

August 10, 2006

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

**SUBJECT: REPORT OF ANALYTICAL RESULTS FOR FOUR WATER
SAMPLES, BATCH FOUR, FROM THE VICINITY OF THE ZION
NUCLEAR STATION, ZION, ILLINOIS
[INSPECTION REPORT NO. 050-00295/2006-001] (RFTA NO. 06-001)**

Dear Mr. Snell:

The Oak Ridge Institute for Science and Education (ORISE) received Batch Four, consisting of four water samples, on July 25, 2006. These samples were collected in the vicinity of the Zion Nuclear Station in Zion, Illinois. The four water samples were analyzed for tritium to a minimum detectable concentration of 190 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, Manager
Laboratory

RDC:WPI:ar

Enclosures

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TABLE 1

**SAMPLE IDENTIFICATIONS
AND COLLECTION DATA
ZION NUCLEAR STATION
ZION, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Collection Time	Collection Date
1701W0027	Z-06-4-01	7/17/2006	11:30 AM
1701W0028	Z-06-4-02	7/17/2006	9:35 AM
1701W0029	Z-06-4-03	7/17/2006	8:45 AM
1701W0030	Z-06-4-04	7/17/2006	10:45 AM

TABLE 2

**CONCENTRATIONS OF SELECTED
GAMMA EMITTING RADIONUCLIDES
IN A SELECTED WATER SAMPLE
BY GAMMA SPECTROSCOPY CP1, REVISION 15
ZION NUCLEAR STATION
ZION, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Radionuclide Concentrations ^a (pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1701W0028	Z-06-4-02	-1.8 ± 1.8 ^b	2.2 ± 1.8	0.3 ± 1.8	0.8 ± 1.7

^aThe range of MDCs for the selected radionuclides is 3.0 pCi/L to 3.3 pCi/L.

^bUncertainties 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
ZION NUCLEAR STATION
ZION, ILLINOIS**

ORISE Sample ID	NRC Region III Sample ID	Tritium Concentrations, TPUs, and MDCs^a (pCi/L)			
1701W0027	Z-06-4-01	70	±	110 ^b	(190)
1701W0028	Z-06-4-02	210	±	120	(190)
1701W0029	Z-06-4-03	10	±	110	(190)
1701W0030	Z-06-4-04	50	±	110	(190)

^aMDCs are in parentheses.

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