

**KEWAUNEE NUCLEAR POWER PLANT**

**ANNUAL  
ENVIRONMENTAL MONITORING REPORT  
JANUARY - DECEMBER 1995**

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**WISCONSIN PUBLIC SERVICE CORPORATION  
WISCONSIN POWER & LIGHT COMPANY  
MADISON GAS & ELECTRIC COMPANY**

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REPORT TO

WISCONSIN PUBLIC SERVICE CORPORATION  
WISCONSIN POWER AND LIGHT COMPANY  
MADISON GAS AND ELECTRIC COMPANY

RADIOLOGICAL MONITORING PROGRAM FOR  
THE KEWAUNEE NUCLEAR POWER PLANT  
KEWAUNEE, WISCONSIN

ANNUAL REPORT - PART I  
SUMMARY AND INTERPRETATION  
January - December 1995

PREPARED AND SUBMITTED  
BY  
TELEDYNE ISOTOPES MIDWEST LABORATORY  
PROJECT NO. 8002

Approved by: \_\_\_\_\_

  
L.G. Huebner  
Manager

16 April 1996

## PREFACE

The staff members of the Teledyne Isotopes Midwest Laboratory (TIML) were responsible for the acquisition of data presented in this report. Assistance in sample collection was provided by Wisconsin Public Service Corporation personnel.

The report was prepared by L. G. Huebner, Manager. He was assisted in report preparation by other staff members of the laboratory.

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## 1.0 INTRODUCTION

The Kewaunee Nuclear Power Plant is a 535 megawatt pressurized water reactor located on the Wisconsin shore of Lake Michigan in Kewaunee County. The Kewaunee Nuclear Power Plant became critical on March 7, 1974. Initial Power generation was achieved on April 8, 1974, and the Plant was declared commercial on June 16, 1974. This report summarizes the environmental operation data collected during the period January - December 1995.

Wisconsin Public Service Corporation, an operating company for the Kewaunee Nuclear Power Plant, assumes the responsibility for the environmental program at the Plant and any questions relating to this subject should be directed to Mr. Mark Reinhart, Superintendent of Radiation Protection at (414) 433-2560.

## 2.0 SUMMARY

Results of sample analyses during the period January - December 1995 are summarized in Table 4.5. Radionuclide concentrations measured at indicator locations are compared with levels measured at control locations and in preoperational studies. The comparisons indicate background-level radioactivities in all samples collected.



### 3.0 RADIOLOGICAL SURVEILLANCE PROGRAM

Following is a description of the Radiological Surveillance Program and its execution.

#### 3.1 Methodology

The sampling locations are shown in Figure 4-1. Table 4.1 describes the locations, lists for each direction and distance from the reactor, and indicates which are indicators and which are control locations.

The sampling program monitors the air, terrestrial, and aquatic environments. The types of samples collected at each location and the frequency of collections are presented in Table 4.2, using sample codes defined in Table 4.3. The collections and analyses that comprise the program are described below. Finally, the execution of the program in the current reporting year is discussed.

##### 3.1.1 The Air Program

###### Airborne Particulates

The airborne particulate samples are collected on 47 mm diameter glass fiber filters at a volumetric rate of approximately one cubic foot per minute. The filters are collected weekly from six locations (K-1f, K-2, K-7, K-8, K-15 and K-16), and dispatched by mail to TIML for radiometric analysis. The material on the filter is counted for gross beta activity approximately five days after receipt to allow for decay of naturally-occurring short-lived radionuclides.

Quarterly composites from each sampling location are analyzed for gamma-emitting isotopes by a germanium detector.

###### Airborne Iodine

Charcoal filters are located at locations K-1f, K-2, K-7, K-8, K-15 and K-16. The filters are changed bi-weekly and analyzed for iodine-131 immediately after arrival at the laboratory.

###### Ambient Gamma Radiation - TLDs

The integrated gamma-ray background is measured at six air sampling locations (K-1f, K-2, K-7, K-8, K-15 and K-16), at four milk sampling locations (K-3, K-4, K-5 and K-6), and four additional sites (K-17, located 4.25 miles west of the plant; K-27, located 1.5 miles northwest of the plant; K-30, located 1.0 miles north of the plant and K-31, located 6.25 miles north-northwest of the plant) by thermoluminescent dosimetry (TLDs). Two TLD cards, each having four main readout areas containing  $\text{CaSO}_4:\text{Dy}$  phosphor, are placed at each location (eight TLDs at each location). One card is exchanged quarterly, the other card is exchanged annually and read only on an emergency basis.

## Precipitation

Monthly composites of precipitation samples collected at K-11 are analyzed for tritium activity by liquid scintillation.

### 3.1.2 The Terrestrial Program

#### Milk

Milk samples are collected semimonthly (one gallon from each location) from May through October, and monthly (two gallons from each location) during the rest of the year from four herds that graze within four miles of the reactor site (K-4, K-5, K-12 and K-19), from two herds that graze between four and ten miles from the reactor site (K-3 and K-6), and from a dairy in Green Bay (K-28). The milk samples are analyzed for iodine-131, strontium-89 and-90, cesium-137, barium-lanthanum-140, potassium-40, calcium and stable potassium.

#### Well Water

One gallon water samples are collected quarterly from four off-site wells located at K-10, K-11, K-12 and K-13 and from two on-site wells located at K-1g and K-1h.

Gross beta and gamma spectroscopic analyses are performed on the total residue of each water sample. The concentration of potassium-40 is calculated from total potassium, which is determined by flame photometry on all samples.

Additionally, samples of water from two on-site wells (K-1g and K-1h) are also analyzed for gross alpha. Water from one on-site well (K-1g) is also analyzed for tritium, strontium-89 and strontium-90.

#### Domestic Meat

Domestic meat samples (chickens) are obtained annually (in the third quarter) at locations K-20, K-24, K-27, and K-29. The flesh is separated from the bones, gamma scanned and analyzed for gross alpha and gross beta activities.

#### Eggs

Eggs are collected quarterly at locations K-24 or K-27. The samples are gamma scanned and analyzed for gross beta, strontium-89 and strontium-90 activities.

#### Vegetables

Vegetable samples (6 varieties) are collected at locations K-17 and K-26, and two varieties of grain, if available, at location K-23. The samples are gamma scanned and analyzed for gross beta, strontium-89 and strontium-90 activities.

### Grass and Cattle Feed

Grass samples are collected during the second, third and fourth quarters from two on-site locations (K-1b and K-1f) and from six dairy farms (K-3, K-4, K-5, K-6, K-12 and K-19). The samples are analyzed for gross beta, strontium-89, strontium-90 and gamma emitting isotopes. During the first quarter, cattle feed is collected from the same six dairy farms and the same analyses are performed.

### Soil

Soil samples are collected twice a year on-site at K-1f and from the six dairy farms (K-3, K-4, K-5, K-6, K-12 and K-19). The samples are analyzed for gross alpha, gross beta, strontium-89, strontium-90 and gamma emitting isotopes.

## 3.1.3 The Aquatic Program

### Surface Water

One-gallon water samples are taken monthly from three locations on Lake Michigan: 1) at the point where the condenser water is discharged into Lake Michigan (K-1d); 2) Two Creeks Park (K-14) located 2.5 miles south of the reactor site; and 3) at the main pumping station located approximately equidistant from Kewaunee and Green Bay, that pumps water from the Rostok water intake (K-9) located 11.5 miles north of the reactor site. Both raw and tap water are collected at K-9. Additionally, one-gallon water samples are taken monthly from three creeks that pass through the site (K-1a, K-1b, and K-1e). Samples from North and Middle Creeks (K-1a, K-1b) are collected near the mouth of each creek. Samples from the South Creek (K-1e) are collected about ten feet downstream from the point where the outflow from the two drain pipes meet. Water samples at K-14 are collected and analyzed in duplicate.

The water samples are gamma scanned and analyzed for gross beta activity in the total residue, dissolved solids and suspended solids, and potassium-40. The concentration of potassium-40 is calculated from total potassium, which is determined by flame photometry. The tritium activity is determined by liquid scintillation technique. Quarterly composites of monthly grab samples are also analyzed for tritium, strontium-89 and strontium-90.

### Fish

Fish samples are collected during the second, third and fourth quarters at location K-1d. The flesh is separated from the bones, gamma scanned and analyzed for gross beta activity. Ashed bone samples are analyzed for gross beta, strontium-89 and strontium-90 activities.

## Slime

Slime samples are collected during the second and third quarters from three Lake Michigan locations (K-1d, K-9 and K-14), and from three creek locations (K-1a, K-1b and K-1e), if available. The samples are analyzed for gross beta activity. If the quantity is sufficient, they are also gamma scanned and analyzed for strontium-89 and strontium-90 activities.

## Bottom Sediments

Bottom sediments are collected in May and November from five locations (K-1c, K-1d, K-1j, K-9 and K-14). The samples are analyzed for gross beta, strontium-89, strontium-90 and gamma emitting isotopes. Since it is known that the measured radioactivity per unit mass of sediment increases with decreasing particle size, the sampling procedure is designed to assure collection of very fine particles.

### 3.1.4 Program Execution

Program execution is summarized in Table 4.4. The program was executed as described in the preceding sections, with the following exceptions:

No domestic meat sample was available at location K-20 during 1995.

### 3.1.5 Program Modifications

Eggs were not available at Schlies Farm (K-27) for the fourth quarter of 1995. The collection was made at the Fectum Farm (K-24).

## 3.2 Results and Discussion

The results for the reporting period January to December 1995 are presented in summary form in Table 4.5. For each type of analysis of each sampled medium, this table shows the annual mean and range for all indicator locations and for all control locations. The location with the highest annual mean and the results for this location are also given.

The discussion of the results has been divided into three broad categories: the air, terrestrial, and aquatic environments. Within each category, samples will be discussed in the order listed in Table 4.4. Any discussion of previous environmental data for the Kewaunee Nuclear Power Plant refers to data collected by Teledyne Isotopes Midwest Laboratory or its predecessor, Hazleton Environmental Sciences.

The tabulated results of all measurements made in 1995 are not included in this section, although references to these results will be made in the discussion. The complete tabulation of the 1995 results is contained in Part II of the 1995 annual report on the Radiological Monitoring Program for the Kewaunee Nuclear Power Plant.

### 3.2.1 Atmospheric Nuclear Detonations and Nuclear Accidents

There were no reported atmospheric nuclear tests in 1995. The last reported test was conducted by the People's Republic of China on October 16, 1980. The reported yield was in the 200 kiloton to 1 megaton range.

There were no reported accidents at nuclear facilities in 1995.

### 3.2.2 The Air Environment

#### Airborne Particulates

In air particulates, the annual gross beta concentration at indicator and control locations measured 0.019 and 0.018 pCi/m<sup>3</sup>, respectively. These concentrations were equal or slightly lower than in 1988 (0.025 and 0.023 pCi/m<sup>3</sup>, respectively), in 1989 (0.025 and 0.024 pCi/m<sup>3</sup>, respectively), in 1990 (0.024 pCi/m<sup>3</sup> at both locations), in 1991 and in 1992 (0.018 and 0.019 pCi/m<sup>3</sup>, respectively), in 1993 (0.020 pCi/m<sup>3</sup> at both locations) and in 1994 (0.016 and 0.018 pCi/m<sup>3</sup>, respectively).

Gamma spectroscopic analyses of quarterly composites of air particulate filters yielded similar results for indicator and control locations. Beryllium-7, which is produced continuously in the upper atmosphere by cosmic radiation (Arnold and Al-Salih, 1955), was detected in all samples. All other gamma-emitting isotopes were below their respective LLD limits.

#### Airborne Iodine

Bi-monthly levels of airborne iodine-131 were below the lower limit of detection (LLD) of 0.03 pCi/m<sup>3</sup> at all locations. Thus, there is no indication of an effect of the plant operation on the local air environment.

### Ambient Gamma Radiation - TLDs

Ambient gamma radiation was monitored by TLDs at fourteen locations: seven indicator and seven control.

The quarterly TLDs at the indicator locations measured a mean dose equivalent of  $(16.7 \pm 2.3 \text{ mR/91 days})^*$ , in agreement with the mean at the control locations of  $(15.6 \pm 1.9 \text{ mR/91 days})^*$ , and were similar to the means obtained in 1988 (18.0 and 17.4 mR/91 days, respectively), in 1989 (17.5 and 16.9 mR/91 days, respectively), in 1990 (14.4 mR/91 days at both indicator and control locations), in 1991 (13.7 and 12.5 mR/91 days, respectively), in 1992 (15.0 and 13.8 mR/91 days, respectively), in 1993 (15.0 and 13.8 mR/91 days, respectively) and in 1994 (14.8 and 13.8 mR/91 days, respectively). All these values are slightly lower than the United States average value of 19.5 mR/91 days due to natural background radiation (National Council on Radiation Protection and Measurements, 1975). The highest annual mean was 20.4 mR/91 days, measured at the indicator location K-7.

### Precipitation

Precipitation was monitored at one indicator location, K-11. The tritium concentration was below the LLD level of 330 pCi/L in all samples.

### 3.2.3 The Terrestrial Environment

#### Milk

Of 119 analyses for iodine-131 in milk, all were below the LLD level of 0.5 pCi/L.

Strontium-89 concentrations were below the LLD level of 1.0 pCi/L in all samples.

Low levels of Strontium-90 were found in all samples tested. The mean values were identical for indicator and control locations (1.6 pCi/L at both indicator and control locations) and were nearly identical to those in 1989 (1.6 and 1.7 pCi/L, respectively), in 1990 (1.7 and 1.6 pCi/L, respectively), in 1991 (1.6 and 1.7 pCi/L, respectively), in 1992 (1.7 and 1.6 pCi/L, respectively), in 1993 (1.7 and 1.4 pCi/L, respectively) and in 1994 (1.7 and 1.5 pCi/L, respectively).

Barium-lanthanum-140 concentrations were below the LLD of 15 pCi/L in all samples. Cesium-137 concentrations were below the LLD of 10 pCi/L in all samples.

Potassium-40 results were similar at both the indicator and control locations (1440 and 1410 pCi/L, respectively), and were essentially identical to the levels observed in 1978 through 1994.

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\*Unless otherwise indicated, uncertainties of average values are standard deviations of the individual measurements over the period averaged. The uncertainty for each location corresponds to the two-standard deviation error of the average dose of eight dosimeters placed at the location.

### Milk (continued)

Due to the chemical similarities between strontium and calcium, and cesium and potassium, organisms tend to deposit cesium-137 in the soft tissue and muscle and strontium-89 and-90 in the bones. Consequently, the ratios of strontium-90 activity to the weight of calcium in milk and cesium-137 activity to the weight of potassium in milk were monitored in order to detect potential environmental accumulation of these radionuclides. No statistically significant variations in the ratios were observed. The measured concentrations of stable potassium and calcium are in agreement with previously determined values of  $1.50 \pm 0.21$  g/L and  $1.16 \pm 0.08$  g/L, respectively (National Center for Radiological Health, 1968).

### Well Water

Gross alpha concentration was measured at the two on-site wells, (K-1g and K-1h) and averaged 4.8 pCi/L.

Gross beta concentration in well water averaged 1.2 pCi/L in samples from the control location. The mean value for all indicator locations was 2.6 pCi/L and was similar to values observed in 1977 through 1994 (3.3, 3.4, 3.0, 3.0, 3.6, 3.2, 2.9, 2.3, 2.6, 2.5, 2.1, 3.3, 2.5, 2.0, 2.2, 2.6, 2.2 and 2.0 pCi/L respectively). The differences between mean gross beta concentrations are not statistically significant because the counting uncertainties of the individual measurements are typically 0.3 to 1.3 pCi/L in all samples.

Tritium concentration in the on-site well (K-1g) was below the LLD of 330 pCi/L in all samples.

All gamma-emitting isotopes were below their respective LLDs in all samples.

The concentrations of strontium-89 and strontium-90 in well water were below their respective detection limits of 0.7 and 0.6 pCi/L.

Potassium-40 averages were quite low (under 1.8 pCi/L), in agreement with previously measured values.

### Domestic Meat

In meat (chickens), gross alpha concentration was below the LLD level of 0.15 pCi/g wet weight in all samples. Gross beta concentration averaged 2.62 pCi/g wet weight for indicator locations and 2.99 pCi/g wet weight for the control location. The difference is not significant. Gamma-spectroscopic analyses showed that almost all of the beta activity was due to naturally occurring potassium-40. All other gamma-emitting isotopes were below their respective LLD limits.

### Eggs

In egg samples, gross beta concentration averaged 1.07 pCi/g wet weight, similar to the concentration of the naturally-occurring potassium-40 observed in the samples ( 1.26 pCi/g ). All other gamma-emitting isotopes were below their respective LLDs. The level of strontium-89 was below the LLD of 0.007 pCi/g wet weight in all samples. Strontium-90 was below the LLD level of 0.003 pCi/g wet weight in all samples.

### Vegetables

In vegetables, gross beta concentrations were similar at both the indicator and control locations (2.39 pCi/g wet weight and 1.80 pCi/g wet weight, respectively) and was due primarily to potassium-40 activity. Strontium-89 was below the LLD level of 0.006 pCi/g wet weight in all samples. Strontium-90 activity was below the LLD level of 0.002 pCi/g wet weight in all samples.

All other gamma-emitting isotopes were below their respective LLD levels.

In addition to potassium-40, naturally-occurring beryllium-7 was detected in both wheat and clover samples. These samples were of similar radioisotopic composition to the vegetables, but the concentration of radionuclides was slightly higher due to the lower water content of wheat and clover.

### Grass and Cattle Feed

In grass, mean gross beta concentrations were similar at both indicator and control locations (6.25 and 6.40 pCi/g wet weight, respectively) and in both cases was predominantly due to naturally occurring potassium-40 and beryllium-7. All other gamma-emitting isotopes were below their respective LLD's. Strontium-89 was below the LLD of 0.014 pCi/g wet weight in all samples. Strontium-90 activity was below the LLD of 0.006 pCi/g wet weight in all but one sample (0.007 pCi/g wet weight).

For cattlefeed, the mean gross beta concentration was lower at the control locations (7.33 pCi/g wet weight) than at indicator locations (12.39 pCi/g wet weight). The highest average gross beta level was in the samples from the indicator location K-4 (16.93 pCi/g wet weight), and reflected the high potassium-40 level (19.75 pCi/g wet weight) observed in the samples. The pattern was similar to that observed in 1978 through 1994. Strontium-89 levels were below the LLD level of 0.021 pCi/g wet weight in all samples. Strontium-90 activity measured 0.029 pCi/g wet at the indicator locations, similar to that observed in 1994 (0.020 pCi/g wet weight). Measured activity at the control locations was 0.026 pCi/g wet weight, (0.012 pCi/g wet in 1994). The presence of the radiostrontium is attributable to fallout from previous nuclear testing. All other gamma-emitting isotopes were below their respective LLD levels.

### Soil

No significant differences were found in gross alpha concentrations between indicator (8.93 pCi/g dry weight) and control (7.09 pCi/g dry weight) in soil samples. Mean gross beta levels were similar at indicator and control locations (23.36 and 21.74 pCi/g dry weight, respectively), and is primarily due to the potassium-40 activity. Strontium-89 was below the LLD level of 0.030 pCi/g dry weight in all samples. Strontium-90 was detected in eight of fourteen samples and levels were slightly higher at the indicator locations than at the control locations (0.086 and 0.039 pCi/g dry weight, respectively). Cesium-137 was detected in twelve of fourteen samples and was identical at both indicator and control locations (0.21 pCi/g dry weight). Beryllium-7 was detected above the LLD level of 0.22 pCi/g dry weight in six of the fourteen samples tested and averaged 0.69 and 0.60 pCi/g dry weight at indicator and control locations.



### Soil (continued)

Potassium-40 was detected in all samples and averaged 24.27 and 22.78 pCi/g dry weight at indicator and control locations, respectively. All other gamma-emitting isotopes were below their respective LLD's. The levels of detected activities were similar to those observed from 1979 through 1994.

## 3.2.4 The Aquatic Environment

### Surface Water

In surface water, mean gross beta activity in suspended solids was below the LLD level of 1.3 pCi/L in all samples. Mean gross beta concentration in dissolved solids was higher at indicator locations (4.3 pCi/L) as compared to the control locations (2.2 pCi/L) and was similar to activities observed in 1978 (5.4 and 2.7 pCi/L), 1979 (5.7 and 2.7 pCi/L), 1980 (5.1 and 2.7 pCi/L), 1981 (4.3 and 2.7 pCi/L), 1982 (4.9 and 2.4 pCi/L), 1983 (5.1 and 2.6 pCi/L), 1984 (5.0 and 2.7 pCi/L), 1985 (5.6 and 2.7 pCi/L), 1986 (4.1 and 2.5 pCi/L), 1987 (5.3 and 2.5 pCi/L) in 1988 (4.8 and 3.6 pCi/L), in 1989 (5.7 and 3.0 pCi/L), in 1990 (4.1 and 2.6 pCi/L), in 1991 (5.1 and 2.2 pCi/L), in 1992 (4.5 and 2.2 pCi/L), in 1993 and 1994 (5.0 and 2.3 pCi/L). The control sample is Lake Michigan water, which varies very little in gross beta concentration during the year, while indicator samples include two creek locations (K-1a and K-1e) which are much higher in gross beta concentration and exhibit large month-to-month variations. The K-1a creek draws its water from the surrounding fields which are heavily fertilized; and the K-1e creek draws its water mainly from the Sewage Treatment Plant. In general, gross beta concentration levels were high when potassium-40 levels were high and low when potassium-40 levels were low, indicating that the fluctuations in beta concentration were due to variations in potassium-40 concentrations and not to plant operations. The fact that similar fluctuations at these locations were observed in the pre-operational studies conducted prior to 1974 supports this assessment.

Tritium concentration was below the LLD level of 330 pCi/L in all but two samples. Tritium was detected at locations K-1d and K-14b at levels of 1317 and 344 pCi/L, respectively. Both were below the limits of Appendix C, Table C-1, page C-2.

Strontium-89 concentration was below the LLD of 1.5 pCi/L in all samples. Concentrations of strontium-90 were detected at both indicator and control locations and measured 0.8 and 1.2 pCi/L, respectively.

All gamma-emitting isotopes were below their respective LLDs in all samples.

### Fish

In fish samples, the gross beta concentration averaged 2.52 pCi/g wet weight in muscles and 1.09 pCi/g wet weight in bone fractions. In muscle, the gross beta concentration was primarily due to potassium-40 activity. The average beta concentration of 2.52 pCi/g wet weight was lower than the average of the 1973 range of 3.34 to 3.62 pCi/g wet weight. The cesium-137 concentration in muscle averaged 0.056 pCi/g wet weight and was roughly half the levels observed in 1979 and 1980 (0.12 pCi/g wet weight in both years), 1981 (0.15 pCi/g wet weight), 1982 (0.17 pCi/g wet weight), 1983 (0.14 pCi/g wet weight), 1984 (0.10 pCi/g

### Fish (continued)

wet weight), 1985 (0.11 pCi/g wet weight), 1986 (0.11 pCi/g wet weight), 1987 (0.11 pCi/g wet weight), 1988 (0.12 pCi/g wet weight), 1989 (0.11 pCi/g wet weight), 1990 (0.075 pCi/g wet weight), and 1991 (0.11 pCi/g wet weight). The levels were almost identical to those seen in 1992 (0.066 pCi/g wet weight), in 1993 (0.068 pCi/g wet weight) and in 1994 (0.067 pCi/g wet weight). The strontium-89 concentration was below the LLD of 0.078 pCi/g wet weight in all samples. Strontium-90 was detected in all bone samples and averaged 0.079 pCi/g wet weight.

### Periphyton (Slime)

In periphyton (slime) samples, mean gross beta concentrations were slightly higher at the indicator locations than at the control locations (4.18 and 2.85 pCi/g wet weight, respectively). Strontium-89 concentration was below the LLD level of 0.051 pCi/g wet weight in all samples. Strontium-90 was detected at one of the ten indicator locations at a concentration of 0.027 pCi/g wet weight. Traces of Co-58 were detected in three of the four slime samples collected from locations K-1d (condenser discharge) and K-1e (South Creek effluent) and averaged 0.102 pCi/g wet weight. Co-60 was detected in one slime sample from location K-1e (South Creek effluent) at a concentration of 0.044 pCi/g wet weight. The low level Cobalt radioactivity observed in the Periphyton (slime) is most probably due to back flow from normal routine plant effluents. The mouth of the South Creek is susceptible to back flow from Lake Michigan, implying that the radioactivity is due to routine plant effluents. Kewaunee will continue to monitor the situation and collect additional samples if conditions warrant. Cs-137 was detected in four of ten samples and averaged 0.079 pCi/g wet weight, slightly higher than 1994 (0.055 pCi/g wet weight). All other gamma-emitting isotopes, except naturally-occurring beryllium-7 and potassium-40, were below their respective LLDs.

### Bottom Sediments

In bottom sediment samples, the mean gross beta concentration was similar at indicator locations and at the control location (6.8 and 4.3 pCi/g dry weight, respectively), due primarily to potassium-40. The difference is not statistically significant.

Cesium-137 was detected in four of ten samples and averaged 0.050 pCi/g dry weight at indicator locations and less than 0.023 pCi/g dry weight at control locations. Cs-134 was below the LLD level of 0.034 pCi/g dry weight in all samples. The cesium-137 level was lower than the levels observed in 1979 (0.12 pCi/g dry weight), in 1980 (0.19 pCi/g dry weight), in 1981 (0.18 pCi/g dry weight), in 1982 (0.13 pCi/g dry weight), in 1983 (0.16 pCi/g dry weight), and in 1984 (0.07 pCi/g dry weight), and similar to concentrations observed in 1985 (0.05 pCi/g dry weight), in 1986 (0.037 pCi/g dry weight), in 1987 (0.038 pCi/g dry weight) and in 1988 (0.049 pCi/g dry weight), in 1989 (0.056 pCi/g dry weight), in 1990 (0.058 pCi/g dry weight), in 1991 (0.057 pCi/g dry weight), in 1992 (0.047 pCi/g dry weight), in 1993 (0.034 pCi/g dry weight) and in 1994 (0.050 pCi/g dry weight). Levels of Strontium-89 were below their respective LLDs of 0.036 pCi/g dry weight in all samples. Strontium-90 concentrations were below their respective LLDs of 0.013 pCi/g dry weight in all samples.

### 3.3 Land Use Census

The 1995 Land Use Census satisfies the requirements of the KNPP Radiological Environmental Monitoring Manual. Section 2.2.2 states:

A land use census shall be conducted and shall identify within a distance of 8 km (5 miles) the location, in each of the 10 meteorological sectors, of the nearest milk animal, the nearest residence and the nearest garden of greater than 50m<sup>2</sup> (500 ft<sup>2</sup>) producing broad leaf vegetation.

The 1995 Land Use Census included a complete door-to-door count of the residences, milk animals, and gardens in the ten meteorological sectors within five miles of KNPP.

This census is conducted every five years during the growing season per Health Physics Procedure HP 1.14.

In instances where multiple fields were farmed by the same individual, observations were taken using the closest field to KNPP.

Table 4.6.1 lists the results of the 1995 census. Distances calculated in the 1995 census have been verified and supersede the 1994 measurements.

Table 4.6.2 describes the changes from 1994 to 1995. Changes of ownership are also noted.

Table 4.6.3 is a comparison to the five year census of 1985 and 1990. Changes are consistent with the national trend of moving away from farming (24% decrease in farms with milk animals, 15% decrease in the number of fields farmed, and 50% decrease in the number of large gardens). Total number of homes in the area remained consistent. The difference between non-farming and farming homesteads was not tracked, but one would assume farming losses were offset by non-farming "suburban type" increases.

The 1995 Land Use Census was completed on August 31, 1995.

#### 4.0 FIGURES AND TABLES

# KEWAUNEE NUCLEAR POWER PLANT

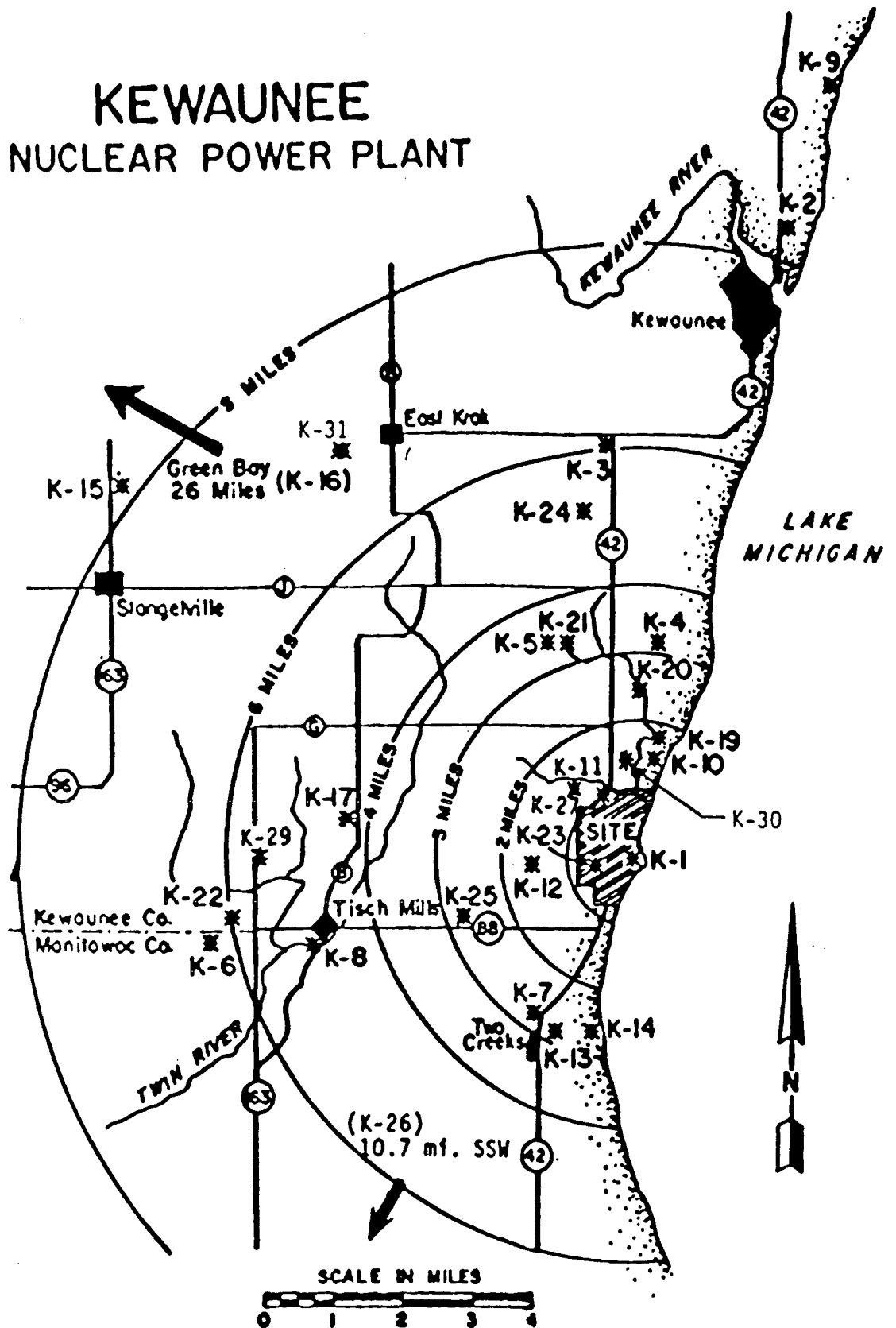


Figure 4-1. Sampling locations, Kewaunee Nuclear Power Plant

Table 4.1. Sampling locations, Kewaunee Nuclear Power Plant.

Code	Type <sup>a</sup>	Distance (miles) <sup>b</sup> and Sector	Location
K-1			Onsite
K-1a	I	0.62 N	North Creek
K-1b	I	0.12 N	Middle Creek
K-1c	I	0.10 N	500' north of condenser discharge
K-1d	I	0.10 E	Condenser discharge
K-1e	I	0.12 S	South Creek
K-1f	I	0.12 S	Meteorological Tower
K-1g	I	0.06 W	South Well
K-1h	I	0.12 NW	North Well
K-1j	I	0.10 S	500' south of condenser discharge
K-2	C	9.5 NNE	WPS Operations Building in Kewaunee
K-3	C	6.0 N	Lyle and John Siegmund Farm, Route 1, Kewaunee
K-4	I	3.0 N	Tom Stangel Farm, Route 1, Kewaunee
K-5	I	3.5 NNW	Ed Paplham Farm, Route 1, Kewaunee
K-6	C	6.7 WSW	Novitsky Farm
K-7	I	2.75 SSW	Ron Zimmerman Farm, Route 3, Two Rivers
K-8	C	5.0 WSW	Saint Mary's Church, Tisch Mills
K-9	C	11.5 NNE	Rostok Water Intake for Green Bay, Wisconsin, two miles north of Kewaunee
K-10	I	1.5 NNE	Turner Farm, Kewaunee site
K-11	I	1.0 NW	Harlan Ihlenfeld Farm
K-12	I	1.5 WSW	Lecaptain Farm, one mile west of site
K-13	C	3.0 SSW	Rand's General Store
K-14	I	2.5 S	Two Creeks Park, 2.5 miles south of site
K-15	C	9.25 NW	Gas Substation, 1.5 miles north of Stangelville
K-16	C	26 NW	WPS Division Office Building, Green Bay, Wisconsin
K-17	I	4.25 W	Jansky's Farm, Route 1, Kewaunee
K-19	I	1.75 NNE	Wayne Paral Farm, Route 1, Kewaunee
K-20	I	2.5 N	Carl Struck Farm, Route 1, Kewaunee
K-23	I	0.5 W	0.5 miles west of plant, Kewaunee site
K-24	I	5.45 N	Fectum Farm, Route 1, Kewaunee
K-25 <sup>c</sup>	C	2.75 WSW	Wotachek Farm, Route 1, Denmark
K-26	C	10.7 SSW	Bertler's Fruit Stand (8.0 miles south of "BB")
K-27	I	1.5 NW	Schlies Farm, 0.5 miles west of K-11
K-28	C	26 NW	Hansen Dairy, Green Bay, Wisconsin
K-29	I	5.75 W	Kunesh Farm, Route 1, Kewaunee
K-30	I	1.00 N	End of site boundary
K-31	C	6.25 NNW	E. Krok Substation

<sup>a</sup> I= indicator; C = control.

<sup>b</sup> Distances are measured from reactor stack.

<sup>c</sup> Replaced by K-29 in summer 1990 because Wotachek Farm no longer had chickens.

Table 4.2. Type and frequency of collection.

Location	Frequency					
	Weekly	Biweekly	Monthly	Quarterly	Semiannually	Annually
K-1a			SW		SL	
K-1b			SW	GR <sup>a</sup>	SL	
K-1c					BS <sup>b</sup>	
K-1d			SW	FI	BS <sup>b</sup> , SL	
K-1e			SW		SL	
K-1f	AP	AI		GR <sup>a</sup> , TLD	SO	
K-1g				WW		
K-1h				WW		
K-1j					BS <sup>b</sup>	
K-2	AP	AI		TLD		
K-3			MI <sup>c</sup>	GR <sup>a</sup> , TLD, CF <sup>d</sup>	SO	
K-4			MI <sup>c</sup>	GR <sup>a</sup> , TLD, CF <sup>d</sup>	SO	
K-5			MI <sup>c</sup>	GR <sup>a</sup> , TLD, CF <sup>d</sup>	SO	
K-6			MI <sup>c</sup>	GR <sup>a</sup> , TLD, CF <sup>d</sup>	SO	
K-7	AP	AI		TLD		
K-8	AP	AI		TLD		
K-9			SW		BS <sup>b</sup> , SL	
K-10				WW		
K-11			PR	WW		
K-12			MI <sup>c</sup>	GR <sup>a</sup> , CF <sup>d</sup> , WW	SO	
K-13				WW		
K-14			SW		BS <sup>b</sup> , SL	
K-15	AP	AI		TLD		
K-16	AP	AI		TLD		
K-17				TLD		VE
K-19			MI <sup>c</sup>	GR <sup>a</sup> , CF <sup>d</sup>	SO	
K-20						DM
K-23						GRN
K-24				EG <sup>g</sup>		DM
K-25 <sup>e</sup>						DM
K-26						VE
K-27				TLD, EG <sup>f</sup>		DM
K-28			MI <sup>c</sup>			
K-29						DM
K-30				TLD		
K-31				TLD		

<sup>a</sup> Three times a year, second (April, May, June), third (July, August, September), and fourth (October, November, December) quarters.

<sup>b</sup> To be collected in May and November.

<sup>c</sup> Monthly from November through April; semimonthly May through October.

<sup>d</sup> First quarter (January, February, March) only.

<sup>e</sup> Replaced by K-29 in summer of 1990.

<sup>f</sup> First (January, February, March), second (April, May, June), third (July, August, September) quarters 1995 only.

<sup>g</sup> Fourth (October, November, December) 1995 quarter only.

Table 4.3. Sample codes used in Table 4.2.

Code	Description
AP	Airborne Particulate
AI	Airborne Iodine
TLD	Thermoluminescent Dosimeter
PR	Precipitation
MI	Milk
WW	Well Water
DM	Domestic Meat
EG	Eggs
VE	Vegetables
GRN	Grain
GR	Grass
CF	Cattlefeed
SO	Soil
SW	Surface Water
FI.	Fish
SL	Slime
BS	Bottom Sediments



Table 4.4. Sampling Summary, January - December 1995.

Sample Type	Collection Type and Frequency <sup>a</sup>	Number of Locations	Number of Samples Collected	Number of Samples Missed
<u>Air Environment</u>				
Airborne particulates	C/W	6	318	0
Airborne Iodine	C/BW	6	156	0
TLD's	C/Q	14	55	1
Precipitation	C/M	1	12	0
<u>Terrestrial Environment</u>				
Milk (May-Oct)	G/SM	7	70	0
(Nov-Apr)	G/M	7	49	0
Well water	G/Q	6	24	0
Domestic meat	G/A	4	3	1
Eggs	G/Q	1	4	0
Vegetables - 6 varieties	G/A	2	6	0
Grain - wheat	G/A	1	1	0
- clover	G/A	1	1	0
Grass	G/TA	8	24	0
Cattle feed	G/A	6	12	0
Soil	G/SA	7	14	0
<u>Aquatic Environment</u>				
Surface water	G/M	7	96	0
Fish	G/TA	1	5	0
Slime	G/SA	6	12	0
Bottom sediments	G/SA	5	10	0

<sup>a</sup> Type of collection is coded as follows: C = continuous; G = grab.  
 Frequency is coded as follows: W = weekly; SM = semimonthly; M = monthly; Q=quarterly;  
 SA = semiannually; TA = three times per year; FA = four times per year; A = annually; BW = bi-weekly.

Table 4.5 Environmental Radiological Monitoring Program Summary.

Name of Facility Kewaunee Nuclear Power Plant Docket No. 50-305  
 Location of Facility Kewaunee County, Wisconsin Reporting Period January - December 1995  
 (County, State)

Sample Type (Units)	Type and Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Locations Mean (F) <sup>c</sup> Range <sup>c</sup>	Location with Highest Quarterly Mean		Control Locations Mean (F) <sup>c</sup> Range	Number Non-Routine Results <sup>e</sup>
				Location <sup>d</sup>	Mean (F) <sup>c</sup> Range <sup>c</sup>		
Airborne particulates (pCi/m <sup>3</sup> )	GB 318	0.003	0.019 (106/106) (0.007-0.039)	K-1, Onsite	0.019 (53/53) (0.008-0.035)	0.018 (207/212) (0.004-0.040)	0
	GS 24			K-8, Tisch Mills 5.0mi. WSW	0.019 (53/53) (0.008-0.038)		
	Be-7	0.010	0.069 (8/8) (0.045-0.091)	K-8, Tisch Mills 5.0mi. WSW	0.076 (4/4) (0.044-0.095)	0.069 (16/16) (0.032-0.095)	0
	Nb-95	0.0018	<LLD	-	-	<LLD	0
	Zr-95	0.0031	<LLD	-	-	<LLD	0
	Ru-103	0.0017	<LLD	-	-	<LLD	0
	Ru-106	0.011	<LLD	-	-	<LLD	0
	Cs-134	0.0016	<LLD	-	-	<LLD	0
	Cs-137	0.0014	<LLD	-	-	<LLD	0
	Ce-141	0.0026	<LLD	-	-	<LLD	0
Ce-144	0.0070	<LLD	-	-	<LLD	0	
Airborne Iodine (pCi/m <sup>3</sup> )	I-131 156	0.03	<LLD	-	-	<LLD	0
TLD-Quarterly (mR/91 days)	Gamma 55	1	16.7 (28/28) (12.3-24.1)	K-7, Zimmerman Farm, 2.75 mi SSW	20.4 (4/4) (18.1-22.6)	15.6 (27/27) (12.5-21.3)	0
Precipitation (pCi/L)	H-3 12	330	<LLD	-	-	None	0
Milk (pCi/L)	I-131 119	0.5	<LLD	-	-	<LLD	0
	Sr-89 84	1.0	<LLD	-	-	<LLD	0
	Sr-90 84	0.5	1.6 (48/48) (0.9-4.4)	K-12, Lecaptain Farm 1.5 mi WSW	2.2 (12/12) (1.5-4.4)	1.6 (36/36) (1.1-2.8)	0
	GS 119			K-12, Lecaptain Farm 1.5 mi WSW	1510 (17/17) (1340-1670)	1410 (51/51) (1200-1590)	0
	Cs-134	10	<LLD	-	-	<LLD	0
	Cs-137	10	<LLD	-	-	<LLD	0
	Ba-La-140	15	<LLD	-	-	<LLD	0
	(g/L) K-stable 84	1.0	1.66 (48/48) (1.48-1.87)	K-12, Lecaptain Farm 1.5 mi WSW	1.74 (12/12) (1.64-1.87)	1.62 (36/36) (1.39-1.77)	0
	(g/L) Ca 84	0.4	0.90 (48/48) (0.71-1.11)	K-6, Novitsky Farm 6.7 mi WSW	0.99 (12/12) (0.81-1.10)	0.93 (36/36) (0.73-1.13)	0
	Well Water (pCi/L)	GA 8	2.8	4.8 (7/8) (2.9-8.3)	K-1h, North Well Onsite, 0.12 mi .NW	6.0 (3/4) (4.0-8.3)	None
GB 24		0.5	2.6 (20/20) (0.8-5.8)	K-1h, North Well Onsite, 0.12 mi .NW	5.1 (4/4) (3.3-5.8)	1.2 (4/4) (1.1-1.3)	0
H-3 4		330	<LLD	-	-	None	0
K-40 (flame) 24		0.86	1.77 (14/20) (0.95-2.77)	K-1g, South Well Onsite, 0.06 mi .W	2.36 (4/4) (1.56-2.77)	0.98(3/4) (0.95-1.04)	0
Sr-89 4		0.7	<LLD	-	-	None	0
Sr-90 4		0.3	<LLD	-	-	None	0
GS 24				-	-	None	0
Mn-54 15			<LLD	-	-	<LLD	0
Fe-59 30			<LLD	-	-	<LLD	0
Co-58 15			<LLD	-	-	<LLD	0
Co-60 15			<LLD	-	-	<LLD	0
Zr-Nb-95 15			<LLD	-	-	<LLD	0
Cs-134 10			<LLD	-	-	<LLD	0
Cs-137 10			<LLD	-	-	<LLD	0
Ba-La-140 15		<LLD	-	-	<LLD	0	

Table 4.5 Environmental Radiological Monitoring Program Summary.

Name of Facility Kewaunee Nuclear Power Plant Docket No. 50-305  
 Location of Facility Kewaunee County, Wisconsin Reporting Period January - December 1995  
 (County, State)

Sample Type (Units)	Type and Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Locations Mean (F) <sup>c</sup> Range <sup>c</sup>	Location with Highest Quarterly Mean		Control Locations Mean (F) <sup>c</sup> Range	Number Non-Routine Results <sup>e</sup>
				Location <sup>d</sup>	Mean (F) <sup>c</sup> Range <sup>c</sup>		
Domestic Meat (Chickens) (pCi/g wet)	GA 3	0.15	<LLD	-	-	<LLD	0
	GB 3	0.03	2.62 (2/2) (2.58-2.66)	K-24, Fectum Farm 5.45 mi N	2.99(1/1)	2.99 (1/1)	0
	GS 3	0.53	<LLD	-	-	<LLD	0
	Be-7	0.5	2.40 (2/2) (2.26-2.53)	K-24, Fectum Farm 5.45 mi N	3.11 (1/1)	3.11 (1/1)	0
	K-40	0.094	<LLD	-	-	<LLD	0
	Nb-95	0.084	<LLD	-	-	<LLD	0
	Zr-95	0.094	<LLD	-	-	<LLD	0
	Ru-103	0.34	<LLD	-	-	<LLD	0
	Ru-106	0.032	<LLD	-	-	<LLD	0
	Cs-134	0.037	<LLD	-	-	<LLD	0
	Cs-137	0.15	<LLD	-	-	<LLD	0
Ce-141	0.17	<LLD	-	-	<LLD	0	
Ce-144							
Eggs (pCi/g wet)	GB 4	0.01	1.07 (4/4) (0.98-1.20)	K-27, Schlies Farm 1.5 mi NW	1.07 (4/4) (0.98-1.20)	None	0
	Sr-89 4	0.007	<LLD	-	-	None	0
	Sr-90 4	0.003	<LLD	-	-	None	0
	GS						
	Be-7	0.072	<LLD	-	-	None	0
	K-40	0.01	1.26 (4/4) (1.08-1.41)	K-27, Schlies Farm 1.5 mi NW	1.26 (4/4) (1.08-1.41)	None	0
	Nb-95	0.010	<LLD	-	-	None	0
	Zr-95	0.018	<LLD	-	-	None	0
	Ru-103	0.010	<LLD	-	-	None	0
	Ru-106	0.067	<LLD	-	-	None	0
	Cs-134	0.007	<LLD	-	-	None	0
Cs-137	0.006	<LLD	-	-	None	0	
Ce-141	0.021	<LLD	-	-	None	0	
Ce-144	0.056	<LLD	-	-	None	0	
Vegetables (pCi/g wet)	GB 6	0.1	2.39 (3/3) (1.60-3.08)	K-17, Jansky's Farm 4.25 mi W	2.39 (3/3) (1.60-3.08)	1.80 (3/3) (1.59-2.15)	0
	Sr-89 6	0.003	<LLD	-	-	<LLD	0
	Sr-90 6	0.002	<LLD	-	-	<LLD	0
	GS 6						
	Be-7	0.089	<LLD	-	-	<LLD	0
	K-40	0.75	3.01 (3/3) (2.13-4.19)	K-17, Jansky's Farm 4.25 mi W	3.01 (3/3) (2.13-4.19)	2.26 (3/3) (2.02-2.48)	0
	Nb-95	0.010	<LLD	-	-	<LLD	0
	Zr-95	0.021	<LLD	-	-	<LLD	0
	Ru-103	0.009	<LLD	-	-	<LLD	0
	Ru-106	0.082	<LLD	-	-	<LLD	0
	Cs-134	0.007	<LLD	-	-	<LLD	0
Cs-137	0.010	<LLD	-	-	<LLD	0	
Ce-141	0.016	<LLD	-	-	<LLD	0	
Ce-144	0.083	<LLD	-	-	<LLD	0	

Table 4.5 Environmental Radiological Monitoring Program Summary.

Name of Facility Kewaunee Nuclear Power Plant  
 Location of Facility Kewaunee County, Wisconsin  
 (County, State)

Docket No. 50-305  
 Reporting Period January - December 1995

Sample Type (Units)	Type and Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Locations Mean (F) <sup>c</sup> Range <sup>c</sup>	Location with Highest Quarterly Mean		Control Locations Mean (F) <sup>c</sup> Range	Number Non-Routine Results <sup>e</sup>
				Location <sup>d</sup>	Mean (F) <sup>c</sup> Range <sup>c</sup>		
Grain - Wheat & Clover (pCi/g wet)	GB 2	0.10	5.18 (2/2) (3.98-6.38)	K-23, Kewaunee Site 0.5 mi W	5.18 (2/2) (3.98-6.38)	None	0
	Sr-89 2	0.007	<LLD	-	-	None	0
	Sr-90 2	0.004	<LLD	-	-	None	0
	GS 2						
	Be-7 2	0.27	1.01 (2/2) (0.96-1.05)	K-23, Kewaunee Site 0.5 mi	1.01 (2/2) (0.96-1.05)	None	0
	K-40 2	0.10	7.33 (2/2) (4.97-6.96)	K-23, Kewaunee Site 0.5 mi W	7.33 (2/2) (4.97-6.96)	None	0
	Nb-95 2	0.024	<LLD	-	-	None	0
	Zr-95 2	0.063	<LLD	-	-	None	0
	Ru-103 2	0.033	<LLD	-	-	None	0
	Ru-106 2	0.17	<LLD	-	-	None	0
	Cs-134 2	0.038	<LLD	-	-	None	0
	Cs-137 2	0.029	<LLD	-	-	None	0
	Ce-141 2	0.044	<LLD	-	-	None	0
Ce-144 2	0.20	<LLD	-	-	None	0	
Cattlefeed (pCi/g wet)	GB 12	0.1	12.39 (8/8) (2.38-27.26)	K-4, Stangel Farm 3.0 mi N	16.93 (2/2) (8.89-24.96)	7.33 (4/4) (2.95-14.28)	0
	Sr-89 12	0.021	<LLD	-	-	<LLD	0
	Sr-90 12	0.002	0.029 (6/8) (0.010-0.048)	K-5, Paral Farm 1.75 mi NNE	0.048 (1/2)	0.026 (3/4) (0.003-0.055)	0
	GS 12						
	Be-7 12	0.27	0.55 (6/8) (0.36-1.04)	K-4, Stangel Farm 3.0 mi N	1.04 (1/2)	0.45 (3/4) (0.41-0.50)	0
	K-40 12	1.0	12.74(8/8) (2.45-32.01)	K-4, Stangel Farm 3.0 mi N	19.75 (2/2) (7.48-32.01)	8.18 (4/4) (3.06-13.28)	0
	Nb-95 12	0.033	<LLD	-	-	<LLD	0
	Zr-95 12	0.067	<LLD	-	-	<LLD	0
	Ru-103 12	0.032	<LLD	-	-	<LLD	0
	Ru-106 12	0.28	<LLD	-	-	<LLD	0
	Cs-134 12	0.036	<LLD	-	-	<LLD	0
	Cs-137 12	0.033	<LLD	-	-	<LLD	0
	Ce-141 12	0.053	<LLD	-	-	<LLD	0
Ce-144 12	0.19	<LLD	-	-	<LLD	0	
Grass (pCi/g wet)	GB 24	0.1	6.25 (18/18) (4.99-7.94)	K-12, Lecaptain Farm 1.5 mi WSW	6.61 (3/3) (5.55-7.94)	6.40 (6/6) (3.71-8.40)	0
	Sr-89 24	0.014	<LLD	-	-	<LLD	0
	Sr-90 24	0.006	0.007 (1/18)	K-12, Lecaptain Farm 1.5 mi WSW	0.007(1/3)	<LLD	0
	GS 24						
	Be-7 24	0.19	1.66 (18/18) (0.27-3.57)	K-5, Paral Farm 1.75 mi NNE	2.22 (3/3) (1.62-2.71)	1.64 (5/6) (0.83-2.98)	0
	K-40 24	0.1	6.94 (18/18) (4.79-8.84)	K-3, Siegmund Farm, 6.0 mi N	8.60 (3/3) (8.34-8.90)	7.99 (6/6) (5.37-8.90)	0
	Nb-95 24	0.031	<LLD	-	-	<LLD	0
	Zr-95 24	0.077	<LLD	-	-	<LLD	0
	Ru-103 24	0.047	<LLD	-	-	<LLD	0
	Ru-106 24	0.36	<LLD	-	-	<LLD	0
	Cs-134 24	0.044	<LLD	-	-	<LLD	0
	Cs-137 24	0.046	<LLD	-	-	<LLD	0
	Ce-141 24	0.093	<LLD	-	-	<LLD	0
Ce-144 24	0.37	<LLD	-	-	<LLD	0	

Table 4.5 Environmental Radiological Monitoring Program Summary.

Name of Facility Kewaunee Nuclear Power Plant Docket No. 50-305  
 Location of Facility Kewaunee County, Wisconsin Reporting Period January - December 1995  
 (County, State)

Sample Type (Units)	Type and Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Locations Mean (F) <sup>c</sup> Range <sup>c</sup>	Location with Highest Quarterly Mean		Control Locations Mean (F) <sup>c</sup> Range	Number Non-Routine Results <sup>e</sup>	
				Location <sup>d</sup>	Mean (F) <sup>c</sup> Range <sup>c</sup>			
Soil (pCi/g dry)	GA 14	5.0	8.93 (10/10) (5.20-14.23)	K-1f, Met Tower 0.12 mi S	9.92 (2/2) (5.60-14.23)	7.09 (4/4) (5.71-8.70)	0	
	GB 14	2.0	23.36 (10/10) (14.21-32.91)	K-5, Paplham Farm 3.5 mi NNW	32.31 (2/2) (31.71-32.91)	21.74 (4/4) (17.95-23.96)	0	
	Sr-89 14	0.030	<LLD	-	-	<LLD	0	
	Sr-90 14	0.019	0.086 (5/10) (0.058-0.126)	K-19, Paral Farm 1.75 mi NNE	0.102 (2/2) (0.078-0.126)	0.039 (3/4) (0.026-0.052)	0	
	CS	Be-7 14	0.22	0.69 (4/10) (0.30-1.77)	K-12, Lecaptain Farm 1.5 mi WSW	1.06 (1/2) (0.34-1.77)	0.60 (2/4) (0.34-0.85)	0
		K-40	1.4	24.27 (10/10) (15.21-34.75)	K-5, Paplham Farm 3.5 mi NNW	29.21 (2/2) (23.68-34.75)	22.78 (4/4) (19.12-25.56)	0
		Nb-95	0.050	<LLD	-	-	<LLD	0
		Zr-95	0.070	<LLD	-	-	<LLD	0
		Ru-103	0.023	<LLD	-	-	<LLD	0
		Ru-106	0.18	<LLD	-	-	<LLD	0
		Cs-134	0.037	<LLD	-	-	<LLD	0
		Cs-137	0.024	0.21 (8/10) (0.12-0.39)	K-19, Paral Farm 1.75 mi NNE	0.29 (2/2) (0.20-0.39)	0.21 (4/4) (0.14-0.32)	0
	Ce-141	0.051	<LLD	-	-	<LLD	0	
	Ce-144	0.14	<LLD	-	-	<LLD	0	
Surface Water (pCi/L)	GB (SS) 96	1.3	<LLD	-	-	<LLD	0	
	GB (DS) 96	1.0	4.3 (72/72) (1.3-15.3)	K-1a, North Creek Onsite 0.62 mi N	9.4 (12/12) (5.2-15.3)	2.2 (24/24) (1.9-2.6)	0	
	GB (TR) 96	1.0	4.3 (72/72) (1.3-15.3)	K-1a, North Creek Onsite 0.62 mi N	9.4 (12/12) (5.2-15.3)	2.3 (24/24) (1.9-3.3)	0	
	CS	Mn-54 15		<LLD	-	-	<LLD	0
		Fe-59 30		<LLD	-	-	<LLD	0
		Co-58 15		<LLD	-	-	<LLD	0
		Co-60 15		<LLD	-	-	<LLD	0
		Zr-Nb-95 15		<LLD	-	-	<LLD	0
		Cs-134 10		<LLD	-	-	<LLD	0
		Cs-137 10		<LLD	-	-	<LLD	0
		Ba-La-140 15		<LLD	-	-	<LLD	0
	H-3 32	330	831 (2/24) (344-1317)	K-1d, Condenser Discharge, 0.10 mi E	1317 (1/4)	<LLD	0	
	Sr-89 32	1.5	<LLD	-	-	<LLD	0	
	Sr-90 32	0.7	0.8 (3/24) (0.8-0.9)	K-9, Rostok Water Intake, 11.5 mi. NNE	1.2 (1/8)	1.2 (1/8)	0	
K-40 (flame) 96	0.87	3.17 (68/72) (0.95-13.84)	K-1a, North Creek Onsite 0.62 mi N	8.25 (12/12) (4.67-13.84)	1.08 (17/24) (0.95-1.21)	0		
Fish - Muscle (pCi/g wet)	GB 5	0.5	2.52 (5/5) (0.89-3.43)	K-1d, Condenser Discharge, 0.10 mi E	2.52 (5/5) (0.89-3.43)	None	0	
	CS	K-40 5	0.1	2.52 (5/5) (1.10-3.08)	K-1d, Condenser Discharge, 0.10 mi E	2.52 (5/5) (1.10-3.08)	None	0
		Mn-54	0.016	<LLD	-	-	None	0
		Fe-59	0.048	<LLD	-	-	None	0
		Co-58	0.012	<LLD	-	-	None	0
		Co-60	0.015	<LLD	-	-	None	0
		Cs-134	0.016	<LLD	-	-	None	0
		Cs-137	0.019	0.056 (5/5) (0.033-0.071)	K-1d, Condenser Discharge, 0.10 mi E	0.056 (5/5) (0.033-0.071)	None	0

Table 4.5 Environmental Radiological Monitoring Program Summary.

Name of Facility Kewaunee Nuclear Power Plant Docket No. 50-305  
 Location of Facility Kewaunee County, Wisconsin Reporting Period January - December 1995  
 (County, State)

Sample Type (Units)	Type and Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Locations Mean (F) <sup>c</sup> Range <sup>c</sup>	Location with Highest Quarterly Mean		Control Locations Mean (F) <sup>c</sup> Range	Number Non-Routine Results <sup>e</sup>
				Location <sup>d</sup>	Mean (F) <sup>c</sup> Range <sup>c</sup>		
Fish - Bones (pCi/g wet)	GB 5	0.1	1.09 (5/5) (0.67-1.39)	K-1d, Condenser Discharge, 0.10 mi E	1.09 (5/5) (0.67-1.39)	None	0
	Sr-89 5	0.078	<LLD	-	-	None	0
	Sr-90 5	0.005	0.079 (5/5) (0.044-0.139)	K-1d, Condenser Discharge, 0.10 mi E	0.079 (5/5) (0.044-0.139)	None	0
Periphyton (Slime) (pCi/g wet)	GB 12	0.1	4.18 (10/10) (2.66-6.11)	K-1b, Middle Creek 0.12 mi N	4.69 (2/2) (3.98-5.39)	2.85 (2/2) (2.03-3.67)	0
	Sr-89 12	0.051	<LLD	-	-	<LLD	0
	Sr-90 12	0.020	0.027 (1/10)	K-1a, North Creek 0.62 mi. N	0.027 (1/2)	<LLD	0
	GS 12						
	Be-7	0.32	1.16 (9/10) (0.51-2.20)	K-1d, Condenser Discharge, 0.10 mi E	1.49 (2/2) (0.77-2.20)	<LLD	0
	K-40	0.2	3.18 (10/10) (1.61-5.22)	K-1b, Middle Creek 0.12 mi N	4.95 (2/2) (4.67-5.22)	3.03 (2/2) (2.68-3.37)	0
	Mn-54	0.027	<LLD	-	-	<LLD	0
	Co-58	0.042	0.102 (3/10) (0.056-0.160)	K-1e, South Creek 0.12 mi. S	0.108 (2/2) (0.056-0.160)	<LLD	0
	Co-60	0.033	0.044 (1/10)	K-1e, South Creek 0.12 mi. S	0.044 (1/2)	<LLD	0
	Nb-95	0.036	<LLD	-	-	<LLD	0
	Zr-95	0.049	<LLD	-	-	<LLD	0
	Ru-103	0.023	<LLD	-	-	<LLD	0
	Ru-106	0.29	<LLD	-	-	<LLD	0
	Cs-134	0.039	<LLD	-	-	<LLD	0
	Cs-137	0.032	0.079 (4/10) (0.057-0.100)	K-14, Two Creeks Park, 2.5 mi S	0.100 (1/2)	<LLD	0
	Ce-141	0.048	<LLD	-	-	<LLD	0
Ce-144	0.20	<LLD	-	-	<LLD	0	
Bottom Sediments (pCi/g dry)	GB 10	1.0	6.77 (8/8) (5.13-8.15)	K-14, Two Creeks Park, 2.5 mi S	7.93 (2/2) (7.70-8.15)	4.32 (2/2) (3.58-5.05)	0
	Sr-89 10	0.036	<LLD	-	-	<LLD	0
	Sr-90 10	0.013	<LLD	-	-	<LLD	0
	GS 10						
	K-40	1.0	8.20 (8/8) (5.01-11.18)	K-1c, 500' N of Condenser Discharge 0.10 mi N	9.48 (2/2) (7.77-11.18)	5.86 (2/2) (5.10-6.62)	0
	Co-58	0.036	<LLD	-	-	<LLD	0
	Co-60	0.032	<LLD	-	-	<LLD	0
	Cs-134	0.034	<LLD	-	-	<LLD	0
Cs-137	0.023	0.050 (4/8) (0.029-0.058)	K-1d, Condenser Discharge, 0.10 mi E	0.056 (1/2)	<LLD	0	

- <sup>a</sup> GA = gross alpha, GB = gross beta, GS = gamma spectroscopy, SS = suspended solids, DS = dissolved solids, TR = total residue.
- <sup>b</sup> LLD = nominal lower limit of detection based on 4.66 sigma counting error for background sample.
- <sup>c</sup> Mean based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (F).
- <sup>d</sup> Locations are specified by station code (Table 4.1), distance (miles) and direction relative to reactor site.
- <sup>e</sup> Non-routine results are those which exceed ten times the control station value. If no control station value is available, the result is considered non-routine if it exceeds ten times the pre-operational value for the location.

Table 4.6.1 Land Use Census

The following table lists an inventory of residence, gardens  $\geq 500 \text{ ft}^2$  and milk animals found nearest to the plant in each of the 10 meteorological sectors within a five mile radius of the Kewaunee Nuclear Power Plant.

Sector	Township No.	Residence	Garden	Milk Animals	Distance From Plant (miles)	Sample ID
A	24	X	X		1.95	
A	13			X	2.66	
B	24	X			1.20	
B	24			X	1.16	K-19
B	24		X		1.27	K-19
R	26	X	X	X	1.00	K-11
Q	23	X			1.31	
Q	23			X	1.39	
Q	23		X		1.33	K-27
P	26	X			1.33	
P	26		X		1.37	
P	22			X	1.97	
N	35	X			0.95	
N	26		X		1.04	
N	34			X	1.44	K-12
M	35	X	X		1.33	
M	34			X	1.49	
L	35	X			0.85	
L	35		X	X	1.28	
K	35	X	X		0.80	
K	10			X	1.80	
J	11	X	(Note 1)	(Note 1)	2.68	

Note 1.: There were no milk animals or gardens  $\geq 500 \text{ ft}^2$  located in Sector J within five miles of the Kewaunee Nuclear Power Plant.

Table 4.6.2 Land Use Census

The following is a sector by sector listing of those changes between the 1994 and 1995 census.

Sector A	The nearest milk animal changed from township 24 (2.00 miles) to township 13 (2.66 miles)
Sector B	No changes
Sector R	The nearest garden changed from township 23 (1.85 miles) to township 26 (1.00 miles)
Sector Q	No changes
Sector P	No changes
Sector N	No changes
Sector M	No changes
Sector L	No changes
Sector K	The nearest milk animal changed from township 10 (3.20 miles) to township 10 (1.80 miles)
Sector J	No changes



Table 4.6.3 Land Use Census; Five Year Comparison

Sector	Number of Occupied Homes			Number of Vacant Homes			Number of Gardens			Number of Farms with Milk Animals			Number of Fields		
	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995	1985	1990	1995
J	4	4	3	NA	0	1	2	0	0	0	0	0	0	0	0
K	54	55	56	NA	4	2	33	16	18	16	11	12	18	18	16
L	35	29	29	NA	0	1	23	12	12	10	8	7	16	15	14
M	88	101	103	NA	9	6	56	29	26	10	8	8	17	19	18
N	30	32	31	NA	2	4	20	8	8	9	8	7	12	11	10
P	39	48	46	NA	4	4	29	16	19	13	9	9	18	14	14
Q	41	48	47	NA	5	5	29	15	16	19	20	20	24	24	25
R	37	34	37	NA	6	4	25	12	12	19	10	10	17	13	13
A	35	37	37	NA	2	2	20	9	10	12	7	7	19	13	10
B	27	30	28	NA	1	1	21	8	8	6	6	6	7	6	6
<b>Total</b>	<b>390</b>	<b>418</b>	<b>417</b>	<b>0</b>	<b>33</b>	<b>30</b>	<b>258</b>	<b>125</b>	<b>129</b>	<b>114</b>	<b>87</b>	<b>86</b>	<b>148</b>	<b>133</b>	<b>126</b>

## 5.0 REFERENCES

- Arnold, J. R. and H. A. Al-Salih. 1955. Beryllium-7 Produced by Cosmic Rays. *Science* 121: 451-453.
- Eisenbud, M. 1963. *Environmental Radioactivity*, McGraw-Hill, New York, New York, pp. 213, 275, and 276.
- Gold, S., H. W. Barkhau, B. Shlein, and B. Kahn, 1964 *Measurement of Naturally Occurring Radionuclides in Air, in the Natural Radiation Environment*, University of Chicago Press, Chicago, Illinois, 369-382.
- Hazelton Environmental Sciences, 1979. Annual Report. Radiological Monitoring for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1978.
- Hazelton Environmental Sciences, 1980. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1979.
- Hazelton Environmental Sciences, 1981 Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1980.
- Hazelton Environmental Sciences, 1982. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1981.
- Hazelton Environmental Sciences, 1983. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1982.
- Industrial BIO-TEST Laboratories, Inc. 1974. Annual Report. Pre-operational Radiological Monitoring Program for the Kewaunee Nuclear Power Plant. Kewaunee, Wisconsin. January - December 1973.
- Industrial BIO-TEST Laboratories, Inc. 1975 Semi-annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin. Jan. - June, 1975.
- NALCO Environmental Sciences. 1977. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, January - December 1976.
- NALCO Environmental Sciences. 1978. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1977.
- National Center for Radiological Health. 1968. Section 1. Milk Surveillance. *Radiological Health Data Rep.*, December 9: 730-746.
- National Council on Radiation Protection and Measurements. 1975. *Natural Radiation Background in the United States*. NCRP Report No. 45.

