TELEDYNE
ISOTOPES

REPORT TO
NEBRASKA PUBLIC POWER DISTRICT
COLUMBUS, NEBRASKA
RADIATION ENVIRONMENTAL MONITORING PROGRAM
COOPER NUCLEAR STATION
NEMAHA COUNTY, NEBRASKA

ANNUAL REPORT
JANUARY 1 TO DECEMBER 31, 1993

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PREFACE

This report covers the period of January 1 through December 31, 1993. All sample collections were made by a contractor and personnel of the Nebraska Public Power District. Analyses were performed and reports of analyses were prepared by Teledyne Isotopes and forwarded to Nebraska Public Power District.

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I. INTRODUCTION

This report contains a complete tabulation of data collected during the period January through December 1993, for the operational Radiological Environmental Monitoring Program performed for the Cooper Nuclear Station (CNS) of the Nebraska Public Power District (NPPD) by Teledyne Isotopes.

Cooper Nuclear Station is located in Nemaha County in the southeast corner of Nebraska on the Missouri River. A portion of the site extends into Missouri. The reactor is a 778 megawatt boiling water reactor. Initial criticality was attained on February 21, 1974. The reactor reached 50% power on June 25, 1974 and 100% power on November 20, 1974.

Radiological environmental monitoring began in 1971 before the plant became operational and has continued to the present. The program monitors radiation levels in air, terrestrial and aquatic environments. Most samples are collected by NPPD personnel. All are shipped for analysis to a contractor's laboratory where there exists special facilities required for measurements of extremely low levels of radioactivity. From 1971 through 1976 the contractor was Teledyne Isotopes, Westwood, New Jersey. NALCO Environmental Sciences assumed responsibility for the analyses effective January 1, 1977.

On November 1, 1978 Hazelton Environmental Sciences Corporation (HESC) assumed responsibility for the program. Prior to November 1, 1978 Hazelton Environmental Sciences operated as NALCO Environmental Sciences. Teledyne Isotopes again assumed responsibility for the analyses effective January 1, 1979 through December 31, 1993.

II. SUMMARY

Presented in this report are summaries and discussions of the data generated for the Radiological Environmental Monitoring Program (REMP) for the Cooper Nuclear Station (CNS) of the Nebraska Public Power District (NPPD) for 1993.

Part V, Table 3 presents the yearly summary of the program with the total number of samples of each type analyzed, the yearly average for all samples, the number of detections per total number of samples, the station with the highest average, the average of the control station, and the inclusive dates of the analyses.

Part VI is a discussion of each type of sample analyzed and its impact, if any, on the environment. Included also is a graph of the isotopes of interest since 1977 and the statistical results for each quarter of the year. This is followed by a complete tabulation of the data by sample type and station number.

The 1993 radiological environmental measurements for CNS indicates that there has been no residual fallout resulting from the explosion and fire at the Chernobyl Reactor in the Soviet Union which occurred on April 26, 1986. It may be concluded from all measurements taken that the operations of CNS had no detectable impact on the environment in the vicinity of CNS.

III. SAMPLING AND ANALYSES PROGRAM, STATIONS AND MAPS

The 1993 sampling and analysis program is described in Table 1. Teledyne Isotopes has a comprehensive quality assurance/quality control program designed to assure the reliability of data obtained. The results for 1993 of the Intercomparison Program conducted by the EPA Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, are contained in Appendix B.

Sampling locations are summarized in Table 2. The type or status of each location and its distance and direction from the reactor elevated release point are specified. A map of locations follows (Figure 1). Complete descriptions of current and earlier sampling locations are given in Appendix G.

The annual land use census for 1993 is described in Appendix A. There were no milk animals found within three miles of CNS in 1993. Gardens were found in 11 sectors within 3 miles of CNS in 1992. Only 4 Sectors contained gardens during 1993 due to the flooding of the Missouri River.

All of the required samples were analyzed in 1993 except for the following:

PATHWAY	SAMPLE	STATION	COLLECTION PERIOD	REASON
Airborne	Air Particulate	07	05/04-05/11	Pump out of service.
Airborne	Charcoal	07	05/04-05/11	Pump out of service.
Airborne	Air Particulate	07	05/18-05/25	Pump out of service.
Airborne	Charcoal	07	05/18-05/25	Pump out of service.
Airborne	Air Particulate	07	05/25-06/01	Pump out of service.
Airborne	Charcoal	07	05/25-06/01	Pump out of service.
Airborne	Air Particulate	03	07/06-07/13	Missouri River Flood

PATHWAY	SAMPLE	STATION	COLLECTION PERIOD	REASON
Airborne	Charcoal	03	07/06-07/13	Missouri River Flood
Airborne	Air Particulate	03	07/13-07/20	Missouri River Flood
Airborne	Charcoal	03	07/13-07/20	Missouri River Flood
Airborne	Air Particulate	02-06	07/20-07/28	Missouri River Flood
Airborne	Charcoal	02-06	07/20-07/28	Missouri River Flood
Airborne	Air Particulate	02-06	07/28-08/03	Missouri River Flood
Airborne	Charcoal	02-06	07/28-08/03	Missouri River Flood
Airborne	Air Particulate	03-06	08/03-08/10	Missouri River Flood
Airborne	Charcoal	03-06	08/03-08/10	Missouri River Flood
Airborne	Air Particulate	03-06	08/10-08/17	Missouri River Flood
Airborne	Charcoal	03-06	08/10-08/17	Missouri River Flood
Airborne	Air Particulate	03-06	08/17-08/24	Missouri River Flood
Airborne	Charcoal	03-06	08/17-08/24	Missouri River Flood
Airborne	Air Particulate	03-06	08/24-08/31	Missouri River Flood
Airborne	Charcoal	03-06	08/24-08/31	Missouri River Flood

PATHWAY	SAMPLE	STATION	COLLECTION PERIOD	REASON
Airborne	Air Particulate	03-06	08/31-09/07	Missouri River Flood
Airborne	Charcoal	03-06	08/31-09/07	Missouri River Flood
Airborne	Air Particulate	03-06	09/07-09/14	Missouri River Flood
Airborne	Charcoal	03-06	09/07-09/14	Missouri River Flood
Airborne	Air Particulate	03-06	09/14-09/22	Missouri River Flood
Airborne	Charcoal	03-06	09/14-09/22	Missouri River Flood
Airborne	Air Particulate	03-06	09/22-09/28	Missouri River Flood
Airborne	Charcoal	03-06	09/22-09/28	Missouri River Flood
Airborne	Air Particulate	03-06	09/28-10/06	Missouri River Flood
Airborne	Charcoal	03-06	09/28-10/06	Missouri River Flood
Airborne	Air Particulate	03-06	10/06-10/13	Missouri River Flood
Airborne	Charcoal	03-06	10/06-10/13	Missouri River Flood
Airborne	Air Particulate	03-06	10/13-10/19	Missouri River Flood
Airborne	Charcoal	03-06	10/13-10/19	Missouri River Flood
Airborne	Air Particulate	03-06	10/19-10/26	Missouri River Flood
Airborne	Charcoal	03-06	10/19-10/26	Missouri River Flood

PATHWAY	SAMPLE	STATION	COLLECTION PERIOD	REASON
Airborne	Air Particulate	03-06	10/26-11/02	Missouri River Flood
Airborne	Charcoal	03-06	10/26-11/02	Missouri River Flood
Airborne	Air Particulate	03-06	11/02-11/10	Missouri River Flood
Airborne	Charcoal	03-06	11/02-11/10	Missouri River Flood
Airborne	Air Particulate	03, 05	11/09-11/16	Missouri River Flood
Airborne	Charcoal	03, 05	11/09-11/16	Missouri River Flood
Airborne	Air Particulate	05	11/16-11/23	Missouri River Flood
Airborne	Charcoal	05	11/16-11/23	Missouri River Flood
Airborne	Air Particulate	05, 07	11/23-12/01	Missouri River Flood
Airborne	Charcoal	05, 07	11/23-12/01	Missouri River Flood
Airborne	Air Particulate	05, 07	12/01-12/07	Missouri River Flood
Airborne	Charcoal	05, 07	12/01-12/07	Missouri River Flood
Airborne	Air Particulate	05, 07	12/07-12/14	Missouri River Flood
Airborne	Charcoal	05, 07	12/07-12/14	Missouri River Flood
Airborne	Air Particulate	05, 07	12/14-12/21	Missouri River Flood
Airborne	Charcoal	05, 07	12/14-12/21	Missouri River Flood

PATHWAY	SAMPLE	STATION	COLLECTION PERIOD	REASON
Airborne	Air Particulate	05	12/21-12/28	Missouri River Flood
Airborne	Charcoal	05	12/21-12/28	Missouri River Flood
Waterborne	River Water	12, 28	07/27	Missouri River Flood
Ingestion	Broadleaf Terrestrial Vegetation	35	07/20	Missouri River Flood

TABLE 1

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

SAMPLING SCHEDULE AND ANALYSIS

ONCE PER 7 DAYS

Sample Type	Station Nos.	Analyses
Airborne - Particulate	1 - 10	Gross alpha, beta, Gamma isotopic on quarterly composite of each station and on each sample in which gross beta activity is > 10 times the yearly mean of control samples.
Airborne - Iodine	1-10	I-131

ONCE PER 15 DAYS

Sample Type	Station Nos.	Analyses
Milk - Nearest Producer (peak pasture only)	99	I-131 (low level) Gamma isotopic Sr-89, Sr-90, Elem. Ca. on monthly composite

ONCE PER 31 DAYS

Sample Type	Station Nos.	Analyses
River Water	12,28	Gross alpha - sus and dis Gross beta - sus and dis, Sr-89, Sr-90, Gamma isotopic Tritium on quarterly composite

ONCE PER 31 DAYS

Sample Type	Station Nos.	Analyses
Milk - Nearest Producer (except peak pasture season)	99	I-131 (low level) Sr-89, Sr-90 Elem. Ca Gamma isotopic
Food Products - Broad-leaf Vegetation (when available)	35, 44, 96	I-131 Gamma isotopic

ONCE PER 92 DAYS

Sample Type	Station Nos.	Analyses
Background Radiation	1 - 10, 20, 44, 56, 58, 59, 66, 67, 71, 79 - 91, 94	TLD Readout (gamma dose)
Groundwater	11, 47	Gross alpha, beta Gamma isotopic Tritium
Milk - Commercial and Other Milk Producers	42, 100	I-131 (low level) Sr-89, Sr-90 Elem. Ca Gamma isotopic

2 TIMES/YEAR

Sample Type	Station Nos.	Analyses
Fish (Summer and Fall)	28, 35	Gross beta Sr-89, Sr-90 Gamma isotopic
Shoreline Sediment	28	Gamma isotopic

TABLE 2

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
BROWNVILLE, NEBRASKA

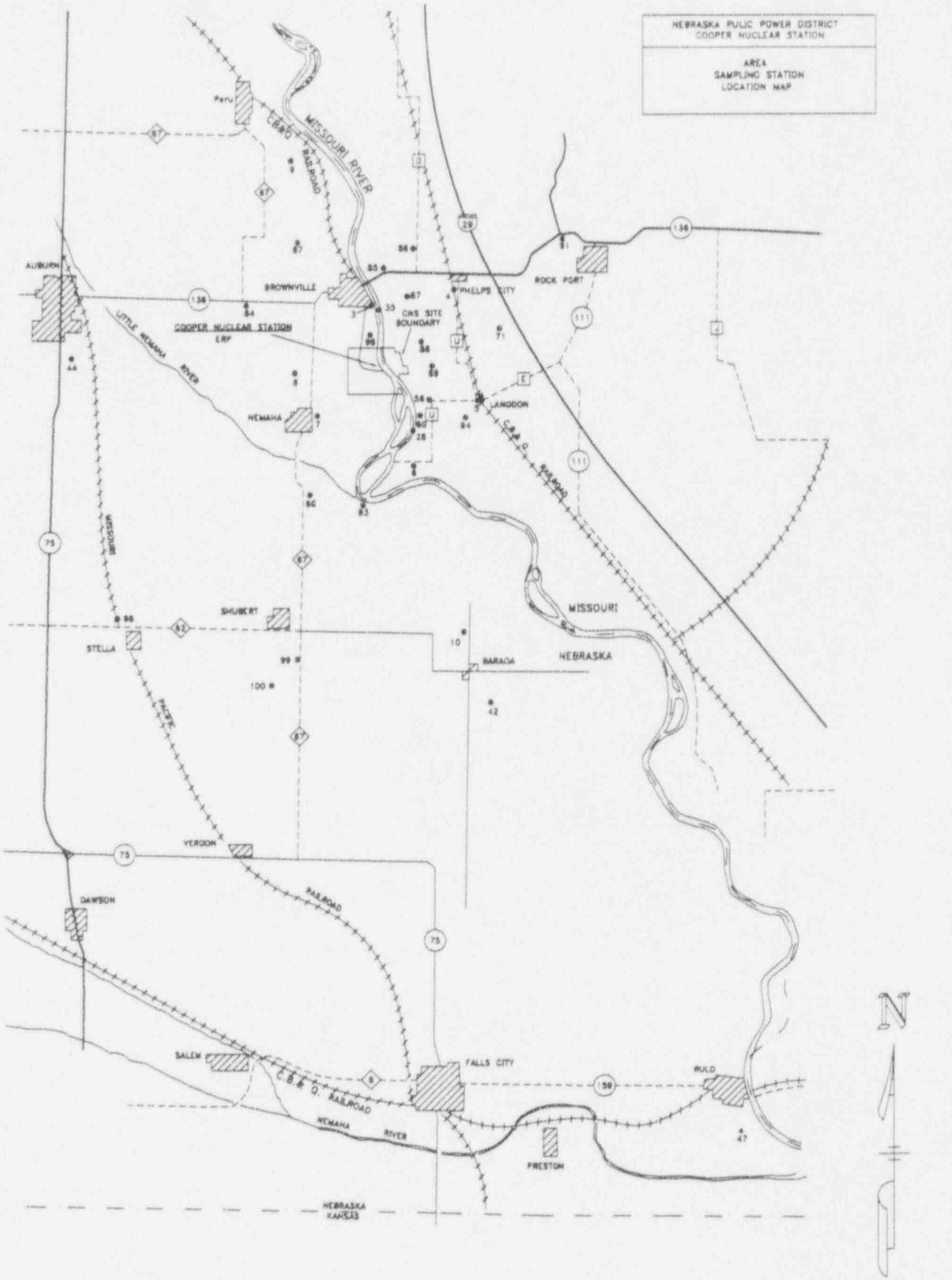
DISTANCE AND DIRECTION FROM THE ELEVATED RELEASE POINT (ERP)
TO THE SAMPLE STATION LOCATIONS

STATION NUMBER	DISTANCE[a] (MILES)	DIRECTION[a] (DEGREES)	CLASSIFICATION[b]
1	0.10	225	IND
2	0.75	225	IND
3	2.5	338	IND
4	3.0	43	IND
5	3.5	102	IND
6	3.0	165	IND
7	2.5	230	IND
8	2.5	260	IND
9	7.3	335	IND
10	10.0	160	IND
11	0.15	225	IND
12	0.10	360	CON
20	0.96	315	IND
28	1.8	150	IND
35	2.0	350	IND AND CON
42	12.9	156	IND
44	10.3	270	CON
47	25.8	154	IND
56	1.9	118	IND
58	1.1	219	IND
59	1.0	189	IND
66	4.5	200	IND
67	4.8	325	IND
71	4.3	71	IND
79	0.85	299	IND
80	0.75	284	IND
81	0.80	265	IND
82	0.80	176	IND
83	4.4	189	IND
84	4.4	297	IND
85	3.1	3	IND
86	4.6	16	IND
87	1.75	20	IND
88	1.75	63	IND

STATION NUMBER	DISTANCE[a] (MILES)	DIRECTION[a] (DEGREES)	CLASSIFICATION[b]
89	2.0	86	IND
90	2.25	134	IND
91	6.9	54	IND
94	3.6	108	IND
96	1.25	334	IND
99	10.25	189	IND
100	11.5	197	IND

a Distance and direction are specified with respect to reactor elevated release point.

b Classification codes: IND = indicator; CON = control.



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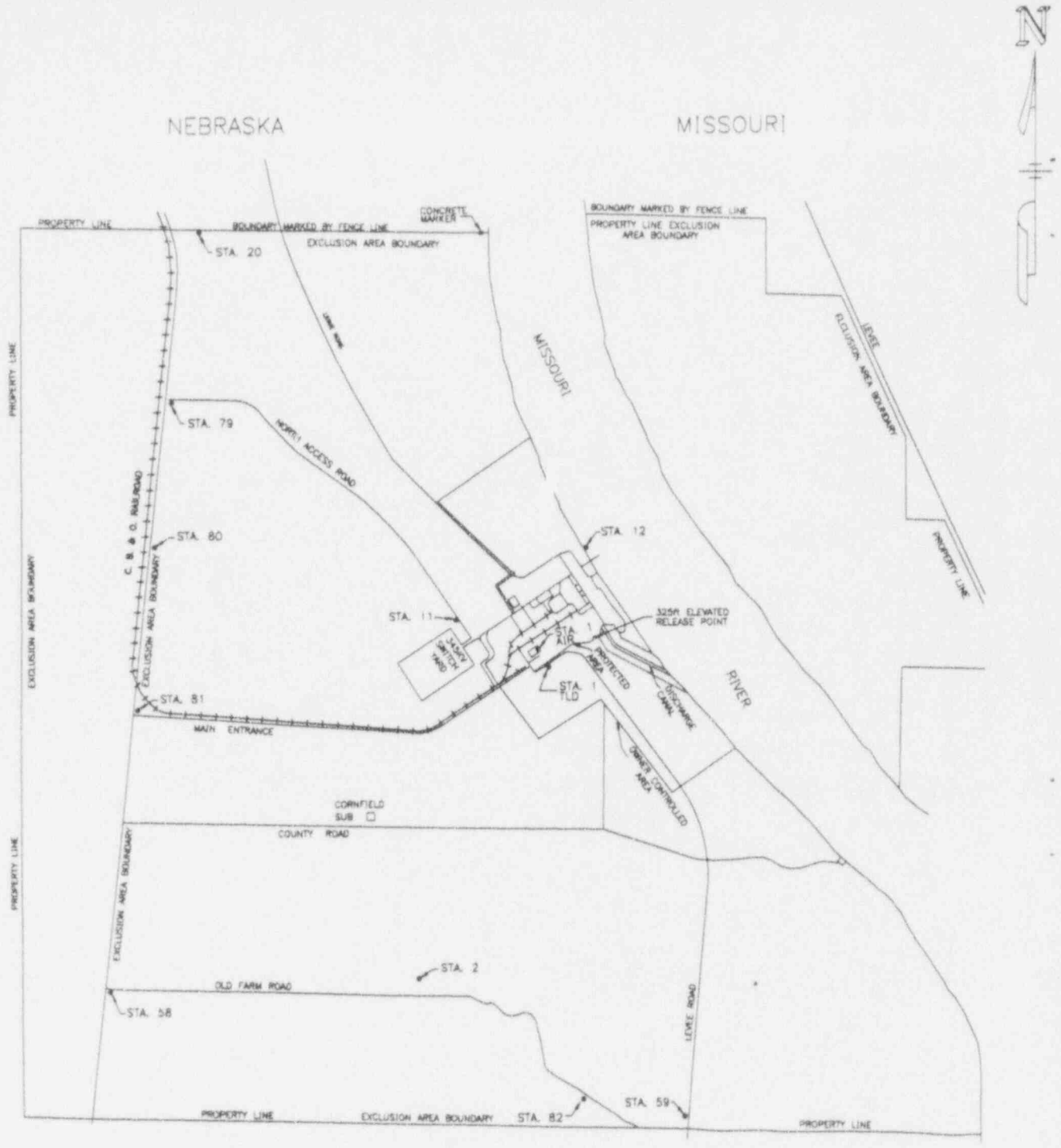

NEBRASKA PUBLIC POWER DISTRICT COOPER NUCLEAR STATION
SITE SAMPLING STATION LOCATIONS MAP

CADD FILE: M0013729

IV. DISCUSSION

A. Program Objectives and Data Interpretation

The objective of the monitoring program is to detect and assess the impact of possible releases to the environs of radionuclides from the operations of the Cooper Nuclear Station. This objective requires measurements of low levels of radioactivity equal to or lower than pre-determined limits of detection. In addition the source of the environmental radiation must be established. Sources of environmental radiation include:

(1) Natural background radiation from cosmic rays (Be-7).
(2) Terrestrial, primordial radionuclides from the environment (K-40, Ra-226, Th-228).
(3) Fallout from atmospheric nuclear tests such as the September 1977 detonation by the Peoples' Republic of China and the atmospheric weapons test of October 16, 1980 (fission products and fusion products).
(4) Releases from nuclear power plants such as CNS (fission products and neutron activation products).
(5) Fallout from the Chernobyl Nuclear Reactor Accident.

Radiation levels measured in the vicinity of an operating power station are compared with preoperational measurements at the same locations to distinguish power plant effects from other sources. Also, results of the monitoring program are related to events known to cause elevated levels of radiation in the environment, e.g., atmospheric nuclear detonations or abnormal plant releases.

B. Atmospheric Nuclear Tests

Three atmospheric nuclear detonations in the People's Republic of China influenced program results significantly in late 1976 and in 1977. Two of these detonations occurred in late 1976 (September 26 and November 17) and one in late 1977 (September 17). As a consequence of these tests elevated activities of gross beta in air particulate filters and I-131 in milk were observed throughout most of the United States.

No atmospheric nuclear tests have been conducted since 1977, thus no short-lived fission products were detected in air particulate samples. Also no I-131 was detected from radiogases from any sources.

On April 26, 1986 the fire and explosion of Chernobyl Reactor No. 4 in the Soviet Union resulted in the release of fission products to the atmosphere and worldwide fallout. Following the explosion, elevated levels of gross beta activities in air particulates and I-131 in charcoal filters and milk samples were measured. Additionally, in 1986, Cs-137 and the short-lived isotopes I-131, Ru-106, and Cs-134 were detected in broadleaf vegetation. Similar results occurred in other areas of the United States and the entire Northern Hemisphere.

V. RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM TABLES

Presented in Table 3 are the radiological environmental monitoring program summaries (REMPS) generated from the reports of analyses performed during 1993 for the NPPD sampling and analyses program. The REMPS tables conform to the requirements of Table 1 in Regulatory Guide 4.8 (Reference 6).

The average activity level for all samples collected for the year for each sample type are summarized in this table. The mean, range and fraction of detections to total samples assayed are presented. The station location and station number with the highest annual mean is also tabulated. If a control station is specified the comparable results of the control are listed.

From the REMPS table it is possible to determine the total number of each type of sample analyzed and the average activity of all samples from all stations of each nuclide. If there were no positive detections the maximum of the lowest levels of detection is listed. The station having the highest level of activity is specified. From this data it is possible to determine any high levels of activity and the source. The dose impact on the population can thus be evaluated.

TABLE 3

RADIOLOGICAL ENVIRONMENTAL

MONITORING PROGRAM SUMMARIES

(REMP)

1993

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - AIRBORNE
SAMPLE - AIR PARTICULATE FILTERS
UNITS - PCI/CU.M.

COMPILATION - ANNUAL SUMMARY
CONTROL -

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN STATION FRACTION STATION DESCRIPTION	MEAN X E-00 RANGE	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
GR-A	434	0.00200	0.00250 0.0010- 0.0120 434/434	4 STATION 4 - 3.0 MI. 43 DEG. IND.	036/036	0.00281 0.0013- 0.0081	0	12/31/92-12/31/93
GR-B	434	0.00300	0.0235 0.00520- 0.12000 434/434	07 STATION 07 - 2.5 MI. 230 DEG. IND.	042/042	0.0265 0.01100- 0.0720	0	12/31/92-12/31/93

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - AIRBORNE
SAMPLE - CHARCOAL FILTERS
UNITS - PCI/CU.M.

COMPILATION - ANNUAL SUMMARY
CONTROL -

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN STATION FRACTION	MEAN X E-00 RANGE STATION DESCRIPTION	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
I-131	434		LT 0.08000 LT 0.00900- LT 0.08000 000/434				0	12/31/92-12/31/93

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - AIRBORNE
SAMPLE - COMPOSITE OF AIR PARTICULATE FILTERS
UNITS - PCI/CU.M.

COMPILATION - ANNUAL SUMMARY
CONTROL -

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN STATION FRACTION STATION DESCRIPTION	MEAN X E-00 RANGE	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
BE-7	39	0.05000	0.11900 0.0752- 0.2220 039/039	07 STATION 07 - 2.5 MI. 230 DEG. IND.	0.1423 004/004 0.0761- 0.2220		0	12/31/92-12/31/93
K-40	39	0.06000	0.02260 0.00964- 0.04230 004/039	06 STATION 06 - 3.0 MI. 165 DEG. IND.	0.04230 001/004 0.04230- 0.04230		0	12/31/92-12/31/93
I-131	39		LT 1.0000 LT 0.0409- LT 1.0000 000/039				0	12/31/92-12/31/93
CS-137	39	0.00300	LT 0.00700 LT 0.00030- LT 0.00700 000/039					

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - INGESTION
SAMPLE - FISH
UNITS - PCI/GM WET

COMPILATION - ANNUAL SUMMARY
CONTROL -

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN MEAN X E-00 STATION FRACTION RANGE STATION DESCRIPTION	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
GR-B	8	0.250	5.5 4.8- 7.1 008/008	5.7 35 004/004 4.8- 7.1 STATION 35 - 2.0 MI. 350 DEG. IND.		0	06/02/93-10/07/93
SR-89	8	0.0300	LT 0.00700 LT 0.00400- LT 0.00700 000/008			0	06/02/93-10/07/93
SR-90	8	0.0300	0.0066 0.00330- 0.00820 004/008	0.00820 35 001/004 0.00820- 0.00820 STATION 35 - 2.0 MI. 350 DEG. IND.		0	06/02/93-10/07/93
K-40	8	0.4700	3.29 2.21- 4.10 008/008	3.42 35 004/004 2.22- 4.10 STATION 35 - 2.0 MI. 350 DEG. IND.		0	06/02/93-10/07/93
I-131	8	0.03100	LT 0.0700 LT 0.01000- LT 0.0700 000/008			0	06/02/93-10/07/93
CS-137	8	0.03100	LT 0.01000 LT 0.00600- LT 0.01000 000/008			0	06/02/93-10/07/93

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - INGESTION
SAMPLE - MILK - NEAREST
UNITS - PCI/LITER

COMPILATION - ANNUAL SUMMARY
CONTROL -

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN STATION	FRACTION	MEAN X E-00 RANGE STATION DESCRIPTION	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
CA (mg/l)	17		1.6 0.17- 1.8 017/017	99	017/017	1.6 0.17- 1.8		0	01/05/93-12/07/93
I-131	23		LT 0.300 LT 0.200- LT 0.300 000/023					0	01/05/93-12/07/93
SR-89	18		LT 1.0 LT 0.6- LT 1.0 000/018					0	01/05/93-12/07/93
SR-90	18		2.0 1.3- 3.3 018/018	99	018/018	2.0 1.3- 3.3		0	01/05/93-12/07/93
K-40	20		1370. 1140.- 1530. 023/023	99	023/023	1370. 1140.- 1530.		0	01/05/93-12/07/93
I-131	20		LT 20.000 LT 4.00- LT 20.00 000/023					0	01/05/93-12/07/93
CS-137	20		LT 5.00 LT 3.00- LT 5.00 000/023					0	01/05/93-12/07/93

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - INGESTION
SAMPLE - MILK OTHER PRODUCERS
UNITS - PCI/LITER

COMPILATION - ANNUAL SUMMARY
CONTROL -

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN MEAN X E-00 RANGE STATION FRACTION STATION DESCRIPTION	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
CA (mg/l)	8		1.8 1.7- 1.8 008/008	1.8 42 004/004 1.7- 1.8 STATION 42 - 12.85 MI. 156 DEG. IND.		0	01/13/93-10/12/93
I-131	8	0.780	LT 0.200 LT 0.200- LT 0.200 000/008			0	01/13/93-10/12/93
SR-89	8	2.0	LT 1.0 LT 0.5- LT 1.0 000/008			0	01/13/93-10/12/93
SR-90	8	1.4	1.6 1.4- 2.0 008/008	1.7 100 004/004 1.4- 2.0 STATION 100 - 11.5 MI. 197 DEG. IND		0	01/13/93-10/12/93
K-40	8	140.0	1410. 1290.- 1500. 008/008	1430. 100 004/004 1330.- 1500. STATION 100 - 11.5 MI. 197 DEG. IND		0	01/13/93-10/12/93
I-131	8	0.7800	LT 09.000 LT 5.00- LT 09.00 000/008			0	01/13/93-10/12/93
CS-137	8	9.00	LT 5.00 LT 4.00- LT 5.00 000/008			0	01/13/93-10/12/93

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - WATERBORNE
SAMPLE - WATER - GROUND
UNITS - PCI/LITER

COMPILATION - ANNUAL SUMMARY
CONTROL -

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN STATION FRACTION STATION DESCRIPTION	MEAN X E-00 RANGE	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
GR-A	8	4.0	3.0 3.0- 3.0 001/008	47 001/004 STATION 47 - 25.8 MI. 154 DEG. IND.	3.0 3.0- 3.0		0	01/20/93-10/19/93
GR-B	8	1.8	9.5 8.2- 12 008/008	11 004/004 STATION 11 - 0.15 MI. 225 DEG. IND.	10 8.4- 12		0	01/20/93-10/19/93
I-131	8	9.00	LT 20.00 LT 4.00- LT 20.00 000/008				0	01/20/93-10/19/93
CS-137	8	9.00	LT 4.00 LT 3.00- LT 4.00 000/008				0	01/20/93-10/19/93
H-3	8	140.	140. 140.- 140. 001/008	47 001/004 STATION 47 - 25.8 MI. 154 DEG. IND.	140. 140.- 140.		0	01/20/93-10/19/93

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - WATERBORNE
SAMPLE - WATER - RIVER
UNITS - PCI/LITER

COMPILATION - ANNUAL SUMMARY
CONTROL - STATION 12 - 0.1 MI. 360 DEG. CON.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN MEAN X E-00 STATION FRACTION RANGE STATION DESCRIPTION	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
GR-A DIS	22	4.0	4.0 0.86- 5.0 007/022	4.5 12 004/011 3.3- 5.0 STATION 12 - 0.10 MI. 360 DEG. CON.	4.5 3.3- 5.0 004/011	0	01/20/93-12/07/93
GR-A SUS	22	4.0	3.9 0.44- 13.0 013/022	4.9 12 005/011 1.3- 11 STATION 12 - 0.10 MI. 360 DEG. CON.	4.9 1.3- 11 005/011	0	01/20/93-12/07/93
GR-B DIS	22	1.8	13.0 4.9- 23 022/022	13.0 12 011/011 8.3- 23 STATION 12 - 0.10 MI. 360 DEG. CON.	13.0 8.3- 23 011/011	0	01/20/93-12/07/93
GR-B SUS	22	1.8	15 1.4- 95 021/022	20.0 28 010/011 1.8- 95.0 STATION 28 - 1.8 MI. 150 DEG. IND.	11.0 1.4- 54.0 011/011	0	01/20/93-12/07/93
SR-89	22	1.1	LT 2.0 LT 0.5- LT 2.0 000/022		LT 1.0 LT 0.600- LT 1.0 000/011	0	01/20/93-12/07/93
SR-90	22	0.930	LT 0.900 LT 0.400 LT 0.900 000/022			0	01/20/93-12/07/93
K-40	22	140.0	66.0 61.3- 70.8 003/022	68.4 28 002/011 66.0- 70.8 STATION 28- 1.8 MI. 150 DEG. IND.	61.3 61.3- 61.3 001/012	0	01/20/93-12/07/93
I-131	22	9.00	LT 20.0 LT 4.0- LT 20.0 000/022		LT 10.0 LT 5.0- LT 10.0 000/011	0	01/20/93-12/07/93
CS-137	22	9.00	LT 5.0 LT 3.0- LT 5.0 000/022		LT 5.0 LT 3.0- LT 5.0 000/012	0	01/20/93-12/07/93
H-3	8	140.	LT 100. LT 100. LT100 000/008			0	01/20/93-12/07/93

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - GAMMA EXPOSURE
SAMPLE - ENVIRONMENTAL TLD
UNITS - mR

COMPILATION - ANNUAL SUMMARY
CONTROL -

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN MEAN X E-00 STATION FRACTION RANGE STATION DESCRIPTION	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
TLD	127	2mR					
Total Exposure/year			67.2 mR 53.3- 92.9 127/127	92.9 mR 01 004/004 STATION 01 - 0.1 MI. 225 DEG. IND.	77.8 44 004/004 STATION 44 - 10.25 MI. 270 DEG. CON.	0	01/15/93-01/11/94
Average Exposure/ quarter			16.9 mR 11.8- 32.0 032/032	23.2 mR 13.9- 31.8 01 004/004 STATION 01 - 0.1 MI. 225 DEG. IND.	19.4 mR 14.5- 26.9 44 004/004 STATION 44 - 10.25 MI. 270 DEG. CON.	0	01/15/93-01/11/94

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - INGESTION
SAMPLE - BROADLEAF TERRESTRIAL VEGETATION
UNITS - PCI/GM WET

COMPILATION - ANNUAL SUMMARY
CONTROL - STATION 44 - 10.3 MI. 270 DEG. CON.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN MEAN X E-00 STATION FRACTION RANGE STATION L[illegible]IPTION	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
I-131	57	0.0500	LT 0.03 LT 0.004- LT 0.03 000/057			0	05/19/93-10/19/93
BE-7	57	1.20	3.00 0.190- 11.0 057/057	4.25 96 020/020 0.970- 11.0 STATION 96 - 1.25 MI. 334 DEG. IND.		0	05/19/93-10/19/93
K-40	57	0.9300	5.34 1.13- 13.1 057/057	5.98 44 020/020 3.34- 13.1 STATION 44 - 10.25 MI. 270 DEG. CON.		0	05/19/93-10/19/93
I-131	57	0.05000	LT 0.1000 LT 0.01000- LT 0.1000 000/057			0	05/19/93-10/19/93
CS-137	57	0.1600	0.01800 0.0116- 0.0223 004/057	0.0180 96 004/020 0.0116- 0.0223 STATION 96 - 1.25 MI. 334 DEG. IND.		0	05/19/93-10/19/93
RA-226	57	0.8000	0.411 0.308- 0.549 003/057	0.411 96 003/020 0.308- 0.549 STATION 96 - 1.25 MI. 334 DEG. IND.		0	05/19/93-10/19/93
TH-228	57	0.4700	0.0839 0.0104- 0.294 011/057	0.113 96 006/020 0.0104- 0.294 STATION 96 - 1.25 MI. 334 DEG. IND.		0	05/19/93-10/19/93

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY - AQUATIC
SAMPLE - SHORELINE SEDIMENT
UNITS - PCI/GM DRY

COMPILATION - ANNUAL SUMMARY
CONTROL -

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

ANALYSIS	NO	LIMIT OF DETECTION MEAN X E-00	ALL INDICATOR SAMPLES MEAN X E-00 RANGE FRACTION	LOCATION WITH HIGHEST MEAN STATION FRACTION STATION DESCRIPTION	MEAN X E-00 RANGE	CONTROL LOCATION MEAN X E-00 RANGE FRACTION	NON-ROUTINE	REPORTING PERIOD
BE-7	2	0.2300	0.4430 0.259- 0.626 002/002	28 002/002 STATION 28 - 1.8 MI. 150 DEG. IND.	0.4430 0.259 0.626		0	05/04/93-10/26/93
K-40	2	0.4700	15.7 15.5- 15.8 002/002	28 002/002 STATION 28 - 1.8 MI. 150 DEG. IND.	15.7 15.5 15.8		0	05/04/93-10/26/93
MN-54	2	0.03100	0.0154 0.0154- 0.0154 001/002	28 001/002 STATION 28 - 1.8 MI. 150 DEG. IND.	0.0154 0.0154 0.0154		0	05/04/93-10/26/93
I-131	2	0.03100	LT 0.0400 LT 0.0300- LT 0.0400 000/002				0	05/04/93-10/26/93
CS-137	2	0.03100	0.0520 0.0459- 0.0580 002/002	28 002/002 STATION 28 - 1.8 MI. 150 DEG. IND.	0.0520 0.0459 0.0580		0	05/04/93-10/26/93
CE-141	2	0.04700	0.0422 0.0422- 0.0422 001/002	28 001/002 STATION 28 - 1.8 MI. 150 DEG. IND.	0.0422 0.0422 0.0422		0	05/04/93-10/26/93
RA-226	2	0.1100	1.66 1.54- 1.77 002/002	28 002/002 STATION 28 - 1.8 MI. 150 DEG. IND.	1.66 1.54 1.77		0	05/04/93-10/26/93
TH-228	2	0.1100	0.9110 0.7420 1.080 002/002	28 002/002 STATION 28 - 1.8 MI. 150 DEG. IND.	0.9110 0.7420 1.080		0	05/04/93-10/26/93

VI. DISCUSSION, IMPACT ON THE ENVIRONMENT

GRAPHS OF RESULTS FROM 1977 -- 1993

AND

STATISTICAL TABLES

FOR

EACH QUARTER

A and B. AIR PARTICULATE SAMPLES - GROSS BETA AND GROSS ALPHA

(See Tables A-1 - A-4, B-1 - B-4)

STATIONS 01 to 10

Air particulates were collected on membrane filters at ten locations (01-10). The filters were changed weekly and analyzed for gross beta and gross alpha activities. Quarterly composites are analyzed for gamma emitting isotopes.

The average gross beta activity of all stations for each quarter of 1992 and 1993 is summarized below:

1992	First Quarter	0.024	pCi/Cu. M.
	Second Quarter	0.019	pCi/Cu. M.
	Third Quarter	0.020	pCi/Cu. M.
	Fourth Quarter	0.027	pCi/Cu. M.
	Average 1992	0.023	pCi/Cu. M.
1993	First Quarter	0.030	pCi/Cu. M.
	Second Quarter	0.015	pCi/Cu. M.
	Third Quarter	0.020	pCi/Cu. M.
	Fourth Quarter	0.029	pCi/Cu. M.
	Average 1993	0.024	pCi/Cu. M.

The level of beta activity was at normal environmental levels in 1993 showing the natural seasonal variations. There was a slight increase in the level of gross beta activity during the first quarter; there was a slight decrease from the second quarter of 1992; the third quarter was the same; the fourth quarter was slightly higher as shown in Table A-4. The increase and decline in activity often occurs and is attributed to natural phenomena.

The gross alpha activity continued low and close to the limits of detection. Gross alpha activity is probably due to the alpha emitters found in soil and particulates drawn into the filters.

No effect attributable to the Cooper Nuclear Station was observed in the results of monitoring air particulates.

A and B. AIR PARTICULATE SAMPLES - GROSS BETA AND GROSS ALPHA

(See Tables A-1 - A-4, B-1 - B-4)

STATIONS 01 to 10

Figure A1, B1 shows the gross beta, gross alpha and Ce-144 activity in the environs of CNS. The results for 1986 through 1993 are on the second page of Figure A-1, B-1. The gross beta activity in 1993 was similar to previous years in which there were no nuclear atmospheric weapons tests or nuclear accidents. The gross alpha activity remained low and near the normal detection level. Cesium-144 was below the level of detection.

Figure A-2 shows the gross beta activity in air samples through April 1989 at Jefferson City, Missouri as reported by the Environmental Radiation Monitoring System (ERAMS) of the US Environmental Protection Agency. No more recent data was available. This data was taken from Environmental Radiation Data distributed by the Eastern Environmental Radiation Facility, Montgomery, Alabama. The measurements by ERAMS were made after a waiting period which may explain the somewhat lower results because of decay of the isotopes having a shorter half-life. Measurements of Ce-144 were no longer reported because the activity has approached the limit of detection by the analytical techniques now used.

FIGURE A1, B1

AIR PARTICULATES - CNS

ALPHA AND BETA MONTHLY AVERAGE - ALL LOCATIONS

CE-144 QUARTERLY AVERAGE - ALL LOCATIONS

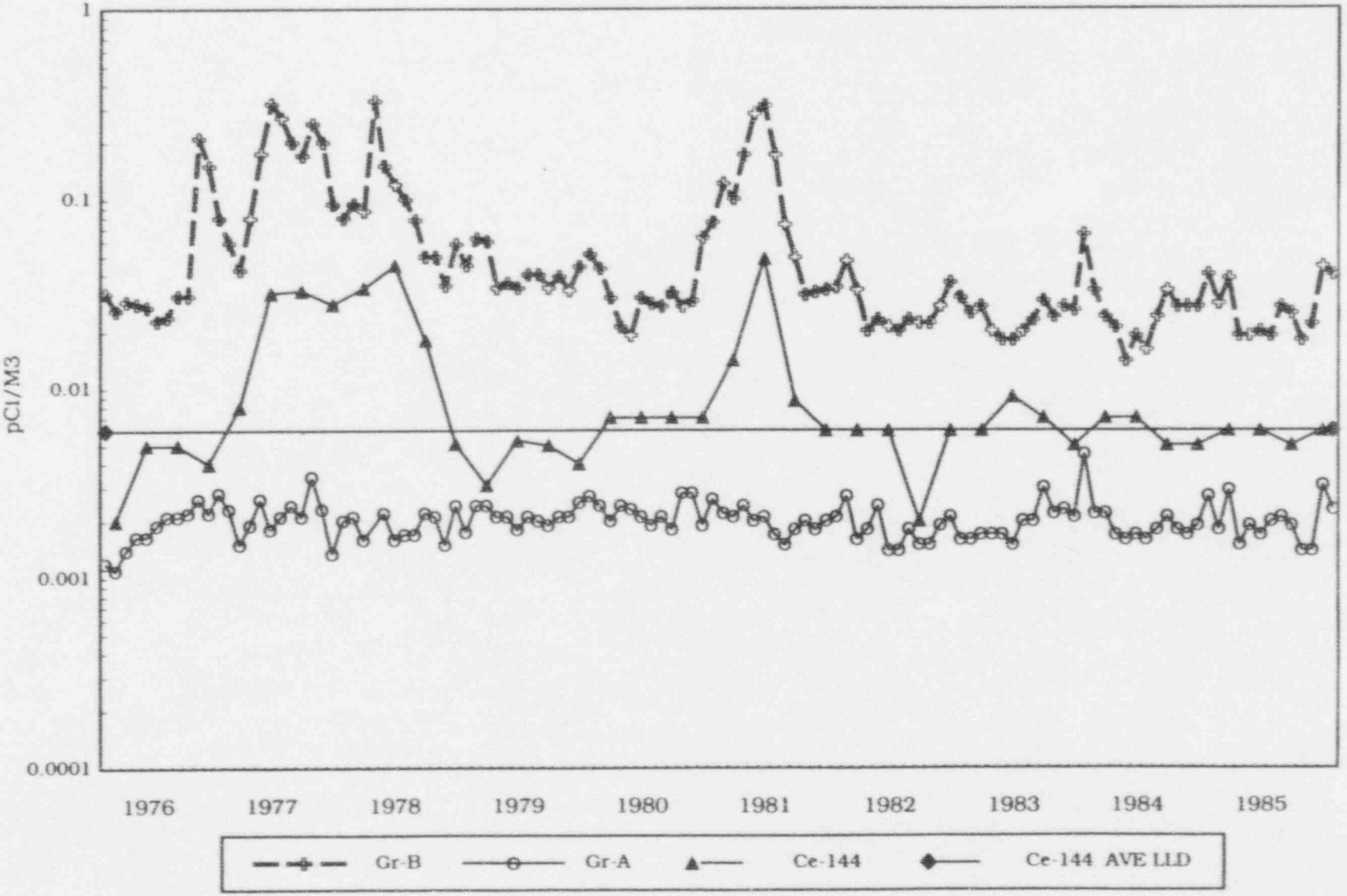

FIGURE A1, B1

AIR PARTICULATES - CNS

ALPHA AND BETA MONTHLY AVERAGE - ALL LOCATIONS

CE-144 QUARTERLY AVERAGE - ALL LOCATIONS

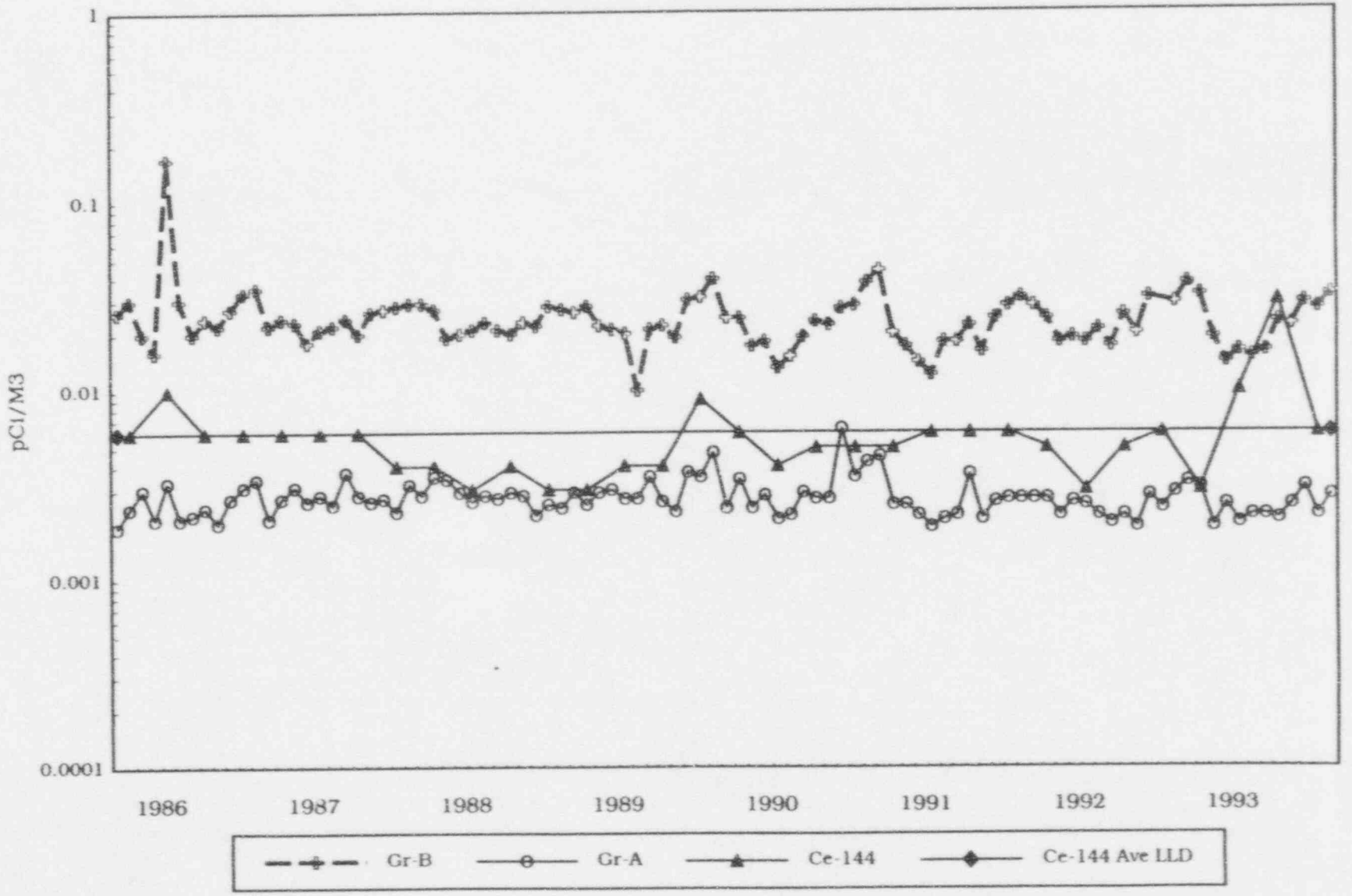

FIGURE A-2

AIR PARTICULATES

BETA MONTHLY AVERAGE - JEFFERSON CITY

MISSOURI ERAMS EPA

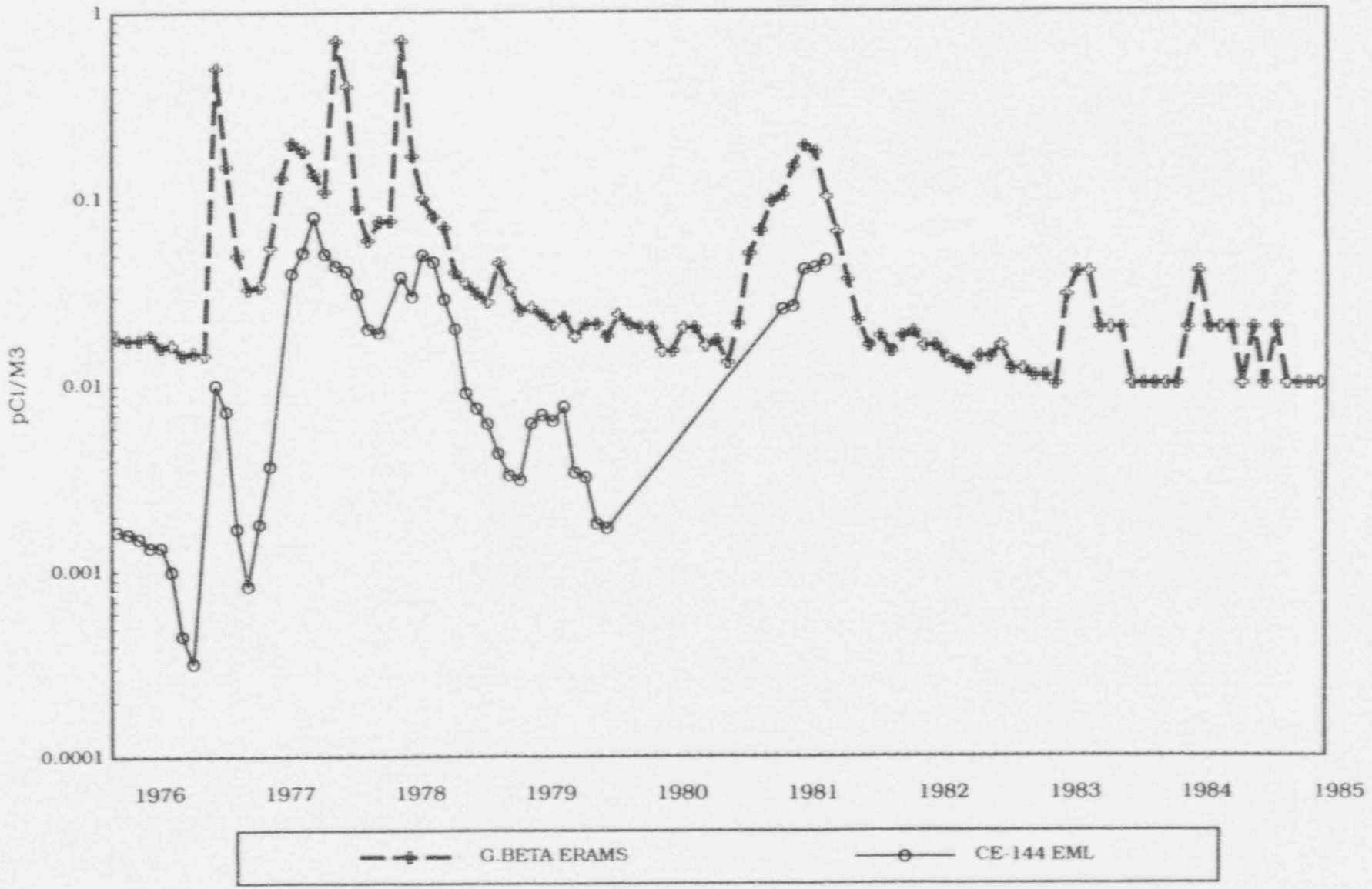

FIGURE A-2

AIR PARTICULATES

BETA MONTHLY AVERAGE - JEFFERSON CITY

MISSOURI ERAMS EPA

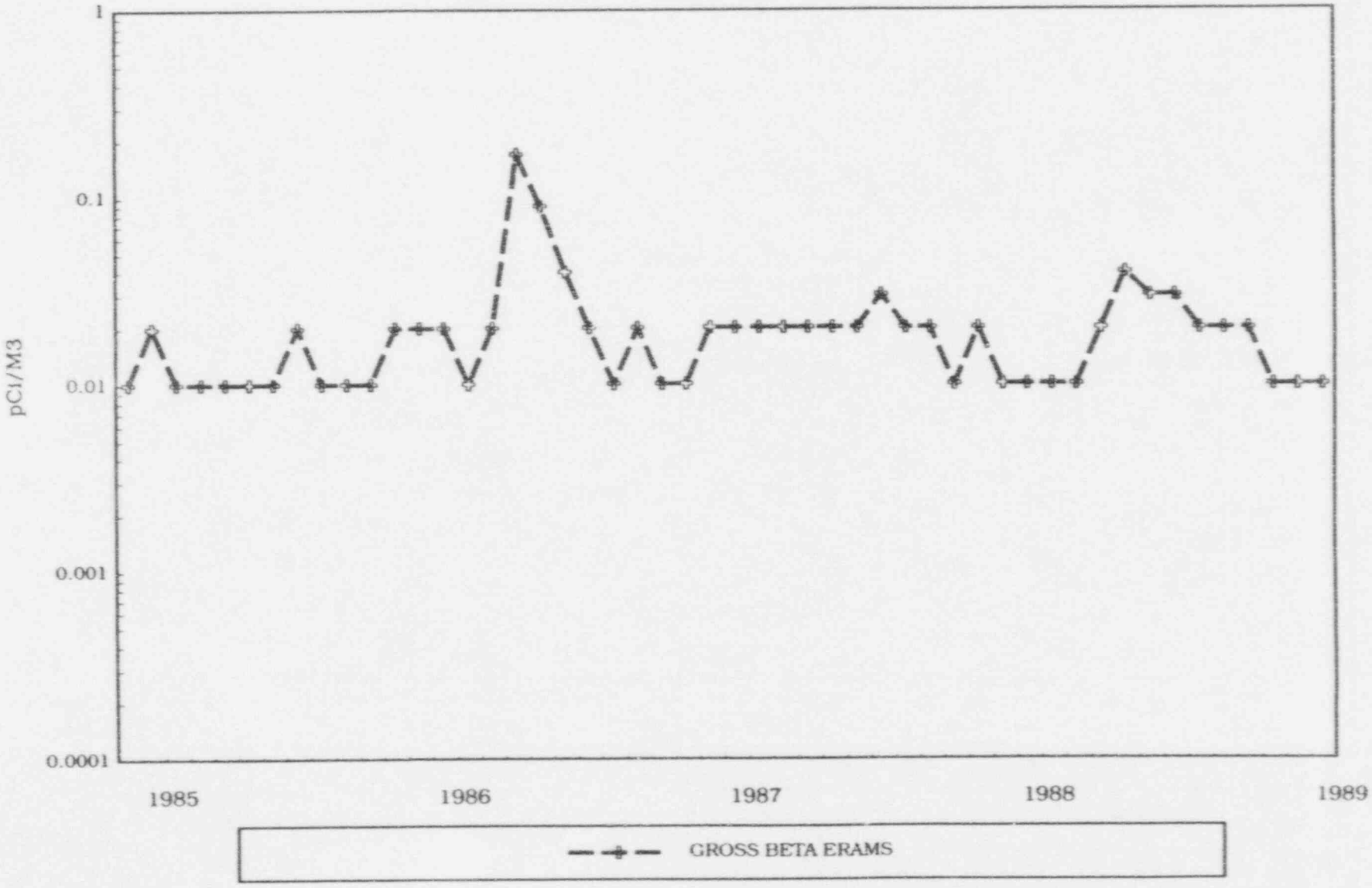

TABLE A-1

WEEKLY COLLECTIONS FIRST QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 12/29-02/02	MONTHLY SUMMARY 02/02-03/02	MONTHLY SUMMARY 03/02-03/30	FIRST QUARTER SUMMARY 12/29-03/30
GROSS BETA	01	3.6 ± 1.4 E-02	3.2 ± 0.3 E-02	2.0 ± 0.6 E-02	3.0 ± 1.1 E-02
	02	3.3 ± 1.4 E-02	3.1 ± 0.2 E-02	1.8 ± 0.4 E-02	2.8 ± 1.1 E-02
	03	3.8 ± 1.9 E-02	3.0 ± 0.1 E-02	1.9 ± 0.6 E-02	3.0 ± 1.4 E-02
	04	3.4 ± 1.5 E-02	3.0 ± 0.3 E-02	1.8 ± 0.5 E-02	2.8 ± 1.2 E-02
	05	3.3 ± 1.1 E-02	3.2 ± 0.3 E-02	1.8 ± 0.7 E-02	2.8 ± 1.0 E-02
	06	3.6 ± 1.3 E-02	3.3 ± 0.2 E-02	1.9 ± 0.5 E-02	3.0 ± 1.1 E-02
	07	3.9 ± 2.1 E-02	3.5 ± 0.2 E-02	2.1 ± 0.5 E-02	3.2 ± 1.5 E-02
	08	3.9 ± 2.8 E-02	3.2 ± 0.3 E-02	2.3 ± 0.8 E-02	3.2 ± 1.8 E-02
	09	3.6 ± 1.5 E-02	3.1 ± 0.3 E-02	2.0 ± 0.7 E-02	2.9 ± 1.2 E-02
	10	4.7 ± 4.2 E-02	3.0 ± 0.2 E-02	1.8 ± 0.5 E-02	3.3 ± 2.7 E-02
AVERAGE ALL STATIONS	01-10	3.7 ± 2.0 E-02	3.2 ± 0.3 E-02	1.9 ± 0.5 E-02	3.0 ± 1.5 E-02
		$\bar{x}$ and s			Grand $\bar{x}$ and s

