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Nuclear Generating Station
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102-07249 TNW/TMJ
April 29, 2016

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sirs:

Subject: **Palo Verde Nuclear Generating Station (PVNGS)**
Units 1, 2, 3 and Independent Spent Fuel Storage Installation
Docket Nos. STN 50-528/529/530 and 72-44
Annual Radioactive Effluent Release Report (ARERR) 2015

In accordance with PVNGS Technical Specification 5.6.3, enclosed please find the Annual Radioactive Effluent Release Report for 2015. Included in this report is a correction to the 2014 ARERR, Table 45.

In addition, the enclosed report includes the annual report of a sealed source contamination event as required by Technical Requirements Manual section 3.7.102.4, Appendix F of this report.

No new commitments are being made to the NRC by this letter. Should you need further information regarding this submittal, please contact Michael D. DiLorenzo, Licensing Section Leader, at (623) 393-3495.

Sincerely,

Weber, Thomas N(Z00499)

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Enclosure: 2015 Annual Radioactive Effluent Release Report

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ENCLOSURE

Palo Verde Nuclear Generating Station
Units 1, 2, & 3

2015 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

PALO VERDE NUCLEAR GENERATING STATION
UNITS 1, 2 AND 3

2015

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

USNRC Docket No. STN 50-528/529/530
RCTSAI 1566

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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 2015. 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.

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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 μCi/ml for the principal gamma emitters (except Ce-144)

3.0E-06 μCi/ml for Ce-144

1.0E-06 μCi/ml for I-131.

1.0E-03 μCi/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 μCi/ml for Cs-134

2.0E-06 μCi/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 mrems to the total body and to less than or equal to 5 mrems to any organ, and

b. During any calendar year to less than or equal to 3 mrems to the total body and to less than or equal to 10 mrems 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 ($\overline{E}$) 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 There were no revisions to the Offsite Dose Calculation Manual (ODCM) in 2015.

7.1 There were no revisions to the Process Control Program (PCP) in 2015.

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. Evaporation Pond One is approximately 250 acres. This equates to 3.08E+11 cc evaporated from Pond One for each of the first and fourth quarters and 8.48E+11 cc evaporated from Pond One for each of the second and third quarters. Evaporation Pond Two is approximately 235 acres. The amount evaporated from Pond Two is 2.90E+11 cc for each of the first and fourth quarters and 7.97E+11 cc for each of the second and third quarters.

Evaporation Pond Three is constructed of two smaller ponds of 90 acres each (3A and 3B). The amount evaporated from each section of Pond Three is 1.11E+11 cc for each of the first and fourth quarters and 3.05E+11 cc for each of the second and third quarters.

Using a site boundary X/Q of 5.0E-05 sec/m^3 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 method used for the setpoint values are more reliable than basing the setpoints upon the constantly varying values of 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).

None.

9.6 SAMPLES RESULTS FROM GROUNDWATER WELLS THAT ARE NOT DESCRIBED IN THE ODCM AS PART OF THE REMP (NEI 07-07, Industry Groundwater Protection Initiative, August 2007), are included in Appendix D. This initiative provides added assurance that ground water will not be adversely affected by PVNGS operations.

There were no NEI 07-07, reportable leaks or spills.

There were no positive sample results.

9.7 REPORT ADDENDUM

Appendix E contains a correction to Table 45 –
Summary of Individual Doses, for the 2014 ARERR.

10.0 DISCUSSION

10.1 Unit One

Unit One operated without a refueling outage.

Maintenance outages:
NONE

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

10.2 Unit Two

Unit Two operated with a refueling outage (2R19) from October 10, 2015 to November 15, 2015.

Maintenance outages:
NONE

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

10.3 Unit Three

Unit Three operated with a refueling outage (3R18) from April 4, 2015 to May 3, 2015.

Maintenance outages:
NONE

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

10.4 Carbon-14

Carbon-14 is formed naturally in the upper atmosphere and also is formed in operating nuclear reactors.

Carbon-14 is not a new power plant emission. Because the overall quantity of radioactive releases has steadily decreased due to improvements in power plant operations, carbon-14 may now qualify as a "principal radionuclide" under revised federal regulatory guidance. The levels of other releases have declined, so carbon-14 releases, expressed as a percentage of total releases, have the potential to achieve "principal radionuclide" status (anything greater than one percent of overall radioactivity in effluents) per updated federal regulatory guidance.

The radiation dose to the public from carbon-14 is much lower than regulatory limits and has been a very small contributor to the total radiation dose that Americans receive each year from natural and manmade sources.

Studies by the United Nations Scientific Committee on the Effects of Atomic Radiation, the National Research Council's BEIR VII study group and the National Council on Radiation Protection and Measurements all show that the risk associated with low-dose radiation from natural and man-made sources, including nuclear power plants, is negligible.

Radiation is measured in units called millirem. The average American is exposed to 620 millirem of radiation every year. Approximately 311 millirem of this comes from natural sources. The majority of the remaining dose (approximately 300 millirem) comes from medical procedures such as CAT scans. Less than one-tenth of a percent of all radiation exposure is from nuclear facilities. Reference: NCRPReport No. 160, Table 1.1.

Starting with the 2010 Annual Radioactive Effluent Release Report, PVNGS will include the estimated exposure from carbon-14 in the Appendix C, dose calculations. The PVNGS calculated production of carbon-14 is 18.5 Curies per cycle (500 days) or 13.5 curies per year. Based on published literature, twenty percent (20%) of the carbon-14 released is assumed to be in an inorganic form (CO_2). PVNGS will use an estimated value of 2.7 curies of carbon-14 released, per reactor, per year. The 2.7 curies will be divided equally between each quarter (0.68 curies per reactor, per quarter). Appendix C, dose calculations include this estimated carbon-14 dose. Appendix C also includes the dose excluding carbon-14 for comparison with historical reports.

