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ENVIRONMENTAL RADIATION DATA

REPORT 77

January–March 1994

United States Environmental Protection Agency

Office of Radiation and Indoor Air

Preface

Environmental Radiation Data (ERD) is compiled and distributed 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). Data from similar networks operated by contributing States, Canada, Mexico, and the Pan American Health Organization are reported in the ERD when available.

ERAMS was established in 1973 by the United States Environmental Protection Agency. It is comprised of a nationwide network of sampling stations that provide air, surface and drinking water, and milk samples from which environmental radiation levels are derived. The major emphasis for ERAMS is upon identifying trends in the accumulation of long-lived radionuclides in the environment.

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 levels, gamma analyses for fission products, and 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).

Data Reporting Rationale

Frequently, there is little or no radioactivity in environmental media. Thus, the results of laboratory analyses should show a distribution of negative and positive numbers about zero. A negative value occurs when a previously determined background value is subtracted from a sample value that is less than that of the background. From July 1975 to March 1991, ERAMS data were reported as calculated, whether the results were negative, zero, or positive. Since April 1991, negative results have been denoted as "not detectable," or "ND." For gamma analyses only, results less than the 2σ counting error are also denoted as "not detectable."

All data are stored in the NAREL sample database as generated, and these values are available for statistical evaluation. However, caution should be exercised in the use of the data in this report for statistical analysis, since the removal of negative numbers produces a positive bias in the distribution of results.

Reported Error Terms

Each reported value for specific analyses will be accompanied by a counting error term at the 2σ (95%) confidence level. Error terms are therefore reported as counting errors. At the very low levels characteristic of most ERAMS measurements, counting error is the greatest contributor to overall error.

Significant Figures

No more than three significant figures will be reported. A datum that contains more than three figures will be rounded off to three figures.

Reporting Levels

The reporting units, smallest increments for reporting, and routine minimum detectable concentrations (MDCs) for each isotope 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. Reporting increments are sometimes considerably smaller than MDCs to avoid truncation errors in averaging.

Averages

Averages will be calculated along with appropriate error terms in an annual summary and analysis of ERAMS data. In calculating these averages, all values of individual data, including negative numbers, will be utilized. Averages will not be included in ERD quarterly reports.

Table 1

ERAMS Reporting Increments and Minimum Detectable Concentrations for Radionuclide Analyses

Radionuclide	Media	Reporting Units	Reporting Increments	Minimum Detectable Concentrations
Gross Alpha	Water	pCi/L	1 pCi/L	2 pCi/L
† Gross Beta	Air	pCi/m^3	0.01 pCi/m^3	0.0015 pCi/m^3
	Water	pCi/L	1 pCi/L	2 pCi/L
	Precipitation	nCi/m^2	0.01 nCi/m^2	0.005 nCi/m^2
	(specific radiochemical analyses)			
Tritium	Water	nCi/L	0.1 nCi/L	0.15 nCi/L
	Milk	nCi/L	0.1 nCi/L	0.15 nCi/L
†† Plutonium-238,239/240	Air	aCi/m^3	0.1 aCi/m^3	1.5 aCi/m^3
	Water	pCi/L	0.001 pCi/L	0.1 pCi/L
‡ Uranium-234,235,238	Air	aCi/m^3	0.1 aCi/m^3	1.5 aCi/m^3
	Water	pCi/L	0.001 pCi/L	0.1 pCi/L
Radium-226	Water	pCi/L	0.1 pCi/L	0.02 pCi/L
Strontium-90	Milk	pCi/L	0.1 pCi/L	2 pCi/L
	Water	pCi/L	0.1 pCi/L	1 pCi/L
‡‡ Iodine-131	Milk (gamma)	pCi/L	1 pCi/L	4 pCi/L
	Water (gamma)	pCi/L	1 pCi/L	4 pCi/L
	Water	pCi/L	0.1 pCi/L	0.3 pCi/L
Cesium-137	Milk	pCi/L	1 pCi/L	5 pCi/L
	Water	pCi/L	1 pCi/L	5 pCi/L
‡‡ Barium-140	Milk	pCi/L	1 pCi/L	15 pCi/L
	Water	pCi/L	1 pCi/L	15 pCi/L
Potassium	Milk	g/L	0.1 g/L	0.06 g/L
	Water	g/L	0.1 g/L	0.06 g/L
Potassium-40	Water	pCi/L	1 pCi/L	50 pCi/L

† The MDC for precipitation is based on the assumption of 1 cm of precipitation.

†† The MDC for air is based on an assumed total sample volume of 60,000 m^3. Measurement by alpha spectroscopy includes contributions of plutonium-239 and plutonium-240.

‡ The MDC for air is based on an assumed total sample volume of 60,000 m^3.

‡‡ Activity as of the day of counting.

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 and 29 hours after collection to allow for radon and thoron daughter product decay. 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 $1\,\mathrm{pCi/m^3}$. 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 those 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 composite of the March, April, and May precipitation samples is analyzed for plutonium-238, -239, -240, and uranium-234, -235, and -238.

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

Tables 2–4 contain the data from airborne particulate samples for January–March 1994. Tables 5–7 contain the data from precipitation samples for January–March 1994. Table 8 contains the data from tritium in precipitation samples for January–March 1994 at the selected sites.

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† The counts at five hours for the Montgomery, Alabama, station are performed on a low background beta counter.

Table 2

Gross Beta in Airborne Particulates

January 1994

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
AK:Juneau	7	0.0	0.0	0.0	0.02	0.00	0.01
AL:Montgomery	9	0.6	0.1	0.2	0.11	0.01	0.02
AR:Little Rock	9	0.2	0.1	0.1	0.02	0.01	0.02
AZ:Phoenix	3	1.3	0.5	0.8	0.03	0.02	0.02
CA:Berkeley	8	4.9	0.0	0.7	0.04	0.00	0.02
CA:Los Angeles	8	0.3	0.0	0.2	0.02	0.01	0.02
CO:Denver	9	1.3	0.2	0.6	0.02	0.01	0.01
CT:Hartford	9	0.0	0.0	0.0	0.02	0.01	0.01
DE:Wilmington	8	0.1	0.0	0.1	0.02	0.01	0.01
FL:Jacksonville	5	0.1	0.0	0.0	0.01	0.00	0.01
FL:Miami	9	0.1	0.0	0.0	0.01	0.00	0.01
HI:Honolulu	5	0.2	0.1	0.1	0.00	0.00	0.00
IA:Iowa City	9	0.1	0.0	0.1	0.04	0.02	0.02
ID:Boise	8	0.3	0.1	0.2	0.03	0.00	0.01
ID:Idaho Falls	9	0.0	0.0	0.0	0.02	0.01	0.01
IL:Chicago	6	0.4	0.0	0.1	0.02	0.02	0.02
IN:Indianapolis	8	0.2	0.0	0.1	0.03	0.01	0.02
KS:Topeka	9	2.0	0.2	0.9	0.03	0.01	0.02
KY:Frankfort	4	0.0	0.0	0.0	0.02	0.01	0.02
LA:New Orleans	6	0.2	0.1	0.1	0.02	0.01	0.01
MA:Lawrence	2	0.0	0.0	0.0	0.01	0.01	0.01
ME:Augusta	6	0.0	0.0	0.0	0.02	0.01	0.01
MI:Lansing	9	0.1	0.0	0.0	0.02	0.00	0.01
MN:Minneapolis	4	0.1	0.0	0.1	0.04	0.02	0.03
MO:Jefferson City	8	0.5	0.1	0.3	0.03	0.01	0.02
MS:Jackson	8	0.1	0.0	0.1	0.03	0.01	0.01
NC:Charlotte	6	0.1	0.0	0.0	0.03	0.01	0.01
NC:Wilmington	5	0.0	0.0	0.0	0.02	0.01	0.01
ND:Bismarck	5	0.0	0.0	0.0	0.03	0.02	0.02
NE:Lincoln	3	1.0	0.0	0.5	0.03	0.01	0.02
NH:Concord	8	0.1	0.0	0.0	0.02	0.01	0.01
NJ:Trenton	6	0.1	0.0	0.0	0.02	0.01	0.01
NM:Santa Fe	7	0.7	0.2	0.4	0.02	0.00	0.01
NV:Las Vegas	9	0.4	0.1	0.2	0.03	0.01	0.02
NY:Albany	4	0.0	0.0	0.0	0.03	0.01	0.02
NY:Niagara Falls	8	0.1	0.0	0.0	0.02	0.01	0.02
NY:Syracuse	2	0.0	0.0	0.0	0.01	0.01	0.01