TABLE A-2

WEEKLY COLLECTIONS SECOND QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 03/30-04/28	MONTHLY SUMMARY 04/28-06/01	MONTHLY SUMMARY 06/01-06/29	SECOND QUARTER SUMMARY 03/30-06/29
GROSS BETA	01	1.4 ± 0.4 E-02	1.6 ± 0.4 E-02	1.5 ± 0.3 E-02	1.5 ± 0.3 E-02
	02	1.4 ± 0.3 E-02	1.5 ± 0.3 E-02	1.4 ± 0.4 E-02	1.4 ± 0.3 E-02
	03	1.6 ± 0.5 E-02	1.6 ± 0.1 E-02	1.4 ± 0.3 E-02	1.5 ± 0.3 E-02
	04	1.4 ± 0.6 E-02	1.5 ± 0.1 E-02	1.7 ± 0.3 E-02	1.5 ± 0.4 E-02
	05	1.4 ± 0.7 E-02	1.5 ± 0.2 E-02	1.4 ± 0.3 E-02	1.4 ± 0.4 E-02
	06	1.4 ± 0.6 E-02	1.5 ± 0.2 E-02	1.5 ± 0.3 E-02	1.5 ± 0.4 E-02
	07	1.6 ± 0.5 E-02	**	2.1 ± 0.2 E-02	1.8 ± 0.4 E-02
	08	1.5 ± 0.5 E-02	1.6 ± 0.2 E-02	1.3 ± 0.4 E-02	1.5 ± 0.4 E-02
	09	1.3 ± 0.5 E-02	1.9 ± 1.1 E-02	1.6 ± 0.4 E-02	1.7 ± 0.7 E-02
	10	1.2 ± 0.5 E-02	1.6 ± 0.1 E-02	1.6 ± 0.2 E-02	1.5 ± 0.3 E-02
AVERAGE ALL STATIONS	01-10	1.4 ± 0.5 E-02	1.6 ± 0.4 E-02	1.5 ± 0.4 E-02	1.5 ± 0.4 E-02
		$\bar{x}$ and s			Grand $\bar{x}$ and s

**Sample not collected - pump out of service.

TABLE A-3

WEEKLY COLLECTIONS - THIRD QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 06/29-08/03	MONTHLY SUMMARY 08/03-08/31	MONTHLY SUMMARY 08/31-09/28	THIRD QUARTER SUMMARY 06/29-09/28
GROSS BETA	01	1.5 ± 0.2 E-02	2.2 ± 0.3 E-02	2.0 ± 0.3 E-02	1.8 ± 0.4 E-02
	02	1.7 ± 0.2 E-02	2.1 ± 0.2 E-02	1.9 ± 0.3 E-02	1.9 ± 0.3 E-02
	03	1.6 ± 0.3 E-02	*	*	1.6 ± 0.3 E-02
	04	1.6 ± 0.2 E-02	*	*	1.6 ± 0.2 E-02
	05	1.5 ± 0.2 E-02	*	*	1.5 ± 0.2 E-02
	06	1.6 ± 0.6 E-02	*	*	1.6 ± 0.6 E-02
	07	2.3 ± 0.3 E-02	3.0 ± 0.4 E-02	2.5 ± 0.2 E-02	2.5 ± 0.4 E-02
	08	1.2 ± 0.4 E-02	2.2 ± 0.4 E-02	3.1 ± 0.7 E-02	2.1 ± 1.0 E-02
	09	1.7 ± 0.6 E-02	2.1 ± 0.3 E-02	2.1 ± 0.6 E-02	1.9 ± 0.5 E-02
	10	1.5 ± 0.7 E-02	2.3 ± 0.4 E-02	1.8 ± 0.1 E-02	1.8 ± 0.6 E-02
AVERAGE ALL STATIONS	01-10	1.6 ± 0.5 E-02	2.3 ± 0.4 E-02	2.2 ± 0.6 E-02	2.0 ± 0.6 E-02
		$\bar{x}$ and s			Grand $\bar{x}$ and s

*Sample not collected -- Flood Missouri River

TABLE A-4

WEEKLY COLLECTIONS FOURTH QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 09/28-11/02	MONTHLY SUMMARY 11/02-11/30	MONTHLY SUMMARY 11/30-12/28	FOURTH QUARTER SUMMARY 09/28-12/28
GROSS BETA	01	2.7 ± 0.6 E-02	2.9 ± 0.3 E-02	3.2 ± 0.7 E-02	2.9 ± 0.6 E-02
	02	2.4 ± 0.5 E-02	2.8 ± 0.5 E-02	3.3 ± 0.7 E-02	2.8 ± 0.7 E-02
	03	*	2.6 ± 0.4 E-02	2.9 ± 0.5 E-02	2.8 ± 0.5 E-02
	04	*	4.0 ± 0.3 E-02	4.6 ± 0.7 E-02	4.4 ± 0.6 E-02
	05	*	*	*	*
	06	*	2.8 ± 0.3 E-02	3.2 ± 0.4 E-02	3.0 ± 0.4 E-02
	07	3.2 ± 1.5 E-02	1.6 ± 0.3 E-02	2.6 ± 0.3 E-02	2.6 ± 1.3 E-02
	08	3.9 ± 1.9 E-02	2.3 ± 0.2 E-02	2.8 ± 0.8 E-02	3.1 ± 1.3 E-02
	09	2.4 ± 0.7 E-02	2.6 ± 0.3 E-02	2.7 ± 0.7 E-02	2.6 ± 0.6 E-02
	10	2.7 ± 0.6 E-02	3.0 ± 0.3 E-02	3.0 ± 0.8 E-02	2.9 ± 0.6 E-02
AVERAGE ALL STATIONS	01-10	2.9 ± 1.1 E-02	2.7 ± 0.6 E-02	3.2 ± 0.8 E-02	2.9 ± 0.9 E-02
		$\bar{x}$ and s			Grand $\bar{x}$ and s

*Samples not collected -- Flood Missouri River.

TABLE B-1

WEEKLY COLLECTIONS FIRST QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 12/29-02/02	MONTHLY SUMMARY 02/02-03/02	MONTHLY SUMMARY 03/02-03/30	FIRST QUARTER SUMMARY 12/29-03/30
GROSS ALPHA	01	3.6 ± 1.7 E-03	2.8 ± 0.6 E-03	2.0 ± 0.1 E-03	2.9 ± 1.2 E-03
	02	3.3 ± 1.3 E-03	3.1 ± 0.4 E-03	1.9 ± 0.6 E-03	2.8 ± 1.1 E-03
	03	3.5 ± 2.0 E-03	3.6 ± 1.1 E-03	1.8 ± 0.5 E-03	3.0 ± 1.6 E-03
	04	3.6 ± 2.5 E-03	2.9 ± 0.7 E-03	2.1 ± 0.6 E-03	2.9 ± 1.7 E-03
	05	2.5 ± 1.2 E-03	2.9 ± 0.6 E-03	1.8 ± 0.5 E-03	2.4 ± 0.9 E-03
	06	2.5 ± 1.4 E-03	3.8 ± 0.9 E-03	1.8 ± 0.4 E-03	2.7 ± 1.2 E-03
	07	3.5 ± 2.2 E-03	3.2 ± 1.4 E-03	1.7 ± 0.5 E-03	2.9 ± 1.7 E-03
	08	3.1 ± 2.2 E-03	2.6 ± 0.5 E-03	2.2 ± 0.3 E-03	2.7 ± 1.4 E-03
	09	2.9 ± 1.1 E-03	3.3 ± 1.3 E-03	1.8 ± 0.5 E-03	2.7 ± 1.2 E-03
	10	4.4 ± 4.4 E-03	3.0 ± 0.6 E-03	1.8 ± 0.4 E-03	3.2 ± 2.8 E-03
AVERAGE ALL STATIONS	01-10	3.3 ± 2.1 E-03	3.1 ± 0.8 E-03	1.9 ± 0.4 E-03	2.8 ± 1.5 E-03
		$\bar{x}$ and s			Grand $\bar{x}$ and s

TABLE B-2

WEEKLY COLLECTIONS SECOND QUARTER 1992

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 03/30-04/28	MONTHLY SUMMARY 04/28-06/01	MONTHLY SUMMARY 06/01-06/29	SECOND QUARTER SUMMARY 03/30-06/29
GROSS ALPHA	01	2.2 ± 0.5 E-03	1.8 ± 0.5 E-03	2.1 ± 0.1 E-03	2.0 ± 0.4 E-03
	02	2.2 ± 0.9 E-03	2.0 ± 0.3 E-03	1.8 ± 0.5 E-03	2.0 ± 0.6 E-03
	03	3.4 ± 2.4 E-03	2.1 ± 0.2 E-03	2.2 ± 0.4 E-03	2.5 ± 1.4 E-03
	04	2.8 ± 1.1 E-03	1.8 ± 0.3 E-03	3.5 ± 1.2 E-03	2.6 ± 1.1 E-03
	05	2.7 ± 0.8 E-03	1.8 ± 0.5 E-03	2.3 ± 0.6 E-03	2.2 ± 0.7 E-03
	06	2.1 ± 0.8 E-03	1.8 ± 0.2 E-03	1.8 ± 0.6 E-03	1.9 ± 0.5 E-03
	07	3.1 ± 0.8 E-03	**	2.5 ± 0.3 E-03	2.8 ± 0.6 E-03
	08	2.2 ± 0.9 E-03	2.0 ± 0.8 E-03	2.3 ± 0.6 E-03	2.1 ± 0.7 E-03
	09	2.3 ± 0.9 E-03	1.9 ± 0.3 E-03	2.1 ± 0.2 E-03	2.1 ± 0.5 E-03
	10	1.9 ± 1.2 E-03	2.4 ± 1.0 E-03	2.0 ± 1.3 E-03	2.1 ± 0.9 E-03
AVERAGE ALL STATIONS	01-10	2.5 ± 1.1 E-03	2.0 ± 0.5 E-03	2.2 ± 0.7 E-03	2.2 ± 0.8 E-03
		$\bar{x}$ and s			Grand $\bar{x}$ and s

**Sample not collected - pump out of service.

TABLE B-3

WEEKLY COLLECTIONS - THIRD QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 06/29-08/03	MONTHLY SUMMARY 08/03-08/31	MONTHLY SUMMARY 08/31-09/28	THIRD QUARTER SUMMARY 06/29-09/28
GROSS ALPHA	01	2.0 ± 0.8 E-03	2.1 ± 0.6 E-03	2.2 ± 1.2 E-03	2.1 ± 0.8 E-03
	02	2.3 ± 0.6 E-03	1.9 ± 0.6 E-03	2.1 ± 1.2 E-03	2.1 ± 0.8 E-03
	03	2.8 ± 1.4 E-03	*	*	2.8 ± 1.4 E-03
	04	2.4 ± 0.8 E-03	*	*	2.4 ± 0.8 E-03
	05	2.0 ± 0.1 E-03	*	*	2.0 ± 0.1 E-03
	06	2.2 ± 0.3 E-03	*	*	2.2 ± 0.3 E-03
	07	2.5 ± 0.7 E-03	2.5 ± 0.6 E-03	3.5 ± 0.5 E-03	2.8 ± 0.8 E-03
	08	2.0 ± 0.2 E-03	1.8 ± 0.5 E-03	2.5 ± 0.6 E-03	2.1 ± 0.5 E-03
	09	2.5 ± 0.6 E-03	1.9 ± 0.5 E-03	2.4 ± 0.5 E-03	2.3 ± 0.5 E-03
	10	2.0 ± 0.6 E-03	2.4 ± 1.1 E-03	2.4 ± 1.3 E-03	2.2 ± 0.9 E-03
AVERAGE ALL STATIONS	01-10	2.2 ± 0.6 E-03	2.1 ± 0.7 E-03	2.5 ± 1.0 E-03	2.3 ± 0.7 E-03
		$\bar{x}$ and s			Grand $\bar{x}$ and s

*Sample not collected -- Flood Missouri River

TABLE B-4

WEEKLY COLLECTIONS FOURTH QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 09/28-11/02	MONTHLY SUMMARY 11/02-11/30	MONTHLY SUMMARY 11/30-12/28	FOURTH QUARTER SUMMARY 09/28-12/28
GROSS ALPHA	01	2.5 ± 0.6 E-03	2.5 ± 0.3 E-03	2.9 ± 1.5 E-03	2.7 ± 0.9 E-03
	02	2.8 ± 0.7 E-03	2.4 ± 0.6 E-03	2.7 ± 1.1 E-03	2.6 ± 0.8 E-03
	03	*	2.0 ± 0.0 E-03	2.8 ± 0.9 E-03	2.5 ± 0.8 E-03
	04	*	2.5 ± 0.6 E-03	3.6 ± 1.9 E-03	3.1 ± 1.5 E-03
	05	*	*	*	*
	06	*	1.9 ± 0.2 E-03	3.1 ± 1.0 E-03	2.5 ± 1.0 E-03
	07	2.8 ± 0.6 E-03	1.9 ± 0.2 E-03	1.7 ± 1.4 E-03	2.3 ± 0.7 E-03
	08	4.4 ± 1.7 E-03	2.0 ± 0.5 E-03	2.5 ± 0.8 E-03	3.1 ± 1.6 E-03
	09	2.8 ± 1.1 E-03	1.9 ± 0.2 E-03	2.6 ± 1.5 E-03	2.4 ± 1.1 E-03
	10	3.3 ± 0.6 E-03	3.0 ± 0.2 E-03	2.5 ± 0.5 E-03	2.9 ± 0.6 E-03
AVERAGE ALL STATIONS	01-10	3.1 ± 1.1 E-03	2.2 ± 0.5 E-03	2.8 ± 1.1 E-03	2.7 ± 1.0 E-03
		$\bar{x}$ and s			Grand $\bar{x}$ and s

*Samples not collected -- Flood Missouri River.

C. AIR RADIOIODINE - CHARCOAL FILTERS (See Tables C-1 through C-4)

STATIONS 01 TO 10

Charcoal filters used in series with air particulate filters were collected weekly during 1993 at stations 01 through 10 and monitored for radioiodine.

Tables C-1 through C-4 show the average monthly and quarterly results for each station and the average of all 10 stations. Airborne I-131 levels were below the limits of detection for all of 1993.

Figure C-1 plots the results of I-131 as monitored in charcoal filters and summarized monthly in 1993 compared with previous years. Results for 1993 were below the normal limits of detection indicating no atmospheric effect from the operations of CNS.

FIGURE C-1

AIRBORNE I-131

MONTHLY AVERAGE - ALL LOCATIONS

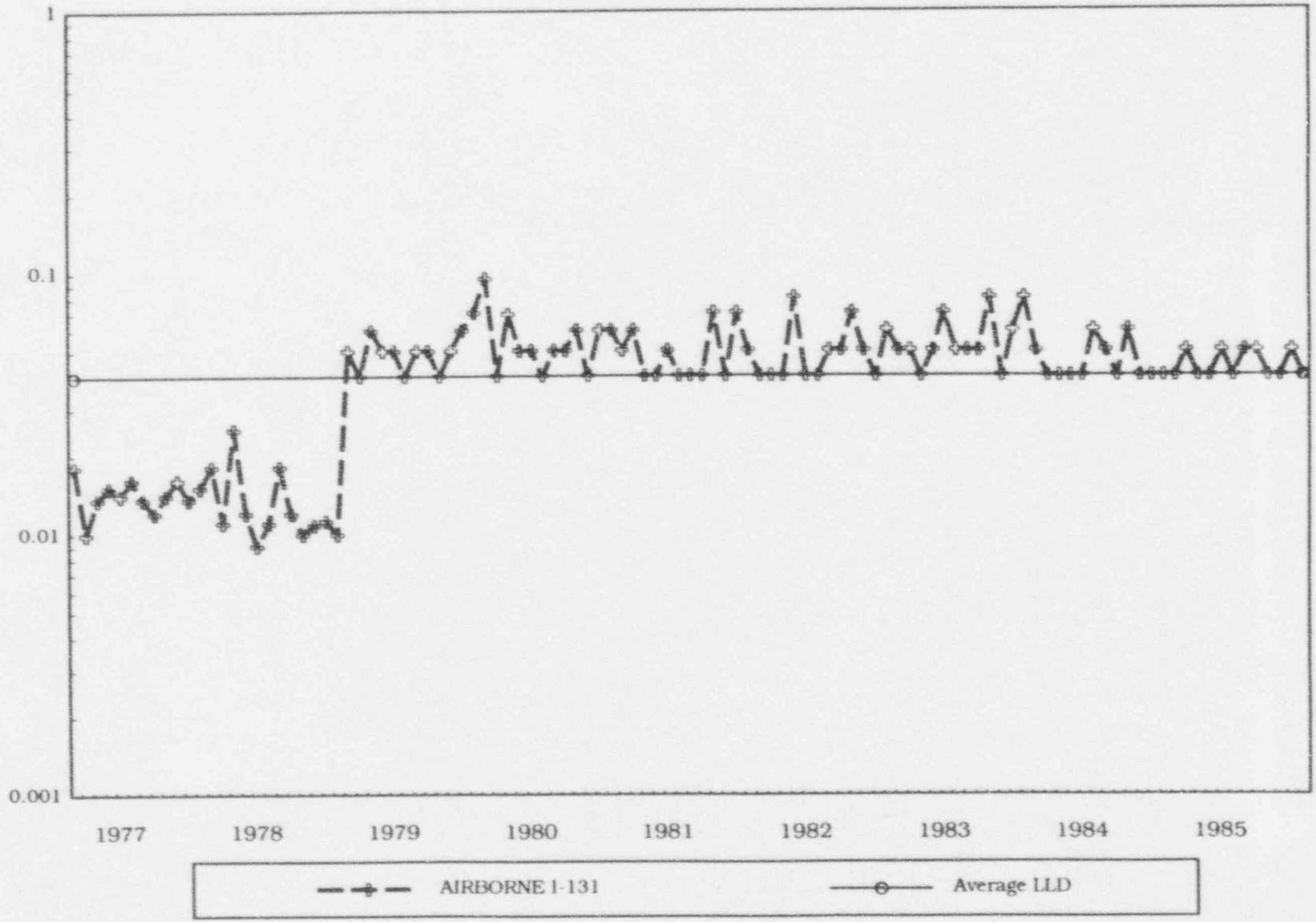

FIGURE C-1

AIRBORNE I-131

MONTHLY AVERAGE - ALL LOCATIONS

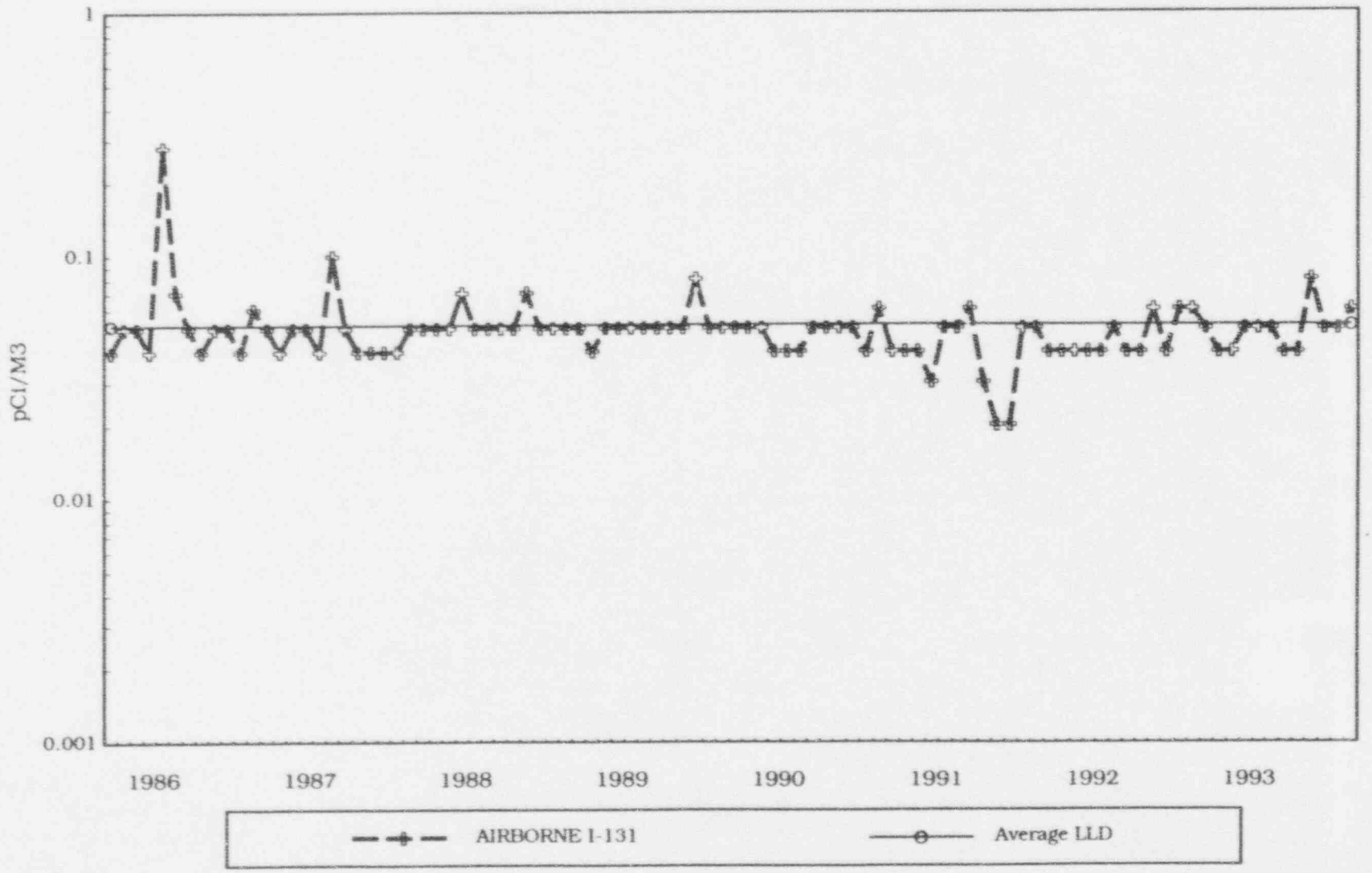

TABLE C-1

WEEKLY COLLECTIONS FIRST QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

CHARCOAL FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 12/29-02/02	MONTHLY SUMMARY 02/02-03/02	MONTHLY SUMMARY 03/02-03/30	QUARTERLY SUMMARY 12/29-03/30	DET./ TOTAL	RANGE
IODINE-131	01	L.T. 5. E-02	L.T. 3. E-02	L.T. 4. E-02	L.T. 5. E-02	0/13	(L.T.2.-L.T.5.)E-02
	02	L.T. 5 E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 5 E-02	0/13	(L.T.2.-L.T.5.)E-02
	03	L.T. 4. E-02	L.T. 4. E-02	L.T. 3. E-02	L.T. 4. E-02	0/13	(L.T.2.-L.T.4.)E-02
	04	L.T. 4. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 4. E-02	0/13	(L.T.2.-L.T.4.)E-02
	05	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02	0/13	(L.T.1.-L.T.3.)E-02
	06	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	0/13	(L.T.2.-L.T.2.)E-02
	07	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	0/13	(L.T.2.-L.T.2.)E-02
	08	L.T. 3. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 3. E-02	0/13	(L.T.2.-L.T.3.)E-02
	09	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	0/13	(L.T.2.-L.T.2.)E-02
	10	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02	0/13	(L.T.1.-L.T.3.)E-02
	01-10	L.T. 5. E-02	L.T. 4. E-02	L.T. 4. E-02	L.T. 5. E-02		--
	DET./TOTAL	0/50	0/40	0/40	0/130	0/130	--
	RANGE	(L.T.1.-L.T.5.)E-02	(L.T.1.-L.T.4.)E-02	(L.T.1.-L.T.4.)E-02	(L.T.1.-L.T.5.)E-02	--	(L.T.1.-L.T.5.)E-02

TABLE C-2

WEEKLY COLLECTIONS SECOND QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

CHARCOAL FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 03/30-04/28	MONTHLY SUMMARY 04/28-06/01	MONTHLY SUMMARY 06/01-06/29	QUARTERLY SUMMARY 03/30-06/29	DET./ TOTAL	RANGE
IODINE-131	01	L.T. 5. E-02	L.T. 4. E-02	L.T. 5. E-02	L.T. 5. E-02	0/13	(L.T.2.-L.T.5.)E-02
	02	L.T. 5 E-02	L.T. 4. E-02	L.T. 5. E-02	L.T. 5 E-02	0/13	(L.T.2.-L.T.5.)E-02
	03	L.T. 5. E-02	L.T. 4. E-02	L.T. 5. E-02	L.T. 5. E-02	0/13	(L.T.1.-L.T.5.)E-02
	04	L.T. 5. E-02	L.T. 4. E-02	L.T. 5. E-02	L.T. 5. E-02	0/13	(L.T.1.-L.T.5.)E-02
	05	L.T. 3. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 3. E-02	0/13	(L.T.1.-L.T.3.)E-02
	06	L.T. 4. E-02	L.T. 5. E-02	L.T. 3. E-02	L.T. 5. E-02	0/13	(L.T.2.-L.T.5.)E-02
	07	L.T. 4. E-02	**	L.T. 3. E-02	L.T. 4. E-02	0/13	(L.T.2.-L.T.4.)E-02
	08	L.T. 4. E-02	L.T. 5. E-02	L.T. 3. E-02	L.T. 5. E-02	0/13	(L.T.2.-L.T.5.)E-02
	09	L.T. 4. E-02	L.T. 5. E-02	L.T. 3. E-02	L.T. 5. E-02	0/13	(L.T.2.-L.T.5.)E-02
	10	L.T. 3. E-02	L.T. 5. E-02	L.T. 2. E-02	L.T. 5. E-02	0/13	(L.T.1.-L.T.5.)E-02
	01-10	L.T. 5. E-02	L.T. 5. E-02	L.T. 5. E-02	L.T. 5. E-02		--
	DET./TOTAL	0/40	0/50	0/40	0/130	0/130	--
	RANGE	(L.T.1.-L.T.5.)E-02	(L.T.1.-L.T.5.)E-02	(L.T.1.-L.T.5.)E-02	(L.T.1.-L.T.5.)E-02	--	(L.T.1.-L.T.5.)E-02

**Sample not collected - pump out of service.

TABLE C-3

WEEKLY COLLECTIONS THIRD QUARTER 1992

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

CHARCOAL FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 06/29-08/03	MONTHLY SUMMARY 08/03-08/31	MONTHLY SUMMARY 08/31-09/28	QUARTERLY SUMMARY 06/29-09/28	DET./ TOTAL	RANGE
IODINE-131	01	L.T. 3. E-02	L.T. 4. E-02	L.T. 5. E-02	L.T. 5. E-02	0/13	(L.T.1.-L.T.5.)E-02
	02	L.T. 3. E-02	L.T. 3. E-02	L.T. 8. E-02	L.T. 8 E-02	0/11	(L.T.1.-L.T.8.)E-02
	03	L.T. 2. E-02	*	*	L.T. 2. E-02	0/1	(L.T.2.-L.T.2.)E-02
	04	L.T. 3. E-02	*	*	L.T. 3. E-02	0/3	(L.T.2.-L.T.3.)E-02
	05	L.T. 3. E-02	*	*	L.T. 3. E-02	0/3	(L.T.1.-L.T.3.)E-02
	06	L.T. 2. E-02	*	*	L.T. 2. E-02	0/3	(L.T.2.-L.T.2.)E-02
	07	L.T. 4. E-02	L.T. 3. E-02	L.T. 5. E-02	L.T. 5. E-02	0/13	(L.T.1.-L.T.5.)E-02
	08	L.T. 4. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 4. E-02	0/13	(L.T.1.-L.T.4.)E-02
	09	L.T. 4. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 4. E-02	0/13	(L.T.1.-L.T.4.)E-02
	10	L.T. 2. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 3. E-02	0/13	(L.T.1.-L.T.3.)E-02
	01-10	L.T. 4. E-02	L.T. 4. E-02	L.T. 8. E-02	L.T. 8. E-02		--
	DET./TOTAL	0/38	0/24	0/24	0/86		--
	RANGE	(L.T.1.-L.T.4.)E-02	(L.T.1.-L.T.4.)E-02	(L.T.1.-L.T.8.)E-02	(L.T.1.-L.T.8.)E-02	--	(L.T.1.-L.T.8.)E-02

*Sample not collected -- Flood Missouri River

TABLE C-4

WEEKLY COLLECTIONS FOURTH QUARTER 1993

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

CHARCOAL FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER	MONTHLY SUMMARY 09/28-11/02	MONTHLY SUMMARY 11/02-11/30	MONTHLY SUMMARY 11/30-12/28	QUARTERLY SUMMARY 09/28-12/28	DET./ TOTAL	RANGE
IODINE-131	01	L.T. 3. E-02	L.T. 4. E-02	L.T. 6. E-02	L.T. 6. E-02	0/13	(L.T.1.-L.T.6.)E-02
	02	L.T. 4 E-02	L.T. 3. E-02	L.T. 6. E-02	L.T. 6 E-02	0/13	(L.T.1.-L.T.6.)E-02
	03	*	L.T. 4. E-02	L.T. 5. E-02	L.T. 5. E-02	0/6	(L.T.3.-L.T.5.)E-02
	04	*	L.T. 3. E-02	L.T. 5. E-02	L.T. 5. E-02	0/7	(L.T.2.-L.T.5.)E-02
	05	*	*	*	*	0/0	*
	06	*	L.T. 4. E-02	L.T. 4. E-02	L.T. 4. E-02	0/7	(L.T.2.-L.T.4.)E-02
	07	L.T. 4. E-02	L.T. 4. E-02	L.T. 4. E-02	L.T. 4. E-02	0/9	(L.T.1.-L.T.4.)E-02
	08	L.T. 4. E-02	L.T. 5. E-02	L.T. 4. E-02	L.T. 5. E-02	0/13	(L.T.1.-L.T.5.)E-02
	09	L.T. 4. E-02	L.T. 5. E-02	L.T. 4. E-02	L.T. 5. E-02	0/13	(L.T.1.-L.T.5.)E-02
	10	L.T. 5. E-02	L.T. 4. E-02	L.T. 4. E-02	L.T. 5. E-02	0/13	(L.T.1.-L.T.5.)E-02
	01-10	L.T. 5. E-02	L.T. 5. E-02	L.T. 6. E-02	L.T. 6. E-02	0/94	
	DET./TOTAL	0/30	0/31	0/33	0/94		
	RANGE	(L.T.1.-L.T.5.)E-02	(L.T.1.-L.T.5.)E-02	(L.T.2.-L.T.6.)E-02	(L.T.1.-L.T.6.)E-02	--	(L.T.1.-L.T.6.)E-02

*Samples not collected -- Flood Missouri River.

D. COMPOSITES OF AIR PARTICULATE FILTERS - GAMMA

(See Tables D-1 and D-2)

STATIONS 01 TO 10

Air Particulate Filters, which were collected weekly, were composited for each station for a quarterly gamma spectral analysis during the four quarters of 1993.

Beryllium-7, a naturally occurring cosmogenic nuclide, was detected in 39 of 39 samples at a level of 0.12 pCi per cubic meter which is similar to the levels of past years. Potassium-40, also a naturally occurring nuclide, was detected in four of 39 samples at a level near the normal level of detection.

Figure D-1 graphs the gross beta, gross alpha and Ce-144 activity as measured on air particulate filters collected weekly at CNS. (This is the same as Figure A-1, B-1). The plot illustrates that there were no detections of Ce-144 above the normal level of detection as measured by the quarterly gamma scan of samples from CNS.

Figure D-2 shows that measurements of Ce-144 are no longer reported by the Environmental Measurements Laboratory of the US Department of Energy because the artificial nuclides such as Ce-144, have reached the limits of detection by the analytical techniques now used.

FIGURE D-1

AIR PARTICULATES - CNS

ALPHA AND BETA MONTHLY AVERAGE - ALL LOCATIONS

CE-144 QUARTERLY AVERAGE - ALL LOCATIONS

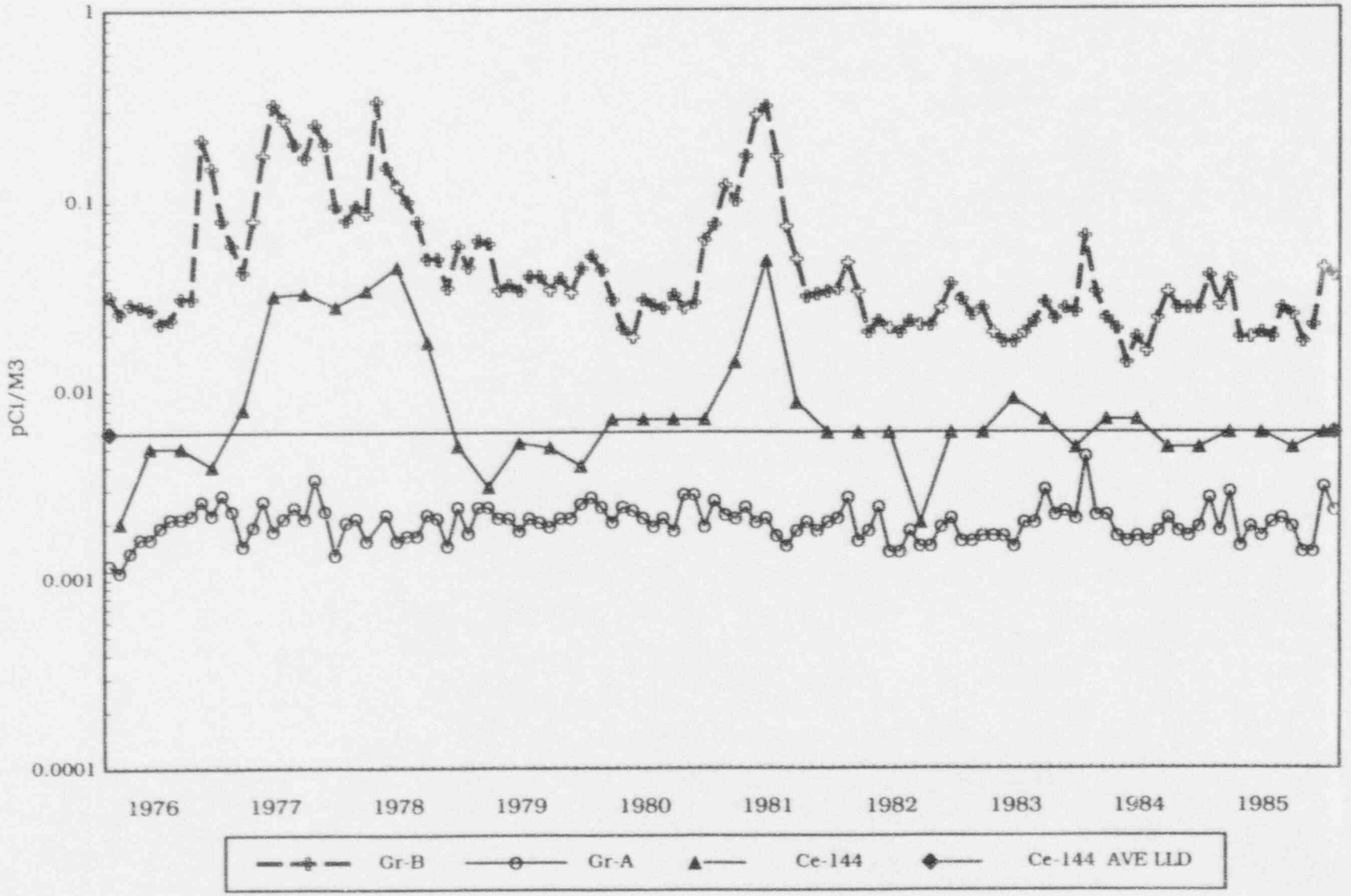

FIGURE D-1

AIR PARTICULATES - CNS

ALPHA AND BETA MONTHLY AVERAGE - ALL LOCATIONS

CE-144 QUARTERLY AVERAGE - ALL LOCATIONS

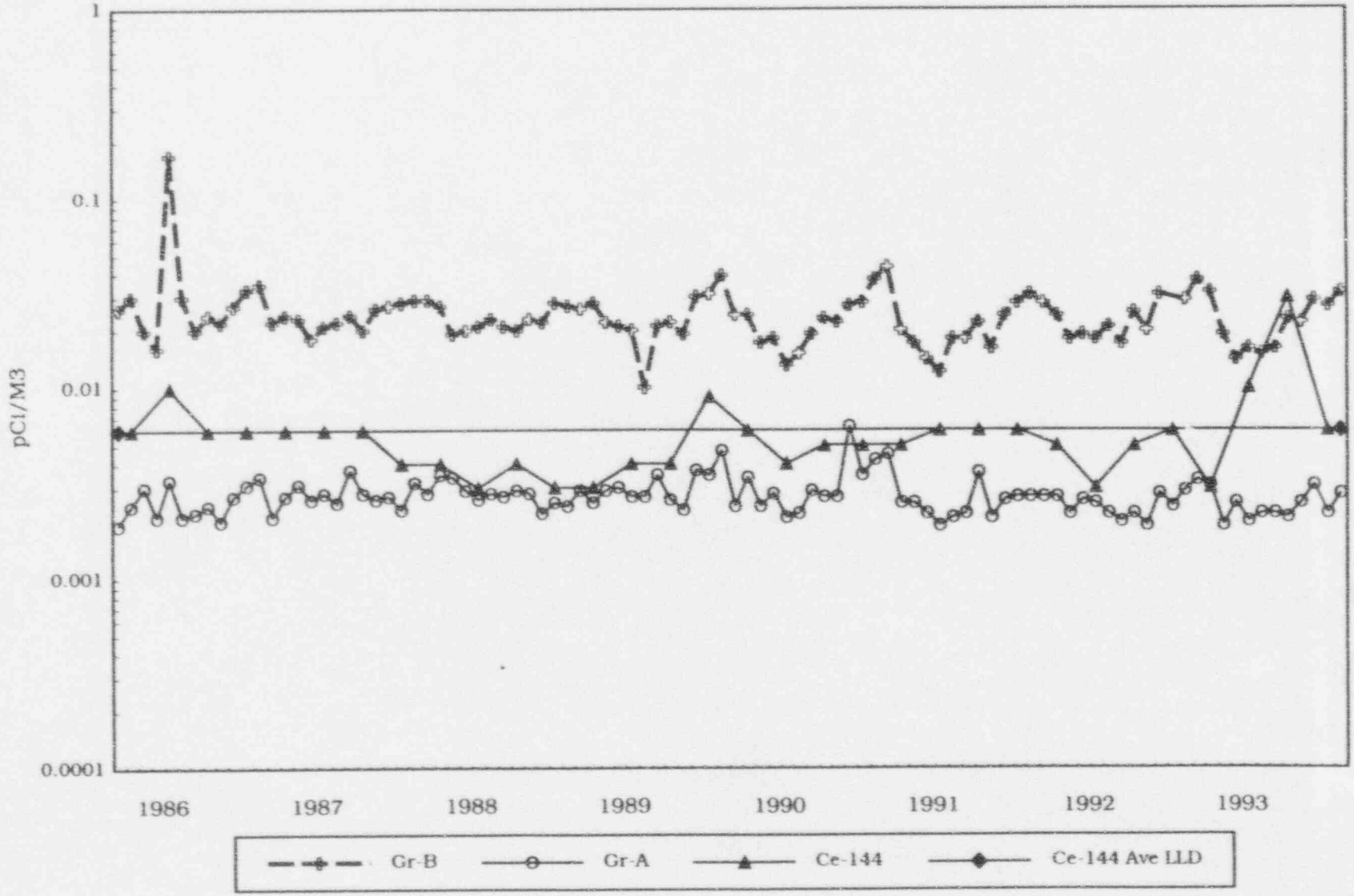

FIGURE D-2

AIR PARTICULATES

BETA MONTHLY AVERAGE - JEFFERSON CITY

MISSOURI ERAMS EPA

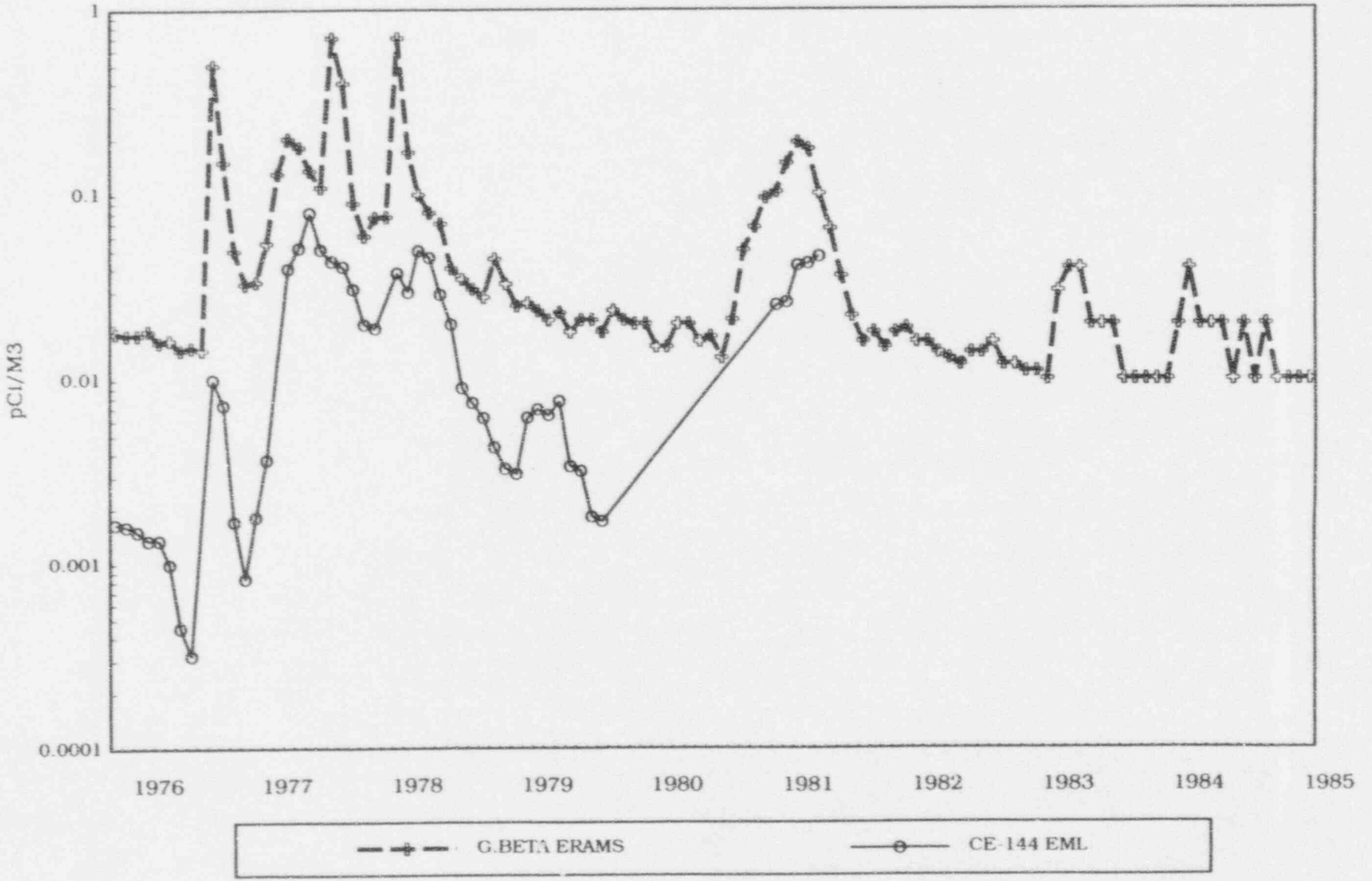

FIGURE D-2

AIR PARTICULATES

BETA MONTHLY AVERAGE - JEFFERSON CITY

MISSOURI ERAMS EPA

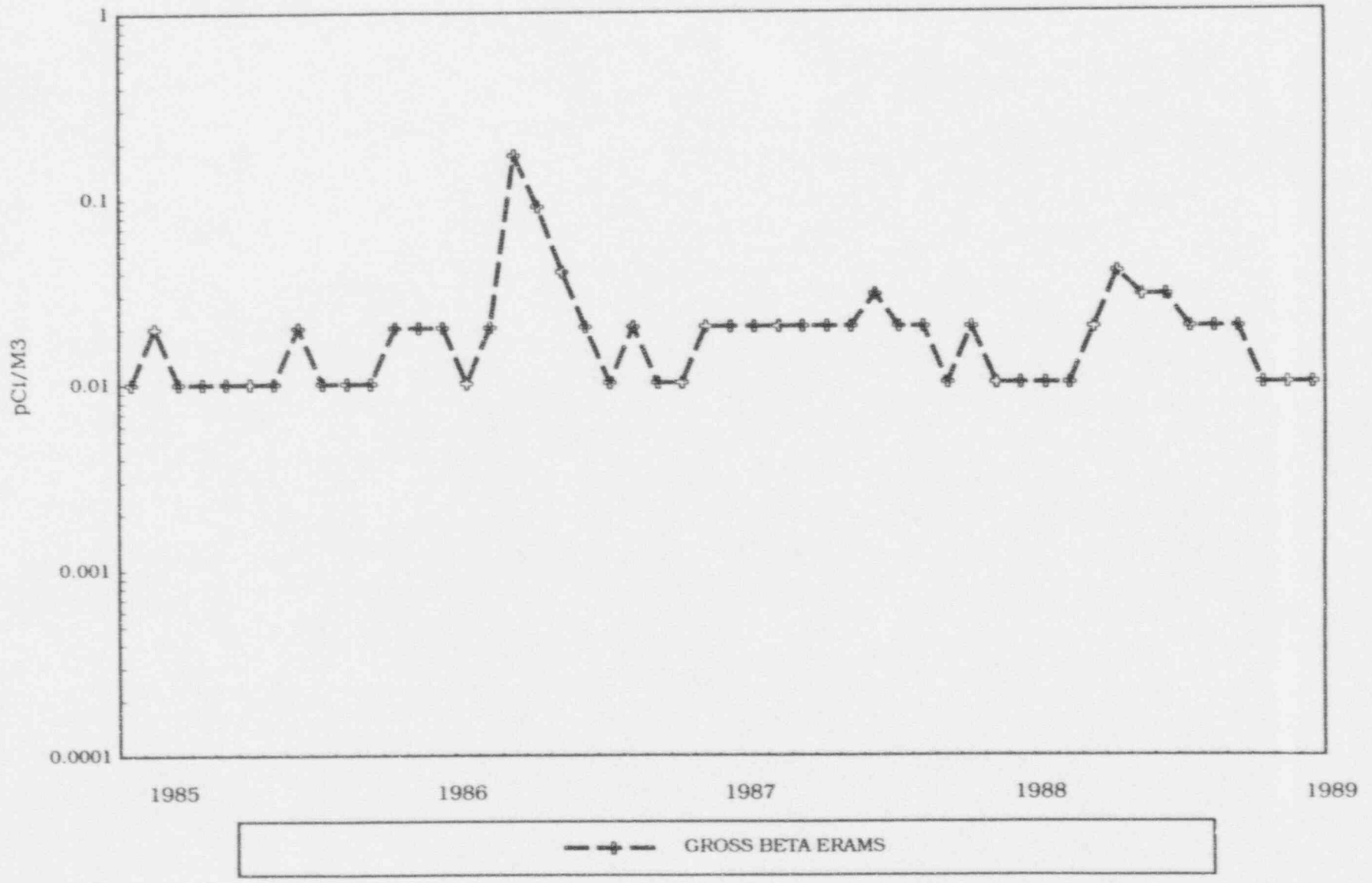

TABLE D-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

COMPOSITE OF WEEKLY AIR PARTICULATE FILTERS

pCi/Cu. M.

SAMPLE NUCLIDE	STATION NUMBER		FIRST QUARTER 12/29-03/30	SECOND QUARTER 03/30-06/29	THIRD QUARTER 06/29-09/28	FOURTH QUARTER 09/28-12/28
BE-7	01-10	Mean±std.dev. det./total range	8.60 ± 0.9 E-02 10/10 (7.52-9.84)E-02	1.5 ± 0.3 E-01 10/10 (1.23-2.22)E-01	1.2 ± 0.3(E-01) 10/10 0.76 ± 1.73(E-01	1.2 ± 0.2(E-01) 9/9 (0.76-1.64)E-01
K-40	01-10	Mean±std.dev. det./total range	2.85 ± 0.61E-02 1/10 --	9.8 ± 0.3 E-03 2/10 (9.6-10)E-03	4.23 ± 2.21 E-02 1/10 --	L.T. 4. E-02 0/9 --
I-131 (by gamma spectroscopy)	01-10	Mean±std.dev. det./total range	L.T. 1. E-01 0/10 --	L.T. 3. E-01 0/10 --	L.T. 1. E 00 0/10 --	L.T. 2. E-01 0/9 --
Cs-134	01-10	Mean±std.dev. det./total range	L.T. 7. E-04 0/10 --	L.T. 1. E-03 0/10 --	L.T. 8. E-03 0/10 --	L.T. 1. E-03 0/9 --
Cs-137	01-10	Mean±std.dev. det./total range	L.T. 7. E-04 0/10 --	L.T. 1. E-03 0/10 --	L.T. 7. E-03 0/10 --	L.T. 1. E-03 0/9 --
Ra-226	01-10	Mean±std.dev. det./total range	L.T. 1. E-02 0/10 --	L.T. 2. E-02 0/10 --	L.T. 1. E-01 0/10 --	L.T. 2. E-02 0/9 --
Th-228	01-10	Mean±std.dev. det./total range	L.T. 1. E-03 0/10 --	L.T. 2. E-03 0/10 --	L.T. 1. E-02 0/10 --	L.T. 2. E-03 0/9 --

TABLE D-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AIRBORNE

COMPOSITE OF WEEKLY AIR PARTICULATE FILTERS - PCI/CU.M.