10.5 Tritium

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.

10.6 Dose Summary

Dose for 2015 was primarily due to the release of tritium. Tritium production is estimated to be 1000 curies per Reactor Unit per year. In order to control plant tritium concentrations, tritium releases should match tritium production. For 2015, PVNGS released a total of 2050 curies of tritium (see Table 39).

Total dose due to releases from all three Units for 2015 were lower than 2014, primarily due to decreased releases of tritium.

Table 1: Evaporation Pond Data					
Evaporation Pond 1(1A, 1B, 1C)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	3.22E+11	8.85E+11	8.85E+11	3.22E+11	
Tritium Concentration (uCi/cc)	4.85E-06	3.34E-06	3.65E-06	2.98E-06	
Tritium Curies	1.83E-01	1.16E+00	1.21E+00	3.52E-01	2.91E+00
Evaporation Pond 2 (2A and 2B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.40E+11	7.97E+11	7.97E+11	2.90E+11	
Tritium Concentration (uCi/cc)	1.45E-06	1.46E-06	1.75E-06	1.12E-06	
Tritium curies	1.80E-01	4.91E-01	6.04E-01	1.45E-01	1.42E+00
Evaporation Pond 3 (3A and 3B)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Historical volume of water evaporated (ml)	2.22E+11	3.05E+11	3.05E+11	1.11E+11	
3B Tritium Concentration (uCi/cc)	1.65E-06	1.08E-06	1.24E-06	8.76E-07	
3B Tritium curies	1.81E-01	3.25E-01	3.73E-01	9.62E-02	9.76E-01
Dose (mRem)	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Pond 1	7.61E-03	1.43E-02	1.50E-02	4.16E-03	4.12E-02
Pond 2	2.50E-03	6.81E-03	8.38E-03	2.01E-03	1.97E-02
Pond 3	2.51E-03	4.51E-03	5.18E-03	1.33E-03	1.35E-02
Total	6.71E-03	2.57E-02	2.86E-02	7.51E-03	7.44E-02

Table 2: Batch Release Data			
All times are in hours	Unit 1	Unit 2	Unit 3
January - June			
Number of batch releases	20	24	43
Total time period for batch releases	114.54	366.34	1275.06
Maximum time period for a batch release	92.00	105.90	168.00
Average time period for a batch release	5.73	15.26	29.65
Minimum time period for a batch release	0.53	0.51	0.10
July - December			
Number of batch releases	21	42	19
Total time period for batch releases	161.18	1501.48	198.17
Maximum time period for a batch release	103.80	168.00	123.75
Average time period for a batch release	7.68	35.75	10.43
Minimum time period for a batch release	0.52	0.18	0.50
January - December			
Number of batch releases	41	66	62
Total time period for batch releases	275.72	1867.82	1473.23
Maximum time period for a batch release	103.80	168.00	168.00
Average time period for a batch release	6.72	28.30	23.76
Minimum time period for a batch release	0.52	0.18	0.10

Table 3: Units 1, 2 & 3 Gaseous Effluents Average Lower Limit Of Detection					
µCi/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.					

Table 4: Unit 1 Gaseous Effluents - Summation Of All Releases							
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total For Year	Est. Total Error % (1)
A. Fission & activation gases							
1. Total release	Ci	5.87E-02	6.86E-02	7.22E-02	5.02E-02	2.50E-01	**3.54E+01**
2. Average release rate for period	µCi/sec	7.55E-03	8.73E-03	9.08E-03	6.32E-03	7.93E-03	
3. Percent of ODCM Requirement limit	%	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	
B. Iodine 131							
1. Total Iodine 131	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.32E+01**
2. Average release rate for period	µCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of ODCM Requirement limit	%	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	
C. Particulates							
1. Particulates with half- lives > 8 days	Ci	7.35E-07	3.25E-07	0.00E+00	6.73E-07	1.73E-06	**3.43E+01**
2. Average release rate for period	µCi/sec	9.45E-08	4.13E-08	0.00E+00	8.47E-08	5.50E-08	
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**	
D. Tritium							
1. Total release	Ci	2.03E+01	9.09E+01	2.14E+01	1.98E+02	3.31E+02	**3.85E+01**
2. Average release rate for period	µCi/sec	2.61E+00	1.16E+01	2.69E+00	2.49E+01	1.05E+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
1. Fission gases						
Ar-41	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
2. Iodines						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-132	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

Table 6: Unit 1 Gaseous Effluents - Ground Level Releases - Continuous - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3.Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	7.35E-07	0.00E+00	0.00E+00	0.00E+00	7.35E-07
Co-60	Ci	0.00E+00	3.25E-07	0.00E+00	6.73E-07	9.98E-07
Cr-51	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Os-191	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**7.35E-07**	**3.25E-07**	**0.00E+00**	**6.73E-07**	**1.73E-06**
4.Tritium						
H-3	Ci	2.03E+01	2.89E+01	2.13E+01	2.47E+01	9.51E+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
1. Fission gases						
Ar-41	Ci	5.85E-02	6.86E-02	7.22E-02	5.02E-02	2.50E-01
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	2.15E-04	0.00E+00	0.00E+00	0.00E+00	2.15E-04
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**5.87E-02**	**6.86E-02**	**7.22E-02**	**5.02E-02**	**2.50E-01**
2. Iodines						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-132	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

