

ENVIRONMENTAL

RADIATION

DATA

REPORT 94

April - June 1998

United States Environmental Protection Agency

Office of Radiation and Indoor Air

(This page intentionally left blank)

Preface

Environmental Radiation Data (ERD) is compiled and published quarterly by the Office of Radiation and Indoor Air's National Air and Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama, and contains data from the Environmental Radiation Ambient Monitoring System (ERAMS). ERD is published in both hard-copy and electronic formats. Electronic reports are available online at www.epa.gov/narel.

The United States Environmental Protection Agency established ERAMS in 1973 with an emphasis on identifying trends in the accumulation of long-lived radionuclides in the environment. ERAMS is comprised of a nationwide network of sampling stations that provide air, precipitation, surface water, drinking water, and milk samples.

Sampling locations are selected to provide optimal population coverage while functioning to monitor fallout from nuclear devices and other forms of radioactive contamination of the environment. The radiation analyses performed on these samples include gross alpha and gross beta analyses, gamma analyses, and radionuclide-specific analyses for uranium, plutonium, strontium, iodine, radium, and tritium. This monitoring effort also provides ancillary information on natural background levels and on routine and accidental releases into the environment from stationary sources.

The radiochemical procedures used by NAREL to analyze the ERAMS samples are contained in the *Eastern Environmental Radiation Facility Radiochemistry Procedures Manual* (EPA 520/5-84-006). Station operation and sample collection are in accordance with procedures contained in the *ERAMS Manual* (EPA 520/5-84-007, 008, 009).

(This page intentionally left blank)

Acknowledgments

All sampling for the Environmental Radiation Ambient Monitoring System (ERAMS) is performed by volunteer collectors who are frequently members of the health departments or related environmental agencies of their respective states. The National Air and Radiation Environmental Laboratory (NAREL) on behalf of the U.S. Environmental Protection Agency would like to acknowledge the time and effort of these volunteer collectors, who are so essential to the successful operation of ERAMS. The efforts of the sample collectors are especially appreciated during times of emergency operation when sampling frequencies are increased and schedules are sometimes demanding.

(This page intentionally left blank)

Data Reporting Conventions

Every laboratory measurement involves uncertainty. When there is little or no radioactivity in a sample, one consequence of measurement uncertainty is the possibility of obtaining a measured value that is less than zero. Such a negative result occurs when random effects in the measurement process cause the measured value for the sample to be less than that of the blank or background, which is subtracted from it. From April 1991 to December 1995, negative results were reported as “not detected” or “ND,” and gamma analysis results that were less than their estimated measurement uncertainties were also reported as “ND.” In January 1996 both of these practices were discontinued. Although negative activities are physically impossible, the inclusion of negative results in the report allows better statistical analysis of the data.

Results of gamma analyses are still reported as “ND” when gamma-emitting radionuclides are not detected.

Measurement Uncertainty

Each measured value y is reported with an expanded uncertainty $U = k u_c(y)$, which is determined from the combined standard uncertainty $u_c(y)$ and the coverage factor $k = 2$. The interval from $y - U$ to $y + U$ is estimated to have a level of confidence of approximately 95%.

Significant Figures

Expanded uncertainties are reported to two significant figures. Measurement results are rounded to the corresponding number of decimal places.

Detection Capability

The minimum detectable concentrations (MDCs) for each radionuclide are shown in Table 1. The MDC is defined as the minimum concentration that gives a 95% probability of detection when the detection criteria are chosen to give only a 5% probability of false detection in a blank sample.

(This page intentionally left blank)

Table 1**Reporting Units and Minimum Detectable Concentrations
for Radionuclide Analyses**

Radionuclide	Media	Reporting Unit	Minimum Detectable Concentration
Gross Alpha	Water	pCi/L	2
Gross Beta	Air	pCi/m ³	0.0015
	Water	pCi/L	2
	Precipitation	pCi/L	2
Tritium	Water	pCi/L	150
	Milk	pCi/L	150
* Plutonium-238,239/240	Air	aCi/m ³	0.75
	Water	pCi/L	0.1
† Uranium-234,235,238	Air	aCi/m ³	0.75
	Water	pCi/L	0.1
Radium-226	Water	pCi/L	0.02
Strontium-90	Milk	pCi/L	2
	Water	pCi/L	1
‡ Iodine-131	Milk (gamma)	pCi/L	4
	Water (gamma)	pCi/L	4
	Water	pCi/L	0.3
Cesium-137	Milk	pCi/L	5
	Water	pCi/L	5
‡ Barium-140	Milk	pCi/L	15
	Water	pCi/L	15
Potassium	Milk	g/L	0.06
	Water	g/L	0.06
Potassium-40	Water	pCi/L	50

* The MDC for air is based on an assumed total sample volume of 120,000 m³. Measurement by alpha spectrometry includes combined activities of ²³⁹Pu and ²⁴⁰Pu, since the relative contributions of these two isotopes cannot be determined.

† The MDC for air is based on an assumed total sample volume of 120,000 m³.

‡ Activity as of the day of counting.

(This page intentionally left blank)

1. Air Program

Airborne Particulates and Precipitation

Gross beta radioactivity measurements and certain specific analyses are performed on air particulates and precipitation samples as indicator measurements in assessing the general (national) impact of all contributing sources on environmental levels of radiation.

Airborne particulates are collected continuously at field stations representing wide geographic coverage, including present and potential sources of environmental radioactivity. Sampling sites are located throughout the United States.

Filters (10-cm diameter synthetic fiber) from air samplers are changed twice weekly and field measurements are made with a G-M survey meter at 5 hours after collection to allow for decay of natural radon isotopes and their progeny. Field estimates are reported to appropriate EPA officials by telephone or mail depending on the activity levels found.

The filters are sent to NAREL for more sensitive analyses in a low background beta counter. Gamma scans are performed on all filters showing gross beta counts greater than 1 pCi/m³. The laboratory obtained values are usually lower than the field estimates due to the decay of naturally occurring radionuclides between the times of the two measurements.

Precipitation samples are collected at most field stations collecting air filters. These samples are also sent to NAREL where they are composited monthly for gamma scans, tritium, and gross beta activity measurements.

A compilation of individual measurements is available from the National Air and Radiation Environmental Laboratory, 540 South Morris Avenue, Montgomery, AL 36115-2601.

