

PALO VERDE NUCLEAR GENERATING STATION  
UNITS 1, 2 AND 3

2005

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

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Prepared by:

Digitally signed by: Kutner, Kevin W(Z58001)  
Date: 04/14/2006 13:38:22  
Reason: I am the author of this document  
Location: PVNGS

Reviewed by:

Digitally signed by: Bungard, James P(Z18012)  
Date: 04/15/2006 16:08:58  
Reason: I have reviewed this document  
Location: PVNGS

Approved by:

Digitally signed by: Gaffney, John P(Z36459)  
Date: 04/21/2006 17:44:04  
Reason: I am approving this document  
Location: PVNGS

## TABLE OF CONTENTS

SECTION	PAGE
INTRODUCTION .....	5
BIBLIOGRAPHY .....	6
APPENDIX A SOURCE TERMS AND EFFLUENT AND WASTE DISPOSAL REPORTS.....	7
APPENDIX B METEOROLOGY .....	63
APPENDIX C DOSE CALCULATIONS.....	86
APPENDIX D OFFSITE DOSE CALCULATION MANUAL Revision 20 .....	95

## LIST OF TABLES

TABLE	PAGE
1 Evaporation Pond Data .....	15
2 Batch Release Data .....	15
3 Units 1, 2 & 3 Gaseous Effluents Average Lower Limit Of Detection .....	16
4 Unit 1 Gaseous Effluents - Summation Of All Releases .....	17
5 Unit 1 Gaseous Effluents - Ground Level Releases - Continuous - Fission Gases and Iodines.....	18
6 Unit 1 Gaseous Effluents - Ground Level Releases - Continuous - Particulates .....	19
7 Unit 1 Gaseous Effluents - Ground Level Releases - Batch - Fission Gases and Iodines.....	20
8 Unit 1 Gaseous Effluents - Ground Level Releases - Batch - Particulates .....	21
9 Unit 1 Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines .....	22
10 Unit 1 Gaseous Effluents - Continuous and Batch - Particulates.....	23
11 Unit 1 Radiation Doses At And Beyond The Site Boundary .....	24

## LIST OF TABLES

TABLE		PAGE
12	Unit 2 Gaseous Effluents - Summation Of All Releases .....	25
13	Unit 2 Gaseous Effluents - Ground Level Releases - Continuous - Fission Gases and Iodines.....	26
14	Unit 2 Gaseous Effluents - Ground Level Releases - Continuous - Particulates .....	27
15	Unit 2 Gaseous Effluents - Ground Level Releases - Batch - Fission Gases and Iodines.....	28
16	Unit 2 Gaseous Effluents - Ground Level Releases - Batch - Particulates .....	29
17	Unit 2 Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines .....	30
18	Unit 2 Gaseous Effluents - Continuous and Batch - Particulates.....	31
19	Unit 2 Radiation Doses At And Beyond The Site Boundary .....	32
20	Unit 3 Gaseous Effluents - Summation Of All Releases .....	33
21	Unit 3 Gaseous Effluents - Ground Level Releases - Continuous - Fission Gases and Iodines.....	34
22	Unit 3 Gaseous Effluents - Ground Level Releases - Continuous - Particulates .....	35
23	Unit 3 Gaseous Effluents - Ground Level Releases - Batch - Fission Gases and Iodines.....	36
24	Unit 3 Gaseous Effluents - Ground Level Releases - Batch - Particulates .....	37
25	Unit 3 Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines .....	38
26	Unit 3 Gaseous Effluents - Continuous and Batch - Particulates.....	39
27	Unit 3 Radiation Doses At And Beyond The Site Boundary .....	40

## LIST OF TABLES

<b>TABLE</b>		<b>PAGE</b>
28	Units 1, 2, and 3 Gaseous Effluents - Continuous - Fission Gases and Iodines - Total By Quarter .....	41
29	Units 1, 2, and 3 Gaseous Effluents - Continuous - Particulates - Total By Quarter .....	42
30	Units 1, 2, and 3 Gaseous Effluents - Batch - Fission Gases and Iodines - Total By Quarter .....	43
31	Units 1, 2, and 3 Gaseous Effluents - Batch - Particulates - Total By Quarter .....	44
32	Units 1, 2, and 3 Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines - Total By Quarter .....	45
33	Units 1, 2, and 3 Gaseous Effluents - Continuous and Batch - Particulates - Total By Quarter .....	46
34	Units 1, 2 and 3 Gaseous Effluents- Continuous - Fission Gases and Iodine - Total By Unit .....	47
35	Units 1, 2 and 3 Gaseous Effluents- Continuous - Particulates - Total By Unit .....	48
36	Units 1, 2 and 3 Gaseous Effluents- Batch - Fission Gases and Iodine - Total By Unit .....	49
37	Units 1, 2 and 3 Gaseous Effluents- Batch - Particulates - Total By Unit .....	50
38	Units 1, 2 and 3 Gaseous Effluents- Continuous and Batch - Fission Gases and Iodine - Total By Unit .....	51
39	Units 1, 2 and 3 Gaseous Effluents - Continuous and Batch - Particulates - Total By Unit .....	52
40	Estimation of Total Percent Error .....	53
41	Effluent Monitoring Instrumentation Out Of Service Greater Than 30 Days .....	54
42	Solid Waste Summary .....	55
43	Doses To Special Locations For 2005 .....	89
44	Integrated Population Dose for 2005 .....	90
45	Summary of Individual Doses for 2005 .....	94

## INTRODUCTION

This report summarizes effluent and waste disposal source term data, meteorological data and doses from radioactive effluents for the Palo Verde Nuclear Generating Station (PVNGS) for the period of January through December 2005. The data presented meets the reporting requirements of Regulatory Guide 1.21 (Revision 1, June 1974) of the U.S. Nuclear Regulatory Commission and the PVNGS Technical Specifications.

## BIBLIOGRAPHY

U.S. Nuclear Regulatory Commission, Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," Revision 1, 1974.

U.S. Nuclear Regulatory Commission, Regulatory Guide 1.23 (Safety Guide 23), "Onsite Meteorological Programs," 1972.

U.S. Nuclear Regulatory Commission, NUREG/CR-2919, "XOQDOQ: Computer Program for the Meteorological Evaluation of Routine Effluent Releases at Nuclear Power Stations," 1982.

U.S. Nuclear Regulatory Commission, NUREG-0579, "Users Guide to GASPARG Code," June 1980.

U.S. Nuclear Regulatory Commission, Regulatory Guide 1.109, "Calculations of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR 50, Appendix I," Revision 1, 1977.

U.S. Nuclear Regulatory Commission, NUREG-0172, "Age-specific Radiation Dose Commitment Factors for a One-Year Chronic Intake," 1977.

U.S. Nuclear Regulatory Commission, NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants," 1978.

"Technical Specifications, Palo Verde Nuclear Generating Station, Unit No. 1, Docket No. 50-528, Appendix "A" to License No. NPF-41".

"Technical Specifications, Palo Verde Nuclear Generating Station, Unit No. 2, Docket No. 50-529, Appendix "A" to License No. NPF-51".

"Technical Specifications, Palo Verde Nuclear Generating Station, Unit No. 3, Docket No. 50-530, Appendix "A" to License No. NPF-74".

Bechtel Power Corp., "Cooling Tower Blowdown System Solar Evaporation Pond," Sept. 1980.

Generation Engineering, "Geotechnical Exploration for Evaporation Pond #2," Oct. 1986

Letter No. 212-00789-WFQ/RHM, "1989 PVNGS Evaporation Pan Data," Jan. 1989.

Offsite Dose Calculation Manual Palo Verde Nuclear Generating Station Units 1, 2 and 3, Rev. 20.

**APPENDIX A**  
**SOURCE TERMS**  
**AND**  
**EFFLUENT AND WASTE DISPOSAL REPORTS**

## Supplemental Information

### 1.0 REGULATORY LIMITS

#### 1.1 Liquid Releases

##### 1.1.1 PVNGS ODCM Requirement 3.2

The concentration of radioactive material discharged from secondary system liquid waste to the circulating water system shall be limited to:

5.0E-07  $\mu\text{Ci/ml}$  for the principal gamma emitters (except Ce-144)

3.0E-06  $\mu\text{Ci/ml}$  for Ce-144

1.0E-06  $\mu\text{Ci/ml}$  for I-131.

1.0E-03  $\mu\text{Ci/ml}$  for H-3

The concentration of radioactive material discharged from secondary system liquid waste to the onsite evaporation ponds shall be limited to:

2.0E-06  $\mu\text{Ci/ml}$  for Cs-134

2.0E-06  $\mu\text{Ci/ml}$  for Cs-137

The concentrations specified in 10 CFR Part 20.1001-20.2402, Appendix B, Table 2, Column 2, for all other isotopes

##### 1.1.2 PVNGS ODCM Requirement 4.4

The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each reactor unit, to areas at and beyond the SITE BOUNDARY shall be limited:

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



## 1.2 Gaseous Releases

### 1.2.1 PVNGS ODCM Requirement 3.1

The dose rate due to radioactive materials released in gaseous effluents from the site shall be limited to the following:

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

### 1.2.2 PVNGS ODCM Requirement 4.1

The air dose due to noble gases released in gaseous effluents, from each reactor unit, to areas at and beyond the SITE BOUNDARY shall be limited to the following:

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

### 1.2.3 PVNGS ODCM Requirement 4.2

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

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

### 1.2.4 PVNGS ODCM Requirement 4.3

The GASEOUS RADWASTE SYSTEM and the VENTILATION EXHAUST TREATMENT SYSTEM shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected gaseous effluent air doses due to gaseous effluent releases, from each reactor unit, from the site, when averaged over 31 days, would exceed 0.2 mrad for gamma radiation and 0.4 mrad for beta radiation. The VENTILATION EXHAUST TREATMENT SYSTEM shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected doses due to gaseous effluent releases, from each reactor unit, to areas at and beyond the SITE BOUNDARY when averaged over 31 days, would exceed 0.3 mrem to any organ of a MEMBER OF THE PUBLIC.

### 1.3 Total Dose

#### 1.3.1 PVNGS ODCM Requirement 5.1

The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to direct radiation from uranium fuel cycle sources shall be limited to less than or equal to 25 mrems to the total body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems.

### 2.0 MAXIMUM PERMISSIBLE CONCENTRATIONS

Air: Release Concentrations are limited to dose rate limits described in section 1.2.1 of this report.

### 3.0 AVERAGE ENERGY

The average energy ( $\bar{E}$ ) of the radionuclide mixture in releases of fission and activation gases is not applicable to PVNGS.

### 4.0 MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY IN GASEOUS EFFLUENTS

For continuous releases, sampling is in accordance with PVNGS ODCM Table 3-1. Particulate and iodine radionuclides are sampled continuously at the Plant Vent and Fuel Building exhaust points. The particulate filters and charcoal cartridges are exchanged for analysis at least four times per month. Noble gas and tritium are sampled at least once per 31 days. The hourly average Radiation Monitoring System (RMS) effluent monitor readings are used, when available, to account for increases and decreases in noble gas concentrations between noble gas grab samples. The tritium concentration is assumed constant between sampling periods.

For batch releases, sampling is also in accordance with PVNGS ODCM Table 3-1. For containment purges, the noble gas concentration may be adjusted to account for decreases or increases in concentration during the purge using RMS readings. The volume of air released during the purge is determined using the exhaust fan rated flow rate. For Waste Gas Decay Tank releases, the volume released is corrected to standard pressure.

Effective January 1, 2004, Containment Purge release permits are updated by removing the permit pre-release particulate and iodine activity. This eliminates double accounting for the Containment Purge particulate and iodine activity at the Plant Vent but allows the particulate and iodine activity to be included in the Containment Purge pre-release dose projection.

The Lower Limit of Detection (LLD) of a measurement system is defined in Table 3 - 1 of the PVNGS ODCM. An average LLD for each radionuclide is provided in Table 3.

**5.0 BATCH RELEASES**

5.1 Gaseous.

Batch release durations are presented in Table 2.

5.2 Liquid

None.

**6.0 ABNORMAL RELEASES**

None.

**7.0 OFFSITE DOSE CALCULATION MANUAL AND PROCESS CONTROL PROGRAM (PCP) REVISIONS**

7.1 ODCM, Revision 20, effective August 31, 2005, contains changes associated with the implementation of the Radioactive Environmental Monitoring Program (REMP). The ODCM revision is included as Appendix D.

7.2 There were no revisions to the Process Control Program (PCP).

**8.0 EFFLUENTS AND SOLID WASTES**

8.1 Gaseous Effluents

Gaseous effluent information is presented in Table 1 through Table 41. Included in these tables are summaries of the effluents and estimated total error.

8.2 Liquid Effluents

There were no liquid effluent releases beyond the Site Boundary from PVNGS.

8.3 Solid Waste

Solid waste shipments are summarized in Table 42.

## **9.0 MISCELLANEOUS INFORMATION**

### **9.1 EVAPORATION PONDS**

Releases made to the Evaporation Ponds are limited to the concentrations specified in PVNGS ODCM Requirement 3.2. The Evaporation Ponds were monitored in accordance with PVNGS ODCM Requirement 6.1.

The average historical evaporation is approximately 12 inches, per pond, for each of the first and fourth quarters, and 33 inches, per pond, for each of the second and third quarters. This equates to  $3.09E+11$  cc evaporated from Pond One for each of the first and fourth quarters and  $8.50E+11$  cc evaporated from Pond One for each of the second and third quarters. The amount evaporated from Pond Two is  $2.89E+11$  cc for each of the first and fourth quarters and  $7.96E+11$  cc for each of the second and third quarters. Using a site boundary  $X/Q$  of  $5.0E-05$  sec/m<sup>3</sup> for the evaporation ponds and equation 4-3 from the ODCM, the dose from the evaporation ponds to a hypothetical individual at the site boundary, for all pathways, is summarized in Table 1.

### **9.2 RADIATION MONITORING SYSTEM SETPOINT VERIFICATION**

Current effluent monitor noble gas channel alert alarm setpoints are based on an assumed one per cent failed fuel source term. The current setpoints are more conservative than setpoints calculated using the actual noble gas source term presented in Table 38.

### **9.3 RCS RADIOIODINE (TRM T5.0.600)**

There were no cases where primary coolant specific activity exceeded the Technical Specification 3.4.17 limits during the reporting period.

### **9.4 INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)**

There are no radioactive effluents from the NAC-UMS System. Direct dose at the Site Boundary is reported in the Annual Radiological Environmental Operating Report.

### **9.5 MAJOR CHANGES TO THE RADIOACTIVE WASTE SYSTEMS (liquid, gaseous, and solid).**

Licensee-initiated major changes to the radioactive waste systems (liquid, gaseous, and solid) are submitted as part of the FSAR update (TRM T5.0.500.4.a).

### **9.6 REPORT ADDENDUM**

None.

## 10.0 DISCUSSION

### 10.1 Unit One

Unit One operated with a refueling outage (U1R12) from October 8, 2005 to Dec 24, 2005.

Additional Maintenance outages:

U1M12B, 2-9-05 to 2-19-05

U1M12C, 3-18-05 to 3-21-05

U1M12D, 8-12-05 to 8-28-05.

Estimated number of fuel defects (source: INPO, CDE)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	1	1	1	1	1	1	1	1	n/a	0

### 10.2 Unit Two

Unit Two operated with a refueling outage (U2R12) from April 2, 2005 to May 20, 2005.

Additional Maintenance outages:

U2M13A, 8-22-05 to 8-26-05

U2M13B, 10-11-05 to 10-20-05.

Estimated number of fuel defects (source: INPO, CDE)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	n/a	n/a	0	0	0	0	0	0	0

### 10.3 Unit Three

Unit Three operated without a refueling outage.

Maintenance outages:

U3M12A, 5-23-05 to 6-24-05

U3M12B, 7-6-05 to 7-13-05

U3M12C, 10-2-05 to 10-7-05

U3M12D, 10-11-05 to 10-21-05

Estimated number of fuel defects (source: INPO, CDE)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	0	0	0	0	0	0	0	0	0

### 10.4 General

PVNGS does not have a liquid release pathway. Removal of tritium is performed by operation of the Boric Acid Concentrator (BAC) in the release mode.

Comparison of PVNGS annual tritium curies released to other utilities should be made only after summing both liquid and gaseous tritium curies released.

## 10.5 Summary

Dose for 2005 was primarily due to the release of tritium. Tritium production is approximately 1000 curies per Reactor Unit per year. In order to control plant tritium concentrations, tritium releases should match tritium production. For 2005, PVNGS released a total of 2050 curies of tritium (see Table 39).

Total dose from releases from all three Units for the year 2005 were less than year 2004 mainly due to 70 less curies of tritium being released.

<b>Table 1: Evaporation Pond Data</b>					
Evaporation Pond 1	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	3.09E+11	8.50E+11	8.50E+11	3.09E+11	
Tritium Concentration (uCi/cc)	1.12E-06	1.21E-06	1.60E-06	2.04E-06	
Tritium Curies	3.46E-01	1.03E+00	1.36E+00	6.30E-01	3.36E+00
Evaporation Pond 2	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.89E+11	7.96E+11	7.96E+11	2.89E+11	
Tritium Concentration (uCi/cc)	1.63E-06	1.74E-06	1.69E-06	1.76E-06	
Tritium curies	4.72E-01	1.38E+00	1.34E+00	5.10E-01	3.71E+00
Dose (mRem)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Pond 1	4.80E-03	1.43E-02	1.89E-02	8.73E-03	4.67E-02
Pond 2	6.55E-03	1.92E-02	1.86E-02	7.07E-03	5.14E-02
<b>Total</b>	<b>1.13E-02</b>	<b>3.34E-02</b>	<b>3.75E-02</b>	<b>1.58E-02</b>	<b>9.81E-02</b>

<b>Table 2: Batch Release Data</b>			
All times are in hours	Unit 1	Unit 2	Unit 3
<b>January - June</b>			
Number of batch releases	32	43	35
Total time period for batch releases	598.60	1912.39	1530.36
Maximum time period for a batch release	130.98	168.00	168.00
Average time period for a batch release	18.71	44.47	43.72
Minimum time period for a batch release	1.03	0.02	0.40
<b>July - December</b>			
Number of batch releases	61	28	33
Total time period for batch releases	3718.07	429.45	964.08
Maximum time period for a batch release	168.00	129.65	168.00
Average time period for a batch release	60.95	15.34	29.21
Minimum time period for a batch release	0.03	1.11	0.54
<b>January - December</b>			
Number of batch releases	93	71	68
Total time period for batch releases	4316.68	2341.83	2494.44
Maximum time period for a batch release	168.00	168.00	168.00
Average time period for a batch release	46.42	32.98	36.68
Minimum time period for a batch release	0.03	0.02	0.40

**Table 3:  
Units 1, 2 & 3  
Gaseous Effluents Average Lower Limit Of Detection**

$\mu\text{Ci/cc}$					
Nuclide	Continuous	Batch	Nuclide	Continuous	Batch
Antimony-122	2.20E-13	1.90E-11	Argon-41	4.50E-08	4.50E-08
Antimony-124	8.40E-14	1.70E-11	Krypton-85	7.40E-06	7.40E-06
Barium-140	3.40E-13	5.70E-11	Krypton-85m	2.20E-08	2.20E-08
Bromine-82	3.30E-13	1.40E-11	Krypton-87	5.70E-08	5.70E-08
Cerium-141	8.70E-14	3.10E-11	Krypton-88	7.40E-08	7.40E-08
Cerium-144	3.60E-13	6.50E-11	Xenon-125	2.20E-08	2.20E-08
Cesium-134	1.00E-13	2.60E-11	Xenon-127	2.10E-08	2.10E-08
Cesium-137	8.10E-14	1.70E-11	Xenon-131m	9.10E-07	9.10E-07
Cesium-138	5.20E-10	7.30E-10	Xenon-133	6.30E-08	6.30E-08
Chromium-51	6.90E-13	1.40E-10	Xenon-133m	1.90E-07	1.90E-07
Cobalt-58	8.50E-14	1.70E-11	Xenon-135	2.00E-08	2.00E-08
Cobalt-60	1.00E-13	1.90E-11	Xenon-135m	8.90E-08	8.90E-08
Iron-59	1.70E-13	3.20E-11	Xenon-138	2.00E-07	2.00E-07
Lanthanum-140	2.80E-13	2.10E-11	Iodine-131	8.00E-14	7.00E-12
Manganese-54	8.30E-14	1.70E-11	Iodine-132	6.60E-12	1.90E-11
Molybdenum-99	2.40E-13	2.80E-11	Iodine-133	4.70E-13	1.10E-11
Niobium-95	8.70E-14	1.80E-11	Iodine-134	5.90E-11	8.20E-11
Rubidium-88	1.90E-08	1.90E-08	Iodine-135	7.00E-12	5.50E-11
Ruthenium-103	7.40E-14	1.50E-11			
Strontium-89	2.15E-15	(1)			
Strontium-90	5.60E-16	(1)			
Tellurium-123m	6.60E-14	1.50E-11			
Tritium	3.80E-07	3.80E-07			
Zinc-65	1.90E-13	3.80E-11			
Zirconium-95	1.80E-13	4.10E-11			
Gross Alpha	3.60E-15	(1)			
(1) Not required for batch releases.					



