



Nebraska Public Power District
Nebraska's Energy Leader

NLS2002054
May 15, 2002

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: Annual Radiological Environmental Operating Report
Cooper Nuclear Station, NRC Docket No. 50-298, DPR-46

The purpose of this letter is to submit the Cooper Nuclear Station (CNS) Annual Radiological Environmental Operating Report for the period of January 1, 2001, through December 31, 2001. The enclosed report is being submitted in accordance with CNS Technical Specification 5.6.2.

Per 10 CFR 50.4(b)(1), we are enclosing one copy of the report for your use, one copy to the Regional Office and one copy to the NRC Senior Resident Inspector.

Should you have any questions regarding this submittal, please contact me at 402-825-2760 or Paul V. Fleming, Acting Risk and Regulatory Affairs Manager, at 402-825-2774.

Sincerely,

David L. Wilson
Vice President - Nuclear

/dnm
Enclosure

cc: Regional Administrator w/enclosure
USNRC - Region IV

Senior Project Manager w/enclosure
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/enclosure
USNRC - Cooper Nuclear Station

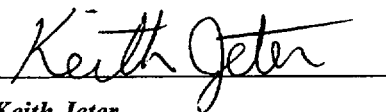
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NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
Radiological Environmental Monitoring Program
2001 Annual Report
January 1, 2001 to December 31, 2001

Approved by



Keith Jeter
Laboratory Director

Prepared by
Teledyne Brown Engineering
2508 Quality Lane
Knoxville, TN 37931-3133

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PREFACE

This report covers the period of January 1 through December 31, 2001. Personnel of the Nebraska Public Power District made all sample collections. Analyses were performed and reports of analyses were prepared by Teledyne Brown Engineering – Environmental Services and forwarded to Nebraska Public Power District.

I. INTRODUCTION

I. INTRODUCTION

This report contains a complete tabulation of data collected during the period January through December 2001, for the operational Radiological Environmental Monitoring Program performed for the Cooper Nuclear Station (CNS) of the Nebraska Public Power District (NPPD) by Teledyne Brown Engineering - Environmental Services.

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 (net electrical) boiling water reactor. Initial criticality was attained on February 21, 1974. The reactor reached 50 percent power on June 25, 1974 and 100 percent 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. All 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 (now trading as Teledyne Brown Engineering - Environmental Services) again assumed responsibility for the analyses effective January 1, 1979 through December 31, 2001.

The United States Nuclear Regulatory Commission (USNRC) regulations (10CFR50.34a) require that nuclear power plants be designed, constructed, and operated to keep levels of radioactive material in effluents to unrestricted areas as low as is reasonably achievable (ALARA). To ensure these criteria are met, the operating license for Nebraska Public Power District's Cooper Nuclear Station includes Technical Specifications which address the release of radioactive effluents. Inplant monitoring is used to ensure that these release limits are not exceeded. As a precaution against unexpected or undefined environmental processes which might allow undue accumulation of radioactivity in the environment, a program for monitoring the plant environs is also included in NPPD's CNS Technical Specifications.

A. 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 Iodine-131 in charcoal filters and milk samples were measured. Additionally, in 1986, Cesium-137 and the short-lived isotopes Iodine-131, Ruthenium-106, and Cesium-134 were detected in broadleaf vegetation. Similar results occurred in other areas of the United States and the entire Northern Hemisphere.

B. 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 (Berillium-7).
- (2) Terrestrial, primordial radionuclides from the environment (potassium-40, Radium-226, Thorium-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.

II. SUMMARY

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 2001.

A discussion of each type of sample analyzed and its impact, if any, on the environment is presented in Section IV. Included also are graphs of the isotopes of interest for the past several years and the statistical results for each quarter of the year.

Section VI is the Radiological Environmental Monitoring Program Summary. It contains the yearly summary of the program with the total number of samples of each type analyzed. It lists the yearly average and range for the control locations versus the indicator locations and the number of detections per total number of samples. It identifies the station with the highest yearly average, the distance and location of that station and provides the range of detection.

Section 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.

Section 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.

III. SAMPLING AND ANALYSIS PROGRAM

III. SAMPLING AND ANALYSIS PROGRAM

The 2001 sampling and analysis program is described in Table 1. Teledyne Brown Engineering - Environmental Services has a comprehensive quality assurance/quality control program designed to assure the reliability of data obtained. The results for the 2001 Intercomparison Program conducted by the Analytic's, Inc. and Environmental Resource Associates are contained in Appendix B.

Sampling locations are indicated in the map labeled Figure 1. The sample types collected at each location and the approximate distance and direction from the reactor elevated release point are specified.

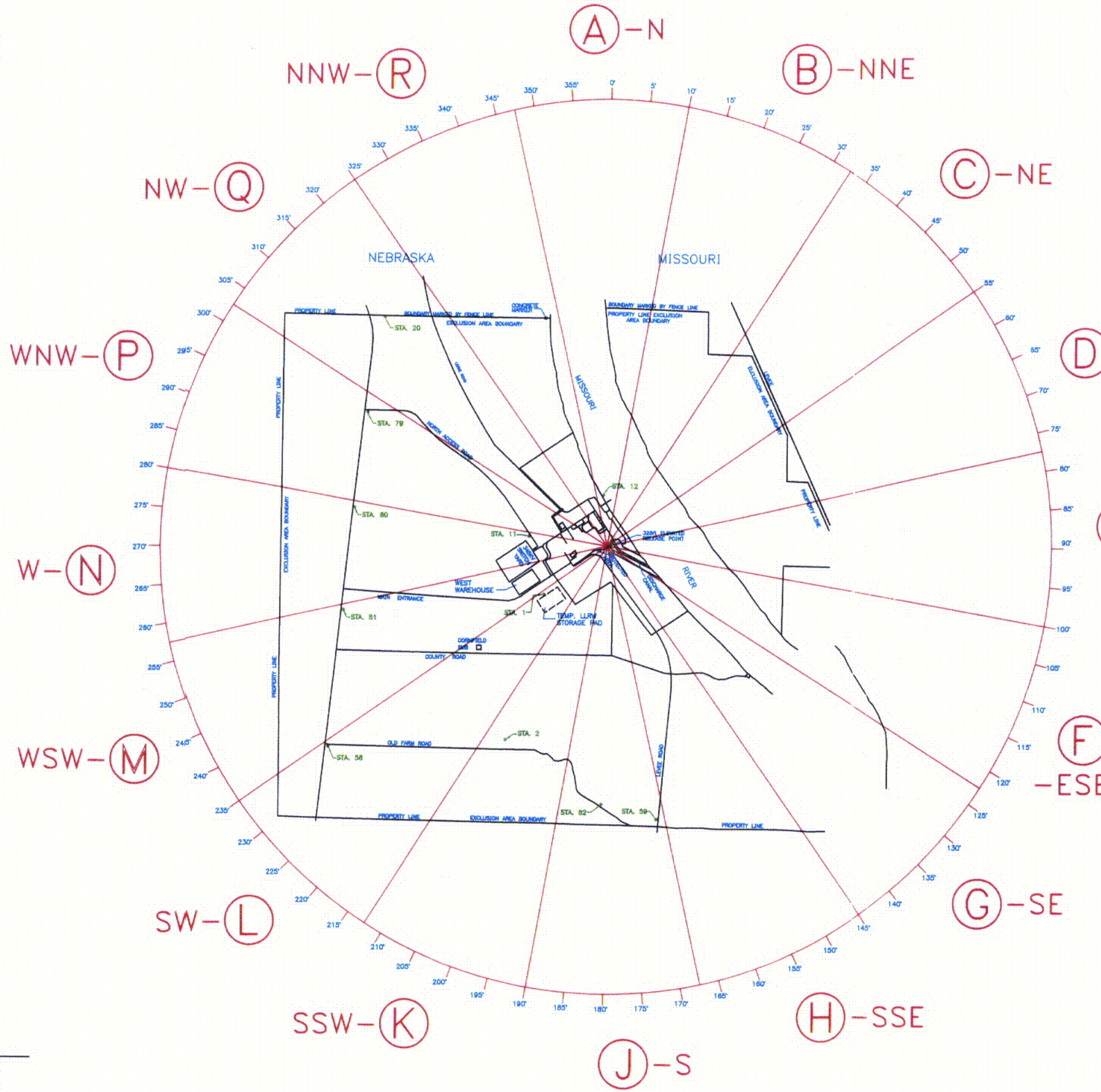
The annual land use census for 2001 is described in Appendix A. There were no milk animals found within three miles of CNS in 2001 and no evidence of potable water use from the river. The nearest garden to CNS is in sector D, 1.7 miles from CNS. Gardens were found in eight sectors during 1999, in nine sectors during 2000, and in nine sectors during 2001. The nearest resident to CNS is in sector Q, 0.9 miles from CNS.

All of the required 2001 environmental monitoring, including sampling and analysis, was conducted as specified in Table D4.1-1 of the CNS Offsite Dose Assessment Manual (ODAM), except as noted in Appendix E, Exception Table.

TABLE 1

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
Environmental Radiation Surveillance Program
Sampling Schedule and Analysis

<i>Sample Type</i>	<i>Station</i>	<i>Frequency</i>	<i>Analyses</i>
Airborne/ Particulate	1-10	Once per 7 days	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	Once per 7 days	I-131
Milk / Nearest Producer peak pasture only	61	Once per 15 days	I-131 (low level), Gamma Isotopic Sr-89, Sr-90, elem. Ca. on monthly composite
River Water	12, 28	Once per 31 days	Gross alpha, sus and dis Gross beta, sus and dis, Sr-89, Sr-90, Gamma Isotopic, Tritium on quarterly composite
Milk/ Nearest Producer Non-peak pasture	61, 99	Once per 31 days	I-131 (low level) Sr-89, Sr-90, elem. Ca., Gamma Isotopic
Food Products / Broadleaf Vegetation	28, 35, 96, 101	Monthly when available	I-131 (low level), Gamma Isotopic
Background Radiation Thermoluminescent Dosimeters	1-10, 20, 44, 56, 58, 59, 66, 67, 71, 79-91, 94	Once per 92 days	TLD Readout (gamma dose)
Groundwater	11, 47	Once per 92 days	Gross Alpha, Beta, Gamma Isotopic, Tritium
Milk Other Producers	42, 99, 100	Once per 92 days	I-131 (low level) Sr-89, Sr-90, elem. Ca., Gamma Isotopic
Fish (Summer and Fall)	28, 35	Two times per year	Gross Beta, Sr-89, Sr-90, Gamma Isotopic on edible portions
Shoreline Sediment	28	Two times per year	Gamma Isotopic



LEGEND

- Federal HWY
- Nebraska State HWY
- Interstate
- Missouri State HWY
- Missouri County Road
- Transmission Line
- CNS Environmental Sample Stations

SAMPLING LOCATION KEY (SITE)

Station Number	Distance* (miles)	Direction* (degrees)	Classification	Sample Type(s)
1	0.1	230	IND	AP, C, TL
2	0.75	210	IND	AP, C, TL
11	0.15	275	IND	WG
12	0.1	355	CON	WR
20	0.96	315	IND	TL
58	1.1	234	IND	TL
59	1	170	IND	TL
79	0.85	299	IND	TL
80	0.75	280	IND	TL
81	0.8	255	IND	TL
82	0.8	185	IND	TL

*Approximate distance and direction with respect to reactor Elevated Release Point (ERP)

NOTE:
 Environmental sample type codes: AP = air particulate filters; C = charcoal cartridges
 FI = fish; M = milk; SH = shoreline sediment; TL = environmental thermoluminescent dosimeters; VT = broadleaf vegetation; WG = groundwater; WR = river water.

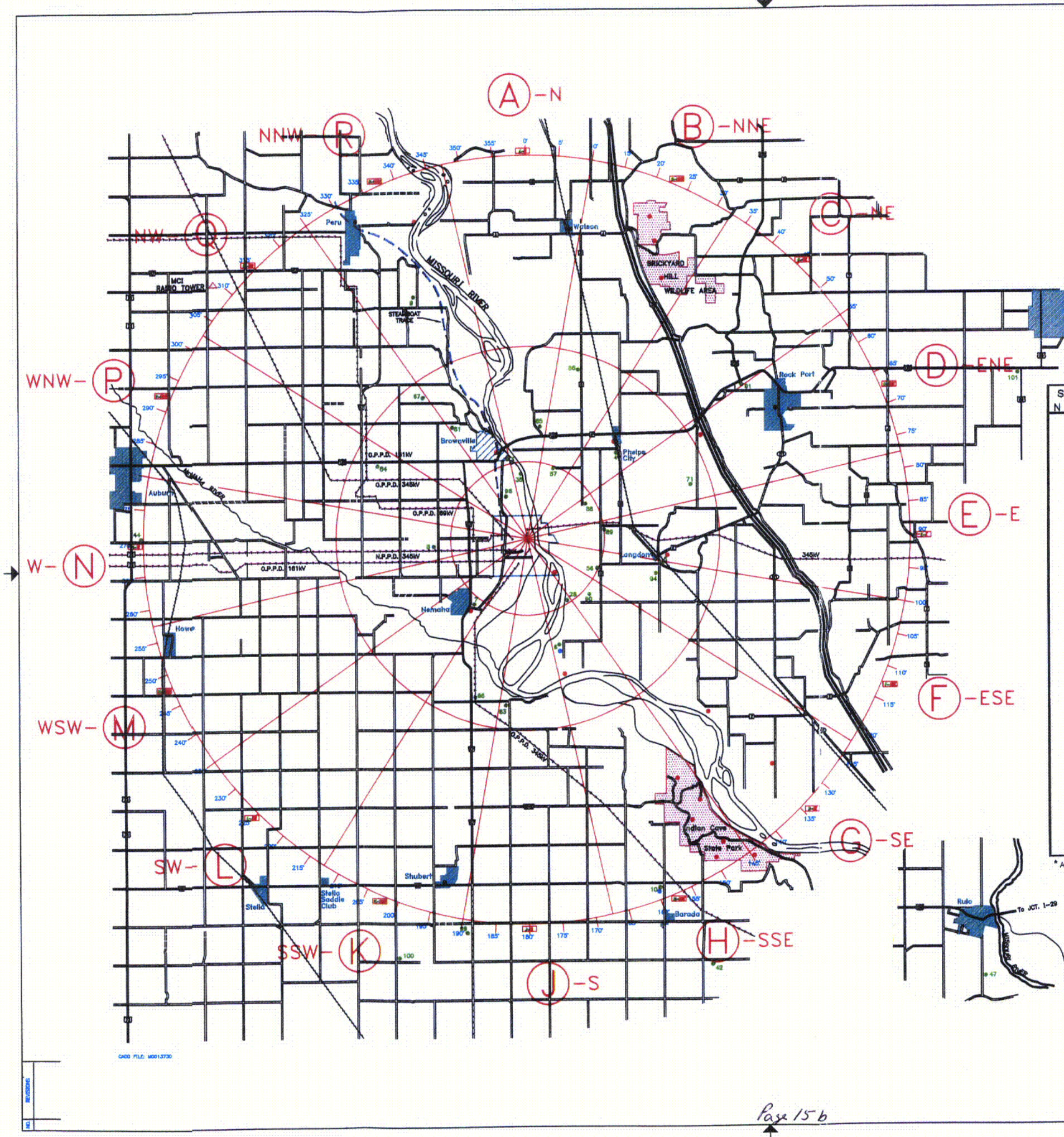
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MAP OF SAMPLING STATIONS SITE

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LEGEND

- Federal HWY
- Nebraska State HWY
- Interstate
- Missouri State HWY
- Missouri County Road
- Transmission Line
- CNS Environmental Sample Stations

SAMPLING LOCATION KEY (AREA)

Station Number	Distance* (miles)	Direction* (degrees)	Classification	Sample Type(s)
3	2.5	338	IND	AP, C, TL
4	3	43	IND	AP, C, TL
5	3.5	102	IND	AP, C, TL
6	3	165	IND	AP, C, TL
7	2.5	220	IND	AP, C, TL
8	2.5	260	IND	AP, C, TL
9	7.3	335	IND	AP, C, TL
10	10	160	IND	AP, C, TL
28	1.8	150	IND	WR, FI, SH, VT
35	2	350	IND & CON	VT, FI, WR
42	12.9	156	IND	M (Other)
44	10.3	270	CON	TL
47	25.8	154	IND	WG
56	1.9	118	IND	TL
61	3.5	326	IND	M (Nearest)
66	4.5	200	IND	TL
67	4.8	325	IND	TL
71	4.3	71	IND	TL
83	4.4	189	IND	TL
84	4.4	297	IND	TL
85	3.1	3	IND	TL
86	4.6	16	IND	TL
87	1.75	20	IND	TL
88	1.75	63	IND	TL
89	2	86	IND	TL
90	2.25	134	IND	TL
91	6.9	54	IND	TL
94	3.6	108	IND	TL
96	1.25	334	IND	VT
99	10.5	189	IND	M (Nearest, Other)
100	11.5	197	IND	M (Other)
101	13.3	73	CON	VT

* Approximate distance and direction with respect to reactor Elevated Release Point (ERP)

NOTE:
 Environmental sample type codes: AP = air particulate filters; C = charcoal cartridges
 FI = fish; M = milk; SH = shoreline sediment; TL = environmental thermoluminescent dosimeters; VT = broadleaf vegetation; WG = groundwater; WR = river water.

COZ

CADD DRAWING

Nebraska Public Power District
 SAMPLING STATIONS AREA
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IV. SUMMARY AND DISCUSSION OF 2001 ANALYTICAL RESULTS

IV. SUMMARY AND DISCUSSION OF 2001 ANALYTICAL RESULTS

Data from the radiological analyses of environmental media collected during 2001 are tabulated and discussed below. The procedures and specifications followed in the laboratory for these analyses are as required in the Teledyne Brown Engineering Quality Assurance manual and are explained in the Teledyne Brown Engineering Analytical Procedures. A synopsis of analytical procedures used for the environmental samples is provided in Appendix C. In addition to internal quality control measures performed by Teledyne, the laboratory also participates in an Interlaboratory Comparison Program. Participation in this program ensures that independent checks on the precision and accuracy of the measurements of radioactive material in environmental samples are performed. The results of the Interlaboratory Comparison are provided in Appendix B.

Radiological analyses of environmental media characteristically approach and frequently fall below the detection limits of state-of-the-art measurement methods. The "less than" values in the data tables were calculated from each specific analysis and are dependent on sample size, detector efficiency, length of counting time, chemical yield, when appropriate, and the radioactive decay factor from time of counting to time of collection. Teledyne Brown Engineering's analytical methods meet the Lower Limit of Detection (LLD) requirements given in Table 2 of the USNRC Branch Technical Position, Radiological Monitoring Acceptable Program (November 1979, Revision 1). Section C contains a discussion of the LLD formulas.

The following is a discussion and summary of the results of the environmental measurements taken during the 2001 reporting period

A. *Airborne Particulates*

Gross beta activity was observed in 480 of the 482 indicator samples collected during 2001. The average concentration was 0.025 pCi/m³ and a range of 0.004 to 0.11 pCi/m³. The results of the gross beta activities are presented in Section VII-1 and Trending Graph 1. The gross beta activities for 2001 were comparable to levels measured in the previous several years. Prior to that period the gross beta activities were higher due to atmospheric nuclear weapons testing performed in other countries. The preoperational period of 1971 through 1974 averaged 0.098 pCi/m³ gross beta.

Air particulate filters were collected weekly and composited by locations on a quarterly basis. They were analyzed by gamma ray spectroscopy. The results are presented in Section VII-2. Beryllium-7, which is produced continuously in the upper atmosphere by cosmic radiation, was measured in 40 of 40 composite samples. The indicator locations had an average concentration of 0.104 pCi/m³ and a range of 0.029 to 0.154 pCi/m³. During the preoperational period, beryllium-7 was measured at comparable levels, as would be expected. Cobalt-60 was measured in one sample at a concentration of 0.003 pCi/m³. Thorium-228 was measured in one sample at a concentration of 0.001 pCi/m³. All other gamma emitters were below the detection limits. The Environmental Measurements Laboratory of the US Department of Energy no longer reports measurements of

cerium-144 because the artificial nuclides such as cerium-144 have reached the limits of detection by the analytical techniques now used.

B. *Airborne Iodine*

Charcoal cartridges used to collect airborne iodine were collected weekly and analyzed by gamma spectrometry for iodine-131. Stations 01 through 10 were monitored. The results are presented in Section VII-1. All results were below the required lower limit of detection. The preoperational period of 1971 through 1974 averaged less than 0.02 pCi/m³ iodine-131.

C. *Fish*

Aquatic biota can be sensitive indicators of radionuclide accumulation in the environment because of their ability to concentrate certain chemical elements, which have radioactive isotopes. The results are presented in Table VII-3 and Trending Graph 2. Nine samples of fish were collected during the summer and fall of 2001. A middle-top feeding fish (carp) and a bottom feeding fish (catfish) were collected in June and October. These samples were analyzed for gross beta, strontium-89/90 and by gamma ray spectroscopy. As expected naturally occurring potassium-40 was detected in all samples. The average concentration at the control location was 2878 pCi/kg (wet weight) and a range of 2380 to 3390 pCi/kg (wet weight). The average concentration for the five indicator samples was 2946 pCi/kg (wet weight) with a range of 2800 to 3090 pCi/kg (wet weight). The preoperational period of 1971 through 1974 averaged 2400 pCi/kg potassium-40.

The fission product cesium-137 was not measured in any samples for 2001. Cobalt-60 was not measured in any samples for 2001. Strontium-89 was not detected during 2001. Strontium 90 was detected at a concentration of 7.75 pCi/kg (wet). The preoperational period averaged 0.075 pCi/gram strontium-90. Naturally occurring thorium-228 was measured in one of the five indicator samples at a concentration of 7.37 pCi/kg (wet weight). All other gamma emitters were below their detection levels.

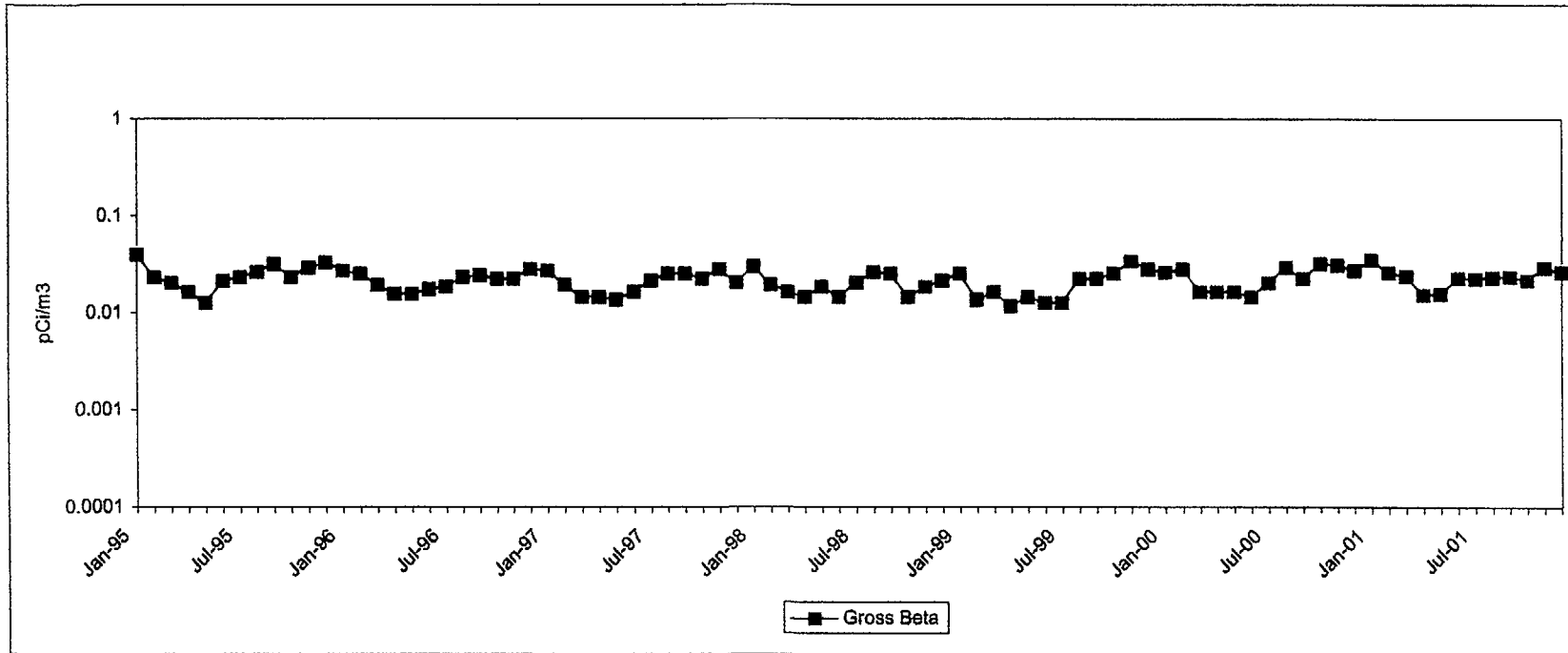
D. *Milk – Nearest Producer*

Milk samples are collected once every 15 days in peak pasture season and once every 31 days the rest of the year. The results are presented in Table VII-4 and Trending Graph 3. Nineteen samples were analyzed by gamma ray spectroscopy. As expected, naturally occurring potassium-40 was measured in all samples with an average of 1196 pCi/liter and a range of 1070 to 1540 pCi/liter.

The fission product cesium-137 was not detected during 2001. The preoperational period of 1971 through 1974 averaged 7.33 pCi/liter cesium-137. Strontium-89 was not detected in the 12 samples analyzed. Strontium-90 was detected in all samples monitored with an average level of 1.00 pCi/liter and a range of 0.66 to 2.8 pCi/liter. This is a normal environmental level. The

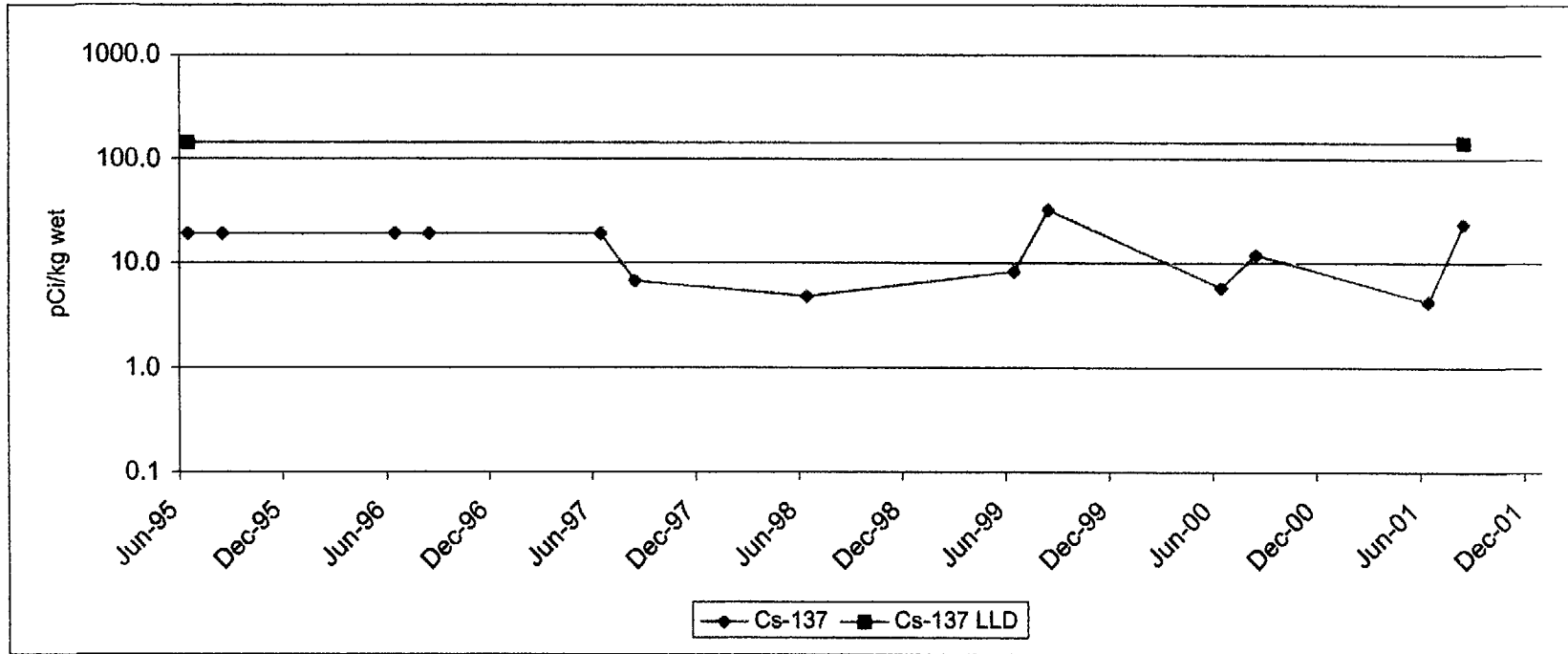
TRENDING GRAPH 1

GROSS BETA IN AIR PARTICULATES
MONTHLY AVERAGE - ALL LOCATIONS



TRENDING GRAPH 2

CESIUM-137 IN FISH
ALL LOCATIONS



preoperational period averaged 7.20 pCi/liter strontium-90. Elemental calcium was detected at an average concentration of 1.00 pCi/liter with a range of 0.21 to 1.93 pCi/liter. Naturally occurring radium-226 was measured in one of the nineteen samples analyzed at a concentration of 113 pCi/liter. All other gamma emitters were below their detection levels. The preoperational period averaged less than 0.2 pCi/liter iodine-131.

E. *Milk – Other Producers*

Eight milk samples were collected from two locations of other producers during 2001 and results are presented in Table VII-5 and Trending Graphs 5 and 6. Station 99 and station 100 were sampled quarterly in 2001. Naturally occurring potassium-40 was detected in all eight samples analyzed with an average concentration of 1248 pCi/liter and a range of 1040 to 1470 pCi/liter. Strontium 89 was not detected during 2001. Strontium 90 was measured in seven of the eight samples with an average concentration of 1.10 pCi/liter with a range of 0.66 to 1.8 pCi/liter. Elemental calcium was measured in the eight samples with an average concentration of 1.10 pCi/liter and a range of 0.85 to 1.3 pCi/liter. Naturally occurring thorium-228 was measured in one of the eight samples analyzed at a concentration of 5.94 pCi/liter. All other gamma emitters were below their detection levels.

The levels of radioactivity of the nuclides iodine-131 and cesium-137 are plotted on Trending Graph 4. A comparison of graph 3 and graph 4 indicate there was no appreciable difference between the levels of activity of the nearest producer and the commercial producers. This indicates there is no effect on milk samples from the operation of the Cooper Nuclear Station.

F. *Ground Water*

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 located 0.15 miles from the plant and station 47 is 25.8 miles from the plant. The results are presented in Table VII-6 and Trending Graph 5.

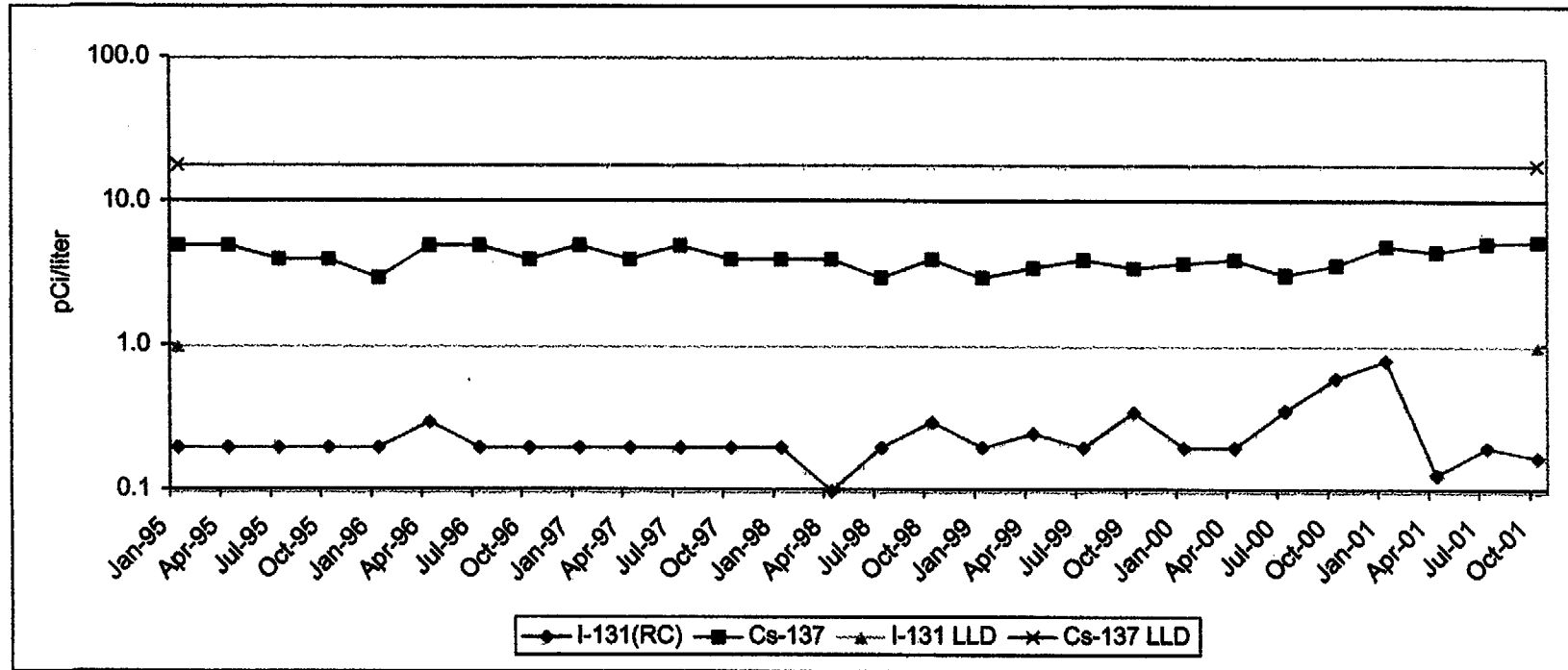
The gross beta activity for the eight indicator samples had an average concentration of 6.76 pCi/liter and a range of 4.0 to 9.0 pCi/liter. This is statistically similar to past years. The preoperational period of 1971 through 1974 averaged 9.33 pCi/liter gross beta. Gross alpha was detected in one of the eight samples with a concentration of 3.10 pCi/liter. The preoperational period averaged 9.33 pCi/liter gross beta. There were no other gamma emitters measured above their detection levels. Tritium levels have been plotted in Trending Graph 5. The graph indicates this activity has remained essentially unchanged. The preoperational period averaged 379 pCi/liter tritium.