## 5.0 REFERENCES (continued)

- Solon, L. R., W. M. Lowder, A. Shambroon, and H. Blatz. 1960. Investigations of Natural Environmental Radiation. *Science*. 131: 903-906.
- Teledyne Isotopes Midwest Laboratory. 1984. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1983.
- Teledyne Isotopes Midwest Laboratory. 1985. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1984.
- Teledyne Isotopes Midwest Laboratory. 1986. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1985.
- Teledyne Isotopes Midwest Laboratory. 1987. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1986.
- Teledyne Isotopes Midwest Laboratory. 1988. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1987.
- Teledyne Isotopes Midwest Laboratory. 1989. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1988.
- Teledyne Isotopes Midwest Laboratory. 1990. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1989.
- Teledyne Isotopes Midwest Laboratory. 1991. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1990.
- Teledyne Isotopes Midwest Laboratory. 1992. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1991.
- Teledyne Isotopes Midwest Laboratory. 1993. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1992.
- Teledyne Isotopes Midwest Laboratory. 1994. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1993.
- Teledyne Isotopes Midwest Laboratory. 1995. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report - Part II, Data Tabulations and Analysis, January - December 1994.

5.0 REFERENCES (continued)

Teledyne Isotopes Midwest Laboratory. 1996. Annual Report. Radiological Monitoring Program for the Kewaunee Nuclear Power Plant, Kewaunee, Wisconsin, Final Report-Part II, Data Tabulations and Analysis, January - December 1995.

Wilson, D.W., G. M. Ward, and J. E. Johnson, 1969. In Environmental Contamination by Radioactive Materials. International Atomic Energy Agency, p. 125

## APPENDIX A

### INTERLABORATORY COMPARISON PROGRAM RESULTS

NOTE: Teledyne's Midwest Laboratory participates in intercomparison studies administered by U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada. The results are reported in Appendix A. Also reported are results of International Intercomparison and Teledyne testing of TLD's, as well as, in-house spikes, blanks and duplicates. Appendix A is updated four times a year; the complete Appendix is included in March, June, September and December monthly progress reports only. Please refer to March, June, September and December progress reports for information.

January, 1995 through December, 1995

## Appendix A

### Interlaboratory Comparison Program Results

Teledyne's Midwest Laboratory (formerly Hazleton Environmental Sciences) has participated in interlaboratory comparison (crosscheck) programs since the formulation of its quality control program in December 1971. These programs are operated by agencies which supply environmental type samples (e.g., milk or water) containing concentrations of radionuclides known to the issuing agency but not to participant laboratories. The purpose of such a program is to provide an independent check on the laboratory's analytical procedures and to alert it to any possible problems.

Participant laboratories measure the concentration of specified radionuclides and report them to the issuing agency. Several months later, the agency reports the known values to the participant laboratories and specifies control limits. Results consistently higher or lower than the known values or outside the control limits indicate a need to check the instruments or procedures used.

The results in Table A-1 were obtained through participation in the environmental sample crosscheck program for milk, water and air filters during the past twelve months. Data for previous years is available upon request.

This program is conducted by the U.S. Environmental Protection Agency Intercomparison and Calibration Section, Quality Assurance Branch, Environmental Monitoring and Support Laboratory, Las Vegas, Nevada.

The results in Table A-2 were obtained for Thermoluminescent Dosimeters (TLDs), since 1976 via various International Intercomparisons of Environmental Dosimeters under the sponsorships listed in Table A-2. Also Teledyne testing results are listed.

Table A-3 lists results of the analyses on in-house "spiked" samples for the past twelve months. Data for previous years available upon request.

Table A-4 lists results of the analyses on in-house "blank" samples for the past twelve months. Data for previous years available upon request.

Table A-5 list results of the in-house "duplicate" program for the past twelve months. Acceptance is based on the difference of the results being less than the sum of the errors. Data for previous years available upon request.

Attachment A lists acceptance criteria for "spiked" samples.

Out-of-limit results are explained directly below the result.

Table A-1. U.S. Environmental Protection Agency's crosscheck program, comparison of EPA and Teledyne's Midwest Laboratory results for various sample media<sup>a</sup>.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L <sup>b</sup>		
				Teledyne Results $\pm 2$ Sigma <sup>c</sup>	EPA Result <sup>d</sup> 1s, N=1	Control Limits
STW-723	WATER	Jan, 1995	Sr-89	17.7 $\pm$ 1.5	20.0 $\pm$ 5.0	11.3 - 28.7
STW-723	WATER	Jan, 1995	Sr-90	13.7 $\pm$ 0.6	15.0 $\pm$ 5.0	6.3 - 23.7
STW-724	WATER	Jan, 1995	Gr. Alpha	4.3 $\pm$ 0.6	5.0 $\pm$ 5.0	0.0 - 13.7
STW-724	WATER	Jan, 1995	Gr. Beta	4.7 $\pm$ 0.6	5.0 $\pm$ 5.0	0.0 - 13.7
STW-725	WATER	Feb, 1995	I-131	99.0 $\pm$ 4.4	100.0 $\pm$ 10.0	82.7 - 117.3
STW-726	WATER	Feb, 1995	Ra-226	19.2 $\pm$ 0.4	19.1 $\pm$ 2.9	14.1 - 24.1
STW-726	WATER	Feb, 1995	Ra-228	19.2 $\pm$ 2.0	20.0 $\pm$ 5.0	11.3 - 28.7
STW-726	WATER	Feb, 1995	Uranium	24.9 $\pm$ 0.2	25.5 $\pm$ 3.0	20.3 - 30.7
STW-727	WATER	Mar, 1995	H-3	7,460.0 $\pm$ 87.2	7,435.0 $\pm$ 744.0	6,144.2 - 8,725.8
STW-728	WATER	Mar, 1995	Pu-239	11.0 $\pm$ 0.6	11.1 $\pm$ 1.1	9.2 - 13.0
STW-729	WATER	Apr, 1995	Gr. Alpha	41.7 $\pm$ 0.6	47.5 $\pm$ 11.9	26.9 - 68.1
STW-729	WATER	Apr, 1995	Ra-226	13.4 $\pm$ 0.5	14.9 $\pm$ 2.2	11.1 - 18.7
STW-729	WATER	Apr, 1995	Ra-228	13.1 $\pm$ 2.4	15.8 $\pm$ 4.0	8.9 - 22.7
STW-729	WATER	Apr, 1995	Uranium	9.5 $\pm$ 0.6	10.0 $\pm$ 3.0	4.8 - 15.2
STW-730	WATER	Apr, 1995	Co-60	29.0 $\pm$ 1.7	29.0 $\pm$ 5.0	20.3 - 37.7
STW-730	WATER	Apr, 1995	Cs-134	17.3 $\pm$ 1.2	20.0 $\pm$ 5.0	11.3 - 28.7
STW-730	WATER	Apr, 1995	Cs-137	11.0 $\pm$ 1.0	11.0 $\pm$ 5.0	2.3 - 19.7
STW-730	WATER	Apr, 1995	Gr. Beta	74.8 $\pm$ 3.2	86.6 $\pm$ 10.0	69.3 - 103.9
STW-730	WATER	Apr, 1995	Sr-89	17.0 $\pm$ 0.0	20.0 $\pm$ 5.0	11.3 - 28.7
STW-730	WATER	Apr, 1995	Sr-90	12.7 $\pm$ 1.2	15.0 $\pm$ 5.0	6.3 - 23.7
STW-732	WATER	Jun, 1995	Ra-226	14.7 $\pm$ 0.3	14.8 $\pm$ 2.2	11.0 - 18.6
STW-732	WATER	Jun, 1995	Ra-228	11.9 $\pm$ 0.6	15.0 $\pm$ 3.8	8.4 - 21.6
STW-732	WATER	Jun, 1995	Uranium	13.9 $\pm$ 0.3	15.2 $\pm$ 3.0	10.0 - 20.4
STW-735	WATER	Jul, 1995	Gr. Alpha	16.4 $\pm$ 2.4	27.5 $\pm$ 6.9	15.5 - 39.5
STW-735	WATER	Jul, 1995	Gr. Beta	16.8 $\pm$ 1.0	19.4 $\pm$ 5.0	10.7 - 28.1
STW-736	WATER	Aug, 1995	H-3	4,773.7 $\pm$ 49.9	4,872.0 $\pm$ 487.0	4,027.1 - 5,716.9

<sup>a</sup> Results obtained by Teledyne Brown Engineering Environmental Services Midwest Laboratory as a participant in the environmental sample crosscheck program operated by the Intercomparison and Calibration Section, Quality Assurance Branch, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency (EPA), Las Vegas, Nevada.

<sup>b</sup> All results are in pCi/L, except for elemental potassium (K) data in milk, which are in mg/L; air filter samples, which are in pCi/Filter.

<sup>c</sup> Unless otherwise indicated, the TBEESML results are given as the mean  $\pm$  2 standard deviations for three determinations.

<sup>d</sup> USEPA results are presented as the known values and expected laboratory precision (1s, 1 determination) and control limits as defined by the EPA.

Table A-2. Crosscheck program results; Thermoluminescent Dosimeters. (TLDs).

Lab Code	TLD Type	Date	Measurement	mR		
				Teledyne Results ± 2 Sigma	Known Value ± 2 Sigma	Average ± 2 Sigma (All Participants)
<u>2nd International Intercomparison</u>						
115-2	CaF <sub>2</sub> : Mn Bulb	Apr, 1976	Field	17.0 ± 1.9	17.1	16.4 ± 7.7
115-2	CaF <sub>2</sub> : Mn Bulb	Apr, 1976	Lab	20.8 ± 4.1	21.3	18.8 ± 7.6
Second International Intercomparison of Environmental Dosimeters conducted in April of 1976 by the Health and Safety Laboratory (HASL), New York, New York, and the School of Public Health of the University of Texas, Houston, Texas.						
<u>3rd International Intercomparison</u>						
115-3	CaF <sub>2</sub> : Mn Bulb	Jun, 1977	Field	30.7 ± 3.2	34.9 ± 4.8	31.5 ± 3.0
115-3	CaF <sub>2</sub> : Mn Bulb	Jun, 1977	Lab	89.6 ± 6.4	91.7 ± 14.6	86.2 ± 24.0
Third International Intercomparison of Environmental Dosimeters conducted in the summer of 1977 by Oak Ridge National Laboratory and the School of Public Health of the University of Texas, Houston, Texas.						
<u>4th International Intercomparison</u>						
115-4	CaF <sub>2</sub> : Mn Bulb	Jun, 1979	Field	14.1 ± 1.1	14.1 ± 1.4	16.0 ± 9.0
115-4	CaF <sub>2</sub> : Mn Bulb	Jun, 1979	Lab, High	40.4 ± 1.4	45.8 ± 9.2	43.9 ± 13.2
115-4	CaF <sub>2</sub> : Mn Bulb	Jun, 1979	Lab, Low	9.8 ± 1.3	12.2 ± 2.4	12.0 ± 7.4
Fourth International Intercomparison of Environmental Dosimeters conducted in the summer of 1979 by the School of Public Health of the University of Texas, Houston, Texas.						
<u>5th International Intercomparison</u>						
115-5A	CaF <sub>2</sub> : Mn Bulb	Oct, 1980	Field	31.4 ± 1.8	30.0 ± 6.0	30.2 ± 14.6
115-5A	CaF <sub>2</sub> : Mn Bulb	Oct, 1980	Lab, End	96.6 ± 5.8	88.4 ± 8.8	90.7 ± 31.2
115-5A	CaF <sub>2</sub> : Mn Bulb	Oct, 1980	Lab, Start	77.4 ± 5.8	75.2 ± 7.6	75.8 ± 40.4
Fifth International Intercomparison of Environmental Dosimeters conducted in the fall of 1980 at Idaho Falls, Idaho and sponsored by the School of Public Health of the University of Texas, Houston, Texas and the Environmental Measurements Laboratory, New York, New York, U.S. Department of Energy.						
<u>5th International Intercomparison</u>						
115-5B	LiF-100 Chips	Oct, 1980	Field	30.3 ± 4.8	30.0 ± 6.0	30.2 ± 14.6
115-5B	LiF-100 Chips	Oct, 1980	Lab, End	85.4 ± 11.7	88.4 ± 8.8	90.7 ± 31.2
115-5B	LiF-100 Chips	Oct, 1980	Lab, Start	81.1 ± 7.4	75.2 ± 7.6	75.8 ± 40.4
Fifth International Intercomparison of Environmental Dosimeters conducted in the fall of 1980 at Idaho Falls, Idaho and sponsored by the School of Public Health of the University of Texas, Houston, Texas and the Environmental Measurements Laboratory, New York, New York, U.S. Department of Energy.						
<u>6th International Intercomparison</u>						
115-6						
Teledyne did not participate in the Sixth International Intercomparison of Environmental Dosimeters.						
<u>7th International Intercomparison</u>						
115-7A	LiF-100 Chips	Jun, 1984	Field	75.4 ± 2.6	75.8 ± 6.0	75.1 ± 29.8



Table A-2. Crosscheck program results; Thermoluminescent Dosimeters. (TLDs).

Lab Code	TLD Type	Date	Measurement	mR		
				Teledyne Results ± 2 Sigma	Known Value ± 2 Sigma	Average ± 2 Sigma (All Participants)
115-7A	LiF-100 Chips	Jun, 1984	Lab, Co-60	80.0 ± 3.5	79.9 ± 4.0	77.9 ± 27.6
115-7A	LiF-100 Chips	Jun, 1984	Lab, Cs-137	66.6 ± 2.5	75.0 ± 3.8	73.0 ± 22.2

Seventh International Intercomparison of Environmental Dosimeters conducted in the spring and summer of 1984 at Las Vegas, Nevada, and sponsored by the U.S. Department of Energy, The Nuclear Regulatory Commission, and the U.S. Environmental Protection Agency.

7th International Intercomparison

115-7B	LiF-100 Chips	Jun, 1984	Field	71.5 ± 2.6	75.8 ± 6.0	75.1 ± 29.8
115-7B	LiF-100 Chips	Jun, 1984	Lab, Co-60	84.8 ± 6.4	79.9 ± 4.0	77.9 ± 27.6
115-7B	LiF-100 Chips	Jun, 1984	Lab, Cs-137	78.8 ± 1.6	75.0 ± 3.8	73.0 ± 22.2

Seventh International Intercomparison of Environmental Dosimeters conducted in the spring and summer of 1984 at Las Vegas, Nevada, and sponsored by the U.S. Department of Energy, The Nuclear Regulatory Commission, and the U.S. Environmental Protection Agency.

7th International Intercomparison

115-7C	CaSO <sub>4</sub> : Dy Cards	Jun, 1984	Field	76.8 ± 2.7	75.8 ± 6.0	75.1 ± 29.8
115-7C	CaSO <sub>4</sub> : Dy Cards	Jun, 1984	Lab, Co-60	82.5 ± 3.7	79.9 ± 4.0	77.9 ± 27.6
115-7C	CaSO <sub>4</sub> : Dy Cards	Jun, 1984	Lab, Cs-137	79.0 ± 3.2	75.0 ± 3.8	73.0 ± 22.2

Seventh International Intercomparison of Environmental Dosimeters conducted in the spring and summer of 1984 at Las Vegas, Nevada, and sponsored by the U.S. Department of Energy, The Nuclear Regulatory Commission, and the U.S. Environmental Protection Agency.

8th International Intercomparison

115-8A	LiF-100 Chips	Jan, 1986	Field, Site 1	29.5 ± 1.4	29.7 ± 1.5	28.9 ± 12.4
115-8A	LiF-100 Chips	Jan, 1986	Field, Site 2	11.3 ± 0.8	10.4 ± 0.5	10.1 ± 9.1
115-8A	LiF-100 Chips	Jan, 1986	Lab, Cs-137	13.7 ± 0.9	17.2 ± 0.9	16.2 ± 6.8

Eighth International Intercomparison of Environmental Dosimeters conducted in the fall and winter of 1985-1986 at New York, New York, and sponsored by the U.S. Department of Energy.

8th International Intercomparison

115-8B	LiF-100 Chips	Jan, 1986	Field, Site 1	32.3 ± 1.2	29.7 ± 1.5	28.9 ± 12.4
115-8B	LiF-100 Chips	Jan, 1986	Field, Site 2	9.0 ± 1.0	10.4 ± 0.5	10.1 ± 9.0
115-8B	LiF-100 Chips	Jan, 1986	Lab, Cs-137	15.8 ± 0.9	17.2 ± 0.9	16.2 ± 6.8

Eighth International Intercomparison of Environmental Dosimeters conducted in the fall and winter of 1985-1986 at New York, New York, and sponsored by the U.S. Department of Energy.

8th International Intercomparison

115-8C	CaSO <sub>4</sub> : Dy Cards	Jan, 1986	Field, Site 1	32.2 ± 0.7	29.7 ± 1.5	28.9 ± 12.4
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Table A-2. Crosscheck program results; Thermoluminescent Dosimeters. (TLDs).

Lab Code	TLD Type	Date	Measurement	mR		
				Teledyne Results ± 2 Sigma	Known Value ± 2 Sigma	Average ± 2 Sigma (All Participants)
115-8C	CaSO <sub>4</sub> : Dy Cards	Jan, 1986	Field, Site 2	10.6±0.6	10.4 ± 0.5	10.1 ± 9.0
115-8C	CaSO <sub>4</sub> : Dy Cards	Jan, 1986	Lab, Cs-137	18.1±0.8	17.2 ± 0.9	16.2 ± 6.8

Eighth International Intercomparison of Environmental Dosimeters conducted in the fall and winter of 1985-1986 at New York, New York, and sponsored by the U.S. Department of Energy.

9th International Intercomparison

115-9

The Ninth International Intercomparison of Environmental Dosimeters was not available to Teledyne's Midwest Laboratory.

10th International Intercomparison

115-10A	LiF-100 Chips	Aug, 1993	Field	25.7±1.4	27.0 ± 1.6	26.4 ± 10.2
115-10A	LiF-100 Chips	Aug, 1993	Lab, 1	22.7±1.6	25.9 ± 1.3	25.0 ± 9.4
115-10A	LiF-100 Chips	Aug, 1993	Lab, 2	62.7±2.6	72.7 ± 1.9	69.8 ± 20.3

The Tenth International Intercomparison of Environmental Dosimeters conducted in 1993 at Idaho State University and sponsored by the U.S. Department of Energy and the Idaho State University.

10th International Intercomparison

115-10B	CaSO <sub>4</sub> : Dy Cards	Aug, 1993	Field	26.0±2.3	27.0 ± 1.6	26.4 ± 10.2
115-10B	CaSO <sub>4</sub> : Dy Cards	Aug, 1993	Lab, 1	24.1±1.7	25.9 ± 1.3	25.0 ± 9.4
115-10B	CaSO <sub>4</sub> : Dy Cards	Aug, 1993	Lab, 2	69.2±3.0	72.7 ± 1.9	69.8 ± 20.3

The Tenth International Intercomparison of Environmental Dosimeters conducted in 1993 at Idaho State University and sponsored by the U.S. Department of Energy and the Idaho State University.

Teledyne Testing

89-1	LiF-100 Chips	Sep, 1989	Lab	21.0±0.4	22.4	ND
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ND = No Data; Teledyne Testing was only performed by Teledyne.

Chips were irradiated by Teledyne Isotopes, Inc., Westwood, New Jersey, in September, 1989.

Teledyne Testing

89-2	Teledyne CaSO <sub>4</sub> : Dy Cards	Nov, 1989	Lab	20.9±1.0	20.3	ND
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ND = No Data; Teledyne Testing was only performed by Teledyne.

Cards were irradiated by Teledyne Isotopes, Inc., Westwood, New Jersey, in June, 1990.

Table A-2. Crosscheck program results; Thermoluminescent Dosimeters. (TLDs).

Lab Code	TLD Type	Date	Measurement	mR		
				Teledyne Results ± 2 Sigma	Known Value ± 2 Sigma	Average ± 2 Sigma (All Participants)
<u>Teledyne Testing</u>						
90-1	Teledyne CaSo <sub>4</sub> : Dy Cards	Jun, 1990	Lab	20.6 ± 1.4	19.6	ND
ND = No Data; Teledyne Testing was only performed by Teledyne. Cards were irradiated by Teledyne Isotopes, Inc., Westwood, New Jersey, in June, 1990.						
<u>Teledyne Testing</u>						
90-2	Teledyne CaSo <sub>4</sub> : Dy Cards	Jun, 1990	Lab	100.8 ± 4.3	100.0	ND
ND = No Data; Teledyne Testing was only performed by Teledyne. Cards were irradiated by Dosimetry Associates, Inc., Northville, MI, in October, 1990.						
<u>Teledyne Testing</u>						
91-1	Teledyne CaSo <sub>4</sub> : Dy Cards	Oct, 1990	Lab, 1	33.4 ± 2.0	32.0	ND
91-1	Teledyne CaSo <sub>4</sub> : Dy Cards	Oct, 1990	Lab, 2	55.2 ± 4.7	58.8	ND
91-1	Teledyne CaSo <sub>4</sub> : Dy Cards	Oct, 1990	Lab, 3	87.8 ± 6.2	85.5	ND
ND = No Data; Teledyne Testing was only performed by Teledyne. Cards were irradiated by Teledyne Isotopes, Inc., Westwood, New Jersey, in October, 1991.						
<u>Teledyne Testing</u>						
92-1	LiF-100 Chips	Feb, 1992	Lab, 1	11.1 ± 0.2	10.7	ND
92-1	LiF-100 Chips	Feb, 1992	Lab, 2	25.6 ± 0.5	25.4	ND
92-1	LiF-100 Chips	Feb, 1992	Lab, 3	46.4 ± 0.5	46.3	ND
ND = No Data; Teledyne Testing was only performed by Teledyne. Chips were irradiated by Teledyne Isotopes, Inc., Westwood, New Jersey, in February, 1992.						
<u>Teledyne Testing</u>						
92-2	Teledyne CaSo <sub>4</sub> : Dy Cards	Apr, 1992	Reader 1, #1	20.1 ± 0.1	20.1	ND
92-2	Teledyne CaSo <sub>4</sub> : Dy Cards	Apr, 1992	Reader 1, #2	40.6 ± 0.1	40.0	ND

Table A-2. Crosscheck program results; Thermoluminescent Dosimeters. (TLDs).

Lab Code	TLD Type	Date	Measurement	mR		
				Teledyne Results $\pm 2$ Sigma	Known Value $\pm 2$ Sigma	Average $\pm 2$ Sigma (All Participants)
92-2	Teledyne CaSO <sub>4</sub> : Dy Cards	Apr, 1992	Reader 1, #3	60.0 $\pm$ 1.3	60.3	ND
92-2	Teledyne CaSO <sub>4</sub> : Dy Cards	Apr, 1992	Reader 2, #1	20.3 $\pm$ 0.3	20.1	ND
92-2	Teledyne CaSO <sub>4</sub> : Dy Cards	Apr, 1992	Reader 2, #2	39.2 $\pm$ 0.3	40.0	ND
92-2	Teledyne CaSO <sub>4</sub> : Dy Cards	Apr, 1992	Reader 2, #3	60.7 $\pm$ 0.4	60.3	ND

ND = No Data; Teledyne Testing was only performed by Teledyne.

Cards were irradiated by Teledyne Isotopes, Inc., Westwood, New Jersey, in April, 1992.

Teledyne Testing

93-1	Teledyne LiF-100 Chips	Mar, 1993	Lab, 1	10.0 $\pm$ 1.0	10.2	ND
93-1	Teledyne LiF-100 Chips	Mar, 1993	Lab, 2	25.2 $\pm$ 2.2	25.5	ND
93-1	Teledyne LiF-100 Chips	Mar, 1993	Lab, 3	42.7 $\pm$ 5.7	45.9	ND

ND = No Data; Teledyne Testing was only performed by Teledyne.

Chips were irradiated by Teledyne Isotopes, Inc., Westwood, New Jersey, in March, 1993. Due to a potential error of 10-12% when cards were irradiated, results of the testing on the cards will not be published. Data is available upon request.

Teledyne Testing

94-1	Teledyne LiF-100 Chips	Nov, 1994	Lab, 1	15.6 $\pm$ 0.4	14.9	ND
94-1	Teledyne LiF-100 Chips	Nov, 1994	Lab, 2	30.2 $\pm$ 0.4	29.8	ND
94-1	Teledyne LiF-100 Chips	Nov, 1994	Lab, 3	59.2 $\pm$ 0.3	59.7	ND
94-1	Teledyne CaSO <sub>4</sub> : Dy Cards	Nov, 1994	Reader 1, #1	14.9 $\pm$ 0.1	14.9	ND
94-1	Teledyne CaSO <sub>4</sub> : Dy Cards	Nov, 1994	Reader 1, #2	30.8 $\pm$ 0.1	29.8	ND

Table A-2. Crosscheck program results; Thermoluminescent Dosimeters. (TLDs).

Lab Code	TLD Type	Date	Measurement	mR		
				Teledyne Results ± 2 Sigma	Known Value ± 2 Sigma	Average ± 2 Sigma (All Participants)
94-1	Teledyne CaSo <sub>4</sub> : Dy Cards	Nov, 1994	Reader 1, #3	58.9 ± 0.3	59.7	ND
94-1	Teledyne CaSo <sub>4</sub> : Dy Cards	Nov, 1994	Reader 2, #1	15.4 ± 0.2	14.9	ND
94-1	Teledyne CaSo <sub>4</sub> : Dy Cards	Nov, 1994	Reader 2, #2	31.4 ± 0.2	29.8	ND
94-1	Teledyne CaSo <sub>4</sub> : Dy Cards	Nov, 1994	Reader 2, #3	60.1 ± 0.3	59.7	ND

ND = No Data; Teledyne Testing was only performed by Teledyne.

Cards were irradiated by Teledyne Isotopes, Inc., Westwood, New Jersey, in November, 1994.

Table A-3. In-house "spike" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L <sup>a</sup>		
				Teledyne Results 2s, n=1 <sup>b</sup>	Known Activity	Control <sup>c</sup> Limits
SPMI-205	MILK	Jan, 1995	Cs-137	51.2 ± 7.5	49.4	39.4 - 59.4
SPMI-205	MILK	Jan, 1995	Sr-89	19.4 ± 3.4	23.1	13.1 - 33.1
SPMI-205	MILK	Jan, 1995	Sr-90	26.2 ± 1.3	28.1	18.1 - 38.1
SPAP-284	AIR FILTER	Jan, 1995	Cs-137	2.2 ± 0.0	1.9	1.2 - 2.7
SPAP-284	AIR FILTER	Jan, 1995	I-131(g)	2.2 ± 0.0	1.9	1.2 - 2.7
SPW-286	WATER	Jan, 1995	H-3	40929.9 ± 5594.5	40871.0	32696.8 - 49045.2
SPW-289	WATER	Jan, 1995	Co-60	250.5 ± 14.1	247.5	222.8 - 272.3
SPW-289	WATER	Jan, 1995	Cs-134	290.5 ± 14.4	321.3	289.2 - 353.4
SPW-289	WATER	Jan, 1995	Cs-137	387.7 ± 21.2	394.3	354.9 - 433.7
SPAP-408	AIR FILTER	Jan, 1995	Gr. Beta	7.5 ± 0.0	8.1	0.0 - 18.1
SPMI-707	MILK	Jan, 1995	I-131	80.3 ± 1.4	86.0	68.8 - 103.2
SPMI-707	MILK	Jan, 1995	I-131(g)	84.8 ± 10.4	86.0	51.6 - 96.0
SPCH-717	CHARCOAL CANISTER	Jan, 1995	I-131(g)	2.9 ± 0.1	2.5	1.5 - 3.4
SPVE-729	VEGETATION	Feb, 1995	I-131(g)	1.9 ± 0.1	1.9	1.1 - 2.6
SPW-1204	WATER	Feb, 1995	Ra-226	6.9 ± 0.1	6.9	4.8 - 9.0
SPW-1790	WATER	Mar, 1995	Sr-89	0.9 ± 3.9	42.7	32.7 - 52.7
<p>The raw data was reviewed and found to be free of errors. The sample was repeated with similar results. An Investigation was conducted to determine the cause of this deviation. No apparent cause was found for this discrepancy. It was determined the "spike" was prepared improperly. Another "spike" was prepared and analyzed (See SPW-6388). No further action is planned.</p>						
SPW-1790	WATER	Mar, 1995	Sr-90	31.4 ± 1.8	39.1	31.3 - 46.9
<p>The raw data was reviewed and found to be free of errors. The sample was repeated with similar results. An Investigation was conducted to determine the cause of this deviation. No apparent cause was found for this discrepancy. It was determined the "spike" was prepared improperly. Another "spike" was prepared and analyzed (See SPW-6388). No further action is planned.</p>						
SPW-3051	WATER	Mar, 1995	Gr. Alpha	88.5 ± 3.7	82.9	41.5 - 124.4
SPW-3051	WATER	Mar, 1995	Gr. Beta	83.0 ± 2.3	87.2	77.2 - 97.2
SPAP-2513	AIR FILTER	Apr, 1995	Gr. Beta	7.5 ± 0.0	8.1	0.0 - 18.1
SPAP-2542	AIR FILTER	Apr, 1995	Cs-137	2.3 ± 2.1	1.9	1.2 - 2.7
SPW-2544	WATER	Apr, 1995	H-3	9656.2 ± 291.8	9333.0	7466.4 - 11199.6
SPW-2652	WATER	Apr, 1995	Co-60	23.8 ± 2.4	24.8	14.8 - 34.8
SPW-2652	WATER	Apr, 1995	Cs-134	29.3 ± 2.3	30.8	20.8 - 40.8
SPW-2652	WATER	Apr, 1995	Cs-137	42.3 ± 3.9	40.9	30.9 - 50.9
SPMI-2988	MILK	Apr, 1995	Cs-134	37.0 ± 1.8	40.7	30.7 - 50.7
SPMI-2988	MILK	Apr, 1995	Cs-137	62.4 ± 3.1	54.5	44.5 - 64.5
SPMI-2988	MILK	Apr, 1995	Sr-89	32.6 ± 3.3	36.5	26.5 - 46.5

Table A-3. In-house "spike" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L <sup>a</sup>		
				Teledyne Results 2s, n=1 <sup>b</sup>	Known Activity	Control <sup>c</sup> Limits
SPMI-2988	MILK	Apr, 1995	Sr-90	25.6 ± 1.6	24.9	14.9 - 34.9
SPW-3051	WATER	Apr, 1995	Gr. Alpha	88.0 ± 3.8	82.9	41.5 - 124.4
SPW-3051	WATER	Apr, 1995	Gr. Beta	79.6 ± 2.3	87.2	77.2 - 97.2
SPW-3589	WATER	May, 1995	Fe-55	2033.7 ± 500.2	2274.0	1819.2 - 2728.8
SPF-3708	FISH	May, 1995	Cs-134	0.1 ± 0.0	0.1	0.1 - 0.2
SPF-3708	FISH	May, 1995	Cs-137	0.2 ± 0.0	0.2	0.1 - 0.2
SPW-6008	WATER	May, 1995	Gr. Alpha	17.3 ± 1.4	20.7	10.4 - 31.1
SPW-6008	WATER	May, 1995	Gr. Beta	21.2 ± 1.0	21.8	11.8 - 31.8
SPSO-5130	SOIL	May, 1995	Cs-134	0.3 ± 0.0	0.3	0.2 - 0.4
SPSO-5130	SOIL	May, 1995	Cs-137	0.5 ± 0.0	0.5	0.3 - 0.7
SPW-6388	WATER	May, 1995	Sr-89	18.7 ± 2.4	21.2	11.2 - 31.2
SPW-6388	WATER	May, 1995	Sr-90	21.2 ± 1.1	23.2	13.2 - 33.2
SPW-6398	WATER	May, 1995	Sr-89	18.7 ± 2.4	21.2	11.2 - 31.2
SPW-6398	WATER	May, 1995	Sr-90	21.2 ± 1.1	23.2	13.2 - 33.2
SPW-5608	WATER	Jun, 1995	I-131	78.8 ± 2.3	85.5	68.4 - 102.6
SPCH-5964	CHARCOAL CANISTER	Jun, 1995	I-131(g)	2.2 ± 0.1	2.3	1.4 - 3.3
SPW-6005	WATER	Jun, 1995	I-131	48.2 ± 1.9	46.8	34.8 - 58.8
SPVE-6006	VEGETATION	Jun, 1995	I-131(g)	0.6 ± 0.0	0.5	0.3 - 0.8
SPMI-6838	MILK	Jun, 1995	I-131	38.5 ± 0.5	39.6	27.6 - 51.6
SPW-6839	WATER	Jun, 1995	I-131	34.9 ± 0.5	39.5	27.5 - 51.5
SPVE-7190	VEGETATION	Jul, 1995	I-131(g)	1.1 ± 0.0	1.0	0.6 - 1.4
SPMI-7525	MILK	Jul, 1995	Cs-134	31.5 ± 2.5	34.4	24.4 - 44.4
SPMI-7525	MILK	Jul, 1995	Cs-137	50.2 ± 4.0	43.4	33.4 - 53.4
SPMI-7525	MILK	Jul, 1995	I-131(g)	44.7 ± 5.4	45.6	27.4 - 55.6
SPMI-7525	MILK	Jul, 1995	Sr-90	28.0 ± 1.4	27.9	17.9 - 37.9
SPAP-7554	AIR FILTER	Jul, 1995	Gr. Beta	7.3 ± 0.0	8.1	0.0 - 18.1
SPAP-7557	AIR FILTER	Jul, 1995	Cs-137	2.3 ± 0.0	1.9	1.2 - 2.7
SPW-7569	WATER	Jul, 1995	H-3	25806.9 ± 447.7	26669.0	21335.2 - 32002.8
SPW-8179	WATER	Jul, 1995	Fe-55	2.3 ± 0.4	2.1	0.0 - 22.1
SPW-9981	WATER	Sep, 1995	Sr-89	34.6 ± 4.9	39.0	29.0 - 49.0
SPW-9981	WATER	Sep, 1995	Sr-90	20.3 ± 1.3	20.0	10.0 - 30.0
SPMI-10919	MILK	Oct, 1995	Cs-134	27.9 ± 3.9	27.8	17.8 - 37.8
SPMI-10919	MILK	Oct, 1995	Cs-137	52.3 ± 6.9	43.1	33.1 - 53.1
SPMI-10919	MILK	Oct, 1995	I-131	70.9 ± 0.8	73.4	58.7 - 88.0

Table A-3. In-house "spike" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L <sup>a</sup>		
				Teledyne Results 2s, n=1 <sup>b</sup>	Known Activity	Control <sup>c</sup> Limits
SPMI-10919	MILK	Oct, 1995	I-131(g)	77.1 ± 7.9	73.4	44.0 - 83.4
SPF-10921	FISH	Oct, 1995	Co-60	0.7 ± 0.0	0.8	0.5 - 1.1
SPF-10921	FISH	Oct, 1995	Cs-134	0.5 ± 0.0	0.6	0.3 - 0.8
SPF-10921	FISH	Oct, 1995	Cs-137	0.9 ± 0.1	0.9	0.5 - 1.2
SPCH-11238	CHARCOAL CANISTER	Oct, 1995	I-131(g)	0.8 ± 0.0	0.8	0.5 - 1.1
SPAP-10967	AIR FILTER	Nov, 1995	Gr. Beta	7.3 ± 0.0	8.0	0.0 - 18.0
SPW-12079	WATER	Nov, 1995	H-3	27963.4 ± 445.5	29315.0	23452.0 - 35178.0
SPW-12081	WATER	Nov, 1995	Co-60	22.0 ± 1.9	23.0	13.0 - 33.0
SPW-12081	WATER	Nov, 1995	Cs-134	38.1 ± 2.0	41.7	31.7 - 51.7
SPW-12081	WATER	Nov, 1995	Cs-137	27.2 ± 3.0	24.3	14.3 - 34.3
SPW-12084	WATER	Nov, 1995	Gr. Alpha	75.3 ± 3.2	82.8	41.4 - 124.2
SPW-12084	WATER	Nov, 1995	Gr. Beta	86.9 ± 2.5	86.3	76.3 - 96.3
SPW-12809	WATER	Dec, 1995	Gr. Alpha	19.6 ± 3.0	20.7	10.4 - 31.1
SPW-12809	WATER	Dec, 1995	Gr. Beta	21.0 ± 1.8	21.6	11.6 - 31.6

<sup>a</sup> All results are in pCi/L, except for elemental potassium (K) in milk, which are in mg/L.; air filter samples, which are in pCi/Filter; and food products, which are in mg/kg.

<sup>b</sup> All samples are the results of single determinations.

<sup>c</sup> Control limits are based on Attachment A, page A2 of this report.

NOTE: For fish, Jello is used for the spike matrix. For vegetation, Sawdust is used for the spike matrix.



Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Sample Date	Analysis	Concentration pCi/L <sup>a</sup>		
				Teledyne Results (4.66 Sigma)		Acceptance Criteria (4.66 Sigma)
				LLD	Activity <sup>b</sup>	
SPM-204	MILK	Jan 1995	Co-60	<5.3	0.41 ± 3.48	<10.0
SPM-204	MILK	Jan 1995	Cs-134	<4.4	-0.07 ± 2.05	<10.0
SPM-204	MILK	Jan 1995	Cs-137	<4.3	1.32 ± 2.53	<10.0
SPM-204	MILK	Jan 1995	I-131	<0.5	-0.03 ± 0.22	<0.5
SPM-204	MILK	Jan 1995	Sr-89	<0.8	0.14 ± 1.08	<5.0
SPM-204	MILK	Jan 1995	Sr-90	N/A	1.46 ± 0.48	<1.0
Low level of Sr-90 concentration in milk (1-5 pCi/L) is not unusual.						
SPAP-283	AIR FILTER	Jan 1995	Co-60	<2.7	-0.36 ± 1.40	<10.0
SPAP-283	AIR FILTER	Jan 1995	Cs-134	<1.5	-0.67 ± 1.33	<10.0
SPAP-283	AIR FILTER	Jan 1995	Cs-137	<2.4	0.46 ± 1.33	<10.0
SPW-285	WATER	Jan 1995	H-3	<165.0	-48.53 ± 84.76	<200.0
SPCH-287	CHARCOAL CANISTER	Jan 1995	I-131(g)	<2.3	-1.98 ± 3.12	<9.6
SPW-288	WATER	Jan 1995	Co-60	<2.3	-0.11 ± 2.02	<10.0
SPW-288	WATER	Jan 1995	Cs-134	<3.5	-0.19 ± 2.61	<10.0
SPW-288	WATER	Jan 1995	Cs-137	<4.7	0.98 ± 2.54	<10.0
SPAP-409	AIR FILTER	Jan 1995	Gr. Beta	<0.5	0.02 ± 0.28	<3.2
SPVE-728	VEGETATION	Jan 1995	I-131(g)	<12.0	2.33 ± 7.54	<20.0
SPW-957	WATER	Feb 1995	Co-60	<3.7	-1.25 ± 3.02	<10.0
SPW-957	WATER	Feb 1995	Cs-134	<5.2	0.76 ± 2.77	<10.0
SPW-957	WATER	Feb 1995	Cs-137	<3.6	-1.38 ± 2.65	<10.0
SPW-1106	WATER	Feb 1995	Ni-63	<12.0	0.25 ± 6.31	<20.0
SPW-3052	WATER	Mar 1995	Gr. Alpha	<0.6	0.49 ± 0.43	<1.0
SPW-3052	WATER	Mar 1995	Gr. Beta	<1.4	3.05 ± 0.98	<3.2
SPAP-2514	AIR FILTER	Apr 1995	Gr. Beta	<0.3	0.03 ± 0.25	<3.2
SPAP-2543	AIR FILTER	Apr 1995	Co-60	<4.4	0.39 ± 2.20	<10.0
SPAP-2543	AIR FILTER	Apr 1995	Cs-134	<1.9	0.05 ± 2.11	<10.0
SPAP-2543	AIR FILTER	Apr 1995	Cs-137	<1.1	-1.24 ± 1.83	<10.0
SPW-2545	WATER	Apr 1995	H-3	<169	97.76 ± 88.37	<200.0
SPW-2651	WATER	Apr 1995	Co-60	<3.17	-1.08 ± 2.45	<10.0
SPW-2651	WATER	Apr 1995	Cs-134	<3.32	0.29 ± 2.57	<10.0
SPW-2651	WATER	Apr 1995	Cs-137	<3.56	-0.92 ± 2.64	<10.0
SPMI-2987	MILK	Apr 1995	Cs-134	<3.4	0.37 ± 1.89	<10.0
SPMI-2987	MILK	Apr 1995	Cs-137	<3.3	1.29 ± 1.75	<10.0
SPMI-2987	MILK	Apr 1995	Sr-89	<0.4	0.06 ± 0.62	<5.0

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Sample Date	Analysis	Concentration pCi/L <sup>a</sup>		
				Teledyne Results (4.66 Sigma)		Acceptance Criteria (4.66 Sigma)
				LLD	Activity <sup>b</sup>	
SPMI-2987	MILK	Apr 1995	Sr-90	N/A	1.47 ± 0.38	< 1.0
Low level of Sr-90 concentration in milk (1-5 pCi/L) is not unusual.						
SPW-3052	WATER	Apr 1995	Gr. Alpha	<0.7	0.23 ± 0.47	< 1.0
SPW-3052	WATER	Apr 1995	Gr. Beta	<1.7	-0.02 ± 1.09	< 3.2
SPW-3590	WATER	May 1995	Fe-55	<602.0	0.00 ± 365.40	< 1000.0
SPF-3709	FISH	May 1995	Co-60	<8.4	2.21 ± 5.97	< 10.0
SPF-3709	FISH	May 1995	Cs-134	<1.3	6.79 ± 8.55	< 10.0
SPF-3709	FISH	May 1995	Cs-137	<1.3	3.61 ± 7.81	< 10.0
SPSO-5131	SOIL	May 1995	Cs-134	<0.034	0.01 ± 0.01	< 10.0
SPSO-5131	SOIL	May 1995	Cs-137	<0.012	0.00 ± 0.01	< 10.0
SPCH-5975	CHARCOAL CANISTER	Jun 1995	I-131(g)	<3.0	-0.71 ± 2.68	< 9.6
SPVE-6007	VEGETATION	Jun 1995	I-131(g)	<0.009	0.00 ± 0.01	< 20.0
SPW-6011	WATER	Jun 1995	I-131	<0.4	-0.03 ± 0.19	< 0.5
SPVE-7191	VEGETATION	Jul 1995	I-131(g)	<0.005	-0.00 ± 0.00	< 20.0
SPMI-7526	MILK	Jul 1995	Co-60	<5.8	1.19 ± 3.34	< 10.0
SPMI-7526	MILK	Jul 1995	Cs-134	<5.1	0.48 ± 2.76	< 10.0
SPMI-7526	MILK	Jul 1995	Cs-137	<3.7	0.98 ± 2.39	< 10.0
SPMI-7526	MILK	Jul 1995	I-131	<0.5	0.00 ± 0.23	< 0.5
SPMI-7526	MILK	Jul 1995	Sr-89	<0.6	-0.19 ± 0.82	< 5.0
SPMI-7526	MILK	Jul 1995	Sr-90	N/A	1.35 ± 0.36	< 1.0
Low level of Sr-90 concentration in milk (1-5 pCi/L) is not unusual.						
SPAP-7556	AIR FILTER	Jul 1995	Gr. Beta	<1.0	0.06 ± 0.55	< 3.2
SPAP-7558	AIR FILTER	Jul 1995	Co-60	<4.2	0.39 ± 3.06	< 10.0
SPAP-7558	AIR FILTER	Jul 1995	Co-60	<4.2	0.04 ± 3.07	< 10.0
SPAP-7558	AIR FILTER	Jul 1995	Cs-134	<3.0	-1.23 ± 2.45	< 10.0
SPAP-7558	AIR FILTER	Jul 1995	Cs-137	<3.5	1.18 ± 2.04	< 10.0
SPW-7570	WATER	Jul 1995	H-3	<164	51.58 ± 83.71	< 200.0
SPW-8180	WATER	Jul 1995	Fe-55	<0.4	0.00 ± 0.27	< 1000.0
SPW-8931	WATER	Aug 1995	Ra-228	<1.0	0.58 ± 0.61	< 1.0
SPW-9982	WATER	Sep 1995	Sr-89	<0.8	0.52 ± 0.76	< 5.0
SPW-9982	WATER	Sep 1995	Sr-90	<0.4	0.21 ± 0.21	< 1.0
SPMI-10920	MILK	Oct 1995	Co-60	<3.8	-0.45 ± 5.05	< 10.0
SPMI-10920	MILK	Oct 1995	Cs-134	<3.5	-2.79 ± 4.35	< 10.0
SPMI-10920	MILK	Oct 1995	Cs-137	<6.0	1.55 ± 4.13	< 10.0

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Sample Date	Analysis	Concentration pCi/L <sup>a</sup>		
				Teledyne Results (4.66 Sigma)		Acceptance Criteria (4.66 Sigma)
				LLD	Activity <sup>b</sup>	
SPMI-10920	MILK	Oct 1995	I-131	<0.4	0.10 ± 0.19	<0.5
SPF-10922	FISH	Oct 1995	Co-60	<5.4	5.74 ± 4.70	<10.0
SPF-10922	FISH	Oct 1995	Cs-134	<8.9	2.47 ± 5.44	<10.0
SPF-10922	FISH	Oct 1995	Cs-137	<5.4	-2.44 ± 5.08	<10.0
SPSO-11225	SOIL	Oct 1995	Cs-134	<0.034	0.00 ± 0.02	<10.0
SPSO-11225	SOIL	Oct 1995	Cs-137	<0.019	-0.00 ± 0.01	<10.0
SPCH-11238	CHARCOAL CANISTER	Oct 1995	I-131(g)	<1.9	-0.00 ± 0.01	<9.6
SPAP-10968	AIR FILTER	Nov 1995	Gr. Beta	<0.4	0.61 ± 0.26	<3.2
SPW-12080	WATER	Nov 1995	H-3	<149	23.01 ± 74.94	<200.0
SPW-12082	WATER	Nov 1995	Co-60	<2.1	0.62 ± 1.13	<10.0
SPW-12082	WATER	Nov 1995	Cs-134	<1.9	0.02 ± 1.28	<10.0
SPW-12082	WATER	Nov 1995	Cs-137	<2.4	1.53 ± 1.22	<10.0
SPW-12082	WATER	Nov 1995	Gr. Alpha	<0.6	0.19 ± 0.43	<1.0
SPW-12082	WATER	Nov 1995	Gr. Beta	<1.7	0.06 ± 1.11	<3.2
SPW-12808	WATER	Dec 1995	Gr. Alpha	<1.0	0.08 ± 0.49	<1.0
SPW-12808	WATER	Dec 1995	Gr. Beta	<1.6	-0.53 ± 0.78	<3.2

<sup>a</sup> Liquid sample results are reported in pCi/Liter, air filter sample results are in pCi/filter, charcoal sample results are in pCi/charcoal, and solid sample results are in pCi/kilogram.

<sup>b</sup> The activity reported is the net activity result.

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
WW-62, 63	Jan, 1995	Gr. Beta	1.4160 ± 0.4220	1.2900 ± 0.4000	1.3530 ± 0.2907
WW-62, 63	Jan, 1995	H-3	22.5635 ± 80.8891	18.8029 ± 80.7140	20.6832 ± 57.1354
WW-41, 42	Jan, 1995	Gr. Alpha	5.0970 ± 2.5260	2.4790 ± 2.1920	3.7880 ± 1.6722
WW-41, 42	Jan, 1995	Gr. Beta	4.6720 ± 0.8260	4.9650 ± 0.8770	4.8185 ± 0.6024
WW-41, 42	Jan, 1995	H-3	30.0800 ± 81.2250	-47.0000 ± 77.7750	-8.4600 ± 56.2282
WW-41, 42	Jan, 1995	K-40	1.3840 ± 0.2076	1.7300 ± 0.2595	1.5570 ± 0.1662
WW-41, 42	Jan, 1995	Sr-89	-0.3474 ± 0.5730	-0.0685 ± 0.5382	-0.2079 ± 0.3931
WW-41, 42	Jan, 1995	Sr-90	0.2017 ± 0.2519	0.1389 ± 0.2174	0.1703 ± 0.1664
CF-20, 21	Jan, 1995	Be-7	0.4327 ± 0.1200	0.4741 ± 0.1250	0.4534 ± 0.0866
CF-20, 21	Jan, 1995	Gr. Beta	2.9120 ± 0.0930	2.9920 ± 0.0920	2.9520 ± 0.0654
CF-20, 21	Jan, 1995	K-40	4.0808 ± 0.3060	3.7714 ± 0.3050	3.9261 ± 0.2160
CF-20, 21	Jan, 1995	Sr-89	0.0013 ± 0.0043	0.0000 ± 0.0058	0.0007 ± 0.0036
CF-20, 21	Jan, 1995	Sr-90	0.0017 ± 0.0011	0.0026 ± 0.0015	0.0021 ± 0.0009
CW-105, 106	Jan, 1995	Gr. Beta	5.4370 ± 0.9970	6.1900 ± 1.0260	5.8135 ± 0.7153
CW-105, 106	Jan, 1995	Gr. Beta	0.0490 ± 0.4360	0.0590 ± 0.4360	0.0540 ± 0.3083
MI-83, 84	Jan, 1995	Co-60	-0.3330 ± 2.5300	0.6530 ± 2.1700	0.1600 ± 1.6666
MI-83, 84	Jan, 1995	Cs-137	-1.1400 ± 2.2700	0.0761 ± 1.8700	-0.5320 ± 1.4705
MI-83, 84	Jan, 1995	I-131(G)	-1.9100 ± 3.2000	1.4700 ± 2.4700	-0.2200 ± 2.0212
MI-187, 188	Jan, 1995	I-131	0.1496 ± 0.2574	0.2682 ± 0.3828	0.2089 ± 0.2306
MI-187, 188	Jan, 1995	K-40	1,573.0000 ± 138.0000	1,426.0000 ± 177.0000	1,499.5000 ± 112.2197
SW-213, 214	Jan, 1995	H-3	5,939.6340 ± 241.2390	6,091.2412 ± 232.8063	6,015.4376 ± 167.6269
WW-240, 241	Jan, 1995	H-3	39.8030 ± 80.3410	9.9510 ± 78.9420	24.8770 ± 56.3172
WW-316, 317	Jan, 1995	H-3	17,618.0000 ± 377.0000	17,390.0000 ± 381.0000	17,504.0000 ± 267.9972
MI-295, 296	Jan, 1995	Co-60	-1.0900 ± 2.3700	0.2510 ± 2.8000	-0.4195 ± 1.8342
MI-295, 296	Jan, 1995	Cs-134	-0.6360 ± 1.8100	0.7830 ± 2.4400	0.0735 ± 1.5190
MI-295, 296	Jan, 1995	Cs-137	0.5200 ± 1.8200	1.2900 ± 2.6800	0.9050 ± 1.6198
MI-295, 296	Jan, 1995	I-131	0.1300 ± 0.2600	0.2300 ± 0.3400	0.1800 ± 0.2140
MI-295, 296	Jan, 1995	I-131(g)	-0.3970 ± 2.3600	-0.0386 ± 4.3000	-0.2178 ± 2.4525
MI-295, 296	Jan, 1995	K-40	1,449.1000 ± 91.2000	1,311.8000 ± 108.0000	1,380.4500 ± 70.6779
MI-295, 296	Jan, 1995	La-140	0.6220 ± 1.6900	-1.1800 ± 2.5000	-0.2790 ± 1.5088
MI-295, 296	Jan, 1995	Sr-89	0.2267 ± 0.7985	0.1552 ± 0.9326	0.1909 ± 0.6139
MI-295, 296	Jan, 1995	Sr-90	1.3813 ± 0.3839	1.6174 ± 0.4296	1.4993 ± 0.2881
LW-609, 610	Jan, 1995	Gr. Beta	2.6380 ± 0.7310	1.6940 ± 0.6930	2.1660 ± 0.5036
LW-344, 345	Jan, 1995	Co-60	-0.1680 ± 1.8700	1.5200 ± 3.1100	0.6760 ± 1.8145
LW-344, 345	Jan, 1995	Cs-137	0.3820 ± 1.9200	-0.1570 ± 2.9500	0.1125 ± 1.7599
LW-344, 345	Jan, 1995	Gr. Beta	3.2810 ± 0.9440	3.3500 ± 0.9390	3.3155 ± 0.6657

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
MI-374, 375	Jan, 1995	I-131	-0.0572 ± 0.2162	-0.0743 ± 0.2780	-0.0658 ± 0.1761
MI-374, 375	Jan, 1995	K-40	1,250.0000 ± 150.0000	1,286.5000 ± 141.0000	1,268.2500 ± 102.9332
SW-463, 464	Jan, 1995	Gr. Beta	1.8970 ± 0.5970	1.9470 ± 0.6020	1.9220 ± 0.4239
SW-463, 464	Jan, 1995	H-3	35.5580 ± 80.3070	7.4860 ± 78.9880	21.5220 ± 56.3212
WWU-860, 861	Jan, 1995	Gr. Alpha	0.3000 ± 0.6000	0.2000 ± 0.3000	0.2500 ± 0.3354
WWU-860, 861	Jan, 1995	Gr. Beta	0.8450 ± 1.3200	1.7600 ± 1.3500	1.3025 ± 0.9440
WWU-860, 861	Jan, 1995	K-40	61.8050 ± 32.9000	70.9860 ± 36.2000	66.3955 ± 24.4584
SW-586, 587	Jan, 1995	Co-60	-2.1600 ± 2.2900	1.9400 ± 2.7500	-0.1100 ± 1.7893
SW-586, 587	Jan, 1995	Cs-137	0.5590 ± 2.3400	1.5000 ± 2.8800	1.0295 ± 1.8554
WW-547, 548	Jan, 1995	H-3	602.5630 ± 102.9290	619.5980 ± 103.5540	611.0805 ± 73.0031
SWT-715, 716	Jan, 1995	Gr. Beta	2.3000 ± 0.6000	2.3000 ± 0.5000	2.3000 ± 0.3905
SW-694, 695	Feb, 1995	Gr. Beta	3.9100 ± 0.7450	4.1790 ± 0.7550	4.0445 ± 0.5303
WW-736, 737	Feb, 1995	H-3	9,951.8722 ± 284.2655	10,200.7626 ± 287.5238	10,076.3174 ± 202.1613
WW-763, 764	Feb, 1995	H-3	584.4290 ± 101.0550	707.1020 ± 105.5380	645.7655 ± 73.0589
MI-881, 882	Feb, 1995	I-131	0.1760 ± 0.2567	0.1552 ± 0.2852	0.1656 ± 0.1919
MI-881, 882	Feb, 1995	K-40	1,340.4000 ± 164.0000	1,492.0000 ± 101.0000	1,416.2000 ± 96.3029
MI-838, 839	Feb, 1995	Co-60	0.9670 ± 2.6500	-0.4760 ± 3.8100	0.2455 ± 2.3205
MI-838, 839	Feb, 1995	Cs-134	-0.0557 ± 2.2800	-1.4200 ± 3.0900	-0.7379 ± 1.9201
MI-838, 839	Feb, 1995	Cs-137	-0.4380 ± 2.5500	-0.4370 ± 3.0900	-0.4375 ± 2.0032
MI-838, 839	Feb, 1995	I-131	0.1283 ± 0.1951	0.0880 ± 0.1984	0.1081 ± 0.1391
MI-838, 839	Feb, 1995	I-131(g)	-0.2560 ± 2.5800	-0.5630 ± 3.1800	-0.4095 ± 2.0475
MI-838, 839	Feb, 1995	K-40	1,298.6000 ± 99.4000	1,232.5000 ± 125.0000	1,265.5500 ± 79.8520
MI-838, 839	Feb, 1995	Sr-89	0.5302 ± 0.5774	0.5000 ± 0.6000	0.5151 ± 0.4164
MI-838, 839	Feb, 1995	Sr-90	0.8186 ± 0.2809	0.8000 ± 0.3000	0.8093 ± 0.2055
MI-937, 938	Feb, 1995	I-131	-0.0083 ± 0.1800	-0.0270 ± 0.1800	-0.0177 ± 0.1273
MI-937, 938	Feb, 1995	K-40	1,451.8000 ± 69.6000	1,456.6000 ± 141.0000	1,454.2000 ± 78.6212
SW-904, 905	Feb, 1995	H-3	640.3425 ± 104.5679	597.4040 ± 103.0233	618.8733 ± 73.3966
MI-1216, 1217	Feb, 1995	I-131	0.2640 ± 0.2740	0.1160 ± 0.2600	0.1900 ± 0.1889
MI-1216, 1217	Feb, 1995	K-40	1,583.0000 ± 131.0000	1,493.6000 ± 174.0000	1,538.3000 ± 108.9002
SW-1237, 1238	Feb, 1995	H-3	55.3942 ± 97.3964	4.8591 ± 95.3581	30.1267 ± 68.1528
SW-1264, 1265	Feb, 1995	H-3	67.0910 ± 81.1760	109.2630 ± 83.1440	88.1770 ± 58.1001
G-1343, 1344	Feb, 1995	Be-7	11.4490 ± 0.2850	11.8800 ± 0.2560	11.6645 ± 0.1915
G-1343, 1344	Feb, 1995	K-40	2.9844 ± 0.2420	3.0269 ± 0.2250	3.0057 ± 0.1652
SW-1494, 1495	Feb, 1995	Co-60	-2.1900 ± 4.1200	0.0565 ± 3.4400	-1.0668 ± 2.6837
SW-1494, 1495	Feb, 1995	Cs-137	3.4500 ± 3.6600	0.2430 ± 3.5700	1.8465 ± 2.5564
SW-1367, 1368	Feb, 1995	H-3	560.3183 ± 103.1109	606.1104 ± 104.7919	583.2144 ± 73.5072

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
WW-1394, 1395	Feb, 1995	H-3	47.8810 ± 80.1790	-24.8930 ± 76.6250	11.4940 ± 55.4528
SWT-1515, 1516	Feb, 1995	Gr. Beta	2.4460 ± 0.5250	1.6920 ± 0.5000	2.0690 ± 0.3625
WW-1536, 1537	Feb, 1995	H-3	2,874.3025 ± 167.5000	2,924.0574 ± 168.6330	2,899.1800 ± 118.8416
WW-1563, 1564	Mar, 1995	H-3	33.5160 ± 82.6640	39.5490 ± 82.9570	36.5325 ± 58.5560
WW-1618, 1619	Mar, 1995	Co-60	2.8000 ± 1.5000	2.2000 ± 4.6000	2.5000 ± 2.4192
WW-1618, 1619	Mar, 1995	Cs-137	-0.9000 ± 1.7000	-2.5000 ± 3.2000	-1.7000 ± 1.8118
WW-1618, 1619	Mar, 1995	H-3	4,333.0000 ± 204.0000	4,457.0000 ± 206.0000	4,395.0000 ± 144.9586
MI-1663, 1664	Mar, 1995	Co-60	1.9500 ± 3.2400	-1.5300 ± 2.7200	0.2100 ± 2.1152
MI-1663, 1664	Mar, 1995	Cs-134	0.1690 ± 2.7700	-1.1300 ± 2.0500	-0.4805 ± 1.7230
MI-1663, 1664	Mar, 1995	Cs-137	-0.0737 ± 2.7400	0.9210 ± 2.4100	0.4237 ± 1.8245
MI-1663, 1664	Mar, 1995	I-131	0.1226 ± 0.2720	0.2261 ± 0.3010	0.1744 ± 0.2028
MI-1663, 1664	Mar, 1995	I-131(g)	-0.4090 ± 3.7100	0.1220 ± 3.4200	-0.1435 ± 2.5229
MI-1663, 1664	Mar, 1995	K-40	1,592.1000 ± 124.0000	1,555.6000 ± 118.0000	1,573.8500 ± 85.5862
MI-1663, 1664	Mar, 1995	La-140	-1.6500 ± 3.1000	-0.2240 ± 2.6800	-0.9370 ± 2.0489
MI-1663, 1664	Mar, 1995	Sr-89	0.5984 ± 0.6672	0.5889 ± 0.7467	0.5937 ± 0.5007
MI-1663, 1664	Mar, 1995	Sr-90	1.3624 ± 0.3718	1.5034 ± 0.4517	1.4329 ± 0.2925
WW-1684, 1685	Mar, 1995	Gr. Beta	4.9280 ± 0.7420	5.0100 ± 0.7400	4.9690 ± 0.5240
WW-1684, 1685	Mar, 1995	H-3	81.7160 ± 84.9140	85.7340 ± 85.1040	83.7250 ± 60.1105
LW-1707, 1708	Mar, 1995	Co-58	0.4070 ± 3.0300	0.0486 ± 2.8500	0.2278 ± 2.0799
LW-1707, 1708	Mar, 1995	Co-60	1.0600 ± 2.8900	1.5000 ± 2.7000	1.2800 ± 1.9775
LW-1707, 1708	Mar, 1995	Cs-134	-1.8600 ± 3.0500	-1.5400 ± 2.8300	-1.7000 ± 2.0803
LW-1707, 1708	Mar, 1995	Cs-137	2.5900 ± 2.9600	-1.3700 ± 2.5100	0.6100 ± 1.9405
LW-1707, 1708	Mar, 1995	Fe-59	5.5200 ± 6.1500	-6.6900 ± 6.1500	-0.5850 ± 4.3487
LW-1707, 1708	Mar, 1995	Gr. Beta	1.9570 ± 0.4850	2.1270 ± 0.4760	2.0420 ± 0.3398
LW-1707, 1708	Mar, 1995	I-131	0.2350 ± 0.2925	-0.0500 ± 0.2859	0.0925 ± 0.2045
LW-1707, 1708	Mar, 1995	I-131(g)	-0.6900 ± 6.6800	-0.6210 ± 6.2000	-0.6555 ± 4.5569
LW-1707, 1708	Mar, 1995	K-40	79.3000 ± 42.8000	75.3000 ± 39.2000	77.3000 ± 29.0193
LW-1707, 1708	Mar, 1995	La-140	-3.5900 ± 5.0900	1.2800 ± 4.5800	-1.1550 ± 3.4236
LW-1707, 1708	Mar, 1995	Mn-54	-1.9300 ± 3.1200	0.7640 ± 2.5200	-0.5830 ± 2.0053
LW-1707, 1708	Mar, 1995	Ru-103	-0.1320 ± 3.3400	-0.7770 ± 2.9700	-0.4545 ± 2.2348
LW-1707, 1708	Mar, 1995	Zn-65	-2.6700 ± 6.4700	-1.7400 ± 5.7700	-2.2050 ± 4.3346
LW-1707, 1708	Mar, 1995	Zr-Nb-95	-0.2680 ± 3.0600	-3.2400 ± 2.7200	-1.7540 ± 2.0471
SW-1762, 1763	Mar, 1995	H-3	104.4150 ± 89.3960	92.2110 ± 88.8390	98.3130 ± 63.0159
SO-1861, 1862	Mar, 1995	Cs-137	0.2587 ± 0.0414	0.2481 ± 0.0248	0.2534 ± 0.0241
SO-1861, 1862	Mar, 1995	K-40	11.7290 ± 0.5530	11.2500 ± 0.4990	11.4895 ± 0.3724
SO-1861, 1862	Mar, 1995	Ra-226	1.6890 ± 0.3970	1.5274 ± 0.2730	1.6082 ± 0.2409

