

November 3, 2010

Mr. John Nicholson
 U. S. Nuclear Regulatory Commission
 Region I
 475 Allendale Road
 King of Prussia, PA 60532-4351

SUBJECT: ORISE CONTRACT NO. DE-AC05-06OR23100
LETTER REPORT FOR ANALYTICAL RESULTS FOR FIFTY SOIL SAMPLES
FROM ABB, INC., WINDSOR, CONNECTICUT
[INSPECTION REPORT NO. 060021706/2010003] (RFTA NO. 10-001)
DCN: 2016-LR-03-0

Dear Mr. Nicholson:

The Oak Ridge Institute for Science and Education (ORISE) received 50 soil samples on September 16, 2010 from ABB, Inc. in Windsor, Connecticut. The samples were analyzed according to the 303 form supplied with the samples except for Gross Alpha which was removed from the request for analysis by an e-mail from Laurie Kauffman on October 28, 2010. After reviewing the preliminary results of the gamma spectroscopy (GS), you decided that alpha spectroscopy analysis was not required. The sample identification numbers are presented in Table 1 and the gamma spectroscopy results for the requested radionuclides are provided in Table 2. The requested detection limit of 0.1 pCi/g for thorium-232 (Th-232) was not met for a majority of the samples. The Th-232 concentration was statistically positive above the requested detection limit for the samples, but it was determined that additional count time was not needed. The pertinent procedure reference is included with the data table.

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

My contact information is listed below. You may also contact Wade Ivey at 865.576.9184 with any questions or comments.

Sincerely,



Dale Condra, Manager
 Laboratory

RDC:WPI:jc

Enclosures

c: T. Carter, NRC/FSME/DWMEP T-8F5 File 2016
 T. Patterson, NRC/FSME/TWFN 8D42
 Electronic: S. Roberts, ORISE T. Vitkus, ORISE

Distribution approval and concurrence :	Initials
Technical Review	TJ
Quality Review	JB

TABLE 1
SAMPLE IDENTIFICATIONS
AND COLLECTION INFORMATION
ABB, INC.
WINDSOR, CONNECTICUT

ORISE Sample ID	NRC Region I Sample ID	Collection Date	Collection Time
2016S0038	ABB-10-3-1	8/19/10	10:55
2016S0039	ABB-10-3-2	8/19/10	11:00
2016S0040	ABB-10-3-3	8/19/10	11:05
2016S0041	ABB-10-3-4	8/19/10	11:10
2016S0042	ABB-10-3-5	8/19/10	11:10
2016S0043	ABB-10-3-6	8/19/10	11:15
2016S0044	ABB-10-3-7	8/19/10	11:20
2016S0045	ABB-10-3-8	8/19/10	11:25
2016S0046	ABB-10-3-9	8/19/10	11:30
2016S0047	ABB-10-3-10	8/19/10	11:35
2016S0048	ABB-10-3-11	8/19/10	12:55
2016S0049	ABB-10-3-12	8/19/10	13:00
2016S0050	ABB-10-3-13	8/19/10	13:05
2016S0051	ABB-10-3-14	8/19/10	13:08
2016S0052	ABB-10-3-15	8/19/10	13:10
2016S0053	ABB-10-3-16	8/19/10	13:12
2016S0054	ABB-10-3-17	8/19/10	13:16
2016S0055	ABB-10-3-18	8/19/10	13:20
2016S0056	ABB-10-3-19	8/19/10	13:27
2016S0057	ABB-10-3-20	8/19/10	13:30
2016S0058	ABB-10-4-1	8/26/10	14:30
2016S0059	ABB-10-4-2	8/26/10	14:35
2016S0060	ABB-10-4-3	8/26/10	14:40
2016S0061	ABB-10-4-4	8/26/10	14:45
2016S0062	ABB-10-4-5	8/26/10	14:50
2016S0063	ABB-10-4-6	8/26/10	14:55
2016S0064	ABB-10-4-7	8/26/10	15:05
2016S0065	ABB-10-4-8	8/26/10	15:15
2016S0066	ABB-10-4-9	8/26/10	15:20
2016S0067	ABB-10-4-10	8/26/10	15:30
2016S0068	ABB-10-4-11	8/27/10	10:15
2016S0069	ABB-10-4-12	8/27/10	10:25
2016S0070	ABB-10-4-13	8/27/10	10:35

TABLE 1 (cont.)

