ZION STATION

RADIOACTIVE WASTE AND ENVIRONMENTAL MONITORING

Annual Report 1979

EBERLINE INSTRUMENT CORPORATION
Midwest Facility

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ENVIRONMENTAL SAMPLING AND ANALYSIS PROGRAM

for

ZION GENERATING STATION
Commonwealth Edison Company

ANNUAL REPORT 1979

EBERLINE INSTRUMENT CORPORATION
Midwest Facility

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INTRODUCTION

Zion Station, adjacent to Lake Michigan in Zion, Illinois, consists of two Westinghouse pressurized water reactors, each with a generating capacity of 1100 MWE (3250 MWT) at full power. The Zion plant has been designed to minimize radioactive releases to the environment. The Technical Specifications limit radionuclide releases to values that will insure that radiation doses attributable to the operation of the plant will satisfy the "as low as practicable" philosophy.

Various environmental samples are collected at indicator and background stations and analyzed to determine if changes in radioactivity levels may be attributable to the operation of the plant. If significant changes due to the plant are measured, these changes are correlated with effluent releases. The results of these analyses are summarized on a monthly basis and reported to the Nuclear Regulatory Commission annually.

SUMMARY

Gaseous and liquid effluents for the period remained below the Technical Specification limits. Calculations of environmental concentrations based on effluent and meteorological data for the period indicate that consumption by the public of radioactive materials attributable to the plant are unlikely to exceed regulatory limits. Gamma radiation exposure from noble gases released to the atmosphere represented the critical pathway for the period with a maximum individual dose estimated to be 0.2 mrem for the year, when a shielding and accupancy factor of 1.4 is assumed. Environmental monitoring results confirm that dose via other pathways was not significant.

1.0 EFFLUENTS

1.1 GASEOUS EFFLUENTS TO THE ATMOSPHERE

Measured concentrations and isotopic composition of noble gases, radioiodine, and particulate radioactivity released to the atmosphere during the year, are listed in Table 1.1-1. A total of 3.41 E+04 curies of noble gases was released with a maximum release rate of 2.1 E+04 μCi/sec during any one-hour period.

A total of 6.19 E-03 curies of I-131 was released during the year.

A total of 6.12 E-02 curies of beta-gamma emitters and non-detectable amounts of alpha emitters was released as airborne particulate matter.

1.2 LIQUIDS RELEASED TO LAKE MICHIGAN

A total of 1.24 E+08 liters of radioactive liquid wastes containing 2.17 curies (excluding tritium) were discharged from the station. These wastes were released at a maximum monthly average concentration of 1.5 E-09 μCi/ml which is 12.8% of the Technical Specification release limits for unidentified radioactivity. During the same period, 601 curies of tritium and 6.13 E-03 curies of alpha radioactivity were released. Monthly release estimates and principal radionuclides in liquid effluents are given in Table 1.2-1.

2.0 SOLID RADIOACTIVE WASTES

Solid radioactive wastes were shipped to Richland, Washington; Hanford, Washington; Beatty, Nevada; and/or Barnwell Nuclear Center, South Carolina. The record of waste shipments is summarized in Table 2.0-1.

3.0 DOSE TO MAN

3.1 GASEOUS EFFLUENT PATHWAYS

GAMMA DOSE RATES

Gamma air and whole body dose rates off-site were calculated based on measured release rates, isotopic composition of the noble gases, and meteorological data for the period (Table 3.1-1). Isodose contours of whole body dose are shown in Figure 3.1-1 for the year. Based on measured effluents and meteorological data, the maximum dose to an individual would be 0.2 mrem for the year, with an occupancy or shielding factor of 1.4 included. The maximum gamma air dose was 2.7 mrad.

BETA AIR AND SKIN RATES

The range of beta particles in air is relatively small (on the order of a few meters of less): consequently, plumes of gaseous effluents may be considered "infinite" for purpose of calculating the dose from beta radiation incident on the skin. However, the actual dose to sensitive skin tissues is difficult to calculate because this depends on the beta particle energies, thickness of inert skin, and clothing covering sensitive tissues. For purposes of this report the skin is taken to have a thickness of 0.7 mg/cm^2 and an occupancy factor of 0.5 is used. The skin dose from beta and gamma radiation for the year was 0.2 mrem.

The air concentrations of radioactive noble gases at the off-site receptor locations are given in Figure 3.1-2. The maximum off-site beta air dose for the year was 0.6 mrad.

RADIOACTIVE IODINE

The human thyroid exhibits a significant capacity to concentrate ingested or inhaled iodine, and the radioiodine, I-131, released during routine operation of the plant, may be made available to man thus resulting in a dose to the thyroid. The principal pathway of interest for this radionuclide is ingestion of radioiodine in milk by an infant. Calculations made in previous years indicate that contributions to doses from inhalation of I-131 and I-133, and I-133 in milk are negligible.

IODINE-131 CONCENTRATIONS IN AIR

The calculated concentration contours for I-131 in air are shown in Figure 3.1-3. Included in these calculations is an iodine cloud depletion factor which accounts for the phenomenon of elemental iodine deposition on the ground. The maximum off-site average concentration is estimated to be 3.1×10^{-3} pCi/m^3 for the year.

DOSE TO INFANTS THYROID

The hypothetical thyroid dose to an infant living near the plant via ingestion of milk was calculated. The radionuclide considered was I-131 and the source of milk was taken to be the nearest dairy farm with the cows pastured from May to October. The maximum infant's thyroid dose was 0.0 mrem during the year (Table 3.1-1).

CONCENTRATION OF PARTICULATES IN AIR

Concentrations contours of radioactive airborne particulates are shown in Figure 3.1-4. The maximum off-site average level is estimated to be 2.6×10^{-2}.

SUMMARY OF DOSES

Table 3.1-1 summarizes the doses resulting from releases of airborne radioactivity via the different exposure pathways.

3.2 LIQUID EFFLUENT PATHWAYS

The three principal pathways through the aquatic environment for potential doses to man from liquid waste are ingestion of potable water, eating aquatic foods, and exposure while walking on the shoreline. Not all of these pathways are applicable at a given time or station but a reasonable approximation of the dose can be made by adjusting the dose formula for season of the year or type and degree of use of the aquatic environment. NRC* developed equations were used to calculate the doses to the whole body, lower GI tract, thyroid, bone and skin; specific parameters for use in the equations are given in Table 3.2-1. In general, the values of the parameters used were taken from HERMES**, a report which summarizes the living habits of persons in the North Central U.S. These doses are summarized in Table 3.2-2. No organ dose exceeded 9×10^{-2} mrem for the year.

4.0 SITE METEOROLOGY

A summary of the site meteorological measurements taken during each calendar quarter of the year is given in Appendix II. The data are presented as cumulative joint frequency distributions of 35' level wind direction and wind speed class by atmospheric stability class determined from the temperature difference between the 125' and 35' levels. Data recovery for these measurements was 96%.

*Nuclear Regulatory Commission, Regulatory Guide 1.109 (Rev 1).

**J. F. Fletcher and W. L. Dotson (compilers), "HERMES-A digital Computer Code for Estimating Regional Radiological Effects from the Nuclear Power Industry," USAEC Report HEDL-TME-71-168, Hanford Engineering Development Laboratory, 1971.

5.0 ENVIRONMENTAL MONITORING

Table 5.0-1 provides an outline of the radiological environmental monitoring program as required in current Technical Specifications. This program went into effect in November 1977 and differs from previous programs in the number and types of analyses performed. Tables 5.0-2 to 5.0-5 summarize data for the year.

Except for tables of special interest, tables listing all data are no longer included in the annual report. All data tables are available for inspection at the Station.

Specific findings for various environmental media are discussed below.

5.1 GAMMA RADIATION

External radiation dose from on-site sources and noble gases released to the atmosphere was measured at three indicator and ten reference (background) locations using solid lithium fluoride thermoluminescent dosimeters (TLD). A comparison of the TLD results for reference stations with on-site indicator stations is included in Table 5.1-1.

5.2 AIRBORNE I-131 and PARTICULATE RADIOACTIVITY

Concentrations of airborne I-131 and particulate radioactivity at monitoring locations are summarized in Tables 5.0-2 through 5.0-5. Locations of the samplers are the same as for direct radiation measurements, shown in Figure 5.0-1. Airborne I-131 remained below the LLD of 0.10 pCi/m^3 throughout the year.

Gross beta concentrations ranged from less than 0.01 to 0.08 pCi/m^3 in indicator stations with an average concentration of 0.04 pCi/m^3. No radioactivity attributable to station operation was detected in any sample.

5.3 AQUATIC RADIOACTIVITY

Water samples were collected weekly from six public water works that draw water from Lake Michigan. The samples are composited and analyzed monthly for gamma emitters and quarterly for tritium. Gamma emitters were in all cases below the limits of detection for the program, and tritium concentrations were within the ranges expected in environmental water.

Cooling water samples are composited, collected weekly, and analyzed for gross beta and tritium concentrations. Some samples contained both gross beta activity and tritium in concentrations above what would be expected in environmental samples. Two samples from Z-23S (Discharge area 1) collected in January contained gross beta activity

of 100 pCi/l and 70 pCi/l. These samples were analyzed by gamma spectrometry as a supplementary analysis and found to contain Cs-134 and Cs-137.

Fish samples were collected from the vicinity of the station, and the edible portions analyzed for gamma emitters. Concentrations of radioactivity in these samples were either below the limits of detection for the program or at levels usually encountered in the environment indicating the presence of no radioactivity due to station operations.

Sediment samples were collected from the areas of the North and South discharges and analyzed for gamma emitters. Gamma radioactivity was below the limit of detection for both of the samples.

5.4 MILK

Milk samples are collected from November through April, and weekly the rest of the year. From May through October the samples are analyzed for I-131 by high-sensitivity methods (iodine chemistry and low level beta counting) and non-grazing season samples are analyzed by gamma counting. Radioiodine remained below the limits of detection thoughout the year.

6.0 ANALYTICAL PROCEDURES

A summary of the procedures used for analyzing radioactivity in environmental samples is given in Appendix III of the report for the period January through June 1975. Procedures used during the period covered by this report remain unchanged.

7.0 MILCH ANIMAL CENSUS

There are no milk-producing animals within a five-mile radius of the Zion Generating Station. The closest dairy animals on record are those at Amestead Dairy (Z-32), located just over five miles at 270°. This information was obtained through the Agricultural Extension Office in Grayslake, Illinois.

APPENDIX I

TABLES AND FIGURES

TABLE 1.1-1

REPORT OF RADIOACTIVE EFFLUENTS

FACILITY: Zion

DOCKET NOS: 50-295 and 50-304

YEAR: 1979

I. Airborne Effluents	UNITS	January	February	March	First Quarter	April	May	June	Second Quarter	6 MO TOTAL	TECH SPEC REF
1. Gross Radioactivity Releases											
a) Total Release	Curies	2,278.23	2,264.70	5,477.88	10,020.81	3,198.56	3,500.84	2,110.91	8,810.31	18,831.12	3.8.A.1.a.1
b) Maximum Release Rate (1)	uci/sec	2,611.00	2,611.00	4,900.18	4,900.18	20,931.00	8,258.00	9,395.00	20,931.00	20,931.00	3.8.A.1.a.2
c) Isotopes Released	CAries										3.8.A.1.a.3
Xe-131m		3.27 E-2	N.D.	25.09	25.12	N.D.	9.62 E-3	6.71 E-3	1.63 E-2	25.14	
Xe-133m		1.47 E-2	N.D.	1.59	1.60	9.50 E-3	N.D.	4.80	4.81	6.41	
Kr-89		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Kr-88m		N.D.	N.D.	7.56 E-2	7.56 E-2	N.D.	N.D.	N.D.	N.D.	7.56 E-2	
Xe-135		224.10	230.86	367.36	822.32	309.05	349.99	202.84	861.88	1,684.20	
Xe-133		2054.09	2033.83	5083.77	9171.69	2889.50	3150.84	1900.64	7940.98	17,112.67	
Ar-41		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Kr-85		N.D.	N.D.	N.D.	N.D.	N.D.	2.18 E-6	2.63	2.63	2.63	
											3.12.1.A.
d) Percent of quarterly gaseous activity limit (6800 uci/sec)	%	3.02	3.00	7.26	13.28	4.24	4.64	2.79	11.67	24.95	3.8.A.1.b.1 3.12.1.A
2. Iodine Releases											
a) Isotopes Released	Curies										3.8.A.1.c
I-131		5.48 E-4	1.10 E-4	4.56 E-4	1.11 E-3	1.39 E-3	1.27 E-4	7.58 E-4	2.28 E-3	3.39 E-3	
I-133		2.26 E-4	1.04 E-5	7.28 E-4	9.64 E-4	1.99 E-4	6.39 E-4	2.67 E-5	8.65 E-4	1.83 E-3	
I-135		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
b) Percent of Iodine 131 Limit	%(2)	--	--	--	--	--	--	--	--	--	3.8.A.1.c 3.12.1.B

1. Gross Gaseous Radioactivity Release Maximum Release Rate 60,000 uc/sec.
2. Iodine and Particulate Limits are Total Limit - See Item 14 of this report.

POOR ORIGINAL

TABLE 1.1-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

DOCKET NOS: 50-295 and 50-304

YEAR: 1979

FACILITY: Zion

I. Airborne Effluents	UNITS	July	August	September	Third Quarter	October	November	December	Fourth Quarter	ANNUAL TOTAL	TECH SPEC REF
1. Gross Radioactivity Releases											
a) Total Release	Curies	3,727.87	4,737.53	4,137.14	12,602.54	1,572.63	558.16	518.94	2,649.73	5,252.27	6.6A3f1a1
c) Maximum Release Rate (1)	uci/sec	14,755.00	9,503.00	15,216.00	15,216.00	4,227.00	11,272.00	[illegible],00	11,272.00	5,216.00	6.6A3f1a2
c) Isotopes Released	Curies										6.6A3f1a3
Xe-131m		3.65E-2	N.D.	N.D.	3,65E-2	144.29	37.69	31.13	213.11	213.15	
Xe-133m		N.D.	2.00E-2	N.D.	2.00E-2	3.99	3.30	3.35	10.64	10.66	
Kr-88		3.80E-2	3.96E-2	23.27	23.35	8.46	N.D.	9.69	18.15	41.50	
Kr-85m		2.30E-3	3.05E-2	N.D.	3.28E-2	N.D.	N.D.	1.56	1.56	1.59	
Xe-133		362.99	473.58	411.26	1,247.83	149.25	55.43	47.92	252.60	1,500.43	
Xe-133		3364.80	4263.86	3702.61	11,331.27	1263.55	457.30	425.29	2146.14	3,477.41	
Ar-41		N.D.	N.D.	N.D.	N.D.	3.09	4.44	N.D.	7.53	7.53	
Kr-85		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
											3.12.1.A.1
c) Percent of quarterly gaseous activity limit (6650 uci/sec)	%	4.94	6.28	5.48	16.70	2.08	0.74	0.69	3.51	20.21	6.6A3f1a4 3.12.1.A
2. Iodine Releases											
a) Isotopes Released	Curies										6.6A3f1b1
I-131		2.00E-5	4.34E-5	9.60E-4	1.02E-3	1.68E-3	1.02E-4	1.18E-6	1.78E-3	2.80E-3	
I-133		2.32E-5	1.71E-3	9.39E-4	2.67E-3	1.36E-4	1.02E-6	3.56E-7	1.37E-4	2.81E-3	
I-135		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
b) Percent of Iodine 131 Limit	%(2)	- -	- -	- -	- -	- -	- -	- -	- -	- -	6.6A3f1b2
											3.12.1.B

1. Gross Gaseous Radioactivity Release Maximum Release Rate 60,000 uc/sec.
2. Iodine and Particulate Limits are Total Limit - See Item 14 of this report.

