

February 14, 2007

Mr. John Hickman  
 U.S. Nuclear Regulatory Commission  
 11545 Rockville Pike  
 Mailstop: T-7E18  
 Rockville, MD 20852

**SUBJECT: REPORT FOR ANALYSES OF TEN WATER SAMPLES FROM YANKEE  
 ROWE IN ROWE, MASSACHUSETTS  
 [TAC #: L52675] [RFTA NO. 06-001]**

Dear Mr. Hickman:

The Oak Ridge Institute for Science and Education (ORISE) received ten water samples on December 15, 2006 associated with Yankee Rowe in Rowe, Massachusetts. Sample analysis was initiated based on the sampling plan received on November 29, 2006. Sample identifications and collection data for the samples addressed in this report are presented in Table 1. The gamma spectroscopy, gross alpha and beta, carbon-14, tritium, and total radiostrontium data are provided in Tables 2-6, respectively. The pertinent procedure references are provided in the tables.

ORISE's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request. The letter report was delayed because of higher priority analytical work submitted by Region I.

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:km

Enclosures

- c: T. Carter, NRC/FSME/DWMEP 7J8  
 E. Knox-Davin, NRC/FSME/TWFN 8A23  
 J. Peckenpaugh, NRC/FSME/DWMEP/EPPADL/TWEN 7J8  
 File 1728
- E. Abelquist, ORISE  
 S. Kirk, ORISE  
 D. Everhart, Region I

Distribution approval and concurrence :	Initials
Technical Management Team Member	<i>GLB</i>
Quality Manager	<i>CTP</i>

Voice: 865.241.3242

Fax: 865.241.3248

E-mail: Dale.Condra@orau.org

**TABLE 1**

**SAMPLE IDENTIFICATIONS  
AND COLLECTION DATA  
YANKEE ROWE  
ROWE, MASSACHUSETTS**

<b>ORISE Sample ID</b>	<b>NRC Sample ID</b>	<b>Collection Date</b>	<b>Collection Time</b>
1728W0001	Well CB-6	12/11/2006	11:30
1728W0002	Well 107A	12/11/2006	13:36
1728W0003	Well MW-110A	12/11/2006	16:30
1728W0004	Well MW-102C	12/12/2006	10:08
1728W0005	Well MW-102A	12/12/2006	10:14
1728W0006	Well MW-107C	12/12/2006	12:34
1728W0007	Well MW-105C	12/12/2006	15:20
1728W0008	Well MW-107D	12/12/2006	16:16
1728W0009	Well MW-106A	12/13/2006	10:55
1728W0010	Well MW-105B	12/13/2006	11:16

TABLE 2

CONCENTRATIONS OF SELECTED  
 GAMMA EMITTING RADIONUCLIDES  
 IN WATER SAMPLES  
 BY GAMMA SPECTROSCOPY CP1, REVISION 15  
 YANKEE ROWE  
 ROWE, MASSACHUSETTS

ORISE Sample ID	NRC Sample ID	Radionuclide Concentrations <sup>a</sup> (pCi/L)			
		Co-58	Co-60	Cs-134	Cs-137
1728W0001	Well CB-6	-0.7 ± 3.1 <sup>b</sup>	0.6 ± 3.0	-0.1 ± 3.1	1.3 ± 2.5
1728W0002	Well 107A	-1.6 ± 3.2	-0.2 ± 3.4	1.0 ± 3.3	2.9 ± 2.9
1728W0003	Well MW-110A	0.7 ± 2.8	5.2 ± 4.0	-1.3 ± 3.1	-4.0 ± 5.9
1728W0004	Well MW-102C	-0.6 ± 3.5	2.7 ± 3.8	3.5 ± 3.8	1.1 ± 3.0
1728W0005	Well MW-102A	-1.1 ± 2.7	-0.2 ± 2.3	0.4 ± 2.6	2.2 ± 3.7
1728W0006	Well MW-107C	-2.1 ± 3.0	1.8 ± 2.9	1.6 ± 3.0	1.3 ± 3.0
1728W0007	Well MW-105C	2.3 ± 3.6	1.1 ± 3.1	3.5 ± 3.7	0.5 ± 2.9
1728W0008	Well MW-107D	1.7 ± 3.0	3.2 ± 2.2	0.6 ± 2.9	-7.4 ± 5.3
1728W0009	Well MW-106A	2.3 ± 2.6	-0.6 ± 2.3	0.1 ± 2.4	345 ± 14
1728W0010	Well MW-105B	2.7 ± 2.4	2.5 ± 4.6	-1.2 ± 2.9	0.5 ± 2.1

<sup>a</sup>The range of MDCs for the selected radionuclides is 3.7 pCi/L to 5.9 pCi/L.

