

August 3, 2006

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

SUBJECT: ANALYTICAL RESULTS FOR SIX WATER SAMPLES IN BATCH FIVE FROM THE VICINITY OF THE BYRON GENERATING STATION, BYRON, ILLINOIS [INSPECTION REPORT NO. 050-00454/2006-004] (RFTA NO. 06-001)

Dear Mr. Snell:

The Oak Ridge Institute for Science and Education (ORISE) received Batch Five, consisting of six water samples on July 17, 2006 that were collected in the vicinity of the Byron Generating Station in Byron, Illinois. The samples were analyzed for tritium to a minimum detectable concentration of 180 pCi/L using a liquid scintillation analyzer. The chain-of-custody identified one water sample 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,

Dale Condra

Dale Condra, Manager
Laboratory

RDC:WPI:db

Enclosures

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TABLE 1

**SAMPLE IDENTIFICATIONS
AND COLLECTION DATA
BYRON GENERATING STATION
BYRON, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Collection Date	Collection Time
1689W0074	BY-06-5-01	7/13/06	8:55 AM
1689W0075	BY-06-5-02	7/13/06	9:14 AM
1689W0076	BY-06-5-03	7/13/06	9:25 AM
1689W0077	BY-06-5-04	7/13/06	9:40 AM
1689W0078	BY-06-5-05	7/13/06	9:53 AM
1689W0079	BY-06-5-06	7/13/06	10:09 AM

TABLE 2

CONCENTRATIONS OF SELECTED
 GAMMA EMITTING RADIONUCLIDES
 IN A SELECTED WATER SAMPLE
 BY GAMMA SPECTROSCOPY CP1, REVISION 15
 BYRON GENERATING STATION
 BYRON, ILLINOIS

ORISE Sample ID	NRC Region III Sample ID	Radionuclide Concentrations ^a (pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1689W0078	BY-06-5-05	0.2 ± 2.8 ^b	1.6 ± 3.1	0.0 ^c ± 3.3	-0.2 ± 2.9

^aThe range of MDCs for the selected radionuclides is 4.8 pCi/L to 5.6 pCi/L.

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

^cZero value is due to rounding.

TABLE 3

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

ORISE Sample ID	NRC Region III Sample ID	Tritium Concentrations, TPUs, and MDCs^a (pCi/L)			
1689W0074	BY-06-5-01	60	±	100 ^b	(180)
1689W0075	BY-06-5-02	20	±	100	(180)
1689W0076	BY-06-5-03	60	±	100	(180)
1689W0077	BY-06-5-04	60	±	100	(180)
1689W0078	BY-06-5-05	50	±	100	(180)
1689W0079	BY-06-5-06	20	±	100	(180)

^aMDCs are in parentheses.

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