TABLE 1.1-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

FACILITY: ZION Docket Nos: 50-295 and 50-304 YEAR: 1979

I. Airborne Effluents	UNITS	January	February	March	First Quarter	April	May	June	Second Quarter	6 mo. Total	TECH SPEC REF.
B. Particulate Releases											6.6A3flc1
a) Gross Radioactivity	Curies	4.77E-2	2.98E-4	2.10E-3	5.01E-2	2.94E-3	3.51E-3	5.51E-4	7.00E-3	5.71E-2	6.6A3flc2
b) Gross Alpha Radioactivity	Curies	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	6.6A3flc3
c) Isotopes Released	Curies										
Sr-89		----	----	----	4.90E-11	----	-----	-----	(2)	(2)	
Sr-90		----	----	----	2.00E-11	----	-----	-----	(2)	(2)	
Co-58		3.12E-6	N.D.	2.58E-4	2.61E-4	1.40E-4	2.01E-4	4.47E-5	3.85E-5	6.46E-4	
Co-60		4.77E-2	1.66E-7	7.09E-4	4.84E-2	1.43E-4	3.66E-4	3.41E-4	8.50E-4	4.93E-2	
Cs-134		1.45E-5	1.01E-4	2.96E-4	4.12E-4	6.96E-5	2.50E-3	8.45E-5	2.65E-3	3.06E-3	
Cs-137		2.41E-5	9.06E-5	4.01E-4	5.16E-4	2.53E-3	1.15E-4	7.99E-5	2.72E-3	3.24E-3	
Mn-54		N.D.	N.D.	3.60E-3	3.60E-5	8.29E-12	1.51E-6	3.37E-7	1.85E-6	3.79E-5	
I-131		9.83E-9	4.84E-6	1.19E-4	1.24E-4	3.02E-4	1.97E-7	2.80E-7	3.50E-6	1.28E-4	
I-133		N.D.	N.D.	3.01E-5	3.01E-5	N.D.	3.28E-4	N.D.	3.28E-4	3.58E-4	
I-135		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Nb-95		N.D.	N.D.	8.39E-5	8.39E-5	3.36E-6	9.08E-8	4.08E-7	3.86E-6	8.77E-5	
Zr-95		N.D.	N.D.	N.D.	N.D.	5.19E-5	N.D.	N.D.	5.19E-5	5.19E-5	
Cr-51		N.D.	N.D.	N.D.	N.D.	2.14E-8	N.D.	N.D.	2.14E-8	2.14E-8	
Ba-La 140		9.66E-8	N.D.	N.D.	9.66E-8	N.D.	N.D.	N.D.	N.D.	9.66E-8	
Mo 99		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Te 99m		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
NP 239		1.79E-6	N.D.	6.86E-8	1.86E-6	N.D.	N.D.	N.D.	N.D.	1.86E-6	
Na 24		1.10E-6	1.01E-4	3.47E-5	1.37E-5	1.37E-4	2.47E-6	N.D.	2.47E-6	1.40E-4	
Sb 124		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Fe 59		N.D.	N.D.	1.33E-4	1.33E-4	N.D.	N.D.	N.D.	N.D.	1.33E-4	
a) Percent of Particulate	(1) %	-----	-----	-----	------	-----	------	------	------	-----	6.6A2flc4
with half lives greater											3.12.1.B
than 8 days											

N.D. = No detectable activity above background

1. Iodine and Particulate limits are expressed as a combined limit-See Item I.4 of this report.

2. Waiting for analysis results - data will be presented in an errata to the Annual Report

POOR ORIGINAL

TABLE 1.1-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

FACILITY: ZION Docket Nos: 50-295 and 50-304 YEAR: 1979

I. Airborne Effluents	UNITS	July	August	September	Third Quarter	October	November	December	Fourth Quarter	6 mo. Total	TECH SPEC REF.
3. Particulate Releases											6.8.3.f.1.c.1
a) Gross Radioactivity	Curies	9.97E-4	3.86E-4	1.43E-3	2.81E-3	4.94E-4	7.21E-4	1.05E-4	1.32E-3	4.13E-3	6.8.3.f.1.c.2
b) Gross Unidentified Radioactivity	Curies	N.D.	N.D.	N.D.	N.D.	N.D.	1.30E-4	N.D.	1.30E-4	1.30E-4	6.8.3.f.1.c.3
c) Isotopes Released	Curies										
Sr-89		- -	- -	- -	N.D.	- -	- -	- -	(2)	(2)	
Sr-90		- -	- -	- -	N.D.	- -	- -	- -	(2)	(2)	
Co-58		3.78E-6	2.77E-8	5.42E-5	5.80E-5	7.46E-7	2.42E-5	N.D.	2.50E-5	8.30E-5	
Co-60		1.98E-4	1.00E-4	2.77E-4	5.75E-4	1.22E-5	4.46E-5	1.50E-5	7.18E-5	6.47E-4	
Cs-134		6.36E-4	2.26E-4	7.16E-5	9.34E-4	4.55E-6	5.20E-6	1.43E-6	1.12E-5	9.45E-4	
Cs-137		1.39E-4	3.93E-5	8.52E-5	2.64E-4	2.51E-5	3.58E-5	2.49E-5	8.58E-5	3.50E-4	
Mn-54		1.32E-6	1.99E-8	6.51E-6	7.85E-6	3.68E-7	5.81E-7	N.D.	9.49E-7	8.80E-6	
I-131		1.29E-9	N.D.	5.31E-5	5.31E-5	3.42E-6	N.D.	1.18E-6	4.60E-6	5.77E-5	
I-133		N.D.	6.18E-6	8.50E-4	8.56E-4	1.27E-4	N.D.	N.D.	1.27E-4	9.83E-4	
I-135		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Nb-95		N.D.	N.D.	3.02E-7	3.02E-7	1.71E-8	4.75E-5	N.D.	4.75E-5	4.78E-5	
Zr-95		N.D.	N.D.	N.D.	N.D.	N.D.	4.54E-5	N.D.	4.54E-5	4.54E-5	
Cr-51		N.D.	6.39E-6	N.D.	6.39E-6	4.74E-6	9.31E-6	5.89E-5	7.30E-5	7.94E-5	
Ba-La 140		N.D.	N.D.	N.D.	N.D.	6.41E-6	N.D.	N.D.	6.41E-6	6.41E-6	
Mo 99		1.84E-5	N.D.	N.D.	1.84E-5	N.D.	N.D.	N.D.	N.D.	1.84E-5	
Tc 99m		N.D.	5.29E-8	N.D.	5.29E-8	3.15E-5	3.59E-5	N.D.	6.74E-5	6.75E-5	
UP 239		N.D.	5.96E-6	N.D.	5.96E-6	6.05E-7	N.D.	3.59E-6	4.20E-6	1.02E-5	
Na 24		1.48E-7	1.39E-6	3.29E-5	1.44E-5	1.64E-6	N.D.	N.D.	1.64E-6	3.60E-5	
SB 124		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Fe 59		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
d) Percent of Particulate	(1) %	- -	- -	- -	- -	- -	- -	- -	- -	- -	6.8.3.f.1.c.4
with half lives greater											6.12.1.3
than 8 days											

N.D. = No detectable activity above background

1. Iodine and Particulate limits are expressed as a combined limit-See Item I.4 of this report.

2. Waiting for analysis results - data will be presented in an errata to the Annual Report

TABLE 1.1-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

FACILITY: ZION Docket Nos: 50-295 and 50-304 YEAR: 1979

I. Airborne Effluents	UNITS	January	February	March	First Quarter	April	May	June	Second Quarter	6mo. Total	TECH SPEC REF
4.Sum of Iodine 131 and Particulate with half lives greater than 8 days		4.83 E-2	3.03 E-4	2.37 E-4	4.88 E-2	4.33 E-3	3.31 E-3	1.31 E-3	8.95 E-3	5.78 E-2	3.12.13
a) Percent of Limit (2 uci/sec)	%	9.00 E-1	6.26 E-3	4.42 E-2	9.50 E-1	8.36 E-2	6.18 E-2	2.53 E-2	1.70 E-1	1.12	3.12.13
b) Percent of quarterly limit (0.16 uci/sec)	%	--	--	--	3.88	--	--	--	7.12 E-1	4.59	3.12.1,3.1

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TABLE 1.1-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

FACILITY: ZION Docket Nos: 50-295 and 50-304 YEAR: 1979

I. Airborne Effluents	UNITS	July	August	September	Third Quarter	October	November	December	Fourth Quarter	6mo. Total	TECH SPEC REF
4. Sum of Iodine 131 and Particulate with half lives greater than 8 days	curies	9.99E-4	4.16E-4	1.51E-3	2.93E-3	2.01E-3	7.87E-4	1.03E-4	2.90E-3	5.83E-3	
a) Percent of Limit (2 uci/sec)	%	1.86E-2	7.76E-3	2.91E-2	5.55E-2	3.76E-2	1.52E-2	1.92E-3	5.47E-2	1.10E-1	
b) Percent of quarterly limit (0.16 uci/sec)	%	- -	- -	- -	2.33E-1	- -	- -	- -	2.31E-1	4.64E-1	

TABLE 1.2-1

REPORT OF RADIOACTIVE EFFLUENTS

Unit I Discharge

FACILITY: ZION

Docket Nos: 50-295 and 50-304

YEAR: 1979

II. Liquid Effluents	UNITS	January	February	March	First Quarter	April	May	June	Second Quarter	Ano. Total	TECH. SPEC REF.
1. Gross Radioactivity*											
a) Total Release	Curies	6.87 E-2	8.55 E-2	1.19 E-1	2.73 E-1	1.98 E-1	7.17 E-2	1.45 E-2	2.84 E-1	5.57 E-1	[illegible]
b) Average Concentration Released	uci/ml	5.19 E-10	7.14E-10	9.19 E-10	7.17 E-10	1.55 E-9	5.41E-10	1.38E-10	7.43 E-10	7.30 E-10	[illegible]
c) Maximum Concentration Released	uci/ml	4.28 E-9	2.68 E-8	1.65 E-8	2.68 E-8	2.15 E-8	9.89 E-9	4.39 E-9	2.15 E-8	2.68 E-8	[illegible]
d) Percent of Tech Spec Limit (5 curies)	%	1.37	1.71	2.38	5.46	3.96	1.43	2.90	8.29	13.75	[illegible]
2. Tritium (1)											
a) Total Release	Curies	4.42 E+1	3.44 E+1	2.89 E+1	1.08 E+2	3.95 E+1	7.67 E+1	3.08 E+1	1.47 E+2	2.55 E+2	[illegible]
b) Average Concentration Released	uci/ml	3.34 E-7	2.88 E-7	2.23 E-7	2.82 E-7	3.08 E-7	5.79 E-7	2.94 E-7	3.94 E-7	3.38 E-7	[illegible]
c) Percent of Tech Spec Limit (3×10^{-3} uci/ml)	%	1.11 E-2	9.60 E-3	7.43 E-3	9.38 E-3	1.03 E-2	1.93 E-2	9.80 E-3	1.31 E-2	1.13 E-2	[illegible]
3. Dissolved Noble Gases											
a) Total Release	Curies	3.56 E-2	1.13	1.30 E-1	1.30	5.12 E-2	8.05 E-2	8.06 E-4	1.33 E-1	1.43	[illegible]
b) Average Concentration Released	uci/ml	2.69 E-10	9.44 E-9	1.00 E-9	3.57 E-9	1.05 E-11	6.08 E-10	7.69 E-12	2.09 E-10	1.89 E-9	[illegible]

N.D. = No detectable activity above background * Excluding tritium and Dissolved Noble Gases

(1) Minimum detectable tritium is 1×10^{-5} uc/cc

POOR ORIGINAL

TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

FACILITY: ZION Docket Nos: 50-295 and 50-304 Unit I Discharge YEAR: 1979

II. Liquid Effluents	UNITS	July	August	September	Third Quarter	October	November	December	Fourth Quarter	Ann. Total	TECH. SPEC. REQ.
1. Gross Radioactivity*							No Liquid	No Liquid			
a) Total Release	Curies	5.41E-2	3.45E-2	5.14E-2	1.40E-1	2.65E-3	Waste	Waste	2.65E-3	1.43E-1	[illegible]
b) Average Concentration Released	uci/ml	4.08E-10	2.63E-10	4.01E-10	3.57E-10	7.38E-11	Discharged	Discharged	2.46E-11	1.91E-10	[illegible]
c) Maximum Concentration Released	uci/ml	7.56E-9	4.72E-9	1.12E-8	1.12E-8	5.41E-9			5.41E-9	1.12E-8	[illegible]
d) Percent of Tech Spec Limit (5 curies)	%	1.08	6.90E-1	1.03	2.80	5.30E-2			5.30E-2	2.85	[illegible]
2. Tritium (1)											
a) Total Release	Curies	1.13E+2	1.33E+2	7.64E+1	3.22 E+2	2.44E+1			2.44E+1	3.46E+2	[illegible]
b) Average Concentration Released	uci/ml	8.53E-7	1.01E-6	5.96E-7	8.20E-7	6.79E-7			2.26E-7	5.23E-7	[illegible]
c) Percent of Tech Spec Limit (3×10^{-3} uci/ml)	%	2.84E-2	3.37E-2	1.99E-2	2.73E-2	2.26E-2			7.53E-3	1.74E-2	[illegible]
3. Dissolved Noble Gases											
a) Total Release	Curies	1.48E-3	1.10E-2	1.13E-2	2.38 E-2	5.23E-3			5.23E-3	2.90E-2	[illegible]
b) Average Concentration Released	uci/ml	1.12E-11	8.39E-11	8.82E-11	6.11E-11	1.46 E-10			4.87E-11	5.49E-11	[illegible]

N.D. = No detectable activity above background * Excluding tritium and Dissolved Noble Gases

(1) Minimum detectable tritium is 1×10^{-5} uc/cc

TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

Unit I Discharge

FACILITY: ZION Docket Nos: 50-295 and 50-304 YEAR: 1979

I. Liquid Effluents	UNITS	January	February	March	First Quarter	April	May	June	Second Quarter	6mo. Total	TECH SPEC REF.
A. Gross Alpha Radioactivity											
a) Total Release	Curies	4.12 E-4	3.27 E-3	9.10 E-5	3.77 E-3	1.35 E-3	2.76 E-4	9.19 E-5	1.72 E-3	5.49 E-3	[illegible]
b) Average Concentration Released	uci/ml	3.11 E-12	2.73E-11	7.03 E-13	1.04 E-11	1.05E-11	2.08 E-12	8.76E-13	4.48 E-12	7.44 E-12	[illegible]
B. Volume of Liquid Waste to Discharge	Liters	2.42 E+7	1.27 E+7	1.45 E+7	5.14 E+7	1.53 E+7	1.12 E+7	1.42 E+7	4.07 E+7	9.21 E+7	[illegible]
C. Volume of Dilution Water	Liters	1.32 E+11	1.20E+11	1.29 E+11	3.81 E+11	1.28 E+11	1.32 E+11	1.05 E+11	3.65 E+11	7.46 E+11	[illegible]
D. Isotopes Released	Curies										[illegible]
Cs-134		2.00 E-2	7.99 E-3	1.16 E-2	3.96 E-2	1.75 E-2	1.04 E-2	3.09 E-3	3.10 E-2	7.06 E-2	
Ba-La-140		6.63 E-5	N.D.	1.28 E-3	1.34 E-3	5.50 E-4	N.D.	N.D.	5.50 E-4	1.89 E-3	
I-131		1.94 E-4	1.36 E-3	3.13 E-3	4.68 E-3	2.27 E-3	2.01 E-3	4.60 E-5	4.32 E-3	9.00 E-3	
Cs-137		3.56 E-2	1.76 E-2	1.62 E-2	6.94 E-2	1.31 E-2	1.33 E-2	1.44 E-3	2.78 E-2	9.72 E-2	
Co-58		4.03 E-3	3.23 E-3	2.26 E-2	2.98 E-2	6.61 E-2	1.98 E-2	1.63 E-3	8.75 E-2	1.17 E-1	
Co-60		6.54 E-3	5.29 E-2	3.27 E-2	9.21 E-2	3.67 E-2	1.80 E-2	5.48 E-3	6.02 E-2	1.52 E-1	
Cr-51		5.94 E-4	N.D.	1.57 E-2	1.63 E-2	3.97 E-2	2.22 E-3	3.56 E-4	4.23 E-2	5.86 E-2	
Mn-54		4.72 E-4	2.37 E-3	2.67 E-3	5.51 E-3	2.15 E-3	1.05 E-3	2.29 E-3	5.49 E-3	1.10 E-2	
Zn-65		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Sr-89		--	--	--	2.65 E-4	--	--	--	*	*	
Sr-90		--	--	--	3.13 E-4	--	--	--	*	*	
Cs-64		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
I-132		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	

N.D. = No detectable activity above background

* Waiting for analysis results - data will be presented in an errata to the Annual Report.