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

TABLE 3

CONCENTRATIONS OF ALPHA AND  
 BETA EMITTING RADIONUCLIDES  
 IN WATER SAMPLES  
 BY LOW BACKGROUND ALPHA/BETA COUNTING  
 AP1, REVISION 14; CP3, REVISION 2  
 YANKEE ROWE  
 ROWE, MASSACHUSETTS

ORISE Sample ID	NRC Sample ID	Radionuclide Concentrations <sup>a</sup> (pCi/L)	
		Gross Alpha	Gross Beta
1728W0001	Well CB-6	-0.20 ± 0.76 <sup>b</sup> (1.54)	6.2 ± 1.5 (2.0)
1728W0002	Well 107A	-0.3 ± 1.6 (3.2)	14.1 ± 3.1 (4.0)
1728W0003	Well MW-110A	-1.4 ± 1.9 (4.1)	16.2 ± 3.5 (4.5)
1728W0004	Well MW-102C	0.00 <sup>c</sup> ± 0.81 (1.56)	4.9 ± 1.4 (2.0)
1728W0005	Well MW-102A	-0.21 ± 0.59 (1.21)	3.5 ± 1.1 (1.6)
1728W0006	Well MW-107C	0.7 ± 1.1 (1.9)	3.5 ± 1.1 (1.6)
1728W0007	Well MW-105C	0.4 ± 1.2 (2.1)	4.5 ± 1.2 (1.6)
1728W0008	Well MW-107D	0.62 ± 0.91 (1.57)	4.7 ± 1.2 (1.6)
1728W0009	Well MW-106A	17.6 ± 3.6 (3.2)	303 ± 27 (3)
1728W0010	Well MW-105B	2.5 ± 2.0 (3.2)	13.5 ± 2.4 (2.7)

<sup>a</sup>The MDCs for each radionuclide are in parentheses.

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

<sup>c</sup>Zero value is due to rounding.

TABLE 4

CONCENTRATIONS OF CARBON-14  
 IN WATER SAMPLES  
 BY LIQUID SCINTILLATION ANALYSIS  
 AP9, REVISION 3; CP4, REVISION 3  
 YANKEE ROWE  
 ROWE, MASSACHUSETTS

ORISE Sample ID	NRC Sample ID	Radionuclide Concentrations, TPUs, and MDCs <sup>a</sup> (pCi/L)
1728W0001	Well CB-6	-3 ± 10 <sup>b</sup> (18)
1728W0002	Well 107A	1.5 ± 9.7 (16.4)
1728W0003	Well MW-110A	1.8 ± 9.7 (16.4)
1728W0004	Well MW-102C	-5.5 ± 9.6 (16.4)
1728W0005	Well MW-102A	2.2 ± 9.7 (16.4)
1728W0006	Well MW-107C	4.7 ± 9.7 (16.4)
1728W0007	Well MW-105C	1.3 ± 9.6 (16.4)
1728W0008	Well MW-107D	1.3 ± 9.6 (16.4)
1728W0009	Well MW-106A	-4.9 ± 9.6 (16.4)
1728W0010	Well MW-105B	-2.3 ± 9.6 (16.4)

<sup>a</sup>The MDCs are in parentheses.

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

TABLE 5

CONCENTRATIONS OF TRITIUM (H-3)  
 IN WATER SAMPLES  
 BY LIQUID SCINTILLATION ANALYSIS  
 AP2, REVISION 15; CP4, REVISION 3  
 YANKEE ROWE  
 ROWE, MASSACHUSETTS

ORISE Sample ID	NRC Sample ID	Radionuclide Concentrations, TPUs, and MDCs <sup>a</sup> (pCi/L)
1728W0001	Well CB-6	710 ± 250 <sup>b</sup> (360)
1728W0002	Well 107A	4,780 ± 450 (360)
1728W0003	Well MW-110A	2,460 ± 340 (360)
1728W0004	Well MW-102C	4,020 ± 410 (360)
1728W0005	Well MW-102A	4,710 ± 440 (360)
1728W0006	Well MW-107C	35,200 ± 1,500 (360)
1728W0007	Well MW-105C	3,380 ± 380 (360)
1728W0008	Well MW-107D	12,330 ± 740 (360)
1728W0009	Well MW-106A	4,700 ± 440 (360)
1728W0010	Well MW-105B	4,890 ± 450 (360)

<sup>a</sup>The MDCs are in parentheses.

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

TABLE 6

CONCENTRATIONS OF TOTAL RADIOSTRONTIUM  
 IN WATER SAMPLES  
 BY LOW BACKGROUND BETA COUNTING  
 AP4, REVISION 13; CP3, REVISION 2  
 YANKEE ROWE  
 ROWE, MASSACHUSETTS

ORISE Sample ID	NRC Sample ID	Radionuclide Concentrations, TPUs, and MDCs <sup>a</sup> (pCi/L)
1728W0001	Well CB-6	-1.9 ± 2.6 <sup>b</sup> (4.9)
1728W0002	Well 107A	2.0 ± 2.6 (4.4)
1728W0003	Well MW-110A	-0.4 ± 2.5 (4.5)
1728W0004	Well MW-102C	-1.4 ± 2.2 (4.1)
1728W0005	Well MW-102A	-0.9 ± 2.2 (4.0)
1728W0006	Well MW-107C	-0.2 ± 2.4 (4.4)
1728W0007	Well MW-105C	-0.5 ± 2.6 (4.7)
1728W0008	Well MW-107D	-1.1 ± 2.6 (4.8)
1728W0009	Well MW-106A	-0.2 ± 2.3 (4.1)
1728W0010	Well MW-105B	-0.2 ± 2.2 (4.0)

<sup>a</sup>The MDCs are in parentheses.

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