G. *River Water*

River water was collected monthly and monitored for gross beta and gross alpha, suspended and dissolved, strontium-89, strontium-90 plus gamma emitting

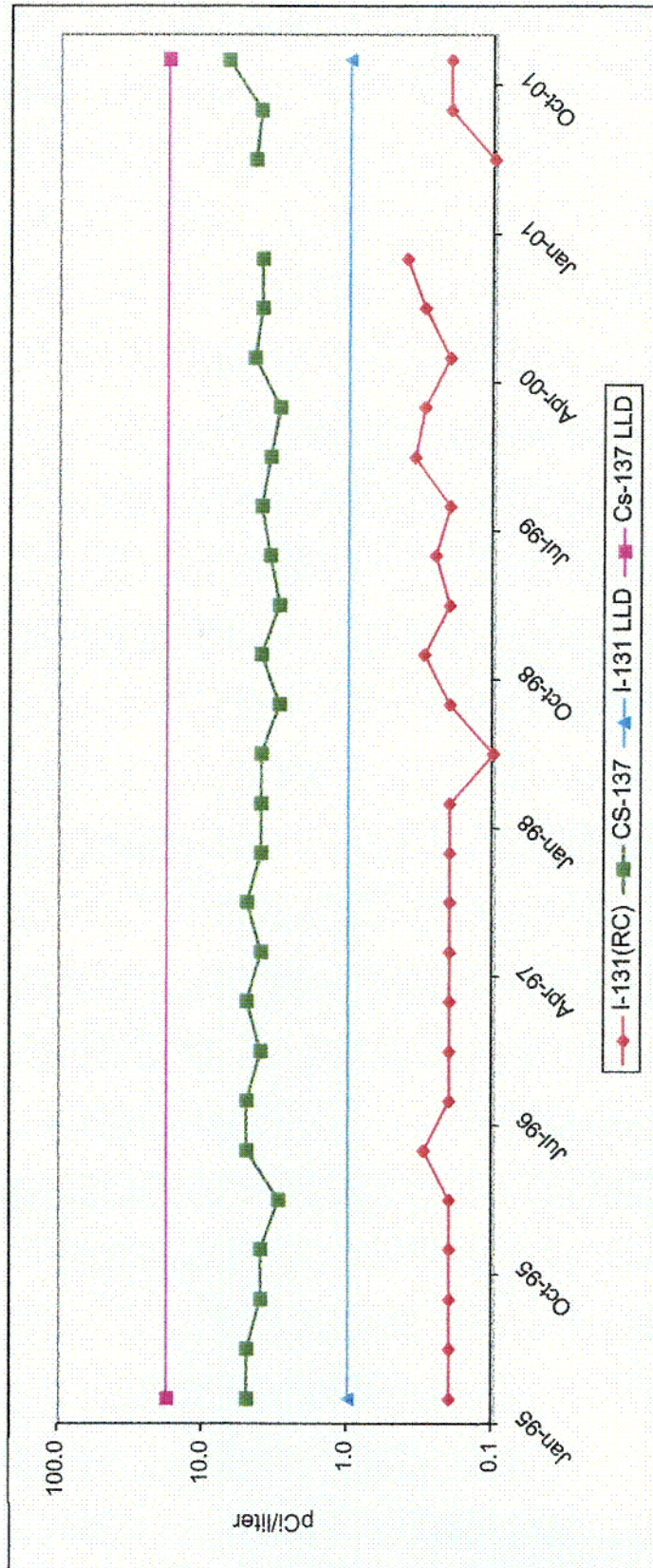
TRENDING GRAPH 3

IODINE-131 AND CESIUM-137 IN MILK - NEAREST PRODUCER
STATION 61



TRENDING GRAPH 4

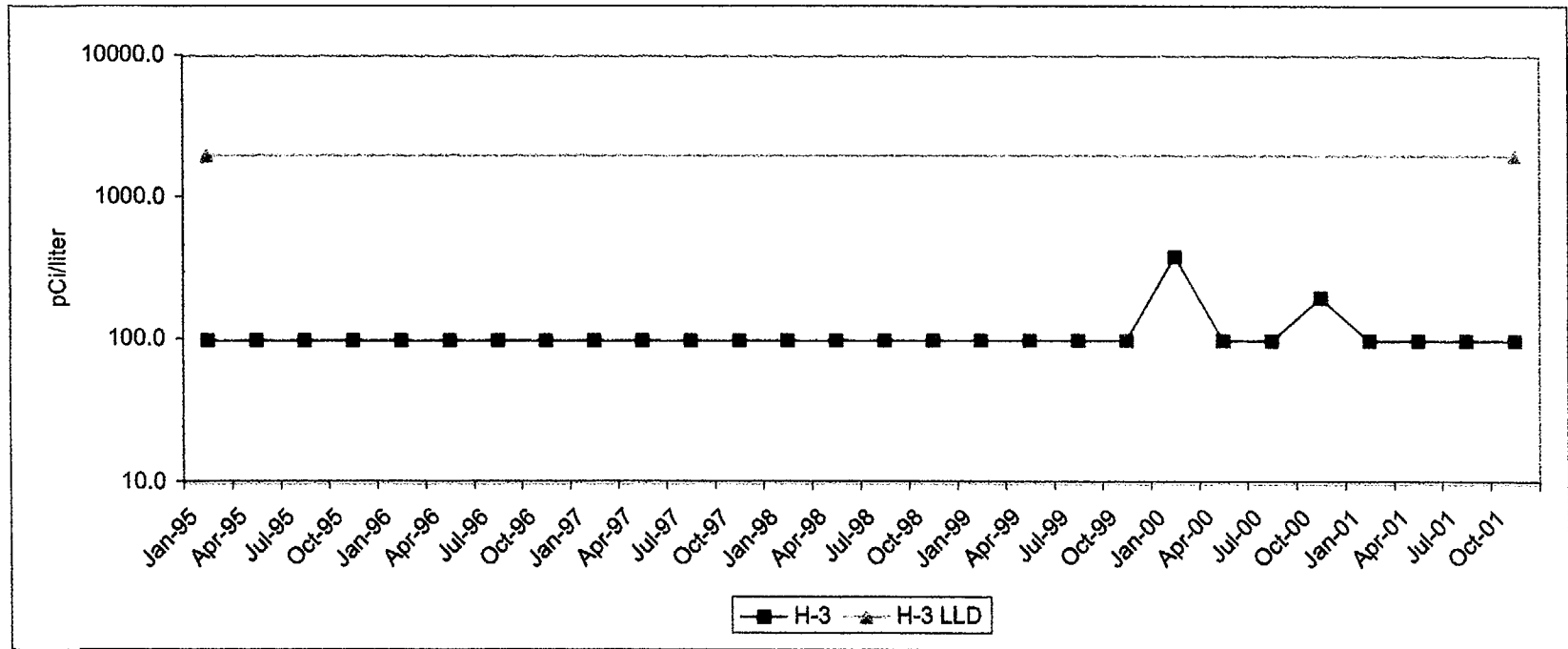
IODINE-131 AND CESIUM-137 IN MILK - OTHER PRODUCERS
 QUARTERLY AVERAGE - ALL LOCATIONS



Due to delay in analysis, sample results for I-131 for the first quarter of 2001 were excluded and are not plotted.

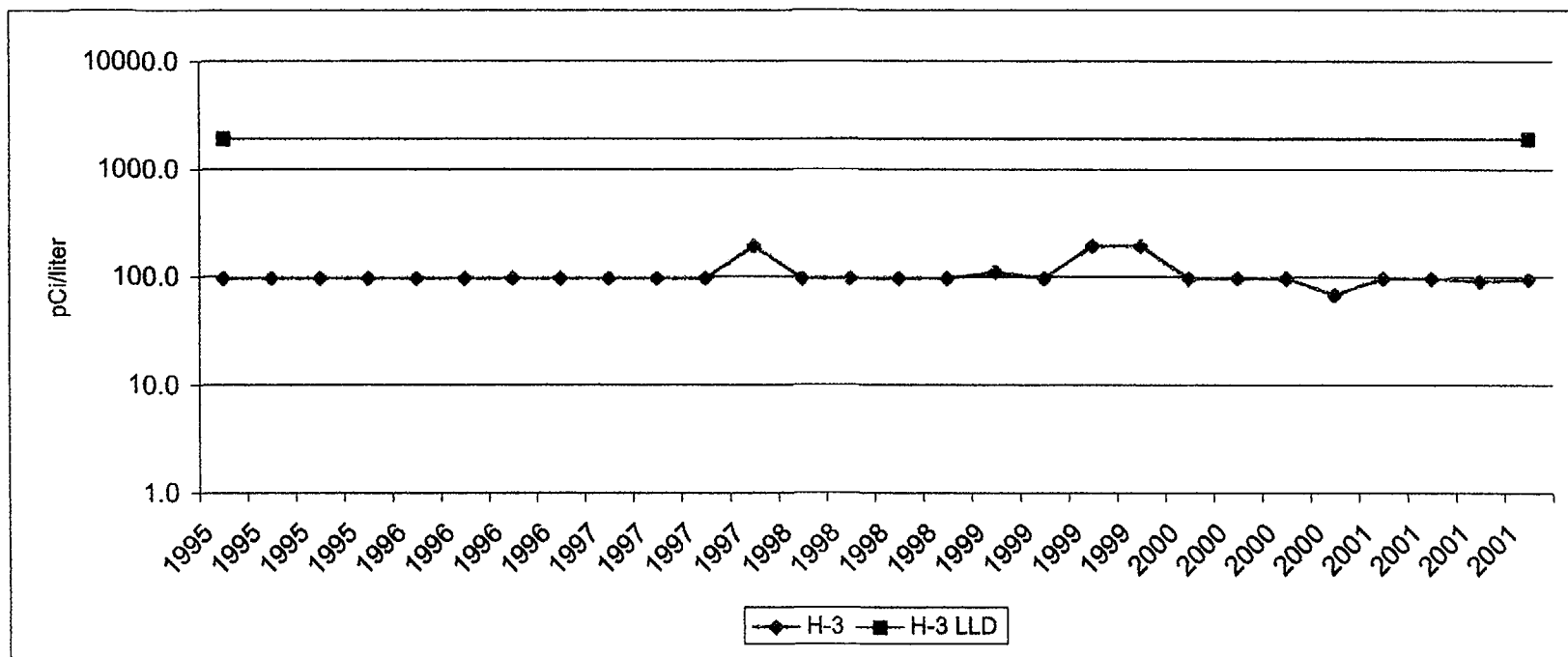
TRENDING GRAPH 5

TRITIUM IN GROUND WATER
QUARTERLY AVERAGE - ALL LOCATIONS



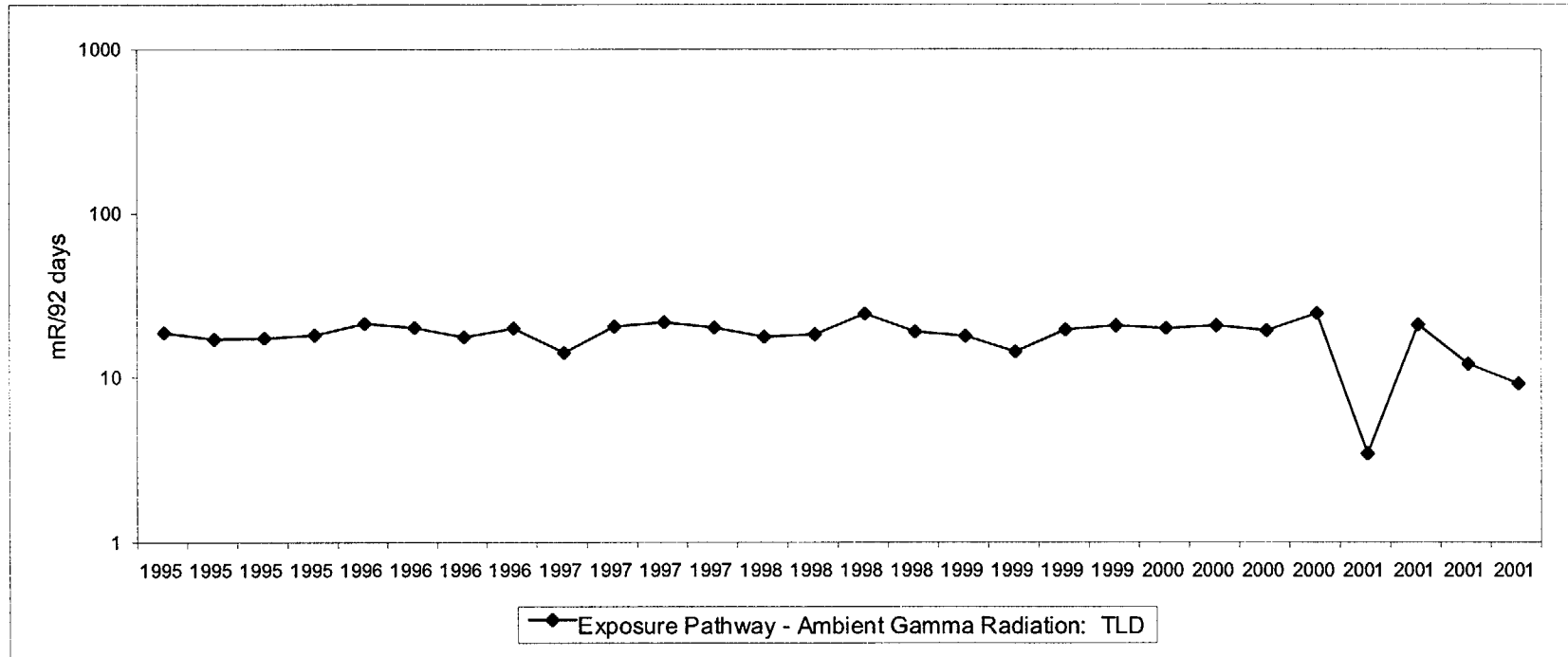
TRENDING GRAPH 6

TRITIUM IN RIVER WATER
QUARTERLY AVERAGE - ALL LOCATIONS



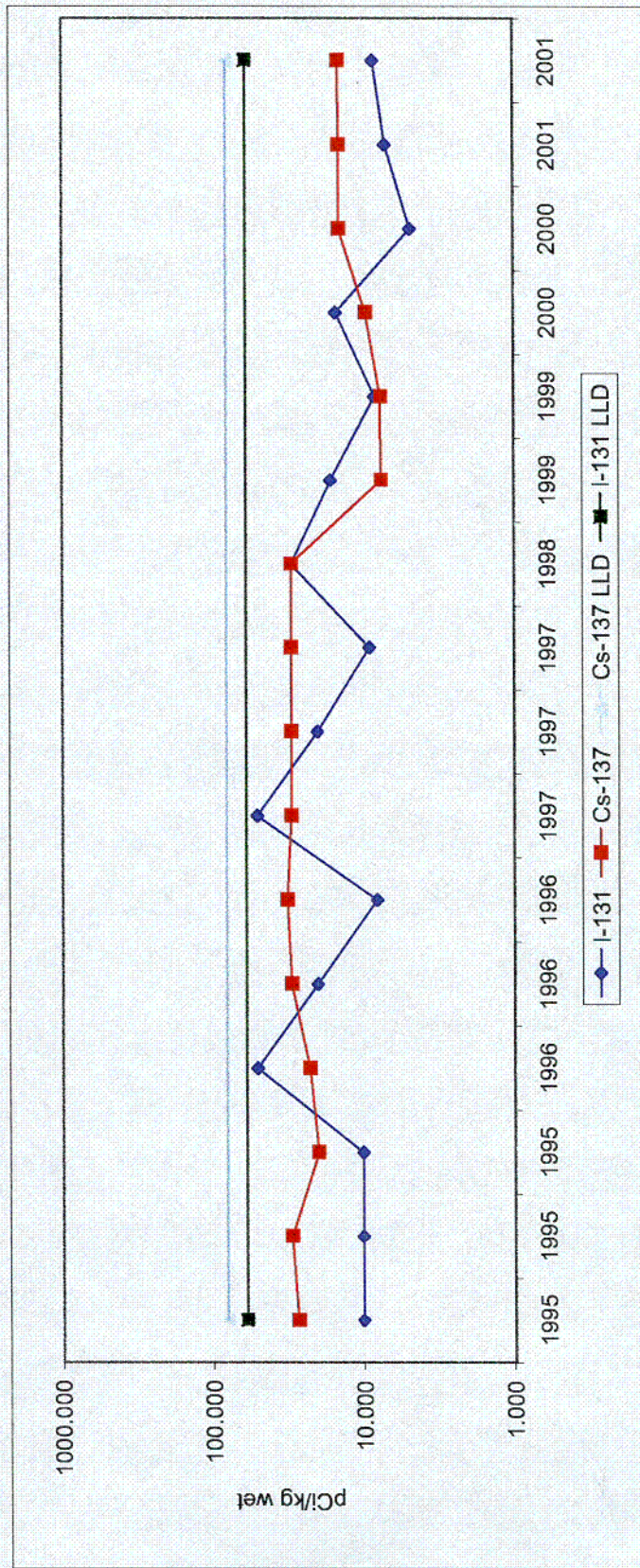
TRENDING GRAPH 7

AMBIENT RADIATION
THERMOLUMINESCENT DOSIMETRY
QUARTERLY AVERAGE - ALL LOCATIONS



Note: The anomaly observed during the 1st quarter of 2001 was the result of a change in TLD vendor and a one time change in TLD badge type, which is known to read lower than those used previously or subsequently.

TRENDING GRAPH 8
IODINE-131 AND CESIUM-137 IN FOOD - BROADLEAF VEGETATION
 ALL STATIONS



isotopes. A quarterly composite was measured for tritium. The results are presented in table VII-7 and Trending Graph 6.

There was no detection of potassium-40 above the normal level of detection. In fact, no gamma emitters were detected above their detection limits. Strontium-89 was not measured in 2001. Strontium-90 was measured in one of the eleven indicator samples analyzed with a concentration of 0.32 pCi/liter. Gross alpha (Dissolved) was measured in three of the eleven control samples with an average concentration of 5.27 pCi/liter and a range of 3.9 to 6.7 pCi/liter. Gross Alpha (Dissolved) was measured in two of the eleven indicator samples with an average concentration of 3.75 pCi/liter and a range of 3.1 to 4.4 pCi/liter. The preoperational period of 1971 through 1974 averaged 2.35 pCi/liter gross alpha (Dissolved). Gross Alpha (Suspended) was measured in six of the eleven control samples with an average concentration of 15.1 pCi/liter and a range of 0.43 to 60 pCi/liter. Gross alpha (Suspended) was measured in two of the eleven indicator samples with an average concentration of 5.05 pCi/liter and a range of 2.7 to 7.4 pCi/liter. The preoperational period averaged 1.70 pCi/liter gross alpha (Suspended). All eleven of the control samples analyzed for gross beta (Dissolved) had measurable concentrations with an average of 8.96 pCi/liter and a range of 6.8 to 11 pCi/liter. All eleven indicator locations had an average concentration of 8.12 pCi/liter and a range of 6.9 to 9.6 pCi/liter. The preoperational period averaged 8.83 pCi/liter gross beta (Dissolved). Gross beta (Suspended) was measured in nine of the eleven control samples with an average concentration of 33.4 pCi/liter and a range of 1.0 to 120 pCi/liter. Gross beta (Suspended) was measured in eight of the eleven indicator samples with an average concentration of 4.55 pCi/liter and a range of 1.3 to 11 pCi/liter. The preoperational period averaged 5.67 pCi/liter gross beta (Suspended). Tritium was measured in one of the four control samples with a concentration of 96.0 pCi/liter. Tritium was measured in one of the four indicator samples with a concentration of 100 pCi/liter. The preoperational period averaged 338 pCi/liter tritium. Below are a comparison of the 2000 and 2001 results for gross alpha and gross beta. The average readings were similar to previous years but are within normal yearly fluctuations.

	2000 Average pCi/liter	2001 Average pCi/liter
Gross Alpha Dissolved	3.21	4.66
Gross Alpha Suspended	1.47	12.6
Gross Beta Dissolved	8.21	8.54
Gross Beta Suspended	2.75	19.8

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. Trending Graph 6 illustrates the level of activity for tritium.

H. *Thermoluminescent Dosimeters*

Thermoluminescent dosimeters (TLDs) determine environmental radiation doses and the results are presented in Table VII-8 and Trending Graph 7. Ambient radiation was monitored at 32 locations within a 10 mile radius of the Cooper Nuclear Station and collected quarterly. The quarterly averages for the indicator locations was 14.9 milliRoentgen/quarter and a range from 0.1 to 43.3 milliRoentgen/quarter. The control station 44, which is located 10.5 miles, 270 degrees had an average of 17.3 milliRoentgen/quarter and a range from 5.5 to 37.9 milliRoentgen/quarter. The highest station was Station 85 with an average of 17.5 milliRoentgen/quarter and a range from 9.5 to 35.3 milliRoentgen/quarter. The preoperational period of 1971 through 1974 averaged 7.0 milliRoentgen/quarter.

The gamma exposures monitored by thermoluminescent dosimeters from 1995 through 2001 are plotted. The data from year to year is in good agreement and indicates no adverse changes in radiation exposure to the population near the Cooper Nuclear Station.

I. *Food – Broadleaf Vegetation*

Thirteen food samples were collected from three locations. They were analyzed for iodine-131 by chemical separation and by gamma spectrometry. The results are presented in Table VII-9 and Trending Graph 8. Iodine-131 was not measured above the detection limits in the thirteen samples analyzed. As expected, naturally occurring potassium-40 was monitored in three of three control samples with an average activity of 7983 pCi/kg (wet weight) and a range from 5170 to 9990 pCi/kg (wet weight). Potassium-40 was detected in ten of the ten indicator samples with an average concentration of 5425 pCi/kg (wet weight) and a range from 527 to 7830 pCi/kg (wet weight). The preoperational period of 1971 through 1974 averaged 3900 pCi/kg potassium-40. Cosmogenic beryllium-7 was detected in three of the three control samples with an average concentration of 2616 pCi/kg (wet weight) and a range from 1540 to 3970 pCi/kg (wet weight). The average at the indicator locations was 2298 pCi/kg (wet weight) and a range from 74.2 to 4130 pCi/kg (wet weight). All other gamma emitters were below the detection limits.

J. *Shoreline Sediment*

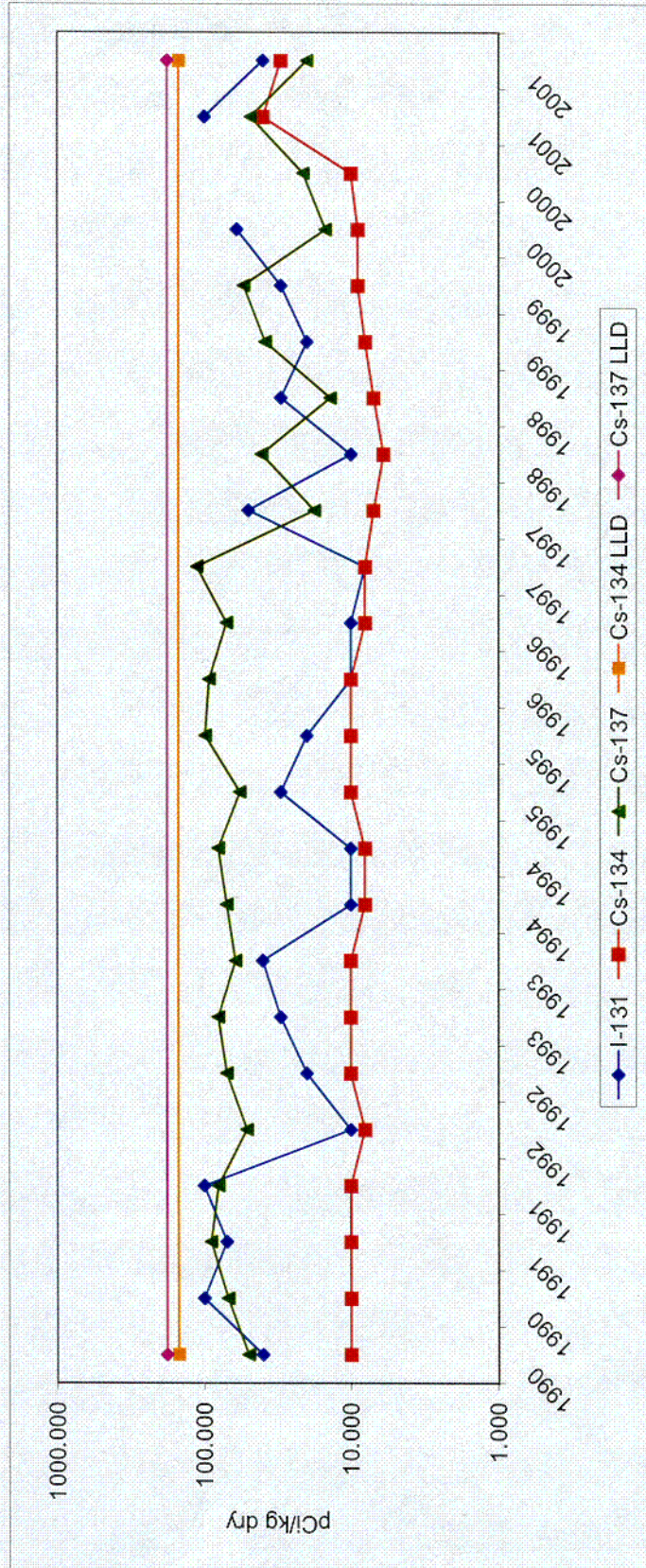
Sediment samples were collected during May and October from Station 28 and were analyzed by gamma spectrometry. The results are presented in Table VII-10 and Trending Graph 9. One man-made and a number of naturally occurring radioisotopes were detected in these samples. Cesium-137 was detected in one of two samples with an activity of 48.2 pCi/kg (dry weight). As expected, naturally

occurring potassium-40 was observed in the two samples with an average activity of 14150 pCi/kg (dry weight) and a range from 12900 to 15400 pCi/kg (dry weight). Radium-226 was measured in one of the two samples with a concentration of 1370 pCi/kg (dry weight). Naturally occurring, thorium-228 was observed in the two samples with an average concentration of 930 pCi/kg (dry weight) and a range from 819 to 1040 pCi/kg (dry weight). All other gamma emitters were below their detection limits.

The results of the analyses have been presented. Based on the evidence of the Radiological Environmental Monitoring Program, the Nebraska Public Power District, Cooper Nuclear Station is operating within regulatory limits.

TRENDING GRAPH 9

**IODINE-131, CESIUM-134, AND CESIUM-137 IN SHORELINE SEDIMENT
STATION 28**



Due to delay in analysis, sample results for I-131 for the second quarter of 2000 were excluded and are not plotted.

V. CONCLUSIONS

V. CONCLUSIONS

The results of the 2001 Radiological Environmental Monitoring Program (REMP) for the Cooper Nuclear Station (CNS) of the Nebraska Public Power District (NPPD) have been presented. The report contains data tables, summaries, and discussions of the data and trending graphs.

Naturally occurring radioactivity was observed in sample media in the expected activity ranges. Occasional samples of a few media showed the presence of man-made isotopes. They have been discussed individually in the text. Observed activities were at very low concentrations and had no significant dose consequence.

Section IV is a discussion of each type of sample analyzed and its impact, if any, on the environment. Included also are graphs of the isotopes of interest for the past several years.

Section VI presents the yearly summary of the program with the total number of samples of each type analyzed, the number of detection per total number of samples, the station with the highest average, the average of the control station, and the inclusive dates of the analyses. This is followed by a complete tabulation of the data by sample type and station number in Section VII.

The 2001 radiological environmental measurements for the Cooper Nuclear Station indicates that there has been no residual fallout resulting from the explosion and fire at 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 the Cooper Nuclear Station.

SECTION VI.

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
SUMMARY - 2001

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Cooper Nuclear Station
 Location of Facility Nemaha, Nebraska
 (County, State)

Docket No. 50-298
 Reporting Period January 1, 2001 to December 31, 2001

Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed	Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	Location with Highest Annual Mean		Control Location Mean () (2) Range (2)	No. of Reportable Occurrences	
				Name	Mean () (2) Range (2)			
Air Iodine (pCi/m ³)	I-131	482	0.07	-(0/482)		-(0/0)	0	
			-			-		
Air Particulate (pCi/m ³)	Gross Beta (Weekly)	482	0.01	.025(480/482) (.004-0.110)	Sta. 3 2.5 mi.	.028(41/42) (.004-0.110)	-(0/0)	0
	Gross Alpha (Weekly)	482	-	.004(361/482) (0.001-0.038)	Sta. 4 3.0 mi.	0.005(31/46) (0.001-0.038)	-(0/0)	0
	Gamma	40						
	Be-7	40	-	0.104(40/40) (0.029-0.154)	Sta. 2 0.75 mi.	0.124(4/4) (0.103-0.140)	-(0/0)	0
	Co-60	40	-	0.003(1/40)	Sta. 8 2.5 mi.	0.003(1/40)	-(0/0)	0
				-			-	
	Th-228	40	-	0.001(1/40)	Sta. 8 2.5 mi.	0.001(1/40)	-(0/0)	0
			-			-		
Fish (pCi/kg wet)	Gr Beta	9	-	4120(5/5) (2000-6600)	Sta. 35 2.0 mi.	5325(4/4) (3100-6200)	5325(4/4) (3100-6200)	0
	Sr-89	9	-	-(0/5)			-(0/4)	0
				-		-		

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(1) Nominal Lower Limit of Detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Cooper Nuclear Station
 Location of Facility Nemaha, Nebraska
 (County, State)

Docket No. 50-298
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				Name	Mean () (2) Range (2)			
Fish (pCi/kg wet)	Sr-90	9	-	7.75(4/5) (4.5-12)	Sta. 28 1.8 mi.	7.75(4/5) (4.5-12)	-(0/4) -	0
	Gamma	9						
	K-40	9	-	2946(5/5) (2800-3090)	Sta. 28 1.8 mi.	2946(5/5) (2800-3090)	2878(4/4) (2380-3390)	0
	Co-60	9	0.13	-(0/5) -			-(0/4) -	0
	Cs-137	9	0.15	-(0/5) -			-(0/4) -	0
	Th-228	9		7.37(1/5) -	Sta. 28 1.8 mi.	7.37(1/5) -	-(0/4) -	0
Milk Nearest Producers (pCi/liter)	Sr-89	12	-	-(0/12) -			-(0/0) -	0
	Sr-90	12	-	1.00(12/12) (0.66-2.8)	Sta. 61 3.5 mi.	1.00(12/12) (0.66-2.8)	-(0/0) -	0
	Ca (gm/liter)	12	-	1.00(12/12) (0.213-1.93)	Sta. 61 3.5 mi.	1.00(12/12) (0.213-1.93)	-(0/0) -	0

(1) Nominal Lower Limit of Detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Cooper Nuclear Station
 Location of Facility Nemaha, Nebraska
 (County, State)

Docket No. 50-298
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Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed	Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	Location with Highest Annual Mean		Control Location Mean () (2) Range (2)	No. of Reportable Occurrences	
				Name	Mean () (2) Range (2)			
Milk Nearest Producers (pCi/liter)	Gamma	19						
	K-40	19	-	1196(19/19) (1070-1540)	Sta. 61 3.5 mi.	1196(19/19) (1070-1540)	-(0/0) -	0
	Ra-226	19	-	113(1/19) -	Sta. 61 3.5 mi.	113(1/19) -	-(0/0) -	0
Milk Other Producers (pCi/liter)	Sr-89	8	-	-(0/8) -			-(0/0) -	0
	Sr-90	8	-	1.10(7/8) (0.66-1.8)	Sta. 99 10.5 mi.	1.23(3/4) (0.78-1.5)	-(0/0) -	0
	Ca (gm/liter)	8	-	1.10(8/8) (0.85-1.3)	Sta. 99 10.5 mi.	1.18(4/4) (1.10-1.2)	-(0/0) -	0
Milk Other Producers (pCi/liter)	Gamma	8						
	K-40	8	-	1284(8/8) (1040-1470)	Sta. 100 11.5 mi.	1288(4/4) (1190-1400)	-(0/0) -	0
	Th-228	8	-	5.94(1/8) -	Sta. 99 10.5 mi.	5.94(1/4) -	-(0/0) -	0

(1) Nominal Lower Limit of Detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

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 (County, State)

Docket No. 50-298
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Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed	Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	Location with Highest Annual Mean		Control Location Mean () (2) Range (2)	No. of Reportable Occurrences	
				Name	Mean () (2) Range (2)			
Groundwater (pCi/liter)	Gross Alpha	8	-	3.10(1/8)	Sta. 47 25.8 mi.	3.10(1/8)	-(0/0)	0
				-		-	-	
	Gross Beta	8	4	6.76(8/8) (4.0-9.0)	Sta. 11 0.15 mi.	7.10(4/4) (5.4-8.3)	-(0/0) -	0
	H-3	8	2000	-(0/8) -		-(0/8) -	-(0/0) -	0
	Gamma	8						
	K-40	8	-	-(0/8) -		-(0/8) -	-(0/0) -	0
River Water (pCi/liter)	Gross Alpha (Dissolved)	22	-	3.75(2/11) (3.1-4.4)	Sta. 35 2.0 mi.	6.7(1/2) (1.4-1.9)	5.27(3/11) (3.9-6.7)	0
	Gross Alpha (Suspended)	22	-	5.05(2/11) (2.7-7.4)	Sta. 35 2.0 mi.	17.8(4/8) (1.4-60)	15.1(6/11) (0.43-60)	0
	Gross Beta (Dissolved)	22	4	8.12(11/11) (6.9-9.6)	Sta. 35 2.0 mi.	9.85(2/2) (9.70-10)	8.96(11/11) (6.8-11)	0
	Gross Beta (Suspended)	22		4.55(8/11) (1.3-11)	Sta. 12 0.10 mi	36.8(7/9) (2.8-120)	33.4(9/11) (1.0-120)	0

(1) Nominal Lower Limit of Detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

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 (County, State)

Docket No. 50-298
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				Name	Mean () (2) Range (2)				
River Water (pCi/liter)	I-131	22	0.46(1/11)	Sta. 12	0.10 mi	0.48(1/9)	0.48(1/11)	0	
	Gamma	22	-			-	-		
	K-40	22	-(0/11)				-(0/11)	0	
	H-3	8	2000	100(1/4)	Sta. 28	1.8 mi.	100(1/4)	96.0(1/4)	0
	Sr-89	22	-	-(0/11)				-(0/11)	0
	Sr-90	22	-	0.32(1/11)	Sta. 28	1.8 mi.	0.32(1/11)	-(0/11)	0
Direct Radiation (mR/Standard Month)	Gamma	126	-	10.6(122/122)	Sta. 85	3.1 mi.	13.4(4/4)	13.3(4/4)	0
	Dose Quarterly			(0.00-27.1)			(9.5-19.2)	(5.5-21.8)	
Broadleaf/Vegetation (pCi/kg wet)	Gamma	13							
	Be-7	13	-	2298(10/10)	Sta. 35	2.0 mi.	2616(3/3)	2616(3/3)	0
				(74.2-4130)			(1540-3970)	(1540-3970)	
	K-40	13	-	5425(10/10)	Sta. 35	2.0 mi.	7983(3/3)	7983(3/3)	0
				(527-7830)			(5170-9990)	(5170-9990)	

(1) Nominal Lower Limit of Detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Cooper Nuclear Station
 Location of Facility Nemaha, Nebraska
 (County, State)

Docket No. 50-298
 Reporting Period January 1, 2001 to December 31, 2001

Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed	Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	Location with Highest Annual Mean		Control Location Mean () (2) Range (2)	No. of Reportable Occurrences	
				Name	Mean () (2) Range (2)			
Broadleaf/Vegetation (pCi/kg wet)	Cs-137	13	0.08	-(0/10)		-(0/3)	0	
	I-131	13	0.06	-(0/10)		-(0/3)	0	
Shoreline Sediment (pCi/kg dry)	Gamma	2						
	Be-7	2	-	428(1/2)	Sta. 28 1.8 mi.	428(1/2)	-(0/0)	0
	K-40	2	-	14150(2/2) (12900-15400)	Sta. 28 1.8 mi.	14150(2/2) (12900-15400)	-(0/0)	0
	Cs-137	2	0.18	48.2(1/2)	Sta. 28 1.8 mi.	48.2(1/2)	-(0/0)	0
	Ra-226	2	-	1370(1/2)	Sta. 28 1.8 mi.	1370(1/2)	-(0/0)	0
	Th-228	2	-	930(2/2) (819-1040)	Sta. 28 1.8 mi.	930(2/2) (819-1040)	-(0/0)	0

(1) Nominal Lower Limit of Detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

SECTION VII. COMPLETE DATA TABLES

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 01

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
12/26	01/02	9.95E+03	CU. FT.	3.9 ± 0.4 E-02	4.1 ± 1.9 E-03	01/08	L.T. 3. E-02
01/02	01/09	1.01E+04	CU. FT.	2.7 ± 0.3 E-02	3.2 ± 1.7 E-03	01/17	L.T. 2. E-02
01/09	01/16	1.00E+04	CU. FT.	3.2 ± 0.3 E-02	4.5 ± 1.8 E-03	01/19	L.T. 2. E-02
01/16	01/23	1.01E+04	CU. FT.	3.3 ± 0.4 E-02	2.5 ± 1.2 E-03	01/29	L.T. 3. E-02
01/23	01/30	1.00E+04	CU. FT.	1.6 ± 0.3 E-02	1.6 ± 1.0 E-03	02/06	L.T. 2. E-02
01/30	02/06	1.01E+04	CU. FT.	2.2 ± 0.3 E-02	2.7 ± 1.4 E-03	02/12	L.T. 4. E-02
02/06	02/12	8.69E+03	CU. FT.	2.3 ± 0.3 E-02	2.3 ± 1.5 E-03	02/21	L.T. 7. E-02
02/12	02/20			(a)	(a)		(a)
02/20	02/28	(b)		1.6 ± 0.1 E 01	1.1 ± 0.5 E 00	03/05	L.T. 6. E+00
02/28	03/06	8.48E+03	CU. FT.	2.6 ± 0.4 E-02	2.6 ± 1.4 E-03	03/14	L.T. 3. E-02
03/06	03/13	1.01E+04	CU. FT.	2.3 ± 0.3 E-02	L.T. 1. E-03	03/21	L.T. 4. E-02
03/13	03/21	1.12E+04	CU. FT.	4.1 ± 0.4 E-02	2.2 ± 0.3 E-02	03/26	L.T. 4. E-02
03/21	03/27	8.72E+03	CU. FT.	1.3 ± 0.3 E-02	L.T. 1. E-03	04/03	L.T. 5. E-02
03/27	04/03	1.02E+04	CU. FT.	1.1 ± 0.2 E-02	L.T. 1. E-03	04/06	L.T. 1. E-02
04/03	04/10	9.27E+03	CU. FT.	1.6 ± 0.3 E-02	1.8 ± 1.3 E-03	04/13	L.T. 2. E-02
04/10	04/17	1.02E+04	CU. FT.	1.2 ± 0.2 E-02	1.4 ± 1.0 E-03	04/23	L.T. 1. E-02
04/17	04/23	9.04E+03	CU. FT.	1.3 ± 0.3 E-02	L.T. 1. E-03	05/01	L.T. 5. E-02
04/24	05/01	1.10E+04	CU. FT.	1.1 ± 0.2 E-02	1.9 ± 1.1 E-03	05/08	L.T. 2. E-02
05/01	05/08	1.02E+04	CU. FT.	1.2 ± 0.2 E-02	1.9 ± 1.1 E-03	05/10	L.T. 3. E-02
05/08	05/15	1.00E+04	CU. FT.	2.5 ± 0.3 E-02	5.0 ± 1.7 E-03	05/17	L.T. 2. E-02
05/15	05/22	1.01E+04	CU. FT.	1.7 ± 0.3 E-02	2.5 ± 1.5 E-03	05/24	L.T. 2. E-02
05/22	05/29	1.01E+04	CU. FT.	1.0 ± 0.3 E-02	L.T. 2. E-03	06/01	L.T. 3. E-02
05/29	06/05	1.02E+04	CU. FT.	1.1 ± 0.2 E-02	L.T. 2. E-03	06/08	L.T. 2. E-02
06/05	06/12	9.86E+03	CU. FT.	2.2 ± 0.3 E-02	2.4 ± 1.4 E-03	06/19	L.T. 2. E-02
06/12	06/19	1.02E+04	CU. FT.	2.1 ± 0.3 E-02	L.T. 2. E-03	06/27	L.T. 5. E-02
06/19	06/26	9.54E+03	CU. FT.	4.0 ± 0.4 E-02	1.9 ± 0.3 E-02	06/29	L.T. 2. E-02

