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Edwin I. Hatch Nuclear Plant - Units 1 & 2
Joseph M. Farley Nuclear Plant - Units 1 & 2
Vogtle Electric Generating Plant - Units 1 & 2
Annual Radioactive Effluent Release Reports for 2012

Ladies and Gentlemen:

In accordance with section 5.6.3 of the referenced plants' Technical Specifications, Southern Nuclear Operating Company hereby submits the Annual Radioactive Effluent Release Reports for 2012. The Annual Radioactive Effluent Release Report for the Edwin I. Hatch Nuclear Plant (Hatch), Joseph M. Farley Nuclear Plant (Farley), and the Vogtle Electric Generating Plant (Vogtle) are provided in Enclosures 1, 2, and 3, respectively.

Technical Specification 5.5.1.c. for each plant requires that the Offsite Dose Calculation Manual (ODCM) be provided as a part of, or concurrent with, the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. During the reporting period for the Annual Radioactive Effluent Release Report for 2012, there were no changes to the ODCM from any of the sites.

Respectfully submitted,

A handwritten signature in cursive script that reads "C. R. Pierce". The signature is written in dark ink and is positioned above the printed name of the signatory.

C. R. Pierce
Regulatory Affairs Director

CRP/GAL/lac

Enclosures: 1. Hatch Annual Radioactive Effluent Release Report for 2012
2. Farley Annual Radioactive Effluent Release Report for 2012
3. Vogtle Annual Radioactive Effluent Release Report for 2012

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**Edwin I. Hatch Nuclear Plant
Joseph M. Farley Nuclear Plant
Vogtle Electric Generating Plant
Annual Radioactive Effluent Release Reports for 2012**

Enclosure 1

Hatch Annual Radioactive Effluent Release Report for 2012

SOUTHERN COMPANY
E. I. HATCH NUCLEAR PLANT
UNITS NO. 1 & 2
ANNUAL REPORT
PLANT RADIOACTIVE EFFLUENT RELEASES
JANUARY 1, 2012 THROUGH DECEMBER 31, 2012

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1.0 Liquid Effluents

1.1 Regulatory Requirements

1.1.1 Concentration Limits

The concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS shall be limited to ten times the concentrations specified in 10 CFR Part 20, 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 1E-04 microcuries/ml total activity.

1.1.2 Dose Limits

The dose or dose commitment, to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released from each unit to UNRESTRICTED AREAS, shall be limited:

- a. During any calendar quarter, to less than or equal to 1.5 mrem to the whole 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 whole body and to less than or equal to 10 mrem to any organ.

1.2 Effluent Concentration Limit

ECL values used in determining allowable liquid radwaste release rates and concentrations, for principal gamma emitters, I-131, tritium, Sr-89, Sr-90 and Fe-55, are taken from 10 CFR Part 20, Appendix B, Table 2, Column 2.

A tolerance factor of up to 10 is utilized to allow flexibility in establishing practical monitor set points which can accommodate effluent releases at concentrations higher than the ECL values stated in 10 CFR 20, Appendix B, Table 2, Column 2.

For dissolved or entrained noble gases in liquid radwaste, the ECL is 1E-04 uCi/ml total activity.

For gross alpha in liquid radwaste, the ECL is 2E-09 uCi/ml.

Furthermore, for all the above radionuclides, or categories of radioactivity, the overall ECL fraction is determined in accordance with 10 CFR Part 20, Appendix B.

The method utilizing the ECL fraction to determine liquid radwaste release rates and effluent radiation monitor set points is described in Subsection 1.3 of this report.

The method utilizing the ECL fraction to determine the dose released from groundwater outfalls is described in Subsection 1.4 of this report.

1.3 *Measurements and Approximations of Total Radioactivity for Liquid Radwaste*

Prior to the release of any tank containing liquid radwaste, following the required recirculations, samples are collected and analyzed in accordance with the Edwin I. Hatch Nuclear Plant Offsite Dose Calculation Manual (ODCM) Table 2-3. A sample from each tank planned for release is analyzed for principal gamma emitters, I-131, and dissolved and entrained noble gases, by gamma spectroscopy. Monthly and quarterly composites are prepared for analysis by extracting aliquots from each sample taken from the tanks released.

Liquid radwaste sample analyses are performed as described in Section 1.3.1.

1.3.1 *Total Radioactivity Determination for Liquid Radwaste*

<u>MEASUREMENT</u>	<u>FREQUENCY</u>	<u>METHOD</u>
1. Gamma Isotopic	Each Batch	Gamma Spectroscopy with computerized data reduction
2. Dissolved or entrained noble gas	Each Batch	Gamma Spectroscopy with computerized data reduction
3. Tritium	Monthly Composite	Distillation and liquid scintillation counting
4. Gross alpha	Monthly Composite	Gas flow proportional counting
5. Sr-89 & 90	Quarterly Composite	Chemical separation and gas flow proportional counting
6. Fe-55	Quarterly Composite	Chemical separation and liquid scintillation counting

Gamma isotopic measurements are performed in-house using germanium detectors with a resolution of 2.0 keV or lower. The detectors are shielded by four inches of lead. A liquid radwaste sample is typically counted for 2000 seconds and a peak search of the resulting gamma ray spectrum is performed. Energy and net count data for all significant peaks are determined and a quantitative reduction or MDC calculation is performed to ensure that the MDC's are met for the nuclides specified in the ODCM Chapter 10 (i.e., Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141 and Ce-144). The quantitative calculations, corrections for counting time, decay time, sample volume, sample geometry, detector efficiency, baseline counts, branching ratio and MDC calculations, are made based on the counts at the location in the spectrum where the peak for that radionuclide would be located, if present. Typically achieved liquid effluent sample analyses minimum detectable concentrations are reported in Table 1-4.

Tritium, Gross Alpha, Sr-89, Sr-90 and Fe-55 are, in some cases, analyzed offsite.

The radionuclide concentrations determined by gamma spectroscopic analysis of samples taken from tanks planned for release, in addition to the most current sample analysis results available for tritium, gross alpha, Sr-89, Sr-90 and Fe-55, are used along with the corresponding ECL values to determine the ECL fraction for these tanks. This ECL fraction is then used, with the appropriate safety factors, tolerance factors, and the expected dilution stream flow to calculate maximum permissible release rate and a liquid effluent monitor setpoint. The monitor setpoint is calculated to assure that the limits of the ODCM are not exceeded.

A monitor reading in excess of the calculated setpoint will result in an automatic termination of the liquid radwaste discharge. Liquid effluent discharge is also automatically terminated if the dilution stream flow rate falls below the minimum assured dilution flow rate used in the setpoint calculations and established as a setpoint on the dilution stream flow monitor.

Radionuclide concentrations, safety factors, dilution stream flow rate, and the liquid effluent radiation monitor calibration factor, are entered into the computer and a pre-release printout is generated. If the release is not permissible, appropriate warnings will be displayed on the computer screen. If the release is permissible, it is approved by the Chemistry Foreman on duty. The pertinent information is transferred manually from the prerelease printout to a one-page release permit, which is forwarded to Radwaste Operations. When the release is completed, the release permit is returned from Radwaste Operations to Chemistry with the actual release data provided. These data are input into the computer and a post-release printout is generated. The post release printout contains the actual release rates, the actual release concentrations and quantities, the actual dilution flow, and the calculated doses to a Member of the Public.

1.4 Measurements and Approximations of Total Radioactivity for Groundwater Outfall – Y22N008A

Samples are collected and analyzed in accordance with the Edwin I. Hatch Nuclear Plant Offsite Dose Calculation Manual (ODCM) Table 2-3. Weekly, monthly and quarterly composites are prepared for analysis by extracting aliquots from each outfall's automatic sampler, which collects a composite sample over a seven-day period. Sample analyses are performed as described in Section 1.4.1.

1.4.1 Total Radioactivity Determination for Groundwater Outfalls

<u>MEASUREMENT</u>	<u>FREQUENCY</u>	<u>METHOD</u>
1. Gamma Isotopic	Weekly Composite	Gamma Spectroscopy with computerized data reduction
2. Tritium	Weekly Composite	Distillation and liquid scintillation counting
3. Gross beta*	Quarterly Composite	Chemical separation and gas flow proportional or scintillation counting
4. Sr-89 & 90**	Quarterly Composite	Chemical separation and gas flow proportional or scintillation counting

*Gross beta analysis is used for sample screening.

** If the Gross beta analysis yields a detectable value above background, a Sr-89/90 analysis will be performed.

Gamma isotopic measurements are performed in-house using germanium detectors with a resolution of 2.0 keV or lower. The detectors are shielded by four inches of lead. A weekly composite sample is typically counted to Environmental MDC's and a peak search of the resulting gamma ray spectrum is performed. Energy and net count data for all significant peaks are determined and a quantitative reduction or MDC calculation is performed to ensure that the MDC's are met for the nuclides specified in the ODCM Chapter 10 (i.e., Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141 and Ce-144). The quantitative calculations, corrections for counting time, decay time, sample volume, sample geometry, detector efficiency, baseline counts, branching ratio and MDC calculations, are made based on the counts at the location in the spectrum where the peak for that radionuclide would be located, if present. Typically achieved liquid effluent sample analyses minimum detectable concentrations are reported in Table 1-4.

Tritium, Gross Beta, Sr-89 and Sr-90 are, in some cases, analyzed offsite.

The radionuclide concentrations determined by gamma spectroscopic analysis of the weekly composite sample, in addition to the most current sample analysis results available for tritium, gross beta, Sr-89 and Sr-90, are used along with the corresponding ECL values to determine the ECL fraction for these composite samples. This ECL fraction is then used, with the appropriate safety factors, tolerance factors, and the expected dilution stream flow to calculate projected dose released.

Radionuclide concentrations, safety factors and dilution stream flow rate are entered into the computer and a pre-release printout is generated for each release period. When the release period is complete, the release permit is updated with the actual release data collected during the release period. These data are input into the computer and a post-release printout is generated. The post release printout contains the actual release rates, the actual release concentrations and quantities, the actual dilution flow, and the calculated doses to a Member of the Public. Cumulative dose results are tabulated along with the percent of the ODCM limit for each release period, for the current quarter and year.

1.5 Total Error Estimation

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%. Therefore, the total error estimation is + or - 18%.

1.6 Liquid Effluent Release Data

Regulatory Guide 1.21, Tables 2A and 2B are found in this report as Table 1-1A, for Unit 1, Table 1-1B, for Unit 2 and Table 1-1C, for the site; and Table 1-2A, for Unit 1, 1-2B, for Unit 2, and Table 1-2C, for the site. Typical liquid minimum detectable concentrations (MDC's) used for analyses are found in Table 1-4.

The values for the four categories of Tables 1-1A, and 1-1B, and 1-1C, are calculated and the Tables completed as follows:

1. Fission and activation products - The total release values (not including tritium, gases, and alpha) are comprised of the sum of the measured individual radionuclide activities. This sum is for each batch released to the river for the respective quarter.
2. Tritium - The measured tritium concentrations in the monthly composite samples are used to calculate the total release and average diluted concentration during each period.
3. Dissolved and entrained gases - Concentrations of dissolved and entrained gases in liquid effluents are measured by germanium spectroscopy using a one liter sample from each liquid radwaste batch. The measured concentrations are used to calculate the total release and the average diluted concentration during the period. Radioisotopes of iodine in any form are also determined during the isotopic analysis for each batch; therefore, a separate analysis for possible gaseous forms is not performed because it would not provide additional information.
4. Gross alpha radioactivity - The measured gross alpha concentrations in the monthly composite samples are used to calculate the total release of alpha radioactivity.

1.7 Radiological Impact Due to Liquid Releases

Doses to a Member of the Public due to radioactivity in liquid effluents were calculated in accordance with the Offsite Dose Calculation Manual. Results are presented in Table 1-3A for Unit 1, and 1-3B for Unit 2, for all four quarters.

1.8 Liquid Effluents - Batch Releases

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

Unit 1 Liquid Batch Releases: Table 1-5A

Unit 2 Liquid Batch Releases: Table 1-5B

1.9 Liquid Effluents - Continuous Releases

Continuous Release information is summarized in the following tables:

Unit 1 Liquid Continuous Releases: Table 1-2A

Unit 2 Liquid Continuous Releases: Table 1-2B

Hatch Site Continuous Releases: Table 1-2C

1.10 Liquid Effluents - Abnormal Releases

There were no abnormal liquid releases for this reporting period.

Table 1-1A

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents - Summation Of All Releases

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	1.73E-03	0.00E+00	6.82E-04	1.64E-04
2. Average diluted concentration during period	uCi/mL	5.43E-09	0.00E+00	2.06E-09	3.35E-09
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	5.63E+00	0.00E+00	3.52E+00	1.41E+00
2. Average diluted Concentration during period	uCi/mL	1.76E-05	0.00E+00	1.06E-05	2.89E-05
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	0.00E+00	0.00E+00	2.08E-06	3.03E-06
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	6.28E-12	6.18E-11
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
E: Waste Vol Release (Pre-Dilution)					
	Liters	1.63E+06	0.00E+00	1.25E+06	2.35E+05
F. Volume of Dilution Water Used					
	Liters	3.19E+08	0.00E+00	3.32E+08	4.90E+07

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

Table 1-1B

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents - Summation Of All Releases

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	3.35E-04	1.33E-05	5.02E-05	0.00E+00
2. Average diluted concentration during period	uCi/mL	8.57E-11	1.81E-12	9.51E-12	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	4.33E+00	4.19E-02	1.46E-02	1.46E-02
2. Average diluted Concentration during period	uCi/mL	1.11E-06	5.73E-09	2.76E-09	3.74E-09
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	1.27E-03	0.00E+00	0.00E+00	0.00E+00
2. Average diluted Concentration during period	uCi/mL	3.24E-10	0.00E+00	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
E: Waste Vol Release (Pre-Dilution)					
	Liters	3.90E+06	3.57E+06	3.54E+06	2.05E+06
F. Volume of Dilution Water Used					
	Liters	3.91E+09	7.32E+09	5.28E+09	3.89E+09

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

Table 1-1C

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents - Summation Of All Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	2.07E-03	1.33E-05	7.32E-04	1.64E-04
2. Average diluted concentration during period	uCi/mL	4.89E-10	1.81E-12	1.30E-10	4.16E-11
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	9.96E+00	4.61E-02	3.53E+00	1.43E+00
2. Average diluted Concentration during period	uCi/mL	2.36E-06	6.30E-09	6.29E-07	3.63E-07
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	1.27E-03	0.00E+00	2.08E-06	3.03E-06
2. Average diluted Concentration during period	uCi/mL	3.00E-10	0.00E+00	3.71E-13	7.68E-13
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
E: Waste Vol Release (Pre-Dilution)					
	Liters	5.53E+06	3.57E+06	4.79E+06	2.28E+06
F. Volume of Dilution Water Used					
	Liters	4.23E+09	7.32E+09	5.61E+09	3.94E+09

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

Table 1-2A

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Continuous Mode					
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved And Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2A

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
As-76	Curies	0.00E+00	0.00E+00	0.00E+00	1.22E-05
Co-58	Curies	4.65E-05	0.00E+00	2.84E-05	2.75E-06
Co-60	Curies	6.63E-04	0.00E+00	2.64E-04	5.36E-05
Cr-51	Curies	3.84E-04	0.00E+00	0.00E+00	0.00E+00
Fe-55	Curies	3.15E-04	0.00E+00	0.00E+00	0.00E+00
Fe-59	Curies	2.41E-06	0.00E+00	0.00E+00	0.00E+00
Mn-54	Curies	1.05E-04	0.00E+00	7.01E-05	1.48E-05
Mn-56	Curies	0.00E+00	0.00E+00	0.00E+00	2.33E-05
Na-24	Curies	0.00E+00	0.00E+00	1.59E-04	2.30E-05
Nb-95	Curies	6.23E-07	0.00E+00	0.00E+00	0.00E+00
Nb-97	Curies	2.57E-05	0.00E+00	0.00E+00	3.68E-09
Sr-89	Curies	6.89E-05	0.00E+00	2.24E-05	0.00E+00
Sr-90	Curies	1.57E-05	0.00E+00	0.00E+00	0.00E+00
Zn-65	Curies	2.82E-05	0.00E+00	4.85E-05	9.07E-06
Cs-137	Curies	6.52E-05	0.00E+00	8.95E-05	1.49E-05
Cs-138	Curies	0.00E+00	0.00E+00	0.00E+00	7.80E-06
Zn-69M	Curies	0.00E+00	0.00E+00	0.00E+00	2.52E-06
Ag-110M	Curies	1.19E-05	0.00E+00	0.00E+00	0.00E+00
Total For Period	Curies	1.73E-03	0.00E+00	6.82E-04	1.64E-04
Tritium					
H-3	Curies	5.63E+00	0.00E+00	3.52E+00	1.41E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2A

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Dissolved And Entrained Gases					
Xe-135	Curies	0.00E+00	0.00E+00	2.08E-06	3.03E-06
Total For Period	Curies	0.00E+00	0.00E+00	2.08E-06	3.03E-06
Gross Alpha Radioactivity					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2B
Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: 2
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Continuous Mode					
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Sr-89	Curies	1.17E-04	1.33E-05	5.02E-05	0.00E+00
Total For Period	Curies	1.17E-04	1.33E-05	5.02E-05	0.00E+00
Tritium					
H-3	Curies	1.78E-02	4.19E-02	1.46E-02	1.46E-02
Dissolved And Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2B
Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: 2
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Y-92	Curies	1.12E-04	0.00E+00	0.00E+00	0.00E+00
Co-58	Curies	2.15E-06	0.00E+00	0.00E+00	0.00E+00
Co-60	Curies	2.38E-05	0.00E+00	0.00E+00	0.00E+00
Mn-54	Curies	9.63E-06	0.00E+00	0.00E+00	0.00E+00
Sr-90	Curies	8.25E-06	0.00E+00	0.00E+00	0.00E+00
Y-91M	Curies	2.22E-05	0.00E+00	0.00E+00	0.00E+00
Zn-65	Curies	2.88E-06	0.00E+00	0.00E+00	0.00E+00
La-140	Curies	6.16E-06	0.00E+00	0.00E+00	0.00E+00
Sb-124	Curies	2.55E-07	0.00E+00	0.00E+00	0.00E+00
Tc-99M	Curies	1.17E-05	0.00E+00	0.00E+00	0.00E+00
Zn-69M	Curies	1.91E-05	0.00E+00	0.00E+00	0.00E+00
Total For Period	Curies	2.18E-04	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	4.31E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved And Entrained Gases					
Xe-133	Curies	4.55E-04	0.00E+00	0.00E+00	0.00E+00
Xe-135	Curies	8.12E-04	0.00E+00	0.00E+00	0.00E+00
Total For Period	Curies	1.27E-03	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C
Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: Site
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Continuous Mode					
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Sr-89	Curies	1.17E-04	1.33E-05	5.02E-05	0.00E+00
Total For Period	Curies	1.17E-04	1.33E-05	5.02E-05	0.00E+00
Tritium					
H-3	Curies	1.78E-02	4.61E-02	1.46E-02	1.46E-02
Dissolved And Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Y-92	Curies	1.12E-04	0.00E+00	0.00E+00	0.00E+00
As-76	Curies	0.00E+00	0.00E+00	0.00E+00	1.22E-05
Co-58	Curies	4.86E-05	0.00E+00	2.84E-05	2.75E-06
Co-60	Curies	6.87E-04	0.00E+00	2.64E-04	5.36E-05
Cr-51	Curies	3.84E-04	0.00E+00	0.00E+00	0.00E+00
Fe-55	Curies	3.15E-04	0.00E+00	0.00E+00	0.00E+00
Fe-59	Curies	2.41E-06	0.00E+00	0.00E+00	0.00E+00
Mn-54	Curies	1.15E-04	0.00E+00	7.01E-05	1.48E-05
Mn-56	Curies	0.00E+00	0.00E+00	0.00E+00	2.33E-05
Na-24	Curies	0.00E+00	0.00E+00	1.59E-04	2.30E-05
Nb-95	Curies	6.23E-07	0.00E+00	0.00E+00	0.00E+00
Nb-97	Curies	2.57E-05	0.00E+00	0.00E+00	3.68E-09
Sr-89	Curies	6.89E-05	0.00E+00	2.24E-05	0.00E+00
Sr-90	Curies	2.39E-05	0.00E+00	0.00E+00	0.00E+00
Y-91M	Curies	2.22E-05	0.00E+00	0.00E+00	0.00E+00
Zn-65	Curies	3.11E-05	0.00E+00	4.85E-05	9.07E-06
Cs-137	Curies	6.52E-05	0.00E+00	8.95E-05	1.49E-05
Cs-138	Curies	0.00E+00	0.00E+00	0.00E+00	7.80E-06
La-140	Curies	6.16E-06	0.00E+00	0.00E+00	0.00E+00
Sb-124	Curies	2.55E-07	0.00E+00	0.00E+00	0.00E+00
Tc-99M	Curies	1.17E-05	0.00E+00	0.00E+00	0.00E+00
Zn-69M	Curies	1.91E-05	0.00E+00	0.00E+00	2.52E-06
Ag-110M	Curies	1.19E-05	0.00E+00	0.00E+00	0.00E+00
Total For Period	Curies	1.95E-03	0.00E+00	6.82E-04	1.64E-04

Zeros in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Tritium					
H-3	Curies	9.94E+00	0.00E+00	3.52E+00	1.41E+00
Dissolved And Entrained Gases					
Xe-133	Curies	4.55E-04	0.00E+00	0.00E+00	0.00E+00
Xe-135	Curies	8.12E-04	0.00E+00	2.08E-06	3.03E-06
Total For Period	Curies	1.27E-03	0.00E+00	2.08E-06	3.03E-06
Gross Alpha Radioactivity					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Zeros in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-3A

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses to a member of the public due to Liquid Releases

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	5.00E+00	mRem	2.73E-04	5.46E-03	0.00E+00	0.00E+00	2.90E-04	5.79E-03	5.16E-05	1.03E-03
GI-Lli	5.00E+00	mRem	4.08E-04	8.16E-03	0.00E+00	0.00E+00	1.73E-04	3.46E-03	4.27E-05	8.54E-04
Kidney	5.00E+00	mRem	1.53E-04	3.06E-03	0.00E+00	0.00E+00	1.64E-04	3.29E-03	3.63E-05	7.26E-04
Liver	5.00E+00	mRem	3.85E-04	7.69E-03	0.00E+00	0.00E+00	4.33E-04	8.66E-03	8.48E-05	1.70E-03
Lung	5.00E+00	mRem	7.54E-05	1.51E-03	0.00E+00	0.00E+00	6.65E-05	1.33E-03	1.84E-05	3.69E-04
Thyroid	5.00E+00	mRem	3.95E-05	7.91E-04	0.00E+00	0.00E+00	2.28E-05	4.57E-04	1.06E-05	2.13E-04
Total Body	1.50E+00	mRem	2.98E-04	1.99E-02	0.00E+00	0.00E+00	2.98E-04	1.99E-02	6.07E-05	4.04E-03

Cumulative Doses per Year

Organ	ODCM Lmt	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.00E+01	mRem	6.15E-04	6.15E-03	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
GI-Lli	1.00E+01	mRem	6.24E-04	6.24E-03	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Kidney	1.00E+01	mRem	3.54E-04	3.54E-03	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Liver	1.00E+01	mRem	9.02E-04	9.02E-03	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Lung	1.00E+01	mRem	1.60E-04	1.60E-03	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Thyroid	1.00E+01	mRem	7.30E-05	7.30E-04	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Total Body	3.00E+00	mRem	6.57E-04	2.19E-02	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Tot Body Liq Dose

Table 1-3B

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses to a member of the public due to Liquid Releases

Unit: 2

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	5.00E+00	mRem	4.01E-05	8.03E-04	1.56E-06	3.11E-05	5.64E-06	1.13E-04	0.00E+00	0.00E+00
GI-Lli	5.00E+00	mRem	7.31E-05	1.46E-03	6.25E-07	1.25E-05	1.04E-06	2.08E-05	1.94E-07	3.87E-06
Kidney	5.00E+00	mRem	5.20E-05	1.04E-03	3.76E-07	7.51E-06	1.36E-07	2.73E-06	1.94E-07	3.87E-06
Liver	5.00E+00	mRem	5.35E-05	1.07E-03	3.76E-07	7.51E-06	1.36E-07	2.73E-06	1.94E-07	3.87E-06
Lung	5.00E+00	mRem	5.10E-05	1.02E-03	3.76E-07	7.51E-06	1.36E-07	2.73E-06	1.94E-07	3.87E-06
Thyroid	5.00E+00	mRem	5.10E-05	1.02E-03	3.76E-07	7.51E-06	1.36E-07	2.73E-06	1.94E-07	3.87E-06
Total Body	1.50E+00	mRem	5.95E-05	3.97E-03	4.20E-07	2.80E-05	2.98E-07	1.99E-05	1.94E-07	1.29E-05

Cumulative Doses per Year

Organ	ODCM Lmt	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.00E+01	mRem	4.73E-05	4.73E-04	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
GI-Lli	1.00E+01	mRem	7.49E-05	7.49E-04	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Kidney	1.00E+01	mRem	5.27E-05	5.27E-04	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Liver	1.00E+01	mRem	5.42E-05	5.42E-04	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Lung	1.00E+01	mRem	5.18E-05	5.18E-04	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Thyroid	1.00E+01	mRem	5.18E-05	5.18E-04	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Organ Liq Dose
Total Body	3.00E+00	mRem	6.04E-05	2.01E-03	MAX INDIVIDUAL LIQUID / Adult	Ann Cum Tot Body Liq Dose

Table 1-4
E. I. HATCH NUCLEAR PLANT RADIOACTIVE
EFFLUENT RELEASE REPORT - 2012
MINIMUM DETECTABLE CONCENTRATIONS - LIQUID SAMPLE ANALYSES
STARTING: 1-Jan-2012 ENDING: 31-Dec-2012

The values in this table represent a priori Minimum Detectable Concentrations (MDC) that are typically achieved in laboratory analyses of liquid radwaste samples.

RADIONUCLIDE	MDC	UNITS
Mn-54	1.97E-08	uCi/ml
Fe-59	3.94E-08	uCi/ml
Co-58	1.59E-08	uCi/ml
Co-60	1.72E-08	uCi/ml
Zn-65	2.92E-08	uCi/ml
Mo-99	1.20E-07	uCi/ml
Cs-134	1.75E-08	uCi/ml
Cs-137	1.62E-08	uCi/ml
Ce-141	1.92E-08	uCi/ml
Ce-144	8.83E-08	uCi/ml
I-131	1.43E-08	uCi/ml
Xe-135	1.03E-08	uCi/ml
Fe-55	2.34E-08	uCi/ml
Sr-89	1.44E-08	uCi/ml
Sr-90	8.50E-09	uCi/ml
H-3	6.00E-07	uCi/ml

Table 1-5A**Hatch Nuclear Plant****RADIOACTIVE EFFLUENT RELEASE REPORT - 2012****Liquid Effluents - Batch Release Summary****Unit: 1****Starting: 1-Jan-2012 Ending: 31-Dec-2012**

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		48	0	42	8	98
2. Total time period for Batch releases	(Minutes)	5.71E+03	0.00E+00	5.56E+03	9.43E+02	1.22E+04
3. Maximum time period for a batch release	(Minutes)	1.70E+02	0.00E+00	1.80E+02	1.77E+02	1.80E+02
4. Average time period for a batch release	(Minutes)	1.19E+02	0.00E+00	1.32E+02	1.18E+02	1.25E+02
5. Minimum time period for a batch release	(Minutes)	7.90E+01	0.00E+00	8.80E+01	7.80E+01	7.80E+01
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	5.25E+03	2.26E+03	1.58E+03	1.67E+03	2.69E+03
Replace this text in the Station Parameters						

Table 1-5B**Hatch Nuclear Plant****RADIOACTIVE EFFLUENT RELEASE REPORT - 2012****Liquid Effluents - Batch Release Summary****Unit: 2****Starting: 1-Jan-2012 Ending: 31-Dec-2012**

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		26	0	0	0	26
2. Total time period for Batch releases	(Minutes)	3.07E+03	0.00E+00	0.00E+00	0.00E+00	3.07E+03
3. Maximum time period for a batch release	(Minutes)	1.72E+02	0.00E+00	0.00E+00	0.00E+00	1.72E+02
4. Average time period for a batch release	(Minutes)	1.18E+02	0.00E+00	0.00E+00	0.00E+00	1.18E+02
5. Minimum time period for a batch release	(Minutes)	6.00E+00	0.00E+00	0.00E+00	0.00E+00	6.00E+00
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	5.25E+03	2.26E+03	1.58E+03	1.67E+03	2.69E+03
Replace this text in the Station Parameters						

Table 1-6A

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents - Abnormal Release Summary

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 1-6B**Hatch Nuclear Plant****RADIOACTIVE EFFLUENT RELEASE REPORT - 2012****Liquid Effluents - Abnormal Release Summary****Unit: 2****Starting: 1-Jan-2012 Ending: 31-Dec-2012**

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 1-6C

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents - Abnormal Release Summary

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

2.0 Gaseous Effluents

2.1 Regulatory Requirements

The ODCM Specifications presented in this section are for Unit 1 and Unit 2.