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
SW-1919, 1920	Mar, 1995	H-3	-9.1230 ± 85.2000	66.6680 ± 88.8670	28.7725 ± 61.5556
SW-1919, 1920	Mar, 1995	H-3	-9.1230 ± 85.2005	66.6679 ± 88.8672	28.7725 ± 61.5559
WWU-2031, 2032	Mar, 1995	Gr. Alpha	1.9830 ± 2.2510	3.0330 ± 2.4400	2.5080 ± 1.6599
WWU-2031, 2032	Mar, 1995	Gr. Beta	1.2540 ± 1.9270	2.1120 ± 1.9680	1.6830 ± 1.3772
CW-1997, 1998	Mar, 1995	Gr. Beta	2.6670 ± 0.9880	2.3100 ± 1.3570	2.4885 ± 0.8393
CW-1997, 1998	Mar, 1995	Gr. Beta	-0.5301 ± 0.9521	0.6351 ± 1.1355	0.0525 ± 0.7409
AP-2784, 2785	Mar, 1995	Co-60	-0.0004 ± 0.0006	-0.0003 ± 0.0005	-0.0003 ± 0.0004
AP-2784, 2785	Mar, 1995	Cs-137	-0.0003 ± 0.0006	0.0001 ± 0.0004	-0.0001 ± 0.0004
MI-2083, 2084	Mar, 1995	I-131	0.0210 ± 0.1920	0.0150 ± 0.1850	0.0180 ± 0.1333
MI-2083, 2084	Mar, 1995	K-40	1,273.9000 ± 69.7000	1,328.9000 ± 59.8000	1,301.4000 ± 45.9188
MI-2083, 2084	Mar, 1995	Sr-90	1.5850 ± 0.4530	1.8040 ± 0.5520	1.6945 ± 0.3570
SW-2104, 2105	Mar, 1995	Gr. Beta	1.6690 ± 0.5320	1.7090 ± 0.5640	1.6890 ± 0.3877
SW-2200, 2201	Mar, 1995	H-3	33.7710 ± 85.6270	54.0340 ± 86.5810	43.9025 ± 60.8857
SW-2355, 2356	Mar, 1995	Co-60	0.6430 ± 1.5100	0.8670 ± 1.5800	0.7550 ± 1.0928
SW-2355, 2356	Mar, 1995	Cs-137	2.2000 ± 1.5400	0.0533 ± 1.8500	1.1267 ± 1.2035
AP-2453, 2454	Mar, 1995	Sr-89	0.0002 ± 0.0006	-0.0001 ± 0.0006	0.0000 ± 0.0004
AP-2453, 2454	Mar, 1995	Sr-90	0.0000 ± 0.0002	0.0001 ± 0.0003	0.0001 ± 0.0002
AP-2805, 2806	Mar, 1995	Co-60	-0.0001 ± 0.0004	0.0002 ± 0.0003	0.0000 ± 0.0002
AP-2805, 2806	Mar, 1995	Cs-137	0.0002 ± 0.0004	0.0000 ± 0.0004	0.0001 ± 0.0003
SW-2221, 2222	Mar, 1995	K-40	149.6900 ± 74.4000	119.3800 ± 46.7000	134.5350 ± 43.9211
PW-2248, 2249	Mar, 1995	H-3	154.6240 ± 91.0610	164.7520 ± 91.5110	159.6880 ± 64.5491
PW-2271, 2272	Mar, 1995	Co-60	-0.4760 ± 1.9800	-1.2100 ± 2.8900	-0.8430 ± 1.7516
PW-2271, 2272	Mar, 1995	Cs-137	0.9590 ± 2.0500	0.8750 ± 3.4600	0.9170 ± 2.0109
MI-2149, 2150	Apr, 1995	Co-60	-1.2100 ± 2.2200	0.6560 ± 2.6900	-0.2770 ± 1.7439
MI-2149, 2150	Apr, 1995	Cs-137	0.1650 ± 2.0400	2.3100 ± 2.2200	1.2375 ± 1.5075
MI-2149, 2150	Apr, 1995	I-131(G)	0.0888 ± 2.2200	0.3000 ± 2.5100	0.1944 ± 1.6754
WW-2313, 2314	Apr, 1995	Gr. Beta	0.5850 ± 0.4990	0.9810 ± 0.5230	0.7830 ± 0.3614
CW-2401, 2402	Apr, 1995	Gr. Beta	1.7069 ± 1.2973	3.4661 ± 1.4515	2.5865 ± 0.9734
CW-2401, 2402	Apr, 1995	Gr. Beta	0.0096 ± 1.1238	0.4760 ± 1.1031	0.2428 ± 0.7874
SL-2567, 2568	Apr, 1995	K-40	1.4123 ± 0.4360	1.7225 ± 0.3760	1.5674 ± 0.2879
WW-2432, 2433	Apr, 1995	H-3	-21.5803 ± 82.7489	2.6975 ± 83.9276	-9.4414 ± 58.9305
WW-2659, 2660	Apr, 1995	Gr. Beta	0.5450 ± 0.6040	0.3970 ± 0.4440	0.4710 ± 0.3748
WW-2659, 2660	Apr, 1995	H-3	38.3900 ± 87.4520	133.3540 ± 91.7350	85.8720 ± 63.3703
MI-2713, 2714	Apr, 1995	I-131	0.3870 ± 0.5277	0.1686 ± 0.2430	0.2778 ± 0.2905
MI-2713, 2714	Apr, 1995	K-40	1,420.9000 ± 137.0000	1,420.0000 ± 137.0000	1,420.4500 ± 96.8736
CW-2739, 2740	Apr, 1995	Gr. Beta	13.7987 ± 2.0770	14.3132 ± 2.1038	14.0560 ± 1.4782

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
CW-2739, 2740	Apr, 1995	Gr. Beta	5.0526 ± 1.5206	2.2742 ± 1.3431	3.6634 ± 1.0144
SW-2686, 2687	Apr, 1995	H-3	52.6753 ± 86.9675	2.0260 ± 84.5748	27.3506 ± 60.6552
WW-3447, 3448	Apr, 1995	Gr. Alpha	-0.2920 ± 1.6860	-1.4650 ± 1.6480	-0.8785 ± 1.1788
WW-3447, 3448	Apr, 1995	Gr. Beta	1.2340 ± 1.7000	3.1840 ± 1.8140	2.2090 ± 1.2430
CW-2835, 2836	Apr, 1995	Gr. Beta	1.9571 ± 1.4080	2.7378 ± 1.4641	2.3474 ± 1.0157
CW-2835, 2836	Apr, 1995	Gr. Beta	0.1817 ± 1.1916	0.8185 ± 1.2403	0.5001 ± 0.8600
CW-2918, 2919	Apr, 1995	Gr. Beta	5.3065 ± 1.6254	4.2821 ± 1.5611	4.7943 ± 1.1268
CW-2918, 2919	Apr, 1995	Gr. Beta	2.0988 ± 1.3349	0.7752 ± 1.2404	1.4370 ± 0.9111
F-3552, 3553	Apr, 1995	K-40	3.1142 ± 0.4410	2.8860 ± 0.2410	3.0001 ± 0.2513
F-3552, 3553	Apr, 1995	Sr-89	-0.0061 ± 0.0064	0.0011 ± 0.0080	-0.0025 ± 0.0051
F-3552, 3553	Apr, 1995	Sr-90	0.0023 ± 0.0029	0.0005 ± 0.0036	0.0014 ± 0.0023
SWT-3343, 3344	Apr, 1995	Gr. Beta	2.3310 ± 0.5190	2.9830 ± 0.4800	2.6570 ± 0.3535
G-3133, 3134	Apr, 1995	K-40	6.5000 ± 0.1740	6.0532 ± 0.3120	6.2766 ± 0.1786
SW-3403, 3404	Apr, 1995	H-3	159.5512 ± 90.5914	72.7069 ± 86.6327	116.1290 ± 62.6738
WW-3424, 3425	Apr, 1995	H-3	442.5093 ± 116.7309	430.4409 ± 116.3142	436.4751 ± 82.3940
LW-3682, 3683	Apr, 1995	Gr. Beta	2.0500 ± 0.5760	1.5240 ± 0.5500	1.7870 ± 0.3982
LW-3682, 3683	Apr, 1995	Gr. Beta	2.0501 ± 0.6760	1.5244 ± 0.5500	1.7872 ± 0.4358
LW-3682, 3683	Apr, 1995	H-3	139.9350 ± 91.1490	75.0380 ± 88.2140	107.4865 ± 63.4229
LW-3682, 3683	Apr, 1995	H-3	75.0378 ± 88.2143	139.9353 ± 91.1494	107.4865 ± 63.4231
SO-3531, 3532	May, 1995	Cs-137	0.1624 ± 0.0246	0.1418 ± 0.0306	0.1521 ± 0.0196
SO-3531, 3532	May, 1995	Gr. Alpha	6.8662 ± 3.5751	9.2164 ± 3.8687	8.0413 ± 2.6338
SO-3531, 3532	May, 1995	Gr. Beta	17.0973 ± 3.0829	18.8034 ± 3.1329	17.9503 ± 2.1977
SO-3531, 3532	May, 1995	K-40	25.0380 ± 0.7710	23.8180 ± 0.6600	24.4280 ± 0.5075
SO-3531, 3532	May, 1995	Sr-89	-0.0129 ± 0.0215	0.0014 ± 0.0202	-0.0057 ± 0.0147
SO-3531, 3532	May, 1995	Sr-90	0.0261 ± 0.0109	0.0122 ± 0.0093	0.0191 ± 0.0072
WW-3577, 3578	May, 1995	Co-60	-0.2530 ± 2.2200	0.5410 ± 2.5800	0.1440 ± 1.7018
WW-3577, 3578	May, 1995	Cs-137	1.1500 ± 2.2000	-1.6400 ± 2.9200	-0.2450 ± 1.8280
WW-3577, 3578	May, 1995	H-3	33.5750 ± 90.9827	58.7563 ± 92.0487	46.1657 ± 64.7125
MI-3598, 3599	May, 1995	I-131	0.2288 ± 0.3515	0.2122 ± 0.3043	0.2205 ± 0.2324
MI-3598, 3599	May, 1995	K-40	1,349.0000 ± 112.0000	1,297.4000 ± 151.0000	1,323.2000 ± 94.0013
MI-3809, 3810	May, 1995	Co-60	-0.3700 ± 2.9600	0.1820 ± 2.9600	-0.0940 ± 2.0930
MI-3809, 3810	May, 1995	Cs-137	0.9060 ± 2.5000	0.1380 ± 2.3600	0.5220 ± 1.7190
MI-3809, 3810	May, 1995	I-131	0.1445 ± 0.1573	0.1738 ± 0.2057	0.1592 ± 0.1295
CW-3838, 3839	May, 1995	Gr. Beta	1.9922 ± 1.3549	3.4291 ± 1.4650	2.7106 ± 0.9977
CW-3838, 3839	May, 1995	Gr. Beta	-0.7347 ± 1.2274	-1.0782 ± 1.2004	-0.9064 ± 0.8584
F-4309, 4310	May, 1995	Co-60	-0.0017 ± 0.0093	-0.0032 ± 0.0166	-0.0024 ± 0.0095



Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
F-4309, 4310	May, 1995	Cs-137	0.0028 ± 0.0089	0.0012 ± 0.0133	0.0020 ± 0.0080
F-4288, 4289	May, 1995	Co-60	0.0038 ± 0.0097	0.0012 ± 0.0088	0.0025 ± 0.0065
F-4288, 4289	May, 1995	Cs-137	0.0002 ± 0.0067	0.0022 ± 0.0062	0.0012 ± 0.0045
F-4330, 4331	May, 1995	Co-60	0.0018 ± 0.0046	0.0031 ± 0.0050	0.0024 ± 0.0034
F-4330, 4331	May, 1995	Cs-137	0.0001 ± 0.0042	-0.0007 ± 0.0038	-0.0003 ± 0.0028
MI-4377, 4378	May, 1995	Co-60	0.9480 ± 1.7400	2.2200 ± 2.6600	1.5840 ± 1.5893
MI-4377, 4378	May, 1995	Cs-134	0.7830 ± 1.4900	-0.2080 ± 2.3000	0.2875 ± 1.3702
MI-4377, 4378	May, 1995	Cs-137	0.8740 ± 1.3800	0.6430 ± 2.1400	0.7585 ± 1.2732
MI-4377, 4378	May, 1995	I-131	-0.0785 ± 0.1490	-0.0420 ± 0.1498	-0.0602 ± 0.1056
MI-4377, 4378	May, 1995	I-131(g)	0.1700 ± 1.3000	-1.1200 ± 2.6200	-0.4750 ± 1.4624
MI-4377, 4378	May, 1995	K-40	1,385.1000 ± 63.2000	1,344.3000 ± 92.5000	1,364.7000 ± 56.0145
MI-4377, 4378	May, 1995	Sr-89	-0.0069 ± 0.7313	0.0069 ± 1.1490	0.0000 ± 0.6810
MI-4377, 4378	May, 1995	Sr-90	1.2729 ± 0.4414	1.3229 ± 0.6414	1.2979 ± 0.3893
MI-4544, 4545	May, 1995	I-131	0.0524 ± 0.2867	0.0574 ± 0.2367	0.0549 ± 0.1859
MI-4544, 4545	May, 1995	K-40	1,410.0000 ± 72.3000	1,359.0000 ± 65.7000	1,384.5000 ± 48.8461
MI-4544, 4545	May, 1995	Sr-90	2.1444 ± 0.5153	1.2741 ± 0.4112	1.7093 ± 0.3296
G-4604, 4605	May, 1995	Be-7	1.9338 ± 0.3520	1.7467 ± 0.3580	1.8403 ± 0.2510
G-4604, 4605	May, 1995	Co-60	-0.0112 ± 0.0217	-0.0175 ± 0.0189	-0.0144 ± 0.0144
G-4604, 4605	May, 1995	Cs-134	0.0076 ± 0.0165	0.0079 ± 0.0163	0.0078 ± 0.0116
G-4604, 4605	May, 1995	Cs-137	0.1303 ± 0.0332	0.1283 ± 0.0420	0.1293 ± 0.0268
G-4604, 4605	May, 1995	Gr. Beta	3.9523 ± 0.1425	3.9500 ± 0.1562	3.9512 ± 0.1057
G-4604, 4605	May, 1995	I-131(g)	0.0101 ± 0.0227	0.0055 ± 0.0263	0.0078 ± 0.0174
G-4604, 4605	May, 1995	K-40	5.1487 ± 0.6580	5.1002 ± 0.6970	5.1245 ± 0.4793
CW-4575, 4576	May, 1995	Gr. Beta	1.9783 ± 1.1888	2.8278 ± 1.2558	2.4030 ± 0.8646
CW-4575, 4576	May, 1995	Gr. Beta	-0.2059 ± 1.0000	-0.5589 ± 0.9721	-0.3824 ± 0.6973
MI-4695, 4696	May, 1995	I-131	0.1049 ± 0.1737	0.0942 ± 0.1607	0.0995 ± 0.1183
MI-4695, 4696	May, 1995	K-40	1,568.8000 ± 114.0000	1,573.1000 ± 50.1000	1,570.9500 ± 62.2616
MI-4716, 4717	May, 1995	Sr-89	-0.2701 ± 0.7584	-0.0499 ± 0.8752	-0.1600 ± 0.5790
MI-4716, 4717	May, 1995	Sr-90	1.1720 ± 0.4391	1.6280 ± 0.4432	1.4000 ± 0.3119
G-4814, 4815	May, 1995	Be-7	0.6081 ± 0.2520	0.5837 ± 0.1750	0.5959 ± 0.1534
G-4814, 4815	May, 1995	K-40	5.8319 ± 0.6100	5.1295 ± 0.5050	5.4807 ± 0.3960
WW-4784, 4785	May, 1995	H-3	18,665.3086 ± 390.2155	18,274.9314 ± 386.3294	18,470.1200 ± 274.5535
SW-4759, 4760	May, 1995	H-3	3,679.8217 ± 213.9409	3,817.7847 ± 217.0401	3,748.8032 ± 152.3787
SO-5178, 5179	May, 1995	Cs-137	0.8481 ± 0.0691	0.8110 ± 0.0710	0.8296 ± 0.0495
SO-5178, 5179	May, 1995	K-40	19.9200 ± 1.0800	22.0860 ± 1.1800	21.0030 ± 0.7998
SWU-5663, 5664	May, 1995	Gr. Beta	2.4654 ± 0.6199	2.5106 ± 0.6258	2.4880 ± 0.4404

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
SWU-5663, 5664	May, 1995	H-3	867.2182 ± 104.9067	865.5032 ± 104.8506	866.3607 ± 74.1604
BS - 6983, 6984	May, 1995	Gr. Beta	7.3555 ± 1.2333	8.0347 ± 1.4183	7.6951 ± 0.9397
BS - 6983, 6984	May, 1995	Gr. Beta	7.3555 ± 1.2333	8.0347 ± 1.4183	7.6951 ± 0.9397
BS - 6983, 6984	May, 1995	K-40	8.3490 ± 0.3090	8.5309 ± 0.0683	8.4400 ± 0.1582
BS - 6983, 6984	May, 1995	K-40	8.3490 ± 0.3090	8.5309 ± 0.0683	8.4400 ± 0.1582
BS-6983, 6984	May, 1995	Cs-137	0.0074 ± 0.0008	0.0094 ± 0.0024	0.0084 ± 0.0013
BS-6983, 6984	May, 1995	Gr. Beta	7.3555 ± 1.2333	8.0347 ± 1.4183	7.6951 ± 0.9397
BS-6983, 6984	May, 1995	K-40	8.3490 ± 0.3090	8.5309 ± 0.0683	8.4400 ± 0.1582
BS - 5494, 5495	May, 1995	Cs-137	0.5929 ± 0.0319	0.5876 ± 0.0378	0.5903 ± 0.0247
BS - 5494, 5495	May, 1995	Cs-137	0.5929 ± 0.0319	0.5876 ± 0.0378	0.5903 ± 0.0247
BS - 5494, 5495	May, 1995	K-40	21.0920 ± 0.6570	21.3050 ± 0.7070	21.1985 ± 0.4826
BS - 5494, 5495	May, 1995	K-40	21.0920 ± 0.6570	21.3050 ± 0.7070	21.1985 ± 0.4826
BS-5494, 5495	May, 1995	Cs-137	0.5929 ± 0.0319	0.5876 ± 0.0378	0.5903 ± 0.0247
BS-5494, 5495	May, 1995	K-40	21.0920 ± 0.6570	21.3050 ± 0.7070	21.1985 ± 0.4826
F-5025, 5026	May, 1995	Co-60	0.0024 ± 0.0064	0.0028 ± 0.0077	0.0026 ± 0.0050
F-5025, 5026	May, 1995	Cs-137	-0.0006 ± 0.0050	-0.0038 ± 0.0063	-0.0022 ± 0.0040
F-5385, 5386	May, 1995	K-40	2.5044 ± 0.3450	2.5992 ± 0.3830	2.5518 ± 0.2577
F-5046, 5047	May, 1995	Co-60	0.0012 ± 0.0067	-0.0021 ± 0.0073	-0.0004 ± 0.0049
F-5046, 5047	May, 1995	Cs-137	0.0018 ± 0.0053	-0.0003 ± 0.0046	0.0007 ± 0.0035
WW-5244, 5245	May, 1995	H-3	608.3574 ± 96.3200	463.5639 ± 91.1176	535.9606 ± 66.2947
SW-6013, 6014	May, 1995	Co-60	0.8080 ± 2.2000	1.5300 ± 3.0300	1.1690 ± 1.8722
SW-6013, 6014	May, 1995	Cs-137	-0.6750 ± 2.3000	0.4560 ± 2.3200	-0.1095 ± 1.6334
MI-5620, 5621	May, 1995	I-131	0.1589 ± 0.1736	0.0147 ± 0.1644	0.0868 ± 0.1196
MI-5620, 5621	May, 1995	K-40	1,526.2000 ± 119.0000	1,449.3000 ± 162.0000	1,487.7500 ± 100.5050
WW - 5642, 5643	May, 1995	Gr. Alpha	2.3120 ± 2.3250	2.3120 ± 2.3250	2.3120 ± 1.6440
WW - 5642, 5643	May, 1995	Gr. Beta	2.3120 ± 3.2540	2.3120 ± 3.2540	2.3120 ± 2.3009
WW - 5642, 5643	May, 1995	K-40	94.3550 ± 19.8000	58.9910 ± 29.5000	76.6730 ± 17.7644
DW-5738, 5739	May, 1995	Gr. Beta	2.5151 ± 1.1685	3.5614 ± 1.2103	3.0383 ± 0.8411
DW-5738, 5739	May, 1995	I-131	-0.0458 ± 0.1650	-0.0284 ± 0.1486	-0.0371 ± 0.1110
LW-6327, 6328	May, 1995	Gr. Beta	6.4501 ± 1.0293	6.6100 ± 1.0327	6.5300 ± 0.7290
W-6398, 6399	May, 1995	Sr-89	15.1044 ± 3.8169	18.1475 ± 2.7239	16.6259 ± 2.3446
W-6398, 6399	May, 1995	Sr-90	25.0828 ± 1.8532	24.4207 ± 1.3058	24.7518 ± 1.1335
WW-6184, 6185	Jun, 1995	Gr. Beta	6.0148 ± 1.1147	7.4613 ± 1.3560	6.7380 ± 0.8777
WW-6184, 6185	Jun, 1995	H-3	86.1439 ± 78.3469	106.9572 ± 79.2631	96.5505 ± 55.7245
MI-5684, 5685	Jun, 1995	Co-60	0.0976 ± 2.9600	0.4260 ± 4.6300	0.2618 ± 2.7477
MI-5684, 5685	Jun, 1995	Cs-137	1.8400 ± 2.6500	-0.9210 ± 3.2400	0.4595 ± 2.0929

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
MI-5684, 5685	Jun, 1995	I-131	0.0829 ± 0.1477	-0.0025 ± 0.1466	0.0402 ± 0.1041
CW-5713, 5714	Jun, 1995	Gr. Beta	3.1068 ± 1.4397	3.2557 ± 1.4487	3.1812 ± 1.0212
CW-5713, 5714	Jun, 1995	Gr. Beta	0.0491 ± 1.4849	0.3925 ± 1.5076	0.2208 ± 1.0580
SL-5832, 5833	Jun, 1995	Co-60	0.0410 ± 0.0114	0.0585 ± 0.0182	0.0498 ± 0.0107
SL-5832, 5833	Jun, 1995	Cs-137	0.0550 ± 0.0124	0.0499 ± 0.0215	0.0525 ± 0.0124
SL-5832, 5833	Jun, 1995	Gr. Beta	4.6800 ± 0.4800	4.6800 ± 0.4800	4.6800 ± 0.3394
SL-5832, 5833	Jun, 1995	K-40	2.9035 ± 0.2750	2.4429 ± 0.3290	2.6732 ± 0.2144
SL-5832, 5833	Jun, 1995	Sr-89	0.0106 ± 0.0261	0.0048 ± 0.0336	0.0077 ± 0.0213
SL-5832, 5833	Jun, 1995	Sr-90	0.0102 ± 0.0114	0.0164 ± 0.0148	0.0133 ± 0.0093
WW-5992, 5993	Jun, 1995	Co-60	0.3950 ± 1.2200	0.9060 ± 2.6500	0.6505 ± 1.4587
WW-5992, 5993	Jun, 1995	Cs-137	-1.4000 ± 1.3800	-1.4400 ± 3.0300	-1.4200 ± 1.6647
WW-5992, 5993	Jun, 1995	H-3	67.0084 ± 76.1576	94.0370 ± 77.3473	80.5227 ± 54.2738
SL-6205, 6206	Jun, 1995	Co-60	0.0029 ± 0.0088	0.0111 ± 0.0120	0.0070 ± 0.0074
SL-6205, 6206	Jun, 1995	Cs-134	0.0033 ± 0.0070	0.0002 ± 0.0096	0.0018 ± 0.0059
SL-6205, 6206	Jun, 1995	Cs-137	0.0138 ± 0.0091	0.0174 ± 0.0104	0.0156 ± 0.0069
SL-6205, 6206	Jun, 1995	Gr. Beta	3.3400 ± 0.1000	3.3400 ± 0.1000	3.3400 ± 0.0707
SL-6205, 6206	Jun, 1995	I-131(g)	-0.0060 ± 0.0135	-0.0003 ± 0.0197	-0.0031 ± 0.0119
SL-6205, 6206	Jun, 1995	K-40	3.3386 ± 0.3100	3.3294 ± 0.3780	3.3340 ± 0.2444
SW-6256, 6257	Jun, 1995	H-3	423.9034 ± 92.0134	585.0329 ± 97.8935	504.4682 ± 67.1744
MI-6277, 6278	Jun, 1995	I-131	0.0926 ± 0.1619	0.0532 ± 0.2284	0.0729 ± 0.1400
MI-6277, 6278	Jun, 1995	K-40	1,285.5000 ± 152.0000	1,355.2000 ± 114.0000	1,320.3500 ± 95.0000
SW-6232, 6233	Jun, 1995	H-3	68.3732 ± 79.4680	136.7465 ± 82.4296	102.5599 ± 57.2490
VE-6348, 6349	Jun, 1995	Gr. Alpha	0.3230 ± 0.0990	0.1780 ± 0.0520	0.2505 ± 0.0559
VE-6348, 6349	Jun, 1995	Gr. Beta	3.2970 ± 0.1410	3.4170 ± 0.0920	3.3570 ± 0.0842
VE-6348, 6349	Jun, 1995	K-40	3.1425 ± 0.3310	2.9775 ± 0.3350	3.0600 ± 0.2355
MI-6419, 6420	Jun, 1995	I-131	0.1154 ± 0.1633	0.1197 ± 0.1806	0.1175 ± 0.1217
MI-6419, 6420	Jun, 1995	K-40	1,457.2000 ± 175.0000	1,339.3000 ± 150.0000	1,398.2500 ± 115.2443
MI-6521, 6522	Jun, 1995	I-131	0.0534 ± 0.1511	0.0344 ± 0.1784	0.0439 ± 0.1169
MI-6521, 6522	Jun, 1995	K-40	1,475.4000 ± 123.0000	1,274.6000 ± 160.0000	1,375.0000 ± 100.9071
SL-6500, 6501	Jun, 1995	K-40	1.8001 ± 0.4550	2.1667 ± 0.5460	1.9834 ± 0.3554
MI-6446, 6447	Jun, 1995	Co-60	0.1640 ± 4.8700	0.4440 ± 2.8200	0.3040 ± 2.8138
MI-6446, 6447	Jun, 1995	Cs-137	1.3000 ± 3.3600	0.0563 ± 2.1800	0.6782 ± 2.0026
MI-6446, 6447	Jun, 1995	I-131	-0.0433 ± 0.2077	0.0000 ± 0.2377	-0.0217 ± 0.1578
CW-6474, 6475	Jun, 1995	Gr. Beta	2.8423 ± 1.4039	3.1674 ± 1.4145	3.0049 ± 0.9965
MI-6474, 6475	Jun, 1995	Gr. Beta	0.0000 ± 1.1519	0.0909 ± 1.1588	0.0455 ± 0.8170
MI-6564, 6565	Jun, 1995	I-131	0.2460 ± 0.2607	0.0948 ± 0.2353	0.1704 ± 0.1756

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
BS-6960, 6961	Jun, 1995	Cs-137	0.0752 ± 0.0292	0.0475 ± 0.0274	0.0613 ± 0.0200
BS-6960, 6961	Jun, 1995	K-40	17.6680 ± 0.8700	17.0190 ± 1.0600	17.3435 ± 0.6857
WW-6861, 6862	Jun, 1995	H-3	1,422.4460 ± 128.0232	1,505.1361 ± 130.2761	1,463.7910 ± 91.3261
MI-6840, 6841	Jun, 1995	I-131	0.1583 ± 0.2131	0.0509 ± 0.1801	0.1046 ± 0.1395
LW-6889, 6890	Jun, 1995	Co-60	-2.4000 ± 3.4100	1.4300 ± 1.7400	-0.4850 ± 1.9141
LW-6889, 6890	Jun, 1995	Cs-137	-0.5210 ± 3.0300	0.1410 ± 2.1900	-0.1900 ± 1.8693
LW-6889, 6890	Jun, 1995	Gr. Beta	3.0131 ± 0.8315	3.0285 ± 0.8358	3.0208 ± 0.5895
SW-7053, 7054	Jun, 1995	H-3	73.2226 ± 75.6858	126.8001 ± 78.1734	100.0114 ± 54.4046
SW-7011, 7012	Jun, 1995	H-3	203.5633 ± 81.5943	226.7766 ± 82.6041	215.1699 ± 58.0540
MI-7032, 7033	Jun, 1995	I-131	0.2720 ± 0.2879	-0.0925 ± 0.2629	0.0897 ± 0.1949
MI-7032, 7033	Jun, 1995	K-40	1,577.6000 ± 127.0000	1,522.8000 ± 164.0000	1,550.2000 ± 103.7123
SWU-7101, 7102	Jun, 1995	Gr. Beta	1.9679 ± 0.4592	2.1339 ± 0.5061	2.0509 ± 0.3417
SWU-7101, 7102	Jun, 1995	H-3	118.5873 ± 85.7967	92.6463 ± 84.6688	105.6168 ± 60.2700
SWU - 7828, 7829	Jun, 1995	Sr-89	0.5896 ± 0.7987	0.0977 ± 0.6691	0.3436 ± 0.5210
SWU - 7828, 7829	Jun, 1995	Sr-90	0.2398 ± 0.3028	0.1937 ± 0.2742	0.2168 ± 0.2042
SWU - 7828, 7829	Jun, 1995	Sr-90	0.2398 ± 0.3028	0.1937 ± 0.2742	0.2168 ± 0.2042
SWU-7828, 7829	Jun, 1995	Sr-89	0.5896 ± 0.7987	0.0977 ± 0.6691	0.3436 ± 0.5210
SWU-7828, 7829	Jun, 1995	Sr-89	0.5896 ± 0.7987	0.0977 ± 0.6691	0.3436 ± 0.5210
SWU-7828, 7829	Jun, 1995	Sr-89	0.5896 ± 0.7987	0.0977 ± 0.6691	0.3436 ± 0.5210
SWU-7828, 7829	Jun, 1995	Sr-90	0.2398 ± 0.3028	0.1937 ± 0.2742	0.2168 ± 0.2042
SWU-7828, 7829	Jun, 1995	Sr-90	0.2398 ± 0.3028	0.1937 ± 0.2742	0.2168 ± 0.2042
SWU-7828, 7829	Jun, 1995	Sr-90	0.2398 ± 0.3028	0.1937 ± 0.2742	0.2168 ± 0.2042
SWU-7828, 7829	Jun, 1995	Sr-90	0.2398 ± 0.3028	0.1937 ± 0.2742	0.2168 ± 0.2042
SWU-7828, 7829	Jun, 1995	Sr-90	0.2398 ± 0.3028	0.1937 ± 0.2742	0.2168 ± 0.2042
AP-8111, 8112	Jun, 1995	Co-60	-0.0002 ± 0.0007	0.0004 ± 0.0007	0.0001 ± 0.0005
AP-8111, 8112	Jun, 1995	Cs-137	-0.0002 ± 0.0007	0.0004 ± 0.0005	0.0001 ± 0.0004
SW-7080, 7081	Jun, 1995	Gr. Beta	2.3011 ± 0.5921	2.6708 ± 0.6113	2.4860 ± 0.4255
SW-7080, 7081	Jun, 1995	K-40	61.2620 ± 28.3000	95.4390 ± 26.0000	78.3505 ± 19.2152
WWT-7122, 7123	Jun, 1995	H-3	3.8386 ± 81.4299	-13.4353 ± 80.6115	-4.7983 ± 57.2910
LW-7239, 7240	Jun, 1995	Gr. Beta	2.5177 ± 0.0580	2.4081 ± 0.6061	2.4629 ± 0.3044
WW-7143, 7144	Jun, 1995	H-3	539.1386 ± 103.3228	436.4159 ± 99.5398	487.7772 ± 71.7352
PW-7174, 7175	Jun, 1995	H-3	144.0732 ± 84.2861	121.4242 ± 83.2655	132.7487 ± 59.2395
SW-7216, 7217	Jun, 1995	H-3	20.3728 ± 81.4069	62.9704 ± 83.3227	41.6716 ± 58.2446
WW-7281, 7282	Jun, 1995	Gr. Beta	1.8051 ± 0.3271	2.1056 ± 0.5796	1.9553 ± 0.3328
V-7281, 7282	Jun, 1995	H-3	-24.3250 ± 75.1716	10.3381 ± 76.8357	-6.9934 ± 53.7459
SW-7387, 7388	Jul, 1995	Co-60	1.0200 ± 1.9000	0.1530 ± 1.6700	0.5865 ± 1.2648

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
SW-7387, 7388	Jul, 1995	Cs-137	0.5600 ± 2.3400	-0.8650 ± 2.0400	-0.1525 ± 1.5522
AP-8133, 8134	Jul, 1995	Co-60	-0.0000 ± 0.0005	0.0003 ± 0.0006	0.0001 ± 0.0004
AP-8133, 8134	Jul, 1995	Cs-137	-0.0001 ± 0.0004	0.0000 ± 0.0005	-0.0001 ± 0.0003
AP-7600, 7601	Jul, 1995	Sr-89	0.0008 ± 0.0008	0.0010 ± 0.0008	0.0009 ± 0.0005
AP-7600, 7601	Jul, 1995	Sr-90	-0.0001 ± 0.0003	0.0005 ± 0.0003	0.0002 ± 0.0002
MI-7260, 7261	Jul, 1995	Co-60	0.3390 ± 2.9100	0.5630 ± 5.2400	0.4510 ± 2.9969
MI-7260, 7261	Jul, 1995	Cs-137	1.6600 ± 2.5900	-1.4600 ± 3.3700	0.1000 ± 2.1251
MI-7260, 7261	Jul, 1995	I-131	0.1745 ± 0.1944	0.1004 ± 0.1792	0.1374 ± 0.1322
WW-7454, 7455	Jul, 1995	H-3	7,142.7529 ± 243.6211	6,985.4236 ± 241.2186	7,064.0882 ± 171.4188
LW - 7487, 7488	Jul, 1995	K-40	48.0000 ± 14.4000	95.7520 ± 39.9000	71.8760 ± 21.2095
LW - 7487, 7488	Jul, 1995	K-40	48.0000 ± 14.4000	95.7520 ± 39.9000	71.8760 ± 21.2095
LW-7487, 7488	Jul, 1995	Co-60	0.4460 ± 1.0700	0.3830 ± 3.0000	0.4145 ± 1.5926
LW-7487, 7488	Jul, 1995	Cs-134	0.1230 ± 1.0600	-2.3900 ± 3.0100	-1.1335 ± 1.5956
LW-7487, 7488	Jul, 1995	Cs-137	0.4920 ± 1.1000	-2.2200 ± 2.8400	-0.8640 ± 1.5228
LW-7487, 7488	Jul, 1995	Gr. Beta	2.1095 ± 0.4725	1.8520 ± 0.4810	1.9807 ± 0.3371
LW-7487, 7488	Jul, 1995	I-131	0.2323 ± 0.2677	-0.0343 ± 0.2508	0.0990 ± 0.1834
LW-7487, 7488	Jul, 1995	I-131(g)	0.3390 ± 2.4400	0.9230 ± 10.5000	0.6310 ± 5.3899
LW-7487, 7488	Jul, 1995	K-40	48.0000 ± 14.4000	95.7520 ± 39.9000	71.8760 ± 21.2095
LW-7487, 7488	Jul, 1995	K-40	48.0000 ± 14.4000	95.7520 ± 39.9000	71.8760 ± 21.2095
LW-7487, 7488	Jul, 1995	K-40	48.0000 ± 14.4000	95.7520 ± 39.9000	71.8760 ± 21.2095
LW-7487, 7488	Jul, 1995	K-40	48.0000 ± 14.4000	95.7520 ± 39.9000	71.8760 ± 21.2095
SW-7323, 7324	Jul, 1995	Gr. Beta	2.3224 ± 0.7511	2.5774 ± 0.7631	2.4499 ± 0.5354
SW-7323, 7324	Jul, 1995	H-3	77.8879 ± 83.9931	48.4345 ± 82.6045	63.1612 ± 58.9032
F-7366, 7367	Jul, 1995	Co-60	0.0092 ± 0.0141	0.0061 ± 0.0119	0.0076 ± 0.0092
F-7366, 7367	Jul, 1995	Cs-137	0.0115 ± 0.0108	0.0019 ± 0.0111	0.0067 ± 0.0077
MI-7510, 7511	Jul, 1995	I-131	0.3443 ± 0.3987	0.1361 ± 0.3508	0.2402 ± 0.2655
F-7344, 7345	Jul, 1995	Co-60	0.0037 ± 0.0077	-0.0071 ± 0.0119	-0.0017 ± 0.0071
F-7344, 7345	Jul, 1995	Cs-137	0.0023 ± 0.0057	0.0024 ± 0.0097	0.0023 ± 0.0056
MI-7429, 7430	Jul, 1995	I-131	-0.1525 ± 0.3171	0.1594 ± 0.2283	0.0035 ± 0.1953
F-8154, 8155	Jul, 1995	Gr. Beta	2.3081 ± 0.0743	2.2522 ± 0.0730	2.2802 ± 0.0521
F-8154, 8155	Jul, 1995	K-40	2.2313 ± 0.2640	2.1161 ± 0.4420	2.1737 ± 0.2574
MI-7575, 7576	Jul, 1995	Co-60	-1.0000 ± 2.8600	1.6000 ± 3.1700	0.3000 ± 2.1347
MI-7575, 7576	Jul, 1995	Cs-134	1.7300 ± 2.4200	-0.6220 ± 2.3600	0.5540 ± 1.6901
MI-7575, 7576	Jul, 1995	Cs-137	-0.7550 ± 2.5100	1.2800 ± 2.3800	0.2625 ± 1.7295
MI-7575, 7576	Jul, 1995	I-131	0.1795 ± 0.2309	0.0704 ± 0.2260	0.1250 ± 0.1616
MI-7575, 7576	Jul, 1995	I-131(g)	0.8570 ± 2.2400	0.8540 ± 2.4400	0.8555 ± 1.6561

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
MI-7575, 7576	Jul, 1995	K-40	1,481.9000 ± 111.0000	1,398.8000 ± 106.0000	1,440.3500 ± 76.7414
MI-7575, 7576	Jul, 1995	Sr-89	0.6192 ± 0.9862	-0.5435 ± 0.9244	0.0378 ± 0.6758
MI-7575, 7576	Jul, 1995	Sr-90	1.2363 ± 0.4155	1.7902 ± 0.4124	1.5133 ± 0.2927
WWT-7621, 7622	Jul, 1995	I-131	0.0940 ± 0.2062	0.0628 ± 0.2223	0.0784 ± 0.1516
MI-7739, 7740	Jul, 1995	Co-60	0.8900 ± 4.9100	-0.5720 ± 4.5800	0.1590 ± 3.3572
MI-7739, 7740	Jul, 1995	Cs-137	0.8600 ± 3.7300	-0.4130 ± 3.1400	0.2235 ± 2.4379
MI-7739, 7740	Jul, 1995	I-131	0.1928 ± 0.2674	-0.0475 ± 0.2351	0.0727 ± 0.1780
G-7805, 7806	Jul, 1995	Co-60	-0.0049 ± 0.0159	0.0015 ± 0.0156	-0.0017 ± 0.0111
G-7805, 7806	Jul, 1995	Cs-134	-0.0076 ± 0.0157	0.0025 ± 0.0094	-0.0025 ± 0.0091
G-7805, 7806	Jul, 1995	Cs-137	0.0045 ± 0.0140	0.0006 ± 0.0118	0.0026 ± 0.0092
G-7805, 7806	Jul, 1995	Gr. Beta	5.0973 ± 0.1994	5.1127 ± 0.2103	5.1050 ± 0.1449
G-7805, 7806	Jul, 1995	I-131(g)	-0.0048 ± 0.0205	-0.0183 ± 0.0205	-0.0115 ± 0.0145
G-7805, 7806	Jul, 1995	K-40	6.0481 ± 0.5610	5.8484 ± 0.5100	5.9483 ± 0.3791
CW-7648, 7649	Jul, 1995	Gr. Beta	6.6883 ± 1.7265	6.7478 ± 1.7419	6.7181 ± 1.2263
CW-7648, 7649	Jul, 1995	Gr. Beta	0.7444 ± 1.2623	0.2325 ± 1.2230	0.4885 ± 0.8788
CW-7648, 7649	Jul, 1995	H-3	-64.4182 ± 97.4643	-70.1870 ± 97.2364	-67.3026 ± 68.8371
WW-7673, 7674	Jul, 1995	Gr. Beta	14.1451 ± 2.2254	14.2212 ± 2.2315	14.1831 ± 1.5757
WW-7673, 7674	Jul, 1995	H-3	15.3145 ± 81.7571	36.3720 ± 82.7373	25.8432 ± 58.1586
MI-7896, 7897	Jul, 1995	Sr-89	0.3508 ± 0.9697	0.1856 ± 0.8702	0.2682 ± 0.6514
MI-7896, 7897	Jul, 1995	Sr-90	1.7110 ± 0.4271	1.2961 ± 0.3929	1.5036 ± 0.2902
WW-7967, 7968	Jul, 1995	H-3	109.4679 ± 84.6270	70.8322 ± 82.8444	90.1500 ± 59.2134
MI-7922, 7923	Jul, 1995	Co-60	0.5680 ± 3.1300	-1.0500 ± 4.4600	-0.2410 ± 2.7244
MI-7922, 7923	Jul, 1995	Cs-137	1.2100 ± 2.8600	-0.5040 ± 3.4200	0.3530 ± 2.2291
MI-7922, 7923	Jul, 1995	I-131	0.0502 ± 0.1932	0.0416 ± 0.2336	0.0459 ± 0.1516
LW-7944, 7945	Jul, 1995	Co-60	0.0830 ± 2.2000	1.3000 ± 1.8900	0.6915 ± 1.4502
LW-7944, 7945	Jul, 1995	Cs-137	0.6400 ± 2.2200	-1.3800 ± 1.8200	-0.3700 ± 1.4353
LW-7944, 7945	Jul, 1995	Gr. Beta	4.1332 ± 0.9251	3.9971 ± 0.9393	4.0652 ± 0.6592
SW-8704, 8705	Jul, 1995	Co-60	0.1830 ± 2.4900	0.9840 ± 1.7900	0.5835 ± 1.5333
SW-8704, 8705	Jul, 1995	Cs-137	0.2640 ± 3.4500	-0.6630 ± 1.9100	-0.1995 ± 1.9717
WW-8196, 8197	Jul, 1995	H-3	51.4226 ± 87.9172	176.0234 ± 93.3551	113.7230 ± 64.1183
SWU-8318, 8319	Jul, 1995	Gr. Beta	1.9584 ± 0.4714	1.9228 ± 0.4731	1.9406 ± 0.3340
SWU-8318, 8319	Jul, 1995	H-3	102.7030 ± 103.6806	35.5141 ± 101.1620	69.1086 ± 72.4283
SWU-8318, 8319	Jul, 1995	K-40	93.2530 ± 39.7000	99.7420 ± 49.1000	96.4975 ± 31.5710
SP-8540, 8541	Jul, 1995	Gr. Alpha	5.1903 ± 1.3072	3.8567 ± 1.0701	4.5235 ± 0.8447
SP-8540, 8541	Jul, 1995	Sr-89	1,443.0886 ± 42.0809	1,419.4750 ± 35.3491	1,431.2818 ± 27.4789
SP-8540, 8541	Jul, 1995	Sr-90	15.7496 ± 3.7553	19.4328 ± 4.1309	17.5912 ± 2.7914

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
VE-8090, 8091	Jul, 1995	Gr. Beta	2.3819 ± 0.0781	2.3059 ± 0.0779	2.3439 ± 0.0552
VE-8090, 8091	Jul, 1995	K-40	2.8208 ± 0.1170	2.7639 ± 0.1330	2.7924 ± 0.0886
SW-8175, 8176	Jul, 1995	Gr. Alpha	0.5000 ± 0.6000	0.6583 ± 0.8198	0.5791 ± 0.5080
SW-8175, 8176	Jul, 1995	Gr. Beta	0.8100 ± 1.1000	0.8265 ± 1.0847	0.8182 ± 0.7724
SW-8175, 8176	Jul, 1995	K-40	89.8150 ± 23.8000	67.3590 ± 39.3000	78.5870 ± 22.9724
SW-8251, 8252	Jul, 1995	H-3	86.7952 ± 78.8856	43.9921 ± 76.9259	65.3937 ± 55.0921
SW-8606, 8607	Jul, 1995	Co-60	0.1320 ± 1.7100	-0.2180 ± 2.6000	-0.0430 ± 1.5560
SW-8606, 8607	Jul, 1995	Cs-137	-1.0400 ± 2.0400	-0.6580 ± 2.2400	-0.8490 ± 1.5149
G - 8272, 8273	Aug, 1995	K-40	6.7487 ± 0.6490	6.6636 ± 0.9730	6.7062 ± 0.5848
G - 8272, 8273	Aug, 1995	Sr-89	0.0014 ± 0.0091	-0.0007 ± 0.0029	0.0004 ± 0.0048
G - 8272, 8273	Aug, 1995	Sr-90	0.0053 ± 0.0029	0.0016 ± 0.0012	0.0034 ± 0.0016
G-8272, 8273	Aug, 1995	Gr. Beta	6.2167 ± 0.2594	5.9667 ± 0.2551	6.0917 ± 0.1819
MI-8293, 8294	Aug, 1995	I-131	-0.1058 ± 0.1908	0.0093 ± 0.2009	-0.0483 ± 0.1385
MI-8389, 8390	Aug, 1995	I-131	-0.0127 ± 0.1267	0.1153 ± 0.1318	0.0513 ± 0.0914
MI-8389, 8390	Aug, 1995	K-40	1,543.8000 ± 120.0000	1,369.6000 ± 162.0000	1,456.7000 ± 100.8018
MI-8413, 8414	Aug, 1995	Co-60	0.2940 ± 3.1400	-2.3500 ± 5.2200	-1.0280 ± 3.0458
MI-8413, 8414	Aug, 1995	Cs-137	-0.7370 ± 2.8900	-1.3600 ± 3.3100	-1.0485 ± 2.1971
MI-8413, 8414	Aug, 1995	I-131	0.1142 ± 0.2124	0.0598 ± 0.2344	0.0870 ± 0.1581
LW-8440, 8441	Aug, 1995	Co-60	0.1030 ± 2.3800	1.0300 ± 1.8100	0.5665 ± 1.4950
LW-8440, 8441	Aug, 1995	Cs-137	0.7760 ± 1.9900	-0.3890 ± 2.0500	0.1935 ± 1.4285
LW-8440, 8441	Aug, 1995	Gr. Beta	3.3064 ± 1.1388	4.6623 ± 1.2154	3.9844 ± 0.8327
WW-8518, 8519	Aug, 1995	Co-60	1.4700 ± 3.1400	-1.8100 ± 2.9800	-0.1700 ± 2.1645
WW-8518, 8519	Aug, 1995	Cs-137	1.7100 ± 2.8700	0.4430 ± 2.7700	1.0765 ± 1.9944
WW-8518, 8519	Aug, 1995	H-3	10.6795 ± 74.0469	-19.5791 ± 72.5777	-4.4498 ± 51.8422
VE-8564, 8565	Aug, 1995	Co-60	0.0053 ± 0.0122	0.0054 ± 0.0128	0.0053 ± 0.0088
VE-8564, 8565	Aug, 1995	Cs-137	0.0038 ± 0.0093	-0.0003 ± 0.0082	0.0018 ± 0.0062
MI-8585, 8586	Aug, 1995	Co-60	-0.4810 ± 4.0600	1.8800 ± 2.5900	0.6995 ± 2.4079
MI-8585, 8586	Aug, 1995	Cs-134	0.1220 ± 3.5000	0.9370 ± 2.2700	0.5295 ± 2.0858
MI-8585, 8586	Aug, 1995	Cs-137	1.7700 ± 3.6400	0.2160 ± 2.0700	0.9930 ± 2.0937
MI-8585, 8586	Aug, 1995	I-131	-0.2002 ± 0.2079	0.0732 ± 0.1900	-0.0635 ± 0.1408
MI-8585, 8586	Aug, 1995	I-131(g)	0.1360 ± 9.0300	2.4300 ± 6.8100	1.2830 ± 5.6550
MI-8585, 8586	Aug, 1995	K-40	1,454.6000 ± 150.0000	1,478.2000 ± 104.0000	1,466.4000 ± 91.2634
MI-8585, 8586	Aug, 1995	Sr-89	0.1158 ± 1.1111	-0.0833 ± 0.9491	0.0162 ± 0.7306
MI-8585, 8586	Aug, 1995	Sr-90	1.9078 ± 0.4296	1.6029 ± 0.3807	1.7553 ± 0.2870
MI-8674, 8675	Aug, 1995	Co-60	-0.7910 ± 3.2300	0.4890 ± 3.3400	-0.1510 ± 2.3232
MI-8674, 8675	Aug, 1995	Cs-137	0.7690 ± 2.4300	0.4160 ± 2.4000	0.5925 ± 1.7077

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
MI-8674, 8675	Aug, 1995	I-131	0.1471 ± 0.2525	-0.0869 ± 0.2167	0.0301 ± 0.1664
SW-8648, 8649	Aug, 1995	H-3	35.5546 ± 75.1429	21.3328 ± 74.4670	28.4437 ± 52.8956
F-8754, 8755	Aug, 1995	Co-60	0.0009 ± 0.0110	0.0031 ± 0.0106	0.0020 ± 0.0076
F-8754, 8755	Aug, 1995	Cs-134	-0.0026 ± 0.0090	-0.0022 ± 0.0087	-0.0024 ± 0.0063
F-8754, 8755	Aug, 1995	Cs-137	0.0528 ± 0.0207	0.0563 ± 0.0171	0.0546 ± 0.0134
F-8754, 8755	Aug, 1995	Gr. Beta	13.1178 ± 0.3041	12.6488 ± 0.2780	12.8833 ± 0.2060
F-8754, 8755	Aug, 1995	I-131(g)	0.0026 ± 0.0139	0.0013 ± 0.0121	0.0019 ± 0.0092
F-8754, 8755	Aug, 1995	K-40	2.8119 ± 0.3670	3.2605 ± 0.3670	3.0362 ± 0.2595
VE-8946, 8947	Aug, 1995	Gr. Alpha	0.2000 ± 0.0800	0.2018 ± 0.0786	0.2009 ± 0.0561
VE-8946, 8947	Aug, 1995	Gr. Beta	4.3000 ± 0.1500	4.3179 ± 0.1511	4.3089 ± 0.1065
VE-8946, 8947	Aug, 1995	K-40	3.9615 ± 0.2670	4.0418 ± 0.3300	4.0017 ± 0.2122
VE - 8802, 8803	Aug, 1995	Sr-89	-0.0001 ± 0.0018	-0.0004 ± 0.0022	-0.0002 ± 0.0014
VE - 8802, 8803	Aug, 1995	Sr-90	0.0011 ± 0.0006	0.0013 ± 0.0007	0.0012 ± 0.0005
VE-8802, 8803	Aug, 1995	K-40	2.3052 ± 0.2360	2.3039 ± 0.3070	2.3046 ± 0.1936
VE-8845, 8846	Aug, 1995	I-131	0.0098 ± 0.1785	0.0835 ± 0.1740	0.0467 ± 0.1246
CW-8873, 8874	Aug, 1995	Gr. Beta	1.8586 ± 1.3992	4.2592 ± 1.5511	3.0589 ± 1.0445
CW-8873, 8874	Aug, 1995	Gr. Beta	-0.6043 ± 1.1348	-0.0465 ± 1.1799	-0.3254 ± 0.8185
MI-8902, 8903	Aug, 1995	I-131	-0.0387 ± 0.2325	0.1320 ± 0.3198	0.0466 ± 0.1977
VE-9035, 9036	Aug, 1995	K-40	2.1934 ± 0.2790	2.3847 ± 0.3380	2.2891 ± 0.2191
SW-9056, 9057	Aug, 1995	H-3	140.7425 ± 79.5937	55.2281 ± 75.6687	97.9853 ± 54.9111
MI-9113, 9114	Aug, 1995	I-131	0.2205 ± 0.3289	0.2711 ± 0.2835	0.2458 ± 0.2171
LW-9079, 9080	Aug, 1995	Co-60	0.8410 ± 2.8400	0.1630 ± 2.9900	0.5020 ± 2.0619
LW-9079, 9080	Aug, 1995	Cs-137	0.7700 ± 2.7700	-0.5330 ± 2.6700	0.1185 ± 1.9237
LW-9079, 9080	Aug, 1995	Gr. Beta	2.7566 ± 0.8607	2.6961 ± 0.8549	2.7264 ± 0.6065
SW-9183, 9184	Aug, 1995	Co-60	-0.3280 ± 3.0000	2.2200 ± 4.0400	0.9460 ± 2.5160
SW-9183, 9184	Aug, 1995	Cs-137	0.8200 ± 3.4400	0.2580 ± 4.3700	0.5390 ± 2.7808
SWU-9162, 9163	Aug, 1995	Gr. Beta	2.5000 ± 0.5000	2.5094 ± 0.5480	2.5047 ± 0.3709
SWU-9162, 9163	Aug, 1995	H-3	152.0000 ± 88.0000	157.4341 ± 83.7394	154.7170 ± 60.7377
WW-9276, 9277	Aug, 1995	H-3	1,636.0299 ± 130.9904	1,680.8118 ± 132.2095	1,658.4209 ± 93.0562
VE-9210, 9211	Aug, 1995	Gr. Beta	4.1000 ± 0.2000	4.0920 ± 0.1675	4.0960 ± 0.1304
VE-9210, 9211	Aug, 1995	K-40	4.6449 ± 0.1090	4.6203 ± 0.1150	4.6326 ± 0.0792
DW-9371, 9372	Aug, 1995	Gr. Beta	4.9900 ± 1.1960	4.5327 ± 1.1679	4.7613 ± 0.8358
DW-9371, 9372	Aug, 1995	I-131	0.1312 ± 0.2093	0.1381 ± 0.1961	0.1346 ± 0.1434
MI-9297, 9298	Aug, 1995	I-131	0.0434 ± 0.1996	0.0510 ± 0.2134	0.0472 ± 0.1461
MI-9297, 9298	Aug, 1995	K-40	1,727.8000 ± 180.0000	1,602.7000 ± 172.0000	1,665.2500 ± 124.4829
WW-9252, 9253	Sep, 1995	H-3	530.8948 ± 98.7085	538.0449 ± 98.9671	534.4698 ± 69.8889



Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
MI-9327, 9328	Sep, 1995	I-131	0.1442 ± 0.1680	0.0972 ± 0.1575	0.1207 ± 0.1151
WW-9396, 9397	Sep, 1995	Co-60	2.0600 ± 2.4700	0.6870 ± 2.9500	1.3735 ± 1.9238
WW-9396, 9397	Sep, 1995	Cs-137	2.6700 ± 2.7300	0.7790 ± 2.5900	1.7245 ± 1.8816
WW-9396, 9397	Sep, 1995	Gr. Beta	0.6947 ± 1.3597	1.7640 ± 1.3095	1.2293 ± 0.9439
WW-9396, 9397	Sep, 1995	H-3	14.9063 ± 76.6085	48.8927 ± 78.1795	31.8995 ± 54.7287
SW - 10075, 10076	Sep, 1995	H-3	262.0954 ± 87.9940	265.6857 ± 88.1404	263.8905 ± 62.2730
SW - 10075, 10076	Sep, 1995	Sr-89	-1.1140 ± 0.9865	0.7627 ± 0.9505	-0.1756 ± 0.6849
SW - 10075, 10076	Sep, 1995	Sr-90	0.6409 ± 0.2630	0.3425 ± 0.2113	0.4917 ± 0.1687
MI-9350, 9351	Sep, 1995	I-131	-0.0990 ± 0.1565	0.0745 ± 0.1638	-0.0123 ± 0.1133
MI-9350, 9351	Sep, 1995	K-40	1,335.3000 ± 163.0000	1,521.4000 ± 179.0000	1,428.3500 ± 121.0475
MI - 9463, 9464	Sep, 1995	I-131	0.1059 ± 0.1889	0.0550 ± 0.1695	0.0804 ± 0.1269
MI-9463, 9464	Sep, 1995	K-40	1,814.9000 ± 139.0000	1,743.1000 ± 180.0000	1,779.0000 ± 113.7113
BS - 9710, 9711	Sep, 1995	K-40	8.3415 ± 0.3890	8.7853 ± 0.3190	8.5634 ± 0.2515
CW - 9486, 9487	Sep, 1995	Gr. Beta	0.3695 ± 1.1728	-0.8827 ± 1.4122	-0.2566 ± 0.9179
CW - 9486, 9487	Sep, 1995	Gr. Beta	3.1540 ± 1.5156	3.4306 ± 1.5908	3.2923 ± 1.0986
SO - 9562, 9563	Sep, 1995	Cs-137	0.4189 ± 0.0216	0.4786 ± 0.0443	0.4488 ± 0.0246
SO - 9562, 9563	Sep, 1995	K-40	14.9730 ± 0.4070	15.6780 ± 0.6540	15.3255 ± 0.3852
VE-9515, 9516	Sep, 1995	Co-60	-0.0018 ± 0.0107	-0.0046 ± 0.0074	-0.0032 ± 0.0065
VE-9515, 9516	Sep, 1995	Cs-137	-0.0003 ± 0.0080	-0.0017 ± 0.0071	-0.0010 ± 0.0054
MI-9611, 9612	Sep, 1995	I-131	0.1395 ± 0.2011	0.0905 ± 0.2020	0.1150 ± 0.1425
MI-9611, 9612	Sep, 1995	K-40	1,463.6000 ± 163.0000	1,381.6000 ± 117.0000	1,422.6000 ± 100.3220
SW-9583, 9584	Sep, 1995	H-3	191.7867 ± 84.3836	59.5611 ± 78.5845	125.6739 ± 57.6544
LW - 9632, 9633	Sep, 1995	Gr. Beta	4.9397 ± 0.8738	4.1679 ± 0.7956	4.5538 ± 0.5909
LW-9632, 9633	Sep, 1995	Co-60	0.2420 ± 2.5400	0.6900 ± 1.8800	0.4660 ± 1.5800
LW-9632, 9633	Sep, 1995	Cs-134	-0.9850 ± 2.5000	0.2670 ± 2.3000	-0.3590 ± 1.6985
LW-9632, 9633	Sep, 1995	Cs-137	0.7330 ± 2.7300	1.9600 ± 2.0000	1.3465 ± 1.6921
LW-9632, 9633	Sep, 1995	I-131	-0.0233 ± 0.1923	0.1754 ± 0.2465	0.0761 ± 0.1563
LW-9632, 9633	Sep, 1995	I-131(g)	-1.2000 ± 7.8600	-1.7800 ± 6.9200	-1.4900 ± 5.2361
LW-9632, 9633	Sep, 1995	K-40	73.2000 ± 35.1000	84.4840 ± 38.9000	78.8420 ± 26.1974
MI-9677, 9678	Sep, 1995	I-131	0.1492 ± 0.1575	-0.0782 ± 0.2124	0.0355 ± 0.1322
MI-9677, 9678	Sep, 1995	K-40	1,579.6000 ± 149.0000	1,387.5000 ± 150.0000	1,483.5500 ± 105.7131
CW-9654, 9655	Sep, 1995	Gr. Beta	3.8956 ± 1.4702	4.0324 ± 1.4561	3.9640 ± 1.0346
CW-9654, 9655	Sep, 1995	Gr. Beta	-0.4258 ± 1.0721	0.1637 ± 1.0778	-0.1311 ± 0.7601
MI-9758, 9759	Sep, 1995	Co-60	0.0531 ± 2.3000	-1.0600 ± 5.6200	-0.5035 ± 3.0362
MI-9758, 9759	Sep, 1995	Cs-137	0.1530 ± 2.1000	3.3300 ± 4.1300	1.7415 ± 2.3166
MI-9758, 9759	Sep, 1995	I-131	0.0357 ± 0.1262	0.1303 ± 0.1374	0.0830 ± 0.0933

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
VE-9781, 9782	Sep, 1995	K-40	3.6858 ± 0.3040	3.8621 ± 0.3830	3.7740 ± 0.2445
WW - 9917, 9918	Sep, 1995	Gr. Alpha	1.0000 ± 1.2000	0.1895 ± 1.3470	0.5948 ± 0.9020
WW - 9917, 9918	Sep, 1995	Gr. Beta	2.0000 ± 1.6000	1.4626 ± 1.5372	1.7313 ± 1.1094
WW - 9917, 9918	Sep, 1995	K-40	61.5990 ± 27.2000	55.4580 ± 30.1000	58.5285 ± 20.2845
SWU - 10054, 10055	Sep, 1995	Gr. Beta	2.8699 ± 0.6506	2.9815 ± 0.6273	2.9257 ± 0.4519
SWU - 10054, 10055	Sep, 1995	H-3	272.2258 ± 86.5578	186.8216 ± 82.9725	229.5237 ± 59.9514
CW-9848, 9849	Sep, 1995	Gr. Beta	10.0958 ± 2.0529	10.6091 ± 2.0035	10.3525 ± 1.4343
CW-9848, 9849	Sep, 1995	Gr. Beta	0.6483 ± 1.1139	0.0874 ± 1.0548	0.3678 ± 0.7670
CW-9848, 9849	Sep, 1995	H-3	2.3592 ± 75.6414	-2.9490 ± 75.3926	-0.2949 ± 53.3987
MI-9873, 9874	Sep, 1995	I-131	0.1317 ± 0.1666	0.2502 ± 0.2503	0.1909 ± 0.1503
SW - 10174, 10175	Sep, 1995	Co-60	-0.2100 ± 1.9300	0.0995 ± 3.2500	-0.0553 ± 1.8899
SW - 10174, 10175	Sep, 1995	Cs-137	-0.0756 ± 2.9100	-0.1070 ± 2.8500	-0.0913 ± 2.0366
WW-9988, 9989	Sep, 1995	H-3	126.1391 ± 81.1795	18.2725 ± 76.3358	72.2058 ± 55.7164
SWT - 10033, 10034	Sep, 1995	Gr. Beta	1.7710 ± 0.4680	1.9280 ± 0.4610	1.8495 ± 0.3285
SW - 10216, 10217	Sep, 1995	H-3	76.4356 ± 78.6697	74.6580 ± 78.5893	75.5468 ± 55.5994
SW - 10261, 10262	Sep, 1995	H-3	279.1447 ± 88.4376	300.6173 ± 89.3023	289.8810 ± 62.8413
VE - 10012, 10013	Sep, 1995	Gr. Beta	5.6577 ± 0.3023	5.0000 ± 0.4415	5.3288 ± 0.2675
MI-10120, 10121	Sep, 1995	I-131	0.1055 ± 0.1292	0.0027 ± 0.1196	0.0541 ± 0.0880
MI-10120, 10121	Sep, 1995	K-40	1,446.6000 ± 163.0000	1,300.9000 ± 145.0000	1,373.7500 ± 109.0802
SW-10195, 10196	Sep, 1995	H-3	-19.5632 ± 74.6957	103.1512 ± 80.3270	41.7940 ± 54.8450
CW - 10240, 10241	Sep, 1995	Gr. Beta	2.7919 ± 1.4430	3.6514 ± 1.5144	3.2216 ± 1.0459
CW - 10240, 10241	Sep, 1995	Gr. Beta	0.5909 ± 1.1545	2.4180 ± 1.3151	1.5045 ± 0.8750
SW-10150, 10151	Sep, 1995	H-3	119.1208 ± 81.0078	129.7884 ± 81.4747	124.4546 ± 57.4465
SW - 10282, 10283	Oct, 1995	Gr. Beta	2.1771 ± 0.4791	1.8939 ± 0.4661	2.0355 ± 0.3342
WW - 10349, 10350	Oct, 1995	H-3	64.9002 ± 80.1767	47.3596 ± 79.4055	56.1299 ± 56.4215
WW-10349, 10350	Oct, 1995	Co-60	0.0850 ± 1.2400	1.4900 ± 2.0900	0.7875 ± 1.2151
WW-10349, 10350	Oct, 1995	Cs-137	0.7540 ± 1.1500	0.0703 ± 2.2400	0.4122 ± 1.2590
VE-10370, 10371	Oct, 1995	K-40	3.3443 ± 0.4620	3.2897 ± 0.4770	3.3170 ± 0.3320
F-10491, 10492	Oct, 1995	Co-60	-0.0087 ± 0.0120	0.0051 ± 0.0078	-0.0018 ± 0.0072
F-10491, 10492	Oct, 1995	Cs-137	-0.0053 ± 0.0105	-0.0009 ± 0.0056	-0.0031 ± 0.0059
AP - 10752, 10753	Oct, 1995	Co-60	-0.0006 ± 0.0006	-0.0007 ± 0.0005	-0.0007 ± 0.0004
AP - 10752, 10753	Oct, 1995	Cs-134	0.0007 ± 0.0004	0.0003 ± 0.0007	0.0005 ± 0.0004
AP - 10752, 10753	Oct, 1995	Cs-137	-0.0004 ± 0.0005	0.0000 ± 0.0005	-0.0002 ± 0.0003
AP - 10752, 10753	Oct, 1995	I-131(g)	0.0016 ± 0.0034	-0.0005 ± 0.0047	0.0005 ± 0.0029
AP - 10752, 10753	Oct, 1995	K-40	0.0344 ± 0.0103	0.0436 ± 0.0113	0.0390 ± 0.0076
AP - 11141, 11142	Oct, 1995	Co-60	0.0001 ± 0.0004	0.0002 ± 0.0002	0.0001 ± 0.0002

