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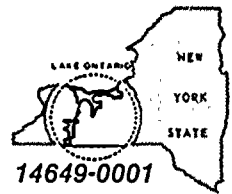




ROCHESTER GAS AND ELECTRIC CORPORATION • 89 EAST AVENUE, ROCHESTER N.Y. 14649-0001

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March 01, 1994

U.S. Nuclear Regulatory Commission  
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Subject: Semiannual Radioactive Effluent Release Report  
R.E. Ginna Nuclear Power Plant  
Docket No. 50-244

Dear Sirs:

This Semiannual Radioactive Effluent Release Report is being submitted in accordance with the requirements of Technical Specification Section 6.9.1.4.

Very truly yours,

Robert C. Mecredy  
Vice President

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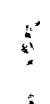
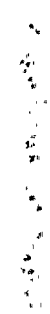
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**SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT**

**R. E. GINNA NUCLEAR PLANT  
ROCHESTER GAS AND ELECTRIC**

**DOCKET NO. 50-244**

**JULY - DECEMBER, 1993**





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## 1.0

### INTRODUCTION

This Semiannual Radioactive Effluent Release Report is for the Rochester Gas and Electric Corporation R.E. Ginna plant and is submitted in accordance with the requirements of Technical Specification Section 6.9.1.4. The report covers the period from July 1, 1993 through December 31, 1993.

This report includes a summary of the quantities of radioactive gaseous and liquid effluents and solid waste released from the plant presented in the format outlined in appendix B of Regulatory Guide 1.21, Revision 1, June 1974.

All gaseous and liquid effluents discharged during this reporting period were in compliance with the limits of the R.E. Ginna Technical Specifications.

## 2.0

### SUPPLEMENTAL INFORMATION

### 2.1

#### Regulatory Limits

The Technical Specification limits applicable to release of radioactive material in liquid and gaseous effluents are:

#### 2.1.1

##### Fission and Activation Gases

The instantaneous dose rate, as calculated in the ODCM, due to noble gases released in gaseous effluents from the site shall be limited to a release rate which would yield  $\leq 500$  mrem/yr to the total body and  $\leq 3000$  mrem/yr to the skin if allowed to continue for a full year.

The air dose, as calculated in the ODCM, due to noble gases released in gaseous effluents from the site shall be limited to the following:

- (i) During any calendar quarter to  $\leq 10$  mrad for gamma radiation and to  $\leq 20$  mrad for beta radiation.

#### 2.1.2

##### Radioiodine, Tritium and Particulates

The instantaneous dose rate, as calculated in the ODCM, due to radioactive materials released in gaseous effluents from the site as radioiodines, radioactive materials in particulate form, and radionuclides other than noble gases with half-lives greater than 8 days shall be limited to a release rate which would yield  $\leq 1500$  mrem/yr to any organ if allowed to continue for a full year.



The dose to an individual, as calculated in the ODCM, from radioiodine, radioactive materials in particulate form and radionuclides other than noble gases with half-lives greater than eight days released with gaseous effluents from the site shall be limited to the following:

- (i) During any calendar quarter to  $\leq 7.5$  mrem to any organ.
- (ii) During any calendar year to  $\leq 15$  mrem to any organ.

### 2.1.3 Liquid Effluents

The release of radioactive liquid effluents shall be such that the concentration in the circulating water discharge does not exceed the limits specified in accordance with Appendix B, Table II, Column 2 and notes thereto of 10CFR20. For dissolved or entrained noble gases the total activity due to dissolved or entrained noble gases shall not exceed  $2 \text{ E-4 uCi/ml}$ .

The dose or dose commitment to an individual as calculated in the ODCM from radioactive materials in liquid effluents released to unrestricted areas shall be limited:

- (i) During any calendar quarter to  $\leq 1.5$  mrem to the total body and to  $\leq 5$  mrem to any organ, and
- (ii) During any calendar year to  $\leq 3$  mrem to the total body and to  $\leq 10$  mrem to any organ.

## 2.2 Maximum Permissible Concentrations (MPC)

2.2.1 For gaseous effluents, maximum permissible concentrations are not directly used in release rate calculations since the applicable limits are stated in terms of dose rate at the unrestricted area boundary.

2.2.2 For liquid effluents, the maximum permissible concentration values specified in 10CFR20, Appendix B, Table II, column 2 are used to calculate release rates and permissible concentrations at the unrestricted area boundary. A value of  $2\text{E-}04 \text{ uCi/ml}$  is used as the MPC for dissolved and entrained noble gases in liquid effluents.

## 2.3 Release Rate Limits

The release rate limits for fission and activation gases from the R.E. Ginna plant are not based on the average energy of the radionuclide mixture in gaseous effluents; therefore, this value is not applicable. However, the average energy of the radionuclide mixture was  $0.277 \text{ Mev}$ .



## 2.4

### Measurements and Approximations of Total Radioactivity

Gamma spectroscopy was the primary analysis method used to determine the radionuclide composition and concentration of gaseous and liquid effluents. Composite samples were analyzed for Sr-89, Sr-90 and Fe-55 by a contract laboratory. Tritium and alpha analysis were done using liquid scintillation and gas flow proportional counting respectively.

The total radioactivity in effluent releases was determined from the measured concentration of each radionuclide present and the total volume of effluents released.

