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REGION II

1975 - 76 ERAMS SUMMARY

DATA REPORT

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION II
REGIONAL OFFICE OF RADIATION PROGRAMS
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

Region II

1975-76 ERAMS Summary Data Report

July, 1977

U.S. Environmental Protection Agency
Region II
Regional Office of Radiation Programs
26 Federal Plaza
New York, N.Y. 10007

Foreword

Since their discovery, radioactive materials have played an increasing role in the lives of the world's population. Because of this, environmental radiation monitoring is necessary to guide the development and enforcement of EPA environmental radiation protection standards.

In 1973 the EPA established a network of selected locations to assist in monitoring ambient radioactivity. The Environmental Radiation Ambient Monitoring System - ERAMS - was designed to provide information on the environmental effects of components of the nuclear fuel cycle, such as nuclear power plants and nuclear fuel fabrication and reprocessing plants. In addition, ERAMS helps to provide information on other sources of radioactivity such as isotopes used in medicine and industrial applications.

The system is also designed to provide data on levels of pollutants for standards-setting, verification that standards are being met, evaluation of the effectiveness of controls, and determination of environmental trends. This information helps to provide direct assessment of the population intake of radioactive pollutants. A set of computational dose calculation models are then used to determine total population dose.

Pathways are monitored for significant population exposure from routine and accidental releases of radioactivity from major sources. ERAMS can then provide data which may be used in the event of an accidental release of radioactivity to the environment, as an indicator of the need for additional sampling and other actions required to insure public safety. This was proven by use following the Chinese atmospheric nuclear tests in September and November 1976, when frequent monitoring was required for constant evaluation of air, milk, and water samples to determine the effect of radiation resulting from fallout.

The data presented here on Region II sites are extracted from ERAMS quarterly reports covering the period from January 1975 to December 1976. Drinking water and surface water samples are compared to new EPA drinking water standards, which went into effect June 24, 1977. Trends, when they occur, are noted.

I believe this report will be valuable to readers concerned with environmental radiation levels in Region II. I encourage users of this report to inform the Regional Office of Radiation Programs of omissions or errors. Your additional comments or request for further information are also solicited.

Gerald M. Hansler, P.E.
Regional Administrator

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ERAMS Summary
Local Data

The ORP established the Environmental Radiation Ambient Monitoring System (ERAMS) in 1973 to keep a record of collected samples of air, water and milk supplies around the country.

General trends of gross alpha and beta radiations and monitoring of radionuclides from the uranium fuel cycle are examined.

This report will consider environmental radiation data collected* and processed by the Eastern Environmental Radiation Facility (EERF) in Montgomery, Alabama, from various sites in Region II.

Each test performed will be discussed and minimum detectable levels mentioned before data are presented for individual locations. These data are shown for 1975 and 1976 for purposes of comparison and identification of trend development.

1. Airborne particulates are continuously collected on filters and are checked with a G-M survey meter at time sequences planned to allow decay of radon and thoron daughters. Filters are then sent to EERF for analysis in a low background beta counter. Gamma analysis is performed only on samples with gross beta count greater than 1 pCi/m^3.

2. Krypton-85 measurements are taken to provide baseline data for comparison of effects of nuclear reactor operations, fuel reprocessing, and nuclear detonations. Dry compressed air samples are purchased from which the Kr-85 may be cryogenically removed and tested on a liquid scintillation system. Minimum detectable level is approximately 2 pCi/m^3.

3. Plutonium and Uranium in Air samples are collected on filters which have been exposed to 25,000 to 40,000 m^3 of air. After chemical treatment, they are analyzed by alpha spectroscopy. Minimum detectable level is 0.015 pCi/sample.

4. Surface water is monitored downstream from all nuclear facilities in operation or planned through 1978, or at background sites. Tritium is checked quarterly and gamma scans annually. Minimum level is 0.2 nCi/l.

5. Drinking water is monitored for major population centers or near nuclear facilities. Tritium is measured quarterly; gamma scan, gross alpha and gross beta are performed annually. An annual test is also run on selected samples for Pu-238, 239, U-234, 235, 238. Minimum level is 0.015 pCi/sample.

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* Actual data collection is effectuated by various state and local government agencies such as those listed on the following page. EPA is grateful to these Agencies for their assistance.

6. Pasteurized Milk is analyzed monthly for content of the following radioisotopes: I-131, Ba-140 and Cs-137; and for potassium. In addition there is an annual analysis for Sr-89, 90: A composite sample of all states in each region is analyzed quarterly and each individual sample is monitored in July only.