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER 12/29-03/30	SECOND QUARTER 03/30-06/29	THIRD QUARTER 06/29-09/28	FOURTH QUARTER 09/28-12/28
BE-7	1-10	8.60 ± 0.9 E-02 (10/10)	1.5 ± 0.3 E-01 (10/10)	1.2 ± 0.3 E-01 (10/10)	1.2 ± 0.2 E-01 (9/9)
K-40	1-10	2.85 ± 0.61E-02 (1/10)	9.8 ± 0.3 E-03 (2/10)	4.23±2.21 E-02 (1/10)	L.T. 4. E-02 (0/9)
Mn-54	1-10	L.T. 7. E-04 (0/10)	L.T. 1. E-03 (0/10)	L.T. 7. E-03 (0/10)	L.T. 1. E-03 (0/9)
Co-58	1-10	L.T. 1. E-03 (0/10)	L.T. 1. E-03 (0/10)	L.T. 1. E-02 (0/10)	L.T. 2. E-03 (0/9)
Fe-59	1-10	L.T. 3. E-03 (0/10)	L.T. 5. E-03 (0/10)	L.T. 4. E-02 (0/10)	L.T. 5. E-03 (0/9)
Co-60	1-10	L.T. 7. E-04 (0/10)	L.T. 1. E-03 (0/10)	L.T. 8. E-03 (0/10)	L.T. 1. E-03 (0/9)
Zn-65	1-10	L.T. 2. E-03 (0/10)	L.T. 2. E-03 (0/10)	L.T. 2. E-02 (0/10)	L.T. 3. E-03 (0/9)
Zr-95	1-10	L.T. 1. E-03 (0/10)	L.T. 2. E-03 (0/10)	L.T. 1. E-02 (0/10)	L.T. 2. E-03 (0/9)
Ru-103	1-10	L.T. 2. E-03 (0/10)	L.T. 3. E-03 (0/10)	L.T. 2. E-02 (0/10)	L.T. 2. E-03 (0/9)
Ru-106	1-10	L.T. 6. E-03 (0/10)	L.T. 8. E-03 (0/10)	L.T. 7. E-02 (0/10)	L.T. 1. E-02 (0/9)
I-131	1-10	L.T. 1. E-01 (0/10)	L.T. 3. E-01 (0/10)	L.T. 1. E 00 (0/10)	L.T. 2. E-01 (0/9)
Cs-134	1-10	L.T. 7. E-04 (0/10)	L.T. 1. E-03 (0/10)	L.T. 8. E-03 (0/10)	L.T. 1. E-03 (0/9)
Cs-137	1-10	L.T. 7. E-04 (0/10)	L.T. 1. E-03 (0/10)	L.T. 7. E-03 (0/10)	L.T. 1. E-03 (0/9)
Ba-140	1-10	L.T. 2. E-02 (0/10)	L.T. 5. E-02 (0/10)	L.T. 2. E-01 (0/10)	L.T. 3. E-02 (0/9)
Ce-141	1-10	L.T. 3. E-03 (0/10)	L.T. 8. E-03 (0/10)	L.T. 3. E-02 (0/10)	L.T. 4. E-03 (0/9)
Ce-144	1-10	L.T. 3. E-03 (0/10)	L.T. 1. E-02 (0/10)	L.T. 3. E-02 (0/10)	L.T. 6. E-03 (0/9)
Ra-226	1-10	L.T. 1. E-02 (0/10)	L.T. 2. E-02 (0/10	L.T. 1. E-01 (0/10)	L.T. 2. E-02 (0/9)
Th-228	1-10	L.T. 1. E-03 (0/10)	L.T. 2. E-03 (0/10)	L.T. 1. E-02 (0/10)	L.T. 2. E-03 (0/9)

E. FISH (See Tables E-1, E-2)

STATIONS 28, 35

Fish samples were collected during the summer and fall at the above stations and analyzed for gross beta, Sr-89, Sr-90, and gamma emitting isotopes. An attempt was made to collect a middle-top feeding fish (carp) and a bottom feeding fish (catfish). Due to the near-flood conditions of the Missouri River in the summer, only carp were available in sufficient numbers for a valid sample. Both types of fish were collected during the fall sampling event.

The gross beta and Sr-90 activities were similar to the levels of previous years. Strontium-90 was detected in four of eight samples at a level of 0.0066 pCi/gram, wet, which is below the normal level of detection. There were no detections of Sr-89. Naturally occurring K-40 was detected in all samples at an average level of 3.29 pCi/gm, wet.

There were no detections of Cs-137 during 1993.

Plotted in Figure E-1 are the radionuclides gross beta, K-40, Sr-90 and Cs-137 monitored in fish samples which show no appreciable change from 1977 through 1993. The plot of the nuclides shows that most of the gross beta activity is due to the terrestrial nuclide K-40.

FIGURE E-1

FISH

SEMIANNUAL AVERAGE - ALL LOCATIONS

GR-B K-40 SR-90 CS-137

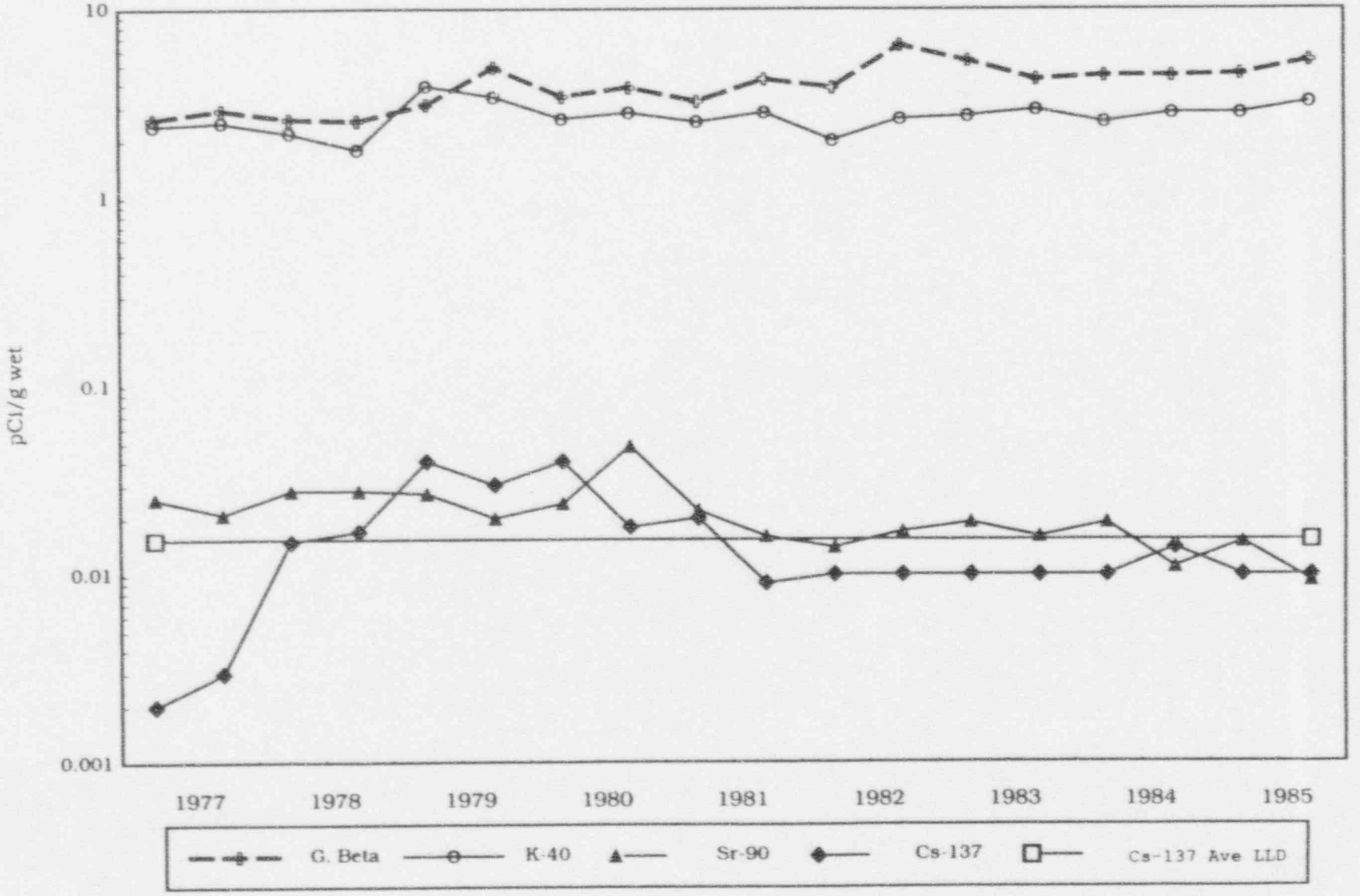

FIGURE E-1

FISH

SEMIANNUAL AVERAGE - ALL LOCATIONS

GR-B K-40 SR-90 CS-137

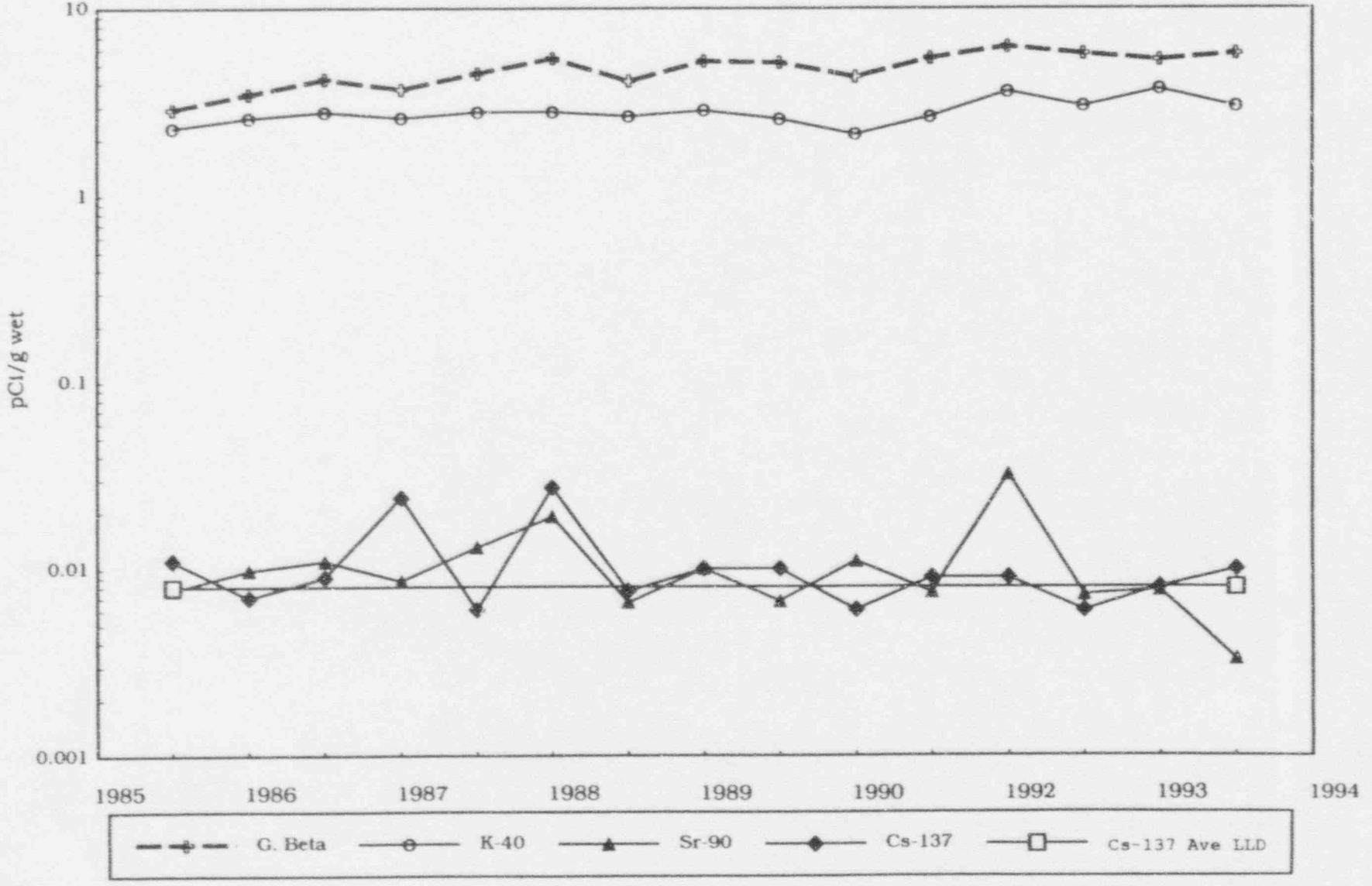

TABLE E-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - INGESTION

FISH - PCI/GM, WET

SAMPLE NUCLIDE	STATION NUMBER		FIRST QUARTER	SECOND QUARTER 06/02	THIRD QUARTER	FOURTH QUARTER 10/06, 10/07
Gross Beta	28, 35	Mean±std.dev. det./total range		5.3 ± 0.2 E 00 3/3 (5.1-5.5)E 00		5.7 ± 0.9 E 00 5/5 (4.8-7.1)E 00
Sr-89	28, 35	Mean±std.dev. det./total range		L.T. 6. E-03 0/3 --		L.T. 7 E-03 0/5 --
Sr-90	28, 35	Mean±std.dev. det./total range		7.7 ± 0.8 E-03 3/3 (6.8-8.2)E-03		3.3 ± 2.1 E-03 1/5 --
K-40	28, 35	Mean±std.dev. det./total range		3.72±0.4 E 00 3/3 (3.31-4.06)E 00		3.0 ± 0.8 E 00 5/5 (2.2-4.1)E 00
Co-60	28, 35	Mean±std.dev. det./total range		L.T. 7. E-03 0/3 --		L.T. 1. E-02 0/5 --
I-131	28, 35	Mean±std.dev. det./total range		L.T. 1. E-02 0/3 --		L.T. 7. E-02 0/5 --
Cs-134	28, 35	Mean±std.dev. det./total range		L.T. 8. E-03 0/3 --		L.T. 1. E-02 0/5 --
Cs-137	28, 35	Mean±std.dev. det./total range		L.T. 8. E-03 0/3 --		L.T. 1. E-02 0/5 --

TABLE E-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - INGESTION

FISH - PCI/GM, WET

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER	SECOND QUARTER 06/02	THIRD QUARTER	FOURTH QUARTER 10/06, 10/07
BE-7	28, 35		L.T. 6. E-02(0/3)		L.T. 1. E-01(0/5)
K-40	28, 35		3.72 ± 0.4E 00(3/3)		3.0 ± 0.8 E 00(5/5)
Mn-54	28, 35		L.T. 7. E-03(0/3)		L.T. 1. E-02(0/5)
Co-58	28, 35		L.T. 7. E-03(0/3)		L.T. 1. E-02(0/5)
Fe-59	28, 35		L.T. 2. E-02(0/3)		L.T. 3. E-02(0/5)
Co-60	28, 35		L.T. 7. E 00(0/3)		L.T. 1. E-02(0/5)
Zn-65	28, 35		L.T. 2. E-02(0/3)		L.T. 3. E-02(0/5)
Zr-95	28, 35		L.T. 7. E-03(0/3)		L.T. 1. E-02(0/5)
Ru-103	28, 35		L.T. 7. E-03(0/3)		L.T. 2. E-02(0/5)
Ru-106	28, 35		L.T. 6. E-02(0/3)		L.T. 1. E-01(0/5)
I-131	28, 35		L.T. 1. E-02(0/3)		L.T. 7. E-02(0/5)
Cs-134	28, 35		L.T. 8. E-03(0/3)		L.T. 1. E-02(0/5)
Cs-137	28, 35		L.T. 8. E-03(0/3)		L.T. 1. E-02(0/5)
Ba-140	28, 35		L.T. 9. E-03(0/3)		L.T. 3. E-02(0/5)
Ce-141	28, 35		L.T. 9. E-03(0/3)		L.T. 3. E-02(0/5)
Ce-144	28, 35		L.T. 4. E-02(0/3)		L.T. 7. E-02(0/5)
Ra-226	28, 35		L.T. 1. E-01(0/3)		L.T. 2. E-01(0/5)
Th-228	28, 35		L.T. 1. E-02(0/3)		L.T. 2. E-02(0/5)

F. MILK (See Tables F-1, F-2)

STATION 99 (NEAREST PRODUCER)

Milk samples from the nearest producer Station 99, 10.25 miles, 189 degrees from the elevated release point of CNS were collected once every 15 days in peak pasture season and once every 31 days the rest of the year. The monthly samples collected January through May and October through December were analyzed for I-131 by chemical separation, for elemental calcium and strontium 89 and 90. In addition they were analyzed for gamma emitting isotopes on a high resolution gamma spectrometer. The samples collected every 15 days during peak pasture season were analyzed upon receipt for I-131 and gamma emitting isotopes. A monthly composite was prepared and analyzed as described above.

There were no detections of I-131 in the twenty-three samples analyzed by chemical separation. There were no detections of Sr-89 in the samples analyzed. Strontium-90 was detected at an average level of 2.0 pCi/liter, which is a normal environmental level. Elemental calcium was found at an average level of 1.6 mg/liter. Potassium-40, a naturally occurring isotope, was detected at an average level of 1370 pCi/liter.

Cesium-137 was not detected in any of the samples analyzed. There was no indication of an effect on the milk of the producer nearest the plant from the operations of CNS.

Shown in Figure F-1 and F-2 are the plots of radionuclides monitored from 1977 through 1993 in milk samples from producers nearest the reactor. The levels of K-40, elemental calcium and Sr-90 remained stable. There were no detections of I-131, Sr-89 or Cs-137. This indicates no effect on milk samples from the operations of CNS.

FIGURE F-1

MILK - NEAREST PRODUCER

QUARTERLY AVERAGE - STATION 61

K-40 I-131 CS-137

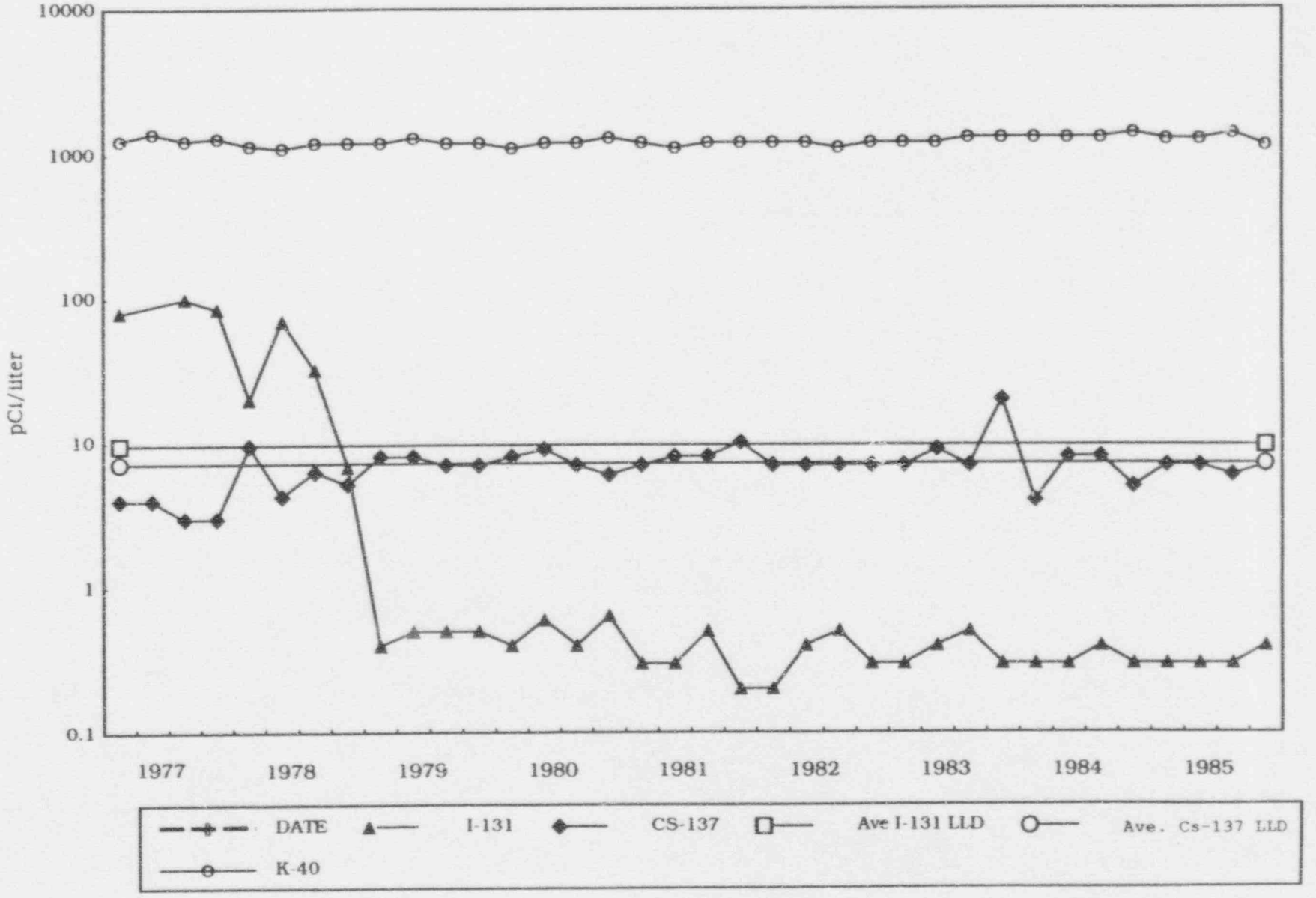

FIGURE F-1

MILK- NEAREST PRODUCER

QUARTERLY AVERAGE - STATION 99

K-40 I-131 CS-137

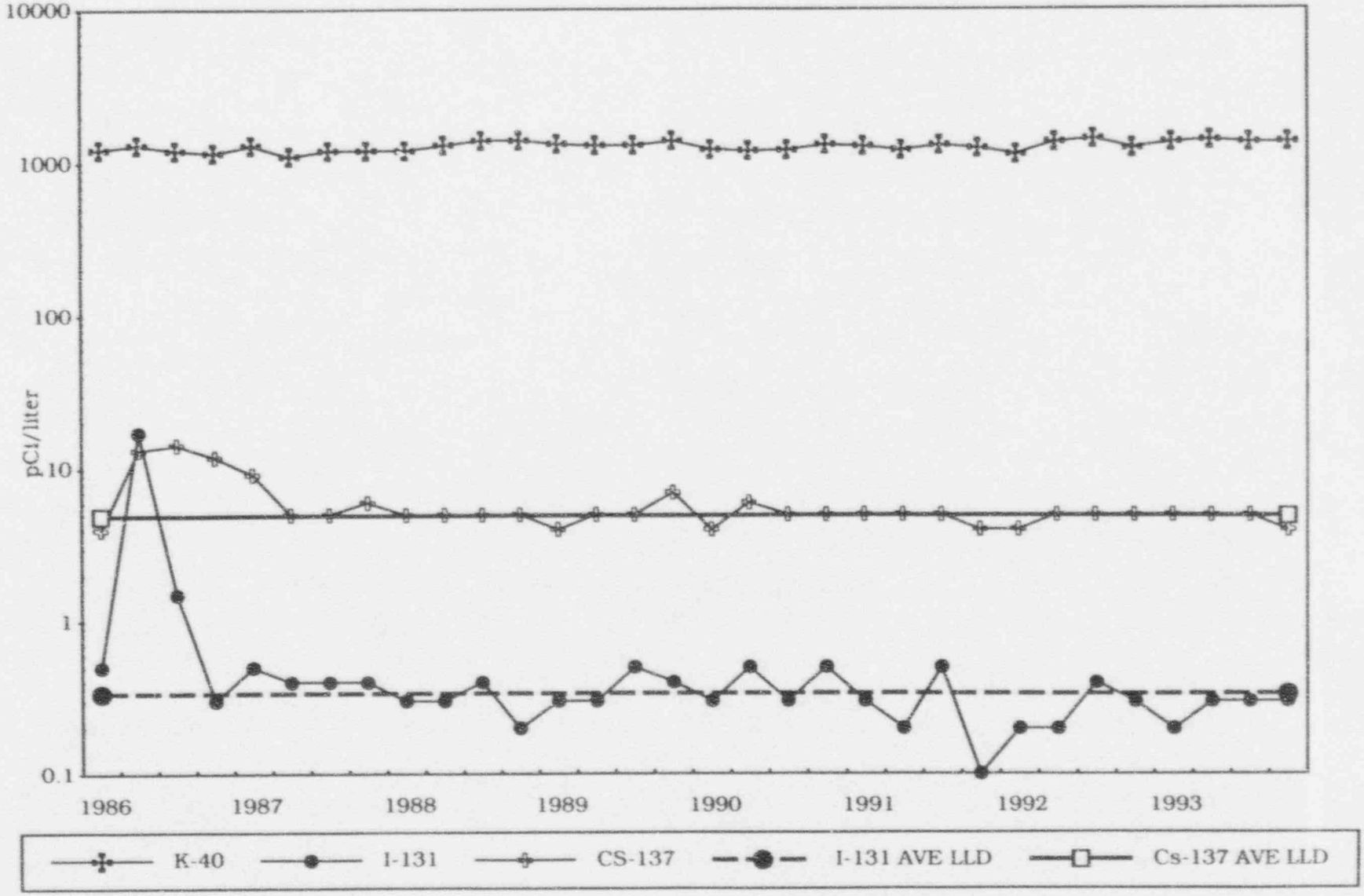

FIGURE F-2

MILK- NEAREST PRODUCER

QUARTERLY AVERAGE - STATION 99

SR-89 SR-90 ELEM. CA.

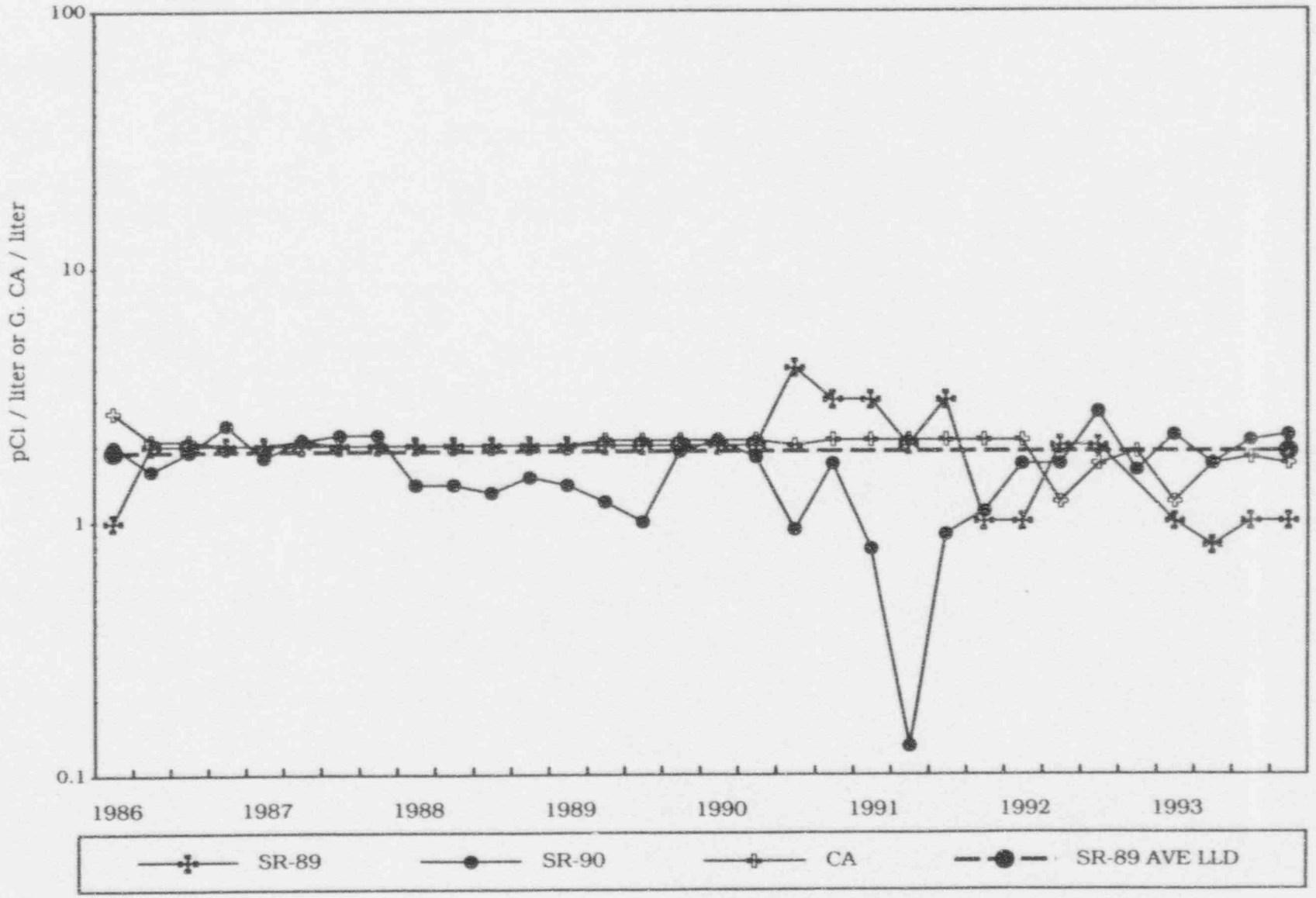

FIGURE F-2

MILK- NEAREST PRODUCER

QUARTERLY AVERAGE - STATION 99

SR-89 SR-90 ELEM. CA.

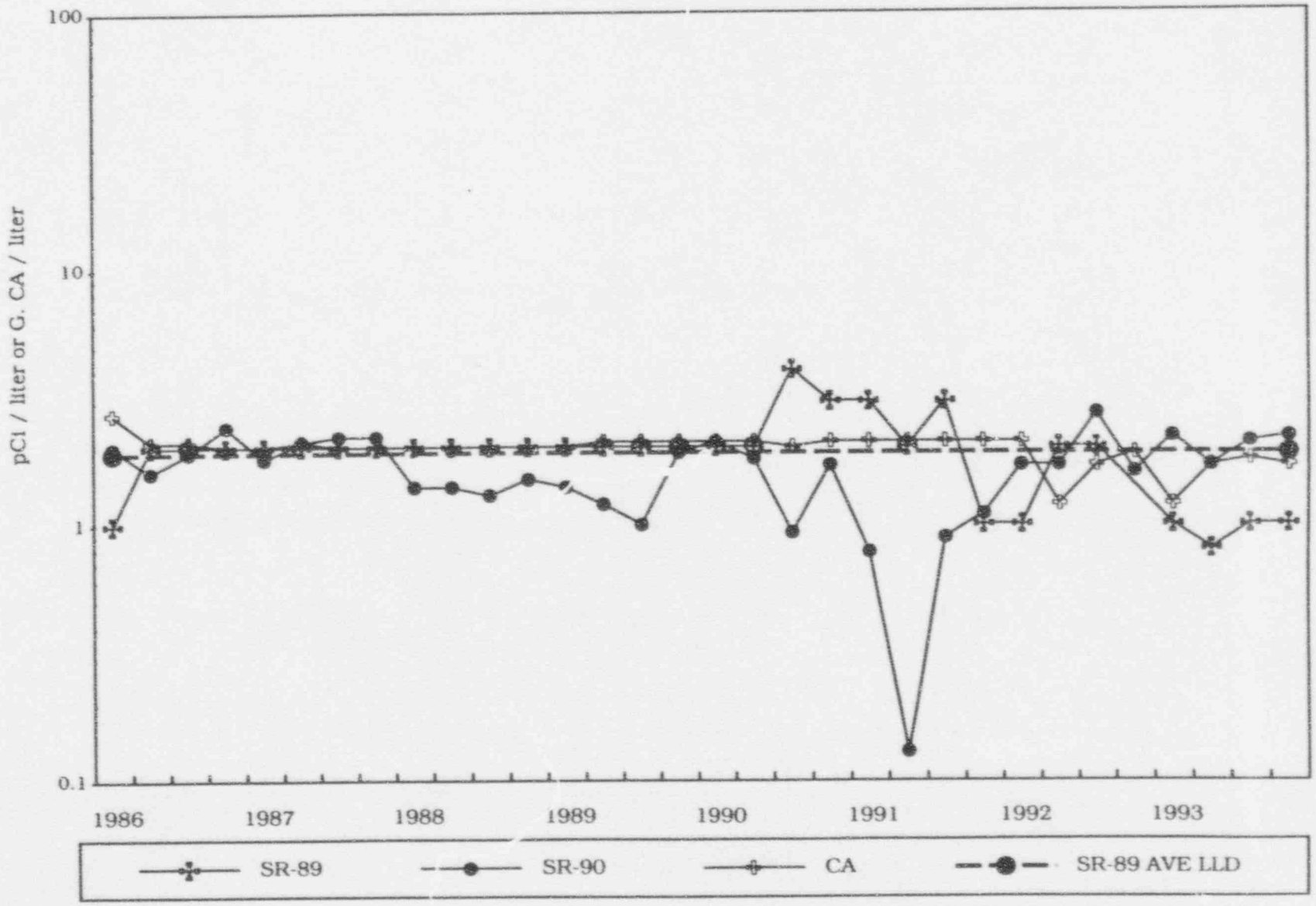

TABLE F-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - INGESTION

MILK - NEAREST PRODUCER - PCI/LITER

SAMPLE NUCLIDE	STATION NUMBER		FIRST QUARTER 01/05-03/02	SECOND QUARTER 04/06-06/29	THIRD QUARTER 07/13-09/21	FOURTH QUARTER 10/05-12/07
SR-89	99	Mean±std.dev. det./total range	L.T. 1. E 00 0/3 --	L.T. 8. E-01 0/5 --	L.T. 1. E 00 0/6 --	L.T. 1. E 00 0/4 --
SR-90	99	Mean±std.dev. det./total range	2.2 ± 1.0 E 00 3/3 (1.3-3.3)E 00	1.7 ± 0.3 E 00 5/5 (1.4-2.0)E 00	2.1 ± 0.3 E 00 6/6 (1.5-2.3)E 00	2.2 ± 0.7 E 00 4/4 (1.'-3.2)E 00
I-131 by chemical separation	99	Mean±std.dev. det./total range	L.T. 2. E-01 0/3 --	L.T. 3. E-01 0/7 --	L.T. 3. E-01 0/9 --	L.T. 3. E-01 0/4 --
Ca gm/liter	99	Mean±std.dev. det./total range	1.2 ± 0.9 E 00 3/3 (0.2-1.8) E 00	1.7 ± 0.1 E 00 5/5 (1.7-1.8)E 00	1.8 ± 0.1 E 00 5/5 (1.7-1.8) E 00	1.7 ± 0.2 E 00 4/4 (1.7-1.7)E 00
K-40	99	Mean±std.dev. det./total range	1.35 ± 0.05E 03 3/3 (1.30-1.39)E 03	1.40±0.13E 03 7/7 (1.14-1.53)E 03	1.35±0.091E 03 9/9 (1.16-1.46)E 03	1.36 ± 0.07 E 03 4/4 (1.28-1.44)E 03
I-131 by gamma spectroscopy	99	Mean±std.dev. det./total range	L.T. 8. E 00 0/3 --	L.T. 1. E 01 0/7 --	L.T. 2. E 01 0/9 --	L.T. 1. E 01 0/4 --
Cs-134	99	Mean±std.dev. det./total range	L.T. 5. E 00 0/3 --	L.T. 5. E 00 0/7 --	L.T. 5. E 00 0/9 --	L.T. 4. E 00 0/4 --
Cs-137	99	Mean±std.dev. det./total range	L.T. 5. E 00 0/3 --	L.T. 5. E 00 0/7 --	L.T. 5. E 00 0/9 --	L.T. 4. E 00 0/4 --

TABLE F-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - INGESTION

MILK - NEAREST PRODUCER - PCI/LITER

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER 01/05-03/02	SECOND QUARTER 04/06-06/29	THIRD QUARTER 07/13-09/21	FOURTH QUARTER 10/05-12/07
BE-7	99	L.T. 4. E 01 (0/3)	L.T. 4. E 01 (0/7)	L.T. 5. E 01 (0/9)	L.T. 3. E 01 (0/4)
K-40	99	1.35±0.05 E 03 (3/3)	1.40±0.13 E 03 (7/7)	1.35±0.091E 03 (9/9)	1.36 ± 0.07E 03 (4/4)
Mn-54	99	L.T. 5. E 00 (0/3)	L.T. 4. E 00 (0/7)	L.T. 5. E 00 (0/9)	L.T. 4. E 00 (0/4)
Co-58	99	L.T. 5. E 00 (0/3)	L.T. 4. E 00 (0/7)	L.T. 5. E 00 (0/9)	L.T. 4. E 00 (0/4)
Fe-59	99	L.T. 1. E 01 (0/3)	L.T. 1. E 01 (0/7)	L.T. 1. E 01 (0/9)	L.T. 1. E 01 (0/4)
Co-60	99	L.T. 5. E 00 (0/3)	L.T. 5. E 00 (0/7)	L.T. 5. E 00 (0/9)	L.T. 5. E 00 (0/4)
Zn-65	99	L.T. 1. E 01 (0/3)	L.T. 1. E 01 (0/7)	L.T. 1. E 01 (0/9)	L.T. 1. E 01 (0/4)
Zr-95	99	L.T. 5. E 00 (0/3)	L.T. 4. E 00 (0/7)	L.T. 5. E 00 (0/9)	L.T. 4. E 00 (0/4)
Ru-103	99	L.T. 5. E 00 (0/3)	L.T. 5. E 00 (0/7)	L.T. 6. E 00 (0/9)	L.T. 5. E 00 (0/4)
Ru-106	99	L.T. 4. E 01 (0/3)	L.T. 4. E 01 (0/7)	L.T. 4. E 01 (0/9)	L.T. 3. E 01 (0/4)
I-131	99	L.T. 8. E 00 (0/3)	L.T. 1. E 01 (0/7)	L.T. 2. E 01 (0/9)	L.T. 1. E 01 (0/4)
Cs-134	99	L.T. 5. E 00 (0/3)	L.T. 5. E 00 (0/7)	L.T. 5. E 00 (0/9)	L.T. 4. E 00 (0/4)
Cs-137	99	L.T. 5. E 00 (0/3)	L.T. 5. E 00 (0/7)	L.T. 5. E 00 (0/9)	L.T. 4. E 00 (0/4)
Ba-140	99	L.T. 6. E 00 (0/3)	L.T. 8. E 00 (0/7)	L.T. 1. E 01 (0/9)	L.T. 7. E 00 (0/4)
Ce-141	99	L.T. 8. E 00 (0/3)	L.T. 9. E 00 (0/7)	L.T. 9. E 00 (0/9)	L.T. 9. E 00 (0/4)
Ce-144	99	L.T. 3. E 01 (0/3)	L.T. 4. E 01 (0/7)	L.T. 3. E 01 (0/9)	L.T. 3. E 01 (0/4)
Ra-226	99	L.T. 8. E 01 (0/3)	L.T. 1. E 02 (0/7)	L.T. 9. E 01 (0/9)	L.T. 8. E 01 (0/4)
Th-228	99	L.T. 8. E 00 (0/3)	L.T. 9. E 00 (0/7)	L.T. 8. E 00 (0/9)	L.T. 7. E 00 (0/4)

G. MILK (SEE TABLES G-1, G-2)

STATIONS 42, 100 (OTHER PRODUCERS)

Milk samples were collected quarterly from other producers, Station 42, 12.9 miles from the plant and Station 100 which is 11.5 miles from the plant. The samples were analyzed for I-131 by chemical separation, for elemental calcium, for Sr-89 and 90 and for gamma emitting isotopes. There were no detections of I-131 in the eight samples monitored.

There were no detections of Sr-89. Strontium-90 was found at an average level of 1.6 pCi/liter. There were 1.8 mg of calcium per liter of milk. Potassium-40 was detected at an average level of 1410. pCi/liter. The strontium-90, K-40 and elemental calcium were at normal environmental levels and were similar to the results obtained from analyses of milk from the nearest producer. There were no detections of Cs-137 in the samples collected. It can be concluded that the operations of CNS had no effect on milk samples and thus no dose impact on the population.

The levels of radioactivities of the nuclides K-40, I-131 and Cs-137 are plotted on Figure G-1. Potassium-40 was at normal environmental levels as in previous years. There were no detections of I-131 or Cs-137. Figure G-2 shows that Sr-90 and elemental calcium are at a level comparable to previous years and there were no detections of Sr-89. These graphs indicate that there was no appreciable difference between the levels of activity of the nearest producer and the commercial producers. This indicated no effect on milk samples from the operations of CNS.

FIGURE G-1

MILK- COMMERCIAL PRODUCERS

QUARTERLY AVERAGE - ALL LOCATIONS

K-40 I-131 Cs-137

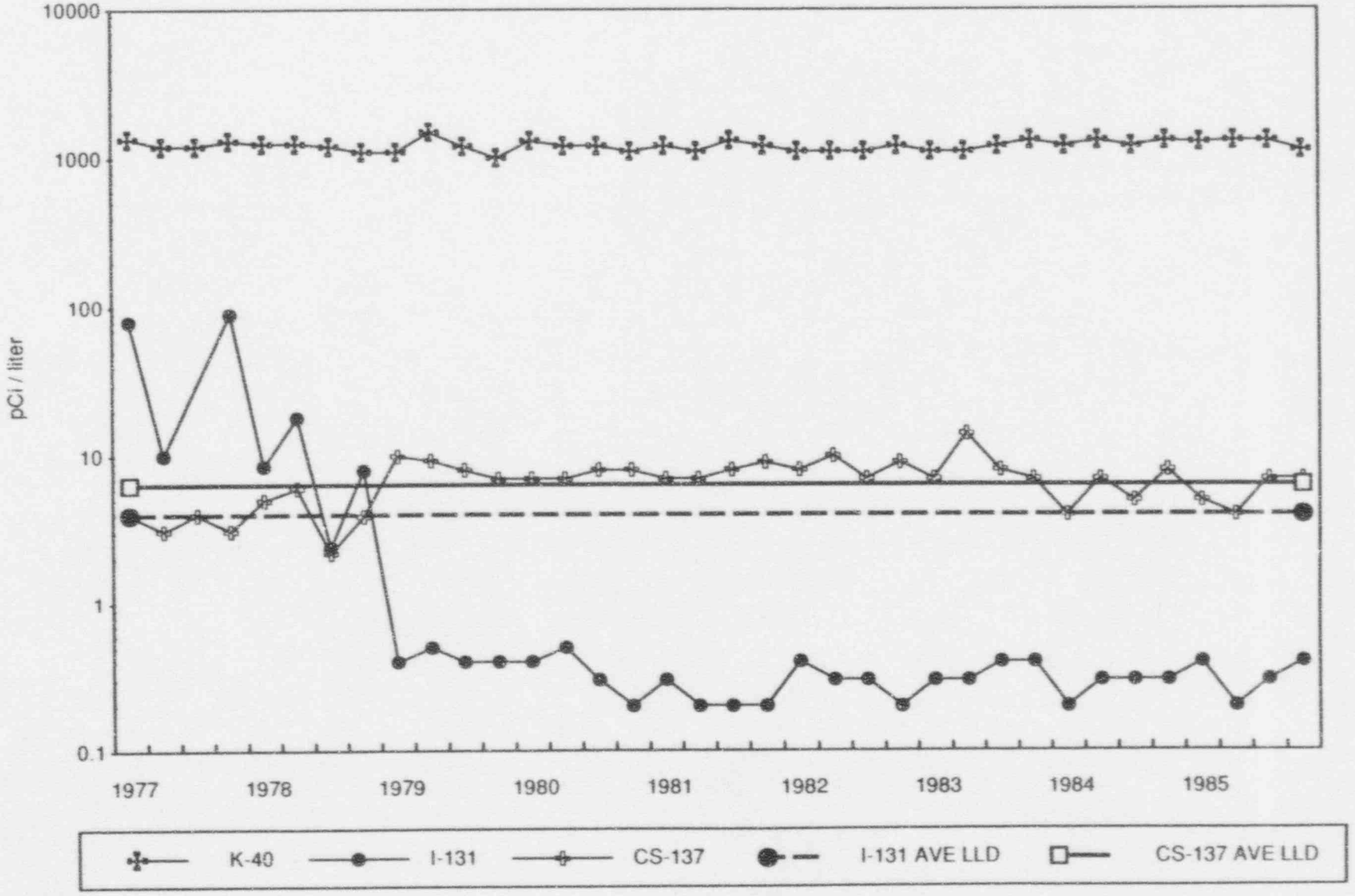

FIGURE G-1

MILK- COMMERCIAL PRODUCERS

QUARTERLY AVERAGE - ALL LOCATIONS

K-40 I-131 Cs-137

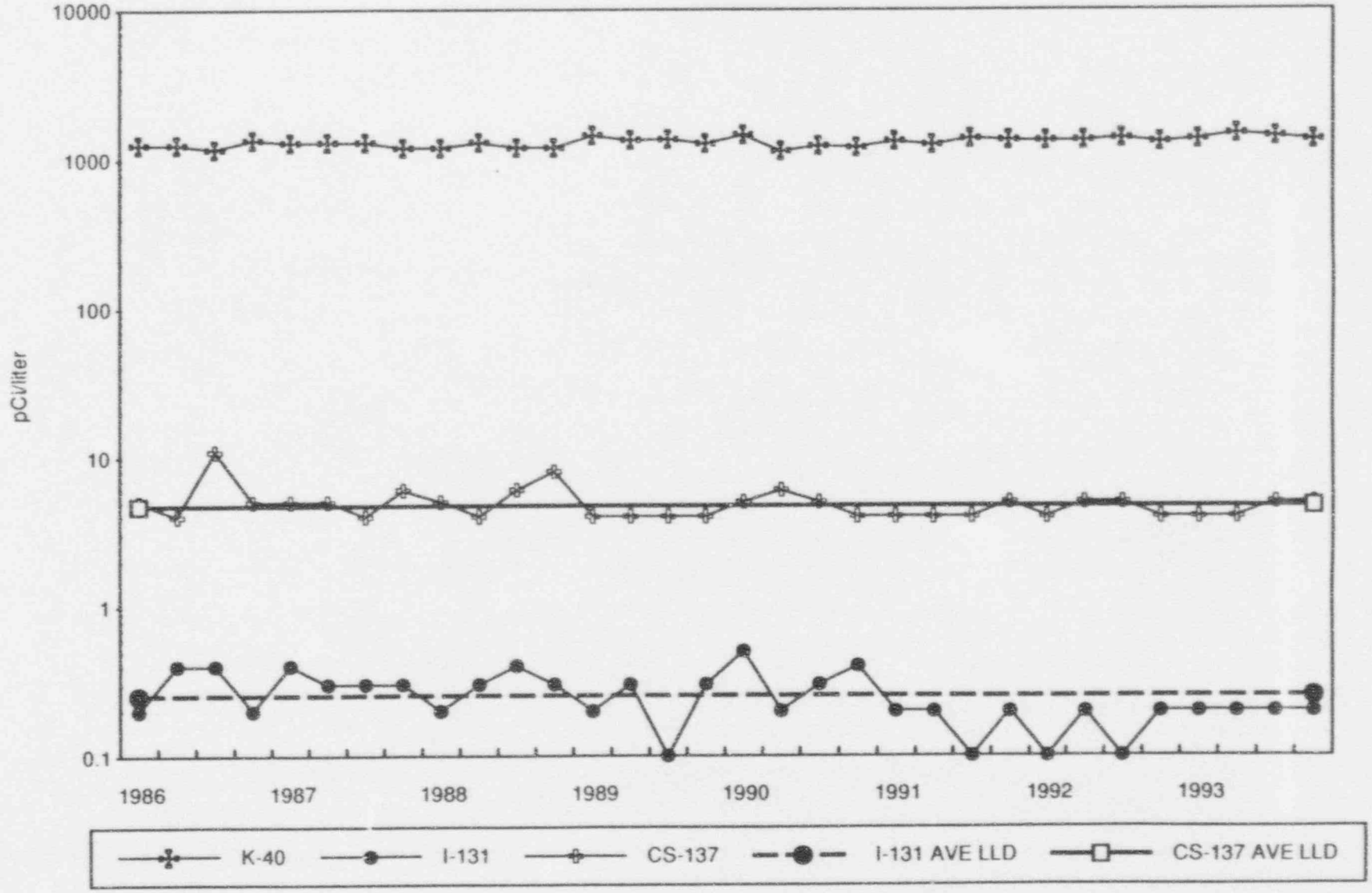

FIGURE G-2
MILK- COMMERCIAL PRODUCERS
QUARTERLY AVERAGE - ALL LOCATIONS
SR-89 SR-90 ELEM. CA.

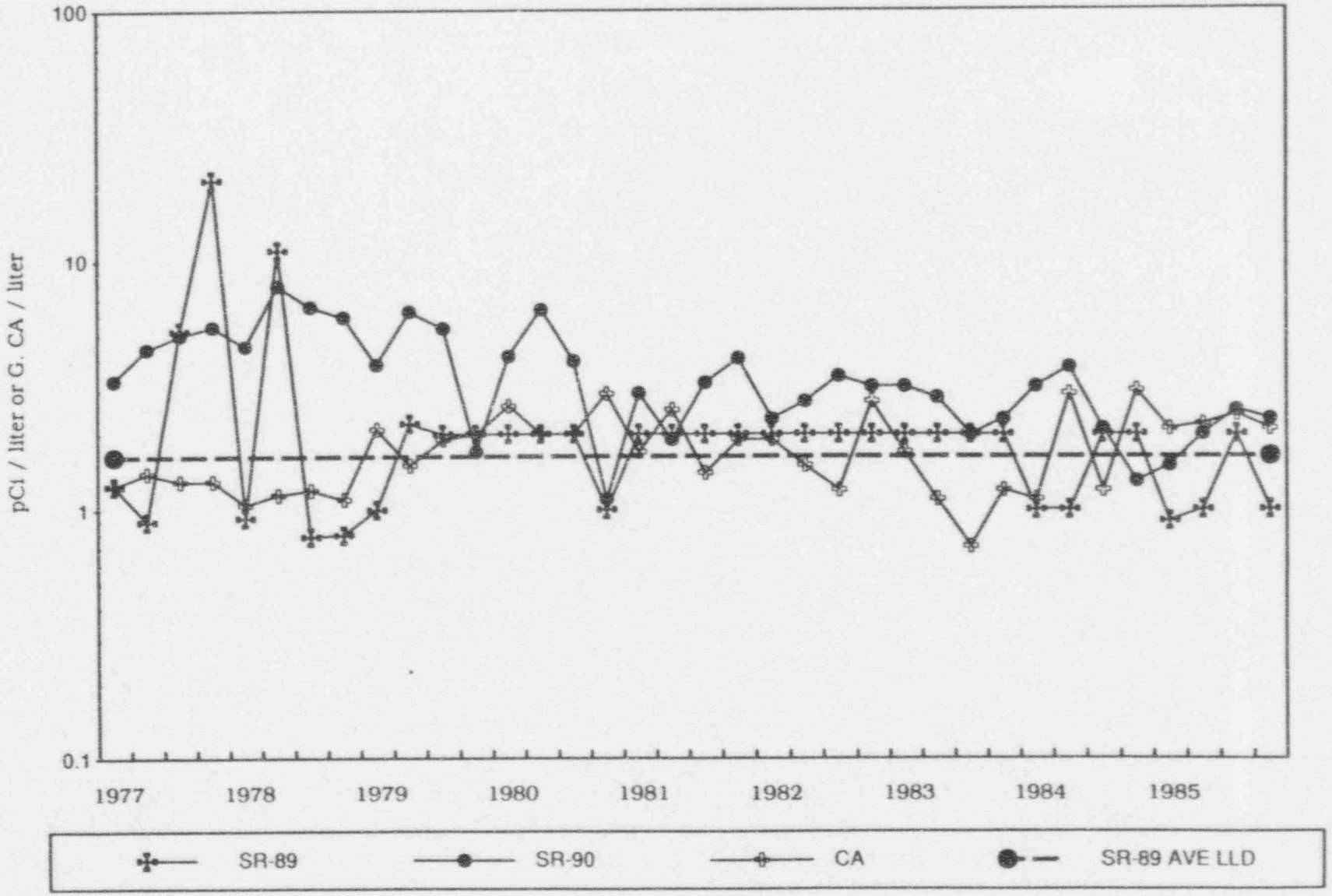

FIGURE G-2

MILK- COMMERCIAL PRODUCERS

QUARTERLY AVERAGE - ALL LOCATIONS

SR-89 SR-90 ELEM. CA.