## 2.5

### Batch Releases

### 2.5.1

#### Liquid

1.	Number of batch releases:	1.71 E+02
2.	Total time period for batch releases:	3.86 E+04 min.
3.	Maximum time period for a batch release:	2.67 E+03 min.
4.	Average time period for batch releases:	2.25 E+02 min.
5.	Minimum time period for a batch release:	3.6 E+01 min.
6.	Average stream flow (LPM) during periods of release effluent into a flowing stream:	1.29 E+06 LPM

### 2.5.2

#### Gaseous

1.	Number of batch releases:	2.8E+01
2.	Total time period for batch releases:	1.28E+04 min.
3.	Maximum time period for a batch release:	2.57E+03 min.
4.	Average time period for batch releases:	6.09E+02 min.
5.	Minimum time period for a batch release:	6.0E+01 min.





2.6

### Abnormal Releases

There were no abnormal releases of liquid or gaseous effluents during the reporting period.

3.0

### **SUMMARY OF GASEOUS RADIOACTIVE EFFLUENTS**

The quantities of radioactive material released in gaseous effluents are summarized in tables 1A and 1B. All releases were considered to be elevated releases.

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### **SUMMARY OF LIQUID RADIOACTIVE EFFLUENTS**

The quantities of radioactive material released in liquid effluents are summarized in tables 2A and 2B.

5.0

### **SOLID WASTES**

The quantities of radioactive material released in shipments of solid waste transported from the site during the reporting period are summarized in Table 3. Principal nuclides were determined by gamma spectroscopy and non-gamma emitters were calculated from scaling factors determined by an independent laboratory from representative samples of that waste type.

6.0

### **LOWER LIMIT OF DETECTION NOT MET**

There were no gamma emitting radionuclides that did not meet the required lower limit of detection for liquid releases.

7.0

### **RADIOLOGICAL IMPACT**

An assessment of doses to the maximally exposed individual from gaseous and liquid effluents was performed for locations representing the maximum dose. In all cases, doses were well below Technical Specification limits. Doses were assessed upon actual meteorological conditions considering the noble gas exposure, inhalation, ground plane and ingestion pathways. The ingestion pathways considered were the produce, vegetable, goat's milk, cow's milk and meat pathway. The results of this assessment are presented in Tables 5A and 5B.



## **8.0 METEOROLOGICAL DATA**

The annual summary of hourly meteorological data collected during 1993 is not included with this report, but can be made available at the R.E. Ginna Plant as allowed by Technical Specifications.

## **9.0 LAND USE CENSUS CHANGES**

There were no changes in critical receptor location for dose calculations during the reporting period.

## **10.0 ANNUAL TABULATION OF PERSONNEL EXPOSURE**

The annual tabulation of the number of station, utility and other personnel receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job function required by Technical Specification 6.9.2.2 and 10CFR20.407 is included as Tables 6A and 6B.

## **11.0 LEAK TEST OF SEALED SOURCES**

No sealed sources were found to be leaking when smeared by both wet and dry smears.

## **12.0 CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL (ODCM)**

There were no changes to the ODCM during the report period.

## **13.0 CHANGES TO THE PROCESS CONTROL PROGRAM (PCP)**

There were no changes to the PCP during the reporting period.

## **14.0 MAJOR CHANGES TO RADWASTE TREATMENT SYSTEMS**

There were no major changes to the Radwaste Treatment Systems during the reporting period.



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**ROCHESTER GAS ELECTRIC CORPORATION**

Table 1A

**EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT**

**GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES  
JULY - DECEMBER 1993**

	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
<b>A. Fission &amp; activation gases</b>				
1. Total release	CI	1.97E+01	1.35E+01	6.60E+00
2. Average release rate for period	uCi/sec	2.48E+00	1.69E+00	
3. Percent of technical specification limit	%	3.94E-04	2.69E-04	
<b>B. Iodines</b>				
1. Total Iodine-131	CI	1.19E-05	3.30E-05	1.80E+01
2. Average release rate for period	uCi/sec	1.50E-06	4.16E-06	
3. Percent of technical specification limit	%	3.30E-03	9.13E-03	
<b>C. Particulates</b>				
1. Particulates with half-lives > 8days	CI	1.24E-06	1.58E-06	4.00E+01
2. Average release rate for period	uCi/sec	1.57E-07	1.99E-07	
3. Percent of technical specification limit	%	1.18E-05	1.50E-05	
4. Gross alpha radioactivity	CI			
<b>D. Tritium</b>				
1. Total release	CI	1.15E+01	1.18E+01	3.20E+00
2. Average release rate for period	uCi/sec	1.44E+00	1.48E+00	
3. Percent of technical specification limit	%	1.70E-04	1.74E-04	
<b>E. Carbon-14</b>				
1. Total release	CI	7.95E-01	7.17E-01	3.00E+01
2. Average release rate for period	uCi/sec	1.00E-01	9.02E-02	
3. Percent of technical specification limit	%	5.32E-06	4.80E-06	

Note: Isotope for which no value is given were not identified in applicable releases.

