QUAD CITIES STATION

RADIOACTIVE WASTE AND ENVIRONMENTAL MONITORING

ANNUAL REPORT 1981

HAZLETON ENVIRONMENTAL SCIENCES

Northbrook, Illinois

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QUAD CITIES NUCLEAR POWER STATION

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INTRODUCTION

Units 1 and 2 of the Quad Cities Station located near Cordova, Illinois next to the Mississippi River, are 800 MWe boiling water reactors, similar in design to Dresden Units 2 and 3. The plant has been designed to keep releases to the environment at levels below those specified in the regulations.

Liquid effluents from Quad Cities are released to the Mississippi River in controlled batches after radioassay of each batch. Gaseous effluents are released to the atmosphere after delay to permit decay of short half-life gases. Releases to the atmosphere are calculated on the basis of analyses of daily grab samples of noble gases and continuously collected composite samples of iodine and particulate matter. The results of effluent analyses are summarized on a monthly basis and reported to the Nuclear Regulatory Commission as required per Technical Specifications. Airborne concentrations of noble gases, I-131 and particulate radioactivity in off-site areas are calculated using effluent and meteorological data on isotopic composition of effluents.

Environmental monitoring is conducted by sampling at indicator and reference (background) locations in the vicinity of the Quad Cities plant to measure changes in radiation or radioactivity levels that may be attributable to plant operations. If significant changes attributable to Quad Cities are measured, these changes are correlated with effluent releases. External gamma radiation exposure from noble gases and I-131 in milk are the most critical pathways at this site; however, an environmental monitoring program is conducted which includes other pathways of less importance.

SUMMARY

Gaseous and liquid effluents for the period remained at a fraction of the Technical Specification limits. Calculations of environmental concentrations based on effluent, Mississippi River flow, and meteorological data for the period indicate that consumption by the public of radionuclides attributable to the plant are unlikely to exceed the 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 * mrem for the year, when a shielding and occupancy factor of 0.7 is assumed. Environmental monitoring results confirm that dose via other pathways was not significant.

* Datum will be provided

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 3.20 E+04 curies of fission and activation gases was released with an average release rate of 1.02E+03 µCi/sec.

A total of 0.46 curies of I-131 was released during the year, with an average release rate of 1.46E-02 µCi/sec.

A total of 0.81 curies of beta-gamma emitters and 9.10E-05 curies of alpha emitters was released as airborne particulate matter, with an average release rate of 2.57E-02 µCi/sec.

A total of 8.58E+01 curies of tritium was released, with an average release rate of 2.72E+00 µCi/sec.

1.2 Liquids Released to the Mississippi

A total of 6.11E+06 liters of radioactive liquid waste (prior to dilution) containing 3.27 curies (excluding tritium, gases, and alpha) were discharged after dilution with a total of 3.08E+09 liters of water. These wastes were released at a quarterly average concentration of 3.31E-06 µCi/ml during the first and second quarters, dicharged on an identified nuclide basis; and 1.27E-07 µCi/ml during the third and fourth quarters, which is 7.4% of the Technical Specification release limits for identified radioactivity. A total of 4.8E-04 curies of alpha radioactivity and 11.9 curies of tritium were released. Quarterly release estimates and principal radionuclides in liquid effluents are given in Table 1.2-1.

2.0 SOLID RADIOACTIVE WASTE

Solid radioactive wastes were shipped to Richland, Washington; Beatty, Nevada; and 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 meterological 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 * mrem for the year, with an occupancy or shielding factor of 0.7 included. The maximum gamma air dose was * mrad.

Beta Air and Skin Rates

The range of beta particles in air is relatively small (on the order of a few meters or 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 7 mg/cm^2 and an occupancy factor of 1.0 is used. The skin dose from beta and gamma radiation for the year was * 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 * 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. Calculation 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 * pCi/m^3 for the year.

Dose to Infant's 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 * mrem during the year (Table 3.1-1).

Concentrations of Particulates in Air

Concentration contours of radioactive airborne particulates are shown in Figure 3.1-4. The maximum off-site average level is estimated to be * .

* Data will be provided

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 G. tract, thyroid, bone and skin; specific parameters for use in the equations are given in the Commonwealth Edison Off-site Dose Calculation Manual. The maximum whole body dose for the years was ** mrem and no organ dose exceeded ** mrem.

4.0 SITE METEOROLOGY

A summary of the site meteorological measurements taken during each quarter of the year is given in Appendix II. The data are presented as cumulative joint frequency distributions of 296' level wind direction and wind speed class by atmospheric stability class determined from the temperature difference between the 296' and 33' levels. Data recovery for these measurements was about 97.6%.

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 or in the Corporate offices.

Specific findings for various environmental media are discussed below.

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* Nuclear Regulatory Commission, Regulatory Guide 1.109 (Rev. 1).
** Data will be provided.

5.1 Gamma Radiation

External radiation dose from on-site sources and noble gases released to the atmosphere was measured at six 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 and off-site indicator stations is included in Table 5.1-1. Additional TLDs, a total of 61 were installed on June 1, 1980 such that each sector was covered at both five miles and the site boundary.

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 shown in figure 5.0-1. Airborne I-131 remained below the LLD of 0.1 pCi/m^3 throughout the year.

Gross beta concentrations ranged from 0.01 to 0.49 pCi/m^3 at indicator locations with an average concentration of 0.11 pCi/m^3 for the year. No radioactivity attributable to station operation was detected in any sample.

5.3 Aquatic Radioactivity

Surface water samples were collected daily and composited for analysis weekly from the Inlet Canal, blowdown diffuser pipe, East Moline Water Works, and Davenport Water Works. The cooling water samples are analyzed weekly for gross beta concentrations. A composite sample from each quarter from the blowdown diffuser pipe does not indicate measurable radioactivity attributable to station operation. Gross beta concentration in the blowdown water sample ranged from 3 to 1800 pCi/l. Supplementary gamma isotopic analysis indicated quantitatively that this activity was mainly due to Cs-134, Cs-137, and Co-60 and is clearly attributable to station releases.

Samples from the two water works are compositied quarterly and analyzed for gamma emmiters. All samples analyzed were below the limits of detection for the program indicating that there was no measurable amount of radioactivity due to station operation present.

Levels of gamma radioactivity in fish collected were measured and found in all cases to be below the lower limits of detection for the program.

A sediment sample was analyzed by gamma spectrometry. Gamma-emitters were either below the limits of detection or at the level usually encountered in the environment (Cs-137, 0.60 pCi/g dry weight) indicating the presence of no radioactivity due to station operation.

5.4 Milk

Milk samples were collected monthly from November through April and weekly from May through October and analyzed for iodine-131. Sampled locations were the Hansen Dairy Farm located about 5 miles northeast of the Station, Turner Farm, 2.5 miles southwest of the Station, and Musal Dairy Farm located 5.5 miles southwest of the Station. Turner Farm went out of dairy business at the end of April 1981 and was replaced by Musal Dairy Farm in early May 1981. Radioiodine was below the limits of detection of 0.5 pCi/l during the grazing period (May to October) and 5.0 pCi/l during the non-grazing period (November to April).

5.5 Special Collection

No special collections were made during the period.

6.0 ANALYTICAL PROCEDURES

A description of the procedures used for analyzing radioactivity in environmental samples is given in Appendix III of the report.

7.0 MILCH ANIMAL CENSUS

A census of milch animals was conducted within five miles of the Station and the finding is presented below. The survey was conducted by "door-to-door" canvas and by information from Illinois and Iowa Agricultural Agents.

Name of Farm or Farmer	Distance and Direction from Station	Milking Animals
Saddle Club Dairy	1 mile S	100 cows

APPENDIX I

DATA TABLES AND FIGURES

Table 1.1-1

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 1st	Quarter 2nd	Est. Total Error, %
A. Fission & Activation Gases				
1. Total release	Ci	1.24E+04	6.99E+03	
2. Average release rate for period	uCi/sec	1.59E+03	8.89E+02	
3. a. Percent of Tech. Spec. limit Chimney	%	3.51E-01	1.97E-01	
b. Percent of Tech. Spec. limit Stack	%	7.81E-01	5.26E-01	
B. Iodines				
1. Total iodine-131	Ci	1.24E-01	1.06E-01	
2. Average release rate for period	uCi/sec	1.59E-02	1.35E-02	
3. a. Percent of Tech. Spec. limit station	%	1.07	.89	
C. Particulates				
1. Particulates with half-lives > 8 days	Ci	1.89E-01	3.35E-01	
2. Average release rate for period	uCi/sec	2.43E-02	4.26E-02	
3. Gross alpha radioactivity	Ci	5.24E-06	9.76E-06	

Table 1.1-1 (continued)

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 3rd & 4th qtr. 1981

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
A. Fission & Activation Gases				
1. Total release	Ci	7.5E03	5.1E03	
2. Average release rate for period	uCi/sec	9.4E02	6.5E02	
3. a. Percent of Tech. Spec. limit Chimney	%	2.7E-01	2.4E-01	
b. Percent of Tech. Spec. limit Stack	%	2.0E-01	5.7E-01	
B. Iodines				
1. Total Iodine-131	Ci	1.3E-01	1.0E-01	
2. Average release rate for period	uCi/sec	1.6E-02	1.3E-02	
3. a. Percent of Tech. Spec. limit station	%	6.8E-01	1.2E00	
C. Particulates				
1. Particulates with half-lives > 8 days	Ci	1.8E-01	1.1E-01	
2. Average release rate for period	uCi/sec	2.2E-02	1.3E-02	
3. Gross alpha radioactivity	Ci	6.3E-05	1.3E-05	

Talble 1.1-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 1st	Quarter 2nd	Est. Total Error, %
D. Tritium				
1. Total release	Ci	4.55E+00	1.39E+01	
2. Average release rate for period	uCi/sec	5.85E-01	1.76E+00	

Table 1.1-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
D. Tritium				
1. Total release	Ci	6.0E01	7.4E00	
2. Average release rate for period	uCi/sec	7.5E-01	9.3E-01	

Table 1.1-1 (continued)

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS- Elevated

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 1st	Quarter 2nd	Quarter	Quarter
1. Fission gases					
Kr-85	Ci	< LLD	< LLD		
Kr-85m	Ci	6.26E+02	4.93E+02		
Kr-87	Ci	6.97E+02	1.66E+02		
Kr-88	Ci	1.07E+03	5.70E+02		
Xe-133	Ci	8.41E+02	1.01E+02		
Xe-135	Ci	1.84E+03	6.23E+02		
Xe-135m	Ci	1.68E+03	1.35E+03		
Xe-138	Ci	4.49E+03	1.86E+03		
	Ci				
	Ci				
Unidentified	Ci				
Total for Period	Ci	1.13E+04	5.16E+03		
2. Iodines					
I-131	Ci	1.04E-01	1.03E-01		
I-133	Ci	4.86E-01	4.85E-01		
I-135	Ci	9.51E-01	8.95E-01		
Total for Period	Ci	1.54E+00	1.48E+00		

Table 1.1-1 (continued)

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS-Elevated Release

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 3rd	Quarter 4th	Quarter	Quarter
1. Fission gases					
Kr-85	Ci	<LLD	<LLD		
Kr-85m	Ci	7.5E02	7.6E02		
Kr-87	Ci	6.5E02	5.1E02		
Kr-88	Ci	1.6E03	1.5E03		
Xe-133	Ci	8.3E02	1.0E03		
Xe-135	Ci	3.7E02	2.4E02		
Xe-135m	Ci	6.4E02	1.3E02		
Xe-138	Ci	2.4E03	3.4E02		
	Ci				
	Ci				
Unidentified	Ci	<LLD	<LLD		
Total for Period	Ci	7.2E03	4.4E03		
2. Iodines					
I-131	Ci	1.2E-01	8.0E-02		
I-133	Ci	3.5E-01	4.1E-01		
I-135	Ci	6.8E-01	6.4E-01		
Total for Period	Ci	1.2E00	1.1E00		

Table 1.1-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS- Elevated

Nuclides Released	Unit	Continuous Mode Quarter 1st	Continuous Mode Quarter 2nd	Batch Mode Quarter	Batch Mode Quarter
3. Particulates					
Sr-89	Ci	3.42E-02	2.71E-2		
Sr-90	Ci	1.19E-04	9.06E-05		
Cs-134	Ci	8.16E-05	3.59E-05		
Cs-137	Ci	6.24E-04	5.88E-04		
Ba-140	Ci	5.64E-02	5.99E-02		
La-140	Ci	< LLD	< LLD		
Cr51	Ci	< LLD	< LLD		
Mn54	Ci	< LLD	< LLD		
Co58	Ci	< LLD	< LLD		
Co60	Ci	3.03E-04	3.30E-04		
I131	Ci	1.62E-02	6.35E-03		
Ag110m	Ci	< LLD	< LLD		
Ce-141	Ci	4.03E-04	3.25E-04		
	Ci				
	Ci				
	Ci				
	Ci				
Unidentified	Ci				

Table 1.1-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS-Elevated Release

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 3rd	Quarter 4th	Quarter	Quarter
3. Particulates					
Sr-89	Ci	1.1E-02	1.4E-02		
Sr-90	Ci	4.1E-05	5.1E-05		
Cs-134	Ci	1.2E-05	1.3E-05		
Cs-137	Ci	2.2E-04	3.2E-04		
Ba-140	Ci	2.6E-02	1.7E-02		
La-140	Ci	<LLD	<LLD		
Cr51	Ci	<LLD	<LLD		
Mn54	Ci	<LLD	<LLD		
Co58	Ci	<LLD	<LLD		
Co60	Ci	9.9E-05	3.0E-04		
I131	Ci	5.5E-03	9.5E-03		
Ag110m	Ci	<LLD	<LLD		
Ce 141	Ci	2.0E-04	3.0E-03		
Ce 144	Ci		1.9E-03		
	Ci				
	Ci				
	Ci				
Unidentified	Ci				

Table 1.1-1 (continued)

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS - Vent Release

Nuclides Released	Unit	Continuous Mode Quarter 1st	Continuous Mode Quarter 2nd	Batch Mode Quarter	Batch Mode Quarter
1. Fission gases					
Kr-85	Ci	< LLD	< LLD		
Kr-85m	Ci	< LLD	< LLD		
Kr-87	Ci	< LLD	< LLD		
Kr-88	Ci	< LLD	< LLD		
Xe-133	Ci	4.73E+02	2.39E+02		
Xe-135	Ci	4.24E+02	3.26E+02		
Xe-135m	Ci	2.89E+02	1.86E+02		
Xe-138	Ci	< LLD	< LLD		
	Ci				
	Ci				
Unidentified	Ci				
Total for Period	Ci	1.19E+03	7.51E+02		
2. Iodines					
I-131	Ci	2.01E-02	3.66E-03		
I-133	Ci	9.41E-02	1.54E-02		
I-135	Ci	2.03E-01	4.61E-02		
Total for Period	Ci	3.17E-01	6.52E-02		

Table 1.1-1 (continued)

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS- Vent Release

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 3rd	Quarter 4th	Quarter	Quarter
1. Fission gases					
Kr-85	Ci	<LLD	<LLD		
Kr-85m	Ci	<LLD	<LLD		
Kr-87	Ci	<LLD	<LLD		
Kr-88	Ci	<LLD	<LLD		
Xe-133	Ci	3.5E01	5.5E02		
Xe-135	Ci	9.5E01	4.0E01		
Xe-135m	Ci	1.7E02	3.7E01		
Xe-138	Ci	<LLD	3.4E01		
	Ci				
	Ci				
Unidentified	Ci	<LLD	<LLD		
Total for Period	Ci	3.0E02	6.6E02		
2. Iodines					
I-131	Ci	5.8E-03	2.4E-02		
I-133	Ci	2.0E-02	3.8E-01		
I-135	Ci	3.2E-02	1.9E00		
Total for Period	Ci	5.8E-02	2.3E00		

