402-R-95-022

ENVIRONMENTAL

RADIATION

DATA

REPORT 83

July–September 1995

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 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 many 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 July–September 1995. Tables 5–7 contain the data from precipitation samples for July–September 1995. Table 8 contains the data from tritium in precipitation samples for July–September 1995 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

July 1995

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
AK:Fairbanks	9	0.1	0.0	0.0	0.01	0.00	0.00
AK:Juneau	6	0.0	0.0	0.0	0.00	0.00	0.00
AL:Montgomery	9	0.4	0.0	0.2	0.02	0.01	0.01
AR:Little Rock	9	0.8	0.1	0.3	0.02	0.01	0.01
AZ:Phoenix	4	0.5	0.3	0.4	0.02	0.01	0.01
CA:Berkeley	6	0.1	0.0	0.0	0.01	0.00	0.00
CA:Los Angeles	8	0.2	0.0	0.1	0.01	0.01	0.01
CO:Denver	9	0.8	0.2	0.5	0.01	0.01	0.01
CT:Hartford	9	0.1	0.0	0.1	0.01	0.01	0.01
DE:Wilmington	8	0.3	0.0	0.2	0.02	0.01	0.01
FL:Jacksonville	9	0.1	0.0	0.1	0.01	0.00	0.01
FL:Miami	9	0.1	0.0	0.0	0.01	0.00	0.01
HI:Honolulu	8	0.2	0.1	0.2	0.00	0.00	0.00
IA:Iowa City	9	1.1	0.2	0.7	0.02	0.01	0.01
ID:Boise	8	0.7	0.2	0.5	0.02	0.01	0.01
ID:Idaho Falls	9	0.0	0.0	0.0	0.01	0.01	0.01
IL:Chicago	6	1.2	0.1	0.4	0.02	0.01	0.02
IN:Indianapolis	4	0.7	0.3	0.5	0.03	0.01	0.01
KS:Topeka	9	2.5	0.8	1.5	0.02	0.01	0.01
ME:Augusta	7	0.2	0.0	0.1	0.01	0.01	0.01
MI:Lansing	9	0.5	0.1	0.2	0.02	0.01	0.01
MN:Minneapolis	4	0.2	0.1	0.2	0.01	0.01	0.01
MN:Welch	8	1.0	0.3	0.6	0.02	0.01	0.01
MS:Jackson	7	0.4	0.3	0.3	0.03	0.01	0.02
NC:Charlotte	8	0.3	0.1	0.1	0.02	0.01	0.02
NC:Wilmington	5	0.0	0.0	0.0	0.01	0.01	0.01
ND:Bismarck	7	0.9	0.2	0.5	0.01	0.01	0.01
NH:Concord	8	0.4	0.0	0.2	0.02	0.01	0.01
NJ:Trenton	9	0.7	0.2	0.5	0.02	0.01	0.01
NM:Santa Fe	4	0.3	0.1	0.2	0.01	0.01	0.01
NV:Las Vegas	8	0.1	0.1	0.1	0.01	0.01	0.01
NY:Albany	4	0.1	0.1	0.1	0.01	0.01	0.01
NY:Niagara Falls	8	0.6	0.1	0.3	0.02	0.01	0.01
NY:Yaphank	8	0.1	0.1	0.1	0.01	0.01	0.01
OH:Columbus	4	0.2	0.0	0.1	0.02	0.01	0.01
OH:Painesville	8	0.4	0.1	0.2	0.02	0.01	0.01
OH:Ross	6	0.0	0.0	0.0	0.08	0.01	0.03

Table 2 (continued)

Gross Beta in Airborne Particulates

July 1995

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
OH:Toledo	9	0.5	0.1	0.2	0.02	0.01	0.01
OR:Portland	7	0.0	0.0	0.0	0.01	0.00	0.00
PA:Harrisburg	9	0.7	0.0	0.3	0.02	0.01	0.01
PA:Pittsburgh	9	0.1	0.0	0.1	0.03	0.01	0.01
SC:Barnwell	2	0.0	0.0	0.0	0.01	0.01	0.01
SC:Columbia	7	0.1	0.0	0.1	0.02	0.01	0.01
SD:Pierre	6	0.5	0.1	0.3	0.02	0.01	0.01
TN:Knoxville	6	0.6	0.2	0.4	0.08	0.02	0.03
TN:Nashville	8	0.3	0.0	0.2	0.02	0.01	0.01
TX:Austin	8	0.2	0.1	0.1	0.01	0.01	0.01
TX:El Paso	9	0.9	0.1	0.5	0.01	0.01	0.01
UT:Salt Lake City	9	0.3	0.0	0.2	0.02	0.01	0.01
VA:Lynchburg	8	0.9	0.2	0.5	0.02	0.01	0.01
VA:Virginia Beach	1	0.1	0.1	0.1	0.01	0.01	0.01
WA:Olympia	9	0.2	0.0	0.1	0.00	0.00	0.00
WA:Spokane	9	0.3	0.1	0.2	0.01	0.00	0.01
WI:Madison	9	0.7	0.1	0.3	0.02	0.01	0.01

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

Table 3

Gross Beta in Airborne Particulates

August 1995

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
AK:Fairbanks	9	0.0	0.0	0.0	0.01	0.00	0.00
AK:Juneau	7	0.0	0.0	0.0	0.01	0.00	0.00
AL:Montgomery	9	0.7	0.0	0.3	0.02	0.01	0.02
AR:Little Rock	7	0.5	0.3	0.3	0.03	0.01	0.02
AZ:Phoenix	5	0.8	0.2	0.4	0.02	0.01	0.01
CA:Berkeley	8	0.1	0.0	0.0	0.01	0.00	0.00
CA:Los Angeles	11	0.4	0.0	0.1	0.01	0.00	0.01
CO:Denver	9	1.1	0.3	0.6	0.02	0.01	0.01
CT:Hartford	8	0.2	0.1	0.1	0.02	0.00	0.01
DE:Wilmington	10	0.3	0.1	0.2	0.02	0.00	0.01
FL:Jacksonville	9	0.1	0.0	0.1	0.02	0.00	0.01
FL:Miami	9	0.1	0.0	0.0	0.02	0.01	0.01
HI:Honolulu	9	0.2	0.1	0.2	0.00	0.00	0.00
IA:Iowa City	8	1.3	0.2	0.6	0.04	0.01	0.02
ID:Boise	9	0.9	0.2	0.5	0.02	0.00	0.01
ID:Idaho Falls	9	0.0	0.0	0.0	0.01	0.00	0.01
IL:Chicago	5	0.5	0.1	0.2	0.02	0.01	0.01
IN:Indianapolis	6	1.0	0.2	0.5	0.03	0.01	0.02
KS:Topeka	9	3.4	0.1	1.4	0.03	0.01	0.01
KY:Frankfort	3	0.4	0.0	0.2	0.04	0.02	0.03
ME:Augusta	8	0.4	0.0	0.2	0.01	0.01	0.01
MI:Lansing	9	0.3	0.1	0.2	0.02	0.00	0.01
MN:Minneapolis	5	0.2	0.1	0.1	0.02	0.01	0.01
MN:Welch	9	1.0	0.0	0.4	0.02	0.01	0.01
MS:Jackson	5	0.4	0.1	0.3	0.04	0.01	0.02
NC:Charlotte	8	0.2	0.1	0.1	0.03	0.01	0.01
NC:Wilmington	4	0.0	0.0	0.0	0.01	0.00	0.01
ND:Bismarck	9	1.0	0.0	0.6	0.02	0.01	0.01
NH:Concord	9	0.2	0.1	0.1	0.01	0.00	0.01
NJ:Trenton	9	1.1	0.3	0.6	0.01	0.00	0.01
NM:Santa Fe	5	0.2	0.0	0.1	0.01	0.01	0.01
NV:Las Vegas	9	0.2	0.1	0.1	0.02	0.01	0.01
NY:Albany	5	0.2	0.1	0.1	0.02	0.01	0.01
NY:Niagara Falls	8	0.3	0.0	0.2	0.01	0.00	0.01
NY:Yaphank	7	0.2	0.0	0.1	0.01	0.00	0.01
OH:Columbus	5	0.1	0.1	0.1	0.02	0.01	0.01
OH:Painesville	9	0.5	0.1	0.3	0.02	0.00	0.01