2.1.1 Dose Rate Limits

The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY shall be limited to the following:

- a. For noble gases: Less than or equal to 500 mrem/yr. to the whole body and less than or equal to 3000 mrem/yr. to the skin and,
- b. For Iodine-131, Iodine-133, tritium and for all radionuclides in particulate form with half lives greater than 8 days: Less than or equal to 1500 mrem/yr. to any organ.

2.1.2 Air Doses Due To Noble Gases in Gaseous Effluents

The air dose due to noble gases released in gaseous effluents, from each unit, to areas at and beyond the SITE BOUNDARY, 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.

2.1.3 Doses To A Member of the Public

The dose to a MEMBER OF THE PUBLIC from Iodine-131, Iodine-133, tritium and all radionuclides in particulate form with half-lives greater than 8 days, in gaseous effluents released from each unit, to areas at and beyond the SITE BOUNDARY, shall be limited to the following.

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

2.2 Measurements and Approximations of Total Radioactivity

Waste gas release at Plant Hatch is confined to four paths: main stack (also called the offgas vent), Unit 1 reactor building vent, Unit 2 reactor building vent, and the recombiner building vent. Each of these four paths is continuously monitored for gaseous radioactivity.

2.2.1 Sample Collection and Analysis

Each of the four gaseous effluent paths is equipped with an integrating-type sample collection device for collecting particulates and iodines. Unless required more frequently under certain circumstances, samples are collected as follows:

1. Noble gas samples are collected by grab sampling monthly.
2. Tritium samples are collected by grab sampling monthly.
3. Radioiodine samples are collected by pulling the sample stream through a charcoal cartridge over a 7-day period.
4. Particulates are collected by pulling the sample stream through a particulate filter over a 7-day period.
5. The 7-day particulate filters above are analyzed for gross alpha activity.
6. Quarterly composite samples are prepared from the particulate filters collected over the previous quarter and the samples are analyzed for Sr-89 and Sr-90.

Sample analyses results and release flow rates from the four release points form the basis for calculating released quantities of radionuclide-specific radioactivity, the dose rates associated with gaseous releases, and the cumulative doses for the current quarter and year. This task is normally performed with computer assistance.

The noble gas grab sample analysis results are used along with maximum expected release flow rates from each of the four vents to calculate monitor setpoints for the gaseous effluent monitors serving the four release points. Calculation of monitor setpoints is described in the ODCM. Typically achieved minimum detectable concentrations for gaseous effluents sample and analyses are reported in Table 2-6.

For each release period, released radioactivity, dose rates, and cumulative doses are calculated. Cumulative dose results are tabulated along with the percent of the ODCM limit for each release, for the current quarter and year.

2.2.2 Total Quantities of Radioactivity, Dose Rates, and Cumulative Doses

The methods for determining release quantities of radioactivity, dose rates, and cumulative doses follow:

2.2.2.1 Fission and Activation Gases

The released radioactivity is determined using sample analyses results collected as described above and the average release flow rates over the period represented by the collected sample.

Dose rates due to noble gases, radioiodines, tritium, and particulates are calculated (with computer assistance). The calculated dose rates are compared to the dose rate limits specified in ODCM 3.1.2 for noble gases, radioiodine, tritium, and particulates. Dose rate calculation methodology is presented in the ODCM.

Beta and gamma air doses due to noble gases are calculated for the location in the unrestricted area with the potential for the highest exposure due to gaseous releases. Air doses are calculated for each release period and cumulative totals are kept for each unit for the calendar quarter and year. Cumulative air doses are compared to the dose limits specified in ODCM 3.1.3. The current percent of the ODCM limits are shown on the printout for each release period. Air dose calculation methodology is presented in the ODCM.

2.2.2.2 Radioiodine, Tritium and Particulate Releases

Released quantities of radioiodines are determined using the weekly samples and release flow rates for the four release points. Radioiodine concentrations are determined by gamma spectroscopy.

Release quantities of particulates are determined using the weekly (filter) samples and release flow rates for the four release points. Gamma spectroscopy is used to quantify concentrations of principal gamma emitters.

After each quarter, the particulate filters from each vent are combined, fused, and a strontium separation is performed. Since sample flows and vent flows are almost constant over each quarterly period the filters from each vent can be dissolved together. Decay corrections are performed back to the middle of the quarterly collection period. If Sr-89 or Sr-90 is not detected, MDC's are calculated. Strontium concentrations are input into the composite file of the computer and used for release dose rate and dose calculations for a Member of the Public.

Tritium samples are obtained monthly from each vent by passing the sample stream through a cold trap. The grams of water vapor/cubic foot is measured upstream of the cold trap in order to alleviate the difficulties in determining water vapor collection efficiencies. The tritium samples are analyzed by an independent laboratory and the results are furnished in uCi/ml of water. The tritium concentration in water is converted to the tritium concentration in air and this value is input into the composite file of the computer and used in release, dose rate, and individual dose calculations.

Dose rates due to radioiodine, tritium and particulates are calculated for a hypothetical child exposed to the inhalation pathway at the location in the unrestricted area where the potential dose rate is expected to be the highest. Dose rates are calculated, for each release point for each release period, and the dose rates from each release point are compared to the dose rate limits as described in ODCM 3.1.2. Doses due to radioiodine, tritium and particulates are calculated for the controlling receptor, which is described in the ODCM. Doses to a Member of the Public are calculated for each release period, and cumulative totals are kept for each unit, for the current calendar quarter and year. Cumulative doses are compared to the dose limits specified in ODCM 3.1.4. The current percent of ODCM limits are shown on the printout for each release period.

2.2.2.3 Gross Alpha Release

The gross alpha release is computed each month by counting the particulate filters, for each week for gross alpha activity in a proportional counter. The four or five weeks' numbers are then recorded on a data sheet and the activity is summed at the end of the month. The summed activity is then divided by the total monthly volume to determine the concentration. This concentration is input into the composite file of the computer and used for release calculations.

2.2.3 Total Error Estimation

The total or maximum error associated with the effluent measurement will include the cumulative errors resulting from the total process of sampling and measurement. Due to the difficulty with assigning error terms for each parameter affecting the final measurement, detailed statistical evaluation of error is not suggested. The objective is to obtain an overall estimate of the error associated with measurements of radioactive materials released in liquid and gaseous effluents and solid waste.

Estimated errors are associated with counting equipment calibration, counting statistics, vent-flow rates, vent sample flow rates, non steady release rates, chemical yield factors and sample losses for such items as charcoal cartridges.

Fission and activation total release was calculated from sample analysis results and release point flow rates.

Statistical error	60%
Counting equipment calibration	10%
Vent flow rates	10%
Non-steady release rates	20%
TOTAL ERROR	65%

I-131 releases were calculated from each weekly sample.

Statistical error	60%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	10%
Non-steady release rates	10%
Losses from charcoal cartridges	10%
TOTAL ERROR	64%

Particulates with half lives greater than 8 days releases were calculated from sample analysis results and release point flow rates.

Statistical error	60%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	10%
Non-steady release rates	10%
TOTAL ERROR	63%

Total tritium releases were calculated from sample analysis results and release point flow rates.

Water vapor in sample stream determination	20%
Vent flow rates	10%
Counting calibration and statistics	10%
Non-steady release rates	50%
TOTAL ERROR	56%

Gross Alpha radioactivity was calculated from sample analysis results and release point flow rates.

Statistical error	60%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	10%
Non-steady release rates	10%
TOTAL ERROR	63%

2.3 Gaseous Effluent Release Data

Regulatory Guide 1.21 Tables 1A, 1B, and 1C are found in this report as Tables 2-1A, 2-1B, 2-1C, 2-2A, 2-2B, 2-2C, 2-3A, 2-3B, 2-3C. Data is presented on a quarterly basis as required by Regulatory Guide 1.21 for all quarters.

To complete table 2-1A, 2-1B, and 2-1C, total release for each of the four categories (fission and activation gases, iodines, particulates, and tritium) was divided by the number of seconds in the quarter to obtain a release rate in uCi/second for each category for each quarter. However, the percent of the ODCM limits are not applicable because we have no curie limits for gaseous releases. Applicable limits are expressed in terms of dose. Noble gases are limited as specified in ODCM 3.1.2. The other three categories (tritium, radioiodines, and particulates) are limited as a group as specified in ODCM 3.1.2.

Dose rates due to noble gas releases and due to radioiodine, tritium, and particulates were calculated as part of the pre-release and post-release permits on individual permits. No limits were exceeded for this reporting period.

Gross alpha radioactivity is reported in Table 2-1A, 2-1B, and 2-1C, as curies released in each quarter.

Limits for cumulative beta and gamma air doses due to noble gases are specified in ODCM 3.1.3. Cumulative air doses are presented in Table 2-4A and 2-4B, along with percent of ODCM limits.

Limits for cumulative doses to a Member of the Public due to radioiodine, tritium and particulates, are specified in ODCM 3.1.4. Cumulative doses to a Member of the Public doses are presented in Table 2-5A, and 2-5B, along with percent of ODCM limits.

2.4 Radiological Impact Due to Gaseous Releases

Dose rates due to noble gas release were calculated for the site in accordance with ODCM 3.1.2. Dose rates due to radioiodine, tritium, and particulates in gaseous releases were calculated in accordance with ODCM 3.1.2.

These dose rates were calculated as part of the pre-release and post release on individual release permits. No limits were exceeded for this reporting period.

Cumulative air doses due to noble gas releases were calculated for each unit in accordance with ODCM 3.1.3. These results are presented in Tables 2-4A and 2-4B.

Cumulative doses to a Member of the Public due to radioiodine, tritium and particulates in gaseous releases were calculated for each unit in accordance with ODCM 3.1.4. These results are presented in Tables 2-5A and 2-5B.

Dose rates and doses were calculated using the methodology presented in the ODCM.

2.5 Gaseous Effluents - Batch Releases

There are no gaseous batch releases from Plant Hatch.

2.6 Gaseous Effluents - Abnormal Releases

There were no unplanned or uncontrolled gaseous releases during this reporting period.

Table 2-1A

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Summation Of All Releases
Unit: 1
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	4.86E+00	6.34E+00	1.19E+01	1.97E+01
2. Average Release rate for period	uCi/sec	6.16E-01	8.04E-01	1.51E+00	2.50E+00
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	2.86E-05	1.46E-04	1.12E-04	8.57E-05
2. Average Release rate for period	uCi/sec	3.62E-06	1.86E-05	1.42E-05	1.09E-05
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8 Days)	Curies	9.89E-06	3.92E-05	3.62E-05	3.02E-05
2. Average Release rate for period	uCi/sec	1.25E-06	4.97E-06	4.59E-06	3.835E-06
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	4.23E+00	4.40E+00	5.76E+00	7.72E+00
2. Average Release rate for period	uCi/sec	5.37E-01	5.58E-01	7.31E-01	9.79E-01
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 2-1B

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Gaseous Effluents - Summation Of All Releases

Unit: 2

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	4.94E+00	6.34E+00	1.19E+01	1.97E+01
2. Average Release rate for period	uCi/sec	6.26E-01	8.04E-01	1.51E+00	2.50E+00
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	6.44E-05	1.57E-04	1.20E-04	1.06E-04
2. Average Release rate for period	uCi/sec	8.16E-06	1.99E-05	1.52E-05	1.34E-05
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8 Days)	Curies	1.93E-05	4.20E-05	3.79E-05	3.27E-05
2. Average Release rate for period	uCi/sec	2.45E-06	5.33E-06	4.81E-06	4.150E-06
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	3.53E+00	4.25E+00	4.07E+00	4.30E+00
2. Average Release rate for period	uCi/sec	4.48E-01	5.39E-01	5.16E-01	5.46E-01
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 2-1C

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Gaseous Effluents - Summation Of All Releases

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	9.80E+00	1.27E+01	2.38E+01	3.95E+01
2. Average Release rate for period	uCi/sec	1.24E+00	1.61E+00	3.02E+00	5.01E+00
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	9.29E-05	3.03E-04	2.32E-04	1.91E-04
2. Average Release rate for period	uCi/sec	1.18E-05	3.85E-05	2.94E-05	2.43E-05
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8 Days)	Curies	2.92E-05	8.12E-05	7.41E-05	6.30E-05
2. Average Release rate for period	uCi/sec	3.71E-06	1.03E-05	9.40E-06	7.985E-06
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	7.76E+00	8.64E+00	9.83E+00	1.20E+01
2. Average Release rate for period	uCi/sec	9.84E-01	1.10E+00	1.25E+00	1.53E+00
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 2-2A

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Elevated Level Releases
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	5.91E-01	0.00E+00	1.77E+00	3.89E+00
Kr-85M	Curies	1.03E-01	0.00E+00	1.51E+00	3.38E+00
Kr-88	Curies	0.00E+00	0.00E+00	0.00E+00	2.86E+00
Xe-133	Curies	3.76E+00	6.09E+00	7.40E+00	8.41E+00
Xe-135	Curies	4.09E-01	2.52E-01	1.22E+00	1.20E+00
Total For Period	Curies	4.86E+00	6.34E+00	1.19E+01	1.97E+01
Iodines					
I-131	Curies	2.28E-05	1.41E-04	1.03E-04	7.88E-05
I-133	Curies	4.13E-05	1.96E-04	2.00E-04	1.45E-04
Total For Period	Curies	6.40E-05	3.37E-04	3.03E-04	2.24E-04
Particulates					
Co-60	Curies	0.00E+00	0.00E+00	0.00E+00	6.03E-08
Sr-89	Curies	3.83E-06	2.10E-05	1.54E-05	1.46E-05
Sr-90	Curies	2.34E-08	1.19E-07	7.74E-08	6.38E-08
Cs-137	Curies	4.96E-08	1.30E-07	8.48E-08	0.00E+00
Ba-140	Curies	2.56E-06	1.69E-05	1.82E-05	1.39E-05
Total For Period	Curies	6.47E-06	3.82E-05	3.38E-05	2.85E-05
Tritium					
H-3	Curies	1.10E-01	6.60E-01	7.49E-01	5.42E-01

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-2A

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Gaseous Effluents - Elevated Level Releases

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Continuous Mode					
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-2A
Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Elevated Level Releases
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-2B

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Elevated Level Releases
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	5.91E-01	0.00E+00	1.77E+00	3.89E+00
Kr-85M	Curies	1.03E-01	0.00E+00	1.51E+00	3.38E+00
Kr-88	Curies	0.00E+00	0.00E+00	0.00E+00	2.86E+00
Xe-133	Curies	3.76E+00	6.09E+00	7.40E+00	8.41E+00
Xe-135	Curies	4.86E-01	2.52E-01	1.22E+00	1.20E+00
Total For Period	Curies	4.94E+00	6.34E+00	1.19E+01	1.97E+01
Iodines					
I-131	Curies	4.60E-05	1.41E-04	1.03E-04	7.88E-05
I-133	Curies	8.11E-05	1.96E-04	2.00E-04	1.45E-04
Total For Period	Curies	1.27E-04	3.37E-04	3.03E-04	2.24E-04
Particulates					
Co-60	Curies	0.00E+00	0.00E+00	0.00E+00	6.03E-08
Sr-89	Curies	8.75E-06	2.10E-05	1.54E-05	1.46E-05
Sr-90	Curies	5.33E-08	1.19E-07	7.74E-08	6.38E-08
Cs-137	Curies	4.96E-08	1.30E-07	8.48E-08	0.00E+00
Ba-140	Curies	4.85E-06	1.69E-05	1.82E-05	1.39E-05
Total For Period	Curies	1.37E-05	3.82E-05	3.38E-05	2.85E-05
Tritium					
H-3	Curies	1.81E-01	6.60E-01	7.49E-01	5.42E-01

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-2B

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Elevated Level Releases
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Continuous Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-2B

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Elevated Level Releases
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-2C

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Elevated Level Releases
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Continuous Mode					
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	1.18E+00	0.00E+00	3.54E+00	7.78E+00
Kr-85M	Curies	2.07E-01	0.00E+00	3.03E+00	6.76E+00
Kr-88	Curies	0.00E+00	0.00E+00	0.00E+00	5.72E+00
Xe-133	Curies	7.51E+00	1.22E+01	1.48E+01	1.68E+01
Xe-135	Curies	8.95E-01	5.05E-01	2.45E+00	2.40E+00
Total For Period	Curies	9.80E+00	1.27E+01	2.38E+01	3.95E+01
Iodines					
I-131	Curies	6.88E-05	2.82E-04	2.07E-04	1.58E-04
I-133	Curies	1.22E-04	3.91E-04	4.00E-04	2.90E-04
Total For Period	Curies	1.91E-04	6.73E-04	6.07E-04	4.48E-04
Particulates					
Co-60	Curies	0.00E+00	0.00E+00	0.00E+00	1.21E-07
Sr-89	Curies	1.26E-05	4.21E-05	3.09E-05	2.91E-05
Sr-90	Curies	7.67E-08	2.39E-07	1.55E-07	1.28E-07
Cs-137	Curies	9.92E-08	2.60E-07	1.70E-07	0.00E+00
Ba-140	Curies	7.41E-06	3.39E-05	3.64E-05	2.77E-05
Total For Period	Curies	2.02E-05	7.64E-05	6.76E-05	5.71E-05
Tritium					
H-3	Curies	2.91E-01	1.32E+00	1.50E+00	1.08E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-2C

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Gaseous Effluents - Elevated Level Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Continuous Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-2C

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Elevated Level Releases
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-3A

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: 1
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Continuous Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
I-131	Curies	5.76E-06	5.56E-06	8.62E-06	6.88E-06
I-133	Curies	0.00E+00	4.03E-06	3.46E-06	7.63E-06
Total For Period	Curies	5.76E-06	9.59E-06	1.21E-05	1.45E-05
Particulates					
Mn-54	Curies	6.27E-07	0.00E+00	0.00E+00	0.00E+00
Co-60	Curies	2.00E-06	0.00E+00	0.00E+00	0.00E+00
Sr-89	Curies	7.94E-07	9.22E-07	2.40E-06	1.69E-06
Sr-90	Curies	0.00E+00	6.79E-08	0.00E+00	0.00E+00
Total For Period	Curies	3.42E-06	9.90E-07	2.40E-06	1.69E-06
Tritium					
H-3	Curies	4.12E+00	3.74E+00	5.01E+00	7.18E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-3A

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-3B

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: 2
Starting: 1-Jan-2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
I-131	Curies	1.84E-05	1.60E-05	1.64E-05	2.68E-05
I-133	Curies	2.29E-05	2.33E-05	3.79E-05	5.96E-05
Total For Period	Curies	4.13E-05	3.93E-05	5.43E-05	8.64E-05
Particulates					
Sr-89	Curies	5.63E-06	3.82E-06	4.15E-06	4.17E-06
Total For Period	Curies	5.63E-06	3.82E-06	4.15E-06	4.17E-06
Tritium					
H-3	Curies	3.35E+00	3.59E+00	3.32E+00	3.76E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-3B

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases

Unit: 2

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Batch Mode					
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-3C

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: Site
Starting: 1-Jan-2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
I-131	Curies	2.41E-05	2.16E-05	2.50E-05	3.36E-05
I-133	Curies	2.29E-05	2.73E-05	4.14E-05	6.73E-05
Total For Period	Curies	4.71E-05	4.89E-05	6.64E-05	1.01E-04
Particulates					
Mn-54	Curies	6.27E-07	0.00E+00	0.00E+00	0.00E+00
Co-60	Curies	2.00E-06	0.00E+00	0.00E+00	0.00E+00
Sr-89	Curies	6.42E-06	4.74E-06	6.56E-06	5.86E-06
Sr-90	Curies	0.00E+00	6.79E-08	0.00E+00	0.00E+00
Total For Period	Curies	9.05E-06	4.81E-06	6.56E-06	5.86E-06
Tritium					
H-3	Curies	7.47E+00	7.32E+00	8.33E+00	1.09E+01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-3C

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: Site
Starting: 1-Jan-2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-4A

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Air Doses Due to Gaseous Releases

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Type of Radiation	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Gamma Air	5.00E+00	mRad	1.83E-05	3.66E-04	3.90E-06	7.79E-05	5.64E-05	1.13E-03	2.16E-04	4.33E-03
Beta Air	1.00E+01	mRad	1.47E-05	1.47E-04	1.45E-05	1.45E-04	4.05E-05	4.05E-04	8.20E-05	8.20E-04

Cumulative Doses Per Year

Type of Radiation	ODCM Lmt	Units	Year to End Date	% ODCM	Receptor	Limit
Gamma Air	1.00E+01	mRad	2.95E-04	2.95E-03	SITE BOUNDARY / Child	Ann Cum Gamma Airdose
Beta Air	2.00E+01	mRad	1.52E-04	7.58E-04	MAX IND. AIRBORNE / Child	Ann Cum Beta Airdose

Table 2-4B

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Air Doses Due to Gaseous Releases
Unit: 2
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Type of Radiation	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Gamma Air	5.00E+00	mRad	1.86E-05	3.73E-04	3.90E-06	7.79E-05	5.64E-05	1.13E-03	2.16E-04	4.33E-03
Beta Air	1.00E+01	mRad	1.51E-05	1.51E-04	1.45E-05	1.45E-04	4.05E-05	4.05E-04	8.20E-05	8.20E-04

Cumulative Doses Per Year

Type of Radiation	ODCM Lmt	Units	Year to End Date	% ODCM	Receptor	Limit
Gamma Air	1.00E+01	mRad	2.95E-04	2.95E-03	SITE BOUNDARY / Child	Ann Cum Gamma Airdose
Beta Air	2.00E+01	mRad	1.52E-04	7.60E-04	MAX IND. AIRBORNE / Child	Ann Cum Beta Airdose

Table 2-5A

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	7.50E+00	mRem	2.81E-05	3.74E-04	7.47E-05	9.96E-04	5.41E-05	7.22E-04	4.45E-05	5.93E-04
GI-Lli	7.50E+00	mRem	2.15E-03	2.87E-02	1.94E-03	2.59E-02	2.61E-03	3.47E-02	3.72E-03	4.97E-02
Kidney	7.50E+00	mRem	2.15E-03	2.86E-02	1.94E-03	2.59E-02	2.61E-03	3.47E-02	3.72E-03	4.97E-02
Liver	7.50E+00	mRem	2.15E-03	2.86E-02	1.94E-03	2.59E-02	2.60E-03	3.47E-02	3.72E-03	4.96E-02
Lung	7.50E+00	mRem	2.15E-03	2.87E-02	1.94E-03	2.59E-02	2.60E-03	3.47E-02	3.72E-03	4.96E-02
Thyroid	7.50E+00	mRem	2.28E-03	3.04E-02	2.33E-03	3.11E-02	2.96E-03	3.95E-02	4.00E-03	5.34E-02
Total Body	7.50E+00	mRem	2.15E-03	2.87E-02	1.95E-03	2.60E-02	2.61E-03	3.48E-02	3.73E-03	4.97E-02

Cumulative Doses per Year

Organ	ODCM Lmt	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.500E+01	mRem	2.014E-04	1.342E-03	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
GI-Lli	1.500E+01	mRem	1.042E-02	6.949E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Kidney	1.500E+01	mRem	1.042E-02	6.948E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Liver	1.500E+01	mRem	1.042E-02	6.946E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Lung	1.500E+01	mRem	1.042E-02	6.946E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Thyroid	1.500E+01	mRem	1.157E-02	7.716E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Total Body	1.500E+01	mRem	1.043E-02	6.955E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose

Table 2-5B

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: 2

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	7.50E+00	mRem	7.48E-05	9.97E-04	8.02E-05	1.07E-03	7.23E-05	9.64E-04	7.07E-05	9.43E-04
GI-Lli	7.50E+00	mRem	1.74E-03	2.32E-02	1.87E-03	2.49E-02	1.73E-03	2.30E-02	1.96E-03	2.61E-02
Kidney	7.50E+00	mRem	1.74E-03	2.32E-02	1.87E-03	2.49E-02	1.73E-03	2.30E-02	1.96E-03	2.61E-02
Liver	7.50E+00	mRem	1.74E-03	2.32E-02	1.87E-03	2.49E-02	1.73E-03	2.30E-02	1.96E-03	2.61E-02
Lung	7.50E+00	mRem	1.74E-03	2.32E-02	1.86E-03	2.49E-02	1.73E-03	2.30E-02	1.96E-03	2.61E-02
Thyroid	7.50E+00	mRem	2.12E-03	2.83E-02	2.42E-03	3.23E-02	2.22E-03	2.96E-02	2.56E-03	3.41E-02
Total Body	7.50E+00	mRem	1.74E-03	2.32E-02	1.87E-03	2.49E-02	1.73E-03	2.31E-02	1.96E-03	2.61E-02

Cumulative Doses per Year

Organ	ODCM Lmt	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.500E+01	mRem	2.980E-04	1.987E-03	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
GI-Lli	1.500E+01	mRem	7.291E-03	4.861E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Kidney	1.500E+01	mRem	7.290E-03	4.860E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Liver	1.500E+01	mRem	7.286E-03	4.857E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Lung	1.500E+01	mRem	7.283E-03	4.856E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Thyroid	1.500E+01	mRem	9.322E-03	6.215E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose
Total Body	1.500E+01	mRem	7.295E-03	4.863E-02	MAX IND. AIRBORNE / Child	Ann Cum Iod/Part Airdose

TABLE 2-6
E. I. HATCH NUCLEAR PLANT RADIOACTIVE
EFFLUENT RELEASE REPORT – 2012
MINIMUM DETECTABLE CONCENTRATIONS - GASEOUS SAMPLE ANALYSES
STARTING: 1-Jan-2012 **ENDING: 31-Dec-2012**

The values in this table represent a priori Minimum Detectable Concentration (MDC) that are typically achieved in laboratory analyses of gaseous radwaste samples.