Table 1.1-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS- Vent Release

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 1st	Quarter 2nd	Quarter	Quarter
3. Particulates					
Sr-89	Ci	2.37E-03	1.25E-04		
Sr-90	Ci	3.75E-05	3.04E-05		
Cs-134	Ci	1.16E-04	1.46E-04		
Cs-137	Ci	4.10E-04	1.47E-02		
Ba-140	Ci	6.83E-03	1.25E-03		
La-140	Ci	< LLD	< LLD		
Cr51	Ci	2.91E-03	4.78E-04		
Mn54	Ci	1.03E-04	5.09E-05		
Co58	Ci	2.23E-04	2.50E-04		
Co60	Ci	2.92E-03	3.07E-03		
I131	Ci	2.46E-03	1.62E-03		
Ag110m	Ci	1.33E-05	< LLD		
Cs-136	Ci	2.29E-04	< LLD		
Fn-65	Ci	1.05E-04	< LLD		
Ce-141	Ci	7.44E-05	< LLD		
	Ci				
	Ci				
Unidentified	Ci				

Table 1.1-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

GASEOUS EFFLUENTS- Vent Release

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 3rd	Quarter 4th	Quarter	Quarter
3. Particulates					
Sr-89	Ci	3.1E-04	1.3E-04		
Sr-90	Ci	1.3E-05	1.4E-05		
Cs-134	Ci	1.0E-04	1.1E-04		
Cs-137	Ci	2.8E-04	9.5E-04		
Ba-140	Ci	3.7E-03	2.9E-02		
La-140 less than 8 day half life	Ci	<LLD	<LLD		
Cr51	Ci	2.1E-03	1.6E-02		
Mn54	Ci	1.0E-04	9.7E-05		
Co58	Ci	1.7E-04	1.0E-05		
Co60	Ci	1.6E-03	2.8E-03		
I131	Ci	1.5E-03	8.3E-03		
Ag110m	Ci	<LLD	1.2E-05		
Ru103	Ci	4.9E-06	<LLD		
Cs136	Ci	<LLD	4.8E-04		
Zn65	Ci	<LLD	7.7E-04		
Sb124	Ci	<LLD	3.4E-05		
Ce141	Ci	<LLD	3.8E-03		
Unidentified	Ci				

Table 1.2-1

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 1st	Quarter 2nd	Est. Total Error, %
A. Fission and Activation Products				
1. Total release (not including tritium, gases, alpha)	Ci	2.17E+00	9.89E-01	
2. Average diluted concentration during period	uCi/ml	2.82E-06	3.80E-06	
3. Percent of applicable limit	%	1.32E+01	1.22E+01	
4. Maximum diluted concentration during period	uCi/ml	6.29E-06	4.58E-06	
B. Tritium				
1. Total release	Ci	2.04E+00	1.60E+00	
2. Average diluted concentration during period	uCi/ml	2.65E-06	1.8 E-06	
3. Percent of applicable limit	%	8.83E-02	6.0 E-02	
C. Dissolved and Entrained Gases				
1. Total release	Ci	4.00E-01	1.16E-02	
2. Average diluted concentration during period	uCi/ml	5.20E-07	1.33E-08	
3. Percent of applicable limit	%	1.73E-02	4.42E-04	
D. Gross Alpha Radioactivity				
1. Total release	Ci	2.93E-04	7.53E-05	
2. Average concentration released	uCi/ml	3.81E-10	8.61E-11	
E. Volume of waste released (prior to dilution)	Liters	1.43E+06	2.68E+05	
F. Volume of dilution water used during period	Liters	7.69E+08	8.75E+07	

Table 1.2-1 (continued)

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 3rd	Quarter 4th	Est. Tota Error, %
A. Fission and Activation Products				
1. Total release (not including tritium, gases, alpha)	Ci	4.8E-02	6.7E-02	
2. Average diluted concentration during period	uCi/ml	2.2E-07	3.3E-08	
3. Percent of applicable limit	%	3.89E00	1.4E-01	
4. Maximum diluted concentration during period	uCi/ml	5.3E-06	9.2E-05	
B. Tritium				
1. Total release	Ci	1.7E-01	8.1E00	
2. Average diluted concentration during period	uCi/ml	7.7E-07	4.1E-06	
3. Percent of applicable limit	%	2.6E-02	1.4E-01	
C. Dissolved and Entrained Gases				
1. Total release	Ci	7.6E-03	1.3E00	
2. Average diluted concentration during period	uCi/ml	3.5E-08	6.5E-07	
3. Percent of applicable limit	%	1.2E-03	2.2E-02	
D. Gross Alpha Radioactivity				
1. Total release	Ci	1.1E-04	3.7E-07	
2. Average concentration released	uCi/ml	5.0E-10	1.9E-13	
E. Volume of waste released (prior to dilution)	Liters	3.1E05	4.1E+06	
F. Volume of dilution water used during period	Liters	2.2E08	2.0E09	

Table 1.2-1 (continued)

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

LIQUID EFFLUENTS

		Continuous Mode		Batch Mode	
	Unit	Quarter 1st	Quarter 2nd	Quarter	Quarter
Sr-89	Ci	9.68E-04	7.44E-04		
Sr-90	Ci	2.87E-04	1.85E-04		
Tc-99m Cs-134	Ci	2.53E-04 4.73E-01	8.80E-04 2.13E-01		
I-133 Cs-137	Ci	1.78E-04 1.49E+00	1.27E-03 7.39E-01		
I-135 I-131	Ci	1.51E-03 1.69E-03	5.09E-04 2.82E-03		
Cr-51 Co-58	Ci	4.81E-04 2.37E-03	3.75E-04 2.03E-03		
Sr-91 Co-60	Ci	< LLD 1.94E-01	6.42E-04 2.31E-02		
Sr-92 Fe-59	Ci	< LLD < LLD	7.83E-05 < LLD		
Zn-65	Ci	2.43E-04	< LLD		
Mn-54	Ci	5.79E-03	5.87E-05		
Cr-51	Ci	< LLD	< LLD		
Zr-95	Ci	< LLD	< LLD		
Nb-95	Ci	< LLD	< LLD		
Mo-99	Ci	< LLD	6.95E-04		
Ag110m	Ci	< LLD	< LLD		
Ba-140	Ci	2.28E-04	1.30E-03		
Cs136	Ci	< LLD	< LLD		
La-140	Ci	4.27E-04	1.01E-03		
Ce-141	Ci	< LLD	3.21E-05		
Unidentified	Ci				
Total for Period (above)	Ci	2.17E+00	9.88E-01		
Xe-133	Ci	2.73E-01	5.70E-03		
Xe-135 Xe-133m	Ci	1.16E-01 1.22E-02	7.92E-03		

Table 1.2-1 (continued)

QUAD CITIES NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1981

LIQUID EFFLUENTS

		Continuous Mode		Batch Mode	
	Unit	Quarter 3rd	Quarter 4th	Quarter	Quarter
Sr-89	Ci	1.7E-03	2.8E-03		
Sr-90	Ci	9.2E-05	7.2E-04		
Tc-99m Cs-134	Ci	8.4E-04 1.1E-02	9.6E-04 7.8E-04		
Ce141 Cs-137	Ci	9.5E-05 4.8E-02	1.4E-04 1.4E-02		
I-133 I-131	Ci	5.7E-03 4.6E-03	4.3E-03 3.1E-03		
Sr-91 Co-58	Ci	5.8E-04 6.3E-04	6.3E-04 5.5E-04		
1135 Co-60	Ci	2.3E-03 1.1E-02	1.3E-03 2.6E-02		
Na24 Fe-59	Ci	3.4E-04 <LLD	4.9E-04 <LLD		
Cs138 Zn-65	Ci	2.6E-03 5.1E-04	<LLD 1.3E-03		
Mn-54	Ci	7.4E-04	1.5E-03		
Cs136 Cr-51	Ci	1.1E-03	3.9E-05 1.9E-03		
Sr-92 Zr-95	Ci	<LLD <LLD	2.1E-05 <LLD		
Nb-95	Ci	<LLD	2.8E-05		
Mo-99	Ci	3.8E-04	9.9E-04		
Ag110m	Ci	<LLD	<LLD		
Ba-140	Ci	1.8E-03	2.1E-03		
Cs136	Ci	8.6E-05	<LLD		
La-140 less than 8 day half life	Ci	<LLD	<LLD		
Np239	Ci	<LLD	1.1E-04		
Unidentified	Ci				
Total for Period (above)	Ci	9.6E-02	6.7E-02		
Xe-133	Ci	3.3E-03	1.2E00		
Xe-133m Xe-135	Ci	<LLD 4.4E-03	5.6E-04 1.2E-01		

Table 2.0-1

RWA - Richland Washington
USE - U. S. Ecology
BSC - Barnwell South Carolina
CN - Chem Nuclear Co.
HN - Hittman Nuclear & Development Co.

SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

January 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
1-02-81	HN	BSC	105.0		14626.1	
1-05-81	HN	BSC	105.0		18118.5	
1-05-81	HN	BSC	135.0		4712.9	
1-05-81	USE	RWA	1289.8		82.4	
1-06-81	HN	BSC	105.0		12057.9	
1-06-81	CN	BSC	85.0		217.0	
1-07-81	HN	BSC	105.0		13312.8	
1-07-81	HN	BSC	90.0		2226.6	
1-08-81	HN	BSC	105.0		6338.3	
1-08-81	USE	RWA	630.0		42.4	
1-09-81	HN	BSC	135.0		7622.9	
1-09-81	HN	BSC	105.0		12353.7	
1-12-81	HN	BSC	105.0		11066.1	
1-12-81	USE	RWA	570.0		44.5	
1-13-81	HN	BSC	105.0		4106.7	
1-14-81	HN	BSC	105.0		8038.0	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
January 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
1-14-81	HN	BSC	135.0		2469.5	
1-15-81	CN	BSC	85.0		22800.0	
1-15-81	USE	RWA	1289.8		17.9	
1-16-81	HN	BSC	105.0		12462.3	
1-16-81	HN	BSC	105.0		16208.8	
1-19-81	HN	BSC	105.0		14563.5	
1-19-81	HN	BSC	135.0		1494.1	
1-20-81	HN	BSC	105.0		10885.6	
1-21-81	HN	BSC	105.0		14886.9	
1-22-81	HN	BSC	105.0		13176.3	
1-23-81	CN	BSC	85.0		15497.0	
1-23-81	HN	BSC	105.0		11314.8	
1-23-81	USE	Beatty, NV	135.0		561.4	
1-26-81	HN	BSC	105.0		13130.2	
1-26-81	USE	RWA	1289.8		81.1	
1-27-81	HN	BSC	105.0		9447.0	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

January 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
1-28-81	HN	BSC	90.0		4518.6	
1-28-81	HN	BSC	105.0		10295.9	
1-29-81	HN	BSC	105.0		14106.5	
1-29-81	HN	BSC	135.0		4650.2	
1-30-81	HN	BSC	105.0		11763.7	
				8519.4		319.2981

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
February 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
2-03-81	HN	BSC	105.0		16371.5	
2-03-81	HN	BSC	105.0		13163.3	
2-04-81	CN	BSC	85.0		15497.0	
2-04-81	HN	BSC	105.0		16686.9	
2-04-81	HN	BSC	135.0		1764.8	
2-05-81	HN	BSC	106.0		11418.7	
2-05-81	USE	RWA	567.5		128.5	
2-06-81	HN	BSC	105.0		11790.9	
2-06-81	HN	BSC	90.0		8503.5	
2-09-81	HN	BSC	90.0		10356.8	
2-09-81	HN	BSC	105.0		19586.3	
2-10-81	HN	BSC	105.0		16725.3	
2-10-81	CN	BSC	85.0		46300.0	
2-11-81	HN	BSC	105.0		16647.3	
2-11-81	HN	BSC	105.0		16168.1	
2-13-81	HN	BSC	105.0		14032.4	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
February 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
2-13-8	USE	RWA	135.0		1021.6	
2-17-8	CN	BSC	85.0		46300.0	
2-17-8	HN	BSC	105.0		20861.4	
2-18-8	HN	BSC	105.0		18018.4	
2-18-8	HN	BSC	105.0		18387.6	
2-19-8	HN	BSC	105.0		12327.4	
2-19-8	HN	BSC	90.0		11204.0	
2-19-8	USE	RWA	1289.8		130.5	
2-20-8	HN	BSC	135.0		2781.7	
2-23-8	HN	BSC	105.0		13234.6	
2-23-8	HN	BSC	105.0		14233.7	
2-24-8	HN	BSC	105.0		15917.9	
2-24-8	CN	BSC	85.0		46300.0	
2-25-8	HN	BSC	135.0		2005.8	
2-25-8	HN	BSC	105.0		16757.8	
2-26-8	HN	BSC	90.0		11643.9	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

February 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
2-27-81	HN	BSC	105.0		15728.3	
2-27-81	HN	BSC	105.0		15461.7	
				5197.3		517.4576

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
March 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
3-02-81	HN	BSC	105.0		16714.5	
3-02-81	HN	BSC	105.0		12436.1	
3-03-81	HN	BSC	105.0		13618.7	
3-03-81	CN	BSC	85.0		46300.0	
3-04-81	HN	BSC	105.0		14805.4	
3-05-81	HN	BSC	90.0		11960.2	
3-05-81	USE	RWA	1289.8		60.5	
3-09-81	HN	BSC	105.0		12827.4	
3-09-81	HN	BSC	90.0		11016.9	
3-10-81	HN	BSC	105.0		14421.2	
3-10-81	CN	BSC	85.0		46300.0	
3-11-81	HN	BSC	105.0		14158.3	
3-11-81	HN	BSC	90.0		12726.3	
3-12-81	HN	BSC	90.0		5957.8	
3-12-81	HN	BSC	102.0		211.3	
3-13-81	HN	BSC	105.0		12585.5	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
March 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
3-13-81	HN	BSC	105.0		14937.9	
3-13-81	HN	BSC	90.0		11404.9	
3-16-81	HN	BSC	105.0		11516.6	
3-16-81	HN	BSC	90.0		12472.0	
3-17-81	HN	BSC	105.0		16863.7	
3-17-81	CN	BSC	85.0		77481.3	
3-18-81	HN	BSC	90.0		13466.6	
3-18-81	HN	BSC	105.0		14169.6	
3-19-81	HN	BSC	90.0		15223.3	
3-19-81	HN	BSC	105.0		18064.0	
3-20-81	HN	BSC	105.0		15336.3	
3-20-81	HN	BSC	90.0		12069.2	
3-23-81	HN	BSC	105.0		22716.8	
3-24-81	HN	BSC	105.0		18355.6	
3-24-81	CN	BSC	85.0		71122.7	
3-25-81	HN	BSC	105.0		13002.3	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

March 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
3-26-8	HN	BSC	105.0		15756.3	
3-27-8	HN	BSC	105.0		18610.2	
3-27-8	HN	BSC	90.0		9312.2	
3-30-8	HN	BSC	105.0		21191.1	
3-31-8	USE	RWA	105.0		20244.2	
				4836.8		689.4169

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
April, 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
4-01-81	USE	RWA	105.0		11816.3	
4-01-81	CN	BSC	85.0		71122.7	
4-02-81	HN	BSC	105.0		19172.9	
4-02-81	USE	RWA	630.0		56.7	
4-03-81	HN	BSC	105.0		15849.5	
4-03-81	USE	RWA	105.0		19979.6	
4-06-81	USE	RWA	105.0		16206.1	
4-06-81	USE	RWA	105.0		18707.5	
4-08-81	HN	BSC	105.0		17196.7	
4-08-81	HN	BSC	105.0		17522.9	
4-08-81	CN	BSC	85.0		71122.7	
4-08-81	CN	BSC	85.0		71122.7	
4-09-81	USE	RWA	622.5		105.7	
4-09-81	USE	RWA	105.0		16424.6	
4-10-81	USE	RWA	105.0		17001.1	
4-10-81	USE	RWA	105.0		13221.1	

Table 2.0-1 (continued)

RWA - Richland Washington
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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

April 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
4-13-81	HN	BSC	105.0		13877.3	
4-13-81	HN	BSC	105.0		15668.6	
4-14-81	CN	BSC	85.0		63700.7	
4-14-81	USE	RWA	1289.8		66.6	
4-15-81	USE	RWA	105.0		15655.1	
4-15-81	CN	BSC	85.0		63700.7	
4-16-81	HN	BSC	105.0		16577.4	
4-16-81	USE	RWA	105.0		13658.3	
4-20-81	USE	RWA	105.0		13403.0	
4-20-81	USE	RWA	105.0		14097.3	
4-21-81	HN	BSC	105.0		17150.2	
4-21-81	CN	BSC	85.0		63700.7	
4-22-81	USE	RWA	105.0		11260.7	
4-23-81	USE	RWA	105.0		14506.8	
4-24-81	CN	BSC	60.5		14260.3	
4-24-81	USE	RWA	105.0		14694.4	

