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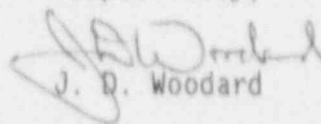
Joseph M. Farley Nuclear Plant
Semiannual Radioactive Effluent Release Report

Gentlemen:

In accordance with the Unit 1 and Unit 2 Technical Specifications, Section 6.9.1.8, the FNP Semiannual Radioactive Effluent Release Report for July 1, 1991 through December 31, 1991 is hereby submitted.

If you have any questions, please advise.

Respectfully,


J. D. Woodard

JDW/DMH

Attachment

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SOUTHERN NUCLEAR OPERATING COMPANY
FARLEY NUCLEAR PLANT UNIT NO. ONE
LICENSE NO. NPF-2
AND
FARLEY NUCLEAR PLANT UNIT NO. TWO
LICENSE NO. NPF-8

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JULY 1, 1991 THROUGH DECEMBER 31, 1991

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CHAPTER 1

INTRODUCTION

This semiannual radioactive release report, for the period July 1 through December 31, 1991, is submitted in accordance with Appendix A of License No.'s NPF-2 and NPF-8. Appendix A will hereinafter be referred to as the Technical Specifications or TS.

A single submittal is made for both units which combines those sections that are common. Separate tables of releases and release totals are included where separate processing systems exist.

This report includes an annual summary of hourly meteorological data collected over the past year and an assessment of the radiation doses due to the radioactive liquid and gaseous effluents released from the Farley Nuclear Plant site over the same period. Additionally Section 2.13 with associated dose contributions to sectors comprises an assessment of radiation doses to the likely most exposed member of the public from reactor releases and other nearby uranium fuel cycle sources (including doses from primary effluent pathways and direct radiation). All assessments of radiation doses are performed in accordance with the OFFSITE DOSE CALCULATION MANUAL (ODCM).

CHAPTER 2

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL

2.1 REGULATORY LIMITS

2.1.1 Fission And Activation Gases

- 1) The dose rate from the site at any time due to noble gases shall be less than or equal to 500 mrem/yr to the total body and 3000 mrem/yr to the skin.
- 2) The air dose from each reactor unit from the site during any calendar quarter due to noble gases shall be less than or equal to 5 mrad for gamma radiation and 10 mrad for beta radiation.
- 3) The air dose from each reactor unit from the site during any calendar year due to noble gases shall be less than or equal to 10 mrad for gamma radiation and 20 mrad for beta radiation.

2.1.2 Iodines And Particulates

- 1) The dose rate from the site at any time due to iodines, particulates and radionuclides with half-lives greater than 8 days shall be less than or equal to 1500 mrem/yr to any organ.
- 2) The dose from each reactor unit from the site during any calendar quarter due to iodines, particulates and radionuclides with half-lives greater than 8 days shall be less than or equal to 7.5 mrem to any organ.
- 3) The dose from each reactor unit from the site during any calendar year due to iodines, particulates and radionuclides with half-lives greater than 8 days shall be less than or equal to 15 mrem to any organ.

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
REGULATORY LIMITS

2.1.3 Liquid Effluents

1) The concentration of radioactive materials released in liquid effluents to unrestricted areas from all reactors at the site shall not exceed at any time the values specified in 10CFR Part 20, Appendix B, Table II, Column 2. The concentration of dissolved or entrained noble gases, released in liquid effluents to unrestricted areas from all reactors at the site, shall not exceed at any time $2E-4$ $\mu\text{Ci/ml}$ in water.

2) The dose or dose commitment due to liquid effluents released from each reactor unit from the site during any calendar quarter shall be less than or equal to 1.5 mrem to the total body and 5 mrem to any organ.

3) The dose or dose commitment due to liquid effluents released from each reactor unit from the site during any calendar year shall be less than or equal to 3 mrem to the total body and 10 mrem to any organ.

2.2 MAXIMUM PERMISSIBLE CONCENTRATIONS

a) Airborne - The maximum permissible concentration of radioactive materials in gaseous effluents is limited by the dose rate restrictions of 10 CFR 20. In this case, the maximum permissible concentrations are actually determined by the dose factors in the ODCM.

b) Liquids - 10 CFR Part 20, Appendix B, Table II, Column 2. Note: The MPC chosen is the most conservative value of either the soluble or insoluble MPC for each isotope.

2.3 AVERAGE ENERGY

Not applicable for Farley's TS.

2.4 MEASUREMENTS AND APPROXIMATIONS OF TOTAL ACTIVITY

The following discussion details the methods used to measure and approximate total activity for the following:

- a. Fission and Activation Gases
- b. Iodines and Particulates
- c. Liquid Effluents

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
MEASUREMENTS AND APPROXIMATIONS OF TOTAL ACTIVITY

Tables 5 and 6 give sampling frequencies and minimum detectable concentration requirements for the analysis of gaseous and liquid effluent streams, respectively.

Values in the attached tables given as zero do not mean that the nuclides were not present. A zero indicates that the nuclide was not detected at levels greater than the sensitivity requirements shown in Tables 5 and 6. For some nuclides, lower detection limits than required may be readily achievable; when a nuclide is measured below its stated limit, it is reported.

2.4.1 Fission And Activation Gases

The following noble gases are considered in evaluating gaseous airborne discharge:

| | |
|---------|--------|
| Kr-87 | Xe-133 |
| Kr-88 | Xe-135 |
| Xe-133m | Xe-138 |

Periodic grab samples from plant effluent streams are analyzed by a computerized pulse height analyzer system utilizing high resolution germanium detectors. (See Table 5 for sampling and analytical requirements). Isotopic values thus obtained are used for release rate calculations as specified in the ODCM. Only those nuclides that are detected are used in this computation. During the period between grab samples, the amount of radioactivity released is based on the effluent monitor readings.

The monitor meter response (cpm/uCi/ml) and the background (cpm) are used to adjust the activity released for variations in monitor readings, as described in the ODCM.

To ensure isotopic distributions do not change significantly during major operational occurrences, the frequency of grab sampling is increased to satisfy the requirements of footnotes (b) and (d) of TS Table 4.11-2, "Radioactive Gaseous Waste Sampling and Analysis Program".

2.4.2 Iodines And Particulates

The radioiodines and radioactive materials in particulate forms to be considered are:

| | |
|-------|-------|
| Mn-54 | I-131 |
| Fe-59 | I-133 |

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
MEASUREMENTS AND APPROXIMATIONS OF TOTAL ACTIVITY

| | |
|-------|--------|
| Co-58 | Cs-134 |
| Co-60 | Cs-137 |
| Zn-65 | Ce-141 |
| Sr-89 | Ce-144 |
| Sr-90 | *H-3 |
| Mo-99 | |

Other nuclides with half-lives greater than 8 days which are identified and measured are also considered. The MDC's will vary and are not required to meet the MDC limits of those isotopes listed specifically.

* Tritium is considered in the gaseous or water vapor form.

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

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

2.4.3 Liquid Effluents

The radionuclides listed below are considered when evaluating liquid effluents:

| | |
|-------|--------|
| Mn-54 | I-131 |
| Fe-59 | Cs-134 |
| Co-58 | Cs-137 |
| Co-60 | Ce-141 |
| Zn-65 | Ce-144 |
| Sr-89 | Mo-99 |
| Sr-90 | Fe-55 |
| | H-3 |

Batch Releases: Representative pre-release grab samples are obtained and analyzed per Table 6. Isotopic analyses are performed using the computerized pulse height analysis system

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
MEASUREMENTS AND APPROXIMATIONS OF TOTAL ACTIVITY

previously described. Aliquots of each pre-release sample proportional to the waste volume released are composited in accordance with requirements in Table 6. Strontium determinations are made by performing a chemical separation and counting the isotope thus separated using a 2 pi gas flow proportional counter. Gross beta and gross alpha determinations are made using 2 pi gas flow proportional counters. Tritium and Iron 55 determinations are made using liquid scintillation techniques. Dissolved gases are determined employing grab sampling techniques and then counting on the pulse height analyzer.

Continuous Releases: Continuous releases (from the Steam Generator Blowdown) are analogous to that of the batch releases except that they are analyzed on a weekly composite basis per Table 6.

2.5 BATCH RELEASES AND ABNORMAL RELEASES

Batch releases and abnormal (non-routine) releases from units 1 and 2 are shown on the following pages.

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
 BATCH RELEASES AND ABNORMAL RELEASES

BATCH RELEASES - UNIT 1

| LIQUIDS | RELEASE(S): ALL | QUARTER 3 | QUARTER 4 |
|--|-----------------|-----------|------------|
| Number of batch releases | | 151. | 102. |
| Total time period for batch releases (min) | | 12877. | 8428. |
| Maximum time period for a batch release (min) | | 120. | 105. |
| Average time period for a batch release (min) | | 85. | 83. |
| Minimum time period for a batch release (min) | | 53. | 63. |
| Average stream flow during periods of release (cfs) | * 8.59E+03 | | * 6.83E+03 |
| | | | |
| GASES | RELEASE(S): ALL | | |
| Number of batch releases | | 0. | 0. |
| Total time period for batch releases (min) | | 0. | 0. |
| Maximum time period for a batch release (min) | | 0. | 0. |
| Average time period for a batch release (min) | | 0. | 0. |
| Minimum time period for a batch release (min) | | 0. | 0. |

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

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
BATCH RELEASES AND ABNORMAL RELEASES

ABNORMAL RELEASES - UNIT 1

| | QUARTER 3 | QUARTER 4 |
|-------------------------|-------------|-------------|
| LIQUIDS | | |
| Number of releases | 0. | 0. |
| Total activity released | 0.00E+00 Ci | 0.00E+00 Ci |
| GASES | | |
| Number of releases | 0. | 0. |
| Total activity released | 0.00E+00 Ci | 0.00E+00 Ci |

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
 BATCH RELEASES AND ABNORMAL RELEASES

BATCH RELEASES - UNIT 2

| LIQUIDS | RELEASE(S): ALL | QUARTER 3 | QUARTER 4 |
|---|-----------------|-----------|------------|
| Number of batch releases | | 80. | 72. |
| Total time period for batch releases (min) | | 7219. | 8025. |
| Maximum time period for a batch release (min) | | 203. | 110. |
| Average time period for a batch release (min) | | 90. | 84. |
| Minimum time period for a batch release (min) | | 69. | 66. |
| Average stream flow during periods of release (cf ³ ; | * 8.59E+03 | | * 6.83E+03 |
| | | | |
| GASES | RELEASE(S): ALL | | |
| Number of batch releases | | 0. | 0. |
| Total time period for batch releases (min) | | 0. | 0. |
| Maximum time period for a batch release (min) | | 0. | 0. |
| Average time period for a batch release (min) | | 0. | 0. |
| Minimum time period for a batch release (min) | | 0. | 0. |

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

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
BATCH RELEASES AND ABNORMAL RELEASES

ABNORMAL RELEASES - UNIT 2

| | QUARTER 3 | QUARTER 4 |
|-------------------------|-------------|-------------|
| LIQUIDS | | |
| Number of releases | 0. | 0. |
| Total activity released | 0.00E+00 Ci | 0.00E+00 Ci |
| GASES | | |
| Number of releases | 0. | 0. |
| Total activity released | 0.00E+00 Ci | 0.00E+00 Ci |

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
ESTIMATE OF TOTAL ERROR

2.6 ESTIMATE OF TOTAL ERROR

2.6.1 Liquid

1) The maximum error associated with volume and flow measurements, based upon plant calibration practice is estimated to be + or - 10%.

2) The average error associated with counting is estimated to be less than + or - 15%.

2.6.2 Gaseous

1) 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% |

2) The average error associated with counting is estimated to be:

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

2.6.3 Solid Radwaste

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

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
SOLID WASTE

2.7 SOLID WASTE

See Table 3

2.8 RADIOLOGICAL IMPACT ON MAN

The doses from liquid and gaseous releases for units 1 and 2 are shown on the following pages.

