

**ORISE**  
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

March 7, 2007

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

**SUBJECT: LETTER REPORT FOR 18 WATER SAMPLES FROM THE VICINITY OF  
THE BRAIDWOOD NUCLEAR GENERATING STATION,  
BRAIDWOOD, ILLINOIS  
[INSPECTION REPORT NO. 050-00456/2007-003] (RFTA NO. 06-001)**

Dear Mr. Snell:

The Oak Ridge Institute for Science and Education (ORISE) received 18 water samples associated with the Braidwood Generating Station on February 5, 2007. The samples were analyzed for tritium to an average minimum detectable concentration of 180 pCi/L using a liquid scintillation analyzer. The chain-of-custody identified three water samples to be analyzed by gamma spectroscopy (GS). The sample identifications and collection data are presented in Table 1. The GS data are presented in Table 2. The tritium data are presented in Table 3. The pertinent procedure references are provided in the specific tables.

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,

*Wade P. Ivey*  
for  
Dale Condra, Manager  
Laboratory

RDC:WPI:ar

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**TABLE 1**

**SAMPLE IDENTIFICATIONS  
AND COLLECTION DATA  
BRAIDWOOD NUCLEAR GENERATING STATION  
BRAIDWOOD, ILLINOIS**

<b>ORISE Sample ID</b>	<b>NRC Region III Sample ID</b>	<b>Collection Date</b>	<b>Collection Time</b>
1732W0001	BD-07-1-01	11/21/06	NDP <sup>a</sup>
1732W0002	BD-07-1-02	11/21/06	NDP
1732W0003	BD-07-1-03	11/29/06	NDP
1732W0004	BD-07-1-04	12/14/06	NDP
1732W0005	BD-07-1-05	12/18/06	NDP
1732W0006	BD-07-1-06	12/20/06	NDP
1732W0007	BD-07-1-07	12/20/06	NDP
1732W0008	BD-07-1-08	12/20/06	NDP
1732W0009	BD-07-1-09	12/20/06	NDP
1732W0010	BD-07-1-10	12/20/06	NDP
1732W0011	BD-07-1-11	12/20/06	NDP
1732W0012	BD-07-1-12	12/20/06	NDP
1732W0013	BD-07-1-13	12/20/06	NDP
1732W0014	BD-07-1-14	12/20/06	NDP
1732W0015	BD-07-1-15	12/20/06	NDP
1732W0016	BD-07-1-16	12/12/06	NDP
1732W0017	BD-07-1-17	01/16/07	NDP
1732W0018	BD-07-1-18	01/17/07	NDP

<sup>a</sup>No data provided.

TABLE 2

CONCENTRATIONS OF SELECTED  
 GAMMA EMITTING RADIONUCLIDES  
 IN SELECTED WATER SAMPLES  
 BY GAMMA SPECTROSCOPY CP1, REVISION 15  
 BRAIDWOOD NUCLEAR GENERATING STATION  
 BRAIDWOOD, ILLINOIS

ORISE Sample ID	NRC Region III Sample ID	Radionuclide Concentrations <sup>a</sup> (pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1732W0005	BD-07-1-05	-3.4 ± 4.8 <sup>b</sup>	2.4 ± 3.0	-0.1 ± 3.5	2.8 ± 3.0
1732W0010	BD-07-1-10	-4.3 ± 4.5	-0.6 ± 3.1	0.3 ± 3.3	-0.1 ± 3.0
1732W0015	BD-07-1-15	-0.8 ± 3.2	0.1 ± 2.3	0.0 <sup>c</sup> ± 2.5	2.0 ± 2.2

<sup>a</sup>The range of MDCs for the selected radionuclides is 3.5 pCi/L to 7.8 pCi/L.

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

**TABLE 3**  
**CONCENTRATIONS OF TRITIUM**  
**IN WATER SAMPLES**  
**BY LIQUID SCINTILLATION ANALYSIS**  
**AP2, REVISION 15; CP4, REVISION 3**  
**BRAIDWOOD NUCLEAR GENERATING STATION**  
**BRAIDWOOD, ILLINOIS**

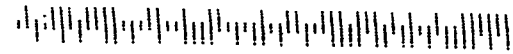
ORISE Sample ID	NRC Region III Sample ID	Tritium Concentrations, TPUs, and MDCs <sup>a</sup> (pCi/L)
1732W0001	BD-07-1-01	90 ± 110 <sup>b</sup> , 180
1732W0002	BD-07-1-02	10 ± 100 , 180
1732W0003	BD-07-1-03	-10 ± 100 , 180
1732W0004	BD-07-1-04	50 ± 100 , 180
1732W0005	BD-07-1-05	40 ± 100 , 180
1732W0006	BD-07-1-06	0 <sup>c</sup> ± 100 , 180
1732W0007	BD-07-1-07	-30 ± 100 , 180
1732W0008	BD-07-1-08	50 ± 100 , 180
1732W0009	BD-07-1-09	90 ± 110 , 180
1732W0010	BD-07-1-10	80 ± 100 , 180
1732W0011	BD-07-1-11	20 ± 100 , 180
1732W0012	BD-07-1-12	20 ± 100 , 180
1732W0013	BD-07-1-13	30 ± 100 , 180
1732W0014	BD-07-1-14	-10 ± 100 , 180
1732W0015	BD-07-1-15	60 ± 100 , 180
1732W0016	BD-07-1-16	10 ± 100 , 180
1732W0017	BD-07-1-17	70 ± 100 , 180
1732W0018	BD-07-1-18	250 ± 110 , 180

<sup>a</sup>MDCs are after the comma.

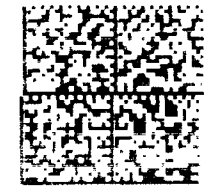
<sup>b</sup>Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

<sup>c</sup>Zero values are due to rounding.

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