

05 MAR -1 01:44

February 23, 2005

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

**SUBJECT: REPORT FOR ANALYSIS OF A CONCRETE SAMPLE FROM THE
YANKEE NUCLEAR POWER STATION, ROWE, MASSACHUSETTS
[INSPECTION NO. 50-029/2004-002] [RFTA NO. 05-001]**

Dear Mr. Kottan:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) received a concrete sample on November 4, 2004 from the Yankee Nuclear Power Station in Rowe, Massachusetts that was collected on October 25, 2004. The sample was analyzed as follows: by gamma spectroscopy (GS) (Procedure CP1, Revision 14), by alpha spectroscopy (AS) (Procedure AP11, Revision 2; Procedure CP2, Revision 12), by liquid scintillation analysis for tritium (H-3) and carbon-14 (C-14) (Procedure AP6, Revision 14; Procedure CP4, Revision 3), by liquid scintillation analysis for nickel-63 (Ni-63), (Non-Routine Procedure AP12, Revision 3; Procedure CP4, Revision 3) and for strontium (Sr-90) by gas-flow proportional counting (Procedure AP4, Revision 12; Procedure CP3, Revision 2). The GS results are presented in Table 1. The AS results are presented in Table 2. The results for H-3, C-14, Ni-63, and Sr-90 have been combined and are presented in Table 3.

The request to analyze the sample for nickel-59 and iron-55 could not be met. ESSAP does not presently have procedures available for those two radionuclides in a concrete matrix.

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

P. O. BOX 117, OAK RIDGE, TENNESSEE 37831-0117

Operated by Oak Ridge Associated Universities for the U.S. Department of Energy



Mr. Jim Kottan

-2-

February 23, 2005

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. Knox-Davin, NRC/NMSS/TWFN 8A23
J. Hickman, NRC/DWMEP/TWFN 7F27

E. Abelquist, ORISE/ESSAP
T. Vitkus, ORISE/ESSAP
File/1621

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

ORISE TABLE 1

**CONCENTRATIONS OF SELECTED
GAMMA EMITTING RADIONUCLIDES
IN A CONCRETE SAMPLE
BY GAMMA SPECTROSCOPY CP1, REVISION 14
YANKEE NUCLEAR POWER STATION
ROWE, MASSACHUSETTS**

ESSAP Sample ID	NRC Region I Sample ID	Radionuclide	Concentrations^a (pCi/g)
1621M0001	STC-CB-01	Mn-54	0.01 ± 0.01^b
1621M0001	STC-CB-01	Co-60	0.01 ± 0.01
1621M0001	STC-CB-01	I-129	0.05 ± 0.06
1621M0001	STC-CB-01	Cs-137	0.05 ± 0.01
1621M0001	STC-CB-01	Eu-152	-0.02 ± 0.01
1621M0001	STC-CB-01	Eu-154	-0.04 ± 0.03
1621M0001	STC-CB-01	Eu-155	0.03 ± 0.02
1621M0001	STC-CB-01	Np-237 by Pa-233	0.01 ± 0.01
1621M0001	STC-CB-01	Am-241	$0.00^c \pm 0.01$

^aThe range of MDCs for the selected radionuclides is 0.01 pCi/g to 0.08 pCi/g.

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

^cZero values are due to rounding.

ORISE TABLE 2

**CONCENTRATIONS OF SELECTED
ALPHA EMITTING RADIONUCLIDES
IN A CONCRETE SAMPLE
BY ALPHA SPECTROSCOPY
PROCEDURES AP11, REVISION 2 AND CP2, REVISION 12
YANKEE NUCLEAR POWER STATION
ROWE, MASSACHUSETTS**

ESSAP Sample ID	NRC Region I Sample ID	Radionuclide	Concentrations^a (pCi/g)
1621M0001	STC-CB-01	Pu-238	-0.01 ± 0.02 ^b
1621M0001	STC-CB-01	Pu-239/240	0.00 ^c ± 0.01
1621M0001	STC-CB-01	Am-241	0.00 ± 0.02
1621M0001	STC-CB-01	Cm-244	0.00 ± 0.02

^aThe range of MDCs for the selected radionuclides is 0.02 pCi/g to 0.04 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 EMITTING RADIONUCLIDES
IN A CONCRETE SAMPLE
YANKEE NUCLEAR POWER STATION
ROWE, MASSACHUSETTS**

ESSAP Sample ID	NRC Region I Sample ID	Radionuclide	Concentrations and MDCs ^a (pCi/g)
1621M0001	STC-CB-01	H-3 ^b	28.9 ± 4.2 ^c (5.5)
1621M0001	STC-CB-01	C-14 ^b	3.8 ± 1.3 (2.0)
1621M0001	STC-CB-01	Ni-63 ^d	0.80 ± 0.93 (1.6)
1621M0001	STC-CB-01	Sr-90 ^e	0.19 ± 0.45 (0.79)

^aMDCs are in parenthesis.

^bAnalyzed by Procedures AP6, Revision 14 and CP4, Revision 3.

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

^dAnalyzed by Non-Routine Procedure AP12, Revision 3 and Procedure CP4, Revision 3.

^eAnalyzed by Procedures AP4, Revision 12 and CP3, Revision 2.