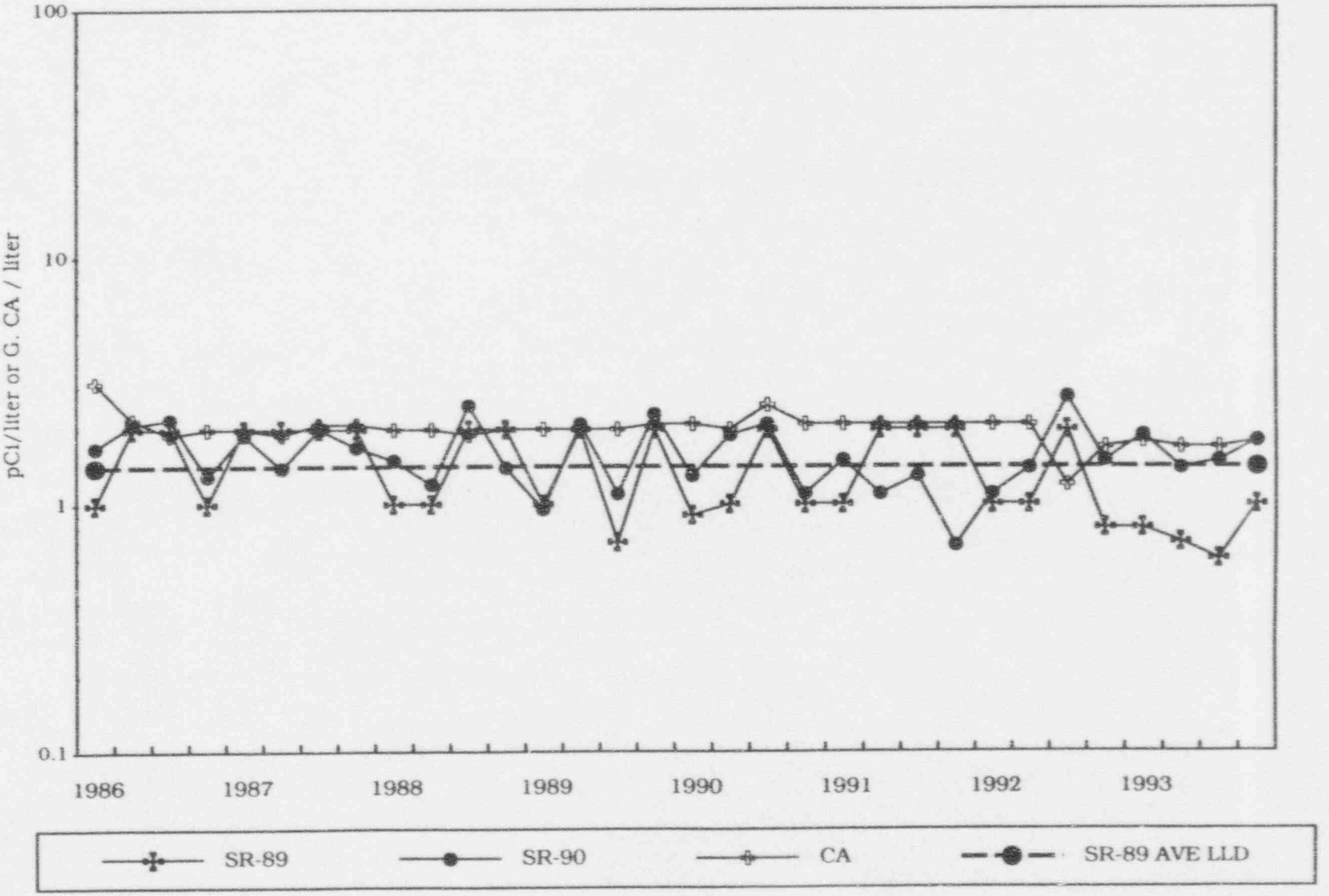

TABLE G-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - INGESTION

MILK - OTHER PRODUCERS - PCI/LITER

SAMPLE NUCLIDE	STATION NUMBER		FIRST QUARTER 01/13	SECOND QUARTER 04/13	THIRD QUARTER 07/13	FOURTH QUARTER 10/12
SR-89	42, 100	Mean±std.dev. det./total range	L.T. 8. E-01 0/2 --	L.T. 7. E-01 0/2 --	L.T. 6. E-01 0/2 --	L.T. 1. E 00 0/2 --
SR-90	42, 100	Mean±std.dev. det./total range	1.9 ± 0.1 E 00 2/2 (1.8-2.0)E 00	1.4 ± 0.2 E 00 2/2 (1.4-1.4)E 00	1.5 ± 0.1 E 00 2/2 (1.4-1.5)E 00	1.8 ± 0.2 E 00 2/2 (1.6-1.9)E 00
I-131 (by chemical separation)	42, 100	Mean±std.dev. det./total range	L.T. 2. E-01 0/2 --	L.T. 2. E-01 0/2 --	L.T. 2. E-01 0/2 --	L.T. 2. E-01 0/2 --
Ca gm/liter	42, 100	Mean±std.dev. det./total range	1.8 ± 0.2 E 00 2/2 (1.8-1.8) E 00	1.7 ± 0.2 E 00 2/2 (1.7-1.7)E 00	1.7 ± 0.2 E 00 2/2 (1.7-1.7)E 00	1.8 ± 0.2 E 00 2/2 (1.8-1.8)E 00
K-40	42, 100	Mean±std.dev. det./total range	1.37 ± 0.1E 03 2/2 (1.29-1.44)E 03	1.49 ± 0.01E 03 2/2 (1.48-1.50)E 03	1.43±0.014E 03 2/2 (1.42±1.44)E 03	1.36 ± 0.04E 03 2/2 (1.33-1.39)E 03
I-131 (by gamma spectroscopy)	42, 100	Mean±std.dev. det./total range	L.T. 7. E 00 0/2 --	L.T. 9. E 00 0/2 --	L.T. 6. E 00 0/2 --	L.T. 9. E 00 0/2 --
Cs-137	42, 100	Mean±std.dev. det./total range	L.T. 4. E 00 0/2 --	L.T. 4. E 00 0/2 --	L.T. 5. E 00 0/2 --	L.T. 5. E 00 0/2 --

TABLE G-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - INGESTION

MILK - OTHER PRODUCERS - PCI/LITER

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER 01/13	SECOND QUARTER 04/13	THIRD QUARTER 07/13	FOURTH QUARTER 10/12
BE-7	42, 100	L.T. 4. E 01 (0/2)	L.T. 4. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 4. E 01 (0/2)
K-40	42, 100	1.37 ± 0.1E 03 (2/2)	1.49 ± 0.01E 03 (2/2)	1.43±0.014E 03 (2/2)	1.36 ± 0.04E 03 (2/2)
Mn-54	42, 100	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 3. E 00 (0/2)	L.T. 4. E 00 (0/2)
Co-58	42, 100	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)
Fe-59	42, 100	L.T. 9. E 00 (0/2)	L.T. 1. E 01 (0/2)	L.T. 8. E 00 (0/2)	L.T. 1. E 01 (0/2)
Co-60	42, 100	L.T. 5. E 00 (0/2)	L.T. 5. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)
Zn-65	42, 100	L.T. 1. E 01 (0/2)	L.T. 1. E 01 (0/2)	L.T. 8. E 00 (0/2)	L.T. 1. E 01 (0/2)
Zr-95	42, 100	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)
Ru-103	42, 100	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 5. E 00 (0/2)
Ru-106	42, 100	L.T. 4. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 4. E 01 (0/2)
I-131	42, 100	L.T. 7. E 00 (0/2)	L.T. 9. E 00 (0/2)	L.T. 6. E 00 (0/2)	L.T. 9. E 00 (0/2)
Cs-134	42, 100	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)
Cs-137	42, 100	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 5. E 00 (0/2)	L.T. 5. E 00 (0/2)
Ba-140	42, 100	L.T. 7. E 00 (0/2)	L.T. 7. E 00 (0/2)	L.T. 5. E 00 (0/2)	L.T. 7. E 00 (0/2)
Ce-141	42, 100	L.T. 8. E 00 (0/2)	L.T. 9. E 00 (0/2)	L.T. 6. E 00 (0/2)	L.T. 8. E 00 (0/2)
Ce-144	42, 100	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)
Ra-226	42, 100	L.T. 9. E 01 (0/2)	L.T. 1. E 02 (0/2)	L.T. 7. E 01 (0/2)	L.T. 9. E 01 (0/2)
Th-228	42, 100	L.T. 7. E 00 (0/2)	L.T. 9. E 00 (0/2)	L.T. 6. E 00 (0/2)	L.T. 7. E 00 (0/2)

H. GROUNDWATER (See Tables H-1 and H-2)

STATIONS 11, 47

Groundwater was collected from two stations quarterly and analyzed for gross beta and gross alpha activity, for tritium and for gamma emitting radionuclides. Station 11 is 0.15 miles from the plant and station 47 is 25.75 miles from the plant.

The gross beta activity averaged 9.5 pCi/liter which is statistically similar to past years. There was one detection of alpha at Station 47 with an activity level of 3.0 pCi/liter. which frequently occurs from natural ground sources. There were no detections of gamma emitters above the normal level of detection. The tritium level averaged 140 pCi/liter for the year which is the normal environmental level.

There was no difference in levels of beta activity or tritium for the station close to the plant as compared with the more distant station. It may be concluded that there was no impact from the operations of CNS on the environment as shown by measurements of radionuclides in groundwater.

Shown in Figure H-1 are the gross alpha, gross beta and tritium levels in groundwater. The levels of these activities have remained essentially unchanged.

FIGURE H-1

GROUNDWATER

QUARTERLY AVERAGE - ALL LOCATIONS

GROSS ALPHA GROSS BETA H-3

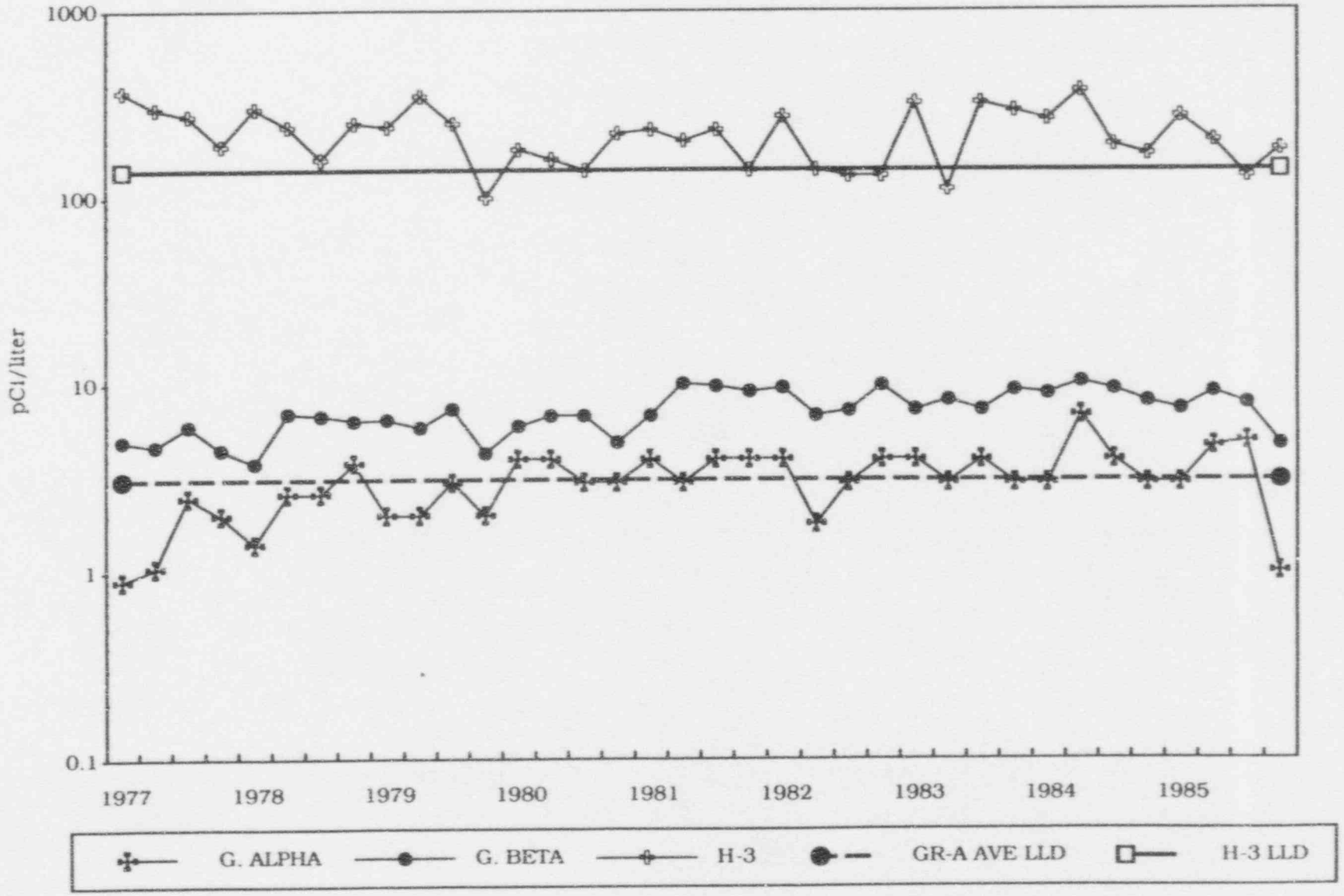

FIGURE H-1

GROUNDWATER

QUARTERLY AVERAGE - ALL LOCATIONS

GROSS ALPHA GROSS BETA H-3

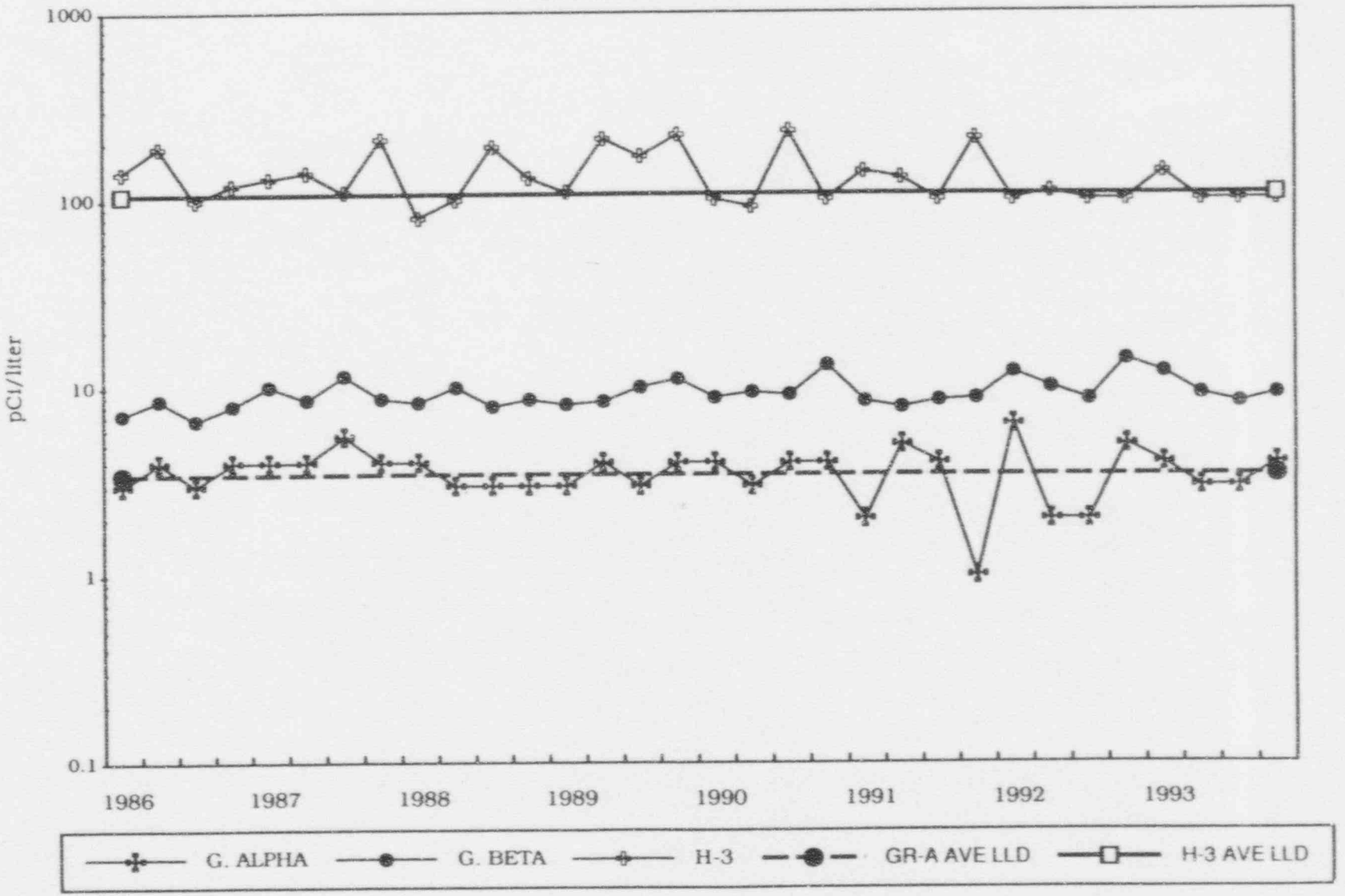

TABLE B-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - WATERBORNE

GROUNDWATER - PCI/LITER

SAMPLE NUCLIDE	STATION NUMBER		FIRST QUARTER 01/19, 01/20	SECOND QUARTER 04/20, 04/21	THIRD QUARTER 07/27, 07-28	FOURTH QUARTER 10/19
GROSS ALPHA	11, 47	Mean±std.dev. det./total range	L.T. 4. E 00 0/2 --	3.0 1.9 E 00 1/2 --	L.T. 3. E 00 0/2 --	L.T. 4. E 00 0/2 --
GROSS BETA	11, 47	Mean±std.dev. det./total range	1.2 ± 0.7 E 01 2/2 (1.1-1.2) E 01	9.2 ± 1.1E 00 2/2 (8.4-10)E 00	8.3 ± 0.1E 00 2/2 (8.2-8.4)E 00	9.2 ± 1.2 E 00 2/2 (8.3-10)E 00
K-40	11, 47	Mean±std.dev. det./total range	L.T. 8. E 01 0/2 --	L.T. 5. E 01 0/2 --	L.T. 6. E 01 0/2 --	L.T. 7. E 01 0/2 --
I-131 (by gamma spectroscopy)	11, 47	Mean±std.dev. det./total range	L.T. 6. E 00 0/2 --	L.T. 6. E 00 0/2 --	L.T. 8. E 00 0/2 --	L.T. 2. E 01 0/2 --
Cs-137	11, 47	Mean±std.dev. det./total range	L.T. 4. E 00 0/2 --	L.T. 4. E 00 0/2 --	L.T. 4. E 00 0/2 --	L.T. 3. E 00 0/2 --
H-3	11, 47	Mean±std.dev. det./total range	1.4 ± 0.8 E 02 1/2 --	L.T. 1. E 02 0/2 --	L.T. 1. E 02 0/2 --	L.T. 1. E 02 0/2 --

TABLE B-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - WATERBORNE

GROUNDWATER - PCI/LITER

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER 01/19, 01/20	SECOND QUARTER 04/20, 04/21	THIRD QUARTER 07/27, 07/28	FOURTH QUARTER 10/19
BE-7	11, 47	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)
K-40	11, 47	L.T. 8. E 01 (0/2)	L.T. 5. E 01 (0/2)	L.T. 6. E 01 (0/2)	L.T. 7. E 01 (0/2)
Mn-54	11, 47	L.T. 3. E 00 (0/2)	L.T. 3. E 00 (0/2)	L.T. 3. E 00 (0/2)	L.T. 3. E 00 (0/2)
Co-58	11, 47	L.T. 3. E 00 (0/2)	L.T. 3. E 00 (0/2)	L.T. 3. E 00 (0/2)	L.T. 3. E 00 (0/2)
Fe-59	11, 47	L.T. 7. E 00 (0/2)	L.T. 7. E 00 (0/2)	L.T. 7. E 00 (0/2)	L.T. 7. E 00 (0/2)
Co-60	11, 47	L.T. 3. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 3. E 00 (0/2)	L.T. 4. E 00 (0/2)
Zn-65	11, 47	L.T. 8. E 00 (0/2)	L.T. 9. E 00 (0/2)	L.T. 8. E 00 (0/2)	L.T. 8. E 00 (0/2)
Zr-95	11, 47	L.T. 3. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)
Ru-103	11, 47	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 5. E 00 (0/2)
Ru-106	11, 47	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)
I-131	11, 47	L.T. 6. E 00 (0/2)	L.T. 6. E 00 (0/2)	L.T. 8. E 00 (0/2)	L.T. 2. E 01 (0/2)
Cs-134	11, 47	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 3. E 00 (0/2)
Cs-137	11, 47	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 4. E 00 (0/2)	L.T. 3. E 00 (0/2)
Ba-140	11, 47	L.T. 6. E 00 (0/2)	L.T. 6. E 00 (0/2)	L.T. 6. E 00 (0/2)	L.T. 8. E 00 (0/2)
Ce-141	11, 47	L.T. 8. E 00 (0/2)	L.T. 6. E 00 (0/2)	L.T. 9. E 00 (0/2)	L.T. 9. E 00 (0/2)
Ce-144	11, 47	L.T. 3. E 01 (0/2)	L.T. 2. E 01 (0/2)	L.T. 3. E 01 (0/2)	L.T. 3. E 01 (0/2)
Ra-226	11, 47	L.T. 9. E 01 (0/2)	L.T. 6. E 01 (0/2)	L.T. 1. E 02 (0/2)	L.T. 8. E 01 (0/2)
Th-228	11, 47	L.T. 7. E 00 (0/2)	L.T. 6. E 00 (0/2)	L.T. 8. E 00 (0/2)	L.T. 7. E 00 (0/2)

I. RIVER WATER (See Table I-1 and I-2)

STATIONS 12, 28

River water was collected monthly and monitored for gross beta and gross alpha, suspended and dissolved, Sr-89 and Sr-90 plus gamma emitting isotopes. A quarterly composite was measured for tritium.

There were three detections of potassium-40 with an average of (66.0 pCi/l) above the normal level of detection. There were no detections of Sr-89 and Sr-90.

The average gross alpha and gross beta readings were similar to previous years as indicated in the summary of 1992 and 1993 averages below:

	1992 Average pCi/liter	1993 Average pCi/liter
Gross Alpha (dissolved)	4.4	4.0
Gross Alpha (suspended)	3.1	3.9
Gross Beta (dissolved)	18.0	13.0
Gross Beta (suspended)	7.5	15.0

Figure I-1, which follows, is a plot of the gross alpha and gross beta of suspended and dissolved particles. The results for 1986 through 1993 are on the second page. The levels of activity continued to rise and fall within statistical limits depending on water levels and turbulence and were probably due to naturally occurring isotopes. No fission or reactor activation products were detected. Figure I-2 illustrates the level of activity for tritium, Sr-89 and Sr-90.

FIGURE I-1

RIVER WATER

QUARTERLY AVERAGE - ALL LOCATIONS

GROSS ALPHA AND GROSS BETA (SUSPENDED AND DISSOLVED SOLIDS)

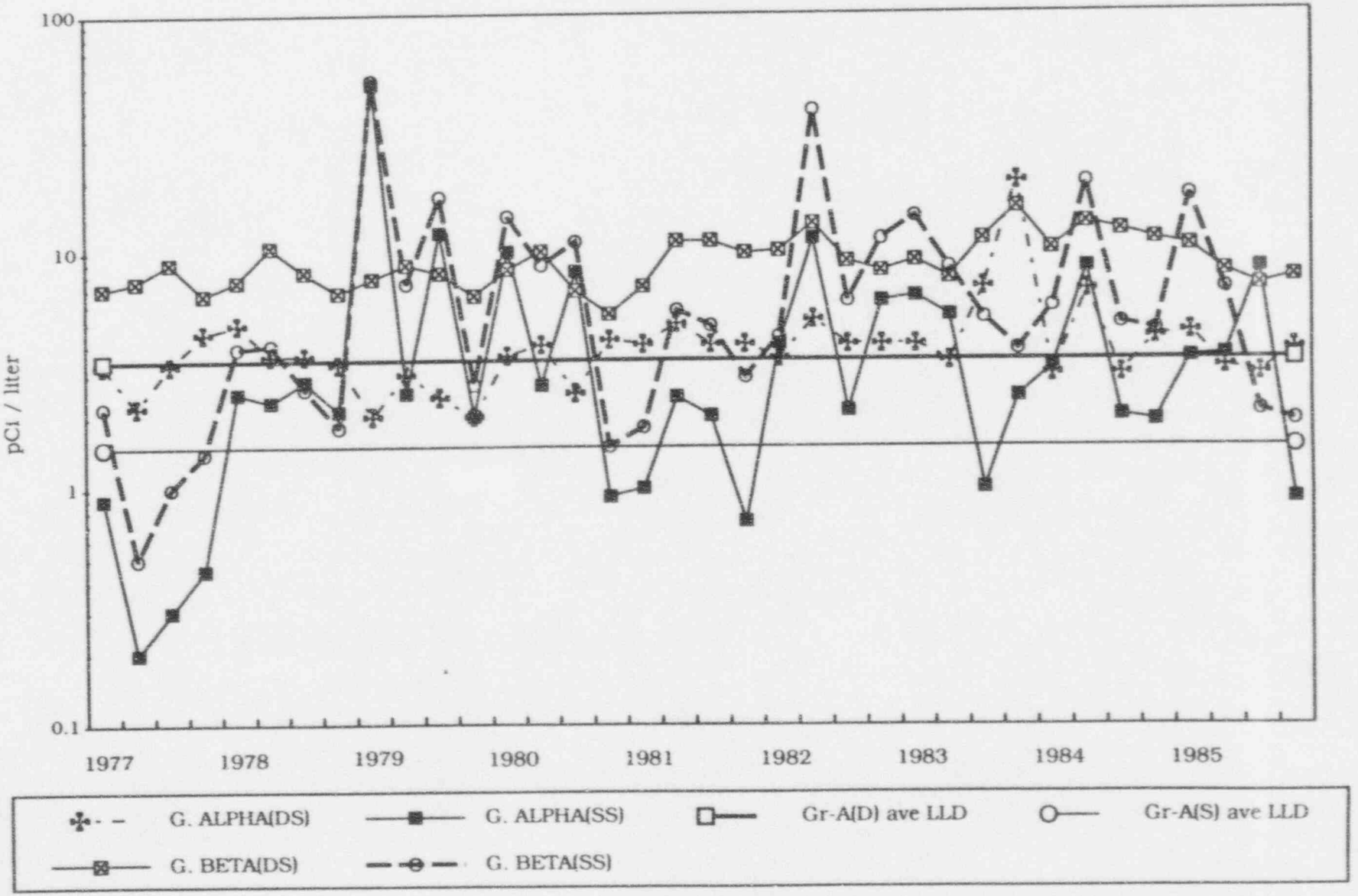

FIGURE I-1

RIVER WATER

QUARTERLY AVERAGE - ALL LOCATIONS

GROSS ALPHA AND GROSS BETA (SUSPENDED AND DISSOLVED SOLIDS)

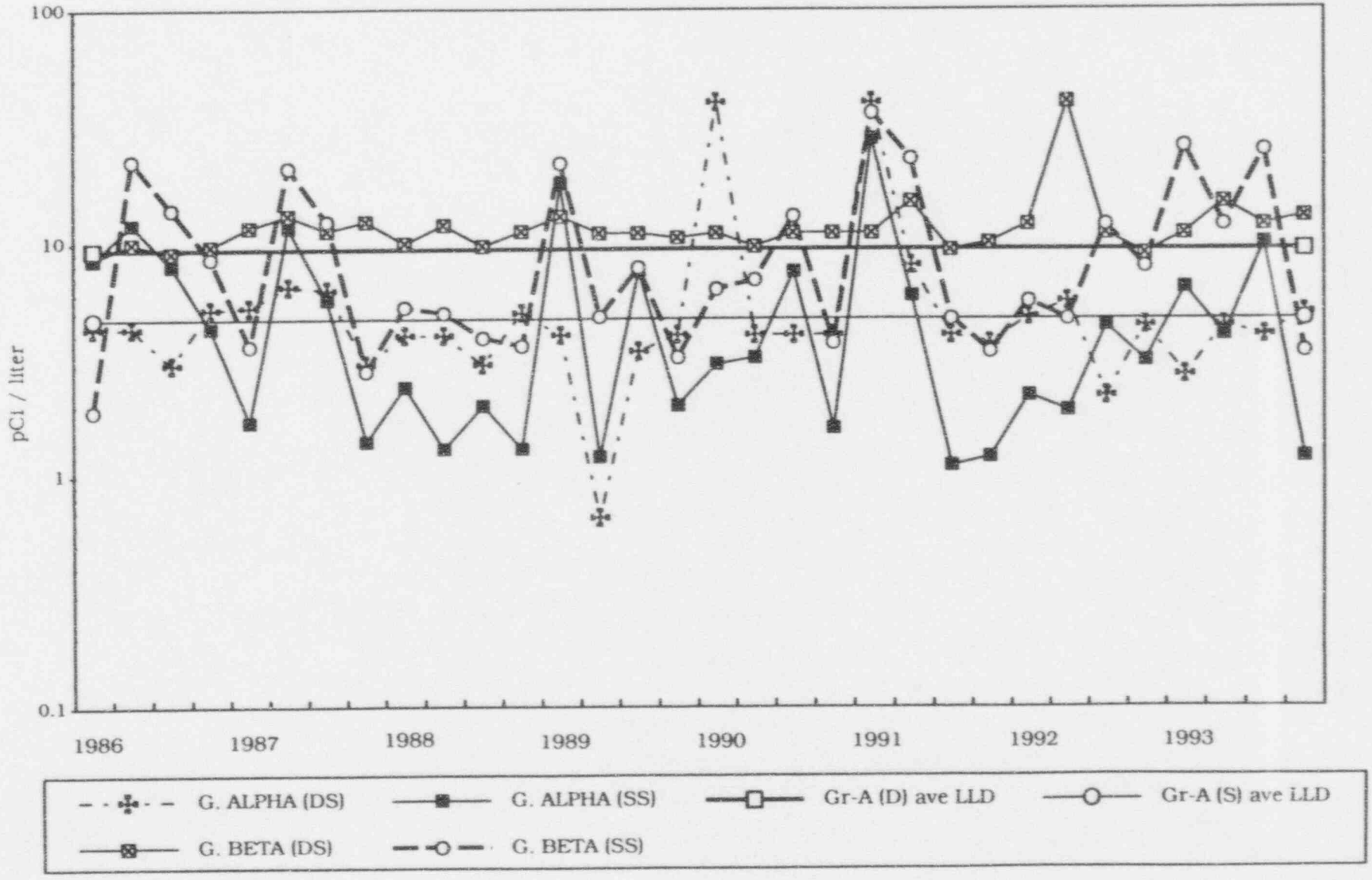

FIGURE I-2
RIVER WATER
QUARTERLY AVERAGE - ALL LOCATIONS
SR-89 SR-90 H-3

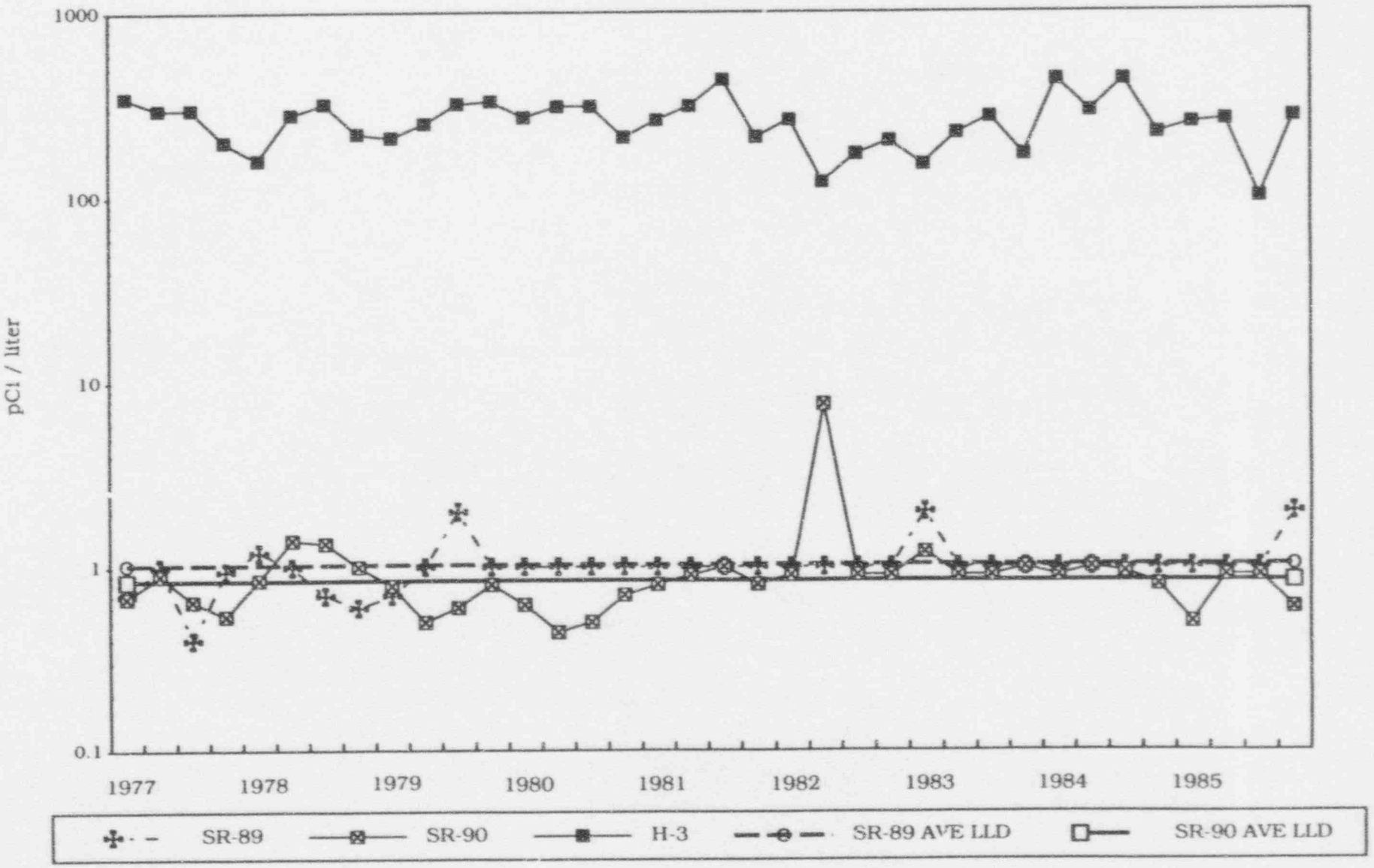

FIGURE I-2

RIVER WATER

QUARTERLY AVERAGE - ALL LOCATIONS

SR-89 SR-90 H-3

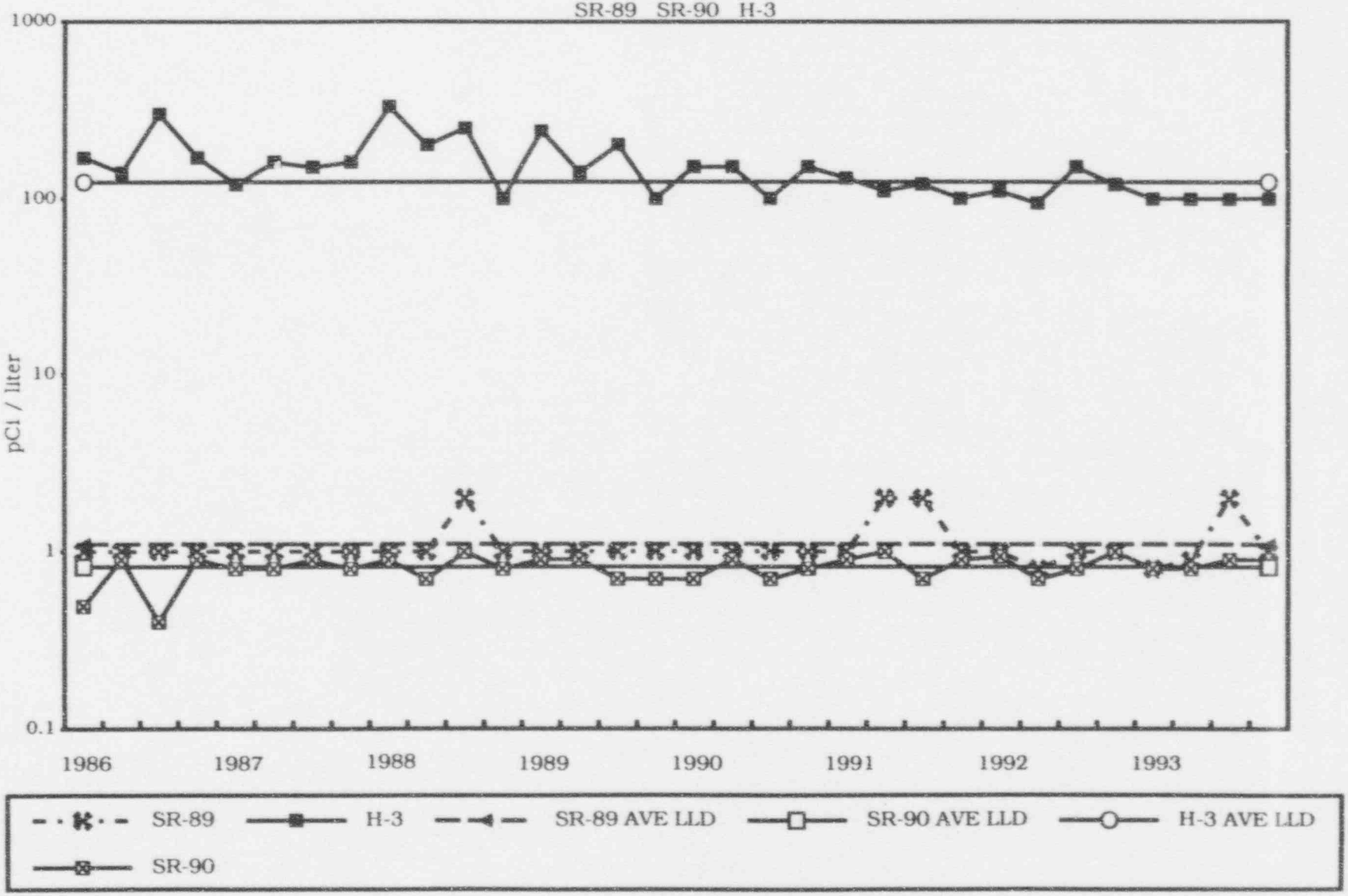

TABLE I-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - WATERBORNE

WATER - RIVER

PCI/LITER

SAMPLE NUCLIDE	STATION NUMBER		FIRST QUARTER 01/19-03/09	SECOND QUARTER 04/06-06/01	THIRD QUARTER 07/06-09/07	FOURTH QUARTER 10/05-12/07
GROSS ALPHA (dissolved)	12, 28	Mean±std.dev. det./total range	2.7 ± 2.6 E 00 2/6 (0.9-4.6) E 00	4.4 ± 0.8 E 00 4/6 (3.3-5.0)E 00	L.T. 4. E 00 0/4 --	5.0 ± 3.8 E 00 1/6 --
GROSS ALPHA (suspended)	12, 28	Mean±std.dev. det./total range	6.4 ± 6.6 E 00 4/6 (0.6-1.3) E 01	4.0 ± 1.6 E 00 5/6 (2.6-6.4)E 00	L.T. 1. E 01 0/4 --	1.2 ± 0.5 E 00 4/6 (0.4-1.6)E 00
GROSS BETA (dissolved)	12, 28	Mean±std.dev. det./total range	1.1 ± 0.4 E 01 6/6 (0.49-1.6)E 01	1.5 ± 0.4 E 01 6/6 (1.2-2.3)E 01	1.2 ± 0.2 E 01 4/4 (1.0-1.4) E 01	1.3 ± 0.4 E 01 6/6 (8.3-19)E 00
GROSS BETA (suspended)	12, 28	Mean±std.dev. det./total range	2.6 ± 4.0 E 01 6/6 (0.14-9.5)E 01	1.2 ± 0.6 E 01 6/6 (5.2-21)E 00	2.5 ± 2.9 E 01 3/4 (0.77-5.8)E 01	3.4 ± 1.3 E 00 6/6 (2.0-5.7)E 00
Sr-89	12, 28	Mean±std.dev. det./total range	L.T. 8. E-01 0/6 --	L.T. 9. E-01 0/6 --	L.T. 2. E 00 0/4 --	L.T. 1. E 00 0/6 --
Sr-90	12, 28	Mean±std.dev. det./total range	L.T. 8 E-01 0/6 --	L.T. 8. E-01 0/6 --	L.T. 9. E-01 0/4 --	L.T. 9. E-01 0/6 --
H-3 (a)	12, 28	Mean±std.dev. det./total range	L.T. 1. E 02 0/2 --	L.T. 1. E 02 0/2 --	L.T. 1. E 02 0/2 --	L.T. 1. E 02 0/2 --
I-131 (by gamma spectroscopy)	12, 28	Mean±std.dev. det./total range	L.T. 8. E 00 0/6 --	L.T. 1. E 01 0/6 --	L.T. 8. E 00 0/4 --	L.T. 2. E 01 0/6 --
Cs-137	12, 28	Mean±std.dev. det./total range	L.T. 5. E 00 0/6 --	L.T. 5. E 00 0/6 --	L.T. 4. E 00 0/4 --	L.T. 5. E 00 0/6 --

(a) Tritium analysis is performed on the quarterly composite of each station only.

TABLE I-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - WATERBORNE

WATER - RIVER

PCI/LITER

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER 01/19-03/09	SECOND QUARTER 04/06-06/01	THIRD QUARTER 07/06-09/07	FOURTH QUARTER 10/05-12/07
BE-7	12, 28	L.T. 4. E 01 (0/6)	L.T. 4. E 01 (0/6)	L.T. 3. E 01 (0/4)	L.T. 4. E 01 (0/6)
K-40	12, 28	6.13±3.24 E 01 (1/6)	6.6 ± 2.8 E 01 (1/6)	6.8 ± 2.6 E 01 (4/4)	7.08 ± 2.80E 01 (1/6)
Mn-54	12, 28	L.T. 4. E 00 (0/6)	L.T. 4. E 00 (0/6)	L.T. 4. E 00 (0/4)	L.T. 4. E 00 (0/6)
Co-58	12, 28	L.T. 4. E 00 (0/6)	L.T. 4. E 00 (0/6)	L.T. 4. E 00 (0/4)	L.T. 5. E 00 (0/6)
Fe-59	12, 28	L.T. 9. E 00 (0/6)	L.T. 8. E 00 (0/6)	L.T. 7. E 00 (0/4)	L.T. 1. E 01 (0/6)
Co-60	12, 28	L.T. 4. E 00 (0/6)	L.T. 4. E 00 (0/6)	L.T. 3. E 00 (0/4)	L.T. 4. E 00 (0/6)
Zn-65	12, 28	L.T. 1. E 01 (0/6)	L.T. 8. E 00 (0/6)	L.T. 7. E 00 (0/4)	L.T. 1. E 01 (0/6)
Zr-95	12, 28	L.T. 4. E 00 (0/6)	L.T. 4. E 00 (0/6)	L.T. 4. E 00 (0/4)	L.T. 5. E 00 (0/6)
Ru-103	12, 28	L.T. 5. E 00 (0/6)	L.T. 5. E 00 (0/6)	L.T. 4. E 00 (0/4)	L.T. 5. E 00 (0/6)
Ru-106	12, 28	L.T. 4. E 01 (0/6)	L.T. 4. E 01 (0/6)	L.T. 4. E 01 (0/4)	L.T. 4. E 01 (0/6)
I-131	12, 28	L.T. 8. E 00 (0/6)	L.T. 1. E 01 (0/6)	L.T. 8. E 00 (0/4)	L.T. 2. E 01 (0/6)
Cs-134	12, 28	L.T. 5. E 00 (0/6)	L.T. 4. E 00 (0/6)	L.T. 4. E 00 (0/4)	L.T. 5. E 00 (0/6)
Cs-137	12, 28	L.T. 5. E 00 (0/6)	L.T. 5. E 00 (0/6)	L.T. 4. E 00 (0/4)	L.T. 5. E 00 (0/6)
Ba-140	12, 28	L.T. 6. E 00 (0/6)	L.T. 8. E 00 (0/6)	L.T. 6. E 00 (0/4)	L.T. 1. E 01 (0/6)
Ce-141	12, 28	L.T. 8. E 00 (0/6)	L.T. 9. E 00 (0/6)	L.T. 6. E 00 (0/4)	L.T. 1. E 01 (0/6)
Ce-144	12, 28	L.T. 3. E 01 (0/6)	L.T. 4. E 01 (0/6)	L.T. 2. E 01 (0/4)	L.T. 3. E 01 (0/4)
Ra-226	12, 28	L.T. 9. E 01 (0/6)	L.T. 1. E 02 (0/6)	L.T. 7. E 01 (0/4)	L.T. 1. E 02 (0/6)
Th-228	12, 28	L.T. 7. E 00 (0/6)	L.T. 1. E 01 (0/6)	L.T. 7. E 00 (0/4)	L.T. 8. E 00 (0/6)

J. AMBIENT RADIATION - THERMOLUMINESCENT DOSIMETERS

(TLDs - See Tables J-1 AND J-2)

STATIONS 01-10, 20, 44, 56, 58, 59, 66, 67, 71, 79-91, 94

Ambient radiation was monitored at 32 locations within a 10 mile radius of CNS and collected quarterly. The quarterly averages for all stations of ambient net gamma radiation ranged from 11.8 milliRoentgen/quarter to 32.0 milliRoentgen/quarter. The highest exposure during each of the four quarters was at Station 01 (0.1 mile, 225 degrees) and averaged 23.2 mR/quarter. The lowest exposure was at Station 03 (2.5 miles, 338 degrees) averaging 14.0 milliRoentgen/quarter.

The radiation at station 44, (10.5 miles, 270 degrees) which is the control station, was an average of 19.4 mR/quarter. This was similar to other stations and to the average of all stations which was 17.0 mR/quarter.

The average total exposure for the year was 67.2 mR which is considerably below the 125 millirems per quarter specified in 10 CFR 20.105 for an unrestricted area. The relationship between milliRoentgen (mR) and millirems (mr) is approximately one for the exposure conditions encountered. No plant effect from CNS was indicated.

The gamma exposures monitored by thermoluminescent dosimeters from 1977 through 1993 are plotted on Figure J-1. The data from year to year is in good agreement and indicates no adverse changes in radiation exposure to the population near CNS.

FIGURE J-1

AMBIENT RADIATION

THERMOLUMINESCENT DOSIMETRY

QUARTERLY AVERAGE - ALL LOCATIONS

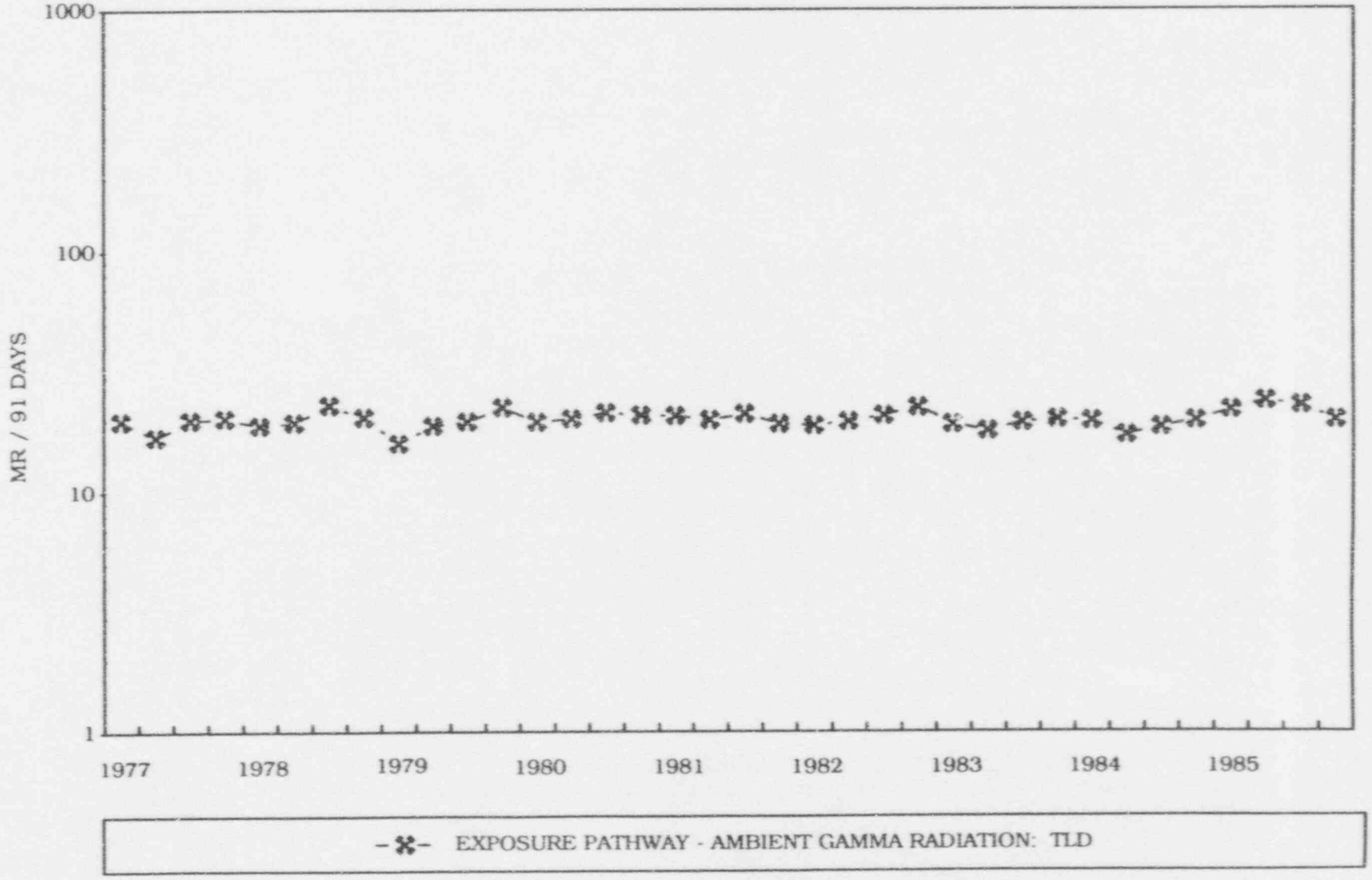

FIGURE J-1

AMBIENT RADIATION

THERMOLUMINESCENT DOSIMETRY

QUARTERLY AVERAGE - ALL LOCATIONS

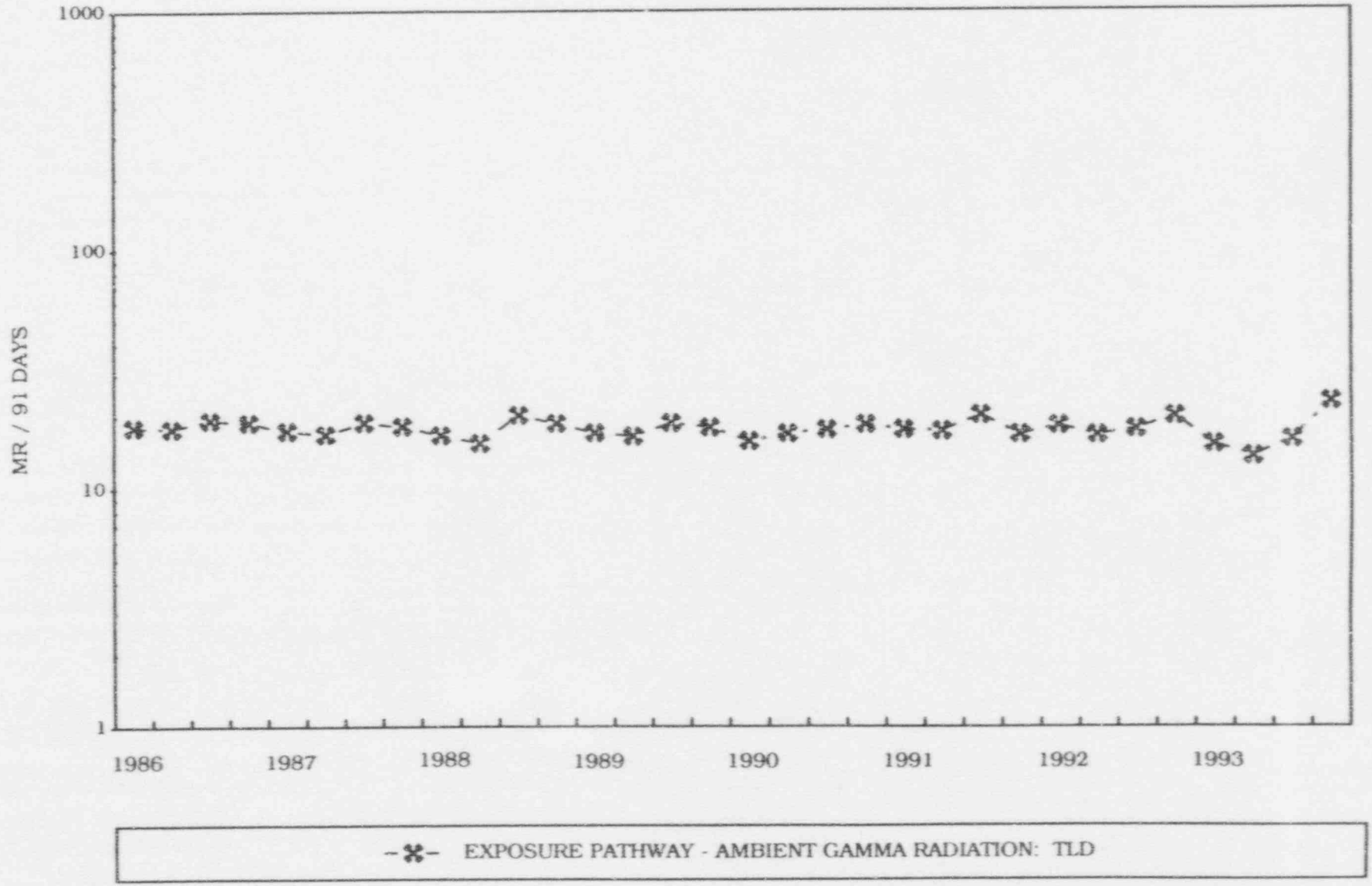

TABLE J-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD

milliRoentgen/Quarter

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER 01/15-04/19	SECOND QUARTER 04/16-07/01	THIRD QUARTER 07/01-10/15	FOURTH QUARTER 10/15-01/12
TLD (Gamma)	01	20.4 ± 1.7	13.9 ± 0.5	26.8 ± 3.7	31.5 ± 0.9
	02	13.2 ± 0.5	13.3 ± 0.6	13.9 ± 1.1	20.1 ± 0.9
	03	12.4 ± 0.4	14.2 ± 0.7	12.3 ± 0.6	17.0 ± 1.0
	04	14.6 ± 0.4	11.9 ± 0.6	13.5 ± 0.7	22.2 ± 1.0
	05	14.2 ± 0.5	12.6 ± 0.5	14.1 ± 1.1	23.2 ± 2.1
	06	15.1 ± 0.5	12.5 ± 0.7	14.3 ± 0.7	21.5 ± 2.0
	07	14.1 ± 0.7	15.1 ± 0.6	14.9 ± 0.6	21.2 ± 0.7
	08	14.5 ± 0.7	12.6 ± 0.8	16.0 ± 0.7	25.0 ± 1.1
	09	16.2 ± 1.5	12.0 ± 0.5	15.3 ± 0.9	22.0 ± 1.3
	10	16.3 ± 0.7	12.5 ± 0.5	15.3 ± 1.1	19.6 ± 1.8
	20	14.6 ± 0.6	14.8 ± 0.7	16.0 ± 0.9	21.2 ± 2.8
	44	14.6 ± 0.0	14.5 ± 0.6	21.8 ± 3.1	26.9 ± 3.4
	56	13.8 ± 0.4	12.1 ± 0.3	15.0 ± 1.0	19.2 ± 1.7
	58	16.7 ± 0.6	14.7 ± 0.7	15.9 ± 0.8	20.8 ± 0.6
	59	15.4 ± 0.5	15.0 ± 1.0	16.5 ± 1.1	22.8 ± 1.4
	66	16.6 ± 0.9	12.7 ± 0.8	17.6 ± 0.8	26.3 ± 1.9
	67	15.3 ± 0.8	13.6 ± 0.2	17.8 ± 0.6	22.4 ± 1.6
	71	*	12.3 ± 0.3	15.5 ± 1.3	25.2 ± 1.7

*STA-71 was badly burned during grass fire two weeks before collection.

