr (pCi/L)^a
1659W0001	Well #601	2.2 ± 2.4 ^b
1659W0002	Well #118	1.6 ± 2.5
1659W0003	Well #118D	-0.2 ± 2.5
1659W0004	Well #C09	-0.7 ± 2.2
1659W0005	Well #168	45.5 ± 4.8
1659W0006	Well #306	4.8 ± 3.0
1659W0007	Well #C16	-0.2 ± 2.1
1659W0008	Well #206	0.6 ± 2.1
1659W0009	Well #506	2.4 ± 2.3
1659W0010	Well #100	2.1 ± 2.2
1659W0011	Well #100D	2.4 ± 2.2
1659W0012	Well #EW4	1.4 ± 2.2

^aThe average MDC for total Sr for a 60 minute count for this sample set is 4.0 pCi/L.

^bUncertainties represent the 95% confidence level, based on total propagated uncertainties.

ORISE TABLE 5

CONCENTRATIONS OF SELECTED ALPHA EMITTING ISOTOPES
 IN WATER SAMPLES
 BY ALPHA SPECTROSCOPY AP11, REVISION 3; CP2, REVISION 12
 BATTELLE WEST JEFFERSON
 COLUMBUS, OHIO

ESSAP Sample ID	NRC Region III Sample ID	Radionuclide Concentrations (pCi/L) ^a						
		Am-241	Pu-238	Pu-239	U-234	U-235	U-238	Total U ^b
1659W0001	Well #601	0.20 ± 0.21 ^c	-0.05 ± 0.08	0.09 ± 0.11	4.77 ± 0.68	0.15 ± 0.13	3.66 ± 0.58	8.58 ± 0.90
1659W0002	Well #118	0.06 ± 0.19	0.00 ^d ± 0.13	0.04 ± 0.11	0.94 ± 0.30	0.07 ± 0.08	0.81 ± 0.26	1.83 ± 0.40
1659W0003	Well #118D	-0.18 ± 0.26	0.12 ± 0.16	0.10 ± 0.09	1.44 ± 0.35	0.33 ± 0.18	1.24 ± 0.36	3.01 ± 0.53
1659W0004	Well #C09	-0.04 ± 0.18	0.02 ± 0.14	0.02 ± 0.06	0.74 ± 0.24	0.08 ± 0.10	0.46 ± 0.18	1.28 ± 0.31
1659W0005	Well #168	0.15 ± 0.24	0.04 ± 0.10	0.00 ± 0.09	2.08 ± 0.43	0.07 ± 0.13	1.84 ± 0.41	3.98 ± 0.61
1659W0006	Well #306	-0.02 ± 0.24	0.04 ± 0.11	0.04 ± 0.08	1.42 ± 0.36	0.07 ± 0.15	1.48 ± 0.36	2.97 ± 0.53
1659W0007	Well #C16	0.05 ± 0.17	0.00 ± 0.07	0.07 ± 0.11	0.79 ± 0.40	0.08 ± 0.15	1.14 ± 0.34	2.00 ± 0.55
1659W0008	Well #206	-0.19 ± 0.19	-0.07 ± 0.16	-0.02 ± 0.12	1.22 ± 0.39	-0.02 ± 0.08	0.45 ± 0.21	1.65 ± 0.45
1659W0009	Well #506	-0.08 ± 0.18	0.02 ± 0.15	0.04 ± 0.09	1.73 ± 0.46	0.15 ± 0.13	1.87 ± 0.42	3.76 ± 0.63
1659W0010	Well #100	0.17 ± 0.20	-0.04 ± 0.13	0.10 ± 0.10	1.83 ± 0.41	0.10 ± 0.14	0.96 ± 0.30	2.90 ± 0.53
1659W0011	Well #100D	0.04 ± 0.21	-0.02 ± 0.13	0.04 ± 0.09	1.45 ± 0.40	0.13 ± 0.11	1.45 ± 0.37	3.03 ± 0.56
1659W0012	Well #EW4	-0.06 ± 0.21	0.00 ± 0.11	0.00 ± 0.08	0.83 ± 0.30	0.05 ± 0.08	0.78 ± 0.27	1.66 ± 0.40

^aThe average MDC for individual uranium isotopes for a sixteen hour count using 0.1 L of sample is 0.25 pCi/L.

^bTotal U is the sum of U-234, U-235, and U-238.

^cUncertainties represent the 95% confidence level, based on total propagated uncertainties.

^dZero values are due to rounding.



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