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
RADIOLOGICAL IMPACT ON Man

DOSES FROM LIQUID AND GASEOUS EFFLUENTS - UNIT 1

| | QUARTER 3 | QUARTER 4 |
|----------------|-----------------|-----------|
| LIQUIDS (mrem) | RELEASE(S): ALL | |
| Bone | 9.68E-03 | 4.90E-03 |
| Liver | 1.44E-02 | 7.20E-03 |
| Whole body | 1.02E-02 | 4.85E-03 |
| Thyroid | 8.77E-04 | 1.13E-03 |
| Kidney | 5.31E-03 | 2.77E-03 |
| Lung | 2.59E-02 | 2.59E-03 |
| GI - LLI | 1.99E-02 | 2.31E-03 |

GASES RELEASE(S): ALL

NOBLE GASES (mRAD)

| | | |
|-----------|----------|----------|
| Gamma Air | 2.16E-03 | 2.48E-03 |
| Beta Air | 1.67E-03 | 2.00E-03 |

PARTICULATE AND IODINE (mrem)

| | | |
|------------|----------|----------|
| Bone | 0.00E+00 | 0.00E+00 |
| Liver | 1.26E-03 | 2.61E-03 |
| Whole body | 1.26E-03 | 2.61E-03 |
| Thyroid | 1.26E-03 | 2.61E-03 |
| Kidney | 1.26E-03 | 2.61E-03 |
| Lung | 1.26E-03 | 2.61E-03 |
| GI - LLI | 1.26E-03 | 2.61E-03 |
| Skin | 0.00E+00 | 0.00E+00 |

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
RADIOLOGICAL IMPACT ON MAN

DOSES FROM LIQUID AND GASEOUS EFFLUENTS - UNIT 2

| | QUARTER 3 | QUARTER 4 |
|----------------|-----------------|-----------|
| LIQUIDS (mrem) | RELEASE(S): ALL | |
| Bone | 1.07E-02 | 1.08E-02 |
| Liver | 1.61E-02 | 1.61E-02 |
| Whole body | 1.11E-02 | 1.10E-02 |
| Thyroid | 5.09E-04 | 6.53E-04 |
| Kidney | 5.65E-03 | 5.46E-03 |
| Lung | 7.83E-03 | 3.15E-03 |
| GI - LLI | 5.24E-03 | 1.95E-03 |

GASES RELEASE(S): ALL

NOBLE GASES (mRAD)

| | | |
|-----------|----------|----------|
| Gamma Air | 4.00E-03 | 3.12E-03 |
| Beta Air | 1.41E-03 | 1.10E-03 |

PARTICULATE AND IODINE (mrem)

| | | |
|------------|----------|----------|
| Bone | 0.00E+00 | 0.00E+00 |
| Liver | 6.04E-03 | 9.91E-03 |
| Whole body | 6.04E-03 | 9.91E-03 |
| Thyroid | 6.04E-03 | 9.91E-03 |
| Kidney | 6.04E-03 | 9.91E-03 |
| Lung | 6.04E-03 | 9.91E-03 |
| GI - LLI | 6.04E-03 | 9.91E-03 |
| Skin | 0.00E+00 | 0.00E+00 |

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
METEOROLOGICAL DATA

2.9 METEOROLOGICAL DATA

See Table 4A, "Cumulative Joint Frequency Distribution".

Continuous Release Mode:

3rd Quarter, 1991 : 4A-CQ3
4th Quarter, 1991 : 4A-CQ4

Batch Release Mode (Units 1 and 2):

3rd Quarter, 1991 : 4A-1BQ3 and 4A-2BQ3
4th Quarter, 1991 : 4A-1BQ4 and 4A-2BQ4

2.10 MINIMUM DETECTABLE CONCENTRATION (MDC)

Detectable limits for activity analyses are based upon the technical feasibility and on the potential significance in the environment of the quantities released. However, in practice, when an isotope's a posteriori MDC could not be met due to other nuclides being present in much greater concentrations, the a priori MDC as defined in the TS table 4.11-1 a. is relied upon.

2.11 DEVIATIONS FROM LIQUID WASTE RELEASE PROGRAM

There were no deviations from the Liquid Waste Release Program during the second half of 1991.

2.12 DEVIATIONS FROM GASEOUS WASTE RELEASE PROGRAM

There were no deviations from the Gaseous Waste Release Program during the second half of 1991.

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
ANNUAL RADIATION DOSE ASSESSMENT (1991)

2.13 ANNUAL RADIATION DOSE ASSESSMENT (1991)

DOSES FROM LIQUID AND GASEOUS EFFLUENTS

LIQUIDS (mrem) RELEASE(S): ALL

| | |
|------------|----------|
| Bone | 7.00E-02 |
| Liver | 1.05E-01 |
| Whole body | 7.32E-02 |
| Thyroid | 8.15E-03 |
| Kidney | 3.83E-02 |
| Lung | 1.08E-01 |
| GI - LLI | 2.37E-01 |

GASES RELEASE(S): ALL

NOBLE GASES (mRAD)

| | |
|-----------|----------|
| Gamma Air | 3.57E-02 |
| Beta Air | 3.75E-02 |

PARTICULATE AND IODINE (mrem)

| | |
|------------|----------|
| Bone | 1.47E-03 |
| Liver | 2.55E-02 |
| Whole body | 2.45E-02 |
| Thyroid | 5.92E-01 |
| Kidney | 2.58E-02 |
| Lung | 2.37E-02 |
| GI - LLI | 2.38E-02 |
| Skin | 1.13E-05 |

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
ANNUAL RADIATION DOSE ASSESSMENT (1991)

Maximum Real Exposure

The maximum real exposure is an assessment of radiation doses to the likely most exposed member of the public from reactor releases and other nearby uranium fuel cycle sources : including doses from all primary effluent pathways and direct radiation (liquid pathways are limited to the Chattahoochee River) for the previous 12 consecutive months in conformance with 40 CFR 190.

A tabulation of doses to sixteen 22.5 degree sectors around the plant calculated at the site boundary provides the quarterly and yearly dose for each sector. The dose or dose commitment to any member of the public due to releases of radioactivity and radiation from uranium fuel cycle sources are limited to less than or equal to 25 mrem to the total body or an organ (except the thyroid which is limited to less than or equal to 75 mrem) over 4 consecutive quarters. This technical specification is provided to meet the dose limitations of 40 CFR 190.

Since the Farley Nuclear Plant is the only uranium fuel cycle source within a radius of 50 miles, the dose to any member of the public will be less than the dose in the highest sector. The tabulation below includes the quarterly and yearly doses from the highest sector for each of the following:

1. Gaseous iodine / particulate
2. Noble gases
3. Direct Radiation (Direct radiation data are actual field measurements made by thermoluminescent dosimetry as opposed to calculated data based on effluents. It should be noted that the direct radiation values reported herein include background radiation. Based on preoperational data, the reported direct radiation doses are essentially attributable to background radiation.)

SUPPLEMENTAL INFORMATION FOR EFFLUENT AND WASTE DISPOSAL
ANNUAL RADIATION DOSE ASSESSMENT (1991)

MAXIMUM OFF-SITE DOSES

Dose, Millirems *

| Source | Note | 1st Qtr | 2nd Qtr | 3rd Qtr | 4th Qtr | Year |
|-----------------------------|------|---|-------------------|-------------------|-------------------|------------------|
| Liquid effluents | (1) | GI 4.43E-02 | GI 1.62E-01 | LUNG 3.37E-02 | LIV 2.33E-02 | GI 2.37E-01 |
| Iodines and Particulates | (2) | THY 4.36E-01 | THY 1.36E-01 | THY 7.30E-03 | THY 1.25E-02 | THY 5.92E-01 |
| Noble gases | (2) | Type of Air Dose BETA 3.04E-02 | GAMMA 1.61E-03 | GAMMA 6.16E-03 | GAMMA 5.60E-03 | BETA 3.75E-02 |
| Direct radiation | (3) | Sector NE 2.72E+01 | E 3.18E+01 | NE 3.44E+01 | NE 2.25E+01 | E 7.86E+01 |

Note:

1. The liquid effluent total body and organ doses are determined by the fish pathway. These are calculated using the bioaccumulation factors, dose conversion factors, and assumptions of Regulatory Guide 1.109 (October 1977).
2. Gaseous effluent doses are calculated using annual average X/Q methodology per NUREG-0133 (October 1978).
3. Direct radiation was assessed using thermoluminescent dosimetry. Two dosimeters containing three LiF TLD chips were placed at selected locations within each of 16 sectors around the plant. These chips were collected and read quarterly and annually.

* All doses in mrem except noble gas doses which are in mRAD.

CHAPTER 3

TABLE 1A-1

GASEOUS EFFLUENTS -- SUMMATION OF RELEASE(S): ALL - UNIT 1

| | UNITS | QUARTER 3 | QUARTER 4 |
|--|---------|--------------|--------------|
| A. FISSION AND ACTIVATION GASES | | | |
| 1. TOTAL RELEASE | Ci | 2.76E+01 | 4.16E+01 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | μCi/SEC | 3.47E+00 | 5.23E+00 |
| 3. PERCENT OF TECHNICAL SPECIFICATION LIMIT | % | N/A | N/A |
| B. IODINES | | | |
| 1. TOTAL IODINE-131 | Ci | 0.00E+00 | 0.00E+00 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | μCi/SEC | 0.00E+00 | 0.00E+00 |
| 3. PERCENT OF TECHNICAL SPECIFICATION LIMIT | % | N/A | N/A |

TABLE 1A-1

GASEOUS EFFLUENTS -- SUMMATION OF RELEASE(S): ALL - UNIT 1

| | UNITS | QUARTER 3 | QUARTER 4 |
|--|---------|--------------|--------------|
| C. PARTICULATES | | | |
| 1. PARTICULATES WITH HALF-LIVES >8 DAYS | Ci | 0.00E+00 | 0.00E+00 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | µCi/SEC | 0.00E+00 | 0.00E+00 |
| 3. PERCENT OF TECHNICAL SPECIFICATION LIMIT | % | N/A | N/A |
| 4. GROSS ALPHA RADIOACTIVITY | Ci | 3.16E-08 | 7.59E-08 |
| D. TRITIUM | | | |
| 1. TOTAL RELEASE | Ci | 7.80E+00 | 1.49E+01 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | µCi/SEC | 9.81E-01 | 1.87E+00 |
| 3. PERCENT OF TECHNICAL SPECIFICATION LIMIT | % | N/A | N/A |

CHAPTER 4

TABLE 1A-2

GASEOUS EFFLUENTS -- SUMMATION OF RELEASE(S): ALL - UNIT 2

| | UNITS | QUARTER 3 | QUARTER 4 |
|--|---------|--------------|--------------|
| A. FISSION AND ACTIVATION GASES | | | |
| 1. TOTAL RELEASE | Ci | 1.26E+01 | 9.81E+00 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 1.59E+00 | 1.23E+00 |
| 3. PERCENT OF TECHNICAL SPECIFICATION LIMIT | % | N/A | N/A |
| B. IODINES | | | |
| 1. TOTAL IODINE-131 | Ci | 0.00E+00 | 0.00E+00 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 0.00E+00 | 0.00E+00 |
| 3. PERCENT OF TECHNICAL SPECIFICATION LIMIT | % | N/A | N/A |

TABLE 1A-2

GASEOUS EFFLUENTS -- SUMMATION OF RELEASE(S); ALL - UNIT 2

| | UNITS | QUARTER 3 | QUARTER 4 |
|---|---------|--------------|--------------|
| C. PARTICULATES | | | |
| 1. PARTICULATES WITH HALF-LIVES >8 DAYS | Ci | 0.00E+00 | 0.00E+00 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 0.00E+00 | 0.00E+00 |
| 3. PERCENT OF TECHNICAL, SPECIFICATION LIMIT | % | N/A | N/A |
| 4. GROSS ALPHA RADIOACTIVITY | Ci | 4.80E-08 | 2.22E-07 |

D. TRITIUM

| | | | |
|---|---------|----------|----------|
| 1. TOTAL RELEASE | Ci | 3.42E+01 | 5.61E+01 |
| 2. AVERAGE RELEASE RATE FOR PERIOD | uCi/SEC | 4.31E+00 | 7.06E+00 |
| 3. PERCENT OF TECHNICAL, SPECIFICATION LIMIT | % | N/A | N/A |

CHAPTER 5

TABLE 1B-1

GASEOUS EFFLUENTS - Elevated Releases RELEASE(S): ALL - UNIT 1

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

1. FISSION AND ACTIVATION GASES

| | | | | | |
|--------|----|----------|----------|----------|----------|
| AR-41 | Ci | 4.84E+00 | 6.38E+00 | 0.00E+00 | 0.00E+00 |
| XE-133 | Ci | 1.64E+01 | 3.47E+01 | 0.00E+00 | 0.00E+00 |
| XE-135 | Ci | 6.37E+00 | 4.77E-01 | 0.00E+00 | 0.00E+00 |

| | | | | | |
|-----------|----|----------|----------|----------|----------|
| TOTAL FOR | | | | | |
| PERIOD | Ci | 2.76E+01 | 4.16E+01 | 0.00E+00 | 0.00E+00 |
| (ABOVE) | | | | | |

TABLE 1B-1

GASEOUS EFFLUENTS - Elevated Releases RELEASE(S): ALL - UNIT 1

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

2. IODINES

| | | | | | | | |
|-----------|---|----|---|----------|---|----------|---|
| TOTAL FOR | : | | : | | : | | : |
| PERIOD | : | Ci | : | 0.00E+00 | : | 0.00E+00 | : |
| (ABOVE) | : | | : | | : | | : |

TABLE 1B-1

GASEOUS EFFLUENTS - Elevated Releases RELEASE(S): ALL - UNIT 1

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

3. PARTICULATES

| | | | | | |
|---------|----|----------|----------|----------|----------|
| H-3 | Ci | 7.80E+00 | 1.49E+01 | 0.00E+00 | 0.00E+00 |
| U-ALPHA | Ci | 3.16E-08 | 7.59E-08 | 0.00E+00 | 0.00E+00 |

| | | | | | |
|-----------|---|----|----------|----------|----------|
| TOTAL FOR | : | : | : | : | : |
| PERIOD | : | Ci | 7.80E+00 | 1.49E+01 | 0.00E+00 |
| (ABOVE) | : | : | : | : | : |

CHAPTER 6

TABLE 1B-2

GASEOUS EFFLUENTS - Elevated Releases RELEASE(S): ALL - UNIT 2

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

1. FISSION AND ACTIVATION GASES

| | | | | | |
|-------|----|----------|----------|----------|----------|
| AR-41 | Ci | 1.26E+01 | 9.81E+00 | 0.00E+00 | 0.00E+00 |
|-------|----|----------|----------|----------|----------|

| | | | | | |
|-----------|---|----|----------|----------|----------|
| TOTAL FOR | : | : | : | : | : |
| PERIOD | : | Ci | 1.26E+01 | 9.81E+00 | 0.00E+00 |
| (ABOVE) | : | : | : | : | : |