TABLE J-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD

milliRoentgen/Quarter

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER 01/15-04/19	SECOND QUARTER 04/16/93-07/01/93	THIRD QUARTER 07/01-10/15	FOURTH QUARTER 10/15-01/11
TLD (Gamma)	79	14.6 ± 1.3	11.8 ± 0.3	15.7 ± 0.5	21.3 ± 1.8
	80	14.4 ± 0.5	14.8 ± 0.6	14.8 ± 1.3	24.9 ± 2.2
	81	17.8 ± 1.6	13.4 ± 0.3	16.2 ± 0.9	26.8 ± 1.3
	82	14.5 ± 0.8	13.2 ± 1.1	15.7 ± 1.2	20.2 ± 2.4
	83	17.5 ± 1.1	16.4 ± 1.5	16.7 ± 0.9	24.9 ± 1.8
	84	15.1 ± 0.7	14.1 ± 0.4	18.0 ± 1.1	22.5 ± 1.0
	85	14.6 ± 0.5	12.8 ± 0.7	14.2 ± 0.8	19.9 ± 1.7
	86	15.0 ± 0.6	13.3 ± 0.9	15.5 ± 0.8	23.0 ± 0.7
	87	13.4 ± 1.2	14.8 ± 0.3	16.0 ± 0.8	23.2 ± 0.8
	88	13.9 ± 0.7	12.3 ± 0.7	15.0 ± 0.8	25.7 ± 3.2
	89	15.9 ± 0.8	15.9 ± 0.5	16.6 ± 0.6	23.6 ± 0.9
	90	15.5 ± 0.1	14.9 ± 0.7	15.1 ± 0.8	25.2 ± 5.0
	91	13.5 ± 0.6	12.2 ± 0.4	15.4 ± 0.7	20.3 ± 2.1
	94	15.2 ± 0.2	13.8 ± 0.8	14.8 ± 0.9	24.6 ± 2.7
Average/Quarter		90.5 days 15.2±1.6 mR/90.5 days	74.3 days 13.6±1.3 mR/74.3 days	106 days 16.0±2.6 mR/106 days	85 days 22.9±2.9 mR/85 days
Average/Day		0.17±0.02 mR/day	0.18±0.02 mR day	0.15±0.02 mR day	0.27±0.03
Range		(12-20)mR/90.5 days	(12-16)mR 74.3 days	(12-27)mR 106 days	(17-32)mR 85 days
Det./Total		31/31	32/32	32/32	32/32

TABLE J-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD

milliRoentgen/Quarter

SAMPLE NUCLIDE	STATION NUMBER	Aver./Quarter	TOTAL mR/year 01/15-01/11/94
TLD (Gamma)	01	23.2 ± 7.8	92.9
	02	15.1 ± 3.3	60.5
	03	13.9 ± 2.2	55.9
	04	15.6 ± 4.6	62.2
	05	16.0 ± 4.8	64.1
	06	16.1 ± 3.9	64.4
	07	16.3 ± 3.3	65.3
	08	17.0 ± 5.5	68.1
	09	16.4 ± 4.2	65.5
	10	15.9 ± 2.9	63.7
	20	16.7 ± 3.1	66.6
	44	19.4 ± 6.0	77.8
	56	15.0 ± 3.0	60.1
	58	17.0 ± 2.7	68.1
	59	17.4 ± 3.6	69.7
	66	18.3 ± 5.7	73.2
	67	17.3 ± 3.8	69.1
	71	17.8 ± 6.9	53.3

TABLE J-2

1992 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD

milliRoentgen/Quarter

SAMPLE NUCLIDE	STATION NUMBER	Aver./Quarter	TOTAL mR/year 01/15-01/11/94
TLD (Gamma)	79	15.9 ± 4.0	63.4
	80	17.2 ± 5.1	68.9
	81	18.6 ± 5.8	74.2
	82	15.9 ± 3.0	63.6
	83	18.9 ± 4.0	75.5
	84	17.4 ± 3.8	69.7
	85	15.4 ± 3.1	61.5
	86	16.7 ± 4.3	66.8
	87	16.9 ± 4.4	67.4
	88	16.7 ± 6.1	66.9
	89	18.0 ± 3.8	72.0
	90	17.7 ± 5.0	70.7
	91	15.4 ± 3.6	61.4
	94	17.1 ± 5.0	68.4
		16.9 ± 1.3 Average mR/Quarter	67.2±7.1
		Range(14-23)	Aver. total mR year. All stations
			Range (53.3-92.9)

K. VEGETATION, BROADLEAF (See Tables K-1 and K-2)

STATIONS 35, 44, 96

Broadleaf vegetation was collected each month during the growing season, May through October. Three samples were collected each month from each station plus a quality control sample except for July when no samples were collected from Station 35. The samples were tested for I-131 by chemical separation and for gamma emitting isotopes by high resolution spectrometry.

The naturally occurring isotopes Be-7, K-40, Ra-226 and Th-228 were detected in the samples at normal environmental levels. No I-131 was detected in any of the 57 samples. Cesium-137 was detected in four samples at an average of 0.018 pCi/gm, wet. Cesium-137 is detected in other areas of the United States and is attributed to fallout from previous atomic weapons testing. The amounts detected are not considered to be significant.

See Figure K-1 for the levels of activities in food samples as represented in broadleaf vegetation in 1993.

FIGURE K-1

FOOD - BROADLEAF VEGETATION

QUARTERLY AVERAGE - ALL STATIONS

K-40 I-131 CS-137

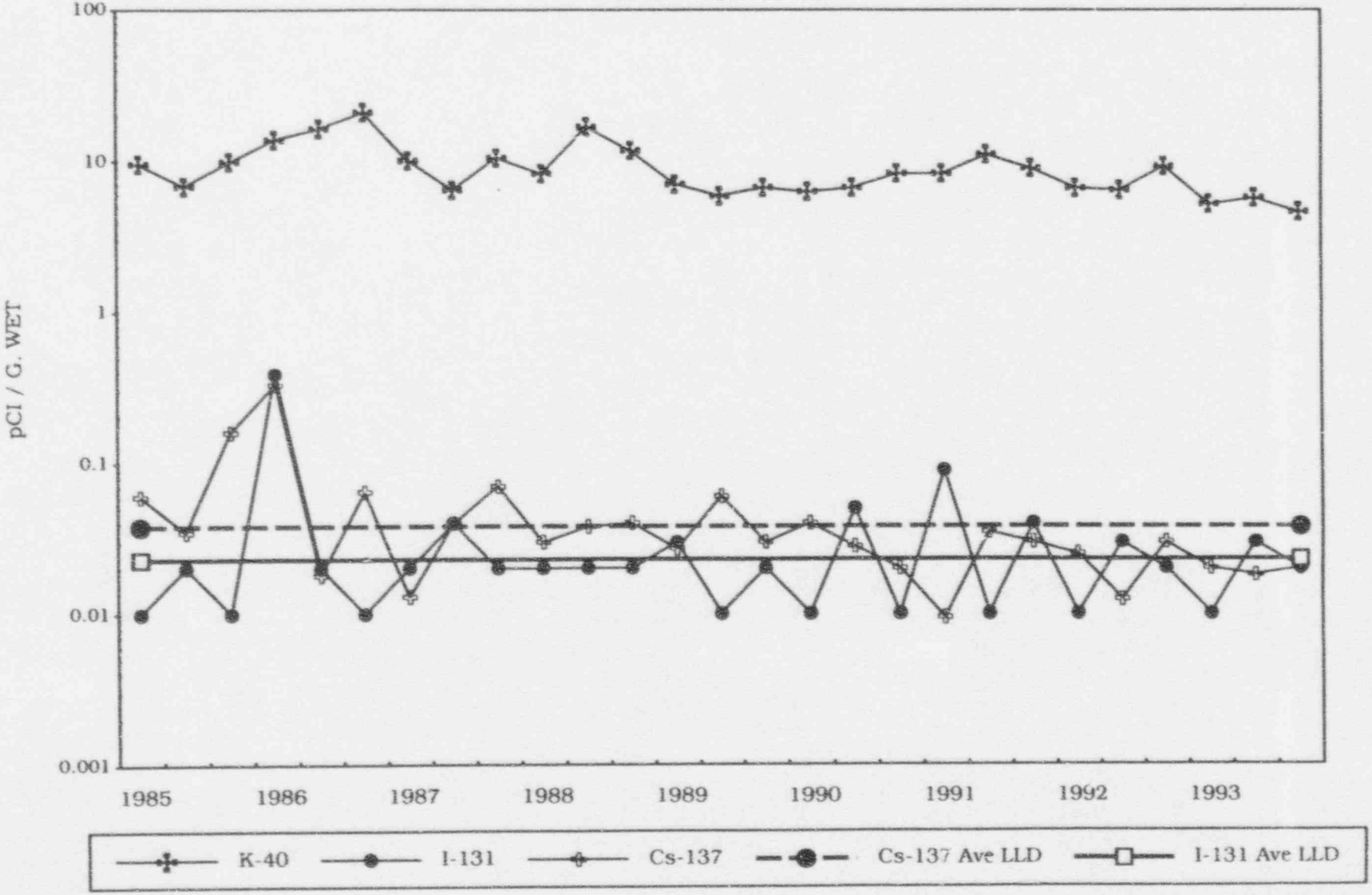

TABLE K-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - INGESTION

BROADLEAF TERRESTRIAL VEGETATION

PCI/GM, WET

SAMPLE NUCLIDE	STATION NUMBER		SECOND QUARTER 05/18, 05/19, 06/15	THIRD QUARTER 07/20, 08/17, 09/28	FOURTH QUARTER 10/19
I-131 (by chemical (separation)	35,44,96	Mean±std.dev. det./total range	L.T. 1. E-02 0/20 --	L.T. 3. E-02 0/27 --	L.T. 2. E-02 0/10 --
Be-7	35,44,96	Mean±std.dev. det./total range	1.5 ± 1.1 E 00 20/20 (0.2 - 4.4) E 00	3.1 ± 1.8 E 00 27/27 (0.78-8.28)E 00	5.7 ± 3.0 E 00 10/10 (1.5-11)E 00
K-40	35,44,96	Mean±std.dev. det./total range	5.2 ± 1.0 E 00 20/20 (3.6 - 7.6) E 00	5.7 ± 3.1 E 00 27/27 (2.1-13)E 00	4.6 ± 2.6 E 00 10/10 (1.1-10)E 00
Co-60	35,44,96	Mean±std.dev. det./total range	L. T. 2. E-02 0/20 --	L.T. 2. E-02 0/27 --	L. T. 2. E-02 0/10 --
Ru-103	35,44,96	Mean±std.dev. det./total range	L. T. 2. E-02 0/20 --	L.T. 3. E-02 0/27 --	L. T. 2. E-02 0/10 --
I-131 (by gamma spectroscopy)	35,44,96	Mean±std.dev. det./total range	L. T. 4. E-02 0/20 --	L.T. 1. E-01 0/27 --	L. T. 7. E-02 0/10 --
Cs-134	35,44,96	Mean±std.dev. det./total range	L. T. 2. E-02 0/20 --	L.T. 2. E-02 0/27 --	L. T. 2. E-02 0/10 --
Cs-137	35,44,96	Mean±std.dev. det./total range	L.T. 2. E-02 0/20 --	1.8 ± 0.5 E-02 4/27 (1.2-2.2)E-02	L. T. 2. E-02 0/10 --

TABLE K-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - INGESTION

BROADLEAF TERRESTRIAL VEGETATION

PCI/GM, WET

SAMPLE NUCLIDE	STATION NUMBER		SECOND QUARTER 05/18, 05/19, 06/15	THIRD QUARTER 07/20, 08/17, 09/28	FOURTH QUARTER 10/19
Ba-140	35,44,96	Mean±std.dev. det./total range	L. T. 3. E-02 0/20 --	L. T. 5. E-02 0/27 --	L. T. 4. E-02 0/10 --
Ra-226	35,44,96	Mean±std.dev. det./total range	3.1 ± 1.5 E-01 1/20 --	4.6 ± 1.2 E-01 2/27 (3.8-5.5)E-01	L. T. 5. E-01 0/10 --
Th-228	35,44,96	Mean±std.dev. det./total range	3.5 ± 1.7 E-02 4/20 --	1.2 ± 1.1 E-01 6/27 (0.2-2.9)E-01	4.6 ± 1.7 E-02 1/10 --

TABLE K-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - INGESTION

BROADLEAF TERRESTRIAL VEGETATION - PCI/GM, WET

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER	SECOND QUARTER 05/18, 05/19, 06/15	THIRD QUARTER 07/20, 08/17, 09/28	FOURTH QUARTER 10/19
BE-7	35,96,98		1.5 ± 1.1 E 00(20/20)	3.1 ± 1.8 E 00 (26/27)	5.7 ± 3.0 E 00 (10/10)
K-40	35,96,98		5.2 ± 1.0 E 00(20/20)	5.7 ± 3.1 E 00 (27/27)	4.6 ± 2.6 E 00 (10/10)
Mn-54	35,96,98		L.T. 2. E-02 (0/20)	L.T. 2. E-02 (0/27)	L.T. 2. E-02 (0/10)
Co-58	35,96,98		L.T. 2. E-02 (0/20)	L.T. 2. E-02 (0/27)	L.T. 2. E-02 (0/10)
Fe-59	35,96,98		L.T. 4. E-02 (0/20)	L.T. 5. E-02 (0/27)	L.T. 5. E-02 (0/10)
Co-60	35,96,98		L.T. 2. E-02 (0/20)	L.T. 2. E-02 (0/27)	L.T. 2. E-02 (0/10)
Zn-65	35,96,98		L.T. 4. E-02 (0/20)	L.T. 5. E-02 (0/27)	L.T. 5. E-02 (0/10)
Zr-95	35,96,98		L.T. 2. E-02 (0/20)	L.T. 2. E-02 (0/27)	L.T. 2. E-02 (0/10)
Ru-103	35,96,98		L.T. 2. E-02 (0/20)	L.T. 3. E-02 (0/27)	L.T. 2. E-02 (0/10)
Ru-106	35,96,98		L.T. 1. E-01 (0/20)	L.T. 2. E-01 (0/27)	L.T. 2. E-01 (0/10)
I-131	35,96,98		L.T. 4. E-02 (0/20)	L.T. 1. E-01 (0/27)	L.T. 7. E-02 (0/10)
Cs-134	35,96,98		L.T. 2. E-02 (0/20)	L.T. 2. E-02 (0/27)	L.T. 2. E-02 (0/10)
Cs-137	35,96,98		L.T. 2. E-02 (0/20)	1.8 ± 0.5 E-02 (4/27)	L.T. 2. E-02 (0/10)
Ba-140	35,96,98		L.T. 3. E-02 (0/20)	L.T. 5. E-02 (0/27)	L.T. 4. E-02 (0/10)
Ce-141	35,96,98		L.T. 3. E-02 (0/20)	L.T. 4. E-02 (0/27)	L.T. 5. E-02 (0/10)
Ce-144	35,96,98		L.T. 1. E-01 (0/20)	L.T. 1. E-01 (0/27)	L.T. 2. E-01 (0/10)
Ra-226	35,96,98		3.1 ± 1.5 E-01 (1/20)	4.63±1.2 E-01 (2/27)	L.T. 5. E-01 (0/10)
Th-228	35,96,98		3.5 ± 1.7 E-02 (4/20)	1.2 ± 1.1 E-01 (6/27)	4.6 ± ± 1.7 E-02(1/10)

L. SHORELINE SEDIMENT

STATION 28

Shoreline sediment samples were collected in the spring and fall from Station 28, 1.8 miles, 150 degrees downstream of the release point of CNS. They were analyzed for gamma emitters by means of a high resolution gamma spectrometer. In the samples collected the naturally occurring isotopes Be-7, K-40, Ra-226 and Th-228 were detected at normal environmental levels. Cesium-137, a fission product, was detected at an average level of 0.052 pCi/gm, dry.

For the samples collected in the fourth quarter the naturally occurring isotopes K-40, Ra-226 and Th-228 were detected at about the same level as in the second quarter. Beryllium-7 was detected at a level of 0.26 pCi/gm dry in the second quarter and 0.63 in the fourth quarter. Manganese-54, an activation product, was detected at a level of 0.015 pCi/gm dry in the spring. Cerium-141 was detected in the fourth quarter sample at a level of 0.0422 pCi/gm dry. All other nuclides were below the detection limit for both the spring and fall.

Presented in Figure L-1 are the plots of the radionuclides K-40, I-131, Cs-134 and Cs-137 in shoreline sediment since 1985. No detections of I-131 nor Cs-134 were seen and K-40 was at a normal environmental level. The Cs-137 was at a low level which is found in many areas and media. Since sediment tends to trap and retain any elements in the water pathway, it acts as a good indicator of the effects on the water pathway of any reactor effluents.

FIGURE L-1
SHORELINE SEDIMENT
QUARTERLY AVERAGE - STATION 28
K-40 I-131 CS-134 CS-137

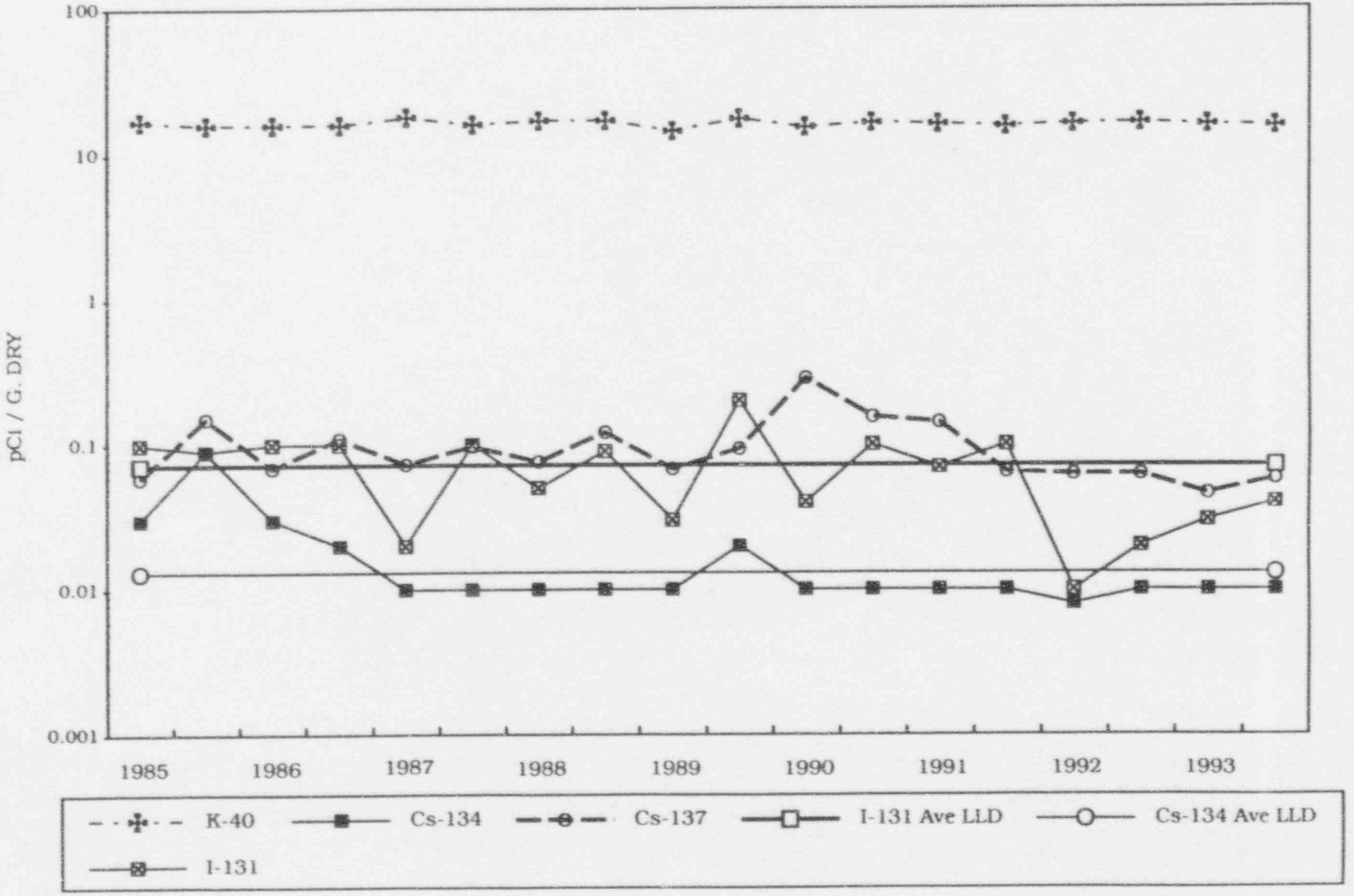

TABLE L-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AQUATIC

SHORELINE SEDIMENT - PCI/GM, DRY

SAMPLE NUCLIDE	STATION NUMBER		SECOND QUARTER 05/04	THIRD QUARTER	FOURTH QUARTER 10/26
Be-7	28	Mean±std.dev. det./total range	2.59 ± 0.68E-01 1/1 --		6.26 ± 0.92E-01 1/1 --
K-40	28	Mean±std.dev. det./total range	1.58 ± 0.16E 01 1/1 --		1.55 ± 0.15 E 01 1/1 --
Mn-54	28	Mean±std.dev. det./total range	1.54 ± 0.83E-02 1/1 --		L.T. 1. E-02 0/1 --
CO-60	28	Mean±std.dev. det./total range	L.T. 1. E-02 0/1 --		L.T. 1. E-02 0/1 --
I-131 (by gamma spectroscopy)	28	Mean±std.dev. det./total range	L.T. 3. E-02 0/1 --		L.T. 4. E-02 0/1 --
Cs-134	28	Mean±std.dev. det./total range	L.T. 1. E-02 0/1 --		L.T. 1. E-02 0/1 --
Cs-137	28	Mean±std.dev. det./total range	4.59 ± 0.76E-02 1/1 --		5.80 ± 0.76 E-02 1/1 --
Ra-226	28	Mean±std.dev. det./total range	1.54 ± 0.18E 00 1/1 --		1.77 ± 0.19 E 00 1/1 --
Th-228	28	Mean±std.dev. det./total range	7.42 ± 0.74E-01 1/1 --		1.08 ± 0.11 E 00 1/1 --

TABLE L-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AQUATIC

SHORELINE SEDIMENT - PCI/GM, DRY

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER	SECOND QUARTER 05/04	THIRD QUARTER	FOURTH QUARTER 10/26
BE-7	28		2.59±0.68 E-01(1/1)		6.26±0.92 E-01(1/1)
K-40	28		1.58±0.16 E 01(1/1)		1.55±0.15 E 01(1/1)
Mn-54	28		1.54 ±0.83E-02(1/1)		L.T. 1. E-02(0/1)
Co-58	28		L.T. 1. E-02(0/1)		L.T. 1. E-02(0/1)
Fe-59	28		L.T. 2. E-02(0/1)		L.T. 3. E-02(0/1)
Co-60	28		L.T. 1. E-02(0/1)		L.T. 1. E-02(0/1)
Zn-65	28		L.T. 2. E-02(0/1)		L.T. 3. E-02(0/1)
Zr-95	28		L.T. 1. E-02(0/1)		L.T. 2. E-02(0/1)
Ru-103	28		L.T. 1. E-02(0/1)		L.T. 1. E-02(0/1)
Ru-106	28		L.T. 8. E-02(0/1)		L.T. 1. E-01(0/1)
I-131	28		L.T. 3. E-02(0/1)		L.T. 4. E-02(0/1)
Cs-134	28		L.T. 1. E-02(0/1)		L.T. 1. E-02(0/1)
Cs-137	28		4.59±0.76 E-02(1/1)		5.80±0.76 E-02(1/1)
Ba-140	28		L.T. 2. E-02(0/1)		L.T. 2. E-02(0/1)
Ce-141	28		L.T. 2. E-02(0/1)		4.22±1.92 E-02(1/1)
Ce-144	28		L.T. 8. E-02(0/1)		L.T. 9. E-02(0/1)
Ra-226	28		1.54±0.18 E 00(1/1)		1.77±0.19 E 00(1/1)
Th-228	28		7.42±0.74 E-01(1/1)		1.08±0.11 E 00(1/1)

SECTION VII

COMPLETE DATA TABLES

A, B, C,

GROSS ALPHA, GROSS BETA, I-131

STATIONS 01-10

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 01

STATION 01 - 0.1 MI. 225 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.01E 04	CU. FT.	3.8 ± 0.4 E-02	3.5 ± 1.7 E-03	01/09		L.T. 2. E-02
01/05	01/12	1.02E 04	CU. FT.	4.0 ± 0.4 E-02	5.2 ± 1.9 E-03	01/19		L.T. 5. E-02
01/12	01/19	9.94E 03	CU. FT.	5.6 ± 0.4 E-02	5.4 ± 2.2 E-03	01/22		L.T. 2. E-02
01/19	01/26	1.02E 04	CU. FT.	2.2 ± 0.3 E-02	L.T. 2. E-03	01/30		L.T. 2. E-02
01/26	02/02	9.92E 03	CU. FT.	2.3 ± 0.3 E-02	1.9 ± 1.3 E-03	02/06		L.T. 2. E-02
02/02	02/09	1.04E 04	CU. FT.	3.1 ± 0.3 E-02	2.4 ± 1.5 E-03	02/12		L.T. 2. E-02
02/09	02/16	9.95E 03	CU. FT.	3.0 ± 0.3 E-02	2.2 ± 1.5 E-03	02/20		L.T. 2. E-02
02/16	02/23	1.00E 04	CU. FT.	3.7 ± 0.4 E-02	3.6 ± 1.8 E-03	02/26		L.T. 3. E-02
02/23	03/02	1.01E 04	CU. FT.	3.0 ± 0.3 E-02	3.1 ± 1.5 E-03	03/06		L.T. 3. E-02
03/02	03/09	1.01E 04	CU. FT.	2.7 ± 0.3 E-02	L.T. 2. E-03	03/13		L.T. 3. E-02
03/09	03/16	1.01E 04	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	03/20		L.T. 2. E-02
03/16	03/23	1.02E 04	CU. FT.	2.2 ± 0.3 E-02	1.9 ± 1.3 E-03	03/26		L.T. 2. E-02
03/23	03/30	9.44E 03	CU. FT.	1.3 ± 0.3 E-02	L.T. 2. E-03	04/04		L.T. 4. E-02
03/30	04/06	1.00E 04	CU. FT.	1.3 ± 0.2 E-02	1.5 ± 1.3 E-03	04/13		L.T. 5. E-02
04/06	04/13	1.01E 04	CU. FT.	1.3 ± 0.2 E-02	2.2 ± 1.3 E-03	04/18		L.T. 2. E-02
04/13	04/20	1.00E 04	CU. FT.	1.0 ± 0.2 E-02	2.5 ± 1.5 E-03	04/25		L.T. 2. E-02
04/20	04/28	1.14E 04	CU. FT.	2.0 ± 0.3 E-02	2.6 ± 1.3 E-03	05/04		L.T. 4. E-02
04/28	05/04	8.74E 03	CU. FT.	1.4 ± 0.3 E-02	1.7 ± 1.3 E-03	05/09		L.T. 2. E-02
05/04	05/11	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	05/16		L.T. 2. E-02
05/11	05/18	1.02E 04	CU. FT.	2.2 ± 0.3 E-02	2.3 ± 1.4 E-03	05/26		L.T. 4. E-02
05/18	05/25	9.96E 03	CU. FT.	1.4 ± 0.2 E-02	1.9 ± 1.4 E-03	06/02		L.T. 3. E-02
05/25	06/01	1.01E 04	CU. FT.	1.4 ± 0.2 E-02	L.T. 1. E-03	06/08		L.T. 4. E-02
06/01	06/08	1.01E 04	CU. FT.	1.1 ± 0.2 E-02	L.T. 2. E-03	06/15		L.T. 3. E-02
06/08	06/15	1.01E 04	CU. FT.	1.8 ± 0.3 E-02	2.2 ± 1.4 E-03	06/22		L.T. 5. E-02
06/15	06/22	9.94E 03	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	06/28		L.T. 3. E-02
06/22	06/29	1.01E 04	CU. FT.	1.4 ± 0.2 E-02	L.T. 2. E-03	07/07		L.T. 3. E-02
06/29	07/06	1.01E 04	CU. FT.	1.7 ± 0.3 E-02	3.3 ± 1.5 E-03	07/10		L.T. 2. E-02
07/06	07/13	9.97E 03	CU. FT.	1.3 ± 0.3 E-02	1.9 ± 1.5 E-03	07/17		L.T. 2. E-02
07/13	07/20	1.01E 04	CU. FT.	1.4 ± 0.3 E-02	L.T. 2. E-03	07/25		L.T. 3. E-02
07/20	07/28	1.19E 04	CU. FT.	1.3 ± 0.2 E-02	L.T. 1. E-03	08/03		L.T. 3. E-02
07/28	08/03	8.40E 03	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	08/07		L.T. 2. E-02
08/03	08/10	1.02E 04	CU. FT.	2.2 ± 0.3 E-02	2.1 ± 1.5 E-03	08/15		L.T. 1. E-02
08/10	08/17	9.92E 03	CU. FT.	1.2 ± 0.3 E-02	L.T. 2. E-03	08/21		L.T. 2. E-02
08/17	08/25	1.15E 04	CU. FT.	1.9 ± 0.3 E-02	2.9 ± 1.4 E-03	08/29		L.T. 2. E-02
08/25	08/31	8.91E 03	CU. FT.	2.5 ± 0.4 E-02	1.4 ± 1.2 E-03	09/05		L.T. 4. E-02
08/31	09/07	9.90E03	CU. FT.	2.0 ± 0.3 E-02	2.0 ± 1.2 E-03	09/17		L.T. 3. E-02
09/07	09/14	1.05E 04	CU. FT.	1.7 ± 0.3 E-02	L.T. 1. E-03	09/18		L.T. 2. E-02
09/14	09/22	1.15E 04	CU. FT.	1.7 ± 0.3 E-02	1.9 ± 1.3 E-03	09/29		L.T. 4. E-02
09/22	09/28	8.42E 03	CU. FT.	2.4 ± 0.3 E-02	3.9 ± 2.0 E-03	10/04		L.T. 5. E-02
09/28	10/06	1.13E 04	CU. FT.	2.1 ± 0.3 E-02	1.8 ± 1.1 E-03	10/13		L.T. 2. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 01

STATION 01 - 0.1 MI. 225 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
10/06	10/13	1.01E 04	CU. FT.	2.9 ± 0.3 E-02	3.5 ± 1.5 E-03	10/18	L.T. 3. E-02
10/13	10/19	8.68E 03	CU. FT.	3.6 ± 0.4 E-02	2.4 ± 1.6 E-03	10/24	L.T. 1. E-02
10/19	10/26	1.04E 04	CU. FT.	2.1 ± 0.3 E-02	2.7 ± 1.5 E-03	11/01	L.T. 3. E-02
10/26	11/02	9.77E 03	CU. FT.	2.6 ± 0.3 E-02	2.2 ± 1.3 E-03	11/07	L.T. 3. E-02
11/02	11/10	1.14E 04	CU. FT.	2.5 ± 0.3 E-02	2.8 ± 1.5 E-03	11/14	L.T. 2. E-02
11/10	11/16	9.08E 03	CU. FT.	3.0 ± 0.4 E-02	2.2 ± 1.5 E-03	11/23	L.T. 2. E-02
11/16	11/24	1.11E 04	CU. FT.	3.0 ± 0.3 E-02	2.6 ± 1.4 E-03	12/02	L.T. 3. E-02
11/24	11/30	8.78E 03	CU. FT.	3.1 ± 0.4 E-02	2.5 ± 1.7 E-03	12/07	L.T. 4. E-02
11/30	12/07	1.01E 04	CU. FT.	4.1 ± 0.4 E-02	3.0 ± 1.5 E-03	12/12	L.T. 3. E-02
12/07	12/14	1.04E 04	CU. FT.	3.1 ± 0.3 E-02	5.0 ± 1.7 E-03	12/21	L.T. 4. E-02
12/14	12/20	8.23E 03	CU. FT.	2.8 ± 0.4 E-02	1.7 ± 1.3 E-03	12/28	L.T. 6. E-02
12/20	12/28	1.00E 04	CU. FT.	2.6 ± 0.3 E-02	L.T. 2. E-03	01/05	L.T. 5. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 02

STATION 02 - 0.75 MI. 225 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.01E 04	CU. FT.	3.5 ± 0.3 E-02	4.3 ± 1.8 E-03	01/09	L.T. 2. E-02
01/05	01/12	1.03E 04	CU. FT.	4.0 ± 0.4 E-02	4.5 ± 1.8 E-03	01/19	L.T. 5. E-02
01/12	01/19	9.89E 03	CU. FT.	5.3 ± 0.4 E-02	3.9 ± 1.9 E-03	01/22	L.T. 2. E-02
01/19	01/26	1.02E 04	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	01/30	L.T. 2. E-02
01/26	02/02	9.88E 03	CU. FT.	2.2 ± 0.3 E-02	1.7 ± 1.2 E-03	02/06	L.T. 2. E-02
02/02	02/09	1.03E 04	CU. FT.	2.9 ± 0.3 E-02	2.6 ± 1.5 E-03	02/12	L.T. 2. E-02
02/09	02/16	9.97E 03	CU. FT.	3.2 ± 0.3 E-02	3.2 ± 1.7 E-03	02/20	L.T. 2. E-02
02/16	02/23	9.98E 03	CU. FT.	3.4 ± 0.4 E-02	3.4 ± 1.8 E-03	02/26	L.T. 3. E-02
02/23	03/02	1.01E 04	CU. FT.	3.0 ± 0.3 E-02	3.2 ± 1.5 E-03	03/06	L.T. 3. E-02
03/02	03/09	1.01E 04	CU. FT.	2.4 ± 0.3 E-02	L.T. 2. E-03	03/13	L.T. 3. E-02
03/09	03/16	1.01E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	03/20	L.T. 2. E-02
03/16	03/23	1.02E 04	CU. FT.	1.8 ± 0.3 E-02	L.T. 1. E-03	03/26	L.T. 2. E-02
03/23	03/30	9.97E 03	CU. FT.	1.5 ± 0.3 E-02	2.4 ± 1.6 E-03	04/04	L.T. 3. E-02
03/30	04/06	1.01E 04	CU. FT.	1.4 ± 0.2 E-02	L.T. 1. E-03	04/13	L.T. 5. E-02
04/06	04/13	1.02E 04	CU. FT.	1.1 ± 0.2 E-02	2.0 ± 1.3 E-03	04/18	L.T. 2. E-02
04/13	04/20	1.00E 04	CU. FT.	1.3 ± 0.3 E-02	2.9 ± 1.6 E-03	04/25	L.T. 2. E-02
04/20	04/27	9.88E 03	CU. FT.	1.9 ± 0.3 E-02	3.0 ± 1.5 E-03	05/04	L.T. 5. E-02
04/27	05/04	1.01E 04	CU. FT.	1.2 ± 0.2 E-02	1.9 ± 1.2 E-03	05/09	L.T. 2. E-02
05/04	05/11	1.01E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	05/16	L.T. 2. E-02
05/11	05/18	1.02E 04	CU. FT.	1.9 ± 0.3 E-02	2.4 ± 1.4 E-03	05/26	L.T. 4. E-02
05/18	05/25	9.91E 03	CU. FT.	1.5 ± 0.2 E-02	1.9 ± 1.4 E-03	06/02	L.T. 3. E-02
05/25	06/01	1.01E 04	CU. FT.	1.5 ± 0.3 E-02	1.7 ± 1.3 E-03	06/08	L.T. 4. E-02
06/01	06/08	1.02E 04	CU. FT.	7.7 ± 2.2 E-03	L.T. 2. E-03	06/15	L.T. 3. E-02
06/08	06/15	1.04E 04	CU. FT.	1.8 ± 0.3 E-02	L.T. 1. E-03	06/22	L.T. 5. E-02
06/15	06/22	9.59E 03	CU. FT.	1.4 ± 0.3 E-02	L.T. 2. E-03	06/28	L.T. 3. E-02
06/22	06/29	1.02E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	07/07	L.T. 3. E-02
06/29	07/06	1.01E 04	CU. FT.	1.8 ± 0.3 E-02	3.0 ± 1.4 E-03	07/10	L.T. 2. E-02
07/06	07/13	9.94E 03	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	07/17	L.T. 2. E-02
07/13	07/20	1.01E 04	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	07/25	L.T. 3. E-02
07/20	07/28*						
07/28	08/03*						
07/20	08/10	3.05E 04	CI. FT.	1.8 ± 0.1 E-02	2.0 ± 0.7 E-03	08/15	L.T. 9. E-03
08/10	08/17	1.02E 04	CU. FT.	2.2 ± 0.3 E-02	2.2 ± 1.5 E-03	08/21	L.T. 2. E-02
08/17	08/24	9.88E 03	CU. FT.	1.9 ± 0.3 E-02	2.2 ± 1.4 E-03	08/29	L.T. 3. E-02
08/24	08/31	1.02E 04	CU. FT.	2.3 ± 0.3 E-02	L.T. 1. E-03	09/05	L.T. 3. E-02
08/31	09/07	9.89E03	CU. FT.	1.9 ± 0.3 E-02	3.2 ± 1.5 E-03	09/17	L.T. 3. E-02
09/07	09/14	1.02E 04	CU. FT.	2.1 ± 0.3 E-02	L.T. 1. E-03	09/18	L.T. 2. E-02
09/14	09/22	1.18E 04	CU. FT.	1.5 ± 0.2 E-02	L.T. 1. E-03	09/29	L.T. 4. E-02
09/24	09/29	5.81E 03	CU. FT.	2.1 ± 0.4 E-02	L.T. 3. E-03	10/04	L.T. 8. E-02

*Sample Not Collected -- Flood Missouri River.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 02

STATION 02 - 0.75 MI. 225 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	MID-COUNT TIME TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
09/28	10/05	9.80E 03	CU. FT.	2.2 ± 0.3 E-02	3.2 ± 1.5 E-03	10/13		L.T. 3. E-02
10/06	10/13	1.14E 04	CU. FT.	3.0 ± 0.3 E-02	3.0 ± 1.3 E-03	10/18		L.T. 1. E-02
10/13	10/19	9.16E 03	CU. FT.	2.9 ± 0.4 E-02	3.6 ± 1.7 E-03	10/24		L.T. 2. E-02
10/19	10/26	9.55E 03	CU. FT.	2.2 ± 0.3 E-02	2.1 ± 1.4 E-03	11/01		L.T. 4. E-02
10/26	11/02	1.03E 04	CU. FT.	1.7 ± 0.3 E-02	2.1 ± 1.3 E-03	11/07		L.T. 3. E-02
11/02	11/10	1.00E 04	CU. FT.	2.2 ± 0.3 E-02	3.2 ± 1.7 E-03	11/14		L.T. 2. E-02
11/09	11/16	9.80E 03	CU. FT.	2.9 ± 0.4 E-02	L.T. 2. E-03	11/21		L.T. 1. E-02
11/16	11/23	1.05E 04	CU. FT.	3.3 ± 0.3 E-02	2.5 ± 1.5 E-03	12/02		L.T. 3. E-02
11/23	11/30	1.00E 04	CU. FT.	2.6 ± 0.3 E-02	1.9 ± 1.4 E-03	12/07		L.T. 3. E-02
11/30	12/07	1.00E 04	CU. FT.	3.6 ± 0.4 E-02	1.7 ± 1.3 E-03	12/12		L.T. 3. E-02
12/07	12/14	9.81E 03	CU. FT.	3.4 ± 0.4 E-02	4.2 ± 1.7 E-03	12/21		L.T. 4. E-02
12/14	12/21	1.02E 04	CU. FT.	2.3 ± 0.3 E-02	2.8 ± 1.4 E-03	12/28		L.T. 5. E-02
12/21	12/28	7.51E 03	CU. FT.	3.9 ± 0.4 E-02	L.T. 2. E-03	01/05		L.T. 6. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 03

STATION 03 - 2.5 MI. 338 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.02E 04	CU. FT.	3.7 ± 0.4 E-02	3.9 ± 1.7 E-03	01/09	L.T. 2. E-02
01/05	01/13	1.14E 04	CU. FT.	5.7 ± 0.4 E-02	5.1 ± 1.7 E-03	01/19	L.T. 4. E-02
01/13	01/19	7.84E 03	CU. FT.	5.6 ± 0.5 E-02	5.7 ± 2.6 E-03	01/22	L.T. 3. E-02
01/19	01/26	9.47E 03	CU. FT.	1.9 ± 0.3 E-02	L.T. 2. E-03	01/30	L.T. 2. E-02
01/26	02/02	9.88E 03	CU. FT.	1.9 ± 0.3 E-02	L.T. 1. E-03	02/06	L.T. 2. E-02
02/02	02/09	1.04E 04	CU. FT.	2.9 ± 0.3 E-02	5.1 ± 1.9 E-03	02/12	L.T. 2. E-02
02/09	02/16	9.01E 03	CU. FT.	2.9 ± 0.3 E-02	2.7 ± 1.7 E-03	02/20	L.T. 2. E-02
02/16	02/23	9.76E 03	CU. FT.	3.2 ± 0.4 E-02	2.9 ± 1.7 E-03	02/26	L.T. 4. E-02
02/23	03/02	1.08E 04	CU. FT.	3.0 ± 0.3 E-02	3.7 ± 1.5 E-03	03/06	L.T. 3. E-02
03/03	03/09	9.03E 03	CU. FT.	2.8 ± 0.3 E-02	L.T. 2. E-03	03/13	L.T. 3. E-02
03/09	03/16	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	03/20	L.T. 2. E-02
03/16	03/23	1.02E 04	CU. FT.	2.0 ± 0.3 E-02	L.T. 1. E-03	03/26	L.T. 2. E-02
03/23	03/30	1.01E 04	CU. FT.	1.4 ± 0.2 E-02	L.T. 2. E-03	04/04	L.T. 3. E-02
03/30	04/06	1.01E 04	CU. FT.	1.4 ± 0.2 E-02	L.T. 1. E-03	04/13	L.T. 5. E-02
04/06	04/13	1.01E 04	CU. FT.	1.2 ± 0.2 E-02	1.8 ± 1.2 E-03	04/18	L.T. 2. E-02
04/13	04/20	9.88E 03	CU. FT.	1.4 ± 0.3 E-02	5.0 ± 2.0 E-03	04/25	L.T. 2. E-02
04/20	04/27	9.93E 03	CU. FT.	2.3 ± 0.3 E-02	5.8 ± 2.0 E-03	05/04	L.T. 5. E-02
04/27	05/04	1.04E 04	CU. FT.	1.6 ± 0.3 E-02	1.9 ± 1.2 E-03	05/09	L.T. 1. E-02
05/04	05/11	9.98E 03	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	05/16	L.T. 2. E-02
05/11	05/19	1.13E 04	CU. FT.	1.8 ± 0.3 E-02	2.5 ± 1.3 E-03	05/26	L.T. 4. E-02
05/19	05/25	8.96E 03	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	06/02	L.T. 3. E-02
05/25	06/01	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	06/08	L.T. 4. E-02
06/01	06/08	1.02E 04	CU. FT.	1.2 ± 0.2 E-02	L.T. 2. E-03	06/15	L.T. 3. E-02
06/08	06/15	9.78E 03	CU. FT.	1.9 ± 0.3 E-02	2.8 ± 1.5 E-03	06/22	L.T. 5. E-02
06/15	06/22	1.01E 04	CU. FT.	1.2 ± 0.2 E-02	L.T. 2. E-03	06/28	L.T. 3. E-02
06/22	06/29	1.03E 04	CU. FT.	1.2 ± 0.2 E-02	2.0 ± 1.5 E-03	07/07	L.T. 2. E-02
06/29	07/06	1.02E 04	CU. FT.	1.6 ± 0.3 E-02	2.8 ± 1.4 E-03	07/10	L.T. 2. E-02
07/06	07/13*						
07/13	07/20*						
07/20	07/28*						
07/28	08/03*						
08/03	08/10*						
08/10	08/17*						
08/17	08/24*						
08/24	08/31*						
08/31	09/07*						
09/07	09/14*						
09/14	09/22*						

*Flood -- Sample not collected.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 03

STATION 03 - 2.5 MI. 338 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
09/24	09/28*						
09/28	10/05*						
10/05	10/13*						
10/13	10/19*						
10/19	10/26*						
10/26	11/02*						
11/02	11/10*						
11/09	11/16*						
11/17	11/23	8.39E 03	CU. FT.	2.3 ± 0.4 E-02	L.T. 2. E-03	12/02	L.T. 4. E-02
11/23	11/30	1.02E 04	CU. FT.	2.8 ± 0.3 E-02	L.T. 2. E-03	12/07	L.T. 3. E-02
11/30	12/07	1.02E 04	CU. FT.	3.6 ± 0.4 E-02	3.6 ± 1.6 E-03	12/12	L.T. 3. E-02
12/07	12/14	9.83E 03	CU. FT.	2.9 ± 0.3 E-02	3.4 ± 1.5 E-03	12/21	L.T. 4. E-02
12/14	12/21	1.02E 04	CU. FT.	2.7 ± 0.3 E-02	2.0 ± 1.2 E-03	12/28	L.T. 5. E-02
12/21	12/28	1.01E 04	CU. FT.	2.4 ± 0.3 E-02	L.T. 2. E-03	01/05	L.T. 4. E-02

*Flood -- Sample not collected.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 04

STATION 04 - 3.0 MI. 43 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	MID-COUNT TIME TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.00E 04	CU. FT.	3.8 ± 0.4 E-02	2.9 ± 1.6 E-03	01/09		L.T. 2. E-02
01/05	01/13	1.16E 04	CU. FT.	4.0 ± 0.4 E-02	3.1 ± 1.4 E-03	01/19		L.T. 4. E-02
01/13	01/19	8.65E 03	CU. FT.	5.4 ± 0.5 E-02	8.1 ± 2.7 E-03	01/22		L.T. 3. E-02
01/19	01/26	1.01E 04	CU. FT.	1.8 ± 0.3 E-02	L.T. 2. E-03	01/30		L.T. 2. E-02
01/26	02/02	1.00E 04	CU. FT.	1.9 ± 0.3 E-02	2.1 ± 1.3 E-03	02/06		L.T. 2. E-02
02/02	02/09	1.02E 04	CU. FT.	2.5 ± 0.3 E-02	2.2 ± 1.5 E-03	02/12		L.T. 2. E-02
02/09	02/16	9.99E 03	CU. FT.	3.0 ± 0.3 E-02	2.5 ± 1.6 E-03	02/20		L.T. 2. E-02
02/16	02/23	1.01E 04	CU. FT.	3.0 ± 0.3 E-02	3.7 ± 1.8 E-03	02/26		L.T. 3. E-02
02/23	03/02	1.01E 04	CU. FT.	3.3 ± 0.3 E-02	3.1 ± 1.5 E-03	03/06		L.T. 3. E-02
03/02	03/09	1.00E 04	CU. FT.	2.4 ± 0.3 E-02	3.0 ± 1.7 E-03	03/13		L.T. 3. E-02
03/09	03/16	1.01E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	03/20		L.T. 2. E-02
03/16	03/23	1.02E 04	CU. FT.	1.8 ± 0.3 E-02	1.5 ± 1.2 E-03	03/26		L.T. 2. E-02
03/23	03/30	1.00E 04	CU. FT.	1.3 ± 0.2 E-02	L.T. 2. E-03	04/04		L.T. 3. E-02
03/30	04/06	1.01E 04	CU. FT.	1.3 ± 0.2 E-02	1.5 ± 1.2 E-03	04/13		L.T. 5. E-02
04/06	04/13	1.00E 04	CU. FT.	1.1 ± 0.2 E-02	3.6 ± 1.6 E-03	04/18		L.T. 2. E-02
04/13	04/20	9.98E 03	CU. FT.	8.3 ± 2.4 E-03	2.2 ± 1.5 E-03	04/25		L.T. 2. E-02
04/20	04/27	9.98E 03	CU. FT.	2.2 ± 0.3 E-02	3.7 ± 1.7 E-03	05/04		L.T. 5. E-02
04/27	05/04	1.02E 04	CU. FT.	1.6 ± 0.3 E-02	1.3 ± 1.1 E-03	05/09		L.T. 1. E-02
05/04	05/11	1.00E 04	CU. FT.	1.6 ± 0.3 E-02	L.T. 2. E-03	05/16		L.T. 2. E-02
05/11	05/19	1.13E 04	CU. FT.	1.5 ± 0.3 E-02	1.6 ± 1.1 E-03	05/26		L.T. 4. E-02
05/19	05/25	8.93E 03	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	06/02		L.T. 3. E-02
05/25	06/01	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	06/08		L.T. 4. E-02
06/01	06/08	1.02E 04	CU. FT.	1.6 ± 0.3 E-02	3.5 ± 1.8 E-03	06/15		L.T. 3. E-02
06/08	06/15	9.84E 03	CU. FT.	2.1 ± 0.3 E-02	4.9 ± 1.9 E-03	06/22		L.T. 5. E-02
06/15	06/22	1.00E 04	CU. FT.	1.6 ± 0.3 E-02	3.4 ± 1.8 E-03	06/28		L.T. 3. E-02
06/22	06/29	1.03E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	07/07		L.T. 2. E-02
06/29	07/06	1.00E 04	CU. FT.	1.9 ± 0.3 E-02	3.3 ± 1.5 E-03	07/10		L.T. 2. E-02
07/06	07/13	9.80E 03	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	07/17		L.T. 2. E-02
07/13	07/20	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	07/25		L.T. 3. E-02
07/20	07/28*							
07/28	08/03*							
08/03	08/10*							
08/10	08/17*							
08/17	08/24*							
08/24	08/31*							
08/31	09/07*							
09/07	09/14*							
09/14	09/22*							

*Sample Not Collected -- Flood Missouri River.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 04

STATION 04 - 3.0 MI. 43 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	MID-COUNT TIME TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
09/24	09/28*							
09/28	10/05*							
10/05	10/13*							
10/13	10/19*							
10/19	10/26*							
10/26	11/02*							
11/02	11/10*							
11/10	11/16	8.37E 03	CU. FT.	3.9 ± 0.4 E-02	1.9 ± 1.6 E-03	11/23		L.T. 2. E-02
11/16	11/23	1.03E 04	CU. FT.	3.8 ± 0.4 E-02	2.5 ± 1.5 E-03	12/02		L.T. 3. E-02
11/23	12/01	1.11E 04	CU. FT.	4.4 ± 0.4 E-02	3.0 ± 1.5 E-03	12/07		L.T. 3. E-02
12/01	12/07	8.93E 03	CU. FT.	5.5 ± 0.5 E-02	4.0 ± 1.9 E-03	12/12		L.T. 3. E-02
12/07	12/14	9.84E 03	CU. FT.	4.8 ± 0.4 E-02	6.0 ± 2.0 E-03	12/21		L.T. 4. E-02
12/14	12/21	1.02E 04	CU. FT.	4.0 ± 0.4 E-02	2.7 ± 1.3 E-03	12/28		L.T. 5. E-02
12/21	12/28	1.01E 04	CU. FT.	4.2 ± 0.4 E-02	1.7 ± 1.4 E-03	01/05		L.T. 4. E-02

*Flood -- Sample not collected.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 05

STATION 05 - 3.5 MI. 102 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.00E 04	CU. FT.	3.6 ± 0.4 E-02	2.5 ± 1.5 E-03	01/09	L.T. 1. E-02
01/05	01/13	1.16E 04	CU. FT.	4.2 ± 0.4 E-02	4.4 ± 1.6 E-03	01/19	L.T. 3. E-02
01/13	01/19	8.65E 03	CU. FT.	4.2 ± 0.4 E-02	L.T. 2. E-03	01/22	L.T. 2. E-02
01/19	01/26	1.01E 04	CU. FT.	2.0 ± 0.3 E-02	2.2 ± 1.6 E-03	01/30	L.T. 1. E-02
01/26	02/02	1.00E 04	CU. FT.	2.3 ± 0.3 E-02	1.3 ± 1.2 E-03	02/06	L.T. 1. E-02
02/02	02/09	1.02E 04	CU. FT.	3.1 ± 0.3 E-02	2.9 ± 1.6 E-03	02/12	L.T. 2. E-02
02/09	02/16	9.99E 03	CU. FT.	3.5 ± 0.3 E-02	2.3 ± 1.5 E-03	02/20	L.T. 1. E-02
02/16	02/23	1.01E 04	CU. FT.	2.9 ± 0.3 E-02	3.7 ± 1.8 E-03	02/26	L.T. 2. E-02
02/23	03/02	1.01E 04	CU. FT.	3.3 ± 0.3 E-02	2.5 ± 1.3 E-03	03/06	L.T. 2. E-02
03/02	03/09	1.00E 04	CU. FT.	2.7 ± 0.3 E-02	L.T. 2. E-03	03/13	L.T. 2. E-02
03/09	03/16	1.01E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	03/20	L.T. 1. E-02
03/16	03/23	1.02E 04	CU. FT.	2.0 ± 0.3 E-02	L.T. 1. E-03	03/26	L.T. 1. E-02
03/23	03/30	1.00E 04	CU. FT.	1.1 ± 0.2 E-02	L.T. 2. E-03	04/04	L.T. 2. E-02
03/30	04/06	1.01E 04	CU. FT.	1.4 ± 0.2 E-02	2.9 ± 1.6 E-03	04/13	L.T. 3. E-02
04/06	04/13	1.01E 04	CU. FT.	8.2 ± 2.2 E-03	2.2 ± 1.3 E-03	04/18	L.T. 1. E-02
04/13	04/20	9.96E 03	CU. FT.	1.1 ± 0.3 E-02	L.T. 2. E-03	04/25	L.T. 1. E-02
04/20	04/27	9.97E 03	CU. FT.	2.3 ± 0.3 E-02	3.7 ± 1.7 E-03	05/04	L.T. 3. E-02
04/27	05/04	1.02E 04	CU. FT.	1.2 ± 0.2 E-02	2.2 ± 1.3 E-03	05/09	L.T. 1. E-02
05/04	05/11	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	05/16	L.T. 1. E-02
05/11	05/19	1.13E 04	CU. FT.	1.6 ± 0.3 E-02	L.T. 1. E-03	05/26	L.T. 2. E-02
05/19	05/25	8.96E 03	CU. FT.	1.6 ± 0.3 E-02	2.0 ± 1.5 E-03	06/02	L.T. 2. E-02
05/25	06/01	1.00E 04	CU. FT.	1.4 ± 0.2 E-02	1.9 ± 1.4 E-03	06/08	L.T. 2. E-02
06/01	06/08	1.02E 04	CU. FT.	1.0 ± 0.2 E-02	L.T. 2. E-03	06/15	L.T. 2. E-02
06/08	06/15	9.84E 03	CU. FT.	1.8 ± 0.3 E-02	3.2 ± 1.6 E-03	06/22	L.T. 3. E-02
06/15	06/22	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	06/28	L.T. 2. E-02
06/22	06/29	9.69E 03	CU. FT.	1.4 ± 0.3 E-02	L.T. 2. E-03	07/07	L.T. 2. E-02
06/29	07/06	1.00E 04	CU. FT.	1.7 ± 0.3 E-02	1.9 ± 1.2 E-03	07/10	L.T. 1. E-02
07/06	07/13	9.91E 03	CU. FT.	1.4 ± 0.3 E-02	L.T. 2. E-03	07/17	L.T. 2. E-02
07/13	07/20	1.00E 04	CU. FT.	1.3 ± 0.2 E-02	L.T. 2. E-03	07/25	L.T. 3. E-02
07/20	07/28*						
07/28	08/03*						
08/03	08/10*						
08/10	08/17*						
08/17	08/24*						
08/24	08/31*						
08/31	09/07*						
09/07	09/14*						
09/14	09/22*						
09/24	09/28*						

*Sample Not Collected -- Flood Missouri River.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 05

STATION 05 - 3.5 MI. 102 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	MID-COUNT TIME TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
09/28	10/05*							
10/05	10/13*							
10/13	10/19*							
10/19	10/26*							
10/26	11/02*							
11/02	11/10*							
11/09	11/16*							
11/16	11/23*							
11/23	12/01*							
12/01	12/07*							
12/07	12/14*							
12/14	12/21*							
12/21	12/28*							

*Flood -- Sample not collected.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 06

