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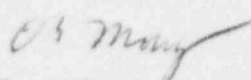
Joseph M. Farley Nuclear Plant  
Annual Radioactive Effluent Release Report

Ladies and Gentlemen:

In accordance with the Unit 1 and Unit 2 Technical Specifications, Sections 6.9.1.8 and 6.9.1.9, the FNP Annual Radioactive Effluent Release Report for 1994 is hereby submitted.

Should you have any questions, please advise.

Respectfully submitted,

  
Dave Morey

WHO/clt:efflrept.doc

Enclosure

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SOUTHERN NUCLEAR OPERATING COMPANY  
FARLEY NUCLEAR PLANT UNIT NO. ONE  
LICENSE NO. NPF-2

AND

FARLEY NUCLEAR PLANT UNIT NO. TWO  
LICENSE NO. NPF-8

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
CALENDAR YEAR 1994

FARLEY NUCLEAR PLANT  
ANNUAL RADIOACTIVE EFFLUENT  
RELEASE REPORT

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FARLEY NUCLEAR PLANT  
ANNUAL RADIOACTIVE EFFLUENT  
RELEASE REPORT

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## 1.0 INTRODUCTION

In accordance with Technical Specification (TS) 6.9.1.8 and 6.9.1.9 and Offsite Dose Calculation Manual (ODCM) 7.2, this Annual Radioactive Effluent Release Report covers the operations of the Farley Nuclear Plant (FNP) during 1994. Information regarding the radioactive liquid and gaseous effluents and solid waste releases are summarized in formats similar to those provided in the Nuclear Regulatory Commission (NRC) Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light Water Cooled Nuclear Power Plants", Revision 1, June 1974. In addition the report includes required or appropriate information regarding meteorology, dose assessment and other pertinent matters.

Detailed information on liquid effluents is provided in Section 2. The quantities of the radioactive effluents (including any unplanned releases) are summarized on a quarterly basis. A tabulation of the total body and organ doses which were calculated in accordance with ODCM 2.4 are presented to show conformance with the limits of ODCM 2.1.3.

Detailed information on gaseous effluents similar to that for liquid effluents is provided in Section 3. Tabulations are provided of the offsite air doses calculated in accordance with ODCM 3.4.2 to show conformance with the limits of ODCM 3.1.3, and the offsite organ doses to a member of the public calculated in accordance with ODCM 3.4.3 to show conformance with the limits of ODCM 3.1.4.

Detailed information as specified by ODCM 7.2.2.4 on any solid radwastes shipped offsite is provided in Section 4. The data is summarized on a semiannual basis.

Assessments of the doses to members of the public due to their activities inside the site boundary are provided in Section 5. These assessments are performed as specified by ODCM 6.2.

A number of miscellaneous matters are addressed in Section 6. These are matters which require reporting only under certain conditions. The alphabetized list given below includes the conditional matters addressed.

A. An assessment of the radiation doses to the likely most exposed member of the public from reactor releases and other nearby uranium fuel cycle sources to show conformance with 40CFR190, should a determination be required by ODCM 5.1.2.

B. Any licensee initiated changes to the ODCM pursuant to TS 6.14 including changes to the sampling locations in the Radiological Environmental Monitoring Program pursuant to ODCM 4.1.1.2.3 or 4.1.2.2.2, or changes in the location of the controlling dose receptor identified in ODCM 3.4.3 pursuant to ODCM 4.1.2.2.1.

C. Discussions of deviations in the Radioactive Effluent Control Program pursuant to ODCM 7.2.2.6.

D. Any major changes to the liquid or gaseous radwaste treatment systems initiated by the licensee as required by ODCM 2.1.5 and 3.1.6, respectively, or to the solid radwaste treatment system pursuant to the Process Control Program (PCP) App. B section B.4.1.

Meteorological data are retained onsite; these data are available to the NRC upon request. The meteorological data include annual as well as quarterly summaries of hourly measurements of wind speed, wind direction and atmospheric stability in the form of joint frequency distribution tables.



## 2.0 LIQUID EFFLUENTS

This section contains applicable ODCM limits for liquid effluents as well as the quantities of radioactive liquid effluents released during 1994. These quantities are summarized on a quarterly basis and include any unplanned releases. A tabulation of the total body and organ doses which were calculated in accordance with ODCM 2.4 are presented to show conformance with the limits of ODCM 2.1.3.

### 2.1 ODCM Limits

In accordance with Technical Specifications 6.8.3.e(ii) and 6.8.3.e(iii), the concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS (see ODCM Figure 10-1) shall be limited at all times to ten times the concentrations specified in 10CFR20, Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to  $1\text{E-}04$  uCi/ML total activity.

In accordance with Technical Specifications 6.8.3.e(iv) and 6.8.3.e(v), the dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each unit, to UNRESTRICTED AREAS (see ODCM Figure 10-1) shall be limited:

- a. During any calendar quarter to less than or equal to 1.5 mrem to the total body and to less than or equal to 5 mrem to any organ, and
- b. During any calendar year to less than or equal to 3 mrem to the total body and to less than or equal to 10 mrem to any organ.

### 2.2 Measurements and Approximation of Total Radioactivity

The radionuclides listed below are considered when evaluating liquid effluents:

IN-54	CS-134
FE-59	CS-137
CO-58	CE-141
CO-60	CE-144
ZN-65	MO-99
SR-89	FE-55
SR-90	H-3
I-131	

Batch Releases: Representative pre-release grab samples are obtained and analyzed in accordance with ODCM Table 2-3. Isotopic analyses are performed using the computerized pulse height analysis system utilizing high resolution germanium detectors. Isotopic values thus obtained are used for release rate calculations as specified in the ODCM. Only those nuclides that are detected are used in the calculations. Strontium determinations are made by performing a chemical separation and counting the isotope thus separated using a 2 pi gas flow proportional counter. Gross beta and gross alpha determinations are made using 2 pi gas flow proportional counters. Tritium and Iron 55 determinations are made using liquid scintillation techniques. Dissolved gases are determined employing grab sampling techniques and then counting on the pulse height analyzer.

Continuous Releases: Continuous releases are analogous to batch releases except that they are analyzed on a weekly composite basis in accordance with ODCM Table 2-3.

The maximum error associated with volume and flow measurements, based upon plant calibration practice is estimated to be + or - 10%. The average error associated with counting is estimated to be less than + or - 15%.

### 2.3 Abnormal Releases

There were no abnormal liquid releases on either Unit 1 or Unit 2 during 1994.

### 2.4 Batch Releases

Batch release information for Units 1 and 2 is summarized in the following tables:

Unit 1 1994 Liquid Batch Releases : Table 1-4A

Unit 2 1994 Liquid Batch Releases : Table 1-4B



TABLE 1-4A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents - Batch Release Summary  
 Unit: 1  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

-----  
 LIQUID RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	330	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	28479.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	280.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	86.30	MINUTES
MINIMUM TIME PERIOD FOR A BATCH RELEASE	:	62.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM :		8.89E+03	CFS *

-----

\* Average River Flow Rate, taken at Walter F. George Lock and Dam, located 30.7 miles above Farley Nuclear Plant.

TABLE 1-4A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents - Batch Release Summary  
 Unit: 1  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

-----  
 LIQUID RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	132	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	11103.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	120.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	84.11	MINUTES
MINIMUM TIME PERIOD FOR A BATCH RELEASE	:	14.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM :		1.27E+04	CFS *

-----

\* Average River Flow Rate, taken at Walter F. George Lock and Dam, located 30.7 miles above Farley Nuclear Plant.

TABLE 1-4B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents - Batch Release Summary  
 Unit: 2  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

-----  
 LIQUID RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	144	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	12723.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	141.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	88.35	MINUTES
MINIMUM TIME PERIOD FOR A BATCH RELEASE	:	60.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM :		8.89E+03	CFS *

-----

\* Average River Flow Rate, taken at Walter F. George Lock and Dam, located 30.7 miles above Farley Nuclear Plant.

TABLE 1-4B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents - Batch Release Summary  
 Unit: 2  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

LIQUID RELEASES

NUMBER OF BATCH RELEASES	:	127	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	11688.67	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	133.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	92.04	MINUTES
MINIMUM TIME PERIOD FOR A BATCH RELEASE	:	72.00	MINUTES
AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF LIQUID EFFLUENT INTO A FLOWING STREAM :		1.27E+04	CFS *

\* Average River Flow Rate, taken at Walter F. George Lock and Dam, located 30.7 miles above Farley Nuclear Plant.

## 2.5 Release Summaries

This section contains the summaries of all radioactive liquid effluents released for Units 1 and 2 during 1994. Typical liquid Minimum Detectable Concentrations (MDC'S) for analyses are in Table 1-5 of this section. Regulatory Guide 1.21 Table 2A is found in this report as Tables 1-1A, 1-1B, and 1-1C. Regulatory Guide 1.21 Table 2B is found in this report as Tables 1-2A, 1-2B, and 1-2C.

### 2.5.1 Liquid Effluents - Summation of All Releases

The summations of all liquid effluent releases are contained in the following tables:

Unit 1	1994	Summation of All Releases	: Table 1-1A
Unit 2	1994	Summation of All Releases	: Table 1-1B
Site	1994	Summation of All Releases	: Table 1-1C

TABLE 1-1A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Liquid Effluents - Summation of All Releases  
Unit: 1  
Starting : 1-Jan-1994      Ending : 30-Jun-1994

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	3.27E-02	7.58E-02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	2.02E-09	4.33E-09	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	2.56E+02	9.34E+01	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.59E-05	5.34E-06	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	5.21E-02	7.89E-04	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	3.23E-09	4.51E-11	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	4.03E-05	4.21E-05	2.50E+01
-----				
E. WASTE VOL RELEASED(PRE-DILUTION)	LITERS	6.15E+07	6.97E+07	1.00E+01
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	1.61E+10	1.74E+10	1.00E+01
-----				

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.



TABLE 1-1A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Liquid Effluents - Summation of All Releases  
Unit: 1  
Starting : 1-Jul-1994      Ending : 31-Dec-1994

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	3.49E-02	1.40E-02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	2.20E-09	9.01E-10	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	1.37E+02	1.60E+02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	8.63E-06	1.03E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	1.12E-04	2.16E-04	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	7.04E-12	1.40E-11	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	1.58E-05	2.82E-05	2.50E+01
-----				
E. WASTE VOL RELEASED (PRE-DILUTION)	LITERS	8.52E+07	8.10E+07	1.00E+01
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	1.58E+10	1.54E+10	1.00E+01
-----				

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-1B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Liquid Effluents - Summation of All Releases  
Unit: 2  
Starting : 1-Jan-1994      Ending : 30-Jun-1994

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	9.92E-03	2.81E-02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	5.30E-10	1.49E-09	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	1.17E+02	7.79E+01	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	6.25E-06	4.12E-06	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	3.70E-02	2.44E-04	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.98E-09	1.29E-11	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	1.76E-05	1.62E-05	2.50E+01
-----				
E. WASTE VOL RELEASED (PRE-DILUTION)	LITERS	6.63E+07	7.01E+07	1.00E+01
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	1.87E+10	1.88E+10	1.00E+01
-----				

\*      Applicable limits are expressed in terms of dose. See Tables  
1-3A and 1-3B of this report.