<b>Table 4: Unit 1 Gaseous Effluents - Summation Of All Releases</b>							
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total For Year	Est. Total Error % (1)
<b>A. Fission &amp; activation gases</b>							
1. Total release	Ci	2.08E+00	1.22E-01	4.27E+00	2.87E+01	3.52E+01	3.54E+01
2. Average release rate for period	μCi/sec	2.67E-01	1.55E-02	5.37E-01	3.61E+00	1.12E+00	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
<b>B. Iodine 131</b>							
1. Total Iodine 131	Ci	2.02E-06	1.23E-06	1.73E-06	1.55E-04	1.60E-04	3.32E+01
2. Average release rate for period	μCi/sec	2.60E-07	1.56E-07	2.18E-07	1.95E-05	5.07E-06	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
<b>C. Particulates</b>							
1. Particulates with half- lives > 8 days	Ci	3.10E-06	7.37E-07	9.60E-07	3.01E-03	3.02E-03	3.43E+01
2. Average release rate for period	μCi/sec	3.98E-07	9.37E-08	1.21E-07	3.79E-04	9.57E-05	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
4. Gross Alpha radioactivity	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	
<b>D. Tritium</b>							
1. Total release	Ci	3.08E+02	1.39E+01	3.66E+02	1.38E+02	8.26E+02	3.85E+01
2. Average release rate for period	μCi/sec	3.96E+01	1.77E+00	4.60E+01	1.74E+01	2.62E+01	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
(1) Estimated total error methodology is presented in Table 40.							
(2) See Table 11 for percent of ODCM Requirement limits.							

Table 5: Unit 1 Gaseous Effluents - Ground Level Releases - Continuous - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	2.64E-02	< LLD	2.64E-02
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	1.61E+00	< LLD	3.29E+00	1.66E+01	2.15E+01
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	1.61E+00	< LLD	3.31E+00	1.66E+01	2.16E+01
<b>2. Iodines</b>						
I-131	Ci	2.02E-06	1.23E-06	1.73E-06	3.91E-05	4.41E-05
I-132	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	2.02E-06	1.23E-06	1.73E-06	3.91E-05	4.41E-05

**Table 6:  
Unit 1  
Gaseous Effluents - Ground Level Releases - Continuous - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3.Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	2.70E-06	< LLD	< LLD	7.56E-05	7.83E-05
Co-60	Ci	< LLD	< LLD	< LLD	2.36E-05	2.36E-05
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	1.25E-06	1.25E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	1.10E-05	1.10E-05
Os-191	Ci	< LLD	7.37E-07	< LLD	3.17E-06	3.91E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	9.49E-07	1.34E-06	2.29E-06
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	3.98E-07	< LLD	7.68E-09	1.45E-07	5.50E-07
Sr-90	Ci	< LLD	< LLD	2.72E-09	5.12E-08	5.39E-08
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	3.08E-06	3.08E-06
total	Ci	3.10E-06	7.37E-07	9.60E-07	1.19E-04	1.24E-04
<b>4.Tritium</b>						
H-3	Ci	1.49E+01	1.39E+01	1.40E+01	1.55E+01	5.82E+01

Table 7: Unit 1 Gaseous Effluents - Ground Level Releases - Batch - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	1.12E-01	1.19E-01	1.60E-01	2.35E-01	6.26E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	7.32E-04	< LLD	7.24E-01	3.31E+00	4.03E+00
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	4.99E-02	4.99E-02
Xe-133	Ci	3.42E-01	2.64E-03	6.57E-02	8.46E+00	8.87E+00
Xe-133m	Ci	< LLD	< LLD	< LLD	8.09E-03	8.09E-03
Xe-135	Ci	7.62E-03	< LLD	8.06E-05	< LLD	7.70E-03
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	4.62E-01	1.22E-01	9.50E-01	1.21E+01	1.36E+01
<b>2. Iodines</b>						
I-131	Ci	< LLD	< LLD	< LLD	1.16E-04	1.16E-04
I-132	Ci	< LLD	< LLD	< LLD	7.07E-05	7.07E-05
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	< LLD	< LLD	1.87E-04	1.87E-04

**Table 8:  
Unit 1  
Gaseous Effluents - Ground Level Releases - Batch - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	3.66E-06	3.66E-06
Co-58	Ci	< LLD	< LLD	< LLD	1.25E-03	1.25E-03
Co-60	Ci	< LLD	< LLD	< LLD	6.28E-04	6.28E-04
Cr-51	Ci	< LLD	< LLD	< LLD	2.20E-04	2.20E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	1.80E-05	1.80E-05
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	3.66E-05	3.66E-05
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	3.70E-05	3.70E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	4.29E-04	4.29E-04
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	7.44E-06	7.44E-06
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	2.63E-04	2.63E-04
total	Ci	< LLD	< LLD	< LLD	2.89E-03	2.89E-03
<b>4. Tritium</b>						
H-3	Ci	2.93E+02	8.05E-03	3.52E+02	1.22E+02	7.67E+02
Note 1 - Not required for batch releases						

**Table 9:  
Unit 1  
Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	1.12E-01	1.19E-01	1.60E-01	2.35E-01	6.26E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	7.32E-04	< LLD	7.24E-01	3.31E+00	4.03E+00
Kr-85m	Ci	< LLD	< LLD	2.64E-02	< LLD	2.64E-02
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	4.99E-02	4.99E-02
Xe-133	Ci	1.96E+00	2.64E-03	3.35E+00	2.51E+01	3.04E+01
Xe-133m	Ci	< LLD	< LLD	< LLD	8.09E-03	8.09E-03
Xe-135	Ci	7.62E-03	< LLD	8.06E-05	< LLD	7.70E-03
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	2.08E+00	1.22E-01	4.27E+00	2.87E+01	3.52E+01
<b>2. Iodines</b>						
I-131	Ci	2.02E-06	1.23E-06	1.73E-06	1.55E-04	1.60E-04
I-132	Ci	< LLD	< LLD	< LLD	7.07E-05	7.07E-05
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	2.02E-06	1.23E-06	1.73E-06	2.26E-04	2.31E-04

**Table 10:  
Unit 1  
Gaseous Effluents - Continuous and Batch - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	3.66E-06	3.66E-06
Co-58	Ci	2.70E-06	< LLD	< LLD	1.33E-03	1.33E-03
Co-60	Ci	< LLD	< LLD	< LLD	6.51E-04	6.51E-04
Cr-51	Ci	< LLD	< LLD	< LLD	2.20E-04	2.20E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	1.80E-05	1.80E-05
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	3.66E-05	3.66E-05
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	3.83E-05	3.83E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	4.40E-04	4.40E-04
Os-191	Ci	< LLD	7.37E-07	< LLD	3.17E-06	3.91E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	9.49E-07	1.34E-06	2.29E-06
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	7.44E-06	7.44E-06
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	3.98E-07	< LLD	7.68E-09	1.45E-07	5.50E-07
Sr-90	Ci	< LLD	< LLD	2.72E-09	5.12E-08	5.39E-08
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	2.66E-04	2.66E-04
total	Ci	3.10E-06	7.37E-07	9.60E-07	3.01E-03	3.02E-03
total > 8 days	Ci	3.10E-06	7.37E-07	9.60E-07	3.01E-03	3.02E-03
<b>4. Tritium</b>						
H-3	Ci	3.08E+02	1.39E+01	3.66E+02	1.38E+02	8.26E+02

Table 11: Unit 1 Radiation Doses At And Beyond The Site Boundary						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	4.93E-04	3.13E-04	7.68E-04	3.14E-03	4.71E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	9.86E-03	6.26E-03	1.54E-02	6.28E-02	4.71E-02
Beta Air Dose	mrad	6.89E-04	1.11E-04	1.56E-03	9.50E-03	1.19E-02
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	6.89E-03	1.11E-03	1.56E-02	9.50E-02	5.95E-02
Maximum Organ Dose (excluding skin)	mrem	1.10E-01	5.01E-03	1.31E-01	5.32E-02	3.00E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Thyroid	Thyroid	Thyroid	Lung	Lung
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	1.47E+00	6.68E-02	1.75E+00	7.09E-01	2.00E+00

Calculations are based on parameters and methodologies of the ODCM using historical meteorology. Dose is calculated to a hypothetical individual. In contrast, Appendix C dose calculations are based on concurrent meteorology, a real individual, and only the actual pathways present.



Table 12: Unit 2 Gaseous Effluents - Summation Of All Releases							
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total For Year	Est. Total Error % (1)
<b>A. Fission &amp; activation gases</b>							
1. Total release	Ci	3.59E-01	3.60E+00	5.31E-01	1.29E-01	4.62E+00	3.54E+01
2. Average release rate for period	μCi/sec	4.62E-02	4.58E-01	6.68E-02	1.62E-02	1.46E-01	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
<b>B. Iodine 131</b>							
1. Total Iodine 131	Ci	< LLD	1.07E-04	< LLD	< LLD	1.07E-04	3.32E+01
2. Average release rate for period	μCi/sec	< LLD	1.36E-05	< LLD	< LLD	3.39E-06	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
<b>C. Particulates</b>							
1. Particulates with half- lives > 8 days	Ci	3.34E-06	5.27E-05	6.10E-09	9.17E-08	5.62E-05	3.43E+01
2. Average release rate for period	μCi/sec	4.30E-07	6.71E-06	7.67E-10	1.15E-08	1.78E-06	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
4. Gross Alpha radioactivity	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	
<b>D. Tritium</b>							
1. Total release	Ci	2.97E+02	1.89E+02	2.03E+01	1.12E+02	6.18E+02	3.85E+01
2. Average release rate for period	μCi/sec	3.82E+01	2.40E+01	2.55E+00	1.41E+01	1.96E+01	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
(1) Estimated total error methodology is presented in Table 40.							
(2) See Table 19 for percent of ODCM Requirement limits.							

Table 13: Unit 2 Gaseous Effluents - Ground Level Releases - Continuous - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
<b>2. Iodines</b>						
I-131	Ci	< LLD	1.07E-04	< LLD	< LLD	1.07E-04
I-132	Ci	< LLD	1.57E-03	< LLD	< LLD	1.57E-03
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	1.68E-03	< LLD	< LLD	1.68E-03

**Table 14:  
Unit 2  
Gaseous Effluents - Ground Level Releases - Continuous - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	5.16E-05	< LLD	< LLD	5.16E-05
Co-60	Ci	3.34E-06	< LLD	< LLD	< LLD	3.34E-06
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Os-191	Ci	< LLD	1.15E-06	< LLD	< LLD	1.15E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-90	Ci	< LLD	< LLD	6.10E-09	9.17E-08	9.78E-08
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	3.34E-06	5.27E-05	6.10E-09	9.17E-08	5.62E-05
<b>4. Tritium</b>						
H-3	Ci	2.76E+01	2.61E+01	2.03E+01	1.08E+01	8.47E+01

Table 15: Unit 2 Gaseous Effluents - Ground Level Releases - Batch - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	2.22E-01	8.39E-02	5.31E-01	1.28E-01	9.66E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	1.60E-03	< LLD	< LLD	1.60E-03
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	2.86E-03	< LLD	< LLD	2.86E-03
Xe-133	Ci	1.34E-01	3.51E+00	< LLD	8.36E-04	3.65E+00
Xe-133m	Ci	< LLD	4.69E-04	< LLD	< LLD	4.69E-04
Xe-135	Ci	2.10E-03	< LLD	< LLD	< LLD	2.10E-03
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	3.59E-01	3.60E+00	5.31E-01	1.29E-01	4.62E+00
<b>2. Iodines</b>						
I-131	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-132	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	< LLD	< LLD	< LLD	< LLD

**Table 16:  
Unit 2  
Gaseous Effluents - Ground Level Releases - Batch - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-60	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
<b>4. Tritium</b>						
H-3	Ci	2.69E+02	1.63E+02	1.92E-02	1.02E+02	5.33E+02
Note 1 - Not required for batch releases						

**Table 17:  
Unit 2  
Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	2.22E-01	8.39E-02	5.31E-01	1.28E-01	9.66E-01
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	1.60E-03	< LLD	< LLD	1.60E-03
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	2.86E-03	< LLD	< LLD	2.86E-03
Xe-133	Ci	1.34E-01	3.51E+00	< LLD	8.36E-04	3.65E+00
Xe-133m	Ci	< LLD	4.69E-04	< LLD	< LLD	4.69E-04
Xe-135	Ci	2.10E-03	< LLD	< LLD	< LLD	2.10E-03
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	3.59E-01	3.60E+00	5.31E-01	1.29E-01	4.62E+00
<b>2. Iodines</b>						
I-131	Ci	< LLD	1.07E-04	< LLD	< LLD	1.07E-04
I-132	Ci	< LLD	1.57E-03	< LLD	< LLD	1.57E-03
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	1.68E-03	< LLD	< LLD	1.68E-03

Table 18: Unit 2 Gaseous Effluents - Continuous and Batch - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	5.16E-05	< LLD	< LLD	5.16E-05
Co-60	Ci	3.34E-06	< LLD	< LLD	< LLD	3.34E-06
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Os-191	Ci	< LLD	1.15E-06	< LLD	< LLD	1.15E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-90	Ci	< LLD	< LLD	6.10E-09	9.17E-08	9.78E-08
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	3.34E-06	5.27E-05	6.10E-09	9.17E-08	5.62E-05
total > 8 days	Ci	3.34E-06	5.27E-05	6.10E-09	9.17E-08	5.62E-05
<b>4. Tritium</b>						
H-3	Ci	2.97E+02	1.89E+02	2.03E+01	1.12E+02	6.18E+02

Table 19: Unit 2 Radiation Doses At And Beyond The Site Boundary						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	5.99E-04	5.71E-04	1.40E-03	3.37E-04	2.90E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	1.20E-02	1.14E-02	2.80E-02	6.74E-03	2.90E-02
Beta Air Dose	mrad	2.47E-04	1.12E-03	4.92E-04	1.19E-04	1.98E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	2.47E-03	1.12E-02	4.92E-03	1.19E-03	9.90E-03
Maximum Organ Dose (excluding skin)	mrem	1.07E-01	6.90E-02	7.27E-03	4.03E-02	2.23E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Lung	Thyroid	W Body	W Body	Thyroid
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	1.43E+00	9.20E-01	9.69E-02	5.37E-01	1.49E+00

Calculations are based on parameters and methodologies of the ODCM using historical meteorology. Dose is calculated to a hypothetical individual. In contrast, Appendix C dose calculations are based on concurrent meteorology, a real individual, and only the actual pathways present.



**Table 20:  
Unit 3  
Gaseous Effluents - Summation Of All Releases**

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total For Year	Est. Total Error % (1)
<b>A. Fission &amp; activation gases</b>							
1. Total release	Ci	8.71E-02	2.74E-01	8.81E-01	1.69E-01	1.41E+00	3.54E+01
2. Average release rate for period	μCi/sec	1.12E-02	3.48E-02	1.11E-01	2.13E-02	4.47E-02	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
<b>B. Iodine 131</b>							
1. Total Iodine 131	Ci	< LLD	5.64E-07	< LLD	< LLD	5.64E-07	3.32E+01
2. Average release rate for period	μCi/sec	< LLD	7.17E-08	< LLD	< LLD	1.79E-08	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
<b>C. Particulates</b>							
1. Particulates with half- lives > 8 days	Ci	1.32E-08	8.66E-06	< LLD	< LLD	8.67E-06	3.43E+01
2. Average release rate for period	μCi/sec	1.69E-09	1.10E-06	< LLD	< LLD	2.75E-07	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
4. Gross Alpha radioactivity	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	
<b>D. Tritium</b>							
1. Total release	Ci	1.20E+01	3.84E+02	1.51E+01	2.00E+02	6.11E+02	3.85E+01
2. Average release rate for period	μCi/sec	1.54E+00	4.88E+01	1.90E+00	2.52E+01	1.94E+01	
3. Percent of ODCM Requirement limit	%	NA (2)	NA (2)	NA (2)	NA (2)	NA (2)	
(1) Estimated total error methodology is presented in Table 40.							
(2) See Table 27 for percent of ODCM Requirement limits.							

Table 21: Unit 3 Gaseous Effluents - Ground Level Releases - Continuous - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
<b>2. Iodines</b>						
I-131	Ci	< LLD	5.64E-07	< LLD	< LLD	5.64E-07
I-132	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	5.64E-07	< LLD	< LLD	5.64E-07

**Table 22:  
Unit 3  
Gaseous Effluents - Ground Level Releases - Continuous - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	3.80E-06	< LLD	< LLD	3.80E-06
Co-60	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	5.20E-09	6.96E-08	< LLD	< LLD	7.48E-08
Sr-90	Ci	7.77E-10	1.04E-08	< LLD	< LLD	1.12E-08
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	5.97E-09	3.88E-06	< LLD	< LLD	3.88E-06
<b>4. Tritium</b>						
H-3	Ci	1.19E+01	1.63E+01	1.50E+01	3.06E+00	4.63E+01

Table 23: Unit 3 Gaseous Effluents - Ground Level Releases - Batch - Fission Gases and Iodines						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	8.71E-02	2.56E-01	8.81E-01	1.69E-01	1.39E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	1.08E-04	< LLD	< LLD	1.08E-04
Xe-133	Ci	< LLD	1.77E-02	4.15E-04	< LLD	1.81E-02
Xe-133m	Ci	< LLD	3.32E-04	< LLD	< LLD	3.32E-04
Xe-135	Ci	< LLD	1.25E-05	< LLD	< LLD	1.25E-05
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	8.71E-02	2.74E-01	8.81E-01	1.69E-01	1.41E+00
<b>2. Iodines</b>						
I-131	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-132	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	< LLD	< LLD	< LLD	< LLD

**Table 24:  
Unit 3  
Gaseous Effluents - Ground Level Releases - Batch - Particulates**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	6.41E-05	3.65E-05	1.01E-04
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	4.79E-06	< LLD	< LLD	4.79E-06
Co-60	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	7.19E-09	< LLD	< LLD	< LLD	7.19E-09
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	7.19E-09	4.79E-06	6.41E-05	3.65E-05	1.05E-04
<b>4. Tritium</b>						
H-3	Ci	1.95E-02	3.68E+02	2.77E-02	1.97E+02	5.64E+02
Note 1 - Not required for batch releases						

**Table 25:  
Unit 3  
Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	8.71E-02	2.56E-01	8.81E-01	1.69E-01	1.39E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	1.08E-04	< LLD	< LLD	1.08E-04
Xe-133	Ci	< LLD	1.77E-02	4.15E-04	< LLD	1.81E-02
Xe-133m	Ci	< LLD	3.32E-04	< LLD	< LLD	3.32E-04
Xe-135	Ci	< LLD	1.25E-05	< LLD	< LLD	1.25E-05
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	8.71E-02	2.74E-01	8.81E-01	1.69E-01	1.41E+00
<b>2. Iodines</b>						
I-131	Ci	< LLD	5.64E-07	< LLD	< LLD	5.64E-07
I-132	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	5.64E-07	< LLD	< LLD	5.64E-07

Table 26: Unit 3 Gaseous Effluents - Continuous and Batch - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	6.41E-05	3.65E-05	1.01E-04
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	8.58E-06	< LLD	< LLD	8.58E-06
Co-60	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	7.19E-09	< LLD	< LLD	< LLD	7.19E-09
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	5.20E-09	6.96E-08	< LLD	< LLD	7.48E-08
Sr-90	Ci	7.77E-10	1.04E-08	< LLD	< LLD	1.12E-08
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	1.32E-08	8.66E-06	6.41E-05	3.65E-05	1.09E-04
total > 8 days	Ci	1.32E-08	8.66E-06	< LLD	< LLD	8.68E-06
<b>4. Tritium</b>						
H-3	Ci	1.20E+01	3.84E+02	1.51E+01	2.00E+02	6.11E+02

Table 27: Unit 3 Radiation Doses At And Beyond The Site Boundary						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	mrad	2.29E-04	6.74E-04	2.31E-03	4.44E-04	3.66E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	4.58E-03	1.35E-02	4.62E-02	8.88E-03	3.66E-02
Beta Air Dose	mrad	8.07E-05	2.43E-04	8.16E-04	1.56E-04	1.30E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	8.07E-04	2.43E-03	8.16E-03	1.56E-03	6.50E-03
Maximum Organ Dose (excluding skin)	mrem	4.29E-03	1.38E-01	5.41E-03	7.17E-02	2.19E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		W Body	Thyroid	(1)	(1)	Thyroid
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	5.72E-02	1.84E+00	7.21E-02	9.56E-01	1.46E+00

Calculations are based on parameters and methodologies of the ODCM using historical meteorology. Dose is calculated to a hypothetical individual. In contrast, Appendix C dose calculations are based on concurrent meteorology, a real individual, and only the actual pathways present.