- (a) Sample not collected due to adverse weather conditions.
 (b) Sample volume not provided. Results are in total pCi.
 (c) Sample not analyzed per client request.
 (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 01

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
		VOLUME	UNITS				
06/26	07/03	8.96E+03	CU. FT.	3.2 ± 0.4 E-02	5.6 ± 1.9 E-03	07/09	L.T. 4. E-02
07/03	07/10	1.00E+04	CU. FT.	2.1 ± 0.3 E-02	L.T. 2. E-03	07/12	L.T. 5. E-02
07/10	07/17	1.02E+04	CU. FT.	2.7 ± 0.3 E-02	7.1 ± 2.0 E-03	07/23	L.T. 3. E-02
07/17	07/24	9.91E+03	CU. FT.	2.3 ± 0.3 E-02	2.3 ± 1.3 E-03	07/27	L.T. 3. E-02
07/24	07/31	1.01E+04	CU. FT.	1.8 ± 0.3 E-02	1.7 ± 1.2 E-03	08/08	L.T. 3. E-02
07/31	08/07	9.26E+03	CU. FT.	2.7 ± 0.3 E-02	1.4 ± 1.2 E-03	08/19	L.T. 3. E-02
08/07	08/14	9.31E+03	CU. FT.	2.7 ± 0.3 E-02	2.9 ± 1.5 E-03	08/22	L.T. 4. E-02
08/14	08/21	1.01E+04	CU. FT.	2.6 ± 0.3 E-02	2.1 ± 1.4 E-03	08/29	L.T. 5. E-02
08/21	08/28	1.01E+04	CU. FT.	2.1 ± -0.3 E-02	2.1 ± 1.2 E-03	08/30	L.T. 2. E-02
08/28	09/04	9.94E+03	CU. FT.	2.9 ± 0.3 E-02	1.6 ± 1.3 E-03	09/06	L.T. 1. E-02
09/04	09/11	9.16E+03	CU. FT.	2.5 ± 0.3 E-02	2.6 ± 1.7 E-03	09/19	L.T. 3. E-02
09/11	09/18	1.00E+04	CU. FT.	2.6 ± 0.3 E-02	L.T. 1. E-03	09/21	L.T. 3. E-02
09/18	09/25	1.00E+04	CU. FT.	2.4 ± 0.3 E-02	2.7 ± 1.5 E-03	09/28	L.T. 4. E-02
09/25	10/02	9.78E+03	CU. FT.	2.2 ± 0.3 E-02	2.4 ± 1.3 E-03	10/05	L.T. 3. E-02
10/02	10/09	9.97E+03	CU. FT.	2.8 ± 0.3 E-02	4.3 ± 1.9 E-03	10/12	L.T. 1. E-02
10/09	10/16	9.91E+03	CU. FT.	1.7 ± 0.3 E-02	L.T. 1. E-03	10/23	L.T. 3. E-02
10/16	10/23	1.03E+04	CU. FT.	1.8 ± 0.3 E-02	2.5 ± 1.3 E-03	10/30	L.T. 3. E-02
10/23	10/30	9.97E+03	CU. FT.	2.9 ± 0.3 E-02	3.1 ± 1.7 E-03	11/08	L.T. 3. E-02
10/30	11/06	1.00E+04	CU. FT.	2.3 ± 0.3 E-02	3.4 ± 1.4 E-03	11/15	L.T. 3. E-02
11/06	11/13	1.03E+04	CU. FT.	3.6 ± 0.4 E-02	2.7 ± 1.3 E-03	11/20	L.T. 4. E-02
11/13	11/20	1.01E+04	CU. FT.	4.5 ± 0.4 E-02	3.8 ± 1.6 E-03	12/06	L.T. 4. E-02
11/20	11/27	1.02E+04	CU. FT.	3.0 ± 0.3 E-02	2.6 ± 1.6 E-03	12/11	L.T. 4. E-02
11/27	12/04	9.92E+03	CU. FT.	1.3 ± 0.2 E-02	L.T. 1. E-03	12/13	L.T. 2. E-02
12/04	12/11	1.02E+04	CU. FT.	2.4 ± 0.3 E-02	L.T. 2. E-03	12/18	L.T. 4. E-02
12/11	12/18	9.87E+03	CU. FT.	4.6 ± 0.4 E-02	3.4 ± 1.5 E-03	12/26	L.T. 5. E-02
12/18	12/26	1.16E+04	CU. FT.	2.4 ± 0.3 E-02	3.6 ± 1.4 E-03	01/04	L.T. 4. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 02

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
12/26	01/02	9.95E+03	CU. FT.	7.5 ± 0.5 E-02	7.2 ± 2.3 E-03	01/08	L.T. 3. E-02
01/02	01/09	1.01E+04	CU. FT.	1.7 ± 0.3 E-02	2.0 ± 1.4 E-03	01/17	L.T. 2. E-02
01/09	01/16	9.10E+03	CU. FT.	3.3 ± 0.4 E-02	2.6 ± 1.6 E-03	01/19	L.T. 2. E-02
01/16	01/23	1.01E+04	CU. FT.	4.5 ± 0.4 E-02	3.5 ± 1.4 E-03	01/29	L.T. 3. E-02
01/23	01/30			(a)	(a)		(a)
01/30	02/06			(a)	(a)		(a)
02/06	02/12			(a)	(a)		(a)
02/12	02/20			(a)	(a)		(a)
02/20	02/28			(a)	(a)		(a)
02/28	03/06	(b)		2.7 ± 0.2 E 01	4.6 ± 0.8 E 00	03/14	L.T. 6. E+00
03/06	03/14			(a)	(a)		(a)
03/14	03/21	(b)		1.6 ± 0.1 E 01	8.4 ± 1.2 E 00	03/26	L.T. 1. E+01
03/21	03/27	8.71E+03	CU. FT.	8.3 ± 2.9 E-03	L.T. 1. E-03	04/03	L.T. 5. E-02
03/27	04/03			(a)	(a)		(a)
04/03	04/10	(b)		8.8 ± 1.0 E 00	1.0 ± 0.4 E 00	04/13	L.T. 7. E+00
04/10	04/17	1.02E+04	CU. FT.	1.1 ± 0.2 E-02	2.2 ± 1.2 E-03	04/23	L.T. 1. E-02
04/17	04/24	9.84E+03	CU. FT.	1.5 ± 0.3 E-02	1.3 ± 1.1 E-03	05/01	L.T. 4. E-02
04/24	05/01	1.01E+04	CU. FT.	2.7 ± 0.3 E-02	3.8 ± 1.5 E-03	05/08	L.T. 2. E-02
05/01	05/08	1.02E+04	CU. FT.	1.7 ± 0.3 E-02	2.6 ± 1.3 E-03	05/10	L.T. 3. E-02
05/08	05/15	9.99E+03	CU. FT.	2.3 ± 0.3 E-02	4.8 ± 1.7 E-03	05/17	L.T. 2. E-02
05/15	05/22	1.01E+04	CU. FT.	1.5 ± 0.3 E-02	1.8 ± 1.4 E-03	05/24	L.T. 2. E-02
05/22	05/29	1.01E+04	CU. FT.	6.1 ± 2.3 E-03	L.T. 2. E-03	06/01	L.T. 3. E-02
05/29	06/05			(a)	(a)		(a)
06/05	06/12	(b)		6.3 ± 0.8 E 00	4.8 ± 3.6 E-01	06/19	L.T. 2. E+01
06/12	06/19	1.02E+04	CU. FT.	1.0 ± 0.2 E-02	L.T. 2. E-03	06/17	L.T. 5. E-02
06/19	06/26	1.01E+04	CU. FT.	4.3 ± 0.4 E-02	2.1 ± 0.3 E-02	06/29	L.T. 2. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 02

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
06/26	07/03	9.97E+03	CU. FT.	3.0 ± 0.3 E-02	5.9 ± 1.9 E-03	07/09	L.T. 3. E-02
07/03	07/10	9.93E+03	CU. FT.	2.2 ± 0.3 E-02	L.T. 2. E-03	07/12	L.T. 5. E-02
07/10	07/17	8.97E+03	CU. FT.	2.7 ± 0.4 E-02	5.8 ± 2.0 E-03	07/23	L.T. 4. E-02
07/17	07/24	9.66E+03	CU. FT.	2.5 ± 0.3 E-02	1.8 ± 1.2 E-03	07/27	L.T. 3. E-02
07/24	07/31	1.01E+04	CU. FT.	1.9 ± 0.3 E-02	L.T. 1. E-03	08/08	L.T. 3. E-02
07/31	08/07	9.94E+03	CU. FT.	2.5 ± 0.3 E-02	2.4 ± 1.3 E-03	08/19	L.T. 3. E-02
08/07	08/14	9.87E+03	CU. FT.	2.4 ± 0.3 E-02	2.6 ± 1.3 E-03	08/22	L.T. 4. E-02
08/14	08/21	9.98E+03	CU. FT.	2.4 ± 0.3 E-02	L.T. 2. E-03	08/29	L.T. 5. E-02
08/21	08/28	9.88E+03	CU. FT.	2.1 ± 0.3 E-02	1.7 ± 1.2 E-03	08/30	L.T. 2. E-02
08/28	09/04	9.76E+03	CU. FT.	3.1 ± 0.3 E-02	3.0 ± 1.6 E-03	09/06	L.T. 2. E-02
09/04	09/11	9.10E+03	CU. FT.	2.6 ± 0.3 E-02	2.2 ± 1.6 E-03	09/19	L.T. 3. E-02
09/11	09/18	9.86E+03	CU. FT.	3.1 ± 0.3 E-02	2.4 ± 1.4 E-03	09/21	L.T. 3. E-02
09/18	09/25	1.00E+04	CU. FT.	2.7 ± 0.3 E-02	3.3 ± 1.6 E-03	09/28	L.T. 4. E-02
09/25	10/02	9.67E+03	CU. FT.	2.4 ± 0.3 E-02	L.T. 1. E-03	10/05	L.T. 3. E-02
10/02	10/09	1.01E+04	CU. FT.	1.9 ± 0.3 E-02	2.1 ± 1.4 E-03	10/12	L.T. 2. E-02
10/09	10/16	1.03E+04	CU. FT.	2.0 ± 0.3 E-02	L.T. 1. E-03	10/23	L.T. 3. E-02
10/16	10/23	9.98E+03	CU. FT.	2.9 ± 0.3 E-02	3.3 ± 1.5 E-03	10/30	L.T. 3. E-02
10/23	10/30	9.91E+03	CU. FT.	3.3 ± 0.3 E-02	3.1 ± 1.8 E-03	11/08	L.T. 3. E-02
10/30	11/06	9.99E+03	CU. FT.	2.9 ± 0.3 E-02	2.9 ± 1.3 E-03	11/15	L.T. 3. E-02
11/06	11/13	1.03E+04	CU. FT.	3.6 ± 0.4 E-02	3.1 ± 1.3 E-03	11/20	L.T. 4. E-02
11/13	11/20	1.01E+04	CU. FT.	4.5 ± 0.4 E-02	4.1 ± 1.7 E-03	12/06	L.T. 4. E-02
11/20	11/27	1.02E+04	CU. FT.	1.6 ± 0.3 E-02	L.T. 2. E-03	12/11	L.T. 2. E-02
11/27	12/04	9.93E+03	CU. FT.	2.2 ± 0.3 E-02	L.T. 1. E-03	12/13	L.T. 2. E-02
12/04	12/11	9.94E+03	CU. FT.	2.8 ± 0.3 E-02	L.T. 2. E-03	12/18	L.T. 3. E-02
12/11	12/18	9.88E+03	CU. FT.	4.3 ± 0.4 E-02	2.7 ± 1.4 E-03	12/26	L.T. 5. E-02
12/18	12/26	1.16E+04	CU. FT.	2.7 ± 0.3 E-02	1.8 ± 1.1 E-03	01/04	L.T. 4. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 03

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
DATE	DATE	VOLUME	UNITS			DATE	
12/26	01/02	8.64E+03	CU. FT.	1.1 ± 0.1 E-01	9.5 ± 2.8 E-03	01/08	L.T. 3. E-02
01/02	01/09	1.01E+04	CU. FT.	2.7 ± 0.3 E-02	3.2 ± 1.7 E-03	01/17	L.T. 2. E-02
01/09	01/16	9.78E+03	CU. FT.	4.2 ± 0.4 E-02	5.2 ± 1.9 E-03	01/19	L.T. 2. E-02
01/16	01/23			(a)	(a)		(a)
01/23	01/30			(a)	(a)		(a)
01/30	02/06	9.91E+03	CU. FT.	2.4 ± 0.3 E-02	1.5 ± 1.1 E-03	02/12	L.T. 4. E-02
02/06	02/12	9.43E+03	CU. FT.	2.7 ± 0.3 E-02	4.4 ± 1.8 E-03	02/21	L.T. 3. E-02
02/12	02/20			(a)	(a)		(a)
02/20	02/28			(a)	(a)		(a)
02/28	03/06	(b)		2.5 ± 0.2 E 01	3.2 ± 0.7 E 00	03/14	L.T. 7. E+00
03/06	03/14	1.13E+04	CU. FT.	3.0 ± 0.3 E-02	3.0 ± 1.3 E-03	03/21	L.T. 3. E-02
03/14	03/21	7.26E+03	CU. FT.	5.7 ± 0.5 E-02	2.3 ± 0.4 E-02	03/26	L.T. 3. E-02
03/21	03/27			(d)	(d)		(d)
03/27	04/03			(d)	(d)		(d)
04/03	04/10			(d)	(d)		(d)
04/10	04/17			(d)	(d)		(d)
04/17	04/24	(b)		L.T. 8. E-01	L.T. 3. E-01	05/01	L.T. 7. E+00
04/24	05/01	9.96E+03	CU. FT.	L.T. 3. E-03	L.T. 9. E-04	05/08	L.T. 2. E-02
05/01	05/08	1.01E+04	CU. FT.	4.0 ± 1.9 E-03	L.T. 9. E-04	05/10	L.T. 1. E-02
05/08	05/15	9.10E+03	CU. FT.	2.7 ± 0.3 E-02	6.2 ± 2.0 E-03	05/17	L.T. 2. E-02
05/15	05/22	1.01E+04	CU. FT.	1.4 ± 0.3 E-02	L.T. 2. E-03	05/24	L.T. 2. E-02
05/22	05/29	1.00E+04	CU. FT.	1.0 ± 0.3 E-02	L.T. 2. E-03	06/01	L.T. 2. E-02
05/29	06/05	1.03E+04	CU. FT.	1.2 ± 0.2 E-02	L.T. 2. E-03	06/08	L.T. 2. E-02
06/05	06/12	9.84E+03	CU. FT.	2.0 ± 0.3 E-02	1.6 ± 1.2 E-03	06/19	L.T. 2. E-02
06/12	06/19	9.52E+03	CU. FT.	2.3 ± 0.3 E-02	L.T. 2. E-03	06/27	L.T. 5. E-02
06/19	06/26	1.07E+04	CU. FT.	4.8 ± 0.4 E-02	2.2 ± 0.3 E-02	06/29	L.T. 1. E-02

- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 03

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
		VOLUME	UNITS						
06/26	07/03	8.78E+03	CU. FT.	3.2 ± 0.4 E-02	4.5 ± 1.8 E-03	07/09	L.T. 2. E-02		
07/03	07/10	1.01E+04	CU. FT.	2.5 ± 0.3 E-02	L.T. 2. E-03	07/12	L.T. 3. E-02		
07/10	07/17	1.04E+04	CU. FT.	2.6 ± 0.3 E-02	5.4 ± 1.8 E-03	07/23	L.T. 3. E-02		
07/17	07/24	9.66E+03	CU. FT.	2.0 ± 0.3 E-02	1.8 ± 1.2 E-03	07/27	L.T. 2. E-02		
07/24	07/31	9.93E+03	CU. FT.	2.2 ± 0.3 E-02	1.5 ± 1.2 E-03	08/08	L.T. 3. E-02		
07/31	08/07	1.00E+04	CU. FT.	1.9 ± 0.3 E-02	1.3 ± 1.1 E-03	08/19	L.T. 3. E-02		
08/07	08/14	8.80E+03	CU. FT.	3.3 ± 0.4 E-02	3.1 ± 1.5 E-03	08/22	L.T. 4. E-02		
08/14	08/21	1.07E+04	CU. FT.	2.3 ± 0.3 E-02	L.T. 2. E-03	08/29	L.T. 4. E-02		
08/21	08/28	1.00E+04	CU. FT.	1.9 ± 0.3 E-02	1.2 ± 1.0 E-03	08/30	L.T. 2. E-02		
08/28	09/04	1.01E+04	CU. FT.	2.2 ± 0.3 E-02	L.T. 1. E-03	09/06	L.T. 2. E-02		
09/04	09/11	9.64E+03	CU. FT.	2.1 ± 0.3 E-02	2.3 ± 1.6 E-03	09/19	L.T. 3. E-02		
09/11	09/18	1.07E+04	CU. FT.	3.0 ± 0.3 E-02	2.1 ± 1.2 E-03	09/21	L.T. 2. E-02		
09/18	09/25	9.92E+03	CU. FT.	2.3 ± 0.3 E-02	2.6 ± 1.5 E-03	09/28	L.T. 4. E-02		
09/25	10/02	1.02E+04	CU. FT.	1.3 ± 0.3 E-02	L.T. 1. E-03	10/05	L.T. 2. E-02		
10/02	10/09	1.01E+04	CU. FT.	2.4 ± 0.3 E-02	2.4 ± 1.6 E-03	10/12	L.T. 2. E-02		
10/09	10/16	9.89E+03	CU. FT.	2.2 ± 0.3 E-02	1.5 ± 1.2 E-03	10/23	L.T. 4. E-02		
10/16	10/23	1.02E+04	CU. FT.	3.2 ± 0.3 E-02	3.2 ± 1.5 E-03	10/30	L.T. 3. E-02		
10/23	10/30	1.00E+04	CU. FT.	2.6 ± 0.3 E-02	2.3 ± 1.6 E-03	11/08	L.T. 3. E-02		
10/30	11/06	8.53E+03	CU. FT.	3.5 ± 0.4 E-02	3.5 ± 1.6 E-03	11/15	L.T. 3. E-02		
11/06	11/13	1.03E+04	CU. FT.	4.3 ± 0.4 E-02	4.1 ± 1.5 E-03	11/20	L.T. 4. E-02		
11/13	11/20	1.00E+04	CU. FT.	2.4 ± 0.3 E-02	2.4 ± 1.4 E-03	12/06	L.T. 4. E-02		
11/20	11/27	1.03E+04	CU. FT.	2.8 ± 0.3 E-02	L.T. 2. E-03	12/11	L.T. 4. E-02		
11/27	12/04	9.93E+03	CU. FT.	2.1 ± 0.3 E-02	1.6 ± 1.3 E-03	12/13	L.T. 2. E-02		
12/04	12/11	1.01E+04	CU. FT.	1.4 ± 0.3 E-02	L.T. 2. E-03	12/18	L.T. 4. E-02		
12/11	12/18	9.86E+03	CU. FT.	4.0 ± 0.4 E-02	3.3 ± 1.5 E-03	12/26	L.T. 5. E-02		
12/18	12/26	1.15E+04	CU. FT.	1.8 ± 0.3 E-02	2.3 ± 1.2 E-03	01/04	L.T. 4. E-02		

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

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

STATION NUMBER 04

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
12/26	01/02	1.00E+04	CU. FT.	6.0 ± 0.4 E-02	5.5 ± 2.1 E-03	01/08	L.T. 3. E-02
01/02	01/09	1.01E+04	CU. FT.	1.4 ± 0.3 E-02	2.7 ± 1.6 E-03	01/17	L.T. 2. E-02
01/09	01/16	1.02E+04	CU. FT.	3.6 ± 0.3 E-02	4.0 ± 1.7 E-03	01/19	L.T. 1. E-02
01/16	01/23	9.85E+03	CU. FT.	2.9 ± 0.3 E-02	1.7 ± 1.1 E-03	01/29	L.T. 2. E-02
01/23	01/30	1.02E+04	CU. FT.	7.2 ± 2.1 E-03	1.8 ± 1.1 E-03	02/06	L.T. 3. E-02
01/30	02/06	1.01E+04	CU. FT.	2.2 ± 0.3 E-02	2.5 ± 1.4 E-03	02/12	L.T. 3. E-02
02/06	02/12	8.23E+03	CU. FT.	1.8 ± 0.3 E-02	L.T. 2. E-03	02/21	L.T. 4. E-02
02/12	02/20			(a)	(a)		(a)
02/20	02/28	(b)		1.7 ± 0.1 E 01	1.5 ± 0.6 E 00	03/05	L.T. 7. E+00
02/28	03/06	8.42E+03	CU. FT.	1.8 ± 0.3 E-02	3.3 ± 1.6 E-03	03/14	L.T. 3. E-02
03/06	03/14	1.13E+04	CU. FT.	2.1 ± 0.3 E-02	1.5 ± 1.0 E-03	03/21	L.T. 2. E-02
03/14	03/21	9.32E+03	CU. FT.	5.5 ± 0.5 E-02	3.1 ± 0.4 E-02	03/26	L.T. 2. E-02
03/21	03/27	8.98E+03	CU. FT.	5.6 ± 2.6 E-03	L.T. 1. E-03	04/03	L.T. 3. E-02
03/27	04/03	1.00E+04	CU. FT.	1.2 ± 0.2 E-02	L.T. 1. E-03	04/06	L.T. 2. E-02
04/03	04/10	9.82E+03	CU. FT.	1.8 ± 0.3 E-02	L.T. 1. E-03	04/13	L.T. 1. E-02
04/10	04/17	1.04E+04	CU. FT.	1.6 ± 0.3 E-02	2.9 ± 1.4 E-03	04/23	L.T. 2. E-02
04/17	04/24	1.01E+04	CU. FT.	1.8 ± 0.3 E-02	2.9 ± 1.4 E-03	05/01	L.T. 5. E-02
04/24	05/01			(d)	(d)		(d)
05/01	05/08			(d)	(d)		(d)
05/08	05/15			(d)	(d)		(d)
05/15	05/22	(b)		2.6 ± 0.7 E 00	L.T. 5. E-01	05/24	L.T. 6. E+00
05/22	05/29	1.01E+04	CU. FT.	1.1 ± 0.3 E-02	L.T. 2. E-03	06/01	L.T. 3. E-02
05/29	06/05	1.01E+04	CU. FT.	1.2 ± 0.2 E-02	L.T. 2. E-03	06/08	L.T. 2. E-02
06/05	06/12	9.86E+03	CU. FT.	2.0 ± 0.3 E-02	L.T. 1. E-03	06/19	L.T. 9. E-03
06/12	06/19	1.02E+04	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	06/27	L.T. 5. E-02
06/19	06/26	1.01E+04	CU. FT.	6.5 ± 0.5 E-02	3.8 ± 0.4 E-02	06/29	L.T. 2. E-02

- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 04

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
DATE	DATE	VOLUME	UNITS			DATE	
06/26	07/03	9.90E+03	CU. FT.	L.T. 3. E-03	1.3 ± 1.1 E-03	07/09	L.T. 3. E-02
07/03	07/10	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	L.T. 2. E-03	07/12	L.T. 3. E-02
07/10	07/17	1.02E+04	CU. FT.	3.1 ± 0.3 E-02	8.6 ± 2.2 E-03	07/23	L.T. 3. E-02
07/17	07/24	9.67E+03	CU. FT.	2.4 ± 0.3 E-02	2.0 ± 1.3 E-03	07/27	L.T. 4. E-02
07/24	07/31	9.92E+03	CU. FT.	2.2 ± 0.3 E-02	L.T. 1. E-03	08/08	L.T. 3. E-02
07/31	08/07	9.02E+03	CU. FT.	2.3 ± 0.3 E-02	L.T. 1. E-03	08/19	L.T. 3. E-02
08/07	08/14	8.90E+03	CU. FT.	2.7 ± 0.4 E-02	1.6 ± 1.2 E-03	08/22	L.T. 4. E-02
08/14	08/21	1.00E+04	CU. FT.	2.3 ± 0.3 E-02	L.T. 2. E-03	08/29	L.T. 5. E-02
08/21	08/28	9.92E+03	CU. FT.	2.2 ± 0.3 E-02	1.7 ± 1.2 E-03	08/30	L.T. 3. E-02
08/28	09/04	9.76E+03	CU. FT.	2.8 ± 0.3 E-02	L.T. 2. E-03	09/06	L.T. 1. E-02
09/04	09/11	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	2.8 ± 1.6 E-03	09/19	L.T. 3. E-02
09/11	09/18	9.93E+03	CU. FT.	2.8 ± 0.3 E-02	1.5 ± 1.1 E-03	09/21	L.T. 2. E-02
09/18	09/25	9.37E+03	CU. FT.	2.4 ± 0.3 E-02	3.0 ± 1.6 E-03	09/28	L.T. 2. E-02
09/25	10/02	9.74E+03	CU. FT.	2.3 ± 0.3 E-02	1.7 ± 1.2 E-03	10/05	L.T. 3. E-02
10/02	10/09	1.02E+04	CU. FT.	2.5 ± 0.3 E-02	2.5 ± 1.6 E-03	10/12	L.T. 2. E-02
10/09	10/16	9.88E+03	CU. FT.	1.9 ± 0.3 E-02	2.0 ± 1.3 E-03	10/23	L.T. 3. E-02
10/16	10/23	1.02E+04	CU. FT.	3.0 ± 0.3 E-02	3.1 ± 1.5 E-03	10/30	L.T. 3. E-02
10/23	10/30	9.99E+03	CU. FT.	2.8 ± 0.3 E-02	3.8 ± 1.9 E-03	11/08	L.T. 3. E-02
10/30	11/06	9.94E+03	CU. FT.	2.8 ± 0.3 E-02	2.5 ± 1.3 E-03	11/15	L.T. 3. E-02
11/06	11/13	1.03E+04	CU. FT.	3.8 ± 0.4 E-02	2.3 ± 1.2 E-03	11/20	L.T. 4. E-02
11/13	11/20	1.00E+04	CU. FT.	3.6 ± 0.4 E-02	2.9 ± 1.5 E-03	12/06	L.T. 4. E-02
11/20	11/27	1.02E+04	CU. FT.	2.7 ± 0.3 E-02	L.T. 2. E-03	12/11	L.T. 4. E-02
11/27	12/04	9.98E+03	CU. FT.	2.6 ± 0.3 E-02	2.5 ± 1.5 E-03	12/13	L.T. 2. E-02
12/04	12/11	1.01E+04	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	12/18	L.T. 4. E-02
12/11	12/18	9.84E+03	CU. FT.	3.3 ± 0.4 E-02	4.6 ± 1.7 E-03	12/26	L.T. 3. E-02
12/18	12/26	1.16E+04	CU. FT.	2.6 ± 0.3 E-02	1.2 ± 0.9 E-03	01/04	L.T. 4. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 05

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
DATE	DATE	VOLUME	UNITS			DATE	
12/26	01/02	9.96E+03	CU. FT.	7.3 ± 0.5 E-02	7.1 ± 2.3 E-03	01/08	L.T. 2. E-02
01/02	01/09	1.01E+04	CU. FT.	3.2 ± 0.3 E-02	3.6 ± 1.7 E-03	01/17	L.T. 1. E-02
01/09	01/16	9.92E+03	CU. FT.	3.5 ± 0.3 E-02	3.7 ± 1.7 E-03	01/19	L.T. 1. E-02
01/16	01/23	9.91E+03	CU. FT.	4.6 ± 0.4 E-02	2.0 ± 1.2 E-03	01/29	L.T. 2. E-02
01/23	01/30	1.02E+04	CU. FT.	2.0 ± 0.3 E-02	1.3 ± 1.0 E-03	02/06	L.T. 3. E-02
01/30	02/06	1.01E+04	CU. FT.	2.7 ± 0.4 E-02	3.0 ± 1.5 E-03	02/12	L.T. 3. E-02
02/06	02/12	8.23E+03	CU. FT.	2.5 ± 0.4 E-02	1.9 ± 1.5 E-03	02/21	L.T. 5. E-02
02/12	02/20	1.14E+04	CU. FT.	3.8 ± 0.3 E-02	1.3 ± 1.0 E-03	02/23	L.T. 3. E-02
02/20	02/28	1.17E+04	CU. FT.	2.6 ± 0.3 E-02	2.2 ± 1.4 E-03	03/05	L.T. 1. E-02
02/28	03/06	8.26E+03	CU. FT.	3.8 ± 0.4 E-02	3.8 ± 1.7 E-03	03/14	L.T. 3. E-02
03/06	03/14	1.13E+04	CU. FT.	2.2 ± 0.3 E-02	2.0 ± 1.1 E-03	03/21	L.T. 2. E-02
03/14	03/21	9.76E+03	CU. FT.	4.1 ± 0.4 E-02	2.0 ± 0.4 E-02	03/26	L.T. 3. E-02
03/21	03/27	8.93E+03	CU. FT.	2.0 ± 0.4 E-02	2.5 ± 1.6 E-03	04/03	L.T. 3. E-02
03/27	04/03	1.00E+04	CU. FT.	1.7 ± 0.3 E-02	1.7 ± 1.2 E-03	04/06	L.T. 2. E-02
04/03	04/10	9.82E+03	CU. FT.	1.9 ± 0.3 E-02	2.9 ± 1.5 E-03	04/13	L.T. 1. E-02
04/10	04/17	1.03E+03	CU. FT.	1.7 ± 0.3 E-02	2.6 ± 1.3 E-03	04/23	L.T. 1. E-02
04/17	04/24	1.02E+04	CU. FT.	1.8 ± 0.3 E-02	3.3 ± 1.5 E-03	05/01	L.T. 5. E-02
04/24	05/01	9.52E+03	CU. FT.	2.5 ± 0.3 E-02	3.3 ± 1.5 E-03	05/08	L.T. 3. E-02
05/01	05/08	1.02E+04	CU. FT.	1.7 ± 0.3 E-02	1.9 ± 1.1 E-03	05/10	L.T. 2. E-02
05/08	05/15	9.10E+03	CU. FT.	2.7 ± 0.3 E-02	5.9 ± 1.9 E-03	05/17	L.T. 2. E-02
05/15	05/22	1.01E+04	CU. FT.	1.6 ± 0.3 E-02	1.7 ± 1.4 E-03	05/24	L.T. 2. E-02
05/22	05/29	1.01E+04	CU. FT.	8.1 ± 2.4 E-03	L.T. 2. E-03	06/01	L.T. 3. E-02
05/29	06/05	1.03E+04	CU. FT.	1.0 ± 0.2 E-02	L.T. 2. E-03	06/08	L.T. 2. E-02
06/05	06/12	9.86E+03	CU. FT.	1.8 ± 0.3 E-02	1.9 ± 1.3 E-03	06/19	L.T. 1. E-02
06/12	06/19	1.02E+04	CU. FT.	1.9 ± 0.3 E-02	L.T. 2. E-03	06/27	L.T. 3. E-02
06/19	06/26	1.01E+04	CU. FT.	5.4 ± 0.4 E-02	2.3 ± 0.4 E-02	06/29	L.T. 2. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 05

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
		VOLUME	UNITS				
06/26	07/03	9.91E+03	CU. FT.	3.1 ± 0.3 E-02	4.6 ± 1.7 E-03	07/09	L.T. 3. E-02
07/03	07/10	1.01E+04	CU. FT.	2.4 ± 0.3 E-02	L.T. 2. E-03	07/12	L.T. 2. E-02
07/10	07/17	1.01E+04	CU. FT.	2.7 ± 0.3 E-02	6.6 ± 2.0 E-03	07/23	L.T. 3. E-02
07/17	07/24	9.70E+03	CU. FT.	1.9 ± 0.3 E-02	1.7 ± 1.2 E-03	07/27	L.T. 3. E-02
07/24	07/31	1.01E+04	CU. FT.	1.9 ± 0.3 E-02	L.T. 1. E-03	08/08	L.T. 2. E-02
07/31	08/07	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	1.3 ± 1.1 E-03	08/19	L.T. 3. E-02
08/07	08/14	1.00E+04	CU. FT.	2.0 ± 0.3 E-02	1.7 ± 1.1 E-03	08/22	L.T. 2. E-02
08/14	08/21	1.01E+04	CU. FT.	1.8 ± 0.3 E-02	L.T. 2. E-03	08/29	L.T. 4. E-02
08/21	08/28	1.01E+04	CU. FT.	1.6 ± 0.3 E-02	1.4 ± 1.1 E-03	08/30	L.T. 3. E-02
08/28	09/04	1.01E+04	CU. FT.	2.2 ± 0.3 E-02	1.8 ± 1.3 E-03	09/06	L.T. 2. E-02
09/04	09/11	1.01E+04	CU. FT.	1.9 ± 0.3 E-02	L.T. 2. E-03	09/19	L.T. 3. E-02
09/11	09/18	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	1.9 ± 1.2 E-03	09/21	L.T. 2. E-02
09/18	09/25	9.94E+03	CU. FT.	2.3 ± 0.3 E-02	L.T. 1. E-03	09/28	L.T. 2. E-02
09/25	10/02	1.00E+04	CU. FT.	1.7 ± 0.3 E-02	2.0 ± 1.2 E-03	10/05	L.T. 2. E-02
10/02	10/09	9.99E+03	CU. FT.	2.2 ± 0.3 E-02	3.4 ± 1.7 E-03	10/12	L.T. 2. E-02
10/09	10/16	9.88E+03	CU. FT.	1.5 ± 0.3 E-02	2.3 ± 1.3 E-03	10/23	L.T. 4. E-02
10/16	10/23	1.04E+04	CU. FT.	2.5 ± 0.3 E-02	2.9 ± 1.4 E-03	10/30	L.T. 2. E-02
10/23	10/30	9.84E+03	CU. FT.	2.3 ± 0.3 E-02	2.6 ± 1.7 E-03	11/08	L.T. 2. E-02
10/30	11/06	9.94E+03	CU. FT.	2.3 ± 0.3 E-02	2.1 ± 1.2 E-03	11/15	L.T. 1. E-02
11/06	11/13	1.03E+04	CU. FT.	3.3 ± 0.3 E-02	3.3 ± 1.4 E-03	11/20	L.T. 2. E-02
11/13	11/20	1.00E+04	CU. FT.	3.9 ± 0.4 E-02	3.4 ± 1.6 E-03	12/06	L.T. 2. E-02
11/20	11/27	1.03E+04	CU. FT.	2.3 ± 0.3 E-02	L.T. 2. E-03	12/11	L.T. 4. E-02
11/27	12/04	9.91E+03	CU. FT.	2.2 ± 0.3 E-02	L.T. 1. E-03	12/13	L.T. 2. E-02
12/04	12/11	1.02E+04	CU. FT.	2.8 ± 0.3 E-02	2.5 ± 1.7 E-03	12/18	L.T. 4. E-02
12/11	12/18	9.84E+03	CU. FT.	3.8 ± 0.4 E-02	3.6 ± 1.5 E-03	12/26	L.T. 5. E-02
12/18	12/26	1.16E+04	CU. FT.	2.7 ± 0.3 E-02	2.8 ± 1.3 E-03	01/04	L.T. 4. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 06