TABLE 1-1B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents - Summation of All Releases  
 Unit: 2  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	7.82E-03	9.24E-03	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	4.31E-10	5.48E-10	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	2.24E+02	2.89E+02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.24E-05	1.72E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	1.67E-04	9.53E-04	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	9.20E-12	5.65E-11	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	1.60E-05	3.64E-05	2.50E+01
-----				
E. WASTE VOL RELEASED (PRE-DILUTION)	LITERS	1.11E+08	8.16E+07	1.00E+01
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	1.80E+10	1.68E+10	1.00E+01
-----				

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-1C  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Liquid Effluents - Summation of All Releases  
Unit: Site  
Starting : 1-Jan-1994      Ending : 30-Jun-1994

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	4.26E-02	1.04E-01	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.22E-09	2.86E-09	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	3.73E+02	1.71E+02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.07E-05	4.71E-06	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	8.91E-02	1.03E-03	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	2.56E-09	2.84E-11	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	5.79E-05	5.83E-05	2.50E+01
-----				
E. WASTE VOL RELEASED (PRE-DILUTION)	LITERS	1.28E+08	1.40E+08	1.00E+01
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	3.47E+10	3.62E+10	1.00E+01
-----				

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

TABLE 1-1C  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents - Summation of All Releases  
 Unit: Site  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	4.27E-02	2.32E-02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.26E-09	7.17E-10	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	3.61E+02	4.49E+02	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.06E-05	1.39E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	2.79E-04	1.17E-03	2.50E+01
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	8.19E-12	3.61E-11	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	3.19E-05	6.46E-05	2.50E+01
-----				
E. WASTE VOL RELEASED (PRE-DILUTION)	LITERS	1.96E+08	1.63E+08	1.00E+01
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	3.38E+10	3.22E+10	1.00E+01
-----				

\* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

### 2.5.2 Liquid Effluents - Continuous and Batch Releases

The continuous and batch release summaries of all liquid effluent releases (includes listing by nuclide) are contained in the following tables:

Unit 1 1994 Continuous and Batch Releases : Table 1-2A  
Unit 2 1994 Continuous and Batch Releases : Table 1-2B  
Site 1994 Continuous and Batch Releases : Table 1-2C



TABLE 1-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents  
 Unit: 1  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	1.27E-01	2.38E-07	2.56E+02	9.34E+01

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	8.08E-04	6.19E-04
AS-76	CURIES	0.00E+00	0.00E+00	0.00E+00	2.26E-05
CE-141	CURIES	0.00E+00	0.00E+00	2.16E-06	1.64E-05
CE-144	CURIES	0.00E+00	0.00E+00	0.00E+00	1.50E-05
CO-57	CURIES	0.00E+00	0.00E+00	5.84E-07	4.01E-05
CO-58	CURIES	0.00E+00	0.00E+00	1.78E-03	1.91E-02
CO-60	CURIES	0.00E+00	0.00E+00	4.11E-03	3.07E-03
CR-51	CURIES	0.00E+00	0.00E+00	5.78E-04	2.23E-03
CS-134	CURIES	5.95E-05	0.00E+00	7.88E-05	7.98E-04
CS-137	CURIES	1.63E-04	0.00E+00	4.79E-04	1.43E-03
FE-55	CURIES	6.98E-10	1.16E-09	2.61E-03	1.24E-03
FE-59	CURIES	0.00E+00	0.00E+00	1.34E-05	7.36E-06
I-131	CURIES	1.12E-04	0.00E+00	1.64E-04	2.62E-05
I-132	CURIES	0.00E+00	0.00E+00	1.13E-04	0.00E+00
I-133	CURIES	7.23E-03	0.00E+00	6.21E-05	0.00E+00
LA-141	CURIES	0.00E+00	0.00E+00	1.30E-04	6.30E-04
MN-54	CURIES	0.00E+00	0.00E+00	3.78E-04	5.14E-04
NA-24	CURIES	0.00E+00	0.00E+00	0.00E+00	1.49E-05
NB-95	CURIES	0.00E+00	0.00E+00	2.96E-04	7.92E-04
NB-97	CURIES	0.00E+00	0.00E+00	2.30E-04	2.80E-04
OTHER	CURIES	1.37E-03	6.99E-04	5.64E-05	1.37E-05
PR-144	CURIES	0.00E+00	0.00E+00	1.25E-03	9.78E-04
RU-103	CURIES	0.00E+00	0.00E+00	1.06E-05	2.99E-05
SB-122	CURIES	0.00E+00	0.00E+00	0.00E+00	4.37E-06
SB-124	CURIES	0.00E+00	0.00E+00	1.09E-03	5.99E-03
SB-125	CURIES	0.00E+00	0.00E+00	9.07E-03	3.56E-02
SN-113	CURIES	0.00E+00	0.00E+00	2.33E-06	6.04E-06
SN-117M	CURIES	0.00E+00	0.00E+00	1.19E-06	2.10E-05
SR-85	CURIES	0.00E+00	0.00E+00	7.57E-07	0.00E+00
SR-89	CURIES	3.18E-11	9.09E-12	2.09E-05	8.46E-06
SR-90	CURIES	1.08E-11	8.94E-05	7.37E-07	1.51E-05
SR-92	CURIES	0.00E+00	0.00E+00	1.80E-05	3.15E-05
TC-99M	CURIES	0.00E+00	0.00E+00	3.97E-06	0.00E+00

TABLE 1-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents  
 Unit: 1  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
FISSION & ACTIVATION PRODUCTS					
TE-125M	CURIES	0.00E+00	0.00E+00	2.15E-04	1.12E-03
TE-132	CURIES	0.00E+00	0.00E+00	9.24E-05	1.18E-06
ZR-95	CURIES	0.00E+00	0.00E+00	6.78E-05	3.31E-04
TOTALS	CURIES	8.93E-03	7.88E-04	2.37E-02	7.50E-02
DISSOLVED AND ENTRAINED GASES					
KR-85	CURIES	0.00E+00	0.00E+00	1.73E-04	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	9.85E-04	1.79E-05
XE-133	CURIES	6.76E-04	0.00E+00	5.02E-02	7.66E-04
XE-133M	CURIES	0.00E+00	0.00E+00	9.85E-05	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	1.88E-05	3.25E-06
XE-135M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.72E-06
TOTALS	CURIES	6.76E-04	0.00E+00	5.15E-02	7.89E-04
G-ALPHA	CURIES	6.50E-11	1.46E-05	4.03E-05	2.75E-05

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-5 for typical minimum detectable concentrations.

TABLE 1-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents  
 Unit: 1  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H-3	CURIES	6.87E-02	2.53E-07	1.37E+02	1.60E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	0.00E+00	3.91E-05
CO-57	CURIES	0.00E+00	0.00E+00	1.08E-04	4.95E-05
CO-58	CURIES	0.00E+00	0.00E+00	1.94E-02	5.35E-03
CO-60	CURIES	0.00E+00	0.00E+00	3.36E-03	2.54E-03
CR-51	CURIES	0.00E+00	0.00E+00	7.93E-05	0.00E+00
CS-134	CURIES	0.00E+00	0.00E+00	9.78E-04	9.17E-04
CS-137	CURIES	0.00E+00	0.00E+00	1.22E-03	1.34E-03
FE-55	CURIES	4.42E-09	8.38E-09	1.04E-03	2.13E-03
I-131	CURIES	0.00E+00	0.00E+00	0.00E+00	6.21E-06
LA-141	CURIES	0.00E+00	0.00E+00	4.01E-05	0.00E+00
MN-54	CURIES	0.00E+00	0.00E+00	4.45E-04	2.54E-04
NA-24	CURIES	0.00E+00	0.00E+00	4.78E-05	0.00E+00
NB-95	CURIES	0.00E+00	0.00E+00	3.10E-04	9.60E-05
NB-97	CURIES	0.00E+00	0.00E+00	3.08E-04	1.97E-04
OTHER	CURIES	1.03E-03	0.00E+00	0.00E+00	0.00E+00
PM-149	CURIES	0.00E+00	0.00E+00	1.66E-05	0.00E+00
SB-122	CURIES	0.00E+00	0.00E+00	4.97E-06	2.16E-06
SB-124	CURIES	0.00E+00	0.00E+00	3.98E-04	0.00E+00
SB-125	CURIES	0.00E+00	0.00E+00	6.00E-03	9.33E-04
SN-113	CURIES	0.00E+00	0.00E+00	0.00E+00	1.08E-06
SR-89	CURIES	5.46E-11	6.18E-11	8.99E-06	1.50E-05
SR-90	CURIES	3.72E-06	1.68E-11	5.88E-06	5.29E-07
SR-92	CURIES	0.00E+00	0.00E+00	9.42E-05	2.89E-05
TC-99M	CURIES	0.00E+00	0.00E+00	0.00E+00	6.75E-06
TE-127M	CURIES	0.00E+00	0.00E+00	0.00E+00	4.69E-05
ZR-95	CURIES	0.00E+00	0.00E+00	3.55E-05	5.61E-06
TOTALS	CURIES	1.03E-03	8.46E-09	3.39E-02	1.40E-02

TABLE 1-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents  
 Unit: 1  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
DISSOLVED AND ENTRAINED GASES					
AR-41	CURIES	0.00E+00	0.00E+00	0.00E+00	2.46E-06
XE-133	CURIES	0.00E+00	0.00E+00	1.00E-04	2.06E-04
XE-135	CURIES	0.00E+00	0.00E+00	1.16E-05	7.99E-06
TOTALS	CURIES	0.00E+00	0.00E+00	1.12E-04	2.16E-04
G-ALPHA	CURIES	5.28E-11	6.37E-11	1.58E-05	2.82E-05

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-5 for typical minimum detectable concentrations.

TABLE 1-2B\*  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Liquid Effluents  
Unit: 2  
Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	4.98E-03	1.43E-06	1.17E+02	7.79E+01

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	5.72E-04	6.61E-04
AS-76	CURIES	0.00E+00	0.00E+00	1.52E-06	3.69E-06
CO-57	CURIES	0.00E+00	0.00E+00	1.26E-06	1.44E-05
CO-58	CURIES	0.00E+00	0.00E+00	1.52E-03	1.15E-02
CO-60	CURIES	0.00E+00	0.00E+00	1.87E-03	1.39E-03
CR-51	CURIES	0.00E+00	0.00E+00	7.64E-05	1.34E-03
CS-134	CURIES	0.00E+00	0.00E+00	6.73E-05	1.88E-04
CS-137	CURIES	0.00E+00	0.00E+00	1.69E-04	2.88E-04
FE-55	CURIES	7.92E-09	1.01E-03	8.36E-04	6.38E-04
I-131	CURIES	0.00E+00	0.00E+00	1.36E-05	1.94E-05
I-132	CURIES	0.00E+00	0.00E+00	8.79E-05	0.00E+00
I-133	CURIES	0.00E+00	0.00E+00	1.89E-06	0.00E+00
LA-141	CURIES	0.00E+00	0.00E+00	6.19E-05	7.23E-05
M-54	CURIES	0.00E+00	0.00E+00	1.65E-04	1.88E-04
Na-24	CURIES	0.00E+00	0.00E+00	2.28E-05	4.31E-06
NB-95	CURIES	0.00E+00	0.00E+00	4.51E-05	2.31E-04
NB-97	CURIES	0.00E+00	0.00E+00	4.82E-05	8.74E-05
OTHER	CURIES	0.00E+00	1.40E-03	5.35E-07	0.00E+00
PR-144	CURIES	0.00E+00	0.00E+00	4.05E-04	0.00E+00
SB-124	CURIES	0.00E+00	0.00E+00	3.61E-04	1.13E-03
SB-125	CURIES	0.00E+00	0.00E+00	3.11E-03	7.10E-03
SN-117M	CURIES	0.00E+00	0.00E+00	3.28E-06	9.40E-06
SR-89	CURIES	1.24E-10	9.46E-11	9.97E-06	9.84E-06
SR-90	CURIES	7.73E-12	1.01E-04	2.85E-07	3.91E-06
SR-92	CURIES	0.00E+00	0.00E+00	1.68E-06	1.32E-05
TE-125M	CURIES	0.00E+00	0.00E+00	3.32E-04	5.33E-04
TE-132	CURIES	0.00E+00	0.00E+00	1.17E-04	0.00E+00
ZN-65	CURIES	0.00E+00	0.00E+00	0.00E+00	2.04E-06
ZN-69M	CURIES	0.00E+00	0.00E+00	7.60E-07	0.00E+00
ZR-95	CURIES	0.00E+00	0.00E+00	1.04E-05	1.56E-04
TOTALS	CURIES	8.05E-09	2.51E-03	9.92E-03	2.56E-02



TABLE 1-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents  
 Unit: 2  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
DISSOLVED AND ENTRAINED GASES					
XE-131M	CURIES	0.00E+00	0.00E+00	1.04E-03	0.00E+00
XE-133	CURIES	0.00E+00	0.00E+00	3.59E-02	2.44E-04
XE-133M	CURIES	0.00E+00	0.00E+00	3.70E-05	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	1.12E-05	0.00E+00
TOTALS	CURIES	0.00E+00	0.00E+00	3.70E-02	2.44E-04
G-ALPHA	CURIES	3.55E-11	3.64E-11	1.76E-05	1.62E-05

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-5 for typical minimum detectable concentrations.