Table 2
Gross Beta in Airborne Particulates
April 1998

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
AK: Fairbanks	2	0.0	0.0	0.0	0.007	0.006	0.006
AL: Montgomery	7				0.029	0.016	0.021
AR: Little Rock	8	0.2	0.0	0.1	0.017	0.008	0.012
AZ: Phoenix	3	0.6	0.5	0.5	0.013	0.009	0.011
CA: Berkeley	7	0.0	0.0	0.0	0.008	0.003	0.005
CA: Los Angeles	7	0.3	0.1	0.1	0.014	0.005	0.009
CO: Denver	8	0.8	0.3	0.6	0.015	0.006	0.010
CT: Hartford	8	0.1	0.1	0.1	0.013	0.005	0.008
DE: Wilmington	7	0.2	0.0	0.1	0.014	0.006	0.010
FL: Miami	4	0.0	0.0	0.0	0.010	0.005	0.008
HI: Honolulu	8	0.2	0.1	0.1	0.010	0.002	0.005
IA: Iowa City	8	0.7	0.1	0.2	0.015	0.008	0.011
ID: Boise	6	1.0	0.2	0.4	0.015	0.004	0.009
ID: Idaho Falls	8				0.012	0.005	0.008
IN: Indianapolis	6	0.3	0.0	0.2	0.019	0.010	0.014
KS: Topeka	5	4.9	0.4	1.6	0.015	0.010	0.013
ME: Augusta	7	0.2	0.0	0.1	0.013	0.004	0.009
MI: Lansing	8	0.5	0.1	0.2	0.014	0.006	0.009
MN: Welch	10	1.1	0.0	0.3	0.013	0.003	0.008
MS: Jackson	7	0.6	0.1	0.2	0.017	0.010	0.014
NC: Charlotte	6	0.1	0.0	0.0	0.019	0.009	0.012
NC: Wilmington	4				0.015	0.006	0.011
ND: Bismarck	3	0.9	0.3	0.6	0.015	0.008	0.011
NH: Concord	7	0.2	0.0	0.1	0.014	0.004	0.008
NM: Santa Fe	2	0.1	0.0	0.1	0.013	0.010	0.011
NV: Las Vegas	8	0.3	0.1	0.2	0.018	0.005	0.009
NY: Albany	4	0.1	0.1	0.1	0.020	0.008	0.013
NY: New York City	2	0.0	0.0	0.0	0.012	0.008	0.010
NY: Yaphank	8	0.1	0.0	0.1	0.014	0.005	0.009
OH: Columbus	3				0.012	0.007	0.009
OH: Painesville	7	0.2	0.1	0.1	0.013	0.007	0.010
OH: Ross	7				0.014	0.006	0.010
PA: Harrisburg	8	0.4	0.1	0.2	0.015	0.007	0.011
SC: Columbia	7	0.9	0.0	0.2	0.023	0.008	0.013
SD: Pierre	4	0.2	0.0	0.2	0.013	0.008	0.011
TN: Knoxville	7	0.6	0.1	0.3	0.019	0.008	0.014
TN: Nashville	6	0.1	0.1	0.1	0.019	0.009	0.014
TN: Oak Ridge/Bethel	8	0.4	0.0	0.2	0.015	0.006	0.011

Table 2 (continued)
Gross Beta in Airborne Particulates
April 1998

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
TN: Oak Ridge/K25	8	0.5	0.1	0.2	0.015	0.005	0.010
TN: Oak Ridge/Melton	8	0.4	0.0	0.2	0.015	0.006	0.009
TN: Oak Ridge/Y12 E	8	0.3	0.0	0.2	0.016	0.006	0.010
TN: Oak Ridge/Y12 W	8	0.2	0.0	0.1	0.015	0.006	0.010
TX: Austin	6	0.2	0.1	0.1	0.025	0.007	0.015
TX: El Paso	7	0.6	0.1	0.3	0.018	0.009	0.012
UT: Salt Lake City	6	0.3	0.0	0.1	0.014	0.007	0.009
VA: Lynchburg	8	0.4	0.1	0.2	0.015	0.006	0.009
WA: Spokane	8	0.2	0.1	0.2	0.019	0.005	0.010
WI: Madison	7	0.5	0.0	0.2	0.014	0.006	0.010

Table 3
Gross Beta in Airborne Particulates
May 1998

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
AK: Fairbanks	1	0.0	0.0	0.0	0.001	0.001	0.001
AL: Montgomery	9				0.050	0.018	0.029
AR: Little Rock	7	0.3	0.0	0.1	0.025	0.008	0.016
AZ: Phoenix	4	0.5	0.4	0.4	0.021	0.007	0.014
CA: Berkeley	9	0.1	0.0	0.0	0.012	0.002	0.005
CA: Los Angeles	9	0.1	0.0	0.0	0.013	0.003	0.007
CO: Denver	8	0.9	0.1	0.5	0.018	0.005	0.011
CT: Hartford	8	0.2	0.0	0.1	0.013	0.003	0.008
DE: Wilmington	9	0.6	0.1	0.2	0.015	0.004	0.009
FL: Miami	4	0.0	0.0	0.0	0.015	0.010	0.012
HI: Honolulu	7	0.1	0.1	0.1	0.007	0.002	0.004
IA: Iowa City	8	0.7	0.1	0.3	0.015	0.009	0.012
ID: Boise	9	0.8	0.0	0.3	0.016	0.003	0.007
ID: Idaho Falls	8				0.013	0.005	0.008
IN: Indianapolis	8	0.3	0.1	0.1	0.020	0.009	0.014
KS: Topeka	8	2.9	0.8	1.4	0.023	0.008	0.014
ME: Augusta	8	0.2	0.0	0.1	0.012	0.005	0.008
MI: Lansing	8	0.9	0.1	0.3	0.013	0.006	0.010
MN: Welch	10	1.0	0.2	0.4	0.015	0.008	0.011
MS: Jackson	9	0.5	0.0	0.3	0.027	0.010	0.018
NC: Charlotte	7	0.1	0.0	0.1	0.028	0.005	0.014
NC: Wilmington	2				0.010	0.004	0.007
ND: Bismarck	4	0.7	0.3	0.4	0.030	0.009	0.014
NH: Concord	9	0.2	0.0	0.1	0.011	0.004	0.007
NM: Santa Fe	2	0.1	0.0	0.1	0.013	0.008	0.011
NV: Las Vegas	8	0.2	0.1	0.1	0.012	0.003	0.008
NY: Albany	4	0.1	0.1	0.1	0.013	0.009	0.011
NY: Yaphank	8	0.3	0.0	0.1	0.013	0.002	0.007
OH: Columbus	2				0.013	0.008	0.011
OH: Painesville	9	0.3	0.1	0.1	0.015	0.004	0.009
OH: Ross	9				0.014	0.008	0.011
PA: Harrisburg	8	0.9	0.1	0.2	0.015	0.007	0.011
SC: Columbia	8	0.3	0.0	0.1	0.026	0.006	0.014
SD: Pierre	6	0.3	0.1	0.2	0.013	0.005	0.010
TN: Knoxville	9	1.2	0.2	0.6	0.026	0.012	0.018
TN: Nashville	8	0.3	0.0	0.2	0.023	0.010	0.017
TN: Oak Ridge/Bethel	8	0.9	0.1	0.4	0.023	0.008	0.014
TN: Oak Ridge/K25	8	0.9	0.0	0.4	0.021	0.002	0.012