Table 2 (continued)

Gross Beta in Airborne Particulates

January 1994

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
NY:Yaphank	8	0.1	0.0	0.1	0.02	0.01	0.02
OH:Columbus	5	0.2	0.1	0.1	0.02	0.01	0.01
OH:Painesville	8	0.1	0.0	0.0	0.02	0.01	0.02
OH:Ross	8	0.0	0.0	0.0	0.02	0.01	0.01
OH:Toledo	9	0.1	0.0	0.1	0.02	0.01	0.02
OR:Portland	8	0.0	0.0	0.0	0.02	0.00	0.01
PA:Harrisburg	7	0.1	0.0	0.0	0.02	0.01	0.01
PA:Pittsburgh	8	0.0	0.0	0.0	0.02	0.01	0.01
SC:Barnwell	2	0.1	0.0	0.1	0.04	0.01	0.03
SC:Columbia	8	0.3	0.0	0.1	0.04	0.01	0.02
SD:Pierre	8	0.7	0.0	0.2	0.04	0.02	0.03
TN:Knoxville	1	0.2	0.2	0.2	0.02	0.02	0.02
TN:Nashville	8	0.1	0.0	0.1	0.03	0.01	0.02
TX:Austin	8	0.3	0.0	0.2	0.02	0.01	0.01
TX:El Paso	9	1.9	0.5	1.1	0.03	0.01	0.02
UT:Salt Lake City	9	0.5	0.0	0.2	0.03	0.01	0.01
VA:Lynchburg	9	0.3	0.1	0.1	0.02	0.01	0.01
VA:Virginia Beach	3	0.1	0.0	0.1	0.02	0.01	0.01
WA:Olympia	1	0.2	0.2	0.2	0.01	0.01	0.01
WA:Spokane	9	0.3	0.1	0.2	0.04	0.00	0.02
WI:Madison	9	0.1	0.0	0.1	0.03	0.01	0.02

Minimum Detectable Concentration for field estimates – 0.1 pCi/m^3.

Table 3

Gross Beta in Airborne Particulates

February 1994

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
AK:Juneau	9	0.0	0.0	0.0	0.02	0.00	0.01
AL:Montgomery	8	0.6	0.1	0.3	0.02	0.01	0.01
AR:Little Rock	8	0.6	0.1	0.2	0.03	0.01	0.02
AZ:Phoenix	4	0.7	0.4	0.5	0.02	0.01	0.01
CA:Berkeley	8	0.3	0.0	0.1	0.03	0.00	0.01
CA:Los Angeles	8	0.3	0.0	0.1	0.02	0.00	0.01
CO:Denver	8	0.8	0.2	0.4	0.02	0.01	0.01
CT:Hartford	8	0.1	0.0	0.0	0.02	0.01	0.01
DE:Wilmington	7	0.1	0.0	0.0	0.02	0.01	0.01
FL:Jacksonville	8	0.1	0.0	0.1	0.01	0.00	0.01
FL:Miami	8	0.1	0.0	0.0	0.01	0.00	0.01
HI:Honolulu	5	0.2	0.1	0.1	0.00	0.00	0.00
IA:Iowa City	8	0.1	0.0	0.0	0.02	0.01	0.02
ID:Boise	8	0.4	0.0	0.2	0.03	0.00	0.01
ID:Idaho Falls	8	0.0	0.0	0.0	0.03	0.00	0.01
IL:Chicago	5	0.1	0.0	0.0	0.02	0.01	0.02
IN:Indianapolis	8	0.1	0.0	0.1	0.02	0.01	0.02
KS:Topeka	8	1.0	0.3	0.6	0.03	0.01	0.02
KY:Frankfort	3	0.1	0.0	0.1	0.02	0.01	0.01
LA:New Orleans	4	0.2	0.1	0.2	0.01	0.01	0.01
MA:Lawrence	3	0.0	0.0	0.0	0.01	0.01	0.01
ME:Augusta	7	0.1	0.0	0.0	0.02	0.01	0.01
MI:Lansing	8	0.0	0.0	0.0	0.02	0.01	0.01
MN:Minneapolis	4	0.1	0.0	0.1	0.03	0.02	0.02
MO:Jefferson City	8	0.3	0.1	0.2	0.02	0.01	0.01
MS:Jackson	8	0.3	0.0	0.1	0.02	0.00	0.01
NC:Charlotte	8	0.1	0.0	0.1	0.02	0.01	0.01
NC:Wilmington	4	0.0	0.0	0.0	0.01	0.00	0.01
ND:Bismarck	7	0.0	0.0	0.0	0.03	0.01	0.02
NH:Concord	8	0.0	0.0	0.0	0.02	0.01	0.01
NJ:Trenton	8	0.0	0.0	0.0	0.02	0.01	0.02
NM:Santa Fe	6	0.3	0.1	0.2	0.02	0.01	0.01
NV:Las Vegas	8	0.4	0.1	0.2	0.03	0.00	0.01
NY:Albany	4	0.1	0.0	0.0	0.02	0.01	0.01
NY:Niagara Falls	8	0.2	0.0	0.1	0.02	0.01	0.01
NY:Syracuse	2	0.0	0.0	0.0	0.01	0.01	0.01
NY:Yaphank	8	0.1	0.0	0.1	0.02	0.01	0.01

Table 3 (continued)

Gross Beta in Airborne Particulates

February 1994

Location	Number of Samples	5-Hour Field Estimate Max (pCi/m^3)	5-Hour Field Estimate Min (pCi/m^3)	5-Hour Field Estimate Avg (pCi/m^3)	NAREL Lab Measurement Max (pCi/m^3)	NAREL Lab Measurement Min (pCi/m^3)	NAREL Lab Measurement Avg (pCi/m^3)
OH:Columbus	3	0.1	0.0	0.0	0.01	0.01	0.01
OH:Painesville	8	0.1	0.0	0.0	0.02	0.01	0.01
OH:Ross	9	0.0	0.0	0.0	0.03	0.01	0.02
OH:Toledo	8	0.1	0.0	0.0	0.02	0.01	0.01
OR:Portland	8	0.0	0.0	0.0	0.02	0.00	0.01
PA:Harrisburg	6	0.1	0.0	0.1	0.02	0.01	0.01
PA:Pittsburgh	8	0.1	0.1	0.1	0.02	0.01	0.01
SC:Barnwell	2	0.0	0.0	0.0	0.01	0.01	0.01
SC:Columbia	9	0.3	0.1	0.2	0.03	0.01	0.01
SD:Pierre	8	0.2	0.1	0.1	0.03	0.01	0.02
TN:Knoxville	1	0.0	0.0	0.0	0.01	0.01	0.01
TN:Nashville	8	0.4	0.0	0.2	0.03	0.01	0.02
TX:El Paso	7	2.1	0.4	1.1	0.03	0.01	0.02
UT:Salt Lake City	8	0.2	0.0	0.1	0.03	0.00	0.01
VA:Lynchburg	8	0.5	0.1	0.2	0.02	0.01	0.01
VA:Virginia Beach	2	0.1	0.0	0.1	0.01	0.01	0.01
WA:Olympia	8	0.2	0.0	0.0	0.02	0.00	0.00
WA:Spokane	8	0.2	0.0	0.1	0.04	0.00	0.02
WI:Madison	8	0.1	0.0	0.1	0.02	0.01	0.01

Minimum Detectable Concentration for field estimates – 0.1 pCi/m^3.