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**ROCHESTER GAS ELECTRIC CORPORATION**

**Table 1B  
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT  
GASEOUS EFFLUENTS - ELEVATED RELEASE**

		Continuous Mode		Batch Mode	
Nuclldes released	Unit	Quarter	Quarter	Quarter	Quarter
		3rd	4th	3rd	4th
1. Fission gases					
argon-41	Cl	6.63E-02	1.38E-01	5.66E-02	4.76E-02
krypton-85	Cl			2.73E-01	1.99E-01
krypton-85m	Cl	5.54E-02	6.18E-02	7.53E-04	3.35E-03
krypton-87	Cl	7.43E-02	7.21E-02	1.35E-04	
krypton-88	Cl	7.35E-02	1.02E-01		3.07E-04
xenon-131m	Cl			1.39E-02	4.64E-02
xenon-133	Cl	1.42E+01	5.70E+00	1.31E+00	3.09E+00
xenon-133m	Cl	1.46E-02	1.85E-02	1.04E-02	1.61E-02
xenon-135	Cl	2.64E+00	2.87E+00	1.90E-02	6.39E-02
xenon-135m	Cl	7.15E-01	7.55E-01		1.50E-04
xenon-138	Cl	2.58E-01	2.76E-01		
others (specify)	Cl				
	Cl				
	Cl				
	Cl				
Total for period	Cl	1.81E+01	9.99E+00	1.69E+00	3.47E+00

**2. Iodines**

Iodine-131	CI	1.19E-05	1.26E-05	1.54E-08	2.04E-05
Iodine-133	CI	1.32E-05	1.32E-05	9.02E-08	4.16E-05
Iodine-135	CI				
<b>Total for period</b>	<b>CI</b>	<b>2.51E-05</b>	<b>2.58E-05</b>	<b>1.06E-07</b>	<b>6.20E-05</b>

**3. Particulates**

strontium-89	CI				
strontium-90	CI				
cesium-134	CI				
cesium-137	CI	1.24E-06	1.58E-06		
Nb-95	CI				
cobalt-58	CI				
cobalt-60	CI				
<b>Total for period</b>	<b>CI</b>	<b>1.24E-06</b>	<b>1.58E-06</b>		
unidentified	CI				

Note: Isotope for which no value is given were not identified in applicable releases.



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**ROCHESTER GAS ELECTRIC CORPORATION**

Table 2A  
**EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT**

**LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES  
JULY - DECEMBER 1993**

<b>A. Fission and activation products</b>	<b>Unit</b>	<b>Quarter 3rd</b>	<b>Quarter 4th</b>	<b>Est.Total Error, %</b>
1. Total release (not including tritium, gases, alpha)	CI	1.78E-02	5.38E-02	7.00E+00
2. Average diluted concentration during period	uCi/ml	1.03E-10	3.18E-10	
3. Percent of applicable limit	%	2.18E-03	1.86E-02	
<b>B. Tritium</b>				
1. Total release	CI	3.34E+01	5.05E+01	3.20E+00
2. Average diluted concentration during period	uCi/ml	1.92E-07	2.99E-07	
3. Percent of applicable limit	%	6.40E-03	9.97E-03	
<b>C. Dissolved and entrained gases</b>				
1. Total release	CI	5.15E-04	8.53E-02	4.00E+01
2. Average diluted concentration during period	uCi/ml	2.96E-12	5.05E-10	
3. Percent of applicable limit	%	1.48E-06	2.53E-04	
<b>D. Gross alpha radioactivity</b>				
1. Total release	CI	N/A	N/A	
<b>E. Vol. of waste released (prior to dilution)</b>				
	Liters	3.84E+07	2.65E+07	5.00E+00
<b>F. Vol. of dilution water used during period</b>				
	Liters	1.74E+11	1.69E+11	5.00E+00

**Note:** Isotope for which no value is given were not identified in applicable releases.

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**ROCHESTER GAS ELECTRIC CORPORATION**

Table 2B  
**EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT**  
**LIQUID EFFLUENTS**

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 3rd	Quarter 4th	Quarter 3rd	Quarter 4th
chromium-51	Cl				
manganese-54	Cl				
iron-55	Cl				1.30E-04
iron-59	Cl				
cobalt-58	Cl			7.08E-05	3.70E-04
cobalt-60	Cl	3.16E-07		4.95E-05	7.74E-05
zinc-65	Cl				
strontium-89	Cl				1.99E-04
strontium-90	Cl				
zirconium/niobium-95	Cl			7.44E-06	4.42E-06
molybdenum-99	Cl		4.05E-05		2.02E-05
silver-110m	Cl				
antimony-122	Cl				
antimony-124	Cl			6.65E-04	3.37E-04
antimony-125	Cl			6.87E-04	1.29E-03
iodine-131	Cl	5.07E-06	5.06E-04	6.45E-04	4.61E-03
iodine-133	Cl	1.86E-04	2.92E-04	1.15E-04	9.23E-03
iodine-135	Cl	4.25E-05	5.30E-05		7.13E-03
cesium-134	Cl	3.45E-06	6.20E-04	8.13E-03	1.45E-02
cesium-136	Cl				1.49E-04
cesium-137	Cl	1.53E-04	7.60E-04	7.07E-03	1.33E-02
barium/lanthanum-140	Cl				9.59E-05
cerium-141	Cl				
Ru-106	Cl				
Ru-103	Cl				
Total for period (above)	Cl	3.90E-04	2.27E-03	1.74E-02	5.15E-02
unidentified	Cl				
xenon-133	Cl			4.85E-04	5.82E-02
xenon-135	Cl			2.97E-05	2.71E-02

**Note:** Isotope for which no value is given were not identified in applicable releases.



Table 3

**EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT**  
**Solid Waste and Irradiated Fuel Shipments**

July - December 1993

**A. Solid waste shipped offsite for burial or disposal (NOT irradiated fuel)**

TYPE OF WASTE	UNIT	6 MONTH PERIOD	EST. TOTAL ERROR
a. Spent resins, filtersludges, evaporator bottoms, etc.	m <sup>3</sup> Ci	8.04 E 0 1.97 E 1	7.0 E 0 7.0 E 0
b. Dry compressible waste, contaminated equipment, etc.	m <sup>3</sup> Ci	1.02 E 2 1.1 E -1	7.0 E 0 7.0 E 0
c. Irradiated components, control rods, etc.	m <sup>3</sup> Ci		
d. Other (describe)	m <sup>3</sup> Ci		