**SAMPLE IDENTIFICATIONS
AND COLLECTION INFORMATION
ABB, INC.
WINDSOR, CONNECTICUT**

ORISE Sample ID	NRC Region I Sample ID	Collection Date	Collection Time
2016S0071	ABB-10-4-14	8/27/10	10:45
2016S0072	ABB-10-4-15	8/27/10	10:50
2016S0073	ABB-10-4-16	8/27/10	11:00
2016S0074	ABB-10-4-17	8/27/10	11:10
2016S0075	ABB-10-4-18	8/27/10	11:15
2016S0076	ABB-10-4-19	8/27/10	11:25
2016S0077	ABB-10-4-20	8/27/10	11:35
2016S0078	ABB-10-5-1	9/1/10	9:55
2016S0079	ABB-10-5-2	9/1/10	10:00
2016S0080	ABB-10-5-3	9/1/10	10:10
2016S0081	ABB-10-5-4	9/1/10	10:20
2016S0082	ABB-10-5-5	9/1/10	10:25
2016S0083	ABB-10-5-6	9/1/10	10:30
2016S0084	ABB-10-5-7	9/1/10	10:45
2016S0085	ABB-10-5-8	9/1/10	10:50
2016S0086	ABB-10-5-9	9/1/10	11:00
2016S0087	ABB-10-5-10	9/1/10	11:05

TABLE 2
CONCENTRATIONS OF SELECTED GAMMA EMITTERS
IN SOIL SAMPLES
BY GAMMA SPECTROSCOPY CP1, REVISION 17
ABB, INC.
WINDSOR, CONNECTICUT