Following the Chinese nuclear tests, several stations were activated to provide additional data on radionuclide concentrations in milk samples. Data were taken over smaller time intervals. All data taken in Region II for this purpose are tabulated separately. Averages are given in the appropriate tables for each city.

These data provide a basis for comparison of relatively stable natural background radiation levels with the fluctuating levels caused by such sources as nuclear power plants and nuclear tests. Until the Chinese tests in 1976, reduced fallout had tended to allow a reduction in background, while new nuclear power plants had been responsible for most of the increases which appeared. It is these trends which are of primary interest in the ERAMS study.

The following agencies are responsible for collection of samples:

Albany:	NYSDEC Division of Air Resources and Radiological Sciences Laboratory, NYS Dept. of Health
Buffalo:	Niagara County Health Department
New York City:	NYC Dept. of Air Resouces and Dept. of Health
Ossining:	Westchester County Health Department
Oswego:	by municipal collection
Poughkeepsie:	County Board of Water Supply
Syracuse:	Onondaga County Health Department, Division of Environmental Sanitation
New Jersey:	samples are collected through NJDEP Bureau of Radiation Protection
San Juan:	Puerto Rico Nuclear Center, Health Physics Division

ANALYSIS OF DATA

Airborne particulates: Gross beta analyses were run on filters both in the field and at the EERF laboratory. The tests at the laboratory revealed significantly higher readings for samples taken after the September and November, 1976, Chinese nuclear tests. The readings dropped again in December to values approaching the former levels.

Krypton-85: No trends were noted for samples taken in the Region II area.

Plutonium and uranium in air: New York City was the only sampling point in the region. Samples, taken only during 1975, showed no trends.

Surface water: Tritium levels found in water around the region showed consistently low levels, never exceeding 2.5% of those allowed by the National Primary Drinking Water Regulations (20,000 pCi/l); and far below the 10 CFR 50 levels of 3,000,000 pCi/l.

Drinking Water: Samples were reasonably consistent in Region II, remaining at less than or equal to 4% of the National Primary Drinking Water Regulations for tritium levels, and at levels well below the allowed values for plutonium and uranium isotopes.

Pasteurized milk samples: Samples remained consistent through the two-year period, within statistical error. However, with errors so large (around ± 100%), it was difficult to detect any trends. By disregarding the error limits, an increase can be noted following the Chinese nuclear tests. This can be seen most clearly in the data chart listing individual measurements made in October through December, 1976.

[It should be noted that data for Ba-140 and I-131 in some cases are recorded as negative values. This is a result of the analysis procedure, which consists of deducting background averages from total counts recorded. The system is gradually being revised to correct such negative values in the future.]

The composite Sr-90 sample data for Region II show a consistent decline over the two-year period, but this does not reflect the results from the Chinese nuclear tests. Sr-89 data showed a marked increase immediately following the first test. Sampling was performed before the second test.

ERAMS Data Analysis of Water Samples Under Drinking Water Standards

° Newly-established drinking water standards, effective June 24, 1977, set the following maximum levels of radioactivity in drinking water:

tritium	20,000 pCi/l
Sr-90	8 pCi/l
Sr-89	80 pCi/l
Cs-134	20,000 pCi/l
Cs-137	200 pCi/l
Ba-140	90 pCi/l
Ra-226 and 228	5 pCi/l

° After analysis of the data collected by the ERAMS network during 1975 and 1976 the following information was noted:

-- Albany drinking water levels were 2% or less of the tritium limit, 3% of the Sr-90 limit, and 4% of the Ra-226 limit.

--Bayside (NJ) surface water tritium levels were a maximum of 2% of the drinking water limit.

-- Buffalo drinking water levels were 2% or less of the tritium limit, 14% of the Sr-90 limit, and 6% or the Ra-226 limit.

-- Ossining surface water samples never exceeded 1.5% of the maximum tritium drinking water limit.

-- Oswego surface water samples were never more than 2% of the drinking water tritium limit.

-- Oyster Creek surface water samples were never in excess of 1.5% of the tritium drinking water standard.

-- Poughkeepsie surface water samples never exceeded 2.5% of the tritium drinking water standard.

-- San Juan drinking water never exceeded 1.5% of the tritium limit, 6% of the Sr-90 limit, or 8% of the Ra-226 limit.

-- Syracuse drinking water never exceeded 4%of the tritium limit, 10% of the Sr-90 limit, or 8% of the Ra-226 limit. Average values for the location were 2% of the tritium limit, 5% of the Sr-90 limit, and 4% of the Ra-226 limit.

