

January 22, 2002

37-2334-01
030-20934

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

SUBJECT: REPORT FOR ANALYSIS OF SAMPLES COLLECTED DURING THE PERIOD OCTOBER 11, 2001 THROUGH OCTOBER 23, 2001 FROM THE ROYERSFORD WASTEWATER TREATMENT FACILITY ROYERSFORD, PENNSYLVANIA (DOCKET NO. 030-20934, RFTA NO. 99-042)

Dear Ms. Ullrich:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE) performed strontium-90, gamma spectroscopy, and percent solid analyses on five filtrate, six sludge, and five filter cake samples from the Royersford Wastewater Treatment Facility, Royersford, Pennsylvania. In addition, tritium analysis was performed on the filtrate and sludge samples. The results are presented in pCi/L for the filtrate and sludge samples, whereas the results for the filter cake samples are presented as pCi/g dry weight for strontium-90 and pCi/g wet weight for gamma spectroscopy. The results are presented in Tables 1 through 5.

ESSAP's Quality Control (QC) procedures were followed for these analyses. Analytical and instrumentation QC for these analyses were within acceptable limits. The QC files are available for your review upon request.

In previous reports, I-125 was reported in the gamma spectroscopy tables. After our telephone conversation on December 13, 2001, it was decided that samples identified as containing I-125 from the current sampling set would be reanalyzed to confirm the presence of this radionuclide. The samples were reanalyzed and the presence of I-125 could not be confirmed. Further investigation revealed that the presence of Sb-125 would lead to the false identification of I-125 or the overestimation of the concentration of I-125, if present. We discovered that this was the case for the Royersford samples. Based on our January 8, 2002 telephone conversation, process knowledge indicates that it is unlikely that I-125 would be present in these samples and that the presence of I-125 has been incorrectly reported in Royersford samples previously analyzed. We regret the reporting of this false positive and we are taking corrective action to prevent this from happening in the future. We understand that, because I-125 was not a radionuclide of concern for this site and because the concentrations reported were below release levels, the false positive did not lead to any erroneous decision making on this project. Per your instructions, we will not revise and reissue any of the previous letter reports associated with this project.

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

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



131047

NMSS/RONI MATERIALS-002

Ms. Elizabeth Ullrich

-2-

January 22, 2002

Please contact me at (865) 241-3242 or Wade Ivey at (865) 576-9184 with any questions or comments.

Sincerely,

A handwritten signature in cursive script that reads "Dale Condra".

Dale Condra
Laboratory Manager
Environmental Survey and
Site Assessment Program

RDC/WPI:ar

Enclosure

cc: G. Purdy, NRC/NMSS/TWFFN/7F27
E. Knox-Davin, NRC/NMSS/TWFFN/8A23
J. Kottan, NRC/Region I
W. Beck, ORISE/ESSAP
E. Abelquist, ORISE/ESSAP
T. Vitkus, ORISE/ESSAP
File/761

TABLE 1

**STRONTIUM-90 CONCENTRATIONS
IN LIQUID AND SOLID SAMPLES
ROYERSFORD WASTEWATER TREATMENT FACILITY
ROYERSFORD, PENNSYLVANIA**

ESSAP SAMPLE ID	NRC SAMPLE ID	Sr-90 Concentrations (pCi/L or pCi/g) ^a	MDC (pCi/L or pCi/g)
0761M024	Filtrate #1, cells C&D	2.4 ± 4.9 ^b	8.5
0761M025	Filtrate #2, cells C&D	0.1 ± 4.5	8.2
0761M026	Filtrate #3, cells C&D	0.3 ± 4.4	7.8
0761M027	Filtrate #4, cells A&B	0.5 ± 4.9	8.8
0761M028	Filtrate #4 (last)	-2 ± 17	31 ^c
0761M029	Sludge #1, with polymer, cells C&D	39 ± 11	15
0761M030	Sludge #2, cells C&D	78 ± 15	18
0761M031	Sludge #3, cells C&D	58 ± 16	22
0761M032	Sludge #4, cells A&B	65 ± 16	21
0761M033	Sludge #4 (last)	36 ± 11	15
0761M034	Sludge #1, before dewatering, cells C&D	55 ± 13	17
0761M035	Filter Cake #1, cells C&D	6.70 ± 0.75	0.64
0761M036	Filter Cake #2, cells C&D	2.66 ± 0.57	0.70
0761M037	Filter Cake #3, cells C&D	3.22 ± 0.64	0.77
0761M038	Filter Cake #4, cells A&B	2.65 ± 0.58	0.72
0761M039	Filter Cake #4 (last)	2.10 ± 0.51	0.66

^aSamples 0761M024-M034 are pCi/L and samples 0761M035-M039 are pCi/g dry material.