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TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

Unit___ ____Discharge

FACILITY: ZION

Docket Nos: 50-295 and 50-304

YEAR: 1979

II. Liquid Effluents	UNITS	July	August	September	Third Quarter	October	November	December	Fourth Quarter	no. Total	TECH SPEC Spec
4. Gross Alpha Radioactivity							No Liquid	No Liquid			
a) Total Release	Curies	1.85E-4	1.83E-4	2.67E-4	6.35E-4	1.62E-6	Waste	Waste	1.62E-6	6.37E-4	[illegible]
b) Average Concentration							Discharged	Discharged			[illegible]
Released	uci/ml	1.40E-12	1.40E-12	2.08E-12	1.61E-12	4.51E-14			1.50 E-14	8.23E-13	
5. Volume of Liquid Waste to Discharge	Liters	1.22E+7	1.42E+7	1.54E+7	4.18E+7	4.65E+6			4.65E+6	4.65E+7	[illegible]
6. Volume of Dilution Water	Liters	1.32E+11	1.31E+11	1.28E+11	3.91E+11	3.60E+10			3.60E+10	4.27E+11	[illegible]
7. Isotopes Released	Curies										[illegible]
Cs-134		1.10E-2	5.41E-3	1.61E-2	3.25E-2	4.88E-4			4.88E-4	3.30E-2	
Ba-La-140		N.D.	N.D.	N.D.	N.D.	N.D.			N.D.	N.D.	
I-131		2.92E-4	6.35E-4	8.47E-4	1.77E-3	N.D.			N.D.	1.77E-3	
Cs-137		5.96E-3	7.07E-3	1.65E-2	2.91E-2	7.23E-4			7.23E-4	3.02E-2	
Co-58		1.27E-2	5.46E-3	4.89E-3	2.31E-2	1.35E-4			1.35E-4	2.32E-2	
Co-60		1.72E-2	1.38E-2	8.47E-3	3.95E-2	9.97E-4			9.97E-4	4.05E-2	
Cr-51		N.D.	4.05E-4	N.D.	4.05E-4	2.30E-4			2.30E-4	6.35E-4	
Mn-54		1.48E-3	7.88E-4	1.60E-4	2.43E-3	7.49E-5			7.49E-5	2.51E-3	
Zn-65		N.D.	N.D.	N.D.	N.D.	N.D.			N.D.	N.D.	
Sr-89		--	--	--	2.[illegible]E-4	--	--	--	*	*	
Sr-90		--	--	--	1.[illegible]E-4	--	--	--	*	*	
Cu-64		N.D.	N.D.	N.D.	N.D.	N.D.			N.D.	N.D.	
I-132		N.D.	N.D.	N.D.	N.D.	N.D.			N.D.	N.D.	

N.D. = No detectable activity above background

* = Waiting for Analysis results- data will be presented in an errata to the Annual Report.

TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

Unit I .Discharge

FACILITY: ZION

Docket Nos: 50-295 and 50-304

YEAR: 1979

II. Liquid Effluents	UNITS	January	February	March	First Quarter	April	May	June	Second Quarter	Sem. Total	TECH SPEC REF.
Sb 124		5.33 E-4	N.D.	5.63 E-3	6.16 E-3	5.23 E-3	5.91 E-4	N.D.	5.82 E-3	1.20 E-2	
I 133		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Ag 110m		6.34 E-5	N.D.	1.87 E-3	1.93 E-3	4.08 E-3	3.49 E-4	N.D.	4.43 E-3	6.36 E-3	
Na 24		.6.39 E-4	2.30 E-4	8.10 E-4	1.68 E-3	1.01 E-3	3.10 E-3	N.D.	4.11 E-3	5.79 E-3	
W 187		N.D.	N.D.	7.06 E-4	7.06 E-4	4.53 E-4	N.D.	N.D.	4.53 E-4	1.16 E-3	
Co 57		N.D.	N.D.	9.41 E-5	9.41 E-5	5.60 E-4	N.D.	N.D.	5.60 E-4	6.54 E-4	
Tc 99m		N.D.	N.D.	5.92 E-4	5.92 E-4	N.D.	N.D.	N.D.	N.D.	5.92 E-4	
Zr 95		N.D.	N.D.	7.54 E-4	7.54 E-4	2.10 E-3	1.52 E-4	N.D.	2.25 E-3	3.00 E-3	
Nb 95		N.D.	N.D.	2.17 E-3	2.17 E-3	6.13 E-3	7.66 E-4	1.51 E-4	7.05 E-3	9.22 E-3	
Fe 59		N.D.	N.D.	2.77 E-4	2.77 E-4	4.24 E-4	N.D.	N.D.	4.24 E-4	7.01 E-4	
Np 239		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	
Xe 133		2.85 E-2	1.07	5.60 E-2	1.15	9.87 E-3	1.43 E-2	6.47 E-4	2.48 E-2	1.17	
Xe 135		6.44 E-3	5.66 E-2	7.39 E-2	1.37 E-1	4.14 E-2	6.62 E-2	1.59 E-4	1.08 E-1	2.45 E-1	
Xe 133m		6.47 E-4	N.D.	5.04 E-4	1.15 E-3	N.D.	N.D.	N.D.	N.D.	N.D.	

N.D. = No detectable activity above backround

POOR ORIGINAL

TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

Unit I Discharge

FACILITY: ZION

Docket Nos: 50-295 and 50-304

YEAR: 1979

II. Liquid Effluents	UNITS	July	August	September	Third Quarter	October	November	December	Fourth Quarter	Est. Total Error %	TECH SPEC. REF.
Sb 124	curies	2.58E-3	4.25E-5	N.D.	2.62E-3	N.D.	No Liquid	No Liquid	N.D.	2.62E-3	
I 133		N.D.	N.D.	N.D.	N.D.	N.D.	Waste	Waste	N.D.	N.D.	
Ag 110m		7.12E-5	8.41E-5	3.45E-5	1.90E-4	N.D.	Discharged	Discharged	N.D.	1.90E-4	
Na 24		4.07E-4	1.99E-4	3.70E-3	4.31E-3	N.D.			N.D.	4.31E-3	
W 187		N.D.	N.D.	N.D.	N.D.	N.D.			N.D.	N.D.	
Co 57		N.D.	N.D.	N.D.	N.D.	N.D.			N.D.	N.D.	
Tc 99 m		N.D.	N.D.	1.91E-4	1.91E-4	N.D.			N.D.	1.91E-4	
Zr 95		7.01E-4	N.D.	1.09E-4	8.10E-4	N.D.			N.D.	8.10E-4	
Nb 95		1.56E-3	3.94E-4	1.88E-4	2.14E-3	N.D.			N.D.	2.14E-3	
Fe 59		N.D.	6.20E-5	1.72E-4	2.34E-4	N.D.			N.D.	2.34E-4	
Np 239		1.78E-4	1.35E-4	N.D.	3.13E-4	N.D.			N.D.	3.13E-4	
Te 133		1.48E-3	8.97E-3	5.90E-3	1.64E-2	4.90E-3			4.90E-3	2.13E-2	
Te 135		N.D.	2.01E-3	5.22E-3	7.23E-3	3.32E-4			3.32E-4	7.56E-3	
Xe 133m		N.D.	N.D.	2.09E-4	2.09E-4	N.D.			N.D.	2.09E-4	

N.D. = No detectable activity above backround

TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

Unit II Discharge

FACILITY: ZION

Docket Nos: 50-295 and 50-304

YEAR: 1979

II. Liquid Effluents	UNITS	January	February	March	First Quarter	April	May	June	Second Quarter	Ann. Total	Ann. Est. Diff.
1. Gross Radioactivity*		No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	
a) Total Release	Curies	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	E.Estimate
b) Average Concentration	uci/ml	Dischrgd	Dischrgd	Dischrgd	Dischrgd	Dischrgd	Dischrgd	Dischrgd	Dischrgd	Dischrgd	E.Estimate
Released											
c) Maximum Concentration	uci/ml										E.Estimate
Released											
d) Percent of Tech Spec	%										E.Estimate
Limit (5 curies)											
2. Tritium (1)											
a) Total Release	Curies										E.Estimate
b) Average Concentration	uci/ml										E.Estimate
Released											
c) Percent of Tech Spec	%										E.Estimate
Limit (3×10^{-3} uci/ml)											
3. Dissolved Noble Gases											
a) Total Release	Curies										E.Estimate
b) Average Concentration	uci/ml										E.Estimate
Released											
		↓	↓	↓	↓	↓	↓	↓	↓	↓	

N.D. = No detectable activity above background * Excluding tritium

(1) Minimum detectable tritium is 1×10^{-5} uc/cc

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TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

Unit 2I Discharge

FACILITY: ZION

Docket Nos: 50-295 and 50-304

YEAR: 1979

II. Liquid Effluents	UNITS	July	August	September	Third Quarter	October	November	December	Fourth Quarter	Ann. Total	Tech. Spec. Limit
1. Gross Radioactivity*		No Liquid	No Liquid	No Liquid	No Liquid						
a) Total Release	Curies	Waste	Waste	Waste	Waste	3.77E-2	5.29E-2	5.57E-2	1.46E-1	1.46E-1	[illegible]
b) Average Concentration	uci/ml	Discharged	Discharged	Discharged	Discharged	6.26E-10	1.16E-9	1.18E-9	9.89E-10	9.89E-10	[illegible]
Released											
c) Maximum Concentration	uci/ml					1.08E-8	1.51E-8	2.41E-8	2.41E-8	2.41E-8	[illegible]
Released											
d) Percent of Tech Spec	%					7.54E-1	1.06	1.11	2.92	2.92	[illegible]
Limit (5 curies)											
2. Tritium (1)											
a) Total Release	Curies					5.61E+1	6.35E+1	3.57E+1	1.55E+2	1.55E+2	[illegible]
b) Average Concentration	uci/ml					9.31E-7	1.39E-6	7.57E-7	1.03E-6	1.03E-6	[illegible]
Released											
c) Percent of Tech Spec	%					3.10E-2	4.63E-2	2.52E-2	3.42E-2	3.42E-2	[illegible]
Limit (3×10^{-3} uci/ml)											
3. Dissolved Noble Gases											
a) Total Release	Curies					1.60E-3	3.14E-5	1.00E-6	1.63E-3	1.63E-3	[illegible]
b) Average Concentration	uci/ml					2.66E-11	5.88E-13	2.12E-14	9.10E-12	9.10E-12	[illegible]
Released											

N.D. = No detectable activity above background * Excluding tritium and Dissolved Noble Gases

(1) Minimum detectable tritium is 1×10^{-5} uc/cc

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TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

Unit II Discharge

FACILITY: ZION

Docket Nos: 50-295 and 50-304

YEAR: 1979

II. Liquid Effluents	UNITS	January	February	March	First Quarter	April	May	June	Second Quarter	Gro. Total	TECH SPEC REF
4. Gross Alpha Radioactivity											
a) Total Release	Curies	No Liquid Waste Dischrgd	No Liquid Waste Dischrgd	No Liquid Waste Dischrgd	No Liquid Waste Dischrgd	No Liquid Waste Dischrgd	No Liquid Waste Dischrgd	No Liquid Waste Dischrgd	No Liquid Waste Dischrgd	No Liquid Waste Dischrgd	[illegible]
b) Average Concentration Released	uci/ml										[illegible]
5. Volume of Liquid Waste to Discharge	Liters										[illegible]
6. Volume of Dilution Water	Liters										[illegible]
7. Isotopes Released	Curies										[illegible]
Cs-134											
Ba-La-140											
I-131											
Cs-137											
Co-58											
Co-60											
Cr-51											
Mn-54											
Zn-65											
Sr-89											
Sr-90											
Cu-64											
I-132											

N.D. = No detectable activity above background

TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

Unit II Discharge

FACILITY: ZION Docket Nos: 50-295 and 50-304 YEAR: 1979

II. Liquid Effluents	UNITS	July	August	September	Third Quarter	October	November	December	Fourth Quarter	6mo. Total	TECH SPEC REF.
4. Gross Alpha Radioactivity		No Liquid	No Liquid	No Liquid	No Liquid						
a) Total Release	Curies	Waste	Waste	Waste	Waste	1.48E-4	1.46E-4	1.06E-4	4.00E-4	4.00E-4	6.6.A.2.c
b) Average Concentration Released	uci/ml	Discharged	Discharged	Discharged	Discharged	2.46E-12	3.20E-12	2.25E-12	2.64E-12	2.64E-12	6.6.A.2.c
5. Volume of Liquid Waste to Discharge	Liters					7.21E+6	2.98E+6	4.57E+6	1.48E+7	1.48E+7	6.6.A.2.c
6. Volume of Dilution Water	Liters					6.02E+10	4.56E+10	4.71E+10	1.53E+11	1.53E+11	6.6.A.2.c
7. Isotopes Released	Curies										6.6.A.2.c
Cs-134						6.26E-3	5.19E-3	2.98E-3	1.44E-2	1.44E-2	
Ba-La-140						N.D.	N.D.	N.D.	N.D.	N.D.	
I-131						6.99E-4	1.11E-4	6.43E-5	8.74E-4	8.74E-4	
Cs-137						7.52E-3	6.67E-3	2.58E-3	1.68E-2	1.68E-2	
Cr-59						7.52E-3	1.62E-2	1.49E-2	3.86E-2	3.86E-2	
Cr-60						7.58E-3	1.32E-2	2.47E-2	4.55E-2	4.55E-2	
Cr-51						5.49E-3	5.97E-3	3.83E-3	1.53E-2	1.53E-2	
Mn-54						2.43E-4	6.64E-4	1.94E-3	2.85E-3	2.85E-3	
Mn-55						5.32E-5	N.D.	N.D.	5.32E-5	5.32E-5	
Sr-89						- -	- -	- -	*	*	
Sr-90						- -	- -	- -	*	*	
Cu-64						N.D.	N.D.	N.D.	N.D.	N.D.	
I-132						N.D.	N.D.	N.D.	N.D.	N.D.	

N.D. = No detectable activity above background

* = Waiting for analysis results - data will be presented in an errata to the Annual Report.

TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

Unit II Discharge

FACILITY: ZION

Docket Nos: 50-295 and 50-304

YEAR: 1979

II. Liquid Effluents	UNITS	January	February	March	First Quarter	April	May	June	Second Quarter	Sto. Cont.	TECH SPEC REF.
Sb 124		No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	No Liquid	
I 133		Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	
Ag 110m		Dischgd	Dischgd	Dischgd	Dischgd	Dischgd	Dischgd	Dischgd	Dischgd	Dischgd	
Na 24											
W 187											
Co 57											
Mo 99											
Zr 95											
Nb 95											
Fe 59											
Np 239											
Te 133											
Te 135											
Xe 133m											

N.D. = No detectable activity above backround

POOR ORIGINAL

TABLE 1.2-1 (Cont.)