Table 3 (continued)

Gross Beta in Airborne Particulates

August 1995

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
OH:Ross	8	0.0	0.0	0.0	0.03	0.01	0.02
OH:Toledo	9	0.9	0.1	0.3	0.02	0.01	0.01
OR:Portland	9	0.0	0.0	0.0	0.01	0.00	0.00
PA:Harrisburg	8	1.1	0.2	0.5	0.02	0.01	0.01
PA:Pittsburgh	8	0.2	0.2	0.2	0.03	0.01	0.02
SC:Barnwell	2	0.0	0.0	0.0	0.01	0.01	0.01
SC:Columbia	9	0.6	0.1	0.3	0.03	0.00	0.01
SD:Pierre	6	0.7	0.1	0.4	0.02	0.01	0.01
TN:Knoxville	8	0.5	0.1	0.4	0.04	0.01	0.02
TN:Nashville	9	0.4	0.1	0.3	0.03	0.01	0.02
TX:Austin	8	0.2	0.1	0.1	0.02	0.01	0.02
TX:El Paso	8	1.0	0.4	0.7	0.02	0.00	0.01
UT:Salt Lake City	8	0.2	0.0	0.1	0.01	0.01	0.01
VA:Lynchburg	9	1.3	0.3	0.9	0.02	0.01	0.01
VA:Virginia Beach	2	0.0	0.0	0.0	0.01	0.01	0.01
WA:Olympia	7	0.2	0.0	0.1	0.01	0.00	0.00
WA:Spokane	7	0.2	0.2	0.2	0.01	0.00	0.01
WI:Madison	8	0.5	0.1	0.3	0.02	0.01	0.01

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

Table 4

Gross Beta in Airborne Particulates

September 1995

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3)			NAREL Lab Measurement (pCi/m^3)		
		Max	Min	Avg	Max	Min	Avg
AK:Fairbanks	8	0.1	0.0	0.0	0.01	0.00	0.00
AK:Juneau	7	0.0	0.0	0.0	0.01	0.00	0.00
AL:Montgomery	8	0.5	0.1	0.3	0.04	0.01	0.02
AR:Little Rock	9	0.8	0.1	0.5	0.03	0.01	0.02
AZ:Phoenix	4	0.9	0.3	0.6	0.02	0.02	0.02
CA:Berkeley	9	0.1	0.0	0.1	0.01	0.00	0.01
CA:Los Angeles	8	0.2	0.0	0.2	0.02	0.01	0.01
CO:Denver	3	0.9	0.5	0.7	0.01	0.01	0.01
CT:Hartford	9	0.2	0.0	0.1	0.01	0.00	0.01
DE:Wilmington	8	0.6	0.0	0.2	0.02	0.01	0.01
FL:Jacksonville	7	0.0	0.0	0.0	0.01	0.00	0.01
FL:Miami	8	0.1	0.0	0.0	0.01	0.00	0.01
HI:Honolulu	8	0.2	0.1	0.1	0.00	0.00	0.00
IA:Iowa City	7	1.0	0.0	0.4	0.03	0.01	0.02
ID:Boise	9	0.9	0.3	0.6	0.02	0.01	0.01
ID:Idaho Falls	8	0.0	0.0	0.0	0.01	0.01	0.01
IL:Chicago	2	0.2	0.1	0.2	0.03	0.01	0.02
IN:Indianapolis	9	0.8	0.3	0.6	0.04	0.01	0.02
KS:Topeka	8	2.4	0.3	1.1	0.02	0.01	0.01
ME:Augusta	8	0.2	0.0	0.1	0.01	0.00	0.01
MI:Lansing	8	0.4	0.1	0.2	0.02	0.00	0.01
MN:Minneapolis	4	0.3	0.1	0.2	0.02	0.01	0.01
MN:Welch	7	1.1	0.1	0.6	0.02	0.01	0.02
MS:Jackson	7	1.0	0.3	0.5	0.03	0.01	0.02
NC:Charlotte	9	0.2	0.1	0.2	0.03	0.01	0.02
NC:Wilmington	4	0.0	0.0	0.0	0.01	0.01	0.01
ND:Bismarck	7	1.7	0.3	0.9	0.02	0.01	0.01
NH:Concord	9	0.2	0.1	0.1	0.01	0.00	0.01
NJ:Trenton	8	0.6	0.2	0.3	0.02	0.01	0.01
NM:Santa Fe	2	0.2	0.1	0.2	0.01	0.01	0.01
NV:Las Vegas	8	0.2	0.1	0.2	0.02	0.01	0.02
NY:Albany	4	0.1	0.0	0.1	0.01	0.01	0.01
NY:Niagara Falls	9	5.2	0.1	0.7	0.02	0.01	0.01
NY:Yaphank	8	0.2	0.0	0.1	0.01	0.00	0.01
OH:Columbus	5	0.2	0.1	0.1	0.02	0.01	0.01
OH:Painesville	9	0.5	0.1	0.3	0.02	0.01	0.01

Table 4 (continued)