TABLE 1-2B\*  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Liquid Effluents  
Unit: 2  
Starting : 1-Jul-1994      Ending : 31-Dec-1994

NUCLIDE	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H-3	CURIES	2.61E-01	2.51E-01	2.24E+02	2.89E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	6.41E-05	2.98E-05
AS-76	CURIES	0.00E+00	0.00E+00	1.26E-06	0.00E+00
CO-57	CURIES	0.00E+00	0.00E+00	1.41E-06	4.15E-06
CO-58	CURIES	0.00E+00	0.00E+00	1.24E-03	5.21E-04
CO-60	CURIES	0.00E+00	0.00E+00	4.91E-04	1.08E-03
CS-134	CURIES	0.00E+00	0.00E+00	2.75E-04	1.23E-03
CS-137	CURIES	0.00E+00	0.00E+00	5.04E-04	2.02E-03
FE-55	CURIES	5.87E-05	4.07E-09	7.00E-04	1.99E-03
I-130	CURIES	0.00E+00	0.00E+00	1.68E-05	0.00E+00
I-131	CURIES	0.00E+00	0.00E+00	0.00E+00	7.11E-07
MN-54	CURIES	0.00E+00	0.00E+00	5.97E-05	1.13E-04
NA-24	CURIES	0.00E+00	0.00E+00	0.00E+00	4.33E-06
NB-95	CURIES	0.00E+00	0.00E+00	5.46E-06	0.00E+00
NB-97	CURIES	0.00E+00	0.00E+00	7.44E-05	1.42E-04
OTHER	CURIES	9.95E-04	0.00E+00	0.00E+00	0.00E+00
SB-122	CURIES	0.00E+00	0.00E+00	0.00E+00	5.01E-06
SB-124	CURIES	0.00E+00	0.00E+00	7.75E-05	0.00E+00
SB-125	CURIES	0.00E+00	0.00E+00	3.23E-03	2.06E-03
SR-89	CURIES	1.24E-10	6.37E-11	1.11E-05	2.51E-05
SR-90	CURIES	5.88E-06	1.07E-11	3.16E-07	7.19E-07
SR-92	CURIES	0.00E+00	0.00E+00	3.99E-06	6.37E-06
TC-99M	CURIES	0.00E+00	0.00E+00	0.00E+00	3.99E-06
ZN-65	CURIES	0.00E+00	0.00E+00	0.00E+00	4.04E-06
TOTALS	CURIES	1.06E-03	4.15E-09	6.76E-03	9.24E-03

DISSOLVED AND ENTRAINED GASES

AR-41	CURIES	0.00E+00	0.00E+00	0.00E+00	3.40E-06
XE-133	CURIES	0.00E+00	0.00E+00	1.51E-04	8.87E-04
XE-133M	CURIES	0.00E+00	0.00E+00	0.00E+00	5.41E-06
XE-135	CURIES	0.00E+00	0.00E+00	1.55E-05	5.73E-05

TABLE 1-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents  
 Unit: 2  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
DISSOLVED AND ENTRAINED GASES					
TOTALS	CURIES	0.00E+00	0.00E+00	1.67E-04	9.53E-04
G-ALPHA	CURIES	2.55E-11	3.18E-12	1.60E-05	3.64E-05

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-5 for typical minimum detectable concentrations.

TABLE 1-2C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	1.32E-01	1.67E-06	3.73E+02	1.71E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	1.38E-03	1.28E-03
AS-76	CURIES	0.00E+00	0.00E+00	1.52E-06	2.63E-05
CE-141	CURIES	0.00E+00	0.00E+00	2.16E-06	1.64E-05
CE-144	CURIES	0.00E+00	0.00E+00	0.00E+00	1.50E-05
CO-57	CURIES	0.00E+00	0.00E+00	1.84E-06	5.45E-05
CO-58	CURIES	0.00E+00	0.00E+00	3.30E-03	3.06E-02
CO-60	CURIES	0.00E+00	0.00E+00	5.98E-03	4.46E-03
CR-51	CURIES	0.00E+00	0.00E+00	6.55E-04	3.57E-03
CS-134	CURIES	5.95E-05	0.00E+00	1.46E-04	9.86E-04
CS-137	CURIES	1.63E-04	0.00E+00	6.48E-04	1.72E-03
FE-55	CURIES	8.61E-09	1.01E-03	3.45E-03	1.88E-03
FE-59	CURIES	0.00E+00	0.00E+00	1.34E-05	7.36E-06
I-131	CURIES	1.12E-04	0.00E+00	1.77E-04	4.56E-05
I-132	CURIES	0.00E+00	0.00E+00	2.01E-04	0.00E+00
I-133	CURIES	7.23E-03	0.00E+00	6.40E-05	0.00E+00
LA-141	CURIES	0.00E+00	0.00E+00	1.92E-04	7.03E-04
MN-54	CURIES	0.00E+00	0.00E+00	5.43E-04	7.02E-04
NA-24	CURIES	0.00E+00	0.00E+00	2.28E-05	1.92E-05
NB-95	CURIES	0.00E+00	0.00E+00	3.41E-04	1.02E-03
NB-97	CURIES	0.00E+00	0.00E+00	2.78E-04	3.67E-04
OTHER	CURIES	1.37E-03	2.10E-03	5.69E-05	1.37E-03
PR-144	CURIES	0.00E+00	0.00E+00	1.66E-03	9.78E-04
RU-103	CURIES	0.00E+00	0.00E+00	1.06E-05	2.99E-05
SB-122	CURIES	0.00E+00	0.00E+00	0.00E+00	4.37E-06
SB-124	CURIES	0.00E+00	0.00E+00	1.45E-03	7.12E-03
SB-125	CURIES	0.00E+00	0.00E+00	1.22E-02	4.27E-02
SN-113	CURIES	0.00E+00	0.00E+00	2.33E-06	6.04E-06
SN-117M	CURIES	0.00E+00	0.00E+00	4.46E-06	3.04E-05
SR-85	CURIES	0.00E+00	0.00E+00	7.57E-07	0.00E+00
SR-89	CURIES	1.56E-10	1.04E-10	3.09E-05	1.83E-05
SR-90	CURIES	1.85E-11	1.91E-04	1.02E-06	1.90E-05
SR-92	CURIES	0.00E+00	0.00E+00	1.97E-05	4.47E-05
TC-99M	CURIES	0.00E+00	0.00E+00	3.97E-06	0.00E+00

TABLE 1-2C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2

FISSION & ACTIVATION PRODUCTS

TE-125M	CURIES	0.00E+00	0.00E+00	5.47E-04	1.66E-03
TE-132	CURIES	0.00E+00	0.00E+00	2.09E-04	1.18E-06
ZN-65	CURIES	0.00E+00	0.00E+00	0.00E+00	2.04E-06
ZN-69M	CURIES	0.00E+00	0.00E+00	7.60E-07	0.00E+00
ZR-95	CURIES	0.00E+00	0.00E+00	7.83E-05	4.87E-04
TOTALS	CURIES	8.93E-03	3.30E-03	3.37E-02	1.01E-01

DISSOLVED AND ENTRAINED GASES

KR-85	CURIES	0.00E+00	0.00E+00	1.73E-04	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	2.02E-03	1.79E-05
XE-133	CURIES	6.76E-04	0.00E+00	8.61E-02	1.01E-03
XE-133M	CURIES	0.00E+00	0.00E+00	1.36E-04	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	3.00E-05	3.25E-06
XE-135M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.72E-06
TOTALS	CURIES	6.76E-04	0.00E+00	8.85E-02	1.03E-03
G-ALPHA	CURIES	1.00E-10	1.46E-05	5.79E-05	4.37E-05

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-5 for typical minimum detectable concentrations.



TABLE 1-2C\*  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Liquid Effluents  
Unit: Site  
Starting : 1-Jul-1994      Ending : 31-Dec-1994

NUCLIDE	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H-3	CURIES	3.30E-01	2.51E-01	3.61E+02	4.49E+02

FISSION & ACTIVATION PRODUCTS

AG-110M	CURIES	0.00E+00	0.00E+00	6.41E-05	6.90E-05
AS-76	CURIES	0.00E+00	0.00E+00	1.26E-06	0.00E+00
CO-57	CURIES	0.00E+00	0.00E+00	1.09E-04	5.37E-05
CO-58	CURIES	0.00E+00	0.00E+00	2.06E-02	5.87E-03
CO-60	CURIES	0.00E+00	0.00E+00	3.85E-03	3.63E-03
CR-51	CURIES	0.00E+00	0.00E+00	7.93E-05	0.00E+00
CS-134	CURIES	0.00E+00	0.00E+00	1.25E-03	2.14E-03
CS-137	CURIES	0.00E+00	0.00E+00	1.73E-03	3.36E-03
FE-55	CURIES	5.87E-05	1.25E-08	1.74E-03	4.12E-03
I-130	CURIES	0.00E+00	0.00E+00	1.68E-05	0.00E+00
I-131	CURIES	0.00E+00	0.00E+00	0.00E+00	6.92E-06
LA-141	CURIES	0.00E+00	0.00E+00	4.01E-05	0.00E+00
MN-54	CURIES	0.00E+00	0.00E+00	5.04E-04	3.67E-04
NA-24	CURIES	0.00E+00	0.00E+00	4.78E-05	4.33E-06
NB-95	CURIES	0.00E+00	0.00E+00	3.16E-04	9.60E-05
NB-97	CURIES	0.00E+00	0.00E+00	3.83E-04	3.39E-04
OTHER	CURIES	2.02E-03	0.00E+00	0.00E+00	0.00E+00
PM-149	CURIES	0.00E+00	0.00E+00	1.66E-05	0.00E+00
SB-122	CURIES	0.00E+00	0.00E+00	4.97E-06	7.17E-06
SB-124	CURIES	0.00E+00	0.00E+00	4.76E-04	0.00E+00
SB-125	CURIES	0.00E+00	0.00E+00	9.23E-03	3.00E-03
SN-113	CURIES	0.00E+00	0.00E+00	0.00E+00	1.08E-06
SR-89	CURIES	1.78E-10	1.26E-10	2.00E-05	4.02E-05
SR-90	CURIES	9.60E-06	2.75E-11	6.20E-06	1.25E-06
SR-92	CURIES	0.00E+00	0.00E+00	9.82E-05	3.53E-05
TC-99M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.07E-05
TE-127M	CURIES	0.00E+00	0.00E+00	0.00E+00	4.69E-05
ZN-65	CURIES	0.00E+00	0.00E+00	0.00E+00	4.04E-06
ZR-95	CURIES	0.00E+00	0.00E+00	3.55E-05	5.61E-06
TOTALS	CURIES	2.09E-03	1.26E-08	4.06E-02	2.32E-02

TABLE 1-2C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Liquid Effluents  
 Unit: Site  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
DISSOLVED AND ENTRAINED GASES					
AR-41	CURIES	0.00E+00	0.00E+00	0.00E+00	5.87E-06
XE-133	CURIES	0.00E+00	0.00E+00	2.52E-04	1.09E-03
XE-133M	CURIES	0.00E+00	0.00E+00	0.00E+00	5.41E-06
XE-135	CURIES	0.00E+00	0.00E+00	2.71E-05	6.53E-05
TOTALS	CURIES	0.00E+00	0.00E+00	2.79E-04	1.17E-03
G-ALPHA	CURIES	7.82E-11	6.68E-11	3.19E-05	6.46E-05

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 1-5 for typical minimum detectable concentrations.



## 2.6 Radiological Impact

The total body and organ doses for Units 1 and 2 are provided in the following tables in order to show conformance with the limits of ODCM 2.1.3 :

Unit 1 1994 Liquid Doses : Table 1-3A

Unit 2 1994 Liquid Doses : Table 1-3B

TABLE 1-3A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
Unit: 1  
Starting: 01-Jan-1994      Ending: 30-Jun-1994

Cumulative Doses per Quarter

Organ	ODCM Limit	Units	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Bone	5.0	mrem	2.27E-03	4.55E-02	6.48E-03	1.30E-01
Liver	5.0	mrem	3.91E-03	7.81E-02	4.64E-03	9.27E-02
TBody	1.5	mrem	3.40E-03	2.27E-01	4.48E-03	2.99E-01
Thyroid	5.0	mrem	4.70E-03	9.40E-02	8.13E-04	1.63E-02
Kidney	5.0	mrem	3.18E-03	6.35E-02	3.26E-03	6.51E-02
Lung	5.0	mrem	4.78E-02	9.56E-01	1.69E-01	3.38E+00
GILLI	5.0	mrem	1.08E-02	2.17E-01	2.90E-02	5.80E-01

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	10.0	mrem	8.76E-03	8.76E-02
Liver	10.0	mrem	8.54E-03	8.54E-02
TBody	3.0	mrem	7.88E-03	2.63E-01
Thyroid	10.0	mrem	5.51E-03	5.51E-02
Kidney	10.0	mrem	6.43E-03	6.43E-02
Lung	10.0	mrem	2.17E-01	2.17E+00
GILLI	10.0	mrem	3.98E-02	3.98E-01

TABLE 1-3A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
Unit: 1  
Starting: 01-Jul-1994      Ending: 31-Dec-1994

Cumulative Doses per Quarter

Organ	ODCM Limit	Units	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Bone	5.0	mrem	2.77E-03	5.54E-02	2.71E-03	5.42E-02
Liver	5.0	mrem	4.98E-03	9.97E-02	5.31E-03	1.06E-01
TBody	1.5	mrem	4.19E-03	2.79E-01	4.16E-03	2.77E-01
Thyroid	5.0	mrem	9.78E-04	1.96E-02	1.18E-03	2.36E-02
Kidney	5.0	mrem	2.21E-03	4.42E-02	2.60E-03	5.20E-02
Lung	5.0	mrem	3.03E-02	6.06E-01	6.19E-03	1.24E-01
GILLI	5.0	mrem	7.18E-03	1.44E-01	3.13E-03	6.25E-02

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	10.0	mrem	1.42E-02	1.42E-01
Liver	10.0	mrem	1.88E-02	1.88E-01
TBody	3.0	mrem	1.62E-02	5.41E-01
Thyroid	10.0	mrem	7.67E-03	7.67E-02
Kidney	10.0	mrem	1.12E-02	1.12E-01
Lung	10.0	mrem	2.53E-01	2.53E+00
GILLI	10.0	mrem	5.01E-02	5.01E-01

TABLE 1-3B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
 Unit: 2  
 Starting: 01-Jan-1994      Ending: 30-Jun-1994