Table 4

Gross Beta in Airborne Particulates

March 1994

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
AK:Juneau	9	0.0	0.0	0.0	0.02	0.00	0.00
AL:Montgomery	9	0.3	0.0	0.2	0.01	0.01	0.01
AR:Little Rock	7	0.4	0.1	0.2	0.01	0.01	0.01
AZ:Phoenix	5	0.7	0.3	0.6	0.02	0.01	0.01
CA:Berkeley	9	0.1	0.0	0.1	0.01	0.00	0.01
CA:Los Angeles	9	0.2	0.0	0.1	0.01	0.01	0.01
CO:Denver	9	0.7	0.2	0.4	0.01	0.01	0.01
CT:Hartford	9	0.1	0.0	0.0	0.01	0.01	0.01
DE:Wilmington	10	0.2	0.0	0.1	0.01	0.01	0.01
FL:Jacksonville	9	0.1	0.0	0.1	0.01	0.01	0.01
FL:Miami	7	0.1	0.0	0.0	0.01	0.01	0.01
HI:Honolulu	9	0.2	0.1	0.1	0.01	0.00	0.00
IA:Iowa City	9	0.2	0.0	0.1	0.02	0.01	0.01
ID:Boise	9	0.6	0.2	0.4	0.01	0.01	0.01
ID:Idaho Falls	9	0.0	0.0	0.0	0.01	0.01	0.01
IL:Chicago	9	0.6	0.0	0.2	0.02	0.01	0.02
IN:Indianapolis	9	0.2	0.1	0.1	0.02	0.01	0.02
KS:Topeka	9	1.5	0.4	1.0	0.02	0.01	0.01
KY:Frankfort	4	0.1	0.1	0.1	0.01	0.01	0.01
LA:New Orleans	6	0.3	0.1	0.2	0.02	0.01	0.01
MA:Lawrence	2	0.0	0.0	0.0	0.01	0.01	0.01
ME:Augusta	7	0.1	0.0	0.0	0.02	0.00	0.01
MI:Lansing	9	0.2	0.0	0.1	0.02	0.00	0.01
MN:Minneapolis	5	0.1	0.0	0.1	0.02	0.01	0.01
MO:Jefferson City	9	0.6	0.1	0.3	0.02	0.01	0.01
MS:Jackson	9	0.3	0.1	0.2	0.02	0.01	0.01
NC:Charlotte	5	0.1	0.0	0.1	0.01	0.00	0.01
NC:Wilmington	3	0.0	0.0	0.0	0.01	0.01	0.01
ND:Bismarck	9	0.3	0.0	0.2	0.02	0.00	0.01
NH:Concord	9	0.1	0.0	0.0	0.01	0.00	0.01
NJ:Trenton	9	0.3	0.0	0.1	0.02	0.01	0.01
NM:Santa Fe	8	0.3	0.0	0.2	0.01	0.01	0.01
NV:Las Vegas	9	0.3	0.1	0.2	0.02	0.01	0.01
NY:Albany	5	0.2	0.0	0.1	0.02	0.01	0.01
NY:Niagara Falls	9	0.1	0.0	0.1	0.02	0.01	0.01
NY:Syracuse	5	0.1	0.0	0.0	0.01	0.01	0.01
NY:Yaphank	9	0.2	0.0	0.1	0.01	0.01	0.01

Table 4 (continued)

Gross Beta in Airborne Particulates

March 1994

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
OH:Columbus	5	0.1	0.0	0.1	0.01	0.00	0.01
OH:Painesville	9	0.2	0.1	0.1	0.02	0.01	0.01
OH:Ross	9	0.0	0.0	0.0	0.02	0.01	0.02
OH:Toledo	9	0.3	0.0	0.1	0.02	0.01	0.01
OR:Portland	7	0.0	0.0	0.0	0.01	0.00	0.01
PA:Harrisburg	9	0.2	0.0	0.1	0.02	0.01	0.01
PA:Pittsburgh	8	0.1	0.0	0.0	0.01	0.01	0.01
SC:Barnwell	1	0.0	0.0	0.0	0.01	0.01	0.01
SC:Columbia	8	0.2	0.0	0.1	0.02	0.01	0.01
SD:Pierre	7	0.6	0.1	0.3	0.02	0.01	0.01
TN:Knoxville	3	0.3	0.0	0.2	0.02	0.00	0.01
TN:Nashville	10	0.2	0.1	0.2	0.02	0.01	0.01
TX:El Paso	10	2.3	0.1	1.0	0.02	0.01	0.01
UT:Salt Lake City	9	0.5	0.1	0.2	0.02	0.01	0.01
VA:Lynchburg	9	0.2	0.1	0.1	0.01	0.01	0.01
VA:Virginia Beach	4	0.1	0.1	0.1	0.01	0.01	0.01
WA:Olympia	6	0.2	0.0	0.1	0.01	0.00	0.00
WA:Spokane	9	0.4	0.1	0.3	0.01	0.00	0.01
WI:Madison	9	0.5	0.0	0.2	0.02	0.01	0.01

Minimum Detectable Concentration for field estimates – 0.1 pCi/m^3.