STATION 06 - 3.0 MI. 165 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	MID-COUNT TIME TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.01E 04	CU. FT.	3.5 ± 0.3 E-02	1.8 ± 1.4 E-03	01/09		L.T. 2. E-02
01/05	01/13	1.16E 04	CU. FT.	4.6 ± 0.4 E-02	3.1 ± 1.4 E-03	01/20		L.T. 2. E-02
01/13	01/19	8.35E 03	CU. FT.	5.3 ± 0.5 E-02	4.6 ± 2.3 E-03	01/22		L.T. 2. E-02
01/19	01/26	1.01E 04	CU. FT.	2.0 ± 0.3 E-02	L.T. 2. E-03	01/30		L.T. 2. E-02
01/26	02/02	1.00E 04	CU. FT.	2.8 ± 0.3 E-02	L.T. 1. E-03	02/06		L.T. 2. E-02
02/02	02/09	1.02E 04	CU. FT.	3.0 ± 0.3 E-02	2.5 ± 1.5 E-03	02/13		L.T. 2. E-02
02/09	02/16	1.00E 04	CU. FT.	3.4 ± 0.3 E-02	4.2 ± 1.9 E-03	02/20		L.T. 2. E-02
02/16	02/23	9.22E 03	CU. FT.	3.4 ± 0.4 E-02	3.7 ± 1.9 E-03	02/26		L.T. 2. E-02
02/23	03/02	1.01E 04	CU. FT.	3.2 ± 0.3 E-02	4.6 ± 1.7 E-03	03/06		L.T. 2. E-02
03/02	03/09	1.01E 04	CU. FT.	2.5 ± 0.3 E-02	L.T. 2. E-03	03/13		L.T. 2. E-02
03/09	03/16	1.00E 04	CU. FT.	1.6 ± 0.3 E-02	L.T. 2. E-03	03/20		L.T. 2. E-02
03/16	03/23	9.65E 03	CU. FT.	2.1 ± 0.3 E-02	1.2 ± 1.1 E-03	03/26		L.T. 2. E-02
03/23	03/30	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	04/04		L.T. 2. E-02
03/30	04/06	1.01E 04	CU. FT.	1.3 ± 0.2 E-02	1.9 ± 1.3 E-03	04/13		L.T. 4. E-02
04/06	04/13	1.00E 04	CU. FT.	1.0 ± 0.2 E-02	1.3 ± 1.2 E-03	04/19		L.T. 4. E-02
04/13	04/20	9.96E 03	CU. FT.	1.1 ± 0.3 E-02	L.T. 2. E-03	04/25		L.T. 2. E-02
04/20	04/27	1.00E 04	CU. FT.	2.3 ± 0.3 E-02	3.1 ± 1.5 E-03	05/04		L.T. 2. E-02
04/27	05/04	1.02E 04	CU. FT.	1.3 ± 0.2 E-02	1.9 ± 1.2 E-03	05/09		L.T. 2. E-02
05/04	05/11	9.31E 03	CU. FT.	1.3 ± 0.3 E-02	L.T. 2. E-03	05/16		L.T. 2. E-02
05/11	05/19	1.12E 04	CU. FT.	1.8 ± 0.3 E-02	2.1 ± 1.2 E-03	05/26		L.T. 5. E-02
05/19	05/25	9.01E 03	CU. FT.	1.5 ± 0.3 E-02	1.6 ± 1.4 E-03	06/02		L.T. 3. E-02
05/25	06/01	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	1.6 ± 1.3 E-03	06/08		L.T. 5. E-02
06/01	06/08	1.02E 04	CU. FT.	1.3 ± 0.3 E-02	L.T. 2. E-03	06/15		L.T. 2. E-02
06/08	06/15	9.83E 03	CU. FT.	1.9 ± 0.3 E-02	L.T. 1. E-03	06/22		L.T. 3. E-02
06/15	06/22	1.00E 04	CU. FT.	1.6 ± 0.3 E-02	2.4 ± 1.6 E-03	06/28		L.T. 2. E-02
06/22	06/29	1.04E 04	CU. FT.	1.2 ± 0.2 E-02	1.9 ± 1.5 E-03	07/07		L.T. 3. E-02
06/29	07/06	1.00E 04	CU. FT.	2.2 ± 0.3 E-02	2.5 ± 1.3 E-03	07/10		L.T. 2. E-02
07/06	07/13	9.88E 03	CU. FT.	1.1 ± 0.2 E-02	2.0 ± 1.6 E-03	07/17		L.T. 2. E-02
07/13	07/20	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	07/25		L.T. 2. E-02
07/20	07/28*							
07/28	08/03*							
08/03	08/10*							
08/10	08/17*							
08/17	08/24*							
08/24	08/31*							
08/31	09/07*							
09/07	09/14*							
09/14	09/22*							
09/24	09/28*							

*Sample Not Collected -- Flood Missouri River.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 06

STATION 06 - 3.0 MI. 165 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
09/28	10/05*						
10/05	10/13*						
10/13	10/19*						
10/19	10/26*						
10/26	11/02*						
11/02	11/10*						
11/10	11/16	8.48E 03	CU. FT.	2.7 ± 0.4 E-02	L.T. 2. E-03	11/20	L.T. 2. E-02
11/16	11/23	1.03E 04	CU. FT.	3.2 ± 0.3 E-02	L.T. 2. E-03	12/02	L.T. 4. E-02
11/23	12/01	1.11E 04	CU. FT.	2.6 ± 0.3 E-02	1.6 ± 1.2 E-03	12/07	L.T. 4. E-02
12/01	12/07	8.93E 03	CU. FT.	3.5 ± 0.4 E-02	L.T. 2. E-03	12/13	L.T. 3. E-02
12/07	12/14	9.85E 03	CU. FT.	3.3 ± 0.4 E-02	4.1 ± 1.6 E-03	12/21	L.T. 3. E-02
12/14	12/21	1.02E 04	CU. FT.	3.2 ± 0.4 E-02	3.7 ± 1.3 E-03	12/29	L.T. 4. E-02
12/21	12/28	1.01E 04	CU. FT.	2.6 ± 0.3 E-02	2.4 ± 1.5 E-03	01/05	L.T. 2. E-02

*Flood -- Sample not collected.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 07

STATION 07 - 2.5 MI. 230 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.01E 04	CU. FT.	3.1 ± 0.3 E-02	2.0 ± 1.4 E-03	01/09	L.T. 2. E-02
01/05	01/12	1.03E 04	CU. FT.	4.8 ± 0.4 E-02	4.9 ± 1.8 E-03	01/20	L.T. 2. E-02
01/12	01/19	8.23E 03	CU. FT.	7.2 ± 0.5 E-02	6.7 ± 2.6 E-03	01/22	L.T. 2. E-02
01/19	01/26	1.05E 04	CU. FT.	2.1 ± 0.3 E-02	L.T. 2. E-03	01/30	L.T. 2. E-02
01/26	02/02	9.56E 03	CU. FT.	2.4 ± 0.3 E-02	2.0 ± 1.4 E-03	02/06	L.T. 2. E-02
02/02	02/09	1.04E 04	CU. FT.	3.5 ± 0.3 E-02	2.9 ± 1.6 E-03	02/13	L.T. 2. E-02
02/09	02/16	9.97E 03	CU. FT.	3.6 ± 0.4 E-02	1.7 ± 1.4 E-03	02/20	L.T. 2. E-02
02/16	02/23	9.98E 03	CU. FT.	3.2 ± 0.3 E-02	3.1 ± 1.8 E-03	02/26	L.T. 2. E-02
02/23	03/02	1.01E 04	CU. FT.	3.7 ± 0.4 E-02	5.0 ± 1.8 E-03	03/06	L.T. 2. E-02
03/02	03/09	1.01E 04	CU. FT.	2.6 ± 0.3 E-02	2.1 ± 1.6 E-03	03/13	L.T. 2. E-02
03/09	03/16	1.01E 04	CU. FT.	1.6 ± 0.3 E-02	1.8 ± 1.5 E-03	03/20	L.T. 2. E-02
03/16	03/23	1.02E 04	CU. FT.	2.5 ± 0.3 E-02	L.T. 1. E-03	03/26	L.T. 2. E-02
03/23	03/30	9.97E 03	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	04/04	L.T. 2. E-02
03/30	04/06	1.00E 04	CU. FT.	1.6 ± 0.3 E-02	3.3 ± 1.6 E-03	04/13	L.T. 4. E-02
04/06	04/13	1.02E 04	CU. FT.	1.5 ± 0.3 E-02	2.9 ± 1.5 E-03	04/19	L.T. 4. E-02
04/13	04/20	1.00E 04	CU. FT.	1.1 ± 0.3 E-02	2.2 ± 1.5 E-03	04/25	L.T. 2. E-02
04/20	04/27	1.03E 04	CU. FT.	2.2 ± 0.3 E-02	4.0 ± 1.7 E-03	05/04	L.T. 2. E-02
04/27	05/04*	1.40E 03	CU. FT.	0.21±0.13 E-02	L.T. 0.7 E-03	05/09	L.T. 1. E-02
05/04	05/11**						
05/11	05/19**						
05/18	05/25**						
05/25	06/01**						
06/07	06/08***						
06/08	06/15	1.04E 04	CU. FT.	2.1 ± 0.3 E-02	2.4 ± 1.4 E-03	06/22	L.T. 3. E-02
06/15	06/22	9.62E 03	CU. FT.	2.3 ± 0.3 E-02	2.3 ± 1.7 E-03	06/28	L.T. 2. E-02
06/22	06/29	1.00E 04	CU. FT.	2.0 ± 0.3 E-02	2.8 ± 1.7 E-03	07/07	L.T. 3. E-02
06/29	07/06	1.01E 04	CU. FT.	2.8 ± 0.3 E-02	3.7 ± 1.6 E-03	07/10	L.T. 2. E-02
07/06	07/13	9.94E 03	CU. FT.	2.0 ± 0.3 E-02	2.1 ± 1.6 E-03	07/17	L.T. 2. E-02
07/13	07/20	1.01E 04	CU. FT.	2.1 ± 0.3 E-02	2.2 ± 1.6 E-03	07/25	L.T. 2. E-02
07/20	07/27	1.00E 04	CU. FT.	2.0 ± 0.3 E-02	2.7 ± 1.6 E-03	08/03	L.T. 4. E-02
07/27	08/03	1.02E 04	CU. FT.	2.4 ± 0.3 E-02	1.9 ± 1.3 E-03	08/07	L.T. 1. E-02
08/03	08/10	9.91E 03	CU. FT.	2.6 ± 0.3 E-02	3.2 ± 1.7 E-03	08/15	L.T. 2. E-02
08/10	08/17	1.01E 04	CU. FT.	3.5 ± 0.4 E-02	1.8 ± 1.4 E-03	08/21	L.T. 3. E-02
08/17	08/24	1.04E 04	CU. FT.	3.0 ± 0.3 E-02	2.8 ± 1.5 E-03	08/29	L.T. 3. E-02
08/24	08/31	9.76E 03	CU. FT.	2.7 ± 0.4 E-02	2.1 ± 1.3 E-03	09/05	L.T. 3. E-02
08/31	09/07	9.89E 03	CU. FT.	2.3 ± 0.3 E-02	2.8 ± 1.4 E-03	09/17	L.T. 3. E-02
09/07	09/14	1.02E 04	CU. FT.	2.7 ± 0.3 E-02	4.1 ± 1.7 E-03	09/18	L.T. 2. E-02
09/14	09/22	1.18E 04	CU. FT.	2.4 ± 0.3 E-02	3.6 ± 1.6 E-03	09/29	L.T. 4. E-02

*Not included in average (electrical problem).
**Sample not collected.
***Not included in average (low air volume).

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 07

STATION 07 - 2.5 MI. 230 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	MID-COUNT TIME TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
09/22	09/28	8.59E 03	CU. FT.	2.4 ± 0.3 E-02	3.5 ± 1.9 E-03	10/04		L.T. 5. E-02
09/28	10/05	9.57E 03	CU. FT.	3.5 ± 0.4 E-02	3.5 ± 1.6 E-03	10/13		L.T. 3. E-02
10/05	10/13	1.12E 04	CU. FT.	3.7 ± 0.3 E-02	3.1 ± 1.3 E-03	10/18		L.T. 3. E-02
10/13	10/19	9.14E 03	CU. FT.	5.2 ± 0.5 E-02	L.T. 2. E-03	10/24		L.T. 2. E-02
10/19	10/26	9.57E 03	CU. FT.	2.3 ± 0.3 E-02	3.0 ± 1.6 E-03	11/01		L.T. 4. E-02
10/26	11/02	1.05E 04	CU. FT.	1.2 ± 0.2 E-02	2.2 ± 1.3 E-03	11/07		L.T. 3. E-02
11/02	11/10	1.01E 04	CU. FT.	1.9 ± 0.3 E-02	L.T. 2. E-03	11/14		L.T. 2. E-02
11/09	11/16	9.80E 03	CU. FT.	1.7 ± 0.3 E-02	1.6 ± 1.3 E-03	11/20		L.T. 1. E-02
11/16	11/23	1.04E 04	CU. FT.	1.3 ± 0.3 E-02	L.T. 2. E-03	12/02		L.T. 4. E-02
11/23	12/01*							
12/01	12/07*							
12/07	12/14*							
12/14	12/21*							
12/21	12/28	9.99E 03	CU. FT.	2.6 ± 0.3 E-02	1.7 ± 1.4 E-03	01/05		L.T. 4. E-02

*Sample not collected. Station not running.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 08

STATION 08 - 2.5 MI. 260 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	MID-COUNT TIME TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.04E 04	CU. FT.	3.0 ± 0.3 E-02	2.8 ± 1.5 E-03	01/09		L.T. 2. E-02
01/05	01/13	1.14E 04	CU. FT.	4.0 ± 0.4 E-02	3.1 ± 1.4 E-03	01/20		L.T. 2. E-02
01/13	01/19	4.65E 03	CU. FT.	8.7 ± 0.8 E-02	6.7 ± 3.9 E-03	01/22		L.T. 3. E-02
01/19	01/26	1.04E 04	CU. FT.	1.9 ± 0.3 E-02	L.T. 2. E-03	01/30		L.T. 2. E-02
01/26	02/02	9.73E 03	CU. FT.	2.1 ± 0.3 E-02	L.T. 1. E-03	02/06		L.T. 2. E-02
02/02	02/09	1.03E 04	CU. FT.	3.0 ± 0.3 E-02	2.7 ± 1.6 E-03	02/13		L.T. 2. E-02
02/09	02/16	9.97E 03	CU. FT.	3.0 ± 0.3 E-02	3.2 ± 1.7 E-03	02/20		L.T. 2. E-02
02/16	02/23	1.00E 04	CU. FT.	3.4 ± 0.4 E-02	L.T. 2. E-03	02/26		L.T. 2. E-02
02/23	03/02	1.01E 04	CU. FT.	3.5 ± 0.4 E-02	2.6 ± 1.4 E-03	03/06		L.T. 2. E-02
03/02	03/09	1.01E 04	CU. FT.	2.2 ± 0.3 E-02	L.T. 2. E-03	03/13		L.T. 2. E-02
03/09	03/16	1.01E 04	CU. FT.	2.7 ± 0.4 E-02	2.0 ± 1.5 E-03	03/20		L.T. 2. E-02
03/16	03/23	1.03E 04	CU. FT.	3.1 ± 0.4 E-02	2.6 ± 1.4 E-03	03/26		L.T. 2. E-02
03/23	03/30	8.19E 03	CU. FT.	1.3 ± 0.3 E-02	L.T. 2. E-03	04/04		L.T. 3. E-02
03/30	04/06	1.01E 04	CU. FT.	1.6 ± 0.3 E-02	L.T. 1. E-03	04/13		L.T. 4. E-02
04/06	04/13	1.01E 04	CU. FT.	1.1 ± 0.2 E-02	3.1 ± 1.5 E-03	04/19		L.T. 4. E-02
04/13	04/20	9.94E 03	CU. FT.	1.0 ± 0.2 E-02	L.T. 2. E-03	04/25		L.T. 2. E-02
04/20	04/27	1.03E 04	CU. FT.	2.1 ± 0.3 E-02	2.6 ± 1.4 E-03	05/04		L.T. 2. E-02
04/27	05/04	9.95E 03	CU. FT.	1.4 ± 0.3 E-02	3.1 ± 1.5 E-03	05/09		L.T. 2. E-02
05/04	05/11	1.00E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	05/16		L.T. 2. E-02
05/11	05/18	1.04E 04	CU. FT.	1.5 ± 0.3 E-02	L.T. 1. E-03	05/26		L.T. 5. E-02
05/18	05/25	9.77E 03	CU. FT.	1.7 ± 0.3 E-02	1.5 ± 1.3 E-03	06/02		L.T. 3. E-02
05/25	06/01	1.01E 04	CU. FT.	1.8 ± 0.3 E-02	2.3 ± 1.5 E-03	06/08		L.T. 5. E-02
06/01	06/08	1.03E 04	CU. FT.	1.1 ± 0.2 E-02	L.T. 2. E-03	06/15		L.T. 2. E-02
06/08	06/15	1.01E 04	CU. FT.	1.8 ± 0.3 E-02	3.2 ± 1.6 E-03	06/22		L.T. 3. E-02
06/15	06/22	9.75E 03	CU. FT.	1.3 ± 0.3 E-02	L.T. 2. E-03	06/28		L.T. 2. E-02
06/22	06/29	1.04E 04	CU. FT.	0.91±0.21 E-02	L.T. 2. E-03	07/07		L.T. 3. E-02
06/29	07/06	1.02E 04	CU. FT.	1.3 ± 0.2 E-02	2.1 ± 1.2 E-03	07/10		L.T. 1. E-02
07/06	07/13	9.73E 03	CU. FT.	0.6 ± 0.2 E-02	L.T. 2. E-03	07/17		L.T. 2. E-02
07/13	07/20	1.01E 04	CU. FT.	9.0 ± 2.2 E-03	L.T. 2. E-03	07/25		L.T. 2. E-02
07/20	07/27	1.02E 04	CU. FT.	1.6 ± 0.3 E-02	L.T. 2. E-03	08/03		L.T. 4. E-02
07/27	08/03	1.02E 04	CU. FT.	1.5 ± 0.2 E-02	1.7 ± 1.3 E-03	08/07		L.T. 1. E-02
08/03	08/10	9.97E 03	CU. FT.	1.8 ± 0.3 E-02	1.9 ± 1.5 E-03	08/15		L.T. 2. E-02
08/10	08/17	1.01E 04	CU. FT.	2.2 ± 0.3 E-02	L.T. 2. E-03	08/21		L.T. 3. E-02
08/17	08/24	1.01E 04	CU. FT.	1.9 ± 0.3 E-02	L.T. 1. E-03	08/29		L.T. 3. E-02
08/24	08/31	9.91E 03	CU. FT.	2.7 ± 0.4 E-02	2.1 ± 1.3 E-03	09/05		L.T. 3. E-02
08/31	09/07	9.89E 03	CU. FT.	4.2 ± 0.4 E-02	3.3 ± 1.6 E-03	09/17		L.T. 3. E-02
09/07	09/14	1.02E 04	CU. FT.	2.7 ± 0.3 E-02	2.6 ± 1.4 E-03	09/18		L.T. 2. E-02
09/14	09/22	1.17E 04	CU. FT.	2.9 ± 0.3 E-02	L.T. 2. E-03	09/29		L.T. 3. E-02
09/22	09/28	8.72E 03	CU. FT.	2.7 ± 0.4 E-02	2.1 ± 1.6 E-03	10/04		L.T. 3. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 08

STATION 08 - 2.5 MI. 260 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
09/28	10/05	9.72E 03	CU. FT.	3.3 ± 0.4 E-02	3.7 ± 1.6 E-03	10/13		L.T. 3. E-02
10/05	10/12	9.98E 03	CU. FT.	5.3 ± 0.4 E-02	5.7 ± 1.9 E-03	10/18		L.T. 3. E-02
10/12	10/19	1.01E 04	CU. FT.	6.2 ± 0.5 E-02	6.7 ± 2.1 E-03	10/24		L.T. 2. E-02
10/19	10/26	9.81E 03	CU. FT.	3.0 ± 0.4 E-02	3.5 ± 1.7 E-03	11/01		L.T. 4. E-02
10/26	11/02	1.03E 04	CU. FT.	1.6 ± 0.3 E-02	2.6 ± 1.4 E-03	11/07		L.T. 2. E-02
11/02	11/10	1.02E 04	CU. FT.	2.0 ± 0.3 E-02	L.T. 2. E-03	11/15		L.T. 3. E-02
11/09	11/16	9.86E 03	CU. FT.	2.5 ± 0.3 E-02	2.6 ± 1.5 E-03	11/20		L.T. 1. E-02
11/16	11/23	1.03E 04	CU. FT.	2.2 ± 0.3 E-02	1.6 ± 1.3 E-03	12/02		L.T. 4. E-02
11/23	11/30	1.01E 04	CU. FT.	2.4 ± 0.3 E-02	1.6 ± 1.3 E-03	12/07		L.T. 5. E-02
11/30	12/07	9.98E 03	CU. FT.	3.9 ± 0.4 E-02	2.3 ± 1.4 E-03	12/13		L.T. 3. E-02
12/07	12/14	1.01E 04	CU. FT.	2.6 ± 0.3 E-02	3.7 ± 1.6 E-03	12/21		L.T. 3. E-02
12/14	12/21	1.02E 04	CU. FT.	2.2 ± 0.3 E-02	2.1 ± 1.2 E-03	12/29		L.T. 4. E-02
12/21	12/28	9.92E 03	CU. FT.	2.4 ± 0.3 E-02	L.T. 2. E-03	01/05		L.T. 4. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 09

STATION 09 - 7.25 MI. 335 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.02E 04	CU. FT.	3.8 ± 0.4 E-02	2.0 ± 1.4 E-03	01/09		L.T. 2. E-02
01/05	01/13	1.15E 04	CU. FT.	4.8 ± 0.4 E-02	4.3 ± 1.6 E-03	01/20		L.T. 2. E-02
01/13	01/19	6.73E 03	CU. FT.	5.2 ± 0.5 E-02	3.8 ± 2.5 E-03	01/22		L.T. 2. E-02
01/19	01/26	1.01E 04	CU. FT.	1.8 ± 0.3 E-02	L.T. 2. E-03	01/30		L.T. 2. E-02
01/26	02/02	9.81E 03	CU. FT.	2.2 ± 0.3 E-02	2.3 ± 1.4 E-03	02/06		L.T. 2. E-02
02/02	02/09	1.03E 04	CU. FT.	3.2 ± 0.3 E-02	3.3 ± 1.7 E-03	02/13		L.T. 2. E-02
02/09	02/16	9.97E 03	CU. FT.	2.7 ± 0.3 E-02	1.9 ± 1.5 E-03	02/20		L.T. 2. E-02
02/16	02/23	1.00E 04	CU. FT.	3.3 ± 0.4 E-02	3.0 ± 1.7 E-03	02/26		L.T. 2. E-02
02/23	03/02	1.02E 04	CU. FT.	3.0 ± 0.3 E-02	5.1 ± 1.8 E-03	03/06		L.T. 2. E-02
03/02	03/09	1.00E 04	CU. FT.	2.9 ± 0.3 E-02	L.T. 2. E-03	03/13		L.T. 2. E-02
03/09	03/16	1.00E 04	CU. FT.	1.8 ± 0.3 E-02	L.T. 2. E-03	03/20		L.T. 2. E-02
03/16	03/23	1.02E 04	CU. FT.	2.1 ± 0.3 E-02	1.1 ± 1.1 E-03	03/26		L.T. 2. E-02
03/23	03/30	1.00E 04	CU. FT.	1.3 ± 0.2 E-02	L.T. 2. E-03	04/04		L.T. 2. E-02
03/30	04/06	1.01E 04	CU. FT.	1.4 ± 0.2 E-02	1.6 ± 1.3 E-03	04/13		L.T. 4. E-02
04/06	04/13	1.01E 04	CU. FT.	1.2 ± 0.2 E-02	2.4 ± 1.4 E-03	04/19		L.T. 4. E-02
04/13	04/20	9.94E 03	CU. FT.	8.4 ± 2.4 E-03	1.6 ± 1.3 E-03	04/25		L.T. 2. E-02
04/20	04/27	1.02E 04	CU. FT.	1.9 ± 0.3 E-02	3.4 ± 1.6 E-03	05/04		L.T. 2. E-02
04/27	05/04	9.99E 03	CU. FT.	1.2 ± 0.2 E-02	1.8 ± 1.2 E-03	05/09		L.T. 2. E-02
05/04	05/11	1.00E 04	CU. FT.	1.6 ± 0.3 E-02	L.T. 2. E-03	05/16		L.T. 2. E-02
05/11	05/18	1.03E 04	CU. FT.	3.8 ± 0.4 E-02	2.4 ± 1.4 E-03	05/26		L.T. 5. E-02
05/18	05/25	9.81E 03	CU. FT.	1.6 ± 0.3 E-02	1.5 ± 1.3 E-03	06/02		L.T. 3. E-02
05/25	06/01	1.01E 04	CU. FT.	1.5 ± 0.3 E-02	1.9 ± 1.4 E-03	06/08		L.T. 5. E-02
06/01	06/08	1.02E 04	CU. FT.	1.3 ± 0.3 E-02	L.T. 2. E-03	06/15		L.T. 2. E-02
06/08	06/15	1.01E 04	CU. FT.	2.2 ± 0.3 E-02	2.3 ± 1.4 E-03	06/22		L.T. 3. E-02
06/15	06/22	9.79E 03	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	06/28		L.T. 2. E-02
06/22	06/29	1.03E 04	CU. FT.	1.3 ± 0.2 E-02	L.T. 2. E-03	07/07		L.T. 3. E-02
06/29	07/06	1.02E 04	CU. FT.	2.1 ± 0.3 E-02	2.4 ± 1.3 E-03	07/10		L.T. 1. E-02
07/06	07/13	9.77E 03	CU. FT.	1.1 ± 0.2 E-02	L.T. 2. E-03	07/17		L.T. 2. E-02
07/13	07/20	1.00E 04	CU. FT.	1.6 ± 0.3 E-02	2.8 ± 1.8 E-03	07/25		L.T. 2. E-02
07/20	07/27	1.02E 04	CU. FT.	1.2 ± 0.2 E-02	L.T. 2. E-03	08/03		L.T. 4. E-02
07/27	08/03	1.00E 04	CU. FT.	2.4 ± 0.3 E-02	3.3 ± 1.6 E-03	08/07		L.T. 2. E-02
08/03	08/10	1.02E 04	CU. FT.	1.8 ± 0.3 E-02	2.4 ± 1.5 E-03	08/15		L.T. 2. E-02
08/10	08/17	9.96E 03	CU. FT.	1.9 ± 0.3 E-02	L.T. 2. E-03	08/21		L.T. 3. E-02
08/17	08/24	1.05E 04	CU. FT.	2.2 ± 0.3 E-02	2.0 ± 1.3 E-03	08/29		L.T. 2. E-02
08/24	08/31	1.00E 04	CU. FT.	2.5 ± 0.4 E-02	1.3 ± 1.1 E-03	09/05		L.T. 2. E-02
08/31	09/07	9.85E 03	CU. FT.	2.9 ± 0.3 E-02	3.1 ± 1.6 E-03	09/17		L.T. 2. E-02
09/07	09/14	1.03E 04	CU. FT.	2.0 ± 0.3 E-02	2.4 ± 1.4 E-03	09/18		L.T. 2. E-02
09/14	09/22	1.17E 04	CU. FT.	1.4 ± 0.2 E-02	L.T. 2. E-03	09/29		L.T. 3. E-02
09/22	09/28	8.69E 03	CU. FT.	2.1 ± 0.3 E-02	L.T. 2. E-03	10/04		L.T. 3. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 09

STATION 09 - 7.25 MI. 335 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE	MID-COUNT TIME TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
09/28	10/05	9.80E 03	CU. FT.	2.1 ± 0.3 E-02	2.1 ± 1.3 E-03	10/13		L.T. 2. E-02
10/05	10/12	1.01E 04	CU. FT.	2.9 ± 0.3 E-02	2.7 ± 1.3 E-03	10/18		L.T. 3. E-02
10/12	10/19	1.01E 04	CU. FT.	3.4 ± 0.4 E-02	4.5 ± 1.7 E-03	10/24		L.T. 2. E-02
10/19	10/26	9.90E 03	CU. FT.	2.0 ± 0.3 E-02	1.6 ± 1.3 E-03	11/01		L.T. 4. E-02
10/26	11/02	1.02E 04	CU. FT.	1.8 ± 0.3 E-02	3.0 ± 1.5 E-03	11/07		L.T. 2. E-02
11/02	11/10	1.03E 04	CU. FT.	2.2 ± 0.3 E-02	1.7 ± 1.4 E-03	11/15		L.T. 3. E-02
11/09	11/16	9.88E 03	CU. FT.	2.5 ± 0.3 E-02	1.7 ± 1.4 E-03	11/20		L.T. 1. E-02
11/16	11/23	1.02E 04	CU. FT.	2.9 ± 0.3 E-02	L.T. 2. E-03	12/02		L.T. 4. E-02
11/23	11/30	1.01E 04	CU. FT.	2.6 ± 0.3 E-02	L.T. 2. E-03	12/07		L.T. 5. E-02
11/30	12/07	9.94E 03	CU. FT.	3.5 ± 0.4 E-02	L.T. 1. E-03	12/13		L.T. 3. E-02
12/07	12/14	1.02E 04	CU. FT.	3.0 ± 0.3 E-02	4.6 ± 1.7 E-03	12/21		L.T. 3. E-02
12/14	12/21	1.01E 04	CU. FT.	1.9 ± 0.3 E-02	2.7 ± 1.4 E-03	12/29		L.T. 4. E-02
12/21	12/28	9.96E 03	CU. FT.	2.3 ± 0.3 E-02	L.T. 2. E-03	01/05		L.T. 4. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 10

STATION 10 - 10.0 MI. 160 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
12/29	01/05	1.02E 04	CU. FT.	3.6 ± 0.4 E-02	2.0 ± 1.4 E-03	01/09	L.T. 1. E-02
01/05	01/12	1.03E 04	CU. FT.	3.7 ± 0.4 E-02	4.6 ± 1.8 E-03	01/20	L.T. 2. E-02
01/12	01/19	4.77E 03	CU. FT.	1.2 ± 0.1 E-01	1.2 ± 0.5 E-02	01/22	L.T. 3. E-02
01/19	01/26	1.04E 04	CU. FT.	1.8 ± 0.3 E-02	L.T. 2. E-03	01/30	L.T. 1. E-02
01/26	02/02	9.64E 03	CU. FT.	2.2 ± 0.3 E-02	1.5 ± 1.2 E-03	02/06	L.T. 1. E-02
02/02	02/09	1.03E 04	CU. FT.	2.8 ± 0.3 E-02	2.2 ± 1.4 E-03	02/13	L.T. 2. E-02
02/09	02/16	9.97E 03	CU. FT.	3.1 ± 0.3 E-02	3.5 ± 1.7 E-03	02/20	L.T. 1. E-02
02/16	02/23	1.00E 04	CU. FT.	3.3 ± 0.4 E-02	3.0 ± 1.7 E-03	02/26	L.T. 2. E-02
02/23	03/02	1.01E 04	CU. FT.	2.9 ± 0.3 E-02	3.2 ± 1.5 E-03	03/06	L.T. 1. E-02
03/02	03/09	1.01E 04	CU. FT.	2.4 ± 0.3 E-02	1.9 ± 1.5 E-03	03/13	L.T. 1. E-02
03/09	03/16	1.01E 04	CU. FT.	1.4 ± 0.3 E-02	L.T. 2. E-03	03/20	L.T. 1. E-02
03/16	03/23	1.02E 04	CU. FT.	2.0 ± 0.3 E-02	1.1 ± 1.1 E-03	03/26	L.T. 1. E-02
03/23	03/30	9.98E 03	CU. FT.	1.3 ± 0.2 E-02	L.T. 2. E-03	04/04	L.T. 2. E-02
03/30	04/06	1.00E 04	CU. FT.	1.4 ± 0.2 E-02	1.5 ± 1.3 E-03	04/13	L.T. 3. E-02
04/06	04/13	1.02E 04	CU. FT.	9.2 ± 2.2 E-03	1.5 ± 1.2 E-03	04/19	L.T. 3. E-02
04/13	04/20	1.02E 04	CU. FT.	7.5 ± 2.3 E-03	L.T. 1. E-03	04/25	L.T. 1. E-02
04/20	04/27	1.00E 04	CU. FT.	1.9 ± 0.3 E-02	3.6 ± 1.6 E-03	05/04	L.T. 2. E-02
04/27	05/04	9.85E 03	CU. FT.	1.4 ± 0.3 E-02	3.8 ± 1.6 E-03	05/09	L.T. 1. E-02
05/04	05/11	1.00E 04	CU. FT.	1.8 ± 0.3 E-02	2.5 ± 1.7 E-03	05/16	L.T. 2. E-02
05/11	05/18	1.02E 04	CU. FT.	1.6 ± 0.3 E-02	L.T. 1. E-03	05/26	L.T. 5. E-02
05/18	05/25	9.86E 03	CU. FT.	1.6 ± 0.3 E-02	2.0 ± 1.4 E-03	06/02	L.T. 3. E-02
05/25	06/01	1.01E 04	CU. FT.	1.6 ± 0.3 E-02	2.9 ± 1.6 E-03	06/08	L.T. 5. E-02
06/01	06/08	1.03E 04	CU. FT.	1.2 ± 0.2 E-02	L.T. 2. E-03	06/15	L.T. 2. E-02
06/08	06/15	1.02E 04	CU. FT.	1.7 ± 0.3 E-02	2.0 ± 1.3 E-03	06/22	L.T. 2. E-02
06/15	06/22	9.67E 03	CU. FT.	1.6 ± 0.3 E-02	L.T. 2. E-03	06/28	L.T. 1. E-02
06/22	06/29	1.01E 04	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	07/07	L.T. 2. E-02
06/29	07/06	1.01E 04	CU. FT.	1.9 ± 0.3 E-02	2.6 ± 1.3 E-03	07/10	L.T. 1. E-02
07/06	07/13	9.94E 03	CU. FT.	1.3 ± 0.3 E-02	L.T. 2. E-03	07/17	L.T. 2. E-02
07/13	07/20	1.01E 04	CU. FT.	1.3 ± 0.2 E-02	L.T. 2. E-03	07/25	L.T. 1. E-02
07/20	07/28	1.15E 04	CU. FT.	0.52 ±.18 E-02	L.T. 1. E-03	08/03	L.T. 2. E-02
07/28	08/03	8.91E 03	CU. FT.	2.3 ± 0.3 E-02	2.5 ± 1.6 E-03	08/07	L.T. 1. E-02
08/03	08/10	9.98E 03	CU. FT.	2.4 ± 0.3 E-02	3.9 ± 1.8 E-03	08/15	L.T. 2. E-02
08/10	08/17	1.00E 04	CU. FT.	2.0 ± 0.3 E-02	1.9 ± 1.4 E-03	08/21	L.T. 3. E-02
08/17	08/24	1.04E 04	CU. FT.	2.1 ± 0.3 E-02	2.0 ± 1.3 E-03	08/29	L.T. 1. E-02
08/24	08/31	9.82E 03	CU. FT.	2.8 ± 0.4 E-02	1.6 ± 1.2 E-03	09/06	L.T. 2. E-02
08/31	09/07	9.87E 03	CU. FT.	1.7 ± 0.3 E-02	4.1 ± 1.7 E-03	09/17	L.T. 3. E-02
09/07	09/14	1.02E 04	CU. FT.	1.8 ± 0.3 E-02	2.4 ± 1.4 E-03	09/18	L.T. 1. E-02
09/14	09/22	1.18E 04	CU. FT.	1.8 ± 0.3 E-02	L.T. 1. E-03	09/29	L.T. 3. E-02
09/22	09/28	8.58 E03	CU. FT.	2.0 ± 0.3 E-02	L.T. 2. E-03	10/04	L.T. 3. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 10

STATION 10 - 10.0 MI. 160 DEG. IND.

COLL. START DATE	TIME STOP DATE	VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT TIME DATE TIME	CHARCOAL FILTER I-131 (PCI/CU. M.)
09/28	10/05	9.83E 03	CU. FT.	2.4 ± 0.3 E-02	3.1 ± 1.5 E-03	10/13	L.T. 3. E-02
10/05	10/12	1.02E 04	CU. FT.	3.2 ± 0.3 E-02	3.4 ± 1.5 E-03	10/18	L.T. 3. E-02
10/12	10/19	1.02E 04	CU. FT.	3.6 ± 0.4 E-02	3.9 ± 1.6 E-03	10/24	L.T. 1. E-02
10/19	10/26	9.61E 03	CU. FT.	2.4 ± 0.3 E-02	3.6 ± 1.7 E-03	11/01	L.T. 5. E-02
10/26	11/02	1.05E 04	CU. FT.	2.1 ± 0.3 E-02	2.3 ± 1.3 E-03	11/07	L.T. 2. E-02
11/02	11/10	9.74E 03	CU. FT.	3.1 ± 0.3 E-02	3.3 ± 1.7 E-03	11/15	L.T. 3. E-02
11/09	11/16	9.87E 03	CU. FT.	2.5 ± 0.3 E-02	2.8 ± 1.6 E-03	11/20	L.T. 1. E-02
11/16	11/23	1.03E 04	CU. FT.	3.3 ± 0.4 E-02	L.T. 3. E-03	12/02	L.T. 3. E-02
11/23	11/30	1.03E 04	CU. FT.	3.3 ± 0.4 E-02	L.T. 3. E-03	12/07	L.T. 3. E-02
11/30	12/07	1.00E 04	CU. FT.	4.2 ± 0.4 E-02	2.8 ± 1.5 E-03	12/13	L.T. 3. E-02
12/07	12/14	1.01E 04	CU. FT.	2.7 ± 0.3 E-02	3.0 ± 1.4 E-03	12/21	L.T. 3. E-02
12/14	12/22	1.12E 04	CU. FT.	2.4 ± 0.3 E-02	2.0 ± 1.1 E-03	12/29	L.T. 4. E-02
12/22	12/28	8.80E 03	CU. FT.	2.5 ± 0.3 E-02	L.T. 2. E-03	01/05	L.T. 4. E-02

D. QUARTERLY COMPOSITES OF AIR PARTICULATE FILTERS

STATIONS 01-10

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 01
STATION 01 - 0.1 MI. 225 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-09/28	09/28-12/28
GAMMA SPECTRUM ANALYSIS:				
BE-7	8.09±1.18 E-02	1.44±0.14 E-01	1.31±0.13 E-01	1.21±0.13 E-01
K-40	L.T. 2. E-02	L.T. 8. E-03	L.T. 8. E-03	L.T. 9. E-03
MN-54	L.T. 7. E-04	L.T. 5. E-04	L.T. 4. E-04	L.T. 6. E-04
CO-58	L.T. 1. E-03	L.T. 7. E-04	L.T. 5. E-04	L.T. 9. E-04
FE-59	L.T. 3. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03
CO-60	L.T. 7. E-04	L.T. 5. E-04	L.T. 4. E-04	L.T. 5. E-04
ZN-65	L.T. 2. E-03	L.T. 1. E-03	L.T. 9. E-04	L.T. 1. E-03
ZR-95	L.T. 1. E-03	L.T. 8. E-04	L.T. 5. E-04	L.T. 9. E-04
RU-103	L.T. 2. E-03	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03
RU-106	L.T. 6. E-03	L.T. 4. E-03	L.T. 3. E-03	L.T. 6. E-03
I-131	L.T. 1. E-01	L.T. 1. E-01	L.T. 8. E-02	L.T. 2. E-01
CS-134	L.T. 7. E-04	L.T. 4. E-04	L.T. 4. E-04	L.T. 6. E-04
CS-137	L.T. 7. E-04	L.T. 5. E-04	L.T. 3. E-04	L.T. 5. E-04
BA-140	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02
CE-141	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-03
CE-144	L.T. 3. E-03	L.T. 3. E-03	L.T. 2. E-03	L.T. 3. E-03
RA-226	L.T. 9. E-03	L.T. 8. E-03	L.T. 7. E-03	L.T. 1. E-02
TH-228	L.T. 9. E-04	L.T. 7. E-04	L.T. 6. E-04	L.T. 9. E-04

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 02
STATION 02 - 0.75 MI. 225 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-09/28	09/28-12/28
GAMMA SPECTRUM ANALYSIS:				
BE-7	8.91±1.16 E-02	1.31±0.13 E-01	1.17±0.12 E-01	1.21±0.13 E-01
K-40	L.T. 9. E-03	1.00±0.55 E-02	L.T. 2. E-02	L.T. 1. E-02
MN-54	L.T. 4. E-04	L.T. 6. E-04	L.T. 6. E-04	L.T. 5. E-04
CO-58	L.T. 7. E-04	L.T. 1. E-03	L.T. 9. E-04	L.T. 7. E-04
FE-59	L.T. 2. E-03	L.T. 3. E-03	L.T. 3. E-03	L.T. 2. E-03
CO-60	L.T. 6. E-04	L.T. 7. E-04	L.T. 6. E-04	L.T. 5. E-04
ZN-65	L.T. 1. E-03	L.T. 2. E-03	L.T. 1. E-03	L.T. 1. E-03
ZR-95	L.T. 9. E-04	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03
RU-103	L.T. 1. E-03	L.T. 2. E-03	L.T. 1. E-03	L.T. 2. E-03
RU-106	L.T. 4. E-03	L.T. 6. E-03	L.T. 5. E-03	L.T. 4. E-03
I-131	L.T. 9. E-02	L.T. 2. E-01	L.T. 1. E-01	L.T. 2. E-01
CS-134	L.T. 6. E-04	L.T. 6. E-04	L.T. 6. E-04	L.T. 6. E-04
CS-137	L.T. 5. E-04	L.T. 6. E-04	L.T. 6. E-04	L.T. 5. E-04
BA-140	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 3. E-02
CE-141	L.T. 3. E-03	L.T. 3. E-03	L.T. 2. E-03	L.T. 4. E-03
CE-144	L.T. 3. E-03	L.T. 3. E-03	L.T. 3. E-03	L.T. 5. E-03
RA-226	L.T. 9. E-03	L.T. 9. E-03	L.T. 8. E-03	L.T. 1. E-02
TH-228	L.T. 9. E-04	L.T. 9. E-04	L.T. 8. E-04	L.T. 1. E-03

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 03
STATION 03 - 2.5 MI. 338 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-07/06	11/17-12/28
GAMMA SPECTRUM ANALYSIS:				
BE-7	7.52±0.99 E-02	1.35±0.13 E-01	1.09±0.91 E-01	1.08±0.15 E-01
K-40	2.85±0.61 E-02	L.T. 8. E-03	L.T. 2. E-01	L.T. 3. E-02
MN-54	L.T. 5. E-04	L.T. 4. E-04	L.T. 7. E-03	L.T. 1. E-03
CO-58	L.T. 9. E-04	L.T. 6. E-04	L.T. 1. E-02	L.T. 2. E-03
FE-59	L.T. 3. E-03	L.T. 2. E-03	L.T. 4. E-02	L.T. 4. E-03
CO-60	L.T. 6. E-04	L.T. 4. E-04	L.T. 8. E-03	L.T. 1. E-03
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 2. E-02	L.T. 3. E-03
ZR-95	L.T. 1. E-03	L.T. 7. E-04	L.T. 1. E-02	L.T. 2. E-03
RU-103	L.T. 1. E-03	L.T. 1. E-03	L.T. 2. E-02	L.T. 2. E-03
RU-106	L.T. 5. E-03	L.T. 3. E-03	L.T. 7. E-02	L.T. 1. E-02
I-131	L.T. 9. E-02	L.T. 1. E-01	L.T. 1. E 00	L.T. 4. E-02
CS-134	L.T. 6. E-04	L.T. 5. E-04	L.T. 8. E-03	L.T. 1. E-03
CS-137	L.T. 5. E-04	L.T. 5. E-04	L.T. 7. E-03	L.T. 1. E-03
BA-140	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-01	L.T. 1. E-02
CE-141	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-02	L.T. 3. E-03
CE-144	L.T. 3. E-03	L.T. 3. E-03	L.T. 3. E-02	L.T. 5. E-03
RA-226	L.T. 7. E-03	L.T. 8. E-03	L.T. 1. E-01	L.T. 2. E-02
TH-228	L.T. 7. E-04	L.T. 8. E-04	L.T. 1. E-02	L.T. 2. E-03

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 04
STATION 04 - 3.0 MI. 43 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-07/20	11/10 12/28
GAMMA SPECTRUM ANALYSIS:				
BE-7	7.65±1.05 E-02	1.37±0.14 E-01	9.60±3.58 E-02	1.64±0.18 E-01
K-40	L.T. 7. E-03	9.64±5.31 E-03	L.T. 4. E-02	L.T. 4. E-02
MN-54	L.T. 5. E-04	L.T. 5. E-04	L.T. 2. E-03	L.T. 1. E-03
CO-58	L.T. 6. E-04	L.T. 9. E-04	L.T. 4. E-03	L.T. 1. E-03
FE-59	L.T. 2. E-03	L.T. 3. E-03	L.T. 1. E-02	L.T. 5. E-03
CO-60	L.T. 6. E-04	L.T. 6. E-04	L.T. 3. E-03	L.T. 1. E-03
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 6. E-03	L.T. 3. E-03
ZR-95	L.T. 9. E-04	L.T. 1. E-03	L.T. 4. E-03	L.T. 2. E-03
RU-103	L.T. 1. E-03	L.T. 2. E-03	L.T. 6. E-03	L.T. 2. E-03
RU-106	L.T. 4. E-03	L.T. 5. E-03	L.T. 2. E-02	L.T. 1. E-02
I-131	L.T. 8. E-02	L.T. 2. E-01	L.T. 6. E-01	L.T. 5. E-02
CS-134	L.T. 5. E-04	L.T. 6. E-04	L.T. 3. E-03	L.T. 1. E-03
CS-137	L.T. 5. E-04	L.T. 6. E-04	L.T. 3. E-03	L.T. 1. E-03
BA-140	L.T. 2. E-02	L.T. 3. E-02	L.T. 8. E-02	L.T. 1. E-02
CE-141	L.T. 2. E-03	L.T. 2. E-03	L.T. 1. E-02	L.T. 3. E-03
CE-144	L.T. 3. E-03	L.T. 3. E-03	L.T. 1. E-02	L.T. 6. E-03
RA-226	L.T. 8. E-03	L.T. 7. E-03	L.T. 4. E-02	L.T. 2. E-02
TH-228	L.T. 1. E-03	L.T. 7. E-04	L.T. 4. E-03	L.T. 1. E-03

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 05
STATION 05 - 3.5 MI. 102 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-07/20 *
GAMMA SPECTRUM ANALYSIS:			
BE-7	8.34±1.04 E-02	1.64±0.16 E-01	8.62±2.87 E-02
K-40	L.T. 7. E-03	L.T. 9. E-03	L.T. 6. E-02
MN-54	L.T. 5. E-04	L.T. 6. E-04	L.T. 2. E-03
CO-58	L.T. 7. E-04	L.T. 9. E-04	L.T. 4. E-03
FE-59	L.T. 2. E-03	L.T. 3. E-03	L.T. 1. E-03
CO-60	L.T. 5. E-04	L.T. 7. E-04	L.T. 2. E-03
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 6. E-03
ZR-95	L.T. 9. E-04	L.T. 1. E-03	L.T. 4. E-03
RU-103	L.T. 1. E-03	L.T. 2. E-03	L.T. 6. E-03
RU-106	L.T. 5. E-03	L.T. 5. E-03	L.T. 2. E-02
I-131	L.T. 9. E-02	L.T. 2. E-01	L.T. 5. E-01
CS-134	L.T. 5. E-04	L.T. 6. E-04	L.T. 2. E-03
CS-137	L.T. 6. E-04	L.T. 6. E-04	L.T. 2. E-03
BA-140	L.T. 2. E-02	L.T. 3. E-02	L.T. 8. E-02
CE-141	L.T. 2. E-03	L.T. 3. E-03	L.T. 8. E-03
CE-144	L.T. 3. E-03	L.T. 4. E-03	L.T. 1. E-02
RA-226	L.T. 9. E-03	L.T. 1. E-02	L.T. 3. E-02
TH-228	L.T. 1. E-03	L.T. 9. E-04	L.T. 3. E-03

*Missouri Flood - Sample Not Collected

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 06
STATION 06 - 3.0 MI. 165 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-07/20	11/10-12/28
GAMMA SPECTRUM ANALYSIS:				
BE-7	7.93±0.88 E-02	1.40±0.14 E-01	7.62±3.41 E-02	1.26±0.15 E-01
K-40	L.T. 5. E-03	L.T. 9. E-03	4.23±2.21 E-02	L.T. 1. E-02
MN-54	L.T. 5. E-04	L.T. 4. E-04	L.T. 3. E-03	L.T. 9. E-04
CO-58	L.T. 7. E-04	L.T. 7. E-04	L.T. 4. E-03	L.T. 1. E-03
FE-59	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-02	L.T. 2. E-03
CO-60	L.T. 6. E-04	L.T. 5. E-04	L.T. 3. E-03	L.T. 8. E-04
ZN-65	L.T. 1. E-03	L.T. 9. E-04	L.T. 7. E-03	L.T. 2. E-03
ZR-95	L.T. 7. E-04	L.T. 8. E-04	L.T. 5. E-03	L.T. 1. E-03
RU-103	L.T. 9. E-04	L.T. 1. E-03	L.T. 7. E-03	L.T. 1. E-03
RU-106	L.T. 4. E-03	L.T. 4. E-03	L.T. 3. E-02	L.T. 7. E-03
I-131	L.T. 6. E-02	L.T. 1. E-01	L.T. 6. E-01	L.T. 5. E-02
CS-134	L.T. 4. E-04	L.T. 5. E-04	L.T. 3. E-03	L.T. 8. E-04
CS-137	L.T. 4. E-04	L.T. 4. E-04	L.T. 3. E-03	L.T. 7. E-04
BA-140	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-01	L.T. 1. E-02
CE-141	L.T. 1. E-03	L.T. 2. E-03	L.T. 1. E-02	L.T. 3. E-03
CE-144	L.T. 2. E-03	L.T. 3. E-03	L.T. 1. E-02	L.T. 5. E-03
RA-226	L.T. 6. E-03	L.T. 9. E-03	L.T. 4. E-02	L.T. 1. E-02
TH-228	L.T. 6. E-04	L.T. 7. E-04	L.T. 4. E-03	L.T. 1. E-03

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 07
STATION 07 - 2.5 MI. 230 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-09/28	09/28-12/28
GAMMA SPECTRUM ANALYSIS:				
BE-7	9.84±0.98 E-02	2.22±0.27 E-01	1.73±0.17 E-01	7.61±1.09 E-02
K-40	L.T. 7. E-03	L.T. 2. E-02	L.T. 9. E-03	L.T. 2. E-02
MN-54	L.T. 4. E-04	L.T. 1. E-03	L.T. 5. E-04	L.T. 6. E-04
CO-58	L.T. 6. E-04	L.T. 1. E-03	L.T. 9. E-04	L.T. 9. E-04
FE-59	L.T. 1. E-03	L.T. 5. E-03	L.T. 3. E-03	L.T. 3. E-03
CO-60	L.T. 4. E-04	L.T. 1. E-03	L.T. 6. E-04	L.T. 7. E-04
ZN-65	L.T. 8. E-04	L.T. 2. E-03	L.T. 1. E-03	L.T. 2. E-03
ZR-95	L.T. 6. E-04	L.T. 2. E-03	L.T. 9. E-04	L.T. 1. E-03
RU-103	L.T. 1. E-03	L.T. 3. E-03	L.T. 2. E-03	L.T. 2. E-03
RU-106	L.T. 4. E-03	L.T. 8. E-03	L.T. 5. E-03	L.T. 6. E-03
I-131	L.T. 7. E-02	L.T. 3. E-01	L.T. 2. E-01	L.T. 2. E-01
CS-134	L.T. 4. E-04	L.T. 1. E-03	L.T. 5. E-04	L.T. 6. E-04
CS-137	L.T. 3. E-04	L.T. 1. E-03	L.T. 5. E-04	L.T. 5. E-04
BA-140	L.T. 7. E-03	L.T. 5. E-02	L.T. 2. E-02	L.T. 2. E-02
CE-141	L.T. 2. E-03	L.T. 8. E-03	L.T. 3. E-03	L.T. 2. E-03
CE-144	L.T. 2. E-03	L.T. 1. E-02	L.T. 3. E-03	L.T. 3. E-03
RA-226	L.T. 7. E-03	L.T. 2. E-02	L.T. 1. E-02	L.T. 8. E-03
TH-228	L.T. 7. E-04	L.T. 2. E-03	L.T. 9. E-04	L.T. 8. E-04

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 08
STATION 08 - 2.5 MI. 260 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-09/28	09/28-12/28
GAMMA SPECTRUM ANALYSIS:				
BE-7	9.64±1.22 E-02	1.23±0.12 E-01	1.52±0.15 E-01	1.18±0.13 E-01
K-40	L.T. 1. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 9. E-03
MN-54	L.T. 6. E-04	L.T. 5. E-04	L.T. 6. E-04	L.T. 5. E-04
CO-58	L.T. 9. E-04	L.T. 8. E-04	L.T. 8. E-04	L.T. 8. E-04
FE-59	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-03
CO-60	L.T. 6. E-04	L.T. 5. E-04	L.T. 6. E-04	L.T. 5. E-04
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03
ZR-95	L.T. 1. E-03	L.T. 8. E-04	L.T. 1. E-03	L.T. 1. E-03
RU-103	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03	L.T. 2. E-03
RU-106	L.T. 5. E-03	L.T. 4. E-03	L.T. 5. E-03	L.T. 6. E-03
I-131	L.T. 1. E-01	L.T. 2. E-01	L.T. 1. E-01	L.T. 2. E-01
CS-134	L.T. 5. E-04	L.T. 6. E-04	L.T. 6. E-04	L.T. 5. E-04
CS-137	L.T. 6. E-04	L.T. 7. E-04	L.T. 5. E-04	L.T. 6. E-04
BA-140	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
CE-141	L.T. 3. E-03	L.T. 2. E-03	L.T. 3. E-03	L.T. 3. E-03
CE-144	L.T. 3. E-03	L.T. 3. E-03	L.T. 4. E-03	L.T. 3. E-03
RA-226	L.T. 1. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 9. E-03
TH-228	L.T. 1. E-03	L.T. 9. E-04	L.T. 1. E-03	L.T. 9. E-04

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 09
STATION 09 - 7.25 MI. 335 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-09/28	09/28-12/28
GAMMA SPECTRUM ANALYSIS:				
BE-7	8.30±0.94 E-02	1.53±0.15 E-01	1.31±0.13 E-01	1.20±0.12 E-01
K-40	L.T. 1. E-02	L.T. 8. E-03	L.T. 8. E-03	L.T. 2. E-02
MN-54	L.T. 5. E-04	L.T. 5. E-04	L.T. 4. E-04	L.T. 6. E-04
CO-58	L.T. 8. E-04	L.T. 7. E-04	L.T. 7. E-04	L.T. 1. E-03
FE-59	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-03
CO-60	L.T. 5. E-04	L.T. 4. E-04	L.T. 5. E-04	L.T. 6. E-04
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03	L.T. 2. E-03
ZR-95	L.T. 9. E-04	L.T. 9. E-04	L.T. 8. E-04	L.T. 1. E-03
RU-103	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03	L.T. 2. E-03
RU-106	L.T. 5. E-03	L.T. 4. E-03	L.T. 4. E-03	L.T. 5. E-03
I-131	L.T. 1. E-01	L.T. 1. E-01	L.T. 1. E-01	L.T. 2. E-01
CS-134	L.T. 6. E-04	L.T. 4. E-04	L.T. 4. E-04	L.T. 6. E-04
CS-137	L.T. 5. E-04	L.T. 6. E-04	L.T. 4. E-04	L.T. 6. E-04
BA-140	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
CE-141	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03
CE-144	L.T. 3. E-03	L.T. 3. E-03	L.T. 3. E-03	L.T. 3. E-03
RA-226	L.T. 7. E-03	L.T. 8. E-03	L.T. 8. E-03	L.T. 8. E-03
TH-228	L.T. 7. E-04	L.T. 7. E-04	L.T. 8. E-04	L.T. 8. E-04

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 10
STATION 10 - 10.0 MI. 160 DEG. IND.