**2. Estimate of major nuclide composition (by type of waste)**

a.			b.		
Fe-55	%	3.1 E 1	Fe-55	%	3.8 E 1
Co-60	%	3.0 E 1	Co-60	%	1.0 E 1
Ni-63	%	1.9 E 1	Nb-95	%	1.0 E 1
Cs-137	%	7 E 0	Cs-137	%	9.0 E 0
C-14	%	5 E 0	Zr-95	%	7 E 0
H-3	%	2 E 0	Co-58	%	7 E 0
Sb-125	%	2 E 0	Cr-51	%	6 E 0
	%		Ce-144	%	5 E 0
	%		Ni-63	%	4 E 0
	%		Cs-134	%	2 E 0
	%		Mn-54	%	1 E 0
	%			%	

**3. Solid Waste Disposition**

<u>NUMBER OF SHIPMENTS</u>	<u>MODE OF TRANSPORTATION</u>	<u>DESTINATION</u>
2	Sole use truck	Barnwell, SC
2	Sole use truck	Oak Ridge, TN

**B. IRRADIATED FUEL SHIPMENTS (Disposition)**

<u>NUMBER OF SHIPMENTS</u>	<u>MODE OF TRANSPORTATION</u>	<u>DESTINATION</u>
None	N/A	N/A



Table 4

RELEASE PERMITS NOT MEETING LLD REQUIREMENTS

No.	Date	Isotopes	Cause
		None	



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Table 5A  
Radiation Doses to Nearest Individual Receptor  
From Gaseous Releases in Rem  
First Quarter

	ADULT			TEEN			CHILD			INFANT		
	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN
N	7.60E-08	8.90E-08	1.10E-07	7.80E-08	9.50E-08	1.10E-07	7.80E-08	9.60E-08	1.10E-07	6.50E-08	8.20E-08	1.10E-07
NNE	7.20E-08	7.90E-08	1.00E-07	7.50E-08	8.30E-08	1.00E-07	7.50E-08	8.50E-08	1.00E-07	6.30E-08	7.20E-08	1.00E-07
NE	6.10E-08	6.60E-08	9.50E-08	6.30E-08	6.90E-08	9.50E-08	6.40E-08	7.10E-08	9.50E-08	5.50E-08	6.10E-08	9.50E-08
ENE	9.10E-08	9.90E-08	1.70E-07	9.20E-08	1.00E-07	1.70E-07	9.10E-08	1.00E-07	1.70E-07	8.10E-08	9.10E-08	1.70E-07
E	7.10E-07	7.50E-07	1.10E-06	7.20E-07	7.70E-07	1.10E-06	7.20E-07	7.70E-07	1.10E-06	6.30E-07	6.80E-07	1.10E-06
ESE	7.70E-07	8.30E-07	1.10E-06	7.90E-07	8.70E-07	1.10E-06	8.00E-07	8.80E-07	1.10E-06	6.80E-07	7.60E-07	1.10E-06
SE	8.20E-07	8.80E-07	1.20E-06	8.60E-07	9.30E-07	1.20E-06	8.80E-07	9.50E-07	1.20E-06	7.50E-07	8.20E-07	1.20E-06
SSE	3.20E-07	3.40E-07	5.10E-07	3.20E-07	3.50E-07	5.10E-07	3.20E-07	3.50E-07	5.10E-07	2.80E-07	3.10E-07	5.10E-07
S	1.40E-06	1.50E-06	2.40E-06	1.50E-06	1.60E-06	2.40E-06	1.50E-06	1.60E-06	2.40E-06	1.30E-06	1.40E-06	2.40E-06
SSW	4.50E-07	4.90E-07	6.60E-07	4.60E-07	5.00E-07	6.60E-07	4.50E-07	5.00E-07	6.60E-07	3.90E-07	4.40E-07	6.60E-07
SW	5.80E-07	6.10E-07	6.30E-07	6.00E-07	6.40E-07	6.30E-07	5.90E-07	6.30E-07	6.30E-07	4.80E-07	5.10E-07	6.30E-07
WSW	5.20E-07	6.00E-07	3.60E-07	5.40E-07	6.40E-07	3.60E-07	5.30E-07	6.40E-07	3.60E-07	4.00E-07	5.00E-07	3.60E-07
W	5.20E-07	6.00E-07	3.60E-07	5.40E-07	6.40E-07	3.60E-07	5.30E-07	6.40E-07	3.60E-07	4.00E-07	5.00E-07	3.60E-07
WNW	2.10E-07	2.20E-07	3.20E-07	2.20E-07	2.30E-07	3.20E-07	2.20E-07	2.30E-07	3.20E-07	1.90E-07	2.00E-07	3.20E-07
NW	2.00E-08	2.30E-08	2.40E-08	2.10E-08	2.40E-08	2.40E-08	2.00E-08	2.40E-08	2.40E-08	1.60E-08	1.90E-08	2.40E-08
NNW	4.70E-08	5.60E-08	6.00E-08	4.90E-08	6.00E-08	6.00E-08	4.80E-08	6.10E-08	6.00E-08	4.00E-08	5.10E-08	6.00E-08
MAX.	1.40E-06	1.50E-06	2.40E-06	1.50E-06	1.60E-06	2.40E-06	1.50E-06	1.60E-06	2.40E-06	1.30E-06	1.40E-06	2.40E-06