Table 8: Unit 1 Gaseous Effluents - Ground Level Releases - Batch - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr-51	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Os-191	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.Tritium						
H-3	Ci	5.95E-02	6.20E+01	1.08E-01	1.74E+02	2.36E+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
1. Fission gases						
Ar-41	Ci	5.85E-02	6.86E-02	7.22E-02	5.02E-02	2.50E-01
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	2.15E-04	0.00E+00	0.00E+00	0.00E+00	2.15E-04
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**5.87E-02**	**6.86E-02**	**7.22E-02**	**5.02E-02**	**2.50E-01**
2. Iodines						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-132	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

Table 10: Unit 1 Gaseous Effluents - Continuous and Batch -Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	7.35E-07	0.00E+00	0.00E+00	0.00E+00	7.35E-07
Co-60	Ci	0.00E+00	3.25E-07	0.00E+00	6.73E-07	9.98E-07
Cr-51	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Os-191	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**7.35E-07**	**3.25E-07**	**0.00E+00**	**6.73E-07**	**1.73E-06**
Total > 8 days	Ci	**7.35E-07**	**3.25E-07**	**0.00E+00**	**6.73E-07**	**1.73E-06**
4.Tritium						
H-3	Ci	2.03E+01	9.09E+01	2.14E+01	1.99E+02	3.31E+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	1.54E-04	1.80E-04	1.90E-04	1.32E-04	6.55E-04
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	**3.08E-03**	**3.60E-03**	**3.80E-03**	**2.64E-03**	**6.55E-03**
Beta Air Dose	mrad	5.43E-05	6.36E-05	6.69E-05	4.65E-05	2.31E-04
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	**5.43E-04**	**6.36E-04**	**6.69E-04**	**4.65E-04**	**1.16E-03**
Maximum Organ Dose (excluding skin)	mrem	**7.29E-03**	**3.26E-02**	**7.68E-03**	**7.12E-02**	**1.19E-01**
Age		Teen	Teen	Teen	Teen	Teen
Organ		Thyroid	Thyroid	Thyroid	Thyroid	Thyroid
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	**9.72E-02**	**4.35E-01**	**1.02E-01**	**9.49E-01**	**7.93E-01**

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)
A. Fission & activation gases							
1. Total release	Ci	8.53E-02	9.98E-02	1.12E-01	9.63E+00	9.93E+00	**3.54E+01**
2. Average release rate for period	µCi/sec	1.10E-02	1.27E-02	1.41E-02	1.21E+00	3.15E-01	
3. Percent of ODCM Requirement limit	%	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	
B. Iodine 131							
1. Total Iodine 131	Ci	0.00E+00	0.00E+00	0.00E+00	2.38E-05	2.38E-05	**3.32E+01**
2. Average release rate for period	µCi/sec	0.00E+00	0.00E+00	0.00E+00	2.99E-06	7.55E-07	
3. Percent of ODCM Requirement limit	%	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	
C. Particulates							
1. Particulates with half- lives > 8 days	Ci	0.00E+00	0.00E+00	0.00E+00	1.39E-04	1.39E-04	**3.43E+01**
2. Average release rate for period	µCi/sec	0.00E+00	0.00E+00	0.00E+00	1.74E-05	4.40E-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**	
D. Tritium							
1. Total release	Ci	3.18E+02	1.04E+02	1.76E+02	3.22E+02	9.20E+02	**3.85E+01**
2. Average release rate for period	µCi/sec	4.09E+01	1.32E+01	2.21E+01	4.05E+01	2.92E+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
1. Fission gases						
Ar-41	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	0.00E+00	0.00E+00	0.00E+00	2.96E-01	2.96E-01
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**2.96E-01**	**2.96E-01**
2. Iodines						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	2.38E-05	2.38E-05
I-132	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	5.84E-06	5.84E-06
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**2.96E-05**	**2.96E-05**

Table 14: Unit 2 Gaseous Effluents - Ground Level Releases - Continuous - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	0.00E+00	0.00E+00	0.00E+00	3.34E-05	3.34E-05
Co-60	Ci	0.00E+00	0.00E+00	0.00E+00	2.12E-05	2.12E-05
Cr-51	Ci	0.00E+00	0.00E+00	0.00E+00	7.32E-05	7.32E-05
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	0.00E+00	7.84E-06	7.84E-06
Os-191	Ci	0.00E+00	0.00E+00	0.00E+00	3.00E-06	3.00E-06
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.39E-04**	**1.39E-04**
4. Tritium						
H-3	Ci	2.65E+01	2.59E+01	2.12E+01	6.61E+01	1.40E+02

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
1. Fission gases						
Ar-41	Ci	7.29E-02	8.42E-02	9.39E-02	7.60E+00	7.86E+00
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	0.00E+00	9.77E-04	9.77E-04
Xe-133	Ci	1.24E-02	1.56E-02	1.79E-02	1.73E+00	1.77E+00
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	1.38E-03	1.38E-03
Xe-135	Ci	0.00E+00	0.00E+00	9.12E-05	0.00E+00	9.12E-05
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**8.53E-02**	**9.98E-02**	**1.12E-01**	**9.34E+00**	**9.63E+00**
2. Iodines						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-132	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