Gross Beta in Airborne Particulates

September 1995

Location	Number of Samples	5-Hour Field Estimate (pCi/m^3) Max	Min	Avg	NAREL Lab Measurement (pCi/m^3) Max	Min	Avg
OH:Ross	8	0.0	0.0	0.0	0.04	0.01	0.03
OH:Toledo	8	0.5	0.1	0.2	0.03	0.01	0.01
OR:Portland	3	0.0	0.0	0.0	0.01	0.01	0.01
PA:Harrisburg	9	0.7	0.0	0.4	0.02	0.01	0.01
PA:Pittsburgh	9	0.5	0.4	0.5	0.03	0.01	0.02
SC:Barnwell	2	0.0	0.0	0.0	0.01	0.01	0.01
SC:Columbia	9	0.4	0.2	0.2	0.03	0.01	0.02
SD:Pierre	8	0.6	0.2	0.3	0.02	0.01	0.01
TN:Knoxville	4	0.4	0.2	0.3	0.04	0.02	0.03
TN:Nashville	9	0.8	0.1	0.3	0.04	0.01	0.02
TX:Austin	9	0.3	0.1	0.2	0.03	0.01	0.02
TX:El Paso	9	0.9	0.1	0.5	0.02	0.01	0.01
UT:Salt Lake City	9	0.5	0.0	0.2	0.02	0.01	0.01
VA:Lynchburg	8	1.3	0.3	0.7	0.02	0.01	0.01
VA:Virginia Beach	1	0.0	0.0	0.0	0.01	0.01	0.01
WA:Olympia	7	0.2	0.0	0.1	0.01	0.00	0.01
WA:Spokane	9	0.6	0.1	0.3	0.02	0.00	0.01
WI:Madison	9	0.6	0.1	0.3	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

July 1995

Location	Depth (mm)	Gross Beta Activity nCi/m^2	$\pm 2\sigma$	Specific Gamma Activity pCi/L $\pm 2\sigma$
AK:Fairbanks	16.0	0.02	0.01	^{7}Be: 63.7±33.0
AK:Juneau	58.0	0.08	0.02	ND
AL:Montgomery	89.4	0.30	0.04	^{7}Be: 38.9±38.2
AR:Little Rock	51.0	0.09	0.02	ND
CO:Denver	47.6	0.08	0.02	ND
CT:Hartford	18.0	0.06	0.01	^{7}Be: 95.1±25.1
DE:Wilmington	85.0	0.20	0.03	^{7}Be: 52.9±26.2
FL:Jacksonville	315.4	0.28	0.09	^{7}Be: 33.0±21.6
FL:Miami	193.8	0.11	0.05	ND
IA:Iowa City	37.2	0.03	0.01	^{214}Bi: 9.0±6.8
ID:Idaho Falls	45.4	0.02	0.01	ND
IL:Chicago	102.8	0.14	0.04	ND
ME:Augusta	65.0	0.17	0.03	^{214}Bi: 9.2±6.4
				^{7}Be: 64.9±23.7
MI:Lansing	39.8	0.04	0.01	ND
MN:Minneapolis	71.0	0.08	0.02	ND
MN:Welch	8.0	0.01	0.00	^{214}Bi: 15.3±6.8
				^{7}Be: 39.0±34.7
				^{214}Pb: 10.8±4.6
MO:Jefferson City	70.0	0.13	0.02	ND
MS:Jackson	42.0	0.02	0.01	ND
NC:Charlotte	95.0	0.44	0.05	^{7}Be: 70.5±28.3
NC:Wilmington	115.0	0.44	0.05	^{7}Be: 67.8±30.3
ND:Bismarck	149.6	0.21	0.05	^{212}Bi: 45.1±38.1
NE:Lincoln	8.0	0.02	0.00	^{214}Pb: 6.4±5.7
NH:Concord	60.0	0.20	0.03	^{7}Be: 50.1±22.2
				^{214}Pb: 7.0±5.0
NJ:Trenton	100.2	0.19	0.04	ND
NY:Albany	55.0	0.17	0.02	^{7}Be: 84.8±39.0
NY:Yaphank	57.0	0.14	0.02	ND
OH:Painesville	60.2	0.25	0.03	^{214}Pb: 7.3±5.2
				^{214}Bi: 9.8±5.8
				^{7}Be: 83.5±29.2
OH:Toledo	58.0	0.10	0.02	ND
OR:Portland	22.0	0.01	0.01	ND
PA:Harrisburg	157.2	0.36	0.06	^{7}Be: 33.4±24.0
SC:Barnwell	95.6	0.20	0.04	ND
SC:Columbia	58.0	0.14	0.02	^{7}Be: 35.7±26.6
TN:Knoxville	14.0	0.02	0.00	^{214}Bi: 6.8±6.3

Table 5 (continued)

Gross Beta and Specific Gamma in Precipitation

July 1995

Location	Depth (mm)	Gross Beta Activity nCi/m^2	$\pm 2\sigma$	Specific Gamma Activity pCi/L	$\pm 2\sigma$
TN:Nashville	62.2	0.09	0.02	^{214}Pb:	5.2±4.7
				^{7}Be:	36.4±25.1
TX:Austin	40.0	0.03	0.01	^{7}Be:	38.3±25.6
TX:El Paso	16.0	0.02	0.01	ND	
VA:Lynchburg	162.2	0.33	0.06	ND	
WA:Olympia	47.0	0.06	0.01	^{7}Be:	33.2±30.9
WI:Madison	106.2	0.15	0.03	^{7}Be:	32.1±28.4