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
12/26	01/02	9.76E+03	CU. FT.	6.4 ± 0.5 E-02	7.5 ± 2.4 E-03	01/08	L.T. 3. E-02
01/02	01/09	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	4.1 ± 1.8 E-03	01/17	L.T. 2. E-02
01/09	01/16	1.02E+04	CU. FT.	2.8 ± 0.3 E-02	3.2 ± 1.5 E-03	01/19	L.T. 1. E-02
01/16	01/23	9.91E+03	CU. FT.	4.7 ± 0.4 E-02	3.6 ± 1.5 E-03	01/29	L.T. 3. E-02
01/23	01/30	1.02E+04	CU. FT.	1.7 ± 0.3 E-02	2.2 ± 1.2 E-03	02/06	L.T. 2. E-02
01/30	02/06	1.01E+04	CU. FT.	1.7 ± 0.3 E-02	2.3 ± 1.3 E-03	02/12	L.T. 3. E-02
02/06	02/12	8.22E+03	CU. FT.	2.6 ± 0.4 E-02	L.T. 2. E-03	02/21	L.T. 4. E-02
02/12	02/20	1.14E+04	CU. FT.	4.5 ± 0.4 E-02	3.0 ± 1.3 E-03	02/23	L.T. 2. E-02
02/20	02/28	1.14E+04	CU. FT.	2.8 ± 0.3 E-02	1.8 ± 1.3 E-03	03/05	L.T. 3. E-02
02/28	03/06	8.41E+03	CU. FT.	2.1 ± 0.3 E-02	2.0 ± 1.3 E-03	03/14	L.T. 5. E-02
03/06	03/14	1.13E+04	CU. FT.	1.6 ± 0.3 E-02	L.T. 9. E-04	03/21	L.T. 2. E-02
03/14	03/21	1.02E+04	CU. FT.	4.2 ± 0.4 E-02	2.2 ± 0.4 E-02	03/26	L.T. 3. E-02
03/21	03/27	8.93E+03	CU. FT.	1.3 ± 0.3 E-02	L.T. 1. E-03	04/03	L.T. 4. E-02
03/27	04/03	1.00E+04	CU. FT.	1.9 ± 0.3 E-02	2.7 ± 1.4 E-03	04/06	L.T. 1. E-02
04/03	04/10	9.82E+03	CU. FT.	9.4 ± 2.3 E-03	L.T. 1. E-03	04/13	L.T. 1. E-02
04/10	04/17	1.03E+03	CU. FT.	9.3 ± 2.2 E-03	1.9 ± 1.2 E-03	04/23	L.T. 5. E-02
04/17	04/24	1.02E+04	CU. FT.	1.8 ± 0.3 E-02	1.5 ± 1.1 E-03	05/01	L.T. 3. E-02
04/24	05/01	9.88E+03	CU. FT.	1.8 ± 0.3 E-02	3.7 ± 1.5 E-03	05/08	L.T. 2. E-02
05/01	05/08	9.96E+03	CU. FT.	1.2 ± 0.2 E-02	1.4 ± 1.0 E-03	05/10	L.T. 2. E-02
05/08	05/15	9.10E+03	CU. FT.	2.7 ± 0.3 E-02	6.8 ± 2.1 E-03	05/17	L.T. 2. E-02
05/15	05/22	1.01E+04	CU. FT.	1.4 ± 0.3 E-02	2.7 ± 1.6 E-03	05/24	L.T. 2. E-02
05/22	05/29	1.01E+04	CU. FT.	1.0 ± 0.3 E-02	L.T. 2. E-03	06/01	L.T. 3. E-02
05/29	06/05	1.03E+04	CU. FT.	8.2 ± 2.2 E-03	L.T. 2. E-03	06/08	L.T. 4. E-02
06/05	06/12	9.86E+03	CU. FT.	1.5 ± 0.3 E-02	L.T. 1. E-03	06/19	L.T. 1. E-02
06/12	06/19	1.02E+04	CU. FT.	1.9 ± 0.3 E-02	L.T. 2. E-03	06/27	L.T. 3. E-02
06/19	06/26	1.01E+04	CU. FT.	4.4 ± 0.4 E-02	1.6 ± 0.3 E-02	06/29	L.T. 2. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 06

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
DATE	DATE	VOLUME	UNITS			DATE	
06/26	07/03	9.91E+03	CU. FT.	3.0 ± 0.3 E-02	5.8 ± 1.9 E-03	07/09	L.T. 2. E-02
07/03	07/10	1.01E+04	CU. FT.	2.3 ± 0.3 E-02	2.2 ± 1.6 E-03	07/12	L.T. 2. E-02
07/10	07/17	1.04E+04	CU. FT.	2.5 ± 0.3 E-02	5.0 ± 1.7 E-03	07/23	L.T. 3. E-02
07/17	07/24	9.70E+03	CU. FT.	1.4 ± 0.3 E-02	1.3 ± 1.1 E-03	07/27	L.T. 3. E-02
07/24	07/31	1.01E+04	CU. FT.	1.9 ± 0.3 E-02	1.6 ± 1.2 E-03	08/08	L.T. 3. E-02
07/31	08/07	9.88E+03	CU. FT.	2.6 ± 0.3 E-02	2.6 ± 1.4 E-03	08/19	L.T. 3. E-02
08/07	08/14	9.64E+03	CU. FT.	3.0 ± 0.3 E-02	1.8 ± 1.2 E-03	08/22	L.T. 4. E-02
08/14	08/21	1.01E+04	CU. FT.	2.5 ± 0.3 E-02	L.T. 2. E-03	08/29	L.T. 4. E-02
08/21	08/28	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	2.2 ± 1.2 E-03	08/30	L.T. 3. E-02
08/28	09/04	1.01E+04	CU. FT.	2.7 ± 0.3 E-02	1.6 ± 1.3 E-03	09/06	L.T. 2. E-02
09/04	09/11	1.02E+04	CU. FT.	2.3 ± 0.3 E-02	L.T. 2. E-03	09/19	L.T. 3. E-02
09/11	09/18	1.01E+04	CU. FT.	3.1 ± 0.3 E-02	L.T. 1. E-03	09/21	L.T. 2. E-02
09/18	09/25	9.94E+03	CU. FT.	2.5 ± 0.3 E-02	L.T. 1. E-03	09/28	L.T. 3. E-02
09/25	10/02	1.02E+04	CU. FT.	2.4 ± 0.3 E-02	1.7 ± 1.1 E-03	10/05	L.T. 2. E-02
10/02	10/09	1.02E+04	CU. FT.	2.4 ± 0.3 E-02	3.6 ± 1.8 E-03	10/12	L.T. 2. E-02
10/09	10/16	9.88E+03	CU. FT.	1.9 ± 0.3 E-02	2.0 ± 1.3 E-03	10/23	L.T. 3. E-02
10/16	10/23	1.04E+04	CU. FT.	1.0 ± 0.2 E-02	2.0 ± 1.2 E-03	10/30	L.T. 3. E-02
10/23	10/30	1.00E+04	CU. FT.	2.6 ± 0.3 E-02	L.T. 2. E-03	11/08	L.T. 3. E-02
10/30	11/06	9.96E+03	CU. FT.	2.5 ± 0.3 E-02	2.9 ± 1.3 E-03	11/15	L.T. 2. E-02
11/06	11/13	1.03E+04	CU. FT.	4.1 ± 0.4 E-02	3.7 ± 1.5 E-03	11/20	L.T. 2. E-02
11/13	11/20	1.00E+04	CU. FT.	3.8 ± 0.4 E-02	5.5 ± 1.9 E-03	12/07	L.T. 3. E-02
11/20	11/27	1.03E+04	CU. FT.	1.0 ± 0.2 E-02	L.T. 2. E-03	12/11	L.T. 4. E-02
11/27	12/04	9.91E+03	CU. FT.	2.8 ± 0.3 E-02	2.4 ± 1.5 E-03	12/13	L.T. 5. E-02
12/04	12/11	1.02E+04	CU. FT.	2.6 ± 0.3 E-02	L.T. 2. E-03	12/18	L.T. 5. E-02
12/11	12/18	9.84E+03	CU. FT.	4.7 ± 0.4 E-02	3.4 ± 1.5 E-03	12/26	L.T. 5. E-02
12/18	12/26	1.16E+04	CU. FT.	2.8 ± 0.3 E-02	1.9 ± 1.1 E-03	01/04	L.T. 4. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 07

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
12/26	01/02	9.31E+03	CU. FT.	8.0 ± 0.5 E-02	6.1 ± 2.2 E-03	01/08	L.T. 3. E-02
01/02	01/09	1.01E+04	CU. FT.	2.2 ± 0.3 E-02	L.T. 2. E-03	01/17	L.T. 2. E-02
01/09	01/16	9.10E+03	CU. FT.	5.2 ± 0.4 E-02	5.7 ± 2.1 E-03	01/19	L.T. 2. E-02
01/16	01/23	1.01E+04	CU. FT.	5.8 ± 0.4 E-02	2.7 ± 1.3 E-03	01/29	L.T. 3. E-02
01/23	01/30	1.01E+04	CU. FT.	1.9 ± 0.3 E-02	1.6 ± 1.0 E-03	02/06	L.T. 3. E-02
01/30	02/06	1.01E+04	CU. FT.	3.0 ± 0.4 E-02	1.8 ± 1.2 E-03	02/12	L.T. 4. E-02
02/06	02/12	5.80E+03	CU. FT.	4.6 ± 0.6 E-02	2.9 ± 2.2 E-03	02/21	L.T. 6. E-02
02/12	02/20	1.15E+04	CU. FT.	5.1 ± 0.4 E-02	4.1 ± 1.5 E-03	02/23	L.T. 2. E-02
02/20	02/28	1.12E+04	CU. FT.	2.8 ± 0.3 E-02	2.7 ± 1.5 E-03	03/05	L.T. 3. E-02
02/28	03/06	6.26E+03	CU. FT.	4.7 ± 0.5 E-02	8.4 ± 2.8 E-03	03/14	L.T. 5. E-02
03/06	03/13	1.01E+04	CU. FT.	1.8 ± 0.3 E-02	1.3 ± 1.0 E-03	03/21	L.T. 3. E-02
03/13	03/21	1.07E+04	CU. FT.	4.1 ± 0.4 E-02	2.1 ± 0.3 E-02	03/26	L.T. 3. E-02
03/21	03/27	8.72E+03	CU. FT.	2.4 ± 0.4 E-02	1.9 ± 1.4 E-03	04/03	L.T. 4. E-02
03/27	04/03	1.02E+04	CU. FT.	1.0 ± 0.2 E-02	1.8 ± 1.2 E-03	04/06	L.T. 1. E-02
04/03	04/10	9.84E+03	CU. FT.	2.3 ± 0.3 E-02	3.0 ± 1.5 E-03	04/13	L.T. 2. E-02
04/10	04/17	1.02E+02	CU. FT.	1.6 ± 0.3 E-02	2.2 ± 1.2 E-03	04/23	L.T. 2. E-02
04/17	04/24	9.88E+03	CU. FT.	9.9 ± 2.5 E-03	2.0 ± 1.2 E-03	05/01	L.T. 4. E-02
04/24	05/01	9.92E+03	CU. FT.	2.8 ± 0.3 E-02	2.9 ± 1.3 E-03	05/08	L.T. 2. E-02
05/01	05/08	1.01E+04	CU. FT.	1.7 ± 0.3 E-02	2.6 ± 1.3 E-03	05/10	L.T. 2. E-02
05/08	05/15	9.96E+03	CU. FT.	3.3 ± 0.4 E-02	7.0 ± 2.0 E-03	05/17	L.T. 8. E-03
05/15	05/22	1.01E+04	CU. FT.	2.5 ± 0.3 E-02	2.4 ± 1.5 E-03	05/24	L.T. 2. E-02
05/22	05/29	1.01E+04	CU. FT.	1.1 ± 0.3 E-02	L.T. 2. E-03	06/01	L.T. 2. E-02
05/29	06/05	1.03E+04	CU. FT.	1.1 ± 0.2 E-02	L.T. 2. E-03	06/08	L.T. 3. E-02
06/05	06/12	9.81E+03	CU. FT.	2.2 ± 0.3 E-02	2.1 ± 1.4 E-03	06/19	L.T. 1. E-02
06/12	06/19	1.02E+04	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	06/27	L.T. 4. E-02
06/19	06/26	1.01E+04	CU. FT.	2.8 ± 0.3 E-02	1.1 ± 0.2 E-02	06/29	L.T. 2. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 07

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
06/26	07/03	9.97E+03	CU. FT.	2.4 ± 0.3 E-02	5.1 ± 1.8 E-03	07/09	L.T. 1. E-02
07/03	07/10	1.00E+04	CU. FT.	2.2 ± 0.3 E-02	L.T. 2. E-03	07/12	L.T. 2. E-02
07/10	07/17	9.80E+03	CU. FT.	2.1 ± 0.3 E-02	4.5 ± 1.7 E-03	07/23	L.T. 3. E-02
07/17	07/24	9.90E+03	CU. FT.	2.0 ± 0.3 E-02	2.3 ± 1.3 E-03	07/27	L.T. 2. E-02
07/24	07/31	1.01E+04	CU. FT.	1.4 ± 0.3 E-02	2.3 ± 1.4 E-03	08/08	L.T. 3. E-02
07/31	08/07	1.01E+04	CU. FT.	2.5 ± 0.3 E-02	1.3 ± 1.1 E-03	08/19	L.T. 3. E-02
08/07	08/14	1.02E+04	CU. FT.	2.3 ± 0.3 E-02	2.4 ± 1.3 E-03	08/22	L.T. 3. E-02
08/14	08/21	1.01E+04	CU. FT.	2.0 ± 0.3 E-02	L.T. 2. E-03	08/29	L.T. 4. E-02
08/21	08/28	1.01E+04	CU. FT.	2.7 ± 0.3 E-02	2.2 ± 1.2 E-03	08/30	L.T. 3. E-02
08/28	09/04	1.01E+04	CU. FT.	2.7 ± 0.3 E-02	1.8 ± 1.3 E-03	09/06	L.T. 2. E-02
09/04	09/11	1.01E+04	CU. FT.	2.3 ± 0.3 E-02	L.T. 2. E-03	09/19	L.T. 4. E-02
09/11	09/18	1.00E+04	CU. FT.	2.8 ± 0.3 E-02	2.7 ± 1.4 E-03	09/21	L.T. 2. E-02
09/18	09/25	1.00E+04	CU. FT.	2.6 ± 0.3 E-02	2.0 ± 1.3 E-03	09/28	L.T. 3. E-02
09/25	10/02	9.98E+03	CU. FT.	2.1 ± 0.3 E-02	1.2 ± 1.0 E-03	10/05	L.T. 2. E-02
10/02	10/09	1.02E+04	CU. FT.	2.1 ± 0.3 E-02	2.4 ± 1.5 E-03	10/12	L.T. 2. E-02
10/09	10/16	9.90E+03	CU. FT.	1.5 ± 0.3 E-02	2.5 ± 1.4 E-03	10/23	L.T. 3. E-02
10/16	10/23	1.04E+04	CU. FT.	9.7 ± 2.3 E-03	1.9 ± 1.2 E-03	10/30	L.T. 3. E-02
10/23	10/30	9.79E+03	CU. FT.	2.6 ± 0.3 E-02	3.5 ± 1.8 E-03	11/08	L.T. 3. E-02
10/30	11/06	9.66E+03	CU. FT.	2.8 ± 0.3 E-02	3.0 ± 1.4 E-03	11/15	L.T. 2. E-02
11/06	11/13	9.80E+03	CU. FT.	3.3 ± 0.4 E-02	3.3 ± 1.4 E-03	11/20	L.T. 2. E-02
11/13	11/20	9.89E+03	CU. FT.	2.4 ± 0.3 E-02	2.8 ± 1.5 E-03	12/07	L.T. 3. E-02
11/20	11/27	1.02E+04	CU. FT.	3.0 ± 0.3 E-0	2.5 ± 1.6 E-03	12/11	L.T. 4. E-02
11/27	12/04	9.93E+03	CU. FT.	1.5 ± 0.3 E-02	2.1 ± 1.4 E-03	12/13	L.T. 5. E-02
12/04	12/11	9.94E+03	CU. FT.	1.9 ± 0.3 E-02	L.T. 2. E-03	12/18	L.T. 5. E-02
12/11	12/18	9.88E+03	CU. FT.	2.1 ± 0.3 E-02	1.3 ± 1.0 E-03	12/26	L.T. 5. E-02
12/18	12/26	1.16E+04	CU. FT.	2.7 ± 0.3 E-02	2.1 ± 1.1 E-03	01/04	L.T. 4. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 08

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
12/26	01/02	1.00E+04	CU. FT.	2.7 ± 0.3 E-02	2.4 ± 1.6 E-03	01/08	L.T. 3. E-02
01/02	01/09	1.01E+04	CU. FT.	2.4 ± 0.3 E-02	3.4 ± 1.7 E-03	01/17	L.T. 2. E-02
01/09	01/16	9.96E+03	CU. FT.	1.7 ± 0.3 E-02	2.7 ± 1.5 E-03	01/19	L.T. 2. E-02
01/16	01/23	1.01E+04	CU. FT.	1.4 ± 0.3 E-02	1.9 ± 1.1 E-03	01/29	L.T. 3. E-02
01/23	01/30			(a)	(a)		(a)
01/30	02/06			(a)	(a)		(a)
02/06	02/12			(a)	(a)		(a)
02/12	02/20	(b)		(b)	(c)		(c)
02/20	02/28	1.14E+04	CU. FT.	8.5 ± 2.5 E-03	L.T. 1. E-03	03/05	L.T. 3. E-02
02/28	03/06	8.56E+03	CU. FT.	8.9 ± 2.6 E-03	1.5 ± 1.1 E-03	03/14	L.T. 5. E-02
03/06	03/14	1.14E+04	CU. FT.	6.7 ± 1.9 E-03	L.T. 9. E-04	03/21	L.T. 2. E-02
03/14	03/21	1.02E+04	CU. FT.	1.5 ± 0.3 E-02	4.4 ± 1.8 E-03	03/26	L.T. 3. E-02
03/21	03/27	8.93E+03	CU. FT.	5.3 ± 2.6 E-03	1.3 ± 1.3 E-03	04/03	L.T. 4. E-02
03/27	04/03			(a)	(a)		(a)
04/03	04/10	(b)		3.3 ± 0.7 E 00	4.8 ± 3.4 E-01	04/13	
04/10	04/17	1.01E+01	CU. FT.	5.3 ± 2.0 E-03	L.T. 9. E-04	04/23	L.T. 2. E-02
04/17	04/24	1.01E+04	CU. FT.	4.2 ± 2.1 E-03	L.T. 1. E-03	05/01	L.T. 4. E-02
04/24	05/01	1.03E+04	CU. FT.	2.7 ± 0.3 E-02	1.5 ± 1.0 E-03	05/08	L.T. 2. E-02
05/01	05/08	9.70E+03	CU. FT.	1.7 ± 0.3 E-02	2.0 ± 1.2 E-03	05/10	L.T. 2. E-02
05/08	05/15	1.00E+04	CU. FT.	2.4 ± 0.3 E-02	3.4 ± 1.4 E-03	05/17	L.T. 7. E-03
05/15	05/22	9.90E+03	CU. FT.	1.8 ± 0.3 E-02	2.0 ± 1.5 E-03	05/24	L.T. 3. E-02
05/22	05/29	1.01E+04	CU. FT.	6.4 ± 2.3 E-03	L.T. 2. E-03	06/01	L.T. 4. E-02
05/29	06/05			(a)	(a)		(a)
06/05	06/12	(b)		8.1 ± 0.9 E 00	L.T. 4. E-01	06/19	L.T. 1. E+01
06/12	06/19	1.02E+04	CU. FT.	1.8 ± 0.3 E-02	L.T. 2. E-03	06/27	L.T. 3. E-02
06/19	06/26	1.01E+04	CU. FT.	4.4 ± 0.4 E-02	1.8 ± 0.3 E-02	06/29	L.T. 1. E+01

- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 08

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME	UNITS	AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
06/26	07/03	9.34E+03	CU. FT.	2.0 ± 0.3 E-02	3.2 ± 1.5 E-03	07/09	L.T. 1. E-02
07/03	07/10	1.00E+04	CU. FT.	2.3 ± 0.3 E-02	2.0 ± 1.6 E-03	07/12	L.T. 2. E-02
07/10	07/17	8.56E+03	CU. FT.	2.5 ± 0.4 E-02	2.4 ± 1.5 E-03	07/23	L.T. 4. E-02
07/17	07/24	9.94E+03	CU. FT.	2.5 ± 0.3 E-02	4.6 ± 1.8 E-03	07/27	L.T. 3. E-02
07/24	07/31	1.00E+04	CU. FT.	2.2 ± 0.3 E-02	2.1 ± 1.3 E-03	08/08	L.T. 3. E-02
07/31	08/07	9.63E+03	CU. FT.	2.7 ± 0.3 E-02	1.6 ± 1.2 E-03	08/19	L.T. 3. E-02
08/07	08/14	1.00E+04	CU. FT.	2.4 ± 0.3 E-02	3.1 ± 1.4 E-03	08/22	L.T. 3. E-02
08/14	08/21	1.01E+04	CU. FT.	2.4 ± 0.3 E-02	1.9 ± 1.4 E-03	08/29	L.T. 4. E-02
08/21	08/28	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	1.2 ± 1.0 E-03	08/30	L.T. 2. E-02
08/28	09/04	9.91E+03	CU. FT.	2.5 ± 0.3 E-02	1.7 ± 1.3 E-03	09/06	L.T. 2. E-02
09/04	09/11	9.51E+03	CU. FT.	2.4 ± 0.3 E-02	3.1 ± 1.8 E-03	09/19	L.T. 4. E-02
09/11	09/18	1.01E+04	CU. FT.	2.6 ± 0.3 E-02	2.5 ± 1.3 E-03	09/21	L.T. 1. E-02
09/18	09/25	1.00E+04	CU. FT.	2.8 ± 0.3 E-02	1.8 ± 1.3 E-03	09/28	L.T. 3. E-02
09/25	10/02	9.41E+03	CU. FT.	2.5 ± 0.3 E-02	2.1 ± 1.3 E-03	10/05	L.T. 2. E-02
10/02	10/09	9.78E+03	CU. FT.	2.6 ± 0.3 E-02	2.2 ± 1.6 E-03	10/12	L.T. 2. E-02
10/09	10/16	1.02E+04	CU. FT.	1.8 ± 0.3 E-02	2.3 ± 1.3 E-03	10/23	L.T. 3. E-02
10/16	10/23	9.97E+03	CU. FT.	2.4 ± 0.3 E-02	1.8 ± 1.2 E-03	10/30	L.T. 4. E-02
10/23	10/30	1.02E+04	CU. FT.	2.7 ± 0.3 E-02	3.6 ± 1.8 E-03	11/08	L.T. 3. E-02
10/30	11/06	9.76E+03	CU. FT.	1.8 ± 0.3 E-02	1.3 ± 1.0 E-03	11/15	L.T. 2. E-02
11/06	11/13	1.01E+04	CU. FT.	3.6 ± 0.4 E-02	4.3 ± 1.6 E-03	11/20	L.T. 2. E-02
11/13	11/20	1.01E+04	CU. FT.	4.4 ± 0.4 E-02	5.7 ± 1.9 E-03	12/07	L.T. 3. E-02
11/20	11/27	1.01E+04	CU. FT.	2.6 ± 0.3 E-02	2.5 ± 1.6 E-03	12/11	L.T. 4. E-02
11/27	12/04	1.00E+04	CU. FT.	2.9 ± 0.3 E-02	L.T. 1. E-03	12/13	L.T. 5. E-02
12/04	12/11	1.00E+04	CU. FT.	2.3 ± 0.3 E-02	L.T. 2. E-03	12/18	L.T. 5. E-02
12/11	12/18	9.80E+03	CU. FT.	4.4 ± 0.4 E-02	5.8 ± 1.9 E-03	12/26	L.T. 3. E-02
12/18	12/26	1.14E+04	CU. FT.	2.0 ± 0.3 E-02	1.6 ± 1.0 E-03	01/04	L.T. 5. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 09

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
DATE	DATE	VOLUME	UNITS			DATE	
12/26	01/02	9.80E+03	CU. FT.	6.1 ± 0.5 E-02	8.8 ± 2.5 E-03	01/08	L.T. 3. E-02
01/02	01/09	1.01E+04	CU. FT.	2.5 ± 0.3 E-02	L.T. 2. E-03	01/17	L.T. 2. E-02
01/09	01/16	1.01E+04	CU. FT.	3.4 ± 0.3 E-02	5.2 ± 1.9 E-03	01/19	L.T. 1. E-02
01/16	01/23	1.00E+04	CU. FT.	4.3 ± 0.4 E-02	3.0 ± 1.4 E-03	01/29	L.T. 3. E-02
01/23	01/30	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	1.6 ± 1.0 E-03	02/06	L.T. 2. E-02
01/30	02/06	1.00E+04	CU. FT.	2.2 ± 0.3 E-02	2.0 ± 1.3 E-03	02/12	L.T. 4. E-02
02/06	02/12	8.36E+03	CU. FT.	2.5 ± 0.4 E-02	L.T. 2. E-03	02/21	L.T. 5. E-02
02/12	02/20	1.12E+04	CU. FT.	2.9 ± 0.3 E-02	2.2 ± 1.2 E-03	02/23	L.T. 2. E-02
02/20	02/28	1.12E+03	CU. FT.	3.1 ± 0.4 E-02	2.4 ± 1.5 E-03	03/05	L.T. 3. E-02
02/28	03/06	6.32E+03	CU. FT.	4.1 ± 0.5 E-02	4.6 ± 2.1 E-03	03/14	L.T. 5. E-02
03/06	03/14	1.14E+04	CU. FT.	2.2 ± 0.3 E-02	1.0 ± 0.9 E-03	03/21	L.T. 5. E-02
03/14	03/21	9.86E+03	CU. FT.	2.4 ± 0.3 E-02	7.0 ± 2.2 E-03	03/26	L.T. 4. E-02
03/21	03/27	8.94E+03	CU. FT.	1.9 ± 0.3 E-02	L.T. 1. E-03	04/03	L.T. 4. E-02
03/27	04/03	1.00E+04	CU. FT.	1.5 ± 0.3 E-02	1.8 ± 1.2 E-03	04/06	L.T. 1. E-02
04/03	04/10	9.85E+03	CU. FT.	1.7 ± 0.3 E-02	2.3 ± 1.3 E-03	04/13	L.T. 2. E-02
04/10	04/17	9.94E+03	CU. FT.	1.3 ± 0.2 E-02	L.T. 9. E-04	04/23	L.T. 3. E-02
04/17	04/24	1.02E+04	CU. FT.	1.7 ± 0.3 E-02	3.5 ± 1.5 E-03	05/01	L.T. 3. E-02
04/24	05/01	1.01E+04	CU. FT.	2.3 ± 0.3 E-02	2.5 ± 1.2 E-03	05/08	L.T. 2. E-02
05/01	05/08	9.72E+03	CU. FT.	1.2 ± 0.3 E-02	1.2 ± 1.0 E-03	05/10	L.T. 2. E-02
05/08	05/15	9.99E+03	CU. FT.	2.3 ± 0.3 E-02	3.1 ± 1.4 E-03	05/17	L.T. 8. E-03
05/15	05/22	1.00E+04	CU. FT.	1.7 ± 0.3 E-02	1.7 ± 1.4 E-03	05/24	L.T. 2. E-02
05/22	05/29	1.01E+04	CU. FT.	8.3 ± 2.5 E-03	L.T. 2. E-03	06/01	L.T. 2. E-02
05/29	06/05	1.03E+04	CU. FT.	1.1 ± 0.2 E-02	L.T. 2. E-03	06/08	L.T. 3. E-02
06/05	06/12	9.82E+03	CU. FT.	1.6 ± 0.3 E-02	L.T. 1. E-03	06/19	L.T. 1. E-02
06/12	06/19	1.02E+04	CU. FT.	1.7 ± 0.3 E-02	L.T. 2. E-03	06/27	L.T. 4. E-02
06/19	06/26	1.01E+04	CU. FT.	3.5 ± 0.4 E-02	1.1 ± 0.2 E-02	06/29	L.T. 2. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 09

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
DATE	DATE	VOLUME	UNITS			DATE	(PCI/CU.M.)
06/26	07/03	9.97E+03	CU. FT.	2.4 ± 0.3 E-02	5.0 ± 1.7 E-03	07/09	L.T. 1. E-02
07/03	07/10	1.01E+04	CU. FT.	2.4 ± 0.3 E-02	2.0 ± 1.6 E-03	07/12	L.T. 2. E-02
07/10	07/17	1.02E+04	CU. FT.	2.2 ± 0.3 E-02	2.7 ± 1.4 E-03	07/23	L.T. 3. E-02
07/17	07/24	9.93E+03	CU. FT.	2.0 ± 0.3 E-02	L.T. 1. E-03	07/27	L.T. 3. E-02
07/24	07/31	9.84E+03	CU. FT.	2.3 ± 0.3 E-02	L.T. 1. E-03	08/08	L.T. 3. E-02
07/31	08/07	1.01E+04	CU. FT.	2.3 ± 0.3 E-02	2.3 ± 1.3 E-03	08/19	L.T. 4. E-02
08/07	08/14	9.81E+03	CU. FT.	2.1 ± 0.3 E-02	2.0 ± 1.2 E-03	08/22	L.T. 4. E-02
08/14	08/21	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	L.T. 2. E-03	08/29	L.T. 5. E-02
08/21	08/28	1.01E+04	CU. FT.	2.2 ± 0.3 E-02	L.T. 1. E-03	08/30	L.T. 1. E-02
08/28	09/04	1.01E+04	CU. FT.	2.5 ± 0.3 E-02	1.7 ± 1.3 E-03	09/06	L.T. 3. E-02
09/04	09/11	1.02E+04	CU. FT.	2.4 ± 0.3 E-02	L.T. 2. E-03	09/19	L.T. 3. E-02
09/11	09/18	1.01E+04	CU. FT.	2.5 ± 0.3 E-02	2.9 ± 1.4 E-03	09/21	L.T. 1. E-02
09/18	09/25	1.00E+04	CU. FT.	2.2 ± 0.3 E-02	L.T. 1. E-03	09/28	L.T. 3. E-02
09/25	10/02	1.02E+04	CU. FT.	2.4 ± 0.3 E-02	2.2 ± 1.2 E-03	10/05	L.T. 2. E-02
10/02	10/09	1.02E+04	CU. FT.	2.5 ± 0.3 E-02	1.9 ± 1.5 E-03	10/12	L.T. 3. E-02
10/09	10/16	9.98E+03	CU. FT.	1.7 ± 0.3 E-02	2.0 ± 1.3 E-03	10/23	L.T. 2. E-02
10/16	10/23	1.04E+04	CU. FT.	8.6 ± 2.2 E-03	L.T. 1. E-03	10/30	L.T. 3. E-02
10/23	10/30	1.01E+04	CU. FT.	2.4 ± 0.3 E-02	L.T. 2. E-03	11/08	L.T. 3. E-02
10/30	11/06	9.82E+03	CU. FT.	2.3 ± 0.3 E-02	2.5 ± 1.3 E-03	11/15	L.T. 2. E-02
11/06	11/13	1.03E+04	CU. FT.	3.0 ± 0.3 E-02	1.8 ± 1.1 E-03	11/20	L.T. 2. E-02
11/13	11/20	1.02E+04	CU. FT.	3.8 ± 0.4 E-02	4.2 ± 1.7 E-03	12/07	L.T. 3. E-02
11/20	11/27	1.01E+04	CU. FT.	3.2 ± 0.3 E-02	2.1 ± 1.6 E-03	12/11	L.T. 3. E-02
11/27	12/04	1.00E+04	CU. FT.	3.1 ± 0.3 E-02	2.1 ± 1.4 E-03	12/13	L.T. 5. E-02
12/04	12/11	1.00E+04	CU. FT.	2.2 ± 0.3 E-02	2.1 ± 1.7 E-03	12/18	L.T. 4. E-02
12/11	12/18	9.94E+03	CU. FT.	3.6 ± 0.4 E-02	2.8 ± 1.4 E-03	12/26	L.T. 5. E-02
12/18	12/26	1.14E+04	CU. FT.	2.3 ± 0.3 E-02	2.4 ± 1.2 E-03	01/04	L.T. 5. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 10

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
DATE	DATE	VOLUME	UNITS			DATE	
12/26	01/02	1.00E+04	CU. FT.	5.1 ± 0.4 E-02	4.8 ± 2.0 E-03	01/08	L.T. 2. E-02
01/02	01/09	1.00E+04	CU. FT.	2.4 ± 0.3 E-02	2.5 ± 1.5 E-03	01/17	L.T. 2. E-02
01/09	01/16	9.99E+03	CU. FT.	2.3 ± 0.3 E-02	2.0 ± 1.3 E-03	01/19	L.T. 1. E-02
01/16	01/23	1.01E+04	CU. FT.	3.2 ± 0.3 E-02	2.7 ± 1.3 E-03	01/29	L.T. 2. E-02
01/23	01/30	1.01E+04	CU. FT.	1.2 ± 0.2 E-02	1.2 ± 0.9 E-03	02/06	L.T. 2. E-02
01/30	02/06	1.01E+04	CU. FT.	1.3 ± 0.3 E-02	2.3 ± 1.3 E-03	02/12	L.T. 4. E-02
02/06	02/12	6.93E+03	CU. FT.	1.5 ± 0.3 E-02	L.T. 2. E-03	02/21	L.T. 5. E-02
02/12	02/20	1.15E+04	CU. FT.	3.5 ± 0.3 E-02	2.8 ± 1.3 E-03	02/23	L.T. 2. E-02
02/20	02/28	1.15E+04	CU. FT.	1.9 ± 0.3 E-02	2.0 ± 1.4 E-03	03/05	L.T. 2. E-02
02/28	03/06	8.56E+03	CU. FT.	2.4 ± 0.3 E-02	2.8 ± 1.4 E-03	03/14	L.T. 4. E-02
03/06	03/14	1.14E+04	CU. FT.	1.3 ± 0.2 E-02	L.T. 9. E-04	03/21	L.T. 4. E-02
03/14	03/21	1.02E+04	CU. FT.	2.0 ± 0.3 E-02	7.3 ± 2.2 E-03	03/26	L.T. 4. E-02
03/21	03/27	8.95E+03	CU. FT.	1.4 ± 0.3 E-02	3.0 ± 1.7 E-03	04/03	L.T. 4. E-02
03/27	04/03	1.00E+04	CU. FT.	9.7 ± 2.3 E-03	L.T. 1. E-03	04/06	L.T. 1. E-02
04/03	04/10	9.84E+03	CU. FT.	1.3 ± 0.3 E-02	2.4 ± 1.4 E-03	04/13	L.T. 2. E-02
04/10	04/17	1.02E+04	CU. FT.	1.3 ± 0.2 E-02	9.7 ± 9.2 E-04	04/23	L.T. 2. E-02
04/17	04/24	9.90E+03	CU. FT.	1.1 ± 0.3 E-02	1.6 ± 1.1 E-03	05/01	L.T. 2. E-02
04/24	05/01	1.02E+04	CU. FT.	2.2 ± 0.3 E-02	3.1 ± 1.4 E-03	05/08	L.T. 2. E-02
05/01	05/08	1.01E+04	CU. FT.	1.7 ± 0.3 E-02	1.0 ± 0.9 E-03	05/10	L.T. 1. E-02
05/08	05/15	9.97E+03	CU. FT.	1.9 ± 0.3 E-02	2.0 ± 1.1 E-03	05/17	L.T. 9. E-03
05/15	05/22	1.00E+04	CU. FT.	1.3 ± 0.3 E-02	1.8 ± 1.4 E-03	05/24	L.T. 2. E-02
05/22	05/29	1.01E+04	CU. FT.	7.9 ± 2.4 E-03	L.T. 2. E-03	06/01	L.T. 4. E-02
05/29	06/05	1.03E+04	CU. FT.	9.5 ± 2.3 E-03	L.T. 2. E-03	06/08	L.T. 3. E-02
06/05	06/12	9.81E+03	CU. FT.	2.1 ± 0.3 E-02	L.T. 1. E-03	06/19	L.T. 1. E-02
06/12	06/19	1.02E+04	CU. FT.	1.4 ± 0.3 E-02	L.T. 2. E-03	06/27	L.T. 4. E-02
06/19	06/26	1.01E+04	CU. FT.	3.4 ± 0.3 E-02	1.1 ± 0.2 E-02	06/29	L.T. 2. E-02