Table 16: Unit 2 Gaseous Effluents - Ground Level Releases - Batch - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr-51	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Os-191	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
4. Tritium						
H-3	Ci	2.91E+02	7.82E+01	1.54E+02	2.56E+02	7.80E+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
1. Fission gases						
Ar-41	Ci	7.29E-02	8.42E-02	9.39E-02	7.60E+00	7.86E+00
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	0.00E+00	9.77E-04	9.77E-04
Xe-133	Ci	1.24E-02	1.56E-02	1.79E-02	2.02E+00	2.07E+00
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	1.38E-03	1.38E-03
Xe-135	Ci	0.00E+00	0.00E+00	9.12E-05	0.00E+00	9.12E-05
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**8.53E-02**	**9.98E-02**	**1.12E-01**	**9.63E+00**	**9.93E+00**
2. Iodines						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	2.38E-05	2.38E-05
I-132	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	5.84E-06	5.84E-06
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**2.96E-05**	**2.96E-05**

Table 18: Unit 2 Gaseous Effluents - Continuous and Batch -Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	0.00E+00	0.00E+00	0.00E+00	3.34E-05	3.34E-05
Co-60	Ci	0.00E+00	0.00E+00	0.00E+00	2.12E-05	2.12E-05
Cr-51	Ci	0.00E+00	0.00E+00	0.00E+00	7.32E-05	7.32E-05
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	0.00E+00	7.84E-06	7.84E-06
Os-191	Ci	0.00E+00	0.00E+00	0.00E+00	3.00E-06	3.00E-06
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.39E-04**	**1.39E-04**
Total > 8 days	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.39E-04**	**1.39E-04**
4. Tritium						
H-3	Ci	3.18E+02	1.04E+02	1.76E+02	3.22E+02	9.20E+02

Table 19: Unit 2 Radiation Doses At And Beyond The Site Boundary						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Unit 2		Q1	Q2	Q3	Q4	year
Gamma Air Dose	mrad	1.93E-04	2.23E-04	2.48E-04	2.02E-02	2.08E-02
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	**3.86E-03**	**4.46E-03**	**4.96E-03**	**4.04E-01**	**2.08E-01**
Beta Air Dose	mrad	7.12E-05	8.26E-05	9.23E-05	7.65E-03	7.89E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	**7.12E-04**	**8.26E-04**	**9.23E-04**	**7.65E-02**	**3.95E-02**
Maximum Organ Dose (excluding skin)	mrem	1.14E-01	3.74E-02	6.30E-02	1.16E-01	3.30E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Thyroid	Thyroid	Thyroid	Thyroid	Thyroid
ODCM Req. 4.2 Limit	%	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	**1.52E+00**	**4.99E-01**	**8.40E-01**	**1.55E+00**	**2.20E+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 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)
A. Fission & activation gases							
1. Total release	Ci	1.02E-01	1.99E+00	3.74E-02	4.77E-02	2.17E+00	**3.54E+01**
2. Average release rate for period	µCi/sec	1.31E-02	2.53E-01	4.71E-03	6.00E-03	6.88E-02	
3. Percent of ODCM Requirement limit	%	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	
B. Iodine 131							
1. Total Iodine 131	Ci	0.00E+00	4.89E-05	0.00E+00	0.00E+00	4.89E-05	**3.32E+01**
2. Average release rate for period	µCi/sec	0.00E+00	6.22E-06	0.00E+00	0.00E+00	1.55E-06	
3. Percent of ODCM Requirement limit	%	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	**NA (2)**	
C. Particulates							
1. Particulates with half- lives > 8 days	Ci	0.00E+00	7.90E-03	1.20E-06	0.00E+00	7.90E-03	**3.43E+01**
2. Average release rate for period	µCi/sec	0.00E+00	1.00E-03	1.51E-07	0.00E+00	2.51E-04	
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**	
D. Tritium							
1. Total release	Ci	2.36E+02	4.08E+02	2.41E+01	1.36E+02	8.04E+02	**3.85E+01**
2. Average release rate for period	µCi/sec	3.03E+01	5.19E+01	3.03E+00	1.71E+01	2.55E+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
1. Fission gases						
Ar-41	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
2. Iodines						
I-131	Ci	0.00E+00	1.71E-05	0.00E+00	0.00E+00	1.71E-05
I-132	Ci	0.00E+00	1.53E-04	0.00E+00	0.00E+00	1.53E-04
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**1.70E-04**	**0.00E+00**	**0.00E+00**	**1.70E-04**

Table 22: Unit 3 Gaseous Effluents - Ground Level Releases - Continuous - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	0.00E+00	5.98E-04	3.12E-07	0.00E+00	5.98E-04
Co-60	Ci	0.00E+00	1.02E-04	0.00E+00	0.00E+00	1.02E-04
Cr-51	Ci	0.00E+00	8.82E-04	0.00E+00	0.00E+00	8.82E-04
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	4.28E-05	0.00E+00	0.00E+00	4.28E-05
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	2.60E-05	0.00E+00	0.00E+00	2.60E-05
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	8.07E-05	0.00E+00	0.00E+00	8.07E-05
Os-191	Ci	0.00E+00	2.98E-06	8.92E-07	0.00E+00	3.87E-06
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	1.88E-06	0.00E+00	0.00E+00	1.88E-06
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	5.76E-05	0.00E+00	0.00E+00	5.76E-05
Total	Ci	**0.00E+00**	**1.79E-03**	**1.20E-06**	**0.00E+00**	**1.79E-03**
4. Tritium						
H-3	Ci	1.56E+01	4.41E+01	2.40E+01	2.13E+01	1.05E+02