Table 5A  
Radiation Doses to Nearest Individual Receptor  
From Gaseous Releases in Rem  
Second Quarter

	ADULT			TEEN			CHILD			INFANT		
	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN
N	3.90E-08	4.00E-08	2.30E-08	4.00E-08	4.10E-08	2.30E-08	3.80E-08	3.90E-08	2.30E-08	2.70E-08	2.80E-08	2.30E-08
NNE	3.90E-08	4.00E-08	2.30E-08	4.00E-08	4.10E-08	2.30E-08	3.80E-08	3.90E-08	2.30E-08	2.70E-08	2.80E-08	2.30E-08
NE	4.20E-08	4.30E-08	2.50E-08	4.30E-08	4.40E-08	2.50E-08	4.10E-08	4.20E-08	2.50E-08	2.90E-08	3.00E-08	2.50E-08
ENE	4.00E-08	4.10E-08	2.20E-08	4.30E-08	4.30E-08	2.20E-08	4.20E-08	4.30E-08	2.20E-08	3.00E-08	3.10E-08	2.20E-08
E	2.50E-06	2.60E-06	2.30E-06	3.60E-06	3.60E-06	3.20E-06	7.20E-06	7.30E-06	6.70E-06	3.00E-06	3.10E-06	2.80E-06
ESE	2.50E-06	2.60E-06	2.20E-06	3.50E-06	3.50E-06	3.10E-06	7.00E-06	7.20E-06	6.50E-06	4.80E-06	5.00E-06	4.60E-06
SE	5.50E-07	5.70E-07	5.20E-07	6.50E-07	6.90E-07	6.10E-07	1.00E-06	1.10E-06	9.50E-07	1.00E-06	1.10E-06	9.70E-07
SSE	3.70E-07	3.80E-07	3.90E-07	4.50E-07	4.60E-07	4.50E-07	7.10E-07	7.30E-07	6.80E-07	8.20E-07	8.40E-07	8.00E-07
S	6.20E-07	6.40E-07	5.70E-07	7.10E-07	7.30E-07	6.40E-07	1.00E-06	1.00E-06	9.00E-07	1.10E-06	1.10E-06	1.00E-06
SSW	5.40E-07	5.50E-07	5.90E-07	6.20E-07	6.30E-07	6.60E-07	9.20E-07	9.40E-07	9.20E-07	1.20E-06	1.30E-06	1.20E-06
SW	1.20E-06	1.20E-06	1.40E-06	1.50E-06	1.50E-06	1.60E-06	2.40E-06	2.40E-06	2.40E-06	3.60E-06	3.60E-06	3.40E-06
WSW	1.00E-06	1.00E-06	7.50E-07	1.30E-06	1.30E-06	9.30E-07	2.00E-06	2.10E-06	1.60E-06	2.10E-06	2.10E-06	1.80E-06
W	5.50E-07	5.50E-07	4.50E-07	6.80E-07	6.90E-07	5.50E-07	1.10E-06	1.20E-06	9.50E-07	8.30E-07	8.30E-07	7.50E-07
WNW	3.00E-07	3.10E-07	2.40E-07	3.20E-07	3.20E-07	2.40E-07	3.20E-07	3.20E-07	2.40E-07	2.50E-07	2.50E-07	2.30E-07
NW	1.40E-08	1.50E-08	7.40E-09	1.50E-08	1.50E-08	7.40E-09	1.40E-08	1.50E-08	7.40E-09	1.00E-08	1.00E-08	7.40E-09
NNW	2.60E-08	2.60E-08	1.40E-08	2.70E-08	2.70E-08	1.40E-08	2.60E-08	2.70E-08	1.40E-08	1.90E-08	1.90E-08	1.40E-08
MAX.	2.50E-06	2.60E-06	2.30E-06	3.60E-06	3.60E-06	3.20E-06	7.20E-06	7.30E-06	6.70E-06	4.80E-06	5.00E-06	4.60E-06