TABLE 1B-2

GASEOUS EFFLUENTS - Elevated Releases RELEASE(S): ALL - UNIT 2

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

2. IODINES

| | | | | | | |
|-----------|---|----|----------|----------|----------|----------|
| TOTAL FOR | : | : | : | : | : | : |
| PERIOD | : | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| (ABOVE) | : | : | : | : | : | : |

TABLE 1B-2

GASEOUS EFFLUENTS - Elevated Releases RELEASE(S): ALL - UNIT 2

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

3. PARTICULATES

| | | | | | |
|---------|----|----------|----------|----------|----------|
| H-3 | Ci | 3.42E+01 | 5.61E+01 | 0.00E+00 | 0.00E+00 |
| G.ALPHA | Ci | 4.80E-08 | 2.22E-07 | 0.00E+00 | 0.00E+00 |

| | | | | | | |
|-----------|---|----|----------|----------|----------|----------|
| TOTAL FOR | : | : | : | : | : | : |
| PERIOD | : | Ci | 3.42E+01 | 5.61E+01 | 0.00E+00 | 0.00E+00 |
| (ABOVE) | : | : | : | : | : | : |

CHAPTER 7

TABLE 1C-1

GASEOUS EFFLUENTS - Ground Level Releases RELEASE(S): ALL - UNIT 1

| | | CONTINUOUS MODE | | BATCH MODE | |
|------------|---------|-----------------|-----------|------------|-----------|
| : NUCLIDES | : UNITS | : QUARTER | : QUARTER | : QUARTER | : QUARTER |
| : RELEASED | : | 3 | 4 | 3 | 4 |

1. FISSION AND ACTIVATION GASES

| | | | | | | |
|-----------|---|----|----------|----------|----------|----------|
| TOTAL FOR | : | : | : | : | : | : |
| PERIOD | : | C1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| (ABOVE) | : | : | : | : | : | : |

TABLE 1C-1

GASEOUS EFFLUENTS - Ground Level Releases RELEASE(S): ALL - UNIT 1

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

2. IODINES

| | | | | | |
|-----------|---|----|----------|----------|----------|
| TOTAL FOR | : | : | : | : | : |
| PERIOD | : | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| (ABOVE) | : | : | : | : | : |

TABLE 1C-1

GASEOUS EFFLUENTS - Ground Level Releases RELEASE(S): ALL - UNIT 1

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

3. PARTICULATES

| | | | | | |
|-----|----|----------|----------|----------|----------|
| H-3 | Ci | 2.40E-03 | 6.43E-03 | 0.00E+00 | 0.00E+00 |
|-----|----|----------|----------|----------|----------|

| | | | | | |
|-----------|----|----------|----------|----------|----------|
| TOTAL FOR | | | | | |
| PERIOD | Ci | 2.40E-03 | 6.43E-03 | 0.00E+00 | 0.00E+00 |
| (ABOVE) | | | | | |

CHAPTER 8

TABLE 1C-2

GASEOUS EFFLUENTS - Ground Level Releases RELEASE(S): ALL - UNIT 2

| CONTINUOUS MODE | | | | BATCH MODE | | | |
|-----------------|-------|---------|---------|------------|---------|---------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | : | 3 | 4 | 3 | 4 | 3 | 4 |

1. FISSION AND ACTIVATION GASES

| | | | | | | | |
|-----------|---|----|----------|----------|----------|----------|---|
| TOTAL FOR | : | : | : | : | : | : | : |
| PERIOD | : | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | : |
| (ABOVE) | : | : | : | : | : | : | : |

TABLE 1C-2

GASEOUS EFFLUENTS - Ground Level Releases RELEASE(S): ALL - UNIT 2

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

2. IODINES

| | | | | | | |
|-----------|---|----|----------|----------|----------|----------|
| TOTAL FOR | : | : | : | : | : | : |
| PERIOD | : | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| (ABOVE) | : | : | : | : | : | : |

TABLE 1C-2

GASEOUS EFFLUENTS - Ground Level Releases RELEASE(S): ALL - UNIT 2

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|---------|------------|---------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |

3. PARTICULATES

| | | | | | |
|-----|----|----------|----------|----------|----------|
| H-3 | C1 | 2.82E-03 | 7.97E-03 | 0.00E+00 | 0.00E+00 |
|-----|----|----------|----------|----------|----------|

| | | | | | |
|-----------|----|----------|----------|----------|----------|
| TOTAL FOR | | | | | |
| PERIOD | C1 | 2.82E-03 | 7.97E-03 | 0.00E+00 | 0.00E+00 |
| (ABOVE) | | | | | |

CHAPTER 9

TABLE 2A-1

LIQUID EFFLUENTS -- SUMMATION OF RELEASE(S): ALL - UNIT 1

| UNITS | QUARTER 3 | QUARTER 4 |
|-------|--------------|--------------|
|-------|--------------|--------------|

A. FISSION AND ACTIVATION PRODUCTS

| | | | |
|--|--------|----------|----------|
| 1. TOTAL RELEASE (EXCL. TRIT., GASES, ALPHA) | Ci | 4.16E-02 | 7.73E-02 |
| 2. AVERAGE DILUTED CONC. DURING PERIOD | uCi/ml | 3.03E-09 | 5.94E-09 |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A |

B. TRITIUM

| | | | |
|--|--------|----------|----------|
| 1. TOTAL RELEASE | Ci | 1.10E+02 | 1.39E+02 |
| 2. AVERAGE DILUTED CONC. DURING PERIOD | uCi/ml | 8.06E-06 | 1.07E-05 |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A |

TABLE 2A-1

LIQUID EFFLUENTS -- SUMMATION OF RELEASE(S): ALL - UNIT 1

| UNITS | QUARTER | QUARTER |
|-------|---------|---------|
| | 3 | 4 |

C. DISSOLVED AND ENTRAINED GASES

| | | | |
|---|--------|----------|----------|
| 1. TOTAL RELEASE | Ci | 1.05E-03 | 8.93E-03 |
| 2. AVERAGE DILUTED CONC. DURING PERIOD | uCi/ml | 7.65E-11 | 6.86E-10 |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A |

D. GROSS ALPHA RADIOACTIVITY

| | | | |
|------------------|----|----------|----------|
| 1. TOTAL RELEASE | Ci | 1.19E-05 | 1.43E-08 |
|------------------|----|----------|----------|

| | | | |
|---|--------|----------|----------|
| E. VOLUME WASTE RELEASED (PRIOR TO DILUTION) | LITERS | 1.05E+08 | 8.98E+07 |
|---|--------|----------|----------|

| | | | |
|--|--------|----------|----------|
| F. VOLUME DILUTION WATER USED DURING PERIOD | LITERS | 1.37E+10 | 1.30E+10 |
|--|--------|----------|----------|

CHAPTER 10

TABLE 2A-2

LIQUID EFFLUENTS -- SUMMATION OF RELEASE(S): ALL - UNIT 2

| UNITS | QUARTER 3 | QUARTER 4 |
|-------|--------------|--------------|
|-------|--------------|--------------|

A. FISSION AND ACTIVATION PRODUCTS

| | | | |
|--|--------|----------|----------|
| 1. TOTAL RELEASE (EXCL. TRIT., GASES, ALPHA) | Ci | 3.02E-02 | 8.66E-02 |
| 2. AVERAGE DILUTED CONC. DURING PERIOD | uCi/ml | 1.92E-09 | 5.63E-09 |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A |

B. TRITIUM

| | | | |
|--|--------|----------|----------|
| 1. TOTAL RELEASE | Ci | 7.43E+01 | 9.28E+01 |
| 2. AVERAGE DILUTED CONC. DURING PERIOD | uCi/ml | 4.72E-06 | 6.04E-06 |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A |

TABLE 2A-7.

LIQUID EFFLUENTS -- SUMMATION OF RELEASE(S): ALL - UNIT 2

| UNITS | QUARTER | QUARTER |
|-------|---------|---------|
| | 3 | 4 |

C. DISSOLVED AND ENTRAINED GASES

| | | | |
|---|--------|----------|----------|
| 1. TOTAL RELEASE | Ci | 4.60E-04 | 1.24E-02 |
| 2. AVERAGE DILUTED CONC. DURING PERIOD | uCi/ml | 2.92E-11 | 8.07E-10 |
| 3. PERCENT OF APPLICABLE LIMIT | % | N/A | N/A |

D. GROSS ALPHA RADIOACTIVITY

| | | | |
|------------------|----|----------|----------|
| 1. TOTAL RELEASE | Ci | 7.29E-06 | 4.37E-08 |
|------------------|----|----------|----------|

| | | | |
|---|--------|----------|----------|
| E. VOLUME WASTE RELEASED (PRIOR TO DILUTION) | LITERS | 1.08E+08 | 7.28E+07 |
|---|--------|----------|----------|

| | | | |
|--|--------|----------|----------|
| F. VOLUME DILUTION WATER USED DURING PERIOD | LITERS | 1.57E+10 | 1.54E+10 |
|--|--------|----------|----------|

CHAPTER 11

TABLE 2B-1

LIQUID EFFLUENTS

RELEASE(S): ALL - UNIT 1

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|----------|------------|----------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |
| H-3 | Ci | 0.00E+00 | 0.00E+00 | 1.10E+02 | 1.39E+02 |
| CR-51 | Ci | 0.00E+00 | 0.00E+00 | 2.99E-04 | 0.00E+00 |
| MN-54 | Ci | 0.00E+00 | 0.00E+00 | 4.22E-05 | 2.61E-05 |
| FE-55 | Ci | 2.15E-02 | 7.37E-02 | 1.92E-03 | 1.32E-03 |
| FE-59 | Ci | 0.00E+00 | 0.00E+00 | 2.75E-06 | 0.00E+00 |
| CO-58 | Ci | 0.00E+00 | 0.00E+00 | 6.56E-03 | 3.27E-04 |
| CO-60 | Ci | 0.00E+00 | 0.00E+00 | 3.48E-03 | 1.38E-03 |
| SR-90 | Ci | 0.00E+00 | 0.00E+00 | 7.66E-06 | 2.10E-06 |
| SR-92 | Ci | 0.00E+00 | 0.00E+00 | 1.60E-05 | 0.00E+00 |
| ZR-95 | Ci | 0.00E+00 | 0.00E+00 | 1.53E-04 | 0.00E+00 |
| NB-95 | Ci | 0.00E+00 | 0.00E+00 | 3.60E-04 | 3.11E-06 |
| RU-103 | Ci | 0.00E+00 | 0.00E+00 | 5.65E-06 | 0.00E+00 |
| RU-105 | Ci | 0.00E+00 | 0.00E+00 | 2.37E-05 | 0.00E+00 |
| AG-110M | Ci | 0.00E+00 | 0.00E+00 | 1.11E-03 | 1.55E-04 |
| I-131 | Ci | 0.00E+00 | 0.00E+00 | 8.29E-07 | 0.00E+00 |
| CS-134 | Ci | 0.00E+00 | 0.00E+00 | 1.15E-04 | 5.83E-05 |
| CS-137 | Ci | 0.00E+00 | 0.00E+00 | 6.54E-04 | 2.21E-04 |
| CS-138 | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.96E-06 |

TABLE 2B-1

LIQUID EFFLUENTS

RELEASE(S): ALL - UNIT 1

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|----------|------------|----------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |
| G. ALPHA | Ci | 0.00E+00 | 0.00E+00 | 1.19E-05 | 1.43E-08 |
| NB-97 | Ci | 0.00E+00 | 0.00E+00 | 5.14E-05 | 2.06E-05 |
| SB-125 | Ci | 0.00E+00 | 0.00E+00 | 5.29E-03 | 6.01E-05 |
| CO-57 | Ci | 0.00E+00 | 0.00E+00 | 1.69E-06 | 0.00E+00 |

| | | | | | |
|-----------|----|----------|----------|----------|----------|
| TOTAL FOR | | | | | |
| PERIOD | Ci | 2.15E-02 | 7.37E-02 | 1.10E+02 | 1.39E+02 |
| (ABOVE) | | | | | |

TABLE 2B-1

LIQUID EFFLUENTS - DISSOLVED AND ENTRAINED GASES - UNIT 1

| | | RELEASE(S): ALL | | | |
|------------|---------|-----------------|------------|------------|------------|
| | | CONTINUOUS MODE | | BATCH MODE | |
| : NUCLIDES | : UNITS | : QUARTER | : QUARTER | : QUARTER | : QUARTER |
| : RELEASED | : | : 3 | : 4 | : 3 | : 4 |
| KR-85M | Ci | 0.00E+00 | 0.00E+00 | 7.03E-07 | 0.00E+00 |
| XE-131M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.54E-05 |
| XE-133 | Ci | 0.00E+00 | 0.00E+00 | 1.04E-03 | 8.87E-03 |
| XE-135 | Ci | 0.00E+00 | 0.00E+00 | 5.73E-06 | 2.98E-06 |
| TOTAL FOR | : | : | : | : | : |
| PERIOD | : Ci | : 0.00E+00 | : 0.00E+00 | : 1.05E-03 | : 8.93E-03 |
| (ABOVE) | : | : | : | : | : |