RADIONUCLIDE	MDC	UNITS
Kr-87	2.94E-08	uCi/cc
Kr-88	3.22E-08	uCi/cc
Xe-133	2.30E-08	uCi/cc
Xe-133m	7.30E-08	uCi/cc
Xe-135	8.73E-09	uCi/cc
Xe-138	1.99E-07	uCi/cc
I-131	1.34E-13*	uCi/cc
I-133	1.53E-13*	uCi/cc
Mn-54	1.62E-13*	uCi/cc
Fe-59	3.42E-13*	uCi/cc
Co-58	1.30E-13*	uCi/cc
Co-60	1.54E-13*	uCi/cc
Zn-65	2.54E-13*	uCi/cc
Mo-99	9.61E-13*	uCi/cc
Cs-134	1.42E-13*	uCi/cc
Cs-137	1.28E-13*	uCi/cc
Ce-141	1.26E-13*	uCi/cc
Ce-144	5.64E-13*	uCi/cc
Sr-89	1.10E-16	uCi/cc
Sr-90	6.70E-16	uCi/cc
H-3	4.00E-07	uCi/cc

** Based on an estimated sample quantity of 4.078E+07 cc's.*

Table 2-7A

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Batch Release Summary
Unit: 1
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		0	0	0	0	0
2. Total time period for batch releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum time period for a batch release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average time period for a batch release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum time period for a batch release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 2-7B

Hatch Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Batch Release Summary
Unit: 2
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		0	0	0	0	0
2. Total time period for batch releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum time period for a batch release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average time period for a batch release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum time period for a batch release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 2-8A

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Gaseous Effluents - Abnormal Release Summary

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 2-8B**Hatch Nuclear Plant****RADIOACTIVE EFFLUENT RELEASE REPORT - 2012****Gaseous Effluents - Abnormal Release Summary****Unit: 2****Starting: 1-Jan-2012 Ending: 31-Dec-2012**

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 2-8C

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Gaseous Effluents - Abnormal Release Summary

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

3.0 Solid Waste

3.1 Regulatory Requirements

The Process Control Program (PCP) and the ODCM requirements presented in this section are for Unit 1 and Unit 2 and are stated in part.

3.1.1 Solid Radioactive Waste System

PCP Section A.3.1 Solid Radioactive Waste System control states:

The solid radwaste system shall be used in accordance with the PROCESS CONTROL PROGRAM to provide for the SOLIDIFICATION of wet solid wastes and for the SOLIDIFICATION and packaging of other radioactive wastes, as required, to ensure that they meet requirements of 10 CFR Parts 20 and 71, prior to shipment of radioactive wastes from the site.

3.1.2 Reporting Requirements

Technical Specification 5.6.3 requires in part:

The Radioactive Effluent Release Report covering the operation of the unit shall be submitted in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODCM and the Process Control Program and in conformance with 10 CFR 50.36a and 10 CFR 50, Appendix I, Section IV.B.1.

PCP Section A.4.1 states in part:

The Radioactive Effluent Release Report, submitted in accordance with Technical Specification 5.6.3, shall include a summary of the quantities of solid radwaste released from the units as outlined in 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, with data summarized on a 6 month basis following the format of Appendix B thereof.

For each type of solid radwaste shipped offsite during the report period, the report shall include the following information:

- a. Total curie quantity (specify whether determined by measurement or estimate).
- b. Principal radionuclides (specify whether determined by measurement or estimate).
- c. Type of waste (such as spent resin, compacted dry waste, evaporator bottoms).

Major changes to the solid radioactive waste treatment system shall be reported to the Nuclear Regulatory Commission in the Radioactive Effluent Release Report for the period in which the evaluation was reviewed and accepted by the PRB.

3.2 Solid Waste Data

Regulatory Guide 1.21, Table 3 is found in this report as Table 3-1.

TABLE 3-1
E. I. HATCH NUCLEAR PLANT RADIOACTIVE
EFFLUENT RELEASE REPORT - 2012 SOLID WASTE
AND IRRADIATED FUEL SHIPMENTS UNIT 1 AND 2
STARTING: 1-Jan-2012 **ENDING: 30-Jun-2012**

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

1. Type of waste	UNIT	6 month period	Est. Total ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³	4.68 E+01	
	Ci	5.09 E+01	1.00 E+ 01
b. Dry compressible waste, contaminated equip. etc.	m ³	8.88 E+02	
	Ci	2.42 E-01	2.00 E+ 01
c. Irradiated components, control rods,	m ³		
	Ci		
d. Control Rod Drive Filters	m ³		
	Ci		
e. Other (describe) Equip. etc.	m ³		
	Ci		

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

ISOTOPE	PERCENT	CURIES
a.Fe-55	18.6	9.45 E+00
Co-60	41.6	2.11 E+01
Zn-65	6.4	3.21 E+00
Mn-54	13.3	6.78 E+00
Cs-137	5.3	2.75 E+00
Cr-51	6.3	3.21 E+00
Other	8.6	4.42 E+00
b.Fe-55	62.8	3.80 E-01
Co-60	15.6	9.42 E-02
Mn-54	4.59	2.77 E-02
Zn-65	2.13	1.29 E-02
Other	14.9	9.02 E-02
c.		
d.		
e.		

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
All waste sent to processors	N/A	N/A

B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	N/A	N/A

TABLE 3-1
E. I. HATCH NUCLEAR PLANT RADIOACTIVE
EFFLUENT RELEASE REPORT - 2012 SOLID WASTE
AND IRRADIATED FUEL SHIPMENTS UNIT 1 AND 2
STARTING: 1-Jul-2012 **ENDING: 31-Dec-2012**

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

1. Type of waste	UNIT	6 month period	Est. Total ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³	2.37E+01	
	Ci	4.63E+02	1.00 E 01
b. Dry compressible waste, contaminated equip. etc.	m ³	1.19E+02	
	Ci	5.67E+00	2.00 E 01
c. Irradiated components, control rods,	m ³		
	Ci		
d. Control Rod Drive Filters	m ³		
	Ci		
e. Other (describe) Equip. etc.	m ³		
	Ci		

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

ISOTOPE	PERCENT	CURIES
a.Fe-55	44.6	2.07 E+02
Co-60	36.4	1.69 E+02
Zn-65	5.1	2.37 E+01
Mn-54	10.4	4.81 E+01
Cs-137	0.1	4.56 E-01
Cr-51	0.1	3.29 E-01
Other	3.3	1.52 E+01
b.Fe-55	62.8	3.56 E+00
Co-60	15.6	8.84 E-01
Mn-54	4.59	2.60 E-01
Zn-65	2.13	1.21 E-01
Other	14.9	8.45 E-01
c.		
d.		
e.		

3. Solid Waste Disposition

Number of Shipments

All waste sent to processors

Mode of Transportation

N/A

Destination

N/A

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments

0

Mode of Transportation

N/A

Destination

N/A

4.0 Doses to Members of the Public Inside the Site Boundary

4.1 Regulatory Requirements

ODCM 7.2.2.3 states in part that the Radioactive Effluent Release Report shall also include an assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY during the report period; this assessment must be performed in accordance with the ODCM.

4.2 Demonstration of Compliance

The locations of concern within the site boundary are the Roadside Park, the Camping Area, the Recreation Area, and the Visitors Center. Listed in Table 4-1 are: The distance and direction from a point midway between the center of Unit 1 and the Unit 2 reactors, the dispersion and deposition factors for any releases from the Main Stack (elevated) and from the reactor building (ground level); and the estimated maximum occupancy factor for an individual and the assumed age group of this individual.

The source term is not listed in Table 4-1. The source term is listed in Tables 2-2A and 2-2B, for the elevated releases. Similarly the source term is listed in Tables 2-3A and 2-3B for the ground level releases.

The maximum doses in units of mrem accumulated by an individual MEMBER OF THE PUBLIC due to their activities inside the site boundary during the reporting period are presented in Table 4-1.

Table 4-1

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses to a Member of the Public Due to Activities Inside the Site Boundary

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Location Name: ROADSIDE PARK
Distance (kilometers): 1.18E+00
Sector: WNW
Occupancy Factor: 2.28E-04
Age Group: Child

Elevated Release	Noble Gas	X/Q (sec/m3): 2.42E-08	
Elevated Release	Particulate and Radioiodine	X/Q (sec/m3): 2.37E-08	D/Q (m-2): 1.29E-09
Ground Level Release	Noble Gas	X/Q (sec/m3): 7.83E-06	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 7.00E-06	D/Q (m-2): 2.01E-08

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	6.75E-11	7.29E-12	4.47E-12	4.94E-12	8.43E-11
Liver	mRem	4.33E-09	4.18E-09	4.75E-09	6.24E-09	1.95E-08
Total Body	mRem	4.33E-09	4.18E-09	4.75E-09	6.24E-09	1.95E-08
Thyroid	mRem	4.57E-09	4.42E-09	5.05E-09	6.66E-09	2.07E-08
Kidney	mRem	4.33E-09	4.18E-09	4.75E-09	6.24E-09	1.95E-08
Lung	mRem	4.34E-09	4.18E-09	4.76E-09	6.25E-09	1.95E-08
GI-Li	mRem	4.33E-09	4.18E-09	4.75E-09	6.24E-09	1.95E-08
Skin	mRem	7.62E-11	1.80E-12	1.73E-12	2.05E-12	8.18E-11

Table 4-1

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses to a Member of the Public Due to Activities Inside the Site Boundary

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Location Name: CAMPING AREA
Distance (kilometers): 1.27E+00
Sector: WNW
Occupancy Factor: 5.48E-03
Age Group: Child

Elevated Release	Noble Gas	X/Q (sec/m3): 2.38E-08	
Elevated Release	Particulate and Radioiodine	X/Q (sec/m3): 2.33E-08	D/Q (m-2): 2.01E-08
Ground Level Release	Noble Gas	X/Q (sec/m3): 7.03E-06	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 6.27E-06	D/Q (m-2): 1.80E-08

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	1.54E-09	4.61E-10	3.29E-10	3.23E-10	2.65E-09
Liver	mRem	9.32E-08	9.03E-08	1.03E-07	1.35E-07	4.21E-07
Total Body	mRem	9.32E-08	9.03E-08	1.03E-07	1.35E-07	4.21E-07
Thyroid	mRem	9.85E-08	9.55E-08	1.09E-07	1.44E-07	4.46E-07
Kidney	mRem	9.32E-08	9.03E-08	1.03E-07	1.35E-07	4.21E-07
Lung	mRem	9.35E-08	9.04E-08	1.03E-07	1.35E-07	4.21E-07
GI-LI	mRem	9.32E-08	9.03E-08	1.03E-07	1.35E-07	4.21E-07
Skin	mRem	1.75E-09	4.01E-10	3.15E-10	3.03E-10	2.76E-09

Table 4-1

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses to a Member of the Public Due to Activities Inside the Site Boundary

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Location Name: RECREATION AREA

Distance (kilometers): 1.03E+00

Sector: SSE

Occupancy Factor: 2.37E-02

Age Group: Child

Elevated Release	Noble Gas	X/Q (sec/m3): 3.30E-08	
Elevated Release	Particulate and Radioiodine	X/Q (sec/m3): 3.21E-08	D/Q (m-2): 1.56E-09
Ground Level Release	Noble Gas	X/Q (sec/m3): 6.42E-06	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 5.73E-06	D/Q (m-2): 2.36E-08

	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>	<u>Year</u>
Bone	mRem	8.14E-09	6.86E-10	4.41E-10	4.89E-10	9.76E-09
Liver	mRem	3.70E-07	3.56E-07	4.05E-07	5.31E-07	1.66E-06
Total Body	mRem	3.70E-07	3.56E-07	4.05E-07	5.31E-07	1.66E-06
Thyroid	mRem	3.91E-07	3.77E-07	4.30E-07	5.67E-07	1.77E-06
Kidney	mRem	3.71E-07	3.56E-07	4.05E-07	5.31E-07	1.66E-06
Lung	mRem	3.72E-07	3.56E-07	4.05E-07	5.32E-07	1.67E-06
GI-Lli	mRem	3.70E-07	3.56E-07	4.05E-07	5.31E-07	1.66E-06
Skin	mRem	9.31E-09	2.23E-10	2.13E-10	2.52E-10	9.99E-09

Table 4-1

Hatch Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses to a Member of the Public Due to Activities Inside the Site Boundary

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Location Name: VISITORS CENTER
Distance (kilometers): 6.94E-01
Sector: WSW
Occupancy Factor: 4.57E-04
Age Group: Child

Elevated Release	Noble Gas	X/Q (sec/m3): 5.00E-08	
Elevated Release	Particulate and Radioiodine	X/Q (sec/m3): 4.97E-08	D/Q (m-2): 2.26E-09
Ground Level Release	Noble Gas	X/Q (sec/m3): 1.87E-05	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 1.72E-05	D/Q (m-2): 5.47E-08

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	3.66E-10	3.50E-11	2.14E-11	2.40E-11	4.47E-10
Liver	mRem	2.13E-08	2.06E-08	2.34E-08	3.07E-08	9.61E-08
Total Body	mRem	2.13E-08	2.06E-08	2.34E-08	3.07E-08	9.61E-08
Thyroid	mRem	2.25E-08	2.18E-08	2.49E-08	3.28E-08	1.02E-07
Kidney	mRem	2.13E-08	2.06E-08	2.34E-08	3.08E-08	9.61E-08
Lung	mRem	2.14E-08	2.06E-08	2.34E-08	3.08E-08	9.62E-08
GI-Li	mRem	2.13E-08	2.06E-08	2.34E-08	3.07E-08	9.61E-08
Skin	mRem	4.15E-10	7.82E-12	7.88E-12	9.73E-12	4.41E-10

5.0 Total Dose from Uranium Fuel Cycle (40 CFR 190)

5.1 Regulatory Requirements

The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC 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 whole body or to any organ, except the thyroid, which shall be limited to less than or equal to 75 mrem.

5.2 Demonstration of Compliance

No dose limits stated in ODCM Sections 2.1.3, 3.1.3, and 3.1.4 were exceeded. Therefore, compliance with 40 CFR 190 dose limits was demonstrated in accordance with the requirements of ODCM Section 5.1.3.

6.0 *Meteorological Data*

The Radioactive Effluent Release Report, to be submitted by May 1 of each year, shall include an annual summary of hourly meteorological data collected over the previous year. This annual summary may be either in the form of an hour-by-hour listing of wind speed, wind direction, atmospheric stability, and precipitation (if measured), on magnetic tape, or, in the form of joint frequency distributions of wind speed, wind direction and atmospheric stability.

In lieu of submission with the Radioactive Effluent Release Report, the licensee has retained this summary of required meteorological data on site in a file. It will be provided to the NRC upon request.

7.0 Program Deviations

7.1 Inoperable Liquid or Gaseous Effluent Monitoring Instrumentation

7.1.1 Regulatory Requirements

ODCM, Chapter 7, Section 7.2.2.6.2 states that the Radioactive Effluent Release Report shall include deviations from the liquid and gaseous effluent monitoring instrumentation operability requirements included in Sections 2.1.1 and 3.1.1, respectively.

7.1.2 Description of Deviations

There were two deviations from the liquid and gaseous effluent monitoring instrumentation operability requirements during this reporting period.

7.2 Tanks Exceeding Curie Content Limits

7.2.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that the report shall include notifications if the contents within any outside temporary tank, for liquids, exceed the limit of Technical Specification 5.5.8.b.

7.2.2 Description of Deviations

There were no outside temporary tanks, for liquids, that exceeded the limit of Technical Specification 5.5.8.b during this reporting period.

7.3 Effluent Sample Analysis Exceeding Minimum Detectable Concentration (MDC)

7.3.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that deviations from MDC(s) required in Table 3-3 shall be included in the Radioactive Effluent Release Report.

7.3.2 Description of Deviation

There were no deviations from MDC(s) required in Table 3-3 during this reporting period.

8.0 *Changes to the Plant Hatch Offsite Dose Calculation Manual (ODCM)*

8.1 *Regulatory Requirements*

Pursuant to Technical Specification 5.5.1 and ODCM Section 7.2.2.5, licensee initiated changes shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

8.2 *Description of Changes*

There were no changes to the Hatch ODCM in 2012.

9.0 Major Changes to Liquid, Gaseous, or Solid Radwaste Treatment Systems

9.1 Regulatory Requirements

The Radioactive Effluent Release Report shall include any major change to liquid, gaseous, or solid radwaste treatment systems pursuant to ODCM Chapter 7, Section 7.2.2.7.

9.2 Description of Major Changes

Gaseous Radwaste System

There were no major changes to the gaseous radwaste system during this reporting period.

Solid Radwaste System

There were no major changes to the solid radwaste system during this reporting period.

Liquid Radwaste System

There were no major changes to the Liquid Radwaste Treatment System during this reporting period.

SOUTHERN COMPANY
E. I. HATCH NUCLEAR PLANT
UNITS NO. 1 & 2
ANNUAL REPORT

JANUARY 1, 2012 - DECEMBER 31, 2012

APPENDIX A

Hatch Nuclear Plant
Appendix A

CARBON-14

Carbon-14 (C-14) is a naturally-occurring radionuclide with a 5730 year half life. Nuclear weapons testing in the 1950s and 1960s significantly increased the amount of C-14 in the atmosphere. Nuclear power plants also produce C-14, but the amount is infinitesimal compared to what has been distributed in the environment due to weapons testing and what is produced by natural cosmic ray interactions.

As nuclear plants have improved gaseous waste processing systems and improved fuel performance, the percentages of “principal radionuclides” in gaseous effluents have changed, and C-14 has become a larger percentage. “Principal radionuclides” are determined based on public dose contribution or the amount of activity discharged compared to other radionuclides of the same effluent type. In Revision 2 (June 2009) of Regulatory Guide 1.21 (RG 1.21), “Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste,” the NRC recommended re-evaluating “principal radionuclides” and reporting C-14 as appropriate. In 2010 Radioactive Effluent Release Reports, virtually all U. S. nuclear power plants will report C-14 amounts released and resulting doses to the maximally exposed member of the public.

Because C-14 is considered a hard-to-detect radionuclide which must be chemically separated from the effluent stream before it can be measured, RG 1.21 provides the option of calculating the C-14 source term based on power generation. The Electric Power Research Institute (EPRI) developed an accepted methodology for calculating C-14, and published the results in Technical Report 1021106 (December 2010), “Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents.” Evaluation of C-14 in radioactive liquid effluents is not required because the quantity and dose contribution has been determined to be insignificant.

At Plant Hatch, the quantity of C-14 released in gaseous effluents in 2010 was estimated to be 14.16 Curies (per unit). Approximately 95% of the C-14 released is in the form of $^{14}\text{CO}_2$ and is incorporated into plants through photosynthesis. Ingestion dose results from this pathway. The remaining 5% is estimated to be organic. Both the organic and inorganic forms of C-14 contribute to inhalation dose. A child is the maximally exposed individual, and bone dose is the highest organ dose. Using the dose calculation methodology from the Hatch ODCM, the resulting bone dose to a child located at the controlling receptor location would be 1.59E-01 mrem in a year which is 1.06% of the regulatory limit of 15 mrem per year (per unit) to any organ due to gaseous effluents. The resulting total body dose to a child located at the controlling receptor location would be 3.18E-02 mrem in a year which is 0.21% of the regulatory limit of 15 mrem per year (per unit) total body dose due to gaseous effluents.

SOUTHERN COMPANY
E. I. HATCH NUCLEAR PLANT
UNITS NO. 1 & 2
ANNUAL REPORT

JANUARY 1, 2012 - DECEMBER 31, 2012

APPENDIX B

Appendix B

Summary of Groundwater Protection Program

Nuclear Management Procedure NMP-EN-002 provides the methodology and criteria for implementation of the Radiological Groundwater Protection Program (GWPP) including evaluating hydrology and geology, conducting a risk assessment, establishing and modifying on-site ground water monitoring, voluntary communications, corrective actions, reporting, and record keeping. Each program element of NEI 07-07 "Industry Ground Water Protection Initiative – Final Guidance Document" is identified in the corresponding procedure element.

At Plant Hatch procedure 64CH-SAM-028-0 Releases Via Planned and Unplanned Routes: Sampling and Analysis procedure provides instructions for the sampling of groundwater sample wells, drainage outfalls, STP effluent and drinking water deep wells for the Releases via Unplanned Routes (RVUR) sampling and analysis program.

The Attachments to 64CH-SAM-028-0 contain the maps of the sampling points, the locations, collection frequency and the analyses required.

In 2012 there was one leak detected by routine sampling. On 12/19/12 the samples from the T11 and T12 wells near the Unit One CST had a tritium concentration of 4.8E6 and 5.7E6 picocuries/liter respectively which was 100 times the normal values

**Edwin I. Hatch Nuclear Plant
Joseph M. Farley Nuclear Plant
Vogtle Electric Generating Plant
Annual Radioactive Effluent Release Reports for 2012**

Enclosure 2

Farley Annual Radioactive Effluent Release Report for 2012

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 2012

FARLEY NUCLEAR PLANT
ANNUAL RADIOACTIVE EFFLUENT
RELEASE REPORT

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FARLEY NUCLEAR PLANT
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1.0 LIQUID EFFLUENTS

This section contains applicable ODCM limits for liquid effluents as well as the quantities of radioactive liquid effluents released during 2012. 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.

1.1 Regulatory Requirements

1.1.1 Concentration Limits

Technical Specifications 5.5.4.b and 5.5.4.c state that 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 $1.0\text{E-}04$ uCi/ml total activity.

1.1.2 Dose Limits

Technical Specifications 5.5.4.d and 5.5.4.e state that 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.

1.2 Effluent Concentration Limit (ECL)

ECL values used in determining allowable liquid radwaste release rates and concentrations, for principal gamma emitters, I-131, tritium, Sr-89, Sr-90 and Fe-55, are taken from 10CFR Part 20, Appendix B, Table 2, Column 2. A tolerance factor of up to 10 is utilized to allow flexibility in establishing practical monitor setpoints which can accommodate effluent releases at concentrations higher than the ECL values stated in 10CFR20, Appendix B, Table 2, Column 2.

For dissolved or entrained noble gases in liquid radwaste, the ECL is $1.0\text{E-}04$ uCi/ml total activity.

For gross alpha in liquid radwaste, the ECL is $2.0\text{E-}09$ uCi/ml.

Furthermore, for all the above radionuclides, or categories of radioactivity, the overall ECL fraction is determined in accordance with 10CFR Part 20, Appendix B.

1.3 Measurements and Approximation of Total Radioactivity

The radionuclides listed below are considered when evaluating liquid effluents:

MN-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	

1.3.1 Total Radioactivity Determination

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. All Strontium and Iron-55 samples are sent offsite to the Georgia Power Environmental Laboratory for analysis. Gross beta and gross alpha determinations are made using 2 pi gas flow proportional counters. Tritium determinations are made using liquid scintillation techniques. Dissolved gases are determined employing grab sampling techniques and then counting on the pulse height analyzer.

The sample analyses results are used along with the ECL values to determine the ECL fraction for the planned release. The ECL fraction is then used, with the appropriate safety factors, and the expected dilution stream flow, to calculate the maximum permissible release rate and a liquid effluent monitor setpoint. The monitor setpoint is calculated to assure that the limits of the ODCM are not exceeded. A monitor reading in excess of the calculated setpoint will result in automatic termination of the liquid radwaste discharge.

Radionuclide concentrations, safety factors, dilution stream flow rate, and liquid effluent radiation monitor calibration factors are used by the computer to generate a pre-release printout. If the release is not permissible, appropriate warnings will be displayed on the computer screen and on the printout. If the release is permissible, it is approved by a Chemistry Technician. The release permit is transferred from the Chemistry Department to the Operations Department for release. When the release is completed, the actual release data are provided to the Chemistry Department. These release data, including release rate and release duration, are input into the computer and a post-release printout is generated. This printout contains the actual release rates, radionuclide concentrations and quantities, dilution flow, and calculated doses to an individual.

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.

Typically achieved liquid effluent sample analyses minimum detectable concentrations are reported in Table 1-4.

1.3.2 Total Error Estimation

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%.

1.4 Liquid Effluent Release Data

Summaries of all radioactive liquid effluents released from Units 1 and 2 during 2012 are presented in accordance with Regulatory Guide 1.21 Tables 2A and 2B. Information required by Table 2A is found in this report in Tables 1-1A, 1-1B, and 1-1C; Table 2-B information is presented in Tables 1-2A, 1-2B, and 1-2C. Data is presented on a quarterly basis as required by Regulatory Guide 1.21 for all four quarters.

1.5 Radiological Impact Due to Liquid Releases

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 2012 Doses to a Member of the Public due to Liquid Releases:
Table 1-3A

Unit 2 2012 Doses to a Member of the Public due to Liquid Releases:
Table 1-3B

1.6 Liquid Effluents - Batch Releases

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

Unit 1 2012 Liquid Effluents - Batch Release Summary: Table 1-5A

Unit 2 2012 Liquid Effluents - Batch Release Summary: Table 1-5B

1.7 Liquid Effluents - Abnormal Releases

There was one abnormal release during 2012. A Unit 2 Component Cooling Water (CCW) heat exchanger experienced a leak of CCW into the service water side. No limits were exceeded due to this abnormal release. The details of this event are included in Condition Report 440063.