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
1. Fission gases						
Ar-41	Ci	1.02E-01	1.95E+00	3.74E-02	4.77E-02	2.14E+00
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	4.49E-04	0.00E+00	0.00E+00	4.49E-04
Xe-133	Ci	0.00E+00	3.25E-02	0.00E+00	0.00E+00	3.25E-02
Xe-133m	Ci	0.00E+00	1.26E-04	0.00E+00	0.00E+00	1.26E-04
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**1.02E-01**	**1.99E+00**	**3.74E-02**	**4.77E-02**	**2.17E+00**
2. Iodines						
I-131	Ci	0.00E+00	3.17E-05	0.00E+00	0.00E+00	3.17E-05
I-132	Ci	0.00E+00	4.06E-04	0.00E+00	0.00E+00	4.06E-04
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**4.37E-04**	**0.00E+00**	**0.00E+00**	**4.37E-04**

Table 24: Unit 3 Gaseous Effluents - Ground Level Releases - Batch - Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	3.70E-05	0.00E+00	0.00E+00	3.70E-05
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	7.88E-06	0.00E+00	0.00E+00	7.88E-06
Co-58	Ci	0.00E+00	7.05E-04	0.00E+00	0.00E+00	7.05E-04
Co-60	Ci	0.00E+00	4.08E-04	0.00E+00	0.00E+00	4.08E-04
Cr-51	Ci	0.00E+00	3.50E-03	0.00E+00	0.00E+00	3.50E-03
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	1.79E-04	0.00E+00	0.00E+00	1.79E-04
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	1.03E-04	0.00E+00	0.00E+00	1.03E-04
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	6.10E-04	0.00E+00	0.00E+00	6.10E-04
Os-191	Ci	0.00E+00	1.02E-04	0.00E+00	0.00E+00	1.02E-04
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	1.61E-05	0.00E+00	0.00E+00	1.61E-05
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	4.79E-04	0.00E+00	0.00E+00	4.79E-04
Total	Ci	**0.00E+00**	**6.15E-03**	**0.00E+00**	**0.00E+00**	**6.15E-03**
4. Tritium						
H-3	Ci	2.20E+02	3.64E+02	9.80E-02	1.14E+02	6.99E+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
1. Fission gases						
Ar-41	Ci	1.02E-01	1.95E+00	3.74E-02	4.77E-02	2.14E+00
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	4.49E-04	0.00E+00	0.00E+00	4.49E-04
Xe-133	Ci	0.00E+00	3.25E-02	0.00E+00	0.00E+00	3.25E-02
Xe-133m	Ci	0.00E+00	1.26E-04	0.00E+00	0.00E+00	1.26E-04
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**1.02E-01**	**1.99E+00**	**3.74E-02**	**4.77E-02**	**2.17E+00**
2. Iodines						
I-131	Ci	0.00E+00	4.89E-05	0.00E+00	0.00E+00	4.89E-05
I-132	Ci	0.00E+00	5.59E-04	0.00E+00	0.00E+00	5.59E-04
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**6.08E-04**	**0.00E+00**	**0.00E+00**	**6.08E-04**

Table 26: Unit 3 Gaseous Effluents - Continuous and Batch -Particulates						
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	3.70E-05	0.00E+00	0.00E+00	3.70E-05
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	7.88E-06	0.00E+00	0.00E+00	7.88E-06
Co-58	Ci	0.00E+00	1.30E-03	3.12E-07	0.00E+00	1.30E-03
Co-60	Ci	0.00E+00	5.10E-04	0.00E+00	0.00E+00	5.10E-04
Cr-51	Ci	0.00E+00	4.38E-03	0.00E+00	0.00E+00	4.38E-03
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	2.22E-04	0.00E+00	0.00E+00	2.22E-04
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	1.29E-04	0.00E+00	0.00E+00	1.29E-04
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	6.90E-04	0.00E+00	0.00E+00	6.90E-04
Os-191	Ci	0.00E+00	1.05E-04	8.92E-07	0.00E+00	1.06E-04
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	1.80E-05	0.00E+00	0.00E+00	1.80E-05
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	5.37E-04	0.00E+00	0.00E+00	5.37E-04
Total	Ci	**0.00E+00**	**7.94E-03**	**1.20E-06**	**0.00E+00**	**7.94E-03**
Total > 8 days	Ci	**0.00E+00**	**7.90E-03**	**1.20E-06**	**0.00E+00**	**7.91E-03**
4. Tritium						
H-3	Ci	2.36E+02	4.08E+02	2.41E+01	1.36E+02	8.04E+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	2.67E-04	5.13E-03	9.82E-05	1.25E-04	5.62E-03
ODCM Req 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	**5.34E-03**	**1.03E-01**	**1.96E-03**	**2.50E-03**	**5.62E-02**
Beta Air Dose	mrad	9.43E-05	1.82E-03	3.46E-05	4.42E-05	1.99E-03
ODCM Req 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	**9.43E-04**	**1.82E-02**	**3.46E-04**	**4.42E-04**	**9.95E-03**
Maximum Organ Dose (excluding skin)	mrem	8.47E-02	1.50E-01	8.65E-03	4.87E-02	2.90E-01
Age		Teen	Teen	Teen	Teen	Teen
Organ		Thyroid	Thyroid	Thyroid	Thyroid	Thyroid
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit	%	**1.13E+00**	**2.00E+00**	**1.15E-01**	**6.49E-01**	**1.93E+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 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
1. Fission gases						
Ar-41	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	0.00E+00	0.00E+00	0.00E+00	2.96E-01	2.96E-01
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**0.00E+00**	**2.96E-01**	**2.96E-01**
2. Iodines						
I-131	Ci	0.00E+00	1.71E-05	0.00E+00	2.38E-05	4.09E-05
I-132	Ci	0.00E+00	1.53E-04	0.00E+00	0.00E+00	1.53E-04
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	5.84E-06	5.84E-06
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**1.70E-04**	**0.00E+00**	**2.96E-05**	**2.00E-04**