DATE COLLECTED:	12/29-03/30	03/30-06/29	06/29-09/28	09/28-12/28
GAMMA SPECTRUM ANALYSIS:				
BE-7	9.79±1.13 E-02	1.53±0.15 E-01	1.30±0.15 E-01	1.36±0.15 E-01
K-40	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02
MN-54	L.T. 7. E-04	L.T. 7. E-04	L.T. 5. E-04	L.T. 8. E-04
CO-58	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03
FE-59	L.T. 3. E-03	L.T. 4. E-03	L.T. 3. E-03	L.T. 4. E-03
CO-60	L.T. 7. E-04	L.T. 6. E-04	L.T. 5. E-04	L.T. 7. E-03
ZN-65	L.T. 2. E-03	L.T. 2. E-03	L.T. 1. E-03	L.T. 2. E-03
ZR-95	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-03
RU-103	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03
RU-106	L.T. 6. E-03	L.T. 6. E-03	L.T. 6. E-03	L.T. 7. E-03
I-131	L.T. 1. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01
CS-134	L.T. 7. E-04	L.T. 8. E-04	L.T. 5. E-04	L.T. 8. E-04
CS-137	L.T. 6. E-04	L.T. 6. E-04	L.T. 6. E-04	L.T. 8. E-04
BA-140	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 3. E-02
CE-141	L.T. 2. E-03	L.T. 3. E-03	L.T. 4. E-03	L.T. 4. E-03
CE-144	L.T. 3. E-03	L.T. 4. E-03	L.T. 6. E-03	L.T. 5. E-03
RA-226	L.T. 9. E-03	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-02
TH-228	L.T. 8. E-04	L.T. 9. E-04	L.T. 1. E-03	L.T. 1. E-03

E. FISH

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
FISH
(PCI/GM WET)
STATION NUMBER 28
STATION 28 - 1.8 MI. 150 DEG. IND.

DATE COLLECTED:	06/02 FISH-CARP	06/02 FISH-CARP QA	10/06 FISH-CARP	10/06 FISH-CATFISH
RADIOCHEMICAL ANALYSIS:				
GR-B	5.5 ± 0.3 E 00	5.1 ± 0.3 E 00	4.9 ± 0.2 E 00	6.0 ± 0.3 E 00
SR-89	L.T. 4. E-03	L.T. 6. E-03	L.T. 4. E-03	L.T. 5. E-03
SR-90	6.8 ± 1.1 E-03	8.2 ± 1.4 E-03	3.3 ± 2.1 E-03	L.T. 3. E-03
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 4. E-02	L.T. 5. E-02	L.T. 1. E-01	L.T. 1. E-01
K-40	3.79±0.38 E 00	3.31±0.33 E 00	2.21±0.22 E 00	3.29±0.33 E 00
MN-54	L.T. 6. E-03	L.T. 6. E-03	L.T. 9. E-03	L.T. 1. E-02
CO-58	L.T. 6. E-03	L.T. 6. E-03	L.T. 1. E-02	L.T. 1. E-02
FE-59	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 3. E-02
CO-60	L.T. 5. E-03	L.T. 5. E-03	L.T. 8. E-03	L.T. 1. E-02
ZN-65	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 3. E-02
ZR-95	L.T. 6. E-03	L.T. 6. E-03	L.T. 1. E-02	L.T. 1. E-02
RU-103	L.T. 5. E-03	L.T. 5. E-03	L.T. 1. E-02	L.T. 2. E-02
RU-106	L.T. 5. E-02	L.T. 5. E-02	L.T. 8. E-02	L.T. 1. E-01
I-131	L.T. 1. E-02	L.T. 1. E-02	L.T. 6. E-02	L.T. 7. E-02
CS-134	L.T. 6. E-03	L.T. 6. E-03	L.T. 9. E-03	L.T. 1. E-02
CS-137	L.T. 6. E-03	L.T. 6. E-03	L.T. 9. E-03	L.T. 1. E-02
BA-140	L.T. 7. E-03	L.T. 7. E-03	L.T. 3. E-02	L.T. 3. E-02
CE-141	L.T. 8. E-03	L.T. 8. E-03	L.T. 2. E-02	L.T. 3. E-02
CE-144	L.T. 3. E-02	L.T. 3. E-02	L.T. 5. E-02	L.T. 7. E-02
RA-226	L.T. 1. E-01	L.T. 1. E-01	L.T. 2. E-01	L.T. 2. E-01
TH-228	L.T. 9. E-03	L.T. 9. E-03	L.T. 1. E-02	L.T. 2. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
FISH
(PCI/GM WET)
STATION NUMBER 35
STATION 35 - 2.0 MI. 350 DEG. CON.

DATE COLLECTED:	06/02 FISH-CARP	10/06 FISH-CARP	10/07 FISH-CATFISH	10/06 QA FISH-CARP
RADIOCHEMICAL ANALYSIS:				
GR-B	5.2 ± 0.2 E 00	7.1 ± 0.4 E 00	5.5 ± 0.3 E 00	4.8 ± 0.2 E 00
SR-89	L.T. 4. E-03	L.T. 7. E-03	L.T. 5. E-03	I.T. 4. E-03
SR-90	8.2 ± 1.1 E-03	L.T. 5. E-03	L.T. 3. E-03	I.T. 3. E-03
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 6. E-02	L.T. 7. E-02	L.T. 8. E-02	L.T. 1. E-01
K-40	4.06±0.41 E 00	3.31±0.33 E 00	2.22±0.22 E 00	4.10±0.41 E 00
MN-54	L.T. 7. E-03	L.T. 6. E-03	L.T. 8. E-03	L.T. 9. E-03
CO-58	L.T. 7. E-03	L.T. 7. E-03	L.T. 9. E-03	L.T. 1. E-02
FE-59	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
CO-60	L.T. 7. E-03	L.T. 7. E-03	L.T. 8. E-03	L.T. 9. E-03
ZN-65	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
ZR-95	L.T. 7. E-03	L.T. 8. E-03	L.T. 9. E-03	I.T. 1. E-02
RU-103	L.T. 7. E-03	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-02
RU-106	L.T. 6. E-02	L.T. 6. E-02	L.T. 7. E-02	L.T. 8. E-02
I-131	L.T. 1. E-02	L.T. 4. E-02	L.T. 5. E-02	L.T. 6. E-02
CS-134	L.T. 8. E-03	L.T. 7. E-03	L.T. 8. E-03	L.T. 9. E-03
CS-137	L.T. 8. E-03	L.T. 7. E-03	L.T. 8. E-03	L.T. 9. E-03
BA-140	L.T. 9. E-03	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02
CE-141	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02
CE-144	L.T. 4. E-02	L.T. 4. E-02	L.T. 4. E-02	L.T. 5. E-02
RA-226	L.T. 1. E-01	L.T. 1. E-01	L.T. 1. E-01	L.T. 2. E-01
TH-228	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02

F. MILK - NEAREST PRODUCERS

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK NEAREST PRODUCER
(PCI/LITER)
STATION NUMBER 99
STATION 99 - 10.25 MI. 189 DEG. IND.

DATE COLLECTED:	01/05	02/02	03/02	04/06	04/06 QA
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 8. E-01	L.T. 9. E-01	L.T. 1. E 00	L.T. 7. E-01	L.T. 8. E-01
SR-90	1.9 ± 0.2 E 00	1.3 ± 0.2 E 00	3.3 ± 0.3 E 00	2.0 ± 0.2 E 00	1.6 ± 0.2 E 00
I-131	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01
CA (gm/liter)	1.7 ± 0.2 E-01	1.8 ± 0.2 E 00	1.7 ± 0.2 E 00	1.7 ± 0.2 E 00	1.8 ± 0.2 E 00
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
K-40	1.30±0.13 E 03	1.39±0.14 E 03	1.35±0.14 E 03	1.37±0.14 E 03	1.42±0.14 E 03
MN-54	L.T. 3. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
FE-59	L.T. 8. E 00	L.T. 1. E 01	L.T. 7. E 00	L.T. 9. E 00	L.T. 8. E 00
CO-60	L.T. 4. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
ZN-65	L.T. 8. E 00	L.T. 1. E 01	L.T. 7. E 00	L.T. 9. E 00	L.T. 8. E 00
ZR-95	L.T. 4. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 7. E 00	L.T. 8. E 00	L.T. 4. E 00	L.T. 8. E 00	L.T. 8. E 00
CS-134	L.T. 4. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
CS-137	L.T. 4. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
BA-140	L.T. 5. E 00	L.T. 6. E 00	L.T. 3. E 00	L.T. 7. E 00	L.T. 6. E 00
CE-141	L.T. 8. E 00	L.T. 8. E 00	L.T. 5. E 00	L.T. 7. E 00	L.T. 6. E 00
CE-144	L.T. 3. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 2. E 01	L.T. 2. E 01
RA-226	L.T. 8. E 01	L.T. 8. E 01	L.T. 6. E 01	L.T. 7. E 01	L.T. 7. E 01
TH-228	L.T. 7. E 00	L.T. 8. E 00	L.T. 6. E 00	L.T. 7. E 00	L.T. 7. E 00

*Duplicate Analysis

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK NEAREST PRODUCER
(PCI/LITER)
STATION NUMBER 99
STATION 99 - 10.25 MI. 189 DEG. IND.

DATE COLLECTED:	05/04	06/01	06/01 QA	06/15	06/29
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 6. E-01		L.T. 8. E-01		
SR-90	1.6 ± 0.1 E 00		1.4 ± 0.2 E 00		
I-131	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 3. E-01
CA (gm/liter)	1.7 ± 0.2 E 00		1.8 ± 0.2 E 00		
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 3. E 01	L.T. 4. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 4. E 01
K-40	1.44±0.14 E 03	1.46±0.15 E 03	1.47±0.15 E 03	1.41±0.14 E 03	1.53±0.15 E 03
MN-54	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
CO-58	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
FE-59	L.T. 1. E 01	L.T. 1. E 01	L.T. 9. E 00	L.T. 8. E 00	L.T. 1. E 01
CO-60	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 5. E 00
ZN-65	L.T. 1. E 01	L.T. 1. E 01	L.T. 9. E 00	L.T. 9. E 00	L.T. 1. E 01
ZR-95	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 5. E 00
RU-106	L.T. 4. E 01	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 4. E 01
I-131	L.T. 8. E 00	L.T. 7. E 00	L.T. 7. E 00	L.T. 7. E 00	L.T. 1. E 01
CS-134	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 5. E 00
CS-137	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 5. E 00	L.T. 4. E 00
BA-140	L.T. 7. E 00	L.T. 5. E 00	L.T. 6. E 00	L.T. 6. E 00	L.T. 8. E 00
CE-141	L.T. 8. E 00	L.T. 9. E 00	L.T. 6. E 00	L.T. 6. E 00	L.T. 9. E 00
CE-144	L.T. 3. E 01	L.T. 4. E 01	L.T. 2. E 01	L.T. 2. E 01	L.T. 3. E 01
RA-226	L.T. 9. E 01	L.T. 1. E 02	L.T. 8. E 01	L.T. 7. E 01	L.T. 9. E 01
TH-228	L.T. 8. E 00	L.T. 9. E 00	L.T. 7. E 00	L.T. 7. E 00	L.T. 8. E 00

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK NEAREST PRODUCER
(PCI/LITER)
STATION NUMBER 99
STATION 99 - 10.25 MI. 189 DEG. IND.

DATE COLLECTED:	06/01-06/29	07/13	07/13 QA	07/13-07/27	07/27
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 7. E-01		L.T. 1. E 00	L.T. 8. E-01	
SR-90	2.0 ± 0.2 E 00		1.5 ± 0.2 E 00	2.2 ± 0.2 E 00	
I-131		L.T. 2. E-01	L.T. 2. E-01		L.T. 3. E-01
CA (gm/liter)	1.7 ± 0.2 E 00			1.8 ± 0.2 E 00	
GAMMA SPECTRUM ANALYSIS:					
BE-7		L.T. 3. E 01	L.T. 4. E 01		L.T. 3. E 01
K-40		1.40±0.14 E 03	1.33±0.13 E 03		1.30±0.13 E 03
MN-54		L.T. 4. E 00	L.T. 4. E 00		L.T. 3. E 00
CO-58		L.T. 4. E 00	L.T. 4. E 00		L.T. 3. E 00
FE-59		L.T. 9. E 00	L.T. 9. E 00		L.T. 8. E 00
CO-60		L.T. 4. E 00	L.T. 4. E 00		L.T. 3. E 00
ZN-65		L.T. 9. E 00	L.T. 9. E 00		L.T. 7. E 00
ZR-95		L.T. 4. E 00	L.T. 4. E 00		L.T. 3. E 00
RU-103		L.T. 4. E 00	L.T. 4. E 00		L.T. 4. E 00
RU-106		L.T. 3. E 01	L.T. 4. E 01		L.T. 3. E 01
I-131		L.T. 7. E 00	L.T. 7. E 00		L.T. 7. E 00
CS-134		L.T. 4. E 00	L.T. 4. E 00		L.T. 3. E 00
CS-137		L.T. 4. E 00	L.T. 4. E 00		L.T. 3. E 00
BA-140		L.T. 6. E 00	L.T. 6. E 00		L.T. 5. E 00
CE-141		L.T. 8. E 00	L.T. 6. E 00		L.T. 6. E 00
CE-144		L.T. 3. E 01	L.T. 2. E 01		L.T. 2. E 01
RA-226		L.T. 9. E 01	L.T. 8. E 01		L.T. 6. E 01
TH-228		L.T. 8. E 00	L.T. 7. E 00		L.T. 5. E 00

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK NEAREST PRODUCER
(PCI/LITER)
STATION NUMBER 99
STATION 99 - 10.25 MI. 189 DEG. IND.

DATE COLLECTED:	08/11	08/11 QA	08/11-08/24	08/24	09/07
RADIOCHEMICAL ANALYSIS:					
SR-89		L.T. 6. E-01	L.T. 1. E 00		
SR-90		2.2 ± 0.2 E 00	2.2 ± 0.2 E 00		
I-131	L.T. 2. E-01	L.T. 2. E-01		L.T. 2. E-01	L.T. 2. E-01
CA (gm/liter)		1.8 ± 0.2 E 00	1.7 ± 0.2 E 00		
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 3. E 01	L.T. 3. E 01		L.T. 3. E 01	L.T. 4. E 01
K-40	1.46±0.15 E 03	1.29±0.13 E 03		1.43±0.14 E 03	1.16±0.12 E 03
MN-54	L.T. 4. E 00	L.T. 3. E 00		L.T. 4. E 00	L.T. 4. E 00
CO-58	L.T. 4. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 4. E 00
FE-59	L.T. 9. E 00	L.T. 8. E 00		L.T. 1. E 01	L.T. 1. E 01
CO-60	L.T. 4. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 4. E 00
ZN-65	L.T. 1. E 01	L.T. 8. E 00		L.T. 9. E 00	L.T. 1. E 01
ZR-95	L.T. 4. E 00	L.T. 3. E 00		L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 5. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01		L.T. 3. E 01	L.T. 4. E 01
I-131	L.T. 7. E 00	L.T. 7. E 00		L.T. 1. E 01	L.T. 1. E 01
CS-134	L.T. 4. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 4. E 00
CS-137	L.T. 4. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 4. E 00
BA-140	L.T. 5. E 00	L.T. 5. E 00		L.T. 8. E 00	L.T. 9. E 00
CE-14	L.T. 6. E 00	L.T. 6. E 00		L.T. 8. E 00	L.T. 7. E 00
CE-144	L.T. 2. E 01	L.T. 2. E 01		L.T. 3. E 01	L.T. 2. E 01
RA-226	L.T. 7. E 01	L.T. 6. E 01		L.T. 8. E 01	L.T. 8. E 01
TH-228	L.T. 7. E 00	L.T. 6. E 00		L.T. 7. E 00	L.T. 7. E 00

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK NEAREST PRODUCER
(PCI/LITER)
STATION NUMBER 99
STATION 99 - 10.25 MI. 189 DEG. IND.

DATE COLLECTED:	09/07 QA	09/21	09/07-09/21	10/05	10/05 QA
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 1. E 00		L.T. 1. E 00	L.T. 1. E 00	L.T. 1. E 00
SR-90	2.3 ± 0.2 E 00		2.0 ± 0.2 E 00	3.2 ± 0.3 E 00	1.7 ± 0.2 E 00
I-131	L.T. 3. E-01	L.T. 2. E-01	1.7 ± 0.2 E 00	L.T. 2. E-01	L.T. 2. E-01
CA (gm/liter)	1.8 ± 0.2 E 00			1.7 ± 0.2 E 00	1.7 ± 0.2 E 00
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 5. E 01	L.T. 3. E 01		L.T. 3. E 01	L.T. 3. E 01
K-40	1.36±0.14 E 03	1.40±0.14 E 03		1.44±0.14 E 03	1.38±0.14 E 03
MN-54	L.T. 5. E 00	L.T. 3. E 00		L.T. 4. E 00	L.T. 4. E 00
CO-58	L.T. 5. E 00	L.T. 3. E 00		L.T. 4. E 00	L.T. 4. E 00
FE-59	L.T. 1. E 01	L.T. 8. E 00		L.T. 1. E 01	L.T. 1. E 01
CO-60	L.T. 5. E 00	L.T. 3. E 00		L.T. 4. E 00	L.T. 4. E 00
ZN-65	L.T. 1. E 01	L.T. 8. E 00		L.T. 8. E 00	L.T. 9. E 00
ZR-95	L.T. 5. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 6. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 5. E 00
RU-106	L.T. 4. E 01	L.T. 3. E 01		L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 2. E 01	L.T. 8. E 00		L.T. 1. E 01	L.T. 1. E 01
CS-134	L.T. 5. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 4. E 00
CS-137	L.T. 5. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 4. E 00
BA-140	L.T. 1. E 01	L.T. 6. E 00		L.T. 7. E 00	L.T. 7. E 00
CE-14	L.T. 9. E 00	L.T. 6. E 00		L.T. 9. E 00	L.T. 8. E 00
CE-144	L.T. 3. E 01	L.T. 2. E 01		L.T. 3. E 01	L.T. 3. E 01
RA-226	L.T. 8. E 01	L.T. 7. E 01		L.T. 8. E 01	L.T. 8. E 01
TH-228	L.T. 8. E 00	L.T. 7. E 00		L.T. 7. E 00	L.T. 7. E 00

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK NEAREST PRODUCER
(PCI/LITER)
STATION NUMBER 99
STATION 99 - 10.25 MI. 189 DEG. IND.

DATE COLLECTED:	11/03	12/07
RADIOCHEMICAL ANALYSIS:		
SR-89	L.T. 1. E 00	L.T. 1. E 00
SR-90	1.8 ± 0.2 E 00	2.1 ± 0.2 E 00
I-131	L.T. 2. E-01	L.T. 3. E-01
CA (gm/liter)	1.7 ± 0.2 E 00	1.7 ± 0.2 E 00
GAMMA SPECTRUM ANALYSIS:		
BE-7	L.T. 3. E 01	L.T. 3. E 01
K-40	1.28±0.13 E 03	1.34±0.13 E 03
MN-54	L.T. 4. E 00	L.T. 4. E 00
CO-58	L.T. 4. E 00	L.T. 3. E 00
FE-59	L.T. 9. E 00	L.T. 1. E 01
CO-60	L.T. 4. E 00	L.T. 5. E 00
ZN-65	L.T. 9. E 00	L.T. 1. E 01
ZR-95	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 7. E 00	L.T. 7. E 00
CS-134	L.T. 4. E 00	L.T. 4. E 00
CS-137	L.T. 4. E 00	L.T. 4. E 00
BA-140	L.T. 6. E 00	L.T. 6. E 00
CE-14	L.T. 6. E 00	L.T. 7. E 00
CE-144	L.T. 2. E 01	L.T. 3. E 01
RA-226	L.T. 7. E 01	L.T. 8. E 01
TH-228	L.T. 7. E 00	L.T. 7. E 00

G. MILK - OTHER PRODUCERS

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK OTHER PRODUCERS
(PCI/LITER)
STATION NUMBER 42
STATION 42 - 12.85 MI. 156 DEG. IND.

DATE COLLECTED:	01/13	04/13	07/13	10/12
RADIOCHEMICAL ANALYSIS:				
SR-89	L.T. 8. E-01	L.T. 7. E-01	L.T. 6. E-01	L.T. 1. E 00
SR-90	1.8 ± 0.2 E 00	1.4 ± 0.2 E 00	1.5 ± 0.2 E 00	1.6 ± 0.2 E 00
I-131	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01
CA (gm/liter)	1.8 ± 0.2 E 00	1.7 ± 0.2 E 00	1.7 ± 0.2 E 00	1.8 ± 0.2 E 00
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01
K-40	1.29±0.13 E 03	1.48±0.15 E 03	1.42±0.14 E 03	1.39±0.14 E 03
MN-54	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00
CO-58	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
FE-59	L.T. 9. E 00	L.T. 9. E 00	L.T. 8. E 00	L.T. 9. E 00
CO-60	L.T. 4. E 00	L.T. 5. E 00	L.T. 4. E 00	L.T. 4. E 00
ZN-65	L.T. 1. E 01	L.T. 9. E 00	L.T. 8. E 00	L.T. 1. E 01
ZR-95	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 6. E 00	L.T. 8. E 00	L.T. 6. E 00	L.T. 8. E 00
CS-134	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
CS-137	L.T. 4. E 00	L.T. 4. E 00	L.T. 5. E 00	L.T. 4. E 00
BA-140	L.T. 6. E 00	L.T. 6. E 00	L.T. 5. E 00	L.T. 6. E 00
CE-141	L.T. 6. E 00	L.T. 8. E 00	L.T. 6. E 00	L.T. 7. E 00
CE-144	L.T. 2. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 3. E 01
RA-226	L.T. 7. E 01	L.T. 9. E 01	L.T. 7. E 01	L.T. 8. E 01
TH-228	L.T. 7. E 00	L.T. 7. E 00	L.T. 6. E 00	L.T. 7. E 00

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK OTHER PRODUCERS
(PCI/LITER)
STATION NUMBER 100
STATION 100 - 11.5 MI. 197 DEG. IND.

DATE COLLECTED:	01/13	04/13	07/13	10/12
RADIOCHEMICAL ANALYSIS:				
SR-89	L.T. 7. E-01	L.T. 6. E-01	L.T. 5. E-01	L.T. 8. E-01
SR-90	2.0 ± 0.2 E 00	1.4 ± 0.2 E 00	1.4 ± 0.2 E 00	1.9 ± 0.2 E 00
I-131	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01
CA (gm/liter)	1.8 ± 0.2 E 00	1.7 ± 0.2 E 00	1.7 ± 0.2 E 00	1.8 ± 0.2 E 00
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 4. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 4. E 01
K-40	1.44±0.14 E 03	1.50±0.15 E 03	1.44±0.14 E 03	1.33±0.13 E 03
MN-54	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
CO-58	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
FE-59	L.T. 9. E 00	L.T. 1. E 01	L.T. 7. E 00	L.T. 1. E 01
CO-60	L.T. 5. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00
ZN-65	L.T. 1. E 01	L.T. 1. E 01	L.T. 7. E 00	L.T. 1. E 01
ZR-95	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 5. E 00
RU-106	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 4. E 01
I-131	L.T. 7. E 00	L.T. 9. E 00	L.T. 5. E 00	L.T. 9. E 00
CS-134	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
CS-137	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 5. E 00
BA-140	L.T. 7. E 00	L.T. 7. E 00	L.T. 4. E 00	L.T. 7. E 00
CE-141	L.T. 8. E 00	L.T. 9. E 00	L.T. 6. E 00	L.T. 8. E 00
CE-144	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
RA-226	L.T. 9. E 01	L.T. 1. E 02	L.T. 7. E 01	L.T. 9. E 01
TH-228	L.T. 7. E 00	L.T. 9. E 00	L.T. 6. E 00	L.T. 7. E 00

H. GROUNDWATER

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - GROUND
(PCI/LITER)
STATION NUMBER 11
STATION 11 - 0.15 MI. 225 DEG. IND.

DATE COLLECTED:	01/20	04/21	07/28	10/19
RADIOCHEMICAL ANALYSIS:				
GR-A	L.T. 4. E 00	L.T. 2. E 00	L.T. 2. E 00	L.T. 4. E 00
GR-B	1.2 ± 0.2 E 01	1.0 ± 0.2 E 01	8.4 ± 1.8 E 00	1.0 ± 0.2 E 01
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
K-40	L.T. 8. E 01	L.T. 5. E 01	L.T. 6. E 01	L.T. 5. E 01
MN-54	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00
FE-59	L.T. 6. E 00	L.T. 7. E 00	L.T. 7. E 00	L.T. 7. E 00
CO-60	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
ZN-65	L.T. 7. E 00	L.T. 9. E 00	L.T. 7. E 00	L.T. 8. E 00
ZR-95	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 5. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 4. E 00	L.T. 6. E 00	L.T. 8. E 00	L.T. 2. E 01
CS-134	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00
CS-137	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00
BA-140	L.T. 4. E 00	L.T. 6. E 00	L.T. 6. E 00	L.T. 8. E 00
CE-141	L.T. 5. E 00	L.T. 6. E 00	L.T. 8. E 00	L.T. 9. E 00
CE-144	L.T. 2. E 01	L.T. 2. E 01	L.T. 3. E 01	L.T. 3. E 01
RA-226	L.T. 6. E 01	L.T. 6. E 01	L.T. 8. E 01	L.T. 8. E 01
TH-228	L.T. 5. E 00	L.T. 6. E 00	L.T. 7. E 00	L.T. 7. E 00
TRITIUM ANALYSIS:				
H-3	L.T. 1. E 02	L.T. 1. E 02	L.T. 1. E 02	L.T. 1. E 02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - GROUND
(PCI/LITER)
STATION NUMBER 47
STATION 47 - 25.75 MI. 154 DEG. IND.

DATE COLLECTED:	01/19	04/20	07/27	10/19
RADIOCHEMICAL ANALYSIS:				
GR-A	L.T. 3. E 00	3.0 ± 1.9 E 00	L.T. 3. E 00	L.T. 4. E 00
GR-B	1.1 ± 0.2 E 01	8.4 ± 1.8 E 00	8.2 ± 1.6 E 00	8.3 ± 1.9 E 00
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
K-40	L.T. 5. E 01	L.T. 5. E 01	L.T. 6. E 01	L.T. 7. E 01
MN-54	L.T. 3. E 00	L.T. 2. E 00	L.T. 3. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00
FE-59	L.T. 7. E 00	L.T. 6. E 00	L.T. 7. E 00	L.T. 7. E 00
CO-60	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00
ZN-65	L.T. 8. E 00	L.T. 5. E 00	L.T. 8. E 00	L.T. 6. E 00
ZR-95	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00
RU-103	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 2. E 01	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 6. E 00	L.T. 6. E 00	L.T. 8. E 00	L.T. 1. E 01
CS-134	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00
CS-137	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00
BA-140	L.T. 6. E 00	L.T. 4. E 00	L.T. 6. E 00	L.T. 7. E 00
CE-141	L.T. 8. E 00	L.T. 6. E 00	L.T. 9. E 00	L.T. 7. E 00
CE-144	L.T. 3. E 01	L.T. 2. E 01	L.T. 3. E 01	L.T. 2. E 01
RA-226	L.T. 9. E 01	L.T. 6. E 01	L.T. 1. E 02	L.T. 6. E 01
TH-228	L.T. 7. E 00	L.T. 5. E 00	L.T. 8. E 00	L.T. 5. E 00
TRITIUM ANALYSIS:				
H-3	1.4 ± 0.8 E 02	L.T. 1. E 02	L.T. 1. E 02	L.T. 1. E 02

L RIVER WATER

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 12
STATION 12 - 0.1 MI. 360 DEG. CON.

DATE COLLECTED:	01/20	02/02	03/09	04/06	05/04
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 8. E-01	L.T. 8. E-01	L.T. 7. E-01	L.T. 9. E-01	L.T. 6. E-01
SR-90	L.T. 7. E-01	L.T. 6. E-01	L.T. 8. E-01	L.T. 8. E-01	L.T. 5. E-01
GR-A DIS	4.6 ± 3.1 E 00	L.T. 4. E 00	L.T. 2. E 00	3.3 ± 2.4 E 00	5.0 ± 3.3 E 00
GR-A SUS	L.T. 4. E-01	L.T. 6. E-01	1.1 ± 0.9 E 01	6.4 ± 2.8 E 00	4.5 ± 2.1 E 00
GR-B DIS	1.1 ± 0.2 E 01	9.6 ± 1.7 E 00	1.5 ± 0.2 E 01	2.3 ± 0.2 E 01	1.3 ± 0.2 E 01
GR-B SUS	1.4 ± 0.5 E 00	2.3 ± 0.7 E 00	5.4 ± 1.1 E 01	2.1 ± 0.2 E 01	1.2 ± 0.2 E 01
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 2. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 4. E 01
K-40	L.T. 5. E 01	L.T. 9. E 01	6.13±3.24 E 01	L.T. 8. E 01	L.T. 6. E 01
MN-54	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00
CO-58	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00
FE-59	L.T. 6. E 00	L.T. 7. E 00	L.T. 7. E 00	L.T. 7. E 00	L.T. 7. E 00
CO-60	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00
ZN-65	L.T. 5. E 00	L.T. 7. E 00	L.T. 8. E 00	L.T. 6. E 00	L.T. 8. E 00
ZR-95	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
RU-103	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 5. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 4. E 01
I-131	L.T. 4. E 00	L.T. 6. E 00	L.T. 7. E 00	L.T. 7. E 00	L.T. 8. E 00
CS-134	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
CS-137	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00
BA-140	L.T. 4. E 00	L.T. 5. E 00	L.T. 6. E 00	L.T. 6. E 00	L.T. 8. E 00
CE-141	L.T. 6. E 00	L.T. 5. E 00	L.T. 6. E 00	L.T. 5. E 00	L.T. 9. E 00
CE-144	L.T. 3. E 01	L.T. 2. E 01	L.T. 2. E 01	L.T. 2. E 01	L.T. 4. E 01
RA-226	L.T. 7. E 01	L.T. 6. E 01	L.T. 6. E 01	L.T. 6. E 01	L.T. 1. E 02
TH-228	L.T. 6. E 00	L.T. 5. E 00	L.T. 6. E 00	L.T. 6. E 00	L.T. 1. E 01
TRITIUM ANALYSIS:	01/20-03/09				
H-3	L.T. 1. E 02				

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 12
STATION 12 - 0.1 MI. 360 DEG. CON.

DATE COLLECTED:	06/01	07/06	07/27*	09/07	10/05
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 7. E-01	L.T. 7. E-01		L.T. 2. E 00	L.T. 9. E-01
SR-90	L.T. 7. E-01	L.T. 6. E-01		L.T. 6. E-01	L.T. 5. E-01
GR-A DIS	L.T. 4. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 3. E 00
GR-A SUS	L.T. 1. E 00	L.T. 2. E 00		L.T. 2. E 00	1.3 ± 0.7 E 00
GR-B DIS	1.2 ± 0.2 E 01	1.0 ± 0.2 E 01		1.4 ± 0.2 E 01	1.9 ± 0.3 E 01
GR-B SUS	5.2 ± 1.0 E 00	8.7 ± 1.3 E 00		7.7 ± 1.1 E 00	3.6 ± 0.8 E 00
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 3. E 01	L.T. 3. E 01		L.T. 3. E 01	L.T. 3. E 01
K-40	L.T. 5. E 01	L.T. 9. E 01		L.T. 5. E 01	L.T. 5. E 01
MN-54	L.T. 3. E 00	L.T. 4. E 00		L.T. 3. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 4. E 00		L.T. 3. E 00	L.T. 3. E 00
FE-59	L.T. 7. E 00	L.T. 7. E 00		L.T. 7. E 00	L.T. 7. E 00
CO-60	L.T. 3. E 00	L.T. 3. E 00		L.T. 3. E 00	L.T. 3. E 00
ZN-65	L.T. 6. E 00	L.T. 7. E 00		L.T. 6. E 00	L.T. 6. E 00
ZR-95	L.T. 3. E 00	L.T. 4. E 00		L.T. 3. E 00	L.T. 3. E 00
RU-103	L.T. 4. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 4. E 01		L.T. 3. E 01	L.T. 2. E 01
I-131	L.T. 6. E 00	L.T. 6. E 00		L.T. 8. E 00	L.T. 1. E 01
CS-134	L.T. 4. E 00	L.T. 4. E 00		L.T. 3. E 00	L.T. 3. E 00
CS-137	L.T. 5. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 3. E 00
BA-140	L.T. 6. E 00	L.T. 5. E 00		L.T. 6. E 00	L.T. 9. E 00
CE-141	L.T. 6. E 00	L.T. 5. E 00		L.T. 6. E 00	L.T. 8. E 00
CE-144	L.T. 2. E 01	L.T. 2. E 01		L.T. 2. E 01	L.T. 3. E 01
RA-226	L.T. 7. E 01	L.T. 7. E 01		L.T. 7. E 01	L.T. 7. E 01
TH-228	L.T. 6. E 00	L.T. 7. E 00		L.T. 6. E 00	L.T. 6. E 00
TRITIUM ANALYSIS:	04/06-06/01	07/06-09/07			
H-3	L.T. 1. E 02	L.T. 1. E 02			

*Missouri River Flood - Sample Not Collected

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 12
STATION 12 - 0.1 MI. 360 DEG. CON.

DATE COLLECTED:	11/03	12/07
RADIOCHEMICAL ANALYSIS:		
SR-89	L.T. 1. E 00	L.T. 5. E-01
SR-90	L.T. 4. E-01	L.T. 5. E-01
GR-A DIS	L.T. 1. E 00	5.0 ± 3.8 E 00
GR-A SUS	L.T. 7. E-01	1.4 ± 1.0 E 00
GR-B DIS	8.3 ± 1.2 E 00	1.2 ± 0.2 E 01
GR-B SUS	3.1 ± 0.8 E 00	5.7 ± 1.0 E 00
GAMMA SPECTRUM ANALYSIS:		
BE-7	L.T. 3. E 01	L.T. 3. E 01
K-40	L.T. 8. E 01	L.T. 9. E 01
MN-54	L.T. 3. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 3. E 00
FE-59	L.T. 8. E 00	L.T. 7. E 00
CO-60	L.T. 3. E 00	L.T. 3. E 00
ZN-65	L.T. 7. 00	L.T. 7. E 00
ZR-95	L.T. 4. E 00	L.T. 3. E 00
RU-103	L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 2. E 01	L.T. 7. E 00
CS-134	L.T. 3. E 00	L.T. 4. E 00
CS-137	L.T. 3. E 00	L.T. 4. E 00
BA-140	L.T. 9. E 00	L.T. 5. E 00
CE-141	L.T. 7. E 00	L.T. 6. E 00
CE-144	L.T. 2. E 01	L.T. 2. E 01
RA-226	L.T. 6. E 01	L.T. 7. E 01
TH-228	L.T. 6. E 00	L.T. 5. E 00
TRITIUM ANALYSIS:	10/05-12/07	
H-3	L.T. 1. E 02	

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 28
STATION 28 - 1.8 MI. 150 DEG. IND.

DATE COLLECTED:	01/19	02/02	03/09	04/06	05/04
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 6. E-01	L.T. 8. E-01	L.T. 7. E-01	L.T. 8. E-01	L.T. 8. E-01
SR-90	L.T. 4. E-01	L.T. 8. E-01	L.T. 7. E-01	L.T. 8. E-01	L.T. 5. E-01
GR-A DIS	8.6 ± 6.1 E-01	L.T. 4. E 00	L.T. 2. E 00	5.0 ± 2.6 E 00	4.3 ± 3.2 E 00
GR-A SUS	6.3 ± 4.5 E-01	8.5 ± 6.2 E-01	1.3 ± 1.1 E 01	3.8 ± 2.2 E 00	2.6 ± 1.5 E 00
GR-B DIS	4.9 ± 0.8 E 00	7.8 ± 1.6 E 00	1.6 ± 0.2 E 01	1.7 ± 0.2 E 01	1.3 ± 0.2 E 01
GR-B SUS	1.8 ± 0.6 E 00	2.6 ± 0.7 E 00	9.5 ± 1.5 E 01	1.5 ± 0.2 E 01	9.9 ± 1.3 E 00
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
K-40	L.T. 6. E 01	L.T. 1. E 02	L.T. 6. E 01	6.60±2.81E 01	L.T. 5. E 01
MN-54	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 4. E 00	L.T. 2. E 00	L.T. 4. E 00	L.T. 3. E 00
FE-59	L.T. 6. E 00	L.T. 9. E 00	L.T. 6. E 00	L.T. 8. E 00	L.T. 8. E 00
CO-60	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00
ZN-65	L.T. 6. E 00	L.T. 1. E 01	L.T. 5. E 00	L.T. 8. E 00	L.T. 8. E 00
ZR-95	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 3. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 4. E 01	L.T. 2. E 01	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 4. E 00	L.T. 8. E 00	L.T. 6. E 00	L.T. 1. E 01	L.T. 7. E 00
CS-134	L.T. 3. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
CS-137	L.T. 4. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
BA-140	L.T. 4. E 00	L.T. 6. E 00	L.T. 4. E 00	L.T. 7. E 00	L.T. 7. E 00
CE-141	L.T. 6. E 00	L.T. 8. E 00	L.T. 6. E 00	L.T. 7. E 00	L.T. 6. E 00
CE-144	L.T. 3. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 2. E 01	L.T. 2. E 01
RA-226	L.T. 9. E 01	L.T. 9. E 01	L.T. 6. E 01	L.T. 7. E 01	L.T. 6. E 01
TH-228	L.T. 7. E 00	L.T. 7. E 00	L.T. 6. E 00	L.T. 7. E 00	L.T. 6. E 00
TRITIUM ANALYSIS:	01/19-03/09				
H-3	L.T. 1. E 02				

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 28
STATION 28 - 1.8 MI. 150 DEG. IND.

DATE COLLECTED:	06/01	07/06	07/27*	09/07	10/05
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 6. E-01	L.T. 9. E-01		L.T. 1. E 00	L.T. 1. E 00
SR-90	L.T. 7. E-01	L.T. 9. E-01		L.T. 5. E-01	L.T. 4. E-01
GR-A DIS	L.T. 4. E 00	L.T. 3. E 00		L.T. 4. E 00	L.T. 3. E 00
GR-A SUS	2.7 ± 1.5 E 00	L.T. 1. E 01		L.T. 2. E 00	4.4 ± 3.8 E-01
GR-B DIS	1.4 ± 0.2 E 01	1.1 ± 0.2 E 01		1.3 ± 0.2 E 01	1.5 ± 0.3 E 01
GR-B SUS	8.3 ± 1.2 E 0	5.8 ± 0.8 E 01		L.T. 1. E 00	2.2 ± 0.6 E 00
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 3. E 01	L.T. 3. E 01		L.T. 3. E 01	L.T. 3. E 01
K-40	L.T. 6. E 01	L.T. 9. E 01		L.T. 4. E 01	L.T. 6. E 01
MN-54	L.T. 3. E 00	L.T. 4. E 00		L.T. 2. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 4. E 00		L.T. 3. E 00	L.T. 3. E 00
FE-59	L.T. 7. E 00	L.T. 7. E 00		L.T. 6. E 00	L.T. 7. E 00
CO-60	L.T. 3. E 00	L.T. 3. E 00		L.T. 3. E 00	L.T. 3. E 00
ZN-65	L.T. 7. E 00	L.T. 7. E 00		L.T. 5. E 00	L.T. 6. E 00
ZR-95	L.T. 3. E 00	L.T. 4. E 00		L.T. 3. E 00	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 4. E 00		L.T. 3. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01		L.T. 2. E 01	L.T. 2. E 01
I-131	L.T. 6. E 00	L.T. 6. E 00		L.T. 7. E 00	L.T. 2. E 01
CS-134	L.T. 3. E 00	L.T. 4. E 00		L.T. 3. E 00	L.T. 3. E 00
CS-137	L.T. 5. E 00	L.T. 4. E 00		L.T. 4. E 00	L.T. 3. E 00
BA-140	L.T. 6. E 00	L.T. 5. E 00		L.T. 5. E 00	L.T. 1. E 01
CE-141	L.T. 6. E 00	L.T. 5. E 00		L.T. 6. E 00	L.T. 9. E 00
CE-144	L.T. 2. E 01	L.T. 2. E 01		L.T. 2. E 01	L.T. 3. E 01
RA-226	L.T. 7. E 01	L.T. 7. E 01		L.T. 6. E 01	L.T. 8. E 01
TH-228	L.T. 6. E 00	L.T. 7. E 00		L.T. 6. E 00	L.T. 7. E 00
TRITIUM ANALYSIS:	04/06-06/01	07/06-09/07			
H-3	L.T. 1. E 02	L.T. 1. E 02			

*Missouri River Flood - Sample Not Collected

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 28
STATION 28 - 1.8 MI. 150 DEG. IND.

DATE COLLECTED:	11/02	12/07
RADIOCHEMICAL ANALYSIS:		
SR-89	L.T. 1. E 00	L.T. 5. E-01
SR-90	L.T. 5. E-01	L.T. 9. E-01
GR-A DIS	L.T. 4. E 00	L.T. 4. E 00
GR-A SUS	1.6 ± 0.9 E 00	L.T. 6. E-01
GR-B DIS	1.1 ± 0.2 E 01	1.0 ± 0.2 E 01
GR-B SUS	3.8 ± 0.8 E 00	2.0 ± 0.6 E 00
GAMMA SPECTRUM ANALYSIS:		
BE-7	L.T. 4. E 01	L.T. 4. E 01
K-40	7.08±2.80 E 01	L.T. 1. E 02
MN-54	L.T. 3. E 00	L.T. 4. E 00
CO-58	L.T. 4. E 00	L.T. 5. E 00
FE-59	L.T. 9. E 00	L.T. 1. E 01
CO-60	L.T. 4. E 00	L.T. 4. E 00
ZN-65	L.T. 6. E 00	L.T. 1. E 01
ZR-95	L.T. 4. E 00	L.T. 5. E 00
RU-103	L.T. 4. E 00	L.T. 5. E 00
RU-106	L.T. 3. E 01	L.T. 4. E 01
I-131	L.T. 1. E 01	L.T. 9. E 00
CS-134	L.T. 3. E 00	L.T. 5. E 00
CS-137	L.T. 4. E 00	L.T. 5. E 00
BA-140	L.T. 9. E 00	L.T. 6. E 00
CE-141	L.T. 1. E 01	L.T. 8. E 00
CE-144	L.T. 3. E 01	L.T. 3. E 01
RA-226	L.T. 1. E 02	L.T. 9. E 01
TH-228	L.T. 8. E 00	L.T. 7. E 00
TRITIUM ANALYSIS:	10/05-12/07	
H-3	L.T. 1. E 02	

J. THERMOLUMINESCENT DOSIMETRY - RADIATION DOSE

TABLE J-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD

milliRoentgen/Quarter

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER 01/15-04/19	SECOND QUARTER 04/16-07/01	THIRD QUARTER 07/01-10/15	FOURTH QUARTER 10/15-01/11
TLD (Gamma)	01	20.4 ± 1.7	13.9 ± 0.5	26.8 ± 3.7	31.8 ± 0.9
	02	13.2 ± 0.5	13.3 ± 0.6	13.9 ± 1.1	20.1 ± 0.9
	03	12.4 ± 0.4	14.2 ± 0.7	12.3 ± 0.6	17.0 ± 1.0
	04	14.6 ± 0.4	11.9 ± 0.6	13.5 ± 0.7	22.2 ± 1.0
	05	14.2 ± 0.5	12.6 ± 0.5	14.1 ± 1.1	23.2 ± 2.1
	06	16.1 ± 0.5	12.5 ± 0.7	14.3 ± 0.7	21.5 ± 2.0
	07	14.1 ± 0.7	15.1 ± 0.6	14.9 ± 0.6	21.2 ± 0.7
	08	14.5 ± 0.7	12.6 ± 0.8	16.0 ± 0.7	25.0 ± 1.1
	09	16.2 ± 1.5	12.0 ± 0.5	15.3 ± 0.9	22.0 ± 1.3
	10	16.3 ± 0.7	12.5 ± 0.5	15.3 ± 1.1	19.6 ± 1.8
	20	14.6 ± 0.6	14.8 ± 0.7	16.0 ± 0.9	21.2 ± 2.8
	44	14.6 ± 0.0	14.5 ± 0.6	21.8 ± 3.1	26.9 ± 3.4
	56	13.8 ± 0.4	12.1 ± 0.3	15.0 ± 1.0	19.2 ± 1.7
	58	16.7 ± 0.6	14.7 ± 0.7	15.9 ± 0.8	20.8 ± 0.6
	59	15.4 ± 0.5	15.0 ± 1.0	16.5 ± 1.1	22.8 ± 1.4
	66	16.6 ± 0.9	12.7 ± 0.8	17.6 ± 0.8	26.3 ± 1.9
	67	15.3 ± 0.8	13.6 ± 0.2	17.8 ± 0.6	22.4 ± 1.6
	71	*	12.3 ± 0.3	15.5 ± 1.3	25.2 ± 1.7

*STA-71 was badly burned during grass fire two weeks before collection.

TABLE J-1

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD

milliRoentgen/Quarter

SAMPLE NUCLIDE	STATION NUMBER	FIRST QUARTER 01/15-04/19	SECOND QUARTER 04/16/93-07/01/93	THIRD QUARTER 07/01-10/15	FOURTH QUARTER 10/15-01/11
TLD (Gamma)	79	14.6 ± 1.3	11.8 ± 0.3	15.7 ± 0.5	21.3 ± 1.8
	80	14.4 ± 0.5	14.8 ± 0.6	14.8 ± 1.3	24.9 ± 2.2
	81	17.8 ± 1.6	13.4 ± 0.3	16.2 ± 0.9	26.8 ± 1.3
	82	14.5 ± 0.8	13.2 ± 1.1	15.7 ± 1.2	20.2 ± 2.4
	83	17.5 ± 1.1	16.4 ± 1.5	16.7 ± 0.9	24.9 ± 1.8
	84	15.1 ± 0.7	14.1 ± 0.4	18.0 ± 1.1	22.5 ± 1.0
	85	14.6 ± 0.5	12.8 ± 0.7	14.2 ± 0.8	19.9 ± 1.7
	86	15.0 ± 0.6	13.3 ± 0.9	15.5 ± 0.6	23.0 ± 0.7
	87	13.4 ± 1.2	14.8 ± 0.3	16.0 ± 0.8	23.2 ± 0.8
	88	13.9 ± 0.7	12.3 ± 0.7	15.0 ± 0.8	25.7 ± 3.2
	89	15.9 ± 0.8	15.9 ± 0.5	16.6 ± 0.6	23.6 ± 0.9
	90	15.5 ± 0.1	14.9 ± 0.7	15.1 ± 0.8	25.2 ± 5.0
	91	13.5 ± 0.6	12.2 ± 0.4	15.4 ± 0.7	20.3 ± 2.1
	94	15.2 ± 0.2	13.8 ± 0.8	14.8 ± 0.9	24.6 ± 2.7
Average/Quarter		90.5 days 15.2±1.6 mR/90.5 days	74.3 days 13.6±1.3 mR/74.3 days	106 days 16.0±2.[illegible] mR/106 days	85 days 22.9±2.9 mR/85 days
Average/Day		0.17±0.02 mR/day	0.18±0.02 mR day	0.15±0.[illegible]2 mR day	0.27±0.03
Range		(12-20)mR/90.5 days	(12-16)mR 74.3 days	(12-27)mR 106 days	(17-32)mR 85 days
Det./Total		31/31	32/32	32/32	32/32

TABLE J-2

1993 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD

milliRoentgen/Quarter

SAMPLE NUCLIDE	STATION NUMBER	Aver./Quarter	TOTAL mR/year 01/15-01/11/94
TLD (Gamma)	01	23.2 ± 7.8	92.9
	02	15.1 ± 3.3	60.5
	03	13.9 ± 2.2	55.9
	04	15.6 ± 4.6	62.2
	05	16.0 ± 4.8	64.1
	06	16.1 ± 3.9	64.4
	07	16.3 ± 3.3	65.3
	08	17.0 ± 5.5	68.1
	09	16.4 ± 4.2	65.5
	10	15.9 ± 2.9	63.7
	20	16.7 ± 3.1	66.6
	44	19.4 ± 6.0	77.8
	56	15.0 ± 3.0	60.1
	58	17.0 ± 2.7	68.1
	59	17.4 ± 3.6	69.7
	66	18.3 ± 5.7	73.2
	67	17.3 ± 3.8	69.1
	71	17.8 ± 6.9	53.3

TABLE J-2

1992 QUARTERLY REPORT

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD

milliRoentgen/Quarter

SAMPLE NUCLIDE	STATION NUMBER	Aver./Quarter	TOTAL mR/year 01/15-01/11/94
TLD (Gamma)	79	15.9 ± 4.0	63.4
	80	17.2 ± 5.1	68.9
	81	18.6 ± 5.8	74.2
	82	15.9 ± 3.9	63.6
	83	18.9 ± 4.0	75.5
	84	17.4 ± 3.8	69.7
	85	15.4 ± 3.1	61.5
	86	16.7 ± 4.3	66.8
	87	16.9 ± 4.4	67.4
	88	16.7 ± 6.1	66.9
	89	18.0 ± 3.8	72.0
	90	17.7 ± 5.0	70.7
	91	15.4 ± 3.6	61.4
	94	17.1 ± 5.0	68.4
		16.9 ± 1.3 Average mR/Quarter	67.2±7.1
		Range(14-23)	Aver. total mR year. All stations
			Range (53.3-92.9)

K. FOOD - BROADLEAF VEGETATION

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35
STATION 35 - 2.0 MI. 350 DEG. CON.

DATE COLLECTED:	05/19 CURLY DOCK	05/19 GIANT RAGWEED	05/19 IRONWEED	05/19 CURLY DOCK QA	06/15 GIANT RAGWEED
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 6. E-03	L.T. 5. E-03	L.T. 6. E-03	L.T. 5. E-03	L.T. 5. E-03
GAMMA SPECTRUM ANALYSIS:					
BE-7	1.94±0.46 E-01	9.62±0.97 E-01	8.06±0.87 E-01	2.14±0.29 E-01	5.22±0.54 E-01
K-40	5.39±0.54 E 00	5.79±0.58 E 00	5.92±0.59 E 00	5.60±0.56 E 00	7.57±0.76 E 00
MN-54	L.T. 7. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 5. E-03	L.T. 8. E-03
CO-58	L.T. 7. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 5. E-03	L.T. 8. E-03
FE-59	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02
CO-60	L.T. 7. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 5. E-03	L.T. 9. E-03
ZN-65	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02
ZR-95	L.T. 8. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 6. E-03	L.T. 9. E-03
RU-103	L.T. 8. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 5. E-03	L.T. 9. E-03
RU-106	L.T. 6. E-02	L.T. 1. E-01	L.T. 9. E-02	L.T. 5. E-02	L.T. 7. E-02
I-131	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02
CS-134	L.T. 7. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 6. E-03	L.T. 9. E-03
CS-137	L.T. 7. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 5. E-03	L.T. 9. E-03
BA-140	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 6. E-03	L.T. 1. E-02
CE-141	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 7. E-03	L.T. 1. E-02
CE-144	L.T. 4. E-02	L.T. 7. E-02	L.T. 6. E-02	L.T. 3. E-02	L.T. 5. E-02
RA-226	L.T. 2. E-02	L.T. 2. E-01	L.T. 2. E-01	L.T. 1. E-01	L.T. 1. E-01
TH-228	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 8. E-03	4.58±0.82 E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35
STATION 35 - 2.0 MI. 350 DEG. CON.

DATE COLLECTED:	06/15 CURLY DOCK	06/15 NETTLES	08/17 COTTONWOOD	08/17 SYCAMORE	08/17 WILD BUCKWHEAT
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 6. E-03	L.T. 5. E-03	L.T. 5. E-03	L.T. 6. E-03	L.T. 4. E-03
GAMMA SPECTRUM ANALYSIS:					
BE-7	5.65±0.72 E-01	1.50±0.15 E 00	7.79±0.83 E-01	3.21±0.32 E 00	1.84±0.18 E 00
K-40	4.17±0.42 E 00	5.22±0.52 E 00	5.77±0.58 E 00	3.38±0.34 E 00	2.75±0.27 E 00
MN-54	L.T. 8. E-03	L.T. 1. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 9. E-03
CO-58	L.T. 8. E-03	L.T. 1. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 8. E-03
FE-59	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
CO-60	L.T. 8. E-03	L.T. 1. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-02
ZN-65	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
ZR-95	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02
RU-103	L.T. 9. E-03	L.T. 1. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-02
RU-106	L.T. 8. E-02	L.T. 1. E-01	L.T. 8. E-02	L.T. 9. E-02	L.T. 8. E-02
I-131	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02
CS-134	L.T. 9. E-03	L.T. 1. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-02
CS-137	L.T. 9. E-03	L.T. 1. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-02
BA-140	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02
CE-141	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02
CE-144	L.T. 5. E-02	L.T. 7. E-02	L.T. 6. E-02	L.T. 9. E-02	L.T. 6. E-02
RA-226	L.T. 2. E-01	L.T. 2. E-01	L.T. 1. E-01	L.T. 3. E-01	L.T. 2. E-01
TH-228	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35
STATION 35 - 2.0 MI. 350 DEG. CON.