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

Unit 1 2012 Liquid Effluents - Abnormal Release Summary: Table 1-6A

Unit 2 2012 Liquid Effluents - Abnormal Release Summary: Table 1-6B

Table 1-1A
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Summation of All Releases
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	1.77E-02	3.12E-02	1.60E-02	2.30E-02
2. Average diluted concentration during period	uCi/mL	1.31E-08	3.85E-08	1.85E-08	4.62E-08
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	1.82E+02	1.28E+01	1.28E+02	1.74E+02
2. Average diluted Concentration during period	uCi/mL	1.35E-04	1.58E-05	1.49E-04	3.49E-04
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	8.98E-03	4.29E-05	2.43E-04	2.64E-04
2. Average diluted Concentration during period	uCi/mL	6.65E-09	5.30E-11	2.82E-10	5.31E-10
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	1.18E-05	0.00E+00	0.00E+00	0.00E+00
E: Waste Vol Release (Pre-Dilution)					
F. Volume of Dilution Water Used	Liters	1.78E+06	9.27E+05	8.60E+05	6.11E+05
	Liters	1.35E+09	8.09E+08	8.61E+08	4.97E+08

* 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
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Summation of All Releases
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	1.89E-02	1.41E-02	1.48E-02	2.83E-02
2. Average diluted concentration during period	uCi/mL	9.83E-09	1.40E-08	1.53E-08	2.89E-08
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	1.29E+02	1.87E+01	1.15E+02	3.15E+02
2. Average diluted Concentration during period	uCi/mL	6.69E-05	1.86E-05	1.19E-04	3.22E-04
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	9.00E-03	2.23E-05	1.61E-04	2.22E-04
2. Average diluted Concentration during period	uCi/mL	4.68E-09	2.22E-11	1.67E-10	2.27E-10
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	9.50E-06	0.00E+00	0.00E+00	0.00E+00
E: Waste Vol Release (Pre-Dilution)	Liters	1.56E+06	1.03E+06	8.89E+05	9.25E+05
F. Volume of Dilution Water Used	Liters	1.92E+09	1.01E+09	9.67E+08	9.77E+08

* 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
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Summation of All Releases
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	3.66E-02	4.53E-02	3.08E-02	5.13E-02
2. Average diluted concentration during period	uCi/mL	1.12E-08	2.49E-08	1.68E-08	3.47E-08
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	3.11E+02	3.16E+01	2.44E+02	4.89E+02
2. Average diluted Concentration during period	uCi/mL	9.50E-05	1.74E-05	1.33E-04	3.31E-04
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	1.80E-02	6.53E-05	4.04E-04	4.87E-04
2. Average diluted Concentration during period	uCi/mL	5.49E-09	3.59E-11	2.21E-10	3.30E-10
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	2.13E-05	0.00E+00	0.00E+00	0.00E+00
E: Waste Vol Release (Pre-Dilution)	Liters	3.34E+06	1.96E+06	1.75E+06	1.54E+06
F. Volume of Dilution Water Used	Liters	3.27E+09	1.82E+09	1.83E+09	1.47E+09

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

Table 1-2A
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Continuous Mode					
Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved And Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2A
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Units	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Be-7	Curies	0.00E+00	9.34E-06	0.00E+00	0.00E+00
Y-88	Curies	3.88E-07	0.00E+00	0.00E+00	0.00E+00
Y-95	Curies	0.00E+00	2.23E-05	0.00E+00	0.00E+00
As-76	Curies	0.00E+00	0.00E+00	3.16E-06	0.00E+00
Co-57	Curies	0.00E+00	1.70E-06	0.00E+00	0.00E+00
Co-58	Curies	3.07E-04	5.53E-03	7.04E-04	1.42E-04
Co-60	Curies	1.17E-03	1.71E-03	5.29E-04	2.82E-04
Cr-51	Curies	0.00E+00	2.37E-03	1.12E-05	0.00E+00
Fe-55	Curies	3.42E-04	5.15E-04	2.59E-04	6.72E-05
Fe-59	Curies	0.00E+00	5.28E-06	0.00E+00	0.00E+00
I-132	Curies	0.00E+00	1.90E-05	0.00E+00	0.00E+00
Mn-54	Curies	0.00E+00	5.03E-05	3.56E-06	1.11E-06
Nb-95	Curies	5.86E-06	6.40E-04	4.84E-05	2.82E-06
Nb-97	Curies	1.01E-05	1.41E-05	2.71E-05	4.32E-06
Ni-56	Curies	1.70E-05	3.66E-05	1.37E-06	7.96E-07
Sr-89	Curies	2.65E-05	0.00E+00	0.00E+00	1.41E-05
Sr-90	Curies	0.00E+00	0.00E+00	1.21E-05	0.00E+00
Sr-92	Curies	0.00E+00	1.03E-06	8.79E-07	0.00E+00
Y-91M	Curies	0.00E+00	7.94E-07	3.43E-07	0.00E+00
Zn-65	Curies	5.20E-06	6.08E-05	2.13E-06	1.55E-06
Zr-95	Curies	6.15E-07	3.58E-04	1.10E-05	0.00E+00
Ce-143	Curies	0.00E+00	1.03E-06	0.00E+00	0.00E+00
Ce-146	Curies	0.00E+00	3.18E-06	0.00E+00	0.00E+00
Cs-134	Curies	5.89E-07	0.00E+00	0.00E+00	3.13E-07
Cs-137	Curies	2.05E-05	9.52E-06	2.32E-05	1.99E-05

Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-2A
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: 1
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Pr-144	Curies	0.00E+00	3.44E-04	0.00E+00	0.00E+00
Rh-105	Curies	0.00E+00	1.01E-03	5.82E-06	0.00E+00
Ru-103	Curies	0.00E+00	4.63E-06	0.00E+00	0.00E+00
Sb-124	Curies	0.00E+00	2.24E-05	1.17E-06	3.11E-07
Sb-125	Curies	9.58E-05	5.23E-04	2.48E-04	1.24E-04
Sn-113	Curies	0.00E+00	6.79E-06	0.00E+00	0.00E+00
Tc-101	Curies	0.00E+00	0.00E+00	1.18E-05	0.00E+00
Te-129	Curies	0.00E+00	7.79E-05	0.00E+00	0.00E+00
Te-132	Curies	0.00E+00	1.68E-05	0.00E+00	0.00E+00
Zn-69M	Curies	5.24E-07	0.00E+00	0.00E+00	0.00E+00
Ag-108M	Curies	4.76E-06	6.16E-06	7.66E-06	0.00E+00
Ag-110M	Curies	2.21E-06	5.37E-05	3.68E-05	8.40E-07
Sn-117M	Curies	1.46E-05	2.21E-06	0.00E+00	0.00E+00
Te-125M	Curies	1.57E-02	1.77E-02	1.40E-02	2.23E-02
Te-129M	Curies	0.00E+00	7.74E-05	0.00E+00	0.00E+00
Total For Period	Curies	1.77E-02	3.12E-02	1.60E-02	2.30E-02
Tritium					
H-3	Curies	1.82E+02	1.28E+01	1.28E+02	1.74E+02

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2A
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: 1
Starting: 1-Jan-2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Dissolved And Entrained Gases					
Ar-41	Curies	2.38E-06	1.21E-06	0.00E+00	4.21E-06
Xe-133	Curies	8.95E-03	4.17E-05	2.43E-04	2.60E-04
Xe-135	Curies	5.95E-06	0.00E+00	0.00E+00	0.00E+00
Xe-133M	Curies	1.84E-05	0.00E+00	0.00E+00	0.00E+00
Xe-135M	Curies	2.84E-06	0.00E+00	0.00E+00	0.00E+00
Total For Period	Curies	8.98E-03	4.29E-05	2.43E-04	2.64E-04

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2B
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: 2
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Continuous Mode					
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved And Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2B

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012**

Liquid Effluents

Unit: 2

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Be-7	Curies	2.94E-05	6.61E-06	0.00E+00	0.00E+00
Y-92	Curies	0.00E+00	2.58E-06	0.00E+00	0.00E+00
Y-94	Curies	0.00E+00	0.00E+00	0.00E+00	1.64E-06
Br-82	Curies	0.00E+00	0.00E+00	0.00E+00	1.96E-06
Co-58	Curies	9.58E-04	1.50E-03	1.54E-04	1.37E-04
Co-60	Curies	2.49E-03	8.52E-04	3.31E-04	3.08E-04
Cr-51	Curies	0.00E+00	6.30E-04	0.00E+00	0.00E+00
Fe-55	Curies	6.67E-04	2.52E-05	5.41E-05	1.28E-04
I-131	Curies	0.00E+00	0.00E+00	6.92E-07	2.46E-05
I-132	Curies	0.00E+00	1.73E-06	0.00E+00	0.00E+00
I-133	Curies	0.00E+00	0.00E+00	1.88E-06	6.46E-05
Mn-54	Curies	1.82E-05	1.56E-05	0.00E+00	4.51E-06
Mo-99	Curies	0.00E+00	0.00E+00	0.00E+00	4.87E-05
Na-24	Curies	0.00E+00	0.00E+00	2.51E-05	3.07E-04
Nb-95	Curies	1.36E-04	1.40E-04	2.52E-06	0.00E+00
Nb-97	Curies	8.31E-05	1.37E-05	7.42E-06	4.60E-06
Ni-56	Curies	1.72E-05	2.42E-05	3.96E-06	0.00E+00
Sr-89	Curies	2.46E-05	0.00E+00	0.00E+00	1.72E-05
Sr-90	Curies	0.00E+00	0.00E+00	0.00E+00	3.63E-06
Sr-92	Curies	4.14E-06	2.50E-06	0.00E+00	0.00E+00
Y-91M	Curies	0.00E+00	0.00E+00	0.00E+00	5.55E-06
Zn-65	Curies	1.05E-04	4.48E-05	1.17E-06	0.00E+00
Zr-95	Curies	3.85E-05	5.32E-05	0.00E+00	0.00E+00
Zr-97	Curies	4.58E-07	0.00E+00	0.00E+00	0.00E+00
Ba-140	Curies	3.20E-06	0.00E+00	0.00E+00	0.00E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.

See Table 1-4 for typical minimum detectable concentrations. - 13 -

Table 1-2B

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012**

Liquid Effluents**Unit: 2****Starting: 1-Jan-2012 Ending: 31-Dec-2012**

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Cs-137	Curies	1.17E-04	5.92E-06	1.76E-06	5.27E-06
Rh-105	Curies	0.00E+00	3.04E-04	0.00E+00	0.00E+00
Sb-122	Curies	0.00E+00	0.00E+00	0.00E+00	2.49E-06
Sb-124	Curies	0.00E+00	3.81E-06	0.00E+00	1.62E-06
Sb-125	Curies	6.41E-04	2.08E-04	1.26E-04	1.43E-04
Sn-113	Curies	0.00E+00	2.90E-06	0.00E+00	0.00E+00
Tc-104	Curies	2.77E-07	0.00E+00	0.00E+00	0.00E+00
Tc-99M	Curies	0.00E+00	0.00E+00	4.29E-06	1.15E-04
Te-129	Curies	0.00E+00	1.71E-05	0.00E+00	0.00E+00
Te-132	Curies	0.00E+00	7.33E-06	0.00E+00	0.00E+00
Ag-108M	Curies	4.21E-06	2.46E-06	1.34E-06	3.39E-07
Ag-110M	Curies	3.44E-05	2.06E-05	2.17E-05	2.71E-06
Sn-117M	Curies	8.54E-06	8.69E-07	0.00E+00	0.00E+00
Te-125M	Curies	1.35E-02	1.03E-02	1.41E-02	2.70E-02
Total For Period	Curies	1.89E-02	1.41E-02	1.48E-02	2.83E-02
Tritium					
H-3	Curies	1.29E+02	1.87E+01	1.15E+02	3.15E+02
Dissolved And Entrained Gases					
Ar-41	Curies	4.75E-06	0.00E+00	0.00E+00	1.73E-05
Xe-133	Curies	8.97E-03	2.23E-05	1.61E-04	2.02E-04
Xe-135	Curies	1.14E-05	0.00E+00	0.00E+00	3.01E-06
Xe-133M	Curies	1.71E-05	0.00E+00	0.00E+00	0.00E+00
Total For Period	Curies	9.00E-03	2.23E-05	1.61E-04	2.22E-04

Zeroes in this table indicates that no radioactivity was present at detectable levels.

See Table 1-4 for typical minimum detectable concentrations. - 14 -

Table 1-2C
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Continuous Mode					
Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved And Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents

Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Units	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Be-7	Curies	2.94E-05	1.59E-05	0.00E+00	0.00E+00
Y-88	Curies	3.88E-07	0.00E+00	0.00E+00	0.00E+00
Y-92	Curies	0.00E+00	2.58E-06	0.00E+00	0.00E+00
Y-94	Curies	0.00E+00	0.00E+00	0.00E+00	1.64E-06
Y-95	Curies	0.00E+00	2.23E-05	0.00E+00	0.00E+00
As-76	Curies	0.00E+00	0.00E+00	3.16E-06	0.00E+00
Br-82	Curies	0.00E+00	0.00E+00	0.00E+00	1.96E-06
Co-57	Curies	0.00E+00	1.70E-06	0.00E+00	0.00E+00
Co-58	Curies	1.26E-03	7.03E-03	8.58E-04	2.79E-04
Co-60	Curies	3.66E-03	2.56E-03	8.60E-04	5.91E-04
Cr-51	Curies	0.00E+00	3.00E-03	1.12E-05	0.00E+00
Fe-55	Curies	1.01E-03	5.40E-04	3.13E-04	1.95E-04
Fe-59	Curies	0.00E+00	5.28E-06	0.00E+00	0.00E+00
I-131	Curies	0.00E+00	0.00E+00	6.92E-07	2.46E-05
I-132	Curies	0.00E+00	2.07E-05	0.00E+00	0.00E+00
I-133	Curies	0.00E+00	0.00E+00	1.88E-06	6.46E-05
Mn-54	Curies	1.82E-05	6.60E-05	3.56E-06	5.62E-06
Mo-99	Curies	0.00E+00	0.00E+00	0.00E+00	4.87E-05
Na-24	Curies	0.00E+00	0.00E+00	2.51E-05	3.07E-04
Nb-95	Curies	1.42E-04	7.80E-04	5.09E-05	2.82E-06
Nb-97	Curies	9.32E-05	2.79E-05	3.45E-05	8.92E-06
Ni-56	Curies	3.43E-05	6.08E-05	5.33E-06	7.96E-07
Sr-89	Curies	5.12E-05	0.00E+00	0.00E+00	3.13E-05
Sr-90	Curies	0.00E+00	0.00E+00	1.21E-05	3.63E-06
Sr-92	Curies	4.14E-06	3.53E-06	8.79E-07	0.00E+00

Zeros in this table indicates that no radioactivity was present at detectable levels.

See Table 1-4 for typical minimum detectable concentrations. - 16 -

Table 1-2C
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Units	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Y-91M	Curies	0.00E+00	7.94E-07	3.43E-07	5.55E-06
Zn-65	Curies	1.10E-04	1.06E-04	3.29E-06	1.55E-06
Zr-95	Curies	3.91E-05	4.12E-04	1.10E-05	0.00E+00
Zr-97	Curies	4.58E-07	0.00E+00	0.00E+00	0.00E+00
Ba-140	Curies	3.20E-06	0.00E+00	0.00E+00	0.00E+00
Ce-143	Curies	0.00E+00	1.03E-06	0.00E+00	0.00E+00
Ce-146	Curies	0.00E+00	3.18E-06	0.00E+00	0.00E+00
Cs-134	Curies	5.89E-07	0.00E+00	0.00E+00	3.13E-07
Cs-137	Curies	1.38E-04	1.54E-05	2.50E-05	2.52E-05
Pr-144	Curies	0.00E+00	3.44E-04	0.00E+00	0.00E+00
Rh-105	Curies	0.00E+00	1.31E-03	5.82E-06	0.00E+00
Ru-103	Curies	0.00E+00	4.63E-06	0.00E+00	0.00E+00
Sb-122	Curies	0.00E+00	0.00E+00	0.00E+00	2.49E-06
Sb-124	Curies	0.00E+00	2.62E-05	1.17E-06	1.93E-06
Sb-125	Curies	7.37E-04	7.31E-04	3.74E-04	2.67E-04
Sn-113	Curies	0.00E+00	9.69E-06	0.00E+00	0.00E+00
Tc-101	Curies	0.00E+00	0.00E+00	1.18E-05	0.00E+00
Tc-104	Curies	2.77E-07	0.00E+00	0.00E+00	0.00E+00
Tc-99M	Curies	0.00E+00	0.00E+00	4.29E-06	1.15E-04
Te-129	Curies	0.00E+00	9.51E-05	0.00E+00	0.00E+00
Te-132	Curies	0.00E+00	2.41E-05	0.00E+00	0.00E+00
Zn-69M	Curies	5.24E-07	0.00E+00	0.00E+00	0.00E+00
Ag-108M	Curies	8.98E-06	8.62E-06	9.01E-06	3.39E-07
Ag-110M	Curies	3.66E-05	7.43E-05	5.84E-05	3.55E-06
Sn-117M	Curies	2.32E-05	3.08E-06	0.00E+00	0.00E+00
Te-125M	Curies	2.92E-02	2.80E-02	2.81E-02	4.93E-02

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations. - 17 -

Table 1-2C
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents

Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

<u>Nuclides Released</u>	<u>Units</u>	<u>Batch Mode</u>			
		<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>
Te-129M	<u>Curies</u>	<u>0.00E+00</u>	<u>7.74E-05</u>	<u>0.00E+00</u>	<u>0.00E+00</u>
Total For Period	Curies	3.66E-02	4.53E-02	3.08E-02	5.13E-02
<u>Tritium</u>					
H-3	Curies	3.11E+02	3.16E+01	2.44E+02	4.89E+02
<u>Dissolved And Entrained Gases</u>					
Ar-41	Curies	7.13E-06	0.00E+00	0.00E+00	2.15E-05
Xe-133	Curies	1.79E-02	6.40E-05	4.04E-04	4.62E-04
Xe-135	Curies	1.73E-05	0.00E+00	0.00E+00	3.01E-06
Xe-133M	Curies	3.55E-05	0.00E+00	0.00E+00	0.00E+00
Xe-135M	<u>Curies</u>	<u>2.84E-06</u>	<u>0.00E+00</u>	<u>0.00E+00</u>	<u>0.00E+00</u>
Total For Period	Curies	1.80E-02	6.53E-05	4.04E-04	4.87E-04

Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-3A

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Doses to a member of the public due to Liquid Releases
Unit: 1
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	5.00E+00	mRem	7.73E-03	1.55E-01	8.11E-03	1.62E-01	5.12E-03	1.02E-01	9.94E-03	1.99E-01
GI-Lli	5.00E+00	mRem	3.32E-02	6.64E-01	3.39E-02	6.77E-01	2.06E-02	4.11E-01	4.18E-02	8.35E-01
Kidney	5.00E+00	mRem	3.32E-02	6.64E-01	3.23E-02	6.47E-01	2.06E-02	4.12E-01	4.24E-02	8.47E-01
Liver	5.00E+00	mRem	5.48E-03	1.10E-01	3.21E-03	6.43E-02	3.08E-03	6.16E-02	5.87E-03	1.17E-01
Lung	5.00E+00	mRem	3.26E-03	6.51E-02	3.01E-03	6.03E-02	2.42E-03	4.85E-02	2.96E-03	5.93E-02
Thyroid	5.00E+00	mRem	4.85E-03	9.70E-02	2.53E-03	5.06E-02	2.69E-03	5.39E-02	5.20E-03	1.04E-01
Total Body	5.00E+00	mRem	3.71E-03	7.42E-02	1.40E-03	2.79E-02	2.03E-03	4.06E-02	3.60E-03	7.21E-02
Total Body	1.50E+00	mRem	3.71E-03	2.47E-01	1.40E-03	9.30E-02	2.03E-03	1.35E-01	3.60E-03	2.40E-01

Cumulative Doses per Year

Organ	ODCM Lmt	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.00E+01	mRem	3.09E-02	3.09E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
GI-Lli	1.00E+01	mRem	1.29E-01	1.29E+00	Maximum Individual Liquid	Liquid Effluent Organ Annual
Kidney	1.00E+01	mRem	1.29E-01	1.29E+00	Maximum Individual Liquid	Liquid Effluent Organ Annual
Liver	1.00E+01	mRem	1.76E-02	1.76E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Lung	1.00E+01	mRem	1.17E-02	1.17E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Thyroid	1.00E+01	mRem	1.53E-02	1.53E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	1.00E+01	mRem	1.07E-02	1.07E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	3.00E+00	mRem	1.07E-02	3.58E-01	Maximum Individual Liquid	Liquid Effluent TB Annual

Table 1-3B
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Doses to a member of the public due to Liquid Releases
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

	<u>ODCM Lmt</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Organ										
Bone	5.00E+00	mRem	5.97E-03	1.19E-01	4.02E-03	8.04E-02	4.78E-03	9.56E-02	8.48E-03	1.70E-01
GI-Lli	5.00E+00	mRem	2.50E-02	5.00E-01	1.75E-02	3.49E-01	2.01E-02	4.03E-01	3.63E-02	7.26E-01
Kidney	5.00E+00	mRem	2.42E-02	4.83E-01	1.72E-02	3.43E-01	2.04E-02	4.08E-01	3.68E-02	7.36E-01
Liver	5.00E+00	mRem	3.92E-03	7.83E-02	2.40E-03	4.79E-02	2.77E-03	5.54E-02	5.89E-03	1.18E-01
Lung	5.00E+00	mRem	5.19E-03	1.04E-01	1.94E-03	3.88E-02	1.56E-03	3.11E-02	3.42E-03	6.85E-02
Thyroid	5.00E+00	mRem	3.17E-03	6.33E-02	2.11E-03	4.21E-02	2.46E-03	4.91E-02	5.39E-03	1.08E-01
Total Body	5.00E+00	mRem	2.53E-03	5.05E-02	1.50E-03	3.00E-02	1.68E-03	3.36E-02	3.98E-03	7.97E-02
Total Body	1.50E+00	mRem	2.53E-03	1.68E-01	1.50E-03	1.00E-01	1.68E-03	1.12E-01	3.98E-03	2.66E-01

Cumulative Doses per Year

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>Year to Ending Date</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Bone	1.00E+01	mRem	2.33E-02	2.33E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
GI-Lli	1.00E+01	mRem	9.89E-02	9.89E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Kidney	1.00E+01	mRem	9.85E-02	9.85E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Liver	1.00E+01	mRem	1.50E-02	1.50E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Lung	1.00E+01	mRem	1.21E-02	1.21E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Thyroid	1.00E+01	mRem	1.31E-02	1.31E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	1.00E+01	mRem	9.69E-03	9.69E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	3.00E+00	mRem	9.69E-03	3.23E-01	Maximum Individual Liquid	Liquid Effluent TB Annual

TABLE 1-4
Joseph M. Farley Nuclear Plant
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
MINIMUM DETECTABLE CONCENTRATION - LIQUID SAMPLE ANALYSES

The values in this table represent a priori Minimum Detectable Concentrations (MDC) that are typically achieved in laboratory analyses of liquid radwaste samples.

Nuclide	MDC (uCi/ML)
MN-54	4.01E-08
CO-58	3.12E-08
FE-59	9.04E-08
CO-60	1.76E-08
ZN-65	1.19E-07
MO-99	2.98E-07
I-131	3.05E-08
CS-134	4.01E-08
CS-137	3.84E-08
CE-141	4.21E-08
CE-144	1.51E-07

Table 1-5A

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012**

Liquid Effluents - Batch Release Summary

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		134	71	65	46	316
2. Total time period for Batch releases	(Minutes)	1.57E+04	7.52E+03	7.00E+03	5.02E+03	3.53E+04
3. Maximum time period for a batch release	(Minutes)	1.90E+02	1.33E+02	1.22E+02	1.28E+02	1.90E+02
4. Average time period for a batch release	(Minutes)	1.17E+02	1.06E+02	1.08E+02	1.09E+02	1.12E+02
5. Minimum time period for a batch release	(Minutes)	9.70E+01	3.00E+00	8.50E+01	9.60E+01	3.00E+00
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	6.61E+03	3.22E+03	2.46E+03	2.31E+03	3.64E+03

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

Table 1-5B
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Batch Release Summary
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		118	79	67	70	334
2. Total time period for Batch releases	(Minutes)	1.21E+04	1.84E+04	7.03E+03	7.10E+03	4.46E+04
3. Maximum time period for a batch release	(Minutes)	1.56E+02	1.01E+04	1.60E+02	1.71E+02	1.01E+04
4. Average time period for a batch release	(Minutes)	1.02E+02	2.33E+02	1.05E+02	1.01E+02	1.34E+02
5. Minimum time period for a batch release	(Minutes)	7.80E+01	8.00E+01	9.30E+01	8.70E+01	7.80E+01
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	6.61E+03	3.22E+03	2.46E+03	2.31E+03	3.64E+03

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

Table 1-6A
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Abnormal Release Summary
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 1-6B
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Abnormal Release Summary
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	1	0	0	1
2. Total Time For All Releases	(Minutes)	0.00E+00	1.01E+04	0.00E+00	0.00E+00	1.01E+04
3. Maximum Time For A Release	(Minutes)	0.00E+00	1.01E+04	0.00E+00	0.00E+00	1.01E+04
4. Average Time For A Release	(Minutes)	0.00E+00	1.01E+04	0.00E+00	0.00E+00	1.01E+04
5. Minimum Time For A Release	(Minutes)	0.00E+00	1.01E+04	0.00E+00	0.00E+00	1.01E+04
6. Total activity for all releases	(Curies)	0.00E+00	7.09E-05	0.00E+00	0.00E+00	7.09E-05

2.0 GASEOUS EFFLUENTS

This section contains applicable ODCM limits for gaseous effluents as well as the quantities of radioactive gaseous effluents released during 2012. 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.

2.1 Regulatory Requirements

The requirements presented in this section are for Unit 1 and Unit 2.

2.1.1 Dose Rate Limits

The dose rates due to radioactive materials released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY shall be limited to the following:

- a. For noble gases: Less than or equal to 500 mrem/yr. to the whole body and less than or equal to 3000 mrem/yr. to the skin, and
- b. For Iodine-131, Iodine-133, tritium and for all radionuclides in particulate form with half-lives greater than 8 days: Less than or equal to 1500 mrem/yr. to any organ.

2.1.2 Air Doses Due to Noble Gases in Gaseous Releases

Technical Specifications 5.5.4.e and 5.5.4.h state that 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.

2.1.3 Doses to a Member of the Public

Technical Specifications 5.5.4.e and 5.5.4.i state that 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.

2.2 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

2.2.1 Sample collection and Analysis

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 release points (i.e. the Plant Vent Stack, Containment Purge when in continuous mode, 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. All gross alpha, Sr-89 and Sr-90 samples are sent offsite to the Georgia Power Environmental Laboratory for analysis.

Batch Releases: The processing of batch type releases (from Containment when in batch mode, or Waste Gas Decay Tanks) is analogous to continuous releases, except that the release is not commenced until samples have been obtained and analyzed. Containment Purge batch releases were commenced at FNP beginning in 2006 in order to take advantage of additional decay time for short lived radionuclides.

Typically achieved minimum detectable concentrations for gaseous effluent sample analyses are reported in Table 2-6.

2.2.2 Total Quantities of Radioactivity, Dose Rates, and Cumulative Doses

The methods for determining release quantities of radioactivity, dose rates, and cumulative doses follow:

2.2.2.1 Fission and Activation Gases

The released radioactivity is determined using sample analyses results collected as described in section 2.2.1 and the average release flow rates over the period represented by the collected sample.

Dose rates due to noble gases, radioiodines, tritium, and particulates are calculated (with computer assistance). The calculated dose rates are compared to the dose rate limits specified in ODCM 3.1.2 for noble gases, radioiodine, tritium, and particulates. Dose rate calculation methodology is presented in the ODCM.

Beta and gamma air doses due to noble gases are calculated for the location in the unrestricted area with the potential for the highest exposure due to gaseous releases. Air doses are calculated for each release period and cumulative totals are kept for each unit for the calendar quarter and year. Cumulative air doses are compared to the dose limits specified in ODCM 3.1.3. The current percent of the ODCM limits are shown on the printout for each release period. Air dose calculation methodology is presented in the ODCM.

2.2.2.2 Radioiodine, Tritium, and Particulate Releases

Released quantities of radioiodines are determined using the weekly samples and release flow rates for the applicable release points. Radioiodine concentrations are determined by gamma spectroscopy.

Release quantities of particulates are determined using the weekly (filter) samples and release flow rates for the applicable release points. Gamma spectroscopy is used to quantify the concentrations of principal gamma emitters.

After each quarter, the particulate filters from each applicable vent (plant vent stack and containment purge) are combined, fused, and a strontium separation is performed. Since sample flows and vent flows are almost constant over each quarterly period the filters from each vent can be dissolved together. Decay corrections are performed back to the middle of the quarterly collection period. If Sr-89 or Sr-90 is not detected, MDC's are calculated. Strontium concentrations are input into the composite file of the computer and used for release dose rate and individual dose calculations.

Tritium samples are obtained monthly from the Plant Vent Stack, the Containment Purge when in batch mode, and the Turbine Building Vent (and weekly for Containment Purge when in continuous mode) by passing the sample stream through a cold trap or by using the bubble method. The grams of water vapor/cubic meter is measured upstream of the cold trap in order to alleviate the difficulties in determining water vapor collection efficiencies. The tritium samples are analyzed onsite and the results furnished in uCi/ml of water. The tritium concentration in water is converted to the tritium concentration in air and this value is input into the composite file of the computer and used in release, dose rate, and individual dose calculations.

Dose rates due to radioiodine, tritium and particulates are calculated for a hypothetical child exposed to the inhalation pathway at the location in the unrestricted area where the potential dose rate is expected to be the highest. Dose rates are calculated, for each release point for each release period, and the dose rates from each release point is compared to the dose rate limits specified in ODCM 3.1.2, allocated for each release point as described in ODCM 3.3.2.

Doses to a Member of the Public (individual doses) due to radioiodine, tritium and particulates are calculated for the controlling receptor, which is described in the ODCM. Individual doses are calculated for each release period, and cumulative totals are kept for each unit, for the current calendar quarter and year. Cumulative individual doses are compared to the dose limits specified in ODCM 3.1.4. The current percent of ODCM limits are shown on the printout for each release period.

2.2.2.3 Gross Alpha Release

The gross alpha release is computed each month by counting the particulate filters, for each week for gross alpha activity in a proportional counter. The highest concentration calculated for any of these weeks is used for the monthly value. This value is input into the composite file of the computer and used for release calculations.

2.2.3 Total Error Estimation

The maximum errors associated with monitor readings, sample flow, vent 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%

2.3 Gaseous Effluent Release Data

Regulatory Guide 1.21 Tables 1A, 1B and 1C are found in this report as Tables 2-1A, 2-1B, 2-1C, 2-2A, 2-2B, 2-2C, 2-3A, 2-3B, and 2-3C. Data are presented on a quarterly basis as required by Regulatory Guide 1.21.

To complete Tables 2-1A and 2-1B, the total release for each of the four categories (fission and activation gases, radioiodines, particulates and tritium) was divided by the number of seconds in the quarter to obtain a release rate in uCi/second for each category. However, the percent of the ODCM limits are not applicable because FNP has no curie limit for gaseous releases. Applicable limits are expressed in terms of dose. Noble gases are limited as specified in ODCM 3.1.2. The other three categories (tritium, radioiodines, and particulates) are limited as a group as specified in ODCM 3.1.2.