REPORT OF RADIOACTIVE EFFLUENTS

FACILITY: ZION

Docket Nos: 50-295 and 50-304

Unit II Discharge

YEAR: 1979

II. Liquid Effluents	UNITS	July	August	September	Third Quarter	October	November	December	Fourth Quarter	Ann. Total	TECH SPEC. REF.
Sb 124		No Liquid	No Liquid	No Liquid	No Liquid	1.50E-3	3.49E-3	1.94E-3	6.93E-3	6.93E-3	
I 133		Waste	Waste	Waste	Waste	N.D.	N.D.	1.55E-5	1.55E-5	1.55E-5	
Ag 110m		Discharged	Discharged	Discharged	Discharged	1.71E-4	6.47E-5	3.06E-4	5.42E-4	5.42E-4	
Na 24						4.50E-4	N.D.	N.D.	4.50E-4	4.50E-4	
W 187						1.07E-4	N.D.	N.D.	1.07E-4	1.07E-4	
Co 57						N.D.	N.D.	1.20E-4	1.20E-4	1.20E-4	
Mo 99						N.D.	N.D.	N.D.	N.D.	N.D.	
Zr 95						N.D.	5.11E-4	4.45E-4	9.56E-4	9.56E-4	
Nb 95						1.21E-4	7.31E-4	1.40E-3	2.25E-3	2.25E-3	
Fe 59						N.D.	8.06E-5	8.80E-5	1.69E-4	1.69E-4	
Np 239						N.D.	8.12E-6	3.45E-4	3.53E-4	3.53E-4	
Te 132						1.53E-3	3.14E-5	N.D.	1.56E-3	1.56E-3	
Xe 135						6.46E-5	N.D.	1.00E-6	6.56E-5	6.56E-5	

N.D. = No detectable activity above backround

POOR ORIGINAL

ZION GENERATING STATION UNIT 1/2

Month January Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec. 6.6A3g)

TABLE 2.0-1

	Date	Disposition of Material	Volume (ft^3) Per Shipment	Volume (ft^3) Per Month	Millicuries Per Shipment	Millicuries Per Month
01	1-5-79	CEMENTED DRUMS	249.90	249.9	2312.64	2312.64
02	1-5-79	CEMENTED DRUMS	176.40	426.30	1704.55	4017.19
03	1-10-79	CEMENTED DRUMS	176.40	602.70	3511.30	7528.49
04	1-12-79	CEMENTED DRUMS	264.60	867.30	2817.80	10,346.29
06	1-18-79	CEMENTED DRUMS	88.20	955.50	8942.50	19,288.79

MONTH TOTAL

NOTE: Shipment #05 was contaminated equipment sent to Robinson Station

955.50

19,288.79

ZION GENERATING STATION UNIT 1/2

Month February Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3g)

TABLE 2.0-1 (Cont.)

	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicuries Per Month
07	2-9-79	Cemented Drums & Cask	545.8	545.80	436.2	436.20
08	2-14-79	Cemented Cask	170.0	715.80	9,207.0	9,643.20
09	2-15-79	Cemented Cask	170.0	885.80	17,297.0	26,940.20
10	2-18-79	Cemented Drums	132.3	1018.10	3,368.95	30,309.15
11	2-19-79	Cemented Drums	176.4	1194.50	2,332.35	32,641.50
	MONTH TOTAL			1194.50		32,641.50

ZION GENERATING STATION UNIT 1/2

Month March Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3g)

TABLE 2.0-1 (Cont.)

#	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicuries Per Month
12	3-1-79	Cemented Cask	80.00	80.00	225,000.00	225,000.00
13	3-2-79	Cemented Drums	176.40	256.40	893.05	225,893.05
14	3-6-79	Cemented Cask	170.00	426.40	72,309.00	298,202.05
15	3-16-79	Cemented Drums	514.50	940.90	528.68	298,730.73
16	3-17-79	Cemented Cask	170.00	1,110.90	44,400.00	343,130.73
17		Not Shipped During	The Month of March			
18	3-21-79	Cemented Drums	514.50	1,625.40	728.72	343,859.45
19	3-23-79	Cemented Drums	132.30	1,757.70	3,517.70	347,377.15
20	3-24-79	Cemented Drums	88.20	1845.90	3,427.35	350,804.50
21	3-28-79	Cemented Drums	132.30	1978.20	5,412.95	356,217.45
	MONTH TOTAL			1978.20		356,217.45

ZION GENERATING STATION UNIT 1/2

Month April Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3g)

TABLE 2.0-1 (Cont.)

#	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicurie Per Month
22	4-1-79	CEMENTED DRUMS	132.3	132.30	5,475.00	5,475.0
23	4-3-79	CEMENTED DRUMS	514.5	646.80	403.65	5,878.65
24	4-6-79	CEMENTED CASK	170.0	816.80	55,008.00	60,886.65
25	4-9-79	CEMENTED DRUMS	485.10	1,301.90	1,267.08	62,153.71
26	4-9-79	CEMENTED DRUMS	132.3	1,434.20	11,482.90	73,636.61
17	4-11-79	TUBE BUNDLE IN CASK	108.0	1,542.20	502.00	74,138.61
27	4-18-79	CEMENTED DRUMS	132.3	1,674.50	1,025.31	75,163.92
28	4-20-79	CEMENTED DRUMS	463.05	2,137.55	111.57	75,275.49
29	4-21-79	CEMENTED DRUMS	176.40	2,313.95	1,552.87	76,828.36
30	4-23-79	CEMENTED DRUMS	132.30	2,446.25	12,093.10	88,921.46
31	4-23-79	CEMENTED DRUMS	170.00	2,616.25	13,300.00	102,221.46
32	4-27-79	CEMENTED DRUMS	176.40	2,792.65	1,227.44	103,448.90
33	4-29-79	CEMENTED DRUMS	374.85	3,167.50	487.77	103,936.67
34	4-30-79	CEMENTED DRUMS	88.20	3,255.70	11,034.00	114,970.67
	MONTH TOTAL			3,255.70		114,970.6

ZION GENERATING STATION UNIT 1/2

Month May Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3g)

TABLE 2.0-1 (Cont.)

#	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicurie Per Month
35	5-02-79	Plywood Boxes (9)	1152.00	1152.00	191.30	191.30
36	5-02-79	Cemented Drums	132.30	1284.30	3,678.00	3869.30
37	5-05-79	Cemented Drums	441.00	1725.30	478.92	4348.22
38	5-07-79	Cemented Drums	36.75	1762.05	9,855.00	14,203.22
39*	5-09-79	Cemented Drums	44.15	1806.20	8.06	14,211.28
40	5-10-79	Cemented Drums	110.25	1916.45	3,973.00	18,184.28
41	5-11-79	Cemented Drums	88.20	2004.65	2,529.90	20,714.18
42	5-14-79	Cemented Cask	170.00	2174.65	40,911.00	61,625.18
43	5-15-79	Cemented Drums	110.25	2284.90	4,810.60	66,435.78
44	5-17-79	Cemented Drums	110.25	2395.15	3,820.00	70,255.78
45	5-17-79	Cemented Drums	485.45	2880.60	412.43	70,668.21
46	5-18-79	Cemented Drums	88.20	2968.80	7,074.00	77,742.21
47	5-19-79	Plywood Boxes (9)	1152.00	4120.80	466.60	78,208.81
48	5-21-79	Cemented Drums	88.20	4209.00	3,204.00	81,412.81

*Shipped to Dresden Station for compacting - Volume reduced to 29.4 ft^3

ZION GENERATING STATION UNIT 1/2

Month May Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3g)

TABLE 2.0-1 (Cont.)

#	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicuries Per Month
49	5-23-79	Cemented Cask	170.00	4379.00	67,152.00	148,564.81
50	5-25-79	Cemented Drums	88.2	4467.20	5,746.40	154,311.21
51		Not Shipped During The Month of May				
52	5-26-79	Cemented Drums	29.40	4496.60	9.000.00	163,311.2
53	5-30-79	Cemented Drums	176.40	4673.00	404.00	163,715.21
54	5-31-79	Plywood Boxes (4)	848.00	*5521.00	371.40	164,086.61
	MONTH TOTAL			5506.25		164,086.6

* Subtracted 14.75 Ft^3 Due to #39 Compacting

ZION GENERATING STATION UNIT 1/2

Month June Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3g)

TABLE 2.0-1 (Cont.)

No.	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicuries Per Month
51	6-2-79	CEMENTED DRUMS	110.25	110.25	5,809.40	5809.40
55	6-1-79	CEMENTED DRUMS&PLYWOOD BOXES	475.50	585.75	365.11	6174.51
56	6-8-79	CEMENTED CASK	170.00	755.75	1,090.00	7264.51
57	6-13-79	CEMENTED DRUMS	132.30	888.05	5,756.40	13020.91
58	6-21-79	CEMENTED CASK	170.00	1058.05	175,000.00	188,020.91
59	6-24-79	CEMENTED DRUMS	88.20	1146.25	4,549.60	192,570.51
	MONTH TOTAL			1146.25		192,570.51

ZION GENERATING STATION UNIT 1/2

Month July Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3g)

TABLE 2.0-1 (Cont.)

No.	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicuries Per Month
60	7-5-79	CEMENTED CASK	80.00	80.00	518,094.00	518,094.00
61	7-5-79	CEMENTED DRUMS	51.45	131.45	19,080.00	537,174.00
62	7-7-79	PLYWOOD BOXES (8)	1056.00	1,187.45	631.00	537,805.00
63A	7-11-79	CEMENTED DRUMS	51.45	1,238.90	3,960.00	541,765.00
63B	7-14-79	CEMENTED DRUMS	88.20	1,327.10	4,194.00	545,959.00
64	7-14-79	CEMENTED CASK	170.00	1,497.10	195,412.00	741,371.00
65	7-15-79	CEMENTED DRUMS	36.75	1,533.85	3,427.20	744,798.20
66	7-17-79	CEMENTED DRUMS	110.25	1,644.10	1,322.35	746,120.55
67	7-17-79	CEMENTED DRUMS	110.25	1,754.35	564.00	746,684.55
68	7-18-79	CEMENTED CASK	170.00	1,924.35	99,913.00	846,597.55
69	7-20-79	CEMENTED DRUMS	56.50	1980.85	9,398.00	855,995.55
70	7-22-79	CEMENTED DRUMS	88.20	2069.05	3,164.40	859,159.95
71	7-25-79	CEMENTED CASK	80.00	2149.05	66,382.00	925,544.95
72	7-26-79	CEMENTED DRUMS	418.95	2568.00	595.39	926,140.34

ZION GENERATING STATION UNIT 1/2

Month July Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3g)

TABLE 2.0-1 (Cont.)

No.	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicuries Per Month
73	7-27-79	CEMENTED DRUMS	104.05	2,672.05	3,139.00	929,279.34
74	7-28-79	CEMENTED DRUMS	110.25	2,782.30	1,008.00	930,287.34
75	7-29-79	CEMENTED DRUMS	88.20	2,870.50	5,659.20	935,946.54
		MONTH TOTAL		2,870.50		935,946.54

ZION GENERATING STATION UNIT 1/2

Month August Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3g)

TABLE 2.0-1 (Cont.)

#	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicuries Per Month
76	8-2-79	Cemented Cask	170.00	170.00	75,076.00	75,076.00
77	8-5-79	Cemented Drums	176.40	346.40	1,716.40	76,792.40
78	8-6-79	Cemented Cask	80.00	426.40	126,240.00	203,032.40
79	8-11-79	Cemented Cask	85.00	511.40	56,838.00	259,870.40
80	8-13-79	Cemented Drums	77.45	588.85	4,017.00	263,887.40
81	8-20-79	Cemented Cask	170.00	758.85	11,424.00	275,311.40
82	8-21-79	Cemented Drums	88.20	847.05	1,953.00	277,264.40
83	8-22-79	Cemented Cask	170.00	1017.05	11,031.00	288,295.40
84	8-24-79	Cemented Drums	147.70	1164.75	3,608.00	291,903.40
85	8-31-79	Cemented Drums	77.20	1241.95	2,377.80	294,281.20
				1241.95		294,281.20

ZION GENERATING STATION UNIT 1/2

Month September Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec 6.6A3E)

POOR ORIGINAL

POOR ORIGINAL

TABLE 2.0-1 (Cont.)

#	Date	Disposition of Material	Volume (ft3) Per Shipment	Volume (ft3) Per Month	Millicuries Per Shipment	Millicuries Per Month
86	9-1-79	Cemented Drums	110.25	110.25	19.84	19.84
87	9-7-79	Cemented Cask	170.00	280.25	178.00	197.84
88	9-20-79	Waste Water Sludge	405.00	685.25	4.10	201.94
89	9-20-79	Waste Water Sludge	405.00	1090.25	6.80	208.74
90	9-23-79	Cemented Cask	170.00	1260.25	11,430.00	11,638.74

MONTHLY TOTAL 1260.25 11,638.74

ZION GENERATING STATION UNIT 1/2

Month October Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec. 6.5A3g)

TABLE 2.0-1 (Cont.)

#	Date	Disposition of Material	Volume (ft^3) Per Shipment	Volume (ft^3) Per Month	Millicuries Per Shipment	Millicuries Per Month
91	10-6-79	CEMENTED CASK	170.00	170.00	31,577.00	31,577.00
92	10-8-79	CEMENTED CASK	170.00	340.00	4,221.00	35,798.00
93	10-10-79	CEMENTED CASK	80.00	420.00	168,731.00	204,529.00
MONTH TOTAL				420.00		204,529.00

ZION GENERATING STATION UNIT 1/2

Month NOVEMBER Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec. 6.6A3g)

TABLE 2.0-1 (Cont.)

#	Date	Disposition of Material	Volume (ft^3) Per Shipment	Volume (ft^3) Per Month	Millicuries Per Shipment	Millicuries Per Month
94	11/20/79	CEMENTED DRUMS	135.00	135.00	916.00	916.00
95	11/21/79	CEMENTED DRUMS	90.00	225.00	876.00	1,792.00
96	11/27/79	CEMENTED CASK	170.00	395.00	7,084.00	8,876.00
97	11/27/79	CEMENTED CASK	80.00	475.00	77,399.00	86,275.00
MONTH TOTAL				475.00		86,275.00

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ZION GENERATING STATION UNIT 1/2

Month December Year 1979

SOLID RADIOACTIVE WASTE
(Tech Spec. 6.6A3g)

TABLE 2.0-1 (Cont.)

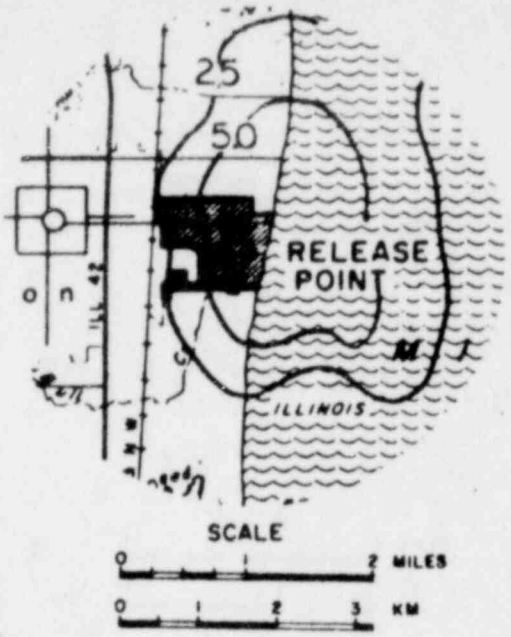
#	Date	Disposition of Material	Volume (ft^3) Per Shipment	Volume (ft^3) Per Month	Millicuries Per Shipment	Millicuries Per Month
98	12-3-79	Cemented Drums	180.00	180.00	1445.00	1445.00
99	12-6-79	Cemented Cask	80.00	260.00	206,500.00	207,945.00
100	12-13-79	Cemented Cask	80.00	340.00	14,681.00	222,626.00
101	12-14-79	Cemented Cask	170.00	510.00	24,698.00	247,324.00
102	12-16-79	Cemented Cask	80.00	590.00	3,645.00	250,969.00
103	12-31-79	Cemented Cask	80.00	670.00	6,000.00	256,969.00
104	12-31-79	Cemented Cask	170.00	840.00	19,752.00	276,721.00
MONTH TOTAL				840.00		276,721.00

FIGURE 3.1-1

Estimated Cumulative Gamma Dose (mrem) from Zion Station for the period January - December 1979.