Table 5

Gross Beta and Specific Gamma in Precipitation

January 1994

Location	Depth (mm)	Gross Beta Activity nCi/m^2	$\pm 2\sigma$	Specific Gamma Activity pCi/L $\pm 2\sigma$
AL:Montgomery	95.0	0.34	0.04	^{7}Be: 82.3±46.1
AR:Little Rock	121.0	0.26	0.04	^{7}Be: 79.9±35.9
CA:Berkeley	71.8	0.04	0.02	ND
CO:Denver	6.0	0.02	0.00	^{7}Be: 138±29
FL:Jacksonville	245.2	0.17	0.07	^{40}K: 39.8±33.1
FL:Miami	85.2	0.15	0.03	ND
HI:Honolulu	45.0	0.11	0.02	ND
ID:Boise	45.0	0.05	0.01	ND
ID:Idaho Falls	0.0	0.00	0.00	ND
IL:Chicago	43.4	0.18	0.02	ND
LA:New Orleans	54.0	0.04	0.02	ND
MO:Jefferson City	21.0	0.03	0.01	ND
MS:Jackson	39.0	0.01	0.01	^{40}K: 57.2±23.5
NC:Charlotte	118.0	0.24	0.04	^{7}Be: 77.4±31.4
NC:Wilmington	63.0	0.05	0.02	ND
ND:Bismarck	3.4	0.01	0.00	^{7}Be: 28.8±24.0
NJ:Trenton	94.4	0.22	0.04	ND
NY:Albany	26.6	0.07	0.01	^{7}Be: 51.1±32.3
OH:Painesville	30.4	0.12	0.01	^{7}Be: 94.2±38.9
OH:Toledo	75.6	0.05	0.02	^{7}Be: 42.0±24.2
OR:Portland	32.0	0.03	0.01	^{7}Be: 47.3±23.8
PA:Harrisburg	132.4	0.30	0.05	^{7}Be: 34.2±27.6
SC:Barnwell	140.4	0.27	0.05	^{7}Be: 28.6±27.7
SC:Columbia	110.2	0.17	0.04	^{7}Be: 38.5±22.6
TN:Knoxville	10.0	0.04	0.00	^{7}Be: 68.2±26.7
TN:Nashville	86.6	0.12	0.03	ND
TX:Austin	40.0	0.07	0.01	^{7}Be: 63.0±23.1
UT:Salt Lake City	17.0	0.01	0.01	ND
VA:Lynchburg	99.0	0.08	0.03	ND
WA:Olympia	96.0	0.05	0.02	^{7}Be: 34.5±25.2
WI:Madison	55.0	0.27	0.03	ND

Note: σ = Counting Error. ND = Not Detectable.

Table 6

Gross Beta and Specific Gamma in Precipitation

February 1994

Location	Depth (mm)	Gross Beta Activity nCi/m^2	$\pm 2\sigma$	Specific Gamma Activity pCi/L	$\pm 2\sigma$
AL:Montgomery	88.4	0.08	0.03	ND	
AR:Little Rock	67.0	0.10	0.02	^{7}Be: 36.7	33.1
AZ:Phoenix	24.0	0.02	0.01	ND	
CA:Berkeley	125.2	0.05	0.03	ND	
CO:Denver	11.4	0.05	0.01	^{7}Be: 35.6	34.4
CT:Hartford	40.0	0.05	0.01	ND	
FL:Jacksonville	23.2	0.03	0.01	ND	
FL:Miami	91.8	0.05	0.03	ND	
HI:Honolulu	47.0	0.09	0.02	ND	
ID:Boise	20.0	0.06	0.01	ND	
IL:Chicago	13.8	0.01	0.00	ND	
LA:New Orleans	46.0	0.05	0.01	^{7}Be: 52.2	34.0
MN:Minneapolis	5.0	0.01	0.00	ND	
MO:Jefferson City	41.0	0.05	0.01	ND	
NC:Charlotte	63.0	0.18	0.03	^{7}Be: 82.7	31.9
NC:Wilmington	78.0	0.12	0.03	ND	
ND:Bismarck	9.4	0.03	0.00	ND	
NJ:Trenton	53.8	0.11	0.02	ND	
NM:Santa Fe	14.0	0.02	0.01	ND	
NV:Las Vegas	14.6	0.03	0.01	ND	
NY:Albany	14.4	0.01	0.00	ND	
NY:Niagara Falls	14.0	0.07	0.01	^{7}Be: 153	34
OH:Painesville	8.6	0.03	0.00	^{7}Be: 79.5	35.1
OH:Toledo	12.0	0.01	0.00	ND	
OR:Portland	109.0	0.13	0.03	ND	
PA:Harrisburg	88.0	0.15	0.03	ND	
SC:Barnwell	145.8	0.18	0.05	ND	
SC:Columbia	129.6	0.43	0.06	ND	
TN:Knoxville	47.0	0.05	0.01	ND	
TN:Nashville	127.6	0.12	0.04	^{7}Be: 26.6	20.7
TX:El Paso	9.0	0.01	0.00	ND	
UT:Salt Lake City	45.8	0.26	0.03	ND	
VA:Lynchburg	74.0	0.06	0.02	ND	
WA:Olympia	191.6	0.12	0.05	^{7}Be: 103	51
WI:Madison	55.2	0.02	0.01	ND	

Note: σ = Counting Error. ND = Not Detectable.

Table 7

Gross Beta and Specific Gamma in Precipitation

March 1994

Location	Depth (mm)	Gross Beta Activity nCi/m^2	$\pm 2\sigma$	Specific Gamma Activity pCi/L	$\pm 2\sigma$
AK:Juneau	40.0	0.02	0.01	^{7}Be:	44.0±26.8
AL:Montgomery	132.0	0.18	0.04	ND	
AR:Little Rock	111.0	0.21	0.04	^{7}Be:	52.5±31.0
AZ:Phoenix	33.0	0.03	0.01	ND	
CA:Berkeley	8.4	0.01	0.00	ND	
CO:Denver	8.6	0.01	0.00	ND	
CT:Hartford	50.0	0.08	0.02	^{7}Be:	62.7±36.0
DE:Wilmington	101.0	0.11	0.03	^{7}Be:	44.3±40.9
FL:Jacksonville	43.6	0.03	0.01	ND	
FL:Miami	13.4	0.01	0.00	ND	
HI:Honolulu	99.0	0.19	0.04	ND	
ID:Boise	10.0	0.01	0.00	ND	
ID:Idaho Falls	19.2	0.03	0.01	ND	
IL:Chicago	74.8	0.05	0.02	ND	
LA:New Orleans	104.0	0.12	0.03	ND	
MN:Minneapolis	13.0	0.02	0.00	^{7}Be:	45.0±22.9
MO:Jefferson City	43.0	0.06	0.01	ND	
MS:Jackson	40.0	0.02	0.01	ND	
NC:Charlotte	111.0	0.19	0.04	^{7}Be:	36.9±27.7
NC:Wilmington	96.0	0.03	0.02	ND	
NJ:Trenton	131.4	0.15	0.04	^{7}Be:	36.2±24.9
NM:Santa Fe	25.0	0.02	0.01	^{7}Be:	38.5±29.2
NV:Las Vegas	4.6	0.05	0.00	^{40}K:	46.2±34.5
NY:Albany	105.0	0.08	0.03	^{7}Be:	30.5±21.1
NY:Niagara Falls	56.0	0.02	0.02	^{7}Be:	21.5±20.9
NY:Yaphank	24.0	0.03	0.01	^{7}Be:	34.4±25.1
OH:Painesville	41.4	0.12	0.02	^{7}Be:	174±40
OH:Toledo	55.0	0.07	0.02	ND	
OR:Portland	49.0	0.03	0.01	^{7}Be:	42.9±26.5
PA:Harrisburg	181.6	0.18	0.06	^{7}Be:	58.8±24.0
SC:Barnwell	66.6	0.15	0.03	ND	
SC:Columbia	117.4	0.12	0.03	ND	
TN:Knoxville	74.8	0.04	0.02	ND	
TN:Nashville	131.2	0.16	0.04	^{7}Be:	40.7±27.3
TX:El Paso	8.0	0.01	0.00	^{7}Be:	40.0±32.9
UT:Salt Lake City	10.2	0.02	0.00	ND	
VA:Lynchburg	97.8	0.04	0.03	ND	
WA:Olympia	132.8	0.06	0.03	ND	
WI:Madison	11.0	0.02	0.00	^{7}Be:	70.4±32.5

Note: σ = Counting Error. ND = Not Detectable.

