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Energy/
Environment
Systems Division

May 18, 1992

Ms. Elizabeth Ullrich
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

SUBJECT: STRONTIUM-90 DATA FOR THE ROYERSFORD SLUDGE SAMPLES

Dear Ms. Ullrich:

Enclosed are the strontium-90 results of analyses performed on samples submitted by the Royersford Wastewater Treatment Plant. Sludge cake samples, summarized in Table 1, are reported in units of activity per gram of wet sample. Liquid sludge samples, summarized in Table 2, are reported in units of activity per liter of sample. Filtrate liquid samples, summarized in Table 3, are reported in activity per liter of sample. Vegetation samples from the reed beds, summarized in Table 4, are reported in units of activity per gram of ashed sample.

Previous gamma spectroscopy and wet chemistry analysis of these samples were submitted in a letter report dated May 8, 1991. Table 2 from the May 8, 1991 letter report was in error. The radionuclide concentrations were reported in pCi/l which is correct, however, the table stated that the concentrations were pCi/g. A revised table is enclosed.

You may contact me at FTS 615-576-0065 if you have any questions regarding these data.

Sincerely,

Wade C. Adams
Health Physicist/Project Leader
Environmental Survey and
Site Assessment Program

WCA:dac

Enclosures

cc: J. Kinneman, NRC/Region I
D. Tiktinsky, NRC/NMSS 6E6
T. Mo, NRC/NMSS 6H3
PMDA, 6E6
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TABLE 1
RADIONUCLIDE CONCENTRATIONS MEASURED
IN SLUDGE SAMPLES (8.3% to 20.7% solids) FROM
ROYERSFORD WASTEWATER TREATMENT PLANT
ROYERSFORD, PENNSYLVANIA

Dates & Times (1990)	Sr-90 (pCi/g)
7/9 - 1700	11.7 ± 0.3 ^a
7/10 - 1040	33.0 ± 0.5
7/11 - 1330	<1.8
7/12 - 1815	<3.4
7/13 - 1930	<1.5
12/12 - 1530	2.2 ± 0.3
12/12 - 1530	2.1 ± 0.3
12/12 - 1530	7.2 ± 0.6

^aUncertainties represent the 95% confidence level based only on counting statistics; additional laboratory uncertainties of ± 6 to 10% have not been propagated into these data.

TABLE 2
RADIONUCLIDE CONCENTRATIONS MEASURED
IN LIQUID SLUDGE SAMPLES (3%-6% solids) FROM
ROYERSFORD WASTEWATER TREATMENT PLANT
ROYERSFORD, PENNSYLVANIA

Dates & Times (1990)	Sr-90 (pCi/l)
5/16 - 1030	639 ± 17 ^a
5/17 - 1130	606 ± 17
5/21 - 1125	331 ± 12
5/24 - 1035	746 ± 17
5/25 - 1225	1423 ± 31
6/26 - 1620	753 ± 24
6/28 - 2045	671 ± 16
7/5 - 1300	542 ± 13
7/6 - 2130	740 ± 16
7/7 - 1015	264 ± 9.8
7/9 - 1700	660 ± 16
7/10 - 1040	68 ± 8
7/11 - 1330	32 ± 8
7/12 - 1815	< 16
7/13 - 1930	< 24

^aUncertainties represent the 95% confidence level based only on counting statistics; additional laboratory uncertainties of ± 6 to 10% have not been propagated into these data.

TABLE 3
RADIONUCLIDE CONCENTRATIONS MEASURED
IN FILTRATE SLUDGE SAMPLES (<3% SOLIDS) FROM
ROYERSFORD WASTEWATER TREATMENT PLANT
ROYERSFORD, PENNSYLVANIA

Times & Dates (1990)	Sr-90 (pCi/l)
5/21 - 1250	11.0 ± 3.1 ^a
6/26 - 1620	6.1 ± 2.8
6/28 - 2045	<4.5
7/5 - 1300	<3.5
7/6 - 2130	6.8 ± 2.4
7/7 - 1015	4.7 ± 2.8
7/9 - 1700	<5.6
7/10 - 1040	<7.5
7/11 - 1330	<9.2
7/12 - 1815	<46

^aUncertainties represent the 95 % confidence level based only on counting statistics; additional laboratory uncertainties of ± 6 to 10% have not been propagated into these data.

TABLE 4
RADIONUCLIDE CONCENTRATIONS MEASURED
IN REED STALK SAMPLES FROM
ROYERSFORD WASTEWATER TREATMENT PLANT
ROYERSFORD, PENNSYLVANIA

Date & Times (1990)	Sr-90 (pCi/g)
12/12 - 1530	0.2 ± 0.1 ^a
12/12 - 1530	0.3 ± 0.1
12/12 - 1530	0.3 ± 0.1

^aUncertainties represent the 95% confidence level based only on counting statistics; additional laboratory uncertainties of ± 6 to 10% have not been propagated into these data.

TABLE 2 (Cont'd)
 RADIONUCLIDE CONCENTRATIONS MEASURED
 IN LIQUID SLUDGE SAMPLES (3% to 6% SOLIDS) FROM
 ROYERSFORD WASTEWATER TREATMENT PLANT

RADIONUCLIDE	RADIONUCLIDE CONCENTRATION (pCi/l)						
	7/6-2130	7/7-1015	7/9-1700	7/10-1040	7/11-1330	7/12-1815	7/13-1930
Cr-51	<3200	<3600	<94000	<82000	<120000	<66000	<98000
Mn-54	7420 ± 550	9640 ± 630	9760 ± 610	13500 ± 600	13970 ± 940	8710 ± 490	13470 ± 890
Co-58	1730 ± 440	2090 ± 580	1900 ± 1300	2100 ± 1300	3500 ± 1800	2370 ± 830	2600 ± 1500
Fe-59	<1100	<1300	<9300	<10000	<12000	<8600	<11000
Co-60	15170 ± 740	21470 ± 890	22450 ± 850	29600 ± 890	31600 ± 1100	23800 ± 770	34500 ± 1000
Zn-65	8900 ± 1000	11500 ± 1100	11300 ± 1500	19000 ± 1900	17900 ± 2000	12400 ± 1400	15100 ± 2200
Sr-90	---	---	---	---	---	---	---
Nb-95	<510	<680	<7800	<7500	<9700	<6800	<8100
Zr-95	<780	<880	<3500	<3500	<4400	<3000	<4100
Ag-110m	<390	160 ± 330	<640	<610	<860	<560	600 ± 540
Sb-125	<830	<930	<1000	890 ± 700	<1300	450 ± 550	<1200
Cs-134	360 ± 260	320 ± 280	520 ± 340	660 ± 240	970 ± 390	420 ± 160	830 ± 310
Cs-137	2560 ± 320	2810 ± 350	4180 ± 460	5470 ± 360	5790 ± 460	3620 ± 440	5120 ± 400
U-234	---	---	---	---	---	---	---
U-235	---	---	---	---	---	---	---
U-238	---	---	---	---	---	---	---
Pu-238	---	---	---	---	---	---	---
Pu-239/240	---	---	---	---	---	---	---

*Nuclide not identified.

^bPoor detection sensitivities for Cr-51, Fe-59, Nb-95, and Zr-95 are the result of small solids content and/or correction for decay between collection and analysis dates.

^cUncertainties represent the 95% confidence levels, based only on counting statistics; additional laboratory uncertainties of ± 6 to 10 have not been propagated into these data.

^dDash indicates analysis not yet completed.