CHAPTER 12

TABLE 2B-2

LIQUID EFFLUENTS

RELEASE(S): ALL - UNIT 2

| | | CONTINUOUS MODE | | BATCH MODE | |
|------------|---------|-----------------|-----------|------------|-----------|
| : NUCLIDES | : UNITS | : QUARTER | : QUARTER | : QUARTER | : QUARTER |
| : RELEASED | : | : 3 | : 4 | : 3 | : 4 |
| H-3 | Ci | 0.00E+00 | 0.00E+00 | 7.43E+01 | 9.28E+01 |
| CR-51 | Ci | 0.00E+00 | 0.00E+00 | 4.00E-05 | 0.00E+00 |
| MN-54 | Ci | 0.00E+00 | 0.00E+00 | 8.74E-05 | 1.08E-04 |
| FE-55 | Ci | 2.15E-02 | 8.05E-02 | 1.35E-03 | 1.58E-03 |
| CO-58 | Ci | 0.00E+00 | 0.00E+00 | 2.30E-03 | 9.22E-04 |
| CO-60 | Ci | 0.00E+00 | 0.00E+00 | 2.09E-03 | 2.27E-03 |
| SR-89 | Ci | 0.00E+00 | 0.00E+00 | 8.24E-07 | 0.00E+00 |
| SR-92 | Ci | 0.00E+00 | 0.00E+00 | 6.68E-06 | 0.00E+00 |
| ZR-95 | Ci | 0.00E+00 | 0.00E+00 | 5.51E-06 | 0.00E+00 |
| NB-95 | Ci | 0.00E+00 | 0.00E+00 | 6.49E-05 | 0.00E+00 |
| AG-110M | Ci | 0.00E+00 | 0.00E+00 | 2.88E-04 | 1.05E-04 |
| CS-134 | Ci | 0.00E+00 | 0.00E+00 | 1.55E-04 | 2.34E-04 |
| CS-137 | Ci | 0.00E+00 | 0.00E+00 | 8.81E-04 | 7.44E-04 |

TABLE 2B-2

LIQUID EFFLUENTS

RELEASE(S): ALL - UNIT 2

| | | CONTINUOUS MODE | | BATCH MODE | |
|----------|-------|-----------------|----------|------------|----------|
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER |
| RELEASED | | 3 | 4 | 3 | 4 |
| G. ALPHA | Ci | 0.00E+00 | 0.00E+00 | 7.29E-06 | 4.37E-08 |
| NB-97 | Ci | 0.00E+00 | 0.00E+00 | 3.97E-05 | 4.47E-05 |
| SB-125 | Ci | 0.00E+00 | 0.00E+00 | 1.36E-03 | 7.95E-05 |

| | | | | | | |
|-----------|---|----------|----------|----------|----------|---|
| TOTAL FOR | : | : | : | : | : | : |
| PERIOD | : | Ci | : | : | : | : |
| (ABOVE) | : | : | : | : | : | : |
| | | 2.15E-02 | 8.05E-02 | 7.43E+01 | 9.28E+01 | |

TABLE 2B-2

LIQUID EFFLUENTS - DISSOLVED AND ENTRAINED GASES - UNIT 2

| RELEASE(S): ALL | | | | | | |
|-----------------|-------|----------|------------|----------|----------|--|
| CONTINUOUS MODE | | | BATCH MODE | | | |
| NUCLIDES | UNITS | QUARTER | QUARTER | QUARTER | QUARTER | |
| RELEASED | | 3 | 4 | 3 | 4 | |
| XE-131M | Ci | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.17E-04 | |
| XE-133 | Ci | 0.00E+00 | 0.00E+00 | 4.56E-04 | 1.23E-02 | |
| XE-135 | Ci | 0.00E+00 | 0.00E+00 | 4.21E-06 | 0.00E+00 | |
| TOTAL FOR | | | | | | |
| PERIOD | Ci | 0.00E+00 | 0.00E+00 | 4.60E-04 | 1.24E-02 | |
| (ABOVE) | | | | | | |

CHAPTER 13

TABLE 3

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

2nd Half, 1991

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

(not irradiated fuel)

| 1. Type of Waste | UNITS | PERIOD July 1 - Dec. 31 |
|--|---------------|----------------------------|
| a. Spent resins, filter sludges, evaporator bottoms, etc. | 3 m Ci* | 1.290E+01 1.020E+03 |
| b. Dry compressible waste, contaminated equipment, etc. | 3 m Ci* | 2.250E+01 1.910E+00 |
| c. Irradiated components, control rods, etc. | 3 m Ci | None None |
| d. Other | 3 m Ci | None None |

* Measured and/or estimated by correlations in accordance with 10 CFR 61.55.

TABLE 3

2. Estimate of major nuclide composition

| | ISOTOPES | % |
|----|----------|-------|
| a. | Ni-63 | 30.90 |
| | Fe-55 | 30.30 |
| | Co-60 | 28.00 |
| | Co-58 | 5.73 |
| | Mn-54 | 2.19 |
| b. | Co-58 | 44.70 |
| | Fe-55 | 16.20 |
| | Co-60 | 9.01 |
| | Pu-241 | 5.97 |
| | Cr-51 | 4.30 |
| | H-3 | 3.00 |
| | Ni-63 | 2.90 |
| | Ba-140 | 2.80 |
| | La-140 | 2.10 |
| | Nb-95 | 2.00 |
| | Zr-95 | 1.50 |
| | Mn-54 | 1.50 |

TABLE 3

TABLE 3 (con't)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

2nd Half, 1991

| | | |
|--|------------------------|--|
| 3. Solid Waste Disposition | | |
| a. | Number of Shipments | 34 |
| b. | Mode of Transportation | Highway |
| c. | Destination | Chem-Nuclear Systems, Inc. Barnwell, South Carolina |
| 4. Type of Container | | |
| a. | (1a) | High Integrity Containers. Strong Tight Containers. |
| b. | (1b) | Strong Tight Containers. |
| c. | (1c) | N/A |
| 5. Solidification Agents | | |
| a. | (1a) | All items shipped dewatered. |
| b. | (1b) | N/A |
| B. IRRADIATED FUEL SHIPMENTS (Disposition) | | |
| 1. | Number of Shipments | None |
| 2. | Mode of Transportation | N/A |
| 3. | Destination | N/A |

CHAPTER 14
TABLE 4A-CQ3

The Quarter 3 cumulative joint frequency table for all releases is contained on the following pages.

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: A

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ENE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ESE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NW | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| NNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VARIABLE | 1 | 5 | 0 | 0 | 0 | 0 | 6 |
| Total | 1 | 6 | 1 | 0 | 0 | 0 | 8 |

Periods of calm(hours): 0
Hours of missing data: 0 (this stability class)
Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: B

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| NE | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| ENE | 0 | 2 | 3 | 0 | 0 | 0 | 5 |
| E | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| ESE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| SE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| WSW | 0 | 3 | 1 | 0 | 0 | 0 | 4 |
| W | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WNW | 1 | 2 | 0 | 0 | 0 | 0 | 3 |
| NW | 0 | 2 | 1 | 0 | 0 | 0 | 3 |
| NNW | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| VARIABLE | 1 | 10 | 0 | 0 | 0 | 0 | 11 |
| Total | 2 | 23 | 8 | 0 | 0 | 0 | 33 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOI² FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: C

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| NE | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| ENE | 0 | 12 | 13 | 0 | 0 | 0 | 25 |
| E | 2 | 10 | 0 | 0 | 0 | 0 | 12 |
| ESE | 0 | 4 | 1 | 0 | 0 | 0 | 5 |
| SE | 1 | 2 | 0 | 0 | 0 | 0 | 3 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 4 | 2 | 0 | 0 | 0 | 6 |
| WSW | 0 | 3 | 1 | 0 | 0 | 0 | 4 |
| W | 0 | 3 | 1 | 0 | 0 | 0 | 4 |
| WNW | 1 | 14 | 9 | 0 | 0 | 0 | 24 |
| NW | 0 | 9 | 8 | 0 | 0 | 0 | 17 |
| NNW | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| VARIABLE | 18 | 19 | 1 | 0 | 0 | 0 | 38 |
| Total | 22 | 81 | 40 | 0 | 0 | 0 | 143 |

Periods of calm(hours): 0
Hours of missing data: 0 (this stability class)
Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: D

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 3 | 2 | 0 | 0 | 0 | 0 | 5 |
| NE | 7 | 24 | 13 | 0 | 0 | 0 | 44 |
| ENE | 17 | 62 | 30 | 0 | 0 | 0 | 109 |
| E | 22 | 28 | 1 | 0 | 0 | 0 | 51 |
| ESE | 20 | 34 | 0 | 0 | 0 | 0 | 54 |
| SE | 10 | 12 | 1 | 0 | 0 | 0 | 23 |
| SSE | 4 | 5 | 0 | 0 | 0 | 0 | 9 |
| S | 4 | 3 | 0 | 0 | 0 | 0 | 7 |
| SSW | 2 | 4 | 2 | 0 | 0 | 0 | 8 |
| SW | 8 | 46 | 9 | 1 | 0 | 0 | 64 |
| WSW | 12 | 32 | 3 | 0 | 0 | 0 | 47 |
| W | 13 | 20 | 1 | 0 | 0 | 0 | 34 |
| WNW | 10 | 49 | 3 | 0 | 0 | 0 | 62 |
| NW | 2 | 36 | 9 | 0 | 0 | 0 | 47 |
| NNW | 0 | 6 | 1 | 0 | 0 | 0 | 7 |
| VARIABLE | 99 | 63 | 6 | 0 | 0 | 0 | 168 |
| Total | 233 | 426 | 79 | 1 | 0 | 0 | 739 |

Periods of calm(hours): 0
Hours of missing data: 0 (this stability class)
Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: E

ALL HOURS IN PERIOD

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 4 | 0 | 0 | 0 | 0 | | 4 |
| NNE | 33 | 9 | 0 | 0 | 0 | 0 | 42 |
| NE | 44 | 35 | 0 | 0 | 0 | 0 | 79 |
| ENE | 29 | 21 | 0 | 0 | 0 | 0 | 50 |
| E | 6 | 13 | 0 | 0 | 0 | 0 | 19 |
| ESE | 9 | 13 | 0 | 0 | 0 | 0 | 22 |
| SE | 9 | 11 | 0 | 0 | 0 | 0 | 20 |
| SSE | 3 | 2 | 7 | 0 | 0 | 0 | 12 |
| S | 6 | 6 | 0 | 0 | 0 | 0 | 12 |
| SSW | 5 | 12 | 2 | 0 | 0 | 0 | 19 |
| SW | 53 | 66 | 12 | 0 | 0 | 0 | 131 |
| WSW | 36 | 16 | 0 | 0 | 0 | 0 | 52 |
| W | 38 | 8 | 1 | 0 | 0 | 0 | 47 |
| WNW | 21 | 9 | 0 | 0 | 0 | 0 | 30 |
| NW | 34 | 6 | 1 | 0 | 0 | 0 | 41 |
| NNW | 13 | 17 | 1 | 0 | 0 | 0 | 31 |
| VARIABLE | 196 | 35 | 3 | 0 | 0 | 0 | 234 |
| Total | 539 | 279 | 27 | 0 | 0 | 0 | 845 |

Periods of calm(hours):

2

Hours of missing data:

0

(this stability clas.)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: F

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 8 | 1 | 0 | 0 | 0 | 0 | 9 |
| NNE | 15 | 1 | 0 | 0 | 0 | 0 | 16 |
| NE | 14 | 2 | 0 | 0 | 0 | 0 | 16 |
| ENE | 11 | 2 | 0 | 0 | 0 | 0 | 13 |
| E | 4 | 0 | 0 | 0 | 0 | 0 | 4 |
| ESE | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| SE | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| SSE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| S | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| SSW | 1 | 3 | 1 | 0 | 0 | 0 | 5 |
| SW | 3 | 7 | 2 | 0 | 0 | 0 | 12 |
| WSW | 11 | 1 | 0 | 0 | 0 | 0 | 12 |
| W | 19 | 5 | 0 | 0 | 0 | 0 | 24 |
| WNW | 17 | 3 | 0 | 0 | 0 | 0 | 20 |
| NW | 15 | 6 | 0 | 0 | 0 | 0 | 21 |
| NNW | 23 | 6 | 0 | 0 | 0 | 0 | 29 |
| VARIABLE | 146 | 7 | 0 | 0 | 0 | 0 | 153 |
| Total | 290 | 47 | 3 | 0 | 0 | 0 | 340 |

Periods of calm(hours):

3

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: G

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 8 | 0 | 0 | 0 | 0 | 0 | 8 |
| NNE | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| NE | 4 | 0 | 0 | 0 | 0 | 0 | 4 |
| ENE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ESE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SE | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 4 | 0 | 0 | 0 | 0 | 0 | 4 |
| WNW | 2 | 1 | 0 | 0 | 0 | 0 | 3 |
| NW | 9 | 0 | 0 | 0 | 0 | 0 | 9 |
| NNW | 30 | 0 | 0 | 0 | 0 | 0 | 30 |
| VARIABLE | 31 | 2 | 0 | 0 | 0 | 0 | 33 |
| Total | 91 | 3 | 0 | 0 | 0 | 0 | 94 |

Periods of calm(hours):

1

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: A

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ENE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ESE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NW | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| NNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VARIABLE | 1 | 5 | 0 | 0 | 0 | 0 | 6 |
| Total | 1 | 6 | 1 | 0 | 0 | 0 | 8 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: B