Cumulative Doses per Quarter

Organ	ODCM Limit	Units	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Bone	5.0	mrem	6.90E-04	1.38E-02	2.89E-03	5.77E-02
Liver	5.0	mrem	1.38E-03	2.77E-02	1.60E-03	3.20E-02
TBody	1.5	mrem	1.24E-03	8.29E-02	1.77E-03	1.18E-01
Thyroid	5.0	mrem	8.95E-04	1.79E-02	6.12E-04	1.22E-02
Kidney	5.0	mrem	1.57E-03	3.15E-02	1.48E-03	2.97E-02
Lung	5.0	mrem	1.51E-02	3.01E-01	3.22E-02	6.45E-01
GILLI	5.0	mrem	4.62E-03	9.24E-02	7.31E-03	1.46E-01

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	10.0	mrem	3.58E-03	3.58E-02
Liver	10.0	mrem	2.98E-03	2.98E-02
TBody	3.0	mrem	3.02E-03	1.01E-01
Thyroid	10.0	mrem	1.51E-03	1.51E-02
Kidney	10.0	mrem	3.06E-03	3.06E-02
Lung	10.0	mrem	4.73E-02	4.73E-01
GILLI	10.0	mrem	1.19E-02	1.19E-01

TABLE 1-3B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSES TO A MEMBER OF THE PUBLIC DUE TO LIQUID RELEASES  
Unit: 2  
Starting: 01-Jul-1994                      Ending: 31-Dec-1994

Cumulative Doses per Quarter

Organ	ODCM Limit	Units	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Bone	5.0	mrem	1.09E-03	2.18E-02	3.53E-03	7.06E-02
Liver	5.0	mrem	2.85E-03	5.71E-02	7.42E-03	1.48E-01
TBody	1.5	mrem	2.52E-03	1.68E-01	5.87E-03	3.91E-01
Thyroid	5.0	mrem	1.54E-03	3.08E-02	1.97E-03	3.95E-02
Kidney	5.0	mrem	1.94E-03	3.89E-02	3.70E-03	7.39E-02
Lung	5.0	mrem	1.61E-02	3.22E-01	1.20E-02	2.39E-01
GILLI	5.0	mrem	3.21E-03	6.41E-02	3.33E-03	6.65E-02

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	10.0	mrem	8.20E-03	8.20E-02
Liver	10.0	mrem	1.33E-02	1.33E-01
TBody	3.0	mrem	1.14E-02	3.80E-01
Thyroid	10.0	mrem	5.02E-03	5.02E-02
Kidney	10.0	mrem	8.70E-03	8.70E-02
Lung	10.0	mrem	7.54E-02	7.54E-01
GILLI	10.0	mrem	1.85E-02	1.85E-01

TABLE 1-5  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 TYPICAL LIQUID MDC'S ACHIEVED ON COUNTING SYSTEM

Nuclide	MDC (uCi/ML)
MN-54	3.14E-08
CO-58	4.92E-08
FE-59	7.19E-08
CO-60	4.77E-08
ZN-65	8.11E-08
MO-99	1.29E-07
I-131	2.53E-08
CS-134	3.51E-08
CS-137	4.28E-08
CE-141	5.41E-08
CE-144	1.95E-07



### 3.0 GASEOUS EFFLUENTS

This section contains applicable ODCM limits for gaseous effluents as well as the quantities of radioactive gaseous effluents released during 1994. These quantities are summarized on a quarterly basis and include any unplanned releases. Tabulations are provided of the offsite air doses calculated in accordance with ODCM 3.4.2 to show conformance with the limits of ODCM 3.1.3, and the offsite organ doses to a member of the public calculated in accordance with ODCM 3.4.3 to show conformance with ODCM 3.1.4.

#### 3.1 ODCM Limits

In accordance with Technical Specifications 6.8.3.e(v) and 6.8.3.e(viii), the air dose due to noble gases released in gaseous effluents, from each reactor unit, to areas at and beyond the SITE BOUNDARY (see ODCM Figure 10-1) shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation, and
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

In accordance with Technical Specifications 6.8.3.e(v) and 6.8.3.e(ix), the dose to a MEMBER OF THE PUBLIC from I-131, I-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released, from each reactor unit, to areas at and beyond the SITE BOUNDARY (see ODCM Figure 10-1) shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 7.5 mrem to any organ, and
- b. During any calendar year: Less than or equal to 15 mrem to any organ.

#### 3.2 Measurements and Approximation of Total Radioactivity

The following noble gases are considered in evaluating gaseous effluents:

KR-87	XE-133
KR-88	XE-135
XE-133M	XE-138

The following radioiodines and radioactive materials in particulate form are specifically considered in evaluating gaseous effluents:

MN-54	MO-99
FE-59	I-131
CO-58	CS-134
CO-60	CS-137
ZN-65	CE-141
SR-89	CE-144
SR-90	H-3

Periodic grab samples from plant effluent streams are analyzed by a computerized pulse height analyzer system utilizing high resolution germanium detectors. Samples are obtained and analyzed in accordance with ODCM Table 3-3. Isotopic values thus obtained are used for release rate calculations as specified in ODCM 3.4.2 and ODCM 3.4.3. Only those nuclides which are detected are used in calculations. For radioiodines and particulates, in addition to the nuclides listed above other nuclides with half-lives greater than 8 days which are identified are also considered.

Continuous Releases: Continuous sampling is performed on the continuous releases points (i.e. the Plant Vent Stack, Containment Purge, and the Turbine Building Vent). Particulate material is collected by filtration. Periodically these filters are removed and analyzed on the pulse height analyzer to identify and quantify radioactive materials collected on the filters. Particulate filters are then analyzed for gross alpha and strontium as required. Gross alpha determinations are made using a 2 pi gas flow proportional counter. SR-89 and SR-90 values are obtained by chemical separation and subsequent analysis using 2 pi gas flow proportional counters.

Batch Releases: The processing of batch type releases (from Containment or Waste Gas Decay Tanks) is analogous to continuous releases, except that the release is not commenced until samples have been obtained and analyzed.

The maximum errors associated with monitor readings, sample flow, sample collection, monitor calibration and laboratory procedure are collectively estimated to be:

Fission and Activation Gases	Iodine	Particulates	Tritium
75%	60%	50%	45%

The average error associated with counting is estimated to be:

Fission and Activation Gases	Iodine	Particulates	Tritium
19%	28%	20%	8%

### 3.3 Abnormal Releases

There were no abnormal gaseous releases on either Unit 1 or Unit 2 during 1994.

### 3.4 Batch Releases

Batch release information for Units 1 and 2 is summarized in the following tables:

Unit 1 1994 Gaseous Batch Releases : Table 2-6A

Unit 2 1994 Gaseous Batch Releases : Table 2-6B

TABLE 2-6A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Gaseous Effluents - Batch Release Summary  
Unit: 1  
Starting : 1-Jan-1994      Ending : 30-Jun-1994

GASEOUS RELEASES

NUMBER OF BATCH RELEASES	:	13	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	5649.25	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	937.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	434.56	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	115.00	MINUTES

TABLE 2-6A  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents - Batch Release Summary  
 Unit: 1  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

-----  
 -----  
 GASEOUS RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	0	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	0.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	0.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	0.00	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	0.00	MINUTES

-----



TABLE 2-6B  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents - Batch Release Summary  
 Unit: 2  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

-----  
 -----  
 GASEOUS RELEASES  
 -----

NUMBER OF BATCH RELEASES	:	0	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	0.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	0.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	0.00	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	0.00	MINUTES

-----

TABLE 2-6B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Gaseous Effluents - Batch Release Summary  
Unit: 2  
Starting : 1-Jul-1994      Ending : 31-Dec-1994

-----  
-----  
GASEOUS RELEASES  
-----

NUMBER OF BATCH RELEASES	:	0	
TOTAL TIME PERIOD FOR BATCH RELEASES	:	0.00	MINUTES
MAXIMUM TIME PERIOD FOR A BATCH RELEASE	:	0.00	MINUTES
AVERAGE TIME PERIOD FOR BATCH RELEASES	:	0.00	MINUTES
MINIMUM TIME FOR A BATCH RELEASE	:	0.00	MINUTES

-----

### 3.5 Release Summaries

This section contains the summaries of all radioactive gaseous effluents released for Units 1 and 2 during 1994. Typical gaseous Minimum Detectable Concentrations (MDC'S) for analyses are in Table 2-7 of this section. Regulatory Guide 1.21 Table 1A is found in this report as Tables 2-1A, 2-1B, and 2-1C. Regulatory Guide 1.21 Table 1B is found in this report as Tables 2-2A, 2-2B, and 2-2C. Regulatory Guide 1.21 Table 1C is found in this report as Tables 2-3A, 2-3B, and 2-3C.

#### 3.5.1 Gaseous Effluents - Summation of All Releases

The summations of all gaseous effluent releases are contained in the following tables:

Unit 1 1994 Summation of All Releases : Table 2-1A  
Unit 2 1994 Summation of All Releases : Table 2-1B  
Site 1994 Summation of All Releases : Table 2-1C

TABLE 2-1A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Gaseous Effluents - Summation of All Releases  
Unit: 1  
Starting : 1-Jan-1994      Ending : 30-Jun-1994

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE	CURIES	1.47E+02	6.06E+00	9.40E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.89E+01	7.71E-01	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. RADIOIODINES				
-----				
1. TOTAL IODINE-131	CURIES	3.60E-03	6.30E-04	8.80E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	4.63E-04	8.01E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	2.58E-03	5.04E-04	7.00E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	3.32E-04	6.41E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
4. GROSS ALPHA RADIOACTIVITY	CURIES	6.47E-08	3.69E-07	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	4.01E+00	4.03E+00	5.30E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	5.16E-01	5.13E-01	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Gaseous Effluents - Summation of All Releases  
Unit: 1  
Starting : 1-Jul-1994      Ending : 31-Dec-1994

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
1. TOTAL RELEASE	CURIES	6.82E+00	4.01E+00	9.40E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	8.58E-01	5.05E-01	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. RADIOIODINES				
1. TOTAL IODINE-131	CURIES	1.20E-05	3.88E-06	8.80E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.51E-06	4.88E-07	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. PARTICULATES				
1. PARTICULATES (HALF-LIVES > 8 DAYS)	CURIES	1.02E-03	6.79E-03	7.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.29E-04	8.54E-04	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
4. GROSS ALPHA RADIOACTIVITY	CURIES	6.33E-07	3.26E-08	
-----				
D. TRITIUM				
1. TOTAL RELEASE	CURIES	2.35E+01	2.31E+01	5.30E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.96E+00	2.91E+00	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.



TABLE 2-1B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Gaseous Effluents - Summation of All Releases  
Unit: 2  
Starting : 1-Jan-1994      Ending : 30-Jun-1994

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE	CURIES	1.40E+01	8.97E+00	9.40E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.80E+00	1.14E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. RADIOIODINES				
-----				
1. TOTAL IODINE-131	CURIES	1.84E-05	3.96E-06	8.80E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.36E-06	5.04E-07	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	6.68E-04	5.66E-04	7.00E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	8.59E-05	7.19E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
4. GROSS ALPHA RADIOACTIVITY	CURIES	7.73E-08	1.50E-08	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	1.52E+01	2.11E+01	5.30E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.95E+00	2.68E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Gaseous Effluents - Summation of All Releases  
Unit: 2  
Starting : 1-Jul-1994      Ending : 31-Dec-1994

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE	CURIES	1.01E+01	1.33E+01	9.40E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.27E+00	1.68E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. RADIOIODINES				
-----				
1. TOTAL IODINE-131	CURIES	0.00E+00	0.00E+00	8.80E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	0.00E+00	0.00E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	9.73E-04	4.76E-04	7.00E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.22E-04	5.99E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
4. GROSS ALPHA RADIOACTIVITY	CURIES	3.52E-07	8.63E-07	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	8.49E+00	7.99E+00	5.30E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.07E+00	1.01E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1C  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Gaseous Effluents - Summation of All Releases  
Unit: Site  
Starting : 1-Jan-1994      Ending : 30-Jun-1994

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE	CURIES	1.61E+02	1.50E+01	9.40E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.07E+01	1.91E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. RADIOIODINES				
-----				
1. TOTAL IODINE-131	CURIES	3.62E-03	6.34E-04	8.80E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	4.65E-04	8.06E-05	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	3.25E-03	1.07E-03	7.00E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	4.18E-04	1.36E-04	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
4. GROSS ALPHA RADIOACTIVITY	CURIES	1.42E-07	3.84E-07	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	1.92E+01	2.51E+01	5.30E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.47E+00	3.19E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

TABLE 2-1C  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
Gaseous Effluents - Summation of All Releases  
Unit: Site  
Starting : 1-Jul-1994      Ending : 31-Dec-1994

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE	CURIES	1.69E+01	1.73E+01	9.40E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.13E+00	2.18E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
B. RADIOIODINES				
-----				
1. TOTAL IODINE-131	CURIES	1.20E-05	3.88E-06	8.80E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.51E-06	4.88E-07	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	1.99E-03	7.27E-03	7.00E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.50E-04	9.14E-04	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				
4. GROSS ALPHA RADIOACTIVITY	CURIES	9.85E-07	8.96E-07	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	3.20E+01	3.11E+01	5.30E+01
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	4.03E+00	3.91E+00	
-----				
3. PERCENT OF APPLICABLE LIMIT	%	*	*	
-----				

\* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, and 2-5B of this report.