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
AP - 11141, 11142	Oct, 1995	Cs-137	0.0000 ± 0.0003	0.0003 ± 0.0004	0.0002 ± 0.0002
MI - 10324, 10325	Oct, 1995	Co-60	0.3420 ± 2.2000	-1.0200 ± 3.2000	-0.3390 ± 1.9416
MI - 10324, 10325	Oct, 1995	Cs-134	1.4400 ± 1.9300	-1.0300 ± 2.5800	0.2050 ± 1.6110
MI - 10324, 10325	Oct, 1995	Cs-137	0.3320 ± 2.0800	0.9930 ± 2.5600	0.6625 ± 1.6492
MI - 10324, 10325	Oct, 1995	I-131	0.1255 ± 0.1379	0.0629 ± 0.2061	0.0942 ± 0.1240
MI - 10324, 10325	Oct, 1995	I-131(g)	-0.8920 ± 2.6900	1.1700 ± 3.2900	0.1390 ± 2.1249
MI - 10324, 10325	Oct, 1995	K-40	1,440.7000 ± 88.9000	1,432.5000 ± 120.0000	1,436.6000 ± 74.6713
MI - 10324, 10325	Oct, 1995	Sr-89	-0.4912 ± 0.9456	-1.3268 ± 0.8823	-0.9090 ± 0.6466
MI - 10324, 10325	Oct, 1995	Sr-90	1.6952 ± 0.3864	1.7252 ± 0.3803	1.7102 ± 0.2711
WWU-10392, 10393	Oct, 1995	I-131	0.0442 ± 0.1674	0.0223 ± 0.1698	0.0333 ± 0.1192
F-10470, 10471	Oct, 1995	Co-60	0.0049 ± 0.0063	0.0037 ± 0.0052	0.0043 ± 0.0041
F-10470, 10471	Oct, 1995	Cs-137	0.0003 ± 0.0050	0.0020 ± 0.0037	0.0011 ± 0.0031
SW - 10413, 10414	Oct, 1995	H-3	41.1376 ± 77.3777	62.2941 ± 78.3358	51.7159 ± 55.0541
WW-10437, 10438	Oct, 1995	H-3	81.6446 ± 78.1486	-10.6493 ± 73.8374	35.4977 ± 53.7568
SO - 10512, 10513	Oct, 1995	I-131	0.0662 ± 0.1335	0.0996 ± 0.1517	0.0829 ± 0.1010
SO - 10577, 10578	Oct, 1995	Co-60	0.0033 ± 0.0117	0.0032 ± 0.0142	0.0033 ± 0.0092
SO - 10577, 10578	Oct, 1995	Cs-134	0.0204 ± 0.0110	0.0277 ± 0.0128	0.0241 ± 0.0084
SO - 10577, 10578	Oct, 1995	Cs-137	0.1528 ± 0.0249	0.1687 ± 0.0241	0.1608 ± 0.0173
SO - 10577, 10578	Oct, 1995	Gr. Beta	18.4120 ± 3.0080	20.0560 ± 3.0020	19.2340 ± 2.1249
SO - 10577, 10578	Oct, 1995	K-40	19.0300 ± 0.5920	18.4690 ± 0.6160	18.7495 ± 0.4272
MI - 10598, 10599	Oct, 1995	I-131	0.0233 ± 0.1528	-0.1143 ± 0.1290	-0.0455 ± 0.1000
F - 10666, 10667	Oct, 1995	Co-60	-0.0011 ± 0.0149	0.0022 ± 0.0134	0.0005 ± 0.0100
F - 10666, 10667	Oct, 1995	Cs-137	0.0062 ± 0.0109	0.0088 ± 0.0102	0.0075 ± 0.0075
WW - 11206, 11207	Oct, 1995	H-3	144.1480 ± 82.0522	298.7082 ± 106.1128	221.4281 ± 67.0681
F - 10687, 10688	Oct, 1995	Co-60	-0.0056 ± 0.0092	0.0052 ± 0.0111	-0.0002 ± 0.0072
F - 10687, 10688	Oct, 1995	Cs-137	0.0051 ± 0.0081	-0.0007 ± 0.0102	0.0022 ± 0.0065
MI - 10710, 10711	Oct, 1995	I-131	-0.0702 ± 0.1760	0.0060 ± 0.1746	-0.0321 ± 0.1240
WW - 10797, 10798	Oct, 1995	H-3	255.7388 ± 88.0244	190.9283 ± 85.4061	223.3336 ± 61.3239
F - 10882, 10883	Oct, 1995	K-40	2.4355 ± 0.2770	2.3158 ± 0.4530	2.3757 ± 0.2655
CW - 10826, 10827	Oct, 1995	Gr. Beta	1.9841 ± 1.3273	1.1082 ± 1.2551	1.5461 ± 0.9134
SWU - 10923, 10924	Oct, 1995	Gr. Beta	2.3790 ± 0.5752	2.7204 ± 0.5897	2.5497 ± 0.4119
SWU - 10923, 10924	Oct, 1995	H-3	908.5097 ± 108.7289	878.3050 ± 107.7372	893.4074 ± 76.5331
F - 10969, 10970	Oct, 1995	Cs-137	0.0391 ± 0.0173	0.0589 ± 0.0281	0.0490 ± 0.0165
F - 10969, 10970	Oct, 1995	Gr. Beta	2.3088 ± 0.0750	2.1970 ± 0.0758	2.2529 ± 0.0533
F - 10969, 10970	Oct, 1995	K-40	2.1279 ± 0.3500	1.8750 ± 0.4010	2.0015 ± 0.2661
CW - 10773, 10774	Oct, 1995	Gr. Beta	8.4208 ± 1.8580	9.9060 ± 2.0352	9.1634 ± 1.3779

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
CW - 10773, 10774	Oct, 1995	Gr. Beta	-0.2668 ± 1.0986	0.8745 ± 1.1142	0.3039 ± 0.7824
CW - 10773, 10774	Oct, 1995	H-3	51.6603 ± 77.7745	67.5106 ± 78.4891	59.5854 ± 55.2481
CW - 10858, 10859	Oct, 1995	Gr. Beta	3.8461 ± 1.5209	5.5313 ± 1.6346	4.6887 ± 1.1163
CW - 10858, 10859	Oct, 1995	Gr. Beta	0.1646 ± 1.1055	-0.2698 ± 1.0572	-0.0526 ± 0.7648
BS - 11056, 11057	Oct, 1995	Cs-137	0.3037 ± 0.0214	0.3183 ± 0.0167	0.3110 ± 0.0136
BS - 11056, 11057	Oct, 1995	K-40	18.5050 ± 0.4060	18.2890 ± 0.3850	18.3970 ± 0.2798
F - 11078, 11079	Oct, 1995	K-40	2.6694 ± 0.1700	2.7062 ± 0.1140	2.6878 ± 0.1023
CW - 11261, 11262	Oct, 1995	Gr. Beta	3.4182 ± 1.5101	3.8050 ± 1.4573	3.6116 ± 1.0493
CW - 11261, 11262	Oct, 1995	Gr. Beta	-0.9607 ± 0.9909	-0.1199 ± 1.1241	-0.5403 ± 0.7492
MI - 11162, 11163	Oct, 1995	I-131	0.2163 ± 0.2174	0.0872 ± 0.2019	0.1517 ± 0.1483
LW - 11185, 11186	Oct, 1995	Co-60	0.2560 ± 2.0000	0.0639 ± 3.9000	0.1600 ± 2.1915
LW - 11185, 11186	Oct, 1995	Cs-137	0.9690 ± 1.9600	1.3800 ± 3.2600	1.1745 ± 1.9019
LW - 11185, 11186	Oct, 1995	Gr. Beta	7.9276 ± 1.3579	6.7150 ± 1.2839	7.3213 ± 0.9344
MI - 11284, 11285	Oct, 1995	I-131	0.1805 ± 0.2626	0.1868 ± 0.2352	0.1837 ± 0.1763
MI - 11284, 11285	Oct, 1995	K-40	1,759.4000 ± 182.0000	1,581.9000 ± 164.0000	1,670.6500 ± 122.4949
DW - 11565, 11566	Oct, 1995	Gr. Beta	2.3856 ± 0.4715	2.6159 ± 0.5003	2.5008 ± 0.3437
DW - 11565, 11566	Oct, 1995	I-131	-0.1047 ± 0.3170	0.1835 ± 0.2833	0.0394 ± 0.2126
SW - 11309, 11310	Oct, 1995	Gr. Alpha	0.5829 ± 0.5262	1.1580 ± 0.6097	0.8705 ± 0.4027
SW - 11309, 11310	Oct, 1995	Gr. Beta	3.1323 ± 0.6596	2.5628 ± 0.6351	2.8475 ± 0.4579
MI - 11351, 11352	Oct, 1995	I-131	0.0319 ± 0.2455	0.0097 ± 0.2195	0.0208 ± 0.1647
MI - 11351, 11352	Oct, 1995	K-40	1,492.6000 ± 166.0000	1,431.8000 ± 160.0000	1,462.2000 ± 115.2779
SW - 11330, 11331	Oct, 1995	H-3	83.4709 ± 77.8239	106.3960 ± 78.8560	94.9335 ± 55.3959
MI - 11407, 11408	Oct, 1995	I-131	-0.1272 ± 0.1871	0.1059 ± 0.1876	-0.0106 ± 0.1325
MI - 11433, 11434	Nov, 1995	I-131	-0.0607 ± 0.1789	0.1317 ± 0.1462	0.0355 ± 0.1155
MI - 11433, 11434	Nov, 1995	K-40	1,446.0000 ± 167.0000	1,450.8000 ± 119.0000	1,448.4000 ± 102.5305
MI - 11433, 11434	Nov, 1995	Sr-89	-0.0542 ± 1.2560	-0.0961 ± 1.1700	-0.0752 ± 0.8583
MI - 11433, 11434	Nov, 1995	Sr-90	1.9383 ± 0.4889	1.8933 ± 0.4555	1.9158 ± 0.3341
BS - 11453, 11454	Nov, 1995	Gr. Beta	8.3022 ± 1.4598	7.0981 ± 1.3963	7.7002 ± 1.0100
BS - 11453, 11454	Nov, 1995	K-40	13.4130 ± 0.6950	14.3840 ± 1.0200	13.8985 ± 0.6171
MI - 11476, 11477	Nov, 1995	I-131	-0.0379 ± 0.1804	0.0878 ± 0.2013	0.0250 ± 0.1352
MI - 11476, 11477	Nov, 1995	K-40	1,425.6000 ± 155.0000	1,379.5000 ± 93.1000	1,402.5500 ± 90.4055
MI - 11476, 11477	Nov, 1995	Sr-89	0.1529 ± 1.5801	0.6656 ± 1.1518	0.4092 ± 0.9777
MI - 11476, 11477	Nov, 1995	Sr-90	1.5845 ± 0.6297	0.7492 ± 0.4308	1.1668 ± 0.3815
WV - 11657, 11658	Nov, 1995	Gr. Beta	0.3756 ± 0.4690	0.4697 ± 0.5060	0.4226 ± 0.3450
WV - 11657, 11658	Nov, 1995	H-3	110.2042 ± 79.0344	172.1940 ± 81.6909	141.1991 ± 56.8327
SW - 11519, 11520	Nov, 1995	H-3	86.0705 ± 77.9529	10.3285 ± 74.5326	48.1995 ± 53.9253

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
WW - 11837, 11838	Nov, 1995	Co-60	0.6630 ± 1.5100	0.0996 ± 3.2500	0.3813 ± 1.7918
WW - 11837, 11838	Nov, 1995	Cs-137	0.0882 ± 1.6800	-0.5360 ± 2.9800	-0.2239 ± 1.7105
MI - 11588, 11589	Nov, 1995	K-40	1,282.9000 ± 161.0000	1,390.4000 ± 145.0000	1,336.6500 ± 108.3351
MI - 11611, 11612	Nov, 1995	I-131	0.0368 ± 0.2007	0.1136 ± 0.2056	0.0752 ± 0.1437
MI - 11611, 11612	Nov, 1995	K-40	1,368.1000 ± 112.0000	1,291.1000 ± 158.0000	1,329.6000 ± 96.8349
CW - 11678, 11679	Nov, 1995	Gr. Beta	2.6565 ± 1.5123	2.0599 ± 1.3520	2.3582 ± 1.0143
MI - 11786, 11787	Nov, 1995	I-131	0.0519 ± 0.1914	-0.0830 ± 0.1791	-0.0156 ± 0.1311
MI - 11786, 11787	Nov, 1995	K-40	1,493.0000 ± 100.0000	1,459.1000 ± 170.0000	1,476.0500 ± 98.6154
CW - 11865, 11866	Nov, 1995	Gr. Beta	1.9803 ± 1.4093	1.1128 ± 1.3439	1.5466 ± 0.9737
LW - 11926, 11927	Nov, 1995	Co-60	-0.6990 ± 2.1700	-1.3700 ± 3.3200	-1.0345 ± 1.9831
LW - 11926, 11927	Nov, 1995	Cs-137	1.3600 ± 2.0100	1.6800 ± 2.6800	1.5200 ± 1.6750
LW - 11926, 11927	Nov, 1995	Gr. Beta	3.5794 ± 0.9059	4.2705 ± 0.9513	3.9250 ± 0.6568
PW - 12451, 12452	Nov, 1995	Co-60	0.1370 ± 1.6200	1.5900 ± 2.0000	0.8635 ± 1.2869
PW - 12451, 12452	Nov, 1995	Cs-137	-1.0900 ± 1.7200	0.8750 ± 2.5000	-0.1075 ± 1.5173
W - 12659, 12660	Nov, 1995	H-3	10,454.1364 ± 283.5019	10,315.0095 ± 281.7458	10,384.5729 ± 199.8462
G - 12184, 12185	Nov, 1995	K-40	7.1257 ± 0.4820	7.2496 ± 0.5540	7.1877 ± 0.3672
DW - 12229, 12230	Nov, 1995	Gr. Beta	1.4868 ± 0.4353	1.5192 ± 0.4562	1.5030 ± 0.3153
DW - 12229, 12230	Nov, 1995	H-3	48.3898 ± 76.5630	70.8565 ± 77.5707	59.6232 ± 54.4957
SO - 12430, 12431	Dec, 1995	Cs-137	0.2060 ± 0.0696	0.1746 ± 0.0629	0.1903 ± 0.0469
SO - 12430, 12431	Dec, 1995	Gr. Alpha	15.7026 ± 4.4545	10.9075 ± 4.1010	13.3051 ± 3.0274
SO - 12430, 12431	Dec, 1995	Gr. Beta	22.3778 ± 2.8536	23.0769 ± 2.9630	22.7273 ± 2.0568
SO - 12430, 12431	Dec, 1995	K-40	16.6990 ± 1.3000	17.6620 ± 1.3500	17.1805 ± 0.9371
LW - 12152, 12153	Dec, 1995	Co-60	1.4300 ± 3.3200	3.3800 ± 2.1000	2.4050 ± 1.9642
LW - 12152, 12153	Dec, 1995	Cs-137	-0.1400 ± 3.1900	0.3640 ± 2.8500	0.1120 ± 2.1388
LW - 12152, 12153	Dec, 1995	Gr. Beta	5.1509 ± 1.3079	4.8804 ± 1.1924	5.0157 ± 0.8849
MI - 12250, 12251	Dec, 1995	I-131	0.1190 ± 0.1943	0.1981 ± 0.2178	0.1586 ± 0.1460
MI - 12250, 12251	Dec, 1995	K-40	1,470.3000 ± 163.0000	1,386.6000 ± 126.0000	1,428.4500 ± 103.0109
WW - 12298, 12299	Dec, 1995	Co-60	0.4210 ± 2.3800	0.1770 ± 4.0900	0.2990 ± 2.3660
WW - 12298, 12299	Dec, 1995	Cs-137	0.1580 ± 2.0500	1.5200 ± 2.7700	0.8390 ± 1.7230
WW - 12298, 12299	Dec, 1995	H-3	42.7622 ± 77.9643	99.7786 ± 80.5282	71.2704 ± 56.0429
LW - 12380, 12381	Dec, 1995	Co-60	1.2700 ± 2.4400	2.2300 ± 2.2300	1.7500 ± 1.6528
LW - 12380, 12381	Dec, 1995	Cs-134	0.5120 ± 2.1300	1.9500 ± 2.2200	1.2310 ± 1.5383
LW - 12380, 12381	Dec, 1995	Cs-137	0.8060 ± 2.5100	1.2200 ± 2.4400	1.0130 ± 1.7503
LW - 12380, 12381	Dec, 1995	I-131	0.0861 ± 0.1243	0.1222 ± 0.2055	0.1041 ± 0.1201
LW - 12380, 12381	Dec, 1995	I-131(g)	-7.3600 ± 13.8000	4.7100 ± 13.4000	-1.3250 ± 9.6177
LW - 12380, 12381	Dec, 1995	K-40	129.0000 ± 41.2000	133.0000 ± 34.7000	131.0000 ± 26.9329

Table A-5. In-house "duplicate" samples.

Lab Codes <sup>b</sup>	Sample Date	Analysis	Concentration in pCi/L <sup>a</sup>		
			First Result	Second Result	Averaged Result
MI - 12325, 12326	Dec, 1995	I-131	-0.1263 ± 0.2456	0.1598 ± 0.2063	0.0167 ± 0.1604
MI - 12325, 12326	Dec, 1995	K-40	1,409.0000 ± 172.0000	1,438.6000 ± 169.0000	1,423.8000 ± 120.5664
WW - 12347, 12348	Dec, 1995	H-3	77.2534 ± 78.8630	87.6308 ± 79.3168	82.4421 ± 55.9252
F - 12688, 12689	Dec, 1995	Co-60	0.0009 ± 0.0117	0.0011 ± 0.0141	0.0010 ± 0.0092
F - 12688, 12689	Dec, 1995	Cs-134	0.0044 ± 0.0094	-0.0069 ± 0.0138	-0.0013 ± 0.0084
F - 12688, 12689	Dec, 1995	Cs-137	0.0366 ± 0.0179	0.0266 ± 0.0149	0.0316 ± 0.0116
F - 12688, 12689	Dec, 1995	I-131(g)	-0.0050 ± 0.0244	0.0254 ± 0.0422	0.0102 ± 0.0244
F - 12688, 12689	Dec, 1995	K-40	2.4139 ± 0.3400	2.5180 ± 0.3700	2.4660 ± 0.2512
PW - 12945, 12946	Dec, 1995	Co-60	0.2950 ± 2.7700	1.4000 ± 1.9600	0.8475 ± 1.6967
PW - 12945, 12946	Dec, 1995	Cs-137	1.4900 ± 2.5600	0.1240 ± 2.1900	0.8070 ± 1.6845

<sup>a</sup> All concentrations are reported in pCi/liter, except solid samples, which are reported in pCi/gram.

<sup>b</sup> Lab codes are comprised of the sample media and the sample numbers. Client codes have been eliminated to protect client anonymity.

12-31-95

ATTACHMENT A

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES<sup>a</sup>

LABORATORY PRECISION: ONE STANDARD DEVIATION VALUES FOR VARIOUS ANALYSES<sup>a</sup>

Analysis	Level	One Standard Deviation for single determinations
Gamma Emitters	5 to 100 pCi/liter or kg >100 pCi/liter or kg	5.0 pCi/liter 5% of known value
Strontium-89 <sup>b</sup>	5 to 50 pCi/liter or kg >50 pCi/liter or kg	5.0 pCi/liter 10% of known value
Strontium-90 <sup>b</sup>	2 to 30 pCi/liter or kg >30 pCi/liter or kg	5.0 pCi/liter 10% of known value
Potassium	>0.1 g/liter or kg	5% of known value
Gross alpha	≤20 pCi/liter >20 pCi/liter	5.0 pCi/liter 25% of known value
Gross beta	≤100 pCi/liter >100 pCi/liter	5.0 pCi/liter 5% of known value
Tritium	≤4,000 pCi/liter >4,000 pCi/liter	1s = (pCi/liter) = 169.85 x (known) <sup>0.0933</sup> 10% of known value
Radium-226,-228	<0.1 pCi/liter	15% of known value
Plutonium	0.1 pCi/liter, gram, or sample	10% of known value
Iodine-131, Iodine-129 <sup>b</sup>	≤55 pCi/liter >55 pCi/liter	6.0 pCi/liter 10% of known value
Uranium-238, Nickel-64 <sup>b</sup> Technetium-99 <sup>b</sup>	≤35 pCi/liter >35 pCi/liter	6.0 pCi/liter 15% of known value
Iron-55 <sup>b</sup>	50 to 100 pCi/liter >100 pCi/liter	10 pCi/liter 10% of known value
Others <sup>b</sup>	—	20% of known value

<sup>a</sup> From EPA publication, "Environmental Radioactivity Laboratory Intercomparison Studies Program, Fiscal Year, 1981-1982, EPA-600/4-81-004.

<sup>b</sup> Teledyne limit.

APPENDIX B

DATA REPORTING CONVENTIONS



## Data Reporting Conventions

1.0. All activities except gross alpha and gross beta are decay corrected to collection time or the end of the collection period.

### 2.0. Single Measurements

Each single measurement is reported as follows:

$$x \pm s$$

where  $x$  = value of the measurement;

$$s = 2s \text{ counting uncertainty (corresponding to the 95\% confidence level).}$$

In cases where the activity is found to be below the lower limit of detection  $L$  it is reported as

$$<L$$

where  $L$  = the lower limit of detection based on  $4.66s$  uncertainty for a background sample.

### 3.0. Duplicate analyses

3.1 Individual results:  $x_1 \pm s_1$   
 $x_1 \pm s_2$

Reported result:  $x \pm s$

where  $x = (1/2) (x_1 \pm x_2)$

$$s = (1/2) \sqrt{s_1^2 + s_2^2}$$

3.2. Individual results:  $<L_1$

$<L_2$

Reported result:  $<L$

where  $L$  = lower of  $L_1$  and  $L_2$

3.3. Individual results:  $x \pm s$

$<L$

Reported result:  $x \pm s$  if  $x \geq L$ ;

$<L$  otherwise

#### 4.0. Computation of Averages and Standard Deviations

- 4.1 Averages and standard deviations listed in the tables are computed from all of the individual measurements over the period averaged; for example, an annual standard deviation would not be the average of quarterly standard deviations. The average  $\bar{x}$  and standard deviation(s) of a set of  $n$  numbers  $x_1, x_2 \dots x_n$  are defined as follows:

$$\bar{x} = \frac{1}{n} \sum x$$

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

- 4.2 Values below the highest lower limit of detection are not included in the average.
- 4.3 If all of the values in the averaging group are less than the highest LLD, the highest LLD is reported.
- 4.4 If all but one of the values are less than the highest LLD, the single value  $x$  and associated two sigma error is reported.
- 4.5 In rounding off, the following rules are followed:
- 4.5.1. If the figure following those to be retained is less than 5, the figure is dropped, and the retained figures are kept unchanged. As an example, 11.443 is rounded off to 11.44.
- 4.5.2. If the figure following those to be retained is equal to or greater than 5, the figure is dropped and the last retained figure is raised by 1. As an example, 11.445 is rounded off to 11.45.

APPENDIX C

Maximum Permissible Concentrations  
of Radioactivity in Air and Water  
Above Background in Unrestricted Areas

Table C-1. Maximum permissible concentrations of radioactivity in air and water above natural background in unrestricted areas.<sup>a</sup>

	Air		Water
Gross alpha	3 pCi/m <sup>3</sup>	Strontium-89	3,000 pCi/l
Gross beta	100 pCi/m <sup>3</sup>	Strontium-90	300 pCi/l
Iodine-131 <sup>b</sup>	0.14 pCi/m <sup>3</sup>	Cesium-137	20,000 pCi/l
		Barium-140	20,000 pCi/l
		Iodine-131	300 pCi/l
		Potassium-40 <sup>c</sup>	3,000 pCi/l
		Gross alpha	30 pCi/l
		Gross beta	100 pCi/l
		Tritium	3 x 10 <sup>6</sup> pCi/l

<sup>a</sup> Taken from Code of Federal Regulations Title 10, Part 20, Table II and appropriate footnotes. Concentrations may be averaged over a period not greater than one year.

<sup>b</sup> From 10 CFR 20 but adjusted by a factor of 700 to reduce the dose resulting from the air-grass-cow-milk-child pathway.

<sup>c</sup> A natural radionuclide.

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REPORT TO

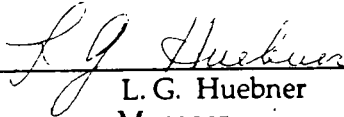
WISCONSIN PUBLIC SERVICE CORPORATION  
WISCONSIN POWER AND LIGHT COMPANY  
MADISON GAS AND ELECTRIC COMPANY

RADIOLOGICAL MONITORING PROGRAM FOR  
THE KEWAUNEE NUCLEAR POWER PLANT  
KEWAUNEE, WISCONSIN

ANNUAL REPORT - PART II  
DATA TABULATIONS AND ANALYSES  
January - December 1995

PREPARED AND SUBMITTED  
BY  
TELEDYNE ISOTOPES MIDWEST LABORATORY  
PROJECT NO. 8002

Approved by: \_\_\_\_\_

  
L.G. Huebner  
Manager

16 April 1996

## PREFACE

The staff members of the Teledyne Isotopes Midwest Laboratory (TIML) were responsible for the acquisition of data presented in this report. Samples were collected by the personnel of TIML and Wisconsin Public Service Corporation.

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## 1.0 INTRODUCTION

The following constitutes Part II of the final report for the 1995 Radiological Monitoring Program conducted at the Kewaunee Nuclear Power Plant (KNPP), Kewaunee, Wisconsin. Included are tabulations of data for all samples collected in 1995, statistical analyses of the data, graphs of data trends, and descriptions of radiochemical procedures. A summary and interpretation of the data presented here are published in Part I of the 1995 Annual Report on the Radiological Monitoring Program for the Kewaunee Nuclear Power Plant.

NOTE: Page 2 is intentionally left out.

# KEWAUNEE NUCLEAR POWER PLANT

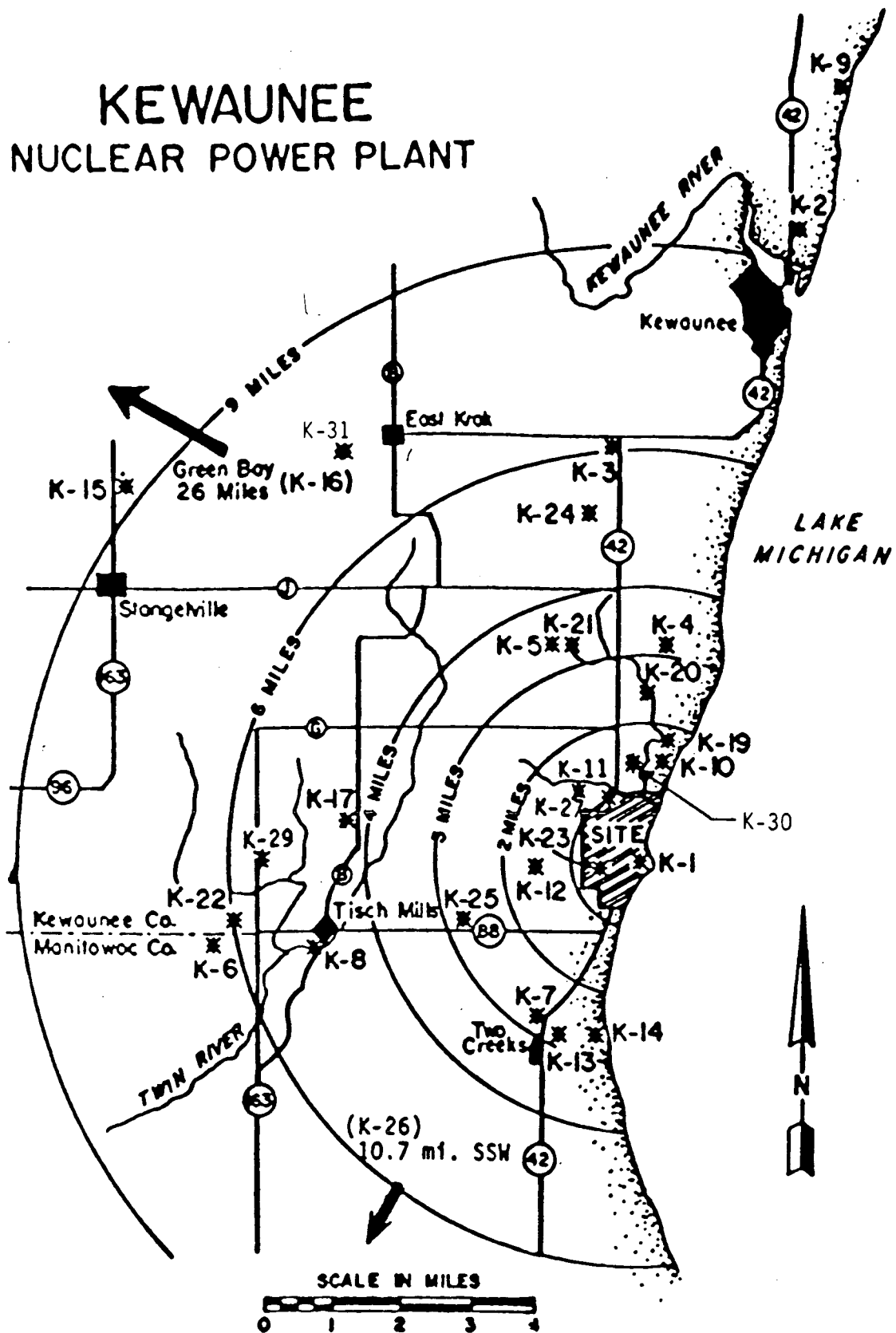


Figure 1. Sampling Locations, Kewaunee Nuclear Power Plant.

Table 1. Sampling locations, Kewaunee Nuclear Power Plant.

Code	Type <sup>a</sup>	Distance (miles) <sup>b</sup> and Sector	Location
K-1			Onsite
K-1a	I	0.62 N	North Creek
K-1b	I	0.12 N	Middle Creek
K-1c	I	0.10 N	500' north of condenser discharge
K-1d	I	0.10 E	Condenser discharge
K-1e	I	0.12 S	South Creek
K-1f	I	0.12 S	Meteorological Tower
K-1g	I	0.06 W	South Well
K-1h	I	0.12 NW	North Well
K-1j	I	0.10 S	500' south of condenser discharge
K-2	C	9.5 NNE	WPS Operations Building in Kewaunee
K-3	C	6.0 N	Lyle and John Siegmund Farm, Route 1, Kewaunee
K-4	I	3.0 N	Tom Stangel Farm, Route 1, Kewaunee
K-5	I	3.5 NNW	Ed Paplham Farm, Route 1, Kewaunee
K-6	C	6.7 WSW	Novitsky Farm
K-7	I	2.75 SSW	Ron Zimmerman Farm, Route 3, Two Rivers
K-8	C	5.0 WSW	Saint Mary's Church, Tisch Mills
K-9	C	11.5 NNE	Rostok Water Intake for Green Bay, Wisconsin, two miles north of Kewaunee
K-10	I	1.5 NNE	Turner Farm, Kewaunee site
K-11	I	1.0 NW	Harlan Ihlenfeld Farm
K-12	I	1.5 WSW	Lecaptain Farm, one mile west of site
K-13	C	3.0 SSW	Rand's General Store
K-14	I	2.5 S	Two Creeks Park, 2.5 miles south of site
K-15	C	9.25 NW	Gas Substation, 1.5 miles north of Stangelville
K-16	C	26 NW	WPS Division Office Building, Green Bay, Wisconsin
K-17	I	4.25 W	Jansky's Farm, Route 1, Kewaunee
K-19	I	1.75 NNE	Wayne Paral Farm, Route 1, Kewaunee
K-20	I	2.5 N	Carl Struck Farm, Route 1, Kewaunee
K-23	I	0.5 W	0.5 miles west of plant, Kewaunee site
K-24	I	5.45 N	Fectum Farm, Route 1, Kewaunee
K-25 <sup>c</sup>	C	2.75 WSW	Wotachek Farm, Route 1, Denmark
K-26	C	10.7 SSW	Bertler's Fruit Stand (8.0 miles south of "BB")
K-27	I	1.5 NW	Schlies Farm, 0.5 miles west of K-11
K-28	C	26 NW	Hansen Dairy, Green Bay, Wisconsin
K-29	I	5.75 W	Kunesh Farm, Route 1, Kewaunee
K-30	I	1.00 N	End of site boundary
K-31	C	6.25 NNW	E. Krok Substation

<sup>a</sup> I= indicator; C = control.

<sup>b</sup> Distances are measured from reactor stack.

<sup>c</sup> Replaced by K-29 in summer 1990 because Wotachek Farm no longer had chickens.

Table 2. Type and frequency of collection.

Location	Frequency					
	Weekly	Biweekly	Monthly	Quarterly	Semiannually	Annually
K-1a			SW		SL	
K-1b			SW	GR <sup>a</sup>	SL	
K-1c					BS <sup>b</sup>	
K-1d			SW	FI	BS <sup>b</sup> , SL	
K-1e			SW		SL	
K-1f	AP	AI		GR <sup>a</sup> , TLD	SO	
K-1g				WW		
K-1h				WW		
K-1j					BS <sup>b</sup>	
K-2	AP	AI		TLD		
K-3			MI <sup>c</sup>	GR <sup>a</sup> , TLD, CF <sup>d</sup>	SO	
K-4			MI <sup>c</sup>	GR <sup>a</sup> , TLD, CF <sup>d</sup>	SO	
K-5			MI <sup>c</sup>	GR <sup>a</sup> , TLD, CF <sup>d</sup>	SO	
K-6			MI <sup>c</sup>	GR <sup>a</sup> , TLD, CF <sup>d</sup>	SO	
K-7	AP	AI		TLD		
K-8	AP	AI		TLD		
K-9			SW		BS <sup>b</sup> , SL	
K-10				WW		
K-11			PR	WW		
K-12			MI <sup>c</sup>	GR <sup>a</sup> , CF <sup>d</sup> , WW	SO	
K-13				WW		
K-14			SW		BS <sup>b</sup> , SL	
K-15	AP	AI		TLD		
K-16	AP	AI		TLD		
K-17				TLD		VE
K-19			MI <sup>c</sup>	GR <sup>a</sup> , CF <sup>d</sup>	SO	
K-20						DM
K-23						GRN
K-24				EG <sup>g</sup>		DM
K-25 <sup>e</sup>						DM
K-26						VE
K-27				TLD, EG <sup>f</sup>		DM
K-28			MI <sup>c</sup>			
K-29						DM
K-30				TLD		
K-31				TLD		

<sup>a</sup> Three times a year, second (April, May, June), third (July, August, September), and fourth (October, November, December) quarters.

<sup>b</sup> To be collected in May and November.

<sup>c</sup> Monthly from November through April; semimonthly May through October.

<sup>d</sup> First quarter (January, February, March) only.

<sup>e</sup> Replaced by K-29 in summer of 1990.

<sup>f</sup> First (January, February, March), second (April, May, June), third (July, August, September) quarters 1995 only.

<sup>g</sup> Fourth (October, November, December) 1995 quarter only.



Table 3. Sample codes used in Table 2.

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Code	Description
AP	Airborne Particulate
AI	Airborne Iodine
TLD	Thermoluminescent Dosimeter
PR	Precipitation
MI	Milk
WW	Well Water
DM	Domestic Meat
EG	Eggs
VE	Vegetables
GRN	Grain
GR	Grass
CF	Cattlefeed
SO	Soil
SW	Surface Water
FI	Fish
SL	Slime
BS	Bottom Sediments

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5.0 GRAPHS OF DATA TRENDS

# GROSS BETA

—●— 1995 K-1f

1.0000

0.1000

pCi/m<sup>3</sup>

0.0100

0.0010

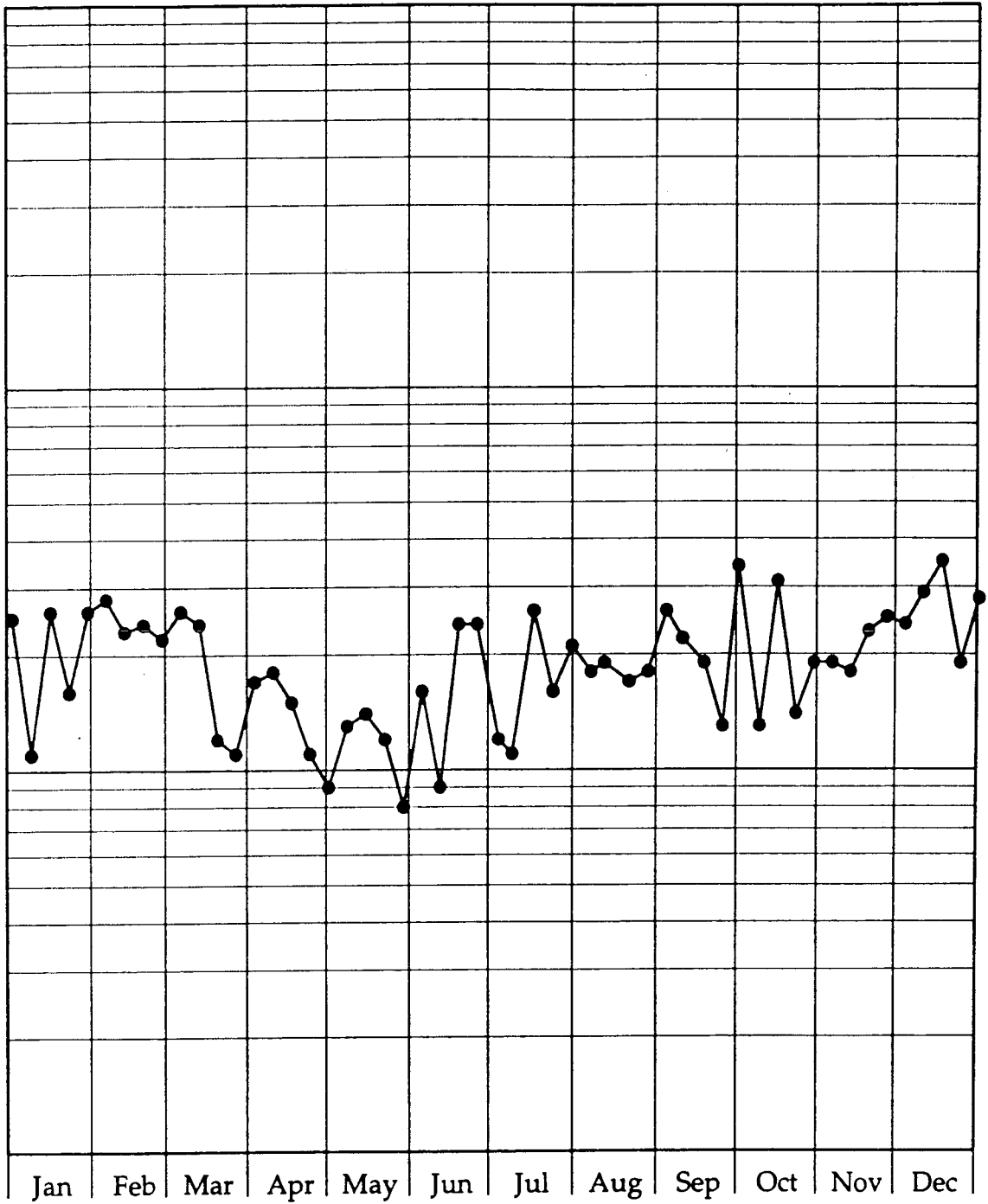


Figure 2. Airborne particulates. Location K-1f (weekly averages). A dashed line indicates missing data.

# GROSS BETA

—●— 1995 K-2

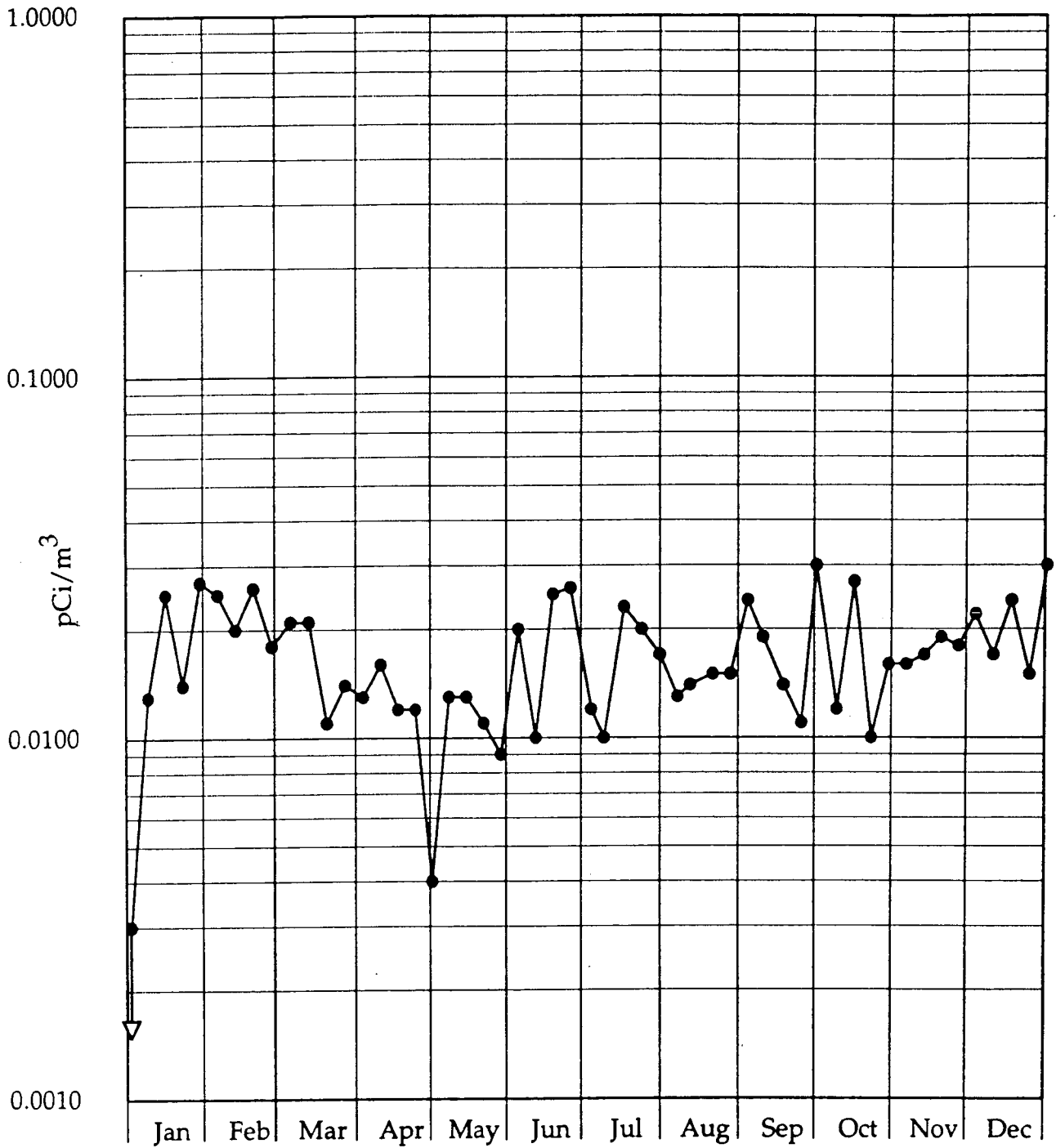


Figure 3. Airborne particulates. Location K-2 (weekly Averages). A dashed line indicates missing data.

# GROSS BETA

—●— 1995 K-7

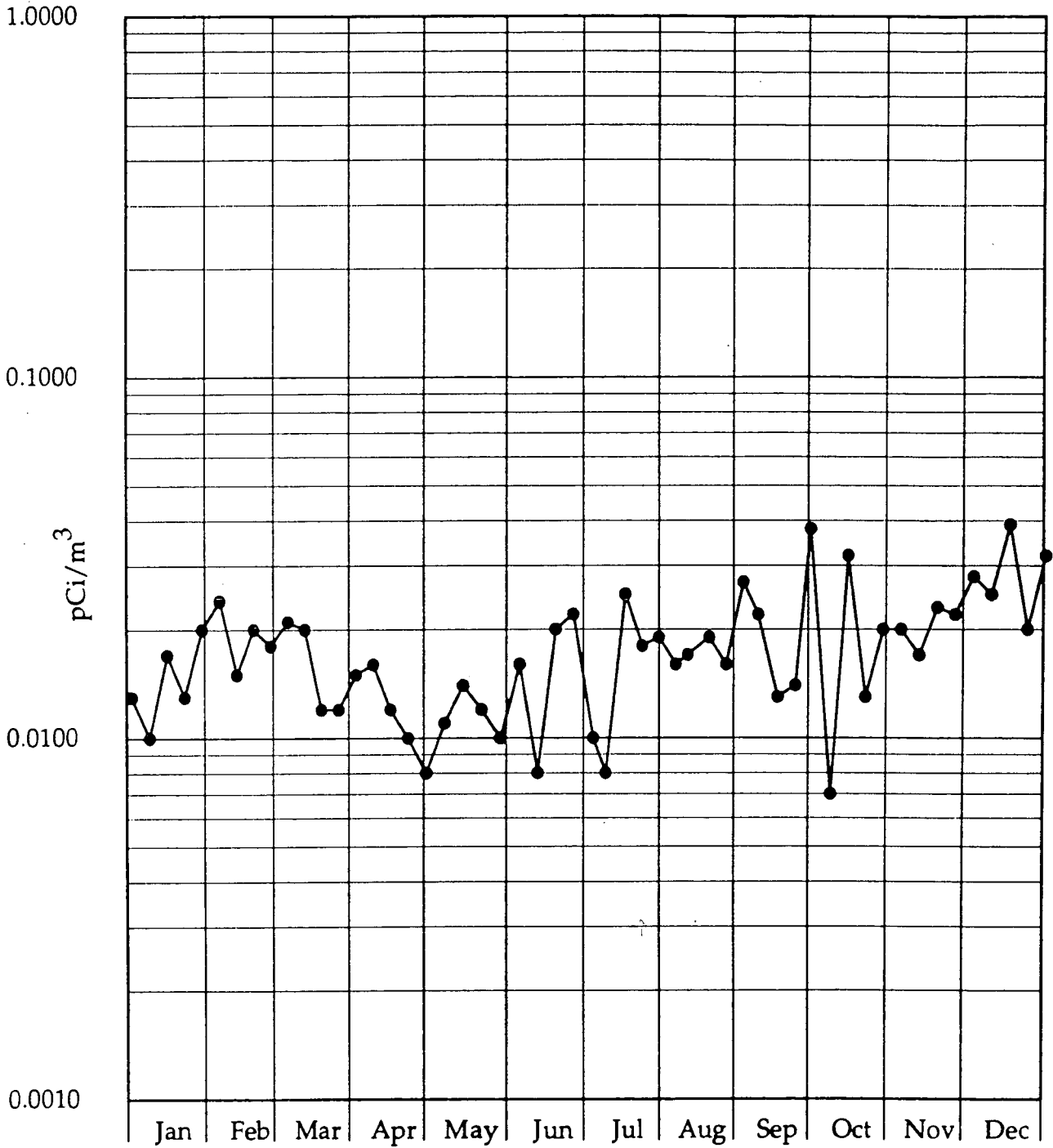


Figure 4. Airborne particulates. Location K-7 (weekly averages). A dashed line indicates missing data.

# GROSS BETA

—●— 1995 K-8

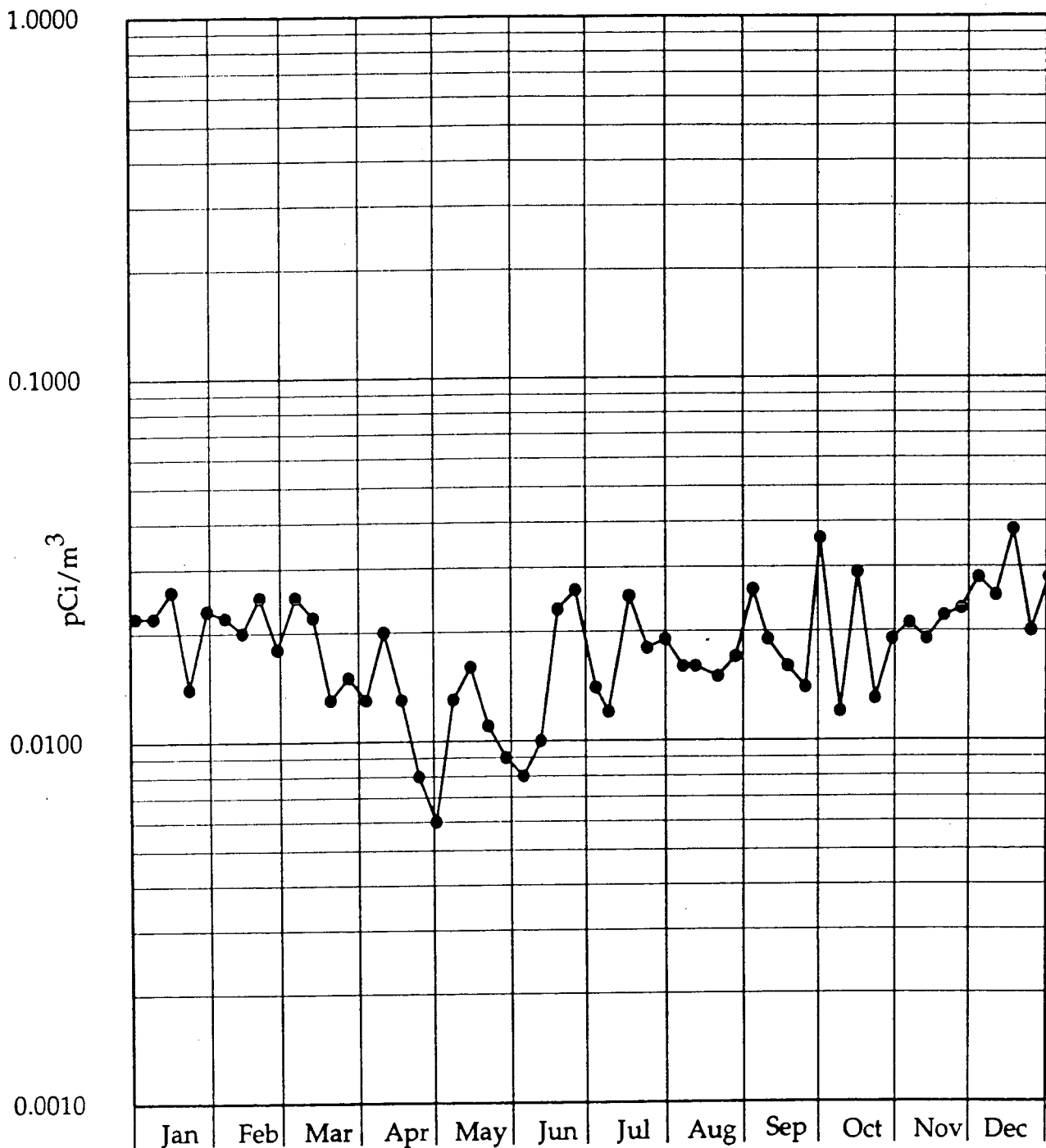


Figure 5. Airborne particulates. Location K-8 (weekly averages). A dashed line indicates missing data.



# GROSS BETA

—●— 1995 K-16

1.0000

0.1000

pCi/m<sup>3</sup>

0.0100

0.0010

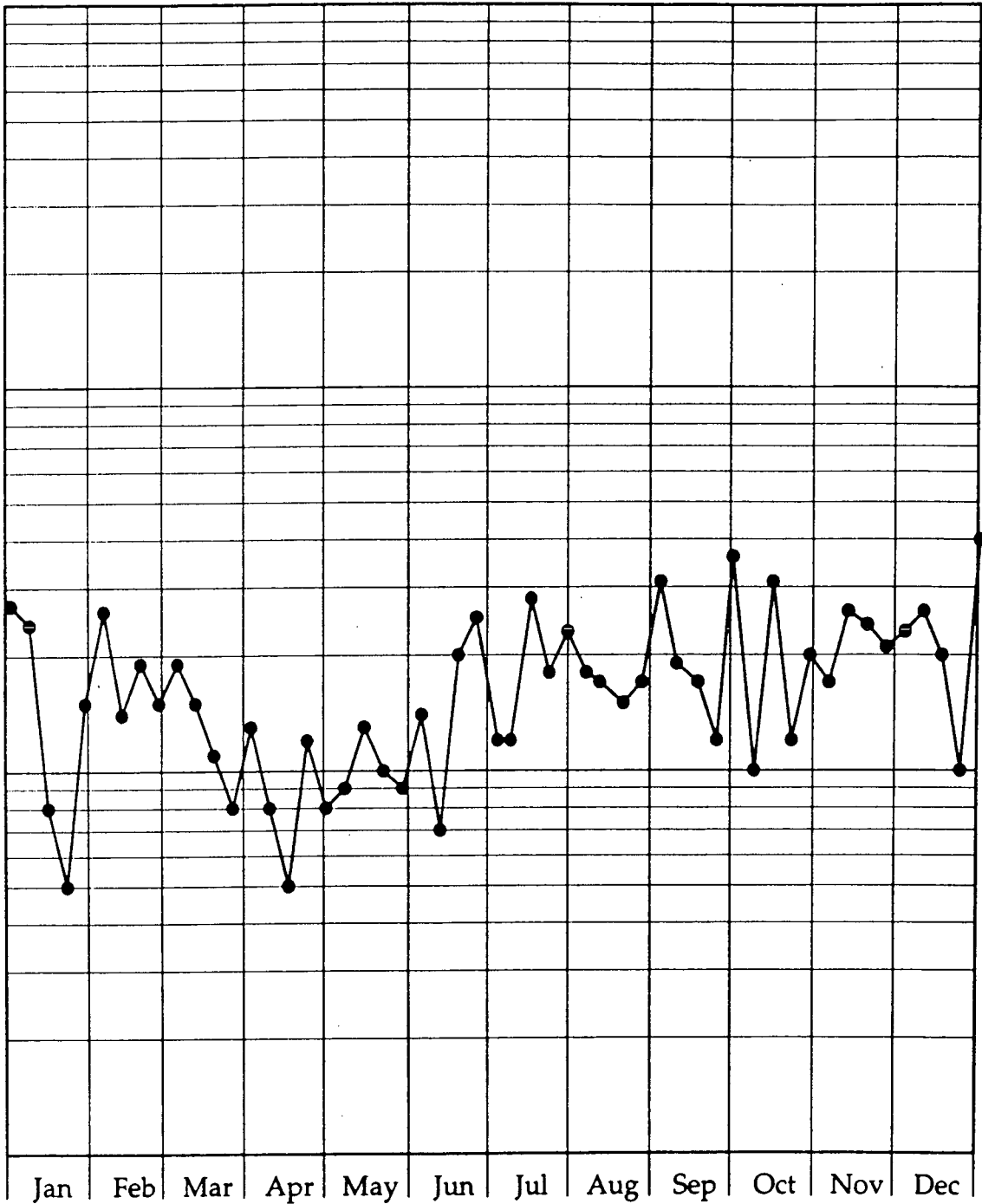


Figure 7. Airborne particulates. Location K-16 (weekly averages). A dashed line indicates missing data.



# GROSS BETA

—●— 1991-1995 K-1f

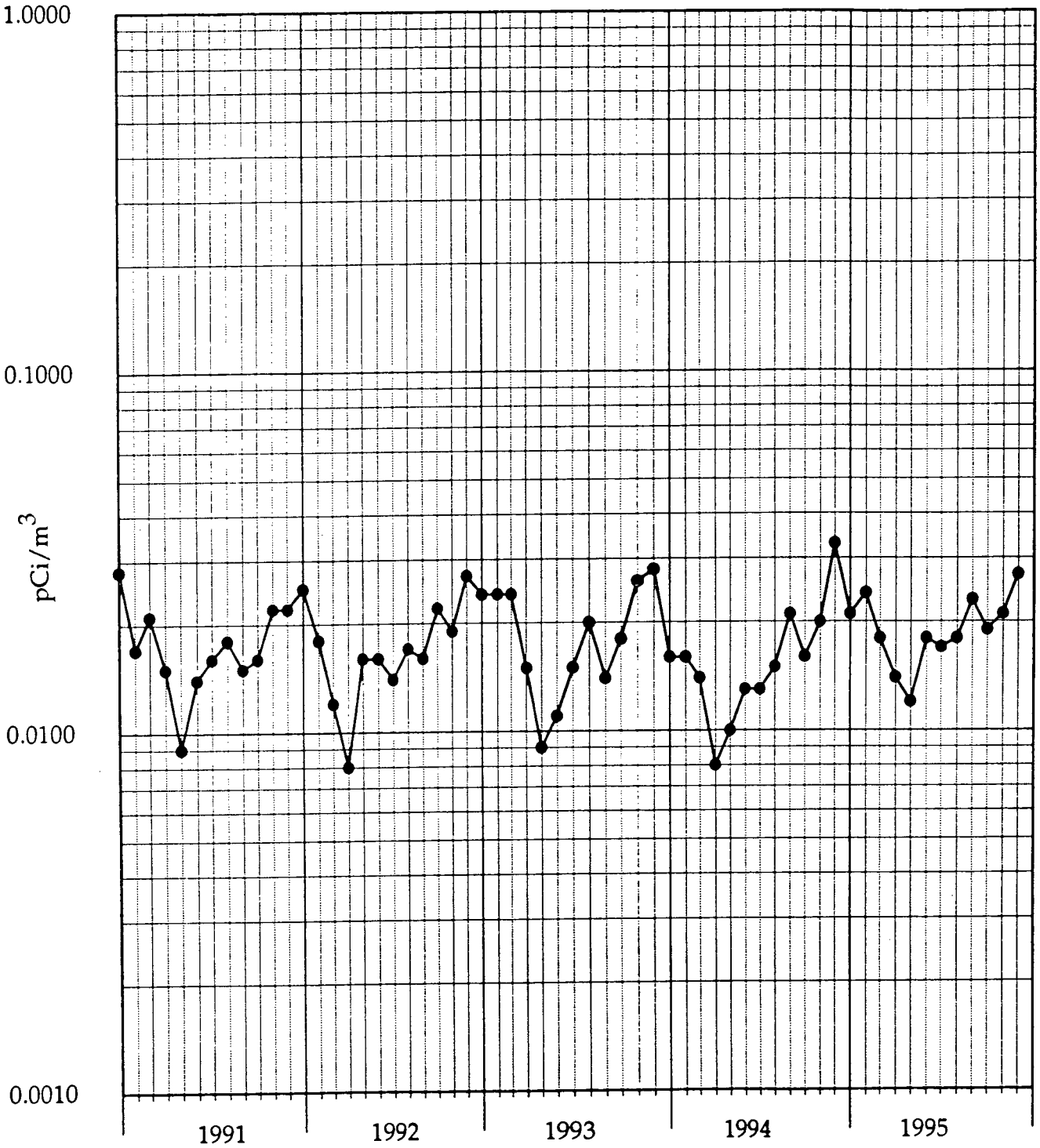


Figure 8. Monthly averages of airborne particulates collected weekly at location K-1f. A dashed line indicates missing data.

# GROSS BETA

—●— 1991-1995 K-2

1.0000

0.1000

pCi/m<sup>3</sup>

0.0100

0.0010

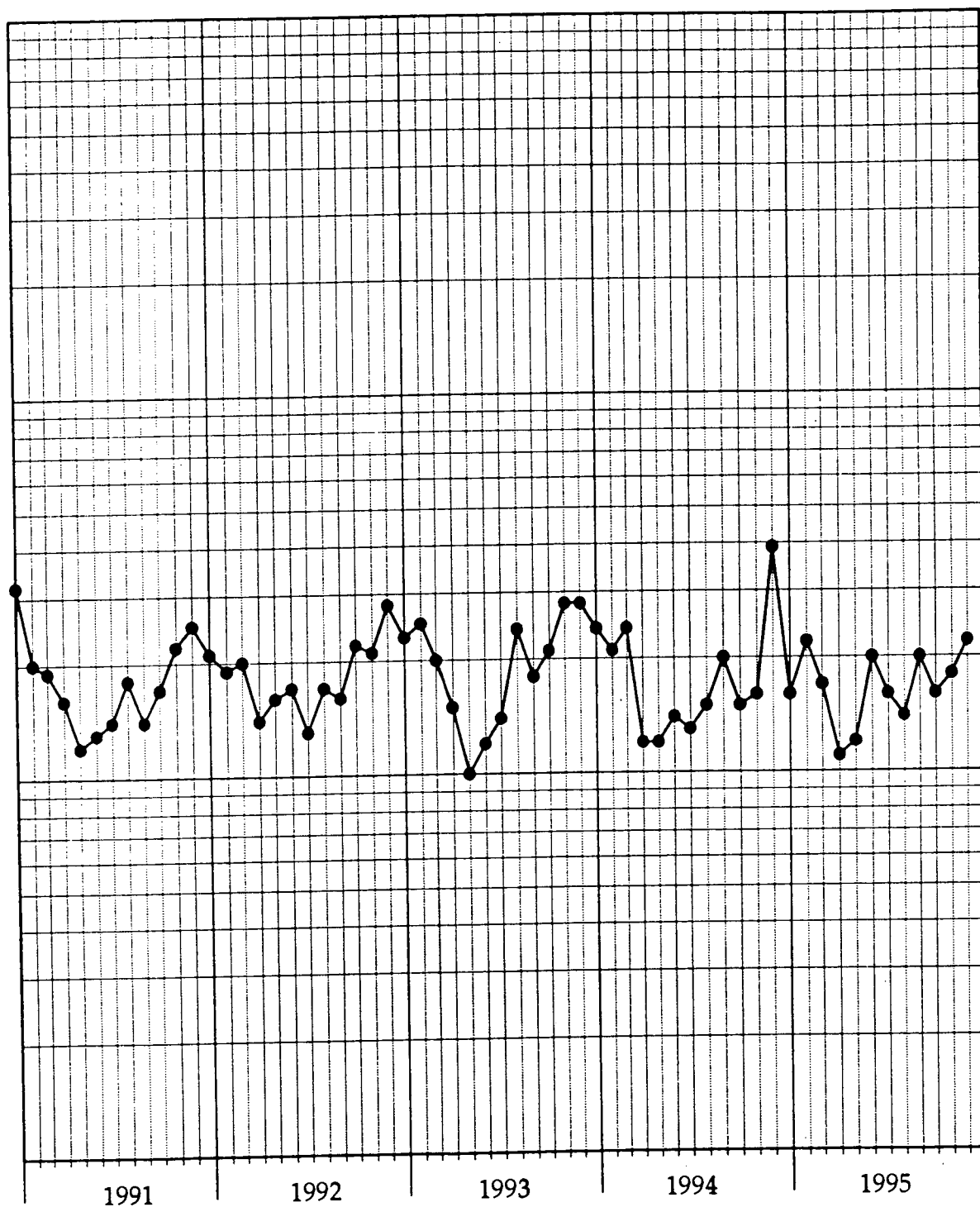


Figure 9. Monthly averages of airborne particulates collected weekly at location K-2. A dashed line indicates missing data.