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations (pCi/g dry weight)					
		Th-232 by Ac-228	Ra-226 by Pb-214	Co-60	U-238 by Th-234	U-235	Total U ^a
2016S0038	ABB-10-3-1	0.67 ± 0.11 ^b , 0.11 ^c	0.45 ± 0.05, 0.06	-0.04 ± 0.04, 0.06	0.68 ± 0.22, 0.60	0.10 ± 0.12, 0.23	1.46 ± 0.46
2016S0039	ABB-10-3-2	0.34 ± 0.08, 0.13	0.31 ± 0.05, 0.06	0.04 ± 0.04, 0.08	0.53 ± 0.22, 0.62	0.03 ± 0.16, 0.25	1.09 ± 0.47
2016S0040	ABB-10-3-3	0.70 ± 0.11, 0.10	0.45 ± 0.04, 0.05	0.01 ± 0.04, 0.06	0.70 ± 0.21, 0.54	-0.09 ± 0.14, 0.22	1.31 ± 0.44
2016S0041	ABB-10-3-4	1.02 ± 0.16, 0.16	0.72 ± 0.07, 0.07	-0.03 ± 0.04, 0.06	0.98 ± 0.29, 0.84	0.06 ± 0.13, 0.25	2.02 ± 0.59
2016S0042	ABB-10-3-5	1.03 ± 0.15, 0.12	0.70 ± 0.07, 0.07	-0.03 ± 0.05, 0.08	0.75 ± 0.30, 0.81	0.00 ^d ± 0.14, 0.27	1.50 ± 0.62
2016S0043	ABB-10-3-6	0.45 ± 0.09, 0.12	0.35 ± 0.05, 0.05	0.02 ± 0.04, 0.08	0.87 ± 0.59, 1.00	-0.12 ± 0.17, 0.25	1.6 ± 1.2
2016S0044	ABB-10-3-7	1.16 ± 0.16, 0.13	0.80 ± 0.07, 0.06	0.02 ± 0.05, 0.08	0.89 ± 0.28, 0.74	-0.02 ± 0.18, 0.29	1.76 ± 0.59
2016S0045	ABB-10-3-8	1.24 ± 0.17, 0.14	0.89 ± 0.08, 0.06	-0.01 ± 0.04, 0.07	1.15 ± 0.62, 1.10	-0.12 ± 0.14, 0.26	2.2 ± 1.2
2016S0046	ABB-10-3-9	0.54 ± 0.10, 0.13	0.45 ± 0.05, 0.06	-0.04 ± 0.05, 0.07	0.64 ± 0.23, 0.62	0.06 ± 0.11, 0.22	1.34 ± 0.47
2016S0047	ABB-10-3-10	0.85 ± 0.14, 0.15	0.70 ± 0.07, 0.08	0.00 ± 0.06, 0.10	0.78 ± 0.35, 0.90	0.07 ± 0.21, 0.34	1.63 ± 0.73
2016S0048	ABB-10-3-11	0.77 ± 0.11, 0.10	0.61 ± 0.05, 0.05	0.03 ± 0.04, 0.07	0.45 ± 0.19, 0.69	0.07 ± 0.14, 0.23	0.97 ± 0.40
2016S0049	ABB-10-3-12	0.46 ± 0.08, 0.11	0.38 ± 0.05, 0.05	-0.01 ± 0.03, 0.06	0.80 ± 0.40, 0.71	0.04 ± 0.10, 0.19	1.64 ± 0.81
2016S0050	ABB-10-3-13	0.91 ± 0.14, 0.13	0.72 ± 0.07, 0.07	-0.04 ± 0.05, 0.07	0.80 ± 0.28, 0.70	0.10 ± 0.14, 0.26	1.70 ± 0.58
2016S0051	ABB-10-3-14	0.83 ± 0.14, 0.14	0.65 ± 0.07, 0.07	0.00 ± 0.05, 0.08	0.71 ± 0.25, 0.91	-0.03 ± 0.20, 0.31	1.39 ± 0.54
2016S0052	ABB-10-3-15	0.65 ± 0.11, 0.10	0.47 ± 0.05, 0.05	-0.03 ± 0.04, 0.06	0.73 ± 0.21, 0.58	-0.06 ± 0.14, 0.23	1.40 ± 0.44
2016S0053	ABB-10-3-16	0.78 ± 0.12, 0.13	0.59 ± 0.06, 0.05	-0.01 ± 0.04, 0.06	0.45 ± 0.05, 0.73	0.08 ± 0.12, 0.22	0.98 ± 0.16
2016S0054	ABB-10-3-17	1.19 ± 0.18, 0.16	0.90 ± 0.08, 0.08	0.00 ± 0.06, 0.09	1.18 ± 0.34, 0.89	0.11 ± 0.16, 0.31	2.47 ± 0.70
2016S0055	ABB-10-3-18	0.56 ± 0.10, 0.09	0.43 ± 0.06, 0.06	0.02 ± 0.04, 0.08	0.38 ± 0.23, 0.79	0.14 ± 0.16, 0.26	0.90 ± 0.49
2016S0056	ABB-10-3-19	0.53 ± 0.09, 0.08	0.35 ± 0.04, 0.05	-0.01 ± 0.03, 0.05	0.36 ± 0.16, 0.46	0.08 ± 0.04, 0.13	0.80 ± 0.32

TABLE 2 (cont.)
CONCENTRATIONS OF SELECTED GAMMA EMITTERS
IN SOIL SAMPLES
BY GAMMA SPECTROSCOPY CP1, REVISION 17
ABB, INC.
WINDSOR, CONNECTICUT

