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# ENVIRONMENTAL RADIATION DATA

REPORT 99

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United States Environmental Protection Agency

Office of Radiation and Indoor Air

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# 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).

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# 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.

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# 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.

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# 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/m³ | 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/m³ | 0.75 |
| | Water | pCi/L | 0.1 |
| † Uranium-234,235,238 | Air | aCi/m³ | 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 $^{239}$Pu and $^{240}$Pu, 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.

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# 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 $pCi/m^3$. 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 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
## July 1999

| Location | Number of Samples | 5-hour Field Estimate (pCi/m³) | | | NAREL Lab Measurement (pCi/m³) | | |
|---|---|---|---|---|---|---|---|
| | | Max | Min | Avg | Max | Min | Avg |
| AK: Fairbanks | 2 | 0.0 | 0.0 | 0.0 | 0.007 | 0.002 | 0.004 |
| AL: Montgomery | 9 | 0.2 | 0.0 | 0.1 | 0.033 | 0.010 | 0.019 |
| AR: Little Rock | 9 | 0.3 | 0.0 | 0.1 | 0.015 | 0.008 | 0.012 |
| AZ: Phoenix | 4 | 0.4 | 0.2 | 0.3 | 0.028 | 0.006 | 0.015 |
| CA: Berkeley | 9 | 0.1 | 0.0 | 0.0 | 0.005 | 0.001 | 0.003 |
| CA: Los Angeles | 9 | 0.1 | 0.0 | 0.1 | 0.009 | 0.006 | 0.007 |
| CO: Denver | 9 | 0.7 | 0.1 | 0.5 | 0.010 | 0.007 | 0.009 |
| CT: Hartford | 9 | 0.2 | 0.0 | 0.1 | 0.016 | 0.004 | 0.008 |
| DE: Wilmington | 9 | 0.4 | 0.0 | 0.2 | 0.015 | 0.005 | 0.011 |
| FL: Jacksonville | 9 | 0.2 | 0.0 | 0.1 | 0.012 | 0.006 | 0.008 |
| FL: Miami | 4 | 0.0 | 0.0 | 0.0 | 0.017 | 0.007 | 0.010 |
| HI: Honolulu | 7 | 0.1 | 0.1 | 0.1 | 0.002 | 0.001 | 0.001 |
| IA: Iowa City | 9 | 1.1 | 0.2 | 0.5 | 0.015 | 0.005 | 0.010 |
| ID: Boise | 9 | 1.0 | 0.1 | 0.4 | 0.013 | 0.005 | 0.008 |
| ID: Idaho Falls | 9 | | | | 0.011 | 0.006 | 0.008 |
| IN: Indianapolis | 9 | 1.4 | 0.1 | 0.5 | 0.015 | 0.006 | 0.010 |
| KS: Topeka | 9 | 2.1 | 0.3 | 1.2 | 0.017 | 0.005 | 0.011 |
| ME: Augusta | 9 | 0.3 | 0.1 | 0.1 | 0.018 | 0.003 | 0.008 |
| MI: Lansing | 9 | 0.4 | 0.1 | 0.2 | 0.014 | 0.004 | 0.009 |
| MN: Minneapolis | 4 | 0.2 | 0.1 | 0.2 | 0.013 | 0.009 | 0.011 |
| MN: Welch/511 | 1 | 0.1 | 0.1 | 0.1 | 0.007 | 0.007 | 0.007 |
| MS: Jackson | 9 | 0.5 | 0.2 | 0.3 | 0.027 | 0.004 | 0.014 |
| NC: Charlotte | 5 | 0.1 | 0.0 | 0.0 | 0.017 | 0.004 | 0.011 |
| ND: Bismarck | 6 | 1.0 | 0.1 | 0.4 | 0.011 | 0.005 | 0.007 |
| NH: Concord | 9 | 0.5 | 0.1 | 0.2 | 0.022 | 0.004 | 0.009 |
| NV: Las Vegas | 9 | 0.2 | 0.1 | 0.1 | 0.013 | 0.006 | 0.008 |
| NY: Albany | 4 | 0.1 | 0.0 | 0.1 | 0.018 | 0.006 | 0.012 |
| NY: New York City | 9 | 0.2 | 0.0 | 0.1 | 0.015 | 0.005 | 0.010 |
| NY: Yaphank | 9 | 0.2 | 0.0 | 0.1 | 0.014 | 0.004 | 0.009 |
| OH: Painesville | 9 | 0.6 | 0.1 | 0.3 | 0.021 | 0.005 | 0.011 |
| OH: Ross | 8 | | | | 0.017 | 0.007 | 0.012 |
| OR: Portland | 7 | 0.1 | 0.0 | 0.1 | 0.004 | 0.002 | 0.003 |
| PA: Harrisburg | 9 | 0.8 | 0.2 | 0.4 | 0.019 | 0.006 | 0.011 |
| PA: Pittsburgh | 9 | 0.4 | 0.1 | 0.3 | 0.024 | 0.007 | 0.011 |
| SC: Barnwell | 1 | 0.0 | 0.0 | 0.0 | 0.006 | 0.006 | 0.006 |
| SC: Columbia | 8 | 0.6 | 0.1 | 0.3 | 0.020 | 0.005 | 0.013 |
| SD: Pierre | 5 | 0.2 | 0.0 | 0.1 | 0.012 | 0.005 | 0.007 |
| TN: Knoxville | 8 | 0.6 | 0.1 | 0.4 | 0.026 | 0.007 | 0.016 |