Note 1 - All organs except Bone



**Table 28:  
Units 1, 2, and 3  
Gaseous Effluents - Continuous - Fission Gases and Iodines -  
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	< LLD	< LLD	2.64E-02	< LLD	2.64E-02
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	1.61E+00	< LLD	3.29E+00	1.66E+01	2.15E+01
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	1.61E+00	< LLD	3.31E+00	1.66E+01	2.16E+01
<b>2. Iodines</b>						
I-131	Ci	2.02E-06	1.08E-04	1.73E-06	3.91E-05	1.51E-04
I-132	Ci	< LLD	1.57E-03	< LLD	< LLD	1.57E-03
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	2.02E-06	1.68E-03	1.73E-06	3.91E-05	1.72E-03

**Table 29:  
Units 1, 2, and 3  
Gaseous Effluents - Continuous - Particulates -  
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	2.70E-06	5.54E-05	< LLD	7.56E-05	1.34E-04
Co-60	Ci	3.34E-06	< LLD	< LLD	2.36E-05	2.69E-05
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	1.25E-06	1.25E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	1.10E-05	1.10E-05
Os-191	Ci	< LLD	1.88E-06	< LLD	3.17E-06	5.06E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	9.49E-07	1.34E-06	2.29E-06
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	4.03E-07	6.96E-08	7.68E-09	1.45E-07	6.25E-07
Sr-90	Ci	7.77E-10	1.04E-08	8.81E-09	1.43E-07	1.63E-07
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	3.08E-06	3.08E-06
total	Ci	6.44E-06	5.73E-05	9.66E-07	1.19E-04	1.84E-04
<b>4. Tritium</b>						
H-3	Ci	5.43E+01	5.63E+01	4.93E+01	2.94E+01	1.89E+02

**Table 30:  
Units 1, 2, and 3  
Gaseous Effluents - Batch - Fission Gases and Iodines -  
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	4.21E-01	4.59E-01	1.57E+00	5.32E-01	2.98E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	7.32E-04	1.60E-03	7.24E-01	3.31E+00	4.03E+00
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	2.97E-03	< LLD	4.99E-02	5.29E-02
Xe-133	Ci	4.76E-01	3.53E+00	6.62E-02	8.46E+00	1.25E+01
Xe-133m	Ci	< LLD	8.02E-04	< LLD	8.09E-03	8.89E-03
Xe-135	Ci	9.72E-03	1.25E-05	8.06E-05	< LLD	9.81E-03
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	9.08E-01	4.00E+00	2.36E+00	1.24E+01	1.96E+01
<b>2. Iodines</b>						
I-131	Ci	< LLD	< LLD	< LLD	1.16E-04	1.16E-04
I-132	Ci	< LLD	< LLD	< LLD	7.07E-05	7.07E-05
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	< LLD	< LLD	< LLD	1.87E-04	1.87E-04

**Table 31:  
Units 1, 2, and 3  
Gaseous Effluents - Batch - Particulates -  
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	6.41E-05	3.65E-05	1.01E-04
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	3.66E-06	3.66E-06
Co-58	Ci	< LLD	4.79E-06	< LLD	1.25E-03	1.26E-03
Co-60	Ci	< LLD	< LLD	< LLD	6.28E-04	6.28E-04
Cr-51	Ci	< LLD	< LLD	< LLD	2.20E-04	2.20E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	7.19E-09	< LLD	< LLD	1.80E-05	1.80E-05
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	3.66E-05	3.66E-05
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	3.70E-05	3.70E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	4.29E-04	4.29E-04
Os-191	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	7.44E-06	7.44E-06
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1	Note 1
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	2.63E-04	2.63E-04
total	Ci	7.19E-09	4.79E-06	6.41E-05	2.93E-03	3.00E-03
<b>4. Tritium</b>						
H-3	Ci	5.62E+02	5.30E+02	3.52E+02	4.20E+02	1.87E+03
Note 1 - Not required for batch releases						

**Table 32:  
Units 1, 2, and 3  
Gaseous Effluents - Continuous and Batch - Fission Gases and Iodines -  
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>1. Fission gases</b>						
Ar-41	Ci	4.21E-01	4.59E-01	1.57E+00	5.32E-01	2.98E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	7.32E-04	1.60E-03	7.24E-01	3.31E+00	4.03E+00
Kr-85m	Ci	< LLD	< LLD	2.64E-02	< LLD	2.64E-02
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	2.97E-03	< LLD	4.99E-02	5.29E-02
Xe-133	Ci	2.09E+00	3.53E+00	3.35E+00	2.51E+01	3.41E+01
Xe-133m	Ci	< LLD	8.02E-04	< LLD	8.09E-03	8.89E-03
Xe-135	Ci	9.72E-03	1.25E-05	8.06E-05	< LLD	9.81E-03
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	2.52E+00	4.00E+00	5.68E+00	2.90E+01	4.12E+01
<b>2. Iodines</b>						
I-131	Ci	2.02E-06	1.08E-04	1.73E-06	1.55E-04	2.68E-04
I-132	Ci	< LLD	1.57E-03	< LLD	7.07E-05	1.64E-03
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
total	Ci	2.02E-06	1.68E-03	1.73E-06	2.26E-04	1.91E-03

**Table 33:  
Units 1, 2, and 3  
Gaseous Effluents - Continuous and Batch - Particulates -  
Total By Quarter**

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>3. Particulates</b>						
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	6.41E-05	3.65E-05	1.01E-04
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	3.66E-06	3.66E-06
Co-58	Ci	2.70E-06	6.02E-05	< LLD	1.33E-03	1.39E-03
Co-60	Ci	3.34E-06	< LLD	< LLD	6.51E-04	6.55E-04
Cr-51	Ci	< LLD	< LLD	< LLD	2.20E-04	2.20E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	7.19E-09	< LLD	< LLD	1.80E-05	1.80E-05
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	3.66E-05	3.66E-05
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	3.83E-05	3.83E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	< LLD	< LLD	< LLD	4.40E-04	4.40E-04
Os-191	Ci	< LLD	1.88E-06	< LLD	3.17E-06	5.06E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	9.49E-07	1.34E-06	2.29E-06
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	7.44E-06	7.44E-06
Se-75	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	4.03E-07	6.96E-08	7.68E-09	1.45E-07	6.25E-07
Sr-90	Ci	7.77E-10	1.04E-08	8.81E-09	1.43E-07	1.63E-07
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	< LLD	< LLD	< LLD	2.66E-04	2.66E-04
total	Ci	6.45E-06	6.21E-05	6.51E-05	3.05E-03	3.18E-03
total > 8 days	Ci	6.45E-06	6.21E-05	9.66E-07	3.01E-03	3.08E-03
<b>4. Tritium</b>						
H-3	Ci	6.17E+02	5.86E+02	4.02E+02	4.50E+02	2.05E+03

**Table 34:  
Units 1, 2 and 3  
Gaseous Effluents- Continuous - Fission Gases and Iodine -  
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
<b>1. Fission gases</b>					
Ar-41	Ci	< LLD	< LLD	< LLD	< LLD
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85m	Ci	2.64E-02	< LLD	< LLD	2.64E-02
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	2.15E+01	< LLD	< LLD	2.15E+01
Xe-133m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	< LLD	< LLD	< LLD	< LLD
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
total	Ci	2.16E+01	< LLD	< LLD	2.16E+01
<b>2. Iodines</b>					
I-131	Ci	4.41E-05	1.07E-04	5.64E-07	1.51E-04
I-132	Ci	< LLD	1.57E-03	< LLD	1.57E-03
I-133	Ci	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
total	Ci	4.41E-05	1.68E-03	5.64E-07	1.72E-03

**Table 35:  
Units 1, 2 and 3  
Gaseous Effluents- Continuous - Particulates -  
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
<b>3. Particulates</b>					
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	7.83E-05	5.16E-05	3.80E-06	1.34E-04
Co-60	Ci	2.36E-05	3.34E-06	< LLD	2.69E-05
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	1.25E-06	< LLD	< LLD	1.25E-06
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	1.10E-05	< LLD	< LLD	1.10E-05
Os-191	Ci	3.91E-06	1.15E-06	< LLD	5.06E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	2.29E-06	< LLD	< LLD	2.29E-06
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	< LLD	< LLD	< LLD	< LLD
Se-75	Ci	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	5.50E-07	< LLD	7.48E-08	6.25E-07
Sr-90	Ci	5.39E-08	9.78E-08	1.12E-08	1.63E-07
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	3.08E-06	< LLD	< LLD	3.08E-06
total	Ci	1.24E-04	5.62E-05	3.88E-06	1.84E-04
<b>4. Tritium</b>					
H-3	Ci	5.82E+01	8.47E+01	4.63E+01	1.89E+02



**Table 36:  
Units 1, 2 and 3  
Gaseous Effluents- Batch - Fission Gases and Iodine -  
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
<b>1. Fission gases</b>					
Ar-41	Ci	6.26E-01	9.66E-01	1.39E+00	2.98E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	4.03E+00	1.60E-03	< LLD	4.03E+00
Kr-85m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	4.99E-02	2.86E-03	1.08E-04	5.29E-02
Xe-133	Ci	8.87E+00	3.65E+00	1.81E-02	1.25E+01
Xe-133m	Ci	8.09E-03	4.69E-04	3.32E-04	8.89E-03
Xe-135	Ci	7.70E-03	2.10E-03	1.25E-05	9.81E-03
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
total	Ci	1.36E+01	4.62E+00	1.41E+00	1.96E+01
<b>2. Iodines</b>					
I-131	Ci	1.16E-04	< LLD	< LLD	1.16E-04
I-132	Ci	7.07E-05	< LLD	< LLD	7.07E-05
I-133	Ci	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
total	Ci	1.87E-04	< LLD	< LLD	1.87E-04

**Table 37:  
Units 1, 2 and 3  
Gaseous Effluents- Batch - Particulates -  
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1,2 and 3
<b>3. Particulates</b>					
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	1.01E-04	1.01E-04
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	3.66E-06	< LLD	< LLD	3.66E-06
Co-58	Ci	1.25E-03	< LLD	4.79E-06	1.26E-03
Co-60	Ci	6.28E-04	< LLD	< LLD	6.28E-04
Cr-51	Ci	2.20E-04	< LLD	< LLD	2.20E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	1.80E-05	< LLD	7.19E-09	1.80E-05
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	3.66E-05	< LLD	< LLD	3.66E-05
La-140	Ci	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	3.70E-05	< LLD	< LLD	3.70E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	4.29E-04	< LLD	< LLD	4.29E-04
Os-191	Ci	< LLD	< LLD	< LLD	< LLD
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	7.44E-06	< LLD	< LLD	7.44E-06
Se-75	Ci	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	2.63E-04	< LLD	< LLD	2.63E-04
total	Ci	2.89E-03	< LLD	1.05E-04	3.00E-03
<b>4. Tritium</b>					
H-3	Ci	7.67E+02	5.33E+02	5.64E+02	1.87E+03
Note 1 - Not required for batch releases					

**Table 38:  
Units 1, 2 and 3  
Gaseous Effluents- Continuous and Batch - Fission Gases and Iodine -  
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
<b>1. Fission gases</b>					
Ar-41	Ci	6.26E-01	9.66E-01	1.39E+00	2.98E+00
Kr-83m	Ci	< LLD	< LLD	< LLD	< LLD
Kr-85	Ci	4.03E+00	1.60E-03	< LLD	4.03E+00
Kr-85m	Ci	2.64E-02	< LLD	< LLD	2.64E-02
Kr-87	Ci	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	< LLD	< LLD	< LLD	< LLD
Kr-89	Ci	< LLD	< LLD	< LLD	< LLD
Kr-90	Ci	< LLD	< LLD	< LLD	< LLD
Xe-131m	Ci	4.99E-02	2.86E-03	1.08E-04	5.29E-02
Xe-133	Ci	3.04E+01	3.65E+00	1.81E-02	3.41E+01
Xe-133m	Ci	8.09E-03	4.69E-04	3.32E-04	8.89E-03
Xe-135	Ci	7.70E-03	2.10E-03	1.25E-05	9.81E-03
Xe-135m	Ci	< LLD	< LLD	< LLD	< LLD
Xe-137	Ci	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	< LLD	< LLD	< LLD	< LLD
total	Ci	3.52E+01	4.62E+00	1.41E+00	4.12E+01
<b>2. Iodines</b>					
I-131	Ci	1.60E-04	1.07E-04	5.64E-07	2.68E-04
I-132	Ci	7.07E-05	1.57E-03	< LLD	1.64E-03
I-133	Ci	< LLD	< LLD	< LLD	< LLD
I-134	Ci	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD
total	Ci	2.31E-04	1.68E-03	5.64E-07	1.91E-03

**Table 39:  
Units 1, 2 and 3  
Gaseous Effluents - Continuous and Batch - Particulates -  
Total By Unit**

Nuclides Released	Unit	Unit 1	Unit 2	Unit 3	Total Units 1, 2 and 3
<b>3. Particulates</b>					
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD
Br-82	Ci	< LLD	< LLD	1.01E-04	1.01E-04
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD
Co-57	Ci	3.66E-06	< LLD	< LLD	3.66E-06
Co-58	Ci	1.33E-03	5.16E-05	8.58E-06	1.39E-03
Co-60	Ci	6.51E-04	3.34E-06	< LLD	6.55E-04
Cr-51	Ci	2.20E-04	< LLD	< LLD	2.20E-04
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	1.80E-05	< LLD	7.19E-09	1.80E-05
Cs-138	Ci	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	3.66E-05	< LLD	< LLD	3.66E-05
La-140	Ci	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	3.83E-05	< LLD	< LLD	3.83E-05
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	4.40E-04	< LLD	< LLD	4.40E-04
Os-191	Ci	3.91E-06	1.15E-06	< LLD	5.06E-06
Rb-88	Ci	< LLD	< LLD	< LLD	< LLD
Ru-103	Ci	2.29E-06	< LLD	< LLD	2.29E-06
Sb-122	Ci	< LLD	< LLD	< LLD	< LLD
Sb-124	Ci	7.44E-06	< LLD	< LLD	7.44E-06
Se-75	Ci	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	5.50E-07	< LLD	7.48E-08	6.25E-07
Sr-90	Ci	5.39E-08	9.78E-08	1.12E-08	1.63E-07
Te-123m	Ci	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	2.66E-04	< LLD	< LLD	2.66E-04
total	Ci	3.02E-03	5.62E-05	1.09E-04	3.18E-03
total > 8 days	Ci	3.02E-03	5.62E-05	8.68E-06	3.08E-03
<b>4. Tritium</b>					
H-3	Ci	8.26E+02	6.18E+02	6.11E+02	2.05E+03

**Table 40:  
Estimation of Total Percent Error**

The estimated total error is calculated as follows:

$$\text{Total Percent Error} = (E_1^2 + E_2^2 + E_3^2 + \dots + E_n^2)^{1/2}$$

Where  $E_n$  = Percent error associated with each contributing parameter.

Parameters contributing to errors in the measurement of gaseous effluents; process flow rates, sample collection, analytical counting and tank volumes.

The following values (%) were used for error calculations.