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations (pCi/g dry weight)					
		Th-232 by Ac-228	Ra-226 by Pb-214	Co-60	U-238 by Th-234	U-235	Total U ^a
2016S0057	ABB-10-3-20	0.45 ± 0.08 , 0.11	0.34 ± 0.04 , 0.04	0.01 ± 0.03 , 0.06	0.27 ± 0.19 , 0.59	0.04 ± 0.09 , 0.18	0.58 ± 0.39
2016S0058	ABB-10-4-1	0.38 ± 0.08 , 0.10	0.31 ± 0.04 , 0.05	0.02 ± 0.04 , 0.06	0.44 ± 0.19 , 0.50	-0.01 ± 0.10 , 0.19	0.87 ± 0.39
2016S0059	ABB-10-4-2	0.43 ± 0.09 , 0.12	0.28 ± 0.04 , 0.05	-0.04 ± 0.04 , 0.07	0.42 ± 0.22 , 0.69	0.08 ± 0.14 , 0.23	0.92 ± 0.46
2016S0060	ABB-10-4-3	0.45 ± 0.08 , 0.07	0.27 ± 0.03 , 0.04	-0.01 ± 0.03 , 0.05	0.35 ± 0.15 , 0.40	0.09 ± 0.10 , 0.18	0.79 ± 0.32
2016S0061	ABB-10-4-4	0.51 ± 0.09 , 0.12	0.35 ± 0.04 , 0.05	0.00 ± 0.03 , 0.06	0.30 ± 0.18 , 0.62	0.00 ± 0.10 , 0.18	0.60 ± 0.37
2016S0062	ABB-10-4-5	0.77 ± 0.12 , 0.12	0.52 ± 0.06 , 0.06	0.01 ± 0.04 , 0.07	0.53 ± 0.23 , 0.65	0.03 ± 0.12 , 0.23	1.09 ± 0.48
2016S0063	ABB-10-4-6	0.45 ± 0.09 , 0.11	0.34 ± 0.05 , 0.06	0.03 ± 0.04 , 0.08	0.31 ± 0.21 , 0.75	0.02 ± 0.17 , 0.26	0.64 ± 0.45
2016S0064	ABB-10-4-7	0.41 ± 0.07 , 0.08	0.32 ± 0.03 , 0.04	0.02 ± 0.03 , 0.05	0.20 ± 0.18 , 0.43	0.04 ± 0.11 , 0.18	0.44 ± 0.38
2016S0065	ABB-10-4-8	0.44 ± 0.08 , 0.11	0.28 ± 0.04 , 0.05	-0.01 ± 0.03 , 0.05	0.39 ± 0.18 , 0.55	0.01 ± 0.09 , 0.17	0.79 ± 0.37
2016S0066	ABB-10-4-9	0.68 ± 0.11 , 0.11	0.50 ± 0.06 , 0.06	-0.01 ± 0.04 , 0.07	0.67 ± 0.25 , 0.62	0.06 ± 0.12 , 0.23	1.40 ± 0.51
2016S0067	ABB-10-4-10	0.94 ± 0.15 , 0.16	0.77 ± 0.07 , 0.08	0.02 ± 0.05 , 0.10	0.62 ± 0.31 , 0.99	-0.01 ± 0.23 , 0.35	1.23 ± 0.66
2016S0068	ABB-10-4-11	0.58 ± 0.10 , 0.09	0.47 ± 0.05 , 0.05	0.02 ± 0.03 , 0.06	0.46 ± 0.18 , 0.50	-0.08 ± 0.13 , 0.22	0.84 ± 0.38
2016S0069	ABB-10-4-12	0.66 ± 0.10 , 0.13	0.54 ± 0.05 , 0.05	-0.04 ± 0.03 , 0.05	0.65 ± 0.20 , 0.60	0.00 ± 0.10 , 0.18	1.30 ± 0.41
2016S0070	ABB-10-4-13	1.04 ± 0.15 , 0.14	0.74 ± 0.07 , 0.07	-0.03 ± 0.06 , 0.09	0.94 ± 0.29 , 0.79	0.13 ± 0.14 , 0.27	2.01 ± 0.60
2016S0071	ABB-10-4-14	0.71 ± 0.12 , 0.12	0.53 ± 0.06 , 0.06	-0.01 ± 0.05 , 0.08	0.74 ± 0.28 , 0.98	0.13 ± 0.19 , 0.31	1.61 ± 0.59
2016S0072	ABB-10-4-15	0.91 ± 0.13 , 0.11	0.67 ± 0.06 , 0.06	0.02 ± 0.04 , 0.07	0.61 ± 0.23 , 0.65	0.02 ± 0.15 , 0.26	1.24 ± 0.48
2016S0073	ABB-10-4-16	0.88 ± 0.13 , 0.12	0.64 ± 0.06 , 0.07	0.02 ± 0.04 , 0.07	0.62 ± 0.21 , 0.60	0.06 ± 0.11 , 0.22	1.30 ± 0.43
2016S0074	ABB-10-4-17	0.77 ± 0.13 , 0.12	0.46 ± 0.06 , 0.07	0.00 ± 0.06 , 0.09	0.50 ± 0.26 , 0.76	0.00 ± 0.13 , 0.25	1.00 ± 0.54
2016S0075	ABB-10-4-18	0.57 ± 0.11 , 0.15	0.40 ± 0.05 , 0.07	0.01 ± 0.05 , 0.09	0.35 ± 0.25 , 0.84	0.22 ± 0.18 , 0.30	0.22 ± 0.74