Table 2.0-1 (continued)

RWA - Richland Washington
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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
April 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
4-24-81	USE	RWA	105.0		14553.4	
4-27-81	USE	RWA	90.0		1411.0	
4-27-81	USE	RWA	105.0		19886.4	
4-28-81	CN	BSC	85.0		63700.7	
4-29-81	USE	RWA	105.0		16430.0	
4-29-81	USE	RWA	105.0		20101.0	
4-30-81	HN	BSC	105.0		18346.2	
4-30-81	USE	RWA	105.0		29909.4	
				6227.8		946.9450

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
May 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
5-01	HN	BSC	105.0		18607.1	
5-01	USE	RWA	105.0		15609.5	
5-04	USE	RWA	105.0		13029.4	
5-04	USE	RWA	105.0		11403.8	
5-05	CN	BSC	85.0		135.4	
5-06	CN	BSC	85.0		135.4	
5-06	USE	RWA	105.0		35950.5	
5-06	HN	BSC	105.0		33059.2	
5-07	HN	BSC	105.0		19654.5	
5-08	USE	RWA	105.0		27084.3	
5-08	USE	RWA	105.0		28551.8	
5-11	HN	BSC	105.0		2858.4	
5-11	USE	RWA	105.0		17354.1	
5-13	CN	BSC	85.0		135.4	
5-13	CN	BSC	85.0		135.4	
5-13	CN	BSC	60.5		17696.8	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
May 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
5-13	USE	RWA	105.0		18075.5	
5-13	USE	RWA	105.0		26942.2	
5-14	HN	BSC	105.0		24329.7	
5-14	HN	BSC	52.5		39628.9	
5-15	HN	BSC	105.0		28566.0	
5-15	USE	RWA	105.0		27134.3	
5-18	USE	RWA	105.0		20034.7	
5-19	CN	BSC	85.0		135.4	
5-19	USE	RWA	135.0		1519.6	
5-20	USE	RWA	105.0		25710.5	
5-20	HN	BSC	105.0		20959.8	
5-21	CN	BSC	50.0		23232.3	
5-21	USE	RWA	105.0		20101.7	
5-22	USE	RWA	105.0		20793.6	
5-26	USE	RWA	105.0		21644.1	
5-27	HN	BSC	105.0		14709.1	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

May 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
5-27	USE	RWA	105.0		18750.0	
5-27	CN	BSC	85.0		135.4	
5-28	HN	BSC	105.0		18048.6	
5-29	USE	RWA	105.0		15508.3	
5-29	USE	RWA	105.0		10824.6	
				3643.0		638.1853

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

June 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
6-01	HN	BSC	105.0		36153.7	
6-01	HN	BSC	105.0		35134.3	
6-03	USE	RWA	105.0		32519.7	
6-04	USE	RWA	105.0		33789.3	
6-05	HN	BSC	105.0		11941.3	
6-05	HN	BSC	105.0		20737.8	
6-08	HN	BSC	105.0		28647.4	
6-11	USE	RWA	1289.8		73.0	
6-12	HN	BSC	105.0		18710.8	
6-12	HN	BSC	105.0		25760.5	
6-15	HN	BSC	105.0		18664.4	
6-17	HN	BSC	105.0		1477.5	
6-18	HN	BSC	52.5		46668.7	
6-19	HN	BSC	105.0		33299.7	
6-19	HN	BSC	105.0		26762.0	
6-23	HN	BSC	105.0		19464.4	

Table 2.0-1 (continued)

RWA - Richland Washington
USE - U. S. Ecology
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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

June 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
6-24	HN	BSC	105.0		22363.3	
6-25	HN	BSC	105.0		15641.7	
6-26	HN	BSC	105.0		19275.5	
6-29	HN	BSC	105.0		15892.2	
				3232.3		462.9812

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
JULY 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
7/1/81	HN	BSC	105		36441.08	
7/1/81	HN	BSC	105		17425.31	
7/2/81	HN	BSC	105		24932.90	
7/6/81	HN	BSC	105		24559.82	
7/8/81	HN	BSC	105		19134	
7/9/81	Tristate	USE	1289.75		93.70	
7/9/81	HN	BSC	105		9567.57	
7/10/8	HN	BSC	105		26004.14	
7/10/8	HN	BSC	106		4331.92	
7/13/8	HN	BSC	105		22863.56	
7/15/8	HN	BSC	105		15041.92	
7/17/8	HN	BSC	105		18141.52	
7/16/8	Hacke	BSC	106		7243.06	
7/17/8	HN	BSC	105		15923.90	
7/20/8	HN	BSC	105		15130.00	
7/22/8	McCormack	BSC	105		32753.11	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

JULY 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	m - CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
7/23/81	HN	BSC	105		32875.58	
7/24/81	HN	BSC	105		27107.33	
7/24/81	Hacke	BSC	105		27793.25	
7/27/81	HN	BSC	105		14796.36	
7/29/81	HN	BSC	105		19908.19	
7/29/81	Hacke	BSC	105		19229.22	
7/30/81	HN	BSC	105		24711.97	
7/31/81	HN	BSC	85.08		218.16	
				3686.08		456228.47

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

AUGUST 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	MILLICURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
8/3/81	HN	BSC	105		4336.93	
8/3/81	HN	BSC	105		4362.03	
8/4/81	HN	BSC	105		14654.65	
8/5/81	HN	BSC	105		15417.27	
8/7/81	HN	BSC	85.08		143.65	
8/10/81	HN	BSC	105		20780.04	
8/12/81	HN	BSC	105		11067.97	
8/12/81	Tristate	USE	1289.75		36.48	
8/13/81	Hacke	BSC	105		25670.36	
8/14/81	HN	BSC	105		12510.95	
8/14/81	HN	BSC	105		18206.32	
8/17/81	HN	BSC	105		14407.50	
8/19/81	McCormack	BSC	105		8824.19	
8/20/81	HN	BSC	105		14331	
8/20/81	Tristate	USE	630		113.64	
8/21/81	HN	BSC	105		9534.32	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

AUGUST 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	MILLICURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
8/21/81	HN	BSC	105		12064.59	
8/24/81	McCormack	BSC	105		12473.45	
8/26/81	HN	BSC	105		1428.60	
8/26/81	Hacke	BSC	105		2200.48	
8/27/81	HN	BSC	105		13792.50	
8/27/81	Tristate	USE	837.5		238.17	
8/28/81	McCormack	BSC	105		10111.25	
8/28/81	HN	BSC	90		9758	
8/31/81	Hacke	USE	105		514.67	
				5032.33		236979.93

Table 2.0-1 (continued)

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BSC - Barnwell South Carolina
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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

SEPTEMBER 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
9/2/81	McCormack	BSC	105		12251.19	
9/2/81	HN	BSC	105		11747.67	
9/8/81	HN	BSC	105		17146.45	
9/8/81	HN	BSC	105		41294.56	
9/9/81	HN	BSC	105		12760.13	
9/10/81	Hacke	BSC	105		16520.93	
9/11/81	HN	BSC	105		3980.15	
9/11/81	Hacke	BSC	85.08		171.09	
9/14/81	HN	BSC	105		16084.00	
9/16/81	HN	BSC	106		14047.76	
9/17/81	HN	BSC	105		14916.97	
9/17/81	HN	BSC	85.08		91.25	
9/18/81	Hacke	BSC	105		20574.16	
9/21/81	HN	BSC	105		23040.77	
9/23/81	HN	BSC	105		22038	
9/24/81	Hacke	BSC	105		15185.34	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

SEPTEMBER 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	MILLICURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
9/23/81	HN	BSC	105		16811.82	
9/28/81	HN	BSC	105		13338.78	
9/24/81	Tristate	BSC	1289.75		43.50	
9/28/81	HN	BSC	105		15749.45	
9/30/81	HN	BSC	105		8075.18	
				3350.91		295871.15

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

OCTOBER 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	MILLICURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
10/1/81	Tristate	USE	1225.5		100.86	
10/5/81	HN	BSC	105		3934.48	
10/7/81	HN	BSC	105		470.22	
10/2/81	HN	BSC	105		7793.88	
10/7/81	Tristate	USE	1327.25		29.74	
10/8/81	HN	BSC	105		5282.75	
10/9/81	HN	BSC	105		12427.07	
10/14/81	HN	BSC	105		11077.21	
10/15/81	HN	BSC	105		8770.44	
10/19/81	HN	BSC	105		6436.05	
10/22/81	Tristate	USE	1225.5		130.54	
10/23/81	Hacke	BSC	105		7794.94	
10/26/81	HN	BSC	105		9722.24	
10/26/81	HN	BSC	105		12349.05	
10/29/81	Tristate	USE	1289.75		51.00	
				6223		86420.47

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD-CITIES STATION

NOVEMBER 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
11/2/8	HN	BSC	105		5903.07	
11/5/81	Tristate	USE	1131.25		90.41	
11/4/81	HN	BSC	105		6850.84	
11/6/81	HN	BSC	105		7330.20	
11/7/81	HN	BSC	105		14021.09	
11/9/81	HN	BSC	105		369.60	
11/12/8	Hacke	BSC	135		524.31	
11/12/8	HN	BSC	105		396.11	
11/13/8	HN	BSC	105		376.22	
11/16/8	HN	BSC	105		9520.01	
11/18/8	HN	BSC	105		7984.53	
11/19/8	Hacke	BSC	105		9744.49	
11/13/8	HN	USE	101.72		135.03	
11/20/8	HN	BSC	105		28980.41	
11/23/8	HN	BSC	105		16150.03	
11/25/8	Hacke	BSC	105		12576.77	

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
NOVEMBER 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	MILLICURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
11/25/8	HN	BSC	105		17447.91	
11/30/8	HN	USE	105		14694.10	
				2942.97		153195.66

Table 2.0-1 (continued)

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SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
DECEMBER 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	CURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
12/2/81	Hacke	BSC	105		10044.92	
12/3/81	HN	BSC	105		12980.52	
12/3/81	Tristate	USE	1289.75		47.06	
12/4/81	Hacke	BSC	105		552.04	
12/4/81	Hacke	BSC	22.5		48808	
12/7/81	Tristate	USE	105		12155.62	
12/7/81	Tristate	USE	562.5		45.34	
12/19/81	HN	BSC	22.5		39540.81	
12/10/81	Hacke	BSC	105		16385.72	
12/10/81	Tristate	USE	1225.5		71.42	
12/11/81	Hacke	BSC	105		1519.60	
12/11/81	HN	BSC	106		5358.21	
12/14/81	Tristate	USE	570		158.28	
12/18/81	HN	BSC	105		10137.97	
12/14/81	Hacke	BSC	22.5		39097.10	
12/18/81	HN	BSC	105		12866.57	

Table 2.0-1 (continued)

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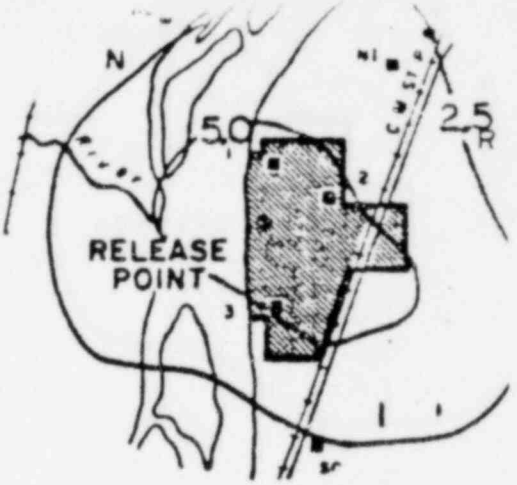
SOLID RADIOACTIVE WASTE SUMMARY
UNITS 1/2
QUAD-CITIES STATION
DECEMBER 1981

DATE	DISPOSITION OF MATERIAL		VOLUME (ft^3) PER SHIPMENT	VOLUME (ft^3) PER MONTH	MILLICURIES PER SHIPMENT	MILLICURIES PER MONTH
	CO. TRANS.	BURIAL SITE				
12/21/8	Hacke	BSC	106		10956.85	
12/21/8	Hacke	BSC	22.5		45794.97	
12/24/8	Hacke	BSC	105		7644.61	
12/23/8	Hacke	BSC	105		6342.12	
12/22/8	Tristate	USE	420		50.83	
12/28/8	HN	BSC	105		6307.44	
12/23/8	Tristate	USE	630		66.25	
12/28/8	Hacke	BSC	22.5		51004.73	
12/30/8	Tristate	USE	1289.75		62.78	
12/30/8	HN	BSC	105		10297.23	
12/31/8	HN	BSC	105		8057.07	
				7677		357654.12

Figure 3.1-1

Estimated Cumulative Gamma Dose (mrem) from the Quad Cities Station for the period January - December 1981.

Isopleth Labels
Small figure - multiply by 10^{-1}
Large figure - multiply by 10^{-2}



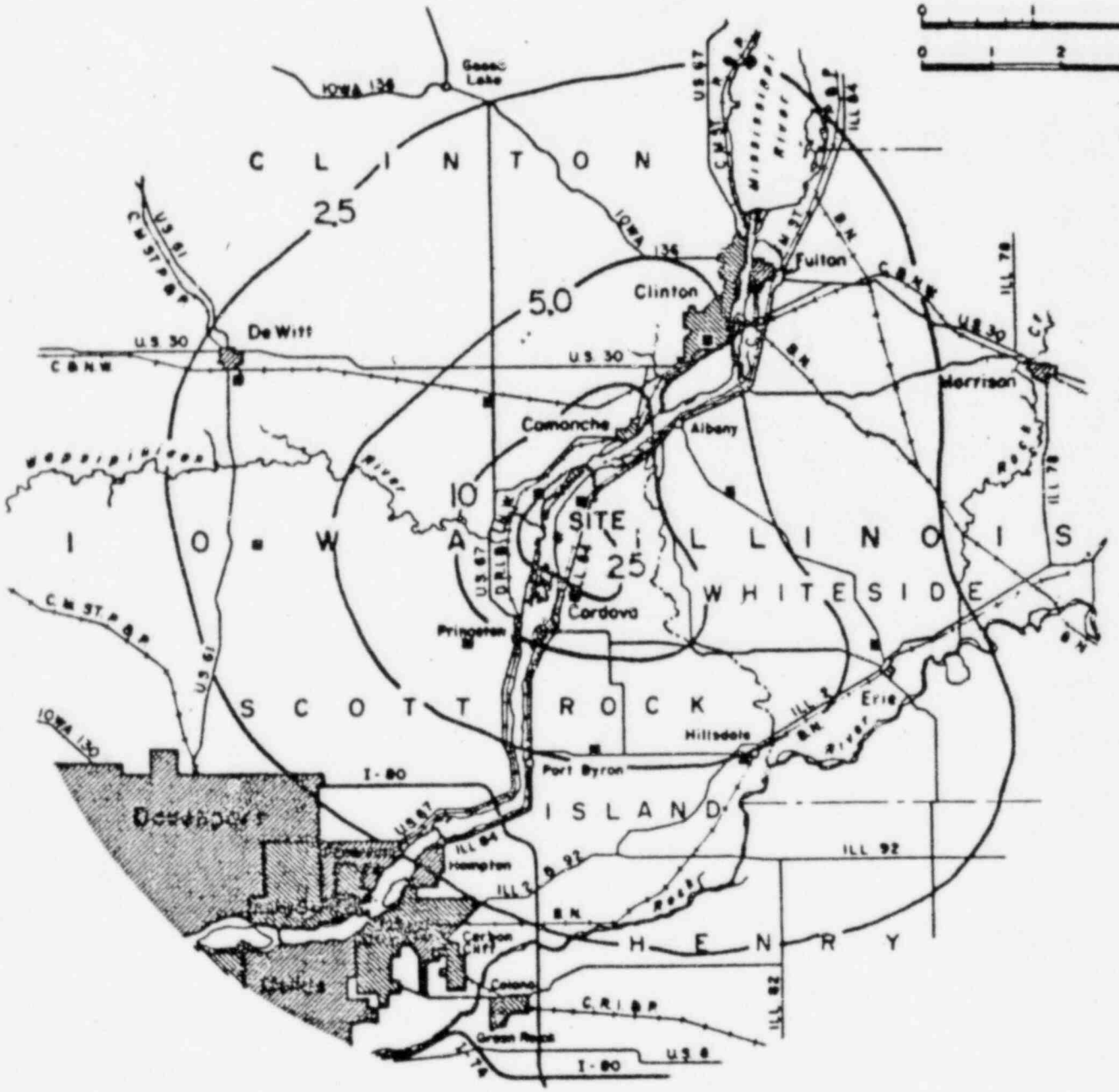


Figure 3.1-2

Estimated Total Concentration (pCi/m^3) of Noble Gases from the Quad Cities Station for the period January - December 1981.