Fission & Act gases	I-131	Particulates	Tritium	
25	25	25	25	Sample counting error
10	10	10	10	Counting system calibration error
5	5	5	5	Counting system source error
20	N/A	N/A	N/A	Temperature/volume correction error
10	10	10	10	Process flow measuring device <sup>(1)</sup>
N/A	15	15	15	Sample flow measuring device
N/A	5	N/A	N/A	Iodine collection efficiency error
N/A	N/A	10	N/A	Plateout error
N/A	N/A	N/A	20	Bubbler collection efficiency error
N/A	N/A	N/A	2	Sample volume transfer error (pipette)
N/A	N/A	N/A	2	Sample volume error (graduate)
Note 1 - % of full scale				

<b>Table 41: Effluent Monitoring Instrumentation Out Of Service Greater Than 30 Days</b>				
<b>Unit</b>	<b>Instrument</b>	<b>Date span of inoperability</b>	<b>Cause of inoperability</b>	<b>Explanation</b>
NONE				

**Table 42:  
Solid Waste Summary**

**A. Solid Waste Shipped Offsite For Burial Or Disposal (not irradiated fuel)**

1.0 Type of Waste	Unit	Jan-Dec	estimated total error %
1.a. Spent resin, filters, evaporator bottoms, etc.	m <sup>3</sup>	2.50E+01	N/A
	Ci	1.11E+02	2.50E+01
1.b. Dry compressible waste, contaminated equipment, etc.	m <sup>3</sup>	5.44E+02	N/A
	Ci	6.36E-01	2.50E+01
1.c. Irradiated components, control rods, etc.	m <sup>3</sup>	1.76E+01	N/A
	Ci	1.45E+01	2.50E+01
1.d. Other (Mixed waste)	m <sup>3</sup>	7.21E+00	N/A
	Ci	4.40E-03	2.50E+01
<p>Volume and activity for dry compressible waste, contaminated equipment, etc., includes PVNGS waste disposed of after being processed by a volume reduction facility. Volume for waste shipped to the Envirocare Bulk Facility is calculated from waste volume not container disposal volume.</p>			

## 2.0 Principal Radionuclides

2.a Estimate of major nuclide concentrations for spent resins, filters, evaporator bottoms, etc.			
Waste Class	Nuclide Name	Percent Abundance	Curies
A	Fe-55	3.97E+01	9.22E-01
A	Ni-63	1.90E+01	4.42E-01
A	Co-60	1.37E+01	3.18E-01
A	Cs-137	1.01E+01	2.35E-01
A	C-14	7.40E+00	1.72E-01
A	H-3	4.43E+00	1.03E-01
A	Sb-125	1.43E+00	3.32E-02
A	Cs-134	1.34E+00	3.12E-02
A	Ag-110m	1.28E+00	2.98E-02
A	Mn-54	6.49E-01	1.51E-02
A	Co-58	6.11E-01	1.42E-02
A	Ni-59	1.84E-01	4.29E-03
A	Sr-90	6.67E-02	1.55E-03
A	Co-57	6.28E-02	1.46E-03
A	Pu-241	5.25E-02	1.22E-03
A	Sb-124	1.18E-02	2.75E-04
A	Pu-238	8.73E-03	2.03E-04
A	Cm-243	8.26E-03	1.92E-04
A	Ce-144	6.62E-03	1.54E-04
A	Zr-95	6.28E-03	1.46E-04
A	Am-241	5.85E-03	1.36E-04
A	Pu-239	2.84E-03	6.60E-05
A	Sn-113	2.81E-03	6.54E-05
A	Tc-99	5.38E-04	1.25E-05
A	Nb-95	4.30E-04	1.00E-05
A	Cm-242	3.15E-04	7.32E-06
	Total		2.33E+00



2.b Estimate of major nuclide concentrations for spent resins, filters, evaporator bottoms, etc.			
Waste Class	Nuclide Name	Percent Abundance	Curies
B	Ni-63	3.91E+01	4.00E+01
B	Fe-55	2.46E+01	2.52E+01
B	Cs-137	1.46E+01	1.49E+01
B	Co-60	9.96E+00	1.02E+01
B	Cs-134	8.59E+00	8.79E+00
B	Mn-54	2.09E+00	2.14E+00
B	Sb-125	3.95E-01	4.04E-01
B	C-14	2.73E-01	2.79E-01
B	Co-57	1.54E-01	1.58E-01
B	Co-58	9.87E-02	1.01E-01
B	Sr-90	6.83E-02	6.99E-02
B	Ni-59	4.80E-02	4.91E-02
B	H-3	4.51E-02	4.62E-02
B	Pu-241	1.79E-02	1.83E-02
B	Ag-110m	8.23E-03	8.43E-03
B	Ce-144	4.65E-03	4.76E-03
B	Cm-243	1.47E-03	1.50E-03
B	Pu-238	5.71E-04	5.85E-04
B	Pu-239	1.24E-04	1.27E-04
B	Am-241	1.20E-04	1.23E-04
B	Tc-99	3.97E-05	4.06E-05
B	Cm-242	3.92E-05	4.01E-05
		Total	1.02E+02

2.c Estimate of major nuclide concentrations for spent resins, filters, evaporator bottoms, etc.			
Waste Class	Nuclide Name	Percent Abundance	Curies
C	Fe-55	4.80E+01	2.85E+00
C	Ni-63	2.20E+01	1.31E+00
C	Co-60	1.51E+01	8.95E-01
C	C-14	1.10E+01	6.53E-01
C	Sb-125	1.56E+00	9.24E-02
C	Mn-54	1.19E+00	7.07E-02
C	Co-58	4.83E-01	2.87E-02
C	Co-57	1.57E-01	9.34E-03
C	Ni-59	1.52E-01	9.04E-03
C	Ag-110m	1.14E-01	6.77E-03
C	Cs-137	8.60E-02	5.11E-03
C	H-3	3.67E-02	2.18E-03
C	Zr-95	3.35E-02	1.99E-03
C	Sn-113	2.79E-02	1.66E-03
C	Te-123m	2.69E-02	1.60E-03
C	Cs-134	2.61E-02	1.55E-03
C	Ce-144	1.44E-02	8.55E-04
C	Pu-241	1.04E-02	6.15E-04
C	Sb-124	6.35E-03	3.77E-04
C	Sr-90	5.79E-03	3.44E-04
C	Tc-99	3.67E-04	2.18E-05
C	Cm-243	3.42E-04	2.03E-05
C	Pu-238	1.78E-04	1.06E-05
C	Cm-242	1.46E-04	8.65E-06
C	Am-241	1.05E-04	6.22E-06
C	Fe-59	9.81E-05	5.83E-06
C	Pu-239	9.68E-05	5.75E-06
C	Nb-95	5.92E-05	3.52E-06
C	Cr-51	6.55E-06	3.89E-07
	Total		5.94E+00

2.d Estimate of major nuclide concentrations for dry compressible waste, contaminated equipment, etc.			
Waste Class	Nuclide Name	Percent Abundance	Curies
A	Fe-55	6.48E+01	4.12E-01
A	Co-58	1.53E+01	9.71E-02
A	Co-60	5.71E+00	3.63E-02
A	Ni-63	5.01E+00	3.19E-02
A	Nb-95	2.83E+00	1.80E-02
A	Zr-95	2.39E+00	1.52E-02
A	Cr-51	1.39E+00	8.82E-03
A	Mn-54	7.56E-01	4.81E-03
A	Fe-59	3.60E-01	2.29E-03
A	Sb-125	3.19E-01	2.03E-03
A	H-3	2.70E-01	1.72E-03
A	Sb-124	1.52E-01	9.65E-04
A	Ag-110m	1.46E-01	9.31E-04
A	Ru-103	1.41E-01	8.99E-04
A	Sn-113	1.22E-01	7.75E-04
A	Co-57	1.10E-01	6.99E-04
A	C-14	6.44E-02	4.10E-04
A	Ni-59	3.77E-02	2.40E-04
A	Zn-65	3.33E-02	2.12E-04
A	Pu-241	3.08E-02	1.96E-04
A	Te-123m	2.85E-02	1.81E-04
A	Ce-144	2.69E-02	1.71E-04
A	Ce-141	1.63E-02	1.04E-04
A	Hf-181	1.44E-02	9.18E-05
A	Cs-134	5.19E-03	3.30E-05
A	Cs-137	4.43E-03	2.82E-05
A	Cm-242	3.52E-03	2.24E-05
A	Sr-89	2.64E-03	1.68E-05
A	Pu-238	7.69E-04	4.89E-06
A	Cm-243	7.40E-04	4.71E-06
A	Sr-90	6.10E-04	3.88E-06
A	Am-241	3.62E-04	2.30E-06
A	Pu-239	2.74E-04	1.74E-06
A	Tc-99	7.34E-05	4.67E-07
	Total		6.36E-01

2.e Estimate of major nuclide concentrations for irradiated components, control rods, etc.			
Waste Class	Nuclide Name	Percent Abundance	Curies
A	Co-60	5.09E+01	7.39E+00
A	Fe-55	4.28E+01	6.22E+00
A	Ni-63	4.83E+00	7.01E-01
A	Mn-54	6.55E-01	9.51E-02
A	Co-58	4.53E-01	6.58E-02
A	H-3	5.84E-02	8.48E-03
A	Zr-95	4.77E-02	6.93E-03
A	Cr-51	4.19E-02	6.08E-03
A	Sb-125	3.86E-02	5.61E-03
A	C-14	2.78E-02	4.04E-03
A	Ni-59	2.62E-02	3.80E-03
A	Nb-95	1.10E-02	1.60E-03
A	Co-57	9.37E-03	1.36E-03
A	Ta-182	8.96E-03	1.30E-03
A	Fe-59	8.34E-03	1.21E-03
A	Sn-113	7.51E-03	1.09E-03
A	Zn-65	6.80E-03	9.87E-04
A	Ce-144	5.64E-03	8.18E-04
A	Pu-241	2.79E-03	4.05E-04
A	Sb-124	1.92E-03	2.79E-04
A	Te-123m	1.16E-03	1.68E-04
A	Cs-134	5.08E-04	7.37E-05
A	Nb-94	3.79E-04	5.50E-05
A	Sr-90	2.81E-04	4.08E-05
A	Cm-242	1.51E-04	2.19E-05
A	Tc-99	1.12E-04	1.63E-05
A	Cm-243	6.45E-05	9.37E-06
A	Pu-238	5.79E-05	8.41E-06
A	I-129	5.24E-05	7.61E-06
A	Ru-103	2.93E-05	4.25E-06
A	Pu-239	2.60E-05	3.77E-06
A	Ce-141	2.54E-05	3.68E-06
A	Am-241	2.27E-05	3.29E-06
A	Sr-89	1.07E-05	1.56E-06
A	Sn-117m	2.62E-06	3.80E-07
A	Cs-137	8.82E-09	1.28E-09
	Total		1.45E+01

2.f Estimate of major nuclide concentrations for Other (mixed waste).			
Waste Class	Nuclide Name	Percent Abundance	Curies
A	Fe-55	4.04E+01	1.78E-03
A	Co-60	1.66E+01	7.33E-04
A	Ni-63	8.52E+00	3.75E-04
A	Cs-137	6.61E+00	2.91E-04
A	C-14	5.43E+00	2.39E-04
A	Pu-241	4.82E+00	2.12E-04
A	Ru-106	4.36E+00	1.92E-04
A	Ce-144	3.52E+00	1.55E-04
A	Ag-110m	3.32E+00	1.46E-04
A	Cs-134	2.91E+00	1.28E-04
A	Mn-54	1.28E+00	5.65E-05
A	Sb-125	1.08E+00	4.76E-05
A	Sr-90	3.50E-01	1.54E-05
A	Eu-154	2.91E-01	1.28E-05
A	Pu-238	1.02E-01	4.47E-06
A	Cm-243	7.59E-02	3.34E-06
A	Co-57	6.90E-02	3.04E-06
A	Co-58	6.90E-02	3.04E-06
A	Cm-242	4.32E-02	1.90E-06
A	Pu-239	3.20E-02	1.41E-06
A	Sn-113	1.79E-02	7.86E-07
A	Am-241	1.60E-02	7.05E-07
A	H-3	1.17E-02	5.15E-07
A	Zr-95	7.79E-03	3.43E-07
A	Te-123m	7.15E-03	3.15E-07
A	Sb-124	2.68E-03	1.18E-07
A	Ni-59	9.93E-04	4.37E-08
A	Nb-95	2.48E-04	1.09E-08
A	Fe-59	8.06E-05	3.55E-09
A	Cr-51	1.27E-05	5.61E-10
A	Ru-103	5.66E-06	2.49E-10
A	Tc-99	4.18E-06	1.84E-10
A	Hf-181	3.63E-06	1.60E-10
A	Sr-89	1.99E-06	8.75E-11
A	Ce-141	5.81E-07	2.56E-11
	Total		4.40E-03

### 3.0 Solid Waste Disposition

#### 3.a

Shipments	Shipper	Mode Of Transportation	Destination
3	APS	Truck	Barnwell, SC
20	APS	Truck	Envirocare, UT (Bulk)
5	APS	Truck	Envirocare, UT (Containerized)
1	APS	Truck	Perma-Fix, FL

#### 3.b Irradiated Fuel Shipments: None

#### 3.c Supplemental Information (This section includes PVNGS and Vendor supplied containers):

Number of Containers	Container Volume ft <sup>3</sup>	Type of Waste	Container Type	Solidification Agent
2	132.4	Resin	EL-142	None
2	199.4	Resin	ES-210	None
1	18.8	Filters	Nuhic-55	None
40	7.5	Evaporator Bottoms	Drum	None
2	98.9	Dry Active Waste	CPC 82.2 Box	None
6	1031.3	Dry Active Waste	Intermodal	None
17	1360	Dry Active Waste	20' Sealand	None
2	65.8	Irradiated Hardware	CPC 38.5 Box	None
1	101.9	Irradiated Hardware	CPC 68.2 Box	None
6	64.9	Irradiated Hardware	Tri-Sector	None
1	1.2	Mixed Waste	Drum	None
6	7.5	Mixed Waste	Drum	None
1	21	Mixed Waste	CPC 16.3 Box	None
9	98.9	Mixed Waste	CPC 82.2 Box	None

**APPENDIX B**  
**METEOROLOGY**

## JOINT FREQUENCY DISTRIBUTION TABLES

The tables presented in this section are results obtained from processing the hourly meteorological data collected at the Palo Verde Nuclear Generating Station for the period of January - December 2005. The joint frequency distribution (JFD) tables represent the frequency, in terms of the number of observations, that a particular wind speed, wind direction, and stability category occurred simultaneously. On a quarterly, semiannual and annual basis, the JFDs were produced for 35-foot wind speed and wind direction by atmospheric stability class corresponding to the seven Pasquill stability categories, and for wind speed and wind direction for all stability classes combined. Atmospheric stability was classified per Regulatory Guide 1.23, using the 200-foot to 35-foot temperature difference (delta T).

In accordance with NUREG-0133, the batch releases for the year were considered as "long term," since the batch releases are sufficiently random in both time of day and duration. Consequently, the JFDs for the batch releases for all quarters are the same as for the continuous releases.

### Discussion

A summary of 2005 Joint Frequency Distribution (JFD) shows a somewhat typical, but variable year. Of the 8760 hours available, only 2 hours of data were lost for a 99.9% data recovery.

The average 35 foot wind speed was 6.4 mph. Distribution of directions was spread over the compass with a predominant direction (3 sectors of 22.5 degrees each) centered on the north. (30.9%) A secondary maximum of three sectors centered on the southwest contained 28.5% of the total. With the northerly directions, the highest frequency occurred at 4.0 mph. Southwesterly flow winds averaged higher speeds with the most frequent speed at 10.0 mph.

Stability class summary:

Overall stable conditions (E,F,G) dominated, with extremely stable (G) conditions occurring during 29.2% of the hours.

Stability class E, F, G, (stable categories) 60.6%.  
Stability class G, (extremely stable) 29.2%.  
Stability class A, B, C, (unstable categories) 21.0%.  
Stability class D, (neutral category) 18.4%.

Light northerly flow is most likely for stable conditions, while unstable atmospheres are usually associated with faster southwesterly winds. This distribution is typical of moderate altitude dry climates.



ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2005 TO 3/31/2005

\*\*\* 1ST QTR \*\*\*

STABILITY CLASS A  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.51- 6.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.51- 8.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.51-11.50	1	0	0	0	0	0	0	0	0	1	1	4	3	0	1	0	11
11.51-14.50	0	0	1	0	0	0	0	0	0	0	1	1	1	0	2	4	9
14.51-20.50	0	1	1	0	0	0	0	0	0	0	3	4	1	0	0	5	15
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	1	2	0	0	0	0	0	0	1	4	9	5	0	3	9	35

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.51- 6.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.51- 8.50	0	0	1	0	0	0	0	0	1	1	1	1	3	0	0	0	8
8.51-11.50	2	1	1	0	1	0	0	0	0	2	3	2	0	0	0	0	12
11.51-14.50	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2	4	4
14.51-20.50	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	1	5
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	2	2	1	1	0	0	0	1	1	3	6	5	1	0	3	29

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4.51- 5.50	0	1	0	0	1	1	0	1	0	2	1	0	0	0	1	0	8
5.51- 6.50	1	2	1	0	1	0	0	0	2	0	1	4	2	0	1	0	15
6.51- 8.50	2	3	1	0	3	0	0	1	3	0	5	4	0	0	0	1	23
8.51-11.50	0	1	1	3	1	2	0	0	1	1	5	1	0	1	0	1	18
11.51-14.50	0	0	0	0	0	0	0	0	0	0	1	1	1	3	0	0	6
14.51-20.50	1	0	0	4	0	0	0	0	0	0	1	0	0	2	0	0	8
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	4	8	3	7	6	3	1	2	6	3	14	10	3	6	2	2	80

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2005 TO 3/31/2005

\*\*\* 1ST QRTR \*\*\*

STABILITY CLASS D  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
1.51- 2.50	0	0	2	2	1	0	0	0	0	3	1	1	3	2	1	3	19
2.51- 3.50	2	5	5	1	1	1	1	6	2	3	15	8	16	9	10	5	90
3.51- 4.50	12	7	5	2	1	2	2	0	7	9	13	10	10	9	8	12	109
4.51- 5.50	6	11	6	2	1	1	1	3	2	5	10	8	5	5	4	5	75
5.51- 6.50	3	8	3	5	0	0	1	2	5	9	2	2	3	3	3	3	58
6.51- 8.50	6	2	11	7	4	5	5	3	4	6	10	3	2	0	2	1	71
8.51-11.50	0	1	3	3	6	10	4	1	3	2	14	9	3	1	3	0	63
11.51-14.50	1	0	3	4	8	2	0	0	0	0	6	1	0	2	1	0	28
14.51-20.50	0	0	1	5	9	0	0	0	0	0	1	2	0	2	2	1	23
>20.50	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	30	34	39	33	31	21	14	15	23	37	79	44	41	33	35	30	539

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
.76- 1.50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2
1.51- 2.50	3	1	0	1	0	0	0	0	0	0	3	0	4	4	7	3	26
2.51- 3.50	8	1	0	1	0	1	0	0	1	2	6	3	7	14	12	9	65
3.51- 4.50	7	5	1	2	0	1	0	0	1	1	2	7	4	4	16	15	66
4.51- 5.50	8	6	1	1	3	0	2	0	3	2	3	1	1	2	4	7	44
5.51- 6.50	6	4	7	0	1	0	0	2	5	8	8	7	2	1	0	3	54
6.51- 8.50	5	8	7	1	1	1	0	5	7	2	16	7	5	3	5	1	74
8.51-11.50	6	4	4	8	5	5	2	6	0	2	8	4	2	1	3	1	61
11.51-14.50	1	0	0	7	15	5	2	3	1	1	4	2	4	1	2	1	49
14.51-20.50	0	0	1	0	12	3	0	0	0	0	2	2	4	3	3	0	30
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	44	29	21	21	37	17	6	16	18	18	52	33	33	33	53	40	471

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	4	1	0	1	2	0	0	0	0	1	0	1	4	6	3	6	29
2.51- 3.50	8	1	4	2	2	0	1	0	1	5	1	6	4	20	14	17	86
3.51- 4.50	13	0	0	0	0	0	0	0	0	3	4	3	3	5	21	28	80
4.51- 5.50	11	2	3	0	0	0	0	0	0	2	6	5	3	3	9	12	56
5.51- 6.50	11	5	0	0	0	0	0	0	2	1	11	4	1	0	4	8	47
6.51- 8.50	5	4	5	0	1	0	0	0	0	4	5	3	4	2	2	1	36
8.51-11.50	4	1	0	4	1	0	0	0	1	1	12	4	1	1	2	1	33
11.51-14.50	2	1	1	0	0	0	0	0	0	0	1	0	0	0	2	1	8
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	58	15	13	7	6	0	1	0	4	17	40	26	20	37	57	75	376

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2005 TO 3/31/2005

\*\*\* 1ST QTR \*\*\*

STABILITY CLASS G  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	5	2	1	0	1	1	0	0	1	0	1	3	3	4	4	4	30
2.51- 3.50	26	8	2	0	0	2	2	0	1	0	3	0	6	10	24	30	114
3.51- 4.50	52	18	2	0	0	1	0	0	0	1	2	4	2	25	59	166	
4.51- 5.50	58	14	1	0	1	0	0	0	0	1	0	3	3	4	12	31	128
5.51- 6.50	35	8	2	0	0	0	0	0	0	0	1	1	0	2	1	15	65
6.51- 8.50	33	13	1	0	0	0	0	0	0	1	2	0	0	1	0	14	65
8.51-11.50	16	30	2	0	0	0	0	0	0	1	1	0	0	0	0	8	58
11.51-14.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	225	93	11	0	2	4	2	0	2	3	9	9	16	23	66	164	629

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	3
1.51- 2.50	12	4	3	4	4	1	0	0	1	4	5	5	14	16	15	16	104
2.51- 3.50	44	15	11	4	3	4	5	6	5	10	25	17	33	53	60	61	356
3.51- 4.50	84	31	8	4	1	4	2	0	8	13	20	22	21	20	70	114	422
4.51- 5.50	83	34	11	3	6	2	3	4	5	12	20	17	12	14	30	55	311
5.51- 6.50	56	27	13	5	2	0	1	4	14	18	30	18	7	6	9	29	239
6.51- 8.50	51	30	26	8	9	6	5	9	15	14	39	18	14	6	9	18	277
8.51-11.50	29	38	11	18	14	17	6	7	5	8	43	25	11	4	9	11	256
11.51-14.50	4	2	5	11	23	7	2	3	1	1	12	6	6	6	7	11	107
14.51-20.50	2	1	3	10	21	3	0	0	0	0	7	9	5	8	5	8	82
>20.50	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	365	182	91	69	83	45	24	33	54	80	201	137	123	133	216	323	2159