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

Table 6

Gross Beta and Specific Gamma in Precipitation

August 1995

Location	Depth (mm)	Gross Beta Activity nCi/m^2	$\pm 2\sigma$	Specific Gamma Activity pCi/L	$\pm 2\sigma$
AK:Fairbanks	42.0	0.03	0.01	^{7}Be:	29.2±28.2
AK:Juneau	32.8	0.03	0.01	^{7}Be:	39.9±27.0
AL:Montgomery	41.0	0.14	0.02	^{214}Bi:	11.0±7.2
AR:Little Rock	34.0	0.06	0.01	^{7}Be:	37.0±31.8
AZ:Phoenix	68.0	0.12	0.02	ND	
CO:Denver	18.6	0.10	0.01	^{7}Be:	88.2±28.6
CT:Hartford	80.0	0.18	0.03	^{214}Pb:	13.9±6.0
				^{214}Bi:	21.2±6.0
DE:Wilmington	45.0	0.09	0.02	ND	
FL:Jacksonville	317.0	0.32	0.09	ND	
FL:Miami	167.0	0.09	0.04	^{208}Tl:	5.1±3.6
IA:Iowa City	20.8	0.02	0.01	ND	
ID:Idaho Falls	10.8	0.05	0.01	^{214}Bi:	17.7±6.7
IL:Chicago	97.6	0.17	0.04	ND	
ME:Augusta	11.0	0.06	0.01	^{214}Bi:	16.6±6.3
				^{7}Be:	90.2±28.2
				^{212}Pb:	5.9±5.3
MI:Lansing	74.2	0.16	0.03	^{7}Be:	50.9±25.9
MN:Minneapolis	102.6	0.12	0.03	ND	
MN:Welch	8.0	0.02	0.00	ND	
MO:Jefferson City	40.0	0.02	0.01	^{7}Be:	40.5±25.6
MS:Jackson	42.0	0.03	0.01	ND	
NC:Charlotte	103.8	0.11	0.03	^{7}Be:	33.7±21.9
				^{212}Pb:	5.3±5.0
NC:Wilmington	52.0	0.05	0.02	ND	
ND:Bismarck	25.6	0.05	0.01	ND	
NE:Lincoln	47.2	0.08	0.02	ND	
NH:Concord	91.8	0.19	0.03	^{214}Bi:	13.2±6.5
				^{7}Be:	28.3±24.6
NJ:Trenton	24.0	0.09	0.01	^{7}Be:	46.9±28.9
NY:Albany	71.0	0.16	0.03	^{7}Be:	31.6±23.1
NY:Yaphank	18.0	0.07	0.01	ND	
OH:Painesville	57.0	0.34	0.03	^{7}Be:	57.2±26.2
OH:Toledo	62.0	0.13	0.02	ND	
OR:Portland	19.0	0.01	0.00	ND	
PA:Harrisburg	8.0	0.09	0.01	^{7}Be:	105±43
SC:Barnwell	118.6	0.30	0.05	ND	
SC:Columbia	158.0	0.21	0.05	ND	
TN:Knoxville	58.0	0.14	0.02	ND	

Table 6 (continued)

Gross Beta and Specific Gamma in Precipitation

August 1995

Location	Depth (mm)	Gross Beta Activity nCi/m^2	$\pm 2\sigma$	Specific Gamma Activity pCi/L	$\pm 2\sigma$
TN:Nashville	97.8	0.10	0.03	^{214}Bi:	14.0±6.1
				^{7}Be:	50.6±29.3
TX:Austin	40.0	0.03	0.01	ND	
TX:El Paso	22.0	0.02	0.01	ND	
VA:Lynchburg	52.4	0.22	0.03	ND	
WA:Olympia	29.8	0.03	0.01	^{212}Pb:	8.6±4.7
				^{7}Be:	37.4±27.2
				^{214}Bi:	11.7±6.2
WI:Madison	48.0	0.04	0.01	ND	

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

Table 7

Gross Beta and Specific Gamma in Precipitation

September 1995

Location	Depth (mm)	Gross Beta Activity nCi/m^2	$\pm 2\sigma$	Specific Gamma Activity pCi/L	$\pm 2\sigma$
AK:Fairbanks	16.0	0.01	0.00	ND	
AK:Juneau	78.4	0.09	0.02	ND	
AL:Montgomery	28.0	0.09	0.01	^{214}Pb:	7.8±4.7
				^{7}Be:	28.5±25.0
AR:Little Rock	40.0	0.07	0.01	ND	
AZ:Phoenix	1.8	0.01	0.00	^{7}Be:	96.8±47.2
CO:Denver	13.0	0.04	0.01	^{212}Pb:	6.3±5.7
CT:Hartford	76.0	0.05	0.02	ND	
DE:Wilmington	127.0	0.12	0.04	^{212}Pb:	7.6±5.3
				^{7}Be:	26.5±24.4
FL:Jacksonville	223.8	0.28	0.08	^{214}Pb:	13.8±5.0
				^{214}Bi:	27.6±5.6
FL:Miami	131.0	0.05	0.03	ND	
HI:Honolulu	7.6	0.04	0.00	ND	
IA:Iowa City	19.4	0.04	0.01	ND	
ID:Idaho Falls	14.8	0.09	0.01	^{212}Pb:	5.7±5.6
IL:Chicago	18.6	0.01	0.00	^{214}Bi:	9.2±7.0
ME:Augusta	86.0	0.16	0.03	^{7}Be:	51.5±23.3
MI:Lansing	30.2	0.02	0.01	^{7}Be:	56.2±56.1
MN:Minneapolis	18.6	0.03	0.01	ND	
MN:Welch	37.8	0.10	0.02	ND	
MS:Jackson	42.0	0.07	0.01	^{214}Bi:	8.9±6.6
NC:Charlotte	61.0	0.11	0.02	^{7}Be:	49.0±25.1
NC:Wilmington	6.6	0.00	0.00	ND	
ND:Bismarck	17.4	0.02	0.01	ND	
NE:Lincoln	16.0	0.05	0.01	^{7}Be:	45.1±28.6
NH:Concord	58.4	0.07	0.02	ND	
NJ:Trenton	103.6	0.10	0.03	^{7}Be:	20.6±19.4
NY:Albany	45.4	0.15	0.02	^{7}Be:	57.2±23.6
NY:Yaphank	118.0	0.15	0.04	ND	
OH:Painesville	27.8	0.06	0.01	^{7}Be:	39.7±24.3
OH:Toledo	14.0	0.06	0.01	^{212}Bi:	30.0±26.9
OR:Portland	15.0	0.04	0.01	^{7}Be:	59.0±30.3
PA:Harrisburg	47.0	0.12	0.02	^{7}Be:	27.8±22.1
SC:Barnwell	192.6	0.23	0.06	ND	
SC:Columbia	97.8	0.12	0.03	^{214}Bi:	8.2±5.5
				^{7}Be:	39.8±25.8
TN:Knoxville	36.0	0.10	0.02	^{7}Be:	49.0±25.0
TN:Nashville	45.4	0.05	0.01	^{7}Be:	41.4±27.8
TX:Austin	60.0	0.07	0.02	^{7}Be:	28.4±25.1

Table 7 (continued)

Gross Beta and Specific Gamma in Precipitation

September 1995

Location	Depth (mm)	Gross Beta Activity nCi/m^2	$\pm 2\sigma$	Specific Gamma Activity pCi/L	$\pm 2\sigma$
TX:El Paso	93.6	0.08	0.03	^{7}Be:	40.7±33.3
UT:Salt Lake City	6.6	0.03	0.00	^{7}Be:	87.4±31.2
VA:Lynchburg	6.8	0.07	0.01	ND	
WA:Olympia	39.0	0.05	0.01	ND	
WI:Madison	54.6	0.04	0.01	ND	