### 3.5.2 Gaseous Effluents - Mixed Mode Releases

The summaries of all gaseous effluent mixed mode releases (includes listing by nuclide) are contained in the following tables :

Unit 1 1994 Mixed Mode Summary : Table 2-2A  
Unit 2 1994 Mixed Mode Summary : Table 2-2B  
Site 1994 Mixed Mode Summary : Table 2-2C



TABLE 2-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 1  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2

FISSION GASES

AR-41	CURIES	3.40E+00	5.34E+00	0.00E+00	0.00E+00
KR-85M	CURIES	0.00E+00	0.00E+00	8.55E-03	0.00E+00
XE-135	CURIES	2.66E+00	1.32E-01	2.66E-01	9.68E-05
XE-133M	CURIES	6.20E-01	0.00E+00	2.62E-01	0.00E+00
XE-133	CURIES	1.12E+02	0.00E+00	2.36E+01	5.36E-03
XE-131M	CURIES	0.00E+00	0.00E+00	3.37E-01	0.00E+00
KR-85	CURIES	0.00E+00	0.00E+00	1.07E+00	8.26E-02
TOTAL FOR PERIOD	CURIES	1.19E+02	5.97E+00	2.55E+01	8.81E-02

IODINES

I-132	CURIES	1.12E-04	0.00E+00	0.00E+00	0.00E+00
I-133	CURIES	1.98E-05	4.03E-05	0.00E+00	0.00E+00
I-131	CURIES	3.57E-03	6.30E-04	2.76E-07	0.00E+00
TOTAL FOR PERIOD	CURIES	3.70E-03	6.70E-04	2.76E-07	0.00E+00

PARTICULATES

I-131	CURIES	3.52E-06	2.74E-07	1.14E-08	0.00E+00
CR-51	CURIES	0.00E+00	7.84E-07	0.00E+00	0.00E+00
CO-58	CURIES	0.00E+00	9.40E-07	0.00E+00	0.00E+00
Y-88	CURIES	0.00E+00	0.00E+00	2.65E-04	0.00E+00
OTHER	CURIES	2.17E-03	4.89E-04	1.26E-04	1.84E-08
TOTAL FOR PERIOD	CURIES	2.17E-03	4.91E-04	3.91E-04	1.84E-08



TABLE 2-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 1  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	4.01E+00	4.03E+00	0.00E+00	0.00E+00
G-ALPHA	CURIES	6.47E-08	3.69E-07	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

TABLE 2-2A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 1  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
AR-41	CURIES	5.84E+00	3.98E+00	0.00E+00	0.00E+00
XE-135	CURIES	9.78E-01	0.00E+00	0.00E+00	0.00E+00
XE-133	CURIES	0.00E+00	3.20E-02	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	6.82E+00	4.01E+00	0.00E+00	0.00E+00
IODINES					
I-133	CURIES	1.45E-04	8.38E-05	0.00E+00	0.00E+00
I-131	CURIES	1.20E-05	3.88E-06	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.57E-04	8.76E-05	0.00E+00	0.00E+00
PARTICULATES					
OTHER	CURIES	1.02E-03	6.78E-03	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.02E-03	6.78E-03	0.00E+00	0.00E+00
H-3	CURIES	2.35E+01	2.31E+01	0.00E+00	0.00E+00
G-ALPHA	CURIES	6.33E-07	3.42E-08	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

TABLE 2-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 2  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
FISSION GASES					
AR-41	CURIES	5.06E+00	8.91E+00	0.00E+00	0.00E+00
XE-133	CURIES	8.96E+00	6.47E-02	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.40E+01	8.97E+00	0.00E+00	0.00E+00
IODINES					
I-133	CURIES	7.83E-06	8.44E-06	0.00E+00	0.00E+00
I-131	CURIES	1.84E-05	3.96E-06	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	2.62E-05	1.24E-05	0.00E+00	0.00E+00
PARTICULATES					
SR-90	CURIES	0.00E+00	3.21E-09	0.00E+00	0.00E+00
OTHER	CURIES	6.60E-04	5.56E-04	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	6.60E-04	5.57E-04	0.00E+00	0.00E+00
H-3	CURIES	1.52E+01	2.11E+01	0.00E+00	0.00E+00
G-ALPHA	CURIES	7.73E-08	1.50E-08	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

TABLE 2-2B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Mixed-Mode Level Releases  
 Unit: 2  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
AR-41	CURIES	1.01E+01	6.15E+00	0.00E+00	0.00E+00
XE-135	CURIES	0.00E+00	1.93E+00	0.00E+00	0.00E+00
XE-133	CURIES	0.00E+00	5.25E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.01E+01	1.33E+01	0.00E+00	0.00E+00
PARTICULATES					
SR-90	CURIES	3.75E-16	0.00E+00	0.00E+00	0.00E+00
OTHER	CURIES	9.70E-04	4.70E-04	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	9.70E-04	4.70E-04	0.00E+00	0.00E+00
H-3	CURIES	8.49E+00	7.99E+00	0.00E+00	0.00E+00
G-ALPHA	CURIES	3.52E-07	8.63E-07	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

TABLE 2-2C\*

Joseph M. Farley Nuclear Plant

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994

Gaseous Effluents-Mixed-Mode Level Releases

Unit: Site

Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2

FISSION GASES

AR-41	CURIES	8.45E+00	1.47E+01	0.00E+00	0.00E+00
KR-85M	CURIES	0.00E+00	0.00E+00	8.55E-03	0.00E+00
XE-135	CURIES	2.66E+00	1.32E-01	2.66E-01	9.68E-05
XE-133M	CURIES	6.20E-01	0.00E+00	2.62E-01	0.00E+00
XE-133	CURIES	1.21E+02	6.47E-02	2.36E+01	5.36E-03
XE-131M	CURIES	0.00E+00	0.00E+00	3.37E-01	0.00E+00
KR-85	CURIES	0.00E+00	0.00E+00	1.07E+00	8.26E-02
TOTAL FOR PERIOD	CURIES	1.33E+02	1.49E+01	2.55E+01	8.81E-02

IODINES

I-132	CURIES	1.12E-04	0.00E+00	0.00E+00	0.00E+00
I-133	CURIES	2.76E-05	4.88E-05	0.00E+00	0.00E+00
I-131	CURIES	3.59E-03	6.33E-04	2.76E-07	0.00E+00
TOTAL FOR PERIOD	CURIES	3.73E-03	6.82E-04	2.76E-07	0.00E+00

PARTICULATES

I-131	CURIES	3.52E-06	2.74E-07	1.14E-08	0.00E+00
CR-51	CURIES	0.00E+00	7.84E-07	0.00E+00	0.00E+00
CO-58	CURIES	0.00E+00	9.40E-07	0.00E+00	0.00E+00
Y-88	CURIES	0.00E+00	0.00E+00	2.65E-04	0.00E+00
SR-90	CURIES	0.00E+00	3.21E-09	0.00E+00	0.00E+00
OTHER	CURIES	2.83E-03	1.05E-03	1.26E-04	1.84E-08
TOTAL FOR PERIOD	CURIES	2.83E-03	1.05E-03	3.91E-04	1.84E-08

TABLE 2-2C\*

Joseph M. Farley Nuclear Plant

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994

Gaseous Effluents-Mixed-Mode Level Releases

Unit: Site

Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
H-3	CURIES	1.92E+01	2.51E+01	0.00E+00	0.00E+00
G-ALPHA	CURIES	1.42E-07	3.84E-07	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.



TABLE 2-2C\*

Joseph M. Farley Nuclear Plant

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994

Gaseous Effluents-Mixed-Mode Level Releases

Unit: Site

Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
AR-41	CURIES	1.59E+01	1.01E+01	0.00E+00	0.00E+00
XE-135	CURIES	9.78E-01	1.93E+00	0.00E+00	0.00E+00
XE-133	CURIES	0.00E+00	5.28E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.69E+01	1.73E+01	0.00E+00	0.00E+00
IODINES					
I-133	CURIES	1.45E-04	8.38E-05	0.00E+00	0.00E+00
I-131	CURIES	1.20E-05	3.88E-06	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.57E-04	8.76E-05	0.00E+00	0.00E+00
PARTICULATES					
SR-90	CURIES	3.75E-16	0.00E+00	0.00E+00	0.00E+00
OTHER	CURIES	1.99E-03	7.25E-03	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.99E-03	7.25E-03	0.00E+00	0.00E+00
H-3	CURIES	3.20E+01	3.10E+01	0.00E+00	0.00E+00
G-ALPHA	CURIES	9.85E-07	8.98E-07	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

### 3.5.3 Gaseous Effluents - Ground Mode Releases

The summaries of all gaseous effluent ground mode releases (includes listing by nuclide) are contained in the following tables :

Unit 1 1994 Ground Mode Summary : Table 2-3A  
Unit 2 1994 Ground Mode Summary : Table 2-3B  
Site 1994 Ground Mode Summary : Table 2-3C

TABLE 2-3A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Ground Level Releases  
 Unit: 1  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2

FISSION GASES

XE-133M	CURIES	0.00E+00	0.00E+00	3.89E-02	0.00E+00
XE-133	CURIES	1.59E-01	0.00E+00	2.61E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.59E-01	0.00E+00	2.65E+00	0.00E+00

IODINES

I-133	CURIES	0.00E+00	0.00E+00	4.11E-07	0.00E+00
I-131	CURIES	0.00E+00	0.00E+00	2.31E-05	0.00E+00
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	2.35E-05	0.00E+00

PARTICULATES

I-131	CURIES	0.00E+00	0.00E+00	2.02E-07	0.00E+00
OTHER	CURIES	1.17E-05	1.30E-05	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.17E-05	1.30E-05	2.02E-07	0.00E+00

H-3	CURIES	6.18E-04	4.08E-04	4.37E-04	0.00E+00
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\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

TABLE 2-3A\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Ground Level Releases  
 Unit: 1  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IODINES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATES					
OTHER	CURIES	4.85E-06	1.37E-05	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	4.85E-06	1.37E-05	0.00E+00	0.00E+00
H-3	CURIES	2.41E-04	3.91E-02	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

TABLE 2-3B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Ground Level Releases  
 Unit: 2  
 Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
FISSION GASES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IODINES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATES					
OTHER	CURIES	8.60E-06	8.73E-06	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	8.60E-06	8.73E-06	0.00E+00	0.00E+00
H-3	CURIES	6.62E-04	3.57E-04	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

TABLE 2-3B\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Ground Level Releases  
 Unit: 2  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IODINES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATES					
OTHER	CURIES	3.85E-06	6.57E-06	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	3.85E-06	6.57E-06	0.00E+00	0.00E+00
H-3	CURIES	3.09E-04	2.02E-04	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.



TABLE 2-3C\*

Joseph M. Farley Nuclear Plant

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994

Gaseous Effluents-Ground Level Releases

Unit: Site

Starting : 1-Jan-1994      Ending : 30-Jun-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
FISSION GASES					
XE-133M	CURIES	0.00E+00	0.00E+00	3.89E-02	0.00E+00
XE-133	CURIES	1.59E-01	0.00E+00	2.61E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.59E-01	0.00E+00	2.65E+00	0.00E+00
IODINES					
I-133	CURIES	0.00E+00	0.00E+00	4.11E-07	0.00E+00
I-131	CURIES	0.00E+00	0.00E+00	2.31E-05	0.00E+00
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	2.35E-05	0.00E+00
PARTICULATES					
I-131	CURIES	0.00E+00	0.00E+00	2.02E-07	0.00E+00
OTHER	CURIES	2.03E-05	2.17E-05	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	2.03E-05	2.17E-05	2.02E-07	0.00E+00
H-3	CURIES	1.28E-03	7.65E-04	4.37E-04	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

TABLE 2-3C\*  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 Gaseous Effluents-Ground Level Releases  
 Unit: Site  
 Starting : 1-Jul-1994      Ending : 31-Dec-1994

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IODINES					
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PARTICULATES					
OTHER	CURIES	8.70E-06	2.03E-05	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	8.70E-06	2.03E-05	0.00E+00	0.00E+00
H-3	CURIES	5.50E-04	3.93E-02	0.00E+00	0.00E+00

\* Zeroes in this table indicate that no radioactivity was present at detectable levels. See Table 2-7 for typical minimum detectable concentrations.