Table 3 (continued)
Gross Beta in Airborne Particulates
May 1998

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
TN: Oak Ridge/Melton	8	0.9	0.2	0.4	0.020	0.008	0.013
TN: Oak Ridge/Y12 E	8	1.1	0.1	0.5	0.023	0.008	0.014
TN: Oak Ridge/Y12 W	8	0.4	0.1	0.2	0.023	0.008	0.014
TX: Austin	6	0.4	0.1	0.2	0.021	0.011	0.017
TX: El Paso	7	1.4	0.3	0.6	0.027	0.009	0.015
UT: Salt Lake City	7	0.2	0.0	0.1	0.016	0.005	0.009
VA: Lynchburg	8	0.5	0.1	0.3	0.013	0.003	0.008
WA: Spokane	8	0.4	0.1	0.2	0.015	0.003	0.009
WI: Madison	8	0.5	0.1	0.3	0.013	0.008	0.011

Table 4
Gross Beta in Airborne Particulates
June 1998

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
AK: Fairbanks	3	0.1	0.0	0.0	0.005	0.003	0.004
AL: Montgomery	9	0.1	0.0	0.1	0.025	0.014	0.020
AR: Little Rock	8	0.3	0.0	0.1	0.019	0.009	0.012
AZ: Phoenix	5	0.7	0.5	0.6	0.021	0.007	0.012
CA: Berkeley	9	0.1	0.0	0.0	0.005	0.002	0.003
CA: Los Angeles	9	0.1	0.0	0.1	0.007	0.005	0.006
CO: Denver	9	1.4	0.1	0.6	0.011	0.006	0.008
CT: Hartford	9	0.1	0.1	0.1	0.012	0.003	0.007
DE: Wilmington	9	0.4	0.1	0.2	0.015	0.007	0.010
FL: Jacksonville	2	0.1	0.0	0.1	0.016	0.014	0.015
FL: Miami	3	0.0	0.0	0.0	0.010	0.005	0.008
HI: Honolulu	7	0.2	0.1	0.1	0.004	0.001	0.003
IA: Iowa City	9	0.4	0.1	0.2	0.013	0.005	0.009
ID: Boise	9	0.3	0.1	0.2	0.009	0.002	0.006
ID: Idaho Falls	9				0.009	0.003	0.005
IN: Indianapolis	9	0.5	0.1	0.3	0.016	0.008	0.012
KS: Topeka	9	1.1	0.3	0.6	0.012	0.007	0.009
ME: Augusta	9	0.2	0.0	0.1	0.009	0.004	0.006
MI: Lansing	9	0.3	0.1	0.2	0.009	0.003	0.007
MN: Welch	12	0.7	0.1	0.3	0.011	0.005	0.007
MS: Jackson	8	0.3	0.0	0.2	0.024	0.009	0.015
NC: Charlotte	3	0.0	0.0	0.0	0.021	0.010	0.015
NC: Wilmington	3				0.014	0.007	0.010
ND: Bismarck	3	0.4	0.1	0.2	0.009	0.006	0.008
NH: Concord	9	0.1	0.0	0.1	0.011	0.003	0.006
NV: Las Vegas	9	0.1	0.1	0.1	0.009	0.007	0.008
NY: Albany	4	0.1	0.0	0.1	0.017	0.005	0.009
NY: Yaphank	9	0.5	0.0	0.1	0.012	0.003	0.008
OH: Columbus	3				0.012	0.006	0.009
OH: Painesville	8	0.2	0.1	0.1	0.014	0.007	0.009
OH: Ross	8				0.014	0.006	0.010
PA: Harrisburg	9	0.6	0.1	0.3	0.016	0.005	0.010
SC: Columbia	7	0.4	0.1	0.2	0.020	0.009	0.013
SD: Pierre	7	0.2	0.0	0.1	0.009	0.005	0.007
TN: Knoxville	8	1.3	0.1	0.5	0.038	0.007	0.020
TN: Nashville	9	0.5	0.1	0.2	0.020	0.007	0.013
TN: Oak Ridge/Bethel	9	0.6	0.0	0.3	0.019	0.006	0.012
TN: Oak Ridge/K25	9	0.6	0.1	0.3	0.018	0.007	0.011

Table 4 (continued)
Gross Beta in Airborne Particulates
June 1998

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
TN: Oak Ridge/Melton	9	0.8	0.1	0.4	0.018	0.007	0.012
TN: Oak Ridge/Y12 E	9	0.6	0.0	0.3	0.020	0.006	0.011
TN: Oak Ridge/Y12 W	9	0.3	0.0	0.2	0.022	0.006	0.012
TX: Austin	7	0.2	0.1	0.1	0.011	0.006	0.009
TX: El Paso	8	2.1	0.1	0.5	0.014	0.005	0.009
UT: Salt Lake City	8	0.1	0.0	0.1	0.014	0.005	0.008
VA: Lynchburg	9	0.7	0.2	0.4	0.014	0.007	0.010
WA: Spokane	9	0.2	0.1	0.1	0.009	0.002	0.006
WI: Madison	9	0.4	0.1	0.2	0.011	0.003	0.008

Table 5
Gross Beta and Specific Gamma in Precipitation
April 1998

Location	Gross Beta Activity		Specific Gamma Activity	
	pCi/L $\pm 2\sigma$		Nuclide	pCi/L $\pm 2\sigma$
AL: Montgomery	1.90	0.35	Be7	87 48
			Pb212	9.3 6.7
AR: Little Rock	1.61	0.32		ND
AZ: Phoenix	2.14	0.35	Pb212	5.2 5.8
CO: Denver	1.05	0.29		ND
CT: Hartford	1.46	0.31	Tl208	3.0 4.8
DE: Wilmington	1.21	0.30	Be7	75 49
			Pb212	4.9 5.6
FL: Miami	0.67	0.27		ND
HI: Honolulu	1.63	0.33		ND
IA: Iowa City	1.70	0.33		ND
ME: Augusta	0.78	0.28		ND
MI: Lansing	1.62	0.33		ND
MN: Minneapolis	3.57	0.44		ND
MN: Welch	0.56	0.24		ND
NC: Charlotte	0.50	0.24		ND
NC: Wilmington	1.88	0.34		ND
NE: Lincoln	3.34	0.42	Pb212	6.0 4.9
NH: Concord	0.91	0.28		ND
NV: Las Vegas	3.97	0.48	Be7	54 54
NY: Albany	0.79	0.27	Pb212	7.2 8.6
			Tl208	3.0 5.1
NY: Yaphank	2.32	0.36	Be7	52 33
OH: Painesville	0.87	0.28		ND
OR: Portland	2.14	0.35		ND
PA: Harrisburg	2.72	0.40	Pb212	4.8 7.9
SC: Columbia	3.66	0.42		ND
TN: Knoxville	2.97	0.39		ND
TN: Nashville	2.33	0.36	Be7	77 53
TX: Austin	0.52	0.26		ND
UT: Salt Lake City	1.35	0.30		ND
VA: Lynchburg	2.88	0.41		ND
WI: Madison	0.73	0.27	Pb212	5.5 6.1