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| NNE | 0 | 2 | 1 | 0 | 0 | 0 | 3 |
| NE | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| ENE | 0 | 0 | 3 | 1 | 0 | 0 | 4 |
| E | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ESE | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WSW | 0 | 1 | 3 | 0 | 0 | 0 | 4 |
| W | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NW | 0 | 3 | 1 | 0 | 0 | 0 | 4 |
| NNW | 1 | 1 | 1 | 0 | 0 | 0 | 3 |
| VARIABLE | 0 | 10 | 1 | 0 | 0 | 0 | 11 |
| Total | 1 | 19 | 12 | 1 | 0 | 0 | 33 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: C

ALL HOURS IN PERIOD

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 9-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| NNE | 1 | 4 | 2 | 0 | 0 | 0 | 7 |
| NE | 0 | 5 | 3 | 1 | 0 | 0 | 9 |
| ENE | 0 | 3 | 11 | 5 | 0 | 0 | 19 |
| E | 1 | 0 | 4 | 0 | 0 | 0 | 5 |
| ESE | 0 | 7 | 2 | 0 | 0 | 0 | 9 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| WSW | 0 | 1 | 5 | 0 | 0 | 0 | 6 |
| W | 0 | 2 | 1 | 0 | 0 | 0 | 3 |
| WNW | 0 | 4 | 6 | 2 | 0 | 0 | 12 |
| NW | 1 | 12 | 13 | 0 | 0 | 0 | 26 |
| NNW | 1 | 3 | 6 | 0 | 0 | 0 | 10 |
| VARIABLE | 13 | 17 | 2 | 0 | 0 | 0 | 32 |
| Total | 18 | 60 | 57 | 8 | 0 | 0 | 143 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: D

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 4 | 2 | 0 | 0 | 0 | 0 | 6 |
| NNE | 4 | 7 | 2 | 0 | 0 | 0 | 13 |
| NE | 7 | 17 | 20 | 2 | 0 | 0 | 46 |
| ENE | 6 | 41 | 45 | 11 | 0 | 0 | 103 |
| E | 5 | 25 | 9 | 1 | 0 | 0 | 40 |
| ESE | 2 | 20 | 2 | 0 | 0 | 0 | 24 |
| SE | 4 | 18 | 5 | 0 | 0 | 0 | 27 |
| SSE | 2 | 3 | 4 | 1 | 0 | 0 | 10 |
| S | 1 | 2 | 1 | 0 | 0 | 0 | 4 |
| SSW | 2 | 6 | 2 | 0 | 0 | 0 | 10 |
| SW | 3 | 21 | 28 | 1 | 0 | 0 | 53 |
| WSW | 3 | 26 | 14 | 1 | 0 | 0 | 44 |
| W | 4 | 24 | 10 | 0 | 0 | 0 | 38 |
| WNW | 2 | 31 | 9 | 2 | 0 | 0 | 44 |
| NW | 4 | 36 | 24 | 4 | 0 | 0 | 68 |
| NNW | 2 | 12 | 6 | 0 | 0 | 0 | 20 |
| VARIABLE | 100 | 73 | 14 | 2 | 0 | 0 | 189 |
| Total | 155 | 364 | 195 | 25 | 0 | 0 | 739 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: E

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 6 | 2 | 0 | 0 | 0 | 8 |
| NNE | 5 | 17 | 4 | 0 | 0 | 0 | 26 |
| NE | 3 | 44 | 26 | 0 | 0 | 0 | 73 |
| ENE | 9 | 45 | 35 | 0 | 0 | 0 | 89 |
| E | 1 | 36 | 3 | 0 | 0 | 0 | 40 |
| ESE | 4 | 9 | 9 | 0 | 0 | 0 | 22 |
| SE | 2 | 11 | 9 | 0 | 0 | 0 | 22 |
| SSE | 1 | 12 | 10 | 1 | 0 | 0 | 24 |
| S | 3 | 6 | 2 | 1 | 0 | 0 | 12 |
| SSW | 3 | 10 | 7 | 0 | 0 | 0 | 20 |
| SW | 6 | 46 | 68 | 1 | 0 | 0 | 121 |
| WSW | 3 | 54 | 23 | 0 | 0 | 0 | 80 |
| W | 9 | 32 | 7 | 1 | 0 | 0 | 49 |
| WNW | 6 | 33 | 16 | 0 | 0 | 0 | 55 |
| NW | 5 | 13 | 16 | 1 | 0 | 0 | 35 |
| NNW | 2 | 10 | 9 | 0 | 0 | 0 | 21 |
| VARIABLE | 65 | 69 | 14 | 1 | 0 | 0 | 149 |
| Total | 127 | 453 | 260 | 6 | 0 | 0 | 846 |

Periods of calm(hours):

1

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: F

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 6 | 5 | 0 | 0 | 0 | 11 |
| NNE | 0 | 10 | 7 | 0 | 0 | 0 | 17 |
| NE | 3 | 16 | 22 | 0 | 0 | 0 | 41 |
| ENE | 2 | 22 | 12 | 0 | 0 | 0 | 36 |
| E | 3 | 7 | 6 | 0 | 0 | 0 | 16 |
| ESE | 0 | 3 | 2 | 0 | 0 | 0 | 5 |
| SE | 0 | 3 | 0 | 0 | 0 | 0 | 3 |
| SSE | 0 | 0 | 1 | 1 | 0 | 0 | 2 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 2 | 4 | 4 | 0 | 0 | 0 | 10 |
| SW | 0 | 5 | 7 | 3 | 0 | 0 | 15 |
| WSW | 2 | 8 | 7 | 0 | 0 | 0 | 17 |
| W | 1 | 16 | 9 | 0 | 0 | 0 | 26 |
| WNW | 1 | 21 | 7 | 0 | 0 | 0 | 29 |
| NW | 3 | 13 | 8 | 0 | 0 | 0 | 24 |
| NNW | 3 | 8 | 9 | 0 | 0 | 0 | 20 |
| VARIABLE | 32 | 33 | 6 | 0 | 0 | 0 | 71 |
| Total | 52 | 175 | 112 | 4 | 0 | 0 | 343 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ3

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JUL-91 00:00 TO 30-SEP-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: G

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 3 | 1 | 0 | 0 | 0 | 4 |
| NNE | 1 | 8 | 12 | 0 | 0 | 0 | 21 |
| NE | 2 | 4 | 7 | 0 | 0 | 0 | 13 |
| ENE | 0 | 6 | 4 | 0 | 0 | 0 | 10 |
| E | 0 | 3 | 0 | 0 | 0 | 0 | 3 |
| ESE | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| SE | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| SSE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| SW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| WNW | 0 | 2 | 3 | 0 | 0 | 0 | 5 |
| NW | 0 | 2 | 8 | 0 | 0 | 0 | 10 |
| NNW | 3 | 2 | 2 | 0 | 0 | 0 | 7 |
| VARIABLE | 8 | 6 | 2 | 0 | 0 | 0 | 16 |
| Total | 17 | 39 | 39 | 0 | 0 | 0 | 95 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

CHAPTER 15

TABLE 4A-CQ4

The Quarter 4 cumulative joint frequency table for all releases is contained on the following pages.

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: A

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ENE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| ESE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| SW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VARIABLE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Total | 0 | 4 | 0 | 0 | 0 | 0 | 4 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: B

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| NNE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| NE | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| ENE | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| E | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| ESE | 0 | 3 | 1 | 0 | 0 | 0 | 4 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| WSW | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| W | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WNW | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| NW | 0 | 0 | 2 | 2 | 0 | 0 | 4 |
| NNW | 0 | 1 | 7 | 1 | 0 | 0 | 9 |
| VARIABLE | 1 | 5 | 2 | 0 | 0 | 0 | 8 |
| Total | 1 | 12 | 19 | 4 | 0 | 0 | 36 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: C

ALL HOURS IN PERIOD

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 1 | 2 | 0 | 0 | 0 | 3 |
| NNE | 0 | 2 | 4 | 0 | 0 | 0 | 6 |
| NE | 0 | 2 | 7 | 0 | 0 | 0 | 9 |
| ENE | 0 | 1 | 6 | 0 | 0 | 0 | 7 |
| E | 0 | 4 | 2 | 0 | 0 | 0 | 6 |
| ESE | 0 | 4 | 4 | 0 | 0 | 0 | 8 |
| SE | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| SSE | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| WSW | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| W | 0 | 2 | 2 | 0 | 0 | 0 | 4 |
| WNW | 0 | 3 | 0 | 0 | 0 | 0 | 3 |
| NW | 0 | 3 | 7 | 0 | 0 | 0 | 10 |
| NNW | 0 | 3 | 8 | 3 | 0 | 0 | 14 |
| VARIABLE | 4 | 15 | 7 | 1 | 0 | 0 | 27 |
| Total | 4 | 43 | 52 | 4 | 0 | 0 | 103 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: D

ALL HOURS IN PERIOD

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 7 | 11 | 3 | 0 | 0 | 0 | 21 |
| NNE | 6 | 22 | 1 | 0 | 0 | 0 | 29 |
| NE | 3 | 54 | 12 | 0 | 0 | 0 | 69 |
| ENE | 6 | 34 | 30 | 6 | 0 | 0 | 76 |
| E | 1 | 44 | 13 | 0 | 0 | 0 | 58 |
| ESE | 1 | 28 | 6 | 0 | 0 | 0 | 35 |
| SE | 2 | 20 | 10 | 0 | 0 | 0 | 32 |
| SSE | 2 | 4 | 17 | 2 | 0 | 0 | 25 |
| S | 0 | 4 | 4 | 1 | 0 | 0 | 9 |
| SSW | 1 | 1 | 7 | 11 | 0 | 0 | 20 |
| SW | 1 | 10 | 8 | 0 | 0 | 0 | 19 |
| WSW | 2 | 15 | 2 | 0 | 0 | 0 | 19 |
| W | 2 | 11 | 0 | 0 | 0 | 0 | 13 |
| WNW | 1 | 11 | 3 | 0 | 0 | 0 | 15 |
| NW | 5 | 27 | 21 | 2 | 0 | 0 | 55 |
| NNW | 7 | 57 | 68 | 1 | 0 | 0 | 133 |
| VARIABLE | 47 | 86 | 8 | 0 | 0 | 0 | 141 |
| Total | 94 | 439 | 213 | 23 | 0 | 0 | 769 |

Periods of calm(hours): 0
Hours of missing data: 0 (this stability class)
Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: E

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 8 | 3 | 0 | 0 | 0 | 0 | 11 |
| NNE | 17 | 21 | 0 | 0 | 0 | 0 | 38 |
| NE | 22 | 42 | 1 | 0 | 0 | 0 | 65 |
| E.NE | 26 | 45 | 1 | 0 | 0 | 0 | 72 |
| E | 10 | 20 | 0 | 0 | 0 | 0 | 30 |
| ESE | 6 | 33 | 0 | 0 | 0 | 0 | 39 |
| SE | 5 | 29 | 25 | 0 | 0 | 0 | 59 |
| SSE | 2 | 8 | 9 | 0 | 0 | 0 | 19 |
| S | 0 | 3 | 3 | 0 | 0 | 0 | 6 |
| SSW | 0 | 5 | 6 | 1 | 0 | 0 | 12 |
| SW | 0 | 10 | 18 | 0 | 0 | 0 | 28 |
| WSW | 1 | 16 | 1 | 0 | 0 | 0 | 18 |
| W | 4 | 1 | 1 | 0 | 0 | 0 | 6 |
| WNW | 9 | 5 | 4 | 0 | 0 | 0 | 18 |
| NW | 6 | 32 | 4 | 0 | 0 | 0 | 42 |
| NNW | 6 | 80 | 10 | 0 | 0 | 0 | 96 |
| VARIABLE | 51 | 8 | 0 | 0 | 0 | 0 | 59 |
| Total | 173 | 361 | 83 | 1 | 0 | 0 | 618 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: F

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 9 | 1 | 0 | 0 | 0 | 0 | 10 |
| NNE | 28 | 4 | 0 | 0 | 0 | 0 | 32 |
| NE | 14 | 4 | 0 | 0 | 0 | 0 | 18 |
| ENE | 10 | 11 | 1 | 0 | 0 | 0 | 22 |
| E | 8 | 2 | 0 | 0 | 0 | 0 | 10 |
| ESE | 2 | 9 | 0 | 0 | 0 | 0 | 11 |
| SE | 0 | 3 | 1 | 0 | 0 | 0 | 4 |
| SSE | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| S | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 8 | 0 | 0 | 0 | 0 | 8 |
| WSW | 2 | 8 | 0 | 0 | 0 | 0 | 10 |
| W | 5 | 2 | 0 | 0 | 0 | 0 | 7 |
| WNW | 6 | 3 | 0 | 0 | 0 | 0 | 9 |
| NW | 6 | 14 | 0 | 0 | 0 | 0 | 20 |
| NNW | 25 | 22 | 0 | 0 | 0 | 0 | 47 |
| VARIABLE | 60 | 5 | 0 | 0 | 0 | 0 | 65 |
| Total | 175 | 97 | 4 | 0 | 0 | 0 | 276 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: G

