

April 20, 2011

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 EIGHTEEN SOIL  
 SAMPLES FROM ABB, INC., WINDSOR, CONNECTICUT  
 [TAC NO. U01836/U01837] (RFTA NO. 11-001)  
 DCN: 2016-LR-07-0**

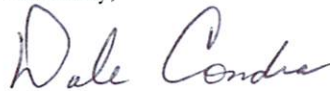
Dear Mr. Nicholson:

The Oak Ridge Institute for Science and Education (ORISE) received 18 soil samples on April 6, 2011 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 via e-mail correspondence from you on April 6, 2011. 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 longer sample count times to further reduce the detection limit were not necessary. 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:bf

Enclosures

c: T. Carter, NRC/FSME/DWMEP T-8F5 File 2016  
 S. Nesmith, NRC/FSME/PBPA/TWFFN 8A23

Electronic: S. Roberts, ORISE T. Vitkus, ORISE

| Distribution approval and concurrence: | Initials |
|--|----------|
| Technical Review                       | ENB      |
| Quality Review                         | JB       |

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

| <b>ORISE<br/>Sample ID</b> | <b>NRC Region I<br/>Sample ID</b> | <b>Collection<br/>Date</b> | <b>Collection<br/>Time</b> |
|----------------------------|-----------------------------------|----------------------------|----------------------------|
| 2016S0139                  | ABB-11-1-1                        | 3/4/11                     | 11:05                      |
| 2016S0140                  | ABB-11-1-2                        | 3/4/11                     | 11:12                      |
| 2016S0141                  | ABB-11-1-3                        | 3/4/11                     | 11:18                      |
| 2016S0142                  | ABB-11-1-4                        | 3/4/11                     | 11:28                      |
| 2016S0143                  | ABB-11-1-5                        | 3/4/11                     | 11:35                      |
| 2016S0144                  | ABB-11-1-6                        | 3/4/11                     | 11:40                      |
| 2016S0145                  | ABB-11-1-7                        | 3/4/11                     | 11:45                      |
| 2016S0146                  | ABB-11-1-8                        | 3/4/11                     | 11:55                      |
| 2016S0147                  | ABB-11-1-9                        | 3/4/11                     | 12:10                      |
| 2016S0148                  | ABB-11-1-10                       | 3/4/11                     | 12:15                      |
| 2016S0149                  | ABB-11-2-1                        | 3/18/11                    | 9:55                       |
| 2016S0150                  | ABB-11-2-2                        | 3/18/11                    | 10:05                      |
| 2016S0151                  | ABB-11-2-3                        | 3/18/11                    | 10:15                      |
| 2016S0152                  | ABB-11-2-4                        | 3/18/11                    | 10:25                      |
| 2016S0153                  | ABB-11-3-1                        | 3/30/11                    | 12:15                      |
| 2016S0154                  | ABB-11-3-2                        | 3/30/11                    | 12:20                      |
| 2016S0155                  | ABB-11-3-3                        | 3/30/11                    | 12:25                      |
| 2016S0156                  | ABB-11-3-4                        | 3/30/11                    | 12:35                      |