Note: ND = Not Detected

Table 6
Gross Beta and Specific Gamma in Precipitation
May 1998

Location	Gross Beta Activity		Specific Gamma Activity	
	pCi/L $\pm 2\sigma$		Nuclide	pCi/L $\pm 2\sigma$
AL: Montgomery	1.13	0.29	Pb212	7.6 6.7
AR: Little Rock	1.52	0.36		ND
CO: Denver	2.51	0.41		ND
CT: Hartford	0.75	0.26		ND
DE: Wilmington	1.78	0.33	Be7	34 37
			Pb212	4.3 7.1
FL: Miami	1.32	0.30		ND
HI: Honolulu	2.47	0.41		ND
IA: Iowa City	2.00	0.34	K40	19 35
ID: Boise	3.17	0.43		ND
ID: Idaho Falls	9.03	0.72	Pb212	9.7 6.9
			Tl208	2.7 4.1
ME: Augusta	1.26	0.31	Pb212	4.8 5.4
MI: Lansing	4.37	0.50	Pb212	8.7 6.5
			Tl208	2.8 3.9
MN: Minneapolis	1.42	0.31		ND
MN: Welch	3.99	0.46	Pb212	4.7 5.5
			Tl208	3.1 4.0
NC: Charlotte	1.95	0.35	Be7	53 31
NC: Wilmington	2.28	0.36	Be7	40 36
			Pb212	4.0 5.1
ND: Bismarck	2.18	0.37		ND
NE: Lincoln	1.70	0.32	K40	33 51
NH: Concord	3.45	0.43	Be7	76 51
NY: Albany	2.10	0.35		ND
NY: Yaphank	1.94	0.34		ND
OH: Painesville	4.82	0.50	Be7	135 52
OR: Portland	2.36	0.38		ND
PA: Harrisburg	2.06	0.40		ND
SC: Columbia	2.56	0.38	K40	26 39
TN: Knoxville	1.87	0.33	Tl208	2.4 3.8
TN: Nashville	1.85	0.34	Be7	50 45
UT: Salt Lake City	2.58	0.43		ND
WI: Madison	1.97	0.35	Pb212	5.9 6.1

Note: ND = Not Detected

Table 7
Gross Beta and Specific Gamma in Precipitation
June 1998

Location	Gross Beta Activity		Specific Gamma Activity	
	pCi/L $\pm 2\sigma$		Nuclide	pCi/L $\pm 2\sigma$
AL: Montgomery	1.64	0.32	Be7	39 29
AR: Little Rock	1.09	0.28	K40	99 33
			Pb212	6.2 7.9
CO: Denver	1.88	0.34		ND
CT: Hartford	2.54	0.38	Be7	61 31
DE: Wilmington	2.66	0.38	Be7	99 53
FL: Miami	0.67	0.25		ND
HI: Honolulu	1.38	0.32		ND
IA: Iowa City	1.69	0.35	Be7	42 31
ID: Boise	1.28	0.30		ND
ID: Idaho Falls	0.76	0.27		ND
ME: Augusta	2.52	0.37	Be7	39 30
MI: Lansing	1.48	0.32	Pb212	7.1 6.3
MN: Minneapolis	1.39	0.32		ND
MN: Welch	6.91	0.58	Be7	55 21
NC: Charlotte	3.22	0.43	Be7	88 41
NC: Wilmington	2.89	0.39	Be7	57 43
ND: Bismarck	1.50	0.32		ND
NE: Lincoln	2.76	0.39		ND
NH: Concord	2.51	0.38	Be7	53 34
			Bi212	34 38
NM: Santa Fe	1.88	0.35		ND
NY: Albany	2.12	0.35	Be7	87 51
			Pb212	4.6 5.7
NY: Yaphank	8.38	0.63		ND
OH: Painesville	2.56	0.37	Be7	81 33
OR: Portland	2.23	0.35	Be7	46 47
			K40	122 35
PA: Harrisburg	5.22	0.48	Be7	64 36
SC: Columbia	8.96	0.65		ND
TN: Knoxville	1.26	0.30	Be7	50 30
TN: Nashville	2.08	0.34	Be7	79 48
TX: Austin	4.74	0.50		ND
UT: Salt Lake City	1.74	0.33		ND
VA: Lynchburg	7.62	0.60		ND
WI: Madison	1.38	0.31		ND

Note: ND = Not Detected

Table 8
Tritium in Precipitation
April - June 1998

Location	April 1998		May 1998		June 1998	
	pCi/L $\pm 2u$		pCi/L $\pm 2u$		pCi/L $\pm 2u$	
AL: Montgomery	-7	79	29	78	-14	76
AR: Little Rock	-41	78	-43	79	11	77
AZ: Phoenix	-30	78	NS		NS	
CO: Denver	59	82	51	80	4	77
CT: Hartford	74	86	25	78	11	81
DE: Wilmington	28	84	14	77	-13	80
FL: Miami	-48	77	65	79	74	80
HI: Honolulu	16	80	16	82	18	78
IA: Iowa City	27	81	38	78	45	79
ID: Boise	NS		45	83	83	81
ID: Idaho Falls	NS		40	83	125	82
ME: Augusta	-15	82	14	77	-38	79
MI: Lansing	27	80	76	80	91	81
MN: Minneapolis	16	80	50	79	77	81
MN: Welch	30	81	88	81	43	79
NC: Charlotte	-16	81	72	80	-16	79
NC: Wilmington	13	82	106	81	16	81
ND: Bismarck	NS		14	82	29	78
NE: Lincoln	2	80	34	82	133	83
NH: Concord	-15	81	9	77	16	81
NM: Santa Fe	NS		NS		27	78
NV: Las Vegas	25	81	NS		NS	
NY: Albany	-50	80	57	79	24	83
NY: Yaphank	-37	80	38	78	-20	79
OH: Painesville	73	83	72	80	72	80
OR: Portland	-27	78	27	82	2	77
PA: Harrisburg	18	82	61	79	-48	81
SC: Columbia	22	81	70	80	5	79
TN: Knoxville	32	81	92	81	68	80
TN: Nashville	-66	77	29	78	70	80
TX: Austin	-29	78	NS		27	78
UT: Salt Lake City	57	82	25	82	68	80
VA: Lynchburg	-4	81	NS		-18	79
WI: Madison	25	81	67	80	29	78

Note: NS = No Sample

Plutonium and Uranium in Airborne Particulates and Precipitation

Environmental radiation levels of plutonium and uranium are determined by the analysis of annually composited samples (air filters) collected from the continuously operating airborne particulate samplers.