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 61 | 22 | 0 | 0 | 0 | 0 | 83 |
| NNE | 17 | 4 | 0 | 0 | 0 | 0 | 21 |
| NE | 7 | 0 | 0 | 0 | 0 | 0 | 7 |
| ENE | 6 | 0 | 0 | 0 | 0 | 0 | 6 |
| E | 2 | 2 | 0 | 0 | 0 | 0 | 4 |
| ESE | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| SE | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| SSE | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| S | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| WSW | 1 | 4 | 0 | 0 | 0 | 0 | 5 |
| W | 8 | 2 | 0 | 0 | 0 | 0 | 10 |
| WNW | 4 | 0 | 0 | 0 | 0 | 0 | 4 |
| NW | 17 | 1 | 0 | 0 | 0 | 0 | 18 |
| NNW | 56 | 9 | 0 | 0 | 0 | 0 | 65 |
| VARIABLE | 167 | 4 | 0 | 0 | 0 | 0 | 171 |
| Total | 349 | 50 | 1 | 0 | 0 | 0 | 400 |

Periods of calm(hours): 2

Hours of missing data: 0

Hours of missing data: 0

2

0

0

(this stability class)

(this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: A

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ENE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| ESE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VARIABLE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Total | 0 | 4 | 0 | 0 | 0 | 0 | 4 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: B

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 0 | 2 | 1 | 0 | 0 | 0 | 3 |
| NE | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| ENE | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| E | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| ESE | 0 | 0 | 4 | 0 | 0 | 0 | 4 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| WNW | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| NW | 0 | 0 | 1 | 2 | 0 | 0 | 3 |
| NNW | 0 | 0 | 5 | 5 | 0 | 0 | 10 |
| VARIABLE | 0 | 4 | 3 | 1 | 0 | 0 | 8 |
| Total | 0 | 7 | 19 | 10 | 0 | 0 | 36 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: C

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 3 | 1 | 0 | 0 | 4 |
| NNE | 0 | 4 | 6 | 0 | 0 | 0 | 10 |
| NE | 0 | 2 | 5 | 2 | 0 | 0 | 9 |
| ENE | 0 | 0 | 6 | 0 | 0 | 0 | 6 |
| E | 0 | 2 | 5 | 1 | 0 | 0 | 8 |
| ESE | 0 | 2 | 6 | 0 | 0 | 0 | 8 |
| SE | 0 | 0 | 3 | 0 | 0 | 0 | 3 |
| SSE | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 0 | 1 | 4 | 0 | 0 | 0 | 5 |
| WNW | 0 | 1 | 3 | 0 | 0 | 0 | 4 |
| NW | 0 | 2 | 4 | 3 | 0 | 0 | 9 |
| NNW | 0 | 0 | 6 | 5 | 0 | 0 | 11 |
| VARIABLE | 1 | 10 | 9 | 3 | 0 | 0 | 23 |
| Total | 1 | 25 | 60 | 17 | 0 | 0 | 103 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: D

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m level | | | | | | TOTAL |
|----------------|----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 4 | 12 | 19 | 4 | 0 | 0 | 39 |
| NNE | 3 | 20 | 8 | 3 | 0 | 0 | 34 |
| NE | 3 | 22 | 41 | 0 | 0 | 0 | 66 |
| ENE | 1 | 28 | 41 | 8 | 0 | 0 | 78 |
| E | 2 | 23 | 35 | 3 | 0 | 0 | 63 |
| ESE | 0 | 24 | 20 | 0 | 0 | 0 | 44 |
| SE | 1 | 13 | 16 | 0 | 0 | 0 | 30 |
| SSE | 1 | 2 | 14 | 16 | 0 | 0 | 33 |
| S | 0 | 4 | 5 | 4 | 0 | 0 | 13 |
| SSW | 0 | 1 | 3 | 15 | 4 | 0 | 23 |
| SW | 1 | 4 | 6 | 3 | 0 | 0 | 14 |
| WSW | 1 | 6 | 4 | 2 | 0 | 0 | 13 |
| W | 2 | 12 | 3 | 0 | 0 | 0 | 17 |
| WNW | 2 | 5 | 6 | 1 | 0 | 0 | 14 |
| NW | 0 | 8 | 22 | 15 | 1 | 0 | 46 |
| NNW | 4 | 7 | 44 | 22 | 0 | 0 | 77 |
| VARIABLE | 33 | 55 | 21 | 5 | 0 | 0 | 114 |
| Total | 58 | 246 | 308 | 101 | 5 | 0 | 718 |

Periods of calm(hours):

51

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: E

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 10 | 12 | 0 | 0 | 0 | 22 |
| NNE | 2 | 7 | 9 | 0 | 0 | 0 | 18 |
| NE | 2 | 17 | 33 | 0 | 0 | 0 | 52 |
| ENE | 0 | 38 | 49 | 0 | 0 | 0 | 87 |
| E | 1 | 12 | 36 | 0 | 0 | 0 | 49 |
| ESE | 2 | 13 | 29 | 0 | 0 | 0 | 44 |
| SE | 0 | 7 | 30 | 0 | 0 | 0 | 37 |
| SSE | 2 | 8 | 24 | 22 | 0 | 0 | 56 |
| S | 2 | 4 | 6 | 2 | 0 | 0 | 14 |
| SSW | 0 | 1 | 9 | 13 | 0 | 0 | 23 |
| SW | 0 | 4 | 15 | 6 | 0 | 0 | 25 |
| WSW | 1 | 1 | 11 | 1 | 0 | 0 | 14 |
| W | 0 | 2 | 3 | 1 | 0 | 0 | 6 |
| WNW | 0 | 7 | 5 | 3 | 0 | 0 | 15 |
| NW | 0 | 2 | 36 | 9 | 0 | 0 | 47 |
| NNW | 0 | 7 | 53 | 5 | 0 | 0 | 65 |
| VARIABLE | 9 | 16 | 7 | 0 | 0 | 0 | 32 |
| Total | 21 | 156 | 367 | 62 | 0 | 0 | 606 |

Periods of calm(hours):

12

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: F

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 9 | 6 | 0 | 0 | 0 | 15 |
| NNE | 0 | 4 | 10 | 0 | 0 | 0 | 14 |
| NE | 0 | 4 | 21 | 0 | 0 | 0 | 25 |
| ENE | 0 | 15 | 36 | 0 | 0 | 0 | 51 |
| E | 0 | 10 | 15 | 0 | 0 | 0 | 25 |
| ESE | 0 | 1 | 11 | 0 | 0 | 0 | 12 |
| SE | 2 | 3 | 4 | 0 | 0 | 0 | 9 |
| SSE | 1 | 3 | 4 | 4 | 0 | 0 | 12 |
| S | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| SSW | 2 | 5 | 0 | 0 | 0 | 0 | 7 |
| SW | 1 | 1 | 6 | 3 | 0 | 0 | 11 |
| WSW | 2 | 0 | 4 | 0 | 0 | 0 | 6 |
| W | 0 | 3 | 3 | 0 | 0 | 0 | 6 |
| WNW | 0 | 1 | 5 | 0 | 0 | 0 | 6 |
| NW | 1 | 1 | 17 | 0 | 0 | 0 | 19 |
| NNW | 0 | 1 | 20 | 1 | 0 | 0 | 22 |
| VARIABLE | 5 | 9 | 6 | 0 | 0 | 0 | 20 |
| Total | 14 | 70 | 170 | 8 | 0 | 0 | 262 |

Periods of calm(hours):

14

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 4A-CQ4

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-OCT-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: G

ALL HOURS IN PERIOD

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 10 | 18 | 8 | 0 | 0 | 0 | 36 |
| NNE | 3 | 12 | 47 | 0 | 0 | 0 | 62 |
| NE | 1 | 18 | 38 | 0 | 0 | 0 | 57 |
| ENE | 2 | 16 | 18 | 0 | 0 | 0 | 36 |
| E | 0 | 6 | 12 | 0 | 0 | 0 | 18 |
| ESE | 2 | 7 | 8 | 0 | 0 | 0 | 17 |
| SE | 1 | 4 | 3 | 0 | 0 | 0 | 8 |
| SSE | 3 | 1 | 0 | 0 | 0 | 0 | 4 |
| S | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| SSW | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| SW | 4 | 2 | 0 | 0 | 0 | 0 | 6 |
| WSW | 5 | 3 | 0 | 0 | 0 | 0 | 8 |
| W | 6 | 9 | 5 | 0 | 0 | 0 | 20 |
| WNW | 2 | 7 | 3 | 0 | 0 | 0 | 12 |
| NW | 2 | 4 | 13 | 0 | 0 | 0 | 19 |
| NNW | 3 | 14 | 32 | 0 | 0 | 0 | 49 |
| VARIABLE | 11 | 20 | 6 | 0 | 0 | 0 | 37 |
| Total | 55 | 144 | 193 | 0 | 0 | 0 | 392 |

Periods of calm(hours):

10

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

CHAPTER 16

TABLE 4A-1BQ3

There were no batch releases on Unit 1 during Quarter 3.

CHAPTER 17
TABLE 4A-1BQ4

There were no batch releases on Unit 1 during Quarter 4.

CHAPTER 18

TABLE 4A-2BQ3

There were no batch releases on Unit 2 during Quarter 3.

CHAPTER 19

TABLE 4A-2BQ4

There were no batch releases on Unit 2 during Quarter 4.

CHAPTER 20

TABLE 4B

TABLE 4B
CLASSIFICATION OF ATMOSPHERIC STABILITY

| Stability Classification | Pasquill Categories | σ_{θ} ^a (degrees) | Temperature channel with height (° F/51m) |
|-----------------------------|------------------------|---|--|
| Extremely unstable | A | 25.0 | <-1.74 |
| Moderately unstable | B | 20.0 | -1.74 to -1.56 |
| Slightly unstable | C | 15.0 | -1.56 to -1.38 |
| Neutral | D | 10.0 | -1.38 to -0.46 |
| Slightly stable | E | 5.0 | -0.46 to 1.38 |
| Moderately stable | F | 2.5 | 1.38 to 3.6 |
| Extremely stable | G | 1.7 | >3.6 |

a Standard deviations of horizontal wind direction fluctuation over a period of 15 minutes to 1 hour. The values shown are averages for each stability classification.

CHAPTER 21

TABLE 5

TABLE 5

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM
 FARLEY NUCLEAR PLANT - UNITS 1 & 2

| a, h | | | | |
|---|--------------------------|----------------------------|---------------------------|--|
| Gaseous Release Type | Sampling Frequency | Minimum Analysis Frequency | Type of Activity Analysis | Minimum Detectable Concentration (MDC) ($\mu\text{Ci/ml}$) |
| A. Waste Gas Storage Tank | Each Tank Grab Sample P | Each Tank P | Principle Gamma Emitters | ^{g, j} 1E-04 |
| B. Containment Purge | Each Purge Grab Sample P | Each Purge Grab Sample P | Principle Gamma Emitters | ^{g, j} 1E-04 |
| | | | H-3 | 1E-06 |
| C. Condenser Steam Jet Air Ejector Plant Vent Stack | M-b, c, e Grab Sample | b M | Principle Gamma Emitters | ^{g, j} 1E-04 |
| | | | H-3 | 1E-06 |

TABLE 5

TABLE 5 (Continued)

| Gaseous Release Type | Sampling Frequency | Minimum Analysis Frequency | Type of Activity Analysis | Minimum Detectable Concentration (MDC) (uCi/ml) |
|---------------------------------------|--------------------|------------------------------|---|---|
| D. Plant Vent Stack Containment Purge | f | | | a,h |
| | Continuous | Charcoal Sample | I-131 | 1E-12 |
| | Charcoal | Sample d | | |
| | | W | I-133 | 1E-10 |
| | f | | | |
| | Continuous | Particulate Sample d | Principle ^g Gamma Emitters (I-131, Others) | 1E-11 |
| | W | | | |
| f | | | | |
| Continuous | M i | Composite Particulate Sample | Gross Alpha | 1E-11 |
| f | | | | |
| Continuous | Q i | Composite Particulate Sample | Sr-89, Sr-90 | 1E-11 |
| f | | | | |
| Continuous | | Noble Gas Monitor | Noble Gases Gross Beta and Gamma | 1E-06 |

TABLE 5 (Continued)

TABLE NOTATION

- a. The MDC is the smallest concentration of radioactive material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$\text{MDC} = 4.66 \frac{s}{b} / E * V * 2.22 \times 10^6 * Y * \exp(-\lambda \Delta t)$$

where:

MDC is the "a priori" lower limit of detection as defined above (as microcurie per unit mass or volume),

s is the standard deviation of the background counting rate
 b
 or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency (as counts per transformation),

V is the sample size (in units mass or volume),

2.22×10^6 is the number of transformations per minute per microcurie,

Y is the fractional radiochemical yield (when applicable),

λ is the radioactive decay constant for the particular radionuclide, and

Δt is the elapsed time between midpoint of sample collection and time of counting (for plant effluents, not environmental samples).

The value of s used in the calculation of the MDC for a
 b
 detection system shall be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. Typical values of E , V , Y , and Δt shall be used in the calculation.