02

- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 10

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU.M.)
DATE	DATE	VOLUME	UNITS			DATE	
06/26	07/03	9.96E+03	CU. FT.	2.9 ± 0.3 E-02	6.3 ± 1.9 E-03	07/09	L.T. 1. E-02
07/03	07/10	1.01E+04	CU. FT.	2.0 ± 0.3 E-02	3.3 ± 1.8 E-03	07/12	L.T. 2. E-02
07/10	07/17	1.03E+04	CU. FT.	2.0 ± 0.3 E-02	2.9 ± 1.4 E-03	07/23	L.T. 3. E-02
07/17	07/24	9.80E+03	CU. FT.	2.0 ± 0.3 E-02	2.7 ± 1.4 E-03	07/27	L.T. 2. E-02
07/24	07/31	1.01E+04	CU. FT.	2.0 ± 0.3 E-02	1.7 ± 1.2 E-03	08/08	L.T. 2. E-02
07/31	08/07	1.01E+04	CU. FT.	3.0 ± 0.3 E-02	2.6 ± 1.4 E-03	08/19	L.T. 4. E-02
08/07	08/14	1.00E+04	CU. FT.	2.7 ± 0.3 E-02	3.3 ± 1.5 E-03	08/22	L.T. 2. E-02
08/14	08/21	1.01E+04	CU. FT.	2.7 ± 0.3 E-02	2.9 ± 1.6 E-03	08/29	L.T. 5. E-02
08/21	08/28	1.01E+04	CU. FT.	2.1 ± 0.3 E-02	2.5 ± 1.3 E-03	08/30	L.T. 2. E-02
08/28	09/04	1.01E+04	CU. FT.	2.4 ± 0.3 E-02	L.T. 1. E-03	09/06	L.T. 2. E-02
09/04	09/11	1.02E+04	CU. FT.	1.6 ± 0.3 E-02	L.T. 2. E-03	09/19	L.T. 3. E-02
09/11	09/18	1.01E+04	CU. FT.	2.8 ± 0.3 E-02	2.2 ± 1.3 E-03	09/21	L.T. 1. E-02
09/18	09/25	9.97E+03	CU. FT.	2.4 ± 0.3 E-02	3.0 ± 1.5 E-03	09/28	L.T. 2. E-02
09/25	10/02	1.02E+04	CU. FT.	1.9 ± 0.3 E-02	2.2 ± 1.2 E-03	10/05	L.T. 2. E-02
10/02	10/09	1.02E+04	CU. FT.	3.0 ± 0.3 E-02	2.1 ± 1.5 E-03	10/12	L.T. 2. E-02
10/09	10/16	9.91E+03	CU. FT.	2.0 ± 0.3 E-02	1.5 ± 1.2 E-03	10/23	L.T. 2. E-02
10/16	10/23	1.03E+04	CU. FT.	1.7 ± 0.3 E-02	2.7 ± 1.4 E-03	10/30	L.T. 2. E-02
10/23	10/30	9.99E+03	CU. FT.	2.1 ± 0.3 E-02	L.T. 2. E-03	11/08	L.T. 2. E-02
10/30	11/06	9.96E+03	CU. FT.	1.8 ± 0.3 E-02	L.T. 9. E-04	11/15	L.T. 2. E-02
11/06	11/13	1.03E+04	CU. FT.	1.9 ± 0.3 E-02	2.7 ± 1.3 E-03	11/20	L.T. 1. E-02
11/13	11/20	1.02E+04	CU. FT.	3.0 ± 0.3 E-02	3.7 ± 1.6 E-03	12/07	L.T. 2. E-02
11/20	11/27	1.01E+04	CU. FT.	2.6 ± 0.3 E-02	L.T. 2. E-03	12/11	L.T. 4. E-02
11/27	12/04	9.93E+03	CU. FT.	1.9 ± 0.3 E-02	L.T. 1. E-03	12/13	L.T. 4. E-02
12/04	12/11	1.01E+04	CU. FT.	2.0 ± 0.3 E-02	L.T. 2. E-03	12/18	L.T. 5. E-02
12/11	12/18	1.00E+04	CU. FT.	3.5 ± 0.4 E-02	4.1 ± 1.6 E-03	12/26	L.T. 5. E-02
12/18	12/26	1.13E+04	CU. FT.	2.7 ± 0.3 E-02	3.4 ± 1.4 E-03	01/04	L.T. 5. E-02

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- (a) Sample not collected due to adverse weather conditions.
- (b) Sample volume not provided. Results are in total pCi.
- (c) Sample not analyzed per client request.
- (d) Sample not available due to pump/power failure.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)

STATION NUMBER 01

DATE COLLECTED 12/26-03/27 03/27-07/03 07/03-09/25 09/25-12/26

GAMMA SPECTRUM ANALYSIS:

BE-7	7.08 ± 0.66	E-02	1.09 ± 0.08	E-01	1.43 ± 0.09	E-01	9.50 ± 1.04	E-02
K-40	L.T. 8.	E-03	L.T. 6.	E-03	L.T. 1.	E-02	L.T. 1.	E-02
MN-54	L.T. 6.	E-04	L.T. 7.	E-04	L.T. 5.	E-04	L.T. 1.	E-03
CO-58	L.T. 1.	E-03	L.T. 1.	E-03	L.T. 8.	E-04	L.T. 2.	E-03
FE-59	L.T. 4.	E-03	L.T. 3.	E-03	L.T. 2.	E-03	L.T. 5.	E-03
CO-60	L.T. 6.	E-04	L.T. 6.	E-04	L.T. 5.	E-04	L.T. 9.	E-04
ZN-65	L.T. 1.	E-03	L.T. 1.	E-03	L.T. 1.	E-03	L.T. 3.	E-03
ZR-95	L.T. 1.	E-03	L.T. 1.	E-03	L.T. 8.	E-04	L.T. 2.	E-03
RU-103	L.T. 3.	E-03	L.T. 2.	E-03	L.T. 1.	E-03	L.T. 3.	E-03
RU-106	L.T. 5.	E-03	L.T. 6.	E-03	L.T. 4.	E-03	L.T. 7.	E-03
I-131	L.T. 3.	E+00	L.T. 2.	E-01	L.T. 1.	E-01	L.T. 8.	E-01
CS-134	L.T. 6.	E-04	L.T. 7.	E-04	L.T. 4.	E-04	L.T. 9.	E-04
CS-137	L.T. 6.	E-04	L.T. 6.	E-04	L.T. 4.	E-04	L.T. 5.	E-04
BA-140	L.T. 1.	E-01	L.T. 3.	E-02	L.T. 2.	E-02	L.T. 8.	E-02
CE-141	L.T. 4.	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. 4.	E-03	L.T. 2.	E-03	L.T. 4.	E-03
RA-226	L.T. 5.	E-03	L.T. 1.	E-02	L.T. 1.	E-02	L.T. 2.	E-02
TH-228	L.T. 8.	E-04	L.T. 7.	E-04	L.T. 3.	E-03	L.T. 5.	E-03

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)

STATION NUMBER 02

DATE COLLECTED	12/26-03/27	03/27-07/03	07/03-09/25	09/25-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	1.40 ± 0.15 E-01	1.38 ± 0.09 E-01	1.03 ± 0.07 E-01	1.13 ± 0.13 E-01
K-40	L.T. 2. E-02	L.T. 1. E-02	L.T. 7. E-03	L.T. 1. E-02
MN-54	L.T. 1. E-03	L.T. 8. E-04	L.T. 6. E-04	L.T. 1. E-03
CO-58	L.T. 3. E-03	L.T. 1. E-03	L.T. 9. E-04	L.T. 2. E-03
FE-59	L.T. 1. E-02	L.T. 3. E-03	L.T. 2. E-03	L.T. 5. E-03
CO-60	L.T. 1. E-03	L.T. 7. E-04	L.T. 5. E-04	L.T. 8. E-04
ZN-65	L.T. 3. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-03
ZR-95	L.T. 3. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 2. E-03
RU-103	L.T. 6. E-03	L.T. 2. E-03	L.T. 1. E-03	L.T. 3. E-03
RU-106	L.T. 1. E-02	L.T. 7. E-03	L.T. 5. E-03	L.T. 8. E-03
I-131	L.T. 7. E+00	L.T. 2. E-01	L.T. 1. E-01	L.T. 9. E-01
CS-134	L.T. 1. E-03	L.T. 8. E-04	L.T. 6. E-04	L.T. 1. E-03
CS-137	L.T. 1. E-03	L.T. 7. E-04	L.T. 5. E-04	L.T. 8. E-04
BA-140	L.T. 4. E-01	L.T. 3. E-02	L.T. 2. E-02	L.T. 8. E-02
CE-141	L.T. 1. E-02	L.T. 3. E-03	L.T. 2. E-03	L.T. 4. E-03
CE-144	L.T. 6. E-03	L.T. 3. E-03	L.T. 2. E-03	L.T. 4. E-03
RA-226	L.T. 2. E-02	L.T. 9. E-03	L.T. 5. E-03	L.T. 2. E-02
TH-228	L.T. 2. E-03	L.T. 1. E-03	L.T. 5. E-04	L.T. 6. E-03

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)

STATION NUMBER 03

DATE COLLECTED	12/26-03/27	03/27-07/03	07/03-09/25	09/25-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	9.80 ± 1.12 E-02	1.16 ± 0.09 E-01	9.69 ± 0.69 E-02	1.00 ± 0.13 E-01
K-40	L.T. 1. E-02	L.T. 1. E-02	L.T. 7. E-03	L.T. 1. E-02
MN-54	L.T. 1. E-03	L.T. 9. E-04	L.T. 6. E-04	L.T. 1. E-03
CO-58	L.T. 2. E-03	L.T. 1. E-03	L.T. 9. E-04	L.T. 2. E-03
FE-59	L.T. 8. E-03	L.T. 4. E-03	L.T. 3. E-03	L.T. 5. E-03
CO-60	L.T. 9. E-04	L.T. 8. E-04	L.T. 5. E-04	L.T. 9. E-04
ZN-65	L.T. 3. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-03
ZR-95	L.T. 2. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 2. E-03
RU-103	L.T. 5. E-03	L.T. 2. E-03	L.T. 1. E-03	L.T. 3. E-03
RU-106	L.T. 9. E-03	L.T. 8. E-03	L.T. 5. E-03	L.T. 9. E-03
I-131	L.T. 5. E+00	L.T. 2. E-01	L.T. 2. E-01	L.T. 9. E-01
CS-134	L.T. 1. E-03	L.T. 9. E-04	L.T. 6. E-04	L.T. 1. E-03
CS-137	L.T. 9. E-04	L.T. 8. E-04	L.T. 5. E-04	L.T. 9. E-04
BA-140	L.T. 3. E-01	L.T. 4. E-02	L.T. 2. E-02	L.T. 9. E-02
CE-141	L.T. 7. E-03	L.T. 3. E-03	L.T. 2. E-03	L.T. 4. E-03
CE-144	L.T. 4. E-03	L.T. 4. E-03	L.T. 2. E-03	L.T. 4. E-03
RA-226	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02
TH-228	L.T. 9. E-04	L.T. 1. E-03	L.T. 5. E-04	L.T. 7. E-03

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)

STATION NUMBER 04

DATE COLLECTED	12/26-03/27	03/27-07/03	07/03-09/25	09/25-12/26
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GAMMA SPECTRUM
ANALYSIS:

BE-7	6.62 ± 0.84 E-02	1.09 ± 0.08 E-01	1.30 ± 0.09 E-01	1.08 ± 0.15 E-01
K-40	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02
MN-54	L.T. 9. E-04	L.T. 8. E-04	L.T. 8. E-04	L.T. 1. E-03
CO-58	L.T. 2. E-03	L.T. 1. E-03	L.T. 1. E-03	L.T. 2. E-03
FE-59	L.T. 6. E-03	L.T. 3. E-03	L.T. 3. E-03	L.T. 7. E-03
CO-60	L.T. 7. E-04	L.T. 7. E-04	L.T. 7. E-04	L.T. 1. E-03
ZN-65	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-03
ZR-95	L.T. 2. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 3. E-03
RU-103	L.T. 4. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 4. E-03
RU-106	L.T. 7. E-03	L.T. 6. E-03	L.T. 6. E-03	L.T. 1. E-02
I-131	L.T. 4. E+00	L.T. 2. E-01	L.T. 2. E-01	L.T. 1. E+00
CS-134	L.T. 8. E-04	L.T. 8. E-04	L.T. 8. E-04	L.T. 1. E-03
CS-137	L.T. 7. E-04	L.T. 6. E-04	L.T. 7. E-04	L.T. 1. E-03
BA-140	L.T. 2. E-01	L.T. 3. E-02	L.T. 3. E-02	L.T. 9. E-02
CE-141	L.T. 6. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 6. E-03
CE-144	L.T. 4. E-03	L.T. 3. E-03	L.T. 3. E-03	L.T. 6. E-03
RA-226	L.T. 2. E-02	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02
TH-228	L.T. 1. E-03	L.T. 1. E-03	L.T. 6. E-04	L.T. 8. E-03

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)

STATION NUMBER 05

DATE COLLECTED	12/26-03/27	03/27-07/03	07/03-09/25	09/25-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	8.83 ± 0.76 E-02	1.23 ± 0.08 E-01	1.17 ± 0.08 E-01	9.41+-1.19E E-02
K-40	L.T. 8. E-03	L.T. 7. E-03	L.T. 9. E-03	L.T. 2. E-02
MN-54	L.T. 7. E-04	L.T. 4. E-04	L.T. 7. E-04	L.T. 1. E-03
CO-58	L.T. 1. E-03	L.T. 6. E-04	L.T. 1. E-03	L.T. 2. E-03
FE-59	L.T. 5. E-03	L.T. 2. E-03	L.T. 3. E-03	L.T. 6. E-03
CO-60	L.T. 5. E-04	L.T. 4. E-04	L.T. 6. E-04	L.T. 1. E-03
ZN-65	L.T. 2. E-03	L.T. 9. E-04	L.T. 2. E-03	L.T. 3. E-03
ZR-95	L.T. 1. E-03	L.T. 7. E-04	L.T. 2. E-03	L.T. 2. E-03
RU-103	L.T. 3. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 4. E-03
RU-106	L.T. 5. E-03	L.T. 3. E-03	L.T. 5. E-03	L.T. 1. E-02
I-131	L.T. 3. E+00	L.T. 1. E-01	L.T. 1. E-01	L.T. 1. E+00
CS-134	L.T. 6. E-04	L.T. 3. E-04	L.T. 7. E-04	L.T. 1. E-03
CS-137	L.T. 7. E-04	L.T. 4. E-04	L.T. 6. E-04	L.T. 1. E-03
BA-140	L.T. 2. E-01	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-01
CE-141	L.T. 4. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 5. E-03
CE-144	L.T. 3. E-03	L.T. 2. E-03	L.T. 3. E-03	L.T. 5. E-03
RA-226	L.T. 6. E-03	L.T. 9. E-03	L.T. 1. E-02	L.T. 2. E-02
TH-228	L.T. 7. E-04	L.T. 5. E-04	L.T. 6. E-04	L.T. 8. E-03

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NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)

STATION NUMBER 06

DATE COLLECTED	12/26-03/27	03/27-07/03	07/03-09/25	09/25-12/26
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GAMMA SPECTRUM
ANALYSIS:

BE-7	8.52 ± 0.96 E-02	1.16 ± 0.08 E-01	1.03 ± 0.08 E-01	1.12 ± 0.13 E-01
K-40	L.T. 1. E-02	L.T. 8. E-03	L.T. 9. E-03	L.T. 2. E-02
MN-54	L.T. 9. E-04	L.T. 4. E-04	L.T. 7. E-04	L.T. 9. E-04
CO-58	L.T. 2. E-03	L.T. 7. E-04	L.T. 1. E-03	L.T. 1. E-03
FE-59	L.T. 7. E-03	L.T. 2. E-03	L.T. 3. E-03	L.T. 4. E-03
CO-60	L.T. 8. E-04	L.T. 4. E-04	L.T. 6. E-04	L.T. 7. E-04
ZN-65	L.T. 2. E-03	L.T. 9. E-04	L.T. 2. E-03	L.T. 2. E-03
ZR-95	L.T. 2. E-03	L.T. 6. E-04	L.T. 2. E-03	L.T. 2. E-03
RU-103	L.T. 4. E-03	L.T. 9. E-03	L.T. 2. E-03	L.T. 2. E-03
RU-106	L.T. 8. E-03	L.T. 3. E-03	L.T. 6. E-03	L.T. 6. E-03
I-131	L.T. 5. E+00	L.T. 9. E-02	L.T. 1. E-01	L.T. 6. E-01
CS-134	L.T. 9. E-04	L.T. 3. E-04	L.T. 7. E-04	L.T. 6. E-04
CS-137	L.T. 8. E-04	L.T. 4. E-04	L.T. 6. E-04	L.T. 7. E-04
BA-140	L.T. 2. E-01	L.T. 2. E-02	L.T. 2. E-02	L.T. 7. E-02
CE-141	L.T. 6. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 4. E-03
CE-144	L.T. 4. E-03	L.T. 2. E-03	L.T. 3. E-03	L.T. 4. E-03
RA-226	L.T. 2. E-02	L.T. 1. E-02	L.T. 8. E-03	L.T. 1. E-02
TH-228	L.T. 1. E-03	L.T. 7. E-04	L.T. 6. E-04	L.T. 5. E-03

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)

STATION NUMBER 07

DATE COLLECTED	12/26-03/27	03/27-07/03	07/03-09/25	09/25-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	9.18 ± 0.85 E-02	1.20 ± 0.08 E-01	1.22 ± 0.08 E-01	6.98 ± 0.92 E-02
K-40	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-02
MN-54	L.T. 7. E-04	L.T. 5. E-04	L.T. 7. E-04	L.T. 7. E-04
CO-58	L.T. 2. E-03	L.T. 8. E-04	L.T. 1. E-03	L.T. 1. E-03
FE-59	L.T. 5. E-03	L.T. 2. E-03	L.T. 3. E-03	L.T. 4. E-03
CO-60	L.T. 6. E-04	L.T. 4. E-04	L.T. 6. E-04	L.T. 8. E-04
ZN-65	L.T. 2. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 1. E-03
ZR-95	L.T. 2. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 1. E-03
RU-103	L.T. 3. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 2. E-03
RU-106	L.T. 6. E-03	L.T. 4. E-03	L.T. 6. E-03	L.T. 5. E-03
I-131	L.T. 4. E+00	L.T. 1. E-01	L.T. 1. E-01	L.T. 5. E-01
CS-134	L.T. 7. E-04	L.T. 4. E-04	L.T. 7. E-04	L.T. 5. E-04
CS-137	L.T. 6. E-04	L.T. 4. E-04	L.T. 6. E-04	L.T. 6. E-04
BA-140	L.T. 2. E-01	L.T. 5. E-02	L.T. 3. E-02	L.T. 5. E-02
CE-141	L.T. 5. 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. 2. E-03	L.T. 3. E-03	L.T. 3. E-03
RA-226	L.T. 1. E-02	L.T. 1. E-03	L.T. 1. E-02	L.T. 1. E-02
TH-228	L.T. 5. E-04	L.T. 7. E-04	L.T. 6. E-04	L.T. 4. E-03

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)

STATION NUMBER 08

DATE COLLECTED	12/26-03/27	03/27-07/03	07/03-09/25	09/25-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	2.91 B365 0 E-02	1.54 ± 0.11 E-01	1.27 ± 0.08 E-01	1.02 ± 0.13 E-01
K-40	L.T. 1. E-02	L.T. 1. E-02	L.T. 8. E-03	L.T. 2. E-02
MN-54	L.T. 9. E-04	L.T. 6. E-04	L.T. 6. E-04	L.T. 1. E-03
CO-58	L.T. 2. E-03	L.T. 9. E-04	L.T. 9. E-04	L.T. 2. E-03
FE-59	L.T. 6. E-03	L.T. 3. E-03	L.T. 3. E-03	L.T. 6. E-03
CO-60	3.09 ± 0.28 E-03	L.T. 5. E-04	L.T. 5. E-04	L.T. 1. E-03
ZN-65	L.T. 2. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 3. E-03
ZR-95	L.T. 2. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 2. E-03
RU-103	L.T. 4. E-03	L.T. 1. E-03	L.T. 1. E-03	L.T. 4. E-03
RU-106	L.T. 7. E-03	L.T. 5. E-03	L.T. 5. E-03	L.T. 1. E-02
I-131	L.T. 4. E+00	L.T. 2. E-01	L.T. 2. E-01	L.T. 1. E+00
CS-134	L.T. 8. E-04	L.T. 5. E-04	L.T. 6. E-04	L.T. 1. E-03
CS-137	L.T. 7. E-04	L.T. 5. E-04	L.T. 5. E-04	L.T. 1. E-03
BA-140	L.T. 2. E-01	L.T. 2. E-02	L.T. 2. E-02	L.T. 1. E-01
CE-141	L.T. 5. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 6. E-03
CE-144	L.T. 3. E-03	L.T. 3. E-03	L.T. 2. E-03	L.T. 5. E-03
RA-226	L.T. 9. E-03	L.T. 2. E-02	L.T. 1. E-02	L.T. 2. E-02
TH-228	1.35 ± 2.21 E-03	L.T. 8. E-04	L.T. 5. E-04	L.T. 8. E-03

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)

STATION NUMBER 09

DATE COLLECTED	12/26-03/27	03/27-07/03	07/03-09/25	09/25-12/26
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GAMMA SPECTRUM
ANALYSIS:

BE-7	7.79 ± 0.72 E-02	1.21 ± 0.08 E-01	1.14 ± 0.06 E-01	1.01 ± 0.12 E-01
K-40	L.T. 7. E-03	L.T. 1. E-02	L.T. 6. E-03	L.T. 1. E-02
MN-54	L.T. 4. E-04	L.T. 5. E-04	L.T. 4. E-04	L.T. 1. E-03
CO-58	L.T. 9. E-04	L.T. 7. E-04	L.T. 6. E-04	L.T. 2. E-03
FE-59	L.T. 3. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 6. E-03
CO-60	L.T. 4. E-04	L.T. 4. E-04	L.T. 3. E-04	L.T. 8. E-04
ZN-65	L.T. 9. E-04	L.T. 1. E-03	L.T. 1. E-03	L.T. 2. E-03
ZR-95	L.T. 1. E-03	L.T. 7. E-04	L.T. 7. E-04	L.T. 2. E-03
RU-103	L.T. 2. E-03	L.T. 1. E-03	L.T. 9. E-04	L.T. 3. E-03
RU-106	L.T. 4. E-03	L.T. 4. E-03	L.T. 3. E-03	L.T. 8. E-03
I-131	L.T. 2. E+00	L.T. 1. E-01	L.T. 9. E-02	L.T. 9. E-01
CS-134	L.T. 4. E-04	L.T. 4. E-04	L.T. 4. E-04	L.T. 1. E-03
CS-137	L.T. 4. E-04	L.T. 5. E-04	L.T. 4. E-04	L.T. 9. E-04
BA-140	L.T. 1. E-01	L.T. 2. E-02	L.T. 1. E-02	L.T. 9. E-02
CE-141	L.T. 3. E-03	L.T. 2. E-03	L.T. 1. E-03	L.T. 4. E-03
CE-144	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 4. E-03
RA-226	L.T. 8. E-03	L.T. 1. E-02	L.T. 1. E-02	L.T. 2. E-02
TH-228	L.T. 4. E-04	L.T. 7. E-04	L.T. 3. E-03	L.T. 7. E-03

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VII-2
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)

STATION NUMBER 10

DATE COLLECTED	12/26-03/27	03/27-07/03	07/03-09/25	09/25-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	5.78 ± 0.68 E-02	9.88 ± 0.65 E-02	1.32 ± 0.07 E-01	8.34 ± 1.12 E-02
K-40	L.T. 8. E-03	L.T. 6. E-03	L.T. 6. E-03	L.T. 1. E-02
MN-54	L.T. 5. E-04	L.T. 4. E-04	L.T. 5. E-04	L.T. 8. E-04
CO-58	L.T. 9. E-04	L.T. 6. E-04	L.T. 7. E-04	L.T. 1. E-03
FE-59	L.T. 3. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 4. E-03
CO-60	L.T. 4. E-04	L.T. 4. E-04	L.T. 4. E-04	L.T. 6. E-04
ZN-65	L.T. 1. E-03	L.T. 8. E-04	L.T. 1. E-03	L.T. 2. E-03
ZR-95	L.T. 1. E-03	L.T. 6. E-04	L.T. 7. E-04	L.T. 2. E-03
RU-103	L.T. 2. E-03	L.T. 9. E-04	L.T. 1. E-03	L.T. 2. E-03
RU-106	L.T. 4. E-03	L.T. 3. E-03	L.T. 4. E-03	L.T. 7. E-03
I-131	L.T. 2. E+00	L.T. 9. E-02	L.T. 1. E-01	L.T. 7. E-01
CS-134	L.T. 3. E-04	L.T. 3. E-04	L.T. 5. E-04	L.T. 7. E-04
CS-137	L.T. 5. E-04	L.T. 3. E-04	L.T. 4. E-04	L.T. 7. E-04
BA-140	L.T. 1. E-01	L.T. 1. E-02	L.T. 2. E-02	L.T. 7. E-02
CE-141	L.T. 3. E-03	L.T. 1. E-03	L.T. 2. E-03	L.T. 4. E-03
CE-144	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 4. E-03
RA-226	L.T. 8. E-03	L.T. 8. E-03	L.T. 5. E-03	L.T. 1. E-02
TH-228	L.T. 6. E-04	L.T. 4. E-04	L.T. 2. E-03	L.T. 5. E-03

VII-3
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 FISH
 (PCI/KG WET)
 STATION NUMBER 28

DATE COLLECTED: 06/20	06/20	06/20	06/20	09/26	09/26
CATFISH	CARP	QA	CARP	CARP	CATFISH

RADIOCHEMICAL ANALYSIS:

GR-B	4.4 ± 0.2	E+03	6.6 ± 0.3	E+03	5.2 ± 0.3	E+03	2.4 ± 0.1	E+03	2.0 ± 0.1	E+03
SR-89	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 5.	E 00	L.T. 3.	E 00
SR-90	4.5 ± 2.5	E 00	L.T. 3.	E 00	6.7 ± 3.0	E 00	1.2 ± 0.1	E+01	7.8 ± 1.0	E 00

GAMMA SPECTRUM
 ANALYSIS:

BE-7	L.T. 3.	E+01	L.T. 7.	E+01	L.T. 3.	E+01	L.T. 2.	E+02	L.T. 2.	E+02
K-40	2.80 ± 0.1	E+03	3.09 ± 0.1	E+03	2.95 ± 0.1	E+03	3.06 ± 0.2	E+03	2.83 ± 0.2	E+03
MN-54	L.T. 4.	E 00	L.T. 6.	E 00	L.T. 4.	E 00	L.T. 2.	E+01	L.T. 2.	E+01
CO-58	L.T. 4.	E 00	L.T. 8.	E 00	L.T. 4.	E 00	L.T. 2.	E+01	L.T. 2.	E+01
FE-59	L.T. 9.	E 00	L.T. 2.	E+01	L.T. 9.	E 00	L.T. 5.	E+01	L.T. 5.	E+01
CO-60	L.T. 4.	E 00	L.T. 5.	E 00	L.T. 4.	E 00	L.T. 2.	E+01	L.T. 2.	E+01
ZN-65	L.T. 8.	E 00	L.T. 1.	E+01	L.T. 9.	E 00	L.T. 5.	E+01	L.T. 5.	E+01
ZR-95	L.T. 7.	E 00	L.T. 8.	E 00	L.T. 6.	E 00	L.T. 2.	E+01	L.T. 2.	E+01
RU-103	L.T. 4.	E 00	L.T. 1.	E+01	L.T. 4.	E 00	L.T. 2.	E+01	L.T. 2.	E+01
RU-106	L.T. 3.	E+01	L.T. 5.	E+01	L.T. 3.	E+01	L.T. 2.	E+02	L.T. 2.	E+02
I-131	L.T. 1.	E+01	L.T. 3.	E+02	L.T. 1.	E+01	L.T. 5.	E+01	L.T. 6.	E+01
CS-134	L.T. 4.	E 00	L.T. 5.	E 00	L.T. 4.	E 00	L.T. 2.	E+01	L.T. 2.	E+01
CS-137	L.T. 4.	E 00	L.T. 5.	E 00	L.T. 4.	E 00	L.T. 2.	E+01	L.T. 2.	E+01
BA-140	L.T. 3.	E+01	L.T. 6.	E+01	L.T. 3.	E+01	L.T. 4.	E+01	L.T. 4.	E+01
CE-141	L.T. 7.	E 00	L.T. 1.	E+01	L.T. 6.	E 00	L.T. 3.	E+01	L.T. 3.	E+01
CE-144	L.T. 2.	E+01	L.T. 3.	E+01	L.T. 2.	E+01	L.T. 1.	E+02	L.T. 1.	E+02
RA-226	L.T. 1.	E+02	L.T. 2.	E+02	L.T. 1.	E+02	L.T. 3.	E+02	L.T. 4.	E+02
TH-228	L.T. 5.	E 00	L.T. 7.	E 00	7.37 ± 2.8	E 00	L.T. 2.	E+01	L.T. 2.	E+01

VII-3
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 FISH
 (PCI/KG WET)
 STATION NUMBER 35

DATE COLLECTED: 06/21/2001	06/21/2001	09/26	09/26
CARP	CATFISH	CARP	CATFISH

RADIOCHEMICAL ANALYSIS:

GR-B	5.9 ± 0.3	E+03	6.1 ± 0.2	E+03	6.2 ± 0.2	E+03	3.1 ± 0.1	E+03
SR-89	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 9.	E 00	L.T. 3.	E 00
SR-90	L.T. 6.	E 00	L.T. 4.	E 00	L.T. 5.	E 00	L.T. 1.	E 00

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 3.	E+01	L.T. 4.	E+01	L.T. 3.	E+02	L.T. 2.	E+02
K-40	2.61 ± 0.11	E+03	3.39 ± 0.11	E+03	2.38 ± 0.41	E+03	3.13 ± 0.21	E+03
MN-54	L.T. 3.	E 00	L.T. 5.	E 00	L.T. 4.	E+01	L.T. 2.	E+01
CO-58	L.T. 4.	E 00	L.T. 5.	E 00	L.T. 4.	E+01	L.T. 2.	E+01
FE-59	L.T. 8.	E 00	L.T. 1.	E+01	L.T. 8.	E+01	L.T. 5.	E+01
CO-60	L.T. 6.	E 00	L.T. 4.	E 00	L.T. 3.	E+01	L.T. 2.	E+01
ZN-65	L.T. 7.	E 00	L.T. 1.	E+01	L.T. 9.	E+01	L.T. 5.	E+01
ZR-95	L.T. 3.	E 00	L.T. 5.	E 00	L.T. 4.	E+01	L.T. 2.	E+01
RU-103	L.T. 4.	E 00	L.T. 5.	E 00	L.T. 4.	E+01	L.T. 3.	E+01
RU-106	L.T. 3.	E+01	L.T. 4.	E+01	L.T. 3.	E+02	L.T. 2.	E+02
I-131	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 1.	E+02	L.T. 6.	E+01
CS-134	L.T. 3.	E 00	L.T. 4.	E 00	L.T. 4.	E+01	L.T. 3.	E+01
CS-137	L.T. 5.	E 00	L.T. 4.	E 00	L.T. 4.	E+01	L.T. 2.	E+01
BA-140	L.T. 7.	E 00	L.T. 1.	E+01	L.T. 8.	E+01	L.T. 5.	E+01
CE-141	L.T. 5.	E 00	L.T. 8.	E 00	L.T. 6.	E+01	L.T. 3.	E+01
CE-144	L.T. 2.	E+01	L.T. 3.	E+01	L.T. 2.	E+02	L.T. 1.	E+02
RA-226	L.T. 8.	E+01	L.T. 1.	E+02	L.T. 1.	E+03	L.T. 4.	E+02
TH-228	L.T. 4.	E 00	L.T. 1.	E+01	L.T. 7.	E+01	L.T. 4.	E+01

VII-4
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 MILK NEAREST PRODUCER
 (PCI/LITER)
 STATION NUMBER 61

DATE COLLECTED: 07/10/2001 07/24/2001 08/07/2001 08/21/2001 09/04/2001

RADIOCHEMICAL ANALYSIS:

SR-89			L.T. 2.	E 00 (b)			L.T. 2.	E 00 (b)		
SR-90			1.1 ± 0.2	E 00 (b)			7.1 ± 1.6	E-01 (b)		
I-131	L.T. 3.	E-01	L.T. 2.	E-01	L.T. 1.	E-01	L.T. 2.	E-01	L.T. 2.	E-01
CA(gm/liter)			1.40 ± 0.14	E 00 (b)			1.92 ± 0.19	E 00 (b)		

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 3.	E+01	L.T. 5.	E+01	L.T. 5.	E+01	L.T. 3.	E+01	L.T. 4.	E+01
K-40	1.13 ± 0.08	E+03	1.54 ± 0.08	E+03	1.22 ± 0.07	E+03	1.17 ± 0.07	E+03	1.08 ± 0.07	E+03
MN-54	L.T. 4.	E+00	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 3.	E+00	L.T. 5.	E+00
CO-58	L.T. 4.	E+00	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 3.	E+00	L.T. 5.	E+00
FE-59	L.T. 9.	E+00	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 8.	E+00	L.T. 1.	E+01
CO-60	L.T. 4.	E+00	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 3.	E+00	L.T. 5.	E+00
ZN-65	L.T. 9.	E+00	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 8.	E+00	L.T. 1.	E+01
ZR-95	L.T. 4.	E+00	L.T. 6.	E+00	L.T. 5.	E+00	L.T. 4.	E+00	L.T. 5.	E+00
RU-103	L.T. 4.	E+00	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 4.	E+00	L.T. 5.	E+00
RU-106	L.T. 3.	E+01	L.T. 5.	E+01	L.T. 5.	E+01	L.T. 3.	E+01	L.T. 5.	E+01
I-131	L.T. 4.	E+00	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 6.	E+00	L.T. 6.	E+00
CS-134	L.T. 4.	E+00	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 3.	E+00	L.T. 6.	E+00
CS-137	L.T. 5.	E+00	L.T. 6.	E+00	L.T. 7.	E+00	L.T. 4.	E+00	L.T. 5.	E+00
BA-140	L.T. 5.	E+00	L.T. 9.	E+00	L.T. 8.	E+00	L.T. 6.	E+00	L.T. 6.	E+00
CE-141	L.T. 6.	E+00	L.T. 9.	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. 4.	E+01	L.T. 3.	E+01	L.T. 2.	E+01	L.T. 3.	E+01
RA-226	L.T. 1.	E+02	L.T. 1.	E+02	L.T. 1.	E+02	L.T. 1.	E+02	L.T. 9.	E+01
TH-228	L.T. 9.	E+00	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 7.	E+00	L.T. 1.	E+01

(a) Data not reported. Declared invalid due to sample mount not decaying properly.
 (b) Monthly composite.

VII-4
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 MILK NEAREST PRODUCER
 (PCI/LITER)
 STATION NUMBER 61

DATE COLLECTED: 09/18/2001 10/09/2001 11/06/2001 12/04/2001

RADIOCHEMICAL ANALYSIS:

SR-89	L.T. 1.	E 00 (b)	L.T. 2.	E 00	L.T. 2.	E 00	L.T. 1.	E 00
SR-90	7.4 ± 2.3	E-01 (b)	9.6 ± 2.2	E-01	6.6 ± 2.2	E-01	8.1 ± 1.7	E-01
I-131	L.T. 2.	E-01	L.T. 2.	E-01	L.T. 2.	E-01	L.T. 1.	E-01
CA(gm/liter)	1.93 ± 0.19	E 00 (b)	1.10 ± 0.11	E 00	7.90 ± 0.79	E 00	1.10 ± 0.11	E 00

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 4.	E+01	L.T. 5.	E+01	L.T. 4.	E+01	L.T. 5.	E+01
K-40	1.09 ± 0.07	E+03	1.07 ± 0.07	E+03	1.26 ± 0.08	E+03	1.15 ± 0.08	E+03
MN-54	L.T. 5.	E+00	L.T. 6.	E+00	L.T. 4.	E+00	L.T. 6.	E+00
CO-58	L.T. 5.	E+00	L.T. 6.	E+00	L.T. 4.	E+00	L.T. 6.	E+00
FE-59	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 9.	E+00	L.T. 1.	E+01
CO-60	L.T. 5.	E+00	L.T. 6.	E+00	L.T. 4.	E+00	L.T. 6.	E+00
ZN-65	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 1.	E+01
ZR-95	L.T. 5.	E+00	L.T. 5.	E+00	L.T. 4.	E+00	L.T. 6.	E+00
RU-103	L.T. 5.	E+00	L.T. 6.	E+00	L.T. 4.	E+00	L.T. 6.	E+00
RU-106	L.T. 4.	E+01	L.T. 5.	E+01	L.T. 4.	E+01	L.T. 5.	E+01
I-131	L.T. 9.	E+00	L.T. 9.	E+00	L.T. 7.	E+00	L.T. 1.	E+01
CS-134	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 4.	E+00	L.T. 6.	E+00
CS-137	L.T. 5.	E+00	L.T. 6.	E+00	L.T. 5.	E+00	L.T. 6.	E+00
BA-140	L.T. 7.	E+00	L.T. 9.	E+00	L.T. 6.	E+00	L.T. 9.	E+00
CE-141	L.T. 7.	E+00	L.T. 8.	E+00	L.T. 5.	E+00	L.T. 9.	E+00
CE-144	L.T. 3.	E+01	L.T. 3.	E+01	L.T. 2.	E+01	L.T. 3.	E+01
RA-226	L.T. 9.	E+01	1.13 ± 0.49	E+02	L.T. 1.	E+02	L.T. 1.	E+02
TH-228	L.T. 1.	E+01	L.T. 9.	E+00	L.T. 6.	E+00	L.T. 1.	E+01

(a) Data not reported. Declared invalid due to sample mount not decaying properly.
 (b) Monthly composite.