Concentrations of plutonium-238, combined plutonium-239 and 240, and uranium-234, 235, and 238 are determined by alpha spectrometry following chemical separation. The volume of air represented by the annual composite ranges from 120,000 to 500,000 cubic meters.

Plutonium and uranium results are published when they become available.

2. Water Program

The ERAMS water program provides data on radionuclide concentrations in the nation's rivers, streams, and drinking water supplies.

Surface Water

Quarterly grab samples are taken downstream from nuclear facilities in as many as 58 stations. Surface water samples are analyzed for tritium quarterly and gamma-emitting radionuclides annually. Tritium is a primary potential radioactive pollutant from nuclear power plants and weapons production activities.

Table 9
Tritium in Surface Water
April - June 1998

Location	Source	Date Collected	³ H pCi/L ± 2σ	
AL: Decatur	Tennessee River	04/08/98	-25	83
AL: Gordon	Chattahoochee River	04/13/98	-18	82
AL: Scottsboro	Tennessee River	04/07/98	61	86
AL: Scottsboro	Tennessee River	06/30/98	142	84
AR: Little Rock	Arkansas River	04/02/98	13	83
CA: Clay Station	Folsom S. Canal	04/21/98	4	83
CA: Eureka	Humboldt Bay	04/10/98	9	83
CO: Platteville	South Platte River	04/14/98	60	85
CT: E. Haddam	Connecticut River	06/22/98	12	82
CT: Waterford	Long Island Sound	06/24/98	-9	81
FL: Crystal River	Gulf Of Mexico	04/07/98	36	84
FL: Ft. Pierce	Atlantic Ocean	04/28/98	-22	81
GA: Baxley	Altamaha River	04/14/98	-60	80
IA: Cedar Rapids	Cedar River	04/06/98	22	85
ID: Buhl	Snake River	04/09/98	100	83
IL: Moline	Mississippi River	04/03/98	0	84
IL: Morris	Illinois River	04/29/98	-5	82
IL: Zion	Lake Michigan	06/30/98	46	79
KS: Le Roy	Neosho River	06/29/98	34	79
LA: New Orleans	Mississippi River	04/30/98	11	83
MA: Plymouth	Cape Cod Bay	04/06/98	5	84
MD: Conowingo	Susquehanna River	04/14/98	36	84
MD: Lusby	Chesapeake Bay	04/21/98	-20	81
ME: Wiscasset	Montseway Bay	04/08/98	-16	83
MI: Bridgman	Lake Michigan	04/06/98	450	100
MI: Charlevoix	Lake Michigan	04/04/98	97	88
MI: Monroe	Lake Erie	04/06/98	4	84
MI: S. Haven	Lake Michigan	04/06/98	177	90
MN: Monticello	Mississippi River	04/27/98	-32	81
MN: Red Wing	Mississippi River	04/20/98	-25	82
MS: Port Gibson	Mississippi River	04/07/98	11	84
NC: Charlotte	Catawba River	04/22/98	168	89
NC: Southport	Atlantic Ocean	04/23/98	-52	80
NV: Boulder City	Colorado River	04/30/98	-61	79
NY: Chelsea	Hudson River	04/13/98	67	86
NY: Oswego	Lake Ontario	06/15/98	165	89
OH: Toledo	Lake Erie	05/27/98	-34	80
OR: Bradwood	Columbia River	04/23/98	-13	82
PA: Danville	Susquehanna River	04/15/98	54	85
PA: Philadelphia	Schuylkill River - Belmont	04/22/98	117	87

Table 9 (continued)
Tritium in Surface Water
April - June 1998

Location	Source	Date Collected	³ H pCi/L ± 2 <i>u</i>	
PA: Philadelphia	Schuylkill River - Queen Lane	04/22/98	22	83
PA: Philadelphia	Delaware River - Baxter	04/22/98	-22	81
SC: Allendale	Savannah River	05/09/98	209	91
SC: Broad River	Broad River	05/05/98	58	85
SC: Hartsville	Lake Robinson	04/06/98	2080	150
TN: Daisy	Tennessee River	04/09/98	249	93
TN: Kingston	Clinch River	04/07/98	287	95
TX: Matagorda	Colorado River	04/15/98	2	84
VA: Doswell	North Anna River	04/01/98	2440	150
VA: Newport News	James River	04/24/98	87	86
VT: Vernon	Connecticut River	04/14/98	27	84
WA: Northport	Columbia River	04/29/98	2	82
WA: Richland	Columbia River	04/06/98	116	89
WI: Two Creeks	Lake Michigan	04/14/98	0	83
WI: Victory	Mississippi River	04/13/98	14	83
WV: Wheeling	Ohio River	04/01/98	55	86

Drinking Water

This program monitors ambient radiation levels in drinking water in as many as 78 sites. These data serve to assess trends and anomalies in concentrations, and to compare with standards set forth in the EPA "National Interim Primary Drinking Water Regulations." These regulations provide for approval of supplies when the combined radium-226 and radium-228 levels do not exceed 5 pCi/L, when the gross alpha (excluding radon and uranium) levels do not exceed 15 pCi/L, when tritium levels do not exceed 20,000 pCi/L, when the strontium-90 levels do not exceed 8 pCi/L, and when the gross beta levels do not exceed 50 pCi/L.

Grab samples are taken at the 78 sites which are either major population centers or selected nuclear facility environs.

The analyses include (a) tritium on a quarterly basis; (b) gross alpha, gross beta, strontium-90, and gamma on annual composites; (c) radium-226 if the gross alpha exceeds 2 pCi/L and radium-228 if the radium-226 falls between 3 and 5 pCi/L; (d) iodine-131 on one quarterly sample per year for each station; and (e) an annual composite for plutonium-238, combined plutonium-239 and 240, and uranium-234, 235, and 238 for stations that demonstrate gross alpha levels greater than 2 pCi/L.