Isopleth Labels:

Small Figure - multiply by 10^{-1}
Large Figure - multiply by 10^{-2}



POOR ORIGINAL

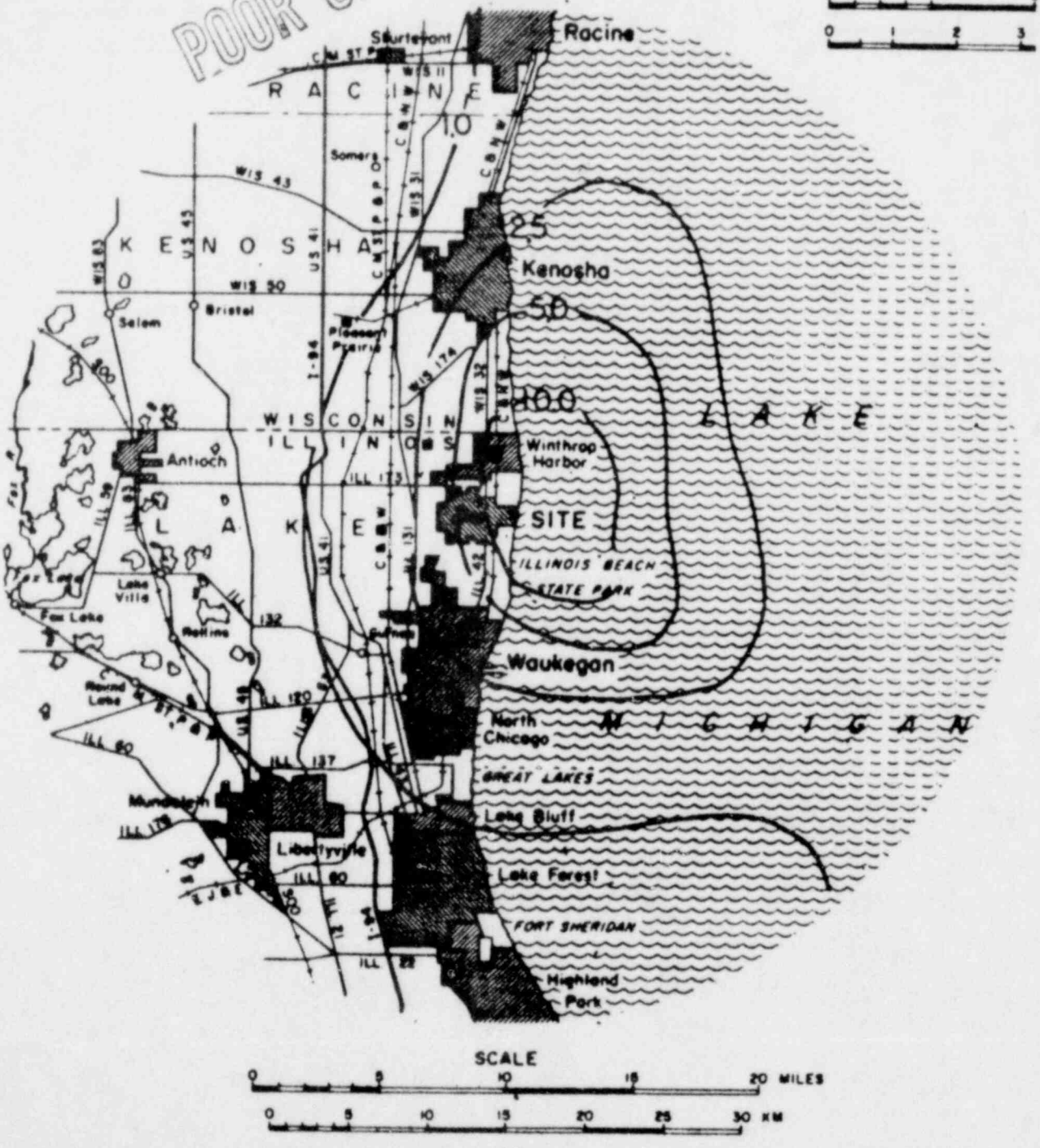


FIGURE 3.1-2

Estimated Total Concentration (pCi/m^3) of Noble Gases from Zion Station for the period January - December 1979.

Isopleth Labels:

Small Figure - multiply by 10^{+4}
Large Figure - multiply by 10^{+2}

POOR ORIGINAL

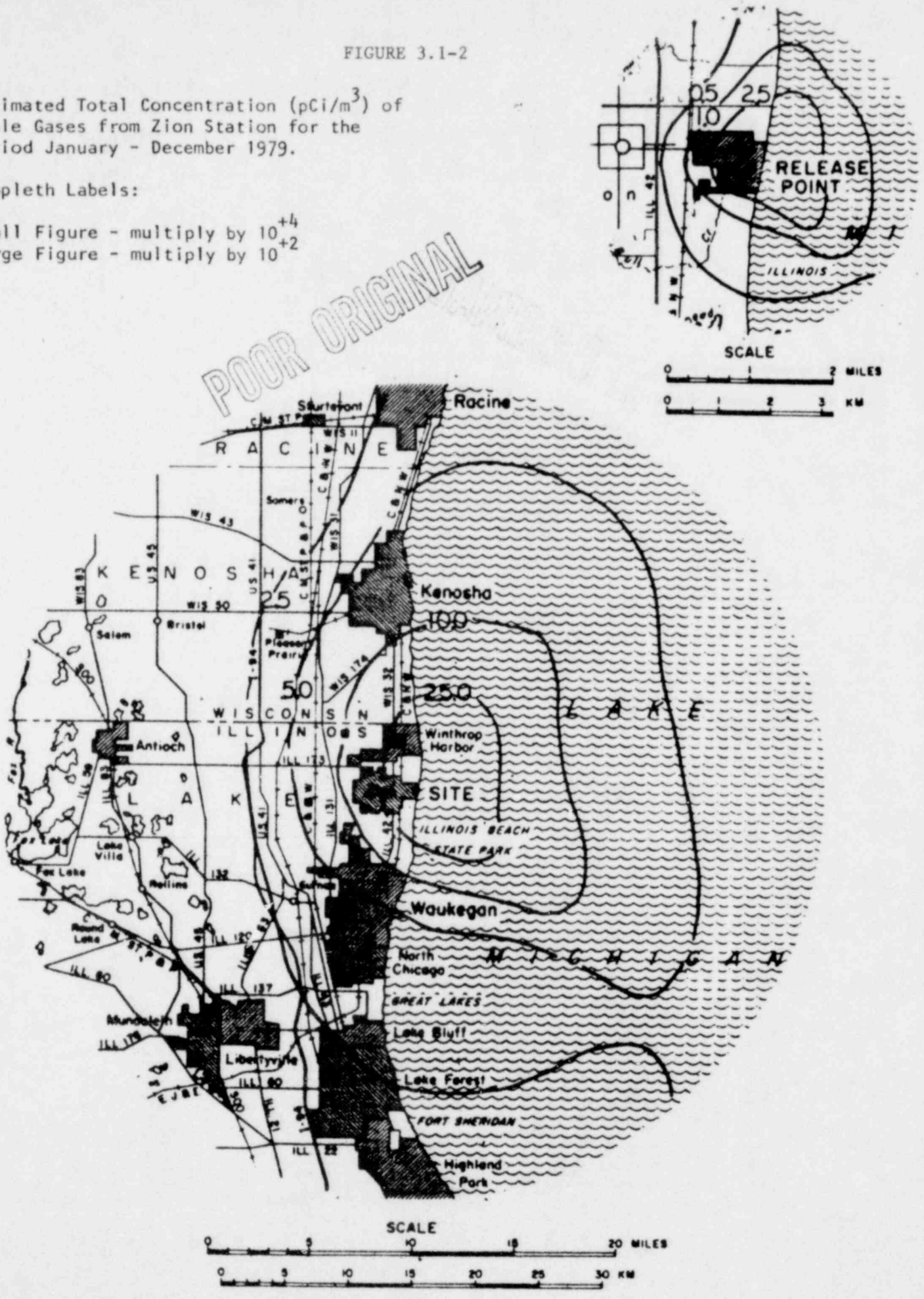


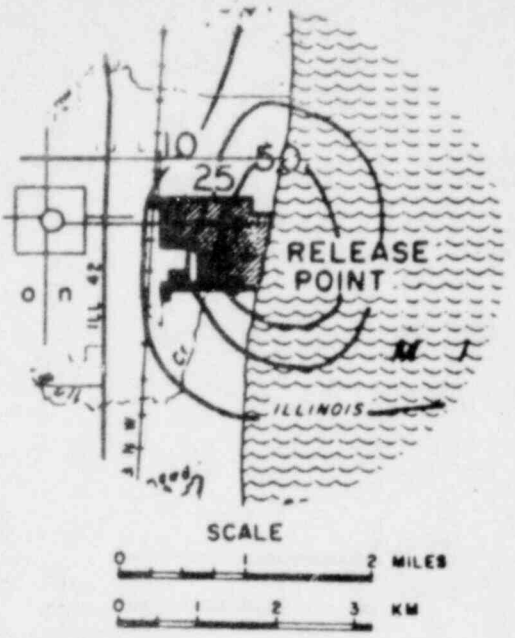
FIGURE 3.1-3

Estimated Total Concentration (pCi/m^3) of Iodine from Zion Station for the period January - December 1979.

Isopleth Labels:

Small Figure - multiply by 10^{-4}
Large Figure - multiply by 10^{-6}

POOR ORIGINAL



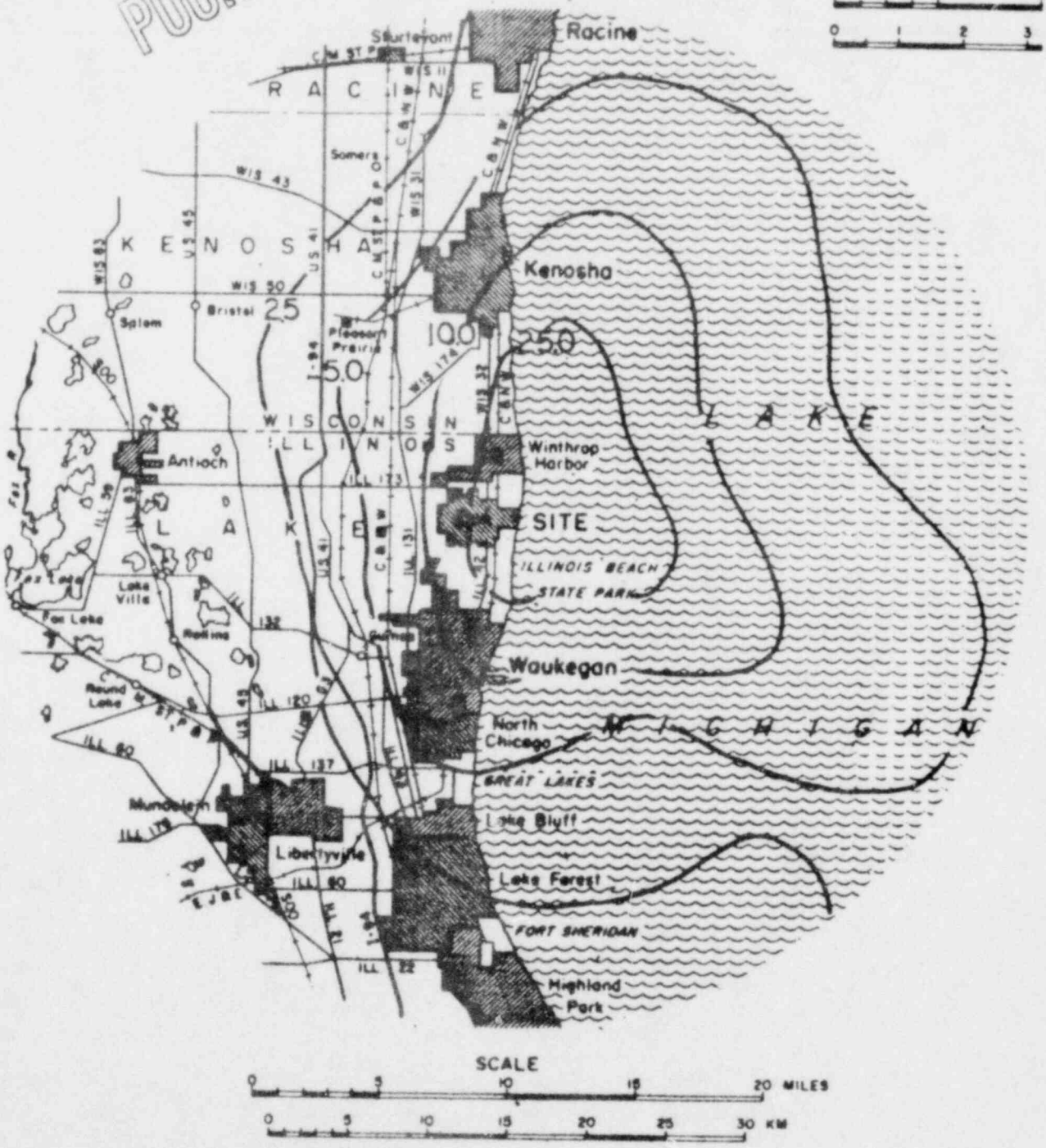


FIGURE 3.1-4

Estimated Total Concentration (pCi/m^3) of Particulate Matter from Zion Station for the period January - December 1979.