Table 8

Tritium in Precipitation

January–March 1994

Location	January 1994 nCi/L	±2σ	February 1994 nCi/L	±2σ	March 1994 nCi/L	±2σ
AK:Juneau	NS		NS		0.1	0.1
AL:Montgomery	0.1	0.1	0.2	0.2	0.1	0.1
AR:Little Rock	0.1	0.2	0.1	0.1	0.1	0.1
AZ:Phoenix	NS		0.1	0.1	0.2	0.2
CA:Berkeley	0.1	0.1	0.1	0.2	0.1	0.2
CO:Denver	0.1	0.1	0.1	0.1	0.2	0.2
CT:Hartford	NS		0.2	0.1	0.2	0.1
DE:Wilmington	NS		NS		0.2	0.2
FL:Jacksonville	0.1	0.2	0.2	0.1	0.1	0.2
FL:Miami	0.2	0.1	0.1	0.1	0.1	0.1
HI:Honolulu	0.1	0.1	0.1	0.1	0.1	0.2
ID:Boise	0.1	0.1	0.2	0.1	0.1	0.2
ID:Idaho Falls	0.1	0.1	NS		0.1	0.1
IL:Chicago	0.1	0.2	0.2	0.1	0.1	0.2
LA:New Orleans	0.1	0.2	0.4	0.2	0.1	0.1
MN:Minneapolis	NS		0.1	0.1	0.2	0.2
MO:Jefferson City	0.1	0.1	0.1	0.1	0.1	0.1
MS:Jackson	0.1	0.1	NS		0.1	0.2
NC:Charlotte	0.1	0.1	0.1	0.1	0.2	0.1
NC:Wilmington	0.2	0.1	0.2	0.1	0.1	0.2
ND:Bismarck	0.1	0.2	0.3	0.2	NS	
NJ:Trenton	0.1	0.1	0.1	0.1	0.1	0.1
NM:Santa Fe	NS		0.2	0.1	0.2	0.1
NV:Las Vegas	NS		0.1	0.1	0.1	0.2
NY:Albany	0.2	0.1	0.3	0.2	0.1	0.1
NY:Niagara Falls	NS		0.1	0.1	0.1	0.1
NY:Yaphank	NS		NS		0.1	0.1
OH:Painesville	0.3	0.2	0.1	0.1	0.1	0.1
OH:Toledo	0.1	0.1	0.1	0.1	0.1	0.1
OR:Portland	0.1	0.2	0.1	0.1	0.1	0.2
PA:Harrisburg	0.1	0.1	0.1	0.1	0.1	0.1
SC:Barnwell	1.3	0.2	0.5	0.2	0.8	0.2
SC:Columbia	0.3	0.2	0.3	0.2	0.3	0.2
TN:Knoxville	0.4	0.2	0.2	0.1	0.1	0.1
TN:Nashville	0.1	0.1	0.2	0.1	0.1	0.1
TX:Austin	0.1	0.1	NS		NS	
TX:El Paso	NS		0.1	0.2	0.1	0.2
UT:Salt Lake City	0.1	0.1	0.2	0.2	0.1	0.1
VA:Lynchburg	0.1	0.1	0.1	0.2	0.1	0.1
WA:Olympia	0.1	0.2	0.1	0.2	0.1	0.2
WI:Madison	0.2	0.1	0.2	0.1	0.1	0.1

Note: σ = Counting Error. NS = No Sample.

Plutonium and Uranium in Airborne Particulates and Precipitation

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

Concentrations of the specific isotopes of plutonium-238, -239, and -240 and uranium-234, -235, and -238 are determined by alpha spectroscopy following chemical separation. The volume of air represented by the semiannual composite ranges from 60,000 to 250,000 cubic meters.

Plutonium and uranium results are published when they become available.

2. Water Program

The ERAMS water program provides data on ambient radiation levels in the nation's rivers, streams, and drinking water supplies.

Surface Water

Quarterly grab samples are taken downstream from operating or future nuclear facilities at 58 stations. Surface water samples are analyzed for tritium quarterly and specific gamma activity annually. Tritium is a primary radioactive pollutant from nuclear power plants and weapons production activities. Tritium concentrations are determined by liquid scintillation counting of distilled samples. Gamma scans are performed annually to determine levels of gamma emitting radionuclides.

Table 9 contains the tritium concentration data for January–March 1994.

Table 9

Tritium in Surface Water

January–March 1994

Location	Source	Date Collected	^{3}H nCi/L	$\pm 2\sigma$
AL:Decatur	Tennessee River	01/12/94	0.1	0.1
AL:Gordon	Chattahoochee River	01/13/94	0.1	0.1
AL:Scottsboro	Tennessee River	01/12/94	0.1	0.2
AR:Little Rock	Arkansas River	01/24/94	0.3	0.2
CA:Clay Station	Folsom S. Canal	01/18/94	0.1	0.2
CA:Diablo Canyon	Pacific Ocean	03/28/94	0.1	0.1
CA:San Onofre	Pacific Ocean	02/16/94	0.1	0.1
CO:Platteville	South Platte River	01/06/94	0.1	0.2
CT:East Haddam	Connecticut River	01/10/94	0.3	0.2
CT:Waterford	Long Island Sound	01/10/94	0.2	0.2
FL:Crystal River	Gulf Of Mexico	01/11/94	0.1	0.2
FL:Ft. Pierce	Atlantic Ocean	01/10/94	0.1	0.2
FL:Homestead	Biscayne Bay	01/14/94	0.2	0.2
GA:Baxley	Altamaha River	01/11/94	0.2	0.2
IA:Cedar Rapids	Cedar River	01/20/94	0.1	0.2
ID:Buhl	Snake River	01/07/94	0.1	0.1
IL:Zion	Lake Michigan	03/29/94	0.1	0.1
KS:Le Roy	Neosho River	03/29/94	0.1	0.2
LA:New Orleans	Mississippi River	01/29/94	0.1	0.2
MA:Plymouth	Cape Cod Bay	02/03/94	0.1	0.2
MD:Conowingo	Susquehanna River	01/24/94	0.1	0.1
MD:Lusby	Chesapeake Bay	01/11/94	0.1	0.1
ME:Wiscasset	Montseway Bay	01/11/94	0.1	0.2
MI:Bridgman	Lake Michigan	03/31/94	0.4	0.2
MI:Monroe	Lake Erie	01/03/94	0.2	0.1
MI:South Haven	Lake Michigan	03/31/94	0.1	0.2
MN:Monticello	Mississippi River	01/05/94	0.1	0.2
MN:Red Wing	Mississippi River	01/04/94	0.1	0.1
MS:Port Gibson	Mississippi River	01/04/94	0.1	0.2
NC:Charlotte	Catawba River	01/12/94	0.5	0.2
NC:Southport	Atlantic Ocean	01/04/94	0.1	0.2
NE:Rulo	Missouri River	01/12/94	0.1	0.2
NJ:Bayside	Delaware River	01/25/94	0.2	0.2
NJ:Oyster Creek	Oyster Creek	01/13/94	0.2	0.2
NV:Boulder City	Colorado River	03/02/94	0.1	0.1
NY:Chelsea	Hudson River	01/10/94	0.1	0.1
NY:Croton-On-Hudson	Hudson River	03/11/94	0.1	0.2

Table 9 (continued)