TOTAL NUMBER OF OBSERVATIONS: 2160  
 TOTAL NUMBER OF VALID OBSERVATIONS: 2159  
 TOTAL NUMBER OF MISSING OBSERVATIONS: 1  
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %  
 MEAN WIND SPEED FOR THIS PERIOD: 6.2 MPH  
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES						
A	B	C	D	E	F	G
1.62	1.34	3.71	24.97	21.82	17.42	29.13

	DISTRIBUTION OF WIND DIRECTION VS STABILITY																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	1	1	2	0	0	0	0	0	0	1	4	9	5	0	3	9	0
B	3	2	2	1	1	0	0	0	1	1	3	6	5	1	0	3	0
C	4	8	3	7	6	3	1	2	6	3	14	10	3	6	2	2	0
D	30	34	39	33	31	21	14	15	23	37	79	44	41	33	35	30	0
E	44	29	21	21	37	17	6	16	18	18	52	33	33	33	53	40	0
F	58	15	13	7	6	0	1	0	4	17	40	26	20	37	57	75	0
G	225	93	11	0	2	4	2	0	2	3	9	9	16	23	66	164	0
TOTAL	365	182	91	69	83	45	24	33	54	80	201	137	123	133	216	323	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2005 TO 6/30/2005

\*\*\* 2ND QRTR \*\*\*

STABILITY CLASS A  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	1	1	2	1	0	0	0	0	1	0	6
5.51- 6.50	0	0	0	1	0	2	5	6	9	4	1	0	2	0	0	0	30
6.51- 8.50	0	0	0	0	1	2	3	6	19	18	22	6	2	0	0	0	79
8.51-11.50	0	0	0	0	0	0	0	5	9	42	46	17	11	1	1	4	136
11.51-14.50	1	0	0	0	1	0	0	1	5	19	33	5	2	8	4	2	81
14.51-20.50	0	0	0	1	0	0	0	0	2	16	30	11	2	6	4	1	73
>20.50	0	0	0	0	1	0	0	0	0	1	4	1	0	0	0	0	7
TOTAL	1	0	0	2	3	4	9	19	46	101	136	40	19	15	10	7	412

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	4
4.51- 5.50	0	1	0	0	1	2	3	2	4	1	1	3	4	1	0	0	23
5.51- 6.50	0	0	0	0	3	2	6	10	12	6	4	5	0	0	0	2	50
6.51- 8.50	1	0	0	0	1	3	5	5	7	4	6	7	2	1	2	0	44
8.51-11.50	0	0	0	0	0	4	0	1	1	9	14	7	3	1	1	1	42
11.51-14.50	0	0	0	1	1	0	0	0	0	2	8	3	0	0	0	0	15
14.51-20.50	0	0	0	1	1	0	0	0	0	0	3	1	0	0	0	0	6
>20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL	1	1	0	2	7	12	15	18	25	23	36	26	10	3	3	3	185

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
3.51- 4.50	1	0	0	1	2	2	4	4	2	2	1	0	0	0	0	0	19
4.51- 5.50	0	0	0	1	3	6	4	8	6	1	3	1	0	0	1	0	34
5.51- 6.50	0	1	0	0	3	3	8	7	3	3	2	1	1	1	0	0	33
6.51- 8.50	0	0	0	0	0	1	0	1	1	6	3	3	3	2	0	1	21
8.51-11.50	0	0	0	0	1	0	0	0	0	1	7	2	0	1	0	1	13
11.51-14.50	0	0	0	0	0	0	0	0	0	0	1	0	0	2	2	0	5
14.51-20.50	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	3
>20.50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	1	1	0	3	9	12	16	20	12	13	18	8	5	7	3	2	130

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2005 TO 6/30/2005

\*\*\* 2ND QRTR \*\*\*

STABILITY CLASS D  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	2	0	1	3	1	0	1	1	0	0	0	0	0	10
2.51- 3.50	1	2	2	1	5	7	7	3	2	3	3	0	2	0	1	0	39
3.51- 4.50	0	0	2	2	3	5	5	7	7	4	4	3	1	0	0	0	43
4.51- 5.50	0	1	2	0	3	3	5	8	1	3	4	2	3	0	0	1	36
5.51- 6.50	0	0	0	1	1	2	5	3	5	2	2	5	3	0	0	0	29
6.51- 8.50	0	0	0	0	0	3	1	2	1	4	10	11	2	1	1	1	37
8.51-11.50	0	0	0	0	1	3	1	0	0	3	7	6	2	2	2	0	27
11.51-14.50	0	0	0	1	2	1	0	0	0	3	7	9	0	2	0	0	25
14.51-20.50	0	0	0	1	2	1	0	0	0	4	13	0	2	0	2	0	25
>20.50	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	5
TOTAL	1	3	6	8	17	26	27	24	16	28	54	37	15	5	6	3	276

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	3	0	1	2	1	0	2	0	0	0	0	1	2	1	0	1	14
2.51- 3.50	9	4	1	2	2	0	0	1	3	0	1	0	0	2	2	1	28
3.51- 4.50	2	0	2	5	1	1	7	1	1	0	2	3	2	0	0	2	29
4.51- 5.50	0	0	1	0	1	0	3	1	4	6	4	4	4	1	1	1	31
5.51- 6.50	1	0	1	1	1	0	1	2	2	4	2	2	0	0	0	0	17
6.51- 8.50	0	0	1	1	1	1	1	0	0	14	21	13	3	2	1	0	59
8.51-11.50	0	0	1	0	1	2	6	0	1	17	30	22	9	1	4	0	94
11.51-14.50	0	0	1	0	2	0	0	0	0	16	16	4	5	1	3	0	48
14.51-20.50	0	0	0	0	2	0	1	0	0	7	4	1	0	1	1	0	17
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	15	4	9	11	12	4	21	5	11	64	80	50	25	9	12	5	337

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	3	1	0	1	2	0	0	0	1	2	0	0	0	0	1	2	13
2.51- 3.50	4	4	1	5	2	1	2	0	3	2	3	0	5	4	3	1	40
3.51- 4.50	2	3	2	1	3	0	1	0	2	6	9	6	6	4	0	4	49
4.51- 5.50	0	0	1	0	0	0	0	1	3	2	9	4	6	1	4	4	35
5.51- 6.50	1	0	0	0	0	0	0	2	5	9	12	7	2	2	3	0	43
6.51- 8.50	1	1	0	1	0	0	0	2	12	28	17	8	3	7	0	0	80
8.51-11.50	0	0	0	0	0	0	1	0	0	17	20	22	2	3	4	0	69
11.51-14.50	0	0	0	0	0	0	0	0	0	2	2	0	1	0	0	0	5
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	11	9	4	8	7	1	4	3	16	52	83	56	30	17	22	11	334

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2005 TO 6/30/2005

\*\*\* 2ND QRTR \*\*\*

STABILITY CLASS G  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	3	4	1	2	1	2	1	0	1	0	2	1	0	2	5	5	30
2.51- 3.50	33	15	2	3	4	3	1	4	1	1	2	4	6	2	7	21	109
3.51- 4.50	50	11	6	6	0	1	2	3	0	2	5	1	4	5	8	27	131
4.51- 5.50	34	17	7	1	2	0	0	3	2	3	2	1	1	4	6	15	98
5.51- 6.50	23	11	5	0	2	0	0	0	1	1	3	1	1	3	5	9	65
6.51- 8.50	14	9	2	0	0	0	1	0	0	2	14	2	2	0	0	7	53
8.51-11.50	6	6	1	0	0	0	0	0	0	6	3	0	0	0	0	0	22
11.51-14.50	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	163	75	24	12	9	6	5	10	5	15	31	10	14	16	31	84	510

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	9	5	2	7	4	3	6	1	2	3	3	2	2	3	6	9	67
2.51- 3.50	47	25	6	11	13	11	10	8	9	6	9	4	14	8	13	23	217
3.51- 4.50	55	14	12	15	9	10	20	15	13	14	21	13	14	9	8	33	275
4.51- 5.50	34	19	11	2	10	11	16	24	22	17	23	15	18	7	13	21	263
5.51- 6.50	25	12	6	3	10	9	25	30	37	29	26	21	9	6	8	11	267
6.51- 8.50	16	10	3	2	3	10	11	14	30	60	104	59	22	9	11	9	373
8.51-11.50	6	6	2	0	3	9	8	6	11	95	127	76	27	9	12	6	403
11.51-14.50	1	2	1	2	6	1	0	1	5	42	67	21	8	13	9	2	181
14.51-20.50	0	0	0	3	5	1	1	0	2	27	51	14	4	8	7	1	124
>20.50	0	0	0	1	1	0	0	0	0	3	7	2	0	0	0	0	14
TOTAL	193	93	43	46	64	65	97	99	131	296	438	227	118	72	87	115	2184

TOTAL NUMBER OF OBSERVATIONS: 2184  
 TOTAL NUMBER OF VALID OBSERVATIONS: 2184  
 TOTAL NUMBER OF MISSING OBSERVATIONS: 0  
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %  
 MEAN WIND SPEED FOR THIS PERIOD: 7.5 MPH  
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES						
A	B	C	D	E	F	G
18.86	8.47	5.95	12.64	15.43	15.29	23.35

	DISTRIBUTION OF WIND DIRECTION VS STABILITY																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	1	0	0	2	3	4	9	19	46	101	136	40	19	15	10	7	0
B	1	1	0	2	7	12	15	18	25	23	36	26	10	3	3	3	0
C	1	1	0	3	9	12	16	20	12	13	18	8	5	7	3	2	0
D	1	3	6	8	17	26	27	24	16	28	54	37	15	5	6	3	0
E	15	4	9	11	12	4	21	5	11	64	80	50	25	9	12	5	0
F	11	9	4	8	7	1	4	3	16	52	83	56	30	17	22	11	0
G	163	75	24	12	9	6	5	10	5	15	31	10	14	16	31	84	0
TOTAL	193	93	43	46	64	65	97	99	131	296	438	227	118	72	87	115	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2005 TO 6/30/2005

\*\*\* 1ST SEMI \*\*\*

STABILITY CLASS A  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	1	1	2	1	0	0	0	0	1	0	6
5.51- 6.50	0	0	0	1	0	2	5	6	9	4	1	0	2	0	0	0	30
6.51- 8.50	0	0	0	0	1	2	3	6	19	18	22	6	2	0	0	0	79
8.51-11.50	1	0	0	0	0	0	0	5	9	43	47	21	14	1	2	4	147
11.51-14.50	1	0	1	0	1	0	0	1	5	19	33	6	3	8	6	6	90
14.51-20.50	0	1	1	1	0	0	0	0	2	16	33	15	3	6	4	6	88
>20.50	0	0	0	0	1	0	0	0	0	1	4	1	0	0	0	0	7
TOTAL	2	1	2	2	3	4	9	19	46	102	140	49	24	15	13	16	447

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	4
4.51- 5.50	0	1	0	0	1	2	3	2	4	1	1	3	4	1	0	0	23
5.51- 6.50	0	0	0	0	3	2	6	10	12	6	4	5	0	0	0	2	50
6.51- 8.50	1	0	1	0	1	3	5	5	8	5	7	8	5	1	2	0	52
8.51-11.50	2	1	1	0	1	4	0	1	1	9	16	10	5	1	1	1	54
11.51-14.50	0	1	0	1	1	0	0	0	2	8	4	0	0	0	0	2	19
14.51-20.50	1	0	0	2	1	0	0	0	0	0	3	2	0	1	0	1	11
>20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL	4	3	2	3	8	12	15	18	26	24	39	32	15	4	3	6	214

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	2
3.51- 4.50	1	1	0	1	2	2	4	4	2	2	1	0	0	0	0	0	20
4.51- 5.50	0	1	0	1	4	7	4	9	6	3	4	1	0	0	2	0	42
5.51- 6.50	1	3	1	0	4	3	8	7	5	3	3	5	3	1	1	0	48
6.51- 8.50	2	3	1	0	3	1	0	2	4	6	8	7	3	2	0	2	44
8.51-11.50	0	1	1	3	2	2	0	0	1	2	12	3	0	2	0	2	31
11.51-14.50	0	0	0	0	0	0	0	0	0	0	2	1	1	5	2	0	11
14.51-20.50	1	0	0	4	0	0	0	0	0	0	2	1	0	3	0	0	11
>20.50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	5	9	3	10	15	15	17	22	18	16	32	18	8	13	5	4	210

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2005 TO 6/30/2005

\*\*\* 1ST SEMI \*\*\*

STABILITY CLASS D  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
1.51- 2.50	0	0	2	4	1	1	3	1	0	4	2	1	3	2	1	4	29
2.51- 3.50	3	7	7	2	6	8	8	9	4	6	18	8	18	9	11	5	129
3.51- 4.50	12	7	7	4	4	7	7	7	14	13	17	13	11	9	8	12	152
4.51- 5.50	6	12	8	2	4	4	6	11	3	8	14	10	8	5	4	6	111
5.51- 6.50	3	8	3	6	1	2	6	5	10	11	11	7	5	3	3	3	87
6.51- 8.50	6	2	11	7	4	8	6	5	5	10	20	14	4	1	3	2	108
8.51-11.50	0	1	3	3	7	13	5	1	3	5	21	15	5	3	5	0	90
11.51-14.50	1	0	3	5	10	3	0	0	0	3	13	10	0	4	1	0	53
14.51-20.50	0	0	1	6	11	1	0	0	0	4	14	2	2	2	4	1	48
>20.50	0	0	0	2	0	0	0	0	0	1	3	1	0	0	0	0	7
TOTAL	31	37	45	41	48	47	41	39	39	65	133	81	56	38	41	33	815

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2
1.51- 2.50	6	1	1	3	1	0	2	0	0	0	3	1	6	5	7	4	40
2.51- 3.50	17	5	1	3	2	1	0	1	4	2	7	3	7	16	14	10	93
3.51- 4.50	9	5	3	7	1	2	7	1	2	1	4	10	6	4	16	17	95
4.51- 5.50	8	6	2	1	4	0	5	1	7	8	7	5	5	3	5	8	75
5.51- 6.50	7	4	8	1	2	0	1	4	7	12	10	9	2	1	0	3	71
6.51- 8.50	5	8	8	2	2	1	5	7	16	37	20	8	5	6	1	133	
8.51-11.50	6	4	5	8	6	7	8	6	1	19	38	26	11	2	7	1	155
11.51-14.50	1	0	1	7	17	5	2	3	1	17	20	6	9	2	5	1	97
14.51-20.50	0	0	1	0	14	3	1	0	0	7	6	3	4	4	4	0	47
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	59	33	30	32	49	21	27	21	29	82	132	83	58	42	65	45	808

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	7	2	0	2	4	0	0	0	1	3	0	1	4	6	4	8	42
2.51- 3.50	12	5	5	7	4	1	3	0	4	7	4	6	9	24	17	18	126
3.51- 4.50	15	3	2	1	3	0	1	0	2	9	13	9	9	9	21	32	129
4.51- 5.50	11	2	4	0	0	0	0	1	3	4	15	9	9	4	13	16	91
5.51- 6.50	12	5	0	0	0	0	0	2	7	10	23	11	3	2	7	8	90
6.51- 8.50	6	5	5	1	1	0	0	0	2	16	33	20	12	5	9	1	116
8.51-11.50	4	1	0	4	1	0	1	0	1	18	32	26	3	4	6	1	102
11.51-14.50	2	1	1	0	0	0	0	0	0	2	3	0	1	0	2	1	13
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	69	24	17	15	13	1	5	3	20	69	123	82	50	54	79	86	710



ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2005 TO 6/30/2005

\*\*\* 1ST SEMI \*\*\*

STABILITY CLASS G  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	8	6	2	2	2	3	1	0	2	0	3	4	3	6	9	9	60
2.51- 3.50	59	23	4	3	4	5	3	4	2	1	5	4	12	12	31	51	223
3.51- 4.50	102	29	8	6	0	2	2	3	0	2	6	3	8	7	33	86	297
4.51- 5.50	92	31	8	1	3	0	0	3	2	4	2	4	4	8	18	46	226
5.51- 6.50	58	19	7	0	2	0	0	0	1	1	4	2	1	5	6	24	130
6.51- 8.50	47	22	3	0	0	0	1	0	0	3	16	2	2	1	0	21	118
8.51-11.50	22	36	3	0	0	0	0	0	0	7	4	0	0	0	0	8	80
11.51-14.50	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	388	168	35	12	11	10	7	10	7	18	40	19	30	39	97	248	1139

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	3
.76- 1.50	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	3
1.51- 2.50	21	9	5	11	8	4	6	1	3	7	8	7	16	19	21	25	171
2.51- 3.50	91	40	17	15	16	15	15	14	14	16	34	21	47	61	73	84	573
3.51- 4.50	139	45	20	19	10	14	22	15	21	27	41	35	35	29	78	147	697
4.51- 5.50	117	53	22	5	16	13	19	28	27	29	43	32	30	21	43	76	574
5.51- 6.50	81	39	19	8	12	9	26	34	51	47	56	39	16	12	17	40	506
6.51- 8.50	67	40	29	10	12	16	16	23	45	74	143	77	36	15	20	27	650
8.51-11.50	35	44	13	18	17	26	14	13	16	103	170	101	38	13	21	17	659
11.51-14.50	5	4	6	13	29	8	2	4	6	43	79	27	14	19	16	13	288
14.51-20.50	2	1	3	13	26	4	1	0	2	27	58	23	9	16	12	9	206
>20.50	0	0	0	3	1	0	0	0	0	3	7	2	0	0	0	0	16
TOTAL	558	275	134	115	147	110	121	132	185	376	639	364	241	205	303	438	4343

TOTAL NUMBER OF OBSERVATIONS: 4344  
 TOTAL NUMBER OF VALID OBSERVATIONS: 4343  
 TOTAL NUMBER OF MISSING OBSERVATIONS: 1  
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %  
 MEAN WIND SPEED FOR THIS PERIOD: 6.9 MPH  
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES						
A	B	C	D	E	F	G
10.29	4.93	4.84	18.77	18.60	16.35	26.23

	DISTRIBUTION OF WIND DIRECTION VS STABILITY																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	2	1	2	2	3	4	9	19	46	102	140	49	24	15	13	16	0
B	4	3	2	3	8	12	15	18	26	24	39	32	15	4	3	6	0
C	5	9	3	10	15	15	17	22	18	16	32	18	8	13	5	4	0
D	31	37	45	41	48	47	41	39	39	65	133	81	56	38	41	33	0
E	59	33	30	32	49	21	27	21	29	82	132	83	58	42	65	45	0
F	69	24	17	15	13	1	5	3	20	69	123	82	50	54	79	86	0
G	388	168	35	12	11	10	7	10	7	18	40	19	30	39	97	248	0
TOTAL	558	275	134	115	147	110	121	132	185	376	639	364	241	205	303	438	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2005 TO 9/30/2005

\*\*\* 3RD QRTR \*\*\*

STABILITY CLASS A  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
4.51- 5.50	0	0	0	0	0	0	1	0	1	2	1	1	1	0	0	0	7
5.51- 6.50	0	0	1	0	0	0	3	3	9	5	8	2	1	1	0	0	33
6.51- 8.50	0	0	1	2	5	8	4	9	24	25	34	14	2	0	0	0	128
8.51-11.50	0	0	0	4	5	9	1	1	12	24	34	8	8	1	0	0	107
11.51-14.50	0	0	0	0	3	1	2	1	0	11	21	3	2	3	0	0	47
14.51-20.50	1	0	0	0	1	2	1	0	1	4	8	0	0	0	0	1	19
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	0	2	6	14	20	12	14	47	71	106	28	15	5	0	1	342