Dose rates due to noble gas releases and due to radioiodines, tritium and particulate releases were calculated as part of the pre-release and post-release permits. No limits were exceeded for this reporting period.

Gross alpha radioactivity is reported in Tables 2-1A, 2-1B and 2-1C as curies released in each quarter.

Limits for cumulative beta and gamma air doses due to noble gases are presented in Tables 2-4A and 2-4B along with the percent of ODCM limits.

Limits for cumulative doses to an individual due to radioiodines, tritium and particulates are specified in ODCM 3.1.4. Cumulative individual doses are presented in Tables 2-5A and 2-5B along with percent of ODCM limits.

2.4 Radiological Impact Due to Gaseous Releases

The air doses due to noble gases and doses to a Member of the Public due to radioiodines, tritium and particulates in 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 2012 Air Doses Due to Noble Gases in Gaseous Releases: Table 2-4A

Unit 2 2012 Air Doses Due to Noble Gases in Gaseous Releases: Table 2-4B

Unit 1 2012 Doses to a Member of the Public Due to Radioiodines, Tritium, and Particulates in Gaseous Releases: Table 2-5A

Unit 2 2012 Doses to a Member of the Public Due to Radioiodines, Tritium, and Particulates in Gaseous Releases: Table 2-5B

2.5 Gaseous Effluents - Batch Releases

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

Unit 1 2012 Gaseous Effluents - Batch Release Summary: Table 2-7A

Unit 2 2012 Gaseous Effluents - Batch Release Summary: Table 2-7B

2.6 Gaseous Effluents - Abnormal Releases

There were no abnormal releases on Unit 1 or Unit 2 during 2012.

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

Unit 1 2012 Gaseous Effluents - Abnormal Release Summary: Table 2-8A

Unit 2 2012 Gaseous Effluents - Abnormal Release Summary: Table 2-8B

Table 2-1A

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012**

Gaseous Effluents - Summation Of All Releases

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	2.21E+00	1.25E+00	8.83E-01	7.96E-01
2. Average Release rate for period	uCi/sec	2.81E-01	1.59E-01	1.12E-01	1.01E-01
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	0.00E+00	8.62E-06	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	1.09E-06	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8 Days)	Curies	1.55E-07	7.41E-07	1.72E-07	0.00E+00
2. Average Release rate for period	uCi/sec	1.97E-08	9.40E-08	2.18E-08	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	1.47E+00	7.78E-01	1.50E+00	1.51E+00
2. Average Release rate for period	uCi/sec	1.87E-01	9.87E-02	1.91E-01	1.91E-01
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 2-1B
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Summation Of All Releases

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	2.83E-01	2.15E-01	2.60E-01	4.08E-01
2. Average Release rate for period	uCi/sec	3.59E-02	2.73E-02	3.30E-02	5.18E-02
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8 Days)	Curies	2.01E-08	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	2.55E-09	0.00E+00	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	6.31E+00	6.95E+00	7.24E+00	1.04E+01
2. Average Release rate for period	uCi/sec	8.00E-01	8.81E-01	9.19E-01	1.32E+00
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 2-1C

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Summation Of All Releases
Unit: Site
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	2.50E+00	1.47E+00	1.14E+00	1.20E+00
2. Average Release rate for period	uCi/sec	3.17E-01	1.86E-01	1.45E-01	1.53E-01
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	0.00E+00	8.62E-06	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	1.09E-06	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8 Days)	Curies	1.75E-07	7.41E-07	1.72E-07	0.00E+00
2. Average Release rate for period	uCi/sec	2.22E-08	9.40E-08	2.18E-08	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	7.78E+00	7.72E+00	8.75E+00	1.19E+01
2. Average Release rate for period	uCi/sec	9.87E-01	9.80E-01	1.11E+00	1.51E+00
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 2-2A

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	1.37E+00	5.60E-01	0.00E+00	0.00E+00
Total For Period	Curies	1.37E+00	5.60E-01	0.00E+00	0.00E+00
Iodines					
I-131	Curies	0.00E+00	8.58E-06	0.00E+00	0.00E+00
Total For Period	Curies	0.00E+00	8.58E-06	0.00E+00	0.00E+00
Particulates					
Co-60	Curies	0.00E+00	7.36E-07	0.00E+00	0.00E+00
Sr-89	Curies	1.55E-07	0.00E+00	1.72E-07	0.00E+00
Total For Period	Curies	1.55E-07	7.36E-07	1.72E-07	0.00E+00
Tritium					
H-3	Curies	1.46E+00	7.55E-01	1.29E+00	1.25E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-2A

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	8.23E-01	3.24E-01	7.61E-01	6.95E-01
Kr-85M	Curies	0.00E+00	0.00E+00	0.00E+00	6.40E-05
Kr-87	Curies	0.00E+00	0.00E+00	0.00E+00	1.26E-04
Xe-131M	Curies	0.00E+00	2.77E-03	0.00E+00	0.00E+00
Xe-133M	Curies	8.11E-05	1.58E-03	5.40E-05	0.00E+00
Xe-133	Curies	1.87E-02	3.57E-01	1.10E-01	9.21E-02
Xe-135	Curies	0.00E+00	6.48E-03	1.24E-02	8.45E-03
Total For Period	Curies	8.42E-01	6.91E-01	8.83E-01	7.96E-01
Iodines					
I-131	Curies	0.00E+00	3.44E-08	0.00E+00	0.00E+00
Total For Period	Curies	0.00E+00	3.44E-08	0.00E+00	0.00E+00
Particulates					
Y-88	Curies	0.00E+00	4.08E-09	0.00E+00	0.00E+00
Sn-113	Curies	0.00E+00	1.16E-09	0.00E+00	0.00E+00
Total For Period	Curies	0.00E+00	5.23E-09	0.00E+00	0.00E+00
Tritium					
H-3	Curies	1.71E-02	2.28E-02	2.17E-01	2.53E-01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-2B

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Sr-90	Curies	2.01E-08	0.00E+00	0.00E+00	0.00E+00
Total For Period	Curies	2.01E-08	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	6.30E+00	6.91E+00	7.20E+00	1.04E+01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-2B

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	2.83E-01	2.15E-01	2.60E-01	4.08E-01
Xe-133	Curies	4.21E-04	0.00E+00	0.00E+00	0.00E+00
Total For Period	Curies	2.83E-01	2.15E-01	2.60E-01	4.08E-01
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	1.16E-02	3.93E-02	4.62E-02	2.22E-02
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-2C

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	1.37E+00	5.60E-01	0.00E+00	0.00E+00
Total For Period	Curies	1.37E+00	5.60E-01	0.00E+00	0.00E+00
Iodines					
I-131	Curies	0.00E+00	8.58E-06	0.00E+00	0.00E+00
Total For Period	Curies	0.00E+00	8.58E-06	0.00E+00	0.00E+00
Particulates					
Co-60	Curies	0.00E+00	7.36E-07	0.00E+00	0.00E+00
Sr-89	Curies	1.55E-07	0.00E+00	1.72E-07	0.00E+00
Sr-90	Curies	2.01E-08	0.00E+00	0.00E+00	0.00E+00
Total For Period	Curies	1.75E-07	7.36E-07	1.72E-07	0.00E+00
Tritium					
H-3	Curies	7.75E+00	7.66E+00	8.48E+00	1.16E+01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-2C

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Gaseous Effluents - Mixed Mode Level Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	1.11E+00	5.39E-01	1.02E+00	1.10E+00
Kr-85M	Curies	0.00E+00	0.00E+00	0.00E+00	6.40E-05
Kr-87	Curies	0.00E+00	0.00E+00	0.00E+00	1.26E-04
Xe-131M	Curies	0.00E+00	2.77E-03	0.00E+00	0.00E+00
Xe-133M	Curies	8.11E-05	1.58E-03	5.40E-05	0.00E+00
Xe-133	Curies	1.91E-02	3.57E-01	1.10E-01	9.21E-02
Xe-135	Curies	0.00E+00	6.48E-03	1.24E-02	8.45E-03
Total For Period	Curies	1.13E+00	9.07E-01	1.14E+00	1.20E+00
Iodines					
I-131	Curies	0.00E+00	3.44E-08	0.00E+00	0.00E+00
Total For Period	Curies	0.00E+00	3.44E-08	0.00E+00	0.00E+00
Particulates					
Y-88	Curies	0.00E+00	4.08E-09	0.00E+00	0.00E+00
Sn-113	Curies	0.00E+00	1.16E-09	0.00E+00	0.00E+00
Total For Period	Curies	0.00E+00	5.23E-09	0.00E+00	0.00E+00
Tritium					
H-3	Curies	2.87E-02	6.21E-02	2.63E-01	2.76E-01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-3A

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012**

Gaseous Effluents - Ground Level Releases

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3A

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
 See Table 2-6 for typical minimum detectable concentrations.

Table 2-3B

**Joseph M Farley Nuclear Plant
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2012**

Gaseous Effluents - Ground Level Releases

Unit: 2

Starting: 1-Jan-2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3B

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012**

Gaseous Effluents - Ground Level Releases

Unit: 2

Starting: 1-Jan-2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Unit	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3C

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: Site
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Continuous Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3C

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases**

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Nuclides Released	Unit	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-4A

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Air Doses Due to Gaseous Releases
Unit: 1
Starting: 1-Jan-2012 Ending: 31-Dec-2012**

Cumulative Doses Per Quarter

Type of Radiation	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Gamma Air	5.00E+00	mRad	6.99E-04	1.40E-02	2.86E-04	5.72E-03	2.45E-04	4.89E-03	2.23E-04	4.46E-03
Beta Air	1.00E+01	mRad	2.47E-04	2.47E-03	1.13E-04	1.13E-03	9.05E-05	9.05E-04	8.21E-05	8.21E-04

Cumulative Doses Per Year

Type of Radiation	ODCM Lmt	Units	Year to End Date	% ODCM	Receptor	Limit
Gamma Air	1.00E+01	mRad	1.45E-03	1.45E-02	Site Boundary SSE Mixed Mode R	Air Dose Gamma Annual
Beta Air	2.00E+01	mRad	5.33E-04	2.66E-03	Site Boundary SSE Mixed Mode R	Air Dose Beta Annual

Table 2-4B

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012**

Air Doses Due to Gaseous Releases

Unit: 2

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

<u>Type of Radiation</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Gamma Air	5.00E+00	mRad	9.01E-05	1.80E-03	6.85E-05	1.37E-03	8.28E-05	1.66E-03	1.30E-04	2.60E-03
Beta Air	1.00E+01	mRad	3.18E-05	3.18E-04	2.42E-05	2.42E-04	2.92E-05	2.92E-04	4.58E-05	4.58E-04

Cumulative Doses Per Year

<u>Type of Radiation</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>Year to End Date</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Gamma Air	1.00E+01	mRad	3.71E-04	3.71E-03	Site Boundary SSE Mixed Mode R	Air Dose Gamma Annual
Beta Air	2.00E+01	mRad	1.31E-04	6.55E-04	Site Boundary SSE Mixed Mode R	Air Dose Beta Annual

Table 2-5A

**Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012**

Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: 1

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	7.50E+00	mRem	1.45E-06	1.93E-05	5.79E-06	7.72E-05	2.09E-06	2.79E-05	0.00E+00	0.00E+00
GI-Lli	7.50E+00	mRem	1.98E-04	2.65E-03	1.12E-04	1.50E-03	2.06E-04	2.74E-03	2.06E-04	2.75E-03
Kidney	7.50E+00	mRem	1.98E-04	2.65E-03	1.12E-04	1.50E-03	2.06E-04	2.74E-03	2.06E-04	2.75E-03
Liver	7.50E+00	mRem	1.98E-04	2.65E-03	1.12E-04	1.50E-03	2.06E-04	2.74E-03	2.06E-04	2.75E-03
Lung	7.50E+00	mRem	1.98E-04	2.65E-03	1.12E-04	1.49E-03	2.06E-04	2.74E-03	2.06E-04	2.75E-03
Thyroid	7.50E+00	mRem	1.98E-04	2.65E-03	2.67E-04	3.56E-03	2.06E-04	2.74E-03	2.06E-04	2.75E-03
Total Body	7.50E+00	mRem	1.98E-04	2.65E-03	1.12E-04	1.50E-03	2.06E-04	2.74E-03	2.06E-04	2.75E-03

Cumulative Doses per Year

Organ	ODCM Lmt	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.500E+01	mRem	9.327E-06	6.218E-05	Gas Controlling Receptor	Iodine/Part Dose Annual
GI-Lli	1.500E+01	mRem	7.227E-04	4.818E-03	Gas Controlling Receptor	Iodine/Part Dose Annual
Kidney	1.500E+01	mRem	7.227E-04	4.818E-03	Gas Controlling Receptor	Iodine/Part Dose Annual
Liver	1.500E+01	mRem	7.225E-04	4.817E-03	Gas Controlling Receptor	Iodine/Part Dose Annual
Lung	1.500E+01	mRem	7.221E-04	4.814E-03	Gas Controlling Receptor	Iodine/Part Dose Annual
Thyroid	1.500E+01	mRem	8.775E-04	5.850E-03	Gas Controlling Receptor	Iodine/Part Dose Annual
Total Body	1.500E+01	mRem	7.226E-04	4.817E-03	Gas Controlling Receptor	Iodine/Part Dose Annual

Table 2-5B

Joseph M Farley Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: 2

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM Lmt	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	7.50E+00	mRem	8.43E-06	1.12E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GI-Lli	7.50E+00	mRem	8.63E-04	1.15E-02	9.50E-04	1.27E-02	9.91E-04	1.32E-02	1.42E-03	1.90E-02
Kidney	7.50E+00	mRem	8.63E-04	1.15E-02	9.50E-04	1.27E-02	9.91E-04	1.32E-02	1.42E-03	1.90E-02
Liver	7.50E+00	mRem	8.63E-04	1.15E-02	9.50E-04	1.27E-02	9.91E-04	1.32E-02	1.42E-03	1.90E-02
Lung	7.50E+00	mRem	8.63E-04	1.15E-02	9.50E-04	1.27E-02	9.91E-04	1.32E-02	1.42E-03	1.90E-02
Thyroid	7.50E+00	mRem	8.63E-04	1.15E-02	9.50E-04	1.27E-02	9.91E-04	1.32E-02	1.42E-03	1.90E-02
Total Body	7.50E+00	mRem	8.65E-04	1.15E-02	9.50E-04	1.27E-02	9.91E-04	1.32E-02	1.42E-03	1.90E-02

Cumulative Doses per Year

Organ	ODCM Lmt	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.500E+01	mRem	8.427E-06	5.618E-05	Gas Controlling Receptor	Iodine/Part Dose Annual
GI-Lli	1.500E+01	mRem	4.225E-03	2.817E-02	Gas Controlling Receptor	Iodine/Part Dose Annual
Kidney	1.500E+01	mRem	4.225E-03	2.817E-02	Gas Controlling Receptor	Iodine/Part Dose Annual
Liver	1.500E+01	mRem	4.225E-03	2.817E-02	Gas Controlling Receptor	Iodine/Part Dose Annual
Lung	1.500E+01	mRem	4.225E-03	2.817E-02	Gas Controlling Receptor	Iodine/Part Dose Annual
Thyroid	1.500E+01	mRem	4.225E-03	2.817E-02	Gas Controlling Receptor	Iodine/Part Dose Annual
Total Body	1.500E+01	mRem	4.227E-03	2.818E-02	Gas Controlling Receptor	Iodine/Part Dose Annual

TABLE 2-6
Joseph M. Farley Nuclear Plant
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
MINIMUM DETECTABLE CONCENTRATIONS - GASEOUS EFFLUENT ANALYSES

The values in this table represent a priori Minimum Detectable Concentrations (MDC) that are typically achieved in laboratory analyses of gaseous radwaste samples.

<u>Nuclide</u>	<u>MDC (uCi/ML)</u>	<u>Nuclide</u>	<u>MDC (uCi/ML)</u>
MN-54	4.17E-14	KR-87	4.64E-08
CO-58	7.65E-14	KR-88	7.46E-08
FE-59	2.53E-14	XE-133	4.71E-08
CO-60	6.01E-14	XE-133M	1.42E-07
ZN-65	2.40E-13	XE-135	1.58E-08
MO-99	4.46E-13	XE-138	1.21E-07
CS-134	5.17E-14	I-131	5.95E-14
CS-137	6.95E-15	I-133	8.96E-14
CE-141	4.28E-14		
CE-144	1.64E-13		

Table 2-7A
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Batch Release Summary
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		175	84	129	157	545
2. Total time period for batch releases	(Minutes)	1.33E+04	8.81E+03	1.14E+04	8.08E+03	4.16E+04
3. Maximum time period for a batch release	(Minutes)	5.92E+02	8.45E+02	2.36E+03	3.54E+02	2.36E+03
4. Average time period for a batch release	(Minutes)	7.61E+01	1.05E+02	8.83E+01	5.15E+01	7.63E+01
5. Minimum time period for a batch release	(Minutes)	4.00E+00	4.00E+00	5.00E+00	4.00E+00	4.00E+00

Table 2-7B
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Batch Release Summary
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		34	49	56	90	229
2. Total time period for batch releases	(Minutes)	3.09E+03	2.41E+03	2.53E+03	4.22E+03	1.22E+04
3. Maximum time period for a batch release	(Minutes)	1.53E+03	2.81E+02	1.04E+02	3.03E+02	1.53E+03
4. Average time period for a batch release	(Minutes)	9.08E+01	4.92E+01	4.52E+01	4.68E+01	5.35E+01
5. Minimum time period for a batch release	(Minutes)	3.00E+00	5.00E+00	6.00E+00	5.00E+00	3.00E+00

Table 2-8A
Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Abnormal Release Summary
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 2-8B

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Abnormal Release Summary
Unit: 2
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases	:	0	0	0	0	0
2. Total Time For All Releases	(Minutes):	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes):	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes):	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes):	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies) :	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

3.0 SOLID WASTE

3.1 Regulatory Requirements

3.1.1 Solid Radioactive Waste System

FNP-0-M-30 step B.3.1 states that the radwaste solidification system shall be OPERABLE and used, as applicable in accordance with a PROCESS CONTROL PROGRAM, for the SOLIDIFICATION and packaging of radioactive wastes to ensure meeting the requirements of 10 CFR Part 20 and 10 CFR Part 71 prior to shipment of radioactive wastes from the site.

3.1.2 Reporting Requirements

FNP-0-M-30 step B.5.1 states that the Annual Radioactive Effluent Release Report, submitted in accordance with Technical Specifications 5.6.2 and 5.6.3, shall include a summary of the quantities of solid radwaste released from the units as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste," Revision 2, June 2009, with data summarized on an annual basis following the format of Table A-3 thereof.

3.2 Solid Waste Data

Regulatory Guide 1.21 Revision 2 Table A-3 is found in the report as Table 3-1.

TABLE 3-1
Joseph M. Farley Nuclear Plant
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT – 2012
SOLID RADIOACTIVE WASTE SHIPPED FOR PROCESSING OR DISPOSAL
Starting 01-Jan-2012 Ending 31-Dec-2012

Resins, Filters, and Evaporator Bottoms	Volume		Curies Shipped
	ft ³	m ³	
Waste Class			
A	3.24E+02	9.18E+00	3.63E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	3.24E+02	9.18E+00	3.63E+00

Major Nuclides for the Above Table:

Waste Class A	Co-60 37.478%	C-14 18.594%	Fe-55 18.151%	Ni-63 14.710%
	Zn-65 4.135%	Sb-125 2.657%	Cs-137 2.619%	
Waste Class B	N/A			
Waste Class C	N/A			
ALL	Co-60 37.478%	C-14 18.594%	Fe-55 18.151%	Ni-63 14.710%
	Zn-65 4.135%	Sb-125 2.657%	Cs-137 2.619%	

Dry Active Waste	Volume		Curies Shipped
	ft ³	m ³	
Waste Class			
A	1.15E+04	3.25E+02	3.23E-01
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	1.15E+04	3.25E+02	3.23E-01

Major Nuclides for the Above Table:

Waste Class A	Fe-55 19.524%	H-3 14.975%	Co-60 14.930%	Nb-95 11.646%
	Zr-95 10.731%	Ni-63 9.352%	Co-58 7.813%	Sb-125 3.202%
	Cr-51 2.998%	C-14 1.244%	Zn-65 1.078%	Mn-54 1.001%
Waste Class B	N/A			
Waste Class C	N/A			
ALL	Fe-55 19.524%	H-3 14.975%	Co-60 14.930%	Nb-95 11.646%
	Zr-95 10.731%	Ni-63 9.352%	Co-58 7.813%	Sb-125 3.202%
	Cr-51 2.998%	C-14 1.244%	Zn-65 1.078%	Mn-54 1.001%

Irradiated Components	Volume		Curies Shipped
	ft ³	m ³	
Waste Class			
A	0.00E+00	0.00E+00	0.00E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	0.00E+00	0.00E+00	0.00E+00

Major Nuclides for the Above Table:

Waste Class A	N/A
Waste Class B	N/A
Waste Class C	N/A
ALL	N/A

TABLE 3-1
Joseph M. Farley Nuclear Plant
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT – 2012
SOLID RADIOACTIVE WASTE SHIPPED FOR PROCESSING OR DISPOSAL
Starting 01-Jan-2012 Ending 31-Dec-2012
(Continued)

Other Waste	Volume		Curies Shipped
	ft ³	m ³	
Waste Class			
A	2.48E+02	7.01E+00	2.09E-04
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	2.48E+02	7.01E+00	2.09E-04

Major Nuclides for the Above Table:

Waste Class A H-3 99.837%

Waste Class B N/A

Waste Class C N/A

ALL H-3 99.837%

Sum of All Low-Level Waste Shipped from Site	Volume		Curies Shipped
	ft ³	m ³	
Waste Class			
A	1.21E+04	3.42E+02	3.95E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
ALL	1.21E+04	3.42E+02	3.95E+00

Major Nuclides for the Above Table:

Waste Class A	Co-60 35.633%	Fe-55 18.262%	C-14 17.175%	Ni-63 14.272%
	Zn-65 3.885%	Sb-125 2.702%	Cs-137 2.446%	H-3 1.229%
	Co-58 1.136%			

Waste Class B N/A

Waste Class C N/A

ALL	Co-60 35.633%	Fe-55 18.262%	C-14 17.175%	Ni-63 14.272%
	Zn-65 3.885%	Sb-125 2.702%	Cs-137 2.446%	H-3 1.229%
	Co-58 1.136%			

4.0 DOSES TO MEMBERS OF THE PUBLIC INSIDE THE SITE BOUNDARY

4.1 Regulatory Requirements

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).

4.2 Demonstration of Compliance

However, this assessment has been performed for 2012 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
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Doses to a Member of the Public Due to Activities Inside the Site Boundary
Unit: Site
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Location Name: Visitor Center
Distance (kilometers): 3.06E-01
Sector: N
Occupancy Factor: 1.37E-03
Age Group: Child

Ground Level Release	Noble Gas	X/Q (sec/m3): 1.04E-04	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 1.04E-04	D/Q (m-2): 4.80E-07
Mixed Mode Release	Noble Gas	X/Q (sec/m3): 8.80E-06	
Mixed Mode Release	Particulate and Radioiodine	X/Q (sec/m3): 8.80E-06	D/Q (m-2): 6.20E-08

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	8.05E-10	4.32E-08	3.94E-11	0.00E+00	4.40E-08
Liver	mRem	3.33E-06	3.36E-06	3.75E-06	5.10E-06	1.55E-05
Total Body	mRem	3.33E-06	3.36E-06	3.75E-06	5.10E-06	1.55E-05
Thyroid	mRem	3.33E-06	3.41E-06	3.75E-06	5.10E-06	1.56E-05
Kidney	mRem	3.33E-06	3.36E-06	3.75E-06	5.10E-06	1.55E-05
Lung	mRem	3.33E-06	3.36E-06	3.75E-06	5.10E-06	1.55E-05
GI-Lli	mRem	3.33E-06	3.36E-06	3.75E-06	5.10E-06	1.55E-05
NG Total Body	mRem	8.38E-06	3.76E-06	3.47E-06	3.74E-06	1.93E-05
Whole Body Dose	mRem	1.17E-05	7.11E-06	7.22E-06	8.85E-06	3.49E-05

Table 4-1

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Doses to a Member of the Public Due to Activities Inside the Site Boundary
Unit: Site
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Location Name: Service Water Pond
Distance (kilometers): 9.66E-01
Sector: N
Occupancy Factor: 7.57E-03
Age Group: Child

Ground Level Release	Noble Gas	X/Q (sec/m3): 4.74E-05	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 4.74E-05	D/Q (m-2): 1.31E-07
Mixed Mode Release	Noble Gas	X/Q (sec/m3): 9.75E-07	
Mixed Mode Release	Particulate and Radioiodine	X/Q (sec/m3): 9.75E-07	D/Q (m-2): 2.78E-08

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	4.93E-10	1.07E-07	2.42E-11	0.00E+00	1.07E-07
Liver	mRem	2.04E-06	2.13E-06	2.30E-06	3.12E-06	9.59E-06
Total Body	mRem	2.04E-06	2.13E-06	2.30E-06	3.12E-06	9.59E-06
Thyroid	mRem	2.04E-06	2.17E-06	2.30E-06	3.12E-06	9.62E-06
Kidney	mRem	2.04E-06	2.13E-06	2.30E-06	3.12E-06	9.59E-06
Lung	mRem	2.04E-06	2.14E-06	2.30E-06	3.12E-06	9.59E-06
GI-Lli	mRem	2.04E-06	2.13E-06	2.30E-06	3.12E-06	9.59E-06
NG Total Body	mRem	5.13E-06	2.30E-06	2.13E-06	2.29E-06	1.18E-05
Whole Body Dose	mRem	7.17E-06	4.43E-06	4.42E-06	5.42E-06	2.14E-05

Table 4-1

Joseph M Farley Nuclear Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses to a Member of the Public Due to Activities Inside the Site Boundary

Unit: Site

Starting: 1-Jan-2012 Ending: 31-Dec-2012

Location Name: River Water Discharge - Air
Distance (kilometers): 1.64E+00
Sector: N
Occupancy Factor: 1.14E-02
Age Group: Child

Ground Level Release	Noble Gas	X/Q (sec/m3): 1.63E-05	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 1.63E-05	D/Q (m-2): 4.55E-08
Mixed Mode Release	Noble Gas	X/Q (sec/m3): 7.05E-07	
Mixed Mode Release	Particulate and Radioiodine	X/Q (sec/m3): 7.05E-07	D/Q (m-2): 1.39E-08

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	5.37E-10	8.04E-08	2.63E-11	0.00E+00	8.09E-08
Liver	mRem	2.22E-06	2.29E-06	2.50E-06	3.40E-06	1.04E-05
Total Body	mRem	2.22E-06	2.29E-06	2.50E-06	3.40E-06	1.04E-05
Thyroid	mRem	2.22E-06	2.32E-06	2.50E-06	3.40E-06	1.04E-05
Kidney	mRem	2.22E-06	2.29E-06	2.50E-06	3.40E-06	1.04E-05
Lung	mRem	2.22E-06	2.29E-06	2.50E-06	3.40E-06	1.04E-05
GI-Li	mRem	2.22E-06	2.29E-06	2.50E-06	3.40E-06	1.04E-05
NG Total Body	mRem	5.58E-06	2.51E-06	2.31E-06	2.50E-06	1.29E-05
Whole Body Dose	mRem	7.80E-06	4.79E-06	4.81E-06	5.90E-06	2.33E-05

Table 4-1

Joseph M Farley Nuclear Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Doses to a Member of the Public Due to Activities Inside the Site Boundary
Unit: Site
Starting: 1-Jan-2012 Ending: 31-Dec-2012

Location Name: New Construction Activity
Distance (kilometers): 3.22E-01
Sector: S
Occupancy Factor: 2.28E-01
Age Group: Adult

Ground Level Release	Noble Gas	X/Q (sec/m3): 1.85E-04	D/Q (m-2): 9.26E-08
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 6.66E-05	D/Q (m-2): 9.26E-08
Mixed Mode Release	Noble Gas	X/Q (sec/m3): 2.42E-06	D/Q (m-2): 8.66E-09
Mixed Mode Release	Particulate and Radioiodine	X/Q (sec/m3): 2.23E-06	D/Q (m-2): 8.66E-09

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	3.28E-08	1.00E-06	8.45E-10	0.00E+00	1.04E-06
Liver	mRem	1.58E-04	1.59E-04	1.79E-04	2.43E-04	7.39E-04
Total Body	mRem	1.58E-04	1.59E-04	1.79E-04	2.43E-04	7.39E-04
Thyroid	mRem	1.58E-04	1.60E-04	1.79E-04	2.43E-04	7.40E-04
Kidney	mRem	1.58E-04	1.59E-04	1.79E-04	2.43E-04	7.39E-04
Lung	mRem	1.58E-04	1.59E-04	1.79E-04	2.43E-04	7.39E-04
GI-Lli	mRem	1.58E-04	1.59E-04	1.79E-04	2.43E-04	7.39E-04
NG Total Body	mRem	3.84E-04	1.72E-04	1.59E-04	1.71E-04	8.86E-04
Whole Body Dose	mRem	5.42E-04	3.31E-04	3.38E-04	4.14E-04	1.62E-03

5.0 TOTAL DOSE FROM URANIUM FUEL CYCLE (40CFR190)

5.1 Regulatory Requirements

Technical Specification 5.5.4.j states that 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).

