

December 09, 2005

Mr. Jim Kottan
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

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**SUBJECT: REPORT FOR ANALYSIS OF CONCRETE AND SOIL SAMPLES FROM
THE YANKEE NUCLEAR POWER STATION,
ROWE, MASSACHUSETTS
[INSPECTION NO. 50-029/2005-002] [RFTA NO. 05-001/06-001]**

Dear Mr. Kottan:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) received one concrete sample on June 27, 2005, one concrete sample on July 28, 2005, and four soil samples on June 29, 2005 from the Yankee Nuclear Power Station in Rowe, Massachusetts. The sample identifications and sampling dates are in Table 1. The soil and concrete samples were analyzed by gamma spectroscopy (GS) (Procedure CP1, Revision 15). The concrete samples were also analyzed by liquid scintillation analysis for tritium (H-3) and carbon-14 (C-14) (Procedure AP6, Revision 15; Procedure CP4, Revision 3), by liquid scintillation analysis for nickel-59/63 (Ni-59/63), (Non-Routine Procedure AP17, Revision 0; Procedure CP4, Revision 3), by liquid scintillation analysis for iron-55 (Fe-55), (Non-Routine Procedure AP16, Revision 0; Procedure CP4, Revision 3) and for strontium-90 (Sr-90) by gas-flow proportional counting (Procedure AP4, Revision 13; Procedure CP3, Revision 2). The GS results are presented in Table 2. The results for H-3, C-14, Fe-55, Ni-59/63, and Sr-90 have been combined and are presented in Table 3.

The completion of all analyses was delayed due to the request to develop analytical procedures to measure Fe-55 and Ni-59/63 in solid matrices. The Fe procedure received the required approvals on September 29, 2005 and the Ni procedure received the required approvals on November 10, 2005.

ESSAP's Quality Control (QC) requirements were met for these analyses. The QC files are available for your review upon request.

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Mr. Jim Kottan

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Please contact me at (865) 241-3242 or Wade Ivey at (865) 576-9184 should you have any questions.

Sincerely,

Dale Condra

Dale Condra
Laboratory Manager
Environmental Survey and
Site Assessment Program

RDC:WPI:ar

Enclosures

cc: T. McLaughlin, NRC/NMSS/TWFN 7F27 E. Abelquist, ORISE/ESSAP
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Distribution approval and concurrence :	Initials
Technical Management Team Member	<i>alB</i>
Quality Manager	<i>ATP</i>

ORISE TABLE 1

**SAMPLE IDENTIFICATIONS
AND COLLECTION DATES
YANKEE NUCLEAR POWER STATION
ROWE, MASSACHUETTS**

ESSAP Sample ID	NRC Region I Sample ID	Collection Date	Collection Time
1621M0002	TDS-100-GR-S	6/23/2005	9:30
1621M0003	TDS-201-GR-S2	7/21/2005	9:20
1621S0018	TBN-02-001	4/28/2005	10:00
1621S0019	TBN-02-005	4/28/2005	14:00
1621S0020	CWP-2	4/16/2005	9:50
1621S0021	CWP-7	4/27/2005	14:00

ORISE TABLE 2

**CONCENTRATIONS OF SELECTED
GAMMA EMITTING RADIONUCLIDES
IN TWO CONCRETE SAMPLES
AND FOUR SOIL SAMPLES
BY GAMMA SPECTROSCOPY CP1, REVISION 15
YANKEE NUCLEAR POWER STATION
ROWE, MASSACHUSETTS**

ESSAP Sample ID	NRC Region I Sample ID	Radionuclide Concentrations (pCi/g dry weight) ^a						
		Co-60	Ag-108m	Sb-125	Cs-137	Eu-152	Eu-154	Eu-155
1621M0002	TDS-100-GR-S	0.05 ± 0.04 ^b	-0.02 ± 0.02	0.01 ± 0.05	0.09 ± 0.05	0.00 ^c ± 0.05	0.00 ± 0.02	0.04 ± 0.05
1621M0003	TDS-201-GR-S2	0.01 ± 0.02	0.01 ± 0.01	0.01 ± 0.04	0.03 ± 0.03	0.03 ± 0.04	0.00 ± 0.02	0.02 ± 0.03
1621S0018A	TBN-02-001	81.5 ± 2.7	1.33 ± 0.25	0.17 ± 0.50	6.31 ± 0.59	0.00 ± 0.48	0.07 ± 0.14	0.52 ± 0.40
1621S0018B	TBN-02-001	87.8 ± 2.9	1.27 ± 0.23	0.40 ± 0.53	7.29 ± 0.65	-0.19 ± 0.46	0.01 ± 0.15	0.20 ± 0.28
1621S0019	TBN-02-005	3.80 ± 0.24	0.09 ± 0.06	0.05 ± 0.13	0.65 ± 0.12	-0.14 ± 0.13	-0.03 ± 0.06	0.22 ± 0.17
1621S0020	CWP-2	0.19 ± 0.09	-0.02 ± 0.04	0.03 ± 0.14	1.00 ± 0.15	0.00 ± 0.15	-0.03 ± 0.08	0.55 ± 0.25
1621S0021	CWP-7	0.02 ± 0.03	-0.01 ± 0.01	0.03 ± 0.04	0.13 ± 0.03	0.07 ± 0.06	0.02 ± 0.02	0.07 ± 0.06

^aThe range of MDCs for the selected radionuclides is 0.10 pCi/g to 0.30 pCi/g.

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

^cZero values are due to rounding.

ORISE TABLE 3

**CONCENTRATIONS OF SELECTED BETA EMITTERS
IN CONCRETE SAMPLES
YANKEE NUCLEAR POWER STATION
ROWE, MASSACHUSETTS**

ESSAP Sample ID	NRC Region I Sample ID	Concentrations and MDCs ^a (pCi/g)					
		H-3 ^b	C-14 ^b	Fe-55 ^c	Ni-59 ^d	Ni-63 ^d	Sr-90 ^e
1621M0002	TDS-100-GR-S	23.9 ± 4.1 ^f (5.5)	55.6 ± 3.0 (3.1)	2.8 ± 3.6 (6.1)	-1.0 ± 1.1 (1.8)	0.5 ± 1.1 (1.9)	-0.15 ± 0.23 (0.43)
1621M0003	TDS-201-GR-S2	23.8 ± 4.1 (5.5)	70.6 ± 3.4 (3.1)	5.5 ± 3.7 (6.1)	0.5 ± 1.1 (1.9)	-0.2 ± 1.1 (1.9)	-0.04 ± 0.23 (0.42)

^aMDCs are in parenthesis

^bAnalyzed by Procedures. AP6, Revision 15 and CP4, Revision 3.

^cAnalyzed by Non-Routine Procedure AP16, Revision 0 and Procedure CP4, Revision 3.

^dAnalyzed by Non-Routine Procedure AP17, Revision 0 and Procedure CP4, Revision 3.

^eAnalyzed by Procedures AP4, Revision 13 and CP3, Revision 2.

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