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	1	0	1	1	1	0	0	1	0	0	0	0	0	0	5
4.51- 5.50	0	0	1	0	2	1	3	5	4	2	3	0	1	0	2	2	25
5.51- 6.50	1	2	0	1	2	3	2	7	15	18	10	9	1	0	1	1	73
6.51- 8.50	0	1	0	5	5	3	1	2	13	14	11	15	1	1	0	0	72
8.51-11.50	0	0	1	0	6	2	0	2	2	2	6	6	1	0	0	0	28
11.51-14.50	0	0	0	0	1	0	0	0	1	1	3	1	0	0	0	0	7
14.51-20.50	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
>20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL	1	3	3	6	17	10	5	14	37	41	32	35	3	2	1	3	213

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	2	0	1	1	0	2	2	0	0	1	0	0	0	9
4.51- 5.50	1	2	0	2	1	0	2	2	11	7	7	1	5	3	3	1	48
5.51- 6.50	0	0	1	2	0	0	2	2	6	8	3	4	1	0	0	1	30
6.51- 8.50	0	1	5	0	1	5	3	0	2	8	5	6	4	1	0	0	41
8.51-11.50	0	0	0	2	0	1	0	0	0	0	1	1	0	0	0	0	5
11.51-14.50	0	0	0	0	5	0	0	0	0	1	3	0	0	0	0	0	9
14.51-20.50	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	3
>20.50	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	1	4	6	8	7	7	8	4	22	26	21	12	11	4	3	2	146

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2005 TO 9/30/2005

\*\*\* 3RD QRTR \*\*\*

STABILITY CLASS D  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	2	0	1	1	0	0	1	1	2	0	2	3	0	13
2.51- 3.50	1	7	2	3	4	2	4	3	3	0	5	4	1	3	4	2	48
3.51- 4.50	7	3	3	4	3	0	3	4	6	7	4	8	3	5	4	2	66
4.51- 5.50	4	1	3	4	1	2	3	4	2	1	9	4	5	3	1	3	50
5.51- 6.50	2	3	3	1	1	0	1	0	0	0	5	5	2	0	1	0	24
6.51- 8.50	1	2	4	2	2	1	3	1	0	0	8	5	5	3	2	2	41
8.51-11.50	0	0	1	6	6	2	0	4	1	1	15	4	3	1	0	1	45
11.51-14.50	1	1	1	0	9	2	0	0	1	3	5	2	2	3	0	0	30
14.51-20.50	1	1	1	1	7	3	1	0	0	5	5	0	0	0	0	1	26
>20.50	0	0	1	0	1	1	0	0	0	0	2	0	0	0	0	0	5
TOTAL	17	18	19	23	34	14	16	16	13	18	59	34	21	20	15	11	348

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	2	0	1	1	1	0	0	0	0	3	1	2	4	3	2	20
2.51- 3.50	4	3	0	5	1	2	2	0	0	3	2	3	3	5	7	5	45
3.51- 4.50	4	4	3	2	1	1	1	0	1	3	6	2	2	6	3	7	46
4.51- 5.50	3	1	1	4	1	0	1	1	1	5	3	4	5	3	3	2	38
5.51- 6.50	0	3	1	2	1	0	1	2	2	4	5	3	0	2	4	2	32
6.51- 8.50	6	5	3	2	4	4	3	2	2	10	12	7	5	3	3	0	71
8.51-11.50	4	3	3	4	5	1	2	1	3	9	35	8	1	4	5	0	88
11.51-14.50	0	0	1	4	8	4	0	2	1	3	12	2	1	0	1	0	39
14.51-20.50	0	0	0	0	15	2	2	0	0	1	0	1	0	0	0	1	22
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	21	21	12	24	38	15	12	8	10	38	78	31	19	27	29	19	402

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	3
1.51- 2.50	5	1	1	0	0	0	1	0	0	1	2	0	2	1	2	4	20
2.51- 3.50	11	2	1	0	0	0	1	1	3	0	8	4	7	5	8	11	62
3.51- 4.50	11	3	2	1	2	3	0	0	0	2	11	9	6	5	8	8	71
4.51- 5.50	11	6	1	1	0	1	1	0	1	4	6	6	5	4	1	4	52
5.51- 6.50	3	2	2	1	0	1	0	0	0	4	6	6	4	5	2	6	42
6.51- 8.50	2	1	3	1	2	0	0	1	3	12	14	8	3	3	3	0	56
8.51-11.50	0	0	1	2	0	1	0	0	0	7	18	5	1	1	2	2	40
11.51-14.50	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
14.51-20.50	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
>20.50	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL	44	15	11	6	4	7	3	3	9	32	65	38	28	24	26	35	350

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2005 TO 9/30/2005

\*\*\* 3RD QRTR \*\*\*

STABILITY CLASS G  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
1.51- 2.50	3	1	2	0	0	0	0	0	0	1	1	2	0	3	5	2	20
2.51- 3.50	16	7	4	1	2	0	1	1	0	1	2	1	8	4	9	17	74
3.51- 4.50	42	18	5	1	1	2	0	0	1	1	1	1	4	4	3	37	121
4.51- 5.50	44	14	4	4	0	0	0	0	0	0	3	0	1	9	5	21	105
5.51- 6.50	26	12	1	2	1	0	0	0	0	2	3	2	1	0	1	7	58
6.51- 8.50	8	2	2	2	0	0	0	0	0	0	1	2	2	2	1	1	23
8.51-11.50	0	2	0	0	0	0	0	0	0	1	0	0	1	0	0	0	4
11.51-14.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.51-20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	139	56	18	10	4	2	1	1	1	7	11	8	17	22	25	85	407

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	1	0	0	1	1	0	0	0	0	1	0	4
1.51- 2.50	8	4	3	3	1	2	2	0	0	3	7	5	4	10	13	8	73
2.51- 3.50	32	19	7	9	7	4	8	5	6	4	17	12	19	17	28	35	229
3.51- 4.50	64	28	14	10	8	8	6	4	10	16	22	20	17	20	18	54	319
4.51- 5.50	63	24	10	15	5	4	9	10	21	23	31	19	22	23	13	33	325
5.51- 6.50	32	22	9	9	5	4	9	14	32	41	40	31	10	8	9	17	292
6.51- 8.50	17	12	18	14	19	21	14	15	44	69	85	57	22	13	9	3	432
8.51-11.50	4	5	6	18	22	16	3	8	18	44	109	32	15	7	7	3	317
11.51-14.50	1	1	2	4	26	7	2	4	3	20	44	8	5	6	1	0	134
14.51-20.50	3	1	1	1	23	7	4	0	3	11	15	2	0	0	0	3	74
>20.50	0	1	1	0	2	1	0	0	1	1	2	0	0	0	0	0	9
TOTAL	224	117	71	83	118	75	57	60	139	233	372	186	114	104	99	156	2208

TOTAL NUMBER OF OBSERVATIONS: 2208  
 TOTAL NUMBER OF VALID OBSERVATIONS: 2208  
 TOTAL NUMBER OF MISSING OBSERVATIONS: 0  
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %  
 MEAN WIND SPEED FOR THIS PERIOD: 6.8 MPH  
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES						
A	B	C	D	E	F	G
15.49	9.65	6.61	15.76	18.21	15.85	18.43

	DISTRIBUTION OF WIND DIRECTION VS STABILITY																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	1	0	2	6	14	20	12	14	47	71	106	28	15	5	0	1	0
B	1	3	3	6	17	10	5	14	37	41	32	35	3	2	1	3	0
C	1	4	6	8	7	7	8	4	22	26	21	12	11	4	3	2	0
D	17	18	19	23	34	14	16	16	13	18	59	34	21	20	15	11	0
E	21	21	12	24	38	15	12	8	10	38	78	31	19	27	29	19	0
F	44	15	11	6	4	7	3	3	9	32	65	38	28	24	26	35	0
G	139	56	18	10	4	2	1	1	7	11	8	17	22	25	85	0	
TOTAL	224	117	71	83	118	75	57	60	139	233	372	186	114	104	99	156	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2005 TO 12/31/2005

\*\*\* 4TH QTR \*\*\*

STABILITY CLASS A  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.51- 5.50	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
5.51- 6.50	0	0	0	0	0	0	0	2	2	0	0	0	0	1	0	0	5
6.51- 8.50	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	3
8.51-11.50	0	0	0	0	3	2	1	0	1	1	2	2	0	0	0	0	12
11.51-14.50	0	1	0	0	3	0	0	0	1	5	3	4	1	0	0	0	18
14.51-20.50	0	1	3	1	4	0	0	0	0	1	2	0	2	2	2	2	20
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	2	3	1	10	2	2	2	5	5	9	5	6	4	2	2	60

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3
4.51- 5.50	0	0	0	0	0	1	1	2	2	1	0	0	0	0	0	0	7
5.51- 6.50	0	0	0	0	0	1	0	1	3	3	0	1	2	0	0	0	11
6.51- 8.50	0	0	1	4	1	1	1	1	1	0	2	4	2	0	0	0	18
8.51-11.50	0	1	0	1	6	1	0	1	0	3	2	2	1	1	0	0	19
11.51-14.50	0	0	0	0	3	0	0	0	0	1	2	1	0	0	1	1	9
14.51-20.50	0	0	0	0	1	0	0	0	0	0	2	0	0	0	1	0	4
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	2	1	5	11	4	2	7	6	9	8	8	5	1	2	1	72

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
3.51- 4.50	0	1	1	2	1	3	2	1	5	1	0	1	0	3	0	0	21
4.51- 5.50	2	0	1	2	2	1	2	4	3	7	3	5	3	0	1	0	36
5.51- 6.50	3	0	2	6	1	3	0	2	2	3	3	4	0	0	0	1	30
6.51- 8.50	1	0	4	7	0	0	0	2	1	0	6	3	1	1	0	0	26
8.51-11.50	0	0	1	5	1	0	0	0	0	1	1	0	1	3	0	1	14
11.51-14.50	1	0	0	0	2	0	0	0	0	0	1	0	0	0	1	0	5
14.51-20.50	0	1	0	1	1	0	0	0	0	0	0	0	0	2	0	0	5
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	8	2	9	24	8	7	4	9	11	12	14	13	5	9	2	2	139

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2005 TO 12/31/2005

\*\*\* 4TH QTR \*\*\*

STABILITY CLASS D  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
1.51- 2.50	3	2	4	1	5	1	2	4	4	4	5	3	1	3	2	3	47
2.51- 3.50	10	2	6	11	5	9	10	8	11	7	6	5	5	12	7	4	118
3.51- 4.50	2	9	12	11	7	3	5	1	10	6	15	8	3	4	4	2	102
4.51- 5.50	1	2	9	15	6	2	2	2	9	5	4	6	5	2	1	2	73
5.51- 6.50	0	2	4	6	0	1	2	0	6	2	7	1	2	1	1	1	36
6.51- 8.50	1	1	4	12	2	2	1	1	0	0	3	3	2	1	1	2	36
8.51-11.50	1	0	1	3	5	0	0	0	2	1	2	0	2	3	0	0	20
11.51-14.50	0	0	0	1	3	0	0	0	1	1	1	2	0	0	1	0	10
14.51-20.50	0	0	0	0	1	1	0	0	1	0	0	0	0	2	0	0	5
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	18	18	40	61	34	19	22	16	44	26	43	28	20	28	17	14	448

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	4
1.51- 2.50	2	6	2	0	1	1	1	1	1	0	2	1	1	4	3	3	29
2.51- 3.50	4	0	3	1	0	1	2	0	1	3	1	0	3	2	4	3	28
3.51- 4.50	4	2	4	1	0	0	3	1	0	5	1	2	2	2	2	2	31
4.51- 5.50	2	1	0	0	0	0	1	2	0	4	4	3	2	0	1	2	22
5.51- 6.50	0	3	2	0	0	0	0	0	1	1	4	2	1	1	2	0	17
6.51- 8.50	0	0	0	2	0	2	0	1	1	2	5	4	4	0	2	0	23
8.51-11.50	0	0	0	2	3	0	0	0	0	2	8	4	1	8	4	0	32
11.51-14.50	0	1	0	0	1	1	0	0	0	3	4	1	2	5	6	3	27
14.51-20.50	0	0	0	0	0	0	0	0	0	1	0	0	1	2	1	0	5
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	13	13	11	7	5	5	7	5	5	21	29	17	18	24	25	13	218

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
1.51- 2.50	7	0	1	3	0	0	0	0	0	0	2	0	4	3	2	4	26
2.51- 3.50	10	6	2	3	1	0	1	2	0	0	2	3	6	6	2	6	50
3.51- 4.50	7	8	4	0	2	2	1	0	1	3	1	4	3	3	7	5	51
4.51- 5.50	5	2	3	2	3	2	1	0	1	2	4	1	2	1	11	9	49
5.51- 6.50	1	3	1	0	1	0	1	0	0	2	2	3	3	2	8	2	29
6.51- 8.50	0	2	4	0	1	0	0	0	0	7	2	5	4	4	4	4	37
8.51-11.50	1	0	0	0	0	0	0	0	0	0	2	0	1	6	4	14	
11.51-14.50	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	32	21	15	8	8	4	4	2	2	14	13	18	23	21	40	34	259

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2005 TO 12/31/2005

\*\*\* 4TH QTR \*\*\*

STABILITY CLASS G  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
1.51- 2.50	13	9	6	1	3	0	2	1	3	3	2	3	2	3	10	17	78
2.51- 3.50	50	27	10	7	1	3	2	1	4	2	3	6	9	5	44	64	238
3.51- 4.50	116	52	9	5	0	4	1	2	0	0	5	2	9	26	61	292	
4.51- 5.50	88	54	10	0	1	0	0	0	0	3	2	2	4	5	9	44	222
5.51- 6.50	39	28	12	0	0	0	0	0	0	1	1	1	1	1	5	16	105
6.51- 8.50	15	11	3	1	0	0	0	0	0	0	1	0	0	1	3	13	48
8.51-11.50	11	5	2	0	0	0	0	0	0	0	0	0	0	0	0	4	22
11.51-14.50	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	4
14.51-20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	333	186	52	14	5	7	5	4	7	9	10	17	19	25	97	221	1011

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	2	0	0	0	0	1	0	1	0	2	2	0	0	9
1.51- 2.50	25	17	13	5	9	2	5	6	8	7	11	7	8	13	17	27	180
2.51- 3.50	75	35	21	23	7	13	15	12	16	12	12	14	23	25	57	77	437
3.51- 4.50	129	73	30	19	10	12	12	6	16	16	17	20	10	21	39	70	500
4.51- 5.50	98	59	23	19	12	6	7	10	16	23	17	17	16	8	23	57	411
5.51- 6.50	43	36	21	12	2	5	3	5	14	12	17	12	9	6	16	20	233
6.51- 8.50	17	14	16	26	4	5	3	5	4	10	19	19	13	7	10	19	191
8.51-11.50	13	6	4	11	18	3	1	1	3	8	15	10	5	16	10	9	133
11.51-14.50	3	2	0	1	12	1	0	0	1	6	13	7	7	6	9	6	74
14.51-20.50	0	2	3	2	7	1	0	0	1	2	4	0	3	8	4	2	39
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	404	244	131	120	81	48	46	45	80	96	126	106	96	112	185	287	2207

TOTAL NUMBER OF OBSERVATIONS: 2208  
 TOTAL NUMBER OF VALID OBSERVATIONS: 2207  
 TOTAL NUMBER OF MISSING OBSERVATIONS: 1  
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %  
 MEAN WIND SPEED FOR THIS PERIOD: 5.2 MPH  
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES						
A	B	C	D	E	F	G
2.72	3.26	6.30	20.30	9.88	11.74	45.81

	DISTRIBUTION OF WIND DIRECTION VS STABILITY																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	0	2	3	1	10	2	2	2	5	5	9	5	6	4	2	2	0
B	0	2	1	5	11	4	2	7	6	9	8	8	5	1	2	1	0
C	8	2	9	24	8	7	4	9	11	12	14	13	5	9	2	2	0
D	18	18	40	61	34	19	22	16	44	26	43	28	20	28	17	14	0
E	13	13	11	7	5	5	7	5	5	21	29	17	18	24	25	13	0
F	32	21	15	8	8	4	4	2	2	14	13	18	23	21	40	34	0
G	333	186	52	14	5	7	5	4	7	9	10	17	19	25	97	221	0
TOTAL	404	244	131	120	81	48	46	45	80	96	126	106	96	112	185	287	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2005 TO 12/31/2005

\*\*\* 2ND SEMI \*\*\*

STABILITY CLASS A  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET

WIND MEASURED AT: 35.0 FEET

WIND THRESHOLD AT: .75 MPH

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
4.51- 5.50	0	0	0	0	0	0	1	0	2	3	1	1	1	0	0	0	9
5.51- 6.50	0	0	1	0	0	0	3	5	11	5	8	2	1	2	0	0	38
6.51- 8.50	0	0	1	2	5	8	5	9	25	26	34	14	2	0	0	0	131
8.51-11.50	0	0	0	4	8	11	2	1	13	25	36	10	8	1	0	0	119
11.51-14.50	0	1	0	0	6	1	2	1	0	12	26	6	6	4	0	0	65
14.51-20.50	1	1	3	1	5	2	1	0	1	5	10	0	2	2	2	3	39
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	2	5	7	24	22	14	16	52	76	115	33	21	9	2	3	402

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	1	1	0	1	1	1	1	0	2	0	0	0	0	0	0	8
4.51- 5.50	0	0	1	0	2	2	2	5	7	5	2	3	0	1	0	2	32
5.51- 6.50	1	2	0	1	2	4	2	8	18	21	10	10	3	0	1	1	84
6.51- 8.50	0	1	1	9	6	4	2	3	14	14	13	19	3	1	0	0	90
8.51-11.50	0	1	1	1	12	3	0	3	2	5	8	8	2	1	0	0	47
11.51-14.50	0	0	0	0	4	0	0	0	1	2	5	2	0	0	1	1	16
14.51-20.50	0	0	0	0	1	0	0	0	1	0	2	1	0	0	1	0	6
>20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL	1	5	4	11	28	14	7	21	43	50	40	43	8	3	3	4	285

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
3.51- 4.50	0	1	1	4	1	4	3	1	7	3	0	1	1	3	0	0	30
4.51- 5.50	3	2	1	4	3	1	4	6	14	14	10	6	8	3	4	1	84
5.51- 6.50	3	0	3	8	1	3	2	4	8	11	6	8	1	0	0	2	60
6.51- 8.50	1	1	9	7	1	5	3	2	3	8	11	9	5	2	0	0	67
8.51-11.50	0	0	1	7	1	1	0	0	0	1	2	1	1	3	0	1	19
11.51-14.50	1	0	0	0	7	0	0	0	0	1	4	0	0	0	1	0	14
14.51-20.50	0	1	0	1	1	0	0	0	1	0	2	0	0	2	0	0	8
>20.50	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	9	6	15	32	15	14	12	13	33	38	35	25	16	13	5	4	285



ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2005 TO 12/31/2005

\*\*\* 2ND SEMI \*\*\*

STABILITY CLASS D  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
1.51- 2.50	3	2	4	3	5	2	3	4	4	5	6	5	1	5	5	3	60
2.51- 3.50	11	9	8	14	9	11	14	11	14	7	11	9	6	15	11	6	166
3.51- 4.50	9	12	15	15	10	3	8	5	16	13	19	16	6	9	8	4	168
4.51- 5.50	5	3	12	19	7	4	5	6	11	6	13	10	10	5	2	5	123
5.51- 6.50	2	5	7	7	1	1	3	0	6	2	12	6	4	1	2	1	60
6.51- 8.50	2	3	8	14	4	3	4	2	0	0	11	8	7	4	3	4	77
8.51-11.50	1	0	2	9	11	2	0	4	3	2	17	4	5	4	0	1	65
11.51-14.50	1	1	1	1	12	2	0	0	2	4	6	4	2	3	1	0	40
14.51-20.50	1	1	1	1	8	4	1	0	1	5	5	0	0	2	0	1	31
>20.50	0	0	1	0	1	1	0	0	0	0	2	0	0	0	0	0	5
TOTAL	35	36	59	84	68	33	38	32	57	44	102	62	41	48	32	25	796