**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 <sup>a</sup> |
| 2016S0139       | ABB-11-1-1             | 0.80 ± 0.13 <sup>b</sup> , 0.16 <sup>c</sup>   | 0.64 ± 0.06, 0.08 | 0.01 ± 0.05, 0.09  | 0.83 ± 0.29, 0.77 | 0.00 <sup>d</sup> ± 0.14, 0.26 | 1.66 ± 0.60          |
| 2016S0140       | ABB-11-1-2             | 1.01 ± 0.16, 0.16                              | 0.76 ± 0.07, 0.08 | -0.02 ± 0.06, 0.10 | 1.13 ± 0.37, 1.10 | 0.29 ± 0.22, 0.37              | 2.55 ± 0.77          |
| 2016S0141       | ABB-11-1-3             | 0.95 ± 0.14, 0.14                              | 0.57 ± 0.06, 0.07 | 0.02 ± 0.05, 0.09  | 0.82 ± 0.30, 0.89 | 0.11 ± 0.13, 0.26              | 1.75 ± 0.61          |
| 2016S0142       | ABB-11-1-4             | 0.80 ± 0.13, 0.13                              | 0.57 ± 0.06, 0.07 | -0.01 ± 0.06, 0.09 | 0.76 ± 0.31, 1.00 | 0.16 ± 0.20, 0.33              | 1.68 ± 0.65          |
| 2016S0143       | ABB-11-1-5             | 0.77 ± 0.13, 0.14                              | 0.51 ± 0.06, 0.08 | -0.06 ± 0.06, 0.08 | 0.46 ± 0.39, 0.92 | -0.03 ± 0.14, 0.26             | 0.89 ± 0.79          |
| 2016S0144       | ABB-11-1-6             | 0.78 ± 0.13, 0.13                              | 0.51 ± 0.06, 0.06 | 0.02 ± 0.05, 0.08  | 0.52 ± 0.27, 0.77 | 0.02 ± 0.19, 0.30              | 1.06 ± 0.57          |
| 2016S0145       | ABB-11-1-7             | 0.93 ± 0.14, 0.14                              | 0.64 ± 0.07, 0.08 | 0.03 ± 0.05, 0.08  | 0.86 ± 0.29, 0.85 | 0.13 ± 0.07, 0.21              | 1.85 ± 0.58          |
| 2016S0146       | ABB-11-1-8             | 0.92 ± 0.15, 0.14                              | 0.68 ± 0.08, 0.07 | -0.01 ± 0.05, 0.09 | 0.42 ± 0.27, 1.00 | 0.16 ± 0.21, 0.34              | 1.00 ± 0.58          |
| 2016S0147       | ABB-11-1-9             | 0.75 ± 0.11, 0.09                              | 0.58 ± 0.05, 0.04 | 0.01 ± 0.03, 0.05  | 0.67 ± 0.19, 0.51 | -0.04 ± 0.14, 0.22             | 1.30 ± 0.40          |
| 2016S0148       | ABB-11-1-10            | 0.92 ± 0.14, 0.12                              | 0.66 ± 0.07, 0.07 | 0.04 ± 0.04, 0.07  | 0.36 ± 0.23, 0.72 | -0.03 ± 0.14, 0.26             | 0.69 ± 0.48          |
| 2016S0149       | ABB-11-2-1             | 0.84 ± 0.12, 0.12                              | 0.57 ± 0.06, 0.07 | 0.03 ± 0.04, 0.07  | 0.59 ± 0.22, 0.61 | 0.05 ± 0.12, 0.23              | 1.23 ± 0.46          |
| 2016S0150       | ABB-11-2-2             | 0.59 ± 0.11, 0.13                              | 0.45 ± 0.06, 0.06 | 0.03 ± 0.04, 0.08  | 0.65 ± 0.27, 0.69 | 0.08 ± 0.17, 0.27              | 1.38 ± 0.57          |
| 2016S0151       | ABB-11-2-3             | 0.68 ± 0.11, 0.10                              | 0.53 ± 0.05, 0.04 | -0.01 ± 0.04, 0.06 | 0.55 ± 0.19, 0.62 | 0.03 ± 0.14, 0.23              | 1.13 ± 0.40          |
| 2016S0152       | ABB-11-2-4             | 0.68 ± 0.11, 0.10                              | 0.58 ± 0.06, 0.06 | 0.05 ± 0.04, 0.07  | 0.51 ± 0.25, 0.78 | 0.03 ± 0.13, 0.24              | 1.05 ± 0.52          |
| 2016S0153       | ABB-11-3-1             | 1.03 ± 0.17, 0.18                              | 0.71 ± 0.08, 0.08 | 0.01 ± 0.06, 0.10  | 0.73 ± 0.32, 1.10 | 0.18 ± 0.22, 0.36              | 1.64 ± 0.68          |
| 2016S0154       | ABB-11-3-2             | 0.88 ± 0.13, 0.10                              | 0.61 ± 0.05, 0.05 | 0.00 ± 0.04, 0.06  | 0.65 ± 0.21, 0.56 | 0.14 ± 0.14, 0.24              | 1.44 ± 0.44          |
| 2016S0155       | ABB-11-3-3             | 0.74 ± 0.12, 0.13                              | 0.74 ± 0.07, 0.07 | -0.02 ± 0.05, 0.09 | 0.59 ± 0.28, 0.87 | -0.11 ± 0.21, 0.32             | 1.07 ± 0.60          |
| 2016S0156       | ABB-11-3-4             | 0.84 ± 0.12, 0.11                              | 0.56 ± 0.05, 0.05 | 0.01 ± 0.04, 0.06  | 0.49 ± 0.20, 0.58 | -0.01 ± 0.14, 0.23             | 0.97 ± 0.42          |

<sup>a</sup>Total uranium is calculated using U-238\*2 + U-235.

<sup>b</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

<sup>c</sup>MDCs are after the commas.

<sup>d</sup>Zero values are due to rounding or sample and background being equal.