# GROSS BETA

● 1991-1995 K-7

1.0000  
0.1000  
pCi/m<sup>3</sup>  
0.0100  
0.0010

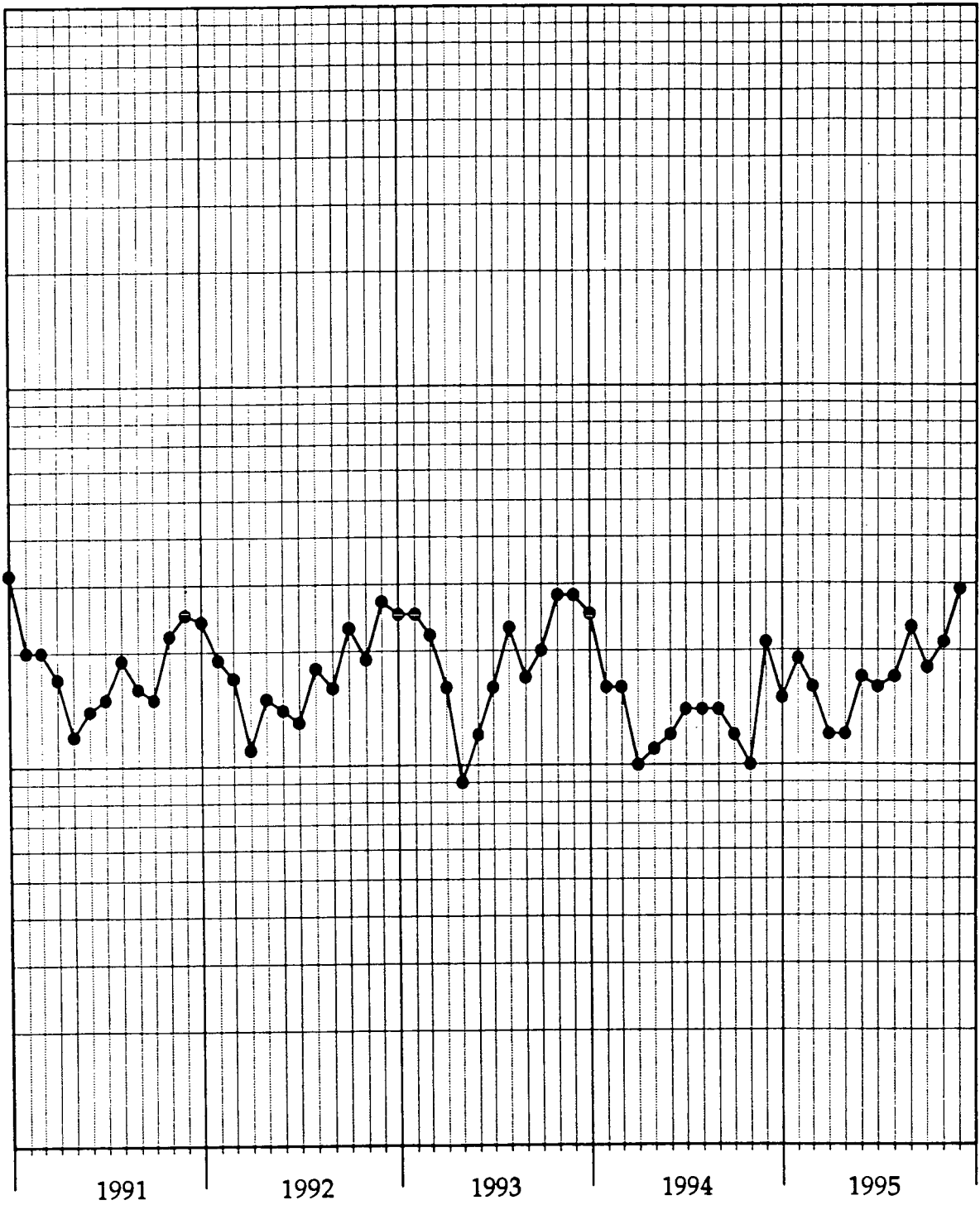


Figure 10. Monthly averages of airborne particulates collected weekly at location K-7. A dashed line indicates missing data.

# GROSS BETA

—●— 1991-1995 K-8

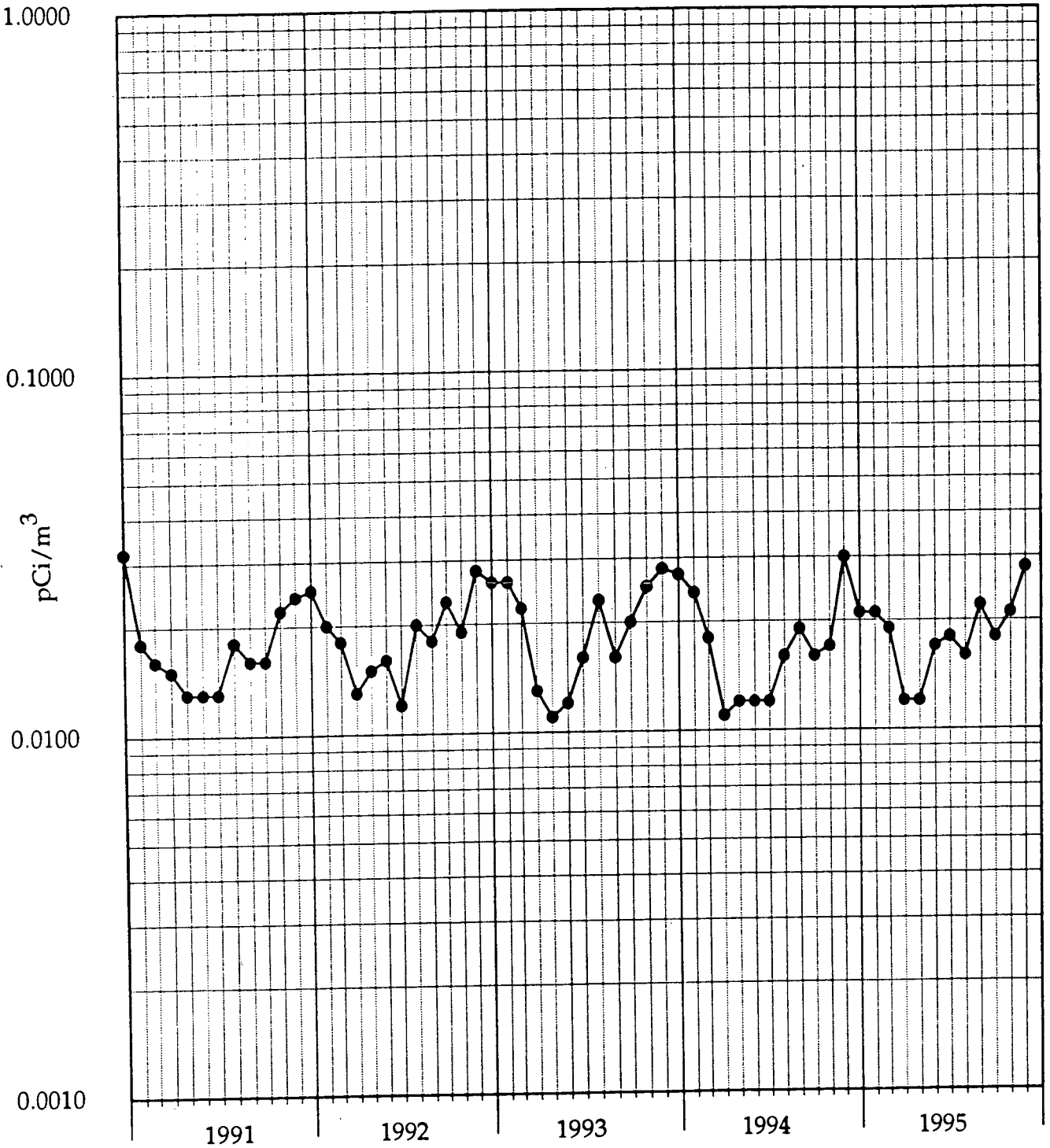


Figure 11. Monthly averages of airborne particulates collected weekly at location K-8. A dashed line indicates missing data.

# GROSS BETA

—●— 1991-1995 K-15

1.0000

0.1000

pCi/m<sup>3</sup>

0.0100

0.0010

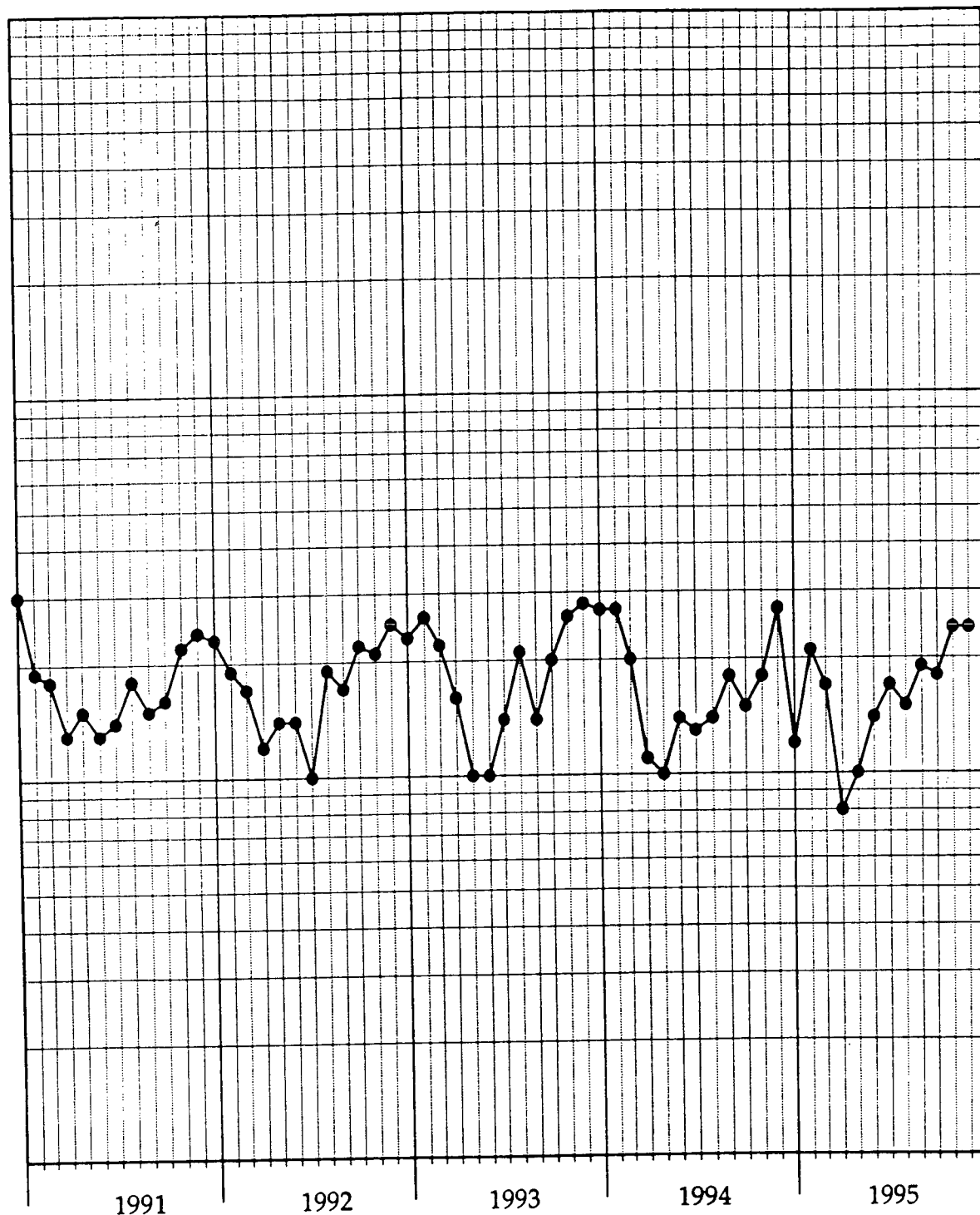


Figure 12. Monthly averages of airborne particulates collected weekly at location K-15. A dashed line indicates missing data.

# GROSS BETA

—●— 1991-1995 K-16

1.0000

0.1000

pCi/m<sup>3</sup>

0.0100

0.0010

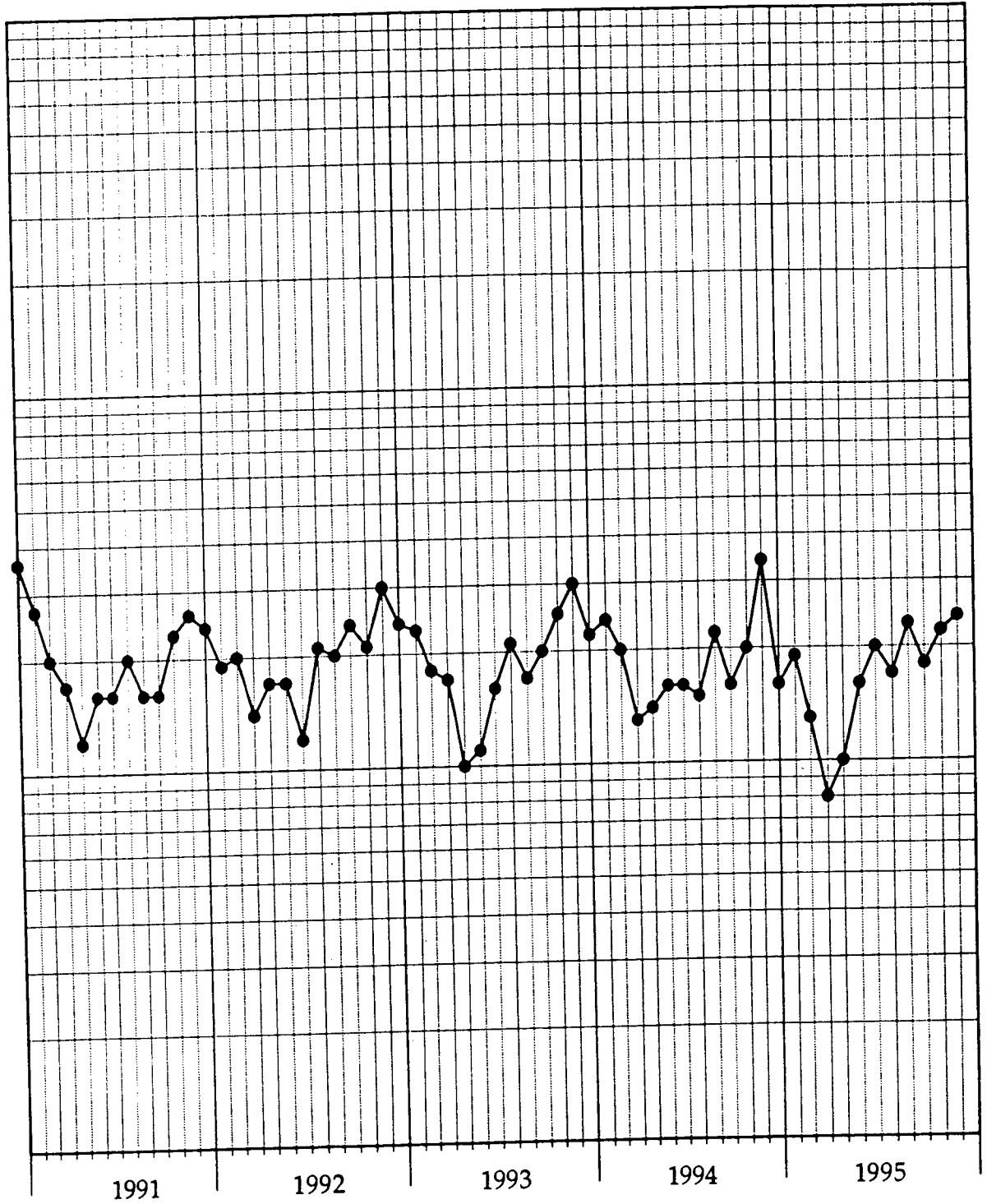


Figure 13. Monthly averages of airborne particulates collected weekly at location K-16. A dashed line indicates missing data.

# GROSS ALPHA

—●— 1991-1995 K-1g

100.0000

10.0000

pCi/l

1.0000

0.1000

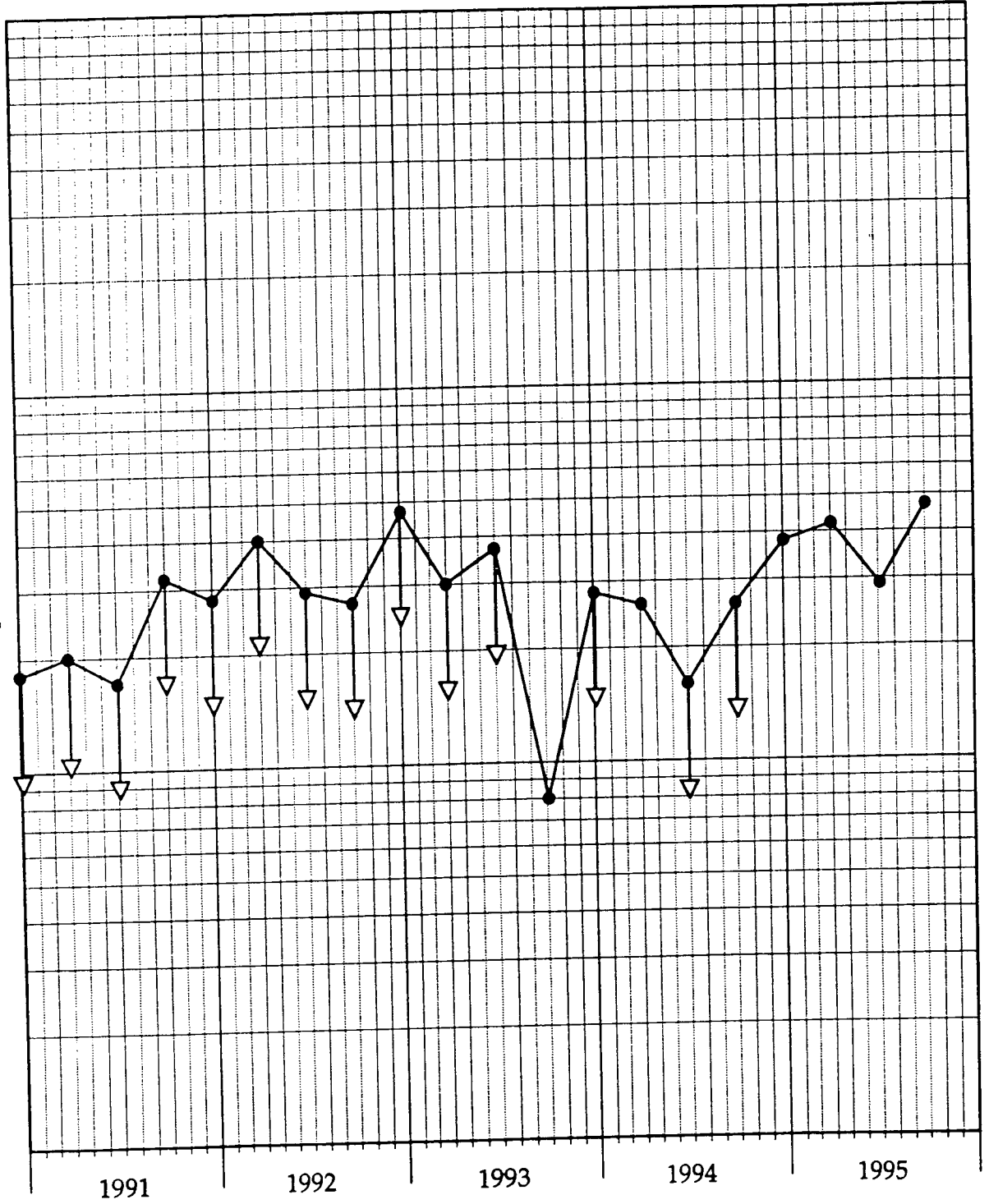


Figure 14. Well water samples. Location K-1g. (Total residue)

# GROSS ALPHA

● 1991-1995 K-1h

100.0000

10.0000

pCi/l

1.0000

0.1000

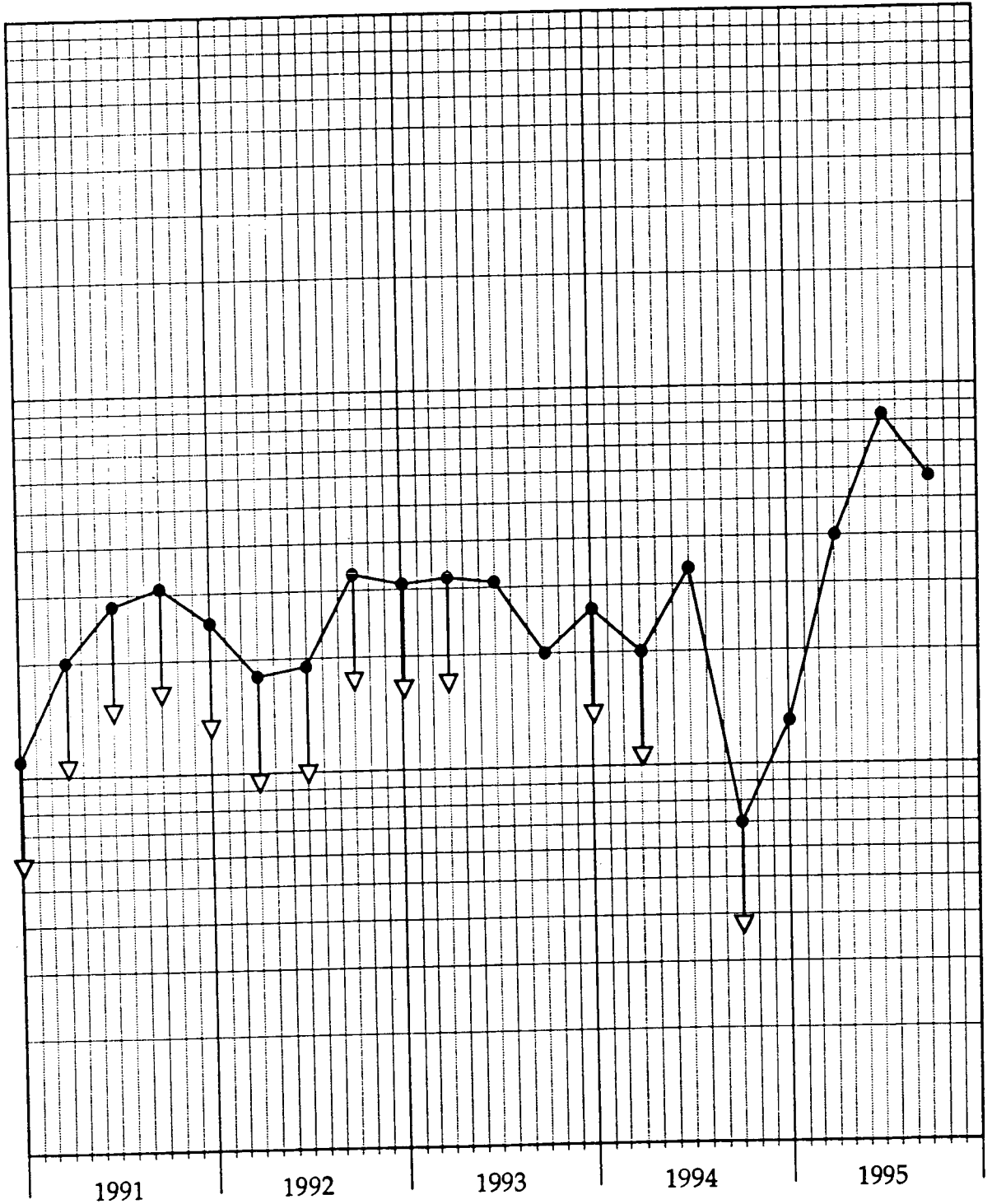


Figure 15. Well water samples. Location K-1h. (Total residue)



# GROSS BETA

—●— 1991-1995 K-1g

100.0000

10.0000

pCi/l

1.0000

0.1000

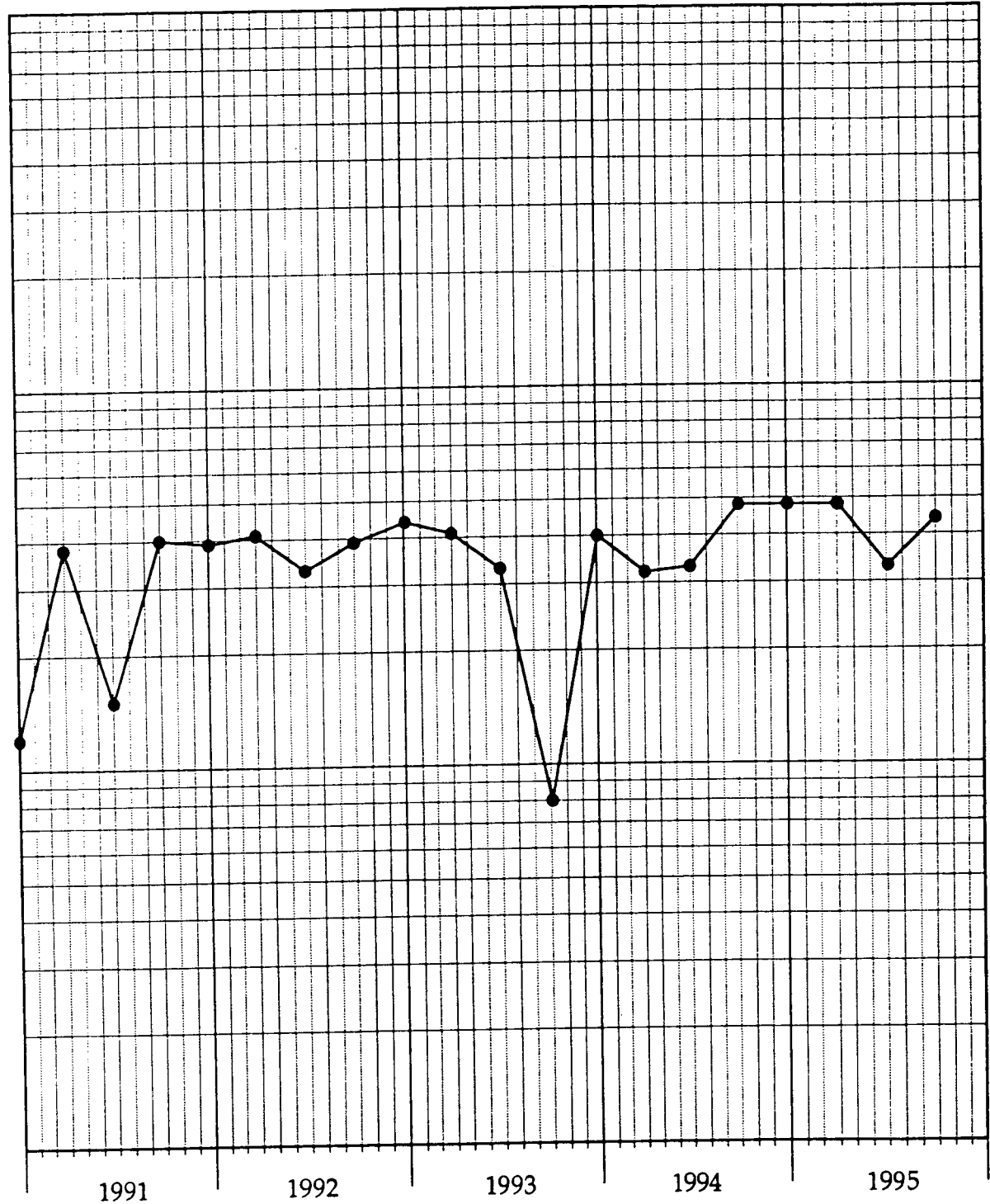


Figure 16. Well water samples. Location K-1g. (Total residue).

# GROSS BETA

—●— 1991-1995 K-1h

100.0000

10.0000

pCi/l

1.0000

0.1000

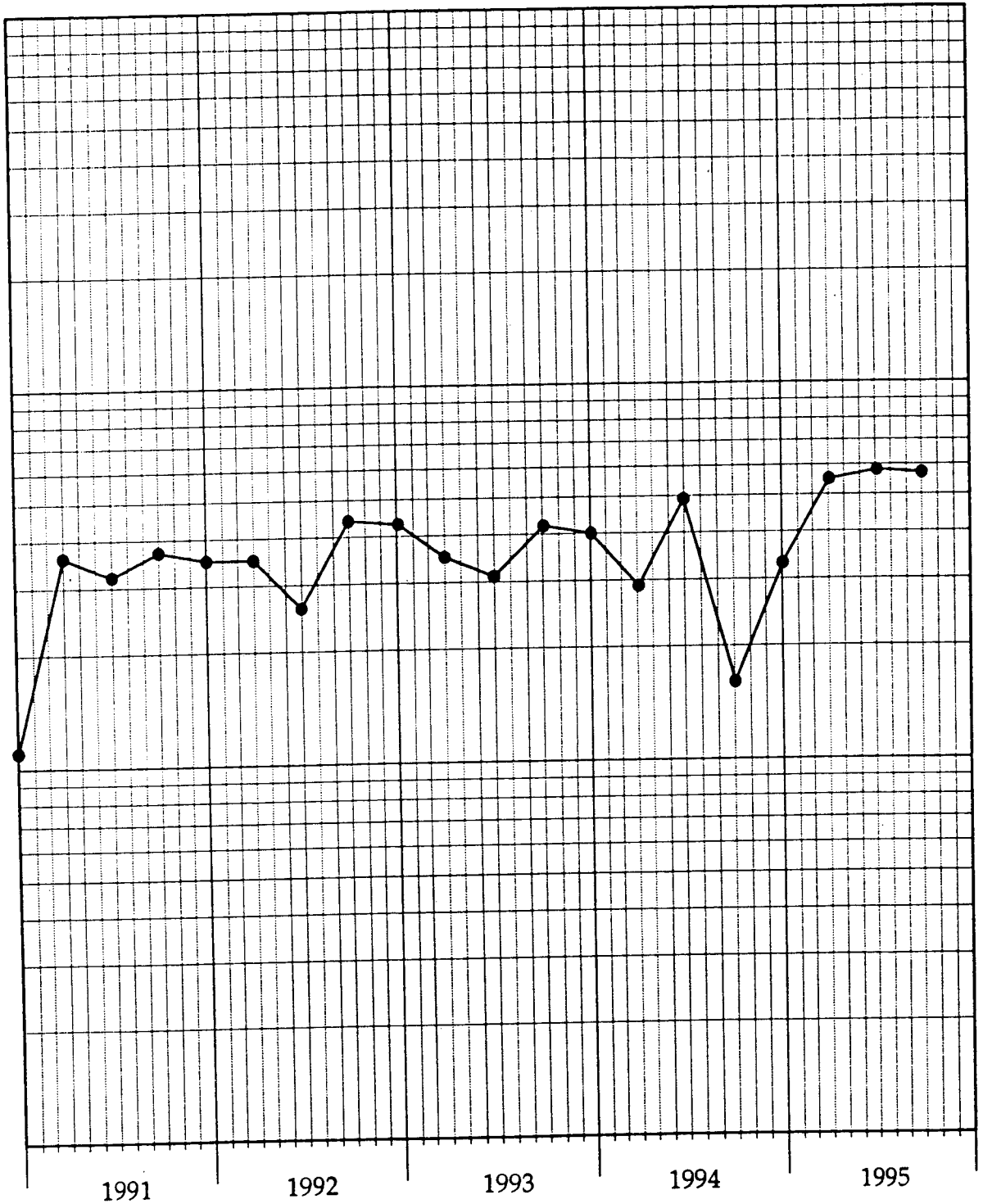


Figure 17. Well water samples. Location K-1h. (Total residue)

# GROSS BETA

—●— 1991-1995 K-10

100.0000

10.0000

pCi/l

1.0000

0.1000

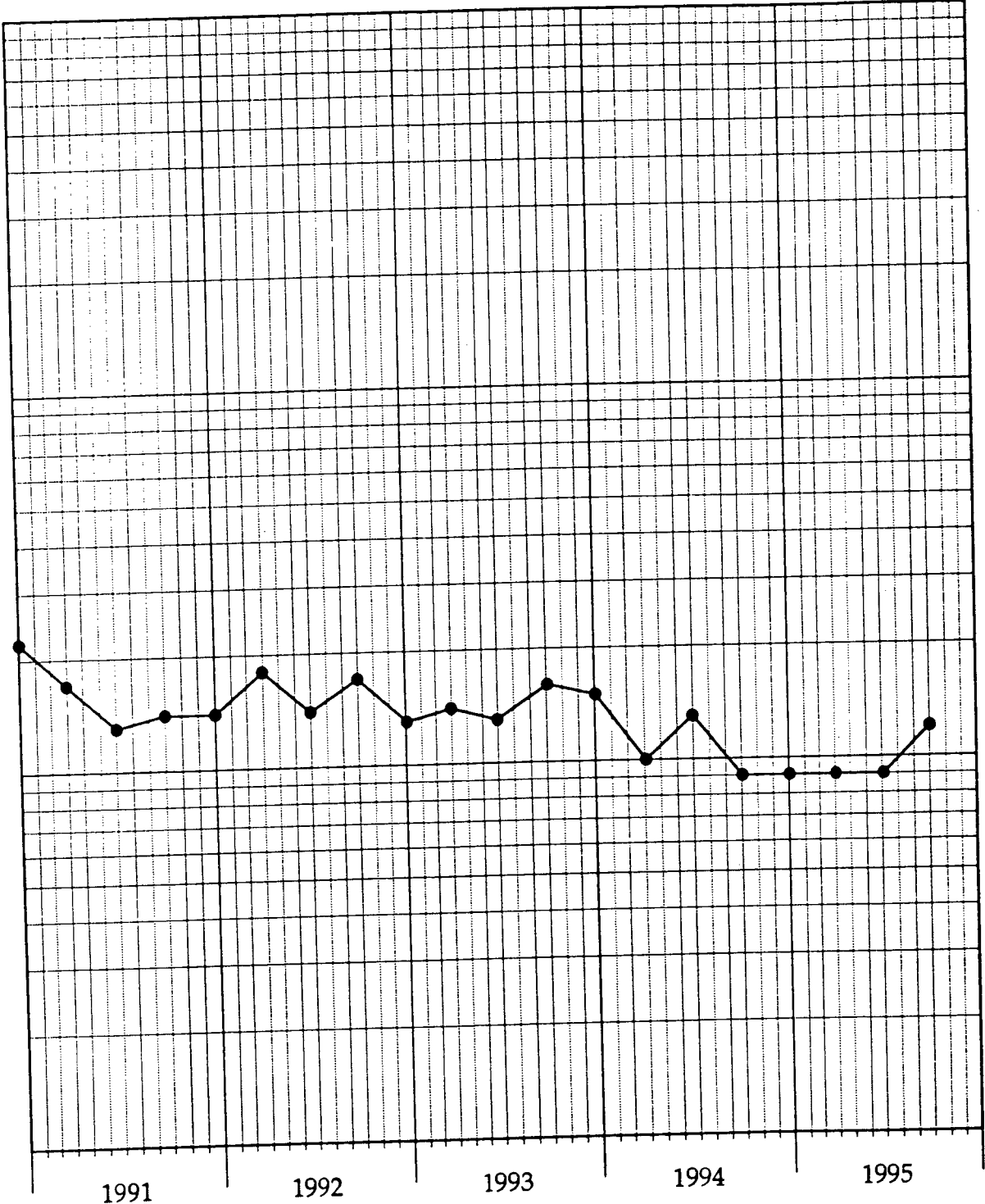


Figure 18. Well water samples. Location K-10. (Total residue)

# GROSS BETA

—●— 1991-1995 K-11

100.0000

10.0000

pCi/l

1.0000

0.1000

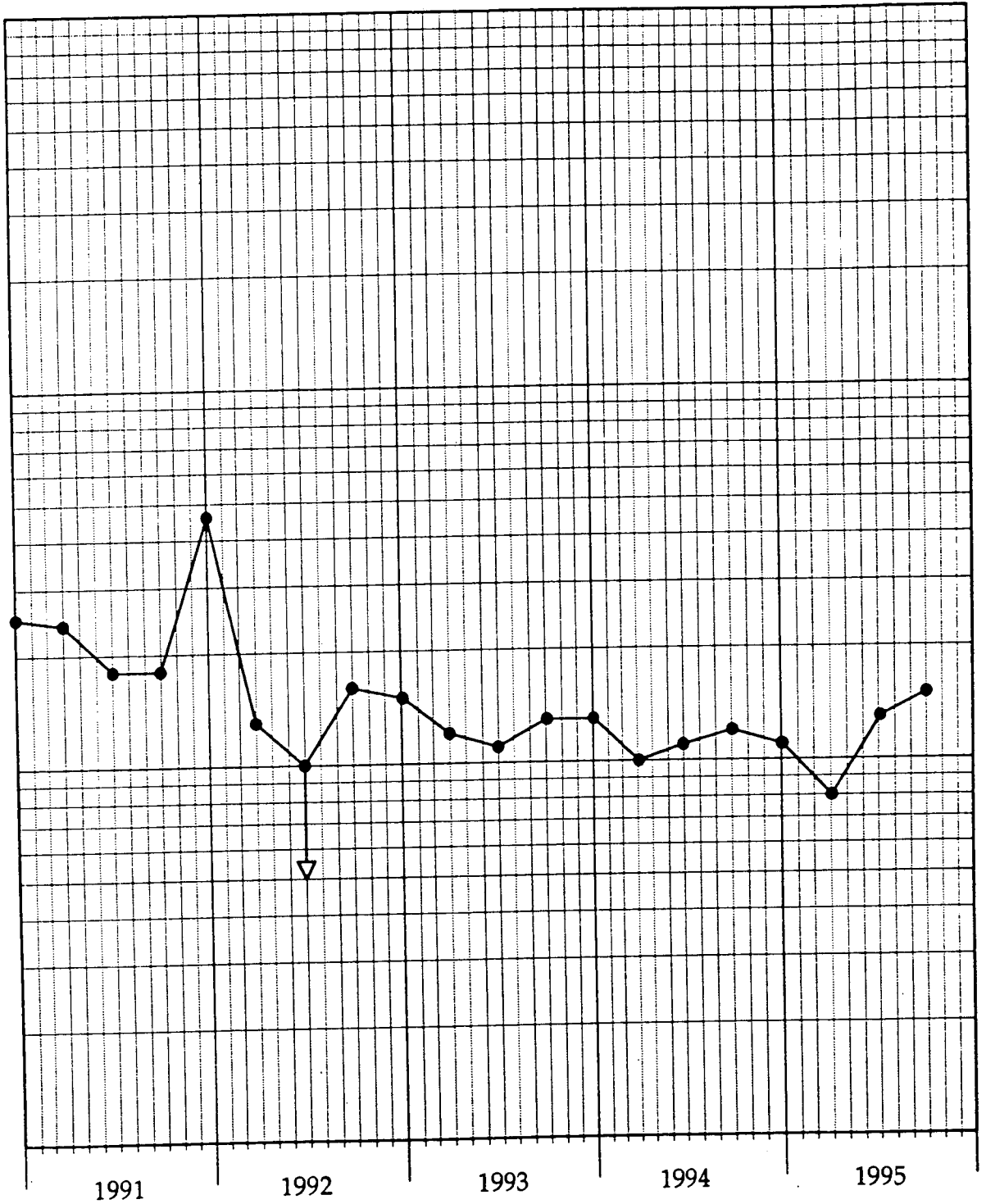


Figure 19. Well water samples. Location K-11. (Total residue)

# GROSS BETA

—●— 1991-1995 K-12

100.0000

10.0000

pCi/l

1.0000

0.1000

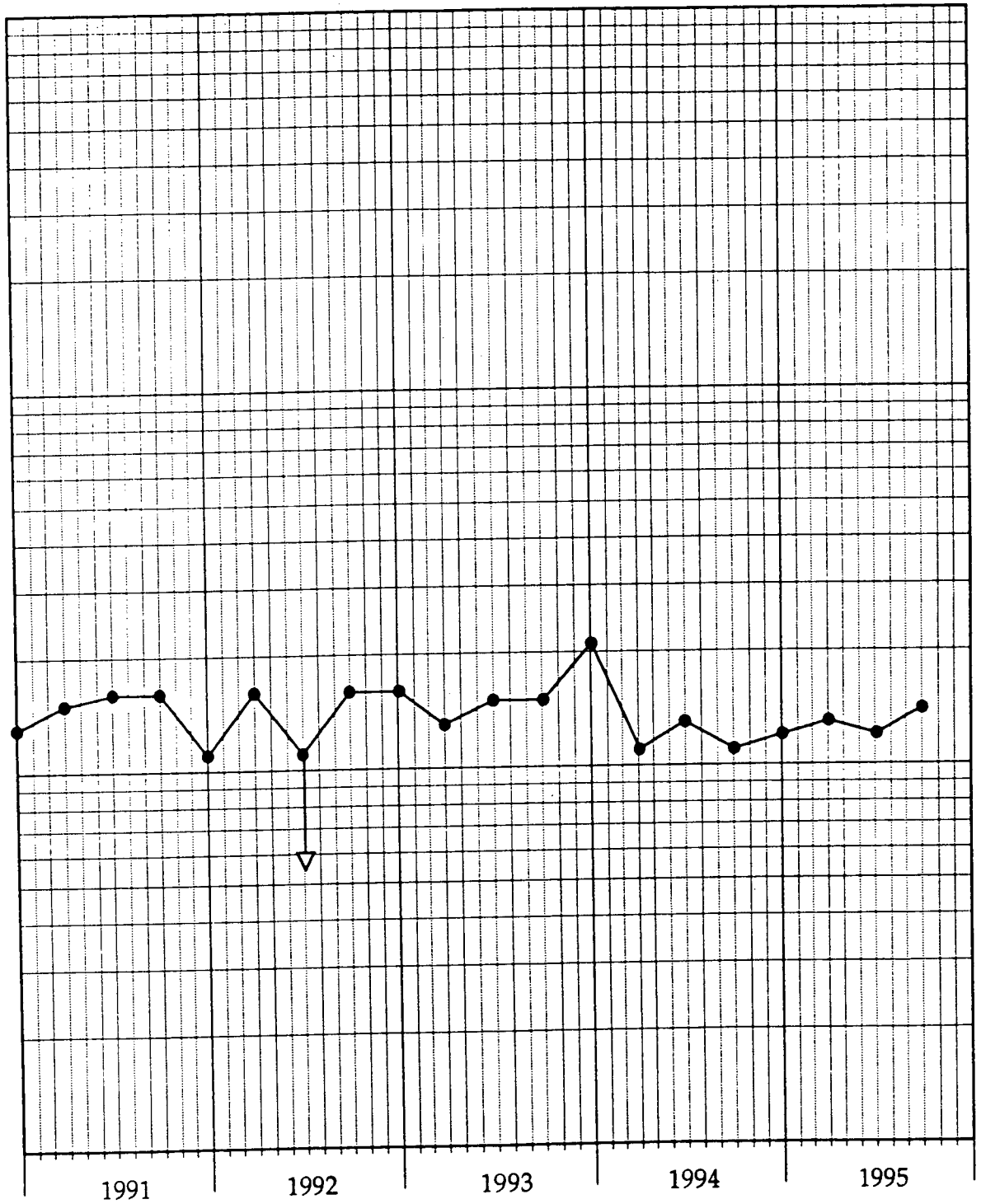


Figure 20. Well water samples. Location K-12. (Total residue)

# GROSS BETA

—●— 1991-1995 K-13

100.0000

10.0000

pCi/l

1.0000

0.1000

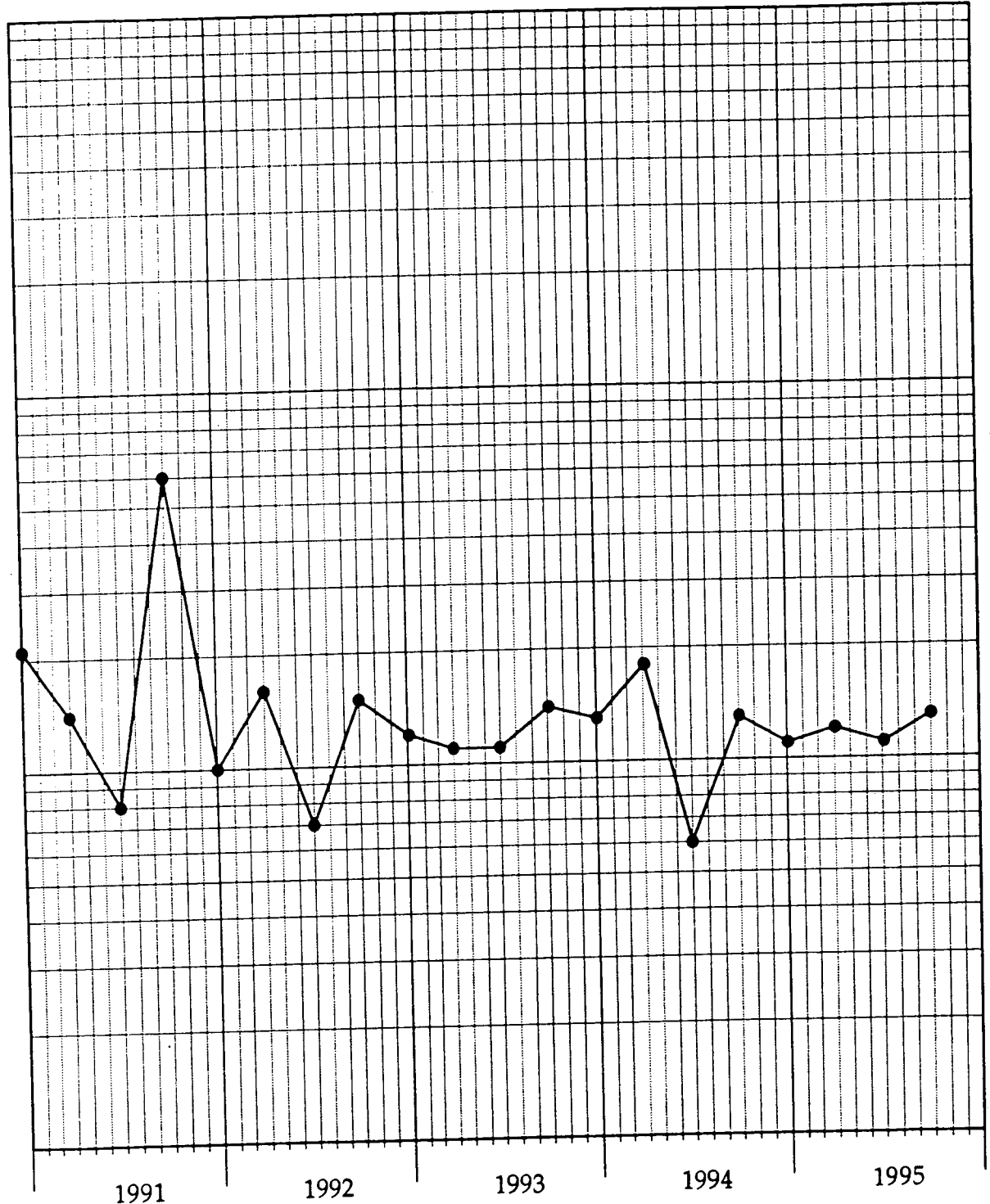


Figure 21. Well water samples. Location K-13. (Total residue)

# STRONTIUM-90

—●— 1991-1995 K-3

100.0000

10.0000

pCi/l

1.0000

0.1000

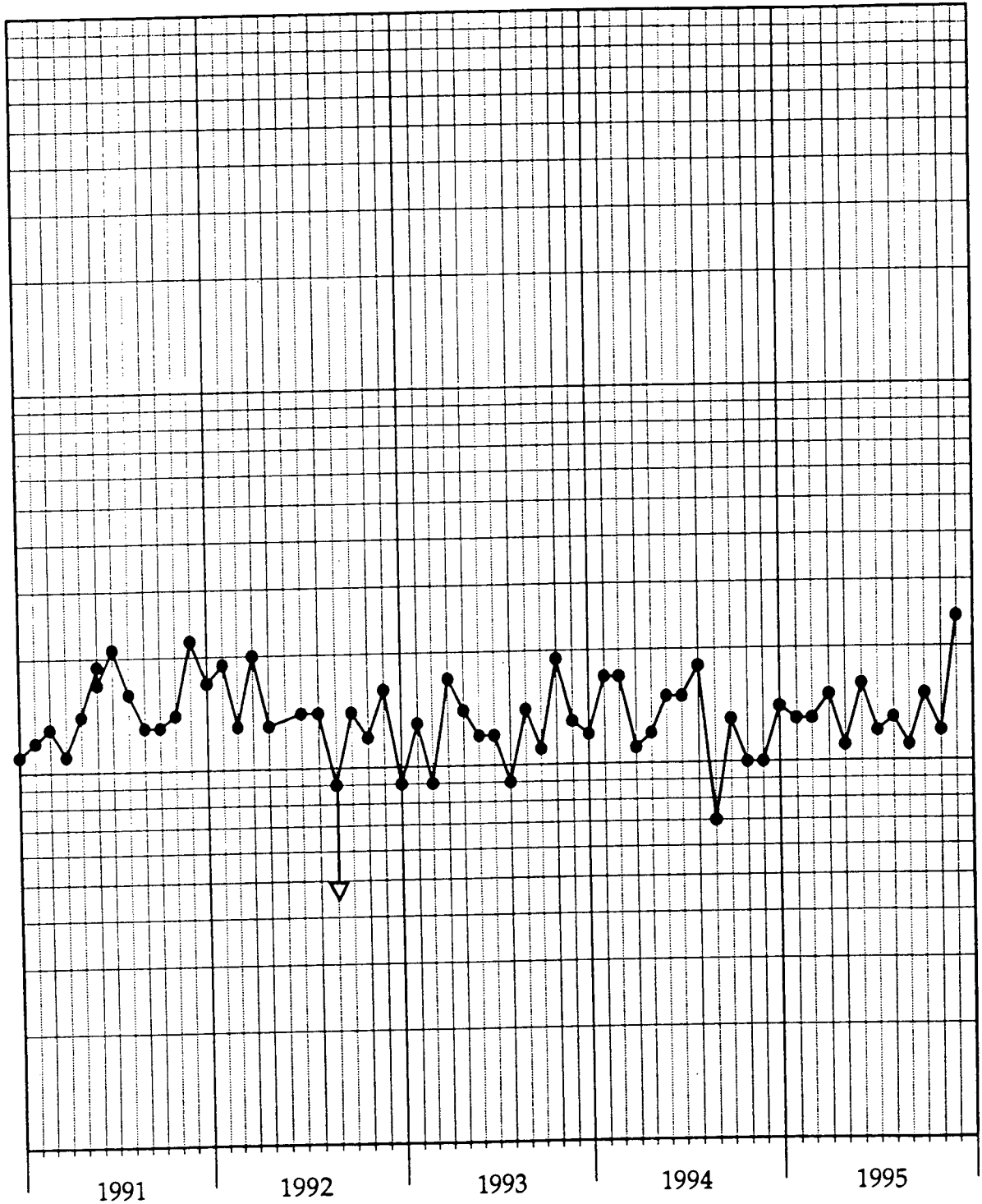


Figure 22. Milk samples. (Location K-3)

# STRONTIUM-90

—●— 1991-1995 K-4

100.0000

10.0000

pCi/l

1.0000

0.1000

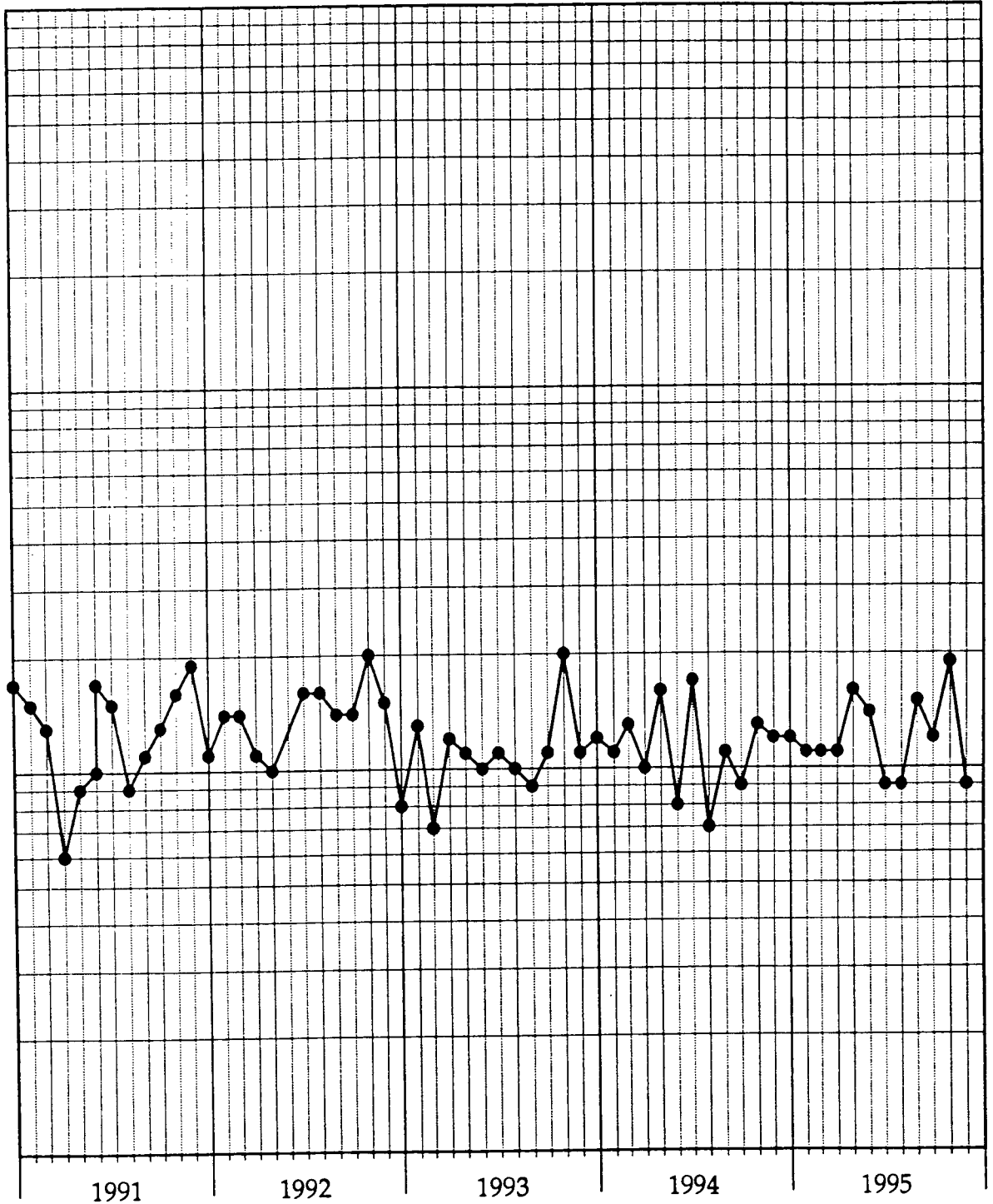


Figure 23. Milk samples. (Location K-4)



# STRONTIUM-90

—●— 1991-1995 K-5

100.0000

10.0000

pCi/l

1.0000

0.1000

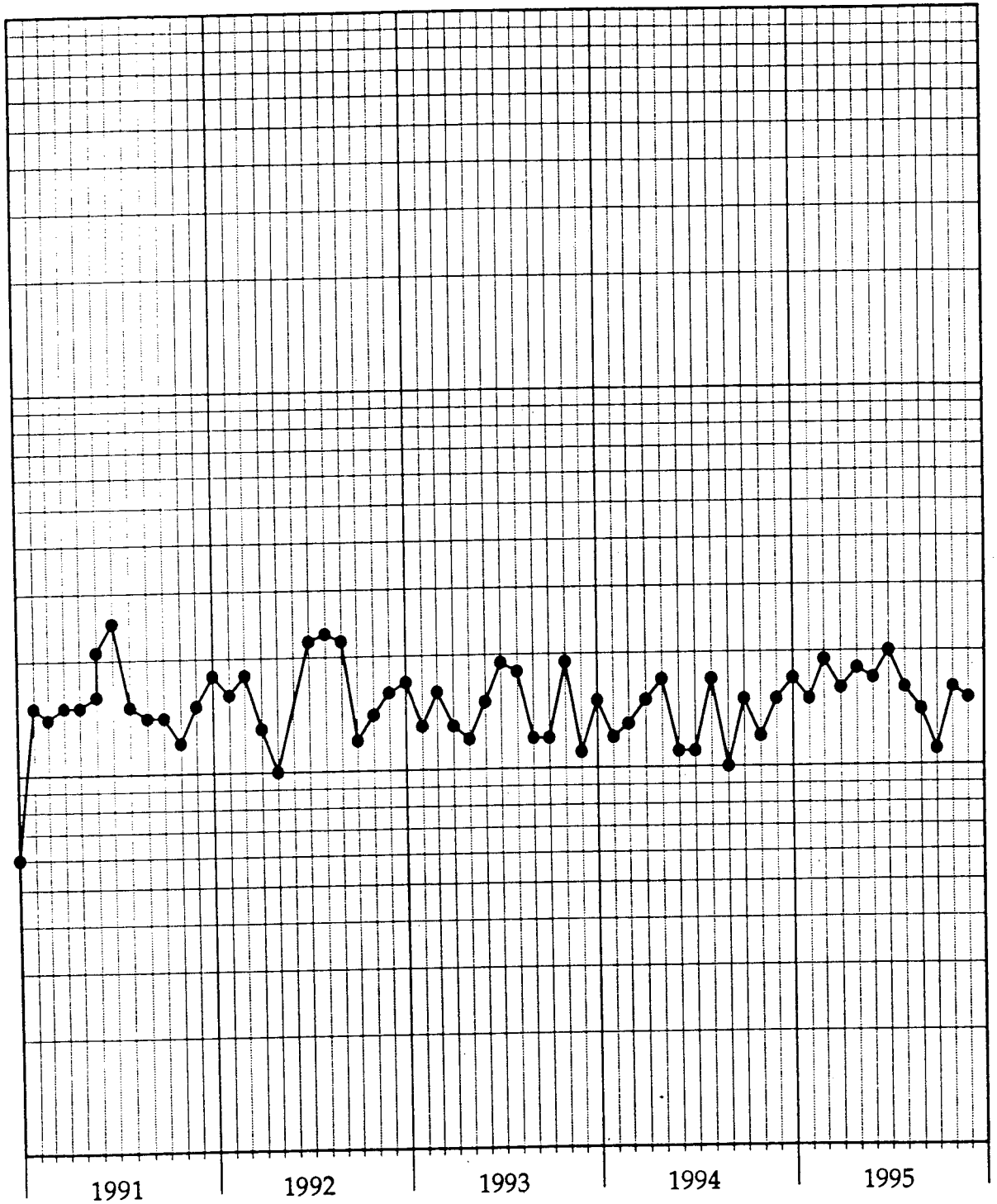


Figure 24. Milk samples. (Location K-5)

# STRONTIUM-90

—●— 1991-1995 K-6

100.0000

10.0000

pCi/l

1.0000

0.1000

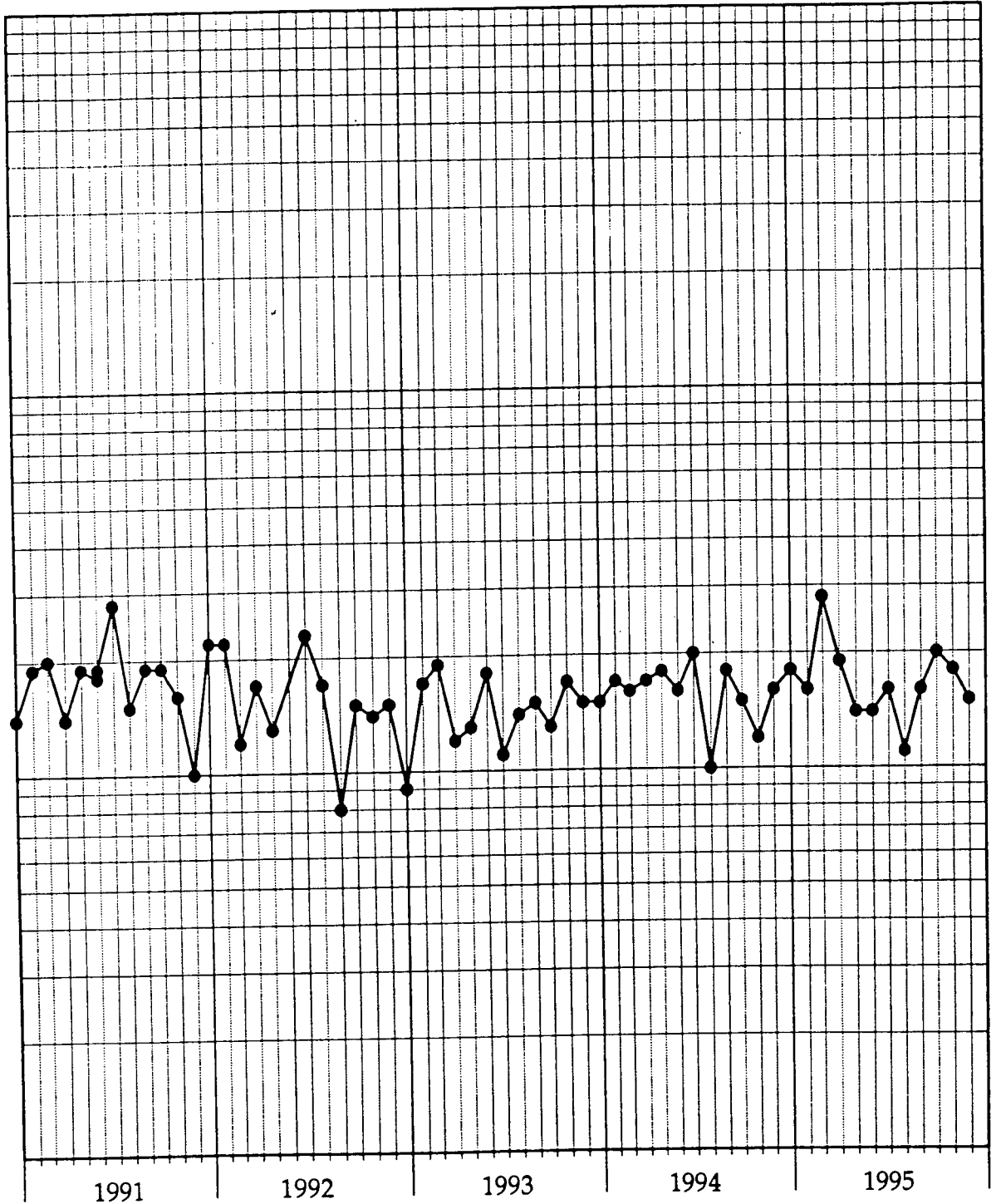


Figure 25. Milk samples. (Location K-6)

# STRONTIUM-90

—●— 1991-1995 K-12

100.0000

10.0000

pCi/l

1.0000

0.1000

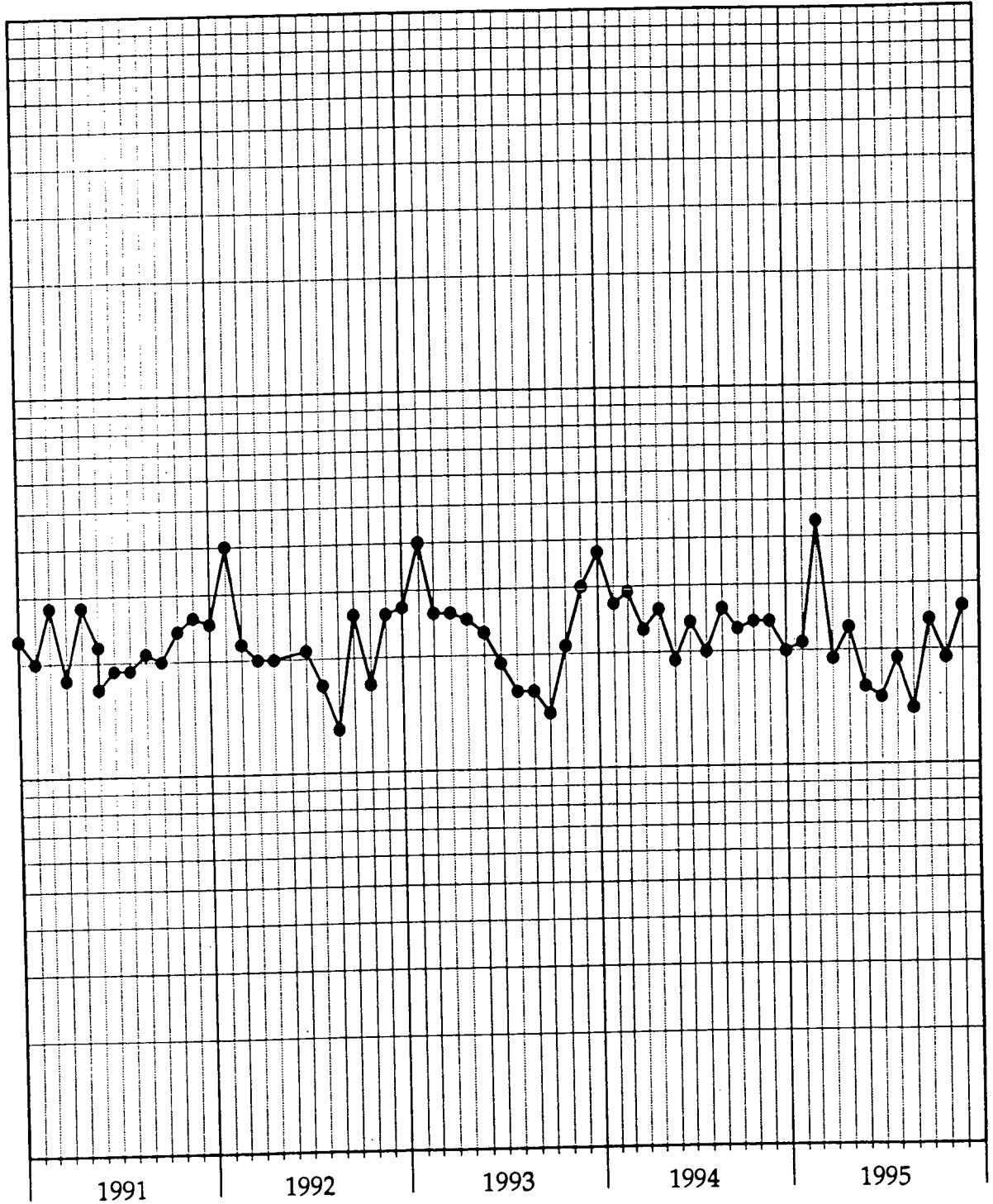


Figure 26. Milk samples. (Location K-12)