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

^cSample M028 has a larger error and MDC due to the small volume used in analysis.

TABLE 2

**GAMMA EMITTING RADIONUCLIDE CONCENTRATIONS
IN LIQUID AND SOLID SAMPLES
ROYERSFORD WASTEWATER TREATMENT FACILITY
ROYERSFORD, PENNSYLVANIA**

ESSAP Sample ID	NRC	Radionuclide Concentrations (pCi/L or pCi/g) ^a				
		Zr-95	Nb-95	Sb-125	Ag-110M	Cs-137
0761M024	Filtrate #1, cells C&D	20 ± 20 ^b	50 ± 30	30 ± 20	30 ± 10	190 ± 10
0761M025	Filtrate #2, cells C&D	20 ± 20	30 ± 20	10 ± 20	11.3 ± 8.7	130 ± 10
0761M026	Filtrate #3, cells C&D	2.4 ± 8.3	12.9 ± 7.8	20 ± 10	7.0 ± 5.1	130 ± 10
0761M027	Filtrate #4, cells A&B	10 ± 20	70 ± 20	20 ± 20	50 ± 10	240 ± 10
0761M028	Filtrate #4 (last)	4 ± 12	40 ± 10	30 ± 10	26.1 ± 6.0	290 ± 10
0761M029	Sludge #1, with polymer, cells C&D	680 ± 170	2,040 ± 210	1,050 ± 130	620 ± 60	3,740 ± 80
0761M030	Sludge #2, cells C&D	490 ± 200	2,230 ± 250	1,170 ± 170	980 ± 80	4,930 ± 110
0761M031	Sludge #3, cells C&D	640 ± 170	2,620 ± 200	1,230 ± 150	900 ± 70	5,020 ± 90
0761M032	Sludge #4, cells A&B	820 ± 140	3,130 ± 170	900 ± 100	1,140 ± 50	2,950 ± 60
0761M033	Sludge #4 (last)	780 ± 170	2,650 ± 200	680 ± 140	1,360 ± 70	5,150 ± 100
0761M034	Sludge #1, before dewatering, cells C&D	470 ± 120	2,090 ± 170	1,270 ± 110	790 ± 60	4,670 ± 80
0761M035	Filter Cake #1, cells C&D	2.7 ± 3.4	3.9 ± 3.1	7.6 ± 2.9	3.4 ± 1.2	17.2 ± 1.7
0761M036	Filter Cake #2, cells C&D	6.1 ± 3.7	5.5 ± 2.9	4.9 ± 3.2	4.5 ± 1.5	21.2 ± 1.9
0761M037	Filter Cake #3, cells C&D	2.6 ± 3.5	7.6 ± 4	6.9 ± 3.6	5.3 ± 2.3	20.3 ± 1.9
0761M038	Filter Cake #4, cells A&B	3.9 ± 2.7	8.3 ± 2.1	4.8 ± 2.8	7.4 ± 1.4	16.4 ± 1.5
0761M039	Filter Cake #4 (last)	3.5 ± 2.8	14.2 ± 2.9	1.6 ± 2.1	6.0 ± 1.4	24.1 ± 1.6

^aSamples 0761M024-M034 are pCi/L and samples 0761M035-M039 are pCi/g wet material.

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

TABLE 3

**GAMMA EMITTING RADIONUCLIDE CONCENTRATIONS
IN LIQUID AND SOLID SAMPLES
ROYERSFORD WASTEWATER TREATMENT FACILITY
ROYERSFORD, PENNSYLVANIA**