Table 10
Tritium in Drinking Water
April - June 1998

Location	Date Collected	³ H pCi/L ± 2 <i>u</i>	
AK: Fairbanks	05/20/98	12	80
AL: Dothan	04/13/98	-54	77
AL: Montgomery	04/08/98	-33	83
AL: Muscle Shoals	04/08/98	-11	83
AL: Scottsboro	04/07/98	19	87
AL: Scottsboro	06/30/98	90	82
AR: Little Rock	04/07/98	30	81
CA: Berkeley	05/04/98	-34	79
CA: Los Angeles	04/02/98	3	85
CO: Denver	04/14/98	-5	82
CO: Platteville	04/14/98	72	85
CT: Hartford	04/03/98	2	84
DE: Dover	04/14/98	-47	80
FL: Tampa	04/13/98	18	81
GA: Baxley	04/14/98	-47	79
GA: Savannah	05/07/98	15	82
HI: Honolulu	04/01/98	-49	82
IA: Cedar Rapids	04/07/98	-98	84
ID: Boise	04/06/98	-29	83
ID: Idaho Falls	04/23/98	4	81
IL: Chicago	04/01/98	-33	83
IL: Morris	05/12/98	-4	80
KS: Topeka	04/02/98	-39	82
LA: New Orleans	04/03/98	-27	83
MA: Lawrence	05/20/98	13	81
MD: Baltimore	04/01/98	-2	84
MD: Conowingo	04/14/98	27	82
ME: Augusta	04/15/98	42	84
MI: Detroit	04/02/98	157	90
MI: Grand Rapids	04/17/98	22	82
MN: Minneapolis	05/04/98	-13	82
MN: Red Wing	04/20/98	-46	80
MO: Jefferson City	04/02/98	-12	84
MS: Jackson	04/08/98	-51	82
MS: Port Gibson	04/07/98	-53	82
MT: Helena	05/12/98	-18	80
NC: Charlotte	04/22/98	123	87
NC: Wilmington	04/23/98	43	83
ND: Bismarck	04/06/98	8	80
NE: Lincoln	04/06/98	-35	82

Table 10 (continued)
Tritium in Drinking Water
April - June 1998

Location	Date Collected	³ H pCi/L ± 2 <i>u</i>	
NH: Concord	04/09/98	-36	82
NM: Santa Fe	05/06/98	-5	80
NV: Las Vegas	04/01/98	0	84
NY: Albany	04/01/98	-58	82
NY: Niagara Falls	05/12/98	89	84
NY: Syracuse	05/14/98	80	83
OH: Cincinnati	06/08/98	32	81
OH: Columbus	06/24/98	-37	77
OH: E. Liverpool	06/03/98	58	82
OH: Painesville	04/02/98	122	89
OH: Toledo	05/27/98	53	82
OK: Oklahoma City	06/30/98	-18	79
OR: Portland	04/01/98	-71	81
PA: Columbia	04/16/98	22	82
PA: Harrisburg	04/16/98	-32	79
PA: Philadelphia - Belmont	04/22/98	81	85
PA: Philadelphia - Baxter	04/22/98	5	82
PA: Philadelphia - Queen Lane	04/22/98	25	82
PA: Pittsburgh	06/03/98	0	79
PC: Corozal	04/15/98	-43	79
RI: Providence	04/17/98	31	83
SC: Barnwell	04/03/98	-47	82
SC: Columbia	04/03/98	386	98
SC: Jenkinsville	04/10/98	96	83
SC: Seneca	04/07/98	18	81
TN: Chattanooga	04/03/98	168	91
TN: Knoxville	04/02/98	23	85
TN: Knoxville	06/30/98	37	79
TN: Oak Ridge - Anderson Co #768	06/30/98	-32	78
TN: Oak Ridge - Anderson Co #772	06/30/98	49	81
TN: Oak Ridge - Knox Co #371	06/30/98	-23	78
TN: Oak Ridge - Roane Co #360	06/30/98	24	78
TN: Oak Ridge - Roane Co #4442	06/30/98	129	83
TX: Austin	04/09/98	-65	81
VA: Doswell	05/26/98	-16	79
VA: Lynchburg	04/01/98	67	82
WA: Richland	04/06/98	129	89
WA: Seattle	04/01/98	-52	83
WI: Genoa	04/13/98	-40	80
WI: Madison	04/10/98	-33	82

3. Milk Program

Pasteurized Milk

Milk is a reliable indicator of the general population's intake of radionuclides since it is consumed fresh by a large segment of the population and can contain several of the biologically significant radionuclides that result from environmental releases from nuclear activities. A primary function of this program is to obtain reliable monitoring data relative to current radionuclide concentrations and determine any long-term trends.

Monthly samples are collected at approximately 55 sampling sites. The samples are composited, according to production, from the major milk suppliers representing more than 80 percent of the milk consumed in a given population center.

The samples are analyzed for gamma-emitting nuclides, including iodine-131, barium-140, cesium-137, and potassium-40. Total potassium concentrations in g/L are determined from potassium-40 activities assuming natural isotopic abundances. All samples collected in July are analyzed for strontium-90.

Iodine-131, barium-140, cesium-137, and potassium-40 are determined by gamma spectral analysis. Strontium-90 is determined by beta counting a total strontium precipitate that has been chemically separated by ion exchange.