# STRONTIUM-90

—●— 1991-1995 K-19

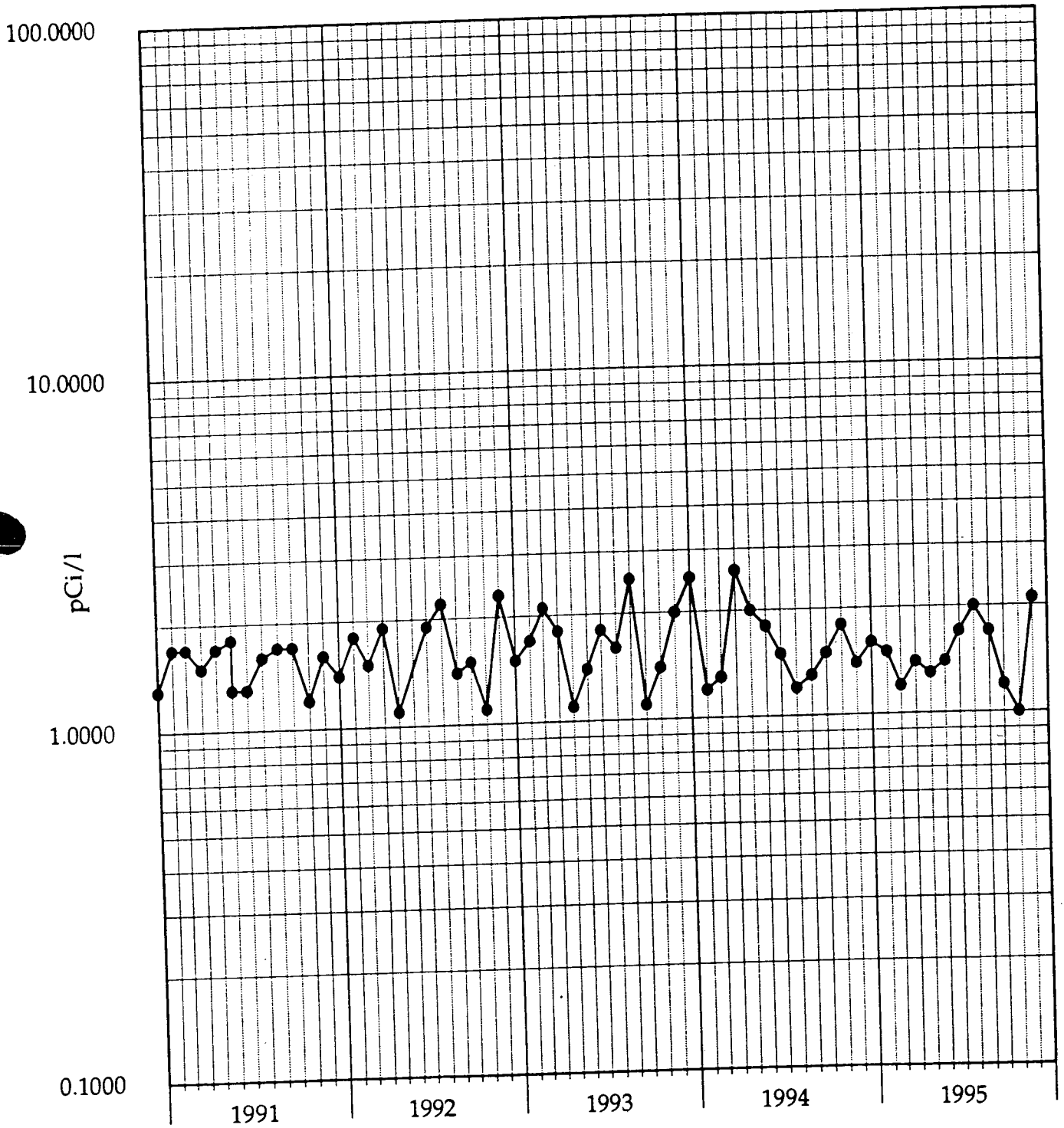


Figure 27. Milk samples. (Location K-19)

# STRONTIUM-90

—●— 1991-1995 K-28

100.0000

10.0000

pCi/l

1.0000

0.1000

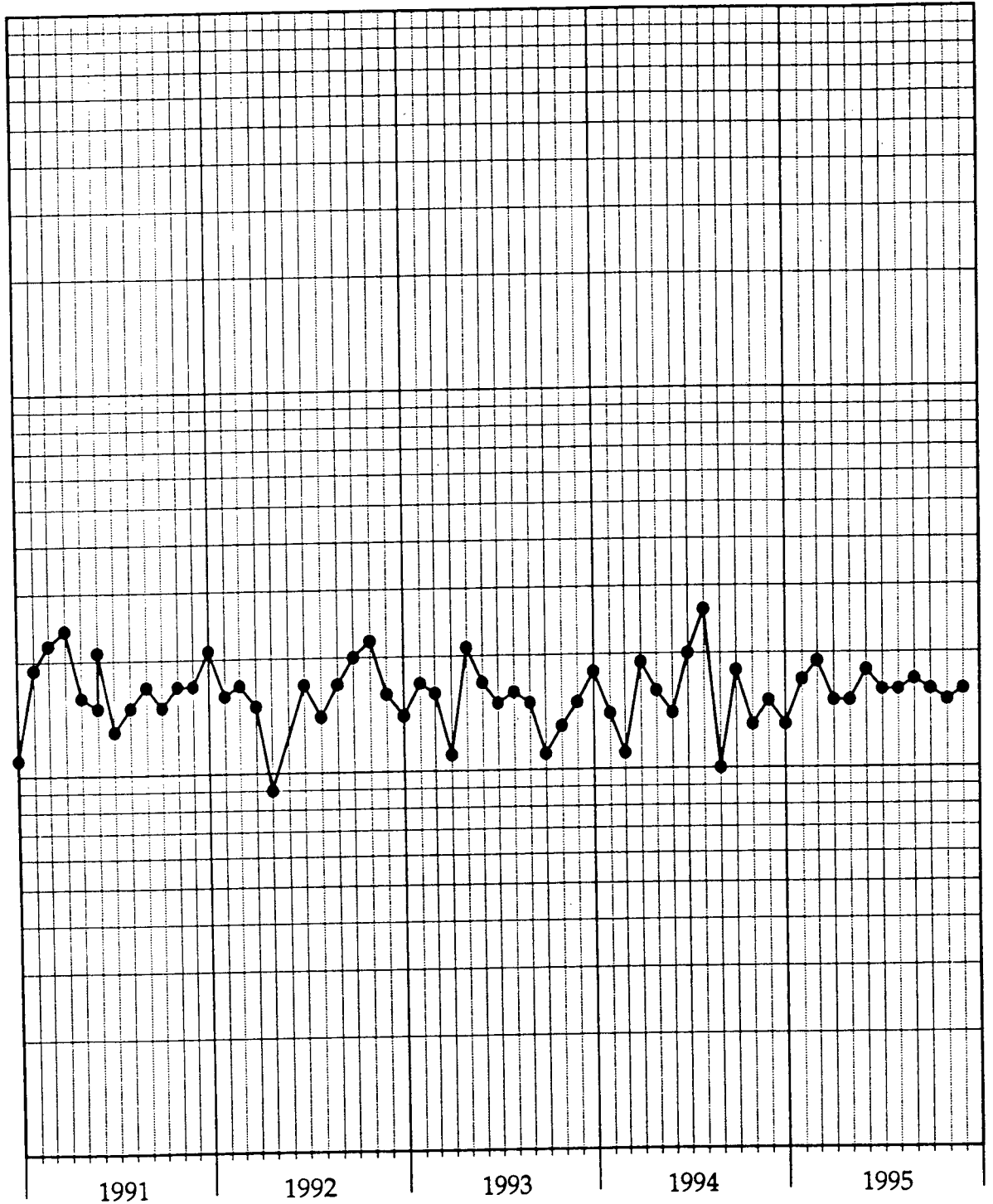


Figure 28. Milk samples. (Location K-28)

# GROSS BETA

- 1991-1995 K-1a DS
- 1991-1995 K-1a SS

100.0000

10.0000

pCi/l

1.0000

0.1000

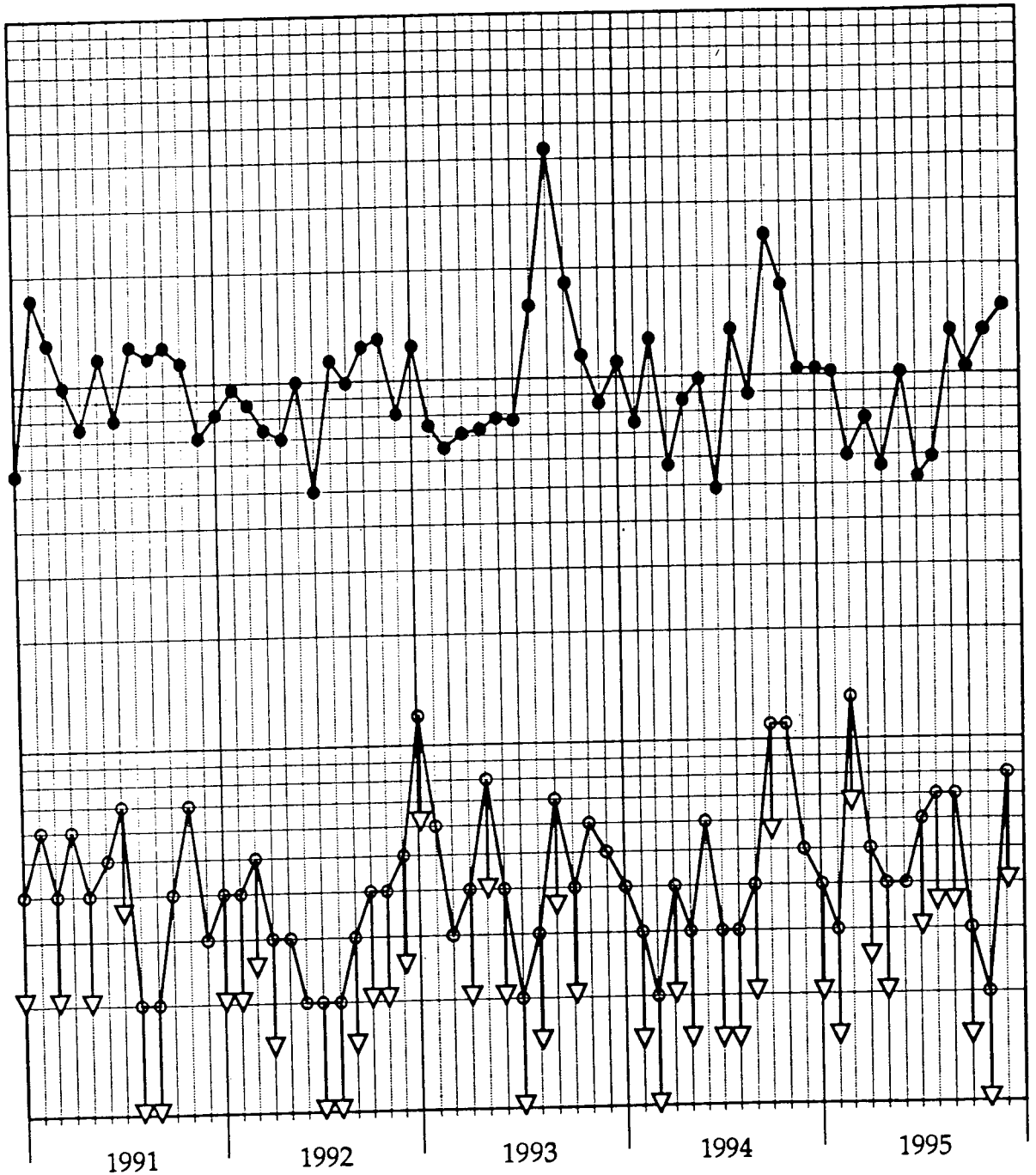


Figure 29. Surface water samples. Collected at North Creek onsite.  
(Location K-1a)

# GROSS BETA

—●— 1991-1995 K-1a

100.0000

10.0000

pCi/l

1.0000

0.1000

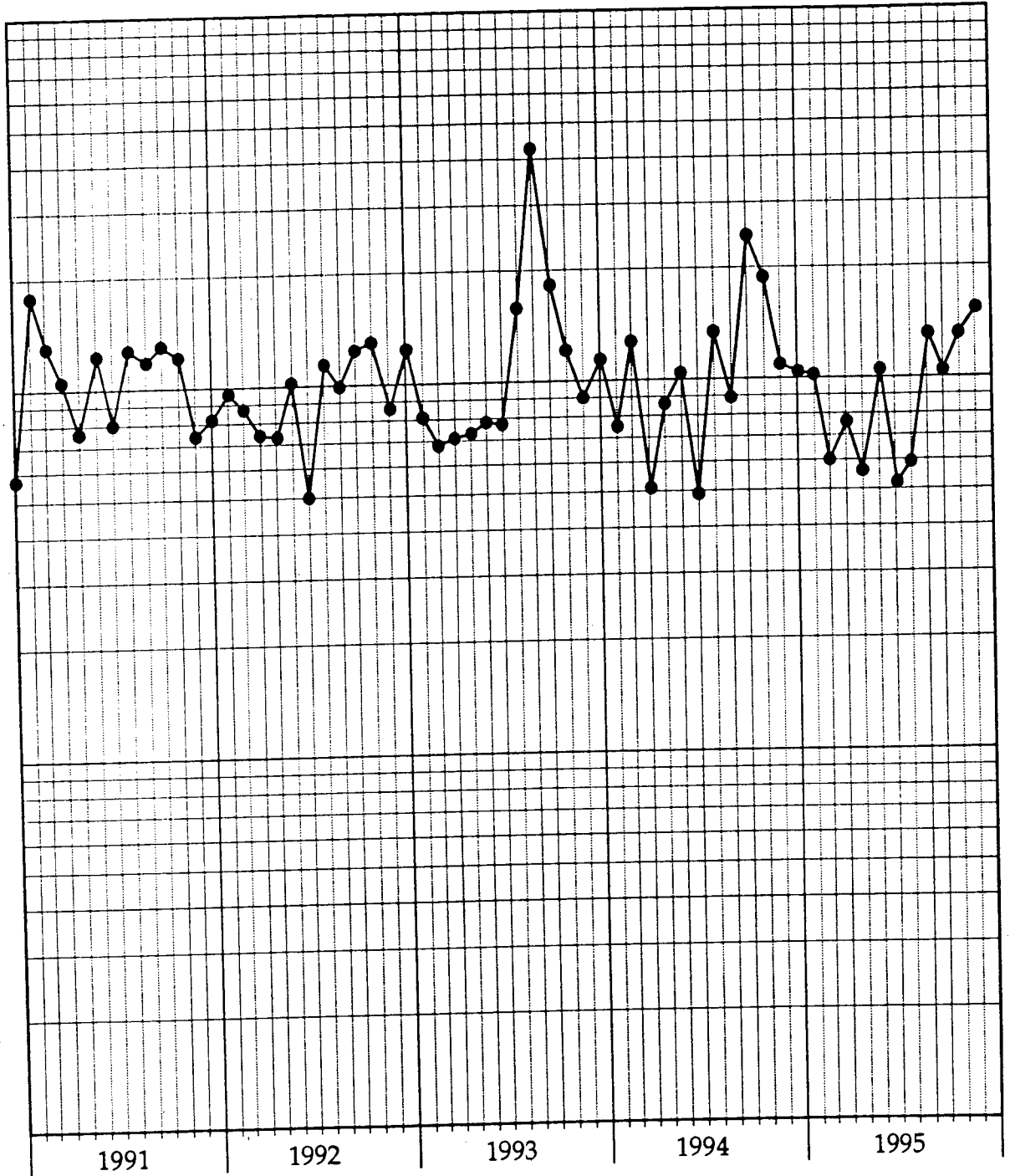
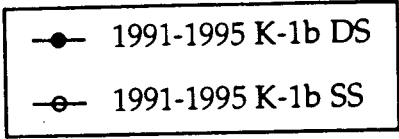


Figure 30. Surface water samples. Collected at North Creek onsite. Total Residue. (Location K-1a)

# GROSS BETA



100.0000

10.0000

pCi/l

1.0000

0.1000

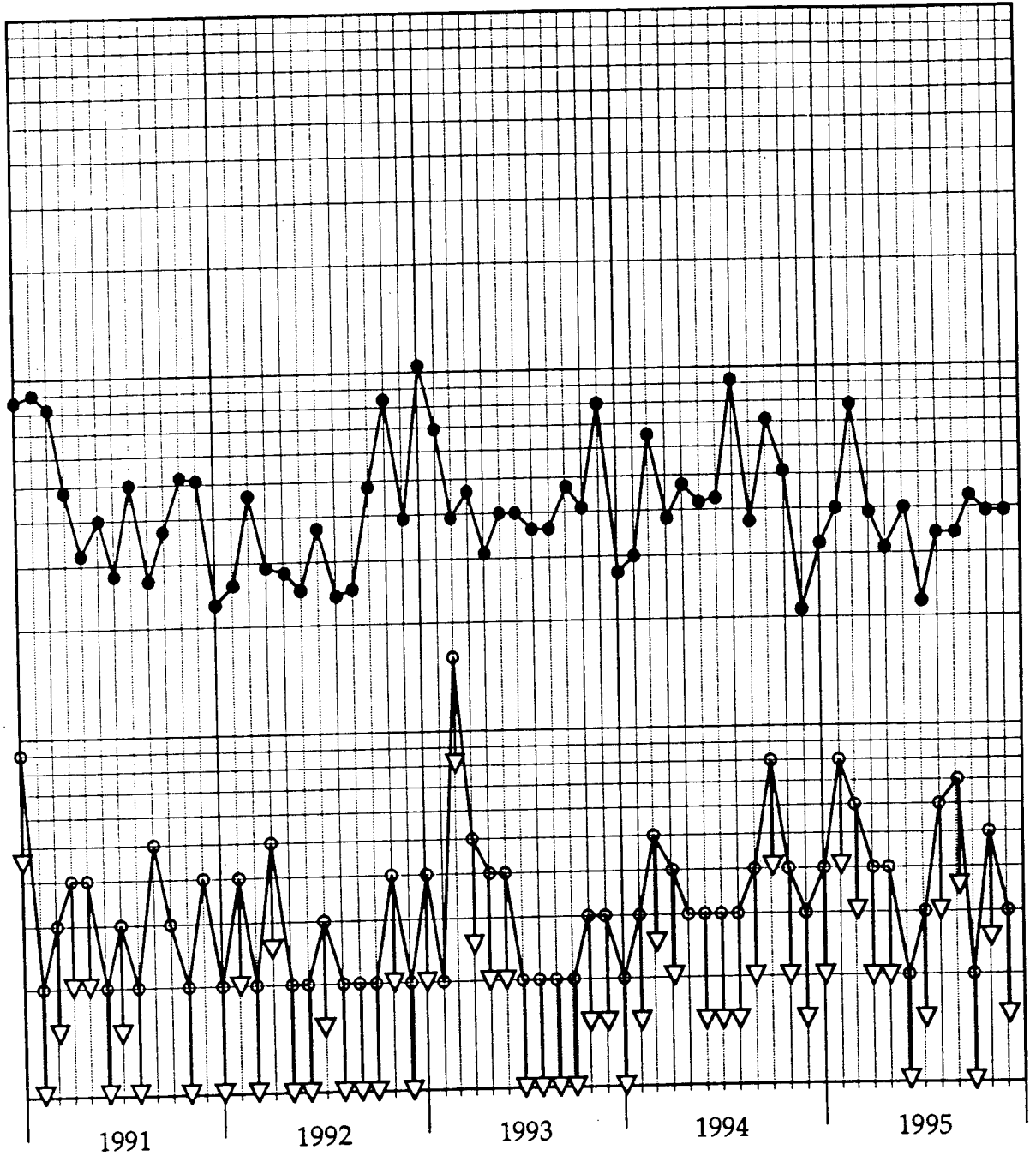


Figure 31. Surface water samples. Collected at Middle Creek onsite.  
(Location K-1b).



# GROSS BETA

—●— 1991-1995 K-1b

100.0000

10.0000

pCi/l

1.0000

0.1000

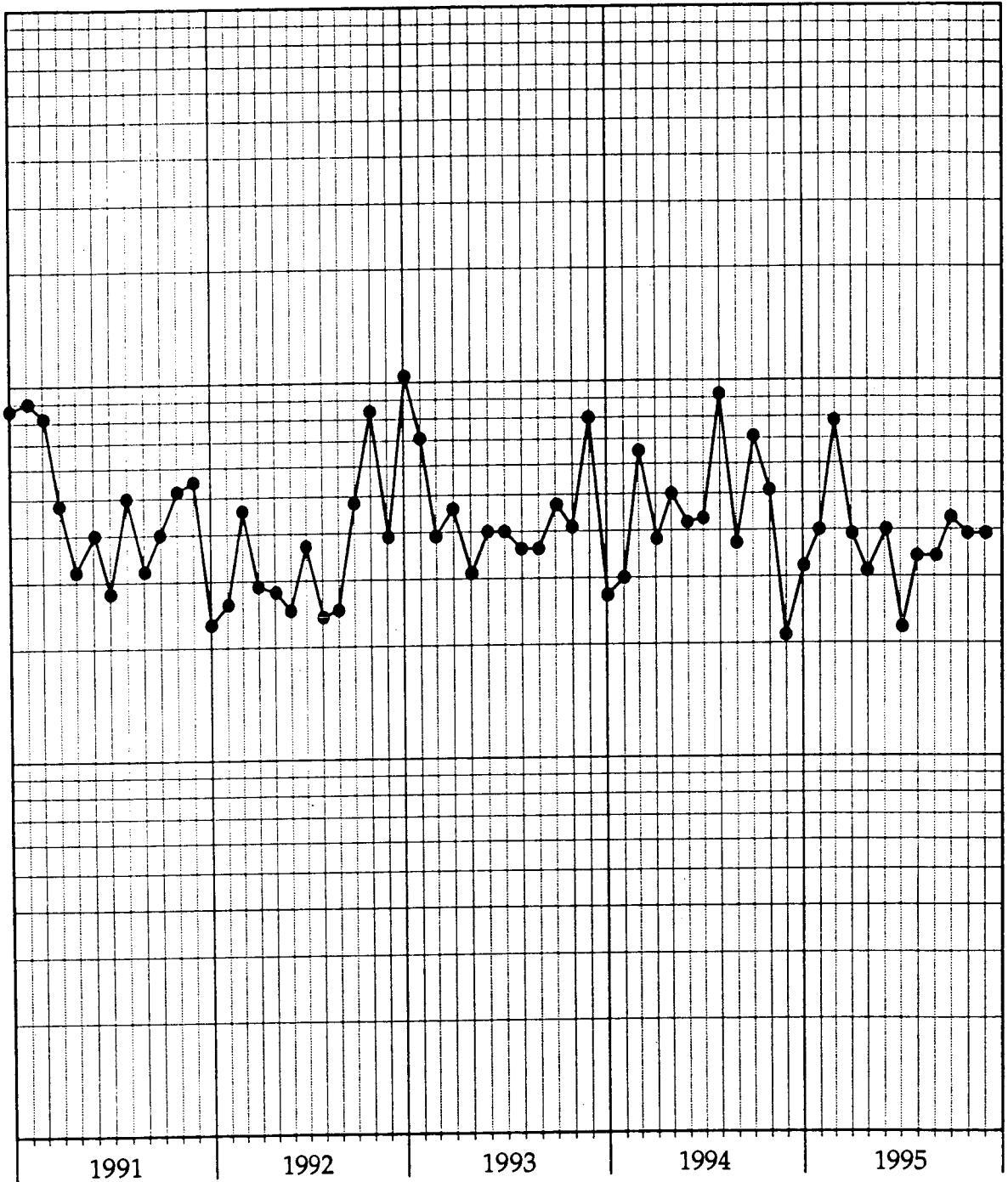
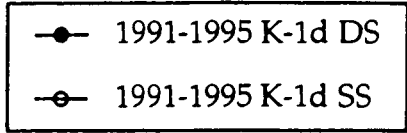


Figure 32. Surface water samples. Collected at Middle Creek onsite. Total residue. (Location K-1b)

# GROSS BETA



100.0000

10.0000

1.0000

0.1000

pCi/l

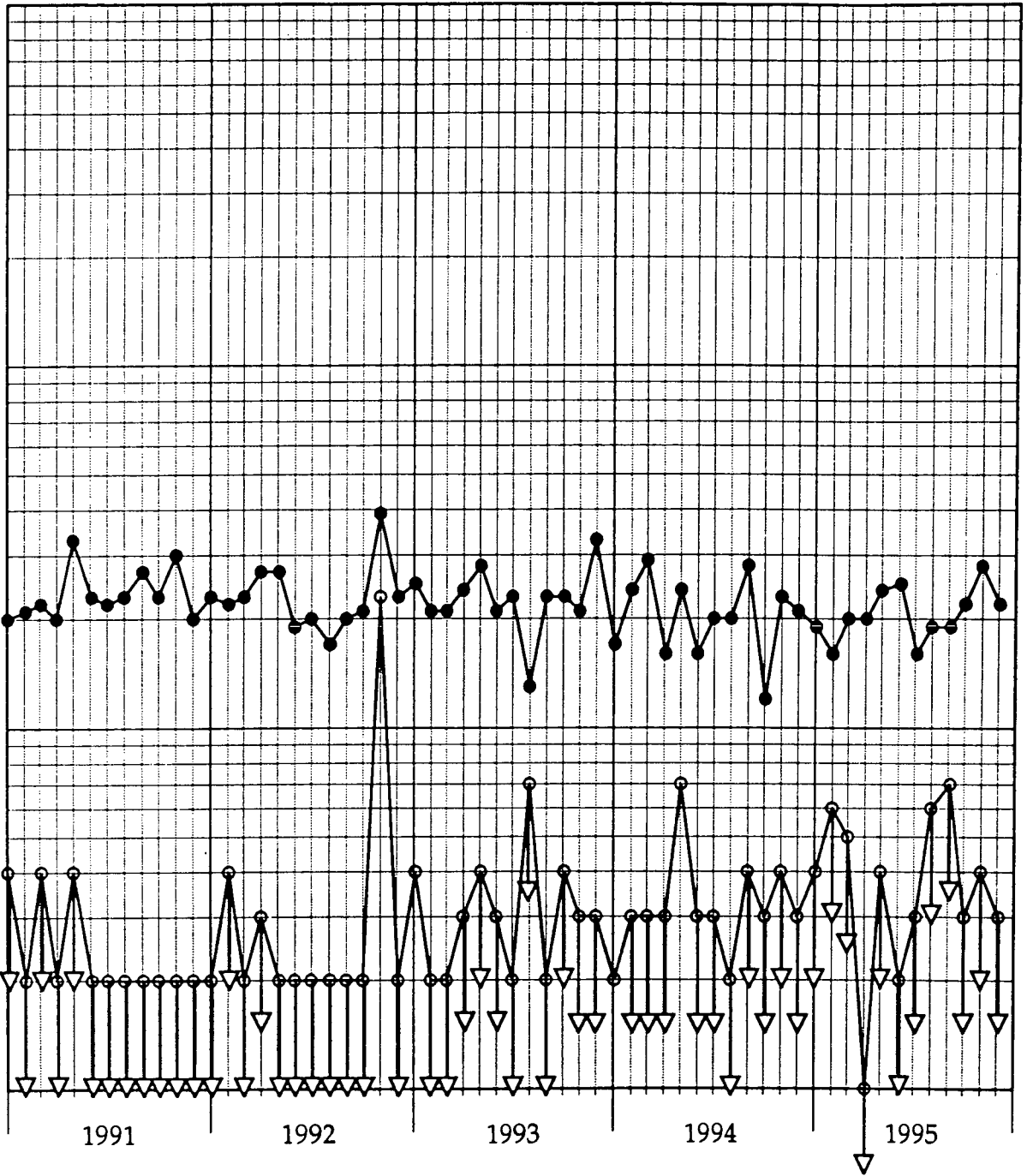


Figure 33. Surface water samples. Collected at the Lake Michigan condenser discharge onsite. (Location K-1d)

November 1992 activity due to sample container having a leak; suspect some sediment due to low volume.

# GROSS BETA

—●— 1991-1995 K-1d

100.0000

10.0000

pCi/l

1.0000

0.1000

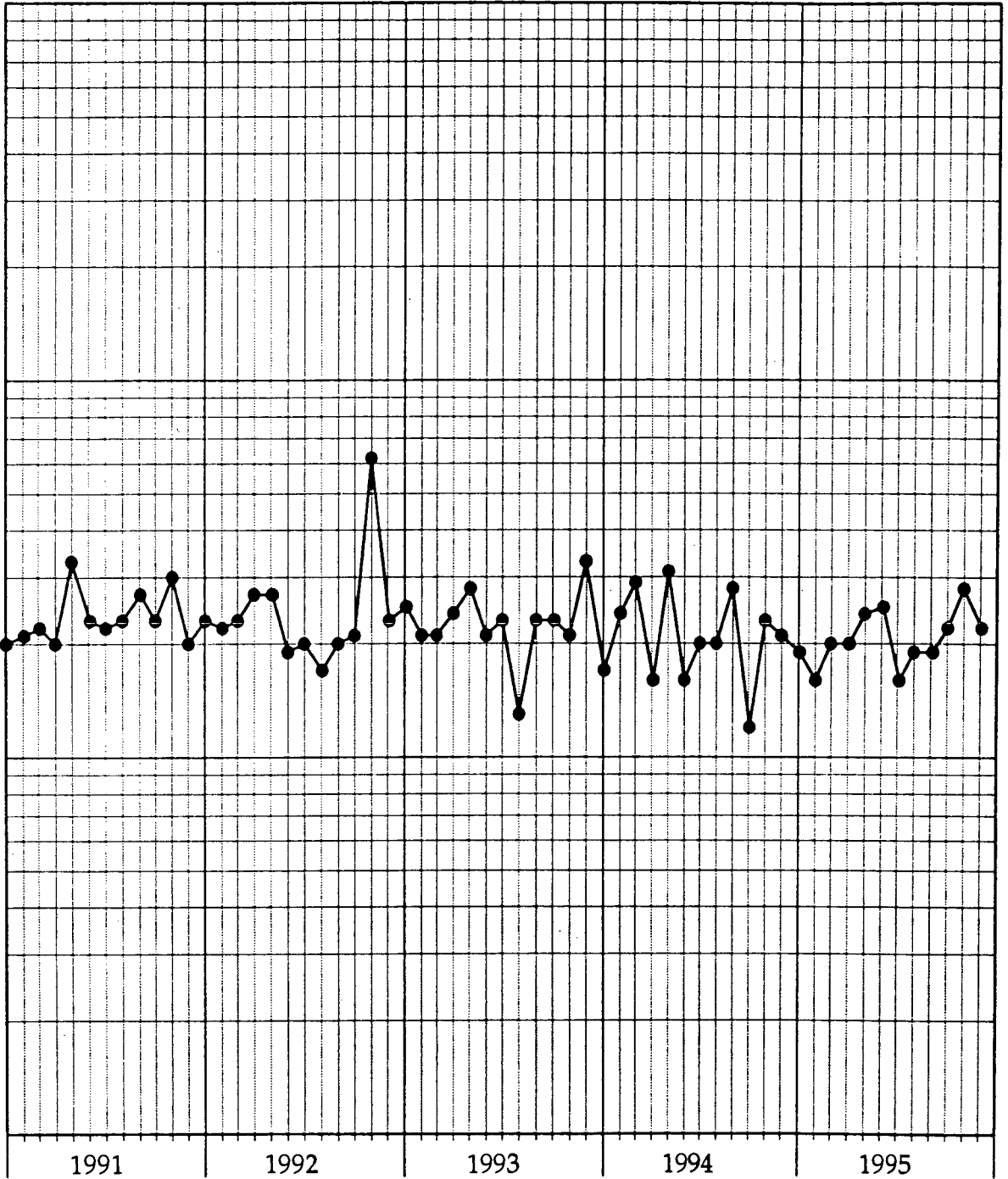


Figure 34. Surface water samples. Collected at the Lake Michigan condenser discharge onsite. Total residue (Location K-1d).

# GROSS BETA

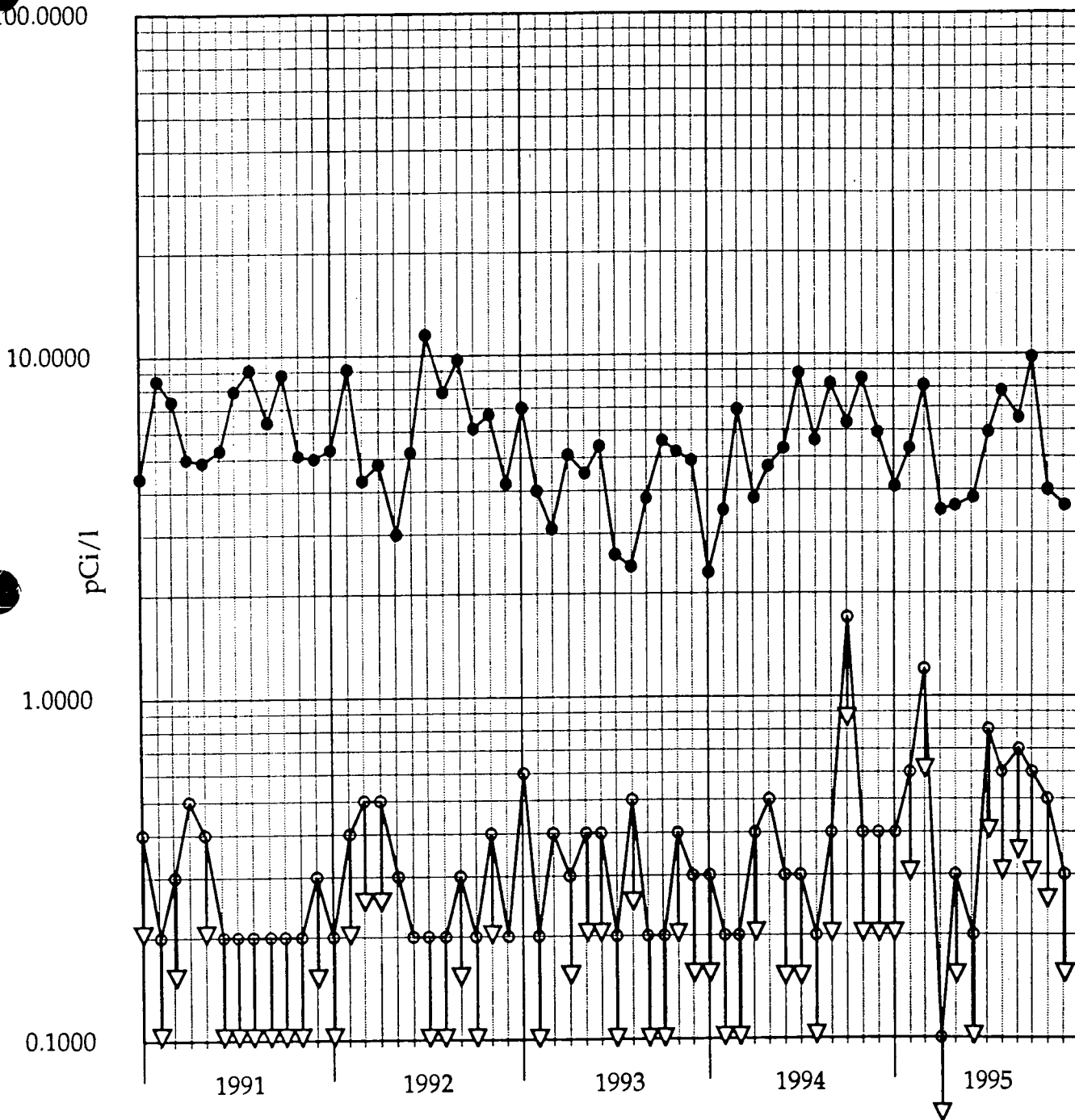
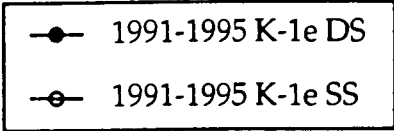


Figure 35. Surface water samples. Collected at South Creek onsite. (Location K-1e).

# GROSS BETA

—○— 1991-1995 K-1e

100.0000

10.0000

pCi/l

1.0000

0.1000

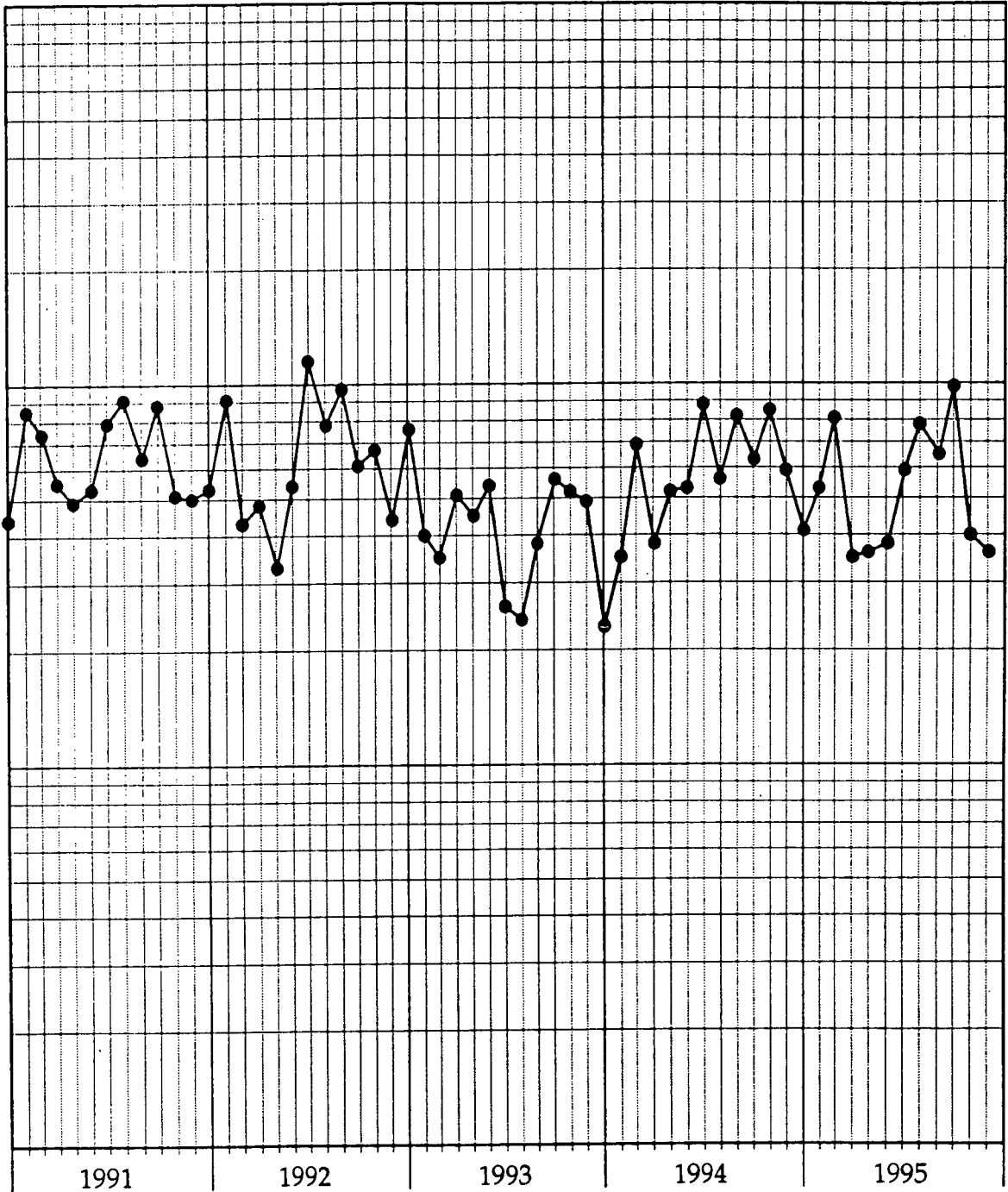


Figure 36. Surface water samples. Collected at South Creek onsite. Total residue (Location K-1e).

# GROSS BETA

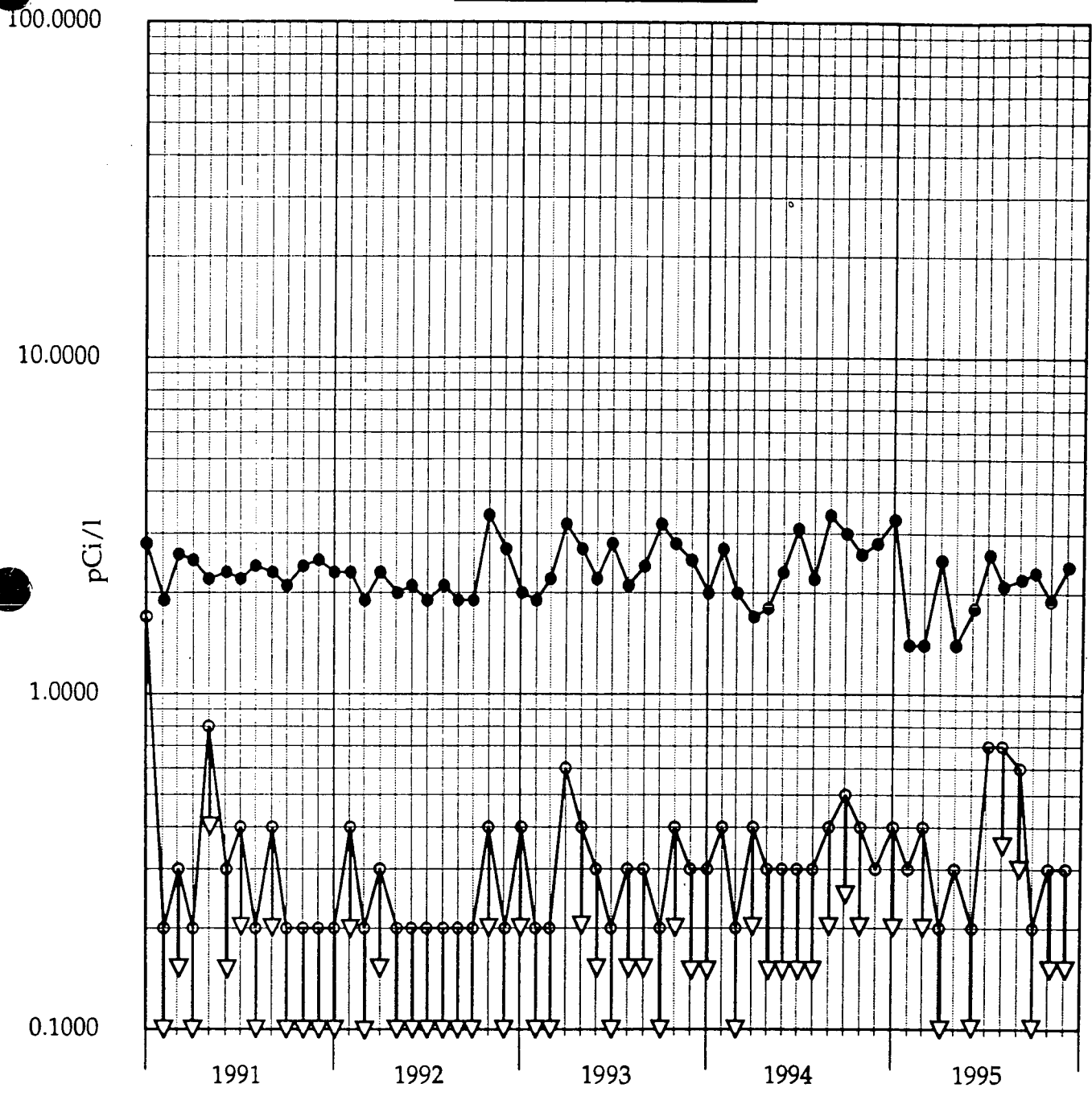
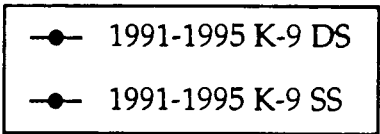


Figure 37. Surface water (raw) samples. Collected at Lake Michigan Rostok intake. (Location K-9)

# GROSS BETA

—●— 1991-1995 K-9

100.0000

10.0000

pCi/l

1.0000

0.1000

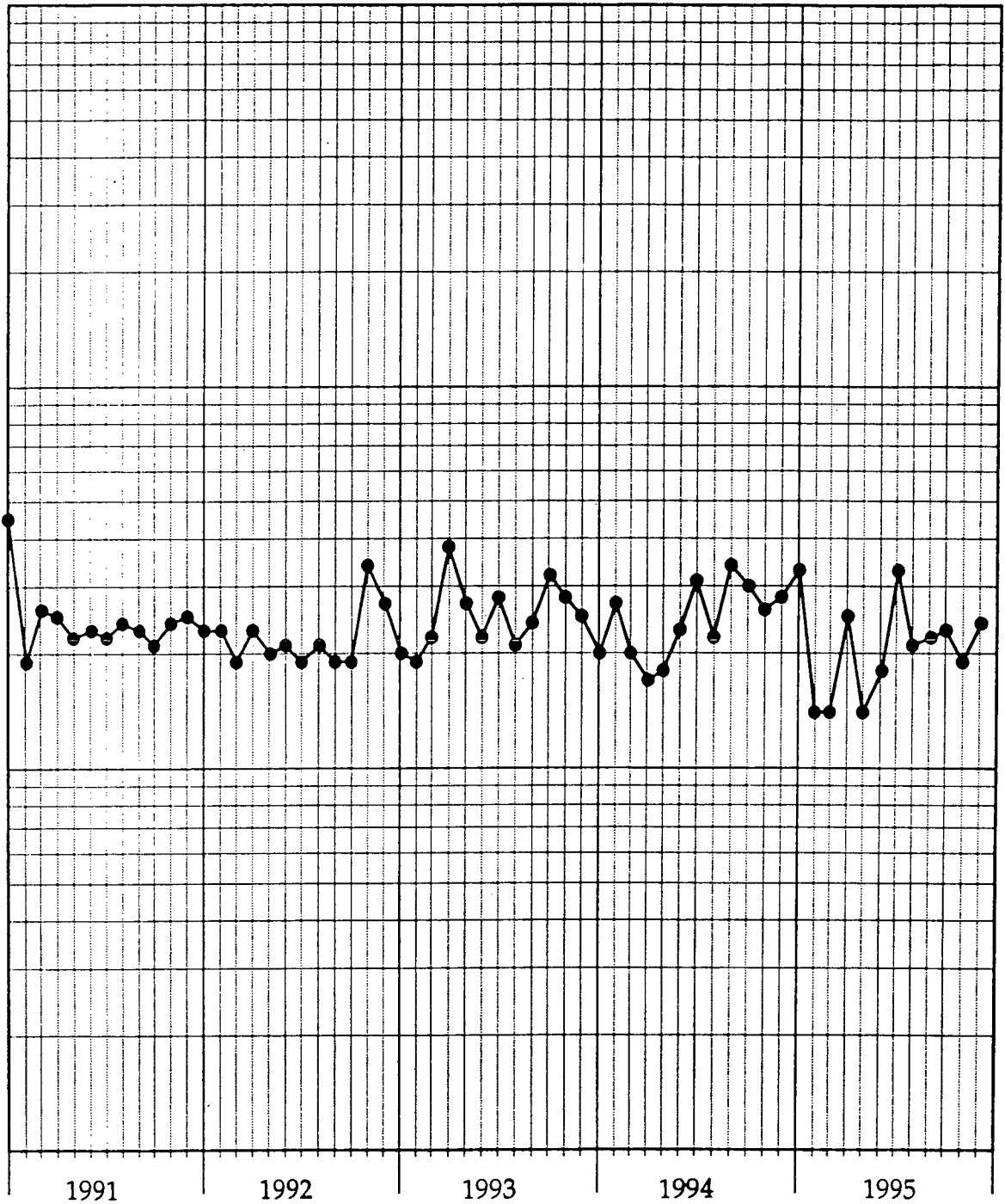


Figure 38. Surface water (raw) samples. Collected at the Lake Michigan Rostok intake. Total residue (Location K-9).

# GROSS BETA

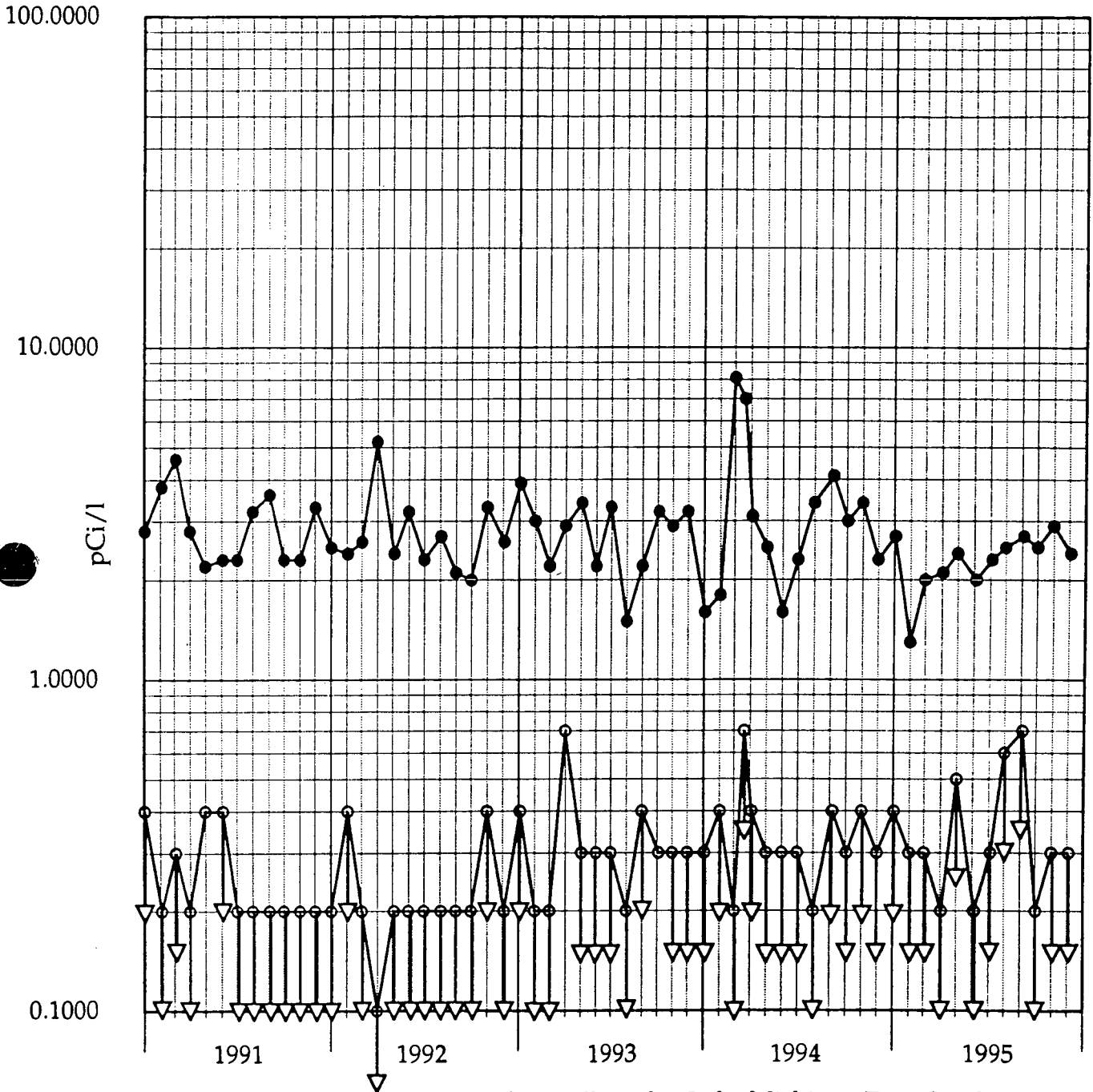
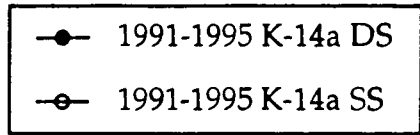


Figure 39. Surface water samples. Collected at Lake Michigan Two Creeks Park. (Location K-14a).



# GROSS BETA

—●— 1991-1995 K-14a

000.0000

10.0000

pCi/l

1.0000

0.1000

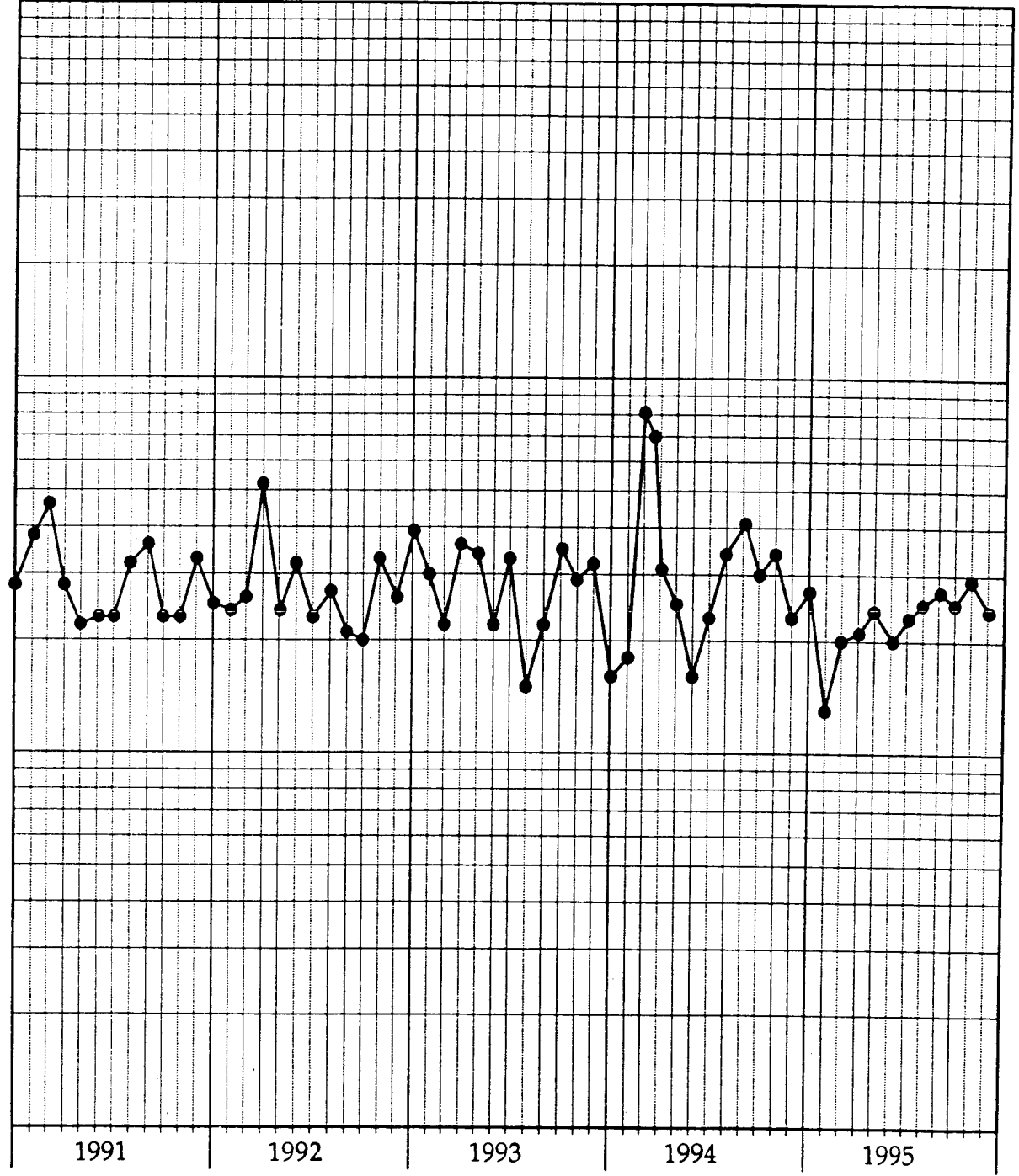


Figure 40. Surface water samples. Collected at the Lake Michigan Two Creeks Park. Total residue (Location K-14a).

# TRITIUM

● 1991-1995 K-1d

00000.0000

10000.0000

pCi/l

1000.0000

100.0000

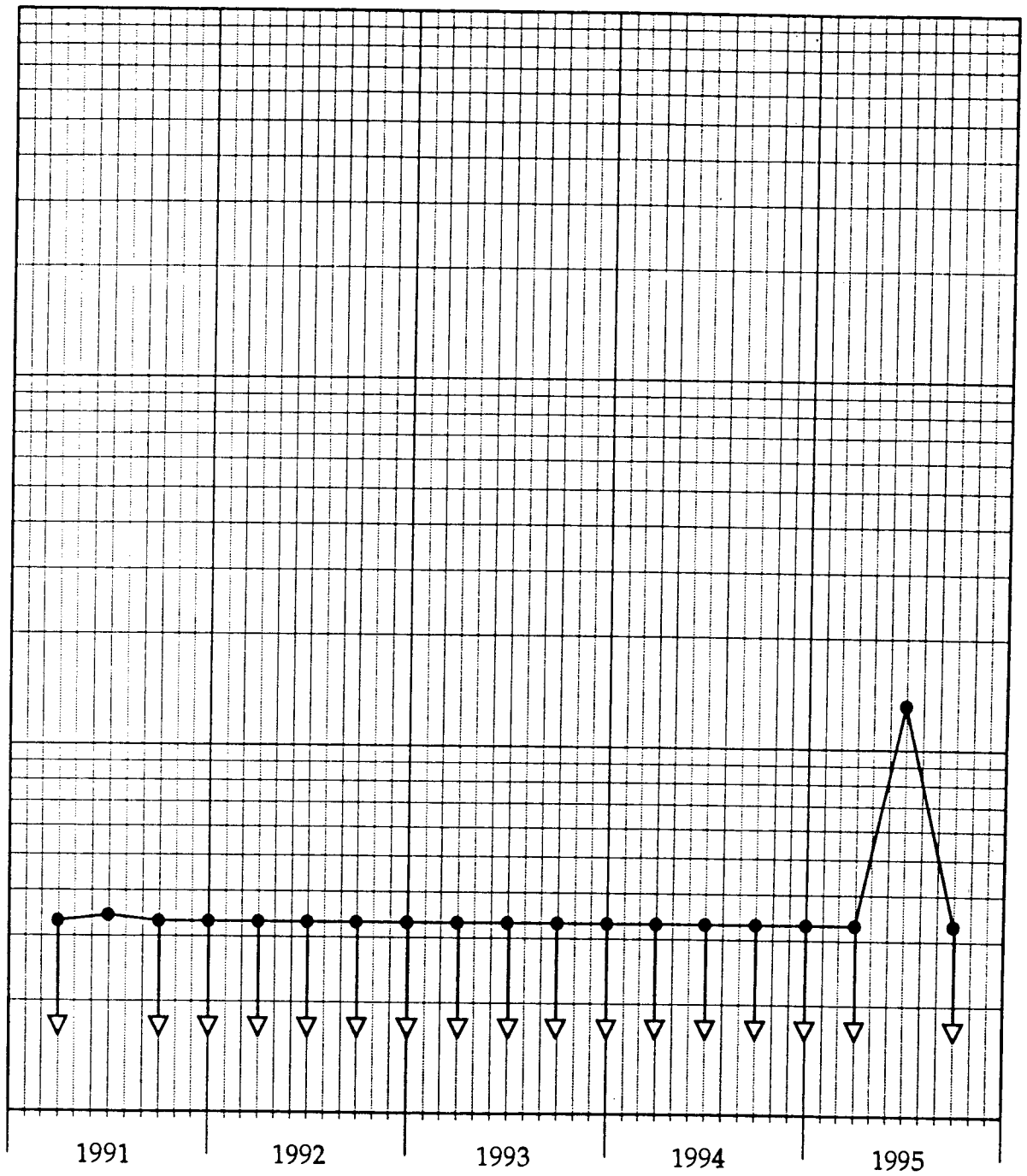


Figure 41. Surface water samples. Collected at the Lake Michigan condenser discharge onsite. (Location K-1d).

# TRITIUM

● 1991-1995 K-14a

100000.0000

10000.0000

pCi/l

1000.0000

100.0000

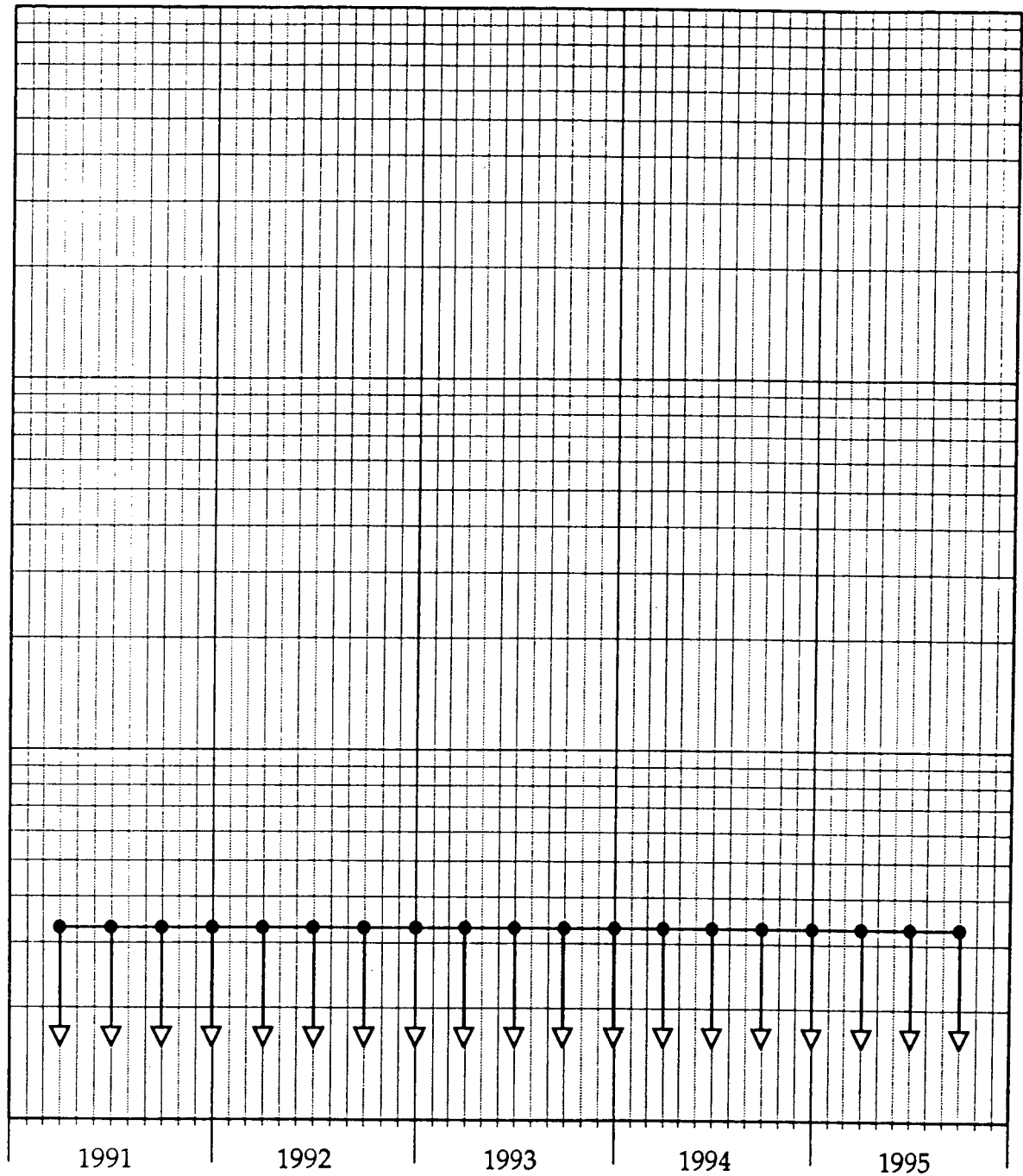


Figure 42. Surface water samples. Collected at Lake Michigan Two Creeks Park. (Location K-14a).