## Table 2 (continued)

## Gross Beta in Airborne Particulates
## July 1999

| Location | Number of Samples | 5-hour Field Estimate (pCi/m³) | | | NAREL Lab Measurement (pCi/m³) | | |
|---|---|---|---|---|---|---|---|
| | | Max | Min | Avg | Max | Min | Avg |
| TN: Nashville | 9 | 0.3 | 0.1 | 0.2 | 0.017 | 0.011 | 0.014 |
| TN: Oak Ridge/Bethel | 9 | 0.7 | 0.1 | 0.4 | 0.014 | 0.007 | 0.010 |
| TN: Oak Ridge/K25 | 9 | 0.8 | 0.1 | 0.5 | 0.015 | 0.007 | 0.010 |
| TN: Oak Ridge/Melton | 9 | 1.0 | 0.2 | 0.5 | 0.015 | 0.007 | 0.011 |
| TN: Oak Ridge/Y12 E | 9 | 0.8 | 0.1 | 0.4 | 0.019 | 0.006 | 0.011 |
| TN: Oak Ridge/Y12 W | 9 | 0.5 | 0.1 | 0.2 | 0.016 | 0.007 | 0.010 |
| TX: Austin | 9 | 0.2 | 0.1 | 0.1 | 0.014 | 0.004 | 0.009 |
| TX: El Paso | 8 | 0.8 | 0.1 | 0.5 | 0.010 | 0.008 | 0.009 |
| UT: Salt Lake City | 5 | 0.5 | 0.0 | 0.2 | 0.016 | 0.008 | 0.011 |
| VA: Lynchburg | 9 | 0.9 | 0.4 | 0.7 | 0.015 | 0.006 | 0.010 |
| WA: Olympia | 3 | | | | 0.004 | 0.002 | 0.003 |
| WA: Spokane | 9 | 0.3 | 0.1 | 0.2 | 0.011 | 0.002 | 0.006 |
| WI: Madison | 8 | 0.9 | 0.2 | 0.3 | 0.020 | 0.007 | 0.011 |

# Table 3

## Gross Beta in Airborne Particulates
## August 1999

| Location | Number of Samples | 5-hour Field Estimate (pCi/m³) | | | NAREL Lab Measurement (pCi/m³) | | |
|---|---|---|---|---|---|---|---|
| | | Max | Min | Avg | Max | Min | Avg |
| AL: Montgomery | 12 | 0.3 | 0.0 | 0.2 | 0.047 | 0.005 | 0.027 |
| AR: Little Rock | 9 | 0.3 | 0.0 | 0.1 | 0.027 | 0.006 | 0.015 |
| AZ: Phoenix | 5 | 0.4 | 0.0 | 0.2 | 0.012 | 0.008 | 0.010 |
| CA: Berkeley | 9 | 0.1 | 0.0 | 0.1 | 0.004 | 0.002 | 0.003 |
| CA: Los Angeles | 9 | 0.1 | 0.0 | 0.1 | 0.011 | 0.005 | 0.007 |
| CO: Denver | 9 | 0.6 | 0.1 | 0.3 | 0.013 | 0.005 | 0.008 |
| CT: Hartford | 9 | 0.2 | 0.0 | 0.1 | 0.011 | 0.004 | 0.007 |
| DE: Wilmington | 9 | 0.3 | 0.1 | 0.2 | 0.016 | 0.005 | 0.011 |
| FL: Jacksonville | 9 | 0.1 | 0.0 | 0.1 | 0.017 | 0.003 | 0.009 |
| FL: Miami | 4 | 0.1 | 0.0 | 0.0 | 0.008 | 0.002 | 0.005 |
| HI: Honolulu | 6 | 0.1 | 0.0 | 0.1 | 0.003 | 0.002 | 0.002 |
| IA: Iowa City | 9 | 1.1 | 0.1 | 0.3 | 0.020 | 0.006 | 0.012 |
| ID: Boise | 9 | 1.1 | 0.3 | 0.5 | 0.013 | 0.006 | 0.010 |
| ID: Idaho Falls | 9 | | | | 0.011 | 0.006 | 0.008 |
| IN: Indianapolis | 9 | 0.6 | 0.0 | 0.3 | 0.015 | 0.006 | 0.009 |
| KS: Topeka | 9 | 3.8 | 0.5 | 1.3 | 0.030 | 0.008 | 0.016 |
| ME: Augusta | 8 | 0.5 | 0.0 | 0.2 | 0.013 | 0.004 | 0.008 |
| MI: Lansing | 9 | 0.3 | 0.1 | 0.2 | 0.013 | 0.005 | 0.008 |
| MN: Minneapolis | 5 | 0.2 | 0.1 | 0.2 | 0.017 | 0.010 | 0.013 |
| MS: Jackson | 9 | 0.7 | 0.2 | 0.4 | 0.046 | 0.010 | 0.019 |
| NC: Charlotte | 6 | 0.3 | 0.1 | 0.1 | 0.023 | 0.006 | 0.016 |
| ND: Bismarck | 5 | 1.8 | 0.1 | 0.9 | 0.014 | 0.007 | 0.011 |
| NH: Concord | 9 | 0.3 | 0.1 | 0.2 | 0.013 | 0.005 | 0.009 |
| NV: Las Vegas | 9 | 0.2 | 0.1 | 0.1 | 0.011 | 0.003 | 0.009 |
| NY: Albany | 3 | 0.4 | 0.1 | 0.2 | 0.012 | 0.008 | 0.010 |
| NY: New York City | 8 | 0.1 | 0.0 | 0.1 | 0.015 | 0.005 | 0.009 |
| NY: Yaphank | 9 | 0.4 | 0.0 | 0.1 | 0.013 | 0.004 | 0.008 |
| OH: Painesville | 7 | 0.4 | 0.1 | 0.2 | 0.012 | 0.006 | 0.009 |
| OH: Ross | 9 | | | | 0.018 | 0.009 | 0.013 |
| OR: Portland | 5 | 0.2 | 0.1 | 0.1 | 0.005 | 0.002 | 0.004 |
| PA: Harrisburg | 9 | 0.5 | 0.1 | 0.3 | 0.015 | 0.006 | 0.010 |
| PA: Pittsburgh | 9 | | | | 0.013 | 0.007 | 0.011 |
| SC: Barnwell | 2 | 0.0 | 0.0 | 0.0 | 0.011 | 0.007 | 0.009 |
| SC: Columbia | 8 | 0.4 | 0.1 | 0.2 | 0.024 | 0.010 | 0.015 |
| SD: Pierre | 6 | 0.4 | 0.1 | 0.2 | 0.013 | 0.005 | 0.008 |
| TN: Knoxville | 9 | 1.3 | 0.3 | 0.7 | 0.032 | 0.017 | 0.023 |
| TN: Nashville | 7 | 0.5 | 0.1 | 0.3 | 0.033 | 0.009 | 0.017 |
| TN: Oak Ridge/Bethel | 9 | 0.9 | 0.4 | 0.7 | 0.020 | 0.010 | 0.015 |