VII-5
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 MILK OTHER PRODUCER
 (PCI/LITER)
 STATION NUMBER 99

DATE COLLECTED: 01/09/2001 04/10/2001 07/10/2001 10/09/2001

RADIOCHEMICAL ANALYSIS:

SR-89	L.T. 1.	E 00	L.T. 2.	E 00	L.T. 5.	E-01	L.T. 1.	E 00
SR-90	1.5 ± 0.3	E 00	L.T. 6.	E-01	7.8 ± 1.5	E-01	1.4 ± 0.4	E 00
I-131	(a)		L.T. 1.	E-01	L.T. 2.	E-01	L.T. 2.	E-01
CA(gm/liter)	1.2 ± 0.1	E+00	1.2 ± 0.1	E 00	1.1 ± 0.1	E 00	1.20 ± 0.12	E 00

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 4.	E+01	L.T. 4.	E+01	L.T. 3.	E+01	L.T. 6.	E+01
K-40	1.26 ± 0.08	E+03	1.47 ± 0.10	E+03	1.35 ± 0.08	E+03	1.04 ± 0.09	E+03
MN-54	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 7.	E+00
CO-58	L.T. 5.	E+00	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 8.	E+00
FE-59	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 8.	E+00	L.T. 2.	E+01
CO-60	L.T. 4.	E+00	L.T. 5.	E+00	L.T. 4.	E+00	L.T. 7.	E+00
ZN-65	L.T. 9.	E+00	L.T. 1.	E+01	L.T. 8.	E+00	L.T. 2.	E+01
ZR-95	L.T. 8.	E+00	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 8.	E+00
RU-103	L.T. 5.	E+00	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 8.	E+00
RU-106	L.T. 4.	E+01	L.T. 4.	E+01	L.T. 3.	E+01	L.T. 6.	E+01
I-131	L.T. 1.	E+01	L.T. 7.	E+00	L.T. 4.	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. 8.	E+00
CS-137	L.T. 4.	E+00	L.T. 7.	E+00	L.T. 4.	E+00	L.T. 7.	E+00
BA-140	L.T. 3.	E+01	L.T. 7.	E+00	L.T. 5.	E+00	L.T. 1.	E+01
CE-141	L.T. 8.	E+00	L.T. 7.	E+00	L.T. 5.	E+00	L.T. 1.	E+01
CE-144	L.T. 3.	E+01	L.T. 3.	E+01	L.T. 2.	E+01	L.T. 4.	E+01
RA-226	L.T. 1.	E+01	L.T. 1.	E+02	L.T. 1.	E+02	L.T. 1.	E+02
TH-228	L.T. 7.	E+00	L.T. 1.	E+01	5.94 ± 2.62	E+00	L.T. 1.	E+01

(a) Due to delay in analysis, the sample value was declared invalid.

VII-5
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK OTHER PRODUCER
(PCI/LITER)
STATION NUMBER 100

DATE COLLECTED: 01/09/2001 04/10/2001 07/10/2001 10/09/2001

RADIOCHEMICAL ANALYSIS:

SR-89	L.T. 8.	E-01	L.T. 8.	E-01	L.T. 5.	E-01	L.T. 8.	E-01
SR-90	6.6 ± 1.8	E-01	7.9 ± 2.2	E-01	7.6 ± 1.4	E-01	1.8 ± 0.3	E 00
I-131	(a)		L.T. 1.	E-01	L.T. 2.	E-01	L.T. 2.	E-01
CA(gm/liter)	1.0 ± 0.1	E+00	9.6 ± 0.1	E-01	0.85 ± 0.08	E+00	1.30 ± 0.13	E 00

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 5.	E+01	L.T. 4.	E+01	L.T. 3.	E+01	L.T. 4.	E+01
K-40	1.40 ± 0.11	E+03	1.36 ± 0.08	E+03	1.19 ± 0.08	E+03	1.20 ± 0.07	E+03
MN-54	L.T. 6.	E+00	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 5.	E+00
CO-58	L.T. 7.	E+00	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 5.	E+00
FE-59	L.T. 2.	E+01	L.T. 9.	E+00	L.T. 8.	E+00	L.T. 1.	E+01
CO-60	L.T. 6.	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. 9.	E+00	L.T. 8.	E+00	L.T. 1.	E+01
ZR-95	L.T. 1.	E+01	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 5.	E+00
RU-103	L.T. 7.	E+00	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 6.	E+00
RU-106	L.T. 5.	E+01	L.T. 4.	E+01	L.T. 3.	E+01	L.T. 5.	E+01
I-131	L.T. 2.	E+01	L.T. 7.	E+00	L.T. 5.	E+00	L.T. 9.	E+00
CS-134	L.T. 5.	E+00	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 6.	E+00
CS-137	L.T. 6.	E+00	L.T. 4.	E+00	L.T. 4.	E+00	L.T. 7.	E+00
BA-140	L.T. 4.	E+01	L.T. 6.	E+00	L.T. 5.	E+00	L.T. 7.	E+00
CE-141	L.T. 1.	E+01	L.T. 7.	E+00	L.T. 6.	E+00	L.T. 5.	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. 2.	E+01	L.T. 1.	E+02	L.T. 1.	E+02	L.T. 9.	E+01
TH-228	L.T. 8.	E+00	L.T. 9.	E+00	L.T. 9.	E+00	L.T. 1.	E+01

(a) Due to delay in analysis, the sample value was declared invalid.

VII-6
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 WATER - GROUND
 (PCI/LITER)
 STATION NUMBER 11

DATE COLLECTED: 01/16/01 04/17/01 07/17/01 10/16/01

RADIOCHEMICAL ANALYSIS:

GR-A	L.T. 3.	E 00	L.T. 2.	E+00	L.T. 6.	E+00	L.T. 4.	E+00
GR-B	7.8 ± 1.8	E 00	5.4 ± 1.6	E+00	6.9 ± 2.9	E+00	8.3 ± 3.0	E+00
I-131	L.T. 7.	E-01	L.T. 2.	E-01	L.T. 3.	E-01	L.T. 3.	E-01

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 2.	E+02	L.T. 5.	E+01	L.T. 5.	E+01	L.T. 4.	E+01
K-40	L.T. 4.	E+02	L.T. 9.	E+01	L.T. 9.	E+01	L.T. 1.	E+02
MN-54	L.T. 2.	E+01 (a)	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 5.	E+00
CO-58	L.T. 2.	E+01 (a)	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 5.	E+00
FE-59	L.T. 4.	E+01 (a)	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 1.	E+01
CO-60	L.T. 2.	E+01 (a)	L.T. 5.	E+00	L.T. 6.	E+00	L.T. 5.	E+00
ZN-65	L.T. 4.	E+01 (a)	L.T. 1.	E+01	L.T. 1.	E+01	L.T. 1.	E+01
ZR-95	L.T. 4.	E+01 (a)	L.T. 5.	E+00	L.T. 6.	E+00	L.T. 5.	E+00
RU-103	L.T. 2.	E+01	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 6.	E+00
RU-106	L.T. 2.	E+02	L.T. 5.	E+01	L.T. 5.	E+01	L.T. 5.	E+01
I-131	L.T. 4.	E+01	L.T. 9.	E+00	L.T. 1.	E+01	L.T. 8.	E+00
CS-134	L.T. 2.	E+01 (a)	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 5.	E+00
CS-137	L.T. 2.	E+01 (a)	L.T. 6.	E+00	L.T. 6.	E+00	L.T. 5.	E+00
BA-140	L.T. 1.	E+02 (a)	L.T. 9.	E+00	L.T. 9.	E+00	L.T. 8.	E+00
CE-141	L.T. 3.	E+01	L.T. 8.	E+00	L.T. 9.	E+00	L.T. 7.	E+00
CE-144	L.T. 1.	E+02	L.T. 3.	E+01	L.T. 4.	E+01	L.T. 3.	E+01
RA-226	L.T. 6.	E+01	L.T. 9.	E+01	L.T. 1.	E+02	L.T. 2.	E+02
TH-228	L.T. 5.	E+01	L.T. 1.	E+01	L.T. 1.	E+01	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
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(a) Due to limited sample volume, the LLD was missed.

VII-6
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 WATER - GROUND
 (PCI/LITER)
 STATION NUMBER 47

DATE COLLECTED: 01/16/01 04/17/01 07/17/01 10/16/01

RADIOCHEMICAL ANALYSIS:

GR-A	3.1 ± 2.9	E 00	L.T. 3.	E 00	L.T. 6.	E 00	L.T. 4.	E 00
GR-B	9.0 ± 1.9	E 00	4.0 ± 2.0	E 00	7.2 ± 2.8	E 00	5.5 ± 2.8	E 00
I-131	L.T. 4.	E-01	L.T. 5.	E-01	L.T. 2.	E-01	L.T. 2.	E-01

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 1.	E+02	L.T. 3.	E+01	L.T. 6.	E+01	L.T. 3.	E+01
K-40	L.T. 2.	E+02	L.T. 8.	E+01	L.T. 1.	E+02	L.T. 8.	E+01
MN-54	L.T. 2.	E+01 (a)	L.T. 4.	E+00	L.T. 7.	E+00	L.T. 3.	E+00
CO-58	L.T. 2.	E+01 (a)	L.T. 4.	E+00	L.T. 7.	E+00	L.T. 3.	E+00
FE-59	L.T. 3.	E+01	L.T. 7.	E+00	L.T. 1.	E+01	L.T. 7.	E+00
CO-60	L.T. 1.	E+01	L.T. 3.	E+00	L.T. 6.	E+00	L.T. 6.	E+00
ZN-65	L.T. 4.	E+01 (a)	L.T. 8.	E+00	L.T. 2.	E+01	L.T. 7.	E+00
ZR-95	L.T. 3.	E+01	L.T. 3.	E+00	L.T. 7.	E+00	L.T. 4.	E+00
RU-103	L.T. 2.	E+01	L.T. 4.	E+00	L.T. 7.	E+00	L.T. 3.	E+00
RU-106	L.T. 1.	E+02	L.T. 3.	E+01	L.T. 6.	E+01	L.T. 3.	E+01
I-131	L.T. 3.	E+01	L.T. 5.	E+00	L.T. 9.	E+00	L.T. 5.	E+00
CS-134	L.T. 2.	E+01 (a)	L.T. 4.	E+00	L.T. 8.	E+00	L.T. 3.	E+00
CS-137	L.T. 2.	E+01 (a)	L.T. 4.	E+00	L.T. 7.	E+00	L.T. 5.	E+00
BA-140	L.T. 7.	E+01 (a)	L.T. 5.	E+00	L.T. 9.	E+00	L.T. 5.	E+00
CE-141	L.T. 2.	E+01	L.T. 5.	E+00	L.T. 1.	E+01	L.T. 5.	E+00
CE-144	L.T. 8.	E+01	L.T. 2.	E+01	L.T. 4.	E+01	L.T. 2.	E+01
RA-226	L.T. 4.	E+01	L.T. 8.	E+01	L.T. 2.	E+02	L.T. 1.	E+02
TH-228	L.T. 2.	E+01	L.T. 7.	E+00	L.T. 1.	E+01	L.T. 5.	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
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(a) Due to limited sample volume, the LLD was missed.

VII-7
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 WATER - RIVER
 (PCI/LITER)
 STATION NUMBER 12

DATE COLLECTED:	02/06/01	04/03/01	05/01/01	06/05/01	07/03/01
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 7. E-01	L.T. 8. E-01	L.T. 7. E-01	L.T. 5. E-01	L.T. 5. E-01
SR-90	L.T. 4. E-01	L.T. 3. E-01	L.T. 9. E-01	L.T. 1. E+00	L.T. 6. E-01
GR-A (Dissolved)	6.7 ± 2.9 E+00	5.2 ± 3.7 E+00	L.T. 3. E+00	L.T. 6. E+00	L.T. 4. E+00
GR-A (Suspended)	4.3 ± 3.0 E-01	3.0 ± 1.9 E+00	6.0 ± 2.3 E+01	6.7 ± 4.9 E+00	L.T. 2. E+00
GR-B (Dissolved)	9.7 ± 1.6 E+00	8.8 ± 2.9 E+00	6.8 ± 3.3 E+00	7.9 ± 3.0 E+00	9.6 ± 2.9 E+00
GR-B (Suspended)	1.0 ± 0.5 E+00	3.9 ± 2.0 E+00	1.2 ± 0.1 E+02	2.2 ± 0.4 E+01	6.1 ± 2.2 E+00
I-131	L.T. 6. E-01	L.T. 8. E-01	L.T. 1. E-01	4.8 ± 1.2 E-01	L.T. 3. E-01
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 5. E+01	L.T. 3. E+01	L.T. 3. E+01	L.T. 4. E+01	L.T. 4. E+01
K-40	L.T. 9. E+01	L.T. 6. E+01	L.T. 7. E+01	L.T. 1. E+02	L.T. 8. E+01
MN-54	L.T. 6. E+00	L.T. 4. E+00	L.T. 4. E+00	L.T. 5. E+00	L.T. 5. E+00
CO-58	L.T. 6. E+00	L.T. 4. E+00	L.T. 4. E+01	L.T. 5. E+00	L.T. 5. E+00
FE-59	L.T. 1. E+01	L.T. 8. E+00	L.T. 7. E+00	L.T. 1. E+01	L.T. 9. E+00
CO-60	L.T. 5. E+00	L.T. 4. E+00	L.T. 4. E+00	L.T. 5. E+00	L.T. 5. E+00
ZN-65	L.T. 1. E+01	L.T. 9. E+00	L.T. 7. E+00	L.T. 1. E+01	L.T. 1. E+01
ZR-95	L.T. 1. E+01	L.T. 4. E+00	L.T. 4. E+00	L.T. 5. E+00	L.T. 5. E+00
RU-103	L.T. 6. E+00	L.T. 4. E+00	L.T. 4. E+00	L.T. 5. E+00	L.T. 5. E+00
RU-106	L.T. 5. E+01	L.T. 3. E+01	L.T. 3. E+01	L.T. 4. E+01	L.T. 5. E+01
I-131	L.T. 1. E+01	L.T. 9. E+00	L.T. 7. E+00	L.T. 7. E+00	L.T. 7. E+00
CS-134	L.T. 6. E+00	L.T. 4. E+00	L.T. 3. E+00	L.T. 5. E+00	L.T. 6. E+00
CS-137	L.T. 6. E+00	L.T. 5. E+00	L.T. 3. E+00	L.T. 5. E+00	L.T. 5. E+00
BA-140	L.T. 3. E+01	L.T. 7. E+00	L.T. 6. E+00	L.T. 7. E+00	L.T. 7. E+00
CE-141	L.T. 9. E+00	L.T. 7. E+00	L.T. 6. E+00	L.T. 7. E+00	L.T. 7. E+00
CE-144	L.T. 3. E+01	L.T. 2. E+01	L.T. 2. E+01	L.T. 3. E+01	L.T. 3. E+01
RA-226	L.T. 1. E+02	L.T. 2. E+02	L.T. 1. E+02	L.T. 2. E+02	L.T. 9. E+01
TH-228	L.T. 9. E+00	L.T. 9. E+00	L.T. 6. E+00	L.T. 7. E+00	L.T. 9. E+00
TRITIUM ANALYSIS:				04/03-06/05	
H-3				L.T. 1. E+02	

(a) Sample not collected.
 (b) Data not reported. Declared invalid due to sample mount not decaying properly.

VII-7
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 WATER - RIVER
 (PCI/LITER)
 STATION NUMBER 12

DATE COLLECTED:	08/07/01	09/04/01	10/02/01	11/06/01	12/04/01
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 8. E-01	L.T. 5. E-01	L.T. 4. E-01	L.T. 5. E-01	L.T. 6. E-01
SR-90	L.T. 7. E-01	L.T. 8. E-01	L.T. 6. E-01	L.T. 7. E-01	L.T. 3. E-01
GR-A (Dissolved)	3.9 ± 3.3 E+00	L.T. 4. E+00	L.T. 3. E+00	L.T. 4. E+00	L.T. 6. E+00
GR-A (Suspended)	L.T. 1. E+00	L.T. 1. E+00	1.4 ± 1.2 E+00	L.T. 2. E+00	L.T. 1. E+01
GR-B (Dissolved)	8.8 ± 2.8 E+00	9.5 ± 2.8 E+00	1.1 ± 0.3 E+01	7.0 ± 2.7 E+00	9.4 ± 2.9 E+00
GR-B (Suspended)	3.7 ± 1.8 E+00	L.T. 2. E+00	2.8 ± 1.7 E+00	L.T. 3. E+00	9.9 ± 0.9 E+01
I-131	L.T. 2. E-01	L.T. 2. E-01	L.T. 3. E-01	L.T. 4. E-01	L.T. 2. E-01
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 4. E+01	L.T. 3. E+01	L.T. 2. E+01	L.T. 3. E+01	L.T. 2. E+01
K-40	L.T. 9. E+01	L.T. 7. E+01	L.T. 6. E+01	L.T. 6. E+01	L.T. 6. E+01
MN-54	L.T. 4. 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. 5. E+00	L.T. 4. E+00	L.T. 3. E+00	L.T. 3. E+00	L.T. 3. E+00
FE-59	L.T. 1. E+01	L.T. 7. E+00	L.T. 6. E+00	L.T. 6. E+00	L.T. 6. E+00
CO-60	L.T. 4. E+00	L.T. 3. E+00	L.T. 3. E+00	L.T. 3. E+00	L.T. 3. E+00
ZN-65	L.T. 9. E+00	L.T. 7. E+00	L.T. 6. E+00	L.T. 6. E+00	L.T. 6. E+00
ZR-95	L.T. 5. E+00	L.T. 4. E+00	L.T. 3. E+00	L.T. 3. E+00	L.T. 3. E+00
RU-103	L.T. 5. E+00	L.T. 4. E+00	L.T. 3. E+00	L.T. 3. E+00	L.T. 3. E+00
RU-106	L.T. 4. E+01	L.T. 3. E+01	L.T. 3. E+01	L.T. 3. E+01	L.T. 2. E+01
I-131	L.T. 1. E+01	L.T. 5. E+00	L.T. 4. E+00	L.T. 5. E+00	L.T. 7. E+00
CS-134	L.T. 4. E+00	L.T. 4. E+00	L.T. 3. 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. 3. E+00	L.T. 3. E+00	L.T. 3. E+00
BA-140	L.T. 9. E+00	L.T. 5. E+00	L.T. 4. E+00	L.T. 5. E+00	L.T. 6. E+00
CE-141	L.T. 7. E+00	L.T. 6. E+00	L.T. 4. E+00	L.T. 5. E+00	L.T. 5. 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. 1. E+02	L.T. 1. E+02	L.T. 1. E+02	L.T. 1. E+02	L.T. 1. E+02
TH-228	L.T. 6. E+00	L.T. 9. E+00	L.T. 5. E+00	L.T. 5. E+00	L.T. 4. E+00
TRITIUM ANALYSIS:					
H-3		07/03-09/04 L.T. 9. E+01			10/02-12/04 9.6 ± 6.1 E+01

(a) Sample not collected.
 (b) Data not reported. Declared invalid due to sample mount not decaying properly.

VII-7
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 WATER - RIVER
 (PCI/LITER)
 STATION NUMBER 28

DATE COLLECTED:	01/02/01	02/06/01	03/06/01	04/03/01	05/01/01
RADIOCHEMICAL ANALYSIS:					
SR-89	(a)	L.T. 7. E-01	L.T. 2. E+00	L.T. 7. E-01	L.T. 7. E-01
SR-90	(a)	L.T. 7. E-01	L.T. 6. E-01	3.2 ± 1.6 E-01	L.T. 3. E+00
GR-A (Dissolved)	(a)	3.1 ± 1.8 E+00	L.T. 4. E+00	L.T. 4. E+00	L.T. 3. E+00
GR-A (Suspended)	(a)	L.T. 3. E-01	L.T. 4. E+00	L.T. 1. E+00	7.4 ± 3.9 E+00
GR-B (Dissolved)	(a)	7.4 ± 1.3 E+00	9.6 ± 2.6 E+00	8.3 ± 2.9 E+00	7.9 ± 3.3 E+00
GR-B (Suspended)	(a)	1.3 ± 0.5 E+00	L.T. 4. E+00	L.T. 3. E+00	1.1 ± 0.3 E+01
I-131	(a)	L.T. 4. E-01	(b)	L.T. 7. E-01	L.T. 1. E-01
GAMMA SPECTRUM ANALYSIS:					
BE-7	(a)	L.T. 6. E+01	L.T. 4. E+01	L.T. 4. E+01	L.T. 4. E+01
K-40	(a)	L.T. 1. E+02	L.T. 7. E+01	L.T. 8. E+01	L.T. 8. E+01
MN-54	(a)	L.T. 6. E+00	L.T. 3. E+00	L.T. 4. E+00	L.T. 4. E+00
CO-58	(a)	L.T. 7. E+00	L.T. 4. E+00	L.T. 5. E+00	L.T. 4. E+00
FE-59	(a)	L.T. 1. E+01	L.T. 8. E+00	L.T. 9. E+00	L.T. 8. E+00
CO-60	(a)	L.T. 6. E+00	L.T. 3. E+00	L.T. 4. E+00	L.T. 4. E+00
ZN-65	(a)	L.T. 1. E+01	L.T. 7. E+00	L.T. 1. E+01	L.T. 8. E+00
ZR-95	(a)	L.T. 1. E+01	L.T. 7. E+00	L.T. 4. E+00	L.T. 4. E+00
RU-103	(a)	L.T. 7. E+00	L.T. 5. E+00	L.T. 5. E+00	L.T. 4. E+00
RU-106	(a)	L.T. 6. E+01	L.T. 3. E+01	L.T. 4. E+01	L.T. 4. E+01
I-131	(a)	L.T. 1. E+01	L.T. 2. E+01	L.T. 1. E+01	L.T. 8. E+00
CS-134	(a)	L.T. 7. E+00	L.T. 3. E+00	L.T. 5. E+00	L.T. 4. E+00
CS-137	(a)	L.T. 6. E+00	L.T. 4. E+00	L.T. 4. E+00	L.T. 4. E+00
BA-140	(a)	L.T. 3. E+01	L.T. 4. E+01	L.T. 9. E+00	L.T. 7. E+00
CE-141	(a)	L.T. 1. E+01	L.T. 8. E+00	L.T. 8. E+00	L.T. 7. E+00
CE-144	(a)	L.T. 4. E+01	L.T. 2. E+01	L.T. 3. E+01	L.T. 3. E+01
RA-226	(a)	L.T. 1. E+02	L.T. 1. E+02	L.T. 8. E+01	L.T. 1. E+02
TH-228	(a)	L.T. 9. E+00	L.T. 9. E+00	L.T. 8. E+00	L.T. 6. E+00
TRITIUM ANALYSIS:					
H-3			01/02-03/06 L.T. 1. E 02		

(a) Sample not collected.
 (b) Data not reported. Declared invalid due to sample mount not decaying properly.

VII-7
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 WATER - RIVER
 (PCI/LITER)
 STATION NUMBER 28

DATE COLLECTED:	06/05/01	07/03/01	08/07/01	09/04/01	10/02/01
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 5. E-01	L.T. 4. E-01	L.T. 6. E-01	L.T. 8. E-01	L.T. 4. E-01
SR-90	L.T. 6. E-01	L.T. 7. E-01	L.T. 6. E-01	L.T. 1. E+00	L.T. 7. E-01
GR-A (Dissolved)	L.T. 6. E+00	4.4 ± 3.7 E+00	L.T. 4. E+00	L.T. 4. E+00	L.T. 3. E+00
GR-A (Suspended)	L.T. 3. E+00	L.T. 2. E+00	L.T. 1. E+00	L.T. 2. E+00	2.7 ± 1.6 E+00
GR-B (Dissolved)	9.2 ± 3.0 E+00	8.5 ± 2.8 E+00	9.1 ± 2.9 E+00	7.4 ± 2.6 E+00	6.9 ± 2.6 E+00
GR-B (Suspended)	3.8 ± 2.1 E+00	4.2 ± 1.9 E+00	L.T. 2. E+00	3.7 ± 1.8 E+00	4.8 ± 1.9 E+00
I-131	4.6 ± 1.4 E-01	L.T. 4. E-01	L.T. 4. E-01	L.T. 2. E-01	L.T. 4. E-01
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 2. E+01	L.T. 4. E+01	L.T. 3. E+01	L.T. 4. E+01	L.T. 5. E+01
K-40	L.T. 7. E+01	L.T. 8. E+01	L.T. 7. E+01	L.T. 1. E+02	L.T. 8. E+01
MN-54	L.T. 3. E+00	L.T. 4. E+00	L.T. 3. E+00	L.T. 4. E+00	L.T. 6. E+00
CO-58	L.T. 3. E+00	L.T. 4. E+00	L.T. 3. E+00	L.T. 4. E+00	L.T. 6. E+00
FE-59	L.T. 5. E+00	L.T. 9. E+00	L.T. 7. E+00	L.T. 8. E+00	L.T. 1. E+01
CO-60	L.T. 3. E+00	L.T. 4. E+00	L.T. 3. E+00	L.T. 4. E+00	L.T. 5. E+00
ZN-65	L.T. 6. E+00	L.T. 1. E+01	L.T. 6. E+00	L.T. 9. E+00	L.T. 1. E+01
ZR-95	L.T. 3. E+00	L.T. 4. E+00	L.T. 3. E+00	L.T. 4. E+00	L.T. 5. 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. 6. E+00
RU-106	L.T. 3. E+01	L.T. 4. E+01	L.T. 3. E+01	L.T. 4. E+01	L.T. 5. E+01
I-131	L.T. 4. E+00	L.T. 6. E+00	L.T. 8. E+00	L.T. 5. E+00	L.T. 9. 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. 6. E+00
CS-137	L.T. 3. E+00	L.T. 5. E+00	L.T. 3. E+00	L.T. 5. E+00	L.T. 6. E+00
BA-140	L.T. 4. E+00	L.T. 6. E+00	L.T. 6. E+00	L.T. 5. E+00	L.T. 8. E+00
CE-141	L.T. 4. E+00	L.T. 4. 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. 3. E+01	L.T. 2. E+01	L.T. 3. E+01	L.T. 3. E+01
RA-226	L.T. 1. E+02	L.T. 9. E+01	L.T. 9. E+01	L.T. 2. E+02	L.T. 9. E+01
TH-228	L.T. 6. E+00	L.T. 6. E+00	L.T. 5. E+00	L.T. 8. E+00	L.T. 1. E+01
TRITIUM ANALYSIS:					
H-3	04/03-06/05 L.T. 1. E+02			07/03-09/04 L.T. 9. E+01	

(a) Sample not collected.
 (b) Data not reported. Declared invalid due to sample mount not decaying properly.

VII-7
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 WATER - RIVER
 (PCI/LITER)
 STATION NUMBER 35

DATE COLLECTED:	01/02/01	03/06/01	
RADIOCHEMICAL ANALYSIS:			
SR-89	(a)	L.T. 2.	E+00
SR-90	(a)	L.T. 7.	E-01
GR-A (Dissolved)	(a)	L.T. 4.	E+00
GR-A (Suspended)	(a)	1.9 ± 0.7	E+01
GR-B (Dissolved)	(a)	1.0 ± 0.3	E+01
GR-B (Suspended)	(a)	4.2 ± 0.4	E+01
I-131	(a)	(b)	
GAMMA SPECTRUM ANALYSIS:			
BE-7	(a)	L.T. 3.	E+01
K-40	(a)	L.T. 6.	E+01
MN-54	(a)	L.T. 3.	E+00
CO-58	(a)	L.T. 3.	E+00
FE-59	(a)	L.T. 8.	E+00
CO-60	(a)	L.T. 6.	E+00
ZN-65	(a)	L.T. 6.	E+00
ZR-95	(a)	L.T. 6.	E+00
RU-103	(a)	L.T. 4.	E+00
RU-106	(a)	L.T. 3.	E+01
I-131	(a)	L.T. 2.	E+01
CS-134	(a)	L.T. 3.	E+00
CS-137	(a)	L.T. 4.	E+00
BA-140	(a)	L.T. 3.	E+01
CE-141	(a)	L.T. 6.	E+00
CE-144	(a)	L.T. 2.	E+01
RA-226	(a)	L.T. 9.	E+01
TH-228	(a)	L.T. 7.	E+00
TRITIUM ANALYSIS:		01/02-03/06	
H-3		L.T. 1.	E+02

(a) Sample not collected.
 (b) Data not reported. Declared invalid due to sample mount not decaying properly.

VII-8
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD
milliRoentgen/Quarter

Sample Nuclide	Station Number	First Quarter 01/01-04/01	Second Quarter 04/16-07/05	Third Quarter 07/05-10/03	Fourth Quarter 10/03-01/03	Quarter Average ± 1 std dev.
TLD	01	3.5 ± 0.3	18.7 ± 1.0	8.2 ± 1.0	0.3 ± 1.7	7.7 ± 8.0
	02	0.8 ± 1.4	20.7 ± 1.0	7.1 ± 1.8	8.4 ± 1.1	9.3 ± 8.3
	03	0.1 ± 0.1	17.9 ± 1.0	11.2 ± 2.5	8.9 ± 0.4	9.5 ± 7.4
	04	0.3 ± 0.6	20.6 ± 1.7	10.6 ± 0.6	9.0 ± 2.3	10.1 ± 8.3
	05	2.3 ± 0.3	17.0 ± 3.1	7.7 ± 0.6	8.3 ± 0.5	8.8 ± 6.1
	06	8.4 ± 3.6	22.5 ± 2.3	8.6 ± 0.1	9.2 ± 1.6	12.2 ± 6.9
	07	0.0 ± 0.0	18.7 ± 1.7	9.9 ± 2.3	7.0 ± 0.3	8.9 ± 7.7
	08	0.1 ± 0.2	16.6 ± 0.7	11.7 ± 2.2	7.6 ± 2.7	9.0 ± 7.0
	09	2.4 ± 0.2	15.4 ± 1.0	9.1 ± 0.9	6.0 ± 2.6	8.2 ± 5.5
	10	1.8 ± 0.0	17.8 ± 2.2	9.3 ± 0.0	7.1 ± 1.7	9.0 ± 6.7
	20	5.4 ± 0.4	19.0 ± 4.0	10.5 ± 1.9	9.3 ± 2.1	11.1 ± 5.7
	44	5.5 ± 1.1	21.8 ± 3.5	14.4 ± 2.4	11.4 ± 0.9	13.3 ± 6.8
	56	1.6 ± 0.1	19.7 ± 2.6	11.4 ± 2.6	8.3 ± 1.3	10.3 ± 7.5
	58	1.2 ± 0.3	15.6 ± 1.9	11.7 ± 2.3	9.8 ± 1.6	9.6 ± 6.1
	59	14.3 ± 1.6	17.2 ± 1.5	10.6 ± 0.7	7.4 ± 0.5	12.4 ± 4.3
	66	2.2 ± 0.2	21.6 ± 6.0	13.9 ± 0.7	11.4 ± 0.5	12.3 ± 8.0
	67	5.5 ± 0.1	17.7 ± 3.1	11.9 ± 1.3	9.5 ± 1.5	11.2 ± 5.1
	71	1.6 ± 1.2	20.4 ± 1.8	11.1 ± 0.0	8.4 ± 2.3	10.4 ± 7.8
	79	4.7 ± 0.5	27.1 ± 5.7	10.7 ± 0.2	8.4 ± 0.8	12.7 ± 9.9
	80	3.3 ± 0.8	21.1 ± 2.5	11.0 ± 0.6	8.3 ± 0.5	10.9 ± 7.5
	81	3.9 ± 0.1	19.9 ± 7.3	11.6 ± 1.3	9.0 ± 3.0	11.1 ± 6.7
	82	3.7 ± 0.0	22.8 ± 2.7	13.6 ± 0.4	10.4 ± 3.3	12.6 ± 7.9
	83	3.8 ± 0.5	18.4 ± 3.1	12.1 ± 0.8	9.8 ± 1.1	11.0 ± 6.0
	84	0.9 ± 0.7	20.8 ± 1.4	13.0 ± 1.9	11.9 ± 0.6	11.7 ± 8.2
	85	12.4 ± 0.8	19.2 ± 2.2	12.6 ± 1.5	9.5 ± 0.0	13.4 ± 4.1

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(a) Sample could not be located at site.

VII-8
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD
 milliRoentgen/Quarter

Sample Nuclide	Station Number	First Quarter 01/01-04/01	Second Quarter 04/16-07/05	Third Quarter 07/05-10/03	Fourth Quarter 10/03-01/03	Quarter Average ± 1 std dev.
TLD	86	1.8 ± 0.5	20.2 ± 1.1	12.6 ± 4.0	8.8 ± 0.0	10.9 ± 7.7
	87	0.0 ± 0.9	20.6 ± 2.2	12.1 ± 1.0	7.0 ± 1.1	9.9 ± 8.7
	88	0.0 ± 0.6	18.5 ± 1.7	13.9 ± 0.0	9.8 ± 0.8	10.6 ± 7.9
	89	(a)	(a)	12.8 ± 1.4	9.3 ± 0.4	11.1 ± 2.5
	90	2.1 ± 0.3	17.8 ± 1.5	11.3 ± 0.9	6.9 ± 2.1	9.5 ± 6.7
	91	7.4 ± 0.9	20.3 ± 2.7	10.5 ± 1.0	9.5 ± 1.6	11.9 ± 5.7
	94	1.9 ± 0.5	19.5 ± 2.8	13.4 ± 2.7	9.8 ± 1.2	11.2 ± 7.4
Average/Quarter		3.2 ± 3.5 mR/90 days	19.4 2.3 mR/80 days	11.2 1.8 mR/90 days	8.5 2.0 mR/92 days	
Average/Day		0.036 ± 0.04 mR/day	0.24 0.03 mR/day	0.13 0.02 mR/day	0.10 0.02 mR/day	
Range		(0.0-14.3) mR/90 days	(15.4-27.1) mR/80 days	(7.1-13.9) mR/90 days	(0.3-11.9) mR/92 days	
Detection/Total		27/30	30/30	31/31	31/31	

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(a) Sample could not be located at site.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 VEGETATION-TERRESTRIAL, BROADLEAF
 (PCI/KG WET)
 STATION NUMBER 35

DATE COLLECTED	05/22/01	05/22/01	05/22/01	06/12/01 QA	06/12/01	06/12/01	06/12/01
RADIOCHEMICAL ANALYSIS:							
I-131	(a)	(a)	(a)	(a)	(a)	(a)	(a)
GAMMA SPECTRUM ANALYSIS:							
BE-7	(a)	(a)	(a)	(a)	(a)	(a)	(a)
K-40	(a)	(a)	(a)	(a)	(a)	(a)	(a)
MN-54	(a)	(a)	(a)	(a)	(a)	(a)	(a)
CO-58	(a)	(a)	(a)	(a)	(a)	(a)	(a)
FE-59	(a)	(a)	(a)	(a)	(a)	(a)	(a)
CO-60	(a)	(a)	(a)	(a)	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)	(a)	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)	(a)	(a)	(a)	(a)
RU-103	(a)	(a)	(a)	(a)	(a)	(a)	(a)
RU-106	(a)	(a)	(a)	(a)	(a)	(a)	(a)
I-131	(a)	(a)	(a)	(a)	(a)	(a)	(a)
CS-134	(a)	(a)	(a)	(a)	(a)	(a)	(a)
CS-137	(a)	(a)	(a)	(a)	(a)	(a)	(a)
BA-140	(a)	(a)	(a)	(a)	(a)	(a)	(a)
CE-141	(a)	(a)	(a)	(a)	(a)	(a)	(a)
CE-144	(a)	(a)	(a)	(a)	(a)	(a)	(a)
RA-226	(a)	(a)	(a)	(a)	(a)	(a)	(a)
TH-228	(a)	(a)	(a)	(a)	(a)	(a)	(a)

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(a) Vegetation sample not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 VEGETATION-TERRESTRIAL, BROADLEAF
 (PCI/KG WET)
 STATION NUMBER 35

DATE COLLECTED	07/17/01	07/17/01	07/17/01	08/14/01	08/14/01	08/14/01	09/11/01
RADIOCHEMICAL ANALYSIS:							
I-131	(a)	(a)	(a)	L.T. 1. E+01 (a)	(a)	(a)	L.T. 7. E 00
GAMMA SPECTRUM ANALYSIS:							
BE-7	(a)	(a)	(a)	1.54 ± 0. E+03 (a)	(a)	(a)	2.34 ± 0. E+03
K-40	(a)	(a)	(a)	9.99 ± 0. E+03 (a)	(a)	(a)	5.17 ± 0. E+03
MN-54	(a)	(a)	(a)	L.T. 2. E+01 (a)	(a)	(a)	L.T. 1. E+01
CO-58	(a)	(a)	(a)	L.T. 3. E+01 (a)	(a)	(a)	L.T. 1. E+01
FE-59	(a)	(a)	(a)	L.T. 6. E+01 (a)	(a)	(a)	L.T. 2. E+01
CO-60	(a)	(a)	(a)	L.T. 2. E+01 (a)	(a)	(a)	L.T. 2. E+01
ZN-65	(a)	(a)	(a)	L.T. 5. E+01 (a)	(a)	(a)	L.T. 2. E+01
ZR-95	(a)	(a)	(a)	L.T. 2. E+01 (a)	(a)	(a)	L.T. 1. E+01
RU-103	(a)	(a)	(a)	L.T. 3. E+01 (a)	(a)	(a)	L.T. 1. E+01
RU-106	(a)	(a)	(a)	L.T. 2. E+02 (a)	(a)	(a)	L.T. 1. E+02
I-131	(a)	(a)	(a)	L.T. 1. E+02 (a)	(a)	(a)	L.T. 2. E+01
CS-134	(a)	(a)	(a)	L.T. 2. E+01 (a)	(a)	(a)	L.T. 1. E+01
CS-137	(a)	(a)	(a)	L.T. 2. E+01 (a)	(a)	(a)	L.T. 1. E+01
BA-140	(a)	(a)	(a)	L.T. 6. E+01 (a)	(a)	(a)	L.T. 2. E+01
CE-141	(a)	(a)	(a)	L.T. 4. E+01 (a)	(a)	(a)	L.T. 2. E+01
CE-144	(a)	(a)	(a)	L.T. 1. E+02 (a)	(a)	(a)	L.T. 6. E+01
RA-226	(a)	(a)	(a)	L.T. 6. E+02 (a)	(a)	(a)	L.T. 3. E+02
TH-228	(a)	(a)	(a)	L.T. 4. E+01 (a)	(a)	(a)	L.T. 2. E+01