Isopleth Labels
Small figure - multiply by 10^1
Large figure - multiply by 10^1

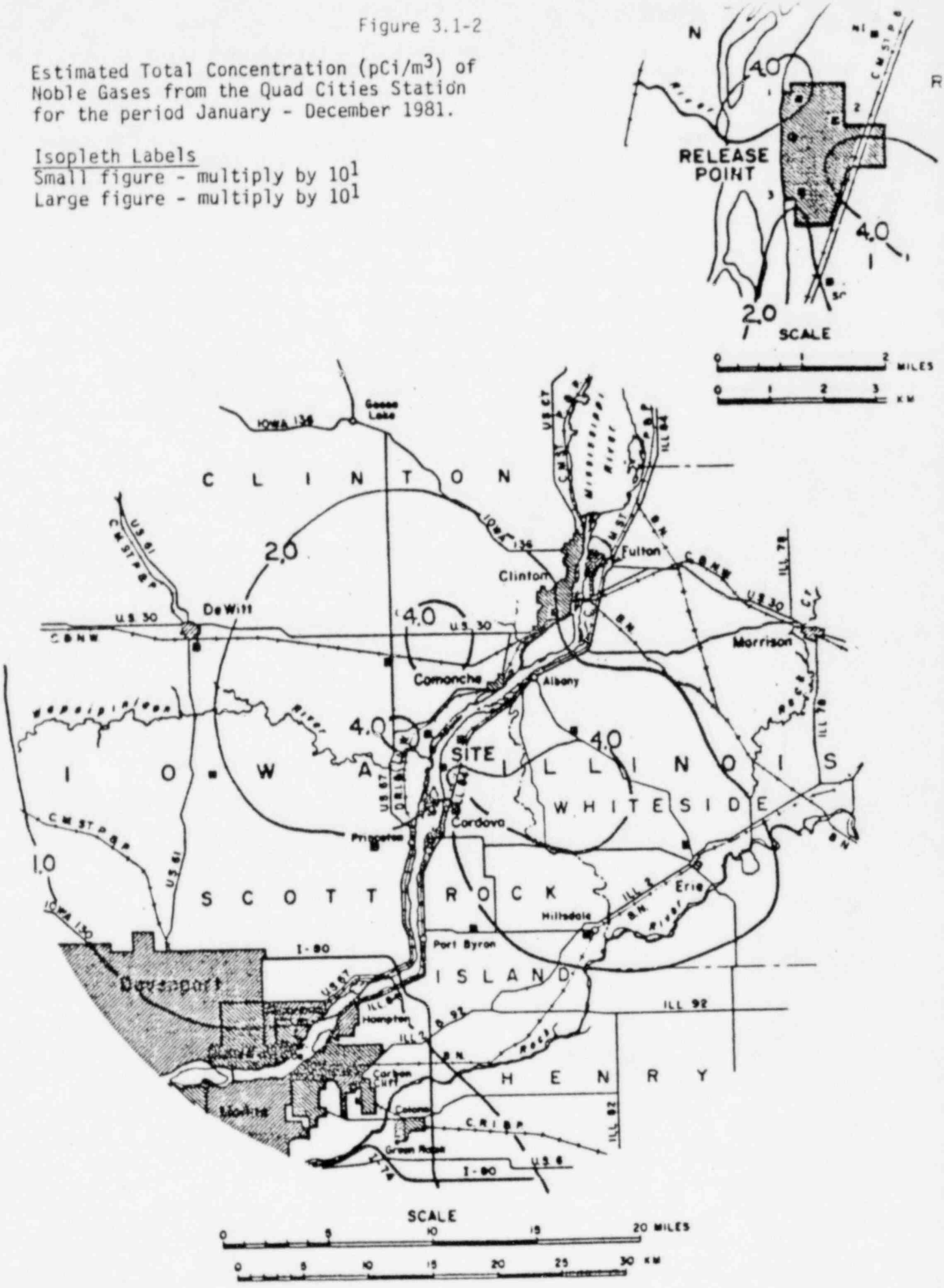


Figure 3.1-3

Estimated Total Concentration (pCi/m^3) of Iodine from the Quad Cities Station for the period January - December 1981.

Isopleth Labels
Small figure - multiply by 10^{-3}
Large figure - multiply by 10^{-3}

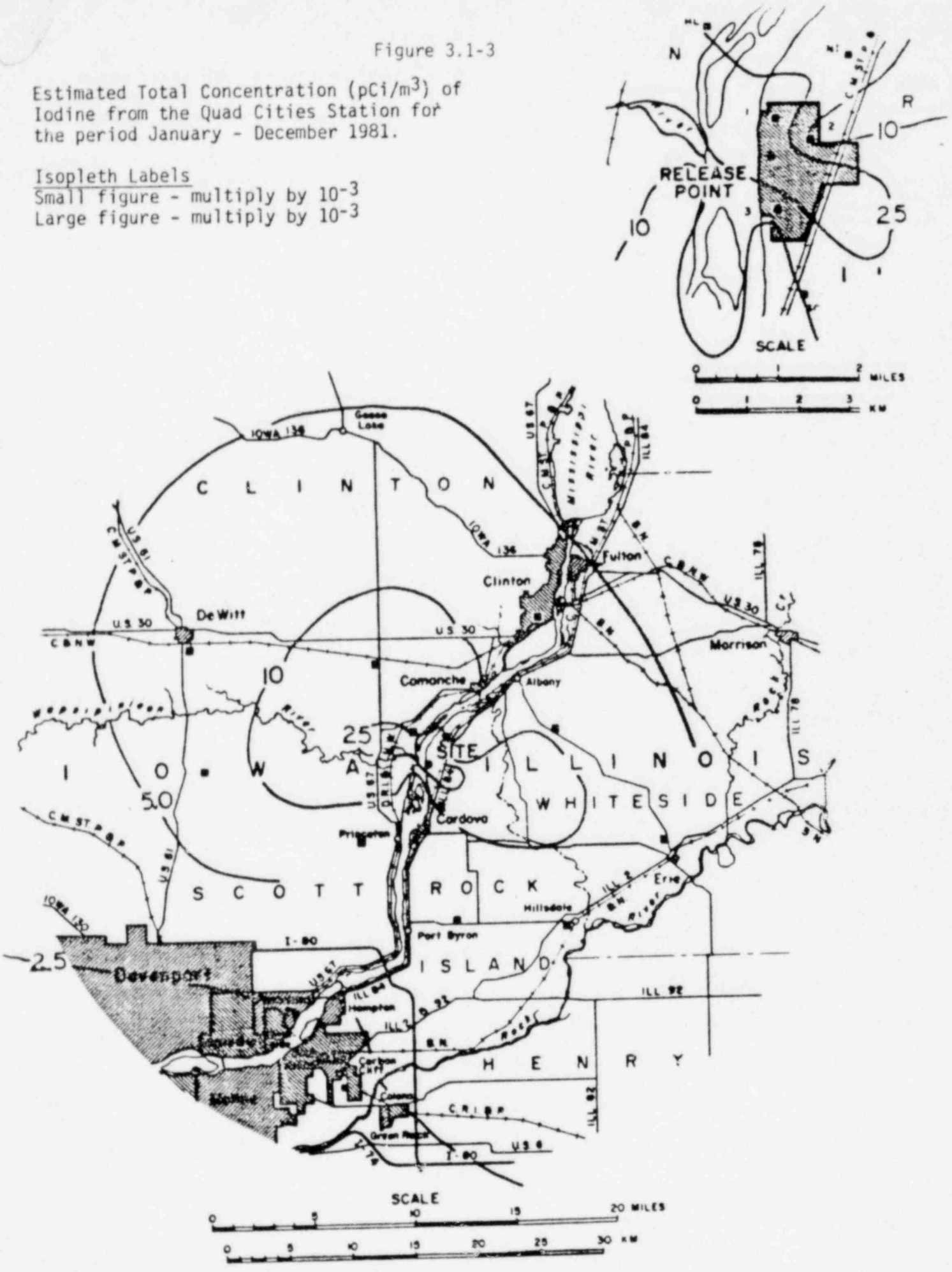
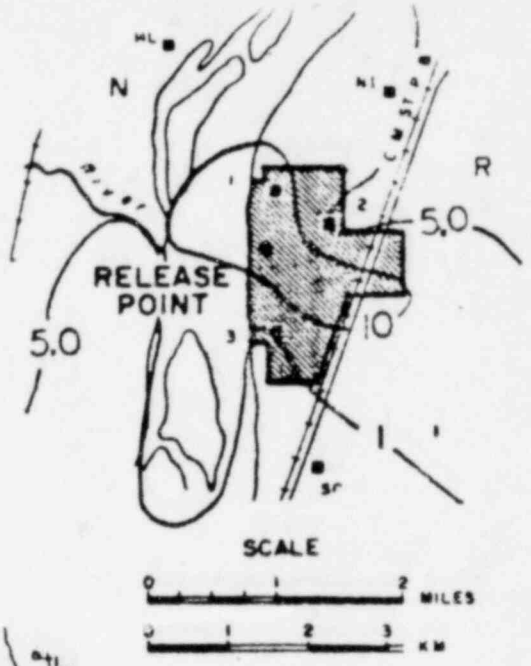


Figure 3.1-4

Estimated Total Concentration (pCi/m^3)
of Particulate Matter from the
Quad Cities Station for the period
January - December 1981.

Isopleth Labels
Small figure - multiply by 10^{-4}
Large figure - multiply by 10^{-5}



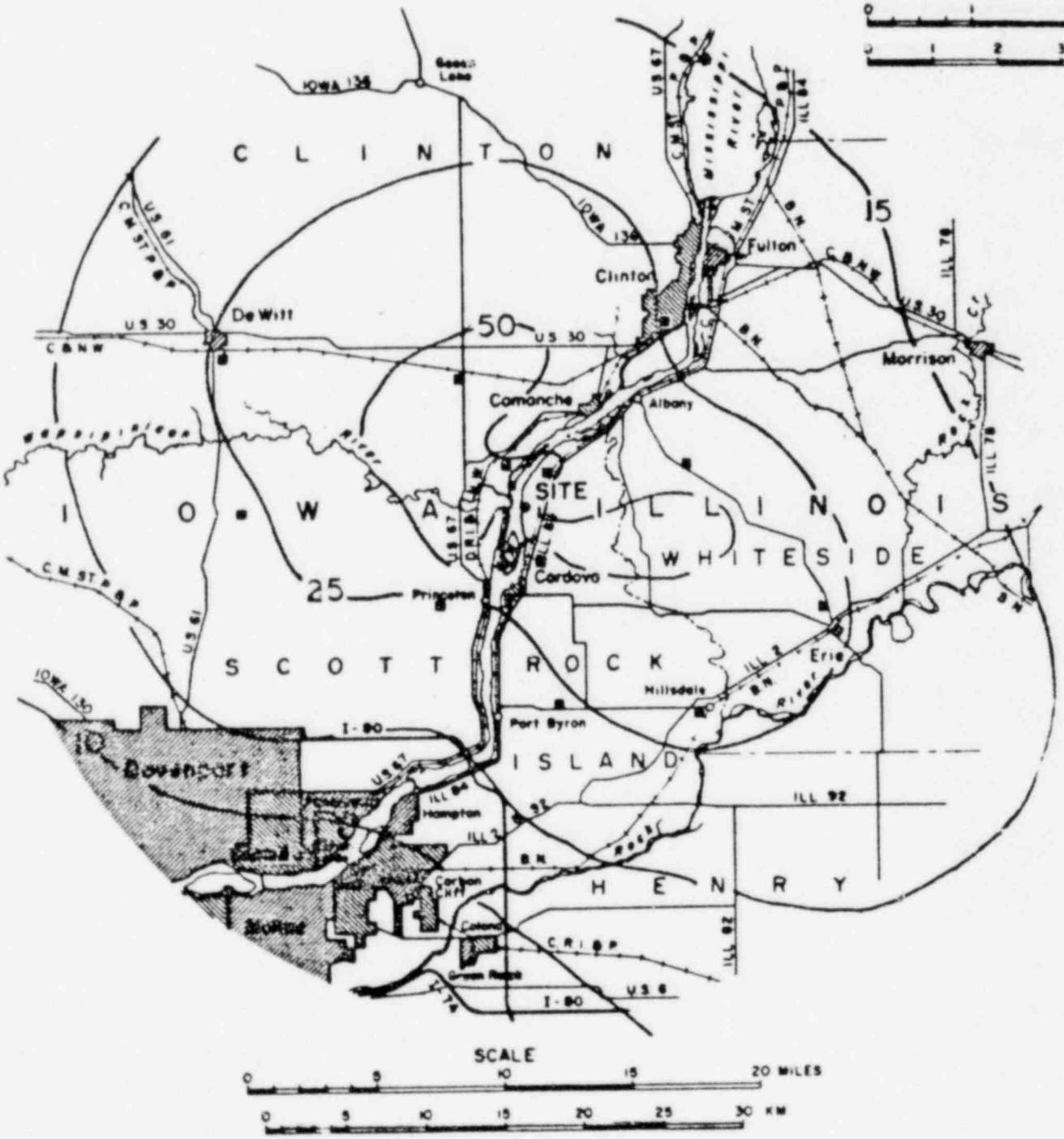


Table 3.1-1

Doses Resulting from Airborne Releases

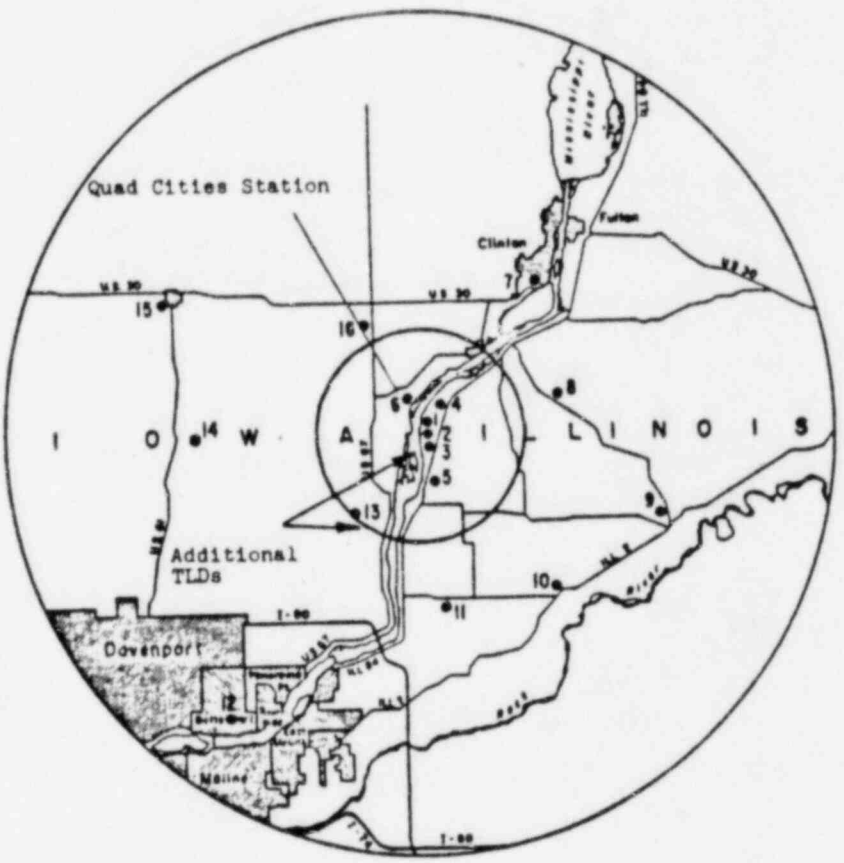
THIS TABLE WILL BE PROVIDED

Figure 5.0-1

LOCATIONS OF FIXED ENVIRONMENTAL RADIOLOGICAL MONITORING STATIONS

Air Samplers

1 - Onsite Station 1
2 - Onsite Station 2
3 - Onsite Station 3
4 - NITRIN
5 - Saddle Club Dairy
6 - Hanson's Boat Landing
7 - Clinton
8 - Sikkema Farm
9 - Erie
10 - Hillsdale
11 - Port Byron
12 - Bettendorf
13 - Princeton
14 - Utica Ridge Road
15 - De Witt
16 - Low Moor



TLD

Same as air samplers plus a sufficient number of additional dosimeters placed near the site and near 5 miles to assure, to the extent practical, that one dosimeter is located at each range in each of the 16 meteorological sctors,

QUAD CITIES NUCLEAR POWER STATION

Standard Radiological Sampling Program

Old Code	New Code	Loc. Type[a]	Location Description	Media							
				Air Samples	TLDs	Milk	Public Water	Cooling Water	Sediment	Fish	Census
Q-14	Q-01		On-site No. 1	X	X						
-15	-02		On-site No. 2	X	X						
-16	-03		On-site No. 3	X	X						
-01	-04		Nitrin	X	X						
-06	-05		Saddle Club Dairy	X	X						
-12	-06		Hanson's Boat Landing	X	X						
-02	-07	C	Clinton	X	X						
-03	-08	C	Sikkema Farm	X	X						
-04	-09	C	Erie	X	X						
-05	-10	C	Hillsdale	X	X						
-07	-11	C	Port Byron	X	X						
-08	-12	C	Bettendorf	X	X						
-09	-13	C	Princeton	X	X						
-10	-14	C	Utica Ridge Road	X	X						
-11	-15	C	DeWitt	X	X						
-13	-16	C	Low Moor	X	X						
-17	-17		Musal Dairy Farm			X					X
-34	-18		Turner Farm			X					X
-20	-19		East Moline Water Works				X				
-21	-20		Davenport Water Works				X				
-18	-21	C	Inlet Canal					X			
-19	-22		Discharge Canal					X			
-27	-23		Lock & Dam No. 14 (Mississippi River)						X		
-27	-24		Davenport Fish Market (Pool No. 14, Mississippi River)							X	

[a] Control (background) locations are indicated by a "C" in this column. All other locations are indicators.