### 3.6 Radiological Impact

The air doses and organ doses due to gaseous effluents for Units 1 and 2 are provided in the following tables in order to show conformance with the limits of ODCM 3.1.3 and ODCM 3.1.4 :

Unit 1 1994 Air Doses	:	Table 2-4A
Unit 2 1994 Air Doses	:	Table 2-4B
Unit 1 1994 Organ Doses	:	Table 2-5A
Unit 2 1994 Organ Doses	:	Table 2-5B

TABLE 2-4A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
AIR DOSES DUE TO GASEOUS RELEASES

Unit: 1

Starting: 01-Jan-1994

Ending: 30-Jun-1994

Cumulative Doses per Quarter

Type of Radi- ation	ODCM Limit	Units	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Gamma	5.0	mrads	4.46E-03	8.91E-02	1.87E-03	3.74E-02
Beta	10.0	mrads	1.02E-02	1.02E-01	6.73E-04	6.73E-03

Cumulative Doses per Year

Type of Radi- ation	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Gamma	10.0	mrads	6.33E-03	6.33E-02
Beta	20.0	mrads	1.09E-02	5.45E-02

TABLE 2-4A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
AIR DOSES DUE TO GASEOUS RELEASES

Unit: 1

Starting: 01-Jul-1994

Ending: 31-Dec-1994

Cumulative Doses per Quarter

Type of Radi- ation	ODCM Limit	Units	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Gamma	5.0	mrad	1.92E-03	3.85E-02	1.27E-03	2.54E-02
Beta	10.0	mrad	7.38E-04	7.38E-03	4.48E-04	4.48E-03

Cumulative Doses per Year

Type of Radi- ation	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Gamma	10.0	mrad	9.52E-03	9.52E-02
Beta	20.0	mrad	1.21E-02	6.04E-02

TABLE 2-4B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
AIR DOSES DUE TO GASEOUS RELEASES

Unit: 2

Starting: 01-Jan-1994

Ending: 30-Jun-1994

Cumulative Doses per Quarter

Type of Radi- ation	ODCM Limit	Units	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Gamma	5.0	mrads	1.72E-03	3.44E-02	2.84E-03	5.67E-02
Beta	10.0	mrads	8.90E-04	8.90E-03	1.00E-03	1.00E-02

Cumulative Doses per Year

Type of Radi- ation	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Gamma	10.0	mrads	4.55E-03	4.55E-02
Beta	20.0	mrads	1.89E-03	9.46E-03



TABLE 2-4B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
AIR DOSES DUE TO GASEOUS RELEASES

Unit: 2

Starting: 01-Jul-1994

Ending: 31-Dec-1994

Cumulative Doses per Quarter

Type of Radi- ation	ODCM Limit	Units	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Gamma	5.0	mrads	3.21E-03	6.42E-02	2.15E-03	4.30E-02
Beta	10.0	mrads	1.13E-03	1.13E-02	1.04E-03	1.04E-02

Cumulative Doses per Year

Type of Radi- ation	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Gamma	10.0	mrads	9.91E-03	9.91E-02
Beta	20.0	mrads	4.07E-03	2.03E-02

TABLE 2-5A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
AND PARTICULATES IN GASEOUS RELEASES  
Unit: 1

Starting: 01-Jan-1994

Ending: 30-Jun-1994

Cumulative Doses per Quarter

Organ	ODCM Limit	Unit	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Bone	7.5	mrem	2.18E-04	2.91E-03	3.80E-05	5.07E-04
Liver	7.5	mrem	7.68E-04	1.02E-02	5.89E-04	7.86E-03
TBody	7.5	mrem	6.82E-04	9.10E-03	5.75E-04	7.66E-03
Thyroid	7.5	mrem	6.62E-02	8.82E-01	1.19E-02	1.59E-01
Kidney	7.5	mrem	8.95E-04	1.19E-02	6.11E-04	8.15E-03
Lung	7.5	mrem	5.70E-04	7.60E-03	5.55E-04	7.40E-03
GILLI	7.5	mrem	5.87E-04	7.83E-03	5.58E-04	7.44E-03

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	15.0	mrem	2.56E-04	1.71E-03
Liver	15.0	mrem	1.36E-03	9.05E-03
TBody	15.0	mrem	1.26E-03	8.38E-03
Thyroid	15.0	mrem	7.81E-02	5.21E-01
Kidney	15.0	mrem	1.51E-03	1.00E-02
Lung	15.0	mrem	1.12E-03	7.50E-03
GILLI	15.0	mrem	1.15E-03	7.64E-03

TABLE 2-5A  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
AND PARTICULATES IN GASEOUS RELEASES

Unit: 1

Starting: 01-Jul-1994

Ending: 31-Dec-1994

Cumulative Doses per Quarter

Organ	ODCM Limit	Unit	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Bone	7.5	mrem	8.63E-08	1.15E-06	6.32E-07	8.42E-06
Liver	7.5	mrem	3.21E-03	4.28E-02	3.21E-03	4.28E-02
TBody	7.5	mrem	3.21E-03	4.28E-02	3.21E-03	4.28E-02
Thyroid	7.5	mrem	3.48E-03	4.64E-02	3.31E-03	4.41E-02
Kidney	7.5	mrem	3.21E-03	4.28E-02	3.21E-03	4.28E-02
Lung	7.5	mrem	3.21E-03	4.28E-02	3.21E-03	4.28E-02
GILLI	7.5	mrem	3.21E-03	4.28E-02	3.21E-03	4.28E-02

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	15.0	mrem	2.57E-04	1.71E-03
Liver	15.0	mrem	7.78E-03	5.18E-02
TBody	15.0	mrem	7.67E-03	5.12E-02
Thyroid	15.0	mrem	8.49E-02	5.66E-01
Kidney	15.0	mrem	7.93E-03	5.28E-02
Lung	15.0	mrem	7.54E-03	5.03E-02
GILLI	15.0	mrem	7.56E-03	5.04E-02

TABLE 2-5B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
AND PARTICULATES IN GASEOUS RELEASES

Unit: 2

Starting: 01-Jan-1994

Ending: 30-Jun-1994

Cumulative Doses per Quarter

Organ	ODCM Limit	Unit	Quarter 1	% of ODCM Limit	Quarter 2	% of ODCM Limit
Bone	7.5	mrem	1.12E-06	1.50E-05	2.56E-06	3.41E-05
Liver	7.5	mrem	2.07E-03	2.76E-02	2.88E-03	3.84E-02
TBody	7.5	mrem	2.07E-03	2.76E-02	2.88E-03	3.84E-02
Thyroid	7.5	mrem	2.41E-03	3.21E-02	2.95E-03	3.94E-02
Kidney	7.5	mrem	2.07E-03	2.77E-02	2.88E-03	3.84E-02
Lung	7.5	mrem	2.07E-03	2.76E-02	2.88E-03	3.84E-02
GILLI	7.5	mrem	2.07E-03	2.76E-02	2.88E-03	3.84E-02

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	15.0	mrem	3.68E-06	2.45E-05
Liver	15.0	mrem	4.95E-03	3.30E-02
TBody	15.0	mrem	4.95E-03	3.30E-02
Thyroid	15.0	mrem	5.36E-03	3.57E-02
Kidney	15.0	mrem	4.95E-03	3.30E-02
Lung	15.0	mrem	4.95E-03	3.30E-02
GILLI	15.0	mrem	4.95E-03	3.30E-02

TABLE 2-5B  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSES TO A MEMBER OF THE PUBLIC DUE TO RADIOIODINES, TRITIUM,  
AND PARTICULATES IN GASEOUS RELEASES

Unit: 2

Starting: 01-Jul-1994

Ending: 31-Dec-1994

Cumulative Doses per Quarter

Organ	ODCM Limit	Unit	Quarter 3	% of ODCM Limit	Quarter 4	% of ODCM Limit
Bone	7.5	mrem	1.75E-07	2.33E-06	7.11E-14	9.47E-13
Liver	7.5	mrem	1.16E-03	1.55E-02	1.09E-03	1.45E-02
TBody	7.5	mrem	1.16E-03	1.55E-02	1.09E-03	1.45E-02
Thyroid	7.5	mrem	1.16E-03	1.55E-02	1.09E-03	1.45E-02
Kidney	7.5	mrem	1.16E-03	1.55E-02	1.09E-03	1.45E-02
Lung	7.5	mrem	1.16E-03	1.55E-02	1.09E-03	1.45E-02
GILLI	7.5	mrem	1.16E-03	1.55E-02	1.09E-03	1.45E-02

Cumulative Doses per Year

Organ	ODCM Limit	Units	Year to Ending Date	% of ODCM Limit
Bone	15.0	mrem	3.85E-06	2.57E-05
Liver	15.0	mrem	7.20E-03	4.80E-02
TBody	15.0	mrem	7.20E-03	4.80E-02
Thyroid	15.0	mrem	7.61E-03	5.07E-02
Kidney	15.0	mrem	7.20E-03	4.80E-02
Lung	15.0	mrem	7.20E-03	4.80E-02
GILLI	15.0	mrem	7.20E-03	4.80E-02

TABLE 2-7  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
TYPICAL GASEOUS MDC'S ACHIEVED ON COUNTING SYSTEM

Nuclide	MDC (uCi/ML)
MN-54	3.21E-15
CO-58	1.53E-14
FE-59	7.96E-15
CO-60	1.95E-14
ZN-65	2.34E-14
MO-99	1.81E-13
CS-134	1.41E-14
CS-137	7.83E-15
CE-141	6.96E-15
CE-144	3.47E-14
KR-87	8.18E-07
KR-88	3.94E-08
XE-133	4.30E-08
XE-133M	4.82E-08
XE-135	1.78E-08
XE-138	1.99E-07
I-131	9.67E-15
I-133	1.80E-13



#### 4.0 SOLID WASTE

This section contains information regarding the types and quantities of solid radioactive waste shipped offsite during 1994 as required in ODCM 7.2.2.4. This information is presented in Table 3.

The error involved in determining the contents of solid radwaste shipments is estimated to be less than + or - 15%.

TABLE 3  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
 Starting: 01-Jan-1994                      Ending: 30-Jun-1994

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL  
 (not irradiated fuel)

1. Type of Waste.	UNITS	6-Months
	3	
a. Spent resins, Filter sludges, evaporator bottoms, etc.	m Ci*	1.050E+01 8.450E+01
	3	
b. Dry compressible waste, contaminated equipment, etc.	m Ci*	2.72E+01 1.39E+01
	3	
c. Irradiated components, control rods, etc.	m Ci*	None None
	3	
d. Other (describe)	m Ci*	None None

\* Measured and/or estimated by correlations in accordance  
 with 10CFR61.55.

TABLE 3  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
Starting: 01-Jan-1994                      Ending: 30-Jun-1994

(continued)

2. Estimate of major nuclide composition.

a. NI-63	24.4%
CO-58	21.8%
CO-60	18.8%
FE-55	15.6%
CR-51	4.2%
CS-137	3.2%
CS-134	2.5%
MN-54	2.4%
NB-95	1.8%
ZR-95	1.1%

b. FE-55	44.6%
CO-58	13.7%
CO-60	11.2%
CR-51	7.7%
H-3	4.5%
NI-63	3.9%
CS-137	3.7%
NB-95	3.0%
MN-54	2.2%
ZR-95	1.7%
CS-134	1.3%

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
49	Highway	Chem-Nuclear Systems, Inc. Barnwell, South Carolina.

TABLE 3  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
 Starting: 01-Jan-1994                      Ending: 30-Jun-1994

(continued)

4. Type of Container(1a)	Type of Container(1b)
High Integrity Containers. Strong Tight Containers.	Strong Tight Containers.
5. Solidification Agent(1a)	Solidification Agent(1b)
All items shipped dewatered with the exception of Sludge which was shipped solidified with Hittman Cement.	None

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
None	N/A	N/A

TABLE 3  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
 Starting: 01-Jul-1994 Ending: 31-Dec-1994

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL  
 (not irradiated fuel)

1. Type of Waste.	UNITS	6-Months
	3	
a. Spent resins, Filter sludges, evaporator bottoms, etc.	m Ci*	6.810E+00 3.980E+02
	3	
b. Dry compressible waste, contaminated equipment, etc.	m Ci*	5.750E+00 2.700E-01
	3	
c. Irradiated components, control rods, etc.	m Ci*	2.900E-01 3.840E+00
	3	
d. Other (describe)	m Ci*	None None

\* Measured and/or estimated by correlations in accordance with 10CFR61.55.

TABLE 3  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
Starting: 01-Jul-1994                      Ending: 31-Dec-1994

(continued)

2. Estimate of major nuclide composition.

a.	NI-63	35.2%
	CO-58	22.1%
	CO-60	20.7%
	CS-137	5.9%
	FE-55	5.9%
	CS-134	4.5%
	MN-54	4.1%
b.	FE-55	46.3%
	CO-58	16.0%
	CO-60	10.0%
	NI-63	6.2%
	NB-95	5.8%
	ZR-95	4.8%
	CR-51	4.1%
	CS-137	1.8%
	MN-54	1.8%
c.	CO-60	44.8%
	NI-63	35.8%
	FE-55	10.6%
	SR-90	3.9%
	ZN-65	3.3%

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
12	Highway	Chem-Nuclear Systems, Inc. Barnwell, South Carolina.