Isopleth Labels:

Small figure - multiply by 10^{-3}
Large Figure - multiply by 10^{-5}

POOR ORIGINAL

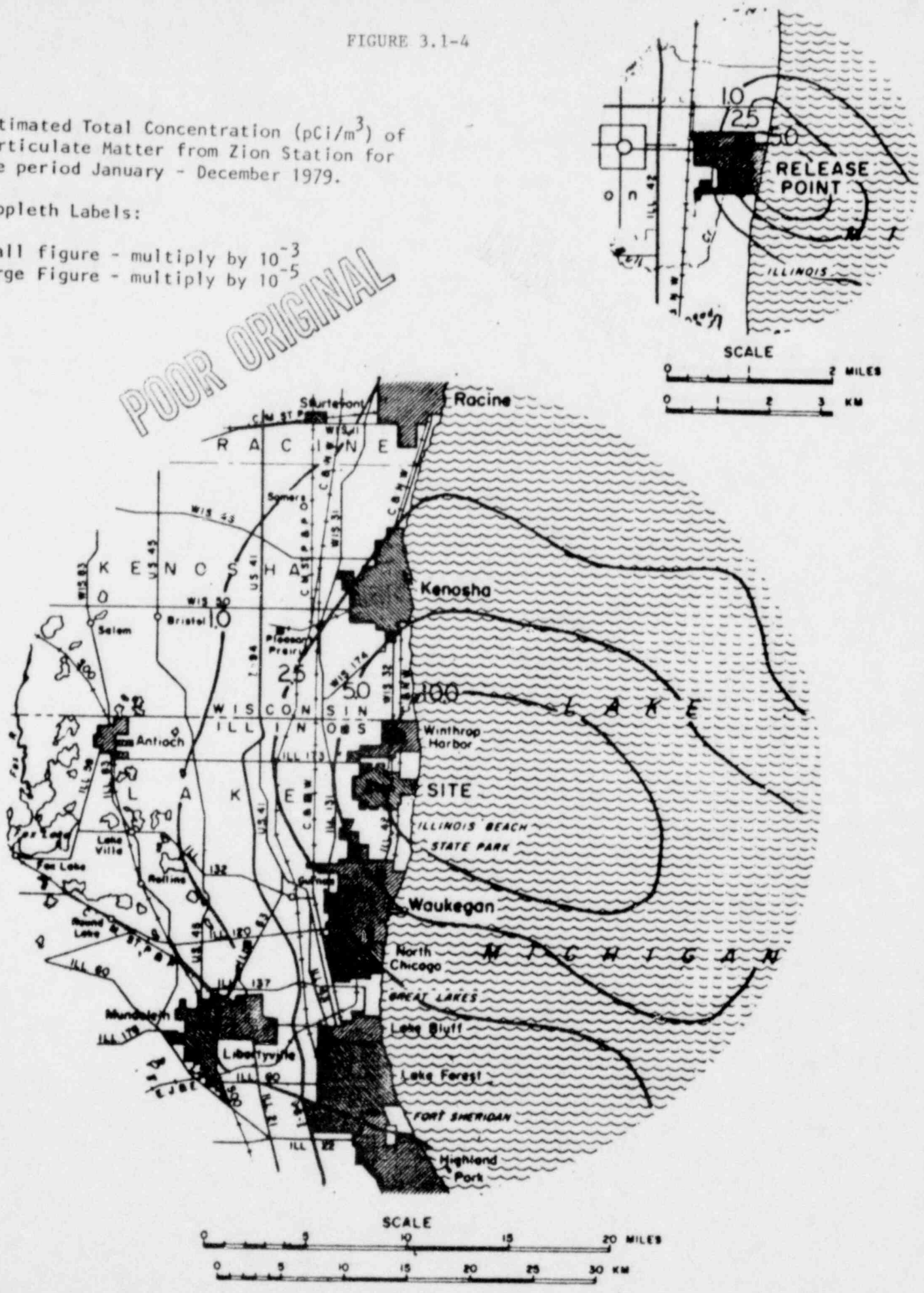


TABLE 3.2-1

VALUES OF PARAMETERS USED TO MAKE DOSE ESTIMATES
RESULTING FROM ZION LIQUID WASTE DISCHARGES

Pathway	Parameter	Unit	Value or Source
Potable Water	M_p/F	CFS^{-1}	1/1.34 E-08x60xF; (a)
	F^1	liters/month	Station Report
	U_p	liters/month	Max. Adult 61, Av Adult 31
	Q_i	Ci/month	Station Report
	D_{ipr}	mrem/pCi	From Regulatory Guide 1.109
	λ_i	hr^{-1}	Table of isotopes or other sources.
	t_p	hr	5.5, (b)
Aquatic Food	M_p/F	CFS^{-1}	1/4.0 E+5, (c)
	U_p	kg/month	Max. Adult 1.0, Av Adult 0.1
	Q_i, D_{ipr}, λ_i	---	See Potable Water
	B_{ip}	liter/kg	Site Data
	t_p	hr	72, (d)
Shoreline Activities	M_p	unitless	1/2 (current frequency factor)
	F	CFS	1.2 E+4, (e)
	W	unitless	0.3 (Table A-2, RG 1.109)
	T_i	d	$0.029/\lambda$ (λ-hr^{-1})
	t	hr	1.3 E+5 (midpoint of Plant operating lifetime)
	t_p	hr	0
	U_p	hr/month	Jun, Jul, Aug, Sep = 16 All other months = 0 (ref: HERMES)

(a) 1/60 is the product of 1/2 (the current frequency factor), 1/10 (the initial entrainment factor), and 1/3 (the lake mixing factor).

(b) It is 1.1 miles from the Plant to the Lake County Public Water intake and a current speed of 0.2 mph is assumed.

(c) Based on the simplified assumption that the near-shore currents constitute a "river" of 5 miles (26,400 ft.) width, 50 ft. depth, and a flow rate at 0.2 mph.

(d) HERMES, pg. 118.

(e) Based on the simplified assumption that the near-shore currents constitute a "river" having a 2600' (to the intake) width, a 15' depth, and a flow rate of 0.2 mph.

TABLE 3.1-1

DOSES RESULTING FROM AIRBORNE RELEASES
ZION 12/79

TYPE	UNITS	DOSE (DIRECTION) BY QUARTER			
GAMMA AIR	(MRAD)	0.66 (N)	0.75 (N)	1.29 (NNE)	0.22 (NNE
BETA AIR	(MRAD)	0.22 (N)	0.22 (N)	0.22 (NNE)	0.04 (NNE
WHOLE BODY	(MREM)	0.05 (N)	0.07 (S)	0.07 (S)	0.01 (N
SKIN DOSE	(MREM)	0.06 (N)	0.09 (S)	0.09 (S)	0.02 (N
INFANT THYROID	(MREM)	0.00 ( )	0.00 (W)	0.00 (W)	0.00 (W
POP WHOLE BODY	(PREM)	1.89	3.86	3.79	0.43

TYPE		YEAR TO DATE MAX DOSE	MAX ALLOWABLE	PERCENT
GAMMA AIR	(MRAD)	2.67	20	13.333
BETA AIR	(MRAD)	0.62	40	1.551
WHOLE BODY	(MREM)	0.17	10	1.733
SKIN DOSE	(MREM)	0.23	30	0.759
INFANT THYROID	(MREM)	0.00	30	0.003

TABLE 3.2-1

ZION NUCLEAR POWER PLANT LIQUID DOSE CALCULATIONS

DOSES RESULTING FROM EXPOSURE TO
RADIOACTIVITY DISCHARGED IN LIQUID WASTE

(DECEMBER 1979)

DOSE BY PATHWAY (MREM)

EXPOSED PERSON PERIOD	POTABLE WATER			AQUATIC FOODS			SHORELINE ACTIVITIES	
	TOTAL BODY	BONE	THYROID	TOTAL BODY	BONE	THYROID	TOTAL BODY	SKIN
"AVERAGE" ADULT								
1ST QTR	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000
2ND QTR	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
3RD QTR	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
4TH QTR	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
"MAXIMUM" ADULT								
1ST QTR	0.000	0.000	0.000	0.000	0.000	0.037	0.000	0.000
2ND QTR	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.000
3RD QTR	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000
4TH QTR	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000

TOTAL ORGAN DOSE SINCE JANUARY FOR "AVERAGE" ADULT

ORGAN	TOTAL DOSE	10CFR50 APP I	PERCENT OF APP I
TOTAL BODY	0.76E-03	6 MREM	0.013
SKIN	0.61E-03	20 MREM	0.003
BONE	0.22E-03	20 MREM	0.001
THYROID	0.96E-02	20 MREM	0.048

LOCATIONS OF FIXED ENVIRONMENTAL RADIOLOGICAL MONITORING STATIONS

1 - Onsite Station 1

2 - Onsite Station 2

3 - Onsite Station 3

4 - Zion (W)

5 - Zion (SW)

6 - Zion (WNW)

7 - Winthrop Harbor City Garage

8 - Kenosha Road Farm

9 - Waukegan

10 - North Chicago

11 - Sheridan Lanes Bowling Alley

12 - Flood Farm

13 - Pleasant Prairie

FIGURE 5.0-1

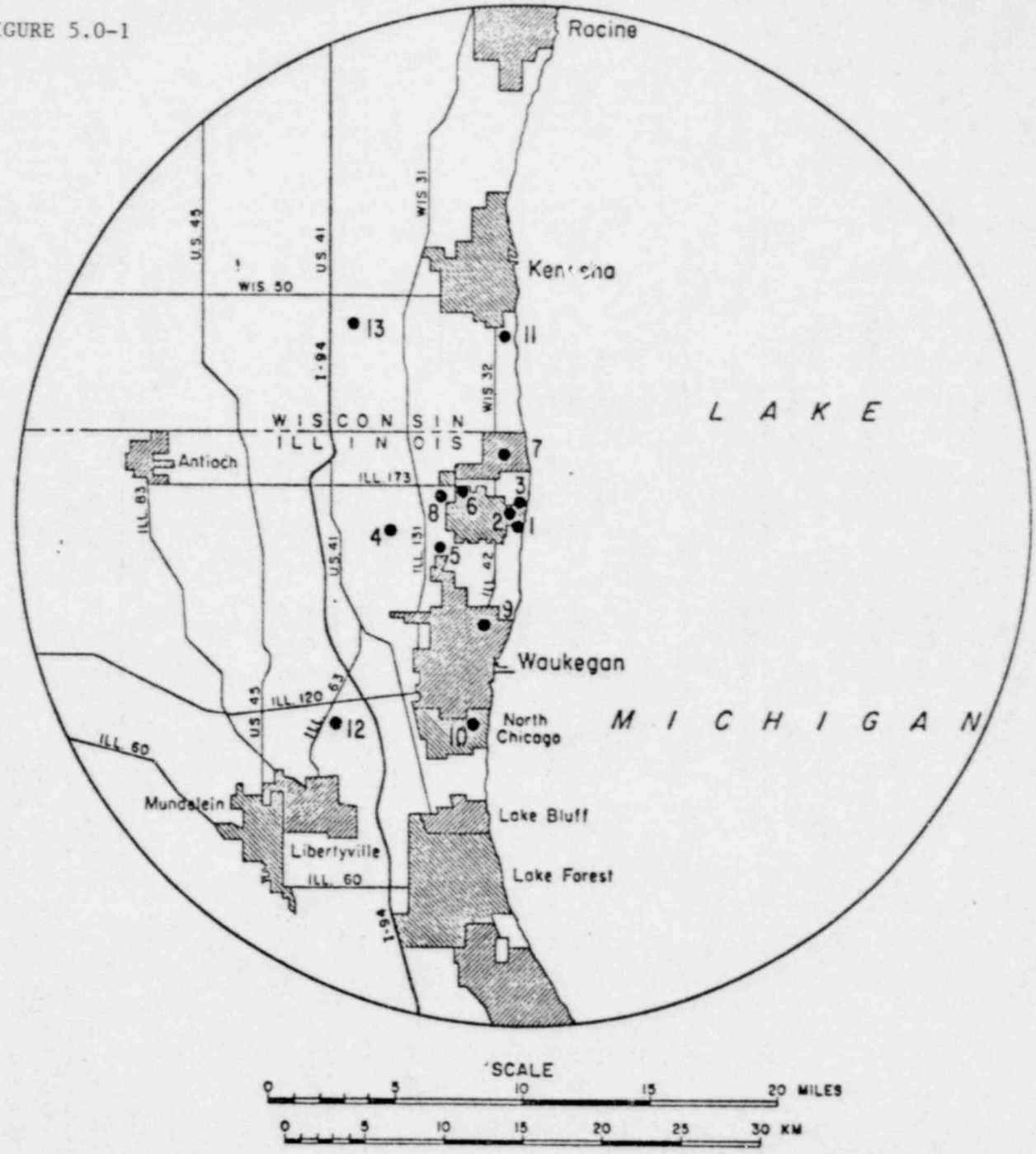


TABLE 5.0-1

ZION STANDARD RADIOLOGICAL MONITORING PROGRAM

Sample Media	Collection Site *	Type of Analysis	Frequency	Non-Routine Reporting Levels ◻
1. Air Monitoring	(a) Onsite and near field	1. Filter - gross beta[a]	1. Weekly	CS-134 10, Cs-137 20 pCi/m^3
	(1) Onsite Station #1 (2) Onsite Station #2 (3) Onsite Station #3	2. Charcoal - I-131	2. Bi-Weekly	0.9 pCi/m^3
		3. Sampling Train - Test and Maintenance	3. Weekly	
	(b) Far Field			
	(1) Zion (W) (2) Zion (SW) (3) Zion (WNW) (4) Winthrop Harbor City Garage (5) Kenosha Road Farm (6) Waukegan (7) N. Chicago (8) Southport Substation (9) Flood Farm (10) Pleasant Prairie DC	1. Filter Exchange 2. Charcoal Exchange 3. Sampling Train - Test and Maintenance	1. Weekly 2. Bi-Weekly 3. Weekly	Same as 1(a) when analyses are made
2. TLD	Same as 1	Gamma Radiation	Quarterly	
3. Fish	Δ Lake Michigan near Zion Station	Gamma isotopic	Semi-annual	Mn-54 3×10^4, Fe-59 1×10^4 Co-58 3×10^4, Co-60 1×10^4 Zn-65 2×10^4, Cs-134 1×10^3 Cs-137 2×10^3 pCi/Kg wet weight
4. Milk	(a) Ames Dairy	I-131	1. Weekly - Grazing Season - May to Oct	I-131 3 pCi/l Cs-134 60 pCi/l Cs-137 70 pCi/l
	(b) Steinbrink Dairy		2. Monthly - Nov to Apr	Ba-La-140 300 pCi/l

Δ On notification provided by station personnel.

* Additional information giving the distance and direction of individual sampling locations may be found in Appendix III of the 1978 Annual Report.

TABLE 5.0-1 (Cont.)

ZION STANDARD RADIOLOGICAL MONITORING PROGRAM (CONT'T)

Sample Media	Collection Site	Type of Analysis	Frequency	Non-Routine Reporting Levels □
5. Public Water Supply	(a) Kenosha Water Works (b) Lake County Water Works (c) Waukegan Water Works (d) N. Chicago Water Works (e) Naval Training Center Water Works (f) Lake Forest Water Works	1. Gamma Isotopic 2. Tritium	1. Monthly Analysis of weekly Composites 2. Quarterly Composite	Footnote**
6. Cooling Water Sample	Δ (a) Inlet Δ (b) Discharge	1. Gross Beta 2. Tritium	1. Weekly 2. Quarterly Composite	
7. Sediment	Lake Michigan (a) Illinois Beach St. Park	Gamma Isotopic	Annual	
8. Dairy Census	(a) Site Boundary to 2 miles (b) 2 miles to 5 miles (c) At dairies listed in item 4	(a) Enumeration by a door-to-door or equivalent counting technique (b) Enumeration by using referenced information from county agricultural agents or other reliable sources.	Annually, during grazing season	

TABLE 5.0-1 (Cont.)

ZION STANDARD RADIOLOGICAL MONITORING PROGRAM (CONT'D)

Sample Media	Collection Site	Type of Analysis	Frequency	Non-Routine Reporting Levels □*
		(c) Inquire as to feeding practices.		
		(1) pasture only		
		(2) feed and chop only		
		(3) pasture and feed; if both, ask farmer to estimate fraction of food from pasture:		
		< 25%		
		25-50%		
		50-75%		
		≥ 75%		

Note:
*Bi-Weekly shall mean that the frequency is once every other week.
□ Average concentration over calendar quarter
**H-3 2×10^4, Mn-54 1×10^3, Fe-59 1×10^2, Co-58 6×10^2, Co-60 2×10^2, Zn-65 2×10^2, Zr-Nb-95 4×10^2, I-131 2, Cs-134 30, Cs-137 50, Ba-La-140 1×10^2 pCi/l.
@A gamma isotopic analysis shall be performed whenever the gross beta concentration in a sample exceeds by five times (5x) the average concentration of the proceeding calendar quarter for the sample location.
Δ Provided by station personnel.