TABLE 5.0-1

QUAD CITIES STANDARD RADIOLOGICAL MONITORING PROGRAM

Sample Media	Collection Site[a]	Type of Analysis	Frequency	Non-Routine Reporting Levels[b]
1. Air Monitoring	(a) Onsite and near Field	1. Filter - gross beta[c]	1. Weekly	Cs-134 10, Cs-137 20 pCi/m^3
	(1) Onsite Station #1 (2) Onsite Station #2 (3) Onsite Station #3 (4) Nitrin (5) Saddle Club Dairy Farm (6) Hanson's Boat Landing	2. Charcoal - I-131 3. Sampling Train - Test and Maintenance	2. Bi-weekly[d] 3. Weekly	0.9 pCi/m^3
	(b) Far Field	1. Filter Exchange	1. Weekly	Same as 1 (a)
	(1) Clinton (2) Sikkema Farm (3) Erie (4) Hillsdale (5) Port Byron (6) Bettendorf (7) Princeton (8) Utica Ridge Road (9) DeWitt (10) Low Moor	2. Charcoal Exchange 3. Sampling Train - Test and Maintenance	2. Bi-weekly 3. Weekly	When analyses are made
2. TLD	Same as 1	Gamma Radiation	Quarterly	
3. Fish	Pool 14 of Mississippi	Gamma isotopic	Semi-annually	Mn-54 $3x10^4$, Fe-59 $1x10^4$ Co-58 $3x10^4$, Co-60 $1x10^4$ Zn-65 $2x10^4$, Cs-134 $1x10^3$ Cs-137 $2x10^3$ pCi/Kg wet weight
4. Milk	(a) Hansen 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) Musal Dairy		2. Monthly - Nov to Apr	Ba-La-140 300 pCi/l

TABLE 5.0-1 (continued)

QUAD CITIES STANDARD RADIOLOGICAL MONITORING PROGRAM

	Sample Media	Collection Site	Type of Analysis	Frequency	Non-Routine Reporting Levels[b]
5.	Public Water	(a) East Moline Water Works (b) Davenport Water Works	1. Gamma Isotopic	1. Monthly Analysis of Weekly Composites	(See footnote e)
6.	Cooling Water[f]	(a) Inlet (b) Discharge	1. Gross Beta	1. Weekly	
7.	Sediment	(a) Lock and Dam No. 14	Gamma Isotopic	Annually	
8.	Dairy Census	(a) Site Boundary to 2 miles	(a) Enumeration by a door-to-door or equivalent counting technique	Annually, during grazing season	
		(b) 2 miles to 5 miles	(b) Enumeration by using referenced information from county agricultural agents or other reliable sources.		
		(c) At dairies listed in item 4.	(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%		

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

[b] Average concentration over calendar quarter.

[c] 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 preceding calendar quarter for the sample location.

[d] Bi-weekly shall mean that the frequency is once every other week.

[e] H-3 $2x10^4$, Mn-54 $1x10^3$, Fe-59 $2x10^2$, Co-58 $6x10^2$, Co-60 $2x10^2$, Zn-65 $2x10^2$, Zr-Nb-95 $4x10^2$, I-131 2, Cs-134 30, Cs-137 50, Ba-La-140 $1x10^2$ pCi/l.

[f] Provided by station personnel.

Table 5.0-2

Environmental Radiological Monitoring Program Quarterly Summary

Name of facility Quad Cities Nuclear Power Station Docket No. 50-254, 50-265

Location of facility Rock Island, Illinois (County, State) Reporting Period 1st Quarter 1981

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean[a] Range	Location with Highest Annual Mean		Control Locations Mean[a] Range	Number of non-routine Results
				Location	Mean Range		
Air Particulates (pCi/m^3)	Gross Beta 77	1.0	0.14 (77/77) (0.04-0.28)	Q-02, Onsite #2 0.5 mi @ 70°	0.16 (13/13) (0.08-0.28)	None	0
Airborne Iodine (pCi/m^3)	I-131 41	0.10	<LLD	-	-	None	0
Gamma Background (TLDs) (mR/Qtr.)	Gamma Dose 16	3.0	11.3 (6/6) (9.1-14.3)	Q-01, Onsite #1 0.5 mi @ 0° Q-11, Port Byron 8.0 mi @ 170°	14.3 (1/1) - 14.3 (1/1)	11.9 (10/10) (10.8-14.3)	0
Milk (pCi/l)	I-131 6	5.0	<LLD	-	-	None	0
Cooling Water (pCi/l)	Gross Beta 34	5.0	112.1 (21/21) (3.0-1800.0)	Q-22B, Spray Canal Blowdown at Station	217 (13/13) (3.5-1800)	6.6 (12/13) (3.0-15.1)	0
	Tritium 1	240	410 (1/1) -	A-22A, Blowdown Diffuser Pipe	410 (1/1) -	None	0
	Gamma Spec. 3						
	Cs-134	10	240 (3/3) (83-440)	Q-22B, Spray Canal Blowdown at Station	240 (3/3) (83-440)	None	0
	Cs-137	10	707 (3/3) (296-1500)	Q-22B, Spray Canal at station	706.7 (3/3) (296-1500)	None	0
	Mn-54	10	60 (1/3)	Q-22B, Spray Canal at station	60 (1/3) -	None	0
	Co-60	10	245 (2/3) (169-320)	Q-22B, Spray Canal at station	245 (2/3) (169-320)	None	0
Public Water (pCi/l)	Gamma Spec. 6	10.0	<LLD	-	-	None	0

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

Table 5.0-3

Environmental Radiological Monitoring Program Quarterly Summary

Name of facility Quad Cities Nuclear Power Station Docket No. 50-254, 50-265

Location of facility Rock Island, Illinois Reporting Period 2nd Quarter 1981

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean[a] Range	Location with Highest Annual Mean		Control Locations Mean[a] Range	Number of non-routine Results
				Location	Mean Range		
Air Particulates (pCi/m^3)	Gross Beta 78	1.0	0.24 (76/78) (0.02-0.49)	Q-01, Onsite #1 0.5 mi @ 0°	0.35 (11/13) (0.15-0.49)	None	0
Airborne Iodine (pCi/m^3)	I-131 36	0.10	<LLD	-	-	None	0
Gamma Background (TLDs) (mR/Qtr.)	Gamma Dose 16	3.0	12.9 (6/6) (11.4-13.9)	Q-11, Port Byron 8.0 mi @ 170°	15.0 (1/1) -	13.1 (10/10) (11.4-15.0)	0
Milk (pCi/l)	I-131 6	5/0.5*	<LLD	-	-	None	0
Cooling Water (pCi/l)	Gross Beta 39	2.0	14.8 (26/26) (3.8-76.4)	Q-22B, Spray Canal Blowdown at Station	23.9 (13/13) (4.8-76.4)	5.6 (13/13) (3.5-12.4)	0
	Tritium 1	240	260 (1/1) -	Q-22A, Blowdown Diffuser Pipe	260 (1/1) -	None	0
Public Water (pCi/l)	Gamma Spec. 6	10.0	<LLD	-	-	None	0
Fish (pCi/g wet)	Gamma Spec. 17						
	Cs-137	0.1	<LLD	-	-	None	0
	Other Gammas	0.2	<LLD	-	-	None	0

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

* November - April LLD = 5.0; May - October LLD = 0.5.

Table 5.0-4

Environmental Radiological Monitoring Program Quarterly Summary

Name of facility Quad Cities Nuclear Power Station Docket No. 50-254, 50-265

Location of facility Rock Island, Illinois (County, State) Reporting Period 3rd Quarter 1981

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean[a] Range	Location with Highest Annual Mean		Control Locations Mean[a] Range	Number of non-routine Results
				Location	Mean Range		
Air Particulates (pCi/m^3)	Gross Beta 73	1.0	0.06 (71/73) (0.02-0.16)	Q-01, Onsite #1 0.5 mi @ 0°	0.07 (9/9) (0.02-0.16)	None	0
Airborne Iodine (pCi/m^3)	I-131 40	0.10	<LLD	-	-	None	0
Gamma Background (TLDs) (mR/Qtr.)	Gamma Dose 16	3.0	12.4 (6/6) (11.5-13.6)	Q-11, Port Byron 8.0 mi @ 170°	13.8 (1/1) -	12.2 (10/10) (9.9-13.8)	0
Milk (pCi/l)	I-131 26	0.5	<LLD	-	-	None	0
Cooling Water (pCi/l)	Gross Beta 39	2.0	5.3 (26/26) (3.0-8.7)	Q-22B, Spray Canal Blowdown at Station	5.8 (13/13) (4.3-8.3)	4.5 (13/13) (3.6-5.1)	0
	Tritium 1	240	330 (1/1) -	Q-22A, Blowdown Diffuser Pipe	330 (1/1) -	None	0
Public Water (pCi/l)	Gamma Spec. 6	10.0	<LLD	-	-	None	0
Bottom Sediments (pCi/g dry)	Gamma Spec. 1						
	Cs-137	0.1	0.60 (1/1)	Q-23, Lock & Dam #14 Mississippi River 15.0 mi @ 220°	0.60 (1/1)	None	0
	Other Gammas	0.2	<LLD	-	-	None	0

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

Table 5.0-5

Environmental Radiological Monitoring Program Quarterly Summary

Name of facility Quad Cities Nuclear Power Station Docket No. 50-254, 50-265

Location of facility Rock Island, Illinois (County, State) Reporting Period 4th Quarter 1981

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean[a] Range	Location with Highest Annual Mean		Control Locations Mean[a] Range	Number of non-routine Results
				Location	Mean Range		
Air Particulates (pCi/m^3)	Gross Beta 84	1.0	0.04 (84/84) (0.01-0.06)	Q-02, Onsite #2 0.5 mi @ 70° Q-03, Onsite #3 0.6 mi @ 170°	0.04 (14/14) (0.03-0.06) 0.04 (14/14) (0.02-0.05)	None	0
Airborne Iodine (pCi/m^3)	I-131 42	0.10	<LLD	-	-	None	0
Gamma Background (TLDs) (mR/Qtr.)	Gamma Dose 16	3.0	11.8 (6/6) (11.0-13.7)	Q-11, Port Byron 8.0 mi @ 170°	14.9 (1/1) -	12.8 (10/10) (11.3-14.9)	0
Milk (pCi/l)	I-131 12	5/0.5*	<LLD	-	-	None	0
Cooling Water (pCi/l)	Gross Beta 42	2.0	4.7 (28/28) (2.8-10.8)	Q-22B, Spray Canal Blowdown at Station	4.8 (14/14) (3.3-8.0)	3.6 (14/14) (2.7-6.0)	0
	Tritium 1	240	690 (1/1) -	Q-22A, Blowdown Diffuser Pipe	690 (1/1) -	None	0
Public Water (pCi/l)	Gamma Spec. 6	10.0	<LLD	-	-	None	0
Fish (pCi/g wet)	Gamma Spec. 9						
	Cs-137	0.1	<LLD	-	-	None	0
	Other Gammas	0.2	<LLD	-	-	None	0

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

* November - April LLD = 5.0; May - October LLD = 0.5.

QUAD CITIES NUCLEAR POWER STATION

Table 5.1-1

Gamma Radiation as Measured by Thermoluminescent Dosimeters (TLD)

Standard Radiological Monitoring Program.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date Placed:		03/28/81	06/27/81	10/03/81
Date Removed:	03/28/81	06/27/81	10/03/81	01/01/82 01/02/82*
Location	Average mR/Quarter			
On-Site Indicator Locations				
Q-01 On-site No. 1	14.3±2.6	11.4±0.5	13.4±1.0	11.8±0.7*
Q-02 On-site No. 2	10.8±2.6	13.7±0.4	11.5±1.1	11.8±0.6*
Q-03 On-site No. 3	9.1±3.9	12.7±0.5	11.5±1.2	11.2±0.6*
Mean ± s.d.	11.4±2.6	12.6±1.2	12.1±1.1	11.6±0.4
Off-Site Indicator Locations				
Q-04 Nitrin	10.8±2.6	12.0±1.0	12.7±1.6	11.0±0.7*
Q-05 Saddle Club Dairy	10.8±2.6	13.9±0.6	11.7±1.1	11.0±0.9*
Q-06 Hanson's Boat Landing	11.7±2.6	13.4±1.0	13.6±1.2	13.7±1.0
Mean ± s.d.	11.1±0.5	13.1±1.0	12.7±1.0	11.9±1.6
Background Locations				
Q-07 Clinton	13.0±2.6	14.0±0.7	13.4±1.0	13.3±1.0
Q-08 Sikkema Farm	13.0±3.9	14.3±0.6	12.5±1.2	13.1±0.7*
Q-09 Erie	10.8±1.3	13.6±0.8	11.6±1.5	12.1±0.8*
Q-10 Hillsdale	10.8±2.67	13.4±1.0	12.9±1.3	12.5±0.7*
Q-11 Port Byron	14.3±3.9	15.0±0.4	13.8±1.1	14.0±0.8*
Q-12 Bettendorf	11.7±1.3	13.0±0.5	12.8±1.2	13.5±1.0
Q-13 Princeton	11.7±2.6	12.6±0.6	12.5±1.1	13.7±1.2
Q-14 Utica Ridge Road	10.8±1.3	11.6±0.5	11.4±1.2	12.0±1.0
Q-15 DeWitt	10.8±2.6	11.4±0.4	9.9±1.1	11.3±1.0
Q-16 Low Moor	11.7±2.6	11.7±0.7	10.8±1.3	11.3±0.9
Mean ± s.d.	11.9±1.2	13.1±1.2	12.7±1.0	12.8±1.1

Table 5.1-1. (continued)

Gamma Radiation as Measured by Thermoluminescent Dosimeters (TLD).

Special Program.