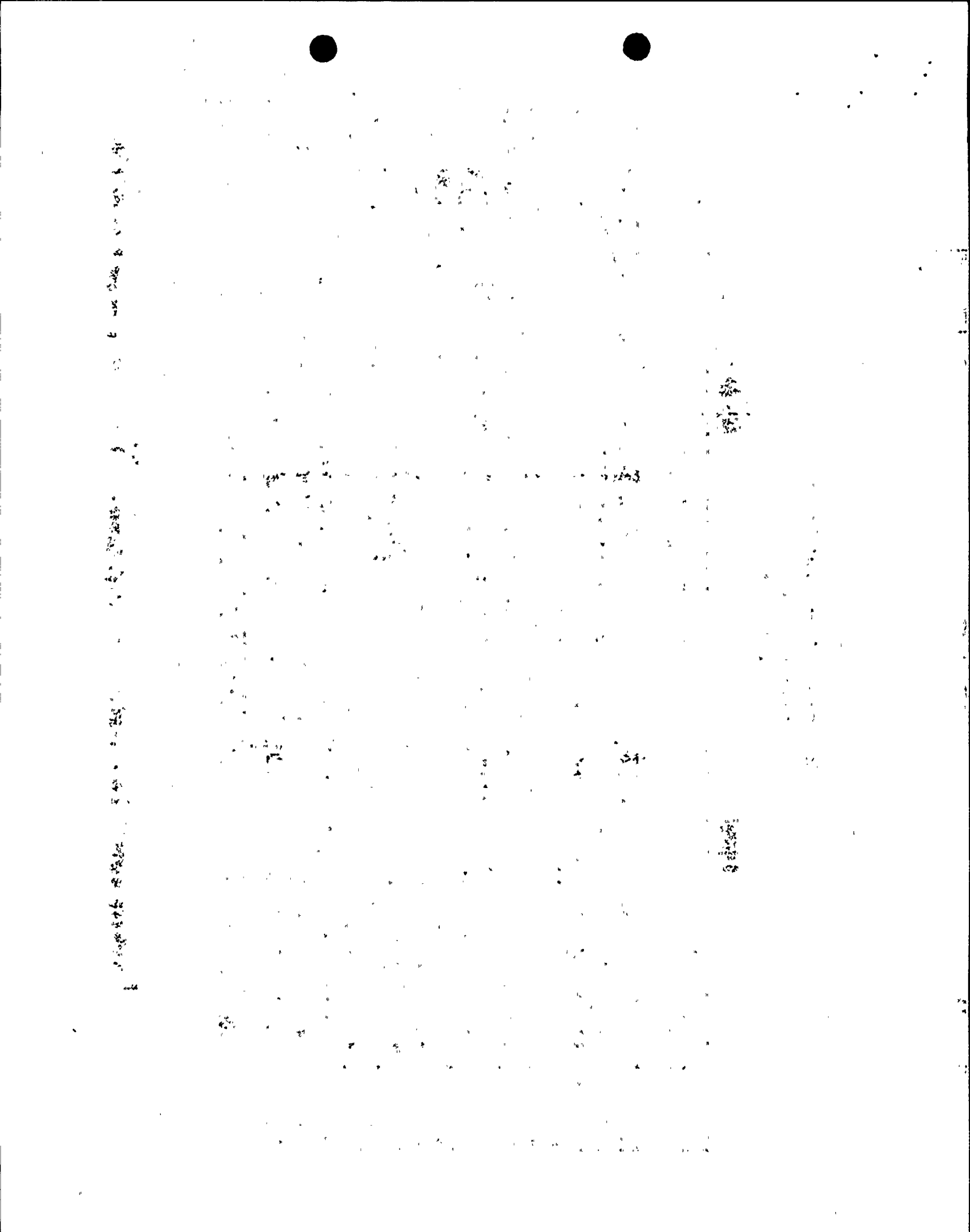


Table 5A  
Radiation Doses to Nearest Individual Receptor  
From Gaseous Releases in Rem  
Third Quarter

	ADULT			TEEN			CHILD			INFANT		
	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN
N	4.00E-08	4.00E-08	4.10E-08	4.10E-08	4.10E-08	4.10E-08	3.90E-08	3.90E-08	4.10E-08	3.00E-08	3.00E-08	4.10E-08
NNE	5.60E-08	5.70E-08	6.20E-08	5.70E-08	5.80E-08	6.20E-08	5.50E-08	5.60E-08	6.20E-08	4.40E-08	4.40E-08	6.20E-08
NE	5.70E-08	5.70E-08	5.30E-08	5.90E-08	5.90E-08	5.30E-08	5.80E-08	5.80E-08	5.30E-08	4.40E-08	4.50E-08	5.30E-08
ENE	3.30E-08	3.30E-08	2.50E-08	3.50E-08	3.50E-08	2.50E-08	3.60E-08	3.70E-08	2.50E-08	2.70E-08	2.80E-08	2.50E-08
E	2.40E-06	2.40E-06	2.30E-06	3.60E-06	3.60E-06	3.50E-06	8.00E-06	8.00E-06	7.70E-06	3.00E-06	3.00E-06	2.90E-06
ESE	1.90E-06	1.90E-06	1.70E-06	2.60E-06	2.70E-06	2.40E-06	5.50E-06	5.60E-06	5.10E-06	3.20E-06	3.30E-06	3.20E-06
SE	7.90E-07	8.30E-07	7.70E-07	9.80E-07	1.00E-06	9.30E-07	1.70E-06	1.70E-06	1.50E-06	7.40E-07	8.10E-07	8.30E-07
SSE	5.80E-07	6.00E-07	5.80E-07	7.20E-07	7.50E-07	7.10E-07	1.30E-06	1.30E-06	1.20E-06	8.00E-07	8.40E-07	8.30E-07
S	2.50E-06	2.60E-06	2.60E-06	3.40E-06	3.50E-06	3.50E-06	6.60E-06	6.80E-06	6.50E-06	5.10E-06	5.20E-06	5.40E-06
SSW	9.00E-07	9.40E-07	8.60E-07	1.20E-06	1.20E-06	1.10E-06	2.40E-06	2.40E-06	2.20E-06	1.90E-06	2.00E-06	2.00E-06
SW	2.00E-06	2.00E-06	2.00E-06	2.70E-06	2.80E-06	2.70E-06	5.70E-06	5.80E-06	5.60E-06	7.40E-06	7.50E-06	7.50E-06
WSW	2.30E-06	2.30E-06	2.20E-06	3.50E-06	3.50E-06	3.30E-06	7.80E-06	7.90E-06	7.60E-06	3.60E-06	3.70E-06	3.50E-06
W	1.10E-06	1.20E-06	1.10E-06	1.70E-06	1.70E-06	1.60E-06	3.70E-06	3.70E-06	3.50E-06	1.60E-06	1.60E-06	1.50E-06
WNW	6.10E-07	6.10E-07	6.40E-07	9.40E-07	9.40E-07	9.50E-07	2.10E-06	2.10E-06	2.10E-06	8.20E-08	8.20E-08	1.20E-07
NW	1.70E-08	1.70E-08	1.40E-08	1.70E-08	1.70E-08	1.40E-08	1.70E-08	1.70E-08	1.40E-08	1.30E-08	1.30E-08	1.40E-08
NNW	1.90E-08	1.90E-08	1.70E-08	2.00E-08	2.00E-08	1.70E-08	2.00E-08	2.00E-08	1.70E-08	1.50E-08	1.50E-08	1.70E-08
MAX	2.50E-06	2.60E-06	2.60E-06	3.60E-06	3.60E-06	3.50E-06	8.00E-06	8.00E-06	7.70E-06	7.40E-06	7.50E-06	7.50E-06