Table 11
Radionuclides in Pasteurized Milk
April 1998

Location	Date Collected	K g/L $\pm 2u$		¹³⁷ Cs pCi/L $\pm 2u$		¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
AL: Montgomery	04/03/98	1.573	0.088	ND		ND	ND
AR: Little Rock	04/13/98	1.66	0.15	ND		ND	ND
CA: Los Angeles	04/21/98	1.561	0.089	ND		ND	ND
CA: Sacramento	04/06/98	1.597	0.081	ND		ND	ND
CA: San Francisco	04/13/98	1.585	0.091	ND		ND	ND
CT: Hartford	04/06/98	1.53	0.12	ND		ND	ND
DE: Wilmington	04/14/98	1.573	0.089	ND		ND	ND
FL: Tampa	04/06/98	1.597	0.048	3.4	1.5	ND	ND
GA: Atlanta	04/29/98	1.561	0.049	ND		ND	ND
HI: Honolulu	04/07/98	1.632	0.050	ND		ND	ND
IA: Des Moines	04/13/98	1.585	0.082	ND		ND	ND
IN: Indianapolis	04/06/98	1.692	0.049	ND		ND	ND
KS: Wichita	04/08/98	1.57	0.14	ND		ND	ND
KY: Louisville	04/08/98	1.50	0.15	ND		ND	ND
MA: Boston	04/06/98	1.55	0.12	ND		ND	ND
MD: Baltimore	04/03/98	1.680	0.081	ND		ND	ND
MD: Baltimore	04/29/98	1.644	0.049	ND		ND	ND
ME: Portland	04/03/98	1.632	0.049	ND		ND	ND
MI: Detroit	04/01/98	1.60	0.12	ND		ND	ND
MI: Grand Rapids	04/06/98	1.70	0.14	ND		ND	ND
MN: St. Paul	04/01/98	1.632	0.092	ND		ND	ND
MO: Kansas City	04/14/98	1.49	0.14	ND		ND	ND
MS: Jackson	04/06/98	1.561	0.089	ND		ND	ND
NJ: Trenton	04/03/98	1.680	0.050	ND		ND	ND
NM: Albuquerque	04/22/98	1.609	0.048	ND		ND	ND
NV: Las Vegas	04/13/98	1.54	0.12	ND		ND	ND
NY: Buffalo	04/09/98	1.644	0.049	ND		ND	ND
NY: Syracuse	04/07/98	1.656	0.049	ND		ND	ND
OH: Cincinnati	04/13/98	1.60	0.12	ND		ND	ND
OH: Cleveland	04/07/98	1.692	0.049	ND		ND	ND
OR: Portland	04/07/98	1.680	0.069	ND		ND	ND
PA: Philadelphia	04/06/98	1.644	0.049	ND		ND	ND
PA: Pittsburgh	04/06/98	1.632	0.049	ND		ND	ND
PR: San Juan	04/17/98	1.644	0.050	ND		ND	ND
SC: Charleston	04/20/98	1.48	0.10	ND		ND	ND
TN: Chattanooga	04/13/98	1.585	0.079	ND		ND	ND
TN: Knoxville	04/13/98	1.644	0.082	ND		ND	ND
TX: Ft. Worth	04/06/98	1.609	0.087	ND		ND	ND
VA: Norfolk	04/02/98	1.561	0.080	ND		ND	ND

Note: ND = Not Detected

Table 11 (continued)
Radionuclides in Pasteurized Milk
April 1998

Location	Date Collected	K g/L $\pm 2u$	¹³⁷ Cs pCi/L $\pm 2u$	¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
VT: Burlington	04/06/98	1.775 0.082	ND	ND	ND
WA: Seattle	04/06/98	1.632 0.092	ND	ND	ND
WA: Spokane	04/06/98	1.585 0.048	ND	ND	ND
WV: Charleston	04/06/98	1.48 0.12	ND	ND	ND

Note: ND = Not Detected

Table 12
Radionuclides in Pasteurized Milk
May 1998

Location	Date Collected	K g/L $\pm 2u$		¹³⁷ Cs pCi/L $\pm 2u$		¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
AL: Montgomery	05/07/98	1.549	0.088	ND		ND	ND
AR: Little Rock	05/04/98	1.656	0.092	ND		ND	ND
AZ: Phoenix	05/12/98	1.50	0.14	ND		ND	ND
CA: Los Angeles	05/05/98	1.740	0.094	ND		ND	ND
CA: Sacramento	05/07/98	1.67	0.15	ND		ND	ND
CA: San Francisco	05/06/98	1.62	0.10	ND		ND	ND
DE: Wilmington	05/19/98	1.680	0.082	ND		ND	ND
FL: Tampa	05/11/98	1.69	0.10	ND		ND	ND
GA: Atlanta	05/27/98	1.561	0.087	ND		ND	ND
HI: Honolulu	05/11/98	1.764	0.051	ND		ND	ND
IA: Des Moines	05/04/98	1.47	0.14	ND		ND	ND
IL: Chicago	05/08/98	1.54	0.12	ND		ND	ND
IN: Indianapolis	05/07/98	1.62	0.10	ND		ND	ND
KS: Wichita	05/12/98	1.597	0.088	ND		ND	ND
KY: Louisville	05/06/98	1.67	0.12	ND		ND	ND
MA: Boston	05/05/98	1.48	0.14	ND		ND	ND
ME: Portland	05/20/98	1.63	0.10	ND		ND	ND
MI: Detroit	05/15/98	1.656	0.093	ND		ND	ND
MI: Grand Rapids	05/04/98	1.53	0.12	ND		ND	ND
MN: St. Paul	05/04/98	1.621	0.092	ND		ND	ND
MO: Kansas City	05/12/98	1.58	0.12	ND		ND	ND
MS: Jackson	05/04/98	1.597	0.048	ND		ND	ND
NC: Charlotte	05/28/98	1.549	0.087	ND		ND	ND
NJ: Trenton	05/11/98	1.454	0.085	ND		ND	ND
NM: Albuquerque	05/11/98	1.60	0.12	ND		ND	ND
NY: Buffalo	05/07/98	1.680	0.079	ND		ND	ND
NY: Syracuse	05/11/98	1.501	0.087	ND		ND	ND
OH: Cincinnati	05/19/98	1.56	0.12	ND		ND	ND
OH: Cleveland	05/04/98	1.668	0.093	ND		ND	ND
OR: Portland	05/08/98	1.49	0.14	ND		ND	ND
PA: Philadelphia	05/05/98	1.63	0.10	ND		ND	ND
PA: Pittsburgh	05/04/98	1.632	0.092	ND		ND	ND
PC: Cristobal	05/05/98	1.764	0.091	8.9	3.1	ND	ND
PR: San Juan	05/19/98	1.63	0.14	ND		ND	ND
SC: Charleston	05/06/98	1.66	0.12	ND		ND	ND
TN: Chattanooga	05/05/98	1.69	0.14	ND		ND	ND
TN: Knoxville	05/04/98	1.621	0.048	ND		ND	ND
TN: Memphis	05/29/98	1.53	0.12	ND		ND	ND
VA: Norfolk	05/11/98	1.51	0.14	ND		ND	ND

Note: ND = Not Detected

Table 12 (continued)
Radionuclides in Pasteurized Milk
May 1998

Location	Date Collected	K g/L $\pm 2u$		¹³⁷ Cs pCi/L $\pm 2u$	¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
VT: Burlington	05/21/98	1.561	0.090	ND	ND	ND
WA: Seattle	05/05/98	1.69	0.10	ND	ND	ND
WA: Spokane	05/05/98	1.668	0.092	ND	ND	ND
WV: Charleston	05/04/98	1.48	0.12	ND	ND	ND