TABLE 3  
 Joseph M. Farley Nuclear Plant  
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
 Starting: 01-Jul-1994                      Ending: 31-Dec-1994

(continued)

4. Type of Container(1a)	Type of Container(1b)
High Integrity Containers.	Strong Tight Containers.
Strong Tight Containers.	
Type of Container(1c)	
High Integrity Containers.	
5. Solidification Agent(1a)	Solidification Agent(1b)
All items shipped dewatered.	None
Solidification Agent(1c)	
None	

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
None	N/A	N/A

## 5.0 ONSITE DOSES TO MEMBERS OF THE PUBLIC

Current FNP effluent controls as established by ODCM 6.1 do not require assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY (ODCM Figure 10-1). However, this assessment has been performed for 1994 using the methods described in ODCM 6.2 and is included in this section as Table 4-1.

TABLE 4-1  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSE TO A MEMBER OF THE PUBLIC  
DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
Unit: Site

Starting: 01-Jan-1994

Ending: 30-Jun-1994

Page: 1

Location Name	VISITOR LOCATION 1 (VIS.CENTER)	
Distance (kilometers)	3.06E-01	
Sector	WSW	
Occupancy Factor	1.37E-03	(1.20E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	1.04E-04
Particulate X/Q (sec/m3)	1.04E-04
Particulate D/Q (m-2)	4.80E-07

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	8.80E-06
Particulate X/Q (sec/m3)	8.80E-06
Particulate D/Q (m-2)	6.20E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	5.27E-05	5.05E-05	1.03E-04	1.03E-04
Liver	mrem	6.16E-05	6.09E-05	1.23E-04	1.23E-04
TBody	mrem	6.16E-05	6.09E-05	1.22E-04	1.22E-04
Thyroid	mrem	8.74E-05	6.30E-05	1.50E-04	1.50E-04
Kidney	mrem	6.17E-05	6.09E-05	1.23E-04	1.23E-04
Lung	mrem	6.16E-05	6.09E-05	1.22E-04	1.22E-04
GI-LLI	mrem	6.16E-05	6.09E-05	1.22E-04	1.22E-04

TABLE 4-1  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSE TO A MEMBER OF THE PUBLIC  
DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
Unit: Site

Starting: 01-Jan-1994

Ending: 30-Jun-1994

Page: 2

Location Name	VISITOR LOCATION 2 (SW POND)
Distance (kilometers)	9.66E-01
Sector	SSW
Occupancy Factor	7.53E-03 (6.60E+01 hr/yr)
Age Group	CHILD

Ground Level Releases:

Noble Gas X/Q (sec/m3)	4.74E-05
Particulate X/Q (sec/m3)	4.74E-05
Particulate D/Q (m-2)	1.31E-07

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	9.75E-07
Particulate X/Q (sec/m3)	9.75E-07
Particulate D/Q (m-2)	2.78E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/r)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	3.95E-05	3.08E-05	7.03E-05	7.03E-05
Liver	mrem	4.50E-05	3.71E-05	8.21E-05	8.21E-05
TBody	mrem	4.49E-05	3.71E-05	8.21E-05	8.21E-05
Thyroid	mrem	6.39E-05	3.84E-05	1.02E-04	1.02E-04
Kidney	mrem	4.50E-05	3.71E-05	8.21E-05	8.21E-05
Lung	mrem	4.49E-05	3.71E-05	8.20E-05	8.20E-05
GI-LLI	mrem	4.49E-05	3.71E-05	8.20E-05	8.20E-05

TABLE 4-1  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSE TO A MEMBER OF THE PUBLIC  
DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
Unit: Site

Starting: 01-Jan-1994

Ending: 30-Jun-1994

Page: 3

Location Name	VISITOR LOCATION 3 (RW DISCH.)	
Distance (kilometers)	1.64E+00	
Sector	SE	
Occupancy Factor	1.14E-02	(9.99E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	1.63E-05
Particulate X/Q (sec/m3)	1.63E-05
Particulate D/Q (m-2)	4.55E-08

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	7.05E-07
Particulate X/Q (sec/m3)	7.05E-07
Particulate D/Q (m-2)	1.39E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 1	Quarter 2	Quarters 1 and 2	Year to Ending Date
Bone	mrem	3.77E-05	3.37E-05	7.14E-05	7.14E-05
Liver	mrem	4.37E-05	4.06E-05	8.43E-05	8.43E-05
TBody	mrem	4.37E-05	4.06E-05	8.43E-05	8.43E-05
Thyroid	mrem	6.20E-05	4.20E-05	1.04E-04	1.04E-04
Kidney	mrem	4.37E-05	4.06E-05	8.43E-05	8.43E-05
Lung	mrem	4.36E-05	4.06E-05	8.42E-05	8.42E-05
GI-LLI	mrem	4.36E-05	4.06E-05	8.42E-05	8.42E-05

TABLE 4-1  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSE TO A MEMBER OF THE PUBLIC  
DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
Unit: Site

Starting: 01-Jul-1994

Ending: 31-Dec-1994

Page: 1

Location Name	VISITOR LOCATION 1 (VIS.CENTER)	
Distance (kilometers)	3.06E-01	
Sector	WSW	
Occupancy Factor	1.37E-03	(1.20E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	1.04E-04
Particulate X/Q (sec/m3)	1.04E-04
Particulate D/Q (m-2)	4.80E-07

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	8.80E-06
Particulate X/Q (sec/m3)	8.80E-06
Particulate D/Q (m-2)	6.20E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 3	Quarter 4	Quarters 3 and 4	Year to Ending Date
Bone	mrem	5.37E-05	3.47E-05	8.83E-05	1.92E-04
Liver	mrem	6.73E-05	4.79E-05	1.15E-04	2.38E-04
TBody	mrem	6.73E-05	4.79E-05	1.15E-04	2.38E-04
Thyroid	mrem	6.76E-05	4.81E-05	1.16E-04	2.66E-04
Kidney	mrem	6.73E-05	4.79E-05	1.15E-04	2.38E-04
Lung	mrem	6.73E-05	4.79E-05	1.15E-04	2.38E-04
GI-LLI	mrem	6.73E-05	4.79E-05	1.15E-04	2.38E-04



TABLE 4-1  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSE TO A MEMBER OF THE PUBLIC  
DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
Unit: Site

Starting: 01-Jul-1994

Ending: 31-Dec-1994

Page: 2

Location Name	VISITOR LOCATION 2 (SW POND)	
Distance (kilometers)	9.66E-01	
Sector	SSW	
Occupancy Factor	7.53E-03	(6.60E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	4.74E-05
Particulate X/Q (sec/m3)	4.74E-05
Particulate D/Q (m-2)	1.31E-07

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	9.75E-07
Particulate X/Q (sec/m3)	9.75E-07
Particulate D/Q (m-2)	2.78E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

	Units	Quarter 3	Quarter 4	Quarters 3 and 4	Year to Ending Date
Bone	mrem	3.27E-05	2.11E-05	5.38E-05	1.24E-04
Liver	mrem	4.10E-05	2.96E-05	7.05E-05	1.53E-04
TBody	mrem	4.10E-05	2.96E-05	7.05E-05	1.53E-04
Thyroid	mrem	4.12E-05	2.96E-05	7.05E-05	1.73E-04
Kidney	mrem	4.10E-05	2.96E-05	7.05E-05	1.53E-04
Lung	mrem	4.10E-05	2.96E-05	7.05E-05	1.53E-04
GI-LLI	mrem	4.10E-05	2.96E-05	7.05E-05	1.53E-04

TABLE 4-1  
Joseph M. Farley Nuclear Plant  
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 1994  
DOSE TO A MEMBER OF THE PUBLIC  
DUE TO ACTIVITIES INSIDE THE SITE BOUNDARY  
Unit: Site

Starting: 01-Jul-1994

Ending: 31-Dec-1994

Page: 3

Location Name	VISITOR LOCATION 3 (RW DISCH.)	
Distance (kilometers)	1.64E+00	
Sector	SE	
Occupancy Factor	1.14E-02	(9.99E+01 hr/yr)
Age Group	CHILD	

Ground Level Releases:

Noble Gas X/Q (sec/m3)	1.63E-05
Particulate X/Q (sec/m3)	1.63E-05
Particulate D/Q (m-2)	4.55E-08

Mixed Mode Releases:

Noble Gas X/Q (sec/m3)	7.05E-07
Particulate X/Q (sec/m3)	7.05E-07
Particulate D/Q (m-2)	1.39E-08

Elevated Releases:

Noble Gas X/Q (sec/m3)	N/A
Particulate X/Q (sec/m3)	N/A
Particulate D/Q (m-2)	N/A

		Units	Quarter 3	Quarter 4	Quarters 3 and 4	Year to Ending Date
Bone	mrem		3.58E-05	2.31E-05	5.89E-05	1.30E-04
Liver	mrem		4.49E-05	3.21E-05	7.69E-05	1.61E-04
TBody	mrem		4.48E-05	3.21E-05	7.69E-05	1.61E-04
Thyroid	mrem		4.50E-05	3.22E-05	7.72E-05	1.81E-04
Kidney	mrem		4.49E-05	3.21E-05	7.69E-05	1.61E-04
Lung	mrem		4.48E-05	3.21E-05	7.69E-05	1.61E-04
GI-LLI	mrem		4.48E-05	3.21E-05	7.69E-05	1.61E-04

## 6.0 MISCELLANEOUS

This section contains several items which are only required to be reported under certain conditions. These include radiation dose assessments to show conformance with 40CFR190 (if required by ODCM 5.1.2), licensee initiated changes to the ODCM within the last year, deviations in the Radioactive Effluent Control Program within the last year pursuant to ODCM 7.2.2.6, major changes to the liquid or gaseous radwaste treatment systems as required by ODCM 2.1.5 and 3.1.6, and any changes to the solid radwaste treatment system pursuant to the Process Control Program (PCP).

### 6.1 Total Dose From Uranium Fuel Cycle

In accordance with Technical Specification 6.8.3.e(x), the dose or dose commitment to any MEMBER OF THE PUBLIC over a calendar year, due to releases of radioactivity and to radiation from uranium fuel cycle sources, shall be limited to less than or equal to 25 mrem to the total body or to any organ, except the thyroid, which shall be limited to less than or equal to 75 mrem (as stated in ODCM 5.1).

With the calculated doses from the release of radioactive materials in liquid or gaseous effluents exceeding twice the limits of ODCM 2.1.3, 3.1.3, or 3.1.4, calculations shall be made according to ODCM 5.2 methods to determine whether the above (ODCM 5.1) limits have been exceeded (as stated in ODCM 5.1.2).

Since none of the ODCM 2.1.3, 3.1.3, or 3.1.4 limits were exceeded during 1994, no calculations were required.

### 6.2 Licensee Initiated Changes to the ODCM

Revision 14 to the ODCM is attached. This revision was made to replace a milk sampling location which was no longer available.

### 6.3 Program Deviations

This section contains any deviations from the composite sampling or MDC requirements included in ODCM Tables 2-3 and 3-3.

There were no deviations from composite sampling or MDC requirements on Unit 1 during 1994.

A deviation from composite sampling requirements occurred on Unit 2 during Quarter 4 in that a Containment Purge particulate filter for one of the weeks was inadvertently discarded prior to being used for composite analysis. Composite analysis for Unit 2 Containment Purge was completed using the remaining particulate filters for the month in question. This incident is documented in Chemistry Incident No. 0-95-001.

There were no deviations from MDC requirements on Unit 2 during 1994.

#### 6.4 Major Changes to the Radwaste Treatment Systems

There were no major changes to the Radwaste Treatment Systems during 1994.

1. Procedure Number FNF-0-M-011 Revision Number 13  
 Procedure Title OFFSITE DDSE CALCULATION MANUAL

- ☒ Safety Related ☐ Non-Safety Related  
☐ New Procedure Request  
☒ Procedure Revision.....New Revision Number 14  
☐ Procedure To Be Voided  
☐ Temporary Change Effective Until Next Permanent Revision....TCN  
☐ Temporary Change To Be Voided.....TCN  
☐ Temporary Change One Time Only or Req'd by Plant Conditions.TCN  
 Dates this temporary change is effective: From \_\_\_\_\_ Through \_\_\_\_\_  
☐ This Procedure is an infrequently performed test or evolution.

## 2. Change Summary

- 2.1 Procedure Page Number(s) Affected by Change(s) 4-14, 4-17

- 2.2 Description of Change(s) REVISE TABLE 4-4 (PAGE 4-14) AND FIGURE 4-3 (PAGE 4-17) TO INDICATE NEW LOCATION FOR COLLECTING ENVIRONMENTAL MILK SAMPLE, AND DELETE PREVIOUS LOCATION

- 2.3 Reason(s) for Change(s) DOCUMENT LOCATION OF NEW SAMPLING LOCATION DUE TO OWNER'S REQUEST THAT SAMPLING BE DISCONTINUED AT PREVIOUS LOCATION.