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	4
1.51- 2.50	2	8	2	1	2	2	1	1	1	0	5	2	3	8	6	5	49
2.51- 3.50	8	3	3	6	1	3	4	0	1	6	3	3	6	7	11	8	73
3.51- 4.50	8	6	7	3	1	1	4	1	1	8	7	4	4	8	5	9	77
4.51- 5.50	5	2	1	4	1	0	2	3	1	9	7	7	7	3	4	4	60
5.51- 6.50	0	6	3	2	1	0	1	2	3	5	9	5	1	3	6	2	49
6.51- 8.50	6	5	3	4	4	6	3	3	3	12	17	11	9	3	5	0	94
8.51-11.50	4	3	3	6	8	1	2	1	3	11	43	12	2	12	9	0	120
11.51-14.50	0	1	1	4	9	5	0	2	1	6	16	3	3	5	7	3	66
14.51-20.50	0	0	0	0	15	2	2	0	0	2	0	1	1	2	1	1	27
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	34	34	23	31	43	20	19	13	15	59	107	48	37	51	54	32	620

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	1	0	0	1	1	0	0	1	1	0	0	5
1.51- 2.50	12	1	2	3	0	0	1	0	0	1	4	0	6	4	4	8	46
2.51- 3.50	21	8	3	3	1	0	2	3	3	0	10	7	13	11	10	17	112
3.51- 4.50	18	11	6	1	4	5	1	0	1	5	12	13	9	8	15	13	122
4.51- 5.50	16	8	4	3	3	3	2	0	2	6	10	7	7	5	12	13	101
5.51- 6.50	4	5	3	1	1	1	1	0	0	6	8	9	7	7	10	8	71
6.51- 8.50	2	3	7	1	3	0	0	1	3	19	16	13	7	7	7	4	93
8.51-11.50	1	0	1	2	0	1	0	0	0	7	18	7	1	2	8	6	54
11.51-14.50	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3
14.51-20.50	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
>20.50	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL	76	36	26	14	12	11	7	5	11	46	78	56	51	45	66	69	609

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2005 TO 12/31/2005

\*\*\* 2ND SEMI \*\*\*

STABILITY CLASS G  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	3
1.51- 2.50	16	10	8	1	3	0	2	1	3	4	3	5	2	6	15	19	98
2.51- 3.50	66	34	14	8	3	3	3	2	4	3	5	7	17	9	53	81	312
3.51- 4.50	158	70	14	6	1	6	1	2	1	1	1	6	6	13	29	98	413
4.51- 5.50	132	68	14	4	1	0	0	0	0	3	5	2	5	14	14	65	327
5.51- 6.50	65	40	13	2	1	0	0	0	0	3	4	3	2	1	6	23	163
6.51- 8.50	23	13	5	3	0	0	0	0	0	0	2	2	2	3	4	14	71
8.51-11.50	11	7	2	0	0	0	0	0	0	1	0	0	1	0	0	4	26
11.51-14.50	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	4
14.51-20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	472	242	70	24	9	9	6	5	8	16	21	25	36	47	122	306	1418

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.76- 1.50	1	0	0	2	0	1	0	0	2	1	1	0	2	2	1	0	13
1.51- 2.50	33	21	16	8	10	4	7	6	8	10	18	12	12	23	30	35	253
2.51- 3.50	107	54	28	32	14	17	23	17	22	16	29	26	42	42	85	112	666
3.51- 4.50	193	101	44	29	18	20	18	10	26	32	39	40	27	41	57	124	819
4.51- 5.50	161	83	33	34	17	10	16	20	37	46	48	36	38	31	36	90	736
5.51- 6.50	75	58	30	21	7	9	12	19	46	53	57	43	19	14	25	37	525
6.51- 8.50	34	26	34	40	23	26	17	20	48	79	104	76	35	20	19	22	623
8.51-11.50	17	11	10	29	40	19	4	9	21	52	124	42	20	23	17	12	450
11.51-14.50	4	3	2	5	38	8	2	4	4	26	57	15	12	12	10	6	208
14.51-20.50	3	3	4	3	30	8	4	0	4	13	19	2	3	8	4	5	113
>20.50	0	1	1	0	2	1	0	0	1	1	2	0	0	0	0	0	9
TOTAL	628	361	202	203	199	123	103	105	219	329	498	292	210	216	284	443	4415

TOTAL NUMBER OF OBSERVATIONS: 4416  
 TOTAL NUMBER OF VALID OBSERVATIONS: 4415  
 TOTAL NUMBER OF MISSING OBSERVATIONS: 1  
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %  
 MEAN WIND SPEED FOR THIS PERIOD: 6.0 MPH  
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES						
A	B	C	D	E	F	G
9.11	6.46	6.46	18.03	14.04	13.79	32.12

DISTRIBUTION OF WIND DIRECTION VS STABILITY																	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	1	2	5	7	24	22	14	16	52	76	115	33	21	9	2	3	0
B	1	5	4	11	28	14	7	21	43	50	40	43	8	3	3	4	0
C	9	6	15	32	15	14	12	13	33	38	35	25	16	13	5	4	0
D	35	36	59	84	68	33	38	32	57	44	102	62	41	48	32	25	0
E	34	34	23	31	43	20	19	13	15	59	107	48	37	51	54	32	0
F	76	36	26	14	12	11	7	5	11	46	78	56	51	45	66	69	0
G	472	242	70	24	9	9	6	5	8	16	21	25	36	47	122	306	0
TOTAL	628	361	202	203	199	123	103	105	219	329	498	292	210	216	284	443	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2005 TO 12/31/2005

\*\*\* ANNUAL \*\*\*

STABILITY CLASS A  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
4.51- 5.50	0	0	0	0	0	0	2	1	4	4	1	1	1	0	1	0	15
5.51- 6.50	0	0	1	1	0	2	8	11	20	9	2	3	2	0	0	0	68
6.51- 8.50	0	0	1	2	6	10	8	15	44	44	56	20	4	0	0	0	210
8.51-11.50	1	0	0	4	8	11	2	6	22	68	83	31	22	2	2	4	266
11.51-14.50	1	1	1	0	7	1	2	2	5	31	59	12	9	12	6	6	155
14.51-20.50	1	2	4	2	5	2	1	0	3	21	43	15	5	8	6	9	127
>20.50	0	0	0	0	1	0	0	0	0	1	4	1	0	0	0	0	7
TOTAL	3	3	7	9	27	26	23	35	98	178	255	82	45	24	15	19	849

STABILITY CLASS B

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	1	1	0	1	2	2	1	1	2	0	0	1	0	0	0	12
4.51- 5.50	0	1	1	0	3	4	5	7	11	6	3	6	4	2	0	2	55
5.51- 6.50	1	2	0	1	5	6	8	18	30	27	14	15	3	0	1	3	134
6.51- 8.50	1	1	2	9	7	7	8	22	19	20	27	8	2	2	0	0	142
8.51-11.50	2	2	2	1	13	7	0	4	3	14	24	18	7	2	1	1	101
11.51-14.50	0	1	0	1	5	0	0	0	1	4	13	6	0	0	1	3	35
14.51-20.50	1	0	0	2	2	0	0	0	1	0	5	3	0	1	1	1	17
>20.50	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
TOTAL	5	8	6	14	36	26	22	39	69	74	79	75	23	7	6	10	499

STABILITY CLASS C

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.51- 3.50	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	4
3.51- 4.50	1	2	1	5	3	6	7	5	9	5	1	1	1	3	0	0	50
4.51- 5.50	3	3	1	5	7	8	8	15	20	17	14	7	8	3	6	1	126
5.51- 6.50	4	3	4	8	5	6	10	11	13	14	9	13	4	1	1	2	108
6.51- 8.50	3	4	10	7	4	6	3	4	7	14	19	16	8	4	0	2	111
8.51-11.50	0	1	2	10	3	3	0	0	1	3	14	4	1	5	0	3	50
11.51-14.50	1	0	0	0	7	0	0	0	0	1	6	1	1	5	3	0	25
14.51-20.50	1	1	0	5	1	0	0	0	1	0	4	1	0	5	0	0	19
>20.50	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	14	15	18	42	30	29	29	35	51	54	67	43	24	26	10	8	495

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2005 TO 12/31/2005

\*\*\* ANNUAL \*\*\*

STABILITY CLASS D  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2
1.51- 2.50	3	2	6	7	6	3	6	5	4	9	8	6	4	7	6	7	89
2.51- 3.50	14	16	15	16	15	19	22	20	18	13	29	17	24	24	22	11	295
3.51- 4.50	21	19	22	19	14	10	15	12	30	26	36	29	17	18	16	16	320
4.51- 5.50	11	15	20	21	11	8	11	17	14	14	27	20	18	10	6	11	234
5.51- 6.50	5	13	10	13	2	3	9	5	16	13	23	13	9	4	5	4	147
6.51- 8.50	8	5	19	21	8	11	10	7	5	10	31	22	11	5	6	6	185
8.51-11.50	1	1	5	12	18	15	5	5	6	7	38	19	10	7	5	1	155
11.51-14.50	2	1	4	6	22	5	0	0	2	7	19	14	2	7	2	0	93
14.51-20.50	1	1	2	7	19	5	1	0	1	9	19	2	2	4	4	2	79
>20.50	0	0	1	2	1	1	0	0	0	1	5	1	0	0	0	0	12
TOTAL	66	73	104	125	116	80	79	71	96	109	235	143	97	86	73	58	1611

STABILITY CLASS E

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	1	0	1	0	0	1	0	0	0	1	0	1	0	6
1.51- 2.50	8	9	3	4	3	2	3	1	1	0	8	3	9	13	13	9	89
2.51- 3.50	25	8	4	9	3	4	4	1	5	8	10	6	13	23	25	18	166
3.51- 4.50	17	11	10	10	2	3	11	2	3	9	11	14	10	12	21	26	172
4.51- 5.50	13	8	3	5	5	0	7	4	8	17	14	12	12	6	9	12	135
5.51- 6.50	7	10	11	3	3	0	2	6	10	17	19	14	3	4	6	5	120
6.51- 8.50	11	13	11	6	6	8	4	8	10	28	54	31	17	8	11	1	227
8.51-11.50	10	7	8	14	14	8	10	7	4	30	81	38	13	14	16	1	275
11.51-14.50	1	1	2	11	26	10	2	5	2	23	36	9	12	7	12	4	163
14.51-20.50	0	0	1	0	29	5	3	0	0	9	6	4	5	6	5	1	74
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	93	67	53	63	92	41	46	34	44	141	239	131	95	93	119	77	1428

STABILITY CLASS F

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	1	0	0	1	1	0	0	1	1	0	0	5
1.51- 2.50	19	3	2	5	4	0	1	0	1	4	4	1	10	10	8	16	88
2.51- 3.50	33	13	8	10	5	1	5	3	7	7	14	13	22	35	27	35	238
3.51- 4.50	33	14	8	2	7	5	2	0	3	14	25	22	18	17	36	45	251
4.51- 5.50	27	10	8	3	3	3	2	1	5	10	25	16	16	9	25	29	192
5.51- 6.50	16	10	3	1	1	1	1	2	7	16	31	20	10	9	17	16	161
6.51- 8.50	8	8	12	2	4	0	0	1	5	35	49	33	19	12	16	5	209
8.51-11.50	5	1	1	6	1	1	1	0	1	25	50	33	4	6	14	7	156
11.51-14.50	3	1	1	0	0	0	0	1	0	3	3	0	1	0	2	1	16
14.51-20.50	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
>20.50	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL	145	60	43	29	25	12	12	8	31	115	201	138	101	99	145	155	1319

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2005 TO 12/31/2005

\*\*\* ANNUAL \*\*\*

STABILITY CLASS G  
 STABILITY BASED ON: DELTA T BETWEEN 200.0 AND 35.0 FEET  
 WIND MEASURED AT: 35.0 FEET  
 WIND THRESHOLD AT: .75 MPH  
 JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS AT 35.00 FEET

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	3
1.51- 2.50	24	16	10	3	5	3	3	1	5	4	6	9	5	12	24	28	158
2.51- 3.50	125	57	18	11	7	8	6	6	6	4	10	11	29	21	84	132	535
3.51- 4.50	260	99	22	12	1	8	3	5	1	3	7	9	14	20	62	184	710
4.51- 5.50	224	99	22	5	4	0	0	3	2	7	7	6	9	22	32	111	553
5.51- 6.50	123	59	20	2	3	0	0	0	1	4	8	5	3	6	12	47	293
6.51- 8.50	70	35	8	3	0	0	1	0	0	3	18	4	4	4	4	35	189
8.51-11.50	33	43	5	0	0	0	0	0	0	8	4	0	1	0	0	12	106
11.51-14.50	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	5	9
14.51-20.50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	860	410	105	36	20	19	13	15	15	34	61	44	66	86	219	554	2557

STABILITY CLASS ALL

SPEED (MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
.76- 1.50	1	0	0	2	0	2	0	0	2	1	1	0	2	2	3	0	16
1.51- 2.50	54	30	21	19	18	8	13	7	11	17	26	19	28	42	51	60	424
2.51- 3.50	198	94	45	47	30	32	38	31	36	32	63	47	89	103	158	196	1239
3.51- 4.50	332	146	64	48	28	34	40	25	47	59	80	75	62	70	135	271	1516
4.51- 5.50	278	136	55	39	33	23	35	48	64	75	91	68	68	52	79	166	1310
5.51- 6.50	156	97	49	29	19	18	38	53	97	100	113	82	35	26	42	77	1031
6.51- 8.50	101	66	63	50	35	42	33	43	93	153	247	153	71	35	39	49	1273
8.51-11.50	52	55	23	47	57	45	18	22	37	155	294	143	58	36	38	29	1109
11.51-14.50	9	7	8	18	67	16	4	8	10	69	136	42	26	31	26	19	496
14.51-20.50	5	4	7	16	56	12	5	0	6	40	77	25	12	24	16	14	319
>20.50	0	1	1	3	3	1	0	0	1	4	9	2	0	0	0	0	25
TOTAL	1186	636	336	318	346	233	224	237	404	705	1137	656	451	421	587	881	8758

TOTAL NUMBER OF OBSERVATIONS: 8760  
 TOTAL NUMBER OF VALID OBSERVATIONS: 8758  
 TOTAL NUMBER OF MISSING OBSERVATIONS: 2  
 PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %  
 MEAN WIND SPEED FOR THIS PERIOD: 6.4 MPH  
 TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES						
A	B	C	D	E	F	G
9.69	5.70	5.65	18.39	16.31	15.06	29.20

	DISTRIBUTION OF WIND DIRECTION VS STABILITY																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	3	3	7	9	27	26	23	35	98	178	255	82	45	24	15	19	0
B	5	8	6	14	36	26	22	39	69	74	79	75	23	7	6	10	0
C	14	15	18	42	30	29	29	35	51	54	67	43	24	26	10	8	0
D	66	73	104	125	116	80	79	71	96	109	235	143	97	86	73	58	0
E	93	67	53	63	92	41	46	34	44	141	239	131	95	93	119	77	0
F	145	60	43	29	25	12	12	8	31	115	201	138	101	99	145	155	0
G	860	410	105	36	20	19	13	15	15	34	61	44	66	86	219	554	0
TOTAL	1186	636	336	318	346	233	224	237	404	705	1137	656	451	421	587	881	0

**APPENDIX C**  
**DOSE CALCULATIONS**

## GASEOUS EFFLUENT DOSE CALCULATIONS

Doses to the maximum individual and the surrounding population resulting from the release of radioactive material in gaseous effluents from the Palo Verde Nuclear Generating Station were calculated using the GASPAR computer program. The radionuclides considered in the dose calculations were Tritium, Iodine-131, Iodine-132, Iodine-133, Iodine-135, all noble gases, and particulates having a half-life greater than eight days and for which dose factors are contained in NUREG-0172. Locations selected for individual dose calculations included for each sector, the site boundary, and within five miles, if present, the nearest residence, the nearest garden, and the nearest milk animal. GASPAR implements the radiological dose models of Regulatory Guide 1.109 to determine the radiation exposure to man from four principal atmospheric exposure pathways: plume, ground deposition, inhalation, and ingestion. Doses to the maximum individual and the population were calculated as a function of age group and pathway for significant body organs.

Table 43 presents the doses on a quarterly, semiannual and annual basis for the Energy Information Center. An occupancy factor of 1.0 (implying continuous occupancy over the entire year) was considered for the Energy Information Center and the exposure pathways considered to calculate its doses were plume, ground deposition, and inhalation.

Table 44 presents the population dose.

Table 45 summarizes the individual doses and compares the result to PVNGS ODCM Requirement limits. The site boundary and residence locations for which data are presented represent the highest annual doses.

Based on results obtained by placing TLDs on the site boundary in each sector, the net dose for this reporting period, from direct-radiation, (plume and ground deposition) from all three units was indistinguishable from preoperational values of 8 - 14  $\mu\text{R/hr}$  (17 - 30 mR/Std Qtr).

There were no liquid effluents associated with the operation of this facility.

## Dose Calculation Models

The GASPAR computer code was used to evaluate the radiological consequences of the routine release of gaseous effluents. GASPAR implements the dose calculational methodologies of Regulatory Guide 1.109, Revision 1.

Source terms for each quarter are combined with station-specific demographic data and each quarter's atmospheric diffusion estimates for gaseous dose calculations.

Atmospheric diffusion estimates are generated by the XOQDOQ computer code using onsite meteorological data as input. Additional input to GASPAR includes the following site-specific data:

0 to 5 mile nearest residence, milk animal and garden in each of the 16 compass sectors, based on the 2005 Land Use Census.

0 to 10 mile population distribution based on the State of Arizona - Maricopa County, Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station, December 2005, Survey Information.

The 10 to 50 mile population distribution from the PVNGS UFSAR, Figure 2.1-11.

The population distribution of metropolitan Phoenix greater than 50 miles from PVNGS, based on the 1980 federal census results, is conservatively included in the 40 to 50 mile sectors (NE=123; ENE=140,097; E=621,130; ESE=8,392).

Absolute humidity of 6.0 g/m<sup>3</sup> from the PVNGS UFSAR, Table 2.3-16.

The fraction of the year that vegetables are grown (0.667) from the PVNGS ER-OL, Section 2.1.3.4, Table 2.1-8.

The fraction of daily feed derived from pasture while on pasture (0.35) and length of grazing season for milk animals beyond 5 miles (0.75) from the PVNGS ER-OL, Section 2.1.3.4.3.

The fraction of daily feed derived from pasture while on pasture (0.05) and length of grazing season for meat animals (0.25) from the PVNGS ER-OL, Section 2.1.3.4.4.

There were three (3) sectors containing milk animal (goat or cow) locations within five (5) miles. For calculational purposes these milk animals are assumed to be fed 100% on pasture grass during the year.

Other values used for input to GASPAR are default values from Regulatory Guide 1.109, Revision 1.