5.2 Demonstration of Compliance

Since none of the ODCM 2.1.3, 3.1.3, or 3.1.4 limits were exceeded during 2012, no calculations were required.

6.0 METEOROLOGICAL DATA

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

7.0 PROGRAM DEVIATIONS

7.1 Inoperable Liquid or Gaseous Effluent Monitoring Instrumentation

7.1.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that the Annual Radioactive Effluent Release Report (the report) shall include deviations from the liquid and gaseous effluent monitoring instrumentation operability requirements included in Sections 2.1.1 and 3.1.1 of the ODCM. The report must also include an explanation as to why the inoperability was not corrected in a timely manner.

7.1.2 Description of Deviations

There were no deviations during 2012.

7.2 Effluent Sample Analysis Exceeding Minimum Detectable Concentration (MDC)

7.2.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that the report shall include deviations from the MDC requirements included in ODCM Tables 2-3 and 3-3.

7.2.2 Description of Deviations

There were no deviations during 2012.

7.3 Incorrect Compositing of Liquid or Gaseous Effluent Samples

7.3.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that the report shall include deviations from composite sampling requirements included in ODCM Tables 2-3 and 3-3.

7.3.2 Description of Deviations

There were no deviations during 2012.

8.0 CHANGES TO THE PLANT FARLEY ODCM

8.1 Regulatory Requirements

Pursuant to Technical Specification 5.5.1.c and ODCM 7.2.2.5, licensee initiated changes to the ODCM shall be submitted to the Nuclear Regulatory Commission as a part of or concurrent with the Annual Radioactive Effluent Release Report for the period in which any changes were made. Included are changes to the radiological environmental monitoring program sampling locations or dose calculation locations or pathways, including any changes made pursuant to ODCM 4.1.2.2.2 (land use census).

8.2 Description of Changes

There were no changes to the ODCM during 2012.

9.0 MAJOR CHANGES TO LIQUID, GASEOUS, OR SOLID RADWASTE TREATMENT SYSTEMS

9.1 Regulatory Requirements

ODCM 7.2.2.7 states in part that, as required by ODCM 2.1.5 and 3.1.6, licensee initiated MAJOR CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS (liquid and gaseous) shall be reported to the Nuclear Regulatory Commission in the Annual Radioactive Effluents Release Report covering the period in which the change was reviewed and accepted for implementation.

Process Control Program (PCP) B.5.1.2 states that licensee initiated major changes to the solid radioactive waste treatment system shall be reported to the Nuclear Regulatory Commission in the Annual Radioactive Effluent Release Report for the period in which the change was implemented. The discussion of each change shall include the information specified in PCP B.4.1.

9.2 Description of Major Changes

There were no changes to the Process Control Program during 2012.

10.0 SERVICE WATER DILUTION BIAS

In March, 2013, the Unit 2 Service Water dilution flow recorder was determined to be biased high by a factor of about 1.43 based on ultrasonic flow detection. Details of this determination can be found in Condition Report 600325 and Technical Evaluation 601127.

Calculations of Curies released were not impacted by this bias since dilution is not a parameter in those calculations. The calculation of liquid concentrations and doses for this report and previous reports, however, were biased low by a factor of 1.43.

Based on an application of the 1.43 correction factor to a random number of liquid releases over the previous five years, no 10CFR20 concentration limits were exceeded as a result of the bias. Since FNP's liquid doses have always been a small fraction of the ODCM limit (less than one percent of the ODCM limit for this year's report), the bias would not have resulted in any liquid dose limits being exceeded or approached. Details of this assessment are included in Technical Evaluation 600968.

CARBON-14

Carbon-14 (C-14) is a naturally-occurring radionuclide with a 5730 year half life. Nuclear weapons testing in the 1950s and 1960s significantly increased the amount of C-14 in the atmosphere. Nuclear power plants also produce C-14, but the amount is infinitesimal compared to what has been distributed in the environment due to weapons testing and what is produced by natural cosmic ray interactions.

As nuclear plants have improved gaseous waste processing systems and improved fuel performance, the percentages of “principal radionuclides” in gaseous effluents have changed, and C-14 has become a larger percentage. “Principal radionuclides” are determined based on public dose contribution or the amount of activity discharged compared to other radionuclides of the same effluent type. In Revision 2 (June 2009) of Regulatory Guide 1.21 (RG 1.21), “Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste,” the NRC recommended re-evaluating “principal radionuclides” and reporting C-14 as appropriate. In 2010 Radioactive Effluent Release Reports, virtually all U. S. nuclear power plants started reporting C-14 amounts released and resulting doses to the maximally exposed member of the public.

Because C-14 is considered a hard-to-detect radionuclide which must be chemically separated from the effluent stream before it can be measured, RG 1.21 provides the option of calculating the C-14 source term based on power generation. The Electric Power Research Institute (EPRI) developed an accepted methodology for calculating C-14, and published the results in Technical Report 1021106 (December 2010), “Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents.” Evaluation of C-14 in radioactive liquid effluents is not required because the quantity and dose contribution has been determined to be insignificant.

At Plant Farley, the annual quantity of C-14 released in gaseous effluents was estimated to be 9.28 Curies (per unit). Approximately 30% of the C-14 released is in the form of $^{14}\text{CO}_2$ and is incorporated into plants through photosynthesis. Ingestion dose results from this pathway. The remaining 70% is estimated to be organic. Both the organic and inorganic forms of C-14 contribute to inhalation dose. A child is the maximally exposed individual, and bone dose is the highest organ dose. Using the dose calculation methodology from the Farley ODCM, the resulting bone dose to a child located at the controlling receptor location would be 4.11E-01 mrem in a year which is 2.74% of the regulatory limit of 15 mrem per year (per unit) to any organ due to gaseous effluents. The resulting total body dose to a child located at the controlling receptor location would be 8.21E-02 mrem in a year which is 0.54% of the regulatory limit of 15 mrem per year (per unit) total body dose due to gaseous effluents.

**Edwin I. Hatch Nuclear Plant
Joseph M. Farley Nuclear Plant
Vogtle Electric Generating Plant
Annual Radioactive Effluent Release Reports for 2012**

Enclosure 3

Vogtle Annual Radioactive Effluent Release Report for 2012

SOUTHERN NUCLEAR COMPANY
VOGTLE ELECTRIC GENERATING PLANT – UNITS 1 AND 2
NRC DOCKET NOS. 50-424 AND 50-425
FACILITY OPERATING LICENSE NOS. NPF-68 AND NPF-81
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
FOR
JANUARY 1, 2012 TO DECEMBER 31, 2012

**VOGTLE ELECTRIC GENERATING PLANT
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
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1.0 Liquid Effluents

1.1 Regulatory Requirements

1.1.1 Concentration Limits

In accordance with Technical Specification 5.5.4.b, the concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS shall be limited at all times to ten times the concentrations specified in 10 CFR 20, 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 E-04 $\mu\text{Ci/ml}$ total activity.

1.1.2 Dose Limits

The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each unit, to UNRESTRICTED AREAS shall be limited as follows:

- a. During any calendar quarter to less than or equal to 1.5 mrem to the whole 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 whole body and to less than or equal to 10 mrem to any organ.

1.2 Effluent Concentration Limit (ECL)

ECL values used for determining the allowable liquid radwaste release rates and concentrations for the principal gamma emitters, I-131, tritium, Sr-89, Sr-90 and Fe-55 are taken from 10 CFR Part 20, Appendix B, Table 2, Column 2. A tolerance factor of up to 10 is utilized to allow flexibility in establishing practical monitor set points which can accommodate effluent releases at concentrations higher than the ECL values stated in 10 CFR 20, Appendix B, Table 2, Column 2.

For dissolved or entrained noble gases in liquid radwaste, the ECL is 1E-04 $\mu\text{Ci/ml}$ total activity.

For gross alpha in liquid radwaste, the ECL is 2 E-09 $\mu\text{Ci/ml}$.

For all the above radionuclides or categories of radioactivity, the overall ECL fraction is determined in accordance with 10 CFR Part 20, Appendix B. The method utilizing the ECL fraction to determine release rates and liquid radwaste effluent radiation monitor set points is described in Subsection 1.3 of this report.

1.3 Measurements and Approximations of Total Radioactivity

1.3.1 Total Radioactivity Determination

Prior to the release of any tank containing liquid radwaste, and following the required recirculation, samples are collected and analyzed in accordance with the Offsite Dose Calculation Manual (ODCM) Table 2-3 "Radioactive Liquid Waste Sampling and Analysis Program". A sample from each tank which is planned for release is analyzed for principal gamma emitters, I-131, and dissolved and entrained noble gases by gamma spectroscopy. Monthly and quarterly composites are prepared for analysis by extracting aliquots from each sample taken from the tanks, which are released. Liquid radwaste sample analyses are performed as follows:

MEASUREMENT	FREQUENCY	METHOD
1. Gamma Isotopic	Each Batch	Gamma Spectroscopy with computerized data reduction.
2. Dissolved or entrained noble gases	Each Batch	Gamma Spectroscopy with computerized data reduction
3. Tritium	Monthly Composite	Distillation and liquid scintillation counting
4. Gross Alpha	Monthly Composite	Gas flow proportional counting
5. Sr-89 & Sr-90	Quarterly Composite	Chemical separation and gas flow proportional or scintillation counting
6. Fe-55	Quarterly Composite	Chemical separation and liquid scintillation counting

1.3.1

Total Radioactivity Determination cont'd

Gamma isotopic measurements are performed using germanium detectors with a resolution of 2.1 keV or lower. A peak search of the resulting gamma ray spectrum is performed by the computer system. Energy and net count data for all significant peaks are determined, and a quantitative reduction or MDC calculation is performed. This ensures that the MDC's are met for the nuclides specified in ODCM Chapter 10 (i.e., Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141 and Ce-144). The quantitative calculations, corrections for counting time, decay time, sample volume, sample geometry, detector efficiency, baseline counts, branching ratio and MDC calculations, are made based on the counts at the location in the spectrum where the peak for that radionuclide would be located, if present.

Tritium, Gross Alpha, Sr-89, Sr-90 and Fe-55 are, in some cases, analyzed offsite.

ECL fraction is determined using radionuclide concentrations of a tank planned for release, the most current results available for tritium, gross alpha, Sr-89, Sr-90 and Fe-55 and the corresponding ECL values.

This ECL fraction is used, with appropriate safety factors, tolerance factors, and the minimum assured dilution stream flow to calculate maximum permissible release rates and a liquid effluent monitor setpoint. The monitor setpoint is calculated to assure that the limits of the Offsite Dose Calculation Manual (ODCM) are not exceeded.

A monitor reading in excess of the calculated setpoint results in an automatic termination of the liquid radwaste discharge. Liquid effluent discharge is also automatically terminated if the dilution stream flow rate falls below the minimum assured dilution flow rate used in the setpoint calculations and established as a setpoint on the dilution stream flow monitor.

Radionuclide concentrations, safety factors, dilution stream flow rate, and liquid effluent radiation monitor calibrations are entered into the computer and a pre-release printout is generated. If the release is not permissible, appropriate warnings will be displayed on the computer screen. If the release is permissible, it is approved by the Chemistry Department and sent to the Operations Department for approval and release. When the release is completed, the necessary data from the release (i.e., release volume, etc.) are provided by the Operations Department to the Chemistry Department. These data are input to the computer and a post-release printout is generated. The post release printout contains the actual release rates, release concentrations and quantities, actual dilution flow, and calculated doses to an individual.

Typically achieved liquid effluent sample analyses minimum detectable concentrations are reported in Table 1-4.

1.3.2

Total Error Estimation

The total or maximum error associated with the effluent measurement includes the cumulative errors resulting from the total operation of sampling and measurement. Because it may be very difficult to assign error terms for each parameter affecting the final measurement, detailed statistical evaluation of error is not suggested. The objective should be to obtain an overall estimate of the error associated with measurements of radioactive materials released in liquid effluents.

- a. Fission and activation total release was calculated from sample analysis results and release point flow rates.

Sampling and statistical error	10%
Counting Equipment Calibration	10%
Tank Volumes and System Flow Rates	20%
TOTAL ERROR	24.5%

- b. Total Tritium release was calculated from sample analysis results and release point volumes.

Sampling and statistical errors	10%
Counting equipment calibration	10%
Tank volumes and system flow rate	20%
TOTAL ERROR	24.5%

- c. Dissolved and entrained gases were calculated from sample analysis results and release point volumes.

Sampling and statistical error	20%
Counting equipment calibration	10%
Tank volumes and system flow rate	20%
TOTAL ERROR	30%

- d. Gross alpha radioactivity was calculated from sample analysis results and release point volumes.

Sampling and statistical error	10%
Counting Equipment calibration	10%
Tank volumes and system flowrates	20%
TOTAL ERROR	24.5%

1.3.2 Total Error Estimation cont'd

- e. Volume of waste prior to dilution was calculated from level indicators on the tanks and pump discharge flow rates and times.

Level Indicator error	10%
Operator Interpretation of gauge	10%
TOTAL ERROR	14%

- f. Volume of dilution water used was calculated from flow totalizers and pump discharge flow rates and times.

Flow totalizer error	10%
Operator interpretation of gauge	10%
TOTAL ERROR	14%

- g. Gross alpha, Sr-89, Sr-90, Fe-55 and H-3 radioactivity has an additional error associated with sample compositing.

Compositing sample error	5%
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1.4 Liquid Effluent Release Data

Regulatory Guide 1.21 Rev. 1 Tables 2A and 2B are found in this report as Tables 1-1A, 1-1B, 1-1C, 1-2A, 1-2B and 1-2C. Data is presented on a quarterly basis as required by Regulatory Guide 1.21 Rev. 1 for all four quarters.

1.5 Radiological Impact Due to Liquid Releases

Doses to an individual due to radioactivity in liquid effluent were calculated in accordance with the Offsite Dose Calculation Manual. Results are presented in Table 1-3A for Unit 1 and 1-3B for Unit 2, for all four quarters.

1.6 Liquid Effluents – Batch Releases

Batch release information for liquid effluents is presented in Table 1-5A for Unit 1 and Table 1-5B for Unit 2.

1.7 Liquid Effluents - Abnormal Releases

There were no abnormal liquid releases during 2012.

Table 1-1A

**Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Summation of All Releases**

Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	3.36E-03	2.53E-02	6.03E-02	1.76E-02
2. Average diluted concentration during period	uCi/mL	8.24E-10	4.49E-09	8.16E-09	2.09E-09
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	2.68E+01	3.54E+02	4.43E+02	1.67E+02
2. Average diluted Concentration during period	uCi/mL	6.58E-06	6.28E-05	5.99E-05	1.98E-05
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	0.00E+00	0.00E+00	6.00E-04	2.63E-04
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	8.11E-11	3.12E-11
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	5.26E-07	5.72E-07	0.00E+00	0.00E+00
E: Waste Vol Release (Pre-Dilution)					
	Liters	2.61E+07	2.98E+07	3.03E+07	3.80E+07
F. Volume of Dilution Water Used					
	Liters	4.05E+09	5.62E+09	7.37E+09	8.40E+09

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

Table 1-1B

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Summation Of All Releases

Unit: 2

Starting: 1-Jan- 2012Ending: 31-Dec-2012

<u>Type of Effluent</u>	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	2.42E-03	2.84E-03	1.81E-02	6.51E-03
2. Average diluted concentration during period	uCi/mL	6.06E-10	5.68E-10	2.69E-09	8.84E-10
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	1.17E+01	2.84E+01	8.28E+01	6.61E+01
2. Average diluted Concentration during period	uCi/mL	2.92E-06	5.67E-06	1.23E-05	8.97E-06
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	0.00E+00	0.00E+00	7.57E-05	5.35E-05
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	1.13E-11	7.25E-12
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	1.01E-06	0.00E+00	0.00E+00	0.00E+00
E: Waste Vol Release (Pre-Dilution)					
	Liters	1.71E+07	2.28E+07	3.19E+07	2.85E+07
F. Volume of Dilution Water Used					
	Liters	3.99E+09	4.98E+09	6.69E+09	7.34E+09

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

Table 1-1C

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Summation Of All Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	5.78E-03	2.82E-02	7.84E-02	2.41E-02
2. Average diluted concentration during period	uCi/mL	7.16E-10	2.65E-09	5.55E-09	1.53E-09
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	3.85E+01	3.83E+02	5.26E+02	2.33E+02
2. Average diluted Concentration during period	uCi/mL	4.76E-06	3.60E-05	3.73E-05	1.48E-05
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	0.00E+00	0.00E+00	6.76E-04	3.17E-04
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	4.79E-11	2.00E-11
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	1.53E-06	5.72E-07	0.00E+00	0.00E+00
E: Waste Vol Release (Pre-Dilution)					
	Liters	4.32E+07	5.26E+07	6.23E+07	6.64E+07
F. Volume of Dilution Water Used					
	Liters	8.04E+09	1.06E+10	1.41E+10	1.57E+10

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

Table 1-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT – 2012
Liquid Effluents

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Batch Mode

<u>Nuclides Released</u>	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>
<u>Fission & Activation</u>					
Co-57	Curies	0.00E+00	0.00E+00	0.00E+00	2.31E-06
Co-58	Curies	2.63E-04	1.52E-04	1.11E-03	2.45E-03
Co-60	Curies	2.04E-04	2.85E-04	1.60E-03	6.59E-04
Cr-51	Curies	0.00E+00	0.00E+00	0.00E+00	2.18E-04
Fe-55	Curies	2.12E-03	2.41E-02	2.00E-02	1.61E-03
Fe-59	Curies	0.00E+00	0.00E+00	0.00E+00	1.87E-05
I-131	Curies	0.00E+00	0.00E+00	2.68E-06	0.00E+00
I-133	Curies	0.00E+00	0.00E+00	4.57E-06	0.00E+00
Mn-54	Curies	1.09E-05	5.57E-06	1.57E-03	3.84E-05
Ni-63	Curies	0.00E+00	0.00E+00	1.70E-03	1.02E-03
Sr-89	Curies	9.36E-05	3.04E-05	1.76E-05	0.00E+00
Sr-90	Curies	0.00E+00	0.00E+00	4.19E-06	0.00E+00
Cs-134	Curies	6.22E-05	1.18E-04	2.85E-04	3.49E-05
Cs-137	Curies	2.17E-04	4.49E-04	1.12E-03	4.47E-04
Eu-152	Curies	0.00E+00	0.00E+00	0.00E+00	6.93E-06
Ru-105	Curies	0.00E+00	0.00E+00	0.00E+00	2.31E-05
Sb-124	Curies	0.00E+00	0.00E+00	0.00E+00	1.50E-05
Sb-125	Curies	3.92E-04	1.67E-04	5.61E-03	6.05E-03
Sb-126	Curies	0.00E+00	1.57E-06	0.00E+00	0.00E+00
Te-125M	Curies	0.00E+00	0.00E+00	2.73E-02	5.03E-03
Total For Period	Curies	3.36E-03	2.53E-02	6.03E-02	1.76E-02

Zeroes in this table indicates that no radioactivity was present at detectable levels.

See Table 1-4 for typical minimum detectable concentrations

Table 1-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Tritium					
H-3	Curies	2.67E+01	3.54E+02	4.43E+02	1.67E+02
Dissolved And Entrained Gases					
Xe-133	Curies	0.00E+00	0.00E+00	5.96E-04	2.63E-04
Xe-135	Curies	0.00E+00	0.00E+00	3.78E-06	0.00E+00
Total For Period	Curies	0.00E+00	0.00E+00	6.00E-04	2.63E-04
Gross Alpha Radioactivity					
G-Alpha	Curies	5.26E-07	5.72E-07	0.00E+00	0.00E+00

Zeros in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	9.82E-02	1.07E-01	6.30E-02	4.84E-02
Dissolved And Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
G-Alpha	Curies	0.00E+00	0.00E+00	9.97E-05	0.00E+00

*Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-2B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Units	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Co-58	Curies	9.53E-05	8.02E-06	7.11E-04	7.06E-04
Co-60	Curies	7.66E-05	1.35E-05	3.18E-04	4.70E-04
Fe-55	Curies	2.16E-03	2.76E-03	5.99E-03	1.66E-04
Mn-54	Curies	0.00E+00	0.00E+00	1.23E-04	0.00E+00
Ni-63	Curies	0.00E+00	0.00E+00	0.00E+00	3.92E-04
Sr-89	Curies	3.55E-06	1.29E-05	9.86E-06	0.00E+00
Sr-90	Curies	0.00E+00	1.29E-06	0.00E+00	0.00E+00
W-187	Curies	0.00E+00	0.00E+00	2.86E-05	0.00E+00
Cs-134	Curies	1.41E-05	5.81E-06	6.62E-05	6.10E-05
Cs-137	Curies	5.13E-05	2.00E-05	3.28E-04	3.10E-04
Sb-125	Curies	2.66E-05	1.70E-05	1.03E-03	4.91E-04
Te-125M	Curies	0.00E+00	0.00E+00	9.47E-03	3.92E-03
Total For Period	Curies	2.42E-03	2.84E-03	1.81E-02	6.51E-03
Tritium					
H-3	Curies	1.16E+01	2.83E+01	8.27E+01	6.61E+01
Dissolved And Entrained Gases					
Xe-133	Curies	0.00E+00	0.00E+00	7.57E-05	5.35E-05
Total For Period	Curies	0.00E+00	0.00E+00	7.57E-05	5.35E-05
Gross Alpha Radioactivity					
G-Alpha	Curies	1.01E-06	0.00E+00	0.00E+00	0.00E+00

*Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-2B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents
Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Units	Continuous Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	3.99E-02	9.58E-02	1.23E-01	7.47E-02
Dissolved and Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents
Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Units	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Co-57	Curies	0.00E+00	0.00E+00	0.00E+00	2.31E-06
Co-58	Curies	3.58E-04	1.60E-04	1.82E-03	3.16E-03
Co-60	Curies	2.81E-04	2.99E-04	1.92E-03	1.13E-03
Cr-51	Curies	0.00E+00	0.00E+00	0.00E+00	2.18E-04
Fe-55	Curies	4.27E-03	2.69E-02	2.60E-02	1.77E-03
Fe-59	Curies	0.00E+00	0.00E+00	0.00E+00	1.87E-05
I-131	Curies	0.00E+00	0.00E+00	2.68E-06	0.00E+00
I-133	Curies	0.00E+00	0.00E+00	4.57E-06	0.00E+00
Mn-54	Curies	1.09E-05	5.57E-06	1.69E-03	3.84E-05
Ni-63	Curies	0.00E+00	0.00E+00	1.70E-03	1.41E-03
Sr-89	Curies	9.72E-05	4.34E-05	2.75E-05	0.00E+00
Sr-90	Curies	0.00E+00	1.29E-06	4.19E-06	0.00E+00
W-187	Curies	0.00E+00	0.00E+00	2.86E-05	0.00E+00
Cs-134	Curies	7.63E-05	1.24E-04	3.51E-04	9.59E-05
Cs-137	Curies	2.68E-04	4.69E-04	1.45E-03	7.56E-04
Eu-152	Curies	0.00E+00	0.00E+00	0.00E+00	6.93E-06
Ru-105	Curies	0.00E+00	0.00E+00	0.00E+00	2.31E-05
Sb-124	Curies	0.00E+00	0.00E+00	0.00E+00	1.50E-05
Sb-125	Curies	4.18E-04	1.84E-04	6.63E-03	6.54E-03
Sb-126	Curies	0.00E+00	1.57E-06	0.00E+00	0.00E+00
Te-125M	Curies	0.00E+00	0.00E+00	3.68E-02	8.95E-03
Total For Period	Curies	5.78E-03	2.82E-02	7.84E-02	2.41E-02

*Zeroes in this table indicates that no radioactivity was present at detectable levels.