Table 5.0-2

Environmental Radiological Monitoring Program

Name of Facility: Zion Generating Station Docket Number: 50-295, 50-304

Location of Facility: Cook, Illinois (County) (State) Reporting Period: 1st Quarter, 1979

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean[1] (Range)	Location with Highest Mean Name, Distance and Direction	Mean (Range)	Control Locations Mean[1] (Range)	Number of Non-routine Reported Measurements
Air Particulates (pCi/m^3)	Gross β 17	0.01	0.04 (12/17) 0.02-0.07	On Site 2 0.2 mi @ 270°	0.05 (2/5)	Not Measured	0
Airborne Iodine (pCi/m^3)	I-131 8	0.10	All LLD	Not Applicable		Not Measured	0
Gamma Background (mR/Qtr)	γ Dose 13	3	10.1 (3/3) 8.6-11.3	On Site 1 0.3 mi @ 200°	11.3 (1/1)	11.3 (10/10) 8.6-14.3	
Milk (pCi/l)	I-131 6	5	All LLD	Not Applicable		Not Measured	0
Cooling Water (pCi/l)	Gross β 26	5	15 (21/26) 4-100	Discharge Area 1	20 (12/13) 4-100	16 (13/13) 5-52	0
	HTO 3	500	All LLD	Not Applicable		All LLD	0
Public Water (pCi/l)	γ Spec. 18	10	All LLD	Not Applicable		Not Measured	0
	HTO 6	200	162 (6/6) 130-230	Navel Training Center 10 mi @ 180°	230 (1/1) 230	Not Measured	0

[1] Mean and range based on detectable measurements only. Fractions indicated in parentheses.

Table 5.0-3

Environmental Radiological Monitoring Program

Name of Facility: Zion Generating Station Docket Number: 50-295, 50-304

Location of Facility: Cook, Illinois (County / State) Reporting Period: 2nd Quarter 1979

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean[1] (Range)	Location with Highest Mean: Name, Distance and Direction	Location with Highest Mean: Mean (Range)	Control Locations Mean[1] (Range)	Number of Non-routine Reported Measurements
Air Particulates (pCi/m^3)	Gross β 39	0.01	0.04 (39/39) 0.01-0.08	On Site 2 0.2 mi @ 270°	0.04 (13/13) 0.02-0.08	Not Measured	0
Airborne Iodine (pCi/m^3)	I-131 21	0.10	All LLD	Not Applicable		Not Measured	0
Gamma Background (mR/Qtr)	γ Dose 13	3	11.3 (3/3) 8.6-14.3	On Site 1 0.3 mi @ 200°	14.3 (1/1) 14.3	13.7 (10/10) 10.3-19.5	0
Milk (pCi/1)	I-131 20	5/0.5*	All LLD	Not Applicable		Not Measured	0
Cooling Water (pCi/1)	Gross β 38	5	6 (14/25) 4-11	Discharge Area 1	6 (7/13) 4-11	20 (13/13) 5-91	0
	HTO 3	500	1130 (2/2) 860-1400	Discharge Area 1	1400 (1/1) 1400	560 (1/1) 560	0
Public Water (pCi/1)	γ Spec. 18	10	All LLD	Not Applicable		Not Measured	0
	HTO 6	200	350 (2/6)	Lake County Waterworks 1.0 mi @ 0°	400 (1/1) 400	Not Measured	0
Fish (pCi/g)	Cs-137 7	0.1	0.2 (1/7) 0.2	Lk. Michigan near Station	0.2 (1/7) 0.2	Not Measured	0
	Other γ 7	0.1	All LLD	Not Applicable		Not Measured	0

[1] Mean and range based on detectable measurements only. Fractions indicated in parentheses.
* November - April, LLD=5; May - October, LLD=0.5.

Table 5.0-4

Environmental Radiological Monitoring Program

Name of Facility: Zion Generating Station Docket Number: 50-295, 50-304

Location of Facility: Cook, Illinois (County) (State) Reporting Period: 3rd Quarter 1979

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean[1] (Range)	Location with Highest Mean: Name, Distance and Direction	Location with Highest Mean: Mean (Range)	Control Locations Mean[1] (Range)	Number of Non-routine Reported Measurements
Air Particulates (pCi/m^3)	Gross β 39	0.01	0.03 (38/39) 0.01-0.05	On Site 1 0.3 mi @ 200°	0.03 (12/13)	Not Measured	0
Airborne Iodine (pCi/m^3)	I-131 18	0.10	All LLD	Not Applicable		Not Measured	0
Gamma Background (mR/Qtr)	γ Dose 13	3	11.6 (3/3) 9.4-13.0	On Site 3 0.2 mi @ 350°	13.0 (1/1) 13.0	11.7 (10/10) 8.6-15.6	0
Milk (pCi/l)	I-131 26	0.5	All LLD	Not Applicable		Not Measured	0
Cooling Water (pCi/l)	Gross β 39	5	4.8 (6/26) 4-6	Discharge Area 2	5.3 (3/3) 5-6	5.4 (7/13) 4-8	0
	HTO 3	500	415 (2/2) 330-500	Discharge Area 1	500 (1/1) 500	410 (1/1) 410	0
Public Water (pCi/l)	γ Spec. 18	10	All LLD	Not Applicable		Not Measured	0
	HTO 6	200	183 (6/6) 140-230	Kenosha Public Water Works 10 mi @ 0°	230 (1/1) 230	Not Measured	0
Fish (pCi/g)	γ Spec. 5	0.1	All LLD	Not Applicable		Not Measured	0
Sediment (pCi/g)	γ Spec. 2	0.2	All LLD	Not Applicable		Not Measured	0

[1] Mean and range based on detectable measurements only. Fractions indicated in parentheses.

Table 5.0-5

Environmental Radiological Monitoring Program

Name of Facility: Zion Generating Station Docket Number: 50-295, 50-304

Location of Facility: Cook, Illinois Reporting Period: 4th Quarter 1979
County State

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean[1] (Range)	Location with Highest Mean Name, Distance and Direction	Mean (Range)	Control Locations Mean[1] (Range)	Number of Non-routine Reported Measurements
Air Particulates (pCi/m^3)	Gross β 39	0.01	0.03 (35/39) 0.01-0.06	On Site 1 0.3 mi @ 200°	0.03 (13/13) 0.02-0.06	Not Measured	0
Airborne Iodine (pCi/m^3)	I-131 21	0.10	All LLD	Not Applicable		Not Measured	0
Gamma Background (mR/Qtr)	γ Dose 13	3	13.4 (3/3) 13.0-14.3	On Site 2 0.2 mi @ 290°	14.3 (1/1) 14.3	15.3 (10/10) 11.8-20.8	0
Milk (pCi/l)	I-131 14	0.5/5*	All LLD	Not Applicable		Not Measured	0
Cooling Water (pCi/l)	Gross β 39	5	7.4 (12/26) 3-20	Discharge Area 1	7.8 (6/13) 4-20	7.1 (9/13) 4-14	0
	HTO 3	500	515 (2/2) 410-620	Discharge Area 1	620 (1/1) 620	430 (1/1) 430	0
Public Water (pCi/l)	γ Spec. 18	10	All LLD	Not Applicable		Not Measured	0
	HTO 6	200	197 (6/6) 110-290	Lake County Water Works 1.0 mi @ 0°	290 (1/1) 290	Not Measured	0

[1] Mean and range based on detectable measurements only. Fractions indicated in parentheses.

GAMMA DOSE AS MEASURED BY THERMOLUMINESCENT DOSIMETERS

QUARTERLY BADGES

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date Annealed:	12/11/78	03/19/79	06/18/79	09/27/79
Date Read:	03/26/79	06/20/79	10/03/79	12/19/79

Location	Average mR/quarter			
On-Site Indicator Stations				
Z-01 On-Site #1 Southside	11.3±2.8	14.3±3.9	12.4±1.6	13.0±2.6
Z-02 On-Site #2 Westside	10.3±1.0	10.9±2.0	9.4±2.1	14.3±3.9
Z-03 On-Site #3 Northside	8.6±0.9	8.6±2.0	13.0±1.3	13.0±5.2
Background Stations				
Z-04 Zion, SW	11.6±1.2	12.5±2.2	9.5±1.2	15.6±1.3
Z-05 Zion, WNW	10.8±1.7	13.0±2.6	11.4±2.2	15.6±3.9
Z-06 Winthrop Harbor City Garage	9.4±1.2	10.5±2.5	10.7±1.7	12.7±2.6
Z-07 Kenosha Road Farm	12.5±1.8	15.6±1.3	13.0±3.9	18.2±2.6
Z-08 Waukegan	10.3±2.2	14.3±3.9	10.2±2.5	14.3±2.6
Z-09 Zion, W	12.2±2.7	15.6±1.3	15.6±2.6	20.8±2.6
Z-10 North Chicago	11.2±1.2	12.5±1.2	11.8±1.6	13.0±1.3
Z-11 Sheridan Lanes Bowling Alley	8.6±0.9	10.3±1.0	8.6±2.3	11.8±2.5
Z-12 Flood Farm	14.3±1.3	19.5±5.2	14.3±2.6	18.2±2.6
Z-13 Pleasant Prairie DC	11.7±2.9	13.0±2.6	11.6±3.0	14.3±1.3
Average Readings				
On-Site (Z-01 to Z-03)	10.1±1.6	11.3±2.6	11.6±1.7	13.4±3.9
(1) Off-Site <5 miles	11.1±1.8	13.6±2.3	11.7±2.4	16.2±2.6
(2) Off-Site >5 miles	11.5±1.6	13.8±2.5	11.6±2.4	14.3±1.9

(1) Stations Z-04, Z-05, Z-06, Z-07, Z-08 and Z-09. (2) Stations Z-10, Z-11, Z-12 and Z-13.

APPENDIX II

METEOROLOGICAL DATA

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1979
STABILITY CLASS - EXTREMELY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	1	0	0	0	0	1
SSE	0	1	0	0	0	0	1
S	0	11	5	0	0	0	16
SSW	0	13	0	0	0	0	13
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	8	0	0	0	0	8
WNW	0	8	0	0	0	0	8
NW	0	6	0	0	0	0	6
NNW	0	1	0	0	0	0	1
VARIABLE	0	10	0	0	0	0	10
TOTAL	0	61	5	0	0	0	66

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 4

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1979
STABILITY CLASS - EXTREMELY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	4	6	1	0	11
NNE	0	1	0	5	9	6	21
NE	0	5	2	2	0	0	9
ENE	0	0	2	4	0	0	6
E	0	6	2	11	3	0	22
ESE	0	3	2	8	2	0	15
SE	0	3	6	3	0	0	12
SSE	0	4	9	5	0	0	18
S	0	7	3	0	0	0	10
SSW	0	7	8	1	0	0	16
SW	0	6	6	10	0	0	22
WSW	0	13	22	11	0	0	46
W	0	19	19	16	4	0	58
WNW	0	16	21	15	2	0	54
NW	0	33	22	2	0	0	57
NNW	0	8	12	2	0	0	22
VARIABLE	0	2	0	0	0	0	2
TOTAL	0	133	140	101	21	6	401

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 2

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 4

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1979
STABILITY CLASS - MODERATELY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	2	0	3	1	0	6
NNE	0	1	1	4	2	0	8
NE	0	2	0	1	2	0	5
ENE	0	0	0	5	2	0	7
E	0	0	1	3	1	0	5
ESE	0	4	7	1	3	0	15
SE	0	2	0	0	0	0	2
SSE	0	2	8	1	0	0	11
S	0	4	4	0	0	0	8
SSW	0	3	0	0	0	0	3
SW	0	7	4	6	0	0	17
WSW	0	5	4	2	0	0	11
W	0	3	3	2	0	0	8
WNW	0	3	2	2	0	0	7
NW	0	7	4	3	0	0	14
NNW	0	4	4	6	0	0	14
VARIABLE	0	1	0	0	0	0	1
TOTAL	0	50	42	39	11	0	142

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 4

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1979
STABILITY CLASS - SLIGHTLY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	5	4	2	1	0	12
NNE	0	2	3	3	2	2	12
NE	0	1	2	4	3	0	10
ENE	0	1	2	0	0	0	3
E	0	2	1	0	0	0	3
ESE	0	1	1	0	0	0	2
SE	0	4	4	1	0	0	9
SSE	0	1	4	0	0	0	5
S	0	2	0	0	0	0	2
SSW	0	1	3	0	0	0	4
SW	0	5	4	4	0	0	13
WSW	0	4	3	2	1	0	10
W	0	4	2	1	0	0	7
WNW	0	8	0	1	0	0	9
NW	0	8	3	1	0	0	12
NNW	0	2	6	6	0	0	14
VARIABLE	0	3	0	0	0	0	3
TOTAL	0	54	42	25	7	2	130

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 4

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1979
STABILITY CLASS - NEUTRAL (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	9	8	18	7	3	45
NNE	0	14	13	15	9	1	52
NE	0	11	4	6	6	0	27
ENE	0	15	4	2	0	0	21
E	0	5	1	2	0	0	8
ESE	0	0	1	0	0	0	1
SE	0	10	4	0	0	0	14
SSE	0	7	12	16	3	0	38
S	0	26	26	18	1	0	71
SSW	0	23	23	3	0	0	49
SW	0	30	16	20	8	1	75
WSW	0	25	21	9	0	0	55
W	0	32	20	6	1	0	59
WNW	0	37	18	15	2	0	72
NW	0	70	26	14	0	0	110
NNW	0	21	30	35	3	0	89
VARIABLE	0	16	0	0	0	0	16
TOTAL	0	351	227	179	40	5	802

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 4

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1979
STABILITY CLASS - SLIGHTLY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	6	2	1	6	0	15
NNE	0	11	1	1	1	1	15
NE	0	2	1	0	0	0	3
ENE	0	6	0	0	0	0	6
E	0	9	0	0	0	0	9
ESE	0	5	0	0	0	0	5
SE	0	1	1	0	0	0	2
SSE	0	7	3	2	0	0	12
S	0	25	20	2	0	0	47
SSW	0	18	10	5	0	0	33
SW	0	13	10	10	1	0	34
WSW	0	18	20	12	1	0	51
W	0	25	28	21	1	0	75
WNW	0	43	27	9	0	0	79
NW	0	51	12	2	0	0	65
NNW	0	14	6	4	3	0	27
VARIABLE	0	27	0	0	0	0	27
TOTAL	0	281	141	69	13	1	505

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 4

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1979
STABILITY CLASS - MODERATELY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	1	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	3	0	0	0	0	3
S	0	5	5	0	0	0	10
SSW	0	13	2	1	0	0	16
SW	0	1	0	1	0	0	2
WSW	0	1	1	0	0	0	2
W	0	13	1	0	0	0	14
WNW	0	27	2	0	0	0	29
NW	0	12	0	0	0	0	12
NNW	0	1	0	0	0	0	1
VARIABLE	0	17	0	0	0	0	17
TOTAL	0	94	12	2	0	0	108

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 4

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1979
STABILITY CLASS - EXTREMELY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	3	4	15	9	4	35
NNE	0	4	29	13	3	0	49
NE	2	8	21	3	0	0	34
ENE	2	9	8	0	0	0	19
E	0	13	2	0	0	0	15
ESE	1	29	6	0	2	0	38
SE	0	33	7	2	0	0	42
SSE	1	12	4	1	0	0	18
S	1	6	19	2	0	0	28
SSW	0	2	0	6	7	0	15
SW	0	1	9	3	3	0	16
WSW	0	1	3	6	0	0	10
W	0	4	3	13	0	0	20
WNW	0	1	7	15	0	0	23
NW	0	5	17	8	0	0	30
NNW	0	3	8	3	0	0	14
VARIABLE	0	0	0	0	0	0	0
TOTAL	7	134	147	90	24	4	406