-- Trenton drinking water levels were 2% of the tritium limit, 20% of the Sr-90 limit, and 6% of the Ra-226 limit. Average values for the city were less than 1.5%of the tritium limit, 10% of the Sr-90 limit, and 3% of the Ra-226 limit.

-- Waretown (NJ) drinking water levels were 2% of the tritium levels, 1% of the Sr-90 limit, and 38% of the Ra-226 limit.

° Average levels in New York State were 1.5% of the tritium limit, 5% of the Sr-90 limit, and 4% of the Ra-226 Limit.

Average levels in New Jersey were 1% of the tritium limit, 5% of the Sr-90 limit, and 10% of the Ra-226 limit.

ERAMS Data (Maximum values for each location-with selected two-year averages)

City	Surface water	% of 10 CFR 50	Drinking Water		% of new DWS*	
Albany			H-3	0.4 nCi/l	2	
			Sr-90	0.2 pCi/l	3	
			Ra-226	0.2 pCi/l	4	
Bayside (NJ)	0.4 nCi/l	<<1			2	
Buffalo			H-3	0.4 nCi/l	2	
			Sr-90	1.1 pCi/l	14	
			Ra-226	0.3 pCi/l	6	
Ossining	0.3 nCi/l	<<1			1.5	
Oswego	0.4 nCi/l	<<1			2	
Oyster Creek (NJ)	0.3 nCi/l	<<1			1.5	
Poughkeepsie	0.5 nCi/l	<<1			2.5	
San Juan (PR)			H-3	0.3 nCi/l	1.5	
			Sr-90	0.5 pCi/l	6	
			Ra-226	0.4 pCi/l	8	Average % of DWS
Syracuse			H-3	0.8 nCi/l	4	2.5
			Sr-90	0.8 pCi/l	10	5
			Ra-226	0.4 pCi/l	8	4
Trenton (NJ)			H-3	0.4 nCi/l	2	
			Sr-90	1.6 pCi/l	20	10
			Ra-226	0.3 pCi/l	6	3
Waretown (NJ)			H-3	0.4 nCi/l	2	
			Sr-90	0.1 pCi/l	1	
			Ra-226	1.9 pCi/l	38	19
Average for New York State locations			H-3	0.34 nCi/l	1.5	
			Sr-90	0.43 pCi/l	5	
			Ra-226	0.21 pCi/l	4	
Average for New Jersey locations			H-3	0.23 nCi/l	1	
			Sr-90	0.43 pCi/l	5	
			Ra-226	0.56 pCi/l	10	

* Drinking Water Standards:

H-3	20,000 pCi/litre
Sr-90	8 pCi/litre
Ra-226	5 pCi/litre

Note: 1 nanoCurie/litre = 1000 picoCuries/litre

APPENDIX I

ALBANY, NEW YORK

Description of Analysis: Drinking Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	ND	ND	0.0 ± 0.2	0.2 ± 0.2
1976	0.0 ± 0.2	0.2 ± 0.2	0.4 ± 0.2	0.2 ± 0.2

Description of Analysis: Annual Drinking Water

Date	Solids	Gross Beta	Sr-90	Ra-226	Alpha and Gamma
4-02-75	66.8 mg/l	1.7 ± 0.9 pCi/l (4-22-75)	ND	ND	ND
4-06-76	78.0 mg/l	1.3 ± 0.9 pCi/l (4-14-76)	0.2 ± 0.1 (pCi/l)	0.2 ± 0.1 (pCi/l)	ND

ND: Not Detectable

BAYSIDE, NEW JERSEY (on the Delaware River)

Description of Analysis: Annual Gamma Analysis

6-17-75 Not Detectable

4-20-76 K-40: 124 ± 73 pCi/m^3

Description of Analysis: Surface WaterTritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	No Sample	ND	0.2 ± 0.2	0.4 ± 0.2
1976	0.2 ± 0.2	0.0 ± 0.2	0.4 ± 0.2	No Sample

ND: Not Detectable

BUFFALO, NEW YORK

Description of Analysis: Kr-85 in air
(pCi/m^3 at STP) ± 2 σ

January to June, 1975	19.0 ± 1.9
July to December, 1975	17.8 ± 1.8
January to June, 1976	17.6 ± 1.8
July to December, 1976	No Sample Taken