## Table 3 (continued)

## Gross Beta in Airborne Particulates
## August 1999

| Location | Number of Samples | 5-hour Field Estimate | | | NAREL Lab Measurement | | |
|---|---|---|---|---|---|---|---|
| | | Max | Min | Avg | Max | Min | Avg |
| | | (pCi/m³) | | | (pCi/m³) | | |
| TN: Oak Ridge/K25 | 9 | 1.4 | 0.5 | 0.9 | 0.019 | 0.011 | 0.015 |
| TN: Oak Ridge/Melton | 9 | 1.5 | 0.6 | 0.9 | 0.019 | 0.010 | 0.015 |
| TN: Oak Ridge/Y12 E | 9 | 1.5 | 0.3 | 0.8 | 0.021 | 0.012 | 0.016 |
| TN: Oak Ridge/Y12 W | 9 | 0.9 | 0.3 | 0.5 | 0.020 | 0.011 | 0.016 |
| TX: Austin | 9 | 0.2 | 0.1 | 0.2 | 0.021 | 0.004 | 0.010 |
| TX: El Paso | 9 | 0.5 | 0.0 | 0.2 | 0.017 | 0.009 | 0.012 |
| UT: Salt Lake City | 3 | 0.2 | 0.0 | 0.1 | 0.012 | 0.010 | 0.012 |
| VA: Lynchburg | 8 | 1.1 | 0.4 | 0.7 | 0.016 | 0.007 | 0.013 |
| WA: Olympia | 7 | | | | 0.005 | 0.002 | 0.003 |
| WA: Spokane | 9 | 0.2 | 0.1 | 0.2 | 0.011 | 0.005 | 0.008 |
| WI: Madison | 9 | 0.6 | 0.1 | 0.3 | 0.023 | 0.005 | 0.011 |

# Table 4

## Gross Beta in Airborne Particulates
## September 1999

| Location | Number of Samples | 5-hour Field Estimate (pCi/m³) | | | NAREL Lab Measurement (pCi/m³) | | |
|---|---|---|---|---|---|---|---|
| | | Max | Min | Avg | Max | Min | Avg |
| AK: Fairbanks | 2 | 0.0 | 0.0 | 0.0 | 0.005 | 0.003 | 0.004 |
| AL: Montgomery | 18 | 0.3 | 0.0 | 0.1 | 0.038 | 0.003 | 0.018 |
| AR: Little Rock | 8 | 0.4 | 0.0 | 0.1 | 0.022 | 0.009 | 0.015 |
| AZ: Phoenix | 4 | 0.9 | 0.4 | 0.6 | 0.015 | 0.006 | 0.012 |
| CA: Berkeley | 8 | 0.2 | 0.0 | 0.1 | 0.012 | 0.004 | 0.009 |
| CA: Los Angeles | 8 | 0.1 | 0.0 | 0.1 | 0.017 | 0.008 | 0.012 |
| CO: Denver | 9 | 1.2 | 0.4 | 0.7 | 0.016 | 0.007 | 0.010 |
| CT: Hartford | 8 | 0.2 | 0.0 | 0.1 | 0.009 | 0.004 | 0.007 |
| DE: Wilmington | 9 | 0.4 | 0.0 | 0.1 | 0.021 | 0.005 | 0.011 |
| FL: Jacksonville | 7 | 0.1 | 0.0 | 0.1 | 0.009 | 0.006 | 0.008 |
| FL: Miami | 2 | 0.0 | 0.0 | 0.0 | 0.009 | 0.004 | 0.007 |
| HI: Honolulu | 9 | 0.2 | 0.1 | 0.1 | 0.005 | 0.003 | 0.004 |
| IA: Iowa City | 9 | 1.1 | 0.1 | 0.5 | 0.017 | 0.005 | 0.011 |
| ID: Boise | 7 | 0.8 | 0.3 | 0.6 | 0.017 | 0.005 | 0.011 |
| ID: Idaho Falls | 9 | | | | 0.017 | 0.007 | 0.010 |
| IN: Indianapolis | 8 | 0.9 | 0.1 | 0.4 | 0.017 | 0.007 | 0.010 |
| KS: Topeka | 9 | 4.1 | 0.4 | 1.5 | 0.026 | 0.009 | 0.014 |
| ME: Augusta | 8 | 0.5 | 0.0 | 0.1 | 0.009 | 0.005 | 0.007 |
| MI: Lansing | 9 | 0.7 | 0.1 | 0.3 | 0.011 | 0.004 | 0.008 |
| MN: Minneapolis | 4 | 0.2 | 0.1 | 0.2 | 0.016 | 0.009 | 0.012 |
| MS: Jackson | 8 | 0.6 | 0.2 | 0.3 | 0.027 | 0.008 | 0.014 |
| NC: Charlotte | 6 | 0.4 | 0.1 | 0.2 | 0.014 | 0.007 | 0.010 |
| ND: Bismarck | 4 | 0.6 | 0.3 | 0.5 | 0.012 | 0.007 | 0.008 |
| NH: Concord | 8 | 0.3 | 0.0 | 0.2 | 0.013 | 0.005 | 0.008 |
| NV: Las Vegas | 8 | 0.2 | 0.1 | 0.1 | 0.014 | 0.002 | 0.010 |
| NY: Albany | 5 | 0.1 | 0.0 | 0.1 | 0.014 | 0.008 | 0.012 |
| NY: New York | 1 | 0.0 | 0.0 | 0.0 | 0.011 | 0.011 | 0.011 |
| NY: New York City | 7 | 0.1 | 0.0 | 0.0 | 0.016 | 0.005 | 0.009 |
| NY: Syracuse | 3 | | | | 0.014 | 0.010 | 0.012 |
| NY: Yaphank | 9 | 0.2 | 0.0 | 0.1 | 0.013 | 0.004 | 0.008 |
| OH: Painesville | 7 | 0.5 | 0.1 | 0.2 | 0.022 | 0.005 | 0.012 |
| OH: Ross | 8 | | | | 0.022 | 0.009 | 0.014 |
| OR: Portland | 8 | 0.2 | 0.1 | 0.1 | 0.011 | 0.003 | 0.006 |
| PA: Harrisburg | 9 | 0.6 | 0.1 | 0.3 | 0.017 | 0.007 | 0.011 |
| PA: Pittsburgh | 8 | | | | 0.019 | 0.005 | 0.013 |
| SC: Barnwell | 2 | 0.0 | 0.0 | 0.0 | 0.011 | 0.004 | 0.007 |
| SC: Columbia | 6 | 0.5 | 0.1 | 0.2 | 0.016 | 0.006 | 0.011 |
| SD: Pierre | 4 | 0.1 | 0.0 | 0.1 | 0.021 | 0.007 | 0.012 |