DATE COLLECTED:	08/17 QA WILD BUCKWHEAT	09/28 WILD GRAPE	09/28 BUCKWHEAT	09/28 SMARTWEED	10/19 BUCKWHEAT
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 5. E-03	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 9. E-03
GAMMA SPECTRUM ANALYSIS:					
BE-7	2.12±0.21 E 00	2.53±0.25 E 00	3.65±0.37 E 00	1.62±0.16 E 00	2.60±0.26 E 00
K-40	2.41±0.24 E 00	2.53±0.25 E 00	2.11±0.21 E 00	1.23±0.12 E 01	2.54±0.25 E 00
MN-54	L.T. 1. E-02	L.T. 1. E-02	L.T. 7. E-03	L.T. 8. E-03	L.T. 2. E-02
CO-58	L.T. 1. E-02	L.T. 1. E-02	L.T. 8. E-03	L.T. 9. E-03	L.T. 2. E-02
FE-59	L.T. 3. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 4. E-02
CO-60	L.T. 1. E-02	L.T. 1. E-02	L.T. 8. E-03	L.T. 9. E-03	L.T. 2. E-02
ZN-65	L.T. 3. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 4. E-02
ZR-95	L.T. 1. E-02	L.T. 2. E-02	L.T. 9. E-03	L.T. 9. E-03	L.T. 2. E-02
RU-103	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02
RU-106	L.T. 1. E-01	L.T. 1. E-01	L.T. 7. E-02	L.T. 7. E-02	L.T. 2. E-01
I-131	L.T. 3. E-02	L.T. 7. E-02	L.T. 4. E-02	L.T. 4. E-02	L.T. 4. E-02
CS-134	L.T. 1. E-02	L.T. 1. E-02	L.T. 8. E-03	L.T. 9. E-03	L.T. 2. E-02
CS-137	L.T. 1. E-02	L.T. 1. E-02	L.T. 8. E-03	L.T. 8. E-03	L.T. 2. E-02
BA-140	L.T. 2. E-02	L.T. 4. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02
CE-141	L.T. 2. E-02	L.T. 4. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02
CE-144	L.T. 7. E-02	L.T. 1. E-01	L.T. 5. E-02	L.T. 6. E-02	L.T. 1. E-01
RA-226	L.T. 2. E-01	L.T. 3. E-01	L.T. 1. E-01	L.T. 2. E-01	L.T. 3. E-01
TH-228	L.T. 2. E-02	L.T. 3. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 3. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35
STATION 35 - 2.0 MI. 350 DEG. CON.

DATE COLLECTED:	10/19 SWAMP SMARTWEED	10/19 WILLOW
RADIOCHEMICAL ANALYSIS:		
I-131	L.T. 7. E-03	L.T. 1. E-02
GAMMA SPECTRUM ANALYSIS:		
BE-7	5.27±0.53 E 00	5.26±0.53 E 00
K-40	4.43±0.44 E 00	4.76±0.48 E 00
MN-54	L.T. 9. E-03	L.T. 1. E-02
CO-58	L.T. 9. E-03	L.T. 1. E-02
FE-59	L.T. 2. E-02	L.T. 3. E-02
CO-60	L.T. 9. E-03	L.T. 1. E-02
ZN-65	L.T. 2. E-02	L.T. 2. E-02
ZR-95	L.T. 1. E-02	L.T. 1. E-02
RU-103	L.T. 1. E-02	L.T. 1. E-02
RU-106	L.T. 8. E-02	L.T. 1. E-01
I-131	L.T. 2. E-02	L.T. 3. E-02
CS-134	L.T. 1. E-02	L.T. 1. E-02
CS-137	L.T. 9. E-03	L.T. 1. E-02
BA-140	L.T. 1. E-02	L.T. 2. E-02
CE-141	L.T. 1. E-02	L.T. 2. E-02
CE-144	L.T. 5. E-02	L.T. 7. E-02
RA-226	L.T. 2. E-01	L.T. 2. E-01
TH-228	L.T. 2. E-02	4.57±1.65 E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 44
STATION 44 - 10.25 MI. 270 DEG. CON.

DATE COLLECTED:	05/18 SHEPHERDSPURSE	05/18 ARKANSAS ROSE	05/18 CLOVER	06/15 ARKANSAS ROSE	06/15 SWEET CLOVER
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 7. E-03	L.T. 8. E-03	L.T. 7. E-03	L.T. 4. E-03	L.T. 6. E-03
GAMMA SPECTRUM ANALYSIS:					
BE-7	1.59±0.16 E 00	4.44±0.44 E 00	2.91±0.29 E 00	1.72±0.17 E 00	9.46±1.27 E-01
K-40	5.60±0.56 E 00	3.84±0.38 E 00	5.96±0.60 E 00	4.77±0.48 E 00	4.09±0.41 E 00
MN-54	L.T. 6. E-03	L.T. 2. E-02	L.T. 8. E-03	L.T. 1. E-02	L.T. 1. E-02
CO-58	L.T. 6. E-03	L.T. 2. E-02	L.T. 8. E-03	L.T. 1. E-02	L.T. 1. E-02
FE-59	L.T. 2. E-02	L.T. 4. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 3. E-02
CO-60	L.T. 7. E-03	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02
ZN-65	L.T. 2. E-02	L.T. 4. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 3. E-02
ZR-95	L.T. 6. E-03	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02
RU-103	L.T. 7. E-03	L.T. 2. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 2. E-02
RU-106	L.T. 5. E-02	L.T. 1. E-01	L.T. 7. E-02	L.T. 1. E-01	L.T. 1. E-01
I-131	L.T. 2. E-02	L.T. 4. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 3. E-02
CS-134	L.T. 7. E-03	L.T. 2. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 2. E-02
CS-137	L.T. 6. E-03	L.T. 2. E-02	L.T. 9. E-03	L.T. 1. E-02	L.T. 2. E-02
BA-140	L.T. 1. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
CE-141	L.T. 1. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02
CE-144	L.T. 4. E-02	L.T. 9. E-02	L.T. 6. E-02	L.T. 8. E-02	L.T. 1. E-01
RA-226	L.T. 1. E-01	L.T. 3. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 3. E-01
TH-228	L.T. 1. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 44
STATION 44 - 10.25 MI. 270 DEG. CON.

DATE COLLECTED:	06/15 RED CLOVER	06/15 QA SWEET CLOVER	07/20 COMMON RAGWEED	07/20 PIG WEED	07/20 SWEET CLOVER
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 5. E-03	L.T. 5. E-03	L.T. 6. E-03	L.T. 6. E-03	L.T. 1. E-02
GAMMA SPECTRUM ANALYSIS:					
BE-7	1.31±0.13 E 00	8.66±1.17 E-01	3.57±0.36 E 00	1.14±0.11 E 00	1.69±0.17 E 00
K-40	5.43±0.54 E 00	4.42±0.44 E 00	5.15±0.51 E 00	5.42±0.54 E 00	3.34±0.33 E 00
MN-54	L.T. 1. E-02	L.T. 1. E-02	L.T. 6. E-03	L.T. 8. E-03	L.T. 7. E-03
CO-58	L.T. 1. E-02	L.T. 1. E-02	L.T. 6. E-03	L.T. 9. E-03	L.T. 7. E-03
FE-59	L.T. 3. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
CO-60	L.T. 1. E-02	L.T. 1. E-02	L.T. 7. E-03	L.T. 8. E-03	L.T. 8. E-03
ZN-65	L.T. 3. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
ZR-95	L.T. 1. E-02	L.T. 1. E-02	L.T. 7. E-03	L.T. 9. E-03	L.T. 7. E-03
RU-103	L.T. 1. E-02	L.T. 2. E-02	L.T. 7. E-03	L.T. 8. E-03	L.T. 8. E-03
RU-106	L.T. 1. E-01	L.T. 1. E-01	L.T. 6. E-02	L.T. 8. E-02	L.T. 6. E-02
I-131	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
CS-134	L.T. 1. E-02	L.T. 1. E-02	L.T. 7. E-03	L.T. 1. E-02	L.T. 7. E-03
CS-137	L.T. 1. E-02	L.T. 1. E-02	L.T. 7. E-03	L.T. 9. E-03	L.T. 7. E-03
BA-140	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02
CE-141	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02
CE-144	L.T. 8. E-02	L.T. 8. E-02	L.T. 5. E-02	L.T. 5. E-02	L.T. 5. E-02
RA-226	L.T. 2. E-01	L.T. 3. E-01	L.T. 1. E-01	L.T. 2. E-01	L.T. 1. E-01
TH-228	L.T. 2. E-02	L.T. 2. E-02	5.50±0.75 E-02	2.13±0.72 E-02	L.T. 1. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 44
STATION 44 - 10.25 MI. 270 DEG. CON.

DATE COLLECTED:	08/17 PARTRIDGE PEA	08/17 ELDERBERRY	08/17 PIGWEED	09/28 LAMBSQUARTER	09/28 MILKWEED
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 5. E-03	L.T. 4. E-03	L.T. 4. E-03	L.T. 2. E-02	L.T. 2. E-02
GAMMA SPECTRUM ANALYSIS:					
BE-7	1.24±0.12 E 00	3.02±0.30 E 00	1.18±0.14 E 00	3.36±0.34 E 00	6.11±0.61 E 00
K-40	3.64±0.36 E 00	6.00±0.60 E 00	1.00±0.10 E 01	5.35±0.53 E 00	4.64±0.47 E 00
MN-54	L.T. 1. E-02	L.T. 6. E-03	L.T. 1. E-02	L.T. 7. E-03	L.T. 5. E-03
CO-58	L.T. 1. E-02	L.T. 6. E-03	L.T. 1. E-02	L.T. 8. E-03	L.T. 5. E-03
FE-59	L.T. 3. E-02	L.T. 1. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 1. E-02
CO-60	L.T. 1. E-02	L.T. 6. E-03	L.T. 2. E-02	L.T. 7. E-03	L.T. 5. E-03
ZN-65	L.T. 2. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 1. E-02
ZR-95	L.T. 1. E-02	L.T. 6. E-03	L.T. 2. E-02	L.T. 9. E-03	L.T. 6. E-03
RU-103	L.T. 1. E-02	L.T. 7. E-03	L.T. 2. E-02	L.T. 9. E-03	L.T. 6. E-03
RU-106	L.T. 1. E-01	L.T. 5. E-02	L.T. 1. E-01	L.T. 7. E-02	L.T. 4. E-02
I-131	L.T. 3. E-02	L.T. 1. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 2. E-02
CS-134	L.T. 1. E-02	L.T. 6. E-03	L.T. 2. E-02	L.T. 8. E-03	L.T. 5. E-03
CS-137	L.T. 1. E-02	L.T. 6. E-03	L.T. 2. E-02	L.T. 8. E-03	L.T. 5. E-03
BA-140	L.T. 2. E-02	L.T. 9. E-03	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02
CE-141	L.T. 2. E-02	L.T. 1. E-02	L.T. 3. E-02	L.T. 1. E-02	L.T. 1. E-02
CE-144	L.T. 6. E-02	L.T. 4. E-02	L.T. 9. E-02	L.T. 4. E-02	L.T. 3. E-02
RA-226	L.T. 2. E-01	L.T. 1. E-01	L.T. 3. E-01	L.T. 1. E-01	L.T. 1. E-01
TH-228	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	7.63±0.80 E-02	L.T. 9. E-03

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 44
STATION 44 - 10.25 MI. 270 DEG. CON.

DATE COLLECTED:	09/28 GIANT RAGWEED	09/28 QA LAMBSQUARTER	10/19 GIANT RAGWEED	10/19 SNAKEWEED	10/19 SL LF LAMB QTR
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 2. E-02	L.T. 9. E-03	L.T. 8. E-03	L.T. 9. E-03	L.T. 9. E-03
GAMMA SPECTRUM ANALYSIS:					
BE-7	5.06±0.51 E 00	1.63±0.16 E 00	5.97±0.60 E 00	3.29±0.33 E 00	1.51±0.15 E 00
K-40	6.27±0.63 E 00	1.31±0.13 E 01	6.35±0.64 E 00	6.13±0.61 E 00	1.01±0.10 E 01
MN-54	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02
CO-58	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02
FE-59	L.T. 4. E-02	L.T. 3. E-02	L.T. 5. E-02	L.T. 3. E-02	L.T. 3. E-02
CO-60	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02
ZN-65	L.T. 3. E-02	L.T. 3. E-02	L.T. 5. E-02	L.T. 3. E-02	L.T. 3. E-02
ZR-95	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02
RU-103	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02
RU-106	L.T. 1. E-01	L.T. 9. E-02	L.T. 2. E-01	L.T. 1. E-01	L.T. 9. E-02
I-131	L.T. 8. E-02	L.T. 5. E-02	L.T. 5. E-02	L.T. 3. E-02	L.T. 2. E-02
CS-134	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02
CS-137	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02
BA-140	L.T. 4. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02
CE-141	L.T. 4. E-02	L.T. 2. E-02	L.T. 5. E-02	L.T. 2. E-02	L.T. 2. E-02
CE-144	L.T. 1. E-01	L.T. 6. E-02	L.T. 2. E-01	L.T. 8. E-02	L.T. 8. E-02
RA-226	L.T. 3. E-01	L.T. 2. E-01	L.T. 5. E-01	L.T. 2. E-01	L.T. 2. E-01
TH-228	L.T. 3. E-02	L.T. 2. E-02	L.T. 4. E-02	L.T. 2. E-02	L.T. 2. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 96
STATION 96 - 1.25 MI. 334 DEG. IND

DATE COLLECTED:	05/19 PLANTAIN	05/19 CLOVER	05/19 CURLY DOCK	06/15 WATERCRESS	06/15 GOLDENROD
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 1. E-02	L.T. 5. E-03	L.T. 6. E-03	L.T. 7. E-03	L.T. 5. E-03
GAMMA SPECTRUM ANALYSIS:					
BE-7	3.22±0.32 E 00	2.70±0.27 E 00	1.07±0.11 E 00	1.67±0.17 E 00	1.08±0.11 E 00
K-40	5.32±0.53 E 00	5.07±0.51 E 00	5.10±0.51 E 00	3.63±0.36 E 00	6.96±0.70 E 00
MN-54	L.T. 9. E-03	L.T. 8. E-03	L.T. 6. E-03	L.T. 9. E-03	L.T. 9. E-03
CO-58	L.T. 9. E-03	L.T. 9. E-03	L.T. 6. E-03	L.T. 8. E-03	L.T. 9. E-03
FE-59	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02
CO-60	L.T. 9. E-03	L.T. 9. E-03	L.T. 6. E-03	L.T. 1. E-02	L.T. 9. E-03
ZN-65	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02
ZR-95	L.T. 9. E-03	L.T. 9. E-03	L.T. 6. E-02	L.T. 8. E-03	L.T. 9. E-03
RU-103	L.T. 1. E-02	L.T. 9. E-03	L.T. 6. E-03	L.T. 1. E-02	L.T. 1. E-02
RU-106	L.T. 8. E-02	L.T. 8. E-02	L.T. 5. E-02	L.T. 8. E-02	L.T. 8. E-02
I-131	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02
CS-134	L.T. 1. E-02	L.T. 9. E-03	L.T. 6. E-03	L.T. 9. E-03	L.T. 1. E-02
CS-137	L.T. 1. E-02	L.T. 1. E-02	L.T. 6. E-03	L.T. 1. E-02	L.T. 1. E-02
BA-140	L.T. 1. E-02	L.T. 1. E-02	L.T. 8. E-03	L.T. 1. E-02	L.T. 1. E-02
CE-141	L.T. 2. E-02	L.T. 1. E-02	L.T. 9. E-03	L.T. 2. E-02	L.T. 1. E-02
CE-144	L.T. 7. E-02	L.T. 5. E-02	L.T. 3. E-02	L.T. 7. E-02	L.T. 5. E-02
RA-226	3.08±1.47 E-01	L.T. 2. E-01	L.T. 1. E-01	L.T. 2. E-01	L.T. 2. E-01
TH-228	3.82±1.05 E-02	4.71±1.24 E-02	1.04±0.49 E-02	L.T. 2. E-02	L.T. 2. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 96
STATION 96 - 1.25 MI. 1 DEG. IND

DATE COLLECTED:	06/15 CURLY DOCK	07/20 SWAMP SMARTWEED	07/20 SWAMP SMARTWEED	07/20 CLOVER	07/20 BLACKSEED PLANTAIN
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 4. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 7. E-03	L.T. 7. E-03
GAMMA SPECTRUM ANALYSIS:					
BE-7	2.08±0.21 E 00	4.24±0.42 E 00	4.67±0.47 E 00	5.11±0.51 E 00	3.63±0.36 E 00
K-40	5.00±0.50 E 00	3.23±0.32 E 00	2.38±0.24 E 00	7.44±0.74 E 00	4.95±0.49 E 00
MN-54	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 9. E-03
CO-58	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 9. E-03
FE-59	L.T. 3. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02
CO-60	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 9. E-03
ZN-65	L.T. 3. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 2. E-02
ZR-95	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02
RU-103	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02
RU-106	L.T. 1. E-01	L.T. 1. E-01	L.T. 9. E-02	L.T. 1. E-01	L.T. 8. E-02
I-131	L.T. 3. E-02	L.T. 3. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 2. E-02
CS-134	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02
CS-137	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	2.14±0.89 E-02	1.67±0.71 E-02
BA-140	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02
CE-141	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02
CE-144	L.T. 8. E-02	L.T. 7. E-02	L.T. 6. E-02	L.T. 7. E-02	L.T. 5. E-02
RA-226	L.T. 3. E-01	L.T. 2. E-01	L.T. 2. E-01	5.49±1.50 E-01	L.T. 2. E-01
TH-228	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	2.94±0.29 E-01	7.66±0.87 E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 96
STATION 96 - 1.25 MI. 334 DEG. IND

DATE COLLECTED:	08/17 COMMON RAGWEED	08/17 SWAMP SMARTWEED	08/17 PARTRIDGE PEA	09/28 COCKLEBUR	09/28 SMARTWEED
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 4. E-03	L.T. 8. E-03	L.T. 6. E-03	L.T. 2. E-02	L.T. 3. E-02
GAMMA SPECTRUM ANALYSIS:					
BE-7	3.49±0.35 E 00	3.17±0.32 E 00	9.70±1.20 E-01	5.05±0.50 E 00	8.28±0.83 E 00
K-40	1.25±0.13 E 00	5.24±0.52 E 00	5.11±0.51 E 00	8.16±0.82 E 00	4.21±0.42 E 00
MN-54	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02
CO-58	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2 E-02	L.T. 1. E-02
FE-59	L.T. 4. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 5. E-02	L.T. 3. E-02
CO-60	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02
ZN-65	L.T. 4. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 5. E-02	L.T. 2. E-02
ZR-95	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02
RU-103	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 3. E-02	L.T. 1. E-02
RU-106	L.T. 1. E-01	L.T. 1. E-01	L.T. 1. E-01	L.T. 2. E-01	L.T. 9. E-02
I-131	L.T. 4. E-02	L.T. 4. E-02	L.T. 3. E-02	L.T. 1. E-01	L.T. 6. E-02
CS-134	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02
CS-137	L.T. 2. E-02	1.16±0.80 E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02
BA-140	L.T. 3. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 5. E-02	L.T. 3. E-02
CE-141	L.T. 2. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 4. E-02	L.T. 3. E-02
CE-144	L.T. 9. E-02	L.T. 1. E-01	L.T. 1. E-01	L.T. 1. E-01	L.T. 8. E-02
RA-226	L.T. 3. E-01	L.T. 3. E-01	L.T. 3. E-01	L.T. 4. E-01	L.T. 2. E-01
TH-228	L.T. 3. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 2. E-02

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 96
STATION 96 - 1.25 MI. 334 DEG. IND

DATE COLLECTED:	09/28 PUNCTUREVINE	10/19 SMARTWEED	10/19 GOLDENROD	10/19 HOARY CRESS	10/19 QA SMARTWEED
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 9. E-03	L.T. 1. E-02
GAMMA SPECTRUM ANALYSIS:					
BE-7	1.85±0.18 E 00	1.10±0.11 E 01	6.30±0.63 E 00	5.66±0.57 E 00	9.80±0.98 E 00
K-40	6.31±0.63 E 00	1.61±0.18 E 00	4.69±0.47 E 00	4.17±0.42 E 00	1.13±0.17 E 00
MN-54	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02
CO-58	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02
FE-59	L.T. 3. E-02	L.T. 4. E-02	L.T. 3. E-02	L.T. 5. E-02	L.T. 4. E-02
CO-60	L.T. 1. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02
ZN-65	L.T. 3. E-02	L.T. 4. E-02	L.T. 4. E-02	L.T. 4. E-02	L.T. 4. E-02
ZR-95	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
RU-103	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
RU-106	L.T. 1. E-01	L.T. 2. E-01	L.T. 1. E-01	L.T. 2. E-01	L.T. 2. E-01
I-131	L.T. 6. E-02	L.T. 4. E-02	L.T. 5. E-02	L.T. 6. E-02	L.T. 7. E-02
CS-134	L.T. 1. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
CS-137	2.23±0.91 E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02	L.T. 2. E-02
BA-140	L.T. 3. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 4. E-02
CE-141	L.T. 2. E-02	L.T. 3. E-02	L.T. 3. E-02	L.T. 4. E-02	L.T. 3. E-02
CE-144	L.T. 7. E-02	L.T. 1. E-01	L.T. 9. E-02	L.T. 1. E-01	L.T. 1. E-01
RA-226	3.77±1.51 E-01	L.T. 4. E-01	L.T. 3. E-01	L.T. 4. E-01	L.T. 4. E-01
TH-228	2.12±0.21 E-01	L.T. 3. E-02	L.T. 2. E-02	L.T. 3. E-02	L.T. 4. E-02

L SHORELINE SEDIMENT

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
SHORELINE SEDIMENT
(PCI/GM DRY)
STATION NUMBER 28
STATION 28 - 1.8 MI. 150 DEG. IND.

DATE COLLECTED:	05/04	10/26
GAMMA SPECTRUM ANALYSIS:		
BE-7	2.59±0.68 E-01	6.26±0.92 E-01
K-40	1.58±0.16 E 01	1.55±0.15 E 01
MN-54	1.54±0.83 E-02	L.T. 1. E-02
CO-58	L.T. 1. E-02	L.T. 1. E-02
FE-59	L.T. 2. E-02	L.T. 3. E-02
CO-60	L.T. 1. E-02	L.T. 1. E-02
ZN-65	L.T. 2. E-02	L.T. 3. E-02
ZR-95	L.T. 1. E-02	L.T. 2. E-02
RU-103	L.T. 1. E-02	L.T. 1. E-02
RU-106	L.T. 8. E-02	L.T. 1. E-01
I-131	L.T. 3. E-02	L.T. 4. E-02
CS-134	L.T. 1. E-02	L.T. 1. E-02
CS-137	4.59±0.76 E-02	5.80±0.76 E-02
PA-140	L.T. 2. E-02	L.T. 2. E-02
CE-141	L.T. 2. E-02	4.22±1.92 E-02
CE-144	L.T. 8. E-02	L.T. 9. E-02
RA-226	1.54±0.18 E 00	1.77±0.19 E 00
TH-228	7.42±0.74 E-01	1.08±0.11 E 00

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1. Nebraska Public Power District, Cooper Nuclear Station Environmental Radiation Monitoring Program, Annual Report, January 1, 1982-December 31, 1982 (prepared by Teledyne Isotopes).

2. Nebraska Public Power District, Cooper Nuclear Station Environmental Radiation Monitoring Program, Annual Report, January 1, 1983-December 31, 1983 (prepared by Teledyne Isotopes).

3. Nebraska Public Power District Cooper Nuclear Station, Environmental Monitoring Program, Annual Report, January 1, 1984 to December 31, 1984. (Prepared by Teledyne Isotopes).

4. U.S. Department of Energy; EML 440 March 1985; EML-444 April 1989; Environmental Measurements Laboratory, US Department of Energy, New York, New York 10014.

5. U.S. Environmental Protection Agency; Environmental Radiation Data, Report 35, July -- September 1983, Report 39, July -- September 1985; Report 40, October -- December 1984; Report 41, January -- March 1985. Report 42, April -- June 1985; Report 43, July-September 1985, Report 44-45, October-March 1986; Report 46, April-June 1986; Report 47, July-September 1986; Report 48, October-December 1986; Report 49, January-March 1987. Environmental Radiation Facility, Montgomery, Alabama.

6. U.S. Department of Energy; EML 460, October 1, 1986; Environmental Measurements Laboratory, US Department of Energy, New York, New York 10014.

7. U.S. Nuclear Regulatory Commission, 1975, Regulatory Guide 4.8, Environmental Technical Specifications for Nuclear Power Plants.

APPENDIX

APPENDIX A

LAND USE CENSUS

LAND USE CENSUS
July 31, 1993
0-3 Miles

Cooper Nuclear Station (CNS) Radiological Effluent Technical Specifications (RETS) require an annual land use census. This census identifies the location of the nearest garden that is greater than 500 Square feet in area and yields edible leafy vegetables, the location of the nearest milk animal, and the location of the nearest resident in each of the 16 meteorological sectors within 3 miles of CNS.

In accordance with the CNS RETS, a land use census was performed on August 10, 1993 to determine the state and use of property at the close of July 1993. A census was not possible until this time because of the disastrous flooding that plagued the area around the plant during the month of July and late June.

Many gardens and residences were destroyed and at the time of this census it is unclear which homes will be repaired or replaced and which ones will be abandoned. In questioning property owners about gardens, some indicated that, because of the heavy rain and large increases in raccoon and deer population in higher ground, gardens (even in higher ground) were abandoned or mowed over even before the heavy flooding.

Sectors A-K were under several feet of water and few houses will be inhabited yet this year. Only 6 sectors had inhabitants within 3 miles, and only 4 sectors had gardens.

No milk animals were found within 3 miles of CNS in 1993 and there was no evidence of potable water use from the river.

LAND USE CENSUS
July 31, 1993
0-3 Miles

Sector	Nearest Resident		Nearest Garden		Nrst Milk Animal
A	None		None		None
B	None		None		None
C	None		None		None
D	None		None		None
E	None		None		None
F	None		None		None
G	None		None		None
H	None		None		None
J	None		None		None
K	None		None		None
L	1.4 miles	230.0°	1.4mi	230.0°	None
M	1.3mi	251.0°	1.8mi	245.0°	None
N	1.0mi	266.5°	None		None
P	1.6mi	293.5°	1.6mi	293.5°	None
Q	0.9mi	307.0°	None		None
R	2.0mi	335.0°	2.0mi	335.0°	None

APPENDIX B

INTERLABORATORY COMPARISON PROGRAM

1993

A summary of the Results of the Analyses by Teledyne Isotopes of the EPA Cross Check Samples

Compared with the Known Activity as reported by the Environmental Monitoring Systems Laboratory, Las Vegas, Nevada

All results which exceed three sigma deviation from the known are appended with a note giving the possible cause of the deviation and corrective action taken.

EPA INTERLABORATORY COMPARISON PROGRAM 1993
Environmental

Collection Date	Media	Nuclide	EPA Result(a)		Teledyne Isotopes Result(b)		Deviation(c)	
01/15/93	Water	Sr-89	15.0 ±	5.0	12.67 ±	1.15	-0.81	
		Sr-90	10.0 ±	5.0	8.33 ±	1.15	-0.58	
01/29/93	Water	Gr-Alpha	34.0 ±	9.0	17.33 ±	1.15	-3.21	(d)
		Gr-Beta	44.0 ±	5.0	52.00 ±	1.00	2.77	(e)
02/05/93	Water	I-131	100.0 ±	10.0	106.67 ±	5.77	1.15	
03/05/93	Water	Ra-226	9.8 ±	1.5	7.67 ±	0.12	-2.46	(f)
		Ra-228	18.5 ±	4.6	19.33 ±	2.31	0.31	
04/20/93	Water	Gr-Alpha	95.0 ±	24.0	94.33 ±	1.15	-0.05	
		Ra-226	24.9 ±	3.7	19.00 ±	1.00	-2.76	(f)
		Ra-228	19.0 ±	4.8	18.33 ±	0.58	-0.24	
		Gr-Beta	177.0 ±	27.0	150.0 ±	0.00	-1.73	
		Sr-89	41.0 ±	5.0	35.33 ±	1.53	-1.96	
		Sr-90	29.0 ±	5.0	27.33 ±	0.58	-0.58	
		Co-60	39.0 ±	5.0	40.67 ±	3.51	0.58	
		Cs-134	27.0 ±	5.0	23.67 ±	1.53	-1.15	
		Cs-137	32.0 ±	5.0	34.33 ±	2.08	0.81	
06/04/93	Water	H-3	9844.0 ±	984.0	9366.67 ±	152.75	-0.84	
06/11/93	Water	Co-60	15.0 ±	5.0	16.33 ±	1.53	0.46	
		Zn-65	103.0 ±	10.0	121.33 ±	20.09	3.18	(g)
		Ru-106	119.0 ±	12.0	106.33 ±	15.89	-1.83	
		Cs-134	5.0 ±	5.0	5.67 ±	0.58	0.23	
		Cs-137	5.0 ±	5.0	6.67 ±	0.58	0.58	
		Ba-133	99.0 ±	10.0	104.33 ±	9.29	0.92	
07/16/93	Water	Sr-89	34.0 ±	5.0	31.67 ±	2.52	-0.81	
		Sr-90	25.0 ±	5.0	24.00 ±	0.00	-0.35	
07/23/93	Water	Gr-Alpha	15.0 ±	5.0	18.67 ±	2.08	1.27	
		Gr-Beta	43.0 ±	6.9	42.67 ±	2.52	-0.08	
08/27/93	Air Filter	Gr-Alpha	19.0 ±	5.0	17.00 ±	0.00	-0.69	
		Gr-Beta	47.0 ±	5.0	49.00 ±	1.73	0.69	
		Sr-90	19.0 ±	5.0	17.67 ±	0.58	-0.46	
		Cs-137	9.0 ±	5.0	9.67 ±	0.58	0.23	

EPA INTERLABORATORY COMPARISON PROGRAM 1993
Environmental

Collection Date	Media	Nuclide	EPA Result(a)		Teledyne Isotopes Result(b)		
09/09/93	Water	Ra-226	14.9 ±	2.2	15.33 ±	0.58	0.34
		Ra-228	20.4 ±	5.1	20.67 ±	1.15	0.09
09/24/93	Milk	Sr-89	30.0 ±	5.0	35.67 ±	3.51	1.96
		Sr-90	25.00 ±	5.0	24.00 ±	1.73	-0.35
		I-131	120.0 ±	12.0	126.67 ±	5.77	0.96
		Cs-137	49.0 ±	5.0	50.67 ±	1.15	0.58
		K	1679.0 ±	84.0	1620.00 ±	17.32	-1.22
10/08/93	Water	I-131	117.0 ±	12.0	103.33 ±	5.77	-1.97
10/29/93	Water	Gr-Alpha	20.0 ±	5.0	20.33 ±	2.08	0.12
		Gr-Beta	15.0 ±	5.0	15.67 ±	2.08	0.23
11/5/93	Water	H-3	7398.0 ±	740.0	6900.00 ±	100.00	-1.17

Footnotes:

(a) EPA Results-Expected laboratory precision (1 sigma). Units are pCi/liter for water and milk except K is in mg/liter. Units are total pCi for air particulate filters.

(b) Teledyne Results - Average ± one sigma. Units are pCi/liter for water and milk except K is in mg/liter. Units are total pCi for air particulate filters.

(c) Normalized deviation from the known.

(d) The EPA switched from Am-241 to Th-230 alpha spike. We calibrated with Th-230, using sodium nitrate to generate a self-absorption curve. The EPA water, however has minerals which have greater self-absorption than the sodium nitrate matrix. The EPA has agreed to send us a gallon of their water which we can use to prepare a self-absorption curve with Th-230.

(e) By oversight, we did not use the special self-absorption curve which we had previously derived using EPA water and Cs-137 standard. We will use the EPA curve in the future. We may also re-derive this curve using a water sample which the EPA has agreed to send us.

(f) The counting data and backgrounds were verified. Possibly some efficiencies used were erroneously high, causing low values. A less likely cause is an error in dilution. New Ra-226 standards will be prepared. Closer monitoring of out of control efficiencies will be done and extra care in preparation of the sample will be maintained.

(g) The calculations were checked and found to be correct. The results of six gamma emitting isotopes were reported to the EPA. The results of four were within 1 normalized deviation; a fifth, within 2 normalized deviations. Only the Zn-65 average was outside the control limits. There is no obvious reason why one isotope should be outside the control limits, while five other isotopes were within control limits.

January 26, 1994

APPENDIX C

STATISTICAL NOTES

APPENDIX C

STATISTICAL NOTES

1. Each activity is reported in one of two forms:

   $x \pm s$ or

   $<L$,

   where

   x = value of measurement;

   s = counting error at the 95% confidence level (2 sigma error);

   L = detection limit based on 4.66 sigma error for counter background

2. All activities are corrected to collection time except for gross alpha and gross beta.

3. Computation of means:

   (a) In any statistical table, the values are entered as

   $\bar{x} \pm \bar{s}$

   or $<L$

   where

   $\bar{x}$ = sample mean = $\frac{\Sigma x}{n}$;

   n = number of data points averaged;

   $\bar{s}$ = average of the 2 sigma counting errors = $\frac{\Sigma s}{n}$

   (b) For gross beta and gross alpha results in air particulates, averaging includes values which are less than the lower limits of detection. The detection limit is used as the sample activity in these cases.

   (c) In all cases, if all values in an averaging group are below detection limits, the highest of the detection limits is reported as a "less than" value without an associated tolerance. If some values are above detection limits and some are below, then:

(1) The mean of the positive results is reported and the number of positives is listed in parentheses.

(d) Means are reported on a quarterly basis except for air particulate and airborne iodine data which are reported monthly. For air particulate and charcoal filters, data for samples collected on the 1st, 2nd, and 3rd day of a month are assigned to the previous month.

(e) In rounding off, numbers followed by a 5 or higher digit are rounded upwards.

Appendix D

Notification Levels

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM
NOTIFICATION LEVELS

Media and Nuclide	Notification Level	
Air		
Gross Alpha	0.1	pCi/m^3
Gross Beta	1.0	pCi/m^3
I-131	0.31	pCi/m^3
Cs-134	3.3	pCi/m^3
Cs-137	6.7	pCi/m^3
Milk		
I-131 (low level)	1.09	pCi/l
Sr-89	6.04	pCi/l
Sr-90	14.82	pCi/l
Cs-134	20.0	pCi/l
Cs-137	23.0	pCi/l
Groundwater		
Gross Alpha	12.0	pCi/l
Gross Beta	33.8	pCi/l
H-3	6700	pCi/l
Mn-54	330	pCi/l
Fe-59	130	pCi/l
Co-58	330	pCi/l
Co-60	100	pCi/l
Zn-65	100	pCi/l
Zr-Nb-95	67	pCi/l
I-131	0.67	pCi/l
Cs-134	10	pCi/l
Cs-137	17	pCi/l
Ba-La-140	67	pCi/l
Food Products		
I-131	0.1	pCi/g wet
Cs-134	0.33	pCi/g wet
Cs-137	0.66	pCi/g wet
Fish		
Gross Beta	10.8	pCi/g wet
Sr-89	3.3	pCi/g wet
Sr-90	1.2	pCi/g wet
Mn-54	10	pCi/g wet

Media and Nuclide	Notification Level	
Fish (Continued)		
Fe-59	3.3	pCi/g wet
Co-58	10	pCi/g wet
Co-60	3.3	pCi/g wet
Zn-65	6.7	pCi/g wet
Cs-134	0.33	pCi/g wet
Cs-137	0.67	pCi/g wet
River Water		
Gross Alpha Sus	22.0	pCi/l
Gross Alpha Dis	27.6	pCi/l
Gross Beta Sus.	58.8	pCi/l
Gross Beta Dis.	88.6	pCi/l
Sr-89	1000.0	pCi/l
Sr-90	100.0	pCi/l
H-3	6700	pCi/l
Mn-54	330	pCi/l
Fe-59	130	pCi/l
Co-58	330	pCi/l
Co-60	100	pCi/l
Zn-65	100	pCi/l
Zr-Nb-95	67	pCi/l
I-131	0.67	pCi/l
Cs-134	10	pCi/l
Cs-137	17	pCi/l
Ba-La-140	67	pCi/l
Shoreline Sediment		
Co-60	0.1	pCi/g dry
Cs-134	0.75	pCi/g dry
Cs-137	0.75	pCi/g dry

APPENDIX B
CONVENTIONS USED
IN
DATA TREND GRAPHS

APPENDIX E

Conventions used in Data Trend Graphs

1. The data trend plots are based on statistical summaries of Section VI.

2. Monthly or quarterly averages are plotted.

3. The conventions used to determine if a "less than" (<) value or detectable result is plotted are those given in Appendix C.

4. Lowest levels of detection (LLD) are noted by a straight line on the graphs.

5. A typical less-than value arising from delayed counting of short-lived isotopes (such as I-131 or Ba-140) or reduced sample size are omitted.

APPENDIX F
DETECTION CAPABILITIES

DETECTION CAPABILITIES
FOR
ENVIRONMENTAL SAMPLE ANALYSIS
Radiochemical Methods
Lower Limit of Detection

	LLD[a]				
	Water (pCi/ℓ)	Milk (pCi/ℓ)	Air Part (pCi/m^3)	Food Products Broadleaf Vegetation[b] (pCi/g wet)	Fish (pci/g wet)
Quantity[c]	0.4 ℓ	-	280 m^3		0.1 g ash
Ash Wt. %[d]	-	-	-		4
α[e]	4.0	-	0.002		-
β[e]	1.4	-	0.003		0.25
Quantity	2 ℓ	1 ℓ	-		3 g ash
Ash Wt. %	-	-	-		4
Sr-89	1.08	2.02	-		0.03
Sr-90	0.93	1.39	-		0.03
Quantity	-	1 ℓ	280 m^3	20 g	-
I-131	-	0.78	0.05[f]	0.05	-
H-3	140	-	-	-	-

[a]LLD - lower limit of detection based on $4.66s_b$; where s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute), specified for listed quantity and ash weight percentage.
[b]The minimum sensitivity will vary with the weight reduction achieved by ashing the sample. Minimum sensitivities for three typical ash weight percentages are specified.
[c]Typical analysis quantity.
[d]Typical ash weight percentage of wet weight.
[e]Listed α and β LLD's are for weightless sample. Self-absorption in sample will increase these LLD's. Typical increases will be factors in the range 1 to 1.3 for β analysis and 1-5 for α analysis.
[f]Iodine collected Charcoal Cartridge air filter.

[a]LLD = lower limit of detection based on $4.66 s_b$; & where s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute). The LLD is at counting time and must be corrected to collection time. The LLDs given above are based on the quantities indicated and the background count rate in the absence of any radionuclides in the sample. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background shall include the typical contributions of other radio-nuclides normally present in the samples (e.g., potassium-40 in milk samples).

Occasionally background fluctuations, unavoidably small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLD's unachievable. In such cases, the contributing factors will be identified and described in the Environmental Radiation Monitoring Program Annual Report.

Note: All LLD's which we require are listed in this table for Ge(Li) Gamma Spectroscopy. If any nuclide is detected, it shall be reported quantitatively whether or not it is one of the 20 nuclides listed above.

LOWER LIMITS OF DETECTION (LLD)
OF
ANALYSES FOR Ge (Li) DETECTOR

		LLD[a]				
		Milk, Water (pCi/ℓ)	Air Part (pCi/m^3)	Fish, (pCi/kg wet)	Food Products (pCi/kg wet)	Shoreline Sediment (pCi/kg dry)
Quantity:		3.5 ℓ	3600 m^3	400 g wet	200 g wet	600 g dry
Isotope	Half-Life					
Be-7	53.2 d	78	0.05	311	1243	233
K-40	1.26×10^9 y	140	0.06	466	932	466
Mn-54	313 d	8	0.003	31	124	31
Co-58	70.8 d	8	0.003	31	124	16
Fe-59	45 d	30	0.006	260	311	31
Co-60	5.26 y	8	0.005	31	124	47
Zn-65	245 d	30	0.003	260	311	31
Nb-95	35.2 d	9	0.003	31	124	31
Zr-95	65 d	9	0.005	47	93	78
Ru-103	39.4 d	8	0.003	31	124	47
Ru-106	368 d	62	0.03	311	1243	233
I-131	8.04 d	9	0.003	31	60	31
Cs-134	2.06 y	9	0.003	31	60	47
Cs-137	30.2 y	9	0.003	31	80	31
Ba-140	12.8 d	15	0.09	109	621	233
La-140	40.2 h	15	0.09	109	621	233
Ce-141	32.5 d	16	0.003	47	155	47
Ce-144	284 d	78	0.01	155	621	233
Ra-226	1600 y	100	0.08	200	800	109
Th-228	1.91 y	31	0.01	93	466	109

[a] LLD = lower limit of detection based on $4.66 s_b$; and where s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute). The LLD is at counting time and must be corrected to collection time. The LLDs given above are based on the quantities indicated and the background count rate in the absence of any radionuclides in the sample. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background shall include the typical contributions of other radio-nuclides normally present in the samples (e.g., potassium-40 in milk samples).

Occasionally background fluctuations, unavoidable small sample size, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLD's unachievable. In such cases, the contributing factors will be identified and described in the Environmental Radiation Monitoring Program Annual Report.

Note: All LLD's which we require are listed in this table for Ge(Li) Gamma Spectroscopy. If any nuclide is detected, it shall be reported quantitatively whether or not it is one of the 20 nuclides listed above.

APPENDIX G

SAMPLE STATION LOCATIONS AND SAMPLE TYPES

Sample Station[a]	Sample Description - Type and Location
No. 1	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: Sample (1) is taken on top of the Material Storage Warehouse on site. Sample (2) is taken approximately 130 feet south of the Materials Warehouse, NW1/4, S32, T5N, R16E, Nemaha County, Nebraska.
No. 2	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: On north side of county road access to the south portion of the CNS site approximately 275 feet west of the former Jefferson Broady farmstead, SW1/4, S32, T5N, R16E, Nemaha County, Nebraska.
No. 3	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: Located on the north side of the Brownville State Recreation Park access road near water gauging station, SE1/4, S18, T5N, R16E, Nemaha County, Nebraska.
No. 4	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: Located 1/2 mile south of Phelps City, Missouri, on west side of Highway "U", NE1/4, S2, T64N, R42W, Atchison County, Missouri.
No. 5	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: 1/4 mile south and 1/4 mile east of Langdon, Missouri, on north side of road, west of railroad tracks, SW1/4, S18, T64N, R41W, Atchison County, Missouri.
No. 6	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: 1 mile west of the end of Missouri State Highway "U", south side of road, SW corner of the intersection, NW1/4, S34, T64N, R42W, Atchison County, Missouri.

Sample Station	Sample Description - Type and Location
No. 7	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: 300 yards east of Highway 67 at Nemaha on north side of road, SW1/4, S6, T4N, R16E, Nemaha County, Nebraska.
No. 8	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: 1/2 mile north, 3/4 mile west and 3/4 mile north of Nemaha on west side of road adjacent to the M. T. Moore Transmission Line, NE1/4, S35, T5N, R15E, Nemaha County, Nebraska.
No. 9	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: 4 miles north of Highway #136 on Highway #67. 1 mile east of Highway #67 and 1/2 mile north on west side of road, SW1/4, S26, T6N, R15E, Nemaha County, Nebraska.
No. 10	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: 1 mile north of Barada, Nebraska, in SW corner of intersection, NE1/4, S14, T3N, R16E, Richardson County, Nebraska.
No. 11	Type: (1) Water - Ground Location: Plant well water supply header at well pits, NW1/4, S32, T5N, R16E, Nemaha County, Nebraska.
No. 12	Type: (1) Water - River Location: Sample (1) will be taken from the Missouri River immediately upstream from the Plant Intake Structure (River Mile 532.5).
No. 20	Type: (1) Environmental Thermoluminescent Dosimetry Location: On NNW boundary of NPPD property, about 20 yards east of county road, SE1/4, S30, T5N, R16E, Nemaha county, Nebraska.

Sample Station	Sample Description - Type and Location
No. 28	Type: (1) Water - River (2) Fish (3) Sediment from Shoreline Location: Sample (1) will be taken below the Plant Discharge Flume Outfall (River Mile 530). Sample (2) will be taken from the Missouri River downstream from the plant site near River Mile 530. Sample (3) will be taken from the Nebraska bank of the river 1/2 to 3/4 miles downstream from the plant site.
No. 35	Type: (1) Fish (2) Food Products - Broadleaf Vegetation Location: Sample (1) will be taken from the Missouri River at about 1 to 3 miles above the intake structure. Sample (2) will be taken about 1/4 mile south of the Brownville State Recreation Area in Sector A.
No. 42	Type: (1) Milk (Other Producer) Location: 1 mile south, 1-1/4 miles east of Barada, Nebraska, south side, M. Wissman farm, NW1/4, S30, T3N, R17E, Richardson County, Nebraska.
No. 44	Type: (1) Environmental Thermoluminescent Dosimetry (2) Food Products - Broadleaf Vegetation Location: 2 miles south of Auburn stoplight, 1/4 mile south of Auburn Country Club on Highway #73-75, 1/2 mile east of Highway #73-75 at fenceline north of county road,SE1/4, S27, T5N, R14E, Nemaha County, Nebraska.
No. 47	Type: (1) Water - Ground Location: Taken at Falls City Municipal Water Supply Wells south of Rulo, Nebraska (from Main Header Flow Meter), SW1/4, S20, T1N, R18E, Richardson County, Nebraska.
No. 56	Type: (1) Environmental Thermoluminescent Dosimetry Location: 1 and 1/4 mile south and west of Langdon, Missouri, on Highway "U", on the right side of the highway, Bill Gebheart farm, NW1/4, S23, T64N, R42W, Atchison County, Missouri.

Sample Station	Sample Description - Type and Location
No. 58	Type: (1) Environmental Thermoluminescent Dosimetry Location: 3 miles south of Brownville, Nebraska, on county road, at the southeast corner of the intersection, with the farm road leading to Sample Station No. 2, SE1/4, S31, T5N, R16E, Nemaha County, Nebraska.
No. 59	Type: (1) Environmental Thermoluminescent Dosimetry Location: 1 mile SSE of the CNS Elevated Release Point, 50 yards west of the levee at the south boundary of NPPD property, SE1/4, S32, T5N, R16E, Nemaha County, Nebraska.
No. 66	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2 miles south of Nemaha, Nebraska, on Highway 67 - east side of Highway. Mrs. Lola Kennedy farm, NW1/4, S19, T4N, R16E, Nemaha County, Nebraska.
No. 67	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2 miles west of Brownville, Nebraska, on U.S. Highway #136, then north 1-1/2 miles on county road, then east 1/2 mile, on north side of road, Walter Parkhurst farm, NE1/4, S11, T5N, R15E, Nemaha County, Nebraska.
No. 71	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2 miles east of Phelps City, Missouri, on U.S. Highway #136, then south 1-1/2 miles on county road, then west 1/4 mile, Tom Boatman farm, SE1/4, S6, T64N, R41W, Atchison County Missouri.
No. 79	Type: (1) Environmental Thermoluminescent Dosimetry Location: 1-7/8 miles south of Brownville, Nebraska, on the east side of the paved road. NPPD property, SE1/4, S30, T5N, R16E, Nemaha County, Nebraska.

Sample Station	Sample Description - Type and Location
No. 80	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2-1/8 miles south of Brownville, Nebraska, on the east side of the paved road. NPPD property, NE1/4, S31, T5N, R16F, Nemaha County, Nebraska.
No. 81	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2-3/8 miles south of Brownville, Nebraska, in the northeast corner of the intersection of the paved county road and the CNS access road. NPPD property, NE1/4, S31, T5N, R16E, Nemaha County, Nebraska.
No. 82	Type: (1) Environmental Thermoluminescent Dosimetry Location: 7/8 mile south of Cooper Nuclear Station in a field. NPPD property, SW1/4, S32, T5N, R16E, Nemaha County, Nebraska.
No. 83	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2-1/4 miles south of Nemaha, Nebraska, on Highway 67, then east 1 mile to the junction of the driveway and county road on the east side of the driveway. Leroy Kennedy. NE1/4, S19, T4N, R16E, Nemaha County, Nebraska.
No. 84	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2-1/2 miles west of Brownville, Nebraska, on the south side of U.S. Highway 136, west of Locust Grove School. Bruce L. Solie. NW1/4, S22, T5N, R15E, Nemaha County, Nebraska.
No. 85.	Type: (1) Environmental Thermoluminescent Dosimetry Location: 1 mile east of Brownville, Nebraska, on U.S. Highway 136, then north 1/4 mile on the east side of the county road. Scott Leseberg. NE1/4, S33, T65N, R42W, Atchison County, Missouri.
No. 86	Type: (1) Environmental Thermoluminescent Dosimetry Location: 1 mile west of Phelps City, Missouri, on U.S. Highway 136, then north 1-1/2 miles on Highway "D", west side. Mrs. Olin (Mildred) Harmes. SE1/4, S22, T65N, R43W, Atchison County, Missouri.

Sample Station	Sample Description - Type and Location
No. 87	Type: (1) Environmental Thermoluminescent Dosimetry
	Location: 1 mile west of Phelps City, Missouri, on U.S. Highway 136, then south 1/2 mile on a county road and then 3/4 mile west on a county road to the end of the road. Robert Graf. SW1/4, S3, T64N, R42W, Atchison County, Missouri.
No. 88	Type: (1) Environmental Thermoluminescent Dosimetry
	Location: 1 mile west of Phelps City, Missouri, on U.S. Highway 136, then south 2 miles at the end of the county road. David Meyerkorth, NW1/4, S11, T64N, R42W, Atchison County, Missouri.
No. 89	Type: (1) Environmental Thermoluminescent Dosimetry
	Location: 2-1/2 miles south of Phelps City, Missouri, on Highway "U", then 1/2 mile west in the southeast corner of the county road intersection. Gertrude Rosenbohm, NE1/4, S14, T64N, R42W, Atchison County, Missouri.
No. 90.	Type: (1) Environmental Thermoluminescent Dosimetry
	Location: 1-1/2 miles west and 3/4 mile south of Langdon, Missouri, on Highway "U", then 1/4 mile west. Garth Green. SW1/4, S23, T64N, R42W, Atchison County, Missouri.
No. 91	Type: (1) Environmental Thermoluminescent Dosimetry
	Location: 1/2 mile west of Rock Port, Missouri, on the south side of the intersection of U.S. Highway 136 and U.S. Highway 275 at the water tower. Mildred Cook. NW1/4, S28, T65N, R41W, Atchison County, Missouri.
No. 94	Type: (1) Environmental Thermoluminescent Dosimetry
	Location: 1/4 mile south of Langdon, Missouri, on the west side of the road. Max Peeler. NE1/4, S24, T64N, R42W, Atchison County, Missouri.

Sample Station	Sample Description - Type and Location
No. 96	Type: (1) Food Products - Broadleaf Vegetation Location: Taken 1 mile south of Brownville, Nebraska, from the road ditch bordering the paved road in Sector R. SE1/4, S19, T5N, R16E, Nemaha County, Nebraska.
No. 99	Type: (1) Milk (Nearest Producer) Location: 1-1/4 miles south of Shubert, Nebraska, on the west side of Highway 67. James Zentner dairy. NE1/4, S24, T3N, R15E, Richardson County, Nebraska.
No. 100	Type: (1) Milk (Other Producer) Location: 2 miles south and 1 mile west of Shubert, Nebraska. Dick James dairy. SW1/4, S23, T3N, R15E, Richardson County, Nebraska.

NOTES: (a) Sample Station numbers missing from the sequence are inactive or discontinued Sample Stations.

APPENDIX H

SUMMARY OF DOSES TO A MEMBER OF THE PUBLIC OFF-SITE

DOSES TO MAXIMUM INDIVIDUAL (MREM), JANUARY-DECEMBER 1993

COOPER NUCLEAR STATION JANUARY-DECEMBER 1993
SPECIAL LOCATION #1 SITE BOUNDARY
AT 0.67 MILES N

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.83E-03	6.73E-03	5.71E-03	5.76E-03	5.71E-03	5.91E-03	6.05E-03	6.80E-03
TEEN	5.88E-03	6.70E-03	5.71E-03	5.79E-03	5.71E-03	5.98E-03	6.21E-03	6.80E-03
CHILD	6.04E-03	6.33E-03	5.71E-03	5.82E-03	5.71E-03	6.23E-03	6.11E-03	6.80E-03
INFANT	5.74E-03	5.74E-03	5.71E-03	5.73E-03	5.71E.03	6.81E-03	5.97E-03	6.80E-03

HI

COOPER NUCLEAR STATION JANUARY-DECEMBER 1993
SPECIAL LOCATION #2 NEAR RESIDENCE
AT 0.90 MILES NW

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.15E-03	2.47E-03	2.11E-03	2.13E-03	2.11E-03	2.33E-03	2.19E-03	2.61E-03
TEEN	2.17E-03	2.45E-03	2.11E-03	2.13E-03	2.11E-03	2.41E-03	2.23E-03	2.61E-03
CHILD	2.22E-03	2.33E-03	2.11E-03	2.15E-03	2.11E-03	2.69E-03	2.20E-03	2.61E-03
INFANT	2.12E-03	2.12E-03	2.11E-03	2.12E-03	2.11E-03	3.34E-03	2.17E-03	2.61E-03

Summary of Doses to Maximum individual at the Site Boundary, Resulting From Exposure to Radioactivity Discharged in Liquid Effluents, January - December 1993, Cooper Nuclear Station

	Dose, mrem							
Period	Skin	Bone	Liver	Total Body	Thyroid	Kidney	Lung	GI-LLI
1st Quarter	1.83E-04	1.26E-01	7.54E-03	3.71E-02	1.55E-04	2.02E-03	7.62E-04	3.76E-02
2nd Quarter	6.75E-05	1.53E-03	4.79E-03	4.48E-03	5.74E-05	9.62E-04	4.23E-04	3.28E-02
3rd Quarter	1.10E-05	2.14E-03	1.55E-03	1.39E-03	9.35E-06	4.53E-04	1.70E-04	3.61E-03
4th Quarter	3.18E-05	1.10E-03	1.72E-03	1.50E-03	2.70E-05	5.13E-04	1.90E-04	5.22E-03
Totals For 1993	2.93E-04	1.31E-01	1.56E-02	4.45E-02	2.49E-04	3.95E-03	1.55E-03	7.92E-02