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

Table 8

Tritium in Precipitation

July–September 1995

Location	July 1995 nCi/L	±2σ	August 1995 nCi/L	±2σ	September 1995 nCi/L	±2σ
AK:Fairbanks	0.1	0.1	0.1	0.1	ND	
AK:Juneau	0.1	0.1	0.1	0.2	ND	
AL:Montgomery	0.1	0.1	ND		0.0	0.1
AR:Little Rock	0.1	0.1	0.0	0.1	ND	
AZ:Phoenix	NS		ND		ND	
CO:Denver	0.1	0.1	0.1	0.2	0.0	0.1
CT:Hartford	0.1	0.1	0.0	0.1	0.0	0.1
DE:Wilmington	0.1	0.1	0.1	0.2	0.0	0.1
FL:Jacksonville	0.1	0.1	0.0	0.1	0.0	0.1
FL:Miami	0.1	0.1	ND		ND	
HI:Honolulu	NS		NS		ND	
IA:Iowa City	0.1	0.1	ND		ND	
ID:Idaho Falls	0.1	0.1	0.0	0.1	ND	
IL:Chicago	0.1	0.1	0.0	0.1	ND	
ME:Augusta	0.1	0.1	ND		0.0	0.1
MI:Lansing	0.1	0.1	ND		0.1	0.1
MN:Minneapolis	0.1	0.1	0.0	0.1	ND	
MN:Welch	0.1	0.1	0.0	0.1	0.0	0.1
MO:Jefferson City	0.1	0.1	ND		NS	
MS:Jackson	0.1	0.1	0.0	0.1	ND	
NC:Charlotte	0.1	0.1	0.0	0.1	0.0	0.1
NC:Wilmington	0.2	0.1	ND		ND	
ND:Bismarck	0.1	0.1	ND		0.1	0.1
NE:Lincoln	0.1	0.1	0.1	0.1	0.0	0.1
NH:Concord	0.1	0.1	ND		0.0	0.1
NJ:Trenton	0.1	0.1	0.0	0.1	ND	
NY:Albany	0.1	0.1	ND		0.1	0.1
NY:Yaphank	0.1	0.1	ND		ND	
OH:Painesville	0.1	0.1	ND		0.0	0.1
OH:Toledo	0.1	0.1	ND		0.0	0.1
OR:Portland	0.1	0.1	ND		ND	
PA:Harrisburg	0.1	0.1	0.0	0.1	0.0	0.1
SC:Barnwell	0.5	0.1	ND		0.0	0.1
SC:Columbia	0.1	0.1	0.0	0.2	ND	
TN:Knoxville	0.1	0.2	0.1	0.1	ND	
TN:Nashville	0.1	0.1	0.0	0.1	ND	
TX:Austin	0.1	0.1	ND		0.0	0.1
TX:El Paso	0.1	0.1	ND		ND	
UT:Salt Lake City	NS		NS		0.0	0.1

Table 8 (continued)

Tritium in Precipitation

July–September 1995

Location	July 1995 nCi/L	±2σ	August 1995 nCi/L	±2σ	September 1995 nCi/L	±2σ
VA:Lynchburg	0.1	0.1	0.1	0.1	ND	
WA:Olympia	0.1	0.1	ND		ND	
WI:Madison	0.1	0.1	ND		0.0	0.1

Note: σ = Counting Error. ND = Not Detectable. 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 July–September 1995.

Table 9

Tritium in Surface Water

July–September 1995

Location	Source	Date Collected	^{3}H nCi/L	$\pm 2\sigma$
AL:Gordon	Chattahoochee River	07/12/95	0.1	0.1
AL:Gordon	Chattahoochee River	09/28/95	0.1	0.1
AR:Little Rock	Arkansas River	07/05/95	0.1	0.1
CA:Clay Station	Folsom S. Canal	07/24/95	0.1	0.1
CA:Eureka	Humboldt Bay	07/06/95	0.1	0.1
CA:San Onofre	Pacific Ocean	09/30/95	ND	
CO:Platteville	South Platte River	07/19/95	0.1	0.1
CT:East Haddam	Connecticut River	07/12/95	0.1	0.1
CT:Waterford	Long Island Sound	07/12/95	0.0	0.1
FL:Crystal River	Gulf Of Mexico	07/31/95	0.1	0.1
FL:Ft. Pierce	Atlantic Ocean	07/10/95	0.1	0.1
FL:Homestead	Biscayne Bay	07/19/95	0.1	0.1
GA:Baxley	Altamaha River	07/05/95	0.1	0.1
IA:Cedar Rapids	Cedar River	09/06/95	ND	
ID:Buhl	Snake River	07/10/95	0.1	0.1
IL:Moline	Mississippi River	07/03/95	0.1	0.1
IL:Zion	Lake Michigan	07/31/95	0.1	0.1
LA:New Orleans	Mississippi River	08/01/95	ND	
MA:Plymouth	Cape Cod Bay	07/26/95	0.1	0.1
MD:Conowingo	Susquehanna River	07/18/95	0.2	0.1
MD:Lusby	Chesapeake Bay	07/11/95	0.1	0.1
ME:Wiscasset	Montseway Bay	07/25/95	0.1	0.1
MI:Bridgman	Lake Michigan	07/26/95	0.2	0.1
MI:Charlevoix	Lake Michigan	07/13/95	0.1	0.1
MI:Monroe	Lake Erie	07/17/95	0.2	0.1
MI:South Haven	Lake Michigan	07/26/95	0.1	0.1
MN:Monticello	Mississippi River	07/12/95	0.1	0.1
MN:Red Wing	Mississippi River	07/19/95	0.1	0.1
MS:Port Gibson	Mississippi River	07/11/95	0.1	0.1
NC:Charlotte	Catawba River	07/12/95	0.3	0.1
NC:Southport	Atlantic Ocean	07/20/95	0.1	0.1
NE:Rulo	Missouri River	07/18/95	0.1	0.1
NJ:Bayside	Delaware River	07/11/95	0.1	0.1
NJ:Oyster Creek	Oyster Creek	07/13/95	0.1	0.1
NV:Boulder City	Colorado River	07/26/95	0.1	0.1
NY:Chelsea	Hudson River	07/12/95	0.1	0.1
NY:Croton-On-Hudson	Hudson River	07/31/95	0.1	0.1

Table 9 (continued)

Tritium in Surface Water

July–September 1995

Location	Source	Date Collected	^{3}H nCi/L	$\pm 2\sigma$
OH:Toledo	Lake Erie	09/20/95	0.0	0.1
OR:Bradwood	Columbia River	07/17/95	0.1	0.1
PA:Danville	Susquehanna River	07/19/95	0.1	0.1
PA:Philadelphia	Delaware River	07/14/95	0.1	0.1
PA:Philadelphia	Schuylkill R.-Belmont	07/14/95	0.2	0.1
PA:Philadelphia	Schuylkill R.-Queen	07/14/95	0.1	0.1
SC:Allendale	Savannah River	07/03/95	2.5	0.2
SC:Broad River	Broad River	07/20/95	0.1	0.1
SC:Hartsville	Lake Robinson	07/06/95	3.1	0.2
TN:Daisy	Tennessee River	09/22/95	0.1	0.1
TN:Kingston	Clinch River	08/15/95	0.1	0.1
TN:Oak Ridge	Clinch River	08/03/95	0.2	0.1
TX:El Paso	Rio Grande	07/11/95	0.1	0.1
TX:Matagorda	Colorado River	07/13/95	0.1	0.1
VA:Doswell	North Anna River	07/05/95	3.0	0.2
VA:Newport News	James River	07/18/95	0.1	0.1
VT:Vernon	Connecticut River	07/06/95	0.1	0.1
WA:Northport	Columbia River	09/25/95	0.1	0.1
WA:Richland	Columbia River	07/12/95	0.1	0.1
WI:Two Creeks	Lake Michigan	07/11/95	0.1	0.2
WI:Victory	Mississippi River	07/10/95	0.1	0.1
WV:Wheeling	Ohio River	07/06/95	0.1	0.1

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

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 July–September 1995.