## Table 4 (continued)

## Gross Beta in Airborne Particulates
## September 1999

| Location | Number of Samples | 5-hour Field Estimate (pCi/m³) | | | NAREL Lab Measurement (pCi/m³) | | |
|---|---|---|---|---|---|---|---|
| | | Max | Min | Avg | Max | Min | Avg |
| TN: Knoxville | 8 | 1.7 | 0.3 | 0.9 | 0.037 | 0.008 | 0.018 |
| TN: Oak Ridge/Bethel | 9 | 1.6 | 0.1 | 0.6 | 0.017 | 0.005 | 0.014 |
| TN: Oak Ridge/K25 | 9 | 1.8 | 0.3 | 0.9 | 0.018 | 0.006 | 0.014 |
| TN: Oak Ridge/Melton | 9 | 1.8 | 0.1 | 0.8 | 0.017 | 0.006 | 0.013 |
| TN: Oak Ridge/Y12 E | 9 | 1.9 | 0.3 | 0.9 | 0.020 | 0.005 | 0.014 |
| TN: Oak Ridge/Y12 W | 9 | 0.9 | 0.1 | 0.4 | 0.017 | 0.006 | 0.014 |
| TX: Austin | 8 | 0.2 | 0.1 | 0.2 | 0.021 | 0.008 | 0.013 |
| TX: El Paso | 8 | 1.0 | 0.6 | 0.7 | 0.018 | 0.010 | 0.014 |
| UT: Salt Lake City | 2 | 0.1 | 0.0 | 0.0 | 0.044 | 0.022 | 0.029 |
| VA: Lynchburg | 8 | 1.0 | 0.1 | 0.5 | 0.016 | 0.003 | 0.009 |
| WA: Spokane | 9 | 0.5 | 0.1 | 0.3 | 0.018 | 0.003 | 0.009 |
| WI: Madison | 8 | 0.6 | 0.1 | 0.3 | 0.018 | 0.004 | 0.009 |

# Table 5

## Gross Beta and Specific Gamma in Precipitation
## July 1999

| Location | Gross Beta Activity | | Specific Gamma Activity | | |
|---|---|---|---|---|---|
| | pCi/L | ± 2*u* | Nuclide | pCi/L | ± 2*u* |
| AL: Montgomery | 2.12 | 0.36 | Be7 | 56 | 38 |
| | | | Pb212 | 5.0 | 6.7 |
| AR: Little Rock | 0.71 | 0.27 | | ND | |
| AZ: Phoenix | 1.98 | 0.36 | | ND | |
| CO: Denver | 1.28 | 0.31 | Be7 | 49 | 30 |
| CT: Hartford | 4.19 | 0.47 | Be7 | 59 | 38 |
| DE: Wilmington | 2.22 | 0.38 | Be7 | 45 | 32 |
| FL: Jacksonville | 1.43 | 0.32 | | ND | |
| FL: Miami | 0.24 | 0.22 | Pb212 | 3.8 | 7.0 |
| HI: Honolulu | 1.95 | 0.36 | K40 | 14 | 28 |
| IA: Iowa City | 0.58 | 0.27 | | ND | |
| ID: Idaho Falls | 3.55 | 0.45 | Be7 | 40 | 28 |
| ME: Augusta | 3.62 | 0.44 | Be7 | 63 | 41 |
| MI: Lansing | 0.89 | 0.28 | K40 | 37 | 55 |
| | | | Tl208 | 3.0 | 2.7 |
| MN: Minneapolis | 0.97 | 0.29 | | ND | |
| MN: Welch | 3.15 | 0.45 | | ND | |
| NC: Charlotte | 3.84 | 0.45 | Be7 | 60 | 28 |
| | | | Pb212 | 4.3 | 6.8 |
| NC: Wilmington | 2.50 | 0.39 | Be7 | 61 | 20 |
| ND: Bismarck | 0.91 | 0.29 | | ND | |
| NH: Concord | 1.68 | 0.34 | | ND | |
| NM: Santa Fe | 1.38 | 0.36 | | ND | |
| NV: Las Vegas | 4.16 | 0.48 | | ND | |
| NY: Albany | 1.29 | 0.32 | Be7 | 21 | 23 |
| NY: Yaphank | 8.38 | 0.64 | Be7 | 29 | 22 |
| OH: Painesville | 1.59 | 0.34 | Be7 | 37 | 29 |
| | | | Tl208 | 2.3 | 3.4 |
| PA: Harrisburg | 2.99 | 0.41 | Be7 | 34 | 27 |
| SC: Barnwell | 1.03 | 0.30 | | ND | |
| SC: Columbia | 0.80 | 0.27 | | ND | |
| TN: Knoxville | 1.29 | 0.31 | Be7 | 49 | 26 |
| TN: Nashville | 1.47 | 0.32 | Be7 | 47 | 26 |
| TX: Austin | 0.55 | 0.25 | | ND | |
| TX: El Paso | 1.27 | 0.31 | | ND | |
| UT: Salt Lake City | 8.71 | 0.68 | Be7 | 86 | 24 |
| | | | K40 | 36 | 26 |