See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents
Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Nuclides Released	Units	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Tritium					
H-3	Curies	3.84E+01	3.83E+02	5.26E+02	2.33E+02
Dissolved And Entrained Gases					
Xe-133	Curies	0.00E+00	0.00E+00	6.72E-04	3.17E-04
Xe-135	Curies	0.00E+00	0.00E+00	3.78E-06	0.00E+00
Total For Period	Curies	0.00E+00	0.00E+00	6.76E-04	3.17E-04
 Gross Alpha Radioactivity					
G-Alpha	Curies	1.53E-06	5.72E-07	0.00E+00	0.00E+00

*Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Liquid Effluents

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	1.38E-01	2.03E-01	1.86E-01	1.23E-01
Dissolved and Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-3A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Doses to a member of the public due to Liquid Releases
Unit: Unit 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Bone	5.00E+00	mRem	1.37E-03	2.73E-02	3.66E-03	7.32E-02	1.16E-02	2.33E-01	5.44E-03	1.09E-01
GI-Lli	5.00E+00	mRem	5.90E-04	1.18E-02	9.48E-03	1.90E-01	1.69E-02	3.38E-01	9.01E-03	1.80E-01
Kidney	5.00E+00	mRem	1.14E-03	2.28E-02	1.09E-02	2.19E-01	1.95E-02	3.90E-01	8.68E-03	1.74E-01
Liver	5.00E+00	mRem	2.51E-03	5.01E-02	1.46E-02	2.91E-01	2.44E-02	4.87E-01	1.07E-02	2.15E-01
Lung	5.00E+00	mRem	1.40E-03	2.80E-02	1.02E-02	2.04E-01	2.22E-02	4.44E-01	2.83E-02	5.66E-01
Thyroid	5.00E+00	mRem	4.55E-04	9.10E-03	9.20E-03	1.84E-01	1.04E-02	2.09E-01	4.99E-03	9.98E-02
Total Body	1.50E+00	mRem	1.89E-03	1.26E-01	1.28E-02	8.57E-01	1.97E-02	1.31E+00	8.77E-03	5.85E-01

Cumulative Doses per Year

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>Year to Ending Date</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Bone	1.00E+01	mRem	2.21E-02	2.21E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
GI-Lli	1.00E+01	mRem	3.60E-02	3.60E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Kidney	1.00E+01	mRem	4.02E-02	4.02E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Liver	1.00E+01	mRem	5.22E-02	5.22E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Lung	1.00E+01	mRem	6.21E-02	6.21E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Thyroid	1.00E+01	mRem	2.51E-02	2.51E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	3.00E+00	mRem	4.32E-02	1.44E+00	Maximum Individual Liquid	Liquid Effluent TB Annual

Table 1-3B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Doses to a member of the public due to Liquid Releases
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Bone	5.00E+00	mRem	4.66E-04	9.32E-03	1.22E-04	2.44E-03	3.32E-03	6.64E-02	2.79E-03	5.58E-02
GI-Lli	5.00E+00	mRem	3.23E-04	6.46E-03	3.85E-04	7.71E-03	4.10E-03	8.19E-02	2.45E-03	4.90E-02
Kidney	5.00E+00	mRem	5.09E-04	1.02E-02	4.20E-04	8.39E-03	5.14E-03	1.03E-01	3.44E-03	6.87E-02
Liver	5.00E+00	mRem	9.78E-04	1.96E-02	5.28E-04	1.06E-02	6.39E-03	1.28E-01	5.22E-03	1.04E-01
Lung	5.00E+00	mRem	4.25E-04	8.50E-03	4.14E-04	8.29E-03	4.72E-03	9.44E-02	2.97E-03	5.93E-02
Thyroid	5.00E+00	mRem	2.83E-04	5.66E-03	3.72E-04	7.43E-03	2.09E-03	4.18E-02	1.60E-03	3.20E-02
Total Body	1.50E+00	mRem	7.61E-04	5.07E-02	4.77E-04	3.18E-02	4.95E-03	3.30E-01	4.06E-03	2.71E-01

Cumulative Doses per Year

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>Year to Ending Date</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Bone	1.00E+01	mRem	6.70E-03	6.70E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
GI-Lli	1.00E+01	mRem	7.25E-03	7.25E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Kidney	1.00E+01	mRem	9.50E-03	9.50E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Liver	1.00E+01	mRem	1.31E-02	1.31E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Lung	1.00E+01	mRem	8.52E-03	8.52E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Thyroid	1.00E+01	mRem	4.35E-03	4.35E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	3.00E+00	mRem	1.02E-02	3.42E-01	Maximum Individual Liquid	Liquid Effluent TB Annual

Table 1-3C

Vogtle Electric Generating Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses to a member of the public due to Liquid Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Bone	5.00E+00	mRem	1.83E-03	3.67E-02	3.78E-03	7.56E-02	1.50E-02	2.99E-01	8.23E-03	1.65E-01
GI-Lli	5.00E+00	mRem	9.12E-04	1.82E-02	9.86E-03	1.97E-01	2.10E-02	4.20E-01	1.15E-02	2.29E-01
Kidney	5.00E+00	mRem	1.65E-03	3.30E-02	1.14E-02	2.27E-01	2.46E-02	4.93E-01	1.21E-02	2.42E-01
Liver	5.00E+00	mRem	3.49E-03	6.97E-02	1.51E-02	3.02E-01	3.08E-02	6.15E-01	1.60E-02	3.19E-01
Lung	5.00E+00	mRem	1.82E-03	3.64E-02	1.06E-02	2.12E-01	2.69E-02	5.38E-01	3.12E-02	6.25E-01
Thyroid	5.00E+00	mRem	7.38E-04	1.48E-02	9.57E-03	1.91E-01	1.25E-02	2.50E-01	6.59E-03	1.32E-01
Total Body	1.50E+00	mRem	2.65E-03	1.77E-01	1.33E-02	8.88E-01	2.46E-02	1.64E+00	1.28E-02	8.56E-01

Cumulative Doses per Year

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>Year to Ending Date</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Bone	1.00E+01	mRem	2.88E-02	2.88E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
GI-Lli	1.00E+01	mRem	4.32E-02	4.32E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Kidney	1.00E+01	mRem	4.98E-02	4.98E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Liver	1.00E+01	mRem	6.53E-02	6.53E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Lung	1.00E+01	mRem	7.06E-02	7.06E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Thyroid	1.00E+01	mRem	2.94E-02	2.94E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	3.00E+00	mRem	5.34E-02	1.78E+00	Maximum Individual Liquid	Liquid Effluent TB Annual

Table 1-4

**Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
MINIMUM DETECTABLE CONCENTRATIONS – LIQUID SAMPLE ANALYSES**

Starting: 1-Jan-2012**Ending: 31-Dec-2012**

The values in this table represent a priori Minimum Detectable Concentrations (MDC) that are typically achieved in laboratory analyses of liquid radwaste samples.

RADIONUCLIDE	MDC	UNITS
Mn-54	2.73E-08	μCi/ml
Fe-59	8.33E-08	μCi/ml
Co-58	3.78E-08	μCi/ml
Co-60	6.76E-08	μCi/ml
Zn-65	1.32E-07	μCi/ml
Mo-99	4.31E-07	μCi/ml
Cs-134	3.06E-08	μCi/ml
Cs-137	4.51E-08	μCi/ml
Ce-141	6.99E-08	μCi/ml
Ce-144	2.95E-07	μCi/ml
I-131	5.97E-08	μCi/ml
Xe-133	9.11E-08	μCi/ml
Xe-135	4.27E-08	μCi/ml
Fe-55	1.00E-06	μCi/ml
Sr-89	5.00E-08	μCi/ml
Sr-90	7.00E-09	μCi/ml
H-3	2.00E-06	μCi/ml
Gross Alpha	7.00E-08	μCi/ml

Table 1-5A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Batch Release Summary
Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		7	16	23	19	65
2. Total time period for Batch releases	(Minutes)	1.72E+03	7.53E+03	8.51E+03	6.03E+03	2.38E+04
3. Maximum time period for a batch	(Minutes)	3.71E+02	4.57E+02	1.11E+03	3.71E+02	1.11E+03
4. Average time period for a batch	(Minutes)	2.46E+02	2.58E+02	3.75E+02	2.51E+02	3.24E+02
5. Minimum time period for a batch	(Minutes)	5.70E+01	4.60E+01	6.20E+01	5.50E+01	4.60E+01
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	4632	4402	4862	4196	4523

*Average river flowrate taken from USGS Monitoring Station 02197500, Savannah River at Burton's Ferry Bridge near Millhaven, Ga. 32 miles downstream of Plant Vogtle.

Table 1-5B

**Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Batch Release Summary**

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		3	1	5	6	15
2. Total time period for Batch releases	(Minutes)	8.13E+02	3.03E+02	2.45E+03	1.66E+03	5.23E+03
3. Maximum time period for a batch	(Minutes)	5.38E+02	3.03E+02	7.60E+02	4.86E+02	7.60E+02
4. Average time period for a batch	(Minutes)	2.71E+02	3.03E+02	4.90E+02	2.77E+02	3.48E+02
5. Minimum time period for a batch	(Minutes)	1.28E+02	3.03E+02	3.39E+02	7.40E+01	7.40E+01
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	4632	4402	4862	4196	4523

*Average river flowrate taken from USGS Monitoring Station 02197500, Savannah River at Burton's Ferry Bridge near Millhaven, Ga. 32 miles downstream of Plant Vogtle.

Table 1-5C

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Batch Release Summary

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		10	17	28	25	80
2. Total time period for Batch releases	(Minutes)	2.54E+03	7.84E+03	1.10E+04	7.69E+03	2.90E+04
3. Maximum time period for a batch	(Minutes)	5.38E+02	1.01E+03	9.97E+02	8.60E+02	1.01E+03
4. Average time period for a batch	(Minutes)	2.54E+02	4.61E+02	3.92E+02	3.08E+02	3.63E+02
5. Minimum time period for a batch	(Minutes)	5.70E+01	8.60E+01	6.70E+01	7.40E+01	5.70E+01
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	4632	4402	4862	4196	4523

*Average river flowrate taken from USGS Monitoring Station 02197500, Savannah River at Burton's Ferry Bridge near Millhaven, Ga. 32 miles downstream of Plant Vogtle.

Table 1-6A

**Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Abnormal Release Summary**

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 1-6B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Abnormal Release Summary
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 1-6C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Liquid Effluents - Abnormal Release Summary
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

2.0 Gaseous Effluents

2.1 Regulatory Requirements

The ODCM Specifications presented in this section are for Unit 1 and Unit 2.

2.1.1 Dose Rate Limits

The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY shall be limited to the following:

- a. For noble gases, Less than or equal to 500 mrem/yr. to the whole body and less than or equal to 3000 mrem/yr. to the skin and,
- b. For Iodine-131, for Iodine-133, for tritium and for all radionuclides in particulate form with half lives greater than 8 days: Less than or equal to 1500 mrem/yr. to any organ.

2.1.2 Air Doses Due to Noble Gases in Gaseous Releases

The air dose due to noble gases released in gaseous effluents, from each unit, to areas at and beyond the SITE BOUNDARY 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.

2.1.3 Doses to a Member of the Public

The dose to a MEMBER OF THE PUBLIC from Iodine-131, Iodine-133, tritium and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released, from each unit, to areas at and beyond the SITE BOUNDARY shall be limited to the following.

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

2.2 Measurements and Approximations of Total Radioactivity

2.2.1 Sample Collection and Analysis

Gaseous Effluents at the Vogtle Electric Generating Plant are currently confined to five paths: plant vents (Unit 1 and Unit 2), the condenser air ejector, the steam packing exhauster systems (Unit 1 and Unit 2), and the Radwaste Processing Facility.

Waste gas decay tanks are batch released through the Unit 1 plant vent. The containment purges are released through their respective plant vents. Containment atmosphere is also released via the containment equipment hatch during periods when the equipment hatch is open with containment purge/vent being stopped. Approval was granted by the NRC to open the equipment hatch during fuel movement; a release permit is generated when the equipment hatch is opened and the containment exhaust fan is not discharging to the plant vent. Any detected activity in the containment equipment hatch permit is included in the Ground Release Table of the effluent report.

All of the paths with the exception of the RPF can be continuously monitored for gaseous radioactivity. The RPF is equipped with an integrated-type sample collection device for collecting particulates. Plant vent, containment, steam jet air ejector, steam-packing exhauster are equipped with an integrated-type sample collection device for collecting particulates and iodines. During this reporting period, there were no continuous radioactive releases through the condenser air ejector and the steam packing exhauster system vents. Batch Waste Gas Decay Tank releases are analyzed for noble gases before each release. The containment atmosphere is analyzed for noble gases prior to each release and for tritium at least on a monthly basis.

Sample analyses results and release flow rates form the basis for calculating released quantities of radionuclide specific radioactivity, dose rates associated with gaseous releases, and cumulative doses for the current quarter and year.

With each release period and batch release, radioactivity, dose rates, and cumulative doses are calculated. Cumulative dose results are tabulated, along with the percent of the ODCM limits for each release for the current quarter and year.

Typically achieved minimum detectable concentrations for gaseous effluent sample analyses are reported in Table 2-6.

2.2.2 Total Quantities of Radioactivity, Dose Rates, and Cumulative Doses

The methods for determining release quantities of radioactivity, dose rates, and cumulative doses are as follows:

2.2.2.1 Fission and Activation Gases

The released radioactivity is determined from sample analyses results collected as described above and average release flow rates over the period represented by the collected sample. Dose rates due to noble gases, radioiodines, tritium, and particulates are calculated. Calculated dose rates are compared to the dose rate limits specified in ODCM 3.1.2 for noble gases, radioiodines, tritium, and particulates. Dose rate calculation methodology is presented in the ODCM.

Beta and gamma air doses due to noble gases are calculated for the location in the unrestricted area with the potential for the highest exposure due to gaseous releases. Air doses are calculated for each release period and cumulative totals are kept for each unit for the calendar quarter and year. Cumulative air doses are compared with the dose limits specified in ODCM 3.1.3. Current percent of the ODCM limits are shown on the printout for each release period. Air dose calculation methodology is presented in the ODCM.

2.2.2.2 Radioiodines, Tritium and Particulate Releases

The released quantities of radioiodines, tritium and particulates are determined using the weekly samples and release flow rates for the two plant vent release points.

After each quarter, the particulate filters from each plant vent are combined, for strontium analysis. Strontium concentrations are input to the composite file of the computer to be used for release dose rate and individual dose calculations.

Doses to a Member of the Public due to radioiodines, tritium and particulates are calculated for the controlling receptor, which is described in Table 3-7 of the ODCM. Doses are calculated for each release period, and cumulative totals are kept for each unit for the current calendar quarter and year. Cumulative doses are compared to the dose limits specified in ODCM 3.1.4.

Current percent of ODCM limits are shown in this report for each release period.

2.2.2.3 Gross Alpha Release

The gross alpha release is calculated each month by counting the particulate filters for each week for gross alpha activity. The four or five weeks' numbers are then recorded on a data sheet and the activity is summed at the end of the month. This concentration is used for release calculations.

2.2.3

Total Error Estimation

The total or maximum error associated with the effluent measurement will include the cumulative errors resulting from the total operation of sampling and measurement. Because it may be very difficult to assign error terms for each parameter affecting the final measurement, detailed statistical evaluation of error are not suggested.

The objective should be to obtain an overall estimate of the error associated with measurements of radioactive materials released in liquid and gaseous effluents and solid waste.

Estimated errors are based on errors in counting equipment calibration, counting statistics, vent-flow rates, vent sample flow rates, non-steady release rates, chemical yield factors, and sample losses for such items as charcoal cartridges.

- a. Fission and activation total release was calculated from sample analysis results and release point flow rates.

Sampling and statistical error in counting	10%
Counting equipment calibration	10%
Vent flow Rates	10%
Non-steady release rates	20%
TOTAL ERROR	26.5%

- b. I-131 releases were calculated from each weekly sample:

Statistical error in counting	10%
Counting equipment calibration	10%
Vent Flow Rates	10%
Vent Sample Flow Rates	50%
Non-Steady release rates	10%
Losses from charcoal cartridges	10%
TOTAL ERROR	55%

- c. Particulates with half-lives greater than 8 day releases were calculated from sample and analysis results and release point flow rates.

Statistical error at MDC concentration	10%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	50%
Non steady release rates	10%
TOTAL ERROR	54%

2.2.3

Total Error Estimation cont'd

- d. Total tritium releases were calculated from sample analysis results and release point flow rates.

Water vapor in sample stream determination	10%
Vent flow rates	10%
Counting calibration and statistics	10%
Non-steady release rates	10%
TOTAL ERROR	20%

- e. Gross Alpha radioactivity was calculated from sample analysis results and release point flow rates.

Statistical error at MDC concentration	10%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	50%
Non Steady release rates	10%
TOTAL ERROR	55%

2.3

Gaseous Effluent Release Data

Regulatory Guide 1.21 Rev. 1 Tables 1A, 1B, and 1C are found in this report as Tables 2-1A, 2-1B, 2-1C, 2-2A, 2-2B, 2-2C, 2-3A, 2-3B, and 2-3C. Data are presented on a quarterly basis as required by Regulatory Guide 1.21 Rev. 1.

To complete table 2-1A, and 2-1B, the total release for each of the four categories (fission and activation gases, iodines, particulates, and tritium) was divided by the number of seconds in the quarter to obtain a release rate in $\mu\text{Ci}/\text{second}$ for each category. However, the percent of the ODCM limits are not applicable because VEGP has no curie limits for gaseous releases. Applicable limits are expressed in terms of dose. Noble gases are limited as specified in ODCM 3.1.2. The other three categories (tritium, radioiodines, and particulates) are limited as a group as specified in ODCM 3.1.2.

Dose rates due to noble gas releases and due to radioiodines, tritium, and particulate releases were calculated as part of the pre-release and post-release permits. No limits were exceeded for this reporting period.

Gross alpha radioactivity is reported in Table 2-1A, and 2-1B as curies released in each quarter.

Limits for cumulative beta and gamma air doses due to noble gases are specified in ODCM 3.1.3. Cumulative air doses are presented in Table 2-4A, and 2-4B along with the percent of the ODCM limits.

Limits for cumulative doses to a Member of the Public due to radioiodines, tritium and particulates, are specified in ODCM 3.1.4. Cumulative doses to a Member of the Public are presented in Table 2-5A, and 2-5B along with percent of ODCM limits.

2.4 Radiological Impact Due to Gaseous Releases

Dose rates due to the release of noble gases were calculated for the site in accordance with ODCM 3.4.1.1. Dose rates due to radioiodines, tritium, and particulates in gaseous releases were calculated in accordance with ODCM 3.4.1.2.

Dose rates were calculated as part of pre-release and post release permits, no limits were exceeded for this reporting period.

Cumulative air doses due to noble gas releases were calculated for each unit in accordance with ODCM 3.4.2. These results are presented in Tables 2-4A and 2-4B.

Cumulative doses to a Member of the Public were calculated for each unit in accordance with ODCM 3.4.3. These results are presented in Tables 2-5A and 2-5B.

Dose rates and doses were calculated using the methodology presented in the Vogtle Electric Generating Plant Offsite Dose Calculation Manual.

2.5 Gaseous Effluents - Batch Releases

Other data pertinent to batch releases of radioactive gaseous effluent from Unit 1 and Unit 2 are listed in Table 2-7A and 2-7B.

2.6 Gaseous Effluents - Abnormal Releases

To support Dry Cask Storage on plant site, a cask crane replacement took place in the Auxiliary Building. This required a 4' x 5' hole to be cut on the roof of the building. When the Railroad Bay Doors and Penetration were open simultaneously, this caused a release from the building. Temporary equipment was setup to collect samples and quantify activity released through Gaseous Effluent permits.

Table 2-1A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Summation Of All Releases

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	5.33E-02	5.57E-02	5.95E-01	3.65E-02
2. Average Release rate for period	uCi/sec	6.76E-03	7.07E-03	7.55E-02	4.63E-03
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	0.00E+00	0.00E+00	8.94E-06	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	1.13E-06	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8	Curies	1.13E-07	2.51E-07	2.29E-07	4.19E-08
2. Average Release rate for period	uCi/sec	1.44E-08	3.18E-08	2.90E-08	5.32E-09
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	2.30E+01	1.01E+01	6.82E+00	6.72E+00
2. Average Release rate for period	uCi/sec	2.92E+00	1.28E+00	8.65E-01	8.53E-01
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 2-1B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Summation Of All Releases

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	1.50E-01	1.86E-01	1.04E+01	1.21E+01
2. Average Release rate for period	uCi/sec	1.90E-02	2.36E-02	1.32E+00	1.53E+00
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8	Curies	0.00E+00	2.22E-07	2.05E-07	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	2.82E-08	2.61E-08	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	3.25E+00	6.66E+00	1.86E+00	1.21E+01
2. Average Release rate for period	uCi/sec	4.12E-01	8.45E-01	2.35E-01	6.86E-02
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 2-1C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Summation Of All Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	2.03E-01	2.42E-01	1.10E+01	1.21E+01
2. Average Release rate for period	uCi/sec	2.57E-02	3.06E-02	1.40E+00	1.54E+00
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	0.00E+00	0.00E+00	8.94E-06	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	1.13E-06	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8	Curies	1.13E-07	4.73E-07	4.34E-07	4.19E-08
2. Average Release rate for period	uCi/sec	1.44E-08	6.00E-08	5.51E-08	5.32E-09
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	2.63E+01	1.68E+01	8.68E+00	7.26E+00
2. Average Release rate for period	uCi/sec	3.33E+00	2.13E+00	1.10E+00	9.21E-01
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Table 2-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
I-131	Curies	0.00E+00	0.00E+00	8.94E-06	0.00E+00
Total For Period	Curies	0.00E+00	0.00E+00	8.94E-06	0.00E+00
Particulates					
Co-58	Curies	0.00E+00	0.00E+00	1.08E-07	0.00E+00
Sr-89	Curies	1.13E-07	2.50E-07	1.21E-07	4.19E-08
Total For Period	Curies	1.13E-07	2.50E-07	2.29E-07	4.19E-08
Tritium					
H-3	Curies	2.30E+01	9.98E+00	6.61E+00	6.60E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported.

Zeros in this table indicates that no radioactivity was present at detectable levels.

See Table 2-6 for typical minimum detectable concentrations.

Table 2-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012
Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	5.33E-02	5.57E-02	5.92E-01	3.65E-02
Total For Period	Curies	5.33E-02	5.57E-02	5.92E-01	3.65E-02
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	4.24E-02	1.40E-01	1.85E-01	1.25E-01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-2B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Continuous Mode			
Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Kr-85M	Curies	0.00E+00	0.00E+00	9.46E-02	1.10E-01
Xe-133	Curies	0.00E+00	0.00E+00	4.75E+00	5.52E+00
Xe-135	Curies	0.00E+00	0.00E+00	5.37E+00	6.24E+00
Total For Period	Curies	0.00E+00	0.00E+00	1.02E+01	1.19E+01
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Sr-89	Curies	0.00E+00	1.91E-07	1.87E-07	0.00E+00
Sr-90	Curies	0.00E+00	3.13E-08	1.86E-08	0.00E+00
Total For Period	Curies	0.00E+00	2.22E-07	2.05E-07	0.00E+00
Tritium					
H-3	Curies	3.21E+00	6.63E+00	1.77E+00	2.30E-01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-2B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012
Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	2.62E-02	2.43E-02	2.85E-02	3.28E-02
Xe-133M	Curies	0.00E+00	0.00E+00	0.00E+00	2.57E-04
Xe-133	Curies	1.21E-01	1.60E-01	1.91E-01	1.97E-01
Xe-135	Curies	2.12E-03	1.86E-03	2.02E-03	2.82E-03
Total For Period	Curies	1.50E-01	1.86E-01	2.22E-01	2.33E-01
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	3.38E-02	3.23E-02	8.23E-02	3.11E-01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-2C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Kr-85M	Curies	0.00E+00	0.00E+00	9.46E-02	1.10E-01
Xe-133	Curies	0.00E+00	0.00E+00	4.75E+00	5.52E+00
Xe-135	Curies	0.00E+00	0.00E+00	5.37E+00	6.24E+00
Total For Period	Curies	0.00E+00	0.00E+00	1.02E+01	3.35E+00
Iodines					
I-131	Curies	0.00E+00	0.00E+00	8.94E-06	0.00E+00
Total For Period		0.00E+00	0.00E+00	8.94E-06	0.00E+00
Particulates					
Co-58	Curies	0.00E+00	0.00E+00	1.08E-07	0.00E+00
Sr-89	Curies	1.13E-07	4.41E-07	3.07E-07	4.19E-08
Sr-90	Curies	0.00E+00	3.13E-08	1.86E-08	0.00E+00
Total For Period	Curies	1.13E-07	4.73E-07	4.34E-07	4.19E-08
Tritium					
H-3	Curies	2.62E+01	1.66E+01	8.38E+00	6.83E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-2C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Mixed Mode Level Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	7.95E-02	8.00E-02	6.20E-01	6.93E-02
Xe-133M	Curies	0.00E+00	0.00E+00	0.00E+00	2.57E-04
Xe-133	Curies	1.21E-01	1.60E-01	1.91E-01	1.97E-01
Xe-135	Curies	2.12E-03	1.86E-03	2.02E-03	2.82E-03
Total For Period	Curies	2.03E-01	2.42E-01	8.14E-01	2.70E-01
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Sr-89	Curies	0.00E+00	4.95E-11	0.00E+00	0.00E+00
Total For Period		0.00E+00	4.95E-11	0.00E+00	0.00E+00
Tritium					
H-3	Curies	7.62E-02	1.72E-01	2.67E-01	4.36E-01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-3A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012
Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012
Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	0.00E+00	0.00E+00	3.52E-03	0.00E+00
Total For Period	Curies	0.00E+00	0.00E+00	3.52E-03	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Sr-89	Curies	0.00E+00	1.20E-11	0.00E+00	0.00E+00
Total For Period	Curies	0.00E+00	1.20E-11	0.00E+00	0.00E+00
Tritium					
H-3	Curies	0.00E+00	1.42E-03	2.64E-02	8.19E-04
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-3B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	0.00E+00	0.00E+00	2.84E-03	3.05E-03
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-3C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012
Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-3C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Ground Level Releases
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

		Batch Mode			
Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	0.00E+00	0.00E+00	3.52E-03	0.00E+00
Total For Period	Curies	0.00E+00	0.00E+00	3.52E-03	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Sr-89	Curies	0.00E+00	1.20E-11	0.00E+00	0.00E+00
Total For Period		0.00E+00	1.20E-11	0.00E+00	0.00E+00
Tritium					
H-3	Curies	0.00E+00	1.42E-03	2.64E-02	8.19E-04
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-4A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Air Doses Due to Gaseous Release

Unit: 1

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Gamma Air	5.00E+00	mRad	7.27E-06	1.45E-04	7.59E-06	1.52E-04	8.33E-05	1.67E-03	4.98E-06	9.95E-05
Beta Air	1.00E+01	mRad	2.56E-06	2.56E-05	2.68E-06	2.68E-05	2.94E-05	2.94E-04	1.75E-06	1.75E-05

Cumulative Doses Per Year

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Unit</u>	<u>Year to End</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Gamma Air	1.00E+01	mRad	1.03E-04	1.03E-03	Site Boundary / Child	Air Dose Gamma Annual 1.21
Beta Air	2.00E+01	mRad	3.64E-05	1.82E-04	Site Boundary / Child	Air Dose Beta Annual 1.21

Table 2-4B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Air Doses Due to Gaseous Release

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Gamma Air	5.00E+00	mRad	4.25E-06	8.50E-05	4.19E-06	8.38E-05	1.82E-04	3.64E-03	2.12E-04	4.23E-03
Beta Air	1.00E+01	mRad	3.20E-06	3.20E-05	3.69E-06	3.69E-05	2.74E-04	2.74E-03	3.18E-04	3.18E-03

Cumulative Doses Per Year

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Unit</u>	<u>Year to End</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Gamma Air	1.00E+01	mRad	4.02E-04	4.02E-03	Site Boundary / Child	Air Dose Gamma Annual 1.21
Beta Air	2.00E+01	mRad	5.98E-04	2.99E-03	Site Boundary / Child	Air Dose Beta Annual 1.21

Table 2-4C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Air Doses Due to Gaseous Release
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Type of Radiation	ODCM	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Gamma Air	5.00E+00	mRad	1.15E-05	2.30E-04	1.18E-05	2.36E-04	2.66E-04	5.31E-03	2.17E-04	4.33E-03
Beta Air	1.00E+01	mRad	5.76E-06	5.76E-05	6.37E-06	6.37E-05	3.03E-04	3.03E-03	3.19E-04	3.19E-03

Cumulative Doses Per Year

Type of Radiation	ODCM	Unit	Year to End	% ODCM	Receptor	Limit
Gamma Air	1.00E+01	mRad	5.05E-04	5.05E-03	Site Boundary / Child	Air Dose Gamma Annual 1.21
Beta Air	2.00E+01	mRad	6.35E-04	3.17E-03	Site Boundary / Child	Air Dose Beta Annual 1.21

Table 2-5A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	7.50E+00	mRem	1.33E-07	1.78E-06	2.95E-07	3.93E-06	1.94E-07	2.59E-06	4.93E-08	6.57E-07
GI-Lli	7.50E+00	mRem	4.98E-04	6.64E-03	2.19E-04	2.92E-03	1.50E-04	2.00E-03	1.45E-04	1.94E-03
Kidney	7.50E+00	mRem	4.98E-04	6.64E-03	2.19E-04	2.92E-03	1.50E-04	2.00E-03	1.45E-04	1.94E-03
Liver	7.50E+00	mRem	4.98E-04	6.64E-03	2.19E-04	2.92E-03	1.50E-04	2.00E-03	1.45E-04	1.94E-03
Lung	7.50E+00	mRem	4.98E-04	6.64E-03	2.19E-04	2.92E-03	1.50E-04	2.00E-03	1.45E-04	1.94E-03
Thyroid	7.50E+00	mRem	4.98E-04	6.64E-03	2.19E-04	2.92E-03	1.65E-04	2.00E-03	1.45E-04	1.94E-03
Total Body	7.50E+00	mRem	4.98E-04	6.64E-03	2.19E-04	2.92E-03	1.50E-04	2.00E-03	1.45E-04	1.94E-03