ESSAP Sample ID	NRC Sample ID	Radionuclide Concentrations (pCi/L or pCi/g) ^a				
		Cs-134	Co-58	Mn-54	Zn-65	Co-60
0761M024	Filtrate #1, cells C&D	30 ± 20 ^b	230 ± 20	820 ± 30	120 ± 40	2,410 ± 80
0761M025	Filtrate #2, cells C&D	20 ± 10	130 ± 20	320 ± 20	150 ± 30	1,470 ± 60
0761M026	Filtrate #3, cells C&D	20 ± 10	100 ± 10	270 ± 10	70 ± 20	1,410 ± 50
0761M027	Filtrate #4, cells A&B	20 ± 10	300 ± 20	530 ± 20	70 ± 30	1,940 ± 70
0761M028	Filtrate #4 (last)	40 ± 10	670 ± 20	750 ± 20	100 ± 20	1,500 ± 50
0761M029	Sludge #1, with polymer, cells C&D	330 ± 70	5,460 ± 180	19,900 ± 500	3,570 ± 250	75,000 ± 2,300
0761M030	Sludge #2, cells C&D	370 ± 100	7,570 ± 250	27,400 ± 700	5,100 ± 350	101,500 ± 3,300
0761M031	Sludge #3, cells C&D	420 ± 80	7,300 ± 220	26,200 ± 650	5,000 ± 300	103,200 ± 3,200
0761M032	Sludge #4, cells A&B	290 ± 50	6,800 ± 200	16,800 ± 430	3,550 ± 200	54,100 ± 1,700
0761M033	Sludge #4 (last)	450 ± 90	14,000 ± 400	25,950 ± 700	4000 ± 300	68,500 ± 2,200
0761M034	Sludge #1, before dewatering, cells C&D	350 ± 60	7,750 ± 210	25,500 ± 630	8,200 ± 340	114,900 ± 3,600
0761M035	Filter Cake #1, cells C&D	0.1 ± 1.6	25.7 ± 3.8	95.9 ± 4.1	21.2 ± 5.9	350 ± 10
0761M036	Filter Cake #2, cells C&D	2.1 ± 1.5	29.2 ± 3.3	116.4 ± 4.5	24.9 ± 5.8	430 ± 10
0761M037	Filter Cake #3, cells C&D	1.6 ± 1.8	27.1 ± 3.5	101.6 ± 4.4	27.8 ± 8.7	380 ± 10
0761M038	Filter Cake #4, cells A&B	0.9 ± 1.3	29.3 ± 2.5	89.2 ± 3.8	19.4 ± 5.1	330 ± 10
0761M039	Filter Cake #4 (last)	1.6 ± 1.5	64.1 ± 3.3	103.8 ± 3.9	18.4 ± 4.9	260 ± 10

^aSamples 0761M024-M034 are pCi/L and samples 0761M035-M039 are pCi/g wet material.

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

TABLE 4

**TRITIUM CONCENTRATIONS
IN LIQUID SAMPLES
ROYERSFORD WASTEWATER TREATMENT FACILITY
ROYERSFORD, PENNSYLVANIA**

ESSAP SAMPLE ID	NRC SAMPLE ID	H-3 Concentrations (pCi/L)	MDC (pCi/L)
0761M024	Filtrate #1, cells C&D	520 ± 440 ^a	730
0761M025	Filtrate #2, cells C&D	210 ± 430	730
0761M026	Filtrate #3, cells C&D	180 ± 430	730
0761M027	Filtrate #4, cells A&B	690 ± 450	730
0761M028	Filtrate #4 (last)	430 ± 440	730
0761M029	Sludge #1, with polymer, cells C&D	310 ± 440	740
0761M030	Sludge #2, cells C&D	160 ± 440	740
0761M031	Sludge #3, cells C&D	-30 ± 430	740
0761M032	Sludge #4, cells A&B	750 ± 460	740
0761M033	Sludge #4 (last)	400 ± 440	740
0761M034	Sludge #1, before dewatering, cells C&D	20 ± 430	740

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

TABLE 5
PERCENT SOLIDS
IN LIQUID AND SOLID SAMPLES
ROYERSFORD WASTEWATER TREATMENT FACILITY
ROYERSFORD, PENNSYLVANIA

ESSAP SAMPLE ID	NRC SAMPLE ID	Percent Solids ^a
0761M024	Filtrate #1, cells C&D	0.09
0761M025	Filtrate #2, cells C&D	0.20
0761M026	Filtrate #3, cells C&D	0.13
0761M027	Filtrate #4, cells A&B	0.12
0761M028	Filtrate #4 (last)	0.04
0761M029	Sludge #1, with polymer, cells C&D	2.53
0761M030	Sludge #2, cells C&D	2.99
0761M031	Sludge #3, cells C&D	4.48
0761M032	Sludge #4, cells A&B	3.81
0761M033	Sludge #4 (last)	2.68
0761M034	Sludge #1, before dewatering, cells C&D	2.86
0761M035	Filter Cake #1, cells C&D	10.81
0761M036	Filter Cake #2, cells C&D	11.17
0761M037	Filter Cake #3, cells C&D	11.43
0761M038	Filter Cake #4, cells A&B	8.97
0761M039	Filter Cake #4 (last)	16.98

^aPercent solids was calculated by:

$$\text{Percent Solids} = \left(\frac{\text{dry weight}}{\text{wet weight}} \right) \times 100$$