Table 5A  
Radiation Doses to Nearest Individual Receptor  
From Gaseous Releases in Rem  
Fourth Quarter

	ADULT			TEEN			CHILD			INFANT		
	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN	T.BODY	THYRD	SKIN
N	3.60E-08	3.60E-08	2.60E-08	3.70E-08	3.80E-08	2.60E-08	3.50E-08	3.60E-08	2.60E-08	2.60E-08	2.70E-08	2.60E-08
NNE	4.30E-08	4.40E-08	3.20E-08	4.40E-08	4.60E-08	3.20E-08	4.40E-08	4.50E-08	3.20E-08	3.30E-08	3.40E-08	3.20E-08
NE	2.30E-08	2.30E-08	1.50E-08	2.30E-08	2.40E-08	1.50E-08	2.30E-08	2.30E-08	1.50E-08	1.70E-08	1.70E-08	1.50E-08
ENE	1.70E-08	1.80E-08	1.00E-08	1.80E-08	1.80E-08	1.00E-08	1.80E-08	1.80E-08	1.00E-08	1.30E-08	1.30E-08	1.00E-08
E	6.40E-07	6.70E-07	6.60E-07	7.90E-07	8.20E-07	8.10E-07	1.30E-06	1.40E-06	1.30E-06	1.10E-06	1.10E-06	1.20E-06
ESE	3.00E-07	3.20E-07	3.20E-07	3.40E-07	3.60E-07	3.70E-07	5.10E-07	5.40E-07	5.30E-07	2.50E-07	2.80E-07	3.20E-07
SE	3.20E-07	3.40E-07	3.50E-07	3.60E-07	3.80E-07	3.90E-07	5.00E-07	5.30E-07	5.30E-07	2.40E-07	2.60E-07	3.10E-07
SSE	3.10E-07	3.20E-07	3.10E-07	3.70E-07	3.80E-07	3.70E-07	5.80E-07	6.00E-07	5.90E-07	7.40E-07	7.60E-07	7.80E-07
S	8.70E-07	9.00E-07	1.10E-06	1.00E-06	1.10E-06	1.30E-06	1.70E-06	1.70E-06	1.90E-06	9.50E-07	1.00E-06	1.30E-06
SSW	1.70E-07	1.80E-07	1.50E-07	1.90E-07	1.90E-07	1.60E-07	2.40E-07	2.50E-07	2.20E-07	1.20E-07	1.20E-07	1.30E-07
SW	2.50E-07	2.60E-07	2.60E-07	2.80E-07	2.90E-07	2.80E-07	3.50E-07	3.70E-07	3.40E-07	3.00E-07	3.20E-07	3.30E-07
WSW	1.50E-07	1.60E-07	1.70E-07	1.80E-07	1.90E-07	1.80E-07	2.40E-07	2.60E-07	2.40E-07	1.80E-07	2.00E-07	2.00E-07
W	2.40E-07	2.50E-07	2.60E-07	2.70E-07	2.80E-07	2.80E-07	3.70E-07	3.80E-07	3.70E-07	2.50E-07	2.60E-07	2.80E-07
WNW	1.40E-07	1.50E-07	1.80E-07	1.50E-07	1.70E-07	1.90E-07	1.90E-07	2.10E-07	2.30E-07	1.10E-07	1.20E-07	1.70E-07
NW	8.40E-09	8.50E-09	4.70E-09	8.90E-09	9.10E-09	4.70E-09	8.90E-09	9.10E-09	4.70E-09	6.50E-09	6.60E-09	4.70E-09
NNW	1.70E-08	1.70E-08	1.20E-08	1.80E-08	1.80E-08	1.20E-08	1.80E-08	1.80E-08	1.20E-08	1.40E-08	1.40E-08	1.20E-08
MAX.	8.70E-07	9.00E-07	1.10E-06	1.00E-06	1.10E-06	1.30E-06	1.70E-06	1.70E-06	1.90E-06	1.10E-06	1.10E-06	1.30E-06



Table 5B

Radiation Dose To Nearest Individual  
From Liquid Releases In REM

	<u>ADULT</u>	<u>TEEN</u>	<u>CHILD</u>	<u>INFANT</u>
<b>First Quarter</b>				
T.BODY	9.10E-06	5.20E-06	2.00E-06	1.60E-08
BONE	6.90E-06	7.20E-06	9.00E-06	1.20E-07
THYRD	5.10E-07	4.60E-07	7.80E-07	8.00E-07
<b>Second Quarter</b>				
T.BODY	6.80E-06	3.90E-06	1.50E-06	1.10E-08
BONE	4.90E-06	5.20E-06	6.40E-06	8.50E-08
THYRD	2.80E-08	2.50E-08	4.10E-08	4.10E-08
<b>Third Quarter</b>				
T.BODY	9.90E-06	5.60E-06	2.20E-06	1.60E-08
BONE	7.10E-06	7.40E-06	9.30E-06	1.20E-07
THYRD	1.10E-07	9.70E-08	1.60E-07	1.60E-07
<b>Fourth Quarter</b>				
T.BODY	1.40E-05	8.20E-06	3.10E-06	2.50E-08
BONE	1.10E-05	1.10E-05	1.40E-05	1.80E-07
THYRD	6.30E-07	5.70E-07	9.70E-07	1.00E-06