Description of Analysis: Precipitation Tritium Concentration
nCi/l ± 2 σ

Month	1975	1976
January	0.2 ± .2	0.2 ± .2
February	ND	0.2 ± .2
March	0.3 ± .2	0.4 ± .2
April	0.3 ± .2	0.3 ± .2
May	ND	0.2 ± .2
June	0.3 ± .2	NS
July	0.2 ± .2	0.3 ± .2
August	0.0 ± .2	0.4 ± .2
September	0.3 ± .2	NS
October	0.3 ± .2	0.3 ± .2
November	0.2 ± .2	0.5 ± .2
December	0.3 ± .2	0.1 ± .2

Description of Analysis: Gross Beta Measurement
(pCi/m^3 of air at STP)

	1975:		1976:	
Months	5-hour test	EERF Lab	5-hour test	EERF Lab
January	0.1	0.07	0.1	0.02
February	0.1	0.07	0.1	0.02
March	0.1	0.09	0.1	0.02
April	0.2	0.12	0.2	0.02
May	0.4	0.10	0.1	0.01
June	0.1	0.05	0.3	0.02
July	0.4	0.05	0.2	0.02
August	0.3	0.03	0.21	0.02
September	0.1	0.02	0.2	0.02
October	0.1	0.02	0.7	0.24
November	0.2	0.02	0.6	0.21
December	0.1	0.02	0.2	0.06

BUFFALO, NEW YORK

Description of Analysis: Radionuclides in Pasteurized Milk Samples

Month	K (g/l) 1975	1976	Cs-137 (pCi/l) 1975	1976	Ba-140 (pCi/l) 1975	1976	I-131 (pCi/l) 1975	1976
January	1.52±.12	1.48±.12	11 ± 7	6 ± 7	0 ± 8	-5 ± 9	0 ± 7	0 ± 7
February	1.53±.12	1.49±.12	15 ± 7	10 ± 7	0 ± 8	-2 ± 9	0 ± 7	5 ± 7
March	1.51±.12	1.41±.11	10 ± 7	7 ± 7	0 ± 8	1 ± 9	0 ± 7	-5 ± 7
April	1.41±.11	1.53±.12	14 ± 7	8 ± 7	0 ± 8	1 ±10	0 ± 7	2 ± 7
May	1.47±.12	1.48±.12	13 ± 7	9 ± 7	0 ± 8	-4 ± 9	0 ± 7	-3 ± 7
June	1.50±.12	1.44±.11	ND	3 ± 7	0 ± 8	-6 ± 9	0 ± 7	-3 ± 7
July	1.51±.12	1.46±.11	11 ± 7	12 ± 7	-6 ± 9	-12 ± 9	-6 ± 7	0 ± 7
August	1.46±.11	1.58±.12	6 ± 7	1 ± 6	-8 ± 9	5 ± 9	0 ± 7	-1 ± 7
September	1.47±.12	1.46±.12	6 ± 7	4 ± 6	3 ± 9	0 ± 9	-3 ± 7	1 ± 7
October	1.43±.11	1.50±.12	2 ± 7	2 ± 7	-10 ± 9	7 ± 9	1 ± 7	5 ± 7
November	1.55±.12	1.50±.12	6 ± 7	4 ± 8	-5 ± 9	5 ± 9	-4 ± 7	5 ± 7
December	1.48±.12	1.47±.12	6 ± 7	3 ± 8	-10 ± 9	5 ± 9	-5 ± 7	5 ± 7

ND: Not Detectable
Individual data for the months of October through December 1976 appear elsewhere in this report.

Description of Analysis: Annual Drinking Water

Date	Solids	Gross Beta	Sr-90	Ra-226	Alpha and Gamma
4-05-76	352.0 mg/l	3.6 ± 1.2 pCi/l 4-20-76	1.1 ± 0.6 pCi/l	0.3 ± 0.1 pCi/l	ND

Description of Analysis: Drinking Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	0.3 ± 0.2	0.4 ± 0.2	0.3 ± 0.2	0.3 ± 0.2
1976	0.5 ± 0.2	0.4 ± 0.2	0.3 ± 0.2	0.4 ± 0.2

Description of Analysis: Plutonium and Uranium Samples in Pasteurized Milk (pCi/l)

	1975	1976
Pu-238	<0.015	<0.015
Pu-239	<0.015	<0.015
U-234	0.017 ± 0.009	0.072 ± 0.014
U-238	0.017 ± 0.009	0.037 ± 0.010

CAMDEN, NEW JERSEY

Description of Analysis: Kr-85 in air
(pCi/m^3 at STP) $\pm$ 2 σ

January to June, 1975	16.7 $\pm$ 1.7
July to December, 1975	17.0 $\pm$ 1.7
January to June, 1976	No Sample Taken
July to December, 1976	Data not yet available