(a) Vegetation sample not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION-TERRESTRIAL, BROADLEAF
(PCI/KG WET)
STATION NUMBER 35

DATE COLLECTED 09/11/01 09/11/01

RADIOCHEMICAL ANALYSIS: (a)

I-131 L.T. 1. E+01

GAMMA SPECTRUM ANALYSIS:

BE-7	3.97 ± 0. E+03	(a)
K-40	8.79 ± 0. E+03	(a)
MN-54	L.T. 2. E+01	(a)
CO-58	L.T. 2. E+01	(a)
FE-59	L.T. 3. E+01	(a)
CO-60	L.T. 2. E+01	(a)
ZN-65	L.T. 4. E+01	(a)
ZR-95	L.T. 2. E+01	(a)
RU-103	L.T. 2. E+01	(a)
RU-106	L.T. 1. E+02	(a)
I-131	L.T. 3. E+01	(a)
CS-134	L.T. 1. E+01	(a)
CS-137	L.T. 2. E+01	(a)
BA-140	L.T. 2. E+01	(a)
CE-141	L.T. 3. E+01	(a)
CE-144	L.T. 1. E+02	(a)
RA-226	L.T. 5. E+02	(a)
TH-228	L.T. 3. E+01	(a)

(a) Vegetation sample not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 VEGETATION-TERRESTRIAL, BROADLEAF
 (PCI/KG WET)
 STATION NUMBER 96

DATE COLLECTED	05/22/01	05/22/01	05/22/01	06/12/01	06/12/01	06/12/01	06/12/01	07/17/01
RADIOCHEMICAL ANALYSIS:								
I-131	(a)	(a)	(a)	L.T. 6. E 00	L.T. 8. E 00	(a)	(a)	(a)
GAMMA SPECTRUM ANALYSIS:								
BE-7	(a)	(a)	(a)	2.50 ± 0. E+03	2.12 ± 0. E+03	(a)	(a)	(a)
K-40	(a)	(a)	(a)	4.58 ± 0. E+03	5.91 ± 0. E+03	(a)	(a)	(a)
MN-54	(a)	(a)	(a)	L.T. 2. E+01	L.T. 9. E 00	(a)	(a)	(a)
CO-58	(a)	(a)	(a)	L.T. 2. E+01	L.T. 9. E 00	(a)	(a)	(a)
FE-59	(a)	(a)	(a)	L.T. 4. E+01	L.T. 2. E+01	(a)	(a)	(a)
CO-60	(a)	(a)	(a)	L.T. 2. E+01	L.T. 8. E 00	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)	L.T. 4. E+01	L.T. 2. E+01	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)	L.T. 2. E+01	L.T. 2. E+01	(a)	(a)	(a)
RU-103	(a)	(a)	(a)	L.T. 2. E+01	L.T. 1. E+01	(a)	(a)	(a)
RU-106	(a)	(a)	(a)	L.T. 2. E+02	L.T. 8. E+01	(a)	(a)	(a)
I-131	(a)	(a)	(a)	L.T. 5. E+01	L.T. 3. E+01	(a)	(a)	(a)
CS-134	(a)	(a)	(a)	L.T. 2. E+01	L.T. 8. E 00	(a)	(a)	(a)
CS-137	(a)	(a)	(a)	L.T. 2. E+01	L.T. 9. E 00	(a)	(a)	(a)
BA-140	(a)	(a)	(a)	L.T. 4. E+01	L.T. 6. E+01	(a)	(a)	(a)
CE-141	(a)	(a)	(a)	L.T. 3. E+01	L.T. 2. E+01	(a)	(a)	(a)
CE-144	(a)	(a)	(a)	L.T. 1. E+02	L.T. 6. E+01	(a)	(a)	(a)
RA-226	(a)	(a)	(a)	L.T. 6. E+02	L.T. 3. E+02	(a)	(a)	(a)
TH-228	(a)	(a)	(a)	L.T. 2. E+01	L.T. 2. E+01	(a)	(a)	(a)

(a) Vegetation sample not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 VEGETATION-TERRESTRIAL, BROADLEAF
 (PCI/KG WET)
 STATION NUMBER 96

DATE COLLECTED	07/17/01	07/17/01	08/14/01 QA	08/14/01	08/14/01	08/14/01	09/11/01
RADIOCHEMICAL ANALYSIS:							
I-131	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 6. E 00
GAMMA SPECTRUM ANALYSIS:							
BE-7	(a)	(a)	(a)	(a)	(a)	(a)	2.34 ± 0. E+03
K-40	(a)	(a)	(a)	(a)	(a)	(a)	7.83 ± 0. E+03
MN-54	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E+01
CO-58	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 2. E+01
FE-59	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 3. E+01
CO-60	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E+01
ZN-65	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 3. E+01
ZR-95	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E+01
RU-103	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E+01
RU-106	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E+02
I-131	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 3. E+01
CS-134	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E+01
CS-137	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E+01
BA-140	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 2. E+01
CE-141	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 3. E+01
CE-144	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 8. E+01
RA-226	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 4. E+02
TH-228	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 3. E+01

(a) Vegetation sample not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION-TERRESTRIAL, BROADLEAF
(PCI/KG WET)
STATION NUMBER 96

DATE COLLECTED 09/11/01 09/11/01

RADIOCHEMICAL ANALYSIS:

I-131 L.T. 9. E 00 (a)

GAMMA SPECTRUM ANALYSIS:

BE-7	2.93 ± 0. E+03	(a)
K-40	6.08 ± 0. E+03	(a)
MN-54	L.T. 1. E+01	(a)
CO-58	L.T. 2. E+01	(a)
FE-59	L.T. 3. E+01	(a)
CO-60	L.T. 1. E+01	(a)
ZN-65	L.T. 3. E+01	(a)
ZR-95	L.T. 1. E+01	(a)
RU-103	L.T. 2. E+01	(a)
RU-106	L.T. 1. E+02	(a)
I-131	L.T. 3. E+01	(a)
CS-134	L.T. 1. E+01	(a)
CS-137	L.T. 1. E+01	(a)
BA-140	L.T. 2. E+01	(a)
CE-141	L.T. 2. E+01	(a)
CE-144	L.T. 9. E+01	(a)
RA-226	L.T. 5. E+02	(a)
TH-228	L.T. 3. E+01	(a)

(a) Vegetation sample not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION-TERRESTRIAL, BROADLEAF
(PCI/KG WET)
STATION NUMBER 101

DATE COLLECTED	05/22/01	05/22/01	05/22/01	06/12/01	06/12/01	06/12/01	07/17/01
RADIOCHEMICAL ANALYSIS:							
I-131	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 6. E 00
GAMMA SPECTRUM ANALYSIS:							
BE-7	(a)	(a)	(a)	(a)	(a)	(a)	7.42 ± 0. E+01
K-40	(a)	(a)	(a)	(a)	(a)	(a)	5.27 ± 0. E+02
MN-54	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 9. E-01
CO-58	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 9. E-01
FE-59	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 2. E 00
CO-60	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 8. E-01
ZN-65	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 2. E 00
ZR-95	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 9. E-01
RU-103	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 9. E-01
RU-106	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 8. E 00
I-131	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E 00
CS-134	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E 00
CS-137	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E 00
BA-140	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E 00
CE-141	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 1. E 00
CE-144	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 6. E 00
RA-226	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 4. E+01
TH-228	(a)	(a)	(a)	(a)	(a)	(a)	L.T. 2. E 00

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(a) Vegetation sample not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 VEGETATION-TERRESTRIAL, BROADLEAF
 (PCI/KG WET)
 STATION NUMBER 101

DATE COLLECTED	07/17/01	07/17/01	08/14/01	08/14/01	08/14/01	09/11/01	09/11/01
RADIOCHEMICAL ANALYSIS:			QA				
I-131	(a)	(a)	L.T. 1. E+01	L.T. 1. E+01	(a)	L.T. 1. E+01	L.T. 7. E 00
GAMMA SPECTRUM ANALYSIS:							
BE-7	(a)	(a)	2.14 ± 0. E+03	1.50 ± 0. E+03	(a)	3.52 ± 0. E+03	4.13 ± 0. E+03
K-40	(a)	(a)	6.44 ± 0. E+03	6.08 ± 0. E+03	(a)	4.33 ± 0. E+03	6.32 ± 0. E+03
MN-54	(a)	(a)	L.T. 2. E+01	L.T. 1. E+01	(a)	L.T. 2. E+01	L.T. 2. E+01
CO-58	(a)	(a)	L.T. 2. E+01	L.T. 1. E+01	(a)	L.T. 2. E+01	L.T. 2. E+01
FE-59	(a)	(a)	L.T. 4. E+01	L.T. 2. E+01	(a)	L.T. 4. E+01	L.T. 4. E+01
CO-60	(a)	(a)	L.T. 1. E+01	L.T. 1. E+01	(a)	L.T. 2. E+01	L.T. 2. E+01
ZN-65	(a)	(a)	L.T. 4. E+01	L.T. 2. E+01	(a)	L.T. 4. E+01	L.T. 4. E+01
ZR-95	(a)	(a)	L.T. 2. E+01	L.T. 1. E+01	(a)	L.T. 2. E+01	L.T. 2. E+01
RU-103	(a)	(a)	L.T. 2. E+01	L.T. 1. E+01	(a)	L.T. 2. E+01	L.T. 2. E+01
RU-106	(a)	(a)	L.T. 1. E+02	L.T. 9. E+01	(a)	L.T. 2. E+02	L.T. 1. E+02
I-131	(a)	(a)	L.T. 3. E+01	L.T. 2. E+01	(a)	L.T. 4. E+01	L.T. 3. E+01
CS-134	(a)	(a)	L.T. 1. E+01	L.T. 9. E 00	(a)	L.T. 2. E+01	L.T. 2. E+01
CS-137	(a)	(a)	L.T. 2. E+01	L.T. 1. E+01	(a)	L.T. 2. E+01	L.T. 2. E+01
BA-140	(a)	(a)	L.T. 2. E+01	L.T. 1. E+01	(a)	L.T. 3. E+01	L.T. 2. E+01
CE-141	(a)	(a)	L.T. 3. E+01	L.T. 2. E+01	(a)	L.T. 3. E+01	L.T. 2. E+01
CE-144	(a)	(a)	L.T. 8. E+01	L.T. 6. E+01	(a)	L.T. 1. E+02	L.T. 1. E+02
RA-226	(a)	(a)	L.T. 5. E+02	L.T. 3. E+02	(a)	L.T. 6. E+02	L.T. 5. E+02
TH-228	(a)	(a)	L.T. 2. E+01	L.T. 2. E+01	(a)	L.T. 3. E+01	L.T. 3. E+01

97

(a) Vegetation sample not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION-TERRESTRIAL, BROADLEAF
(PCI/KG WET)
STATION NUMBER 101

DATE COLLECTED 09/11/01

RADIOCHEMICAL ANALYSIS:

I-131 L.T. 8. E 00

GAMMA SPECTRUM ANALYSIS:

BE-7	1.73 ± 0. E+03
K-40	6.15 ± 0. E+03
MN-54	L.T. 2. E+01
CO-58	L.T. 2. E+01
FE-59	L.T. 4. E+01
CO-60	L.T. 2. E+01
ZN-65	L.T. 4. E+01
ZR-95	L.T. 2. E+01
RU-103	L.T. 2. E+01
RU-106	L.T. 2. E+02
I-131	L.T. 3. E+01
CS-134	L.T. 2. E+01
CS-137	L.T. 2. E+01
BA-140	L.T. 3. E+01
CE-141	L.T. 4. E+01
CE-144	L.T. 1. E+02
RA-226	L.T. 3. E+02
TH-228	L.T. 3. E+01

(a) Vegetation sample not available.

VII-10
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY-AIRBORNE
 SHORELINE SEDIMENT
 (PCI/KG DRY)
 STATION NUMBER 28

DATE COLLECTED: 05/01/01 10/02/01

GAMMA SPECTRUM ANALYSIS:

BE-7	4.28 ± 2.81 E+02	L.T. 2.	E+02
K-40	1.54 ± 0.06 E+04	1.29 ± 0.04	E+04
MN-54	L.T. 2.	L.T. 1.	E+01
CO-58	L.T. 3.	L.T. 2.	E+01
FE-59	L.T. 7.	L.T. 4.	E+01
CO-60	L.T. 3.	L.T. 2.	E+01
ZN-65	L.T. 9.	L.T. 6.	E+01
ZR-95	L.T. 4.	L.T. 4.	E+01
RU-103	L.T. 3.	L.T. 2.	E+01
RU-106	L.T. 3.	L.T. 2.	E+02
I-131	L.T. 1.	L.T. 4.	E+01
CS-134	L.T. 4.	L.T. 3.	E+01
CS-137	4.82 ± 1.05 E+01	L.T. 2.	E+01
BA-140	L.T. 7.	L.T. 3.	E+01
CE-141	L.T. 4.	L.T. 2.	E+01
CE-144	L.T. 2.	L.T. 1.	E+02
RA-226	1.37 ± 0.91 E+03	L.T. 6.	E+02
TH-228	8.19 ± 0.30 E+02	1.04 ± 0.03	E+03

VIII. REFERENCES

VIII. REFERENCES

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).
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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.
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8. U.S. Regulatory Commission, Branch Technical Position, Radiological Monitoring Acceptable Program (November, 1979, Revision 1).

**APPENDIX A
LAND USE CENSUS**

ANNUAL CNS LAND USE CENSUS

Conducted July 31, 2001
0-3 miles

Cooper Nuclear Station (CNS) Offsite Dose Assessment Manual (ODAM) requires 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 leafy green vegetables, 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 ODAM, a land use census was performed on July 31, 2001. The nearest residence was found in sector Q, 0.9 miles from CNS, and the nearest garden was found in sector L, 1.3 miles from CNS.

No milk animals were found within 3 miles of CNS and there was no evidence of potable water use from the Missouri River within three miles downstream of CNS.

ANNUAL CNS LAND USE CENSUS

July 31, 2001
0-3 Miles

SECTOR	NEAREST RESIDENT Distance	Direction in Degrees	NEAREST GARDEN Distance	Direction in Degrees	NEAREST MILK ANIMAL
A/N	3.0 Miles	1.0°	3.0 Miles	1.0°	NONE
B/NNE	NONE	--	NONE	--	NONE
C/NE	NONE	--	NONE	--	NONE
D/ENE	1.7 Miles	62.0°	NONE	--	NONE
E/E	1.8 Miles	92.0°	2.0 Miles	85.0°	NONE
F/ESE	2.3 Miles	112.0°	2.3 Miles	112.0°	NONE
G/SE	NONE	--	NONE	--	NONE
H/SSE	NONE	--	NONE	--	NONE
J/S	NONE	--	NONE	--	NONE
K/SSW	2.2 Miles	210.0°	NONE	--	NONE
L/SW	1.3 Miles	231.0°	1.3 Miles	219.0°	NONE
M/WSW	1.2 Miles	252.0°	1.9 Miles	241.0°	NONE
N/W	1.0 Miles	265.0°	NONE	--	NONE
P/WNW	1.7 Miles	294.0°	2.4 Miles	293.0°	NONE
Q/NW	0.9 Miles	307.0°	2.9 Miles	314.0°	NONE
R/NNW	1.9 Miles	336.0°	1.9 Miles	336.0°	NONE

APPENDIX B
SUMMARY OF INTERLABORATORY COMPARISONS

INTERLABORATORY COMPARISON PROGRAM

A review of the 1999 Interlaboratory Comparison Program verified that Teledyne Brown Engineering did not perform iodine-131, strontium-89, strontium-90, or gamma analyses on milk samples. TBE presumed, erroneously, that we were meeting client contract requirements. The 2001 Interlaboratory Comparison Program includes all contractually required analyses with the exception of iodine-131 in water. This has been included in our blanket purchase order for Analytics and Environmental Resource Associates ERA for the year 2002.

The EPA discontinued their performance evaluation program in 1998. Although Teledyne Brown Engineering participated in the EPA program, there was a lapse in time between the period of the closure of the EPA program and the commencement of the ERA program. We have objective evidence that Teledyne Brown Engineering participates in these commercial ICP programs as well as documentation that we are continuing to do so. For the year 2001 and forward, the determinations in TBE's ICP program are equivalent to or exceed the NRC requirements. This has been verified for all the Nuclear Utility clients. However, in order to ensure this information has been communicated to all the utilities, a copy of this letter is being included in all 2001 annual reports for all utility clients.

The US Environmental Protection Agency (EPA) discontinued their Interlaboratory Comparison Program in December 1998. However, on May 1, 2001, accreditation was granted to Environmental Resource Associates' RadChem Proficiency Testing Program to complete the process of replacing the USEEPA-LV Nuclear Radiation Assessment Division program. Teledyne Brown Engineering participates in the Analytics, Inc. and Environmental Resource Associates (ERA) programs to the fullest extent possible. That is, we participate in the program for all radioactive isotopes prepared and at the maximum frequency of availability.

The National Institute of Standards and Technology (NIST) is the approval authority for laboratory providers participating in Intercomparison Study Programs; however, at this time, there are no approved laboratories for environmental and/or radiochemical isotope analyses.

Trending graphs are provided in this section for the EPA Program and for Analytics when there were at least two sets of data points to plot.

**ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE QC SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

(PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value	Known Value	Ratio TBE/Analytics	Evaluation	
March, 2001	E2584-93	Milk	I-131	pCi/L	75	77	0.97	A	
			Ce-141	pCi/L	166	162	1.03	A	
			Cr-51	pCi/L	433	418	1.04	A	
			Cs-134	pCi/L	212	223	0.95	A	
			Cs-137	pCi/L	165	176	0.94	A	
			Co-58	pCi/L	81	82	0.99	A	
			Mn-54	pCi/L	172	175	0.98	A	
			Fe-59	pCi/L	151	146	1.03	A	
			Zn-65	pCi/L	314	322	0.98	A	
			Co-60	pCi/L	254	254	1	A	
May, 2001	A14428-55	Water	Sr-89	uCi/mL	2.50E-03	2.95E-03	0.85	A	
			Sr-90	uCi/mL	2.00E-04	2.27E-04	0.88	A	
	A14429-55	Water	Gr-Alpha	uCi/mL	1.70E-04	1.45E-04	1.17	A	
	A14434-55	Water	Fe-55	uCi/mL	2.40E-04	2.53E-04	0.95	A	
	June, 2001	2707	Charcoal	I-131	pCi	104.5	81	1.29	W
				I-131	pCi	84.8	72	1.18	A
I-131				pCi	99.6	92	1.08	A	
August, 2001	E2755-396	Milk	Mn-54	pCi/L	131	124	1.06	A	
			Co-58	pCi/L	68	68	1.00	A	
			Fe-59	pCi/L	53	50	1.06	A	
			Co-60	pCi/L	134	132	1.02	A	
			Zn-65	pCi/L	172	162	1.06	A	
			I-131	pCi/L	76	86	0.88	A	
			Cs-134	pCi/L	141	128	1.10	A	
			Cs-137	pCi/L	126	120	1.05	A	
			Ce-141	pCi/L	72	76	0.95	A	
August, 2001	E2757-396	AP Filter	Ce-141	pCi	79	74	1.07	A	
			Cr-51	pCi	100	90	1.11	A	
			Cs-134	pCi	109	125	0.87	A	
			Cs-137	pCi	140	116	1.21	W	
			Co-58	pCi	72	66	1.09	A	
			Mn-54	pCi	161	134	1.20	A	
			Fe-59	pCi	51	49	1.04	A	
			Zn-65	pCi	200	158	1.27	W	
			Co-60	pCi	148	128	1.16	A	

**ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE QC SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value	Known Value	Ratio TBE/Analytics	Evaluation
August, 2001	E2756A-396	Charcoal	I-131	pCi	87	93	0.94	A
September, 2001	A14734-148	Liquid	Sr-89	Total uCi	1.30E-03	1.55E-03	0.84	A
			Sr-90	Total uCi	1.00E-04	1.12E-04	0.89	A
September, 2001	A14735-148	Gas	Xe-133	Total uCi	0.606	0.585	1.04	A
			Kr-85	Total uCi	8.53	8.42	1.01	A
September, 2001	A14736-148	Charcoal	I-131	Total uCi	0.483	0.495	0.98	A
September, 2001	A14737-148	Air Filter	Ce-141	Total uCi	4.99E-02	5.25E-02	0.95	A
			Cr-51	Total uCi	1.68E-01	1.85E-01	0.91	A
			Cs-134	Total uCi	2.47E-02	2.97E-02	0.83	A
			Cs-137	Total uCi	5.18E-02	5.73E-02	0.90	A
			Co-58	Total uCi	4.60E-02	4.75E-02	0.97	A
			Mn-54	Total uCi	3.96E-02	4.02E-02	0.99	A
			Fe-59	Total uCi	2.99E-02	2.92E-02	1.02	A
			Zn-65	Total uCi	5.22E-02	5.12E-02	1.02	A
Co-60	Total uCi	4.71E-02	4.83E-02	0.98	A			
September, 2001	A14738-148	Liquid	Gr-Alpha	Total uCi	5.80E-04	4.67E-04	1.24	A
September, 2001	A14286-148	Liquid	Gr-Alpha	uCi/cc	1.70E-04	1.45E-04	1.17	A
			H-3	uCi/cc	2.92E-03	1.77E-03	1.65	A
September, 2001	E2772-396	Milk	I-131	pCi/L	100	91	1.10	A
			Ce-141	pCi/L	126	121	1.04	A
			Cr-51	pCi/L	349	366	0.95	A
			Cs-134	pCi/L	147	160	0.92	A
			Cs-137	pCi/L	321	319	1.01	A
			Co-58	pCi/L	190	177	1.07	A
			Mn-54	pCi/L	205	205	1.00	A
			Fe-59	pCi/L	85	86	0.99	A
			Zn-65	pCi/L	246	254	0.98	A
			Co-60	pCi/L	261	266	0.98	A

**ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE QC SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value	Known Value	Ratio TBE/Analytics	Evaluation
September, 2001	E2773-396	Charcoal	I-131	68.6	68.6	67	1.02	A
September, 2001	E2774-396	Air Filter	Ce-141	pCi	118	116	1.02	A
			Cr-51	pCi	362	351	1.03	A
			Cs-134	pCi	135	153	0.88	A
			Cs-137	pCi	350	307	1.14	A
			Co-58	pCi	184	170	1.08	A
			Mn-54	pCi	230	197	1.17	A
			Fe-59	pCi	100	82	1.22	W
			Zn-65	pCi	305	244	1.25	W
			Co-60	pCi	267	255	1.05	A
December, 2001	E2980-396	Milk	Sr-89	pCi/L	75	85	0.96	A
			Sr-90	pCi/L	44	59	1.27	W
			Fe-55	pCi/L	108	99	1.09	A
December, 2001	E-2981-396	Milk	I-131	pCi/L	50	61	0.82	A
			Ce-141	pCi/L	352	379	0.93	A
			Cr-51	pCi/L	468	497	0.94	A
			Cs-134	pCi/L	173	199	0.87	A
			Cs-137	pCi/L	312	318	0.98	A
			Co-58	pCi/L	92	90	1.02	A
			Mn-54	pCi/L	148	149	0.99	A
			Fe-59	pCi/L	101	102	0.99	A
			Zn-65	pCi/L	192	206	0.93	A
			Co-60	pCi/L	322	353	0.93	A
			December, 2001	E-2983-396	Air Filter	Ce-141	pCi	185
Cr-51	pCi	190				237	0.80	A
Cs-134	pCi	74				95	0.78	W
Cs-137	pCi	163				152	1.07	A
Co-58	pCi	46				43	1.07	A
Mn-54	pCi	80				71	1.13	A
Fe-59	pCi	57				49	1.16	A
Zn-65	pCi	119				99	1.2	A
Co-60	pCi	165				169	0.98	A

**DOE/EML ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE QC SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

(PAGE 1 OF 3)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value	Known Value	Ratio TBE/EML	Evaluation
December, 2001	E-2982-396	Charcoal	I-131	pCi	89	92	0.93	A
March, 2001	QAP 103	Air Filter	Mn-54	Bq/filter	6.96	6.52	1.07	A
			Co-60	Bq/filter	19.4	19.44	1.00	A
			Cs-134	Bq/filter	2.59	2.83	0.92	A
			Cs-137	Bq/filter	9.52	8.76	1.09	A
			Gr-Alpha	Bq/filter	3.33	3.97	0.84	A
			Gr-Beta	Bq/filter	2.26	2.58	0.88	W
			Sr-90	Bq/filter	7.46	7.1	1.05	A
March, 2001	QAP 103	Water	Co-60	Bq/L	100.3	98.2	1.02	A
			Cs-137	Bq/L	75.8	73	1.04	A
			Gr-Alpha	Bq/L	1600	1900	0.84	A
			Gr-Beta	Bq/L	1200	1297	0.93	A
May, 2001			Sr-90	Bq/L	4.57	4.4	1.04	A
			H-3	Bq/L	61.0	79.3	0.77	W
June, 2001	QAP 2009	Air Filters	Mn-54	Bq/filter	49.5	43.2	1.15	A
			Co-57	Bq/filter	15.2	14.5	1.05	A
			Co-60	Bq/filter	8.79	8.43	1.04	A
			Cs-137	Bq/filter	8.26	7.41	1.11	A
			Gr-Alpha	Bq/filter	2.31	2.35	0.98	A
			Gr-Beta	Bq/filter	1.79	1.52	1.18	A
June, 2001	QAP 2009	Water	Co-60	Bq/L	75.7	73.7	1.03	A
			Cs-137	Bq/L	69.3	67.0	1.03	A
September, 2001	QAP 0109	Air Filters	Mn-54	Bq/filter	97.1	81.15	1.197	A
			Co-60	Bq/filter	18.8	17.5	1.074	A
			Cs-134	Bq/filter	12.7	12.95	0.981	A
			Cs-137	Bq/filter	20.8	17.1	1.216	W
			Gr-Alpha	Bq/filter	5.42	5.362	1.011	A
			Gr-Beta	Bq/filter	12.0	12.77	0.94	A
			Sr-90	Bq/filter	2.56	3.481	0.735	W
September, 2001	QAP 0109	Water	Co-60	Bq/L	207.3	209.0	0.992	A
			Cs-137	Bq/L	47.7	45.133	1.057	A
			Gr-Alpha	Bq/L	1333.0	1150.0	1.159	W
			Gr-Beta	Bq/L	8533.0	7970.0	1.071	A
			Sr-90	Bq/L	4.76	3.729	1.276	W
			H-3	Bq/L	212.3	207.0	1.026	A

**ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE QC SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value	Known Value	Ratio TBE/EML	Evaluation
February, 2001	Rad-29	Water	Co-60	pCi/L	95.5	91.1	1.05	A
			Cs-134	pCi/L	60.5	59.8	1.01	A
			Cs-137	pCi/L	48	45	1.07	A
September, 2001	Rad-38	Water	Ba-133	pCi/L	35.5	36	0.99	A
			Co-60	pCi/L	47.6	46.8	1.02	A
			Cs-134	pCi/L	15.5	15.9	0.97	A
			Cs-137	pCi/L	206	197	1.05	A
			Zn-65	pCi/L	35.4	36.2	0.98	A
August, 2001	Rad-39	Water	Total U	pCi/L	60.3	52.9	1.14	A
			Ra-226	pCi/L	14.7	15.4	0.95	A
September, 2001	Rad-40	Water	Sr-89	pCi/L	26.4	31.2	0.85	A
			Sr-90	pCi/L	28.2	25.9	1.09	A
August, 2001	Rad-41	Water	Gr-Alpha	pCi/L	15.2	17.8	0.85	A
			Gr-Beta	pCi/L	52.0	53.0	0.98	A
September, 2001	Rad-42	Water	H-3	pCi/L	2370	2730	0.87	A
December, 2001	12130109	Water	I-131	pCi/L	3.77	4.38	0.86	A

APPENDIX C
SYNOPSIS OF ANALYTICAL PROCEDURES

ANALYTICAL PROCEDURES SYNOPSIS

Appendix C is a synopsis of the analytical procedures performed during 2001 on samples collected for the Nebraska Public Power Nuclear Plant's Radiological Environmental Monitoring Program. All analyses have been mutually agreed upon by Nebraska Public Power District and Teledyne Brown Engineering and include those recommended by the USNRC Branch Technical Position, Rev. 1, November 1979.

<u>ANALYSIS TITLE</u>	<u>PAGE</u>
Gross Beta Analysis of Samples	C-3
Air Particulates	C-3
Determination of Gross Beta Activity in Water Samples	C-4
Analysis of Samples for Tritium (Liquid Scintillation)	C-5
Analysis of Samples for Strontium-89 and -90	C-6
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GROSS BETA ANALYSIS OF SAMPLES

Air Particulates

After a delay of five or more days, allowing for the radon-222 and radon-220 (thoron) daughter products to decay, the filters are counted in a gas-flow proportional counter. An unused air particulate filter, supplied by the customer, is counted as the blank.

Calculations of the results, the two sigma error and the lower limit of detection (LLD):

$$\text{RESULT (pCi/m}^3\text{)} = ((S/T) - (B/t))/(2.22 V E)$$

$$\text{TWO SIGMA ERROR (pCi/m}^3\text{)} = 2((S/T)^2 + (B/t^2))^{1/2}/(2.22 V E)$$

$$\text{LLD (pCi/m}^3\text{)} = 4.66(B^{1/2})/(2.22 V E t)$$

where:

- S = Gross counts of sample including blank
- B = Counts of blank
- E = Counting efficiency
- T = Number of minutes sample was counted
- t = Number of minutes blank was counted
- V = Sample aliquot size (cubic meters)

DETERMINATION OF GROSS BETA ACTIVITY IN WATER SAMPLES

Introduction

The procedures described in this section are used to measure the overall radioactivity of water samples without identifying the radioactive species present. No chemical separation techniques are involved.

One liter of the sample is evaporated on a hot plate. A smaller volume may be used if the sample has a significant salt content as measured by a conductivity meter. If requested by the customer, the sample is filtered through No. 54 filter paper before evaporation, removing particles greater than 30 microns in size.

After evaporating to a small volume in a beaker, the sample is rinsed into a 2-inch diameter stainless steel planchette which is stamped with a concentric ring pattern to distribute residue evenly. Final evaporation to dryness takes place under heat lamps.

Residue mass is determined by weighing the planchette before and after mounting the sample. The planchette is counted for beta activity on an automatic proportional counter. Results are calculated using empirical self-absorption curves which allow for the change in effective counting efficiency caused by the residue mass.

Detection Capability

Detection capability depends upon the sample volume actually represented on the planchette, the background and the efficiency of the counting instrument, and upon self-absorption of beta particles by the mounted sample. Because the radioactive species are not identified, no decay corrections are made and the reported activity refers to the counting time.

The minimum detectable level (MDL) for water samples is nominally 1.6 picoCuries per liter for gross beta at the 4.66 sigma level (1.0 pCi/L at the 2.83 sigma level), assuming that 1 liter of sample is used and that ½ gram of sample residue is mounted on the planchette. These figures are based upon a counting time of 50 minutes and upon representative values of counting efficiency and background of 0.2 and 1.2 cpm, respectively

The MDL becomes significantly lower as the mount weight decreases because of reduced self-absorption. At a zero mount weight, the 4.66 sigma MDL for gross beta is 0.9 picoCuries per liter. These values reflect a beta counting efficiency of 0.38.

ANALYSIS OF SAMPLES FOR TRITIUM
(Liquid Scintillation)

Water

Ten milliliters of water are mixed with 10 ml of a liquid scintillation "cocktail" and then the mixture is counted in an automatic liquid scintillator.

Calculation of the results, the two sigma error and the lower limit detection (LLD) in pCi/L:

$$\text{RESULT} = (N-B)/(2.22 V E)$$

$$\text{TWO SIGMA ERROR} = 2((N + B)/\Delta t)^{1/2} / (2.22 V E)$$

$$\text{LLD} = 4.66(B/\Delta t)^{1/2} / (2.22 V E)$$

where:

N	=	the gross cpm of the sample
B	=	the background of the detector in cpm
2.22	=	conversion factor changing dpm to pCi
V	=	volume of the sample in ml
E	=	efficiency of the detector
Δt	=	counting time for the sample

ANALYSIS OF SAMPLES FOR STRONTIUM-89 AND -90

Water

Stable strontium carrier is added to 1 liter of sample and the volume is reduced by evaporation. Strontium is precipitated as $\text{Sr}(\text{NO}_3)_2$ using nitric acid. A barium scavenge and an iron (ferric hydroxide) scavenge are performed followed by addition of stable yttrium carrier and a minimum of 5 day period for yttrium ingrowth. Yttrium is then precipitated as hydroxide, dissolved and re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer Sr-90 activity. Strontium-89 activity is determined by precipitating SrCO_3 from the sample after yttrium separation. This precipitate is mounted on a nylon planchette and is covered with an 80 mg/cm^2 aluminum absorber for low level beta counting.

Milk

Stable strontium carrier is added to 1 liter of sample and the sample is first evaporated, then ashed in a muffle furnace. The ash is dissolved and strontium is precipitated as phosphate, then is dissolved and precipitated as SrNO_3 using fuming (90%) nitric acid. A barium chromate scavenge and an iron (ferric hydroxide) scavenge are then performed. Stable yttrium carrier is added and the sample is allowed to stand for a minimum of 5 days for yttrium ingrowth. Yttrium is then precipitated as hydroxide, dissolved and then re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer Sr-90 activity. Strontium-89 is determined by precipitating SrCO_3 from the sample after yttrium separation. This precipitate is mounted on a nylon planchette and is covered with an 80 mg/cm^2 aluminum absorber for low level beta counting.

Soil and Sediment

The sample is first dried under heat lamps and an aliquot is taken. Stable strontium carrier is added and the sample is leached in hydrochloric acid. The mixture is filtered and strontium is precipitated from the liquid portion as phosphate. Strontium is precipitated as $\text{Sr}(\text{NO}_3)_2$ using fuming (90%) nitric acid. A barium chromate scavenge and an iron (ferric hydroxide) scavenge are then performed. Stable yttrium carrier is added and the sample is allowed to stand for a minimum of 5 days for yttrium ingrowth. Yttrium is then precipitated as hydroxide, dissolved and re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer Sr-90 activity. Strontium-89 is determined by precipitating SrCO_3 from the sample after yttrium separation. This precipitate is mounted on a nylon planchette and is covered with an 80 mg/cm^2 aluminum absorber for low level beta counting.

Organic Solids

A wet portion of the sample is dried and then ashed in a muffle furnace. Stable strontium carrier is added and the ash is leached in hydrochloric acid. The sample is filtered and strontium is precipitated from the liquid portion as phosphate. Strontium is precipitated as $\text{Sr}(\text{NO}_3)_2$ using fuming (90%) nitric acid. An iron (ferric hydroxide)

scavenge is performed, followed by addition of stable yttrium carrier and a minimum of 5 days period for yttrium ingrowth. Yttrium is then precipitated as hydroxide, dissolved and re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer strontium-90 activity. Strontium-89 activity is determined by precipitating SrCO₃ from the sample after yttrium separation. This precipitate is counted on a nylon planchette and is covered with an 80 mg/cm² aluminum absorber for low level beta counting.

Air Particulates

Stable strontium carrier is added to the sample and it is leached in nitric acid to bring deposits into solution. The mixture is then filtered and the filtrate is reduced in volume by evaporation. Strontium is precipitated as Sr(NO₃)₂ using fuming (90%) nitric acid. A barium scavenge is used to remove some interfering species. An iron (ferric hydroxide) scavenge is performed, followed by addition of stable yttrium carrier and a 7 to 10 day period for yttrium ingrowth. Yttrium is then precipitated as hydroxide, dissolved and re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer strontium-90 activity. Strontium-89 activity is determined by precipitating SrCO₃ from the sample after yttrium separation. This precipitate is counted on a nylon planchette and is covered with 80 mg/cm² aluminum absorber for low level beta counting.