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
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	7.35E-07	5.98E-04	3.12E-07	3.34E-05	6.32E-04
Co-60	Ci	0.00E+00	1.02E-04	0.00E+00	2.19E-05	1.24E-04
Cr-51	Ci	0.00E+00	8.82E-04	0.00E+00	7.32E-05	9.56E-04
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	4.28E-05	0.00E+00	0.00E+00	4.28E-05
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	2.60E-05	0.00E+00	0.00E+00	2.60E-05
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	8.07E-05	0.00E+00	7.84E-06	8.85E-05
Os-191	Ci	0.00E+00	2.98E-06	8.92E-07	3.00E-06	6.87E-06
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	1.88E-06	0.00E+00	0.00E+00	1.88E-06
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	5.76E-05	0.00E+00	0.00E+00	5.76E-05
Total	Ci	**7.35E-07**	**1.79E-03**	**1.20E-06**	**1.39E-04**	**1.94E-03**
4. Tritium						
H-3	Ci	6.23E+01	9.89E+01	6.65E+01	1.12E+02	3.40E+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
1. Fission gases						
Ar-41	Ci	2.33E-01	2.11E+00	2.03E-01	7.70E+00	1.02E+01
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	4.49E-04	0.00E+00	9.77E-04	1.43E-03
Xe-133	Ci	1.26E-02	4.81E-02	1.79E-02	1.73E+00	1.81E+00
Xe-133m	Ci	0.00E+00	1.26E-04	0.00E+00	1.38E-03	1.50E-03
Xe-135	Ci	0.00E+00	0.00E+00	9.12E-05	0.00E+00	9.12E-05
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**2.46E-01**	**2.15E+00**	**2.21E-01**	**9.43E+00**	**1.21E+01**
2. Iodines						
I-131	Ci	0.00E+00	3.17E-05	0.00E+00	0.00E+00	3.17E-05
I-132	Ci	0.00E+00	4.06E-04	0.00E+00	0.00E+00	4.06E-04
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**4.37E-04**	**0.00E+00**	**0.00E+00**	**4.37E-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
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	3.70E-05	0.00E+00	0.00E+00	3.70E-05
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	7.88E-06	0.00E+00	0.00E+00	7.88E-06
Co-58	Ci	0.00E+00	7.05E-04	0.00E+00	0.00E+00	7.05E-04
Co-60	Ci	0.00E+00	4.08E-04	0.00E+00	0.00E+00	4.08E-04
Cr-51	Ci	0.00E+00	3.50E-03	0.00E+00	0.00E+00	3.50E-03
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	1.79E-04	0.00E+00	0.00E+00	1.79E-04
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	1.03E-04	0.00E+00	0.00E+00	1.03E-04
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	6.10E-04	0.00E+00	0.00E+00	6.10E-04
Os-191	Ci	0.00E+00	1.02E-04	0.00E+00	0.00E+00	1.02E-04
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	1.61E-05	0.00E+00	0.00E+00	1.61E-05
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	4.79E-04	0.00E+00	0.00E+00	4.79E-04
Total	Ci	**0.00E+00**	**6.15E-03**	**0.00E+00**	**0.00E+00**	**6.15E-03**
4. Tritium						
H-3	Ci	5.12E+02	5.04E+02	1.55E+02	5.44E+02	1.71E+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
1. Fission gases						
Ar-41	Ci	2.33E-01	2.11E+00	2.03E-01	7.70E+00	1.02E+01
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	4.49E-04	0.00E+00	9.77E-04	1.43E-03
Xe-133	Ci	1.26E-02	4.81E-02	1.79E-02	2.02E+00	2.10E+00
Xe-133m	Ci	0.00E+00	1.26E-04	0.00E+00	1.38E-03	1.50E-03
Xe-135	Ci	0.00E+00	0.00E+00	9.12E-05	0.00E+00	9.12E-05
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**2.46E-01**	**2.15E+00**	**2.21E-01**	**9.73E+00**	**1.24E+01**
2. Iodines						
I-131	Ci	0.00E+00	4.89E-05	0.00E+00	2.38E-05	7.26E-05
I-132	Ci	0.00E+00	5.59E-04	0.00E+00	0.00E+00	5.59E-04
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	5.84E-06	5.84E-06
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**6.08E-04**	**0.00E+00**	**2.96E-05**	**6.37E-04**

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
3. Particulates						
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	3.70E-05	0.00E+00	0.00E+00	3.70E-05
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	7.88E-06	0.00E+00	0.00E+00	7.88E-06
Co-58	Ci	7.35E-07	1.30E-03	3.12E-07	3.34E-05	1.34E-03
Co-60	Ci	0.00E+00	5.10E-04	0.00E+00	2.19E-05	5.32E-04
Cr-51	Ci	0.00E+00	4.38E-03	0.00E+00	7.32E-05	4.46E-03
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	2.22E-04	0.00E+00	0.00E+00	2.22E-04
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	1.29E-04	0.00E+00	0.00E+00	1.29E-04
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	6.90E-04	0.00E+00	7.84E-06	6.98E-04
Os-191	Ci	0.00E+00	1.05E-04	8.92E-07	3.00E-06	1.09E-04
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	1.80E-05	0.00E+00	0.00E+00	1.80E-05
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	5.37E-04	0.00E+00	0.00E+00	5.37E-04
Total	Ci	**7.35E-07**	**7.94E-03**	**1.20E-06**	**1.39E-04**	**8.08E-03**
Total > 8 days	Ci	**7.35E-07**	**7.90E-03**	**1.20E-06**	**1.39E-04**	**8.05E-03**
4. Tritium						
H-3	Ci	5.74E+02	6.03E+02	2.21E+02	6.57E+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
1. Fission gases					
Ar-41	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	0.00E+00	2.96E-01	0.00E+00	2.96E-01
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**2.96E-01**	**0.00E+00**	**2.96E-01**
2. Iodines					
I-131	Ci	0.00E+00	2.38E-05	1.71E-05	4.09E-05
I-132	Ci	0.00E+00	0.00E+00	1.53E-04	1.53E-04
I-133	Ci	0.00E+00	5.84E-06	0.00E+00	5.84E-06
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**2.96E-05**	**1.70E-04**	**2.00E-04**