Table 10

Tritium in Drinking Water

July–September 1995

Location	Date Collected	^{3}H nCi/L	$\pm 2\sigma$
AK:Fairbanks	07/10/95	0.1	0.1
AL:Dothan	09/28/95	0.1	0.1
AL:Dothan	07/11/95	0.1	0.1
AL:Montgomery	07/12/95	0.1	0.1
AR:Little Rock	07/05/95	0.1	0.1
CA:Berkeley	09/28/95	0.1	0.1
CO:Denver	07/20/95	0.1	0.1
CO:Platteville	07/12/95	0.1	0.1
CT:Hartford	07/03/95	0.1	0.1
DE:Dover	07/11/95	0.1	0.2
FL:Miami	07/11/95	0.1	0.1
FL:Tampa	09/20/95	0.1	0.1
GA:Baxley	07/05/95	0.1	0.1
HI:Honolulu	07/03/95	0.1	0.1
IA:Cedar Rapids	09/06/95	0.0	0.2
ID:Boise	07/03/95	0.1	0.2
ID:Idaho Falls	07/25/95	0.1	0.1
IL:W. Chicago	08/31/95	0.0	0.1
KS:Topeka	07/03/95	0.1	0.1
LA:New Orleans	07/06/95	0.1	0.1
MA:Lawrence	08/16/95	0.0	0.1
MD:Baltimore	07/03/95	0.1	0.1
MD:Conowingo	07/18/95	0.2	0.1
ME:Augusta	07/07/95	0.1	0.1
MI:Detroit	07/12/95	0.3	0.1
MI:Grand Rapids	09/06/95	0.1	0.1
MN:Minneapolis	07/06/95	0.1	0.1
MN:Red Wing	07/06/95	0.1	0.1
MO:Jefferson City	07/03/95	0.1	0.1
MS:Jackson	07/11/95	0.1	0.1
MS:Port Gibson	07/11/95	0.1	0.1
MT:Helena	07/12/95	0.2	0.1
NC:Charlotte	07/12/95	0.1	0.1
NC:Wilmington	07/06/95	0.1	0.1
ND:Bismarck	07/03/95	1.0	0.1
NE:Lincoln	07/20/95	0.0	0.1
NH:Concord	07/10/95	0.1	0.1
NJ:Trenton	07/05/95	0.1	0.1
NJ:Waretown	07/13/95	0.1	0.1
NM:Santa Fe	07/06/95	0.1	0.1
NV:Las Vegas	07/05/95	0.1	0.1

Table 10 (continued)

Tritium in Drinking Water

July–September 1995

Location	Date Collected	^{3}H nCi/L	$\pm 2\sigma$
NY:Albany	07/06/95	0.1	0.1
NY:New York City	07/12/95	0.2	0.2
NY:Niagara Falls	07/05/95	0.2	0.1
NY:Syracuse	09/05/95	ND	
OH:Cincinnati	09/05/95	0.0	0.1
OH:East Liverpool	08/09/95	0.1	0.1
OH:Painesville	07/12/95	0.2	0.1
OH:Toledo	07/06/95	0.1	0.1
OK:Oklahoma	07/11/95	0.1	0.1
OR:Portland	07/06/95	0.1	0.1
PA:Columbia	07/20/95	0.1	0.1
PA:Harrisburg	07/20/95	0.1	0.1
PA:Philadelphia	07/14/95	0.1	0.1
PA:Philadelphia-Queen	07/14/95	0.1	0.1
PA:Philadelphia-Baxter	07/14/95	0.1	0.1
PA:Pittsburgh	08/09/95	0.1	0.1
PC:Corozal	07/05/95	0.1	0.1
RI:Providence	07/03/95	0.1	0.1
SC:Barnwell	07/12/95	0.1	0.1
SC:Columbia	07/07/95	0.1	0.1
SC:Jenkinsville	07/20/95	0.1	0.1
SC:Seneca	07/11/95	0.1	0.1
TN:Chattanooga	07/17/95	0.3	0.1
TN:Knoxville	07/05/95	0.1	0.1
TX:Austin	07/21/95	0.1	0.1
VA:Doswell	09/26/95	0.0	0.1
VA:Lynchburg	07/06/95	0.1	0.1
VA:Virginia Beach	07/06/95	0.1	0.1
WA:Richland	07/12/95	0.1	0.1
WA:Seattle	07/03/95	0.1	0.1
WI:Genoa City	07/10/95	0.1	0.2
WI:Madison	07/21/95	0.1	0.1

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

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 approximately 55 sampling sites with at least one located in most states, 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.

Note: As of the first quarter of 1995, NAREL has discontinued regional compositing of milk samples for strontium-90 analysis.

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 July–September 1995. Table 14 contains the concentrations of strontium-90 in pasteurized milk for July 1995.