Note: ND = Not Detected

## Table 5 (continued)

## Gross Beta and Specific Gamma in Precipitation
## July 1999

| Location | Gross Beta Activity | | Specific Gamma Activity | |
|---|---|---|---|---|
| | pCi/L | ± 2*u* | Nuclide | pCi/L ± 2*u* |
| VA: Lynchburg | 17.25 | 0.91 | K40 | 46 69 |
| WA: Olympia | 0.66 | 0.26 | | ND |
| WI: Madison | 1.08 | 0.30 | K40 | 26 41 |

Note: ND = Not Detected

# Table 6

## Gross Beta and Specific Gamma in Precipitation
## August 1999

| Location | Gross Beta Activity | | Specific Gamma Activity | | |
|---|---|---|---|---|---|
| | pCi/L | ± 2*u* | Nuclide | pCi/L | ± 2*u* |
| AL: Montgomery | 3.58 | 0.44 | Be7 | 62 | 17 |
| AZ: Phoenix | 0.98 | 0.33 | | ND | |
| CO: Denver | 1.41 | 0.31 | | ND | |
| CT: Hartford | 3.20 | 0.42 | Be7 | 79 | 39 |
| DE: Wilmington | 1.43 | 0.32 | | ND | |
| FL: Jacksonville | 1.57 | 0.34 | Be7 | 44 | 20 |
| | | | Tl208 | 1.7 | 1.5 |
| FL: Miami | 0.77 | 0.33 | Be7 | 18 | 15 |
| | | | Pb212 | 3.2 | 3.0 |
| HI: Honolulu | 1.49 | 0.39 | Pb212 | 7.6 | 8.4 |
| | 2.58 | 0.40 | | ND | |
| IA: Iowa City | 0.98 | 0.29 | Be7 | 34 | 17 |
| | | | Pb212 | 2.9 | 3.2 |
| ID: Boise | 4.34 | 0.51 | K40 | 29 | 42 |
| | | | Pb212 | 5.3 | 5.7 |
| ME: Augusta | 3.71 | 0.44 | Be7 | 91 | 38 |
| MI: Lansing | 1.26 | 0.31 | K40 | 34 | 35 |
| MN: Minneapolis | 1.08 | 0.29 | K40 | 9 | 14 |
| MN: Welch | 2.55 | 0.42 | Tl208 | 2.2 | 3.7 |
| NC: Charlotte | 4.41 | 0.48 | Be7 | 61 | 25 |
| NC: Wilmington | 3.69 | 0.45 | Be7 | 68 | 28 |
| ND: Bismarck | 0.72 | 0.28 | | ND | |
| NH: Concord | 2.32 | 0.38 | Be7 | 36 | 30 |
| | | | Tl208 | 3.7 | 3.8 |
| NM: Santa Fe | 1.30 | 0.32 | Be7 | 40 | 35 |
| | | | Pb212 | 4.2 | 6.4 |
| | | | Tl208 | 2.3 | 4.3 |
| NY: Albany | 1.23 | 0.30 | K40 | 21 | 37 |
| NY: Yaphank | 2.66 | 0.39 | | ND | |
| OH: Painesville | 2.28 | 0.37 | Be7 | 55 | 32 |
| | | | Pb212 | 5.2 | 6.2 |
| | | | Tl208 | 3.4 | 3.7 |
| PA: Harrisburg | 2.45 | 0.38 | Be7 | 29 | 28 |
| SC: Barnwell | 4.59 | 0.49 | Be7 | 86 | 33 |
| | | | Tl208 | 3.0 | 3.7 |
| SC: Columbia | 1.82 | 0.35 | Be7 | 31 | 26 |
| TN: Knoxville | 1.11 | 0.30 | Tl208 | 3.8 | 3.6 |

Note: ND = Not Detected

## Table 6 (continued)

## Gross Beta and Specific Gamma in Precipitation
## August 1999

| Location | Gross Beta Activity | | Specific Gamma Activity | |
|---|---|---|---|---|
| | pCi/L | ± 2*u* | Nuclide | pCi/L ± 2*u* |
| TN: Nashville | 2.10 | 0.37 | Be7 | 33 16 |
| TX: El Paso | 0.59 | 0.26 | Pb212 | 4.4 4.0 |
| VA: Lynchburg | 6.28 | 0.57 | | ND |
| WA: Olympia | 1.47 | 0.39 | | ND |
| WI: Madison | 1.18 | 0.30 | | ND |