Note: ND = Not Detected

Table 13
Radionuclides in Pasteurized Milk
June 1998

Location	Date Collected	K g/L $\pm 2u$		¹³⁷ Cs pCi/L $\pm 2u$		¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
AL: Montgomery	06/04/98	1.597	0.048	ND		ND	ND
AR: Little Rock	06/03/98	1.621	0.049	ND		ND	ND
CA: Los Angeles	06/04/98	1.632	0.080	ND		ND	ND
CA: Sacramento	06/15/98	1.644	0.049	ND		ND	ND
CA: San Francisco	06/04/98	1.632	0.049	ND		ND	ND
CT: Hartford	06/05/98	1.621	0.049	ND		ND	ND
DE: Wilmington	06/16/98	1.621	0.049	ND		ND	ND
FL: Tampa	06/04/98	1.632	0.048	2.7	1.5	ND	ND
GA: Atlanta	06/22/98	1.644	0.050	ND		ND	ND
HI: Honolulu	06/05/98	1.704	0.050	ND		ND	ND
IA: Des Moines	06/09/98	1.597	0.089	ND		ND	ND
IL: Chicago	06/04/98	1.55	0.10	ND		ND	ND
IN: Indianapolis	06/08/98	1.656	0.049	ND		ND	ND
KS: Wichita	06/09/98	1.668	0.050	ND		ND	ND
KY: Louisville	06/01/98	1.668	0.089	ND		ND	ND
MA: Boston	06/09/98	1.609	0.089	ND		ND	ND
MD: Baltimore	06/05/98	1.656	0.049	ND		ND	ND
ME: Portland	06/16/98	1.644	0.049	ND		ND	ND
MI: Detroit	06/02/98	1.680	0.049	ND		ND	ND
MI: Grand Rapids	06/08/98	1.668	0.049	ND		ND	ND
MN: St. Paul	06/01/98	1.644	0.090	ND		ND	ND
MO: Kansas City	06/03/98	1.609	0.048	ND		ND	ND
MS: Jackson	06/03/98	1.537	0.088	ND		ND	ND
NC: Charlotte	06/18/98	1.621	0.048	ND		ND	ND
NJ: Trenton	06/24/98	1.632	0.049	ND		ND	ND
NV: Las Vegas	06/29/98	1.64	0.14	ND		ND	ND
NY: Buffalo	06/08/98	1.716	0.049	ND		ND	ND
NY: Syracuse	06/11/98	1.656	0.080	ND		ND	ND
OH: Cincinnati	06/22/98	1.573	0.048	ND		ND	ND
OH: Cleveland	06/15/98	1.692	0.050	ND		ND	ND
OR: Portland	06/09/98	1.716	0.050	ND		ND	ND
PA: Philadelphia	06/03/98	1.656	0.049	ND		ND	ND
PA: Pittsburgh	06/08/98	1.656	0.049	ND		ND	ND
PC: Cristobal	06/12/98	1.597	0.049	3.4	1.6	ND	ND
PR: San Juan	06/19/98	1.644	0.049	ND		ND	ND
SC: Charleston	06/10/98	1.61	0.10	ND		ND	ND
TN: Chattanooga	06/02/98	1.53	0.14	ND		ND	ND
TN: Knoxville	06/01/98	1.64	0.10	ND		ND	ND
TN: Memphis	06/29/98	1.644	0.049	ND		ND	ND

Note: ND = Not Detected

Table 13 (continued)
Radionuclides in Pasteurized Milk
June 1998

Location	Date Collected	K g/L $\pm 2u$		¹³⁷ Cs pCi/L $\pm 2u$	¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
TX: Austin	06/03/98	1.573	0.081	ND	ND	ND
TX: Austin	06/05/98	1.644	0.094	ND	ND	ND
TX: Ft. Worth	06/08/98	1.573	0.081	ND	ND	ND
VA: Norfolk	06/04/98	1.680	0.049	ND	ND	ND
VT: Burlington	06/16/98	1.621	0.049	ND	ND	ND
WA: Seattle	06/02/98	1.668	0.050	ND	ND	ND
WA: Spokane	06/15/98	1.644	0.049	ND	ND	ND
WV: Charleston	06/01/98	1.597	0.089	ND	ND	ND

Note: ND = Not Detected

(This page intentionally left blank)

For More Information

Environmental Radiation Data (ERD) is published quarterly by the U.S. Environmental Protection Agency's Office of Radiation and Indoor Air.

Requests for information concerning the operation of ERAMS and the data that are generated should be directed as follows:

For System Operations– For Analytical Information and Data–

Rhonda Sears John Griggs
National Air and Radiation Environmental National Air and Radiation Environmental
Laboratory Laboratory
540 South Morris Avenue 540 South Morris Avenue
Montgomery, Alabama 36115-2601 Montgomery, Alabama 36115-2601
e-mail: sears.rhonda@epa.gov e-mail: griggs.john@epa.gov

Requests for information concerning publication and distribution of ERD should be directed to:

Charles M. Petko
Office of the Director
National Air and Radiation Environmental Laboratory
540 South Morris Avenue
Montgomery, Alabama 36115-2601
e-mail: petko.charles@epa.gov

Requests for information concerning policies of the Office of Radiation and Indoor Air should be directed to:

William C. Conklin
USEPA - ORIA
Center for Emergency Preparedness and Clean Materials
Radiation Protection Division (MC66085)
501 Third Street, N.W.
Washington, DC 20001
e-mail: conklin.craig@epa.gov

(This page intentionally left blank)

Contents

Page	
List of Tables	v
Preface	vii
Acknowledgments	ix
Data Reporting Conventions	xi
1. Air Program	1
Airborne Particulates and Precipitation	1
Plutonium and Uranium in Airborne Particulates and Precipitation	12
2. Water Program	13
Surface Water	13
Drinking Water	16
3. Milk Program	19
Pasteurized Milk	19

(This page intentionally left blank)

List of Tables

Table	Page
1 Reporting Units and Minimum Detectable Concentrations	xiii
2 Gross Beta in Airborne Particulates: April 1998	2
3 Gross Beta in Airborne Particulates: May 1998	4
4 Gross Beta in Airborne Particulates: June 1998	6
5 Gross Beta and Specific Gamma in Precipitation: April 1998	8
6 Gross Beta and Specific Gamma in Precipitation: May 1998	9
7 Gross Beta and Specific Gamma in Precipitation: June 1998	10
8 Tritium in Precipitation: April - June 1998	11
9 Tritium in Surface Water: April - June 1998	14
10 Tritium in Drinking Water: April - June 1998	17
11 Radionuclides in Pasteurized Milk: April 1998	20
12 Radionuclides in Pasteurized Milk: May 1998	22
13 Radionuclides in Pasteurized Milk: June 1998	24

(This page intentionally left blank)