Cumulative Doses per Year

Organ	ODCM	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.500E+01	mRem	6.715E-07	4.977E-06	Maximum Individual / Child	Iodine/Part Dose Annual 1.2
GI-Lli	1.500E+01	mRem	1.012E-03	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.2
Kidney	1.500E+01	mRem	1.012E-03	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.2
Liver	1.500E+01	mRem	1.012E-03	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.2
Lung	1.500E+01	mRem	1.012E-03	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.2
Thyroid	1.500E+01	mRem	1.027E-03	6.847E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.2
Total Body	1.500E+01	mRem	1.012E-03	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.2

Table 2-5B

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: 2

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	7.50E+00	mRem	0.00E+00	0.00E+00	1.47E-06	1.96E-05	9.58E-07	1.28E-05	0.00E+00	0.00E+00
GI-Lli	7.50E+00	mRem	7.02E-05	9.36E-04	1.44E-04	1.92E-03	4.01E-05	5.35E-04	1.17E-05	1.56E-04
Kidney	7.50E+00	mRem	7.02E-05	9.36E-04	1.44E-04	1.92E-03	4.01E-05	5.35E-04	1.17E-05	1.56E-04
Liver	7.50E+00	mRem	7.02E-05	9.36E-04	1.44E-04	1.92E-03	4.01E-05	5.35E-04	1.17E-05	1.56E-04
Lung	7.50E+00	mRem	7.02E-05	9.36E-04	1.44E-04	1.92E-03	4.01E-05	5.35E-04	1.17E-05	1.56E-04
Thyroid	7.50E+00	mRem	7.02E-05	9.36E-04	1.44E-04	1.92E-03	4.01E-05	5.35E-04	1.17E-05	1.56E-04
Total Body	7.50E+00	mRem	7.02E-05	9.36E-04	1.44E-04	1.92E-03	4.03E-05	5.37E-04	1.17E-05	1.56E-04

Cumulative Doses per Year

Organ	ODCM	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.500E+01	mRem	1.616E-05	1.616E-05	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
GI-Lli	1.500E+01	mRem	2.661E-04	1.774E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Kidney	1.500E+01	mRem	2.660E-04	1.773E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Liver	1.500E+01	mRem	2.660E-04	1.773E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Lung	1.500E+01	mRem	2.660E-04	1.773E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Thyroid	1.500E+01	mRem	2.660E-04	1.773E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Total Body	1.500E+01	mRem	2.665E-04	1.777E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21

Table 2-5C

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: Site

Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Cumulative Doses Per Quarter

Organ	ODCM	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	7.50E+00	mRem	1.33E-07	1.78E-06	1.76E-06	2.35E-05	1.15E-06	1.54E-05	4.93E-08	6.57E-07
GI-Lli	7.50E+00	mRem	5.68E-04	3.63E-04	3.63E-04	4.84E-03	1.90E-04	2.53E-03	1.57E-04	2.09E-03
Kidney	7.50E+00	mRem	5.68E-04	3.63E-04	3.63E-04	4.84E-03	1.90E-04	2.53E-03	1.57E-04	2.09E-03
Liver	7.50E+00	mRem	5.68E-04	3.63E-04	3.63E-04	4.84E-03	1.90E-04	2.53E-03	1.57E-04	2.09E-03
Lung	7.50E+00	mRem	5.68E-04	3.63E-04	3.63E-04	4.84E-03	1.90E-04	2.53E-03	1.57E-04	2.09E-03
Thyroid	7.50E+00	mRem	5.68E-04	3.63E-04	3.63E-04	4.84E-03	2.05E-04	2.74E-03	1.57E-04	2.09E-03
Total Body	7.50E+00	mRem	5.68E-04	3.63E-04	3.63E-04	4.84E-03	1.90E-04	2.53E-03	1.57E-04	2.09E-03

Cumulative Doses per Year

Organ	ODCM	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.500E+01	mRem	7.465E-07	4.977E-06	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
GI-Lli	1.500E+01	mRem	8.909E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Kidney	1.500E+01	mRem	8.908E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Liver	1.500E+01	mRem	8.908E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Lung	1.500E+01	mRem	8.908E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Thyroid	1.500E+01	mRem	8.908E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Total Body	1.500E+01	mRem	8.909E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21

Table 2-6

Vogtle Electric Generating Plant

RADIOACTIVE EFFLUENT RELEASE REPORT – 2012

**MINIMUM DETECTABLE CONCENTRATIONS
GASEOUS SAMPLE ANALYSES**

Starting: 1-Jan-2012

Ending: 31-Dec-2012

RADIONUCLIDE	MDC	UNITS
Kr-87	1.82E-08	μCi/ml
Kr-88	2.53E-08	μCi/ml
Xe-133	2.05E-08	μCi/ml
Xe-133m	8.63E-08	μCi/ml
Xe-135	7.12E-08	μCi/ml
Xe-138	1.05E-07	μCi/ml
I-131	7.93E-15*	μCi/ml
Mn-54	3.94E-14*	μCi/ml
Fe-59	2.45E-14*	μCi/ml
Co-58	1.39E-14*	μCi/ml
Co-60	1.75E-14*	μCi/ml
Zn-65	2.82E-14*	μCi/ml
Mo-99	9.57E-14*	μCi/ml
Cs-134	1.12E-14*	μCi/ml
Cs-137	8.71E-15*	μCi/ml
Ce-141	8.62E-15*	μCi/ml
Ce-144	2.77E-14*	μCi/ml
Sr-89	1.00E-13	μCi/ml
Sr-90	1.00E-13	μCi/ml
H-3	9.00E-08	μCi/ml
Gross Alpha	1.00E-13	μCi/ml

* Based on an estimated sample volume of 5.7E+08 mls for particulate filters and charcoal cartridges.

Table 2-7A

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Batch Release Summary
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		28	30	36	33	127
2. Total time period for batch releases	(Minutes)	2.07E+03	2.07E+03	2.20E+04	1.17E+04	3.78E+04
3. Maximum time period for a batch	(Minutes)	3.25E+02	2.23E+02	7.35E+03	5.44E+03	7.35E+03
4. Average time period for a batch	(Minutes)	7.38E+01	6.90E+01	6.10E+02	3.54E+02	2.97E+02
5. Minimum time period for a batch	(Minutes)	1.30E+01	1.90E+01	1.40E+01	8.00E+00	8.00E+00

Table 2-7B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Batch Release Summary
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		16	14	13	18	61
2. Total time period for batch releases	(Minutes)	9.80E+02	8.83E+02	8.11E+02	1.12E+04	1.38E+04
3. Maximum time period for a batch	(Minutes)	1.37E+02	1.21E+02	2.44E+02	1.00E+04	1.00E+04
4. Average time period for a batch	(Minutes)	6.13E+01	6.31E+01	6.24E+01	6.20E+02	2.27E+02
5. Minimum time period for a batch	(Minutes)	1.50E+01	2.90E+01	3.00E+01	3.70E+01	1.50E+01

Table 2-7C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Batch Release Summary
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		44	44	49	51	188
2. Total time period for batch releases	(Minutes)	3.05E+03	2.95E+03	2.28E+04	2.29E+04	5.16E+04
3. Maximum time period for a batch	(Minutes)	3.25E+02	2.23E+02	7.35E+03	1.00E+04	1.00E+04
4. Average time period for a batch	(Minutes)	6.92E+01	6.71E+01	4.65E+02	4.48E+02	2.75E+02
5. Minimum time period for a batch	(Minutes)	1.30E+01	1.90E+01	1.40E+01	8.00E+00	8.00E+00

Table 2-8A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Abnormal Release Summary
Unit: 1
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	3	0	0	3
2. Total Time For All Releases	(Minutes)	0.00E+00	4.29E+02	0.00E+00	0.00E+00	4.29E+02
3. Maximum Time For A Release	(Minutes)	0.00E+00	2.23E+02	0.00E+00	0.00E+00	2.23E+02
4. Average Time For A Release	(Minutes)	0.00E+00	1.43E+02	0.00E+00	0.00E+00	1.43E+02
5. Minimum Time For A Release	(Minutes)	0.00E+00	8.00E+01	0.00E+00	0.00E+00	8.00E+01
6. Total activity for all releases	(Curies)	0.00E+00	4.29E-03	0.00E+00	0.00E+00	4.29E-03

Table 2-8B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Abnormal Release Summary
Unit: 2
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 2-8C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Gaseous Effluents - Abnormal Release Summary
Unit: Site
Starting: 1-Jan- 2012 Ending: 31-Dec-2012

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	3	0	0	3
2. Total Time For All Releases	(Minutes)	0.00E+00	4.29E+02	0.00E+00	0.00E+00	4.29E+02
3. Maximum Time For A Release	(Minutes)	0.00E+00	2.23E+02	0.00E+00	0.00E+00	2.23E+02
4. Average Time For A Release	(Minutes)	0.00E+00	1.43E+02	0.00E+00	0.00E+00	1.43E+02
5. Minimum Time For A Release	(Minutes)	0.00E+00	8.00E+01	0.00E+00	0.00E+00	8.00E+01
6. Total activity for all releases	(Curies)	0.00E+00	4.29E-03	0.00E+00	0.00E+00	4.29E-03

3.0 Solid Waste

3.1 Regulatory Requirements

The ODCM requirements presented in this section are stated in part for Unit 1 and Unit 2.

3.1.1 Solid Radioactive Waste System

10.2.1 Process Control Program (PCP)

Radioactive wastes shall be solidified or dewatered in accordance with the PCP to meet shipping and transportation requirements during transit and disposal site requirements when received at the disposal site.

3.1.2 Reporting Requirements

12.1 PCP states in part:

The Radioactive Effluent Release Report, submitted in accordance with Technical Specification 5.6.3, shall include a summary of the quantities of solid radwaste released from the units, as outlined in Regulatory Guide 1.21 Rev 2.

3.2 Solid Waste Data

Regulatory Guide 1.21 Rev 2, Table 3 is found in this report as Table 3-1.

Table 3-1
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT AND WASTE DISPOSAL REPORT - 2012
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Units 1 and 2

Page 1 of 4

JANUARY 1, 2012 THROUGH JUNE 30, 2012

Regulatory Guide 1.21 Rev. 2: Effluent and Waste Disposal Semi-Annual Report of Solid Waste and Irradiated Fuel Shipments

PERIOD COVERED: FROM: 1/1/2012 TO: 6/30/2012 FOR UNIT: Vogtle 1 & 2

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

1. Type of waste	UNIT	6 month period	Est. Total ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³	6.38E01	25
	Ci	6.40E00	25
b. Dry compressible waste, contaminated equip. etc.	m ³	1.77E02	25
	Ci	3.79E-02	25
c. Irradiated components, control rods,	m ³	N/A	N/A
	Ci	N/A	N/A
d. Control Rod Drive Filters	m ³	N/A	N/A
	Ci	N/A	N/A
e. Other (describe) equip. etc.	m ³	N/A	N/A
	Ci	N/A	N/A

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

	ISOTOPE	PERCENT	CURIES
a.	Ni-63	45.406	2.9
	Co-60	21.047	1.35
	Co-58	12.757	8.16 E-1
	Fe-55	9.373	6.00 e-1
	Cs-137	3.757	2.40 E-1
b.	Co-60	36.372	1.38 E-2
	Ni-63	16.775	6.35 E-3
	Fe-55	15.270	5.78 E-3
	H-3	11.193	4.24 E-3
	Cs-137	5.537	2.10 E-3
c.	N/A	N/A	N/A
d.	N/A	N/A	N/A
e.	N/A	N/A	N/A

3. Solid Waste Disposition

Number of Shipments

12 total

4

8

Mode of Transportation

Truck

Destination

Energy Solutions

Bear Creek Road or

Gallaher Road

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments

0

Mode of Transportation

N/A

Destination

N/A

Completed By: _____

Date

Reviewed By: _____

Date

Table 3-1
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT AND WASTE DISPOSAL REPORT - 2012
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Units 1 and 2

Page 2 of 4

JANUARY 1, 2012 THROUGH JUNE 30, 2012

ADDITIONAL INFORMATION REQUIRED BY ODCM:

Shipments Sent Directly to Disposal

Shipment No.	Waste Class	Type Container	Shipping Class	Solidification Agent	Volume
NONE					

Shipments to a Waste Processor

Shipment No.	Waste Class	Type Container		Solidification Agent	Processor
RVRS-12-012	A	14-170 Cask as an IP-1	Radioactive LSA II	NONE	Energy Solutions
RVRS-12-011	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-010	A	IP-1	Radioactive LSA I	NONE	Energy Solutions
RVRS-12-008	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-007	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-006	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-005	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-009	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-004	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-003	A	IP-1	Radioactive LSA I	NONE	Energy Solutions
RVRS-12-002	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-001	A	14-170 Cask as an IP-1	Radioactive LSA II	NONE	Energy Solutions

***Steam Generator Blowdown resin goes to Energy Solutions for final evaluation and release.**

TABLE 3-1
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 2012
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Units 1 and 2

Page 3 of 4

JULY 1, 2012 THROUGH DECEMBER 31, 2012

Regulatory Guide 1.21 Rev. 2: Effluent and Waste Disposal Semi-Annual Report of Solid Waste and Irradiated Fuel Shipments

PERIOD COVERED: FROM: 7/1/2012 TO: 12/31/2012 FOR UNIT: Vogtle 1 & 2

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

1.	Type of waste	UNIT	6 month period	Est. Total ERROR %
a.	Spent resins, filter sludges, evaporator bottoms, etc.	m ³	4.73 E01	25
		Ci	2.04 E01	25
b.	Dry compressible waste, contaminated equip. etc.	m ³	1.77E02	25
		Ci	6.09E-01	25
c.	Irradiated components, control rods,	m ³	N/A	N/A
		Ci	N/A	N/A
d.	Control Rod Drive Filters	m ³	N/A	N/A
		Ci	N/A	N/A
e. Other (describe) equip. etc.		m ³	N/A	N/A
		Ci	N/A	N/A

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

	ISOTOPE	PERCENT	CURIES
a.	Ni-63	54.765	1.12 E1
	Co-60	23.562	4.81
	Cs-137	8.106	1.65
	Fe-55	6.019	1.23
	Cs-134	3.424	6.98 E-1
b.	Co-60	36.773	2.24 E-1
	Ni-63	20.501	1.25 E-1
	Fe-55	14.674	8.94 E-2
	H-3	11.677	7.11 E-2
	Co-58	9.156	5.58 E-2
c.	N/A	N/A	N/A
d.	N/A	N/A	N/A
e.	N/A	N/A	N/A

3. Solid Waste Disposition

Number of Shipments

Mode of Transportation

Destination

12 total

Truck

Energy Solutions

1

Barnwell

7

Bear Creek Road or

4

Gallaher Road

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments

Mode of Transportation

Destination

0

N/A

N/A

TABLE 3-1
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT - 2012
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Units 1 and 2

Page 4 of 4

JULY 1, 2012 THROUGH DECEMBER 31, 2012

Additional Information Required by ODCM:

Shipments Sent Directly to Disposal

Shipment No.	Waste Class	Type Container	Shipping Class	Solidification Agent	Volume
NONE					

Shipments to a Waste Processor

Shipment No.	Waste Class	Type Container	Shipping Class	Solidification Agent	Processor
RVRS-12-024	A	IP-1	Radioactive LSA I	NONE	Energy Solutions
RVRS-12-023	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-022	A	14-215 Cask as an IP-1	Radioactive LSA II	NONE	Energy Solutions
RVRS-12-021	A	IP-1	Radioactive LSA I	NONE	Energy Solutions
RVRS-12-020	A	IP-1	Radioactive LSA I	NONE	Energy Solutions
RVRS-12-019	A	14-170 Cask as an IP-1	Radioactive LSA II	NONE	Energy Solutions
RVRS-12-016	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-018	A	14-170 Cask as an IP-1	Radioactive LSA II	NONE	Energy Solutions
RVRS-12-017	A	14-170 Cask as an IP-1	Radioactive LSA II	NONE	Energy Solutions
RVRS-12-015	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-014	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-12-013	A	IP-1	Limited Quantity	NONE	Energy Solutions

* Steam Generator blowdown resin goes to Energy Solutions for final evaluation and release.

4.0 Doses to Members of the Public inside the Site Boundary

4.1 Regulatory Requirements

ODCM 7.2.2.3 states in part:

"The report shall also include assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY during the report period; this assessment must be performed in accordance with Chapter 6. All assumptions used in making these assessments (i.e., specific activity, exposure time, and location) shall be included in the report".

4.2 Demonstration of Compliance

The location of concern within the site boundary is the Visitors Center. The activities at the Visitor Center consist of occasional attendance at meetings and/or short visits for informational purposes.

There will be no radiation dose at this location due to radioactive liquid effluents. Delineated in Table 4-1 for this location are the values of the basic data assumed in the dose assessment due to radioactive gaseous effluents. Listed in this table are distance and direction from a point midway between the center of Unit 1 and the Unit 2 reactors, the dispersion and deposition factors for any releases from the plant vent (mixed mode) and from the turbine building (ground level), and the estimated maximum occupancy factor for an individual and the assumed age group of this individual.

The source term is listed in Tables 2-2A, and 2-2B for the mixed mode releases. Similarly, it is listed in tables 2-3A and 2-3B for the ground level releases.

The maximum doses in units of mrem to a MEMBER OF THE PUBLIC due to their activities inside the site boundary during the reporting period are presented in Table 4-1.

Table 4-1

Vogtle Electric Generating Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012
Doses to a Member of the Public Due to Activities Inside the Site Boundary

Unit: Site

Starting: 1-Jan-2012

Ending: 31-Dec-2012

Location Name: Visitor's Center Receptor
Distance (kilometers): 4.47E-01
Sector: SE
Occupancy Factor: 4.57E-04

Age Group: Child

Ground Level Release	Noble Gas	X/Q (sec/m3): 5.93E-06	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 5.58E-06	D/Q (m-2): 2.28E-08
Mixed Mode Release	Noble Gas	X/Q (sec/m3): 7.12E-07	
Mixed Mode Release	Particulate and Radioiodine	X/Q (sec/m3): 6.74E-07	D/Q (m-2): 5.77E-09

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	6.64E-13	3.35E-11	4.07E-11	2.46E-13	7.51E-11
Liver	mRem	3.05E-07	1.95E-07	1.03E-07	8.45E-08	6.88E-07
Total Body	mRem	3.05E-07	1.95E-07	1.03E-07	8.45E-08	6.88E-07
Thyroid	mRem	3.05E-07	1.95E-07	1.05E-07	8.45E-08	6.89E-07
Kidney	mRem	3.05E-07	1.95E-07	1.03E-07	8.45E-08	6.88E-07
Lung	mRem	3.05E-07	1.95E-07	1.03E-07	8.45E-08	6.88E-07
GI-Lli	mRem	3.05E-07	1.95E-07	1.03E-07	8.45E-08	6.88E-07
NG Total Body	mRem	7.66E-09	7.82E-09	1.76E-07	1.42E-07	3.33E-07
Whole Body Dose	mRem	3.13E-07	2.03E-07	2.79E-07	2.26E-07	1.02E-06

Table 4-1

Vogtle Electric Generating Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2012

Doses to a Member of the Public Due to Activities Inside the Site Boundary

Unit: Site

Starting: 1-Jan-2012

Ending: 31-Dec-2012

Location Name: Units 3&4 Construction

Distance (kilometers): 4.83E-01

Sector: SW

Occupancy Factor: 2.37E-01

Age Group: Adult

Ground Level Release	Noble Gas	X/Q (sec/m3): 1.81E-05	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 6.96E-06	D/Q (m-2): 2.88E-08
Mixed Mode Release	Noble Gas	X/Q (sec/m3): 9.75E-07	
Mixed Mode Release	Particulate and Radioiodine	X/Q (sec/m3): 9.17E-07	D/Q (m-2): 7.14E-09

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	2.38E-10	2.24E-08	2.54E-08	8.82E-11	4.82E-08
Liver	mRem	2.44E-04	1.56E-04	8.49E-05	6.76E-05	5.53E-04
Total Body	mRem	2.44E-04	1.56E-04	8.49E-05	6.76E-05	5.53E-04
Thyroid	mRem	2.44E-04	1.56E-04	8.57E-05	6.76E-05	5.54E-04
Kidney	mRem	2.44E-04	1.56E-04	8.49E-05	6.76E-05	5.53E-04
Lung	mRem	2.44E-04	1.56E-04	8.49E-05	6.76E-05	5.53E-04
GI-Lli	mRem	2.44E-04	1.56E-04	8.49E-05	6.76E-05	5.53E-04
NG Total Body	mRem	5.45E-06	5.56E-06	1.27E-04	1.01E-04	2.39E-04
Whole Body Dose	mRem	2.50E-04	1.62E-04	2.12E-04	1.68E-04	7.92E-04

5.0 Total Dose from Uranium Fuel Cycle (40CFR190)

5.1 Regulatory Requirements

ODCM 5.1 states in part that the annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC 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 whole body or to any organ, except the thyroid, which shall be limited to less than or equal to 75 mrem.

5.2 Demonstration of Compliance

No dose limits stated in ODCM Sections 2.1.3, 3.1.3, and 3.1.4 were exceeded. Therefore, compliance with 40 CFR 190 dose limits was demonstrated in accordance with the requirements of ODCM Section 5.1.3.

6.0 Meteorological Data

ODCM 7.2.2.2 states in part:

The Radioactive Effluent Release Report shall include an annual summary of hourly meteorological data collected over the previous year. This annual summary may be either in the form of an hour-by-hour listing of wind speed, wind direction, atmospheric stability, and precipitation (if measured) on magnetic tape; or in the form of joint frequency distributions of wind speed, wind direction and atmospheric stability.

In lieu of submission with the Radioactive Effluent Release Report, the licensee has the option of retaining this summary of required meteorological data on site in a file that shall be provided to the NRC upon request.

7.0 Program Deviations

7.1 Inoperable Liquid or Gaseous Effluent Monitoring Instrumentation

7.1.1 Regulatory Requirement

ODCM 7.2.2.6 states in part that the report shall include deviations from the liquid and gaseous effluent monitoring instrumentation operability requirements included in Sections 2.1.1 and 3.1.1, respectively. The report shall include an explanation as to why the inoperability of liquid or gaseous effluent monitoring instrumentation was not corrected within the specified time requirement.

7.1.2 Description of Deviations

The inoperability of liquid and gaseous effluent monitors not corrected within the specified time for this reporting period is detailed below. When applicable, compensatory measures were utilized:

- a. 1RE-12442
This monitor was out of service for 30 days because it was replaced with a new monitor. Installation started in August 2012 and was finished in November 2012. The monitor is now in service.
- b. 1FT-1085A
This flow transmitter was taken out of service due to failing calibration in November 2011. This transmitter has been delayed with repair because of the unavailability of parts. The part is scheduled to arrive June 2013, and repair will be scheduled.
- c. 1FT-12839
The flow transmitter for 1FT-12839 failed calibration and as a result, it was taken out of service in June 2012. A replacement transmitter has not been available. Engineering is designing a plan for replacement. It is currently scheduled for return to service in May 2013.
- d. 2RE-0020B
The mechanical seal on the sample pump failed in November 2011. The pump had to be refurbished which delayed return to service. The monitor was placed back into service in August 2012.
- e. 2FT-0018
This flow transmitter was taken out of service for indicating zeros during release in August 2012. It was returned to service in November 2012. During this time period, there was an outage and a new radiation monitor, 1RE-12442, was being installed on Unit 1. This restricted resources for radiation monitor repairs.
- f. 2FT-1085B
This flow transmitter was taken out of service due to failing calibration in November 2011. This flow transmitter was returned to service on May 2012.

7.2 Tanks Exceeding Curie Content Limits

7.2.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that the report shall include a description of the events leading to liquid holdup tanks or gas storage tanks exceeding the limits of Technical Specifications 5.5.12.

7.2.2 Description of Deviations

Limits for outdoor liquid hold-up tanks used for radioactive liquids were not exceeded during this reporting period.
Limits for the gas storage tanks were not exceeded during this reporting period.

8.0 Changes to the Vogtle Electric Generating Plant Offsite Dose Calculation Manual (ODCM)

8.1 Regulatory Requirements

ODCM 7.2.2.5 states in part that changes to the ODCM shall be submitted with the Radioactive Effluent Release Report. These changes may be due to changes in the radiological environmental monitoring program sampling locations as required by ODCM 4.1.1.2.3 or changes to dose calculation locations as required by ODCM 4.1.2.2.2. Land uses and dose calculation locations within five miles of VEGP must be determined by a land use census as required by ODCM 4.1.2.

8.2 Description of Changes

There were no new versions released in 2012.

9.0 Major Changes to Liquid, Gaseous, or Solid Radwaste Treatment Systems

9.1 Regulatory Requirements

ODCM 7.2.2.7 states in part:

As required by Sections 2.1.5 and 3.1.6, licensee initiated MAJOR CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS (liquid and gaseous) shall be reported to the Nuclear Regulatory Commission in the Radioactive Effluent Release Report covering the period in which the change was reviewed and accepted for implementation.

Note 1: In lieu of inclusion in the Radioactive Effluents Release Report, this same information may be submitted as part of the annual FSAR update.

PCP 12.1 states in part:

Licensee major initiated changes to the solid radioactive waste treatment system shall be reported to the Nuclear Regulatory Commission in the Radioactive Effluent Release Report for the period in which the change was implemented.

9.2 Description of Major Changes

Gaseous Radwaste System

There were no major changes to the gaseous radwaste systems in the 2012 assessment period.

Liquid Radwaste System

Major changes to the liquid radwaste facilities are those that contribute to significant changes in release; i.e., either decreases or increases in release volume or activity/dose.

There were no major changes to the liquid radwaste systems occurred during the 2012 assessment period.

Solid Radwaste System

There were no major changes to the solid radwaste systems in the 2012 assessment period.

Appendix A

Vogtle Electric Generating Plant

CARBON-14

Carbon-14 (C-14) is a naturally-occurring radionuclide with a 5730 year half life. Nuclear weapons testing in the 1950s and 1960s significantly increased the amount of C-14 in the atmosphere. Nuclear power plants also produce C-14, but the amount is infinitesimal compared to what has been distributed in the environment due to weapons testing and what is produced by natural cosmic ray interactions.

As nuclear plants have improved gaseous waste processing systems and improved fuel performance, the percentages of “principal radionuclides” in gaseous effluents have changed, and C-14 has become a larger percentage. “Principal radionuclides” are determined based on public dose contribution or the amount of activity discharged compared to other radionuclides of the same effluent type. In Revision 2 (June 2009) of Regulatory Guide 1.21 (RG 1.21), “Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste,” the NRC recommended re-evaluating “principal radionuclides” and reporting C-14 as appropriate. In 2010 Radioactive Effluent Release Reports, virtually all U. S. nuclear power plants started reporting C-14 amounts released and resulting doses to the maximally exposed member of the public.

Because C-14 is considered a hard-to-detect radionuclide which must be chemically separated from the effluent stream before it can be measured, RG 1.21 provides the option of calculating the C-14 source term based on power generation. The Electric Power Research Institute (EPRI) developed an accepted methodology for calculating C-14, and published the results in Technical Report 1021106 (December 2010), “Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents.” Evaluation of C-14 in radioactive liquid effluents is not required because the quantity and dose contribution has been determined to be insignificant.

At Plant Vogtle, the annual quantity of C-14 released in gaseous effluents was estimated to be 12.08 Curies (per unit). Approximately 30% of the C-14 released is in the form of $^{14}\text{CO}_2$ and is incorporated into plants through photosynthesis. Ingestion dose results from this pathway. The remaining 70% is estimated to be organic. Both the organic and inorganic forms of C-14 contribute to inhalation dose. A child is the maximally exposed individual, and bone dose is the highest organ dose. Using the dose calculation methodology from the Vogtle ODCM, the resulting bone dose to a child located at the controlling receptor location would be 8.46E-02 mrem in a year which is 0.56% of the regulatory limit of 15 mrem per year (per unit) to any organ due to gaseous effluents. The resulting total body dose to a child located at the controlling receptor location would be 1.69E-02 mrem in a year which is 0.11% of the regulatory limit of 15 mrem per year (per unit) total body dose due to gaseous effluents