Note: ND = Not Detected

# Table 7

## Gross Beta and Specific Gamma in Precipitation
## September 1999

| Location | Gross Beta Activity | | Specific Gamma Activity | | |
|---|---|---|---|---|---|
| | pCi/L | ± 2*u* | Nuclide | pCi/L | ± 2*u* |
| AL: Montgomery | 4.17 | 0.46 | | ND | |
| AR: Little Rock | 3.68 | 0.45 | Be7 | 37 | 39 |
| AZ: Phoenix | 1.27 | 0.31 | | ND | |
| CO: Denver | 5.57 | 0.54 | Pb212 | 4.5 | 6.8 |
| CT: Hartford | 0.33 | 0.25 | Be7 | 58 | 43 |
| DE: Wilmington | 1.25 | 0.30 | | ND | |
| FL: Jacksonville | 1.09 | 0.30 | Tl208 | 2.0 | 3.4 |
| FL: Miami | 0.82 | 0.28 | | ND | |
| IA: Iowa City | 1.52 | 0.34 | | ND | |
| ID: Idaho Falls | 4.47 | 0.48 | | ND | |
| ME: Augusta | 0.72 | 0.27 | | ND | |
| MI: Lansing | 4.81 | 0.53 | Pb212 | 4.7 | 4.9 |
| MN: Minneapolis | 3.13 | 0.42 | Be7 | 51 | 42 |
| NC: Charlotte | 1.42 | 0.32 | | ND | |
| NC: Wilmington | 0.65 | 0.28 | K40 | 14 | 28 |
| ND: Bismarck | 0.67 | 0.26 | | ND | |
| NH: Concord | 1.96 | 0.36 | K40 | 30 | 49 |
| NM: Santa Fe | 1.76 | 0.35 | K40 | 26 | 34 |
| NY: Albany | 0.95 | 0.30 | Be7 | 48 | 40 |
| | | | Pb212 | 4.8 | 5.5 |
| | | | Tl208 | 2.6 | 3.4 |
| NY: Syracuse | 0.79 | 0.28 | | ND | |
| NY: Yaphank | 2.42 | 0.38 | | ND | |
| OH: Painesville | 2.00 | 0.35 | | ND | |
| PA: Harrisburg | 1.17 | 0.31 | | ND | |
| SC: Barnwell | 4.02 | 0.46 | Be7 | 54 | 48 |
| SC: Columbia | 1.22 | 0.30 | | ND | |
| UT: Salt Lake City | 8.33 | 0.65 | | ND | |
| VA: Lynchburg | 7.18 | 0.60 | | ND | |
| WI: Madison | 1.21 | 0.31 | K40 | 37 | 42 |

Note: ND = Not Detected

# Table 8

## Tritium in Precipitation
## July - September 1999

| Location | July 1999 | | August 1999 | | September 1999 | |
|---|---|---|---|---|---|---|
| | pCi/L | ± 2*u* | pCi/L | ± 2*u* | pCi/L | ± 2*u* |
| AL: Montgomery | -24 | 75 | -20 | 76 | -34 | 79 |
| AR: Little Rock | 2 | 76 | NS | | -20 | 81 |
| AZ: Phoenix | -29 | 75 | 0 | 75 | -50 | 78 |
| CO: Denver | -32 | 75 | 9 | 77 | 7 | 83 |
| CT: Hartford | 42 | 78 | 21 | 81 | -8 | 81 |
| DE: Wilmington | 19 | 77 | -15 | 80 | 20 | 81 |
| FL: Jacksonville | -24 | 75 | -36 | 80 | 3 | 80 |
| FL: Miami | 19 | 76 | -53 | 77 | -10 | 80 |
| HI: Honolulu | -23 | 79 | -21 | 75 | NS | |
| IA: Iowa City | -12 | 76 | -4 | 75 | -18 | 82 |
| ID: Boise | NS | | 28 | 78 | NS | |
| ID: Idaho Falls | 16 | 80 | NS | | 7 | 82 |
| ME: Augusta | -6 | 75 | -5 | 80 | -59 | 78 |
| MI: Lansing | -19 | 75 | 23 | 77 | 41 | 82 |
| MN: Minneapolis | -27 | 75 | 56 | 78 | -3 | 83 |
| MN: Welch | -31 | 75 | -25 | 75 | NS | |
| NC: Charlotte | 41 | 76 | 52 | 82 | 18 | 81 |
| NC: Wilmington | 41 | 77 | -37 | 78 | -38 | 79 |
| ND: Bismarck | -13 | 75 | -32 | 75 | 54 | 86 |
| NH: Concord | 57 | 78 | -20 | 79 | 5 | 81 |
| NM: Santa Fe | -12 | 75 | 18 | 77 | 12 | 83 |
| NV: Las Vegas | -43 | 79 | NS | | NS | |
| NY: Albany | 17 | 77 | 32 | 80 | 60 | 84 |
| NY: Syracuse | NS | | NS | | 18 | 80 |
| NY: Yaphank | 47 | 78 | -24 | 79 | -51 | 79 |
| OH: Painesville | -10 | 75 | 90 | 80 | 18 | 83 |
| PA: Harrisburg | 13 | 76 | -8 | 80 | -16 | 80 |
| SC: Barnwell | 70 | 79 | 57 | 79 | 23 | 80 |
| SC: Columbia | -39 | 74 | 31 | 81 | -10 | 81 |
| TN: Knoxville | -83 | 72 | 23 | 77 | NS | |
| TN: Nashville | -19 | 75 | -5 | 80 | NS | |
| TX: Austin | -10 | 76 | NS | | NS | |
| TX: El Paso | -78 | 72 | -80 | 72 | NS | |
| UT: Salt Lake City | -73 | 73 | NS | | 38 | 83 |
| VA: Lynchburg | 76 | 80 | 31 | 81 | 28 | 82 |
| WA: Olympia | -39 | 78 | -3 | 75 | NS | |
| WI: Madison | 12 | 76 | 25 | 77 | -23 | 80 |

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

In July, 1999, the collection of surface water samples, part of the ERAMS water program, was discontinued.