NEW YORK CITY

Description of Analysis: Radionuclides in Pasteurized Milk Samples

Month	K (g/l) 1975	K (g/l) 1976	Cs-137 (pCi/l) 1975	Cs-137 (pCi/l) 1976	Ba-140 (pCi/l) 1975	Ba-140 (pCi/l) 1976	I-131 (pCi/l) 1975	I-131 (pCi/l) 1976
January	1.48±.12	1.43±.11	10 ± 7	8 ± 7	0 ± 8	7 ± 9	0 ± 7	1 ± 7
February	1.55±.12	1.47±.12	11 ± 7	12 ± 7	0 ± 8	1 ± 10	0 ± 7	5 ± 7
March	1.46±.11	1.53±.12	ND	8 ± 7	0 ± 8	1 ± 9	0 ± 7	3 ± 7
April	1.54±.12	1.52±.12	12 ± 7	25 ± 7	0 ± 8	1 ± 10	0 ± 7	3 ± 7
May	1.35±.11	1.48±.12	ND	8 ± 7	0 ± 8	-3 ± 9	ND	-4 ± 7
June	1.50±.12	1.54±.12	ND	4 ± 7	0 ± 8	-11 ± 9	ND	3 ± 7
July	1.44±.11	1.51±.12	11 ± 7	13 ± 7	-7 ± 9	-1 ± 9	-2 ± 7	-1 ± 7
August	1.51±.12	1.40±.11	10 ± 7	6 ± 7	-10 ± 9	3 ± 9	-1 ± 7	0 ± 7
September	1.41±.11	1.15±.18	12 ± 7	-1 ± 14	3 ± 9	-6 ± 22	3 ± 7	-11 ± 16
October	1.45±.12	1.43±.11	6 ± 7	1 ± 7	-2 ± 9	13 ± 11	-3 ± 7	50 ± 12
November	1.52±.12	1.42±.11	7 ± 7	5 ± 8	-1 ± 9	10 ± 9	0 ± 7	9 ± 7
December	1.48±.12	1.35±.11	6 ± 7	-1 ± 8	-10 ± 9	-1 ± 9	-5 ± 7	3 ± 7

ND: Not Detectable
For individual data for the months of October through December, 1976, see elsewhere in this report.

Description of Analysis: Plutonium and Uranium Samples in Pasteurized Milk

	1975	1976	
Pu-238	<.015	<.015	(pCi/l)
Pu-239	<.015	<.015	
U-234	.068 ± .027	.033 ± .009	
U-238	.059 ± .024	.024 ± .008	

Description of Analysis: Plutonium and Uranium Samples in Airborne Particulates

	1975	
Pu-238	8.6 ± 1.6	(aCi/m^3)
Pu-239	46.2 ± 4.6	
U-234	40.0 ± 3.2	
U-235	2.2 ± .6	
U-238	39.8 ± 3.1	

No samples were analyzed in 1976
Note: 1 attoCurie = 10^{-18} Curie

OSSINING, NEW YORK (Hudson River)

Description of Analysis: Surface Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	ND	ND	0.2 ± 0.2	0.3 ± 0.2
1976	0.2 ± 0.2	0.3 ± 0.2	0.3 ± 0.2	0.3 ± 0.2

ND: Not Detectable

OSWEGO, NEW YORK (Lake Ontario)

Description of Analysis: Surface Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	0.4 ± 0.2	0.3 ± 0.2	0.3 ± 0.2	0.4 ± 0.2
1976	0.3 ± 0.2	0.4 ± 0.2	0.3 ± 0.2	0.3 ± 0.2

OYSTER CREEK, NEW JERSEY

Description of Analysis: Annual Gamma Analysis

4-30-75	Not Detectable	
4-08-76	K-40	192 ± 77 pCi/m^3

Description of Analysis: Surface Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	0.2 ± 0.2	0.2 ± 0.2	0.2 ± 0.2	0.3 ± 0.2
1976	0.1 ± 0.2	0.3 ± 0.2	0.2 ± 0.2	0.3 ± 0.2

POUGHKEEPSIE, NEW YORK (Hudson River)

Description of Analysis: Surface Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	No Sample	0.2 ± 0.2	0.2 ± 0.2	0.2 ± 0.2
1976	0.2 ± 0.2	0.4 ± 0.2	0.2 ± 0.2	0.5 ± 0.2