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
3. Particulates					
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	7.35E-07	3.34E-05	5.98E-04	6.32E-04
Co-60	Ci	9.98E-07	2.12E-05	1.02E-04	1.24E-04
Cr-51	Ci	0.00E+00	7.32E-05	8.82E-04	9.56E-04
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	4.28E-05	4.28E-05
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	2.60E-05	2.60E-05
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	7.84E-06	8.07E-05	8.85E-05
Os-191	Ci	0.00E+00	3.00E-06	3.87E-06	6.87E-06
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	0.00E+00	1.88E-06	1.88E-06
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	5.76E-05	5.76E-05
Total	Ci	**1.73E-06**	**1.39E-04**	**1.79E-03**	**1.94E-03**
4. Tritium					
H-3	Ci	9.51E+01	1.40E+02	1.05E+02	3.40E+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
1. Fission gases					
Ar-41	Ci	2.50E-01	7.86E+00	2.14E+00	1.02E+01
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	9.77E-04	4.49E-04	1.43E-03
Xe-133	Ci	2.15E-04	1.77E+00	3.25E-02	1.81E+00
Xe-133m	Ci	0.00E+00	1.38E-03	1.26E-04	1.50E-03
Xe-135	Ci	0.00E+00	9.12E-05	0.00E+00	9.12E-05
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138		0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**2.50E-01**	**9.63E+00**	**2.17E+00**	**1.21E+01**
2. Iodines					
I-131	Ci	0.00E+00	0.00E+00	3.17E-05	3.17E-05
I-132	Ci	0.00E+00	0.00E+00	4.06E-04	4.06E-04
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**0.00E+00**	**4.37E-04**	**4.37E-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
3. Particulates					
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	3.70E-05	3.70E-05
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	7.88E-06	7.88E-06
Co-58	Ci	0.00E+00	0.00E+00	7.05E-04	7.05E-04
Co-60	Ci	0.00E+00	0.00E+00	4.08E-04	4.08E-04
Cr-51	Ci	0.00E+00	0.00E+00	3.50E-03	3.50E-03
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	1.79E-04	1.79E-04
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	1.03E-04	1.03E-04
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	6.10E-04	6.10E-04
Os-191	Ci	0.00E+00	0.00E+00	1.02E-04	1.02E-04
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	Note 1	Note 1	Note 1	Note 1
Sr-90	Ci	Note 1	Note 1	Note 1	Note 1
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	0.00E+00	1.61E-05	1.61E-05
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	4.79E-04	4.79E-04
Total	Ci	**0.00E+00**	**0.00E+00**	**6.15E-03**	**6.15E-03**
4. Tritium					
H-3	Ci	2.36E+02	7.80E+02	6.99E+02	1.71E+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
1. Fission gases					
Ar-41	Ci	2.50E-01	7.86E+00	2.14E+00	1.02E+01
Kr-83m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131m	Ci	0.00E+00	9.77E-04	4.49E-04	1.43E-03
Xe-133	Ci	2.15E-04	2.07E+00	3.25E-02	2.10E+00
Xe-133m	Ci	0.00E+00	1.38E-03	1.26E-04	1.50E-03
Xe-135	Ci	0.00E+00	9.12E-05	0.00E+00	9.12E-05
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**2.50E-01**	**9.93E+00**	**2.17E+00**	**1.24E+01**
2. Iodines					
I-131	Ci	0.00E+00	2.38E-05	4.89E-05	7.26E-05
I-132	Ci	0.00E+00	0.00E+00	5.59E-04	5.59E-04
I-133	Ci	0.00E+00	5.84E-06	0.00E+00	5.84E-06
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	Ci	**0.00E+00**	**2.96E-05**	**6.08E-04**	**6.37E-04**

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
3. Particulates					
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	3.70E-05	3.70E-05
Ce-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	7.88E-06	7.88E-06
Co-58	Ci	7.35E-07	3.34E-05	1.30E-03	1.34E-03
Co-60	Ci	9.98E-07	2.12E-05	5.10E-04	5.32E-04
Cr-51	Ci	0.00E+00	7.32E-05	4.38E-03	4.46E-03
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	2.22E-04	2.22E-04
La-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	1.29E-04	1.29E-04
Mo-99	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	7.84E-06	6.90E-04	6.98E-04
Os-191	Ci	0.00E+00	3.00E-06	1.06E-04	1.09E-04
Rb-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-124	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb-125	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se-75	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn-113m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tc-99m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Te-123m	Ci	0.00E+00	0.00E+00	1.80E-05	1.80E-05
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	Ci	0.00E+00	0.00E+00	5.37E-04	5.37E-04
Total	Ci	**1.73E-06**	**1.39E-04**	**7.94E-03**	**8.08E-03**
Total > 8 days	Ci	**1.73E-06**	**1.39E-04**	**7.91E-03**	**8.05E-03**
4. Tritium					
H-3	Ci	3.31E+02	9.20E+02	8.04E+02	2.05E+03