TABLE 6A

ROCHESTER GAS & ELECTRIC CORPORATION GINNA STATION  
 NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION  
 FOR 93/01/01 - 93/12/31

ACTUAL WHOLE BODY DOSE		NO. OF PERSONNEL (> or = 100)			TOTAL MAN-REM		
WORK PERMIT CATEGORY	WORK GROUP	CONTRACT WORKERS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS	STATION EMPLOYEES	UTILITY EMPLOYEES
REACTOR OPERATIONS & SURV	MAINTENANCE PERSONNEL	110	43	50	1.040	1.052	0.182
	OPERATING PERSONNEL	0	27	0	0.000	4.728	0.000
	HEALTH PHY. PERSONNEL	48	13	0	2.233	1.136	0.000
	SUPERVISORY PERSONNEL	12	14	16	0.284	1.179	0.637
	ENGINEERING PERSONNEL	4	1	2	0.202	0.041	0.143
ROUTINE MAINTENANCE	MAINTENANCE PERSONNEL	141	43	75	7.305	5.994	3.630
	OPERATING PERSONNEL	0	20	0	0.000	0.249	0.000
	HEALTH PHY. PERSONNEL	51	13	3	14.109	4.378	0.330
	SUPERVISORY PERSONNEL	13	14	15	0.345	1.480	0.677
	ENGINEERING PERSONNEL	3	1	2	0.562	0.162	0.054
INSERVICE INSPECTION	MAINTENANCE PERSONNEL	54	27	44	4.464	1.511	2.617
	OPERATING PERSONNEL	0	6	0	0.000	0.228	0.000
	HEALTH PHY. PERSONNEL	28	8	0	1.377	0.173	0.000
	SUPERVISORY PERSONNEL	10	11	14	1.224	0.870	3.346
	ENGINEERING PERSONNEL	1	0	2	0.020	0.000	0.056
SPECIAL MAINTENANCE	MAINTENANCE PERSONNEL	132	42	77	12.567	8.672	8.857
	OPERATING PERSONNEL	0	22	0	0.000	1.419	0.000
	HEALTH PHY. PERSONNEL	34	11	3	2.651	1.267	0.015
	SUPERVISORY PERSONNEL	9	5	14	0.667	0.513	0.632
	ENGINEERING PERSONNEL	2	1	1	0.149	0.035	0.000
WASTE PROCESSING	MAINTENANCE PERSONNEL	24	14	5	0.452	0.291	0.106
	OPERATING PERSONNEL	0	1	0	0.000	0.093	0.000
	HEALTH PHY. PERSONNEL	18	5	3	0.634	0.261	0.131
	SUPERVISORY PERSONNEL	1	1	3	0.018	0.021	0.111
	ENGINEERING PERSONNEL	0	0	0	0.000	0.000	0.000
REFUELING	MAINTENANCE PERSONNEL	33	18	27	9.426	0.609	2.160
	OPERATING PERSONNEL	0	8	0	0.000	2.143	0.000
	HEALTH PHY. PERSONNEL	13	2	0	0.754	0.339	0.000
	SUPERVISORY PERSONNEL	3	2	5	0.100	0.285	0.120
	ENGINEERING PERSONNEL	1	1	0	0.128	0.448	0.000
MODIFICATIONS	MAINTENANCE PERSONNEL	87	14	12	8.142	0.447	0.216
	OPERATING PERSONNEL	0	0	0	0.000	0.000	0.000
	HEALTH PHY. PERSONNEL	21	3	0	1.769	0.079	0.000
	SUPERVISORY PERSONNEL	5	4	4	0.331	0.083	0.012
	ENGINEERING PERSONNEL	1	0	1	0.000	0.000	0.015
TOTAL	MAINTENANCE PERSONNEL	172	43	77	43.397	18.576	17.768
	OPERATING PERSONNEL	0	27	0	0.000	8.859	0.000
	HEALTH PHY. PERSONNEL	53	13	3	23.527	7.634	0.476
	SUPERVISORY PERSONNEL	14	14	16	2.968	4.431	5.535
	ENGINEERING PERSONNEL	4	1	2	1.061	0.686	0.268
GRAND TOTAL	*****	241	97	98	70.953	40.186	24.047

Table 6B

## STANDARD REPORT OF PERSONNEL WHOLE BODY EXPOSURE 1993

<u>DOSE (REM)</u>	<u>NUMBER OF PEOPLE</u>
00.000 - 00.000	759
00.001 - 00.100	370
00.101 - 00.250	224
00.251 - 00.500	153
00.501 - 00.750	58
00.751 - 01.000	31
01.001 - 02.000	20
02.001 - 03.000	0
03.001 - 04.000	0
04.001 - 05.000	0

Total number of personnel monitored 1615

The total collective dose for 1993 is 193.13 person-rem based on the sum of all personnel TLD badge readings.

## FIVE HIGHEST EXPOSURES FOR THE YEAR

A	1.838 rem
B	1.452 rem
C	1.441 rem
D	1.436 rem
E	1.338 rem

This report contains all personnel monitored during 1993.