SAN JUAN, PUERTO RICO

Description of Analysis: Radionuclides in Pasteurized Milk Samples

Month	K (g/l) 1975	1976	Cs-137 (pCi/l) 1975	1976	Ba-140 (pCi/l) 1975	1976	I-131 (pCi/l) 1975	1976
January	1.40±.11	1.45±.11	ND	3 ± 7	0 ± 8	-7 ± 9	0 ± 7	2 ± 7
February	1.38±.11	1.52±.12	ND	10 ± 7	0 ± 8	-5 ± 9	ND	1 ± 7
March	1.50±.12	1.52±.12	ND	6 ± 7	0 ± 8	-10 ± 9	0 ± 7	-5 ± 7
April	1.43±.11	1.42±.11	10± 7	8 ± 7	ND	7 ± 10	0 ± 7	-1 ± 7
May	1.47±.12	1.52±.12	ND	9 ± 7	0 ± 8	-3 ± 9	0 ± 7	1 ± 7
June	1.49±.12	1.48±.12	ND	6 ± 7	0 ± 8	-5 ± 9	0 ± 7	-4 ± 7
July	1.53±.12	1.47±.12	12 ± 7	6 ± 7	-12 ± 9	-3 ± 9	-3 ± 7	1 ± 7
August	1.50±.12	1.36±.11	12 ± 7	9 ± 7	-8 ± 9	6 ± 9	-3 ± 7	2 ± 7
September	1.49±.12	1.35±.11	16 ± 7	7 ± 7	5 ± 9	3 ± 9	6 ± 7	-2 ± 7
October	1.44±.11	1.46±.12	14 ± 7	8 ± 7	4 ± 9	3 ± 9	5 ± 7	3 ± 7
November	1.51±.12	1.46±.12	7 ± 7	10 ± 7	-8 ± 9	3 ± 9	-2 ± 7	2 ± 7
December	1.44±.11	1.45±.12	17 ± 7	8 ± 8	0 ± 9	6 ± 9	-3 ± 7	-2 ± 7

ND: Not Detectable

See individual data for October to December, 1976 elsewhere in report.

Description of Analysis: Drinking Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	0.0 ± 0.2	ND	0.1 ± 0.2	0.2 ± 0.2
1976	0.0 ± 0.2	0.3 ± 0.2	No Sample	0.1 ± 0.2

ND: Not Detectable

Description of Analysis: Annual Drinking Water

Date	Solids	Gross Beta	Sr-90	Ra-226	Alpha and Gamma
4-11-75	164.0 mg/l	3.1 ± 1.1 pCi/l	ND	ND	ND
4-29-76	239.2 mg/l	1.4 ± 0.9 pCi/l (4-20-76)	0.5 ± 0.4 pCi/l	0.4 ± 0.1 pCi/l	ND

ND: Not Detectable

SYRACUSE, NEW YORK

Description of Analysis: Radionuclides in Pasteurized Milk Samples

Month	K (g/l) 1975	1976	Cs-137 (pCi/l) 1975	1976	Ba-140 (pCi/l) 1975	1976	I-131 (pCi/l) 1975	1976
January	1.54±.12	1.43±.11	ND	5 ± 7	0 ± 8	-5 ± 9	0 ±7	-2 ± 7
February	1.44±.11	1.55±.12	ND	9 ± 7	0 ± 8	-3 ± 9	0 ± 7	3 ± 7
March	1.46±.12	1.48±.12	11 ± 7	8 ± 7	0 ± 8	-9 ± 9	ND	-2 ± 7
April	1.48±.12	1.49±.12	12 ± 7	12 ± 7	0 ± 8	1 ± 9	0 ± 7	-3 ± 7
May	1.51±.12	1.37±.11	18 ± 7	5 ± 7	0 ± 8	-1 ± 9	0 ± 7	-3 ± 7
June	1.50±.12	1.46±.12	10 ± 7	8 ± 7	0 ± 8	-3 ± 9	0 ± 7	4 ± 7
July	1.54±.12	1.50±.12	9 ± 7	7 ± 7	-9 ± 9	-6 ± 9	1 ± 7	0 ± 7
August	1.49±.12	1.38±.11	3 ± 7	-4 ± 6	-3 ± 9	-1 ± 9	0 ± 7	-4 ± 6
September	1.50±.12	1.42±.11	10 ± 7	8 ± 7	0 ± 8	5 ± 9	0 ± 7	9 ± 7
October	1.37±.12	1.46±.12	7 ± 7	6 ± 7	-3 ± 9	2 ± 9	-3 ± 7	3 ± 7
November	1.50±.12	1.33±.11	5 ± 7	5 ± 8	-6 ± 9	7 ± 9	-1 ± 7	5 ± 7
December	1.54±.12	1.41±.11	4 ± 7	3 ± 8	-6 ± 9	-9 ± 9	-3 ± 7	5 ± 6

See individual data for October to December, 1976, elsewhere in this report.
ND: Not Detectable.