3. Prepared By Walden H. Left Signature ENVIRONMENTAL TECH Title 1-31-94 Date  
 4. Reviewed By John A. Rayburn Signature Env. Supervisor Title 1-31-94 Date

## 5. Cross-Disciplinary/PORC Review

- | Group       | Signature          | Title                     | Date           |
|-------------|--------------------|---------------------------|----------------|
| <u>Tech</u> | <u>[Signature]</u> | <u>Tech. Manager</u>      | <u>1-31-94</u> |
| <u>PORC</u> | <u>[Signature]</u> | <u>Nuc. Pl. Gen. Mgr.</u> | <u>2-1-94</u>  |

## 6. Temporary Change Approval (Signature/Date)

- ☐ Member Group Staff  
☐ Shift Foreman  
☐ Senior Reactor Operator  
☐ General Manager-Nuclear Plant
- UNCONTROLLED COPY**  
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## 7. Final Approval (Signature/Date, required within 60 days of temporary approval)

- ☐ Group Supervisor  
☐ Manager  
☐ MSAER  
☐ Vice President-Nuclear  
☒ General Manager-Nuclear Plant
- [Signature] 2/1/94

NUCLEAR SUPPORT	10 CFR 50.59 EVALUATION FORM	SHEET 1 OF <u>5</u>
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A Unit Number:    ☐ One    ☐ Two    ☒ Shared

Activity Title and Number: Offsite Dose Calculation Manual (ODCM) FNP-O-M-011      Revision Number: 14

B 10 CFR 50.59 SCREENING

Does the document to which this evaluation applies represent:

1.   ☐ Yes   ☒ No    A change to the facility as described in the FSAR?

Basis for answer: No physical changes to the plant are required, only changes to the ODCM are being made to change the milk sampling point from one dairy to another.

---

2.   ☐ Yes   ☒ No    A change to procedures described in the FSAR?

Basis for answer: The location for gathering a milk sample is described in the ODCM. No FSAR changes are required to support the ODCM change.

---

3.   ☐ Yes   ☒ No    A test or experiment not described in the FSAR?

Basis for answer: The change in milk sample locations is not considered to be a test or experiment.

---

4.   ☐ Yes   ☒ No    A change to the Technical Specifications and/or Environmental Technical Specifications incorporated into the operating license?

Basis for answer: The technical specifications require licensee changes to the ODCM to be documented and reviewed. This change to the ODCM does not change technical specifications.

---

If ANY of the four questions in Section B are answered "Yes", then PORC review of the safety evaluation is required prior to implementation.

C Preparer: D A Hostetter Date: 1-27-94 Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewer: T.M. Milton Date: 1/28/94 Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed By: W.C. Carr Date: 1/28/94 Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_ FNP Approved: [Signature] Date: 2-1-94

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_ PORC Review: [Signature] Date: 2-1-94

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_ NORB Review: \_\_\_\_\_ Date: \_\_\_\_\_

*This change does not reduce the accuracy or reliability of <sup>effluent</sup> dose calculations or setpoint determinations.*



SAFETY EVALUATION:

1. ( ) YES ; (XX) NO May the proposed activity increase the probability of occurrence of an accident previously evaluated in the FSAR?

BASIS FOR ANSWER: See attached safety evaluation.

2. ( ) YES ; (XX) NO May the proposed activity increase the consequences of an accident previously evaluated in the FSAR?

BASIS FOR ANSWER: See attached safety evaluation.

3. ( ) YES ; (XX) NO May the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the FSAR?

BASIS FOR ANSWER: See attached safety evaluation.

4. ( ) YES ; (XX) NO May the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the FSAR?

BASIS FOR ANSWER: See attached safety evaluation.

SAFETY EVALUATION (CONTINUED):

5. ( ) YES ; (XX) NO May the proposed activity create the possibility of an accident of a different type than any previously evaluated in the FSAR?

BASIS FOR ANSWER: See attached safety evaluation.

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6. ( ) YES ; (XX) NO May the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the FSAR?

BASIS FOR ANSWER: See attached safety evaluation.

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7. ( ) YES ; (XX) NO Does the proposed activity reduce the margin of safety as defined in the basis for any Technical Specification?

BASIS FOR ANSWER: See attached safety evaluation.

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If the answer to any of the questions in Section D is "YES", an unreviewed safety question may be indicated. Approval from the NRC is required before the document/activity may be implemented.

Joseph M. Farley Nuclear Plant Units 1 and 2  
Offsite Dose Calculation Manual Changes  
Revision 14

Safety Evaluation (Sheet 4 of 5)

Background

The Farley Offsite Dose Calculation Manual (ODCM) describes the methods used to comply with the radiological release requirements of the Farley Technical Specifications, 10 CFR 20, and 10 CFR 50, Appendix I. The ODCM provides a description of the physical configuration of the plant effluent release points as well as the calculation procedures for determining the effluent monitor setpoints, offsite doses and offsite dose rates, and describes the radiological environmental monitoring program. The ODCM is being revised to indicate a change in the milk sample location from one dairy to another. Technical specifications require any changes to the ODCM to be documented and reviewed.

This safety evaluation is applicable to Revision 14 of the Farley ODCM. Revision 14 changes are included in Attachment 1.

References:

1. Joseph M. Farley Unit 1 and Unit 2 Technical Specifications
2. Joseph M. Farley Nuclear Plant Units 1 and 2 ODCM

Evaluation

The proposed changes to the ODCM simply relocate the milk sample location. Plant design and operation is unaffected by this change. Therefore, the level of radiological control will not be reduced by the proposed changes to the ODCM since compliance with applicable regulatory requirements governing radioactive effluents and radiological environmental monitoring, including 10 CFR 20.1302, 40 CFR 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50 will continue to be maintained.

Conclusion

The requirements of 10 CFR 50.59 have been reviewed relative to the proposed changes to the ODCM and the following determination has been made:

1. The changes to the ODCM do not increase the probability of occurrence of an accident previously evaluated in the FSAR because they are administrative in nature and alter only the location of the environmental milk sample from one dairy to another.

2. The changes to the ODCM do not increase the consequences of an accident previously evaluated in the FSAR because they do not alter any of the conditions or assumptions in the FSAR accident analyses. Therefore, since the accident analyses remain bounding, the radiological consequences previously evaluated are not adversely affected by the ODCM changes.
3. The changes to the ODCM do not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the FSAR because they do not affect the design or operation of any radiological effluent system equipment. Additionally, there is no adverse impact on the design or operation of any plant system or component important to safety as a result of these ODCM changes.
4. The changes to the ODCM do not increase the consequences of a malfunction of equipment important to safety previously evaluated in the FSAR because they do not affect the design or operation of any plant system or component and because they do not adversely impact the radiological consequences presented in the FSAR accident analyses.
5. The changes to the ODCM do not create the possibility of an accident of a different type than any previously evaluated in the FSAR because they do not involve any change to the configuration or method of operation of any plant system component important to safety. Accordingly, no new failure modes have been defined for any plant system or component important to safety nor has any new limiting single failure been identified. There will be no change in types or increase in the amounts of any effluents released offsite as a result of the ODCM changes.
6. The changes to the ODCM do not create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the FSAR because as stated previously, plant system or component performance will not be adversely affected since the ODCM changes only involve changes in milk sample location. No new accident initiators or single failures have been identified as a result of the ODCM changes.
7. The changes to the ODCM do not reduce the margin of safety as defined in the basis for any technical specification because the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50 is not affected and the changes do not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations.

Based on the preceding evaluation it can be concluded that the Revision 14 changes to the ODCM regarding the offsite milk sample location do not involve an unreviewed safety question as defined by 10 CFR 50.59.

FNPP-O-M-011  
January 26, 1994  
Revision 14

SOUTHERN NUCLEAR OPERATING COMPANY  
JOSEPH M. FARLEY NUCLEAR PLANT

FNPP-O-M-011

OFFSITE DOSE CALCULATION MANUAL

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Approved:

*BO Hill*  
Nuclear Plant - General Manager

Date Issued: 2/1/94

List of Effective Pages

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4-14, 4-17	14

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Table 4-4 (contd). Radiological Environmental Monitoring Locations

Exposure Pathway and/or Sample	Sampling Locations*	Sample Identification
4. INGESTION		
Milk	<u>Indicator Station:</u> None (There are no milk animals within 5 miles per the current land use survey)	
	<u>Control Station:</u> Bruce Ivey Dairy Webb, AL (W-12 miles)	MB-1212
Fish	<u>Indicator Station:</u> Smith Bend (River Mile - 41) Game Fish Bottom Feeding Fish	FGI FBI
	<u>Control Station:</u> Andrews Lock & Dam Reservoir (River Mile - 47) Game Fish Bottom Feeding Fish	FGB FEB
Forage or Leafy Vegetation	<u>Indicator Stations:</u> South Southeast Perimeter (SSE-1.0 miles) North Perimeter (N-0.8 miles) South Perimeter (S-1.0 miles) <sup>3</sup> Northeast Perimeter (NE-1.0 miles) <sup>3</sup>	FI-0701 FI-1606 FI-0801 FI-0201
	<u>Control Station:</u> Dothan, AL (W-18 miles)	FB-1218

\* Distance and direction as measured from the centerpoint between Unit 1 and Unit 2 plant vent stacks.

1. Not required by Section 4.1.1. Used as a spare station.
2. Not required by Section 4.1.1. Use for comparison purposes with State of GA EPD.
3. Alternate forage plots.



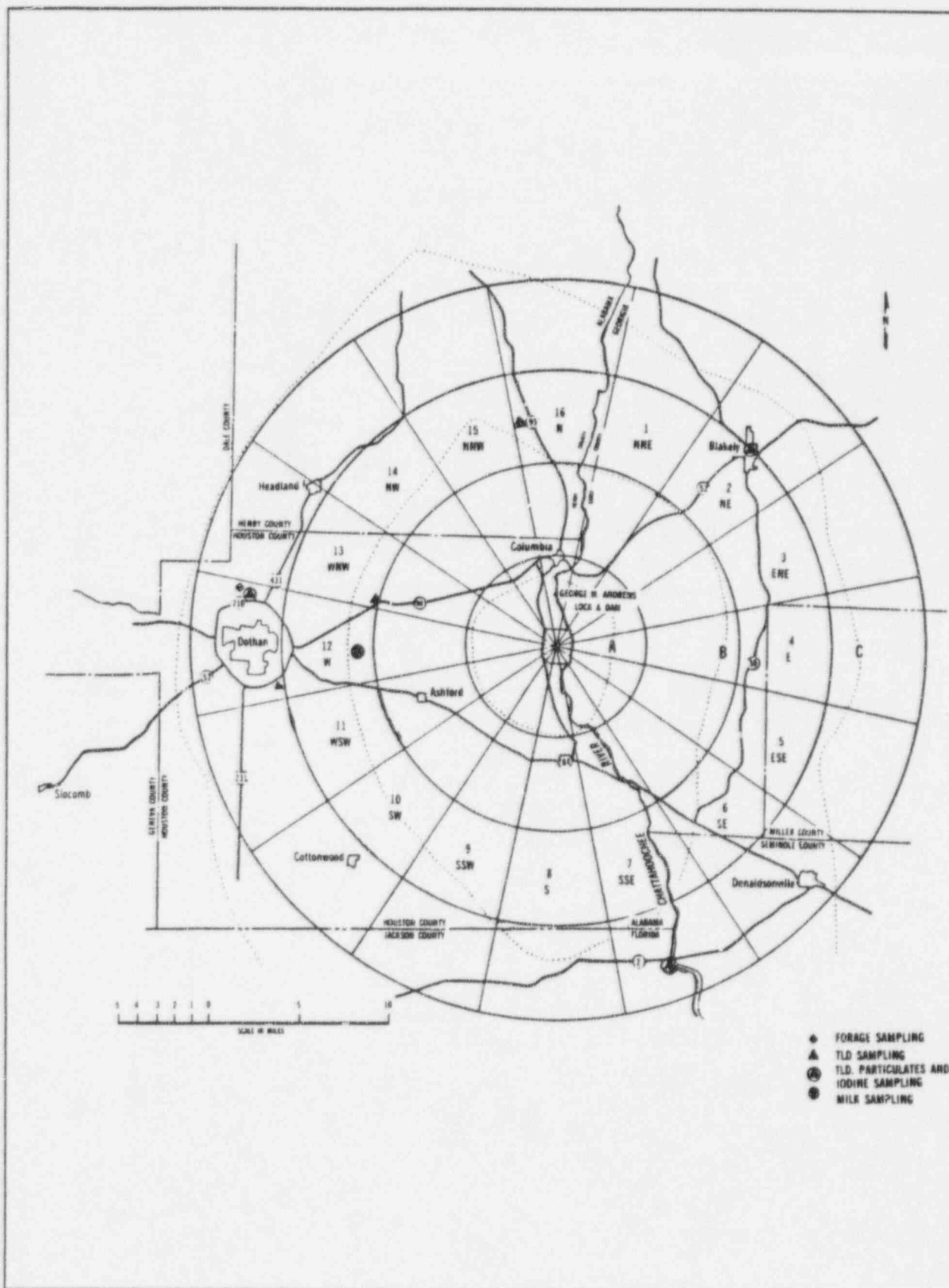


Figure 4-3. Airborne Sampling Locations, 0-20 miles