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 1

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 36

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1979
STABILITY CLASS - MODERATELY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	0	2	3	1	0	7
NNE	0	3	5	2	0	0	10
NE	0	6	2	0	0	0	8
ENE	0	5	3	1	0	0	9
E	0	5	0	0	0	0	5
ESE	0	6	0	0	0	0	6
SE	2	3	0	0	0	0	5
SSE	0	2	3	0	0	0	5
S	0	1	5	0	0	0	6
SSW	0	0	1	1	2	0	4
SW	0	1	1	3	1	0	6
WSW	0	1	2	1	0	0	4
W	0	0	1	3	0	0	4
WNW	0	0	0	0	0	0	0
NW	0	1	4	0	0	0	5
NNW	1	0	1	0	0	0	2
VARIABLE	1	0	0	0	0	0	1
TOTAL	5	34	30	14	4	0	87

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 36

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1979
STABILITY CLASS - SLIGHTLY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	2	7	5	0	1	15
NNE	0	6	5	1	0	0	12
NE	1	3	6	0	0	0	10
ENE	0	7	0	1	0	0	8
E	0	5	1	1	0	0	7
ESE	0	7	0	1	0	0	8
SE	1	7	0	2	0	0	10
SSE	0	1	2	1	0	0	4
S	0	0	4	0	0	0	4
SSW	0	0	1	1	2	0	4
SW	1	0	1	2	0	0	4
WSW	0	0	2	0	2	0	4
W	0	0	1	2	1	0	4
WNW	0	0	1	1	1	0	3
NW	1	1	2	0	0	0	4
NNW	0	1	2	0	0	0	3
VARIABLE	0	0	0	0	0	0	0
TOTAL	4	40	35	18	6	1	104

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 36

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1979
STABILITY CLASS - NEUTRAL (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	2	8	20	21	6	1	58
NNE	3	39	32	16	0	0	90
NE	4	19	15	8	0	0	46
ENE	3	7	3	4	0	0	17
E	1	9	3	8	1	0	22
ESE	2	16	1	7	3	0	29
SE	4	20	2	8	0	0	34
SSE	1	8	7	4	0	0	20
S	2	9	21	6	0	0	38
SSW	0	3	0	9	4	0	16
SW	1	8	7	5	1	0	22
WSW	1	3	5	2	1	0	12
W	0	1	5	3	3	2	14
WNW	2	4	14	6	2	6	34
NW	1	8	12	2	2	0	25
NNW	2	9	7	8	0	0	26
VARIABLE	4	0	0	0	0	0	4
TOTAL	33	171	154	117	23	9	507

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 36

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1979
STABILITY CLASS - SLIGHTLY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	6	24	36	16	4	0	86
NNE	6	22	7	4	0	0	39
NE	4	19	2	0	0	0	25
ENE	1	6	7	4	0	0	18
E	6	6	4	3	0	1	20
ESE	4	5	5	7	0	0	21
SE	5	22	0	0	0	0	27
SSE	4	10	23	5	0	0	42
S	5	40	28	1	0	0	74
SSW	11	16	17	23	4	0	71
SW	3	15	19	19	2	1	59
WSW	3	12	22	2	0	0	39
W	3	11	16	3	0	0	33
WNW	4	13	2	0	0	0	19
NW	2	3	6	0	0	0	11
NNW	2	7	2	0	0	0	11
VARIABLE	11	0	0	0	0	0	11
TOTAL	80	231	196	87	10	2	606

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 2

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 36

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1979
STABILITY CLASS - MODERATELY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	4	12	3	0	0	0	19
NNE	0	2	0	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	1	0	0	0	0	0	1
E	0	2	1	0	0	0	3
ESE	2	1	0	0	0	0	3
SE	4	6	0	0	0	0	10
SSE	1	4	3	2	0	0	10
S	1	10	19	2	0	0	32
SSW	1	23	2	1	0	0	27
SW	5	24	6	0	0	0	35
WSW	6	7	3	0	0	0	16
W	4	12	1	0	0	0	17
WNW	7	11	0	0	0	0	18
NW	4	8	0	0	0	0	12
NNW	2	8	1	0	0	0	11
VARIABLE	6	0	0	0	0	0	6
TOTAL	48	130	39	5	0	0	222

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 1

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 36

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1979
STABILITY CLASS - EXTREMELY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	3	2	0	0	0	0	5
NNE	2	2	0	0	0	0	4
NE	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	1	1	0	0	0	0	2
ESE	5	3	3	0	0	0	11
SE	1	3	2	0	0	0	6
SSE	3	1	4	0	0	0	8
S	7	23	24	0	0	0	54
SSW	8	29	5	0	0	0	42
SW	4	6	0	1	0	0	11
WSW	2	7	1	0	0	0	10
W	6	2	0	0	0	0	8
WNW	8	4	0	0	0	0	12
NW	6	6	0	0	0	0	12
NNW	4	4	0	0	0	0	8
VARIABLE	18	0	0	0	0	0	18
TOTAL	78	94	39	1	0	0	212

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 36

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1979
STABILITY CLASS - EXTREMELY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	2	3	9	24	3	0	41
NNE	0	4	25	18	0	0	47
NE	0	16	12	1	0	0	29
ENE	0	15	11	0	0	0	26
E	0	24	7	0	0	0	31
ESE	0	31	3	0	0	0	34
SE	2	29	13	0	0	0	44
SSE	1	17	25	0	0	0	43
S	0	17	25	0	0	0	42
SSW	0	3	9	0	0	0	12
SW	0	1	17	6	0	0	24
WSW	0	2	7	2	0	0	11
W	0	9	23	4	0	0	36
WNW	1	11	12	1	0	0	25
NW	0	10	22	0	0	0	32
NNW	0	4	8	0	0	0	12
VARIABLE	1	0	0	0	0	0	1
TOTAL	7	196	228	56	3	0	490

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 198

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1979
STABILITY CLASS - MODERATELY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	1	0	2	0	0	3
NNE	1	3	1	0	0	0	5
NE	0	5	1	0	0	0	6
ENE	0	5	0	1	0	0	6
E	1	6	0	0	0	0	7
ESE	0	3	0	0	0	0	3
SE	0	5	0	0	0	0	5
SSE	0	3	1	1	0	0	5
S	1	3	2	0	0	0	6
SSW	0	0	0	0	0	0	0
SW	0	2	1	0	0	0	3
WSW	0	2	0	1	0	0	3
W	0	0	1	0	0	0	1
WNW	0	1	2	0	0	0	3
NW	2	0	0	0	0	0	2
NNW	0	2	1	0	0	0	3
VARIABLE	0	0	0	0	0	0	0
TOTAL	5	41	10	5	0	0	61

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 198

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1979
STABILITY CLASS - SLIGHTLY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	4	5	3	0	0	13
NNE	0	2	5	0	0	0	7
NE	0	4	2	0	0	0	6
ENE	2	0	1	0	0	0	3
E	1	2	0	0	0	0	3
ESE	0	4	1	0	0	0	5
SE	0	3	1	0	0	0	4
SSE	0	2	6	0	0	0	8
S	0	5	1	0	0	0	6
SSW	0	4	0	0	0	0	4
SW	1	1	0	1	0	0	3
WSW	0	1	1	0	0	0	2
W	0	1	1	0	0	0	2
WNW	0	2	1	0	0	0	3
NW	1	0	2	0	0	0	3
NNW	0	0	2	0	0	0	2
VARIABLE	0	0	0	0	0	0	0
TOTAL	6	35	29	4	0	0	74

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 198

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1979
STABILITY CLASS - NEUTRAL (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	22	11	5	0	0	38
NNE	1	8	18	7	0	0	34
NE	3	10	3	0	0	0	16
ENE	3	8	7	1	0	0	19
E	1	7	3	5	0	0	16
ESE	3	9	1	1	0	0	14
SE	5	21	0	0	0	0	26
SSE	2	12	19	0	0	0	33
S	3	25	8	0	0	0	36
SSW	0	13	4	1	0	0	18
SW	1	6	11	8	0	0	26
WSW	2	10	10	4	0	0	26
W	3	13	9	0	0	0	25
WNW	1	7	3	0	0	0	11
NW	1	6	4	0	0	0	11
NNW	0	10	6	0	0	0	16
VARIABLE	2	0	0	0	0	0	2
TOTAL	31	187	117	32	0	0	367

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 198

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1979
STABILITY CLASS - SLIGHTLY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	5	19	11	1	0	0	36
NNE	3	12	25	4	0	0	44
NE	2	10	9	5	0	0	26
ENE	4	5	3	1	0	0	13
E	2	8	3	1	0	0	14
ESE	1	10	3	1	0	0	15
SE	4	17	4	0	0	0	25
SSE	3	12	8	1	0	0	24
S	4	38	7	0	0	0	49
SSW	10	47	15	0	0	0	72
SW	2	29	15	6	0	0	52
WSW	4	28	16	2	0	0	50
W	5	22	4	1	0	0	32
WNW	1	22	4	0	0	0	27
NW	7	39	4	0	0	0	50
NNW	7	21	7	0	0	0	35
VARIABLE	16	0	0	0	0	0	16
TOTAL	80	339	138	23	0	0	580

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 198

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1979
STABILITY CLASS - MODERATELY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	2	5	0	0	0	0	7
NNE	0	2	0	0	0	0	2
NE	1	0	1	0	0	0	2
ENE	1	0	0	0	0	0	1
E	2	0	2	0	0	0	4
ESE	0	1	1	0	0	0	2
SE	0	5	0	0	0	0	5
SSE	0	1	0	0	0	0	1
S	2	13	0	0	0	0	15
SSW	9	31	2	0	0	0	42
SW	5	24	8	0	0	0	37
WSW	8	17	1	0	0	0	26
W	6	13	1	0	0	0	20
WNW	6	9	1	0	0	0	16
NW	6	14	0	0	0	0	20
NNW	6	9	0	0	0	0	15
VARIABLE	11	0	0	0	0	0	11
TOTAL	65	144	17	0	0	0	226

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 198

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1979
STABILITY CLASS - EXTREMELY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	1	0	0	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	4	0	0	0	0	4
SSE	1	0	0	0	0	0	1
S	3	7	0	0	0	0	10
SSW	10	16	0	0	0	0	26
SW	22	28	1	0	0	0	51
WSW	14	18	0	0	0	0	32
W	12	8	0	0	0	0	20
WNW	15	15	0	0	0	0	30
NW	13	4	0	0	0	0	17
NNW	3	3	0	0	0	0	6
VARIABLE	13	0	0	0	0	0	13
TOTAL	108	103	1	0	0	0	212

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 0

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 198

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1979
STABILITY CLASS - EXTREMELY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	2	4	10	0	4	21
NNE	0	1	7	2	4	0	14
NE	0	1	3	2	0	0	6
ENE	0	1	3	1	2	3	10
E	0	5	2	0	1	0	8
ESE	0	3	2	3	0	0	8
SE	0	6	9	0	0	0	15
SSE	0	4	7	1	0	0	12
S	0	3	9	0	0	0	12
SSW	1	1	10	10	4	0	26
SW	1	5	15	29	7	0	57
WSW	0	10	38	22	6	0	76
W	0	14	32	10	0	0	56
WNW	1	18	23	6	0	0	48
NW	1	18	35	1	0	0	55
NNW	1	7	10	10	0	0	28
VARIABLE	0	0	0	0	0	0	0
TOTAL	6	99	209	107	24	7	452

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 21

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 20

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1979
STABILITY CLASS - MODERATELY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	1	2	0	4	1	9
NNE	0	0	4	0	1	2	7
NE	0	0	1	4	2	0	7
ENE	0	0	0	1	0	0	1
E	0	0	3	1	0	0	4
ESE	0	2	1	0	0	0	3
SE	1	0	0	0	0	0	1
SSE	0	1	3	2	0	0	6
S	0	3	0	0	0	0	3
SSW	0	1	3	2	1	0	7
SW	0	1	7	3	0	0	11
WSW	0	2	7	5	0	0	14
W	0	3	5	7	0	0	15
WNW	0	1	10	2	0	0	13
NW	1	1	11	2	0	0	15
NNW	0	8	4	6	1	0	19
VARIABLE	0	0	0	0	0	0	0
TOTAL	3	24	61	35	9	3	135

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 3

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 20

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1979
STABILITY CLASS - SLIGHTLY UNSTABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	1	5	1	1	5	13
NNE	0	0	3	3	2	3	11
NE	0	1	0	0	0	0	1
ENE	0	2	1	0	0	0	3
E	0	0	0	0	0	0	0
ESE	0	1	0	0	1	0	2
SE	1	0	0	0	0	0	1
SSE	0	0	3	1	0	0	4
S	0	1	1	0	0	0	2
SSW	1	2	1	4	0	0	8
SW	1	2	6	7	0	0	16
WSW	0	4	16	5	1	0	26
W	1	0	5	5	0	0	11
WNW	0	3	2	3	0	0	8
NW	0	5	9	3	0	0	17
NNW	0	4	5	1	0	0	10
VARIABLE	0	0	0	0	0	0	0
TOTAL	4	26	57	33	5	8	133

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 4

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 20

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1979
STABILITY CLASS - NEUTRAL (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	9	6	10	1	0	26
NNE	0	9	9	5	1	0	24
NE	1	6	3	1	1	0	12
ENE	2	1	1	1	0	0	5
E	1	3	4	0	0	0	8
ESE	0	2	3	2	0	0	7
SE	1	5	5	1	0	0	12
SSE	0	5	20	6	1	0	32
S	0	21	15	7	0	0	43
SSW	4	20	34	21	1	0	80
SW	5	21	33	42	20	1	122
WSW	2	16	31	22	1	0	72
W	1	20	15	12	0	0	48
WNW	3	14	18	6	0	0	41
NW	4	35	36	8	0	0	83
NNW	1	13	19	4	0	0	37
VARIABLE	0	0	0	0	0	0	0
TOTAL	25	200	252	148	26	1	652

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 9

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 20

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1979
STABILITY CLASS - SLIGHTLY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	2	1	2	4	0	0	9
NNE	1	2	2	2	0	0	7
NE	1	3	0	0	1	1	6
ENE	1	5	1	1	0	0	8
E	0	3	1	0	0	0	4
ESE	1	1	2	1	0	0	5
SE	2	3	7	0	0	0	12
SSE	0	10	4	3	1	1	19
S	8	36	17	0	1	0	62
SSW	8	45	31	13	0	0	97
SW	7	37	27	10	2	0	83
WSW	3	18	13	3	0	0	37
W	3	26	12	5	0	0	46
WNW	2	62	24	3	0	0	91
NW	4	37	11	0	0	0	52
NNW	1	8	1	1	0	0	11
VARIABLE	1	0	0	0	0	0	1
TOTAL	45	297	155	46	5	2	550

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 6

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 20

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1979
STABILITY CLASS - MODERATELY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	3	0	0	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	1	0	0	1	0	0	2
S	0	15	7	2	0	0	24
SSW	2	12	1	0	0	0	15
SW	2	7	0	0	0	0	9
WSW	2	8	0	0	0	0	10
W	2	7	0	0	0	0	9
WNW	3	16	0	0	0	0	19
NW	4	14	0	0	0	0	18
NNW	1	4	0	0	0	0	5
VARIABLE	5	0	0	0	0	0	5
TOTAL	22	88	8	3	0	0	121

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 1

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 20

ZION NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1979
STABILITY CLASS - EXTREMELY STABLE (DELTA T 125-35 FT)
WINDS MEASURED AT 35 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	1	0	0	0	0	0	1
S	2	8	12	0	0	0	22
SSW	3	4	0	0	0	0	7
SW	0	10	0	0	0	0	10
WSW	3	7	0	0	0	0	10
W	2	17	0	0	0	0	19
WNW	5	10	0	0	0	0	15
NW	5	4	0	0	0	0	9
NNW	2	1	0	0	0	0	3
VARIABLE	3	0	0	0	0	0	3
TOTAL	27	61	12	0	0	0	100

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 1

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 20