Description of Analysis: Drinking Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	0.5 ± 0.2	0.8 ± 0.2	No Sample	0.4 ± 0.2
1976	0.5 ± 0.2	0.5 ± 0.2	0.4 ± 0.2	0.4 ± 0.2

Description of Analysis: Annual Drinking Water

Date	Solids	Gross Beta	Sr-90	Ra-226	Alpha and Gamma
5-30-75	68.0 mg/l	1.8 ± 0.9 pCi/l	ND	ND	ND
4-30-76	117.8 mg/l	2.1 ± 1.1 pCi/l (5-26-76)	0.8 ± 0.4 pCi/l	0.4 ± 0.1 pCi/l	ND

ND: Not Detectable

TRENTON, NEW JERSEY

Description of Analysis: Radionuclides in Pasteurized Milk Samples

Month	K (g/l) 1975	1976	Cs-137 (pCi/l) 1975	1976	Ba-140 (pCi/l) 1975	1976	I-131 (pCi/l) 1975	1976
January	1.55±.12	1.54±.12	11 ± 7	12 ± 7	0 ± 8	-5 ± 9	ND	2 ± 7
February	NS	1.53±.12	NS	8 ± 7	NS	-5 ± 9	NS	3 ± 7
March	1.42±.11	1.49±.12	ND	6 ± 7	0 ± 8	-11 ± 9	0 ± 7	-3 ± 7
April	1.53±.12	1.46±.12	ND	10 ± 7	0 ± 8	3 ± 10	ND	3 ± 7
May	1.44±.12	1.49±.12	11 ± 7	5 ± 7	0 ± 8	-7 ± 9	ND	-1 ± 7
June	1.47±.12	1.38±.11	15 ± 7	5 ± 7	0 ± 8	-7 ± 9	0 ± 7	3 ± 7
July	1.48±.12	1.47±.12	9 ± 7	12 ± 7	-6 ± 9	-4 ± 9	-5 ± 7	1 ± 7
August	1.48±.12	1.41±.11	7 ± 7	4 ± 6	-10 ± 9	7 ± 9	3 ± 7	3 ± 7
September	1.60±.12	NS	9 ± 7	NS	0 ± 9	NS	4 ± 7	NS
October	1.47±.11	1.42±.11	9 ± 7	8 ± 7	-14 ± 9	3 ± 9	-3 ± 7	3 ± 7
November	1.46±.12	1.46±.12	10 ± 7	10 ± 7	0 ± 9	2 ± 9	0 ± 7	2 ± 7
December	1.50±.12	1.45±.12	6 ± 7	8 ± 7	-6 ± 9	6 ± 9	-2 ± 7	-2 ± 7

NS: No Sample Taken ND: Not Detectable

Description of Analysis: Drinking Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	0.2 ± 0.2	0.4 ± 0.2	0. ± 0.2	0.1 ± 0.2
1976	0.3 ± 0.2	0.4 ± 0.2	0.2 ± 0.2	0.2 ± 0.2

Description of Analysis: Annual Drinking Water

Date	Solids	Gross Beta	Sr-90	Ra-226	Alpha and Gamma
5-15-75	134.0 mg/l	4.5 ± 1.1 pCi/l	ND	ND	ND
4-08-76	172 mg/l	1.4 ± 0.9 pCi/l (4-20-76)	1.6 ± 1.2 pCi/l	0.3 ± 0.1 pCi/l	ND

* See individual data for October to December, 1976 elsewhere in this report.