Inner Ring, Near Site Boundary, Indicator Locations.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date Placed:		03/28/81	06/27/81	10/03/81
Date Removed:	03/28/81	06/27/81	10/03/81	01/01/82 01/02/82*
Location	Average mR/Quarter			
Q-101-1	10.8±1.3	12.0±0.8	11.4±1.2	11.0±0.6*
Q-101-2	11.7±2.6	10.7±0.8	9.8±1.0	11.0±1.1*
Q-102-1	10.8±2.6	12.4±1.0	12.0±1.2	12.3±0.8*
Q-102-2	11.7±2.6	11.1±0.5	10.8±1.1	12.2±0.6*
Q-103-1	10.8±1.3	11.4±0.8	10.6±1.2	11.3±0.9*
Q-103-2	10.8±1.3	10.1±1.6	10.5±1.0	11.0±0.9*
Q-104-1	9.1±2.6	10.8±0.4	10.1±1.5	10.5±0.5*
Q-104-2	9.1±1.3	12.2±1.1	11.3±1.0	11.1±0.8*
Q-105-1	10.4±1.3	11.2±0.9	11.4±1.1	10.9±0.6*
Q-105-2	11.7±1.3	11.0±0.6	10.8±1.1	11.8±0.6*
Q-106-1	10.4±1.3	11.5±1.1	10.8±1.3	11.5±0.6*
Q-106-2	10.4±1.3	11.2±0.5	11.2±1.1	11.9±0.7*
Q-107-1	10.4±1.3	12.4±0.5	11.7±1.2	13.3±1.6*
Q-107-2	10.4±1.3	10.8±0.6	11.3±1.2	13.0±0.6*
Q-108-1	7.6±1.3	12.1±0.7	11.1±1.2	10.4±0.6*
Q-108-2	13.0±2.5	11.7±0.4	10.5±1.0	10.5±0.6*
Q-109-1	11.7±1.3	11.3±0.7	10.6±1.4	10.2±0.9*
Q-109-2	11.7±2.6	11.6±0.8	10.3±1.2	10.3±0.5*
Q-111-1	14.3±2.6	12.6±0.7	11.3±1.1	13.6±0.9
Q-111-2	11.7±1.3	11.8±0.4	10.1±1.1	12.3±0.9
Q-112-1	11.7±2.6	12.6±0.6	11.1±1.1	12.7±1.0
Q-112-2	13.0±2.6	13.3±0.4	12.5±1.0	13.7±1.3
Q-113-1	13.0±2.6	13.0±0.8	11.3±1.1	11.8±1.3
Q-113-2	11.7±1.3	11.7±0.5	ND (Missing)	11.2±1.8
Q-114-1	11.7±2.6	12.2±0.7	10.3±1.3	9.9±0.9
Q-114-2	9.1±1.3	11.1±0.7	9.9±1.1	10.3±0.9
Q-115-1	10.4±1.3	12.2±0.6	10.8±1.2	13.1±1.0
Q-115-2	11.7±2.6	12.6±0.6	11.6±1.0	13.2±1.0
Q-116-1	13.0±2.6	12.2±0.6	11.2±1.1	12.9±1.0
Q-116-2	13.9±1.3	10.8±0.9	10.4±1.3	11.6±1.0
Mean ± s.d.	11.2±1.4	11.7±0.8	10.9±0.6	11.7±1.1

Table 5.1-1. (continued)

Gamma Radiation as measured by Thermoluminescent Dosimeters (TLD).

Special Program.

Outer Ring, Near 5 Miles Radius, Indicator Locations.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date Placed:		03/28/81	06/27/81	10/03/81
Date Removed:	03/28/81	06/27/81	10/03/81	01/01/82 01/02/82*
Location	Average mR/Quarter			
Q-201-1	13.0±2.6	12.8±0.4	11.8±1.0	14.2±1.0
Q-201-2	13.0±2.6	12.5±0.4	12.5±1.0	14.4±1.2
Q-202-1	11.7±2.6	11.3±0.9	10.0±1.0	11.2±1.0
Q-202-2	10.4±1.3	10.7±0.6	10.7±1.1	10.8±1.0
Q-203-1	11.7±2.6	12.6±0.6	11.4±1.3	12.3±1.0
Q-203-2	13.0±1.3	12.5±0.7	13.7±1.1	12.9±0.6*
Q-204-1	13.0±1.3	13.6±1.0	12.4±1.1	14.4±1.1*
Q-204-2	13/0±1.3	13.6±0.5	13.2±1.2	13.8±0.6*
Q-205-1	11.7±2.6	13.7±0.5	13.3±1.1	13.6±0.7*
Q-205-2	11.7±2.6	12.5±0.6	12.0±1.1	12.2±0.8*
Q-206-1	14.3±2.6	13.1±0.5	11.4±1.2	12.4±0.7*
Q-206-2	14.3±1.3	11.8±0.6	12.5±1.3	12.4±0.9*
Q-207-1	13.0±2.6	12.9±0.6	12.0±1.0	12.6±0.7*
Q-207-2	11.7±1.3	11.3±0.5	11.1±1.2	11.2±0.8*
Q-208-1	11.7±1.3	11.8±0.5	11.4±1.0	11.2±0.6*
Q-208-2	11.7±2.6	13.0±0.7	12.6±1.2	13.4±1.0*
Q-209-1	13.0±2.6	13.2±0.7	11.5±1.3	12.4±0.6*
Q-209-2	13.0±2.6	11.2±0.5	11.4±1.3	10.6±0.8*
Q-210-1	13.0±1.3	11.8±0.5	11.6±1.0	11.5±1.0
Q-210-2	14.3±2.6	13.7±0.7	13.5±1.1	13.9±1.0
Q-211	14.3±2.6	15.0±0.4	13.4±1.1	15.0±1.1
Q-212-1	13.0±2.6	14.7±0.7	13.6±1.0	13.6±0.8
Q-212-2	11.7±1.3	11.3±0.5	10.4±1.0	10.7±1.1
Q-213-1	11.7±2.6	12.4±0.4	11.4±1.3	13.9±1.6
Q-213-2	10.4±1.3	11.0±0.7	10.3±1.3	11.5±1.0
Q-214-1	19.5±3.9	13.3±0.5	11.7±1.0	13.2±1.2
Q-214-2	18.2±3.9	13.3±0.9	13.3±1.5	13.4±0.9
Q-215-1	18.2±3.9	14.3±0.5	12.0±1.0	13.3±0.9
Q-215-2	16.9±1.3	15.7±0.9	13.0±1.7	13.5±0.9
Q-216-1	24.7±6.5	14.6±0.5	11.9±1.3	13.1±0.9
Q-216-2	22.1±3.9	13.3±0.9	12.8±1.2	14.4±1.0
Mean ± s.d.	14.0±3.4	12.8±1.2	12.1±1.0	12.8±1.2

APPENDIX II

METEOROGICAL DATA

APPENDIX II

METEOROGICAL DATA

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1981
STABILITY CLASS - EXTREMELY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	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	0	0	0	0	0	0	0
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	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1981
STABILITY CLASS - MODERATELY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	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	0	0	0	0	1	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	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	2	0	0	0	2
WSW	0	0	1	0	0	0	1
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	3	3
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	3	0	1	3	7

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1981
STABILITY CLASS - SLIGHTLY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

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

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1981
STABILITY CLASS - NEUTRAL (DELTA T 296-33 FT)
WINDS MEASURED AT 295 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	8	24	29	7	1	69
NNE	0	1	12	21	5	0	39
NE	0	12	13	14	10	0	49
ENE	0	9	14	6	8	0	37
E	0	6	4	17	16	0	43
ESE	0	7	6	21	12	0	46
SE	0	3	2	13	10	0	28
SSE	0	3	1	3	15	2	24
S	1	3	4	12	11	7	38
SSW	1	3	9	31	15	4	63
SW	1	6	24	25	9	6	71
WSW	0	10	15	20	6	0	51
W	1	17	24	35	30	8	115
WNW	1	21	32	57	80	34	225
NW	0	5	26	120	84	19	254
NNW	0	5	31	66	9	2	113
VARIABLE	0	0	0	0	0	0	0
TOTAL	5	119	241	490	327	83	1265

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1981
STABILITY CLASS - SLIGHTLY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	2	5	7	0	0	14
NNE	1	3	7	7	0	0	18
NE	0	1	8	14	1	0	24
ENE	0	3	3	13	4	0	23
E	0	4	6	8	4	0	22
ESE	1	1	1	3	5	3	14
SE	0	0	4	8	7	0	19
SSE	0	1	3	11	7	4	26
S	0	0	1	22	18	5	46
SSW	1	2	8	41	14	3	69
SW	1	0	20	22	20	2	65
WSW	1	1	8	25	8	4	47
W	0	1	5	36	22	4	68
WNW	0	2	12	38	24	5	81
NW	0	2	13	34	8	0	57
NNW	0	6	21	33	3	0	63
VARIABLE	0	0	0	0	0	0	0
TOTAL	5	29	125	322	145	30	656

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1981
STABILITY CLASS - MODERATELY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .R-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	4	2	0	0	0	6
NNE	0	1	1	0	0	0	2
NE	0	1	2	2	0	0	5
ENE	1	0	3	4	0	0	8
E	0	0	1	4	4	0	9
ESE	1	1	0	6	4	0	12
SE	0	0	0	3	1	0	4
SSE	0	1	2	9	1	0	13
S	0	0	1	9	1	0	11
SSW	0	1	3	8	0	0	12
SW	0	2	8	11	1	0	22
WSW	1	1	3	6	0	0	11
W	0	3	3	10	2	0	18
WNW	1	2	3	5	0	0	11
NW	0	2	3	2	0	0	7
NNW	0	10	10	5	1	0	26
VARIABLE	0	0	0	0	0	0	0
TOTAL	4	29	45	84	15	0	177

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY - MARCH 1981
STABILITY CLASS - EXTREMELY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .R-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	1	1	0	0	0	2
NNE	0	1	0	0	0	0	1
NE	1	1	0	0	0	0	2
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	0	0	1	0	0	1
S	0	0	0	2	0	0	2
SSW	0	0	2	4	0	0	6
SW	0	3	3	1	0	0	7
WSW	0	1	1	0	0	0	2
W	0	0	1	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	2	0	0	0	0	2
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	1	9	8	8	0	0	26

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1981
STABILITY CLASS - EXTREMELY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	3	3
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	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	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	1	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	1	0	3	4

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

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1981
STABILITY CLASS - MODERATELY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	1	1
NNE	0	0	0	1	3	0	4
NE	0	0	0	0	0	0	0
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	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	3	3	0	0	6
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	1	0	1
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	3	4	4	1	12

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

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1981
STABILITY CLASS - SLIGHTLY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	1	0	1
NNE	0	0	0	2	3	0	5
NE	0	0	0	3	3	0	6
ENE	0	0	0	0	0	0	0
E	0	0	0	1	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	1	1	0	2
SSE	0	0	4	6	3	0	13
S	0	0	1	3	1	0	5
SSW	0	0	5	3	1	0	9
SW	0	0	1	6	0	0	7
WSW	0	0	1	1	0	0	2
W	0	0	0	1	0	0	1
WNW	0	0	0	2	4	0	6
NW	0	0	0	0	6	0	6
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	12	29	23	0	64

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

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1981
STABILITY CLASS - NEUTRAL (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	5	16	26	11	7	65
NNE	0	4	11	23	22	11	71
NE	1	12	17	24	18	2	74
ENE	0	6	23	30	7	10	76
E	0	4	18	25	13	1	61
ESE	1	2	7	17	6	0	33
SE	2	12	23	30	0	0	67
SSE	2	8	19	35	9	1	74
S	0	18	25	28	30	14	115
SSW	3	19	25	36	23	10	116
SW	2	8	10	11	2	3	36
WSW	6	6	11	24	4	10	61
W	0	17	11	22	18	31	99
WNW	0	6	21	30	28	7	92
NW	0	11	26	34	28	4	103
NNW	2	9	23	22	12	1	69
VARIABLE	0	0	0	0	0	0	0
TOTAL	19	147	286	417	231	112	1212

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

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1981
STABILITY CLASS - SLIGHTLY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	3	4	9	7	0	0	23
NNE	1	4	9	12	4	0	30
NE	0	4	15	10	2	0	31
ENE	1	3	12	15	1	0	32
E	1	3	10	20	3	1	38
ESE	0	4	8	28	6	0	46
SE	0	7	20	29	10	0	66
SSE	0	5	12	34	26	3	80
S	0	5	15	30	51	19	120
SSW	1	4	17	29	23	8	82
SW	0	7	8	17	1	1	34
WSW	0	4	11	5	1	0	21
W	1	1	6	4	7	0	19
WNW	1	7	11	11	5	0	35
NW	1	7	22	21	0	0	51
NNW	0	0	12	3	0	0	15
VARIABLE	0	0	0	0	0	0	0
TOTAL	10	69	197	275	140	32	723

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 - 4

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1981
STABILITY CLASS - MODERATELY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	1	1	1	0	0	4
NNE	0	0	3	1	0	0	4
NE	0	0	1	2	0	0	3
ENE	0	0	1	0	0	0	1
E	1	1	5	2	0	0	9
ESE	0	1	5	7	0	0	13
SE	0	0	1	5	0	0	6
SSE	1	0	1	7	1	0	10
S	0	1	3	3	2	0	9
SSW	1	5	4	5	0	0	15
SW	0	1	2	2	0	0	5
WSW	1	1	0	3	0	0	5
W	1	2	1	4	1	0	9
WNW	4	2	1	4	6	0	17
NW	1	5	2	3	0	0	11
NNW	1	3	1	0	0	0	5
VARIABLE	0	0	0	0	0	0	0
TOTAL	12	23	32	49	10	0	126

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

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL - JUNE 1981
STABILITY CLASS - EXTREMELY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .R-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	1	0	0	0	0	1
NNE	1	0	0	0	0	0	1
NE	2	0	0	0	0	0	2
ENE	0	0	0	0	0	0	0
E	1	0	0	0	0	0	1
ESE	0	2	0	0	0	0	2
SE	0	1	2	0	0	0	3
SSE	0	0	0	2	3	0	5
S	1	0	0	1	1	0	3
SSW	0	1	3	1	0	0	5
SW	0	2	0	0	0	0	2
WSW	1	2	0	0	0	0	3
W	1	1	0	0	0	0	2
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	8	10	5	4	4	0	31

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

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1981
STABILITY CLASS - EXTREMELY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	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	0	0	0	0	0	0	0
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	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	2	0	0	2
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	2	0	0	2

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1981
STABILITY CLASS - MODERATELY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	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	0	0	0	0	0	0	0
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	0	1	4	0	0	5
S	0	0	1	2	0	0	3
SSW	0	0	1	0	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	3	6	0	0	9

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1981
STABILITY CLASS - SLIGHTLY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .9-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	1	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	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	0	7	5	0	0	12
S	0	1	5	3	0	0	9
SSW	0	0	4	1	0	0	5
SW	0	0	6	1	0	0	7
WSW	0	0	2	3	0	0	5
W	0	0	0	1	0	0	1
WNW	0	0	0	1	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	1	24	15	1	0	41

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1981
STABILITY CLASS - NEUTRAL (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .R-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	12	22	37	2	0	74
NNE	1	13	27	19	2	0	61
NE	2	13	45	24	5	0	89
ENE	0	15	42	29	2	0	88
E	3	20	31	13	0	0	67
ESE	2	19	27	15	1	0	64
SE	1	17	15	3	2	0	38
SSE	0	23	21	20	1	0	65
S	0	17	21	16	1	0	55
SSW	1	24	18	16	0	0	59
SW	2	22	29	11	4	0	68
WSW	4	27	28	12	0	0	71
W	1	5	16	17	9	0	48
WNW	0	10	16	21	5	7	59
NW	0	9	24	5	1	4	43
NNW	1	8	28	25	0	0	62
VARIABLE	0	0	0	0	0	0	0
TOTAL	19	254	410	282	35	11	1011

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 5

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1981
STABILITY CLASS - SLIGHTLY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	9	22	12	1	0	45
NNE	1	7	12	9	0	0	29
NE	2	12	26	14	2	0	56
ENE	0	12	22	16	0	0	50
E	3	11	25	23	1	0	63
ESE	4	14	14	16	5	0	53
SE	2	13	11	10	4	0	40
SSE	2	14	14	23	2	0	55
S	1	11	24	27	2	0	65
SSW	3	9	25	19	2	1	59
SW	1	6	21	18	3	1	50
WSW	1	4	15	30	2	0	52
W	0	4	7	18	20	0	49
WNW	1	1	7	24	3	1	37
NW	0	3	10	21	2	0	36
NNW	0	3	12	15	1	0	31
VARIABLE	0	0	0	0	0	0	0
TOTAL	22	133	267	295	50	3	770