# TRITIUM

● 1991-1995 K-9

0000.0000

10000.0000

pCi/l

1000.0000

100.0000

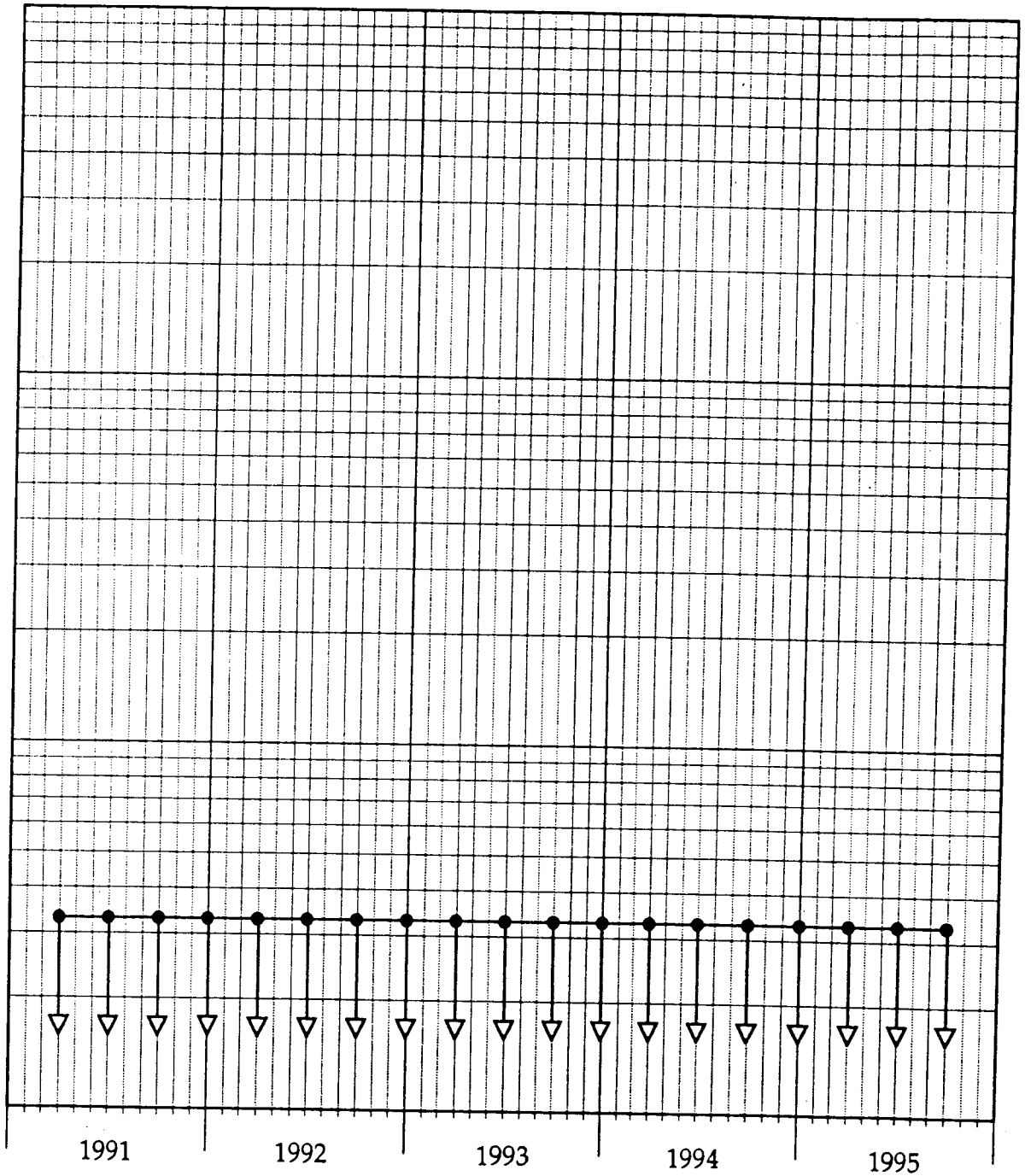


Figure 43. Surface water (raw) samples. Collected at Lake Michigan Rostok intake. (Location K-9).

6.0 DATA TABULATIONS

KEWAUNEE

Table 4. Airborne particulates and charcoal canisters.

Analyses: Gross beta and iodine-131

Location: K-1

Units: pCi/m<sup>3</sup>

Collection: Continuous, weekly exchange.

Date Collected	Volume (m <sup>3</sup> )	Gross Beta	Date Collected	Volume (m <sup>3</sup> )	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-03-95	305	0.025 ± 0.003	07-05-95	350	0.012 ± 0.002
01-10-95	303	0.011 ± 0.002	07-10-95	214	0.011 ± 0.003
01-17-95	306	0.026 ± 0.003	07-18-95	372	0.026 ± 0.003
01-24-95	305	0.016 ± 0.002	07-25-95	361	0.016 ± 0.002
01-31-95	303	0.026 ± 0.003	08-01-95	356	0.021 ± 0.002
02-07-95	304	0.028 ± 0.003	08-08-95	303	0.018 ± 0.003
02-14-95	304	0.023 ± 0.003	08-13-95	301	0.019 ± 0.003
02-21-95	303	0.024 ± 0.003	08-22-95	332	0.017 ± 0.003
02-28-95	305	0.022 ± 0.003	08-29-95	353	0.018 ± 0.003
03-07-95	303	0.026 ± 0.003	09-05-95	357	0.026 ± 0.003
03-14-95	305	0.024 ± 0.003	09-11-95	282	0.022 ± 0.003
03-21-95	305	0.012 ± 0.003	09-19-95	343	0.019 ± 0.002
03-28-95	303	0.011 ± 0.002	09-26-95	330	0.013 ± 0.002
1st Qtr. mean±s.d.		<u>0.021 ± 0.006</u>	10-02-95	356	0.034 ± 0.003
			3rd Qtr. mean±s.d.		<u>0.019 ± 0.006</u>
04-04-95	302	0.017 ± 0.003	10-10-95	354	0.013 ± 0.002
04-11-95	305	0.018 ± 0.003	10-17-95	356	0.031 ± 0.003
04-18-95	303	0.015 ± 0.003	10-24-95	354	0.014 ± 0.002
04-25-95	305	0.011 ± 0.002	10-31-95	358	0.019 ± 0.002
05-02-95	302	0.009 ± 0.002	11-07-95	354	0.019 ± 0.003
05-09-95	305	0.013 ± 0.002	11-14-95	355	0.018 ± 0.003
05-16-95	302	0.014 ± 0.003	11-21-95	352	0.023 ± 0.003
05-23-95	306	0.012 ± 0.002	11-28-95	355	0.025 ± 0.003
05-30-95	315	0.008 ± 0.002	12-05-95	357	0.024 ± 0.003
06-06-95	323	0.016 ± 0.003	12-12-95	354	0.029 ± 0.003
06-13-95	323	0.009 ± 0.002	12-19-95	354	0.035 ± 0.003
06-20-95	315	0.024 ± 0.003	12-26-95	356	0.019 ± 0.003
06-27-95	303	0.024 ± 0.003	01-02-96	352	0.028 ± 0.003
2nd Qtr. mean±s.d.		<u>0.015 ± 0.005</u>	4th Qtr. mean±s.d.		<u>0.023 ± 0.006</u>
Cumulative Average:					0.019
Previous Annual Average:					0.019

\* Iodine-131 is sampled biweekly. Concentrations are <0.03 pCi/m<sup>3</sup> unless otherwise noted.

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Table 5. Airborne particulates and charcoal canisters.  
 Analyses: Gross beta and iodine-131  
 Location: K-2  
 Units: pCi/m<sup>3</sup>  
 Collection: Continuous, weekly exchange.

Date Collected	Volume (m <sup>3</sup> )	Gross Beta	Date Collected	Volume (m <sup>3</sup> )	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-03-95	304 <sup>b</sup>	< 0.003	07-05-95	357	0.012 ± 0.002
01-10-95	305	0.013 ± 0.002	07-10-95	214	0.010 ± 0.003
01-17-95	303	0.025 ± 0.003	07-18-95	339	0.023 ± 0.003
01-24-95	308	0.014 ± 0.002	07-25-95	307	0.020 ± 0.003
01-31-95	300	0.027 ± 0.003	08-01-95	305	0.017 ± 0.003
02-07-95	305	0.025 ± 0.003	08-08-95	303	0.013 ± 0.002
02-14-95	303	0.020 ± 0.003	08-13-95	297	0.014 ± 0.003
02-21-95	302	0.026 ± 0.003	08-22-95	283	0.015 ± 0.003
02-28-95	305	0.018 ± 0.003	08-29-95	303	0.015 ± 0.003
03-07-95	307	0.021 ± 0.003	09-05-95	280	0.024 ± 0.003
03-14-95	302	0.021 ± 0.003	09-11-95	238	0.019 ± 0.003
03-21-95	305	0.011 ± 0.002	09-19-95	343	0.014 ± 0.002
03-28-95	303	0.014 ± 0.002	09-26-95	281	0.011 ± 0.003
1st Qtr. mean±s.d.		<u>0.020 ± 0.005</u>	10-02-95	255	<u>0.030 ± 0.004</u>
			3rd Qtr. mean±s.d.		<u>0.017 ± 0.005</u>
04-04-95	302	0.013 ± 0.002	10-10-95	253	0.012 ± 0.003
04-11-95	305	0.016 ± 0.003	10-17-95	254	0.027 ± 0.003
04-18-95	304	0.012 ± 0.003	10-24-95	227	0.010 ± 0.003
04-25-95	305	0.012 ± 0.002	10-31-95	230	0.016 ± 0.003
05-02-95	302	0.004 ± 0.002	11-07-95	279	0.016 ± 0.003
05-09-95	305	0.013 ± 0.002	11-14-95	254	0.017 ± 0.003
05-16-95	300	0.013 ± 0.002	11-21-95	252	0.019 ± 0.003
05-23-95	308	0.011 ± 0.002	11-28-95	254	0.018 ± 0.003
05-30-95	304	0.009 ± 0.002	12-05-95	254	0.022 ± 0.003
06-06-95	303	0.020 ± 0.003	12-12-95	301	0.017 ± 0.003
06-13-95	301	0.010 ± 0.002	12-19-95	304	0.024 ± 0.003
06-20-95	308	0.025 ± 0.003	12-26-95	255	0.015 ± 0.003
06-27-95	303	0.026 ± 0.003	01-02-96	201	0.030 ± 0.004
2nd Qtr. mean±s.d.		<u>0.014 ± 0.006</u>	4th Qtr. mean±s.d.		<u>0.019 ± 0.005</u>
Cumulative Average:					0.017
Previous Annual Average:					0.019

<sup>a</sup> Iodine-131 is sampled biweekly. Concentrations are <0.03 pCi/m<sup>3</sup> unless otherwise noted.

<sup>b</sup> Filter very light.

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Table 6. Airborne particulates and charcoal canisters.  
 Analyses: Gross beta and iodine-131  
 Location: K-7  
 Units: pCi/m<sup>3</sup>  
 Collection: Continuous, weekly exchange.

Date Collected	Volume (m <sup>3</sup> )	Gross Beta	Date Collected	Volume (m <sup>3</sup> )	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-03-95	327	0.013 ± 0.002	07-05-95	345	0.010 ± 0.002
01-10-95	327	0.010 ± 0.002	07-10-95	210	0.008 ± 0.003
01-17-95	329	0.017 ± 0.002	07-18-95	343	0.025 ± 0.003
01-24-95	306	0.013 ± 0.002	07-25-95	309	0.018 ± 0.003
01-31-95	302	0.020 ± 0.003	08-01-95	305	0.019 ± 0.003
02-07-95	304	0.024 ± 0.003	08-08-95	303	0.016 ± 0.003
02-14-95	304	0.015 ± 0.002	08-13-95	299	0.017 ± 0.003
02-21-95	305	0.020 ± 0.003	08-22-95	309	0.019 ± 0.003
02-28-95	305	0.018 ± 0.003	08-29-95	303	0.016 ± 0.003
03-07-95	301	0.021 ± 0.003	09-05-95	305	0.027 ± 0.003
03-14-95	307	0.020 ± 0.003	09-11-95	260	0.022 ± 0.003
03-21-95	305	0.012 ± 0.003	09-19-95	344	0.013 ± 0.002
03-28-95	303	0.012 ± 0.002	09-26-95	282	0.014 ± 0.003
1st Qtr. mean±s.d.		<u>0.017 ± 0.004</u>	10-02-95	254	<u>0.038 ± 0.004</u>
04-04-95	302	0.015 ± 0.002	3rd Qtr. mean±s.d.		<u>0.019 ± 0.007</u>
04-11-95	304	0.016 ± 0.003	10-10-95	253	0.007 ± 0.003
04-18-95	304	0.012 ± 0.003	10-17-95	256	0.032 ± 0.004
04-25-95	304	0.010 ± 0.002	10-24-95	253	0.013 ± 0.003
05-02-95	302	0.008 ± 0.002	10-31-95	281	0.020 ± 0.003
05-09-95	305	0.011 ± 0.002	11-07-95	304	0.020 ± 0.003
05-16-95	300	0.014 ± 0.003	11-14-95	300	0.017 ± 0.003
05-23-95	309	0.012 ± 0.002	11-21-95	305	0.023 ± 0.003
05-30-95	304	0.010 ± 0.002	11-28-95	302	0.022 ± 0.003
06-06-95	305	0.016 ± 0.003	12-05-95	305	0.028 ± 0.003
06-13-95	299	0.008 ± 0.002	12-12-95	304	0.025 ± 0.003
06-20-95	308	0.020 ± 0.003	12-19-95	304	0.039 ± 0.003
06-27-95	303	0.022 ± 0.003	12-26-95	332	0.020 ± 0.003
2nd Qtr. mean±s.d.		<u>0.013 ± 0.004</u>	01-02-96	352	<u>0.032 ± 0.003</u>
			4th Qtr. mean±s.d.		<u>0.023 ± 0.008</u>
Cumulative Average:					0.018
Previous Annual Average:					0.015

\* Iodine-131 is sampled biweekly. Concentrations are <0.03 pCi/m<sup>3</sup> unless otherwise noted.



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Table 7. Airborne particulates and charcoal canisters.  
 Analyses: Gross beta and iodine-131  
 Location: K-8  
 Units: pCi/m<sup>3</sup>  
 Collection: Continuous, weekly exchange.

Date Collected	Volume (m <sup>3</sup> )	Gross Beta	Date Collected	Volume (m <sup>3</sup> )	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-03-95	327	0.022 ± 0.003	07-05-95	354	0.014 ± 0.002
01-10-95	301	0.022 ± 0.003	07-10-95	209	0.012 ± 0.003
01-17-95	304	0.026 ± 0.003	07-18-95	343	0.025 ± 0.003
01-24-95	333	0.014 ± 0.002	07-25-95	314	0.018 ± 0.003
01-31-95	351	0.023 ± 0.003	08-01-95	305	0.019 ± 0.003
02-07-95	354	0.022 ± 0.003	08-08-95	303	0.016 ± 0.003
02-14-95	354	0.020 ± 0.002	08-13-95	299	0.016 ± 0.003
02-21-95	340	0.025 ± 0.003	08-22-95	309	0.015 ± 0.003
02-28-95	315	0.018 ± 0.003	08-29-95	303	0.017 ± 0.003
03-07-95	302	0.025 ± 0.003	09-05-95	304	0.026 ± 0.003
03-14-95	306	0.022 ± 0.003	09-11-95	259	0.019 ± 0.003
03-21-95	305	0.013 ± 0.003	09-19-95	343	0.016 ± 0.002
03-28-95	303	0.015 ± 0.002	09-26-95	306	0.014 ± 0.003
1st Qtr. meants.d.		<u>0.021 ± 0.004</u>	10-02-95	303	0.036 ± 0.003
			3rd Qtr. meants.d.		<u>0.019 ± 0.006</u>
04-04-95	302	0.013 ± 0.002	10-10-95	294	0.012 ± 0.003
04-11-95	304	0.020 ± 0.003	10-17-95	296 <sup>b</sup>	0.029 ± 0.003
04-18-95	304	0.013 ± 0.003	10-24-95	303	0.013 ± 0.003
04-25-95	304	0.008 ± 0.002	10-31-95	307	0.019 ± 0.003
05-02-95	302	0.006 ± 0.002	11-07-95	304	0.021 ± 0.003
05-09-95	305	0.013 ± 0.002	11-14-95	309	0.019 ± 0.003
05-16-95	300	0.016 ± 0.003	11-21-95	315	0.022 ± 0.003
05-23-95	309	0.011 ± 0.002	11-28-95	301	0.023 ± 0.003
05-30-95	292	0.009 ± 0.002	12-05-95	305	0.028 ± 0.003
06-06-95	303	0.008 ± 0.002	12-12-95	303	0.025 ± 0.003
06-13-95	298	0.010 ± 0.002	12-19-95	304	0.038 ± 0.003
06-20-95	308	0.023 ± 0.003	12-26-95	306	0.020 ± 0.003
06-27-95	303	0.026 ± 0.003	01-02-96	301	0.028 ± 0.003
2nd Qtr. meants.d.		<u>0.014 ± 0.006</u>	4th Qtr. meants.d.		<u>0.023 ± 0.007</u>
Cumulative Average:					0.019
Previous Annual Average:					0.018

<sup>a</sup> Iodine-131 is sampled biweekly. Concentrations are <0.03 pCi/m<sup>3</sup> unless otherwise noted.

<sup>b</sup> Estimated volume.

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Table 8. Airborne particulates and charcoal canisters.  
 Analyses: Gross beta and iodine-131  
 Location: K-15  
 Units: pCi/m<sup>3</sup>  
 Collection: Continuous, weekly exchange.

Date Collected	Volume (m <sup>3</sup> )	Gross Beta	Date Collected	Volume (m <sup>3</sup> )	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-03-95	306	0.021 ± 0.003	07-05-95	355	0.013 ± 0.002
01-10-95	304	0.017 ± 0.003	07-10-95	209	0.012 ± 0.003
01-17-95	304	0.026 ± 0.003	07-18-95	346	0.024 ± 0.003
01-24-95	383	< 0.002	07-25-95	307	0.017 ± 0.003
01-31-95	451	< 0.002	08-01-95	305	0.017 ± 0.003
02-07-95	456	0.022 ± 0.002	08-08-95	303	0.015 ± 0.003
02-14-95	455	0.021 ± 0.002	08-13-95	290	0.014 ± 0.003
02-21-95	455	0.023 ± 0.002	08-22-95	283	0.017 ± 0.003
02-28-95	457	0.018 ± 0.002	08-29-95	253	0.015 ± 0.003
03-07-95	448	0.022 ± 0.002	09-05-95	255 <sup>c</sup>	0.016 ± 0.003
03-14-95	419	0.022 ± 0.002	09-11-95	118	0.018 ± 0.006
03-21-95	432	0.012 ± 0.002	09-19-95	458	0.015 ± 0.002
03-28-95	450	0.011 ± 0.002	09-26-95	410	0.011 ± 0.002
1st Qtr. mean±s.d.		<u>0.020 ± 0.004</u>	10-02-95	405	<u>0.033 ± 0.003</u>
			3rd Qtr. mean±s.d.		<u>0.017 ± 0.005</u>
04-04-95	372 <sup>b</sup>	0.003 ± 0.001	10-10-95	381	0.012 ± 0.002
04-11-95	340	0.014 ± 0.002	10-17-95	355	0.028 ± 0.003
04-18-95	304	0.007 ± 0.002	10-24-95	354	0.013 ± 0.002
04-25-95	305	0.010 ± 0.002	10-31-95	358	0.018 ± 0.002
05-02-95	302	0.007 ± 0.002	11-07-95	253	0.031 ± 0.004
05-09-95	304	0.011 ± 0.002	11-14-95	304	0.023 ± 0.003
05-16-95	300	0.012 ± 0.002	11-21-95	352	0.020 ± 0.003
05-23-95	309	0.008 ± 0.002	11-28-95	380	0.023 ± 0.002
05-30-95	304	0.007 ± 0.002	12-05-95	407	0.020 ± 0.002
06-06-95	303 <sup>b</sup>	< 0.003	12-12-95	405	0.024 ± 0.003
06-13-95	301	0.007 ± 0.002	12-19-95	405	0.029 ± 0.003
06-20-95	308	0.025 ± 0.003	12-26-95	382	0.017 ± 0.002
06-27-95	303	0.023 ± 0.003	01-02-96	352	0.031 ± 0.003
2nd Qtr. mean±s.d.		<u>0.011 ± 0.006</u>	4th Qtr. mean±s.d.		<u>0.022 ± 0.006</u>
Cumulative Average:					0.018
Previous Annual Average:					0.018

\* Iodine-131 is sampled biweekly. Concentrations are <0.03 pCi/m<sup>3</sup> unless otherwise noted.

<sup>b</sup> Filter very light.

<sup>c</sup> Sample pump found not running.

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Table 9. Airborne particulates and charcoal canisters.  
 Analyses: Gross beta and iodine-131  
 Location: K-16  
 Units: pCi/m<sup>3</sup>  
 Collection: Continuous, weekly exchange.

Date Collected	Volume (m <sup>3</sup> )	Gross Beta	Date Collected	Volume (m <sup>3</sup> )	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-03-95	303	0.027 ± 0.003	07-10-95	315	0.012 ± 0.003
01-09-95	262	0.024 ± 0.003	07-17-95	312	0.028 ± 0.003
01-16-95	339	0.008 ± 0.002	07-24-95	312	0.018 ± 0.003
01-23-95	334	0.005 ± 0.002	07-31-95	313	0.023 ± 0.003
01-30-95	334	0.015 ± 0.002	08-07-95	316	0.018 ± 0.003
02-06-95	334	0.026 ± 0.003	08-13-95	312	0.017 ± 0.003
02-13-95	336	0.014 ± 0.002	08-21-95	309	0.015 ± 0.003
02-20-95	336	0.019 ± 0.003	08-28-95	304	0.017 ± 0.003
02-27-95	333	0.015 ± 0.002	09-05-95	346 <sup>b</sup>	0.031 ± 0.003
03-06-95	334	0.019 ± 0.002	09-11-95	305	0.019 ± 0.003
03-13-95	329	0.015 ± 0.002	09-19-95	350	0.017 ± 0.002
03-20-95	324	0.011 ± 0.002	09-25-95	251	0.012 ± 0.003
03-27-95	326	0.008 ± 0.002	10-02-95	304	0.036 ± 0.003
04-03-95	322	0.013 ± 0.002	3rd Qtr. mean±s.d.		0.020 ± 0.007
1st Qtr. mean±s.d.		0.016 ± 0.006	10-09-95	294	0.010 ± 0.003
04-10-95	329	0.008 ± 0.002	10-16-95	290	0.031 ± 0.003
04-17-95	333	0.005 ± 0.002	10-23-95	294	0.012 ± 0.003
04-24-95	322	0.012 ± 0.002	10-30-95	292	0.020 ± 0.003
05-01-95	313	0.008 ± 0.002	11-06-95	282	0.017 ± 0.003
05-08-95	314	0.009 ± 0.002	11-13-95	252	0.026 ± 0.004
05-15-95	313	0.013 ± 0.002	11-21-95	283	0.024 ± 0.003
05-22-95	316	0.010 ± 0.002	11-27-95	284	0.021 ± 0.003
05-30-95	352	0.009 ± 0.002	12-05-95	301	0.023 ± 0.003
06-05-95	260	0.014 ± 0.003	12-11-95	298	0.026 ± 0.003
06-12-95	310	0.007 ± 0.002	12-18-95	302	0.020 ± 0.003
06-19-95	314	0.020 ± 0.003	12-26-95	390	0.010 ± 0.002
06-26-95	309	0.025 ± 0.003	01-02-96	256	0.040 ± 0.004
07-03-95	313	0.012 ± 0.002	4th Qtr. mean±s.d.		0.022 ± 0.008
2nd Qtr. mean±s.d.		0.012 ± 0.005			
Cumulative Average:					0.017
Previous Annual Average:					0.019

<sup>a</sup> Iodine-131 is sampled biweekly. Concentrations are <0.03 pCi/m<sup>3</sup> unless otherwise noted.

<sup>b</sup> Estimated volume; runtime meter not totalizing runtime; volume calculated using actual runtimes.

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Table 10. Airborne particulate data, gross beta analyses, monthly averages, minima and maxima.

<u>January</u>				<u>April</u>			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
<u>Control</u>	0.019	0.005	0.027	<u>Control</u>	0.010	0.003	0.020
K-2	0.020	0.013	0.027	K-2	0.011	0.004	0.016
K-8	0.021	0.014	0.026	K-8	0.012	0.006	0.020
K-15	0.021	0.017	0.026	K-15	0.008	0.003	0.014
K-16	0.016	0.005	0.027	K-16	0.008	0.005	0.012
<u>Indicator</u>	0.018	0.010	0.026	<u>Indicator</u>	0.013	0.008	0.018
K-1	0.021	0.011	0.026	K-1	0.014	0.009	0.018
K-7	0.015	0.010	0.020	K-7	0.012	0.008	0.016

<u>February</u>				<u>May</u>			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
<u>Control</u>	0.021	0.014	0.026	<u>Control</u>	0.011	0.007	0.016
K-2	0.022	0.018	0.026	K-2	0.012	0.009	0.013
K-8	0.021	0.018	0.025	K-8	0.012	0.009	0.016
K-15	0.021	0.018	0.023	K-15	0.010	0.007	0.012
K-16	0.019	0.014	0.026	K-16	0.010	0.009	0.013
<u>Indicator</u>	0.022	0.015	0.028	<u>Indicator</u>	0.012	0.008	0.014
K-1	0.024	0.022	0.028	K-1	0.012	0.008	0.014
K-7	0.019	0.015	0.024	K-7	0.012	0.010	0.014

<u>March</u>				<u>June</u>			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
<u>Control</u>	0.016	0.008	0.025	<u>Control</u>	0.018	0.007	0.026
K-2	0.017	0.011	0.021	K-2	0.020	0.010	0.026
K-8	0.019	0.013	0.025	K-8	0.017	0.008	0.026
K-15	0.017	0.011	0.022	K-15	0.018	0.007	0.025
K-16	0.013	0.008	0.019	K-16	0.016	0.007	0.025
<u>Indicator</u>	0.017	0.011	0.026	<u>Indicator</u>	0.017	0.008	0.024
K-1	0.018	0.011	0.026	K-1	0.018	0.009	0.024
K-7	0.016	0.012	0.021	K-7	0.017	0.008	0.022

Note: Unless otherwise specified, samples collected on the first, second, or third day of a month are grouped with data of the previous month.

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Table 10. Airborne particulate data, gross beta analyses, monthly averages, minima and maxima.

July				October			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
<u>Control</u>	0.018	0.010	0.028	<u>Control</u>	0.018	0.010	0.031
K-2	0.016	0.010	0.023	K-2	0.016	0.010	0.027
K-8	0.018	0.012	0.025	K-8	0.018	0.012	0.029
K-15	0.017	0.012	0.024	K-15	0.018	0.012	0.028
K-16	0.020	0.012	0.028	K-16	0.018	0.010	0.031
<u>Indicator</u>	0.017	0.008	0.026	<u>Indicator</u>	0.019	0.007	0.032
K-1	0.017	0.011	0.026	K-1	0.019	0.013	0.031
K-7	0.016	0.008	0.025	K-7	0.018	0.007	0.032

August				November			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
<u>Control</u>	0.016	0.013	0.018	<u>Control</u>	0.021	0.016	0.031
K-2	0.014	0.013	0.015	K-2	0.018	0.016	0.019
K-8	0.016	0.015	0.017	K-8	0.021	0.019	0.023
K-15	0.015	0.014	0.017	K-15	0.024	0.020	0.031
K-16	0.017	0.015	0.018	K-16	0.022	0.017	0.026
<u>Indicator</u>	0.018	0.016	0.019	<u>Indicator</u>	0.021	0.017	0.025
K-1	0.018	0.017	0.019	K-1	0.021	0.018	0.025
K-7	0.017	0.016	0.019	K-7	0.021	0.017	0.023

September				December			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
<u>Control</u>	0.021	0.011	0.036	<u>Control</u>	0.024	0.010	0.040
K-2	0.020	0.011	0.030	K-2	0.022	0.015	0.030
K-8	0.022	0.014	0.036	K-8	0.028	0.020	0.038
K-15	0.019	0.011	0.033	K-15	0.024	0.017	0.031
K-16	0.023	0.012	0.036	K-16	0.024	0.010	0.040
<u>Indicator</u>	0.023	0.013	0.038	<u>Indicator</u>	0.028	0.019	0.039
K-1	0.023	0.013	0.034	K-1	0.027	0.019	0.035
K-7	0.023	0.013	0.038	K-7	0.029	0.020	0.039

Note: Unless otherwise specified, samples collected on the first, second, or third day of a month are grouped with data of the previous month.

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Table 11. Airborne particulate samples, quarterly composites of weekly samples, analysis for gamma-emitting isotopes, 1995.

	Sample Description and Concentration (pCi/m <sup>3</sup> )			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
<b>Indicator</b>				
<b>K-1f</b>				
Lab Code	KAP-2460	KAP-7684	KAP-10759	KAP-13015
Volume (m <sup>3</sup> )	3954	4009	4610	4612
Be-7	0.083 ± 0.020	0.091 ± 0.017	0.081 ± 0.018	0.045 ± 0.009
Nb-95	< 0.0009	< 0.0013	< 0.0018	< 0.0007
Zr-95	< 0.0010	< 0.0015	< 0.0015	< 0.0009
Ru-103	< 0.0014	< 0.0007	< 0.0007	< 0.0006
Ru-106	< 0.011	< 0.0074	< 0.0051	< 0.0034
Cs-134	< 0.0011	< 0.0005	< 0.0006	< 0.0003
Cs-137	< 0.0007	< 0.0009	< 0.0010	< 0.0002
Ce-141	< 0.0021	< 0.0021	< 0.0021	< 0.0005
Ce-144	< 0.0053	< 0.0053	< 0.0046	< 0.0019
<b>K-2</b>				
Lab Code	KAP-2462	KAP-7685	KAP-10760	KAP-13017
Volume (m <sup>3</sup> )	4025	3949	4106	3850
Be-7	0.061 ± 0.013	0.089 ± 0.014	0.060 ± 0.019	0.045 ± 0.011
Nb-95	< 0.0009	< 0.0006	< 0.0008	< 0.0008
Zr-95	< 0.0023	< 0.0017	< 0.0017	< 0.0011
Ru-103	< 0.0004	< 0.0010	< 0.0010	< 0.0010
Ru-106	< 0.0040	< 0.0051	< 0.0045	< 0.0064
Cs-134	< 0.0010	< 0.0005	< 0.0016	< 0.0006
Cs-137	< 0.0008	< 0.0005	< 0.0014	< 0.0006
Ce-141	< 0.0011	< 0.0008	< 0.0020	< 0.0007
Ce-144	< 0.0031	< 0.0027	< 0.0070	< 0.0040

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Table 11. Airborne particulate samples, quarterly composites of weekly samples, analysis for gamma-emitting isotopes, 1995 (continued).

	Sample Description and Concentration (pCi/m <sup>3</sup> )			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
<b>Control</b>				
<b>K-2</b>				
Lab Code	KAP-2461	KAP-7686	KAP-10761	KAP-13016
Volume (m <sup>3</sup> )	3952	3949	4170	3316
Be-7	0.066 ± 0.014	0.093 ± 0.014	0.074 ± 0.016	0.042 ± 0.014
Nb-95	< 0.0006	< 0.0012	< 0.0010	< 0.0007
Zr-95	< 0.0009	< 0.0009	< 0.0020	< 0.0027
Ru-103	< 0.0010	< 0.0014	< 0.0009	< 0.0015
Ru-106	< 0.0050	< 0.0039	< 0.0080	< 0.0051
Cs-134	< 0.0010	< 0.0006	< 0.0004	< 0.0011
Cs-137	< 0.0006	< 0.0011	< 0.0005	< 0.0012
Ce-141	< 0.0016	< 0.0016	< 0.0012	< 0.0018
Ce-144	< 0.0038	< 0.0036	< 0.0015	< 0.0053
<b>K-8</b>				
Lab Code	KAP-2463	KAP-7687	KAP-10762	KAP-13018
Volume (m <sup>3</sup> )	4195	3935	4254	3949
Be-7	0.086 ± 0.016	0.095 ± 0.015	0.078 ± 0.013	0.044 ± 0.010
Nb-95	< 0.0012	< 0.0013	< 0.0006	< 0.0005
Zr-95	< 0.0031	< 0.0011	< 0.0021	< 0.0012
Ru-103	< 0.0013	< 0.0011	< 0.0012	< 0.0008
Ru-106	< 0.0083	< 0.0048	< 0.0050	< 0.0038
Cs-134	< 0.0012	< 0.0006	< 0.0005	< 0.0003
Cs-137	< 0.0013	< 0.0004	< 0.0006	< 0.0009
Ce-141	< 0.0018	< 0.0012	< 0.0017	< 0.0006
Ce-144	< 0.0060	< 0.0034	< 0.0026	< 0.0017

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Table 11. Airborne particulate samples, quarterly composites of weekly samples, analysis for gamma-emitting isotopes, 1995 (continued).

	Sample Description and Concentration (pCi/m <sup>3</sup> )			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
<b>Control</b>				
<b>K-15</b>				
Lab Code	KAP-2464	KAP-7688	KAP-10763	KAP-13019
Volume (m <sup>3</sup> )	5320	4056	4297	4689
Be-7	0.064 ± 0.012	0.090 ± 0.016	0.070 ± 0.015	0.054 ± 0.010
Nb-95	< 0.0003	< 0.0006	< 0.0005	< 0.0010
Zr-95	< 0.0004	< 0.0008	< 0.0009	< 0.0009
Ru-103	< 0.0004	< 0.0007	< 0.0007	< 0.0011
Ru-106	< 0.0032	< 0.0035	< 0.0042	< 0.0061
Cs-134	< 0.0002	< 0.0005	< 0.0004	< 0.0007
Cs-137	< 0.0003	< 0.0009	< 0.0005	< 0.0005
Ce-141	< 0.0013	< 0.0014	< 0.0013	< 0.0011
Ce-144	< 0.0019	< 0.0037	< 0.0026	< 0.0025
<b>K-16</b>				
Lab Code	KAP-2465	KAP-7689	KAP-10764	KAP-13020
Volume (m <sup>3</sup> )	4224	4099	4050	3817
Be-7	0.053 ± 0.011	0.081 ± 0.017	0.082 ± 0.020	0.032 ± 0.012
Nb-95	< 0.0005	< 0.0006	< 0.0017	< 0.0014
Zr-95	< 0.0005	< 0.0028	< 0.0020	< 0.0031
Ru-103	< 0.0006	< 0.0017	< 0.0016	< 0.0016
Ru-106	< 0.0047	< 0.0051	< 0.0061	< 0.0054
Cs-134	< 0.0003	< 0.0009	< 0.0006	< 0.0006
Cs-137	< 0.0003	< 0.0010	< 0.0011	< 0.0013
Ce-141	< 0.0017	< 0.0025	< 0.0026	< 0.0013
Ce-144	< 0.0050	< 0.0065	< 0.0064	< 0.0033



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Table 12. Ambient gamma radiation (TLD), quarterly exposure, 1995.

	<u>1st. Qtr.</u>	<u>2nd. Qtr.</u>	<u>3rd. Qtr.</u>	<u>4th. Qtr.</u>	
Date Placed	01-03-95	04-03-95	07-05-95	10-02-95	
Date Removed	04-03-95	07-05-95	10-02-95	01-02-95	Mean ± s.d.
	<u>mR/91 days<sup>a</sup></u>				
<b>Indicator</b>					
K-1f	12.6 ± 0.7	14.4 ± 0.4	12.7 ± 0.7	17.2 ± 0.7	14.2 ± 2.1
K-4	13.4 ± 0.2	15.7 ± 0.2	13.7 ± 0.2	17.8 ± 0.5	15.2 ± 2.0
K-5	14.2 ± 0.1	17.3 ± 0.2	14.8 ± 0.1	19.5 ± 0.4	16.5 ± 2.4
K-7	18.1 ± 0.2	21.1 ± 0.9	19.7 ± 0.2	22.6 ± 0.5	20.4 ± 1.9
K-17	16.9 ± 0.3	21.1 ± 0.5	17.7 ± 0.1	24.1 ± 0.2	20.0 ± 3.3
K-27	12.9 ± 0.3	15.7 ± 0.5	12.3 ± 0.3	17.5 ± 0.5	14.6 ± 2.4
K-30	14.3 ± 0.5	16.9 ± 0.8	15.3 ± 0.1	19.0 ± 0.7	16.4 ± 2.1
Mean ± s.d.	14.6 ± 2.1	17.5 ± 2.7	15.2 ± 2.7	19.7 ± 2.7	16.7 ± 2.3
<b>Control</b>					
K-2	12.5 ± 0.4	14.3 ± 0.6	12.9 ± 0.3	16.5 ± 0.6	14.1 ± 1.8
K-3	17.3 ± 0.7	19.8 ± 0.2	17.0 ± 0.8	21.3 ± 0.1	18.9 ± 2.1
K-6	12.9 ± 0.5	15.7 ± 0.2	13.8 ± 0.2	17.1 ± 0.2	14.9 ± 1.9
K-8	14.7 ± 0.4	17.4 ± 0.3	16.0 ± 0.4	19.8 ± 0.3	17.0 ± 2.2
K-15	13.1 ± 0.3	15.3 ± 0.2	14.6 ± 0.1	17.0 ± 0.2	15.0 ± 1.6
K-16	13.2 ± 0.4	15.1 ± 0.1	13.9 ± 0.2	ND <sup>b</sup>	14.1 ± 1.0
K-31	12.8 ± 0.2	14.1 ± 0.1	12.9 ± 0.3	16.4 ± 0.2	14.1 ± 1.7
Mean ± s.d.	13.8 ± 1.7	16.0 ± 2.0	14.4 ± 1.6	18.0 ± 2.0	15.6 ± 1.9

<sup>a</sup> The uncertainty for each location corresponds to the two-standard deviation error of the average dose of eight dosimeters placed at this location.

<sup>b</sup> TLD lost in the field.

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Table 13. Precipitation samples collected at Location K-11; analysis for tritium, January through December, 1995.

Month Collected	Lab Code	H-3	
		pCi/L	T.U. (100 T.U. = 320 pCi/L)
January	KP - 0274	< 330	< 103
February	- 0945	< 330	< 103
March	- 1726	< 330	< 103
April	- 2521	< 330	< 103
May	- 3861	< 330	< 103
June	- 6319	< 330	< 103
July	- 7589	< 330	< 103
August	- 8406	< 330	< 103
September	- 9405	< 330	< 103
October	- 10531	< 330	< 103
November	- 11729	< 330	< 103
December	- 12314	< 330	< 103

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Table 14. Milk, analysis for iodine-131 and gamma-emitting isotopes.  
Collection: Semimonthly during grazing season, monthly at other times.

Collection Date	Lab Code	Concentration (pCi/L)				
		I-131	Cs-134	Cs-137	Ba-La-140	K-40
<b>Indicators</b>						
<b>K-4</b>						
01-04-95	KMI -0013	< 0.5	< 10	< 10	< 15	1440 ± 130
02-02-95	- 0687	< 0.5	< 10	< 10	< 15	1380 ± 160
03-02-95	- 1477	< 0.5	< 10	< 10	< 15	1430 ± 160
04-04-95	- 2295	< 0.5	< 10	< 10	< 15	1380 ± 170
05-02-95	- 3513	< 0.5	< 10	< 10	< 15	1330 ± 140
05-16-95	- 4709	< 0.5	< 10	< 10	< 15	1360 ± 160
06-06-95	- 5822	< 0.5	< 10	< 10	< 15	1280 ± 180
06-16-95	- 6517	< 0.5	< 10	< 10	< 15	1300 ± 170
07-06-95	- 7312	< 0.5	< 10	< 10	< 15	1420 ± 170
07-18-95	- 7886	< 0.5	< 10	< 10	< 15	1540 ± 180
08-02-95	- 8264	< 0.5	< 10	< 10	< 15	1450 ± 150
08-15-95	- 8757	< 0.5	< 10	< 10	< 15	1520 ± 160
09-06-95	- 9345	< 0.5	< 10	< 10	< 15	1620 ± 170
09-19-95	- 9736	< 0.5	< 10	< 10	< 15	1400 ± 110
10-03-95	- 10265	< 0.5	< 10	< 10	< 15	1280 ± 140
11-02-95	- 11430	< 0.5	< 10	< 10	< 15	1470 ± 120
12-05-95	- 12248	< 0.5	< 10	< 10	< 15	1380 ± 170
<b>K-5</b>						
01-03-95	KMI -0014	< 0.5	< 10	< 10	< 15	1330 ± 160
02-02-95	- 0688	< 0.5	< 10	< 10	< 15	1550 ± 160
03-02-95	- 1478	< 0.5	< 10	< 10	< 15	1410 ± 110
04-03-95	- 2296	< 0.5	< 10	< 10	< 15	1480 ± 140
05-02-95	- 3514	< 0.5	< 10	< 10	< 15	1380 ± 120
05-16-95	- 4710	< 0.5	< 10	< 10	< 15	1530 ± 130
06-06-95	- 5823	< 0.5	< 10	< 10	< 15	1490 ± 180
06-13-95	- 6518	< 0.5	< 10	< 10	< 15	1390 ± 190
07-06-95	- 7313	< 0.5	< 10	< 10	< 15	1460 ± 180
07-18-95	- 7887	< 0.5	< 10	< 10	< 15	1550 ± 130
08-02-95	- 8405	< 0.5	< 10	< 10	< 15	1480 ± 160
08-15-95	- 8758	< 0.5	< 10	< 10	< 15	1550 ± 150
09-06-95	- 9346	< 0.5	< 10	< 10	< 15	1480 ± 170
09-19-95	- 9737	< 0.5	< 10	< 10	< 15	1370 ± 140
10-03-95	- 10410	< 0.5	< 10	< 10	< 15	1380 ± 150
11-01-95	- 11431	< 0.5	< 10	< 10	< 15	1570 ± 160
12-04-95	- 12249	< 0.5	< 10	< 10	< 15	1300 ± 160

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Table 14. Milk, analysis for iodine-131 and gamma-emitting isotopes (continued).

Collection Date	Lab Code	Concentration (pCi/L)				
		I-131	Cs-134	Cs-137	Ba-La-140	K-40
<b>Indicators</b>						
<b>K-12</b>						
01-03-95	KMI - 0016	< 0.5	< 10	< 10	< 15	1510 ± 160
02-01-95	- 0690	< 0.5	< 10	< 10	< 15	1440 ± 120
03-01-95	- 1480	< 0.5	< 10	< 10	< 15	1510 ± 120
04-03-95	- 2298	< 0.5	< 10	< 10	< 15	1540 ± 170
05-01-95	- 3516	< 0.5	< 10	< 10	< 15	1670 ± 160
05-16-95	- 4712	< 0.5	< 10	< 10	< 15	1540 ± 170
06-05-95	- 5825	< 0.5	< 10	< 10	< 15	1460 ± 170
06-13-95	- 6520	< 0.5	< 10	< 10	< 15	1530 ± 120
07-05-95	- 7315	< 0.5	< 10	< 10	< 15	1490 ± 120
07-18-95	- 7889	< 0.5	< 10	< 10	< 15	1340 ± 110
08-01-95	- 8266	< 0.5	< 10	< 10	< 15	1520 ± 190
08-15-95	- 8760	< 0.5	< 10	< 10	< 15	1660 ± 180
09-05-95	- 9348	< 0.5	< 10	< 10	< 15	1440 ± 170
09-19-95	- 9739	< 0.5	< 10	< 10	< 15	1390 ± 110
10-02-95	- 10267	< 0.5	< 10	< 10	< 15	1620 ± 180
11-01-95	- 11433, 4	< 0.5	< 10	< 10	< 15	1450 ± 100
12-05-95	- 12252	< 0.5	< 10	< 10	< 15	1490 ± 170
<b>K-19</b>						
01-04-95	KMI - 0017	< 0.5	< 10	< 10	< 15	1350 ± 110
02-01-95	- 0691	< 0.5	< 10	< 10	< 15	1290 ± 100
03-01-95	- 1481	< 0.5	< 10	< 10	< 15	1440 ± 110
04-04-95	- 2299	< 0.5	< 10	< 10	< 15	1400 ± 150
05-02-95	- 3517	< 0.5	< 10	< 10	< 15	1410 ± 150
05-16-95	- 4713	< 0.5	< 10	< 10	< 15	1410 ± 190
06-05-95	- 5826	< 0.5	< 10	< 10	< 15	1240 ± 160
06-13-95	- 6521, 2	< 0.5	< 10	< 10	< 15	1380 ± 100
07-05-95	- 7316	< 0.5	< 10	< 10	< 15	1440 ± 160
07-18-95	- 7890	< 0.5	< 10	< 10	< 15	1360 ± 160
08-02-95	- 8267	< 0.5	< 10	< 10	< 15	1260 ± 150
08-15-95	- 8761	< 0.5	< 10	< 10	< 15	1600 ± 110
09-05-95	- 9349	< 0.5	< 10	< 10	< 15	1400 ± 170
09-19-95	- 9740	< 0.5	< 10	< 10	< 15	1380 ± 150
10-03-95	- 10268	< 0.5	< 10	< 10	< 15	1370 ± 160
11-01-95	- 11435	< 0.5	< 10	< 10	< 15	1390 ± 160
12-04-95	- 12253	< 0.5	< 10	< 10	< 15	1500 ± 210

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Table 14. Milk, analysis for iodine-131 and gamma-emitting isotopes (continued):

Collection Date	Lab Code	Concentration (pCi/L)				
		I-131	Cs-134	Cs-137	Ba-La-140	K-40
<b>Control</b>						
<b>K-3</b>						
01-04-95	KMI - 0012	< 0.5	< 10	< 10	< 15	1270 ± 170
02-02-95	- 0686	< 0.5	< 10	< 10	< 15	1390 ± 130
03-02-95	- 1476	< 0.5	< 10	< 10	< 15	1510 ± 190
04-04-95	- 2294	< 0.5	< 10	< 10	< 15	1480 ± 160
05-02-95	- 3512	< 0.5	< 10	< 10	< 15	1390 ± 160
05-16-95	- 4708	< 0.5	< 10	< 10	< 15	1390 ± 170
06-06-95	- 5821	< 0.5	< 10	< 10	< 15	1420 ± 140
06-13-95	- 6516	< 0.5	< 10	< 10	< 15	1420 ± 160
07-06-95	- 7311	< 0.5	< 10	< 10	< 15	1370 ± 170
07-18-95	- 7885	< 0.5	< 10	< 10	< 15	1290 ± 220
08-02-95	- 8263	< 0.5	< 10	< 10	< 15	1430 ± 160
08-15-95	- 8756	< 0.5	< 10	< 10	< 15	1350 ± 160
09-06-95	- 9344	< 0.5	< 10	< 10	< 15	1480 ± 120
09-19-95	- 9735	< 0.5	< 10	< 10	< 15	1450 ± 170
10-03-95	- 10264	< 0.5	< 10	< 10	< 15	1490 ± 160
11-02-95	- 11429	< 0.5	< 10	< 10	< 15	1400 ± 140
12-05-95	- 12247	< 0.5	< 10	< 10	< 15	1530 ± 180
<b>K-6</b>						
01-03-95	KMI - 0015	< 0.5	< 10	< 10	< 15	1360 ± 160
02-01-95	- 0689	< 0.5	< 10	< 10	< 15	1310 ± 140
03-01-95	- 1479	< 0.5	< 10	< 10	< 15	1390 ± 160
04-03-95	- 2297	< 0.5	< 10	< 10	< 15	1350 ± 130
05-02-95	- 3515	< 0.5	< 10	< 10	< 15	1350 ± 140
05-16-95	- 4711	< 0.5	< 10	< 10	< 15	1370 ± 110
06-05-95	- 5824	< 0.5	< 10	< 10	< 15	1450 ± 180
06-13-95	- 6519	< 0.5	< 10	< 10	< 15	1430 ± 160
07-05-95	- 7314	< 0.5	< 10	< 10	< 15	1420 ± 180
07-18-95	- 7888	< 0.5	< 10	< 10	< 15	1230 ± 140
08-01-95	- 8265	< 0.5	< 10	< 10	< 15	1490 ± 150
08-15-95	- 8759	< 0.5	< 10	< 10	< 15	1330 ± 120
09-05-95	- 9347	< 0.5	< 10	< 10	< 15	1490 ± 170
09-19-95	- 9738	< 0.5	< 10	< 10	< 15	1270 ± 150
10-02-95	- 10266	< 0.5	< 10	< 10	< 15	1360 ± 150
11-01-95	- 11432	< 0.5	< 10	< 10	< 15	1400 ± 160
12-04-95	- 12250,1	< 0.5	< 10	< 10	< 15	1430 ± 100

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Table 14. Milk, analysis for iodine-131 and gamma-emitting isotopes (continued).

Collection Date	Lab Code	Concentration (pCi/L)				
		I-131	Cs-134	Cs-137	Ba-La-140	K-40
<u>Control</u>						
<u>K-28</u>						
01-04-95	KMI - 0018	< 0.5	< 10	< 10	< 15	1200 ± 150
02-02-95	- 0692	< 0.5	< 10	< 10	< 15	1370 ± 160
03-02-95	- 1482	< 0.5	< 10	< 10	< 15	1500 ± 170
04-04-95	- 2300	< 0.5	< 10	< 10	< 15	1250 ± 160
05-02-95	- 3518	< 0.5	< 10	< 10	< 15	1450 ± 140
05-16-95	- 4714	< 0.5	< 10	< 10	< 15	1500 ± 180
06-05-95	- 5827	< 0.5	< 10	< 10	< 15	1590 ± 190
06-13-95	- 6523	< 0.5	< 10	< 10	< 15	1300 ± 170
07-06-95	- 7317	< 0.5	< 10	< 10	< 15	1480 ± 150
07-18-95	- 7891	< 0.5	< 10	< 10	< 15	1580 ± 200
08-01-95	- 8268	< 0.5	< 10	< 10	< 15	1470 ± 120
08-15-95	- 8762	< 0.5	< 10	< 10	< 15	1550 ± 170
09-06-95	- 9350, 1	< 0.5	< 10	< 10	< 15	1430 ± 120
09-19-95	- 9741	< 0.5	< 10	< 10	< 15	1340 ± 150
10-03-95	- 10269	< 0.5	< 10	< 10	< 15	1380 ± 170
11-02-95	- 11436	< 0.5	< 10	< 10	< 15	1450 ± 190
12-04-95	- 12254	< 0.5	< 10	< 10	< 15	1380 ± 180

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Table 15. Milk, analysis for strontium-89, strontium-90, stable potassium, stable calcium, and ratios of strontium-90 per gram of calcium and cesium-137 per gram of potassium.  
Collection: Monthly composites.

1995 Collection Period	Lab Code	Concentration			Ca g/L	Ratios	
		Sr-89 (pCi/L)	Sr-90 (pCi/L)	K g/L		Sr-90 (pCi/L) per gram Ca	Cs-137 (pCi/L) per gram K

Indicators

K-4

January	KMI - 0013	< 0.5	1.2 ± 0.4	1.66 ± 0.15	0.88	1.36	<6.01
February	- 0687	< 0.7	1.1 ± 0.4	1.60 ± 0.18	0.77	1.43	<6.27
March	- 1477	< 0.5	1.1 ± 0.4	1.65 ± 0.18	0.84	1.31	<6.05
April	- 2295	< 0.5	1.1 ± 0.4	1.60 ± 0.20	0.79	1.39	<6.27
May	- 4716, 7	< 0.6	1.6 ± 0.4	1.55 ± 0.12	0.83	1.93	<6.43
June	- 6525	< 0.6	1.4 ± 0.4	1.49 ± 0.14	0.88	1.59	<6.71
July	- 7893	< 0.6	0.9 ± 0.3	1.71 ± 0.10	0.87	1.03	<5.84
August	- 9019	< 0.5	0.9 ± 0.3	1.72 ± 0.13	0.85	1.06	<5.82
September	- 9743	< 0.5	1.5 ± 0.4	1.75 ± 0.12	0.79	1.90	<5.73
October	- 10265	< 0.8	1.2 ± 0.4	1.48 ± 0.16	0.87	1.38	<6.76
November	- 11430	< 0.7	1.9 ± 0.4	1.70 ± 0.14	1.01	1.88	<5.88
December	- 12248	< 0.7	0.9 ± 0.3	1.60 ± 0.20	1.05	0.86	<6.27

K-5

January	KMI - 0014	< 0.5	1.7 ± 0.4	1.54 ± 0.18	0.85	2.00	<6.50
February	- 0688	< 0.5	1.5 ± 0.4	1.79 ± 0.18	0.90	1.67	<5.58
March	- 1478	< 0.4	1.9 ± 0.5	1.63 ± 0.13	0.93	2.04	<6.13
April	- 2296	< 0.4	1.6 ± 0.5	1.71 ± 0.16	0.85	1.88	<5.84
May	- 4718	< 0.7	1.8 ± 0.5	1.68 ± 0.10	0.71	2.54	<5.95
June	- 6526	< 0.6	1.7 ± 0.4	1.66 ± 0.15	0.82	2.07	<6.01
July	- 7894	< 0.6	2.0 ± 0.4	1.74 ± 0.13	0.99	2.02	<5.75
August	- 9020	< 0.8	1.6 ± 0.4	1.75 ± 0.13	0.87	1.84	<5.71
September	- 9744	< 0.5	1.4 ± 0.4	1.65 ± 0.13	0.74	1.89	<6.07
October	- 10410	< 0.9	1.1 ± 0.4	1.60 ± 0.17	0.72	1.53	<6.27
November	- 11431	< 1.0	1.6 ± 0.5	1.82 ± 0.18	0.83	1.93	<5.51
December	- 12249	< 0.8	1.5 ± 0.4	1.50 ± 0.18	0.90	1.67	<6.65

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Table 15. Milk, analysis for strontium-89, strontium-90, stable potassium, stable calcium, and ratios of strontium-90 per gram of calcium and cesium-137 per gram of potassium (continued).

1995 Collection Period	Lab Code	Concentration			Ca g/L	Ratios	
		Sr-89 (pCi/L)	Sr-90 (pCi/L)	K g/L		Sr-90 (pCi/L) per gram Ca	Cs-137 (pCi/L) per gram K
<b>Indicators</b>							
<b>K-12</b>							
January	KMI - 0016	< 0.5	2.0 ± 0.5	1.75 ± 0.18	0.86	2.33	<5.73
February	- 0690	< 0.6	2.1 ± 0.5	1.66 ± 0.14	1.10	1.91	<6.01
March	- 1480	< 0.6	4.4 ± 0.8	1.75 ± 0.14	0.87	5.06	<5.73
April	- 2298	< 0.6	1.9 ± 0.6	1.78 ± 0.20	0.90	2.11	<5.62
May	- 4720	< 0.5	2.3 ± 0.5	1.86 ± 0.13	0.83	2.77	<5.39
June	- 6528	< 0.6	1.6 ± 0.4	1.73 ± 0.12	0.96	1.67	<5.79
July	- 7896, 7	< 0.5	1.5 ± 0.3	1.64 ± 0.06	1.02	1.47	<6.11
August	- 9022	< 0.5	1.9 ± 0.4	1.84 ± 0.15	0.88	2.16	<5.44
September	- 9746	< 0.5	1.4 ± 0.4	1.64 ± 0.12	1.10	1.27	<6.11
October	- 10267	< 0.7	2.4 ± 0.5	1.87 ± 0.21	0.93	2.58	<5.34
November	- 11433, 4	< 0.6	1.9 ± 0.3	1.68 ± 0.12	0.90	2.11	<5.97
December	- 12252	< 0.7	2.6 ± 0.5	1.72 ± 0.20	0.94	2.77	<5.81
<b>K-19</b>							
January	KMI - 0017	< 0.5	1.6 ± 0.4	1.56 ± 0.13	0.90	1.78	<6.41
February	- 0691	< 0.5	1.5 ± 0.4	1.49 ± 0.12	0.86	1.74	<6.71
March	- 1481	< 0.5	1.2 ± 0.4	1.66 ± 0.13	0.97	1.24	<6.01
April	- 2299	< 0.6	1.4 ± 0.5	1.62 ± 0.17	0.93	1.51	<6.18
May	- 4721	< 0.6	1.3 ± 0.4	1.63 ± 0.12	0.82	1.59	<6.13
June	- 6529	< 0.6	1.4 ± 0.4	1.51 ± 0.11	1.11	1.26	<6.60
July	- 7898	< 0.6	1.7 ± 0.4	1.62 ± 0.13	1.03	1.65	<6.18
August	- 9023	< 0.9	2.0 ± 0.4	1.65 ± 0.11	0.90	2.22	<6.05
September	- 9747	< 0.5	1.7 ± 0.4	1.61 ± 0.13	0.89	1.91	<6.22
October	- 10268	< 0.8	1.2 ± 0.4	1.58 ± 0.18	0.96	1.25	<6.31
November	- 11435	< 0.7	1.0 ± 0.4	1.61 ± 0.18	0.90	1.11	<6.22
December	- 12253	< 0.7	2.1 ± 0.4	1.73 ± 0.24	0.93	2.26	<5.77



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Table 15. Milk, analysis for strontium-89, strontium-90, stable potassium, stable calcium, and ratios of strontium-90 per gram of calcium and cesium-137 per gram of potassium (continued).

1995 Collection Period	Lab Code	Concentration			Ca g/L	Ratios	
		Sr-89 (pCi/L)	Sr-90 (pCi/L)	K g/L		Sr-90 (pCi/L) per gram Ca	Cs-137 (pCi/L) per gram K
<u>Control</u>							
K-3							
January	KMI - 0012	< 0.5	1.4 ± 0.4	1.47 ± 0.20	0.86	1.63	<6.81
February	- 0686	< 0.6	1.3 ± 0.4	1.61 ± 0.15	0.80	1.63	<6.22
March	- 1476	< 0.5	1.3 ± 0.4	1.75 ± 0.22	0.88	1.48	<5.73
April	- 2294	< 0.5	1.5 ± 0.5	1.71 ± 0.18	0.80	1.88	<5.84
May	- 4715	< 0.6	1.1 ± 0.4	1.61 ± 0.13	1.13	0.97	<6.22
June	- 6524	< 0.7	1.6 ± 0.4	1.64 ± 0.12	0.91	1.76	<6.09
July	- 7892	< 0.6	1.2 ± 0.4	1.54 ± 0.16	1.06	1.13	<6.50
August	- 9018	< 0.5	1.3 ± 0.3	1.61 ± 0.13	0.92	1.41	<6.22
September	- 9742	< 0.5	1.1 ± 0.3	1.69 ± 0.12	0.87	1.26	<5.90
October	- 10264	< 0.8	1.5 ± 0.4	1.72 ± 0.18	0.95	1.58	<5.81
November	- 11429	< 0.8	1.2 ± 0.4	1.62 ± 0.16	0.90	1.33	<6.18
December	- 12247	< 0.8	2.4 ± 0.5	1.77 ± 0.21	0.93	2.58	<5.65
K-6							
January	KMI - 0015	< 0.5	1.8 ± 0.4	1.57 ± 0.18	1.10	1.64	<6.36
February	- 0689	< 0.7	1.6 ± 0.5	1.51 ± 0.16	0.94	1.70	<6.60
March	- 1479	< 0.5	2.8 ± 0.5	1.61 ± 0.18	1.09	2.57	<6.22
April	- 2297	< 0.5	1.9 ± 0.5	1.56 ± 0.15	1.03	1.84	<6.41
May	- 4719	< 1.0	1.4 ± 0.5	1.57 ± 0.10	0.91	1.54	<6.36
June	- 6527	< 0.6	1.4 ± 0.4	1.66 ± 0.14	0.94	1.49	<6.01
July	- 7895	< 0.6	1.6 ± 0.4	1.53 ± 0.13	0.81	1.98	<6.53
August	- 9021	< 0.8	1.1 ± 0.3	1.63 ± 0.12	0.85	1.29	<6.13
September	- 9745	< 0.6	1.6 ± 0.4	1.60 ± 0.13	1.04	1.54	<6.27
October	- 10266	< 0.7	2.0 ± 0.4	1.57 ± 0.17	1.08	1.85	<6.36
November	- 11432	< 0.6	1.8 ± 0.4	1.62 ± 0.18	1.05	1.71	<6.18
December	- 12250,1	< 0.7	1.5 ± 0.3	1.65 ± 0.12	1.05	1.43	<6.05

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Table 15. Milk, analysis for strontium-89, strontium-90, stable potassium, stable calcium, and ratios of strontium-90 per gram of calcium and cesium-137 per gram of potassium (continued).

1995 Collection Period	Lab Code	Concentration			Ca g/L	Ratios	
		Sr-89 (pCi/L)	Sr-90 (pCi/L)	K g/L		Sr-90 (pCi/L) per gram Ca	Cs-137 (pCi/L) per gram K
<u>Control</u>							
<u>K-28</u>							
January	KMI - 0018	< 0.5	1.3 ± 0.4	1.39 ± 0.17	0.98	1.33	<7.21
February	- 0692	< 0.6	1.7 ± 0.4	1.58 ± 0.18	0.73	2.33	<6.31
March	- 1482	< 0.6	1.9 ± 0.6	1.73 ± 0.20	0.83	2.29	<5.77
April	- 2300	< 0.6	1.5 ± 0.5	1.45 ± 0.18	1.00	1.50	<6.92
May	- 4722	< 0.6	1.5 ± 0.5	1.71 ± 0.13	0.78	1.92	<5.86
June	- 6530	< 0.6	1.8 ± 0.4	1.67 ± 0.15	0.86	2.09	<5.99
July	- 7899	< 0.6	1.6 ± 0.4	1.77 ± 0.14	0.96	1.67	<5.65
August	- 9024	< 0.5	1.6 ± 0.4	1.75 ± 0.12	0.84	1.90	<5.73
September	- 9748	< 0.5	1.7 ± 0.4	1.60 ± 0.11	0.85	2.00	<6.25
October	- 10269	< 0.7	1.6 ± 0.4	1.60 ± 0.20	1.04	1.54	<6.27
November	- 11436	< 0.7	1.5 ± 0.4	1.68 ± 0.22	0.89	1.69	<5.97
December	- 12254	< 0.8	1.6 ± 0.4	1.60 ± 0.21	0.93	1.72	<6.27

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Table 16. Well water samples, analysis for gross alpha<sup>a</sup>, gross beta, potassium-40, and gamma-emitting isotopes.  
Collection: Quarterly.

Sample Description and Concentration (pCi/L)				
<b>Indicator</b>				
<b>K-1g</b>				
Date Collected	01-03-95	04-03-95	07-05-95	10-02-95
Lab Code	KWW-0041,2	KWW-2310	KWW-7327	KWW-10289
Gross alpha	3.8 ± 1.7	4.2 ± 2.9	2.9 ± 2.1	4.7 ± 2.5
Gross beta	4.8 ± 0.6	4.8 ± 2.8	3.3 ± 2.6	4.4 ± 2.7
K-40 (flame photometry)	1.56	2.60	2.51	2.77
Mn-54	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30
Co-58	<15	<15	<15	<15
Co-60	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15
<b>K-1h</b>				
Date Collected	01-03-95	04-03-95	07-05-95	10-02-95
Lab Code	KWW-0043	KWW-2311	KWW-7328	KWW-10290
Gross alpha	1.3 ± 1.2 <sup>b</sup>	4.0 ± 2.4	8.3 ± 2.8	5.7 ± 2.1
Gross beta	3.3 ± 0.8 <sup>b</sup>	5.5 ± 2.4	5.8 ± 3.3	5.7 ± 2.5
K-40 (flame photometry)	1.73	2.25	2.42	2.60
Mn-54	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30
Co-58	<15	<15	<15	<15
Co-60	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15

<sup>a</sup> Gross Alpha analysis required on samples from K-1g and K-1h only.

<sup>b</sup> Sample was reanalyzed for better statistical results.

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Table 16. Well water samples, analysis for gross alpha, gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)				
<b>Indicator</b>				
<b>K-10</b>				
Date Collected	01-03-95	04-03-95	07-05-95	10-02-95
Lab Code	KWW-0044	KWW-2312	KWW-7329	KWW-10291
Gross beta	0.9 ± 0.3	0.9 ± 0.3	0.9 ± 0.3	1.2 ± 0.3
K-40 (flame photometry)	<0.86	<0.86	<0.86	1.21
Mn-54	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30
Co-58	<15	<15	<15	<15
Co-60	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15
<b>K-11</b>				
Date Collected	01-03-95	04-03-95	07-04-95	10-02-95
Lab Code	KWW-0045	KWW-2313, 4	KWW-7330	KWW-10292
Gross beta	1.1 ± 0.3	0.8±0.4	1.3 ± 0.4	1.5 ± 0.3
K-40 (flame photometry)	<0.86	0.95	<0.86	0.95
Mn-54	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30
Co-58	<15	<15	<15	<15
Co-60	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15

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Table 16. Well water samples, analysis for gross alpha, gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)				
<u>Indicator (continued)</u>				
<b>K-12</b>				
Date Collected	01-03-95	04-03-95	07-05-95	10-02-95
Lab Code	KWW-0046	KWW-2315	KWW-7331	KWW-10293
Gross beta	1.2 ± 0.4	1.3 ± 0.4 <sup>*</sup>	1.2 ± 0.3	1.4 ± 0.4
K-40 (flame photometry)	<0.86	1.04	1.04	1.21
Mn-54	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30
Co-58	<15	<15	<15	<15
Co-60	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15
<u>Control</u>				
<b>K-13</b>				
Date Collected	01-03-95	04-03-95	07-05-95	10-02-95
Lab Code	KWW-0047	KWW-2316	KWW-7332	KWW-10294
Gross beta	1.1 ± 0.2	1.2 ± 0.4	1.1 ± 0.2	1.3 ± 0.2
K-40 (flame photometry)	0.95	0.95	<0.86	1.04
Mn-54	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30
Co-58	<15	<15	<15	<15
Co-60	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15

\* Corrected data.

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Table 17. Well water samples from K-1g , analysis for tritium, strontium-89, and strontium-90.  
Collection: Quarterly.