## 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 9

## Tritium in Drinking Water
## July - September 1999

| Location | Date Collected | $^{3}H$ pCi/L | ± 2*u* |
|---|---|---|---|
| AK: Fairbanks | 08/26/99 | 13 | 78 |
| AL: Dothan | 07/08/99 | -20 | 76 |
| AL: Montgomery | 07/01/99 | -12 | 73 |
| AL: Muscle Shoals | 07/01/99 | 97 | 78 |
| AL: Scottsboro | 07/02/99 | 91 | 77 |
| AR: Little Rock | 07/12/99 | -5 | 77 |
| CA: Berkeley | 07/20/99 | -16 | 75 |
| CA: Los Angeles | 07/13/99 | 14 | 78 |
| CO: Denver | 07/23/99 | 64 | 78 |
| CT: Hartford | 07/09/99 | -11 | 77 |
| DE: Dover | 07/07/99 | -5 | 77 |
| FL: Miami | 07/06/99 | 26 | 75 |
| FL: Tampa | 08/11/99 | 10 | 78 |
| GA: Baxley | 07/22/99 | 47 | 78 |
| GA: Savannah | 09/23/99 | 2 | 78 |
| HI: Honolulu | 07/28/99 | 38 | 80 |
| ID: Idaho Falls | 07/19/99 | 71 | 79 |
| IL: W. Chicago | 07/07/99 | 31 | 79 |
| KS: Topeka | 07/06/99 | 60 | 76 |
| LA: New Orleans | 07/22/99 | -20 | 75 |
| MA: Lawrence | 07/09/99 | 14 | 78 |
| MD: Baltimore | 07/06/99 | -12 | 73 |
| MD: Conowingo | 09/15/99 | 227 | 87 |
| ME: Augusta | 07/27/99 | -28 | 74 |
| MI: Detroit | 07/15/99 | 128 | 83 |
| MI: Grand Rapids | 07/08/99 | 37 | 79 |
| MN: Minneapolis | 07/19/99 | -11 | 77 |
| MN: Red Wing | 07/26/99 | -9 | 76 |
| MO: Jefferson City | 07/06/99 | 61 | 76 |
| MS: Jackson | 07/14/99 | 9 | 79 |
| MS: Port Gibson | 07/13/99 | -92 | 74 |
| MT: Helena | 08/06/99 | 20 | 79 |
| NC: Charlotte | 08/04/99 | 493 | 96 |
| NC: Wilmington | 07/20/99 | 379 | 90 |
| ND: Bismarck | 07/06/99 | 17 | 74 |
| NE: Lincoln | 07/07/99 | 19 | 78 |
| NH: Concord | 07/06/99 | 14 | 74 |
| NH: Concord | 09/06/99 | 10 | 81 |
| NM: Santa Fe | 07/06/99 | -3 | 73 |
| NV: Las Vegas | 07/14/99 | 11 | 79 |

## Table 9 (continued)

## Tritium in Drinking Water
## July - September 1999

| Location | Date Collected | $^{3}H$ pCi/L ± 2*u* | |
|---|---|---|---|
| NY: Albany | 07/07/99 | -14 | 72 |
| NY: Syracuse | 08/02/99 | 43 | 81 |
| OH: Cincinnati | 09/01/99 | 2 | 77 |
| OH: E. Liverpool | 09/16/99 | -11 | 77 |
| OH: Painesville | 07/07/99 | 54 | 79 |
| OH: Toledo | 07/07/99 | 137 | 79 |
| OK: Oklahoma City | 07/14/99 | 2 | 78 |
| OR: Portland | 07/13/99 | -50 | 76 |
| PA: Columbia | 09/09/99 | 31 | 79 |
| PA: Harrisburg | 09/17/99 | 46 | 80 |
| PA: Philadelphia - Baxter | 08/06/99 | 131 | 83 |
| PA: Philadelphia - Queen | 08/06/99 | 17 | 79 |
| PA: Pittsburgh | 09/16/99 | 11 | 77 |
| PC: Corozal | 08/03/99 | 31 | 79 |
| RI: Providence | 07/12/99 | 14 | 78 |
| SC: Barnwell | 07/07/99 | -86 | 75 |
| SC: Columbia | 07/28/99 | 127 | 81 |
| SC: Jenkinsville | 07/14/99 | 61 | 80 |
| SC: Seneca | 08/04/99 | 13 | 78 |
| TN: Chattanooga | 07/08/99 | 81 | 81 |
| TN: Knoxville | 07/05/99 | 34 | 75 |
| TN: Oak Ridge - Anderson Co #768 | 09/30/99 | -43 | 75 |
| TN: Oak Ridge - Anderson Co #772 | 09/30/99 | -7 | 77 |
| TN: Oak Ridge - Knox Co #371 | 09/30/99 | 21 | 79 |
| TN: Oak Ridge - Roane Co #360 | 09/30/99 | -28 | 76 |
| TN: Oak Ridge - Roane Co #4442 | 09/30/99 | -14 | 76 |
| TX: Austin | 07/08/99 | 14 | 78 |
| VA: Doswell | 08/23/99 | 56 | 80 |
| VA: Lynchburg | 07/27/99 | 9 | 76 |
| WA: Richland | 07/15/99 | -2 | 79 |
| WA: Seattle | 08/17/99 | -7 | 77 |
| WI: Genoa | 07/13/99 | -34 | 77 |
| WI: Madison | 07/07/99 | 14 | 74 |