Tritium in Surface Water

January–March 1994

Location	Source	Date Collected	^{3}H nCi/L	$\pm 2\sigma$
NY:Oswego	Lake Ontario	03/17/94	0.3	0.2
OH:Toledo	Lake Erie	01/02/94	0.3	0.1
OR:Bradwood	Columbia River	01/12/94	0.1	0.1
PA:Danville	Susquehanna River	02/02/94	0.1	0.2
PA:Danville	Susquehanna River	03/02/94	0.1	0.1
PA:Philadelphia	Delaware River-Baxter	03/02/94	0.1	0.1
PA:Philadelphia	Schuylkill River-Queen	03/02/94	0.1	0.1
SC:Allendale	Savannah River	01/31/94	2.3	0.2
SC:Broad River	Broad River	01/13/94	0.2	0.2
SC:Hartsville	Lake Robinson	01/07/94	2.9	0.2
TN:Daisy	Tennessee River	01/10/94	0.2	0.2
TN:Kingston	Clinch River	01/04/94	0.3	0.1
TN:Oak Ridge	Clinch River	02/15/94	0.4	0.2
TX:Matagorda	Colorado River	01/11/94	0.2	0.2
VA:Doswell	North Anna River	01/05/94	2.2	0.2
VA:Newport News	James River	01/17/94	0.1	0.2
VT:Vernon	Connecticut River	03/09/94	0.3	0.2
WA:Northport	Columbia River	01/19/94	0.1	0.2
WA:Richland	Columbia River	01/06/94	0.1	0.1
WI:Two Creeks	Lake Michigan	02/24/94	0.1	0.2
WI:Victory	Mississippi River	01/10/94	0.2	0.2
WV:Wheeling	Ohio River	01/10/94	0.1	0.1

Note: σ = Counting Error.

Drinking Water

This program monitors ambient radiation levels in drinking water at 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) specific iodine-131 on one quarterly sample per year for each station; and (e) an annual composite for plutonium-238, -239, and -240 and uranium-234, -235, and -238 for stations that demonstrate gross alpha levels greater than 2 pCi/L.

Tritium analyses are performed by scintillation counting of the distilled samples. Gross beta and alpha are determined by evaporating an aliquot on a stainless steel planchet for counting. Radium-226 is determined by the standard emanation technique. Strontium-90 is determined by beta counting a strontium carbonate precipitate isolated by ion exchange.

Table 10 contains the data from drinking water samples for January–March 1994.

Table 10

Tritium in Drinking Water

January–March 1994

Location	Date Collected	^{3}H nCi/L	$\pm 2\sigma$
AK:Fairbanks	01/13/94	0.1	0.2
AL:Dothan	01/13/94	0.1	0.2
AL:Muscle Shoals	01/12/94	0.2	0.1
AL:Scottsboro	01/12/94	0.1	0.1
AR:Little Rock	01/24/94	0.2	0.2
CA:Berkeley	03/31/94	0.1	0.2
CA:Los Angeles	01/03/94	0.2	0.2
CO:Denver	01/07/94	0.1	0.2
CO:Platteville	01/06/94	0.2	0.1
DC:Washington	01/04/94	0.2	0.1
DE:Dover	01/18/94	0.1	0.1
FL:Miami	01/31/94	0.1	0.1
FL:Tampa	01/20/94	0.1	0.2
GA:Baxley	01/11/94	0.1	0.1
GA:Savannah	03/18/94	0.1	0.2
HI:Honolulu	01/06/94	0.1	0.2
IA:Cedar Rapids	01/20/94	0.1	0.2
ID:Boise	01/03/94	0.1	0.1
ID:Idaho Falls	01/21/94	0.1	0.2
IL:W. Chicago	01/31/94	0.1	0.1
KS:Topeka	01/03/94	0.1	0.1
LA:New Orleans	01/03/94	0.2	0.1
MA:Lawrence	01/19/94	0.1	0.1
MD:Baltimore	01/03/94	0.2	0.2
MD:Conowingo	01/24/94	0.3	0.2
ME:Augusta	01/13/94	0.1	0.2
MI:Lansing	01/18/94	0.1	0.1
MN:Minneapolis	01/13/94	0.3	0.2
MN:Red Wing	01/11/94	0.1	0.1
MO:Jefferson City	01/01/94	0.1	0.2
MS:Jackson	01/20/94	0.1	0.1
MS:Port Gibson	01/04/94	0.1	0.1
MT:Helena	01/12/94	0.1	0.1
NC:Charlotte	01/12/94	0.5	0.2
NC:Wilmington	01/04/94	0.2	0.1
ND:Bismarck	01/04/94	0.2	0.1
NE:Lincoln	03/22/94	0.1	0.1
NH:Concord	01/11/94	0.1	0.2
NJ:Trenton	01/13/94	0.1	0.1
NJ:Trenton	01/12/94	0.1	0.1
NM:Santa Fe	01/10/94	0.2	0.2

Table 10 (continued)

Tritium in Drinking Water

January–March 1994

Location	Date Collected	^{3}H nCi/L	$\pm 2\sigma$
NV:Las Vegas	01/03/94	0.1	0.1
NY:Albany	01/03/94	0.1	0.1
NY:New York City	01/05/94	0.2	0.1
NY:Niagara Falls	01/07/94	0.1	0.2
NY:Syracuse	03/18/94	0.1	0.1
OH:Cincinnati	03/31/94	0.1	0.2
OH:East Liverpool	02/17/94	0.1	0.2
OH:Painesville	01/04/94	0.2	0.2
OH:Toledo	01/02/94	0.3	0.1
OK:Oklahoma City	03/23/94	0.1	0.2
OR:Portland	01/05/94	0.1	0.2
PA:Columbia	01/26/94	0.2	0.2
PA:Harrisburg	01/27/94	0.1	0.1
PA:Philadelphia	03/02/94	0.1	0.1
PA:Philadelphia-Baxter	03/02/94	0.1	0.1
PA:Philadelphia-Queen	03/02/94	0.1	0.1
PA:Pittsburgh	02/17/94	0.1	0.1
PC:Corozal	01/12/94	0.1	0.1
RI:Providence	01/01/94	0.1	0.1
SC:Barnwell	01/14/94	0.2	0.2
SC:Columbia	01/04/94	0.3	0.2
SC:Jenkinsville	01/14/94	0.2	0.2
SC:Seneca	01/25/94	0.2	0.2
TN:Chattanooga	02/02/94	0.1	0.2
TN:Knoxville	01/26/94	0.1	0.1
TX:Austin	01/04/94	0.1	0.1
VA:Doswell	03/08/94	0.1	0.2
VA:Lynchburg	01/04/94	0.2	0.2
VA:Virginia Beach	01/03/94	0.1	0.2
WA:Richland	01/06/94	0.1	0.2
WA:Seattle	01/05/94	0.2	0.2
WI:Genoa City	01/10/94	0.1	0.1
WI:Madison	01/07/94	0.1	0.1

Note: σ = Counting Error.

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 important 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 65 sampling sites with at least one located in each state, Puerto Rico, and the Panama Canal Zone. 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. All samples collected in July are analyzed for strontium-90. Also, for the first month of the three quarters beginning January, April, and October, 10 regional composite samples of milk made up from the states within each of EPA's 10 regions are analyzed for strontium-90.

Iodine-131, barium-140, cesium-137, and potassium 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.

Tables 11–13 contain the concentrations of radionuclides in pasteurized milk for January–March 1994. Table 14 contains the concentrations of strontium-90 in pasteurized milk EPA Regional Composites for January 1994.