TABLE 2 (cont.)
CONCENTRATIONS OF SELECTED GAMMA EMITTERS
IN SOIL SAMPLES
BY GAMMA SPECTROSCOPY CP1, REVISION 17
ABB, INC.
WINDSOR, CONNECTICUT

ORISE Sample ID	NRC Region I Sample ID	Radionuclide Concentrations (pCi/g dry weight)					
		Th-232 by Ac-228	Ra-226 by Pb-214	Co-60	U-238 by Th-234	U-235	Total U ^a
2016S0076	ABB-10-4-19	0.80 ± 0.12 , 0.11	0.56 ± 0.05 , 0.05	-0.02 ± 0.04 , 0.07	0.68 ± 0.25 , 0.74	-0.06 ± 0.16 , 0.25	1.30 ± 0.52
2016S0077	ABB-10-4-20	0.81 ± 0.11 , 0.09	0.58 ± 0.05 , 0.05	0.02 ± 0.03 , 0.05	0.54 ± 0.18 , 0.49	0.06 ± 0.13 , 0.22	1.14 ± 0.38
2016S0078	ABB-10-5-1	0.69 ± 0.10 , 0.10	0.48 ± 0.04 , 0.04	-0.01 ± 0.03 , 0.05	0.40 ± 0.18 , 0.55	0.04 ± 0.09 , 0.17	0.84 ± 0.37
2016S0079	ABB-10-5-2	0.90 ± 0.13 , 0.14	0.73 ± 0.07 , 0.07	-0.01 ± 0.05 , 0.07	0.77 ± 0.23 , 0.62	-0.12 ± 0.13 , 0.23	1.42 ± 0.48
2016S0080	ABB-10-5-3	0.59 ± 0.10 , 0.09	0.47 ± 0.05 , 0.05	0.03 ± 0.03 , 0.06	0.52 ± 0.20 , 0.55	0.00 ± 0.13 , 0.22	1.04 ± 0.42
2016S0081	ABB-10-5-4	1.02 ± 0.14 , 0.13	0.68 ± 0.07 , 0.06	0.02 ± 0.04 , 0.07	0.66 ± 0.34 , 0.80	0.07 ± 0.12 , 0.23	1.39 ± 0.69
2016S0082	ABB-10-5-5	0.34 ± 0.07 , 0.09	0.28 ± 0.04 , 0.05	-0.02 ± 0.04 , 0.06	0.35 ± 0.18 , 0.59	0.05 ± 0.09 , 0.18	0.75 ± 0.37
2016S0083	ABB-10-5-6	0.43 ± 0.07 , 0.07	0.31 ± 0.03 , 0.04	0.01 ± 0.03 , 0.05	0.36 ± 0.14 , 0.37	0.12 ± 0.10 , 0.17	0.84 ± 0.30
2016S0084	ABB-10-5-7	0.86 ± 0.13 , 0.13	0.63 ± 0.06 , 0.07	0.04 ± 0.04 , 0.08	0.62 ± 0.26 , 0.72	0.00 ± 0.18 , 0.28	1.24 ± 0.55
2016S0085	ABB-10-5-8	0.73 ± 0.10 , 0.09	0.48 ± 0.05 , 0.05	0.00 ± 0.03 , 0.05	0.40 ± 0.17 , 0.55	0.06 ± 0.09 , 0.17	0.86 ± 0.35
2016S0086	ABB-10-5-9	0.75 ± 0.11 , 0.10	0.56 ± 0.05 , 0.06	0.02 ± 0.04 , 0.07	0.53 ± 0.23 , 0.76	-0.10 ± 0.16 , 0.25	0.96 ± 0.49
2016S0087	ABB-10-5-10	0.77 ± 0.10 , 0.09	0.59 ± 0.05 , 0.05	-0.02 ± 0.03 , 0.06	0.70 ± 0.20 , 0.50	0.06 ± 0.13 , 0.22	1.46 ± 0.42

^aTotal uranium is calculated using U-238*2 + U-235.

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

^cMDCs are after the commas.

^dZero values are due to rounding or sample and background being equal.