# 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.

Quarterly 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 10

## Radionuclides in Pasteurized Milk
## July - September 1999

| Location | Date Collected | K g/L ± 2*u* | | $^{137}$Cs pCi/L ± 2*u* | | $^{140}$Ba pCi/L ± 2*u* | $^{131}$I pCi/L ± 2*u* |
|---|---|---|---|---|---|---|---|
| AL: Montgomery | 07/02/99 | 1.64 | 0.10 | ND | | ND | ND |
| AR: Little Rock | 07/19/99 | 1.573 | 0.093 | ND | | ND | ND |
| AZ: Phoenix | 07/07/99 | 1.55 | 0.12 | ND | | ND | ND |
| CA: Los Angeles | 07/08/99 | 1.75 | 0.10 | ND | | ND | ND |
| CA: Sacramento | 07/21/99 | 1.573 | 0.083 | ND | | ND | ND |
| CA: San Francisco | 07/13/99 | 1.644 | 0.090 | ND | | ND | ND |
| CZ: Panama City | 09/23/99 | 1.680 | 0.091 | 2.5 | 2.3 | ND | ND |
| DE: Wilmington | 07/06/99 | 1.597 | 0.094 | ND | | ND | ND |
| FL: Tampa | 07/12/99 | 1.561 | 0.079 | ND | | ND | ND |
| GA: Atlanta | 07/07/99 | 1.656 | 0.082 | ND | | ND | ND |
| HI: Honolulu | 07/09/99 | 1.585 | 0.089 | ND | | ND | ND |
| IA: Des Moines | 07/12/99 | 1.573 | 0.078 | ND | | ND | ND |
| IL: Chicago | 07/22/99 | 1.61 | 0.10 | ND | | ND | ND |
| IN: Indianapolis | 07/19/99 | 1.597 | 0.080 | ND | | ND | ND |
| KS: Wichita | 07/06/99 | 1.63 | 0.15 | ND | | ND | ND |
| KY: Louisville | 07/07/99 | 1.61 | 0.12 | ND | | ND | ND |
| MA: Boston | 07/05/99 | 1.680 | 0.094 | ND | | ND | ND |
| MD: Baltimore | 07/09/99 | 1.58 | 0.12 | ND | | ND | ND |
| ME: Portland | 07/22/99 | 1.692 | 0.084 | ND | | ND | ND |
| MI: Detroit | 07/13/99 | 1.632 | 0.080 | ND | | ND | ND |
| MI: Grand Rapids | 07/07/99 | 1.692 | 0.089 | ND | | ND | ND |
| MS: Jackson | 07/08/99 | 1.45 | 0.14 | ND | | ND | ND |
| NJ: Trenton | 09/02/99 | 1.609 | 0.082 | ND | | ND | ND |
| NM: Albuquerque | 07/19/99 | 1.45 | 0.14 | ND | | ND | ND |
| NV: Las Vegas | 08/03/99 | 1.54 | 0.12 | ND | | ND | ND |
| NY: Buffalo | 07/06/99 | 1.632 | 0.067 | ND | | ND | ND |
| NY: Syracuse | 07/07/99 | 1.66 | 0.11 | ND | | ND | ND |
| OH: Cleveland | 07/13/99 | 1.61 | 0.10 | ND | | ND | ND |
| OR: Portland | 07/07/99 | 1.609 | 0.093 | ND | | ND | ND |
| PA: Philadelphia | 07/07/99 | 1.632 | 0.083 | ND | | ND | ND |
| PA: Pittsburgh | 07/06/99 | 1.656 | 0.067 | ND | | ND | ND |
| PR: San Juan | 07/20/99 | 1.66 | 0.15 | ND | | ND | ND |
| SD: Rapid City | 07/09/99 | 1.632 | 0.083 | ND | | ND | ND |
| TN: Chattanooga | 07/08/99 | 1.47 | 0.14 | ND | | ND | ND |
| TN: Knoxville | 07/08/99 | 1.656 | 0.068 | ND | | ND | ND |
| TX: Austin | 08/16/99 | 1.454 | 0.088 | ND | | ND | ND |
| TX: Ft. Worth | 07/20/99 | 1.573 | 0.079 | ND | | ND | ND |
| VA: Norfolk | 08/26/99 | 1.58 | 0.15 | ND | | ND | ND |
| VT: Burlington | 07/09/99 | 1.668 | 0.067 | ND | | ND | ND |

Note: ND = Not Detected

## Table 10 (continued)

## Radionuclides in Pasteurized Milk
## July - September 1999

| Location | Date Collected | K g/L ± 2*u* | $^{137}$Cs pCi/L ± 2*u* | $^{140}$Ba pCi/L ± 2*u* | $^{131}$I pCi/L ± 2*u* |
|---|---|---|---|---|---|
| WA: Spokane | 07/06/99 | 1.501 0.092 | ND | ND | ND |
| WV: Charleston | 07/08/99 | 1.525 0.070 | ND | ND | ND |

Note: ND = Not Detected

## Table 11

## Strontium-90 in Pasteurized Milk
## July 1999

Strontium-90 results will be reported at a later date.

## 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–*

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

*For Analytical Information and Data–*

John Griggs
National Air and Radiation Environmental Laboratory
540 South Morris Avenue
Montgomery, Alabama 36115-2601
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Requests for information concerning publication and distribution of ERD should be directed to:

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e-mail: conklin.craig@epa.gov

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