Calculations of the result, two sigma errors and lower limits of detection (LLD) are expressed in activity of pCi/volume or pCi/mass:

$$\text{RESULT Sr-89} = (N/\Delta t - B_C - B_A) / (2.22 V Y_S DF_{\text{Sr-89}} E_{\text{Sr-89}})$$

$$\text{TWO SIGMA ERROR Sr-89} = 2(N/\Delta t + B_C + B_A) / \Delta t^{1/2} / (2.22 V Y_S DF_{\text{Sr-89}} E_{\text{Sr-89}})$$

$$\text{LLD Sr-89} = 4.66(B_C + B_A) / \Delta t^{1/2} / (2.22 V Y_S DF_{\text{Sr-89}} E_{\text{Sr-89}})$$

$$\text{RESULT Sr-90} = (N/\Delta t - B) / (2.22 V Y_1 Y_2 DF IF E)$$

$$\text{TWO SIGMA ERROR Sr-90} = 2(N/\Delta t + B) / \Delta t^{1/2} / (2.22 V Y_1 Y_2 DF E IF)$$

$$\text{LLD Sr-90} = 4.66(B/\Delta t)^{1/2} / (2.22 V Y_1 Y_2 IF DF E)$$

Where :

N	=	total counts from sample
Δt	=	counting time for sample (min)
B _C	=	background rate of counter (cpm) using absorber configuration
2.22	=	dpm /pCi
V	=	volume or weight of sample analyzed
B _A	=	background addition from Sr-90 and ingrowth of Y-90
B _C	=	0.016(K) + (K) E _{γ/abs} (IG _{Y-90})
Y _S	=	chemical yield of strontium

E_{SR-89}	=	efficiency of the counter for Sr-89 with the 80 mg/cm. q. aluminum absorber
K	=	$(N\Delta t - B_C)_{Y-90} / E_{Y-90} IF_{Y-90} DF_{Y-90} Y_1$
DF_{Y-90}	=	the decay factor for Y-90 from the "milk" time to the mid count time
E_{Y-90}	=	efficiency of the counter for Y-90
IF_{Y-90}	=	ingrowth factor for Y-90 from scavenge time to milking time
IG_{Y-90}	=	the ingrowth factor for Y-90 into the strontium mount from the "milk" time to the mid count time
0.016	=	the efficiency of measuring Sr-90 through a No. 6 absorber
$EY/_{abs}$	=	the efficiency of counting Y-90 through a No. 6 absorber
B	=	background rate of counter (cpm)
Y_1	=	chemical yield of yttrium
Y_2	=	chemical yield of strontium
DF	=	decay factor of yttrium from the radiochemical milking time to the mid count time
IF	=	ingrowth factor for Y-90 from scavenge time to the radiochemical milking time

ANALYSIS OF SAMPLES FOR IODINE-131

Milk or Water

Two liters of sample are first equilibrated with stable iodide carrier. A batch treatment with anion exchange resin is used to remove iodine from the sample. The iodine is then stripped from the resin with sodium hypochlorite solution, is reduced with hydroxylamine hydrochloride and is extracted into carbon tetrachloride as free iodine. It is then back-extracted as iodide into sodium bisulfite solution and is precipitated as palladium iodide. The sodium bisulfite solution and is precipitated as palladium iodide. The precipitate is weighed for chemical yield and is mounted on a nylon planchette for low level beta counting. The chemical yield is corrected by measuring the stable iodide content of the milk or the water with a specific ion electrode.

Calculations of results, two sigma error and the lower limit of detection (LLD) in pCi/L:

$$\begin{aligned} \text{RESULT} &= (N/\Delta t - B)/(2.22 E V Y DF) \\ \text{TWO SIGMA ERROR} &= 2((N/\Delta t + B)/\Delta t)^{1/2} / (2.22 E V Y DF) \\ \text{LLD} &= 4.66(B/\Delta t)^{1/2} / (2.22 E V Y DF) \end{aligned}$$

where:

N	=	total counts from sample (counts)
Δt	=	counting time for sample (min)
B	=	background rate of counter (cpm)
2.22	=	dpm/pCi
V	=	volume or weight of sample analyzed
Y	=	chemical yield of the mount or sample counted
DF	=	decay factor from the collection to the counting date
E	=	efficiency of the counter for I-131, corrected for self absorption effects by the formula
E	=	$E_s(\exp-0.0061M)/(\exp-0.0061M_s)$
E_s	=	efficiency of the counter determined from an I-131 standard mount
M_s	=	mass of PdI_2 on the standard mount, mg
M	=	mass of PdI_2 on the sample mount, mg

GAMMA SPECTROMETRY OF SAMPLES

Milk and Water

A 1.0 liter Marinelli beaker is filled with a representative aliquot of the sample. The sample is then counted for approximately 1000 minutes with a shielded high purity germanium (HPGe) detector coupled to a personal computer (PC)-based data acquisition system which performs pulse height analysis.

Dried Solids Other Than Soils and Sediments

A large quantity of the sample is dried at a low temperature, less than 100°C. As much as possible (up to the total sample) is loaded into a tared 1-liter Marinelli and weighed. The sample is then counted for approximately 1000 minutes with a shielded HPGe detector coupled to a PC-based data acquisition system which performs pulse height analysis.

Fish

As much as possible (up to the total sample) of the edible portion of the sample is loaded into a tared Marinelli and weighed. The sample is then counted for approximately 1000 minutes with a shielded HPGe detector coupled to a PC-based data acquisition system which performs pulse height analysis.

Soils and Sediments

Soils and sediments are dried at a low temperature, less than 100°C. The soil or sediment is loaded fully into a tared, standard 300 cc container and weighed. The sample is then counted for approximately six hours with a shielded HPGe detector coupled to a PC-based data acquisition system which performs pulse height and analysis.

Charcoal Cartridges (Air Iodine)

Charcoal cartridges are counted up to five at a time, with one positioned on the face of a HPGe detector and up to four on the side of the HPGe detector. Each HPGe detector is calibrated for both positions. The detection limit for I-131 of each charcoal cartridge can be determined (assuming no positive I-131) uniquely from the volume of air which passed through it. In the event I-131 is observed in the initial counting of a set, each charcoal cartridge is then counted separately, positioned on the face of the detector.

Air Particulate

The thirteen airborne particulate filters for a quarterly composite for each field station are aligned one in front of another and then counted for at least six hours with a shielded HPGe detector coupled to a PC-based data acquisition system which performs pulse height analysis.

A PC software program defines peaks by certain changes in the slope of the spectrum. The program also compares the energy of each peak with a library of peaks for isotope identification and then performs the radioactivity calculation using the appropriate fractional gamma ray abundance, half life, detector efficiency, and net counts in the peak region.

The calculation of results, two sigma error and the lower limit of detection (LLD) in pCi/volume of pCi/mass:

$$\text{RESULT} = (S-B)/(2.22 t E V F DF)$$

$$\text{TWO SIGMA ERROR} = 2(S+B)^{1/2}/(2.22 t E V F DF)$$

$$\text{LLD} = 4.66(B)^{1/2}/(2.22 t E V F DF)$$

where:

S	=	Area, in counts, of sample peak and background (region of spectrum of interest)
B	=	Background area, in counts, under sample peak, determined by a linear interpolation of the representative backgrounds on either side of the peak
t	=	length of time in minutes the sample was counted
2.22	=	dpm/pCi
E	=	detector efficiency for energy of interest and geometry of sample
V	=	sample aliquot size (liters, cubic meters, kilograms, or grams)
F	=	fractional gamma abundance (specific for each emitted gamma)
DF	=	decay factor from the mid-collection date to the counting date

ADDENDUM TO GAMMA SPEC PROCEDURE

Ba-140 (half-life = ~12.8d) decays to La-140 (half-life ~40 hrs) and the daughter radionuclide, La-140 approaches ~90 % of the Ba-140 activity within ~ 6 days. The La-140 photon energy at 1596 KeV is used to quantify the Ba-140 activity due to its high photon emission probability yield (96%) producing a higher count rate when present and therefore, a smaller associated counting error.

Zr-95 (half-life = ~65d) decays to Nb-95 (half-life = ~35d). The photon energy of Nb-95 (~765 KeV) is used to quantify Zr-95 because of the high photon emission probability yield (~100%) yielding a higher count rate and an associated lower counting error. The daughter radionuclide, Nb-95 approaches the Zr-95 activity after a time period of ~65 days, an estimated time interval occurring between sample exposure, collection and shipping, and analysis.

Environmental Dosimetry

Teledyne Brown Engineering out-sources its environmental Dosimetry services to Proxtronics Dosimetry LLC, a Wholly Owned Subsidiary of Proxtronics, Inc. Proxtronics uses a thermo luminescent dosimeter (TLD) manufactured by Panasonic, Inc. Panasonic identifies it as an UD-814 TLD. The TLD has four elements, numbered 1-4. Elements and their filtration are composed of:

ELEMENT	MATERIAL	FILTRATION
1	$^6\text{Li}_2\text{ }^7\text{B}_4\text{O}_7\text{-Cu}$	Thin plastic
2	$\text{CaSO}_4\text{-Tm}$	Plastic
3	$\text{CaSO}_4\text{-Tm/Pb}$	Lead
4	$\text{CaSO}_4\text{-Tm/Pb}$	Lead

This material has a high light output, negligible thermally induced signal loss (fading) and negligible self-dosing. The energy response curve (as well as other features) satisfies NRC Regulatory Guide 4.13. Transit doses are accounted for by use of separate TLDs.

Prior to being sent to Teledyne brown, the Proxtronics badges are exposed to Cs-137, to a known dose and read in the Panasonic UD-710ARreader, with reference badges to establish an element response level for each badge. Badges are then re-annealed for assignment and distribution to Teledyne Brown.

Following the field exposure the badges are returned to Proxtronics for processing in a Panasonic UD-710 Reader. Each element is heated and the measured light emission is recorded. The transit controls are read in the same manner.

Transit Controls are calculated using the following equation:

$$\text{TRANSDOSE} = \left[\frac{(E_{3_1} + E_{4_1} + E_{3_2} + E_{4_2})}{4} \right] - \left[\frac{(E_{3_{\text{trans}}} + E_{4_{\text{trans}}})}{2} \right]$$

All dose is reported as “mR/standard month” using the following equation to calculate:

$$\text{Net Exposure} \div 90 \text{ Days} \times 30.44 \text{ Days} + \frac{\text{Net Exposure}}{\text{Standard Month}}$$

LLD FORMULAS

The LLD formulas in Section C are consistent with the LLD discussion in the ODAM. The term s_b in the ODAM equals $\sqrt{B/t}$ by Poisson statistics, where B = blank counts and t = blank counting intervals. The decay factor term $e^{-\lambda\Delta t}$ in the ODAM is the same as the DF terms in Section C, but does not appear in certain analyses such as gross beta because decay does not apply. In the tritium analysis, decay is not considered because of the relatively long half-life.

Efficiencies and volumes are consistent between the two documents, Chemical yields appear in Section C where applicable but do not apply to other analyses such as tritium and gross beta.

APPENDIX D
DETECTION LIMITS AND REPORTING LEVELS

NEBRASKA PUBLIC POWER - COOPER NUCLEAR STATION
DETECTION LIMITS AND REPORTING LEVELS

<u>Isotope</u>	<u>ODAM LLD</u>	<u>Rept. Level</u>
<u>Water - pCi/liter</u>		
Gross beta	4	
H-3	2000	6700
Mn-54	15	330
Fe-59	30	130
Co-58	15	330
Co-60	15	100
Zn-65	30	100
Zr-95	30	130
Nb-95	15	130
I-131	1 ^(c)	1
Cs-134	15	15
Cs-137	18	18
Ba-140	60	67
La-140	15	67
<u>Air Filter - pCi/m³</u>		
Gross Beta	0.01	N/A
I-131	0.07	0.3
Cs-134	0.05	3.3
Cs-137	0.06	6.7
<u>Fish - pCi/kg-wet</u>		
Mn-54	130	10000
Fe-59	260	3300
Co-58	130	10000
Co-60	130	3300
Zn-65	260	6700
Cs-134	130	330
Cs-137	150	670
<u>Milk - pCi/liter</u>		
I-131	1	
Cs-134	15	
Cs-137	18	
Ba-140	60	
La-140	15	

NEBRASKA PUBLIC POWER - COOPER NUCLEAR STATION
DETECTION LIMITS AND REPORTING LEVELS

<u>Isotope</u>	<u>ODAM LLD</u>	<u>Rept. Level</u>
<u>Vegetation - pCi/kg-wet</u>		
I-131	60	
Cs-134	60	
Cs-137	80	
<u>Sediment - pCi/kg-dry</u>		
Cs-134	150	
Cs-137	180	

APPENDIX E
REMP SAMPLING AND ANALYTICAL EXCEPTIONS

EXCEPTIONS

Appendix E contains the exceptions to the 2001 REMP Program. Where possible, causes of the deviation have been corrected to prevent recurrence. Several samples were unavailable due to seasonal unavailability. A number of samples were held by the laboratory for a long period of time before they were analyzed. NRC Regulatory Guide 4.1 Section C., Subsection b., states, "When a radionuclide with an intermediate half-life (weeks to months) is released continuously or frequently, sampling and analysis of environmental media in the associated pathway should generally be carried out at intervals no greater than two or three half-lives of the nuclide." In some cases in this report, laboratory results that were invalid due to an excessive delay in analysis do not appear in the data tables or on the corresponding trending graphs.

All deviations from the sampling schedule have been documented on the data tables. Data Tables are in Section VII.

Exceptions for Scheduled REMP Sampling and Analysis During 2001, NPPD Cooper Nuclear Station

Station(s)	Pathway	Sample	Collection Period	Exception/Reason	Actions Taken and Replacement Samples, Where Applicable
3	Airborne	Air particulate & Charcoal Filter	03/21/01-04/24/01	Sample not available; pump out of service.	Equipment repaired and returned to normal service; no further action necessary
1	Airborne	Air particulate & Charcoal Filter	02/12/01-02/28/01	Station not accessible due to poor road conditions.	Regular sampling resumed when conditions allowed; no further action necessary
2	Airborne	Air particulate & Charcoal Filter	01/23/01-3/21/01 03/27/01-04/10/01 05/29/01-06/12/01	Station not accessible due to poor road conditions.	Regular sampling resumed when conditions allowed; no further action necessary
3	Airborne	Air particulate & Charcoal Filter	01/16/01-01/30/01 02/12/01-03/06/01	Station not accessible due to poor road conditions.	Regular sampling resumed when conditions allowed; no further action necessary
4	Airborne	Air particulate & Charcoal Filter	04/24/01-05/22/01	Sample not available; pump out of service.	Equipment repaired and returned to normal service; no further action necessary
4	Airborne	Air particulate & Charcoal Filter	02/12/01-02/28/01	Station not accessible due to poor road conditions.	Regular sampling resumed when conditions allowed; no further action necessary
8	Airborne	Air particulate & Charcoal Filter	01/23/01-02/20/01 03/27/01-04/10/01 05/29/01-06/12/01	Station not accessible due to poor road conditions.	Regular sampling resumed when conditions allowed; no further action necessary
61	Ingestion	Milk-Nearest Producer	03/06/01	Declared invalid due to sample mount not decaying properly.	Laboratory provided documentation; no further action required.

Station(s)	Pathway	Sample	Collection Period	Exception/Reason	Actions Taken and Replacement Samples, Where Applicable
100	Ingestion	Milk-Other Producer	01/09/01	Due to delay in analysis, LLD's not met.	Laboratory provided documentation; no further action necessary.
11, 47	Aquatic	Ground Water	01/16/01	Due to limited sample volume; LLD's were not met.	Laboratory provided documentation; no further action necessary.
28, 35	Aquatic	River Water	01/02/01	Sample not taken due ice conditions on the river.	Regular sampling resumed when conditions allowed; no further action necessary.
28, 35	Aquatic	River Water	03/06/01	Declared invalid due to sample mount not decaying properly.	Laboratory provided documentation; no further action required
89	Ambient Gamma	TLD	01/01/01-04/16/01 04/16/01-07/05/01	Sample badge missing.	TLD's for next sampling period were placed at sites; no further action necessary.
35	Ingestion	Broadleaf Vegetation	05/22/01 06/12/01 07/17/01 08/14/01 09/11/01	Insufficient vegetation; no sample taken.	Attributable to natural seasonal variations and mowing; no further action necessary.
96	Ingestion	Broadleaf Vegetation	05/22/01 06/12/01 07/17/01 08/14/01 09/11/01	Insufficient vegetation; no sample taken.	Attributable to natural seasonal variations and mowing; no further action necessary.

Station(s)	Pathway	Sample	Collection Period	Exception/Reason	Actions Taken and Replacement Samples, Where Applicable
101	Ingestion	Broadleaf Vegetation	05/22/01 06/12/01 07/17/01 08/14/01	Insufficient vegetation; no sample taken.	Attributable to natural seasonal variations and mowing; no further action necessary.

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

Summary of Doses to Maximum Individual at the Site Boundary, Resulting from Exposure to Radioactivity Discharged in Liquid Effluents, January-December 2001, Cooper Nuclear Station

Dose to Individual, mrem

<u>Period and Pathway</u>	<u>Skin</u>	<u>Bone</u>	<u>Liver</u>	<u>Total Body</u>	<u>Thyroid</u>	<u>Kidney</u>	<u>Lung</u>	<u>GI-LLI</u>
<u>1st Quarter</u>	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
<u>2nd Quarter</u>	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
<u>3rd Quarter</u>	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
<u>4th Quarter</u>	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
<u>Totals for 2001</u>	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00

Summary of Gaseous Effluent Dose Calculations

DOSES TO MAXIMUM INDIVIDUAL (MREM), JANUARY-DECEMBER 2001

SPECIAL LOCATION NO. 1 A Site Boundary
AT .69 MILES NNW

ANNUAL BETA AIR DOSE = 9.64E-03 MILLRADS
ANNUAL GAMMA AIR DOSE = 1.14E-02 MILLRADS

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	7.61E-03	7.61E-03	7.61E-03	7.61E-03	7.61E-03	7.61E-03	7.71E-03	1.71E-02
GROUND	9.26E-02	9.26E-02	9.26E-02	9.26E-02	9.26E-02	9.26E-02	9.26E-02	1.06E-01
VEGET								
ADULT	1.06E-01	3.30E+00	1.61E+00	3.39E-03	1.18E-03	6.60E-03	1.31E-03	0.00E+00
TEEN	1.65E-01	3.92E+00	2.55E+00	5.32E-03	1.85E-03	8.89E-03	2.38E-03	0.00E+00
CHILD	3.52E-01	3.05E+00	6.02E+00	9.05E-03	3.01E-03	1.70E-02	3.58E-03	0.00E+00
MEAT								
ADULT	4.05E-03	1.25E-01	6.08E-02	1.88E-04	6.45E-05	1.78E-04	5.62E-05	0.00E+00
TEEN	3.26E-03	7.74E-02	5.03E-02	1.52E-04	5.21E-05	1.29E-04	5.32E-05	0.00E+00
CHILD	5.42E-03	4.69E-02	9.28E-02	2.01E-04	6.61E-05	1.94E-04	6.23E-05	0.00E+00
COW MILK								
ADULT	4.34E-03	1.17E-01	5.75E-02	1.03E-03	3.69E-04	4.94E-03	1.47E-04	0.00E+00
TEEN	7.20E-03	1.58E-01	1.04E-01	1.81E-03	6.53E-04	7.82E-03	3.04E-04	0.00E+00
CHILD	1.49E-02	1.25E-01	2.51E-01	3.14E-03	1.08E-03	1.55E-02	4.66E-04	0.00E+00
INFANT	2.67E-02	1.25E-01	5.14E-01	6.23E-03	1.76E-03	3.76E-02	9.22E-04	0.00E+00
GOATMILK								
ADULT	2.31E-03	1.41E-02	9.04E-03	2.85E-03	9.91E-04	5.93E-03	3.23E-04	0.00E+00
TEEN	2.55E-03	1.91E-02	1.63E-02	5.02E-03	1.75E-03	9.39E-03	6.67E-04	0.00E+00
CHILD	3.06E-03	1.51E-02	3.94E-02	8.70E-03	2.91E-03	1.86E-02	1.03E-03	0.00E+00
INFANT	4.44E-03	1.51E-02	7.69E-02	1.70E-02	4.69E-03	4.51E-02	1.87E-03	0.00E+00
INHAL								
ADULT	2.26E-04	1.90E-02	3.39E-03	9.19E-06	4.61E-06	4.28E-05	1.10E-01	0.00E+00
TEEN	3.09E-04	1.99E-02	4.75E-03	1.26E-05	6.33E-06	5.38E-05	1.76E-01	0.00E+00
CHILD	3.79E-04	8.90E-03	6.43E-03	1.22E-05	5.90E-06	6.23E-05	1.51E-01	0.00E+00
INFANT	2.54E-04	3.39E-03	4.87E-03	1.05E-05	3.80E-06	5.69E-05	1.39E-01	0.00E+00

Summary of Gaseous Effluent Dose Calculations

DOSES TO MAXIMUM INDIVIDUAL (MREM), JANUARY-DECEMBER 2001 (CONTINUED)

SPECIAL LOCATION NO. 2 A Site Boundary
AT .67 MILES N

ANNUAL BETA AIR DOSE = 1.04E-02 MILLRADS
ANNUAL GAMMA AIR DOSE = 1.24E-02 MILLRADS

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	8.30E-03	8.30E-03	8.30E-03	8.30E-03	8.30E-03	8.30E-03	8.41E-03	1.85E-02
GROUND	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.22E-01
VEGET								
ADULT	1.22E-01	3.80E+00	1.85E+00	3.92E-03	1.37E-03	9.63E-03	1.50E-03	0.00E+00
TEEN	1.90E-01	4.51E+00	2.93E+00	6.14E-03	2.15E-03	1.30E-02	2.74E-03	0.00E+00
CHILD	4.05E-01	3.51E+00	6.94E+00	1.04E-02	3.50E-03	2.49E-02	4.12E-03	0.00E+00
MEAT								
ADULT	4.66E-03	1.44E-01	7.00E-02	2.17E-04	7.47E-05	2.59E-04	6.47E-05	0.00E+00
TEEN	3.76E-03	8.91E-02	5.79E-02	1.75E-04	6.03E-05	1.88E-04	6.13E-05	0.00E+00
CHILD	6.25E-03	5.40E-02	1.07E-01	2.31E-04	7.65E-05	2.84E-04	7.18E-05	0.00E+00
COW MILK								
ADULT	5.01E-03	1.35E-01	6.63E-02	1.19E-03	4.34E-04	7.22E-03	1.69E-04	0.00E+00
TEEN	8.29E-03	1.82E-01	1.20E-01	2.10E-03	7.68E-04	1.14E-02	3.50E-04	0.00E+00
CHILD	1.72E-02	1.44E-01	2.89E-01	3.63E-03	1.27E-03	2.26E-02	5.37E-04	0.00E+00
INFANT	3.08E-02	1.44E-01	5.93E-01	7.22E-03	2.07E-03	5.49E-02	1.06E-03	0.00E+00
GOATMILK								
ADULT	2.67E-03	1.63E-02	1.05E-02	3.29E-03	1.15E-03	8.66E-03	3.73E-04	0.00E+00
TEEN	2.95E-03	2.20E-02	1.90E-02	5.80E-03	2.04E-03	1.37E-02	7.70E-04	0.00E+00
CHILD	3.54E-03	1.74E-02	4.58E-02	1.01E-02	3.39E-03	2.71E-02	1.18E-03	0.00E+00
INFANT	5.15E-03	1.74E-02	8.92E-02	1.97E-02	5.46E-03	6.59E-02	2.15E-03	0.00E+00
INHAL								
ADULT	2.43E-04	2.04E-02	3.65E-03	9.82E-06	4.91E-06	4.52E-05	1.19E-01	0.00E+00
TEEN	3.32E-04	2.14E-02	5.12E-03	1.35E-05	6.73E-06	5.69E-05	1.90E-01	0.00E+00
CHILD	4.08E-04	9.58E-03	6.92E-03	1.31E-05	6.28E-06	6.58E-05	1.63E-01	0.00E+00
INFANT	2.73E-04	3.65E-03	5.24E-03	1.13E-05	4.05E-06	6.01E-05	1.49E-01	0.00E+00

Summary of Gaseous Effluent Dose Calculations

DOSES TO MAXIMUM INDIVIDUAL (MREM), JANUARY-DECEMBER 2001 (CONTINUED)

SPECIAL LOCATION NO. 3 A Nearest Res
AT .90 MILES NW

ANNUAL BETA AIR DOSE = 3.57E-02 MILLRADS
ANNUAL GAMMA AIR DOSE = 3.83E-02 MILLRADS

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	2.56E-02	2.56E-02	2.56E-02	2.56E-02	2.56E-02	2.56E-02	2.60E-02	6.17E-02
GROUND	6.89E-02	6.89E-02	6.89E-02	6.89E-02	6.89E-02	6.89E-02	6.89E-02	7.88E-02
VEGET								
ADULT	7.87E-02	2.45E+00	1.19E+00	2.55E-03	9.12E-04	1.11E-02	9.71E-04	0.00E+00
TEEN	1.22E-01	2.91E+00	1.89E+00	3.99E-03	1.43E-03	1.49E-02	1.77E-03	0.00E+00
CHILD	2.61E-01	2.26E+00	4.48E+00	6.79E-03	2.33E-03	2.86E-02	2.66E-03	0.00E+00
MEAT								
ADULT	3.01E-03	9.28E-02	4.52E-02	1.41E-04	4.90E-05	2.98E-04	4.18E-05	0.00E+00
TEEN	2.42E-03	5.75E-02	3.73E-02	1.14E-04	3.96E-05	2.16E-04	3.96E-05	0.00E+00
CHILD	4.03E-03	3.48E-02	6.89E-02	1.50E-04	5.02E-05	3.25E-04	4.63E-05	0.00E+00
COW MILK								
ADULT	3.24E-03	8.68E-02	4.28E-02	7.82E-04	3.01E-04	8.30E-03	1.10E-04	0.00E+00
TEEN	5.37E-03	1.17E-01	7.73E-02	1.38E-03	5.33E-04	1.31E-02	2.27E-04	0.00E+00
CHILD	1.11E-02	9.31E-02	1.87E-01	2.39E-03	8.84E-04	2.60E-02	3.48E-04	0.00E+00
INFANT	1.99E-02	9.28E-02	3.83E-01	4.77E-03	1.44E-03	6.31E-02	6.88E-04	0.00E+00
GOATMILK								
ADULT	1.74E-03	1.05E-02	6.95E-03	2.15E-03	7.72E-04	9.96E-03	2.42E-04	0.00E+00
TEEN	1.93E-03	1.42E-02	1.26E-02	3.79E-03	1.37E-03	1.58E-02	5.00E-04	0.00E+00
CHILD	2.33E-03	1.13E-02	3.04E-02	6.57E-03	2.27E-03	3.12E-02	7.68E-04	0.00E+00
INFANT	3.41E-03	1.12E-02	5.91E-02	1.29E-02	3.66E-03	7.58E-02	1.40E-03	0.00E+00
INHAL								
ADULT	4.39E-04	3.65E-02	6.53E-03	2.69E-05	1.63E-05	1.79E-04	2.12E-01	0.00E+00
TEEN	6.00E-04	3.82E-02	9.15E-03	3.69E-05	2.24E-05	2.26E-04	3.39E-01	0.00E+00
CHILD	7.37E-04	1.73E-02	1.24E-02	3.60E-05	2.10E-05	2.64E-04	2.91E-01	0.00E+00
INFANT	4.94E-04	6.69E-03	9.37E-03	3.19E-05	1.37E-05	2.41E-04	2.66E-01	0.00E+00

APPENDIX G
REMP SAMPLE STATION DESCRIPTIONS

REMP SAMPLE STATION DESCRIPTIONS

The following pages contain descriptions of the CNS REMP Sample Stations that were active or were used for part or all of 2001. There were no changes to the CNS REMP Sample Stations from the previous year.

REMP SAMPLE STATION DESCRIPTIONS
SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station (a)</u>	<u>Sample Description – Type and Location</u>
No. 1	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: Outside the northwest edge of fence, east of the gate to the LLRW storage pad on the CNS site, NW ¼, S32, T5N, R16E, Nemaha County, Nebraska.
No. 2	Type: (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: North side of county road to the south portion of CNS site, SW ¼, 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 Brownsville State Recreation Park access road near water gauging station, SE ¼, S18, T5N, R16E, Nemaha County, Nebraska.
No. 4	Type (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: Located ½ mile south of Phelps City, Missouri, on west side of highway “U”, NE ¼, S2, T64N, R42W, Atchison County, Missouri.
No. 5	Type (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: Located ¼ mile south and ¼ mile east of Langdon, Missouri, on north side of road, west of railroad tracks, SW ¼, T64N, R41W, Atchison County, Missouri.
No. 6	Type (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry Location: One mile west of the end of Missouri State Highway “U”, SW corner of the intersection, NW ¼, S34, T64N, R42W, Atchison County, Missouri

<u>Sample Station</u>	<u>Sample Description – Type and Location</u>
No 7	<p>Type (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry</p> <p>Location: 300 yards east of Highway 67 on north side of road, SW ¼, S6, T4N, R16E, Nemaha, Nebraska.</p>
No. 8	<p>Type (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry</p> <p>Location: ½ mile north, ¾ mile west and ¾ mile north of Nemaha, on west side of road adjacent to transmission line, NE ¼, S35, T5N, R15E, Nemaha County, Nebraska.</p>
No. 9	<p>Type (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry</p> <p>Location: Four miles north of Highway 136, on Highway 67. Then 1 mile east of Highway 67 and ½ mile north on west side of road, SW ¼, S26, T6N, R15E, Nemaha County, Nebraska.</p>
No. 10	<p>Type (1) Air Particulate and Charcoal Filters (2) Environmental Thermoluminescent Dosimetry</p> <p>Location: One mile north of Barada, Nebraska, in SW corner of intersection, NE ¼, S14, T3N, R16E, Richardson County, Nebraska.</p>
No. 11	<p>Type: (1) Water – Ground</p> <p>Location: Plant well water supply header at well pits, NW ¼, S32, T5N, R16E, Nemaha County, Nebraska.</p>
No. 12	<p>Type: (1) Water – River</p> <p>Location: Sample (1) taken from the Missouri River immediately upstream from the Plant Intake Structure (River Mile 532.5). During periods when unsafe conditions warrant, Station 35 may be used as an alternate upstream collection site.</p>

<u>Sample Station</u>	<u>Sample Description – Type and Location</u>
No. 20	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: On NNW boundary of NPPD property, east side of county road, SE , S30, T5N, R16E, Nemaha County, Nebraska.</p>
No. 28	<p>Type (1) Water – River, (2) Fish (3) Sediment from Shoreline (4) Food Products – Broadleaf Vegetation</p> <p>Location: Samples (1), (3), and (4) are taken from the Missouri River or its shore downstream near River Mile 530, Sample (2) is taken from the Missouri River ½ to 3 miles downstream of the plant site.</p>
No. 35	<p>Type (1) Fish (2) Water – River (Alternate Site) (3) Food Products – Broadleaf Vegetation</p> <p>Location: Sample (1) will be taken from the Missouri River about 1 to 3 miles above the CNS intake structure. During periods when unsafe conditions warrant, Station 35 may be used as an alternate to Station 12 (upstream collection site) for sample type (2). Sample (3) is taken about ¼ mile south of the Brownville State Recreation Area in Sector A.</p>
No. 42	<p>Type: (1) Milk – Other Producer</p> <p>Location: One mile south, 1 ¼ miles east of Barada, Nebraska, south side of county road, NW ¼, S30, T3N, R17E, Richardson County, Nebraska.</p>
No. 44	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: ¼ mile south of Auburn Country Club on Highway 75, then ½ mile east of Highway 75 at fence line north of county road, SE1/4, S27, T5N, R14E, Nemaha County, Nebraska.</p>
No. 47	<p>Type: (1) Water – Ground</p> <p>Location: At Falls City Municipal water supply well</p>

NOTES:

(a) Sample station numbers missing from the sequence are for inactive or discontinued sampling locations.

<u>Sample Station</u>	<u>Sample Description – Type and Location</u>
No. 56	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: 1 ¼ miles SW of Langdon, Missouri, on Highway “U”, on the right side of the highway, NW ¼, S23, T64N, R42W, Atchison County, Missouri.</p>
No. 58	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: Three miles south of Brownville, Nebraska, on county road, at the SE corner of the intersection with the farm road leading to Sample Station No. 2, SE1/4, S31, T5N, R16E, Nemaha County, Nebraska.</p>
No. 59	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: One mile SSE of the CNS Elevated Release Point, in the vicinity of the levee at the south boundary of NPPD property, SE ¼, S32, T5N, R16E, Nemaha County, Nebraska.</p>
No. 61	<p>Type (1) Milk – Nearest Producer</p> <p>Location: One mile west of Brownville, Nebraska, on Highway 136, then 1 mile north on the county road, turn right and proceed approximately ½ mile east on south side of road, NW1/4, S13, T5N, R15E, Nemaha County, Nebraska.</p>
No. 66	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: Two miles south of Nemaha, Nebraska, on Highway 67 – east side of road, NW1/4, S19, T4N, R16E, Nemaha County, Nebraska.</p>
No. 67	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: 2 miles west of Brownville, Nebraska, on Highway 136, then north 1 ½ miles on county road and east ½ mile, on north side of road, NE1/4, S11, T5N, R15E, Nemaha County, Nebraska. Sample</p>

NOTES:

(a) Sample station numbers missing from the sequence are for inactive or discontinued sampling stations.

<u>Sample Station</u>	<u>Sample Description – Type and Location</u>
No. 71	Type: (1) Environmental Thermoluminescent Dosimetry Location: Two miles east of Phelps City, Missouri, on Highway 36, then south 1 ½ miles on county road and west ¼ mile, SE1/4, S6, T64N, R41W, Atchison County, Missouri.
No. 79	Type: (1) Environmental Thermoluminescent Dosimetry Location: 1 7/8 miles south of Brownville, NE, on east side of paved road, NPPD property, SE1/4, S30, T5N, R16E, Nemaha County, Nebraska.
No. 80	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2 1/8 miles south of Brownville, on east side of paved road, NPPD property, NE1/4, S31, T5N, R16E, Nemaha County, Nebraska.
No. 81	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2 3/8 miles south of Brownville, Nebraska, in the NE corner of the intersection of the paved county road and 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 CNS in a field, on NPPD property, SW1/4, S32, T5N, R16E, Nemaha County, Nebraska.
No. 83	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2 ¼ miles south of Nemaha, Nebraska, on Highway 67, then east 1 mile to the junction of the driveway and county road (east side of drive), NE1/4, S19, T4N, R16E, Nemaha County, Nebraska.
No. 84	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2 ½ miles west of Brownville, NE, south side of Highway 136 west of Locust Grove School, NW1/4, S22, T5N, R15E, Nemaha County, Nebraska. Sample

NOTES:

(a) Sample station numbers missing from the sequence are for inactive or discontinued sampling stations.

<u>Sample Station</u>	<u>Sample Description – Type and Location</u>
No. 85	Type: (1) Environmental Thermoluminescent Dosimetry Location: One mile east of Brownville, Nebraska, on Highway 136, then north ¼ mile on the east side of the county road, NE1/4, S33, T65N, R42W, Atchison County, Missouri.
No. 86	Type: (1) Environmental Thermoluminescent Dosimetry Location: One mile west of Phelps City, Missouri, on Highway 136, then north 1 ½ miles on Highway “D” on west side, SE1/4, S22, T65N, R42W, Atchison County, Missouri.
No. 87	Type: (1) Environmental Thermoluminescent Dosimetry Location: One mile west of Phelps City, Missouri, on Highway 136, then south ½ mile on county road and ¾ mile west on county road to the end of the road, NW1/4, S3, T64N, R42W, Atchison County, Missouri.
No. 88	Type: (1) Environmental Thermoluminescent Dosimetry Location: One mile west of Phelps City, Missouri, on Highway 136, then south 2 miles at the end of the county road, NW1/4, S11, T64N, R42W, Atchison County, Missouri.
No. 89	Type: (1) Environmental Thermoluminescent Dosimetry Location: 2 ½ miles south of Phelps City, Missouri, on Highway “U”, then ½ mile west in the SE corner of the county road intersection, NE1/4, S14, T64N, R42W, Atchison County, Missouri.
No. 90	Type: (1) Environmental Thermoluminescent Dosimetry Location: 1 ½ miles west and ¾ mile south of Langdon, Missouri, on Highway “U”, then ¼ mile west, SW1/4, S23, T64N, R42W, Atchison County, Missouri. Sample

NOTES:

(a) Sample station numbers missing from the sequence are for inactive or discontinued sampling stations.

<u>Sample Station</u>	<u>Sample Description – Type and Location</u>
No. 91	Type: (1) Environmental Thermoluminescent Dosimetry Location: ½ mile west of Rockport, Missouri, on the south side of the intersection of U.S. Highway 136 and U.S. Highway 275, at the south side of the water tower, NW1/4, S28, T65N, R41W, Atchison County, Missouri.
No. 94	Type: (1) Environmental Thermoluminescent Dosimetry Location: ¼ mile of Langdon, Missouri, on the west side of the road, NE1/4, S24, T64N, R42W, Atchison County, Missouri.
No. 96	Type: (1) Food products – Broadleaf Vegetation Location: Approximately 1 mile south of Brownville, Nebraska, along the paved road, in the road ditch in Sector R, SW1/4, S19, T5N, R16E, Nemaha County, Nebraska.
No. 99	Type: (1) Milk (Nearest and Other Producer) Location: 1 ¼ mile south of Shubert, Nebraska, on the west side of Highway 67, NE1/4, S24, T3N, R15E, Richardson County, Nebraska.
No. 100	Type (1) Milk (Other Producer) Location: Two miles south and 1 mile west of Shubert, Nebraska, SW1/4, S23, T3N, R15E, Richardson County, Nebraska.
No. 101	Type: (1) Food Products – Broadleaf Vegetation Location: 5 ½ miles east and ½ mile north of Rock Port, Missouri, near the junction of Highway 136 and Highway 59, in Sector D, encompasses portions of several sections, Athison County, Missouri.

NOTES:

(a) Sample station numbers missing from the sequence are for inactive or discontinued sampling stations.