HOURS OF CALM IN THIS STABILITY CLASS - 0
HOURS OF MISSING WIND MEASUREMENTS IN THIS STABILITY CLASS - 22

HOURS OF MISSING STABILITY MEASUREMENTS IN ALL STABILITY CLASSES - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1981
STABILITY CLASS - MODERATELY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .R-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	3	1	1	0	0	6
NNE	0	5	2	0	0	0	7
NE	4	3	2	0	0	0	9
ENE	1	3	4	2	0	0	10
E	0	4	4	3	0	0	11
ESE	2	5	8	18	1	0	34
SE	3	3	16	15	2	0	39
SSE	2	3	20	23	5	0	53
S	1	0	12	20	3	0	36
SSW	0	2	8	14	0	0	24
SW	0	5	3	0	0	0	8
WSW	1	2	4	0	0	0	7
W	0	2	2	2	1	0	7
WNW	1	2	5	9	2	0	19
NW	1	0	7	4	0	0	12
NNW	1	1	3	3	0	0	8
VARIABLE	0	0	0	0	0	0	0
TOTAL	19	43	101	114	14	0	290

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - JULY - SEPTEMBER 1981
STABILITY CLASS - EXTREMELY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .R-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	1	2	0	0	0	0	3
NE	0	0	0	0	0	0	0
ENE	1	0	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	2	1	0	0	0	3
SE	0	2	0	0	0	0	2
SSE	0	5	2	7	3	0	17
S	1	1	3	4	0	0	9
SSW	0	0	1	2	0	0	3
SW	0	2	2	3	0	0	7
WSW	2	1	2	0	0	0	5
W	1	2	1	0	0	0	4
WNW	1	1	0	0	0	0	2
NW	0	0	1	0	0	0	1
NNW	0	0	0	1	0	0	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	7	18	13	17	3	0	58

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 - 0

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1981
STABILITY CLASS - EXTREMELY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) 0-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	3	4	6	3	0	16
NNE	0	5	6	5	3	0	19
NE	1	0	0	1	7	0	9
ENE	1	1	0	1	0	0	3
E	0	5	4	5	7	5	26
ESE	1	6	2	3	2	0	14
SE	2	17	6	10	14	4	53
SSE	3	6	8	1	7	3	28
S	2	2	4	13	8	3	32
SSW	1	10	16	18	8	0	53
SW	1	3	18	9	3	0	34
WSW	0	1	12	10	5	0	28
W	0	10	21	39	21	10	101
WNW	0	11	39	84	43	6	182
NW	2	12	37	42	11	0	104
NNW	0	11	16	22	4	0	53
VARIABLE	0	0	0	0	0	0	0
TOTAL	14	103	192	269	146	31	755

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 - 10

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1981
STABILITY CLASS - MODERATELY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	2	1	0	0	3
NNE	0	0	2	0	0	0	2
NE	0	0	0	2	1	0	3
ENE	0	1	1	1	0	0	3
E	0	1	2	0	3	0	6
ESE	0	3	0	5	8	0	16
SE	2	2	9	1	1	1	16
SSE	1	3	4	2	3	1	14
S	1	0	5	3	9	0	18
SSW	0	5	7	5	2	0	19
SW	0	1	3	2	1	0	7
WSW	0	1	0	2	0	0	3
W	0	2	2	2	1	0	7
WNW	0	2	6	5	3	0	16
NW	0	2	4	3	1	0	10
NNW	0	2	5	2	0	0	9
VARIABLE	0	0	0	0	0	0	0
TOTAL	4	25	52	36	33	2	152

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 - 10

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1981
STABILITY CLASS - SLIGHTLY UNSTABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) 0-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	3	2	0	0	0	5
NNE	0	5	5	0	0	0	10
NE	1	2	4	2	0	0	9
ENE	0	1	0	0	0	0	1
E	0	3	0	0	2	0	5
ESE	0	0	0	3	1	0	4
SE	1	2	2	0	1	0	6
SSE	0	1	4	2	3	1	11
S	0	4	4	4	4	0	16
SSW	0	3	7	1	2	0	13
SW	0	1	2	4	1	0	8
WSW	1	2	0	1	0	0	4
W	0	0	2	1	1	0	4
WNW	1	0	0	6	0	4	11
NW	1	1	2	9	4	4	21
NNW	1	3	5	1	1	1	12
VARIABLE	0	0	0	0	0	0	0
TOTAL	6	31	39	34	20	10	140

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 - 10

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1981
STABILITY CLASS - NEUTRAL (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	6	20	10	3	0	40
NNE	0	6	7	5	0	0	18
NE	1	6	6	8	0	0	21
ENE	1	2	6	4	0	0	13
E	0	1	22	1	1	0	25
ESE	1	3	27	29	1	0	61
SE	0	3	16	19	1	0	39
SSE	0	3	15	27	3	0	48
S	2	6	10	20	8	1	47
SSW	2	8	13	19	4	0	46
SW	3	2	6	15	6	1	33
WSW	3	5	7	9	1	0	25
W	3	3	5	8	2	0	21
WNW	1	5	13	9	6	9	43
NW	1	6	4	20	29	18	78
NNW	0	1	16	4	7	4	32
VARIABLE	0	0	0	0	0	0	0
TOTAL	19	66	193	207	72	33	590

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 - 10

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1981
STABILITY CLASS - SLIGHTLY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	2	2	3	0	0	8
NNE	1	7	3	3	0	0	14
NE	1	1	5	2	0	0	9
ENE	0	1	8	4	0	0	13
E	3	3	8	12	0	0	26
ESE	0	3	17	29	2	0	51
SE	3	4	8	27	6	0	48
SSE	0	3	6	31	6	1	47
S	2	2	7	7	6	0	24
SSW	1	0	16	12	3	0	32
SW	1	3	4	5	1	0	14
WSW	1	1	10	5	0	0	17
W	0	1	3	2	0	0	6
WNW	0	0	1	11	0	0	12
NW	0	0	5	8	1	0	14
NNW	1	1	4	5	0	0	11
VARIABLE	0	0	0	0	0	0	0
TOTAL	15	32	107	166	25	1	346

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 - 10

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1981
STABILITY CLASS - MODERATELY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	4	2	1	0	0	7
NNE	0	1	4	0	0	0	5
NE	0	0	3	1	0	0	4
ENE	0	1	6	0	0	0	7
E	0	1	5	2	0	0	8
ESE	0	3	1	9	0	0	13
SE	0	5	3	7	7	0	22
SSE	0	1	2	28	11	0	42
S	0	1	3	5	1	0	10
SSW	0	0	5	4	0	0	9
SW	0	4	0	0	0	0	4
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	1	2	1	0	0	4
NW	0	1	6	6	1	0	14
NNW	0	3	5	0	0	0	8
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	25	47	64	20	0	157

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 - 10

QUAD-CITIES NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER - DECEMBER 1981
STABILITY CLASS - EXTREMELY STABLE (DELTA T 296-33 FT)
WINDS MEASURED AT 296 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .8-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	0	0	0	0	0	1
NNE	0	1	0	0	0	0	1
NE	0	1	0	0	0	0	1
ENE	0	2	0	0	0	0	2
E	0	0	0	0	0	0	0
ESE	0	0	2	0	0	0	2
SE	0	1	1	9	1	0	12
SSE	0	0	3	8	1	0	12
S	0	1	6	4	0	0	11
SSW	0	0	0	0	0	0	0
SW	0	3	2	0	0	0	5
WSW	0	5	2	1	0	0	8
W	0	0	0	0	0	0	0
WNW	0	0	1	0	0	0	1
NW	1	0	1	0	0	0	2
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	2	14	18	22	2	0	58

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 - 10

APPENDIX III

ANALYTICAL PROCEDURES

SAMPLE PREPARATION

Different classes of samples require different preparations. In general, food products are prepared as for home use, while others are dried and ashed as received.

1.1 Fish

1. Wash the fish.

2. Fillet and place the flesh immediately (to prevent moisture loss) in a 450 cc plastic container. Add a few cc of formaldehyde. Seal and record wet weight.

   NOTE: If bones are to be analyzed, boil remaining fish in water for about 1 hour. Clean the bones. Air dry, weigh and record as wet weight. Dry at 125° C. Record dry weight. Ash at 800° C, cook, weigh, and record the ash weight. Grind to a homogeneous sample. The sample is ready for analysis.

3. Gamma scan fillet without delay or store in a freezer.

4. After gamma spectroscopic analysis is completed transfer the sample to a drying pan and dry at 125° C.

5. Cook, weigh, and record dry weight.

6. Ash by gradually increasing the temperature to 450° C. If considerable amounts of carbon remain after overnight ashing, the sample should be brushed and placed back in the muffle furnace until ashing is completed. Record ash weight. Grind to pass 30 mesh. The sample is now ready for analysis.

   NOTE: If in sufficient quantity, use surplus flesh for drying and ashing, instead of waiting for gamma scanning to be completed.

1.2 Bottom Sediments and Soil

1. Air dry the entire sample. Grind or pulverize the sample and sieve through a #20 mesh screen.

2. For gamma-spectroscopic analysis seal 450 cc of the ground sample in a Marinnelli beaker. Record dry weight.

3. Seal the remaining sample (up to 1 kg0 in a plastic container and save for other analyses or for possible future rechecking.

1.3 Drinking (clear) water (EPA Method 900.0)

A representative sample must be collected from a free-flowing source of drinking water, and should be large enough so that adequate aliquots can be taken to obtain the required sensitivity.

It is recommended that samples be preserved at the time of collection by adding enough 1N HNO_3 to the sample to bring it to pH 2 (15 ml 1N HNO_3 per liter of sample is usually sufficient) If samples are to be collected without preservation, they should be brought to the laboratory within 5 days, then preserved and held in the original container for a minimum of 16 hours before analysis or transfer of the sample.

The container choice should be plastic over glass to prevent loss due to breakage during transportation and handling.

If the sample was not acidified at the time of collection, use the following procedure:

Procedure

1. Remove 100 ml of sample for tritium analysis, if required.

   NOTE: Water should not be acidified for tritium analysis. If samples are acidified in the field, an additional aliquot should be collected.

2. Add 15 ml of 1N HNO_3 per liter of sample in the original container.

3. Hold the sample in the original container for a minimum of 16 hours before analysis or transfer of the sample.

4. When taking an aliquot for analysis, take acid addition into account. For example:

Sample volume to be analyzed	Volume of aliquot required
200 ml	203 ml
400 ml	406 ml
600 ml	609 ml
800 ml	812 ml
1000 ml	1015 ml
2000 ml	2030 ml
3000 ml	3045 ml
3500 ml	3552 ml

For other volumes, adjust adliquots correspondingly, at the rate of 1.5 ml per 100 ml of sample.

PROCEDURES

2.1 Airborne Particulates

2.1.1. Gross Alpha and/or Gross Beta Activity

Procedure

1. Store the sample for 5 days from the day of collection to allow for decay of short-lived radon and thoron daughters.

2. Place a 47 mm filter on a stainless steel planchet and count the samples on a proportional counter.

3. Calculate the activity in pCi/m^3 using computer program RADIO.

Calculations

Gross alpha (beta) activity:

$$(pCi/m^3) = \frac{A}{B \times C \times 2.22} \pm \frac{2\sqrt{E_{sb}^2 \pm E_b^2}}{B \times C \times 2.22}$$

Where:

A = net alpha (beta) count rate (cpm)
B = efficiency for counting alpha (beta) activity (cpm/dpm)
C = volume of sample (m^3)
E_{sb} = counting error of sample plus background
E_b = counting error of background

2.2 Water

2.2.1 Gross Alpha and/or Gross Beta Activity in Suspended Solids

Principle of Method

The sample is filtered through a tared membrane filter. The filter containing the solids is transferred to a metal planchet, dried and is fixed to the planchet. The gross alpha and/or gross beta activities are measured in low background internal proportional counter.

Reagents

Acetone

Apparatus

Filters; Millipore, membrane Type AA 0.8 μ
Filtration equipment
Planchets (Standard 2" X 1/8" Beckman planchet)
Proportional counter

Procedure

1. Filter one liter of sample through a TARED membrane filter. Wash the non-filterable solids on the filter with distilled water.

2. Place the filter in a planchet and air dry.

3. Dry in an oven for 30 minutes. Dessicate to constant weight and weigh.

4. Fix the filter to the planchet at four peripheral points using acetone (1 drop). Air dry.

5. Count for gross alpha and gross beta activity using a proportional counter.

6. Calculate the activity in pCi/l using computer program OWATAB.

2.2.1 Calculations

Gross alpha (beta) activity:

$$(\text{pCi/liter}) = \frac{A}{B \times C \times D \times 2.22} \pm \frac{2\sqrt{E_{sb}^2 \pm E_b^2}}{B \times C \times D \times 2.22}$$

Where:

A = net alpha (beta) count (cpm)
B = efficiency for counting alpha (beta) activity (cpm/dpm)
C = volume of sample (liters)
D = correction factor for self-absorption in the sample
E_{sb} = counting error of sample plus background
E_b = counting error of background

Reference: Radioassay Procedures for Environmental Samples, U.S. Department of Health, Education and Welfare. Environmental Health Series, January 1967.

2.2.2 Gross Alpha and/or Gross Beta Activity in Dissolved Solids (see note)

Principle of Method

Water samples containing suspended matter are filtered through a membrane filter and the filtrate is analyzed. The filtered water sample is evaporated and the residue is transferred to a tared planchet for counting gross alpha and/or gross beta activity.

Reagents

Lucite: 0.5 mg/ml in acetone
Nitric acid, HNO_3: 3N
Nitric acid, HNO_3: concentrated

Apparatus

Filters; Millipore, membrane Type AA, 0.8 μ
Filtration equipment
Planchets=(Standard 2" x 1/8" Beckman planchet)
Proportional counter

Procedure

1. Filter a volume of sample containing not more than 100 mg of dissolved solids for alpha assay, or not more than 200 mg of dissolved solids for beta assay.

   Note: For gross alpha and gross beta assay in the same sample limit amount of solids to 100 mg.

2. Wash the non-filterable solids on the filter. (Save the filters with suspended matter for separate analyses. See Section 2.2.1).

3. Evaporate the filtrate to NEAR dryness on a hot plate. Add 25 ml concentrated HNO_3 and evaporate to NEAR dryness.

Note: For analysis of total residue (for clear water) proceed as described above but do not fiter the water. Measure out the appropriate amount and proceed with step 3.

4. With distilled water and a few drops of 3N HNO_3, transfer the residue to a 50 ml beaker. Evaporate to NEAR dryness.

5. Transfer quantitatively the residue to a TARED PLANCHET, using an eye dropper.

6. Wash the beaker with distilled water and combine the washing and the residue in the planchet. Evaporate to dryness.

7. Bake in muffle furnace at 600° C for 45 min., cool and weigh.

8. Add a few drops (6-7 drops) of lucite solution and dry under the infrared lamp for 10-20 minutes.

9. Store the sample in a desiccator until it is to be counted.

10. Count the gross alpha and/or the gross beta activity in a low background proportional counter.

11. Calculate the activity in pCi/l using computer program OWATAB.

Calculations:

Gross alpha (beta) activity:

$$(\text{pCi/liter}) = \frac{A}{B \times C \times D \times 2.22} \pm \frac{2\sqrt{E_{sb}^2 \pm E_b^2}}{B \times C \times D \times 2.22}$$

Where:

A = net alpha (beta) count (cpm)
B = efficiency for counting alpha (beta) activity (cpm/dpm)
C = volume of sample (liters)
D = correction factor for self-absorption in the sample
E_{sb} = counting error of sample plus background
E_b = counting error of background

Reference: Radioassay Procedures for Environmental Samples, U.S. Department of Health, Education and Welfare. Environmental Health Series, January 1967.

3.1 Airborne Particulates - Gamma Spectroscopic analyses by Ge(Li) Detector

1. Put the air filter in a filter cup container.
2. Place the filter cup on a Ge(Li) detector.
3. Determine the gamma spectrum using 4096 or 8192 channel of gamma spectrometer with a setting of 0.5 KeV or 0.25 KeV per channel.
4. Identify gamma emitters (if present) by their respective energy peaks.