**Table 43:  
Doses To Special Locations For 2005**

ENERGY INFORMATION CENTER LOCATED ONSITE 0.45 MILE S FROM UNIT 1, 0.29 MILE SSE FROM UNIT 2  
AND 0.20 MILE ESE FROM UNIT 3

(MREM)	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
<b>1ST QUARTER</b>								
ADULT	6.93E-01	6.93E-01	2.66E-03	6.93E-01	6.93E-01	6.93E-01	6.93E-01	6.95E-01
TEEN	6.98E-01	6.98E-01	2.66E-03	6.98E-01	6.98E-01	6.98E-01	6.98E-01	7.00E-01
CHILD	6.18E-01	6.18E-01	2.66E-03	6.18E-01	6.18E-01	6.18E-01	6.18E-01	6.20E-01
INFANT	3.56E-01	3.56E-01	2.66E-03	3.56E-01	3.56E-01	3.56E-01	3.56E-01	3.58E-01
<b>2ND QUARTER</b>								
ADULT	1.95E-01	1.95E-01	1.18E-03	1.95E-01	1.95E-01	1.95E-01	1.95E-01	1.96E-01
TEEN	1.96E-01	1.96E-01	1.18E-03	1.96E-01	1.96E-01	1.97E-01	1.96E-01	1.97E-01
CHILD	1.73E-01	1.73E-01	1.18E-03	1.73E-01	1.73E-01	1.74E-01	1.73E-01	1.74E-01
INFANT	1.00E-01	1.00E-01	1.18E-03	1.00E-01	1.00E-01	1.01E-01	1.00E-01	1.01E-01
<b>1ST SEMI-ANNUAL</b>								
ADULT	8.87E-01	8.87E-01	3.83E-03	8.87E-01	8.87E-01	8.88E-01	8.87E-01	8.90E-01
TEEN	8.94E-01	8.94E-01	3.83E-03	8.94E-01	8.94E-01	8.94E-01	8.94E-01	8.97E-01
CHILD	7.91E-01	7.91E-01	3.83E-03	7.91E-01	7.91E-01	7.92E-01	7.91E-01	7.94E-01
INFANT	4.56E-01	4.56E-01	3.83E-03	4.56E-01	4.56E-01	4.57E-01	4.56E-01	4.59E-01
<b>3RD QUARTER</b>								
ADULT	2.67E-01	2.67E-01	4.36E-03	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.71E-01
TEEN	2.69E-01	2.69E-01	4.36E-03	2.69E-01	2.69E-01	2.69E-01	2.69E-01	2.73E-01
CHILD	2.39E-01	2.39E-01	4.36E-03	2.39E-01	2.39E-01	2.39E-01	2.39E-01	2.43E-01
INFANT	1.39E-01	1.39E-01	4.36E-03	1.39E-01	1.39E-01	1.40E-01	1.39E-01	1.42E-01
<b>4TH QUARTER</b>								
ADULT	4.73E-01	4.73E-01	3.09E-02	4.73E-01	4.73E-01	4.75E-01	4.79E-01	4.94E-01
TEEN	4.76E-01	4.76E-01	3.09E-02	4.76E-01	4.76E-01	4.78E-01	4.85E-01	4.97E-01
CHILD	4.24E-01	4.25E-01	3.09E-02	4.24E-01	4.24E-01	4.27E-01	4.32E-01	4.44E-01
INFANT	2.57E-01	2.57E-01	3.09E-02	2.57E-01	2.57E-01	2.60E-01	2.62E-01	2.28E-01
<b>2ND SEMI-ANNUAL</b>								
ADULT	7.41E-01	7.41E-01	3.52E-02	7.41E-01	7.41E-01	7.43E-01	7.47E-01	7.65E-01
TEEN	7.45E-01	7.45E-01	3.53E-02	7.45E-01	7.45E-01	7.47E-01	7.54E-01	7.70E-01
CHILD	6.63E-01	6.64E-01	3.53E-02	6.63E-01	6.63E-01	6.66E-01	6.71E-01	6.87E-01
INFANT	3.96E-01	3.96E-01	3.52E-02	3.96E-01	3.96E-01	3.99E-01	4.00E-01	3.70E-01
<b>ANNUAL</b>								
ADULT	1.63E+00	1.63E+00	3.91E-02	1.63E+00	1.63E+00	1.63E+00	1.63E+00	1.66E+00
TEEN	1.64E+00	1.64E+00	3.91E-02	1.64E+00	1.64E+00	1.64E+00	1.65E+00	1.67E+00
CHILD	1.45E+00	1.45E+00	3.91E-02	1.45E+00	1.45E+00	1.46E+00	1.46E+00	1.48E+00
INFANT	8.52E-01	8.52E-01	3.91E-02	8.52E-01	8.52E-01	8.56E-01	8.56E-01	8.29E-01

**Table 44:  
Integrated Population Dose for 2005**

JAN - MAR								
PATHWAY	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	6.01E-04 .01%	6.01E-04 .01%	6.01E-04 95.35%	6.01E-04 .01%	6.01E-04 .01%	6.01E-04 .01%	6.01E-04 .01%	1.90E-03 .03%
GROUND	2.36E-05 .00%	2.36E-05 .00%	2.36E-05 3.74%	2.36E-05 .00%	2.36E-05 .00%	2.36E-05 .00%	2.36E-05 .00%	2.78E-05 .00%
INHAL	1.34E+00 22.25%	1.34E+00 22.25%	2.73E-07 .04%	1.34E+00 22.25%	1.34E+00 22.25%	1.34E+00 22.25%	1.34E+00 22.25%	1.34E+00 22.25%
VEGET	4.05E+00 67.21%	4.05E+00 67.21%	5.33E-06 .85%	4.05E+00 67.21%	4.05E+00 67.21%	4.05E+00 67.21%	4.05E+00 67.21%	4.05E+00 67.20%
COW MILK	4.29E-01 7.13%	4.29E-01 7.13%	8.03E-08 .01%	4.29E-01 7.13%	4.29E-01 7.13%	4.29E-01 7.13%	4.29E-01 7.13%	4.29E-01 7.12%
MEAT	2.05E-01 3.40%	2.05E-01 3.40%	4.30E-09 .00%	2.05E-01 3.40%	2.05E-01 3.40%	2.05E-01 3.40%	2.05E-01 3.40%	2.05E-01 3.40%
*TOTAL*	6.02E+00	6.02E+00	6.30E-04	6.02E+00	6.02E+00	6.02E+00	6.02E+00	6.03E+00
(1) PER CAPITA DOSE (REM)	3.07E-06	3.07E-06	3.22E-10	3.07E-06	3.07E-06	3.07E-06	3.07E-06	3.08E-06
APR - JUN								
PATHWAY	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	8.99E-04 .02%	8.99E-04 .02%	8.99E-04 97.19%	8.99E-04 .02%	8.99E-04 .02%	8.99E-04 .02%	8.99E-04 .02%	2.81E-03 .06%
GROUND	9.94E-06 .00%	9.94E-06 .00%	9.94E-06 1.07%	9.94E-06 .00%	9.94E-06 .00%	9.94E-06 .00%	9.94E-06 .00%	1.17E-05 .00%
INHAL	1.09E+00 25.02%	1.09E+00 25.02%	4.57E-06 .49%	1.09E+00 25.02%	1.09E+00 25.02%	1.09E+00 25.03%	1.09E+00 25.02%	1.09E+00 25.01%
VEGET	2.83E+00 64.72%	2.83E+00 64.72%	1.03E-05 1.12%	2.83E+00 64.72%	2.83E+00 64.72%	2.83E+00 64.72%	2.83E+00 64.72%	2.83E+00 64.70%
COW MILK	3.31E-01 7.59%	3.31E-01 7.59%	1.13E-06 .12%	3.31E-01 7.59%	3.31E-01 7.59%	3.32E-01 7.59%	3.31E-01 7.59%	3.31E-01 7.58%
MEAT	1.16E-01 2.64%	1.16E-01 2.64%	7.26E-09 .00%	1.16E-01 2.64%	1.16E-01 2.64%	1.16E-01 2.64%	1.16E-01 2.64%	1.16E-01 2.64%
*TOTAL*	4.37E+00	4.37E+00	9.25E-04	4.37E+00	4.37E+00	4.37E+00	4.37E+00	4.37E+00
(1) PER CAPITA DOSE (REM)	2.23E-06	2.23E-06	4.72E-10	2.23E-06	2.23E-06	2.23E-06	2.23E-06	2.23E-06

**Table 44: (continued)  
Integrated Population Dose for 2005**

JAN - JUN								
PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.50E-03 .01%	1.50E-03 .01%	1.50E-03 96.45%	1.50E-03 .01%	1.50E-03 .01%	1.50E-03 .01%	1.50E-03 .01%	4.70E-03 .05%
GROUND	3.35E-05 .00%	3.35E-05 .00%	3.35E-05 2.16%	3.35E-05 .00%	3.35E-05 .00%	3.35E-05 .00%	3.35E-05 .00%	3.94E-05 .00%
INHAL	2.43E+00 23.42%	2.43E+00 23.42%	4.84E-06 .31%	2.43E+00 23.42%	2.43E+00 23.42%	2.44E+00 23.42%	2.43E+00 23.42%	2.43E+00 23.41%
VEGET	6.88E+00 66.17%	6.88E+00 66.17%	1.57E-05 1.01%	6.88E+00 66.17%	6.88E+00 66.17%	6.88E+00 66.16%	6.88E+00 66.17%	6.88E+00 66.15%
COW MILK	7.61E-01 7.32%	7.61E-01 7.32%	1.21E-06 .08%	7.61E-01 7.32%	7.61E-01 7.32%	7.61E-01 7.32%	7.61E-01 7.32%	7.61E-01 7.32%
MEAT	3.20E-01 3.08%	3.20E-01 3.08%	1.16E-08 .00%	3.20E-01 3.08%	3.20E-01 3.08%	3.20E-01 3.08%	3.20E-01 3.08%	3.20E-01 3.08%
*TOTAL*	1.04E+01	1.04E+01	1.55E-03	1.04E+01	1.04E+01	1.04E+01	1.04E+01	1.04E+01
(1) PER CAPITA DOSE (REM)	5.31E-06	5.31E-06	7.91E-10	5.31E-06	5.31E-06	5.31E-06	5.31E-06	5.31E-06
JUL - SEP								
PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	1.14E-03 .04%	1.14E-03 .04%	1.14E-03 99.61%	1.14E-03 .04%	1.14E-03 .04%	1.14E-03 .04%	1.14E-03 .04%	4.75E-03 .16%
GROUND	4.60E-07 .00%	4.60E-07 .00%	4.60E-07 .04%	4.60E-07 .00%	4.60E-07 .00%	4.60E-07 .00%	4.60E-07 .00%	5.33E-07 .00%
INHAL	7.85E-01 26.37%	7.85E-01 26.37%	7.42E-07 .06%	7.85E-01 26.37%	7.85E-01 26.37%	7.85E-01 26.37%	7.85E-01 26.37%	7.85E-01 26.34%
VEGET	1.85E+00 62.33%	1.85E+00 62.33%	3.16E-06 .28%	1.85E+00 62.33%	1.85E+00 62.33%	1.85E+00 62.33%	1.85E+00 62.33%	1.85E+00 62.26%
COW MILK	2.51E-01 8.44%	2.51E-01 8.44%	6.10E-08 .01%	2.51E-01 8.44%	2.51E-01 8.44%	2.51E-01 8.44%	2.51E-01 8.44%	2.51E-01 8.43%
MEAT	8.38E-02 2.82%	8.38E-02 2.82%	6.90E-09 .00%	8.38E-02 2.82%	8.38E-02 2.82%	8.38E-02 2.82%	8.38E-02 2.82%	8.38E-02 2.81%
*TOTAL*	2.98E+00	2.98E+00	1.15E-03	2.98E+00	2.98E+00	2.98E+00	2.98E+00	2.98E+00
(1) PER CAPITA DOSE (REM)	1.52E-06	1.52E-06	5.87E-10	1.52E-06	1.52E-06	1.52E-06	1.52E-06	1.52E-06

**Table 44: (continued)  
Integrated Population Dose for 2005**

OCT - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	7.17E-03 .12%	7.17E-03 .12%	7.17E-03 63.70%	7.17E-03 .12%	7.17E-03 .12%	7.17E-03 .12%	7.17E-03 .12%	3.32E-02 .57%
GROUND	3.84E-03 .07%	3.84E-03 .07%	3.84E-03 34.15%	3.84E-03 .07%	3.84E-03 .07%	3.84E-03 .07%	3.84E-03 .07%	4.52E-03 .08%
INHAL	1.14E+00 19.60%	1.14E+00 19.60%	7.25E-05 .64%	1.14E+00 19.60%	1.14E+00 19.60%	1.14E+00 19.63%	1.14E+00 19.69%	1.13E+00 19.51%
VEGET	4.11E+00 70.90%	4.11E+00 70.90%	1.52E-04 1.35%	4.11E+00 70.90%	4.10E+00 70.90%	4.11E+00 70.88%	4.10E+00 70.82%	4.10E+00 70.58%
COW MILK	3.45E-01 5.97%	3.45E-01 5.96%	1.63E-05 .14%	3.45E-01 5.97%	3.45E-01 5.97%	3.46E-01 5.97%	3.45E-01 5.96%	3.45E-01 5.94%
MEAT	1.93E-01 3.34%	1.93E-01 3.34%	1.44E-06 .01%	1.93E-01 3.34%	1.93E-01 3.34%	1.93E-01 3.33%	1.93E-01 3.33%	1.93E-01 3.32%
*TOTAL*	5.79E+00	5.79E+00	1.13E-02	5.79E+00	5.79E+00	5.80E+00	5.80E+00	5.82E+00
(1) PER CAPITA DOSE (REM)	2.96E-06	2.96E-06	5.77E-09	2.96E-06	2.96E-06	2.96E-06	2.96E-06	2.97E-06

JUL - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	8.31E-03 .09%	8.31E-03 .09%	8.31E-03 67.02%	8.31E-03 .09%	8.31E-03 .09%	8.31E-03 .09%	8.31E-03 .09%	3.79E-02 .43%
GROUND	3.84E-03 .04%	3.84E-03 .04%	3.84E-03 30.99%	3.84E-03 .04%	3.84E-03 .04%	3.84E-03 .04%	3.84E-03 .04%	4.52E-03 .05%
INHAL	1.92E+00 21.90%	1.92E+00 21.90%	7.32E-05 .59%	1.92E+00 21.90%	1.92E+00 21.90%	1.92E+00 21.92%	1.93E+00 21.96%	1.92E+00 21.83%
VEGET	5.96E+00 67.99%	5.96E+00 68.00%	1.56E-04 1.25%	5.96E+00 67.99%	5.96E+00 67.99%	5.96E+00 67.98%	5.96E+00 67.94%	5.96E+00 67.76%
COW MILK	5.97E-01 6.81%	5.97E-01 6.80%	1.63E-05 .13%	5.97E-01 6.81%	5.97E-01 6.81%	5.97E-01 6.81%	5.97E-01 6.80%	5.97E-01 6.78%
MEAT	2.77E-01 3.16%	2.77E-01 3.16%	1.44E-06 .01%	2.77E-01 3.16%	2.77E-01 3.16%	2.77E-01 3.16%	2.77E-01 3.16%	2.77E-01 3.15%
*TOTAL*	8.77E+00	8.77E+00	1.24E-02	8.76E+00	8.76E+00	8.77E+00	8.77E+00	8.79E+00
(1) PER CAPITA DOSE (REM)	4.48E-06	4.48E-06	6.33E-09	4.47E-06	4.47E-06	4.48E-06	4.48E-06	4.49E-06

**Table 44: (continued)  
Integrated Population Dose for 2005**

JAN - DEC

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
PLUME	9.81E-03 .05%	9.81E-03 .05%	9.81E-03 70.30%	9.81E-03 .05%	9.81E-03 .05%	9.81E-03 .05%	9.81E-03 .05%	4.27E-02 .22%
GROUND	3.88E-03 .02%	3.88E-03 .02%	3.88E-03 27.78%	3.88E-03 .02%	3.88E-03 .02%	3.88E-03 .02%	3.88E-03 .02%	4.56E-03 .02%
INHAL	4.35E+00 22.72%	4.35E+00 22.72%	7.81E-05 .56%	4.35E+00 22.72%	4.35E+00 22.72%	4.36E+00 22.73%	4.36E+00 22.75%	4.35E+00 22.68%
VEGET	1.28E+01 67.00%	1.28E+01 67.00%	1.71E-04 1.23%	1.28E+01 67.00%	1.28E+01 67.00%	1.28E+01 67.00%	1.28E+01 66.98%	1.28E+01 66.89%
COW MILK	1.36E+00 7.08%	1.36E+00 7.08%	1.76E-05 .13%	1.36E+00 7.08%	1.36E+00 7.08%	1.36E+00 7.08%	1.36E+00 7.08%	1.36E+00 7.07%
MEAT	5.97E-01 3.12%	5.97E-01 3.12%	1.45E-06 .01%	5.97E-01 3.12%	5.97E-01 3.12%	5.97E-01 3.12%	5.97E-01 3.12%	5.97E-01 3.11%
*TOTAL*	1.92E+01	1.92E+01	1.40E-02	1.92E+01	1.92E+01	1.92E+01	1.92E+01	1.92E+01
(1) PER CAPITA DOSE (REM)	9.80E-06	9.80E-06	7.15E-09	9.80E-06	9.80E-06	9.80E-06	9.80E-06	9.80E-06

Note 1: Personrem total divided by 50-mile population of 1,959,000

<b>Table 45: Summary of Individual Doses for 2005</b>						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
<b>Gamma Air Dose</b>	<b>mrad</b>	<b>1.01E-03</b>	<b>9.11E-04</b>	<b>2.37E-03</b>	<b>4.78E-03</b>	<b>9.08E-03</b>
ODCM Req. 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	2.02E-02	1.82E-02	4.74E-02	9.56E-02	9.08E-02
<b>Beta Air Dose</b>	<b>mrad</b>	<b>8.21E-04</b>	<b>8.99E-04</b>	<b>1.55E-03</b>	<b>1.23E-02</b>	<b>1.56E-02</b>
ODCM Req. 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	8.21E-03	8.99E-03	1.55E-02	1.23E-01	7.80E-02
<b>Maximum Individual</b>						
Total Body	mrem	6.60E-04	5.89E-04	1.56E-03	2.92E-03	5.73E-03
Skin	mrem	1.18E-03	1.10E-03	2.80E-03	8.54E-03	1.36E-02
<b>Site Boundary Location</b>						
Unit 1	miles	1.87 S	1.87 S	1.87 S	1.87 S	1.87 S
Unit 2	miles	1.68 S	1.68 S	1.68 S	1.68 S	1.68 S
Unit 3	miles	1.46 S	1.46 S	1.46 S	1.46 S	1.46 S
<b>Maximum Organ Dose (excluding skin)</b>	Age	Teen	Child	Child	Teen	Teen
	Organ	Thyroid <sup>(3)</sup>	Thyroid	Thyroid <sup>(3)</sup>	Lung	Lung
	mrem	1.42E-01	2.15E-01	1.01E-01	1.68E-01	4.77E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit <sup>(1)</sup>	%	1.89E+00	2.87E+00	1.35E+00	2.24E+00	3.18E+00
<b>Location</b>						
Unit 1	miles	2.84 S	1.85 N	2.29 NE	2.84 S	2.84 S
Unit 2	miles	2.68 S	2.05 NNE	2.51 NE	2.68 S	2.68 S
Unit 3	miles	2.48 S	2.27 NNE	2.73 NNE	2.48 S	2.48 S
<b>Organ dose from tritium only for Unit 2 location above</b>	<b>mrem</b>	<b>1.42E-01</b>	<b>2.12E-01</b>	<b>1.01E-01</b>	<b>1.63E-01</b>	<b>4.70E-01</b>
Fraction of organ dose from tritium only for Unit 2 location above <sup>(2)</sup>	%	100	99	100	97	99
X/Q for Unit 2 location above	sec/m <sup>3</sup>	5.67E-06	1.16E-06	1.13E-06	8.65E-06	5.56E-06
D/Q for Unit 2 location above	m <sup>-2</sup>	2.46E-09	3.89E-09	3.17E-09	2.66E-09	1.97E-09
Note 1: ODCM Requirement 5.1 has higher limits than ODCM Requirement 4.2, therefore the percent of limits are more conservative based on ODCM Requirement 4.2 than on ODCM Requirement 5.1.						
Note 2: Fraction of dose from tritium varies mainly due to the ratio of tritium to iodine curies released (see Tables 32 and 33) and changes in X/Q and D/Q for each quarter						
Note 3: All organs except bone						