Table 11

Radionuclides in Pasteurized Milk

July 1995

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	07/12/95	1.73	0.09	ND		ND		ND	
AR:Little Rock	07/05/95	1.62	0.08	ND		ND		ND	
AZ:Phoenix	07/27/95	1.60	0.08	ND		ND		ND	
CA:Los Angeles	07/12/95	1.73	0.09	ND		ND		ND	
CA:Sacramento	07/03/95	1.50	0.10	ND		ND		ND	
CA:San Francisco	07/06/95	1.75	0.09	ND		ND		ND	
DE:Wilmington	07/20/95	1.61	0.06	ND		ND		ND	
FL:Tampa	07/24/95	1.70	0.08	ND		ND		ND	
GA:Atlanta	07/11/95	1.60	0.09	ND		ND		ND	
HI:Honolulu	07/18/95	1.67	0.08	ND		ND		ND	
IA:Des Moines	07/10/95	1.69	0.06	ND		ND		ND	
IL:Chicago	07/12/95	1.61	0.09	ND		ND		ND	
IN:Indianapolis	07/12/95	1.62	0.08	ND		ND		ND	
KS:Wichita	07/18/95	1.72	0.08	ND		ND		ND	
KY:Louisville	07/05/95	1.50	0.14	ND		ND		ND	
MA:Boston	07/07/95	1.56	0.08	ND		ND		ND	
MD:Baltimore	07/07/95	1.69	0.08	ND		ND		ND	
ME:Portland	07/24/95	1.64	0.15	ND		ND		ND	
MI:Detroit	07/14/95	1.67	0.08	ND		ND		ND	
MI:Grand Rapids	07/03/95	1.67	0.08	ND		ND		ND	
MO:Kansas City	07/12/95	1.57	0.11	ND		ND		ND	
MS:Jackson	07/12/95	1.63	0.08	ND		ND		ND	
NC:Charlotte	07/05/95	1.58	0.07	ND		ND		ND	
ND:Minot	07/13/95	1.57	0.14	ND		ND		ND	
NJ:Trenton	07/07/95	1.61	0.08	ND		ND		ND	
NM:Albuquerque	07/12/95	1.79	0.09	ND		ND		ND	
NV:Las Vegas	07/10/95	1.55	0.11	ND		ND		ND	
NY:Buffalo	07/10/95	1.77	0.10	ND		ND		ND	
NY:Syracuse	07/10/95	1.64	0.07	ND		ND		ND	
OH:Cincinnati	07/10/95	1.69	0.09	ND		ND		ND	
OH:Cleveland	07/11/95	1.70	0.08	ND		ND		ND	
OR:Portland	07/10/95	1.71	0.06	ND		ND		ND	
PA:Philadelphia	07/07/95	1.67	0.08	ND		ND		ND	
PA:Pittsburgh	07/03/95	1.61	0.09	ND		ND		ND	
PC:Cristobal	07/18/95	1.59	0.11	5	3	ND		ND	
PR:San Juan	07/07/95	1.75	0.09	ND		ND		ND	
SC:Charleston	07/12/95	1.54	0.14	ND		ND		ND	

Table 11 (continued)

Radionuclides in Pasteurized Milk

July 1995

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 $\pm 2\sigma$
TN:Chattanooga	07/03/95	1.42	0.14	ND		ND		ND	
TN:Knoxville	07/05/95	1.50	0.11	ND		ND		ND	
TX:Austin	07/26/95	1.55	0.09	ND		ND		ND	
TX:Ft. Worth	07/12/95	1.48	0.11	ND		ND		ND	
VA:Norfolk	07/30/95	1.60	0.08	ND		ND		ND	
VT:Burlington	07/27/95	1.57	0.08	ND		ND		ND	
WA:Seattle	07/10/95	1.73	0.09	ND		ND		ND	
WA:Spokane	07/11/95	1.69	0.09	ND		ND		ND	
WV:Charleston	07/10/95	1.69	0.09	ND		ND		ND	

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

Table 12

Radionuclides in Pasteurized Milk

August 1995

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	08/11/95	1.57	0.08	ND		ND		ND	
AR:Little Rock	08/16/95	1.66	0.08	ND		ND		ND	
CA:Los Angeles	08/07/95	1.64	0.09	ND		ND		ND	
CA:Sacramento	08/01/95	1.66	0.09	ND		ND		ND	
CA:San Francisco	08/03/95	1.67	0.11	ND		ND		ND	
CO:Denver	08/11/95	1.63	0.10	ND		ND		ND	
CT:Hartford	08/10/95	1.60	0.11	ND		ND		ND	
DE:Wilmington	08/08/95	1.73	0.08	ND		ND		ND	
FL:Tampa	08/08/95	1.42	0.08	ND		ND		ND	
GA:Atlanta	08/08/95	1.59	0.09	ND		ND		ND	
HI:Honolulu	08/15/95	1.66	0.08	ND		ND		ND	
IA:Des Moines	08/01/95	1.56	0.12	ND		ND		ND	
IL:Chicago	08/16/95	1.59	0.06	ND		ND		ND	
IN:Indianapolis	08/07/95	1.67	0.09	ND		ND		ND	
KS:Wichita	08/28/95	1.62	0.09	ND		ND		ND	
KY:Louisville	08/07/95	1.66	0.08	ND		ND		ND	
MA:Boston	08/07/95	1.56	0.11	ND		ND		ND	
MD:Baltimore	08/04/95	1.69	0.08	ND		ND		ND	
MI:Detroit	08/11/95	1.70	0.08	ND		ND		ND	
MI:Grand Rapids	08/10/95	1.63	0.08	ND		ND		ND	
MN:St. Paul	08/04/95	1.60	0.09	ND		ND		ND	
MO:Kansas City	08/21/95	1.63	0.08	ND		ND		ND	
MS:Jackson	08/01/95	1.59	0.08	ND		ND		ND	
NC:Charlotte	08/08/95	1.62	0.08	ND		ND		ND	
ND:Minot	08/07/95	1.59	0.07	ND		ND		ND	
NJ:Trenton	08/09/95	1.57	0.11	ND		ND		ND	
NM:Albuquerque	08/01/95	1.57	0.08	ND		ND		ND	
NV:Las Vegas	08/21/95	1.67	0.08	ND		ND		ND	
NY:Buffalo	08/10/95	1.62	0.08	ND		ND		ND	
NY:Syracuse	08/07/95	1.64	0.08	ND		ND		ND	
OH:Cincinnati	08/15/95	1.66	0.08	ND		ND		ND	
OH:Cleveland	08/17/95	1.55	0.11	ND		ND		ND	
OR:Portland	08/07/95	1.70	0.12	ND		ND		ND	
PA:Philadelphia	08/08/95	1.62	0.09	ND		ND		ND	
PA:Pittsburgh	08/07/95	1.64	0.08	ND		ND		ND	
PC:Cristobal	08/31/95	1.68	0.09	6	3	ND		ND	
PR:San Juan	08/14/95	1.52	0.08	ND		ND		ND	

Table 12 (continued)

Radionuclides in Pasteurized Milk

August 1995

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 $\pm 2\sigma$
SC:Charleston	08/10/95	1.57	0.06	ND		ND		ND	
TN:Chattanooga	08/07/95	1.61	0.14	ND		ND		ND	
TN:Knoxville	08/07/95	1.55	0.07	ND		ND		ND	
TX:Austin	08/17/95	1.57	0.09	ND		ND		ND	
VT:Montpelier	08/22/95	1.63	0.08	ND		ND		ND	
WA:Seattle	08/09/95	1.60	0.08	ND		ND		ND	
WA:Spokane	08/01/95	1.54	0.08	ND		ND		ND	
WV:Charleston	08/07/95	1.62	0.12	ND		ND		ND	