Table 11

Radionuclides in Pasteurized Milk

January 1994

Location	Date Collected	K g/L	K $\pm 2\sigma$	^{137}Cs pCi/L	^{137}Cs $\pm 2\sigma$	^{140}Ba pCi/L	^{140}Ba $\pm 2\sigma$	^{131}I pCi/L	^{131}I $\pm 2\sigma$
AL:Montgomery	01/10/94	1.54	0.09	ND		ND		ND	
AR:Little Rock	01/04/94	1.56	0.06	ND		ND		ND	
AZ:Phoenix	01/12/94	1.59	0.08	ND		ND		ND	
CA:Los Angeles	01/03/94	1.67	0.08	ND		ND		ND	
CA:Sacramento	01/04/94	1.66	0.09	ND		ND		ND	
CA:San Francisco	01/06/94	1.64	0.09	ND		ND		ND	
CO:Denver	01/10/94	1.55	0.06	ND		ND		ND	
CT:Hartford	01/05/94	1.65	0.06	ND		ND		ND	
DE:Wilmington	01/11/94	1.59	0.06	ND		ND		ND	
FL:Tampa	01/03/94	1.66	0.09	5	3	ND		ND	
GA:Atlanta	01/11/94	1.49	0.08	ND		ND		ND	
HI:Honolulu	01/10/94	1.64	0.08	ND		ND		ND	
IA:Des Moines	01/03/94	1.57	0.06	ND		ND		ND	
IL:Chicago	01/06/94	1.64	0.12	ND		ND		ND	
IN:Indianapolis	01/10/94	1.55	0.08	ND		ND		ND	
KS:Wichita	01/26/94	1.49	0.14	ND		ND		ND	
KY:Louisville	01/03/94	1.67	0.09	ND		ND		ND	
MA:Boston	01/03/94	1.47	0.13	ND		ND		ND	
MD:Baltimore	01/06/94	1.56	0.14	ND		ND		ND	
ME:Portland	01/05/94	1.67	0.09	ND		ND		ND	
MI:Detroit	01/05/94	1.67	0.09	ND		ND		ND	
MI:Grand Rapids	01/03/94	1.54	0.09	ND		ND		ND	
MO:Kansas City	01/13/94	1.64	0.09	ND		ND		ND	
MS:Jackson	01/06/94	1.61	0.09	ND		ND		ND	
MT:Helena	01/14/94	1.68	0.07	ND		ND		ND	
NC:Charlotte	01/24/94	1.63	0.08	ND		ND		ND	
ND:Minot	01/04/94	1.66	0.09	ND		ND		ND	
NJ:Trenton	01/06/94	1.61	0.06	ND		ND		ND	
NM:Albuquerque	01/25/94	1.51	0.09	ND		ND		ND	
NV:Las Vegas	01/04/94	1.70	0.08	ND		ND		ND	
NY:Buffalo	01/19/94	1.62	0.14	ND		ND		ND	
NY:Syracuse	01/13/94	1.54	0.09	ND		ND		ND	
OH:Cincinnati	01/07/94	1.62	0.09	ND		ND		ND	
OH:Cleveland	01/28/94	1.57	0.09	ND		ND		ND	
OR:Portland	01/03/94	1.68	0.06	ND		ND		ND	
PA:Philadelphia	01/03/94	1.64	0.09	ND		ND		ND	
PA:Pittsburgh	01/05/94	1.69	0.09	ND		ND		ND	

Table 11 (continued)

Radionuclides in Pasteurized Milk

January 1994

Location	Date Collected	K		^{137}Cs		^{140}Ba		^{131}I	
		g/L	$\pm 2\sigma$	pCi/L	$\pm 2\sigma$	pCi/L	$\pm 2\sigma$	pCi/L	$\pm 2\sigma$
PC:Cristobal	01/03/94	1.58	0.05	7	1	ND		ND	
PR:San Juan	01/07/94	1.61	0.08	ND		ND		ND	
SC:Charleston	01/06/94	1.48	0.09	ND		ND		ND	
SD:Rapid City	01/03/94	1.63	0.08	ND		ND		ND	
TN:Knoxville	01/09/94	1.58	0.14	ND		ND		ND	
TN:Memphis	01/05/94	1.61	0.08	ND		ND		ND	
TX:Austin	01/11/94	1.55	0.09	ND		ND		ND	
TX:Ft. Worth	01/11/94	1.60	0.08	ND		ND		ND	
VT:Burlington	01/04/94	1.60	0.09	ND		ND		ND	
WA:Seattle	01/04/94	1.66	0.08	ND		ND		ND	
WA:Spokane	01/03/94	1.68	0.09	ND		ND		ND	
WV:Charleston	01/10/94	1.57	0.08	ND		ND		ND	

Note: σ = Counting Error. ND = Not Detectable.

Table 12

Radionuclides in Pasteurized Milk

February 1994

Location	Date Collected	K		^{137}Cs		^{140}Ba		^{131}I	
		g/L	$\pm 2\sigma$	pCi/L	$\pm 2\sigma$	pCi/L	$\pm 2\sigma$	pCi/L	$\pm 2\sigma$
AL:Montgomery	02/10/94	1.59	0.06	ND		ND		ND	
AR:Little Rock	02/03/94	1.60	0.09	ND		ND		ND	
CA:Los Angeles	02/07/94	1.61	0.06	ND		ND		ND	
CA:Sacramento	02/01/94	1.50	0.09	ND		ND		ND	
CA:San Francisco	02/07/94	1.66	0.09	ND		ND		ND	
CO:Denver	02/07/94	1.69	0.09	ND		ND		ND	
DE:Wilmington	02/02/94	1.60	0.09	ND		ND		ND	
FL:Tampa	02/07/94	1.61	0.09	3	3	ND		ND	
GA:Atlanta	02/08/94	1.48	0.09	ND		ND		ND	
HI:Honolulu	02/07/94	1.60	0.14	ND		ND		ND	
IA:Des Moines	02/07/94	1.57	0.09	ND		ND		ND	
IL:Chicago	02/04/94	1.73	0.09	ND		ND		ND	
IN:Indianapolis	02/07/94	1.61	0.06	ND		ND		ND	
KS:Wichita	02/22/94	1.69	0.09	ND		ND		ND	
KY:Louisville	02/08/94	1.58	0.09	ND		ND		ND	
LA:New Orleans	02/17/94	1.58	0.06	ND		ND		ND	
MA:Boston	02/08/94	1.63	0.08	ND		ND		ND	
MD:Baltimore	02/04/94	1.60	0.06	ND		ND		ND	
ME:Portland	02/11/94	1.63	0.06	ND		ND		ND	
MI:Detroit	02/07/94	1.69	0.09	ND		ND		ND	
MI:Grand Rapids	02/07/94	1.64	0.08	ND		ND		ND	
MN:St. Paul	02/02/94	1.66	0.09	ND		ND		ND	
MO:Kansas City	02/28/94	1.61	0.07	ND		ND		ND	
MS:Jackson	02/03/94	1.66	0.09	ND		ND		ND	
MT:Helena	02/17/94	1.57	0.06	ND		ND		ND	
NC:Charlotte	02/01/94	1.64	0.09	ND		ND		ND	
ND:Minot	02/01/94	1.80	0.08	ND		ND		ND	
NJ:Trenton	02/10/94	1.58	0.14	ND		ND		ND	
NM:Albuquerque	02/07/94	1.38	0.13	ND		ND		ND	
NV:Las Vegas	02/08/94	1.57	0.10	ND		ND		ND	
NY:Buffalo	02/07/94	1.58	0.08	ND		ND		ND	
NY:Syracuse	02/07/94	1.64	0.09	ND		ND		ND	
OH:Cincinnati	02/17/94	1.57	0.08	ND		ND		ND	
OH:Cleveland	02/28/94	1.60	0.09	ND		ND		ND	
OR:Portland	02/08/94	1.72	0.08	ND		ND		ND	
PA:Philadelphia	02/07/94	1.61	0.08	ND		ND		ND	
PA:Pittsburgh	02/07/94	1.54	0.07	ND		ND		ND	