Date Collected	Lab Code	Concentration (pCi/L)		
		H-3	Sr-89	Sr-90
01-03-95	KWW-0041, 2	<330	<0.6	<0.4
04-03-95	-2310	<330	<0.7	<0.4
07-05-95	-7327	<330	<0.5	<0.3
10-02-95	-10289	<330	<0.7	<0.6

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Table 18. Domestic meat samples (chickens), analysis of flesh for gross alpha, gross beta, and gamma-emitting isotopes.  
Collection: Annually.

Location	Indicator			Control
	K-20	K-27	K-29	K-24
Date Collected	NS <sup>a</sup>	09-05-95	09-05-95	09-05-95
Lab Code	-	KME-9365	KME-9366	KME-9364
Gross Alpha	-	<0.15	<0.09	<0.07
Gross beta	-	2.58±0.20	2.66±0.16	2.99±0.15
Be-7	-	<0.27	<0.53	<0.21
K-40	-	2.26±0.47	2.53±0.55	3.11±0.49
Nb-95	-	<0.041	<0.094	<0.044
Zr-95	-	<0.084	<0.077	<0.074
Ru-103	-	<0.061	<0.094	<0.054
Ru-106	-	<0.23	<0.34	<0.22
Cs-134	-	<0.015	<0.032	<0.021
Cs-137	-	<0.016	<0.037	<0.018
Ce-141	-	<0.14	<0.15	<0.061
Ce-144	-	<0.17	<0.12	<0.073

<sup>a</sup> NS = No sample; sample not available from this location.

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Table 19. Egg samples collected from Schlies Farm (K-27), analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes.  
Collection: Quarterly.

Sample Description and Concentration (pCi/g wet)				
Date Collected	01-03-95	04-03-95	07-04-95	10-02-95
Lab Code	KE-0019	KE-2301	KE-7309	KE-10270
Gross beta	0.98 ± 0.04	1.06±0.06	1.20 ± 0.06	1.05 ± 0.06
Sr-89	<0.002	<0.006	<0.006	<0.007
Sr-90	<0.002	<0.002	<0.003	<0.002
Be-7	<0.049	<0.045	<0.053	<0.072
K-40	1.08±0.16	1.24±0.16	1.41±0.16	1.32±0.18
Nb-95	<0.010	<0.006	<0.005	<0.008
Zr-95	<0.018	<0.012	<0.012	<0.014
Ru-103	<0.010	<0.005	<0.005	<0.008
Ru-106	<0.049	<0.067	<0.064	<0.036
Cs-134	<0.007	<0.005	<0.006	<0.004
Cs-137	<0.005	<0.003	<0.003	<0.006
Ce-141	<0.015	<0.009	<0.021	<0.011
Ce-144	<0.044	<0.046	<0.034	<0.056



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Table 20. Vegetable and grain samples, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes.  
Collection: Annually

Sample Description and Concentration (pCi/g wet)			
	Indicator		
	K-17	K-17	K-17
Location			
Date Collected	09-05-95	09-05-95	09-05-95
Lab Code	KVE-9353	KVE-9354	KVE-9355
Type	Cabbage	Squash	Muskmelon
Gross beta	1.60 ± 0.05	3.08 ± 0.09	2.49 ± 0.07
Sr-89	<0.006	<0.004	<0.002
Sr-90	<0.002	<0.001	<0.001
Be-7	<0.068	<0.058	<0.089
K-40	2.13±0.21	4.19±0.24	2.71±0.25
Nb-95	<0.004	<0.007	<0.010
Zr-95	<0.014	<0.014	<0.011
Ru-103	<0.007	<0.007	<0.005
Ru-106	<0.045	<0.072	<0.054
Cs-134	<0.006	<0.004	<0.006
Cs-137	<0.009	<0.003	<0.008
Ce-141	<0.014	<0.012	<0.015
Ce-144	<0.044	<0.021	<0.083
Control			
	K-26	K-26	K-26
Location			
Date Collected	09-06-95	09-06-95	09-06-95
Lab Code	KVE-9356	KVE-9357	KVE-9358
Type	Corn	Cauliflower	Tomatoes
Gross beta	1.59 ± 0.05	2.15 ± 0.06	1.67 ± 0.05
Sr-89	<0.003	<0.001	<0.001
Sr-90	0.002±0.001	0.002±0.001	<0.001
Be-7	<0.071	<0.076	<0.051
K-40	2.28±0.24	2.48±0.22	2.02±0.21
Nb-95	<0.006	<0.009	<0.007
Zr-95	<0.021	<0.015	<0.011
Ru-103	<0.005	<0.009	<0.007
Ru-106	<0.082	<0.062	<0.053
Cs-134	<0.007	<0.007	<0.005
Cs-137	<0.005	<0.010	<0.008
Ce-141	<0.016	<0.015	<0.016
Ce-144	<0.037	<0.063	<0.054

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Table 20. Vegetable and grain samples, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/g wet)		
	Indicator	
	K-23	K-23
Location	08-01-95	08-01-95
Date Collected	KVE-8278	KVE-8279
Lab Code	Clover	Wheat
Type	$3.98 \pm 0.16$	$6.38 \pm 0.31$
Gross beta	<0.005	<0.007
Sr-89	<0.002	<0.004
Sr-90	$1.05 \pm 0.34$	$0.96 \pm 0.33$
Be-7	$4.97 \pm 0.70$	$6.96 \pm 0.82$
K-40	< 0.021	< 0.024
Nb-95	< 0.050	< 0.063
Zr-95	< 0.021	< 0.033
Ru-103	< 0.16	< 0.17
Ru-106	< 0.038	< 0.016
Cs-134	< 0.029	< 0.026
Cs-137	< 0.037	< 0.044
Ce-141	< 0.20	< 0.16
Ce-144		
Location		
Date Collected		
Lab Code		
Type		
Gross beta		
Sr-89		
Sr-90		
Be-7		
K-40		
Nb-95		
Zr-95		
Ru-103		
Ru-106		
Cs-134		
Cs-137		
Ce-141		
Ce-144		

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Table 21. Cattlefeed samples, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes.  
Collection: First Quarter.

Sample Description and Concentration (pCi/g wet)		
Control		
Location	K-3	K-3
Date Collected	01-04-95	01-04-95
Lab Code	KCF-0020, 1	KCF-0027
Type	Silage	Hay
Gross beta	2.95 ± 0.06	8.99 ± 0.26
Sr-89	<0.004	<0.006
Sr-90	<0.002	0.021±0.004
Be-7	0.45±0.09	0.50±0.16
K-40	3.93±0.22	12.46±0.71
Nb-95	<0.009	<0.022
Zr-95	<0.012	<0.042
Ru-103	<0.012	<0.015
Ru-106	<0.056	<0.16
Cs-134	<0.005	<0.028
Cs-137	<0.010	<0.018
Ce-141	<0.014	<0.031
Ce-144	<0.054	<0.081
Location	K-6	K-6
Date Collected	01-03-95	01-03-95
Lab Code	KCF-0024	KCF-0030
Type	Silage	Hay
Gross beta	3.08 ± 0.10	14.28 ± 0.41
Sr-89	<0.002	<0.013
Sr-90	0.003±0.001	0.055±0.010
Be-7	0.41±0.10	<0.26
K-40	3.06±0.24	13.28±0.63
Nb-95	<0.004	<0.028
Zr-95	<0.010	<0.043
Ru-103	<0.010	<0.026
Ru-106	<0.090	<0.27
Cs-134	<0.006	<0.030
Cs-137	<0.007	<0.028
Ce-141	<0.016	<0.024
Ce-144	<0.039	<0.15

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Table 21. Cattlefeed samples, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/g wet)				
Location	Indicator			
	K-4	K-4	K-5	K-5
Date Collected	01-04-95	01-04-95	01-03-95	01-03-95
Lab Code	KCF-0022	KCF-0028	KCF-0023	KCF-0029
Type	Silage	Hay	Silage	Hay
Gross beta	8.89 ± 0.30	24.96 ± 0.82	3.74 ± 0.12	27.26 ± 0.77
Sr-89	<0.007	<0.021	<0.003	<0.012
Sr-90	0.012±0.004	0.024±0.010	<0.002	0.044±0.009
Be-7	<0.15	1.04±0.22	0.45±0.16	0.41±0.25
K-40	7.48±0.47	32.01±0.91	4.11±0.30	25.41±0.89
Nb-95	<0.017	<0.031	<0.011	<0.029
Zr-95	<0.027	<0.029	<0.024	<0.034
Ru-103	<0.012	<0.015	<0.010	<0.031
Ru-106	<0.12	<0.12	<0.24	<0.18
Cs-134	<0.019	<0.036	<0.012	<0.015
Cs-137	<0.015	<0.027	<0.011	<0.025
Ce-141	<0.030	<0.027	<0.024	<0.028
Ce-144	<0.093	<0.18	<0.091	<0.10
Location	K-12	K-12	K-19	K-19
Date Collected	01-03-95	01-03-95	01-03-95	01-03-95
Lab Code	KCF-0025	KCF-0031	KCF-0026	KCF-0032
Type	Silage	Hay	Silage	Hay
Gross beta	3.26 ± 0.12	13.83 ± 0.45	2.38 ± 0.09	14.77 ± 0.51
Sr-89	<0.003	<0.011	<0.002	<0.012
Sr-90	0.010±0.002	0.033±0.008	0.002±0.001	0.048±0.009
Be-7	0.41±0.16	<0.27	0.36±0.12	0.61±0.28
K-40	2.46±0.36	12.92±0.69	2.45±0.30	15.05±0.70
Nb-95	<0.016	<0.033	<0.011	<0.029
Zr-95	<0.024	<0.067	<0.031	<0.053
Ru-103	<0.016	<0.032	<0.009	<0.025
Ru-106	<0.16	<0.28	<0.054	<0.22
Cs-134	<0.014	<0.018	<0.013	<0.035
Cs-137	<0.011	<0.033	<0.014	<0.023
Ce-141	<0.026	<0.052	<0.018	<0.053
Ce-144	<0.11	<0.19	<0.077	<0.12

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Table 22. Grass samples, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes.  
Collection: Quarterly, April through December

Sample Description and Concentration (pCi/g wet)				
	Indicator			Control
	K-1b	K-1f	K-4	K-3
Location				
Date Collected	06-05-95	06-05-95	06-05-95	05-01-95
Lab Code	KG-5836	KG-5837	KG-5838	KG-3538
Gross beta	5.83 ± 0.19	7.31 ± 0.21	5.64 ± 0.18	6.48 ± 0.19
Sr-89	<0.003	<0.002	<0.002	<0.004
Sr-90	<0.003	<0.002	<0.002	<0.003
Be-7	0.72 ± 0.20	0.94 ± 0.27	0.63 ± 0.19	0.83 ± 0.26
K-40	6.83 ± 0.52	7.10 ± 0.78	6.80 ± 0.62	8.90 ± 0.66
Nb-95	< 0.014	< 0.026	< 0.014	< 0.025
Zr-95	< 0.034	< 0.027	< 0.045	< 0.038
Ru-103	< 0.014	< 0.028	< 0.019	< 0.028
Ru-106	< 0.12	< 0.25	< 0.16	< 0.15
Cs-134	< 0.020	< 0.017	< 0.017	< 0.013
Cs-137	< 0.016	< 0.024	< 0.017	< 0.020
Ce-141	< 0.036	< 0.048	< 0.032	< 0.043
Ce-144	< 0.14	< 0.22	< 0.094	< 0.12
Location	K-5	K-12	K-19	K-6
Date Collected	06-05-95	06-05-95	06-05-95	05-01-95
Lab Code	KG-5839	KG-5841	KG-5842	KG-5840
Gross beta	5.60 ± 0.17	5.55 ± 0.17	5.71 ± 0.18	5.14 ± 0.15
Sr-89	<0.002	<0.003	<0.005	<0.002
Sr-90	<0.002	<0.003	<0.004	0.002±0.001
Be-7	1.62 ± 0.28	0.27 ± 0.12	0.78 ± 0.21	< 0.19
K-40	5.62 ± 0.57	6.69 ± 0.38	6.27 ± 0.49	5.37 ± 0.51
Nb-95	< 0.020	< 0.013	< 0.008	< 0.009
Zr-95	< 0.033	< 0.030	< 0.018	< 0.023
Ru-103	< 0.020	< 0.007	< 0.010	< 0.009
Ru-106	< 0.086	< 0.052	< 0.17	< 0.12
Cs-134	< 0.021	< 0.016	< 0.016	< 0.011
Cs-137	< 0.021	< 0.006	< 0.019	< 0.014
Ce-141	< 0.022	< 0.020	< 0.028	< 0.026
Ce-144	< 0.19	< 0.058	< 0.092	< 0.12

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Table 22. Grass samples, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/g wet)				
Location	Indicator			Control
	K-1b	K-1f	K-4	K-3
Date Collected	08-01-95	08-01-95	08-01-95	08-01-95
Lab Code	KG-8269	KG-8270	KG-8272, 3	KG-8271
Gross beta	$6.28 \pm 0.29$	$5.42 \pm 0.23$	$6.09 \pm 0.18$	$3.71 \pm 0.13$
Sr-89	<0.010	<0.003	<0.003	<0.002
Sr-90	<0.006	<0.002	<0.002	<0.001
Be-7	$0.96 \pm 0.42$	$1.17 \pm 0.29$	$2.45 \pm 0.32$	$1.78 \pm 0.37$
K-40	$7.27 \pm 0.85$	$5.73 \pm 0.56$	$6.73 \pm 0.45$	$8.56 \pm 0.87$
Nb-95	< 0.031	< 0.022	< 0.013	< 0.031
Zr-95	< 0.076	< 0.054	< 0.031	< 0.054
Ru-103	< 0.047	< 0.026	< 0.019	< 0.030
Ru-106	< 0.30	< 0.20	< 0.23	< 0.24
Cs-134	< 0.029	< 0.009	< 0.018	< 0.029
Cs-137	< 0.033	< 0.018	< 0.025	< 0.020
Ce-141	< 0.053	< 0.039	< 0.048	< 0.042
Ce-144	< 0.22	< 0.12	< 0.19	< 0.24
Location	K-5	K-12	K-19	K-6
Date Collected	08-01-95	08-01-95	08-01-95	08-01-95
Lab Code	KG-8274	KG-8276	KG-8277	KG-8275
Gross beta	$6.59 \pm 0.25$	$6.34 \pm 0.24$	$4.99 \pm 0.22$	$7.36 \pm 0.23$
Sr-89	<0.004	<0.009	<0.003	<0.010
Sr-90	<0.002	0.007±0.003	0.003±0.001	<0.005
Be-7	$2.33 \pm 0.34$	$1.18 \pm 0.38$	$1.27 \pm 0.18$	$1.01 \pm 0.34$
K-40	$8.41 \pm 0.73$	$8.27 \pm 0.87$	$4.79 \pm 0.40$	$8.63 \pm 0.87$
Nb-95	< 0.031	< 0.028	< 0.011	< 0.016
Zr-95	< 0.031	< 0.038	< 0.014	< 0.063
Ru-103	< 0.021	< 0.019	< 0.008	< 0.031
Ru-106	< 0.18	< 0.13	< 0.10	< 0.24
Cs-134	< 0.024	< 0.028	< 0.010	< 0.032
Cs-137	< 0.024	< 0.030	< 0.013	< 0.024
Ce-141	< 0.050	< 0.038	< 0.015	< 0.027
Ce-144	< 0.20	< 0.11	< 0.064	< 0.16

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Table 22. Grass samples, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes (continued).

Location	Sample Description and Concentration (pCi/g wet)			
	Indicator			Control
	K-1b	K-1f	K-4	K-3
Date Collected	10-02-95	10-02-95	10-02-95	10-02-95
Lab Code	KG-10272	KG-10273	KG-10275	KG-10274
Gross beta	5.80 ± 0.22	6.89 ± 0.28	7.04 ± 0.23	8.40 ± 0.36
Sr-89	<0.004	<0.004	<0.011	<0.014
Sr-90	0.003±0.001	0.003±0.001	<0.004	<0.006
Be-7	2.43 ± 0.39	3.57 ± 0.49	1.77 ± 0.28	1.61 ± 0.36
K-40	6.10 ± 0.79	7.03 ± 0.89	7.49 ± 0.64	8.34 ± 0.81
Nb-95	< 0.029	< 0.029	< 0.019	< 0.027
Zr-95	< 0.067	< 0.077	< 0.026	< 0.072
Ru-103	< 0.027	< 0.039	< 0.013	< 0.015
Ru-106	< 0.16	< 0.36	< 0.13	< 0.18
Cs-134	< 0.029	< 0.022	< 0.011	< 0.026
Cs-137	< 0.027	< 0.037	< 0.020	< 0.034
Ce-141	< 0.047	< 0.050	< 0.037	< 0.052
Ce-144	< 0.15	< 0.37	< 0.080	< 0.14
Location	K-5	K-12	K-19	K-6
Date Collected	10-02-95	10-02-95	10-02-95	10-02-95
Lab Code	KG-10276	KG-10278	KG-10279	KG-10277
Gross beta	7.40 ± 0.24	7.94 ± 0.24	6.15 ± 0.23	7.28 ± 0.24
Sr-89	<0.008	<0.010	<0.008	<0.007
Sr-90	0.003±0.001	<0.004	<0.003	<0.003
Be-7	2.71 ± 0.46	2.21 ± 0.53	2.94 ± 0.51	2.98 ± 0.39
K-40	8.84 ± 1.05	8.03 ± 0.12	6.94 ± 0.86	8.13 ± 0.64
Nb-95	< 0.029	< 0.025	< 0.017	< 0.010
Zr-95	< 0.075	< 0.068	< 0.065	< 0.053
Ru-103	< 0.037	< 0.031	< 0.038	< 0.017
Ru-106	< 0.32	< 0.31	< 0.36	< 0.24
Cs-134	< 0.021	< 0.040	< 0.044	< 0.016
Cs-137	< 0.046	< 0.020	< 0.031	< 0.026
Ce-141	< 0.043	< 0.069	< 0.093	< 0.035
Ce-144	< 0.22	< 0.23	< 0.33	< 0.11

NOTE: Pages 83 and 84 are intentionally left out.

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Table 23. Soil samples, analysis for gross alpha, gross beta, strontium-89, strontium-90, and gamma-emitting isotopes.  
Collection: Semiannually

Sample Description and Concentration (pCi/g dry)			
Location	Indicator		
	K-1f	K-4	K-5
Date Collected	05-01-95	05-01-95	05-01-95
Lab Code	KSO-3530	KSO-3533	KSO-3534
Gross alpha	5.60 ± 3.40	7.84 ± 3.71	9.44 ± 3.89
Gross beta	14.21 ± 2.97	21.05 ± 3.23	31.71 ± 3.54
Sr-89	< 0.021	< 0.014	< 0.012
Sr-90	< 0.019	< 0.011	0.058 ± 0.011
Be-7	< 0.21	< 0.22	< 0.18
K-40	26.29 ± 0.75	29.46 ± 0.79	34.75 ± 0.75
Nb-95	< 0.230	< 0.017	< 0.015
Zr-95	< 0.037	< 0.036	< 0.037
Ru-103	< 0.009	< 0.02	< 0.017
Ru-106	< 0.18	< 0.02	< 0.13
Cs-134	< 0.028	< 0.023	< 0.027
Cs-137	< 0.024	0.125 ± 0.029	0.248 ± 0.026
Ce-141	< 0.051	< 0.023	< 0.032
Ce-144	< 0.098	< 0.14	< 0.12
Location	K-1f	K-4	K-5
Date Collected	10-02-95	10-02-95	10-02-95
Lab Code	KSO-10295	KSO-10297	KSO-10298
Gross alpha	14.23 ± 6.05	8.86 ± 5.01	8.01 ± 4.43
Gross beta	24.47 ± 4.23	30.19 ± 4.65	32.91 ± 4.44
Sr-89	< 0.022	< 0.026	< 0.025
Sr-90	< 0.008	0.062 ± 0.013	0.108 ± 0.015
Be-7	< 0.12	0.30 ± 0.14	0.35 ± 0.17
K-40	19.94 ± 0.56	22.93 ± 0.61	23.68 ± 0.65
Nb-95	< 0.022	< 0.031	< 0.010
Zr-95	< 0.021	< 0.070	< 0.034
Ru-103	< 0.011	< 0.009	< 0.014
Ru-106	< 0.088	< 0.11	< 0.15
Cs-134	< 0.035	< 0.034	< 0.035
Cs-137	< 0.013	0.145 ± 0.020	0.172 ± 0.025
Ce-141	< 0.031	< 0.031	< 0.027
Ce-144	< 0.091	< 0.09	< 0.12



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Table 23. Soil samples, analysis for gross alpha, gross beta, strontium-89, strontium-90, and gamma-emitting isotopes (continued).

Location	Indicator	
	K-12	K-19
Date Collected	05-01-95	05-01-95
Lab Code	KSO-3536	KSO-3537
Gross alpha	10.35 ± 3.99	5.20 ± 3.35
Gross beta	22.28 ± 3.23	16.21 ± 3.05
Sr-89	< 0.011	< 0.012
Sr-90	< 0.007	0.126 ± 0.016
Be-7	1.77 ± 0.38	< 0.14
K-40	24.24 ± 0.83	20.81 ± 0.53
Nb-95	< 0.015	< 0.010
Zr-95	< 0.014	< 0.023
Ru-103	< 0.023	< 0.010
Ru-106	< 0.13	< 0.13
Cs-134	< 0.020	< 0.018
Cs-137	0.211 ± 0.045	0.386 ± 0.024
Ce-141	< 0.030	< 0.032
Ce-144	< 0.081	< 0.11
Location	K-12	K-19
Date Collected	10-02-95	10-02-95
Lab Code	KSO-10300	KSO-10301
Gross alpha	8.35 ± 4.91	11.40 ± 5.56
Gross beta	25.25 ± 4.30	15.36 ± 3.70
Sr-89	< 0.021	< 0.025
Sr-90	0.012 ± 0.005	0.078 ± 0.013
Be-7	0.34 ± 0.18	< 0.11
K-40	19.90 ± 0.63	15.21 ± 0.48
Nb-95	< 0.009	< 0.015
Zr-95	< 0.028	< 0.020
Ru-103	< 0.016	< 0.013
Ru-106	< 0.12	< 0.11
Cs-134	< 0.037	< 0.027
Cs-137	0.219 ± 0.028	0.195 ± 0.020
Ce-141	< 0.033	< 0.029
Ce-144	< 0.11	< 0.090

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Table 23. Soil samples, analysis for gross alpha, gross beta, strontium-89, strontium-90, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/g dry)		
Control		
	K-3	K-6
Location	05-01-95	05-01-95
Date Collected	KSO-3531, 2	KSO-3535
Lab Code		
Gross alpha	8.04 ± 2.63	8.70 ± 3.79
Gross beta	17.95 ± 2.20	23.15 ± 3.23
Sr-89	< 0.014	< 0.021
Sr-90	< 0.015	0.026 ± 0.012
Be-7	0.34 ± 0.17	0.85 ± 0.21
K-40	24.48 ± 0.51	25.56 ± 0.68
Nb-95	< 0.010	< 0.016
Zr-95	< 0.020	< 0.036
Ru-103	< 0.009	< 0.019
Ru-106	< 0.12	< 0.085
Cs-134	< 0.024	< 0.022
Cs-137	0.172 ± 0.025	0.315 ± 0.029
Ce-141	< 0.018	< 0.026
Ce-144	< 0.11	< 0.12
	K-3	K-6
Location	10-02-95	10-02-95
Date Collected	KSO-10296	KSO-10299
Lab Code		
Gross alpha	5.71 ± 4.23	5.92 ± 4.05
Gross beta	21.90 ± 4.06	23.96 ± 4.00
Sr-89	< 0.030	< 0.022
Sr-90	0.052 ± 0.013	0.039 ± 0.009
Be-7	< 0.13	< 0.13
K-40	21.96 ± 0.58	19.12 ± 0.56
Nb-95	< 0.025	< 0.050
Zr-95	< 0.012	< 0.011
Ru-103	< 0.010	< 0.011
Ru-106	< 0.11	< 0.120
Cs-134	< 0.033	< 0.035
Cs-137	0.202 ± 0.019	0.137 ± 0.022
Ce-141	< 0.019	< 0.034
Ce-144	< 0.11	< 0.071

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes.

Collection: Monthly

Sample Description and Concentration (pCi/L)

**Indicator**

**K-1a**

Date Collected	01-03-95	02-01-95	03-01-95
Lab Code	KSW-0033	KSW-0693	KSW-1483
Gross beta			
Suspended Solids	<0.4	<0.3	< 1.3
Dissolved Solids	10.4 ± 1.1	10.2 ± 1.2	6.0 ± 1.0
Total Residue	10.4 ± 1.1	10.2 ± 1.2	6.0 ± 1.0
K-40 (flame photometry)	7.27	8.13	8.65
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

**K-1b**

Date Collected	01-03-95	02-01-95	03-01-95
Lab Code	KSW-0034	KSW-0694, 5	KSW-1484
Gross beta			
Suspended Solids	<0.4	<0.8	< 0.6
Dissolved Solids	3.2 ± 0.8	4.0 ± 0.5	7.8 ± 0.8
Total Residue	3.2 ± 0.8	4.0 ± 0.5	7.8 ± 0.8
K-40 (flame photometry)	1.56	3.11	6.92
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
Indicator			
<b>K-1a</b>			
Date Collected	04-03-95	05-01-95	06-05-95
Lab Code	KSW-2302	KSW-3539	KSW-5843
Gross beta			
Suspended Solids	<0.5	<0.4	0.4 ± 0.1
Dissolved Solids	7.6 ± 1.0	5.6 ± 1.0	10.1 ± 1.1
Total Residue	7.6 ± 1.0	5.6 ± 1.0	10.5 ± 1.1
K-40 (flame photometry)	6.14	6.23	7.09
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-1b</b>			
Date Collected	04-03-95	05-01-95	06-05-95
Lab Code	KSW-2303	KSW-3540	KSW-5844
Gross beta			
Suspended Solids	<0.4	<0.4	<0.2
Dissolved Solids	3.9 ± 0.7	3.1 ± 0.7	4.0 ± 0.7
Total Residue	3.9 ± 0.7	3.1 ± 0.7	4.0 ± 0.7
K-40 (flame photometry)	2.68	2.34	2.08
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
Indicator			
<b>K-1a</b>			
Date Collected	07-05-95	08-01-95	09-05-95
Lab Code	KSW-7318	KSW-8282	KSW-9379
Gross beta			
Suspended Solids	<0.6	<0.7	<0.7
Dissolved Solids	5.2 ± 0.9	5.9 ± 1.0	13.1 ± 1.3
Total Residue	5.2 ± 0.9	5.9 ± 1.0	13.1 ± 1.3
K-40 (flame photometry)	4.67	5.88	10.38
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-1b</b>			
Date Collected	07-05-95	08-01-95	09-05-95
Lab Code	KSW-7319	KSW-8283	KSW-9380
Gross beta			
Suspended Solids	<0.3	<0.6	<0.7
Dissolved Solids	2.2 ± 0.6	3.4 ± 0.7	3.4 ± 0.6
Total Residue	2.2 ± 0.6	3.4 ± 0.7	3.4 ± 0.6
K-40 (flame photometry)	2.08	2.25	1.90
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
Indicator			
<b>K-1a</b>			
Date Collected	10-02-95	11-01-95	12-04-95
Lab Code	KSW-10280	KSW-11441	KSW-12255
Gross beta			
Suspended Solids	<0.3	<0.2	<0.8
Dissolved Solids	10.4 ± 1.1	13.1 ± 1.3	15.3 ± 1.2
Total Residue	10.4 ± 1.1	13.1 ± 1.3	15.3 ± 1.2
K-40 (flame photometry)	10.38	10.38	13.84
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-1b</b>			
Date Collected	10-02-95	11-01-95	12-04-95
Lab Code	KSW-10281	KSW-11442	KSW-12256
Gross beta			
Suspended Solids	< 0.2	<0.5	<0.3
Dissolved Solids	4.3 ± 0.7	3.9 ± 0.7	3.9 ± 0.7
Total Residue	4.3 ± 0.7	3.9 ± 0.7	3.9 ± 0.7
K-40 (flame photometry)	2.68	3.20	2.08
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
<u>Indicator</u>			
<u>K-1d</u>			
Date Collected	01-03-95	02-01-95	03-01-95
Lab Code	KSW-0035	KSW-0696	KSW-1485
Gross beta			
Suspended Solids	<0.4	<0.6	<0.5
Dissolved Solids	1.9 ± 0.5	1.6 ± 0.4	2.0 ± 0.4
Total Residue	1.9 ± 0.5	1.6 ± 0.4	2.0 ± 0.4
K-40 (flame photometry)	1.04	1.04	1.04
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<u>K-1e</u>			
Date Collected	01-03-95	02-01-95	03-01-95
Lab Code	KSW-0036	KSW-0697	KSW-1486
Gross beta			
Suspended Solids	<0.4	<0.6	<1.2
Dissolved Solids	4.1 ± 1.5	5.3 ± 1.2	8.1 ± 1.3
Total Residue	4.1 ± 1.5	5.3 ± 1.2	8.1 ± 1.3
K-40 (flame photometry)	1.56	4.67	6.06
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
<b>Indicator</b>			
<b>K-1d</b>			
Date Collected	04-03-95	05-01-95	06-05-95
Lab Code	KSW-2304	KSW-3541	KSW-5845
Gross beta			
Suspended Solids	<0.1	<0.4	<0.2
Dissolved Solids	2.0 ± 0.4	2.4 ± 0.5	2.5 ± 0.5
Total Residue	2.0 ± 0.4	2.4 ± 0.5	2.5 ± 0.5
K-40 (flame photometry)	0.95	1.04	0.95
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-1e</b>			
Date Collected	04-03-95	05-01-95	06-05-95
Lab Code	KSW-2305	KSW-3542	KSW-5846
Gross beta			
Suspended Solids	<0.1	<0.3	<0.2
Dissolved Solids	3.5 ± 1.1	3.6 ± 1.2	3.8 ± 1.2
Total Residue	3.5 ± 1.1	3.6 ± 1.2	3.8 ± 1.2
K-40 (flame photometry)	2.77	2.42	2.42
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15



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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
<b>Indicator</b>			
<b>K-1d</b>			
Date Collected	07-05-95	08-01-95	09-05-95
Lab Code	KSW-7320	KSW-8284	KSW-9381
Gross beta			
Suspended Solids	<0.3	<0.6	<0.7
Dissolved Solids	1.6 ± 0.4	1.9 ± 0.5	1.9 ± 0.4
Total Residue	1.6 ± 0.4	1.9 ± 0.5	1.9 ± 0.4
K-40 (flame photometry)	1.04	1.04	0.87
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-1e</b>			
Date Collected	07-05-95	08-01-95	09-05-95
Lab Code	KSW-7321	KSW-8285	KSW-9382
Gross beta			
Suspended Solids	<0.8	<0.6	<0.7
Dissolved Solids	5.9 ± 1.3	7.8 ± 1.4	6.5 ± 1.4
Total Residue	5.9 ± 1.3	7.8 ± 1.4	6.5 ± 1.4
K-40 (flame photometry)	7.44	8.65	5.19
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
<u>Indicator</u>			
<b>K-1d</b>			
Date Collected	10-02-95	11-01-95	12-04-95
Lab Code	KSW-10282, 3	KSW-11443	KSW-12257
Gross beta			
Suspended Solids	<0.3	<0.4	<0.3
Dissolved Solids	2.2 ± 0.3	2.8 ± 0.5	2.2 ± 0.4
Total Residue	2.2 ± 0.3	2.8 ± 0.5	2.2 ± 0.4
K-40 (flame photometry)	1.08	0.95	1.12
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-1e</b>			
Date Collected	10-02-95	11-01-95	12-04-95
Lab Code	KSW-10284	KSW-11444	KSW-12258
Gross beta			
Suspended Solids	<0.6	<0.5	<0.3
Dissolved Solids	9.8 ± 1.3	4.0 ± 1.1	3.6 ± 1.2
Total Residue	9.8 ± 1.3	4.0 ± 1.1	3.6 ± 1.2
K-40 (flame photometry)	1.73	2.42	2.68
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
<b>Indicator</b>			
<b>K-14a</b>			
Date Collected	01-03-95	02-01-95	03-01-95
Lab Code	KSW-0039	KSW-0700 <sup>a</sup>	KSW-1489
Gross beta			
Suspended Solids	<0.4	<0.3	< 0.3
Dissolved Solids	2.7 ± 0.7	1.3 ± 0.5	2.0 ± 0.6
Total Residue	2.7 ± 0.7	1.3 ± 0.5	2.0 ± 0.6
K-40 (flame photometry)	1.56	1.04	0.87
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-14b</b>			
Date Collected	01-03-95	02-01-95	03-01-95
Lab Code	KSW-0040	KSW-0701	KSW-1490
Gross beta			
Suspended Solids	<0.4	<0.3	<0.3
Dissolved Solids	2.7 ± 0.8	2.7 ± 0.6	2.1 ± 0.6
Total Residue	2.7 ± 0.8	2.7 ± 0.6	2.1 ± 0.6
K-40 (flame photometry)	1.30	1.04	0.95
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

<sup>a</sup> Sample was reanalyzed for Dissolved solids, result of reanalysis is 2.1±0.6 pCi/L.

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
Indicator			
<b>K-14a</b>			
Date Collected	04-03-95	05-01-95	06-05-95
Lab Code	KSW-2308	KSW-3545	KSW-5849
Gross beta			
Suspended Solids	<0.2	<0.5	<0.2
Dissolved Solids	2.1 ± 0.4 <sup>a</sup>	2.4 ± 0.6	2.0 ± 0.6
Total Residue	2.1 ± 0.4 <sup>a</sup>	2.4 ± 0.6	2.0 ± 0.6
K-40 (flame photometry)	1.04	1.30	0.95
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-14b</b>			
Date Collected	04-03-95	05-01-95	06-05-95
Lab Code	KSW-2309	KSW-3546	KSW-5850
Gross beta			
Suspended Solids	<0.2	<0.5	<0.2
Dissolved Solids	2.6 ± 0.6 <sup>a</sup>	2.8 ± 0.7	2.4 ± 0.6
Total Residue	2.6 ± 0.6 <sup>a</sup>	2.8 ± 0.7	2.4 ± 0.6
K-40 (flame photometry)	1.04	1.21	0.95
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

<sup>a</sup> Corrected data.

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
<u>Indicator</u>			
<b>K-14a</b>			
Date Collected	07-05-95	08-01-95	09-06-95
Lab Code	KSW-7325	KSW-8288	KSW-9385
Gross beta			
Suspended Solids	<0.3	<0.6	<0.7
Dissolved Solids	2.3 ± 0.6	2.5 ± 0.6	2.7 ± 0.6
Total Residue	2.3 ± 0.6	2.5 ± 0.6	2.7 ± 0.6
K-40 (flame photometry)	1.13	1.12	<0.87
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-14b</b>			
Date Collected	07-05-95	08-01-95	09-06-95
Lab Code	KSW-7326	KSW-8289	KSW-9386
Gross beta			
Suspended Solids	<3.2	0.7 ± 0.5	<0.7
Dissolved Solids	1.9 ± 0.6	2.8 ± 0.6	2.3 ± 0.6
Total Residue	1.9 ± 0.6	3.5 ± 0.8	2.3 ± 0.6
K-40 (flame photometry)	1.04	1.12	<0.87
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)			
<u>Indicator</u>			
<b>K-14a</b>			
Date Collected	10-02-95	11-01-95	12-04-95
Lab Code	KSW-10287	KSW-11447	KSW-12261
Gross beta			
Suspended Solids	< 0.2	<0.3	<0.3
Dissolved Solids	2.5 ± 0.6	2.9 ± 0.6	2.4 ± 0.6
Total Residue	2.5 ± 0.6	2.9 ± 0.6	2.4 ± 0.6
K-40 (flame photometry)	1.21	1.21	1.30
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15
<b>K-14b</b>			
Date Collected	10-02-95	11-01-95	12-04-95
Lab Code	KSW-10288	KSW-11448	KSW-12262
Gross beta			
Suspended Solids	<0.3	<0.3	<0.3
Dissolved Solids	3.4 ± 0.6	2.5 ± 0.6	2.8 ± 0.6
Total Residue	3.4 ± 0.6	2.5 ± 0.6	2.8 ± 0.6
K-40 (flame photometry)	1.21	1.21	1.21
Mn-54	<15	<15	<15
Fe-59	<30	<30	<30
Co-58	<15	<15	<15
Co-60	<15	<15	<15
Zr-Nb-95	<15	<15	<15
Cs-134	<10	<10	<10
Cs-137	<10	<10	<10
Ba-La-140	<15	<15	<15

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)						
<b>Control</b>						
<b>K-9</b>						
Date Collected	01-03-95		02-01-95		03-01-95	
Lab Code	KSW-0037	KSW-0038	KSW-0698	KSW-0699	KSW-1487	KSW-1488
	(Raw)	(Tap)	(Raw)	(Tap)	(Raw)	(Tap)
<b>Gross beta</b>						
Suspended Solids	<0.4	<0.4	<0.3	<0.3	<0.4	<0.3
Dissolved Solids	3.3 ± 0.6	2.0 ± 0.5	1.4 ± 0.7	1.2 ± 0.7	1.4 ± 0.7	1.7 ± 0.4
Total Residue	3.3 ± 0.6	2.0 ± 0.5	1.4 ± 0.7	1.2 ± 0.7	1.4 ± 0.7	1.7 ± 0.4
K-40 (flame photometry)	1.12	<0.86	1.04	1.04	0.87	0.87
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15	<15	<15
<b>K-9</b>						
Date Collected	04-03-95		05-01-95		06-05-95	
Lab Code	KSW-2306	KSW-2307	KSW-3543	KSW-3544	KSW-5847	KSW-5848
	(Raw)	(Tap)	(Raw)	(Tap)	(Raw)	(Tap)
<b>Gross beta</b>						
Suspended Solids	<0.2	<0.1	<0.3	<0.3	<0.2	<0.2
Dissolved Solids	2.5 ± 0.7	1.9 ± 0.4 <sup>a</sup>	1.4 ± 0.7	1.9 ± 0.8	1.8 ± 0.8	2.2 ± 0.4
Total Residue	2.5 ± 0.7	1.9 ± 0.4 <sup>a</sup>	1.4 ± 0.7	1.9 ± 0.8	1.8 ± 0.8	2.2 ± 0.4
K-40 (flame photometry)	1.04	1.04	0.86	0.86	0.95	0.95
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15	<15	<15

<sup>a</sup> Corrected data.

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Table 24. Surface water samples, analysis for gross beta, potassium-40, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/L)						
<u>Control</u>						
<u>K-9</u>						
Date Collected	07-05-95		08-01-95		09-05-95	
Lab Code	KSW-7322	KSW-7323,4	KSW-8286	KSW-8287	KSW-9383	KSW-9384
	(Raw)	(Tap)	(Raw)	(Tap)	(Raw)	(Tap)
Gross beta						
Suspended Solids	0.7 ± 0.2	<0.6	<0.7	<0.7	<0.6	<0.7
Dissolved Solids	2.6 ± 0.8	2.5 ± 0.5	2.1 ± 0.7	2.2 ± 0.7	2.2 ± 0.7	2.0 ± 0.8
Total Residue	3.3 ± 0.8	2.5 ± 0.5	2.1 ± 0.7	2.2 ± 0.7	2.2 ± 0.7	2.0 ± 0.8
K-40 (flame photometry)	1.21	1.04	1.12	1.12	<0.87	<0.87
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15	<15	<15
<u>K-9</u>						
Date Collected	10-02-95		11-01-95		12-04-95	
Lab Code	KSW-10285	KSW-10286	KSW-11445	KSW-11446	KSW-12259	KSW-12260
	(Raw)	(Tap)	(Raw)	(Tap)	(Raw)	(Tap)
Gross beta						
Suspended Solids	<0.2	<0.2	<0.3	<0.3	<0.3	<0.3
Dissolved Solids	2.3 ± 0.7	2.1 ± 0.4	1.9 ± 0.7	2.1 ± 0.4	2.4 ± 0.7	2.0 ± 0.7
Total Residue	2.3 ± 0.7	2.1 ± 0.4	1.9 ± 0.7	2.1 ± 0.4	2.4 ± 0.7	2.0 ± 0.7
K-40 (flame photometry)	1.21	1.21	1.04	1.12	1.04	1.12
Mn-54	<15	<15	<15	<15	<15	<15
Fe-59	<30	<30	<30	<30	<30	<30
Co-58	<15	<15	<15	<15	<15	<15
Co-60	<15	<15	<15	<15	<15	<15
Zr-Nb-95	<15	<15	<15	<15	<15	<15
Cs-134	<10	<10	<10	<10	<10	<10
Cs-137	<10	<10	<10	<10	<10	<10
Ba-La-140	<15	<15	<15	<15	<15	<15



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Table 25. Surface water samples, analyses for tritium, strontium-89 and strontium-90.  
Collection: Quarterly composites of monthly samples.

Location and Collection Period, 1995	Lab Code	Concentration pCi/L		
		H-3	Sr-89	Sr-90
<b>Indicator</b>				
<b>K-1a</b>				
1st Quarter	KSW -1853	< 330	<0.7	0.7±0.3
2nd Quarter	-7416	< 330	<1.0	0.9±0.3
3rd Quarter	-10072	< 330	<0.9	0.6±0.3
4th Quarter	-12984	< 330	<0.8	0.7±0.3
Annual mean ± s.d.		< 330	<1.0	0.7±0.1
<b>K-1b</b>				
1st Quarter	KSW -1854	< 330	< 1.0	0.5±0.3
2nd Quarter	-7417	< 330	< 1.0	0.6±0.3
3rd Quarter	-10073	< 330	< 1.1	< 0.6
4th Quarter	-12985	< 330	< 0.7	< 0.4
Annual mean ± s.d.		< 330	< 1.1	0.6±0.1
<b>K-1d</b>				
1st Quarter	KSW -1855	< 330	< 0.8	0.5±0.3
2nd Quarter	-7418	1,317±129*	< 1.3	< 0.6
3rd Quarter	-10074	< 330	< 1.3	0.7±0.3
4th Quarter	-12986	< 330	< 0.7	0.8±0.3
Annual mean ± s.d.		1,317±0	< 1.3	0.7±0.2
<b>K-1e</b>				
1st Quarter	KSW -1856	< 330	<0.7	0.6±0.3
2nd Quarter	-7419	< 330	<1.0	< 0.5
3rd Quarter	-10075, 6	< 330	< 0.9	< 0.3
4th Quarter	-12987,8	< 330	< 0.7	0.6±0.2
Annual mean ± s.d.		< 330	< 1.0	0.6±0.0

\* Sample was recomposited and analyzed; result of analysis is 1,734±140 pCi/L.

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Table 25. Surface water samples, analyses for tritium, strontium-89 and strontium-90 (continued).

Location and Collection Period, 1995		Concentration pCi/L		
		H-3	Sr-89	Sr-90
<b>Indicator</b>				
<b>K-14a</b>				
1st Quarter	KSW -1859	< 330	< 1.0	0.5±0.3
2nd Quarter	-7422	< 330	< 1.4	<0.7
3rd Quarter	-10079	< 330	< 1.2	0.7±0.4
4th Quarter	-12991	< 330	< 0.7	0.8±0.3
Annual mean ± s.d.		< 330	< 1.4	0.7±0.2
<b>K-14b</b>				
1st Quarter	KSW -1860	344±101 <sup>a</sup>	< 0.8	0.5±0.3
2nd Quarter	-7423	< 330	< 1.1	< 0.5
3rd Quarter	-10080	< 330	< 1.1	< 0.4
4th Quarter	-12992	< 330	< 1.4	0.6±0.4
Annual mean ± s.d.		344±0	< 1.1	0.6±0.1
<b>Control</b>				
<b>K-9</b>				
1st Quarter	KSW - 1857 (Raw)	< 330	< 0.9	< 0.5
	- 1858 (Tap)	< 330	< 0.9	< 0.5
2nd Quarter	- 7420 (Raw)	< 330	< 1.3	0.7±0.4
	- 7421 (Tap)	< 330	< 1.5	< 0.6
3rd Quarter	- 10077 (Raw)	< 330	< 1.0	< 0.5
	- 10078 (Tap)	< 330	< 1.0	< 0.5
4th Quarter	- 12989 (Raw)	< 330	< 1.4	1.2±0.5
	- 12990 (Tap)	< 330	< 0.7	0.7±0.3
Annual mean ± s.d.		< 330	< 1.6	0.9±0.3

<sup>a</sup> Sample was reanalyzed; result of reanalysis is 342±99 pCi/L.

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Table 26. Fish samples collected at K-1d, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes.  
Collection: Three times a year

Sample Description and Concentration (pCi/g wet)

Date Collected	05-31-95		06-14-95		09-26-95	
Lab Code	KF-5828		KF-7308		KF-10271	
Type	Trout		Trout		Trout	
Portion	Flesh	Bones	Flesh	Bones	Flesh	Bones
Gross beta	2.72 ± 0.08	0.92 ± 0.40	0.89 ± 0.05	0.67 ± 0.31	2.51 ± 0.10	1.37 ± 0.51
Sr-89	NA*	<0.068	NA*	<0.075	NA*	<0.047
Sr-90	NA	0.044±0.024	NA	0.139±0.031	NA	0.085±0.020
K-40	2.98 ± 0.36	NA*	1.10 ± 0.29	NA*	2.79 ± 0.40	NA*
Mn-54	< 0.015	NA	< 0.009	NA	< 0.016	NA
Fe-59	< 0.029	NA	< 0.016	NA	< 0.048	NA
Co-58	< 0.007	NA	< 0.009	NA	< 0.010	NA
Co-60	< 0.01	NA	< 0.02	NA	< 0.006	NA
Cs-134	< 0.016	NA	< 0.010	NA	< 0.015	NA
Cs-137	0.068 ± 0.023	NA	0.033 ± 0.019	NA	0.041 ± 0.022	NA

Date Collected	10-30-95		12-26-95	
Lab Code	KF-12263		KF-12899	
Type	Lake Trout		Brown Trout	
Portion	Flesh	Bones	Flesh	Bones
Gross beta	3.43 ± 0.58	1.08 ± 0.43	3.07 ± 0.09	1.39 ± 0.45
Sr-89	NA*	<0.078	NA*	<0.045
Sr-90	NA	0.081±0.023	NA	0.044±0.019
K-40	2.67 ± 0.27	NA*	3.08 ± 0.29	NA*
Mn-54	<0.010	NA	<0.005	NA
Fe-59	<0.042	NA	<0.014	NA
Co-58	<0.012	NA	<0.006	NA
Co-60	<0.009	NA	<0.009	NA
Cs-134	<0.009	NA	<0.014	NA
Cs-137	0.069 ± 0.014	NA	0.071 ± 0.015	NA

\* NA = Not analyzed; analysis not required.

NOTE: Page 105 is intentionally left out.

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Table 27. Slime samples, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes.  
Collection: Semiannually

Location	Indicator		
	K-1a	K-1b	K-1d
Date Collected	06-05-95	06-05-95	06-05-95
Lab Code	KSL-5829	KSL-5830	KSL-5831
Gross beta	3.94 ± 0.63	5.39 ± 0.16	4.32 ± 0.60
Sr-89	<0.023	<0.002	<0.011
Sr-90	0.018±0.011	<0.001	<0.008
Be-7	0.68 ± 0.11	0.51 ± 0.25	2.20 ± 0.18
K-40	2.80 ± 0.27	5.22 ± 0.47	2.37 ± 0.24
Mn-54	< 0.011	< 0.018	< 0.011
Co-58	< 0.015	< 0.010	0.089 ± 0.017
Co-60	< 0.012	< 0.022	< 0.014
Nb-95	< 0.009	< 0.024	< 0.013
Zr-95	< 0.008	< 0.047	< 0.020
Ru-103	< 0.008	< 0.015	< 0.012
Ru-106	< 0.074	< 0.15	< 0.12
Cs-134	< 0.010	< 0.022	< 0.007
Cs-137	< 0.011	< 0.011	0.079 ± 0.017
Ce-141	< 0.018	< 0.046	< 0.010
Ce-144	< 0.036	< 0.16	< 0.063
Location	K-1a	K-1b	K-1d
Date Collected	09-05-95	09-05-95	09-05-95
Lab Code	KSL-9359	KSL-9360	KSL-9361
Gross beta	3.30 ± 0.40	3.98 ± 0.22	3.30 ± 0.38
Sr-89	<0.051	<0.011	<0.028
Sr-90	0.027±0.012	<0.004	<0.010
Be-7	< 0.25	1.17 ± 0.23	0.77 ± 0.13
K-40	3.49 ± 0.60	4.67 ± 0.52	2.38 ± 0.29
Mn-54	< 0.025	< 0.018	< 0.009
Co-58	< 0.042	< 0.024	0.030 ± 0.014
Co-60	< 0.030	< 0.030	< 0.014
Nb-95	< 0.036	< 0.020	< 0.011
Zr-95	< 0.044	< 0.048	< 0.021
Ru-103	< 0.019	< 0.021	< 0.011
Ru-106	< 0.22	< 0.093	< 0.07
Cs-134	< 0.030	< 0.026	< 0.011
Cs-137	< 0.032	< 0.021	0.024 ± 0.013
Ce-141	< 0.048	< 0.027	< 0.016
Ce-144	< 0.096	< 0.10	< 0.089

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Table 27. Slime samples, analysis for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes (continued).

Sample Description and Concentration (pCi/g wet)			
Location	Indicator		Control
	K-1e	K-14	K-9
Date Collected	06-05-95	06-05-95	06-05-95
Lab Code	KSL-5832, 3	KSL-5835	KSL-5834
Gross beta	4.68 ± 0.48	2.66 ± 0.20	3.67 ± 0.11
Sr-89	<0.030	<0.006	<0.002
Sr-90	<0.020	<0.005	<0.001
Be-7	1.19 ± 0.11	0.82 ± 0.13	< 0.15
K-40	2.70 ± 0.20	1.61 ± 0.25	3.37 ± 0.46
Mn-54	< 0.014	< 0.010	< 0.017
Co-58	0.160 ± 0.013	< 0.013	< 0.012
Co-60	0.044 ± 0.009	< 0.015	< 0.018
Nb-95	< 0.008	< 0.013	< 0.016
Zr-95	< 0.011	< 0.023	< 0.044
Ru-103	< 0.005	< 0.010	< 0.021
Ru-106	< 0.040	< 0.062	< 0.13
Cs-134	< 0.008	< 0.013	< 0.021
Cs-137	0.057 ± 0.011	0.023 ± 0.013	< 0.011
Ce-141	< 0.016	< 0.021	< 0.023
Ce-144	< 0.042	< 0.061	< 0.097
Location	K-1e	K-14	K-9
Date Collected	08-01-95	08-01-95	09-06-95
Lab Code	KSL-8280	KSL-8281	KSL-9362
Gross beta	4.11 ± 0.40	6.11 ± 0.56	2.03 ± 0.10
Sr-89	<0.025	<0.031	<0.004
Sr-90	<0.013	<0.016	0.003±0.001
Be-7	1.54 ± 0.19	1.56 ± 0.25	< 0.32
K-40	2.56 ± 0.35	3.99 ± 0.53	2.68 ± 0.52
Mn-54	< 0.014	< 0.021	< 0.027
Co-58	0.056 ± 0.022	< 0.028	< 0.014
Co-60	< 0.018	< 0.033	< 0.009
Nb-95	< 0.014	< 0.029	< 0.030
Zr-95	< 0.036	< 0.043	< 0.049
Ru-103	< 0.008	< 0.023	< 0.022
Ru-106	< 0.093	< 0.22	< 0.29
Cs-134	< 0.016	< 0.029	< 0.039
Cs-137	0.078 ± 0.027	0.100 ± 0.029	< 0.025
Ce-141	< 0.016	< 0.038	< 0.048
Ce-144	< 0.11	< 0.12	< 0.20

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Table 28. Bottom sediment samples, analyses for gross beta, strontium-89, strontium-90, and gamma-emitting isotopes  
Collection: May and November

Sample Description and Concentration (pCi/g dry)					
Location	Indicator				Control
	K-1c	K-1d	K-1j	K-14	K-9
Collection Date	05-01-95	05-01-95	05-01-95	05-01-95	05-01-95
Lab Code	KBS-3525	KBS-3526	KBS-3527	KBS-3529	KBS-3528
Gross beta	5.43 ± 1.20	7.52 ± 1.39	5.13 ± 1.28	8.15 ± 1.43	5.05 ± 1.26
Sr-89	<0.016	<0.010	<0.013	<0.018	<0.012
Sr-90	<0.012	<0.007	<0.010	<0.013	<0.010
K-40	7.77 ± 0.35	10.94 ± 0.44	5.76 ± 0.31	7.34 ± 0.42	6.62 ± 0.03
Co-58	< 0.015	0.020 ± 0.012	< 0.015	< 0.022	< 0.012
Co-60	< 0.013	0.023 ± 0.020	< 0.013	< 0.018	< 0.015
Cs-134	< 0.013	< 0.014	< 0.015	< 0.029	< 0.013
Cs-137	0.029 ± 0.011	0.056 ± 0.014	0.055 ± 0.015	< 0.019	< 0.015
Location	K-1c	K-1d	K-1j	K-14	K-9
Collection Date	11-01-95	11-01-95	11-01-95	11-01-95	11-01-95
Lab Code	KBS-11449	KBS-11450	KBS-11451	KBS-11453, 4	KBS-11452
Gross beta	7.49 ± 1.47	5.34 ± 1.22	7.39 ± 1.39	7.70 ± 1.01	3.58 ± 1.13
Sr-89	<0.023	<0.036	<0.021	<0.018	<0.021
Sr-90	<0.008	<0.011	<0.008	<0.007	<0.010
K-40	11.18 ± 0.36	5.01 ± 0.45	7.10 ± 0.62	10.47 ± 0.46	5.10 ± 0.40
Co-58	< 0.020	< 0.024	< 0.036	< 0.030	< 0.020
Co-60	< 0.019	< 0.023	< 0.029	< 0.032	< 0.020
Cs-134	< 0.025	< 0.032	< 0.034	< 0.031	< 0.028
Cs-137	0.058 ± 0.012	0.023 ± 0.014	< 0.023	< 0.022	< 0.014

NOTE: Pages 109 through 111 are intentionally left out.

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Table 29. Air particulate samples, gross beta, quarterly and annual means and standard deviations, January - December, 1995.

Location	Gross Beta (pCi/m <sup>3</sup> )				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual
<u>Indicator</u>					
K-1f	0.021±0.006	0.015±0.005	0.019±0.006	0.023±0.006	0.019±0.007
K-7	0.017±0.004	0.013±0.004	0.019±0.007	0.023±0.008	0.018±0.007
Mean ± s.d.	0.019±0.005	0.014±0.005	0.019±0.007	0.023±0.007	0.019±0.007
<u>Control</u>					
K-2	0.020±0.005	0.014±0.006	0.017±0.005	0.019±0.005	0.017±0.006
K-8	0.021±0.004	0.014±0.006	0.019±0.006	0.023±0.007	0.019±0.007
K-15	0.019±0.005	0.011±0.006	0.017±0.005	0.022±0.006	0.018±0.007
K-16	0.016±0.007	0.012±0.005	0.020±0.007	0.022±0.008	0.017±0.008
Mean ± s.d.	0.019±0.006	0.013±0.006	0.018±0.006	0.021±0.007	0.018±0.007

NOTE: All means and standard deviations are calculated by using individual results.



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Table 30. Milk samples, strontium-90, quarterly and annual means and standard deviations, January - December, 1995.

Location	Strontium-90 (pCi/L)				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual
<u>Indicator</u>					
K-4	1.1 ± 0.1	1.4 ± 0.3	1.1 ± 0.3	1.3 ± 0.5	1.2 ± 0.3
K-5	1.7 ± 0.2	1.7 ± 0.1	1.7 ± 0.3	1.4 ± 0.3	1.6 ± 0.2
K-12	2.8 ± 1.4	1.9 ± 0.4	1.6 ± 0.3	2.3 ± 0.4	2.2 ± 0.8
K-19	1.4 ± 0.2	1.4 ± 0.1	1.8 ± 0.2	1.4 ± 0.6	1.5 ± 0.3
Mean ± s.d.	1.8 ± 0.9	1.6 ± 0.3	1.5 ± 0.4	1.6 ± 0.6	1.6 ± 0.6
<u>Control</u>					
K-3	1.3 ± 0.1	1.4 ± 0.3	1.2 ± 0.1	1.7 ± 0.6	1.4 ± 0.4
K-6	2.1 ± 0.6	1.6 ± 0.3	1.4 ± 0.3	1.8 ± 0.3	1.7 ± 0.4
K-28	1.6 ± 0.3	1.6 ± 0.2	1.6 ± 0.1	1.6 ± 0.1	1.6 ± 0.2
Mean ± s.d.	1.7 ± 0.5	1.5 ± 0.2	1.4 ± 0.2	1.7 ± 0.3	1.6 ± 0.3

NOTE: All means and standard deviations are calculated by using individual results.

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Table 31. Milk samples, potassium-40, quarterly and annual means and standard deviations, January - December, 1995.

Location	Potassium-40 (g/L)				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual
<u>Indicator</u>					
K-4	1,417 ± 32	1,330 ± 41	1,492 ± 84	1,377 ± 95	1,411 ± 93
K-5	1,430 ± 111	1,454 ± 66	1,482 ± 67	1,417 ± 139	1,453 ± 84
K-12	1,487 ± 40	1,548 ± 76	1,473 ± 112	1,520 ± 89	1,506 ± 87
K-19	1,360 ± 75	1,368 ± 73	1,407 ± 112	1,420 ± 70	1,389 ± 85
Mean ± s.d.	1,423 ± 77	1,425 ± 105	1,454 ± 104	1,433 ± 103	1,440 ± 96
<u>Control</u>					
K-3	1,390 ± 120	1,420 ± 37	1,395 ± 71	1,473 ± 67	1,415 ± 72
K-6	1,353 ± 40	1,390 ± 47	1,372 ± 112	1,397 ± 35	1,378 ± 71
K-28	1,357 ± 150	1,418 ± 141	1,475 ± 86	1,403 ± 40	1,425 ± 111
Mean ± s.d.	1,367 ± 100	1,409 ± 83	1,414 ± 97	1,424 ± 56	1,406 ± 87

NOTE : All means and standard deviations are calculated by using individual results.

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Table 32. Grass samples, gross beta, potassium-40 and strontium-90, annual means and standard deviations, January - December, 1995.

Location	Concentration (pCi/g)		
	Gross Beta	Potassium-40	Strontium-90
<u>Indicator</u>			
K-1b	5.97 ± 0.27	6.73 ± 0.59	0.003 ± 0.000
K-1f	6.54 ± 0.99	6.62 ± 0.77	0.003 ± 0.000
K-4	6.26 ± 0.71	7.01 ± 0.42	< 0.004
K-5	6.53 ± 0.90	7.62 ± 1.75	0.003 ± 0.000
K-12	6.61 ± 1.22	7.66 ± 0.85	0.007 ± 0.000
K-19	5.62 ± 0.59	6.00 ± 1.10	0.003 ± 0.000
Mean ± s.d.	6.38 ± 0.78	6.94 ± 1.04	0.004 ± 0.002
<u>Control</u>			
K-3	6.20 ± 2.36	8.60 ± 0.28	< 0.006
K-6	6.59 ± 1.26	7.38 ± 1.76	0.002 ± 0.000
Mean ± s.d.	6.40 ± 1.70	7.99 ± 1.31	0.002 ± 0.000

NOTE: All means and standard deviations are calculated by using individual results.

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Table 33. Soil samples, gross alpha, gross beta, potassium-40, strontium-90 and cesium-137, annual means and standard deviations, January - December, 1995.

Location	Concentration (pCi/g)				
	gross alpha	gross beta	potassium-40	strontium-90	cesium-137
<u>Indicator</u>					
K-1f	9.92 ± 6.10	19.34 ± 7.25	23.12 ± 4.49	<0.019	<0.019
K-4	8.35 ± 0.72	25.62 ± 6.46	26.20 ± 4.62	0.062 ± 0.000	0.20 ± 0.07
K-5	8.73 ± 1.01	32.31 ± 0.85	29.22 ± 7.83	0.083 ± 0.035	0.15 ± 0.03
K-12	9.35 ± 1.41	23.77 ± 2.10	22.07 ± 3.07	0.012 ± 0.000	0.22 ± 0.01
K-19	8.30 ± 4.38	15.79 ± 0.60	18.01 ± 3.96	0.102 ± 0.034	0.29 ± 0.14
Mean ± s.d.	8.93 ± 2.66	23.36 ± 6.81	23.72 ± 5.50	0.074 ± 0.040	0.21 ± 0.08
<u>Control</u>					
K-3	6.88 ± 1.65	19.93 ± 2.79	23.22 ± 1.78	0.052 ± 0.000	0.19 ± 0.02
K-6	7.31 ± 1.97	23.56 ± 0.57	22.34 ± 4.55	0.033 ± 0.009	0.23 ± 0.13
Mean ± s.d.	7.09 ± 1.50	21.74 ± 2.66	22.78 ± 2.87	0.039 ± 0.013	0.21 ± 0.08

NOTE: All means and standard deviations are calculated by using individual results.

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Table 34. Surface water samples, gross beta total residue, quarterly and annual means and standard deviations, January - December, 1995.

Location	Gross Beta Total Residue (pCi/L)				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual
<u>Indicator</u>					
K1a	8.9 ± 2.5	7.9 ± 2.5	8.1 ± 4.4	9.4 ± 3.4	9.4 ± 3.4
K1b	5.0 ± 2.5	3.7 ± 0.5	3.0 ± 0.7	4.0 ± 0.2	3.9 ± 1.3
K-1d	1.8 ± 0.2	2.3 ± 0.3	1.8 ± 0.2	2.4 ± 0.4	2.1 ± 0.4
K-1e	5.8 ± 2.1	3.6 ± 0.2	6.7 ± 1.0	5.8 ± 3.5	5.5 ± 2.1
K-14a	2.0 ± 0.7	2.2 ± 0.2	2.5 ± 0.2	2.6 ± 0.3	2.3 ± 0.4
K-14b	2.5 ± 0.3	2.7 ± 0.1	2.6 ± 0.8	2.9 ± 0.5	2.6 ± 0.5
Mean ± s.d.	4.3 ± 3.0	3.7 ± 2.2	4.1 ± 2.9	5.1 ± 4.1	6.7 ± 3.8
<u>Control</u>					
K-9 (Raw)	2.0 ± 1.1	1.9 ± 0.6	2.5 ± 0.7	1.4 ± 1.3	2.0 ± 0.9
(Tap)	1.6 ± 0.4	2.0 ± 0.2	2.2 ± 0.3	2.0 ± 0.3	2.0 ± 0.3

NOTE: All means and standard deviations are calculated by using individual results.

KEWAUNEE

Table 35. Bottom sediment samples, gross beta, potassium-40, and cesium-137, annual means and standard deviations, January - December, 1995.

Location	pCi/g dry		
	gross beta	potassium-40	cesium-137
<u>Indicator</u>			
K-1c	6.46 ± 1.46	9.48 ± 2.41	0.044 ± 0.021
K-1d	6.43 ± 1.54	7.98 ± 4.19	0.040 ± 0.023
K-1j	6.26 ± 1.60	6.43 ± 0.95	0.055 ± 0.000
K-14	7.92 ± 0.32	8.91 ± 2.21	<0.022
Mean ± s.d.	6.77 ± 1.24	8.20 ± 2.38	0.044 ± 0.017
<u>Control</u>			
K-9	4.32 ± 1.03	5.86 ± 1.07	<0.015
Mean ± s.d.	4.32 ± 1.03	5.86 ± 1.07	<0.015

NOTE: All means and standard deviations are calculated by using individual results.

**ANNUAL REPORT - PART III**  
**INCIDENT REPORTS**  
**January - December 1995**

## INCIDENT EVALUATION FORM

Attachment 1 to Incident Report 95-212

**Title:** Milk Samples missed in accordance with SP63-164, "Environmental Sample Collection."

**Brief Abstract:** On October 27, 1995, with the plant at 97 percent power, it was discovered that a milk sample was not taken in accordance with SP63-164, Environmental Sample Collection." SP63-164 requires semi-monthly milk samples during the grazing season and monthly milk samples during the non grazing season. The second milk sample for the month of October was not taken.

The next milk sample was taken the first week of November and there were no abnormal findings.

**Cause:** The cause of the missed milk sample was due to personnel inattention to detail.  
B3.05

**Safety Implications:** There are no safety implications. The subsequent milk samples were tested and there were no abnormal findings.

**Reportability Determination:** This event will be included in the Annual Radiological Environmental Monitoring Report, in accordance with SP63-280, "Annual Environmental Reports."

**Corrective Actions (taken or recommended):** The individuals involved were reminded of the importance of obtaining milk samples in accordance with the KNPP Environmental Monitoring Program. This IR evaluation will be required reading for personnel responsible for obtaining environmental samples.

**Similar Events:**

**Additional PORC Concerns:**

PREPARED BY Jay Dressen

DATE 03/13/96