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

Table 13

Radionuclides in Pasteurized Milk

September 1995

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	09/11/95	1.51	0.14	ND		ND		ND	
AR:Little Rock	09/11/95	1.60	0.09	ND		ND		ND	
AZ:Phoenix	09/11/95	1.61	0.11	ND		ND		ND	
CA:Los Angeles	09/07/95	1.66	0.09	ND		ND		ND	
CA:Sacramento	09/20/95	1.62	0.14	ND		ND		ND	
CA:San Francisco	09/06/95	1.70	0.08	ND		ND		ND	
CO:Denver	09/18/95	1.61	0.08	ND		ND		ND	
DE:Wilmington	09/19/95	1.47	0.08	ND		ND		ND	
FL:Tampa	09/06/95	1.67	0.08	ND		ND		ND	
HI:Honolulu	09/26/95	1.61	0.09	ND		ND		ND	
IA:Des Moines	09/11/95	1.49	0.11	ND		ND		ND	
IL:Chicago	09/14/95	1.64	0.08	ND		ND		ND	
IN:Indianapolis	09/11/95	1.55	0.08	ND		ND		ND	
KS:Wichita	09/26/95	1.62	0.12	ND		ND		ND	
KY:Louisville	09/05/95	1.77	0.09	ND		ND		ND	
MA:Boston	09/05/95	1.61	0.09	ND		ND		ND	
MD:Baltimore	09/08/95	1.67	0.12	ND		ND		ND	
MI:Detroit	09/08/95	1.56	0.08	ND		ND		ND	
MI:Grand Rapids	09/05/95	1.54	0.14	ND		ND		ND	
MO:Kansas City	09/12/95	1.59	0.08	ND		ND		ND	
MS:Jackson	09/11/95	1.60	0.11	ND		ND		ND	
NC:Charlotte	09/05/95	1.61	0.07	ND		ND		ND	
ND:Minot	09/07/95	1.60	0.08	ND		ND		ND	
NJ:Trenton	09/07/95	1.57	0.09	ND		ND		ND	
NM:Albuquerque	09/26/95	1.66	0.09	ND		ND		ND	
NV:Las Vegas	09/11/95	1.67	0.09	ND		ND		ND	
NY:Buffalo	09/06/95	1.69	0.08	ND		ND		ND	
NY:Syracuse	09/11/95	1.47	0.14	ND		ND		ND	
OH:Cincinnati	09/20/95	1.57	0.08	ND		ND		ND	
OH:Cleveland	09/26/95	1.56	0.12	ND		ND		ND	
OR:Portland	09/05/95	1.67	0.08	ND		ND		ND	
PA:Philadelphia	09/05/95	1.69	0.12	ND		ND		ND	
PA:Pittsburgh	09/05/95	1.61	0.08	ND		ND		ND	
PC:Cristobal	09/28/95	1.51	0.09	6	2	ND		ND	
PR:San Juan	09/11/95	1.44	0.14	ND		ND		ND	
SC:Charleston	09/18/95	1.57	0.08	ND		ND		ND	
TN:Chattanooga	09/05/95	1.64	0.08	ND		ND		ND	

Table 13 (continued)

Radionuclides in Pasteurized Milk

September 1995

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 $\pm 2\sigma$
TN:Knoxville	09/07/95	1.66	0.08	ND		ND		ND	
TN:Memphis	09/01/95	1.66	0.09	ND		ND		ND	
TX:Austin	09/29/95	1.60	0.08	ND		ND		ND	
TX:Ft. Worth	09/05/95	1.55	0.10	ND		ND		ND	
VA:Norfolk	09/01/95	1.59	0.08	ND		ND		ND	
VT:Burlington	09/27/95	1.70	0.15	ND		ND		ND	
WA:Seattle	09/05/95	1.54	0.09	ND		ND		ND	
WA:Spokane	09/12/95	1.49	0.09	ND		ND		ND	
WV:Charleston	09/05/95	1.49	0.11	ND		ND		ND	

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

Table 14

Strontium-90 in Pasteurized Milk

July 1995

EPA Location	Collection Date	^{90}Sr pCi/L	$\pm 2\sigma$
AL:Montgomery	07/12/95	0.8	0.5
AR:Little Rock	07/05/95	1.7	0.5
AZ:Phoenix	07/27/95	0.0	0.4
CA:Los Angeles	07/12/95	0.0	0.4
CA:Sacramento	07/03/95	0.3	0.5
CA:San Francisco	07/06/95	0.5	0.5
DE:Wilmington	07/20/95	0.7	0.3
FL:Tampa	07/24/95	0.2	0.6
GA:Atlanta	07/11/95	ND	
HI:Honolulu	07/18/95	0.1	0.6
IA:Des Moines	07/10/95	0.9	0.6
IL:Chicago	07/12/95	1.7	0.5
IN:Indianapolis	07/12/95	1.2	0.5
KS:Wichita	07/18/95	0.9	0.5
KY:Louisville	07/05/95	1.1	0.6
MA:Boston	07/07/95	0.8	0.5
MD:Baltimore	07/07/95	0.7	0.4
ME:Portland	07/24/95	0.9	0.6
MI:Detroit	07/14/95	ND	
MI:Grand Rapids	07/03/95	1.2	0.5
MO:Kansas City	07/12/95	1.5	0.5
MS:Jackson	07/12/95	1.1	0.6
NC:Charlotte	07/05/95	1.1	0.5
ND:Minot	07/13/95	1.3	0.8
NJ:Trenton	07/07/95	1.3	0.5
NM:Albuquerque	07/12/95	0.4	0.4
NV:Las Vegas	07/10/95	0.0	0.4
NY:Buffalo	07/10/95	1.2	0.6
NY:Syracuse	07/10/95	1.1	0.6
OH:Cincinnati	07/10/95	0.1	0.4
OH:Cleveland	07/11/95	1.1	0.3
OR:Portland	07/10/95	0.7	0.4
PA:Philadelphia	07/07/95	1.3	0.6
PA:Pittsburgh	07/03/95	1.3	0.6
PC:Cristobal	07/18/95	0.3	0.4
PR:San Juan	07/07/95	0.1	0.5
SC:Charleston	07/12/95	ND	

Table 14 (continued)

Strontium-90 in Pasteurized Milk

July 1995

EPA Location	Collection Date	^{90}Sr pCi/L	$\pm 2\sigma$
TN:Chattanooga	07/03/95	0.5	0.6
TN:Knoxville	07/05/95	1.4	0.5
TX:Austin	07/26/95	0.6	0.6
TX:Ft. Worth	07/12/95	0.7	0.5
VA:Norfolk	07/30/95	1.1	0.7
VT:Burlington	07/27/95	0.9	0.5
WA:Seattle	07/10/95	1.0	0.5
WA:Spokane	07/11/95	1.1	0.5
WV:Charleston	07/10/95	1.4	0.6

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

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

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