UTICA, NEW YORK

Description of Analysis:	Kr-85 in Air (pCi/m^3 at STP) ± 2 o
January to June, 1975	18.3 ± 1.8
July to December, 1975	15.7 ± 1.6
January to June, 1976	18.7 ± 1.9
July to December, 1976	Data not yet available

WARETOWN, NEW JERSEY

Description of Analysis: Drinking Water Tritium Concentration (nCi/l) ± 2 σ

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1975	0.0 ± 0.2	ND	0.2 ± 0.2	0.1 ± 0.2
1976	0.0 ± 0.2	0.2 ± 0.2	0.1 ± 0.2	0.4 ± 0.2

ND: Not Detectable

Description of Analysis: Annual Drinking Water

Date	Solids	Gross Beta	Sr-90	Ra-226	Alpha and Gamma
4-10-75	134.0 mg/l	4.5 ± 1.1 pCi/l (5-15-75)	ND	ND	ND
4-08-76	80.0 mg/l	5.0 ± 1.3 pCi/l	0.1 ± 0.6 pCi/l	1.9 ± 0.2 pCi/l	Alpha: 2.0 ± 0.7 pCi/l Gamma: ND

ND: Not Detectable

APPENDIX II

RESULTS OF PASTEURIZED MILK SAMPLES COLLECTED IN RESPONSE TO THE NUCLEAR TESTS OF SEPTEMBER 26, AND NOVEMBER 17, 1976, BY THE PEOPLE'S REPUBLIC OF CHINA

Location	Date Collected	K g/liter ± 2-Sigma Counting Error	Radionuclide Concentration pCi/liter ± 2-Sigma Counting Error				
			Cs-137	Ba-140	I-131	Sr-90	Sr-89
NY:Buffalo	10/08	1.53 ± .12	3 ± 7	15 ± 12	5 ± 7	3.2 ± 1.0	1 ± 5
	10/15	1.49 ± .12	3 ± 6	-2 ± 9	6 ± 7		
	10/21	1.47 ± .12	0 ± 8	9 ± 9	4 ± 7		
	11/04	1.54 ± .12	3 ± 8	2 ± 9	2 ± 7		
	11/24	1.45 ± .12	4 ± 8	7 ± 9	7 ± 7		
	12/10	1.47 ± .12	3 ± 8	5 ± 9	5 ± 7		
New York City	10/05	1.42 ± .11	1 ± 6	3 ± 9	4 ± 7		
	10/15	1.43 ± .11	1 ± 7	22 ± 12	95 ± 12	5.8 ± .8	9 ± 5
	11/01	1.42 ± .12	5 ± 8	10 ± 9	9 ± 7		
	11/24	1.36 ± .11	5 ± 8	6 ± 9	-2 ± 6		
	12/06	1.35 ± .11	-1 ± 8	-1 ± 9	3 ± 7		
NY:Syracuse	10/04	1.48 ± .11	3 ± 6	2 ± 9	3 ± 7		
	10/21	1.43 ± .11	8 ± 8	2 ± 9	2 ± 7		
	11/08	1.33 ± .11	5 ± 8	7 ± 9	5 ± 7		
	12/06	1.41 ± .11	3 ± 8	-9 ± 9	5 ± 6		
NJ:Trenton	10/22	1.42 ± .11	6 ± 8	22 ± 12	56 ± 10	5.0 ± .5	24 ± 5
	11/01	1.41 ± .11	11 ± 8	8 ± 10	23 ± 8	7.5 ± 0.9	13 ± 5
	11/24	1.43 ± .11	1 ± 8	-1 ± 9	8 ± 7		
	12/02	1.44 ± .11	5 ± 8	1 ± 9	-1 ± 7		
	12/09	1.38 ± .11	-1 ± 8	5 ± 9	1 ± 7		
PR:San Juan	10/07	1.49 ± .12	7 ± 7	0 ± 9	2 ± 6		
	10/12	1.40 ± .11	10 ± 7	4 ± 9	6 ± 7		
	10/13	1.48 ± .12	6 ± 7	2 ± 9	2 ± 7		
	10/15	1.47 ± .12	2 ± 6	7 ± 9	0 ± 7		
	11/10	1.38 ± .11	10 ± 8	6 ± 9	3 ± 7		
	11/26	1.53 ± .12	9 ± 8	-3 ± 9	1 ± 7		
	12/02	1.46 ± .12	9 ± 8	4 ± 9	-4 ± 6		
	12/08	1.44 ± .11	7 ± 8	8 ± 9	-4 ± 6		

APPENDIX III

PASTEURIZED MILK - REGION II QUARTERLY COMPOSITES

Date	Sr-89	Sr-90
January 1975	0 ± 5	4.2 ± 1.1
April 1975	0 ± 5	3.7 ± 1.1
July 1975	2 ± 5	3.3 ± 1.0
October 1975	0 ± 5	4.3 ± 1.1
January 1976	1 ± 5	3.6 ± 0.3
April 1975	1 ± 5	2.7 ± 1.0
July 1976	2 ± 5	2.3 ± 0.8
October 1976	9 ± 5	2.8 ± 0.7

Note: measurements in pCi/l ± 2 sigma counting error