Table 12 (continued)

Radionuclides in Pasteurized Milk

February 1994

Location	Date Collected	K g/L	K $\pm 2\sigma$	^{137}Cs pCi/L	^{137}Cs $\pm 2\sigma$	^{140}Ba pCi/L	^{140}Ba $\pm 2\sigma$	^{131}I pCi/L	^{131}I $\pm 2\sigma$
PC:Cristobal	02/09/94	1.62	0.07	4	2	ND		ND	
PR:San Juan	02/04/94	1.67	0.09	ND		ND		ND	
SC:Charleston	02/10/94	1.61	0.08	ND		ND		ND	
SD:Rapid City	02/07/94	1.58	0.09	ND		ND		ND	
TN:Knoxville	02/08/94	1.57	0.09	ND		ND		ND	
TN:Memphis	02/16/94	1.67	0.08	ND		ND		ND	
TX:Austin	02/08/94	1.58	0.08	ND		ND		ND	
TX:Ft. Worth	02/14/94	1.50	0.08	ND		ND		ND	
VA:Norfolk	02/03/94	1.68	0.09	ND		ND		ND	
VT:Burlington	02/25/94	1.64	0.09	ND		ND		ND	
WA:Seattle	02/08/94	1.59	0.06	ND		ND		ND	
WA:Spokane	02/01/94	1.60	0.08	ND		ND		ND	
WV:Charleston	02/07/94	1.75	0.09	ND		ND		ND	

Note: σ = Counting Error. ND = Not Detectable.

Table 13

Radionuclides in Pasteurized Milk

March 1994

Location	Date Collected	K g/L	K $\pm 2\sigma$	^{137}Cs pCi/L	^{137}Cs $\pm 2\sigma$	^{140}Ba pCi/L	^{140}Ba $\pm 2\sigma$	^{131}I pCi/L	^{131}I $\pm 2\sigma$
AL:Montgomery	03/11/94	1.51	0.14	ND		ND		ND	
AR:Little Rock	03/08/94	1.60	0.09	ND		ND		ND	
AZ:Phoenix	03/14/94	1.62	0.09	ND		ND		ND	
CA:Los Angeles	03/09/94	1.56	0.08	ND		ND		ND	
CA:Sacramento	03/04/94	1.56	0.09	ND		ND		ND	
CA:San Francisco	03/03/94	1.57	0.08	ND		ND		ND	
CO:Denver	03/14/94	1.36	0.08	ND		ND		ND	
DE:Wilmington	03/29/94	1.67	0.09	ND		ND		ND	
FL:Tampa	03/07/94	1.57	0.08	4	2	ND		ND	
GA:Atlanta	03/15/94	1.51	0.09	ND		ND		ND	
HI:Honolulu	03/08/94	1.62	0.09	ND		ND		ND	
IA:Des Moines	03/01/94	1.61	0.09	ND		ND		ND	
IL:Chicago	03/03/94	1.64	0.08	ND		ND		ND	
IN:Indianapolis	03/07/94	1.56	0.09	ND		ND		ND	
KS:Wichita	03/22/94	1.60	0.09	ND		ND		ND	
KY:Louisville	03/08/94	1.63	0.09	ND		ND		ND	
MA:Boston	03/07/94	1.59	0.06	ND		ND		ND	
MD:Baltimore	03/04/94	1.60	0.09	ND		ND		ND	
ME:Portland	03/07/94	1.57	0.14	ND		ND		ND	
MI:Detroit	03/08/94	1.57	0.06	ND		ND		ND	
MI:Grand Rapids	03/07/94	1.45	0.14	ND		ND		ND	
MN:St. Paul	03/02/94	1.67	0.09	ND		ND		ND	
MO:Kansas City	03/29/94	1.60	0.06	ND		ND		ND	
MS:Jackson	03/07/94	1.58	0.09	ND		ND		ND	
MT:Helena	03/17/94	1.64	0.09	ND		ND		ND	
NC:Charlotte	03/08/94	1.63	0.09	ND		ND		ND	
ND:Minot	03/02/94	1.58	0.06	ND		ND		ND	
NJ:Trenton	03/09/94	1.53	0.09	ND		ND		ND	
NM:Albuquerque	03/29/94	1.52	0.06	ND		ND		ND	
NV:Las Vegas	03/01/94	1.62	0.09	ND		ND		ND	
NY:Buffalo	03/21/94	1.61	0.09	ND		ND		ND	
NY:Syracuse	03/07/94	1.56	0.06	ND		ND		ND	
OH:Cincinnati	03/15/94	1.66	0.07	ND		ND		ND	
OH:Cleveland	03/11/94	1.63	0.09	ND		ND		ND	
OK:Oklahoma City	03/14/94	1.61	0.08	ND		ND		ND	
OR:Portland	03/07/94	1.61	0.08	ND		ND		ND	
PA:Philadelphia	03/07/94	1.66	0.08	ND		ND		ND	

Table 13 (continued)

Radionuclides in Pasteurized Milk

March 1994

Location	Date Collected	K g/L	K $\pm 2\sigma$	^{137}Cs pCi/L	^{137}Cs $\pm 2\sigma$	^{140}Ba pCi/L	^{140}Ba $\pm 2\sigma$	^{131}I pCi/L	^{131}I $\pm 2\sigma$
PA:Pittsburgh	03/08/94	1.57	0.06	ND		ND		ND	
PC:Cristobal	03/09/94	1.69	0.09	8	3	ND		ND	
PR:San Juan	03/09/94	1.63	0.08	ND		ND		ND	
SC:Charleston	03/11/94	1.66	0.08	ND		ND		ND	
SD:Rapid City	03/07/94	1.61	0.09	ND		ND		ND	
TN:Knoxville	03/07/94	1.57	0.08	ND		ND		ND	
TN:Memphis	03/10/94	1.56	0.10	ND		ND		ND	
TX:Austin	03/07/94	1.57	0.08	ND		ND		ND	
TX:Ft. Worth	03/08/94	1.57	0.09	ND		ND		ND	
VA:Norfolk	03/29/94	1.57	0.06	ND		ND		ND	
VT:Montpelier	03/28/94	1.60	0.09	ND		ND		ND	
WA:Seattle	03/09/94	1.57	0.10	ND		ND		ND	
WA:Spokane	03/14/94	1.58	0.09	ND		ND		ND	
WV:Charleston	03/07/94	1.55	0.08	ND		ND		ND	

Note: σ = Counting Error. ND = Not Detectable.

Table 14

Strontium-90 in Pasteurized Milk
EPA Regional Composites

January 1994

EPA Region	Collection Date	^{90}Sr pCi/L	$\pm 2\sigma$
I	01/05/94	0.9	0.4
II	01/11/94	1.3	0.4
III	01/06/94	1.4	0.4
IV	01/08/94	0.9	0.4
V	01/10/94	1.2	0.4
VI	01/13/94	1.3	0.4
VII	01/14/94	1.4	0.4
VIII	01/08/94	1.1	0.4
IX	01/07/94	0.5	0.3
X	01/03/94	0.9	0.4

Note: σ = Counting Error.

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