TABLE 5

TABLE 5 (Continued)

TABLE NOTATION

- b. Analyses shall also be performed following shutdown from $>$ or $=$ 15% RATED THERMAL POWER, startup to $>$ or $=$ 15% RATED THERMAL POWER or a THERMAL POWER change exceeding 15% of the RATED THERMAL POWER within a one hour period.
- c. Tritium grab samples shall be taken from the plant vent stack at least once per 24 hours when the refueling canal is flooded.
- d. Samples shall be changed at least once per 7 days and analyses shall be completed within 48 hours after changing (or after removal from sampler). Sampling shall also be performed at least once per 24 hours for at least 2 days following each shutdown from $>$ or $=$ 15% RATED THERMAL POWER, startup to $>$ or $=$ 15% RATED THERMAL POWER or THERMAL POWER change exceeding 15% of RATED THERMAL POWER in one hour and analyses shall be completed within 48 hours of changing. When samples collected for 24 hours are analyzed, the corresponding MDC may be increased by a factor of 10.
- e. Tritium grab samples shall be taken at least once per 7 days from the ventilation exhaust from the spent fuel pool area, whenever spent fuel is in the spent fuel pool.
- f. The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with Specifications 3.11.2.1, 3.11.2.2 and 3.11.2.3.
- g. The principle gamma emitters for which the MDC specification applies exclusively are the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141 and Ce-144 for particulate emissions. This list does not mean that only these nuclides are to be detected and reported. Other which are measurable and identifiable, together with the above nuclides, shall also be identified and reported.
- h. Deviations from MDC requirements of Table 4.11-2 shall be reported per Specification 6.9.1.8 in lieu of any other report.
- i. A composite particulate sample is one in which the quantity of air sampled is proportional to the quantity of air discharged. Either a specimen which is representative of the air discharged may be accumulated and analyzed or the individual samples may be analyzed and weighted in proportion to their respective volume discharged.

TABLE 5

TABLE 5 (Continued)

- j. The principle gamma emitters for which the MDC specification applies exclusively are the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 for gaseous emissions. This does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable together with the above nuclides, shall also be identified and reported.

TABLE 5

TABLE 5 (Continued)

TYPICAL GAS MDC'S FOR RCLS
COUNTING SYSTEM

| Nuclide ----- | MDC (uCi/ml) ----- | Nuclide ----- | MDC (uCi/ml) ----- |
|------------------|-------------------------|------------------|-------------------------|
| Mn-54 | 1.46E-14 | Ce-144 | 5.08E-14 |
| Fe-59 | 4.51E-14 | Kr-87 | 3.44E-08 |
| Co-58 | 1.55E-14 | Kr-88 | 4.71E-08 |
| Co-60 | 2.81E-14 | Xe-133 | 6.30E-08 |
| Zn-65 | 3.04E-14 | Xe-133M | 1.54E-07 |
| Mo-99 | 1.02E-13 | Xe-135 | 1.91E-08 |
| Cs-134 | 4.08E-11 | Xe-138 | 5.04E-08 |
| Cs-137 | 1.31E-14 | I-131 | 3.20E-14 |
| Ce-141 | 1.13E-14 | I-133 | 2.87E-14 |

CHAPTER 22

TABLE 6

TABLE 6

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM
 FARLEY NUCLEAR PLANT - UNITS 1 & 2

| Liquid Release Type | Sampling Frequency | Minimum Analysis Frequency | Type of Activity Analysis | Minimum Detectable Concentration (MDC) (uCi/ml) |
|---|-----------------------------|----------------------------|--|---|
| A. Batch Waste Release Tanks ^c | P Each Batch | P Each Batch | Principle Gamma Emitters ^e | 5E-07 |
| | | | | I-131 |
| | One Batch/M | M | Dissolved & Entrained Gases (Gamma Emitters) | 1E-05 |
| P Each Batch | M ^b Composite | H-3 | 1E-05 | |
| | | Gross Alpha | 1E-07 | |

TABLE 6

TABLE 6 (Continued)

| Liquid Release Type | Sampling Frequency | Minimum Analysis Frequency | Type of Activity Analysis | Minimum Detectable Concentration (MDC) ($\mu\text{Ci/ml}$) |
|---------------------------------------|--------------------|----------------------------|---|--|
| | P Each Batch | b Q Composite | Sr-89, Sr-90 Fe-55 | 5E-08 1E-06 |
| B. Continuous Releases ^{d,f} | D Grab Sample | b W Composite | Principle ^e Gamma Emitters I-131 | 5E-07 1E-06 |
| 1. Steam Generator Blowdown | M Grab Sample | M | Dissolved & Entrained Gases (Gamma Emitters) | 1E-05 |
| | D Grab Sample | b M Composite | H-3 Gross Alpha | 1E-05 1E-07 |
| | D Grab Sample | b Q Composite | Sr-89, Sr-90 Fe-55 | 5E-08 1E-06 |
| 2. Turbine Building Sump | P Grab Sample | b W Composite | Principle ^e Gamma Emitters H-3 | 5E-07 1E-05 |

TABLE 6

TABLE 6 (Continued)

TABLE NOTATION

- a. The MDC is the smallest concentration of radioactive material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$\text{MDC} = \frac{4.66 s_b}{E * V * 2.22 \times 10^6 * Y * \exp(-\lambda \Delta t)}$$

where:

MDC is the "a priori" lower limit of detection as defined above (as microcurie per unit mass or volume),

s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency (as counts per transformation),

V is the sample size (in units mass or volume),

2.22×10^6 is the number of transformations per minute per microcurie,

Y is the fractional radiochemical yield (when applicable),

λ is the radioactive decay constant for the particular radionuclide, and

Δt is the elapsed time between midpoint of sample collection and time of counting (for plant effluents, not environmental samples).

The value of s_b used in the calculation of the MDC for a detection system shall be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. Typical values of E, V, Y, and Δt shall be used in the calculation.

TABLE 6

TABLE 6 (Continued)

TABLE NOTATION

- b. A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen which is representative of the liquids released.
- c. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated, and then thoroughly mixed, by a method described in the OLM, to assure representative sampling.
- d. A continuous release is the discharge of liquid wastes of a nondiscrete volume; e.g., from a volume of system that has an input flow during the effluent release.
- e. The principle gamma emitters for which the MDC specification applies exclusively are the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall also be identified and reported.
- f. Sampling will be performed only if the effluent will be discharged to the environment.
- g. Deviation from the MDC requirements of Table 4.11-1 of the TS shall be reported per Specification 6.9.1.8 in lieu of any other report.

TABLE 6

TABLE 6 (Continued)

TYPICAL LIQUID MDC'S FOR RCLS
COUNTING SYSTEM

| Nuclide ----- | MDC (uCi/ml) ----- | Nuclide ----- | MDC (uCi/ml) ----- |
|------------------|-------------------------|------------------|-------------------------|
| Mn-54 | 2.88E-08 | I-131 | 2.13E-08 |
| Co-58 | 2.15E-08 | Cs-134 | 1.75E-08 |
| Fe-59 | 4.43E-08 | Cs-137 | 2.67E-08 |
| Co-60 | 3.86E-08 | Ce-141 | 3.40E-08 |
| Zn-65 | 7.94E-08 | Ce-144 | 1.65E-07 |
| Mo-99 | 1.88E-07 | | |

CHAPTER 23

TABLE 7

TABLE 7

LIQUID DISCHARGES NOT MEETING SPECIFIED DETECTION LIMITS
Farley Units 1 & 2 - 2nd half, 1991

| | |
|------------------------------------|------|
| Batch # | N/A* |
| Date | N/A |
| Count Time in Seconds | N/A |
| Volume Discharged in Gallons | N/A |
| Dilution Water in Gallons | N/A |
| Total Isotopic Activity (uCi/ml) | N/A |
| Isotope of Interest | N/A |
| MDC Measured | N/A |
| % of Total Isotopic Activity | N/A |
| % of Total Dose | N/A |

* No liquid discharges made that did not meet specified detection limits.

CHAPTER 24

TABLE 8-CA

The annual cumulative joint frequency table for all releases is contained on the following pages.

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: A

ALL HOURS IN PERIOD

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ENE | 0 | 0 | 3 | 0 | 0 | 0 | 3 |
| E | 2 | 1 | 0 | 0 | 0 | 0 | 3 |
| ESE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SE | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| SSE | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 2 | 0 | 2 | 0 | 0 | 4 |
| SW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WNW | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| NW | 0 | 0 | 1 | 0 | 3 | 0 | 4 |
| NNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VARIABLE | 1 | 6 | 0 | 0 | 0 | 0 | 7 |
| Total | 4 | 11 | 5 | 2 | 4 | 0 | 26 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: B

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| NNE | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| NE | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| ENE | 1 | 4 | 14 | 2 | 0 | 0 | 21 |
| E | 0 | 2 | 5 | 0 | 0 | 0 | 7 |
| ESE | 0 | 4 | 1 | 0 | 0 | 0 | 5 |
| SE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| SSE | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 1 | 2 | 1 | 0 | 4 |
| SW | 0 | 3 | 2 | 0 | 1 | 0 | 6 |
| WSW | 0 | 7 | 1 | 0 | 0 | 0 | 8 |
| W | 0 | 1 | 3 | 0 | 0 | 0 | 4 |
| WNW | 1 | 5 | 6 | 1 | 1 | 0 | 14 |
| NW | 0 | 5 | 10 | 2 | 1 | 0 | 18 |
| NNW | 0 | 2 | 12 | 1 | 0 | 0 | 15 |
| VARIABLE | 2 | 19 | 7 | 1 | 0 | 0 | 29 |
| Total | 5 | 55 | 64 | 10 | 4 | 0 | 138 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: C

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 3 | 5 | 0 | 0 | 0 | 8 |
| NNE | 1 | 4 | 4 | 0 | 0 | 0 | 9 |
| NE | 0 | 2 | 18 | 0 | 0 | 0 | 20 |
| ENE | 1 | 18 | 22 | 0 | 0 | 0 | 41 |
| E | 3 | 19 | 5 | 0 | 0 | 0 | 27 |
| ESE | 0 | 12 | 8 | 1 | 0 | 0 | 21 |
| SE | 1 | 2 | 2 | 0 | 0 | 0 | 5 |
| SSE | 0 | 1 | 2 | 0 | 0 | 0 | 3 |
| S | 1 | 2 | 1 | 0 | 0 | 0 | 4 |
| SSW | 0 | 2 | 5 | 0 | 1 | 0 | 8 |
| SW | 0 | 20 | 10 | 1 | 0 | 0 | 31 |
| WSW | 1 | 18 | 3 | 2 | 0 | 0 | 24 |
| W | 2 | 10 | 7 | 0 | 0 | 0 | 19 |
| WNW | 2 | 28 | 17 | 3 | 1 | 0 | 51 |
| NW | 0 | 15 | 36 | 1 | 0 | 0 | 52 |
| NNW | 0 | 8 | 22 | 3 | 0 | 0 | 33 |
| VARIABLE | 26 | 49 | 15 | 1 | 0 | 0 | 91 |
| Total | 38 | 213 | 182 | 12 | 2 | 0 | 447 |

Periods of calm(hours): 0

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: D

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|------|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 14 | 34 | 6 | 0 | 0 | 0 | 54 |
| NNE | 18 | 87 | 10 | 0 | 0 | 0 | 115 |
| NE | 38 | 195 | 82 | 0 | 0 | 0 | 315 |
| ENE | 45 | 186 | 127 | 6 | 0 | 0 | 364 |
| E | 51 | 160 | 43 | 0 | 0 | 0 | 254 |
| ESE | 30 | 165 | 38 | 0 | 0 | 0 | 233 |
| SE | 17 | 118 | 68 | 1 | 0 | 0 | 204 |
| SSE | 11 | 35 | 86 | 21 | 0 | 0 | 153 |
| S | 7 | 23 | 21 | 8 | 1 | 0 | 60 |
| SSW | 9 | 21 | 35 | 22 | 9 | 0 | 96 |
| SW | 19 | 104 | 77 | 11 | 3 | 0 | 214 |
| WSW | 32 | 112 | 16 | 6 | 0 | 0 | 166 |
| W | 34 | 85 | 11 | 1 | 0 | 0 | 129 |
| WNW | 23 | 113 | 35 | 7 | 1 | 0 | 179 |
| NW | 12 | 119 | 104 | 14 | 0 | 0 | 249 |
| NNW | 12 | 121 | 128 | 4 | 0 | 0 | 265 |
| VARIABLE | 256 | 237 | 32 | 1 | 0 | 0 | 526 |
| Total | 628 | 1913 | 919 | 102 | 14 | 0 | 3576 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODL: Ground

STABILITY CLASS: E

ALL HOURS IN PERIOD

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|------|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 21 | 9 | 0 | 0 | 0 | 0 | 29 |
| NNE | 77 | 54 | 0 | 0 | 0 | 0 | 131 |
| NE | 106 | 102 | 2 | 0 | 0 | 0 | 210 |
| ENE | 90 | 93 | 1 | 0 | 0 | 0 | 184 |
| E | 53 | 75 | 2 | 0 | 0 | 0 | 130 |
| ESE | 29 | 92 | 3 | 0 | 0 | 0 | 124 |
| SE | 26 | 98 | 58 | 0 | 0 | 0 | 182 |
| SSE | 14 | 37 | 52 | 3 | 0 | 0 | 106 |
| S | 10 | 28 | 19 | 0 | 0 | 0 | 57 |
| SSW | 14 | 38 | 23 | 2 | 0 | 0 | 77 |
| SW | 84 | 140 | 57 | 0 | 0 | 0 | 281 |
| WSW | 79 | 75 | 2 | 0 | 0 | 0 | 156 |
| W | 75 | 17 | 5 | 0 | 0 | 0 | 97 |
| WNW | 66 | 25 | 8 | 0 | 0 | 0 | 99 |
| NW | 58 | 94 | 21 | 0 | 0 | 0 | 173 |
| NNW | 47 | 121 | 17 | 0 | 0 | 0 | 185 |
| VARIABLE | 426 | 90 | 5 | 0 | 0 | 0 | 521 |
| Total | 1275 | 1187 | 275 | 5 | 0 | 0 | 2742 |