Calculations

1. Calculate the gamma activities using the computer program GAMMA 1 or GAMMA 2.

3.2 Airborne Iodine

3.2 Spectroscopic Analyses by Automatic Gamma Counter

Transfer charcoal to a plastic scintillation vial. Place the vial in the Automatic Gamma Counter (Packard Instrument Co. Model 5975) and count. Record the time.

Calculations

$$\text{I-131 activity } (pCi/m^3) = \frac{A}{B \times C \times 2.22}$$

Where:

A = net count rate of I-131 in the 0.36 MeV peak
B = efficiency for counting I-131 activity in 0.36 MeV peak (cpm/dpm)
C = volume of sample (m^3)

Correction for decay

$$A_o = \frac{A_1 \, e^{\lambda t_2}}{F \, (1 - e^{-\lambda t_1})} \approx \frac{A_1 \, e^{\lambda t_2}}{F \times t_1} \quad \text{when } t_1 << 1$$

Where:

A_o = activity of I-131 at the time of collection (pCi/m3)
A_1 = activity of I-131 at the time of counting
e^1 = 2.71828
= 0.693/half life (days) = 0.693/8.08 = 0.09576/day
t_1 = duration of collection (in days)
t_2 = elapsed time between collection and counting (in days)
F = M^3/day

3.2 Spectroscopic Analysis by Ge(Li) Detector

1. Transfer charcoal to a small plastic bag.

2. Label the plastic bag with the corresponding project, location and date of collection and seal it.

3. Place packed charcoal in a 450 ml. NC (black) container (all locations) and seal with a tape.

4. Place it on the Ge(Li) Detector and count. Record time.

Calculations

Calculation is done by the computer by running the Program GAMMA 2.

3.3 Water - Gamma Spectroscopic Analyses by Ge (Li) Detector

Procedure

1. Measure 3.5 liters of water into a Marinelli beaker.
2. Place the beaker inside the shield on a Ge(Li) detector.
3. Count long enough to meet LLD requirements.
4. After counting, identify gamma emitters (if present) by their respective energy peaks.
5. Store the spectrum on a disc using computer by executing "RUN STORE."
6. After storing, calculate gamma activities, using computer program GAMMA 1 or GAMMA 2.
7. Transfer the sample back to the original container for further analyses.

3.4 Soils and Bottom Sediments - Gamma Spectroscopic Analyses by Ge(Li) Detector

Procedure

1. Transfer the portion of the ground sample set aside for gamma scanning into a 450 ml Marinelli container.

2. Record the dry weight.

3. Place the container inside the shield on a Ge(Li) detector.

4. Count the gamma activity long enough to meet the minimum sensitivity requirements.

5. After counting, identify gamma emitters (if present) by their respective energy peaks.

6. Store the spectrum on a disc using the computer by executing "RUN STORE."

7. After storing, calculate gamma activities using computer Program GAMMA 1 or GAMMA 2.

8. Transfer the sample back to the original container for further analyses.

3.5 Fish and Wildlife - Gamma Spectroscopic Analyses by Ge(Li) Detector

Procedure

1. Transfer a portion of the clean wet flesh of fish or animal into 450 ml Marinelli container.
2. Record wet weight.
3. Add a few cc of formaldehyde and seal the container.
4. Place the container inside the shield on a Ge(Li) detector.
5. Count long enough to meet the minimum sensitivity requirements.
6. After counting, identify gamma emitters (if present) by their respective energy peaks.
7. Store the spectrum on a disc using computer by executing "RUN STORE."
8. After storing, calculate gamma activities using computer program GAMMA 1 or GAMMA 2.
9. Transfer the sample back to the original container for further analyses.

3.6 Ambient Gamma Radiation

A. Thermoluminescent Dosimeters (TLD) - Light Response (Efficiency)

Harshaw Lithium Fluoride TLD-100 chips, 1/8" x 1/8" x 0.035".

Procedure

1. Rinse the chips with warm trichloroethylene followed by the methanol rinse. Dry.
2. Place the chips in a platinum crucible.
3. Anneal for 1 hour at 400°C.
4. Cool quickly by placing the crucible on a metal plate.
5. Anneal for 2 hours at 100°C.

   Note: Avoid exposing the chips to the fluorescent light.
6. Seal 5 chips each in black plastic.
7. Mount the packs on the turntable.
8. Position the Ra-226 needle in the middle of the turntable and start rotation (appr. 60 revolutions per minute). Record the time.
9. Irradiate the chips for 2-6 hrs.
10. Remove the packages from the turntable. Return the Ra-226 needle to the lead container. Record the time.
11. Take the chips out of the plastic bag and place them in the vial.
12. Postanneal the chips for 10 minutes at 100°C.
13. Read each chip twice in the TLD Reader (For test procedure see "Performance Test Procedure for TLD Reader").
14. Subtract second reading from the first to obtain net reading in nanocoulombs.
15. Calculate mean $\pm$ one sigma deviation of five chips.
16. Calculate light response of TLD's (correction factor) by the following equation:

Section 3.6 (continued)

Calculations

$$C.F.\ (\text{nanocoulombs/mrem}) = \frac{A}{B}$$

Where:

C.F = correction factor to be applied in calculating exposure of field TLD's

A = Net reading in nanocoulombs

B = known exposure to TLD's

The exposure to the TLD's (B) is calculated as follows:

$$\text{mrem/hr} = \frac{8400 \times \text{mg Ra-226}}{r^2}$$

For our setup use the following parameters:

Ra-226 = 0.0922 $\pm$ 1.5%

r = 19.6 cm

Thus:

$$\text{mrem/hr} = \frac{8400 \times 0.0933}{384.16} = 2.040$$

The total exposure (B) is equal to:

B (mrem) = 2.040 x hours

3.7 Procedure for Preparation and Readout of TLD Chips

Materials

Harshaw Lithium Fluoride TLD-100 chips, 1/8" x 1/8" x 0.035".
Black plastic bags or boxes
Plastic sealer
Vacuum needle (for handling the chips)
TLD reader

Note: Never handle the chips with bare hands. Use plastic-covered forceps or vacuum needle. Handle them gently, e.g. do not drop them into the vial or on the table. They chip off easily, resulting in efficiency change.

Procedure

1. Rinse the chips with warm trichloroethylene followed by the methanol rinse. Dry.
2. Place the chips in a platinum crucible.
3. Anneal for 1 hour at 400°C.
4. Cool quickly by placing the crucible on a metal plate.
5. Anneal for 2 hours at 100°C.
6. Seal 3 to 5 chips (depending on the specifications) in black plastic or plastic boxes.
7. Label and send out by U.S. Mail.
8. Upon arrival at the lab, store TLDs in the big shield until readout day. Do not store longer than a few days.
9. Connect chips reader one day prior to readout.
10. Turn on gas for a few minutes before readout. Adjust to the mark.
11. Set parameter on the 2000P as follows:

    HV - 470 V (It is 970 V, internal volts = 5000).
    Readout time: 20"
    T_1 - 140° C (Preset)
    T_2 - 250° C (Preset)
    Rise time: -12°/sec (Present)
    Preheat - 100° C (Present)
    Start reading - 90° C

Section 3.7 (continued)

12. Prepare the chips as follows (do this before proceding to the next step).

    12.1 Turn on small muffler furnace or drying oven and adjust to 80°C. Use glass thermometer. Muffler's indicator is not accurate. Let furnace stabilize.

    12.2 Unpack the chips (under reduced incandescent light) and gently place them in the glass vials marked with appropriate location numbers.

    12.3 Place the vials in the furnace. Preanneal for 10 min. at 80°C.

13. Open the drawer and read the standard. It should read 8.34±0.04. Adjust HV, if needed. Take 3 readings after final adjustment. Record.

14. Close the drawer.

15. Check bkg. It should read about 0.7-0.8 in 20". If it is higher, adjust the knob in the back of 2000 P (on left side when facing the instrument).

    Note: Adjust bkg as low as possible but do not let the needle hit zero. The instrument will not record below zero.

16. Make 10 bkg readings (no chip in). Record. Read (do not record) at least 2 dummies to stabilize the temperature.

17. Place the chip in, wait until temperature goes down to 90° C and press "read" button. Make sure the chip is in the cavity of the heating plate.

18. After readout is completed, record the reading, open the drawer, and place next chip.

19. Repeat Steps 16 and 17 until all chips are read out.

    Note: If reading will last longer than 1.5-2.0 hrs., check the standard and bkg about every 2.0 hrs.

20. After readout is completed, turn off the gas.

21. For calculations, use computer program OGTLD.PUB.

3.8 Tritium in Water (Direct Method)

Principle of Method

The water sample is purified by distillation, and portion of the distillate is transferred to a counting vial containing a scintillation fluid. The contents of the vial are then mixed and counted in a liquid scintillation counter.

Reagents

Scintillation medium, insta-gel scintillator
Tritium standard solution

Apparatus

Condenser
Distillation flask, 250-ml capacity
Liquid scintillation counter
Liquid scintillation counting vials

Procedure

1. Distill a 30 ml aliquot of the sample in a 250-ml distillation flask. Add a boiling chip to the flask. Connect a side arm adapter and a condenser to the outlet of the flask. Place a glass vial at the outlet of the condenser. Heat the sample to 100 - 150° C to distill, just to dryness. Collect the distillate for tritium analysis.

2. Dispense 13 ml of the distillate to a low potassium glass vial.

3. Prepare background and standard tritium-water solutions for counting, using the same amount as the sample. Use low tritium background distilled water for these preparations (distillate of most deep well water sources is acceptable, but each source should be checked for tritium activity before using).

4. Dark-adapt all samples, backgrounds, and standards. Add 10 ml of insta-gel scintillator. Count the samples, backgrounds and standards. Count samples containing less than 200 pCi/ml for 300 minutes and samples containing more than 200 pCi/ml for 200 minutes.

Section 3.8 (continued)

5. Counting efficiency:

$$Eff = \frac{\text{cpm of Standard-cpm of background}}{\text{dpm Standard}}$$

$$pCi/ml = \frac{A}{2.22 \times E \times V}$$

Where:
A = net count rate (cpm)
E = efficiency (cpm/dpm)
V = volume

6. Calculate tritium activity using computer program OH3.

3.9 Iodine-131 Milk by Ion Exchange on Anion Exchange Column

After samples have been treated to convert all iodine in the sample to a common oxidation state, the iodine is isolated by solvent extraction or a combination of ion exchange and solvent extraction steps.

Iodine, as the iodine, is concentrated by adsorption on an anion exchanged column. Following a NaCl wash, the iodine is eluted with sodium hypochlorite. Iodine in the iodate form is reduced to I_2 and the elemental iodine extracted into CCl_4, back-extracted into water the finnally precipated as palladium iodide.

Chemical recovery of the added carrier is determined gravimetrically from the PdI_2 precipitate. ^{131}I is determined by beta counting the PdI_2.

Reagents

Anion exchange resin, Dowex 1 x 8 (50-100 mesh) chloride form.

Carbon tetrachloride, CCl_4 - reagent grade.

Hydrochloric acid, HCl, 1N.

Hydrochloric acid, HCl, 3N..

H_2O - HNO_3 - HN_2OH HCL wash solution (50 ml H_2O); 10 ml 1M -

NH_2OH-HCl; (10 ml conc. HNO_3).

Hydroxylamine hydrochloride, NH_2OH HCl - 1 M.

Nitric acid, HNO_3 - concentrated.

Palladium chloride, PdI_2, 20 mg Pd^{++}/ml. 1.2 g Pd Cl_2/100 ml

6N HCl).

Sodium bisulfite, $NaHSO_3$ - 1 M

Sodium chloride, NaCl - 2M

Sodium hypochlorite, NaOCl - 5% (clorox).

Section 3.9 (continued)

Special Apparatus

Chromatographic column, 20 mm x 150 mm (Fisher & Porter Cat. #274-457).

Vacuum filter holder, 2.5 cm^2 filter area

Filter paper, Whatman #42, 24 mm

Mylar

Polyester gummed tape, 1 1/2", Scotch #853

Drying oven

A. Ion Exchange Procedure

1. Set up an ion exchange column of 20 mm diameter and 150 mm length.

2. Pour 20 ml of a slurry of Dowex 1 x 8, Cl^- form (50-100 mesh) into the column and wash down sides with water. Add 2 ml of I^- carrier to 2 liters milk, stir for 20 minutes.

3. Pass the sample through the ion exchange column at a flow rate of 20 ml/min. Save the effluent for other analyses and label it "iodine effluent".

4. Wash column with 500 ml of hot distilled water for milk samples or 200 ml of distilled water for water samples. Discard wash.

5. Wash column with 100 ml of 2 M NaCl at a flow rate of 4 ml/min. Discard wash.

6. Drain the solution from the column.

7. Measure 50 ml 5% sodium hypochlorite in a graduated cylinder. Add sodium hypochlorite to column in 10-20 ml increments, stirring resin as needed to eliminate gas bubbles and maintain flow rate of 2 ml/min. Collect eluate in 250-ml beaker and discard the resin.

B. Iodine Extraction Procedure

1. Acidify the eluate from step [illegible] using concentrated HNO_3 to make the sample 2-3 N in HNO_3, and transfer to 250 ml separatory funnel. (Add the acid slowly with stirring until the vigorous reaction subsides.) Volume of concentrated HNO_3 required will depend on eluate volume as follows):

B. Iodine Extraction Procedure (continued)

eluate volume (ml)	concentrated HNO_3 (ml)
50-60	10
60-70	12
70-80	14
80-90	16

2. Add 50 ml of CCl_4 and 10 ml of 1 M hydroxylamine hydrochloride (freshly prepared). Extract iodine into organic phase (about 2 minutes equilibration). Draw off the organic phase (lower phase) into another separatory funnel

3. Add 25 ml of CCl_4 and 5 ml of 1 M hydroxylamine hydrochloride to the first separatory funnel and again equilibrate for 2 minutes. Combine the organic phases. Discard the aqueous phase (Upper phase) if not other analyses are required. If Pu, U or Sr is required on the same sample aliquot, submit the aqueous phase and data sheet to the approprate laboratory section.

4. Add 20 ml H_2O-HNO_3-NH_2OH HCl wash solution to the separatory funnel containing the CCl_4. Equilibrate 2 minutes. Allow phases to separate and transfer CCl_4 (lower phase) to a clean separatory funnel. Discard the wash solution.

5. Add 25 ml H_2O and 10 drops of 1 M sodium bisulfite (freshley prepared) to the separatory funnel containing the CCl_4. Equilibrate for 2 minutes. Discard the organic phase (lower phase). Drain aqueous phase (upper phase) into a 100-ml beaker. Proceed to the Precipitation of PdI_2.

C. Precipitation of Palladium Iodide

CAUTION: AMMONIUM HYDROXIDE INTERFERES WITH THIS PROCEDURE

1. Add 10 ml of 3 N HCl to the aqueous phase from the iodine extraction procedure in step 5.

2. Place the beaker on a stirrer-hot plate. Using the magnetic stirrer, boil and stir the sample until it evaporates to 30 ml or begins to turn yellow.

3. Add 1.0 ml of 20 mg Pd^{++}/ml palladium chloride per liter of milk, used dropwise, to the solution.

Section 3.9 (continued)

C. Precipitation of Palladium Iodide (continued)

4. Turn the heat off, but continue to stir the sample until it cools to room temperature. Place the beaker in a stainless steel tray and put in the refrigerator overnight.

5. Weigh a clean 24 mm Whatman #42 filter which has been stored over silica gel in a desiccator.

6. Place the weighed filter in the filter holder. Filter the sample and wash the residue with 1 N HI1 and then with absolute alcohol.

7. Remove filter from filter holder and place it on a watch glass.

8. Dry under the lamp for 20 minutes.

9. Cut a 1 1/2" strip of polyester tape and lay it on a clean surface, gummed side up. Place the filter, precipitate side up, in the center of the tape.

10. Cut a 1 1/2" wide piece of mylar. Using a spatula to press it in place, put it directly over the precipitate and seal the edges to the polyester tape. Trim to about 5 mm from the edge of the filter with scissors.

11. Mount the sample on the plastic disc and write the sample number on the back side of the disc.

12. Count the sample on a proportional beta counter.

Calculations

Calculate the sample activity using computer program OIOD131.

Reference: "Determination of 1-131 by Beta-Gamma coincidence Counting of PdI_2". Radiological Science Laboratory. Division of Laboratories and Research, New York State Department of Health, March 1975, Revised February 1977.