Periods of calm(hours): 6

Hours of missing data: 0 (this stability class)

Hours of missing data: 0 (this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: F

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 36 | 5 | 0 | 0 | 0 | 0 | 41 |
| NNE | 60 | 5 | 0 | 0 | 0 | 0 | 65 |
| NE | 46 | 10 | 0 | 0 | 0 | 0 | 56 |
| ENE | 35 | 15 | 2 | 0 | 0 | 0 | 52 |
| E | 21 | 4 | 0 | 0 | 0 | 0 | 25 |
| ESE | 13 | 10 | 2 | 0 | 0 | 0 | 25 |
| SE | 5 | 18 | 3 | 0 | 0 | 0 | 26 |
| SSE | 3 | 4 | 2 | 0 | 0 | 0 | 9 |
| S | 3 | 1 | 2 | 0 | 0 | 0 | 6 |
| SJW | 5 | 4 | 1 | 0 | 0 | 0 | 10 |
| SW | 5 | 23 | 2 | 0 | 0 | 0 | 30 |
| WSW | 22 | 19 | 0 | 0 | 0 | 0 | 41 |
| W | 41 | 10 | 0 | 0 | 0 | 0 | 51 |
| WNW | 38 | 17 | 0 | 0 | 0 | 0 | 55 |
| NW | 45 | 51 | 0 | 0 | 0 | 0 | 96 |
| NNW | 76 | 42 | 0 | 0 | 0 | 0 | 118 |
| VARIABLE | 303 | 14 | 0 | 0 | 0 | 0 | 317 |
| Total | 757 | 252 | 14 | 0 | 0 | 0 | 1023 |

Periods of calm(hours):

6

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Ground

STABILITY CLASS: G

ALL HOURS IN PERIOD

ELEVATION: 10.0 m.

| Wind Direction | Wind Speed (mph) at 10.0 m. level | | | | | | TOTAL |
|-----------------|-----------------------------------|-----------|----------|----------|----------|----------|------------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 119 | 24 | 0 | 0 | 0 | 0 | 143 |
| NNE | 40 | 6 | 0 | 0 | 0 | 0 | 46 |
| NE | 29 | 0 | 0 | 0 | 0 | 0 | 29 |
| ENE | 12 | 0 | 0 | 0 | 0 | 0 | 12 |
| E | 6 | 3 | 0 | 0 | 0 | 0 | 9 |
| ESE | 5 | 4 | 0 | 0 | 0 | 0 | 9 |
| SE | 4 | 4 | 1 | 0 | 0 | 0 | 9 |
| SSE | 4 | 0 | 0 | 0 | 0 | 0 | 4 |
| S | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| SSW | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| SW | 0 | 4 | 0 | 0 | 0 | 0 | 4 |
| WSW | 4 | 5 | 0 | 0 | 0 | 0 | 9 |
| W | 18 | 2 | 0 | 0 | 0 | 0 | 20 |
| WNW | 14 | 2 | 0 | 0 | 0 | 0 | 16 |
| NW | 44 | 2 | 0 | 0 | 0 | 0 | 46 |
| NNW | 147 | 12 | 0 | 0 | 0 | 0 | 159 |
| VARIABLE | 268 | 6 | 0 | 0 | 0 | 0 | 274 |
| Total | 717 | 74 | 1 | 0 | 0 | 0 | 792 |

Periods of calm(hours): 4
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: A

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NNE | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ENE | 1 | 0 | 2 | 1 | 0 | 0 | 4 |
| E | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| ESE | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 2 | 0 | 2 |
| SW | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| WSW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WNW | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| NW | 0 | 0 | 1 | 0 | 0 | 3 | 4 |
| NNW | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VARIABLE | 1 | 6 | 0 | 0 | 0 | 0 | 7 |
| Total | 2 | 13 | 4 | 1 | 2 | 4 | 26 |

Periods of calm(hours): 0
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: B

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 2 | 3 | 0 | 0 | 0 | 5 |
| NNE | 0 | 5 | 3 | 0 | 0 | 0 | 8 |
| NE | 0 | 1 | 2 | 0 | 0 | 0 | 3 |
| ENE | 0 | 1 | 11 | 6 | 0 | 0 | 18 |
| E | 0 | 1 | 4 | 0 | 0 | 0 | 5 |
| ESE | 0 | 1 | 5 | 0 | 0 | 0 | 6 |
| SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SSW | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| SW | 0 | 2 | 0 | 2 | 1 | 2 | 7 |
| WSW | 0 | 1 | 5 | 0 | 0 | 0 | 6 |
| W | 0 | 1 | 2 | 1 | 0 | 0 | 4 |
| WNW | 0 | 0 | 0 | 6 | 0 | 1 | 7 |
| NW | 0 | 9 | 3 | 8 | 0 | 1 | 21 |
| NNW | 1 | 2 | 9 | 6 | 0 | 0 | 18 |
| VARIABLE | 1 | 16 | 11 | 1 | 0 | 0 | 29 |
| Total | 2 | 42 | 58 | 30 | 2 | 4 | 138 |

Periods of calm(hours):

0

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: C

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 0 | 3 | 7 | 1 | 0 | 0 | 11 |
| NNE | 1 | 11 | 11 | 0 | 0 | 0 | 23 |
| NE | 1 | 7 | 14 | 4 | 0 | 0 | 26 |
| ENE | 1 | 6 | 19 | 9 | 0 | 0 | 35 |
| E | 1 | 4 | 10 | 3 | 0 | 0 | 18 |
| ESE | 1 | 11 | 13 | 2 | 0 | 0 | 27 |
| SE | 0 | 0 | 6 | 0 | 0 | 0 | 6 |
| SSE | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| S | 2 | 0 | 1 | 0 | 0 | 0 | 3 |
| SSW | 0 | 3 | 1 | 1 | 0 | 0 | 5 |
| SW | 0 | 9 | 6 | 6 | 1 | 1 | 23 |
| WSW | 1 | 10 | 12 | 1 | 0 | 0 | 24 |
| W | 0 | 8 | 8 | 3 | 2 | 0 | 21 |
| WNW | 0 | 10 | 11 | 5 | 2 | 1 | 29 |
| NW | 1 | 22 | 26 | 16 | 0 | 0 | 65 |
| NNW | 2 | 10 | 26 | 8 | 0 | 0 | 46 |
| VARIABLE | 16 | 42 | 18 | 7 | 0 | 0 | 83 |
| Total | 27 | 156 | 189 | 68 | 5 | 2 | 447 |

Periods of calm(hours):

0

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: D

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|------|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 12 | 54 | 39 | 7 | 0 | 0 | 112 |
| NNE | 12 | 73 | 40 | 13 | 0 | 0 | 138 |
| NE | 21 | 108 | 131 | 12 | 0 | 0 | 272 |
| ENE | 17 | 142 | 170 | 45 | 0 | 0 | 374 |
| E | 14 | 99 | 113 | 13 | 0 | 0 | 239 |
| ESE | 8 | 106 | 104 | 4 | 0 | 0 | 222 |
| SE | 8 | 94 | 92 | 6 | 0 | 0 | 200 |
| SSE | 3 | 20 | 95 | 46 | 6 | 0 | 170 |
| S | 4 | 22 | 40 | 32 | 1 | 0 | 99 |
| SSW | 7 | 13 | 25 | 39 | 12 | 6 | 102 |
| SW | 9 | 51 | 75 | 42 | 7 | 5 | 189 |
| WSW | 11 | 89 | 44 | 12 | 1 | 0 | 157 |
| W | 14 | 76 | 30 | 12 | 6 | 0 | 138 |
| WNW | 10 | 72 | 48 | 14 | 3 | 2 | 149 |
| NW | 9 | 85 | 88 | 83 | 7 | 0 | 272 |
| NNW | 10 | 48 | 102 | 56 | 1 | 0 | 217 |
| VARIABLE | 188 | 221 | 54 | 11 | 0 | 1 | 475 |
| Total | 357 | 1373 | 1290 | 44 | 44 | 14 | 3525 |

Periods of calm(hours): 51
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: E

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|------|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 5 | 36 | 18 | 0 | 0 | 0 | 59 |
| NNE | 13 | 50 | 40 | 0 | 0 | 0 | 103 |
| NE | 8 | 89 | 82 | 1 | 0 | 0 | 180 |
| ENE | 11 | 119 | 110 | 0 | 0 | 0 | 240 |
| E | 4 | 96 | 71 | 0 | 0 | 0 | 171 |
| ESE | 6 | 58 | 75 | 1 | 0 | 0 | 140 |
| SE | 5 | 48 | 69 | 4 | 0 | 0 | 126 |
| SSE | 7 | 39 | 102 | 47 | 1 | 0 | 196 |
| S | 11 | 24 | 44 | 29 | 0 | 0 | 108 |
| SSW | 7 | 24 | 45 | 31 | 0 | 0 | 107 |
| SW | 8 | 90 | 152 | 30 | 0 | 0 | 280 |
| WSW | 7 | 105 | 67 | 1 | 0 | 0 | 180 |
| W | 16 | 77 | 24 | 5 | 0 | 0 | 122 |
| WNW | 9 | 66 | 33 | 11 | 0 | 0 | 119 |
| NW | 8 | 25 | 93 | 23 | 0 | 0 | 149 |
| NNW | 5 | 31 | 93 | 16 | 0 | 0 | 145 |
| VARIABLE | 132 | 142 | 34 | 2 | 0 | 0 | 310 |
| Total | 262 | 1119 | 1152 | 201 | 1 | 0 | 2735 |

Periods of calm(hours): 13
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: F

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|-------------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 2 | 24 | 19 | 0 | 0 | 0 | 45 |
| NNE | 1 | 18 | 28 | 0 | 0 | 0 | 47 |
| NE | 6 | 31 | 73 | 0 | 0 | 0 | 110 |
| ENE | 3 | 47 | 57 | 0 | 0 | 0 | 107 |
| E | 5 | 24 | 31 | 1 | 0 | 0 | 61 |
| ESE | 3 | 16 | 25 | 1 | 0 | 0 | 45 |
| SE | 2 | 17 | 12 | 0 | 0 | 0 | 31 |
| SSE | 2 | 9 | 16 | 9 | 0 | 0 | 36 |
| S | 4 | 13 | 5 | 2 | 0 | 0 | 24 |
| SSW | 7 | 10 | 4 | 0 | 0 | 0 | 21 |
| SW | 1 | 12 | 22 | 6 | 0 | 0 | 41 |
| WSW | 4 | 13 | 23 | 0 | 0 | 0 | 40 |
| W | 5 | 30 | 22 | 0 | 0 | 0 | 57 |
| WNW | 8 | 36 | 17 | 0 | 0 | 0 | 61 |
| NW | 5 | 18 | 68 | 5 | 0 | 0 | 96 |
| NNW | 4 | 15 | 43 | 5 | 0 | 0 | 67 |
| VARIABLE | 54 | 58 | 14 | 0 | 0 | 0 | 126 |
| Total | 116 | 391 | 479 | 29 | 0 | 0 | 1015 |

Periods of calm(hours):

14

Hours of missing data:

0

(this stability class)

Hours of missing data:

0

(this time period, all stability classes)

TABLE 8-CA

FARLEY NUCLEAR PLANT

CUMULATIVE JOINT FREQUENCY DISTRIBUTION

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 01-JAN-91 00:00 TO 31-DEC-91 23:59

RELEASE MODE: Elevated

STABILITY CLASS: G

ALL HOURS IN PERIOD

ELEVATION: 60.3 m.

| Wind Direction | Wind Speed (mph) at 60.3 m. level | | | | | | TOTAL |
|----------------|-----------------------------------|-----|------|-------|-------|-----|-------|
| | 1-3 | 4-7 | 8-12 | 13-18 | 19-24 | >24 | |
| N | 15 | 36 | 13 | 0 | 0 | 0 | 64 |
| NNE | 6 | 28 | 67 | 1 | 0 | 0 | 102 |
| NE | 11 | 27 | 57 | 0 | 0 | 0 | 95 |
| ENE | 3 | 35 | 35 | 0 | 0 | 0 | 73 |
| E | 2 | 18 | 29 | 0 | 0 | 0 | 49 |
| ESE | 5 | 19 | 16 | 0 | 0 | 0 | 40 |
| SE | 2 | 12 | 4 | 0 | 0 | 0 | 18 |
| SSE | 3 | 7 | 5 | 2 | 0 | 0 | 17 |
| S | 0 | 4 | 4 | 1 | 0 | 0 | 9 |
| SSW | 4 | 3 | 0 | 0 | 0 | 0 | 7 |
| SW | 5 | 8 | 2 | 0 | 0 | 0 | 15 |
| WSW | 7 | 5 | 3 | 0 | 0 | 0 | 15 |
| W | 10 | 13 | 5 | 0 | 0 | 0 | 28 |
| WNW | 7 | 20 | 6 | 0 | 0 | 0 | 33 |
| NW | 7 | 13 | 42 | 0 | 0 | 0 | 62 |
| NNW | 9 | 26 | 47 | 0 | 0 | 0 | 82 |
| VARIABLE | 28 | 41 | 8 | 0 | 0 | 0 | 77 |
| Total | 124 | 315 | 343 | 4 | 0 | 0 | 786 |

Periods of calm(hours): 10
 Hours of missing data: 0 (this stability class)
 Hours of missing data: 0 (this time period, all stability classes)

CHAPTER 25

PROCESS CONTROL PROGRAM

There were no changes to the Process Control Program during the second half of 1991.