Table 40:
Estimation of Total Percent Error

The estimated total error is calculated as follows:

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

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 (1)
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				

Table 41: Effluent Monitoring Instrumentation Out Of Service Greater Than 30 Days				
Unit	Instrument	Date span of inoperability	Cause of inoperability	Explanation
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 2015	estimated total error %
1.a. Spent resin, filters, sludges evaporator bottoms, etc.	m3	2.70E+02	2.50E+01
	Ci	1.50E+03	2.50E+01
1.b. Dry compressible waste, contaminated equipment, etc	m3	7.71E+02	2.50E+01
	Ci	2.83E+01	2.50E+01
1.c. Irradiated components, control rods, etc.	m3	0.00E+00	N/A
	Ci	0.00E+00	N/A
1.d. Other (describe)	m3	0.00E+00	N/A
	Ci	0.00E+00	N/A

2.0 Principal Radionuclides

2.a. Spent resin, filters, sludge, evaporator bottoms, etc.			
Nuclide Name	Percent Abundance	Curies	estimated total error %
Ni-63	7.66E+01	1.15E+03	2.50E+01
Fe-55	8.17E+00	1.22E+02	2.50E+01
Co-60	7.11E+00	1.06E+02	2.50E+01
Cs-137	4.82E+00	7.21E+01	2.50E+01
C-14	7.85E-01	1.17E+01	2.50E+01
H-3	7.72E-01	1.15E+01	2.50E+01
Mn-54	4.16E-01	6.22E+00	2.50E+01
Sb-125	3.60E-01	5.39E+00	2.50E+01
Ni-59	3.40E-01	5.09E+00	2.50E+01
Co-58	2.52E-01	3.78E+00	2.50E+01
Co-57	1.39E-01	2.08E+00	2.50E+01
Cs-134	1.28E-01	1.92E+00	2.50E+01
Sr-90	7.92E-02	1.18E+00	2.50E+01
Pu-241	1.39E-02	2.07E-01	2.50E+01
Ce-144	9.98E-03	1.49E-01	2.50E+01
Tc-99	2.98E-03	4.46E-02	2.50E+01
Ag-110m	2.38E-03	3.55E-02	2.50E+01
Am-241	6.75E-04	1.01E-02	2.50E+01
Sn-113	6.59E-04	9.86E-03	2.50E+01
Pu-238	5.68E-04	8.49E-03	2.50E+01
Zn-65	4.99E-04	7.47E-03	2.50E+01
Cm-243	4.94E-04	7.40E-03	2.50E+01
Sb-124	4.25E-04	6.36E-03	2.50E+01
Pu-239	1.76E-04	2.64E-03	2.50E+01
Zr-95	1.08E-04	1.62E-03	2.50E+01
Nb-95	9.85E-05	1.47E-03	2.50E+01
Cr-51	3.85E-05	5.76E-04	2.50E+01
Am-243	1.89E-05	2.83E-04	2.50E+01
Sr-89	1.45E-05	2.17E-04	2.50E+01
Fe-59	6.50E-06	9.72E-05	2.50E+01
Pu-242	3.35E-06	5.01E-05	2.50E+01
Cm-242	2.01E-07	3.01E-06	2.50E+01
Ru-103	6.06E-28	9.07E-27	2.50E+01
	Total	1.50E+03	

2.b. Dry compressible waste, contaminated equip, etc.			
Nuclide Name	Percent Abundance	Curies	estimated total error %
Fe-55	3.36E+01	9.48E+00	2.50E+01
Co-60	2.73E+01	7.72E+00	2.50E+01
Ni-63	2.08E+01	5.87E+00	2.50E+01
C-14	3.48E+00	9.84E-01	2.50E+01
Cr-51	3.43E+00	9.68E-01	2.50E+01
Mn-54	2.29E+00	6.46E-01	2.50E+01
Co-58	1.96E+00	5.53E-01	2.50E+01
Sb-125	1.87E+00	5.29E-01	2.50E+01
H-3	1.72E+00	4.87E-01	2.50E+01
Cs-137	1.41E+00	3.97E-01	2.50E+01
Nb-95	8.25E-01	2.33E-01	2.50E+01
Zr-95	8.25E-01	2.33E-01	2.50E+01
Co-57	3.01E-01	8.50E-02	2.50E+01
Fe-59	8.18E-02	2.31E-02	2.50E+01
Ce-144	7.15E-02	2.02E-02	2.50E+01
Pu-241	2.99E-02	8.44E-03	2.50E+01
Sn-113	2.27E-02	6.41E-03	2.50E+01
Sr-90	1.49E-02	4.20E-03	2.50E+01
Zn-65	1.01E-02	2.86E-03	2.50E+01
Sb-124	8.78E-03	2.48E-03	2.50E+01
Hf-181	7.83E-03	2.21E-03	2.50E+01
Te-123m	4.02E-03	1.14E-03	2.50E+01
Cm-243	1.34E-03	3.79E-04	2.50E+01
Pu-238	1.16E-03	3.27E-04	2.50E+01
Am-241	6.00E-04	1.69E-04	2.50E+01
Pu-239	4.00E-04	1.13E-04	2.50E+01
Am-243	2.31E-04	6.54E-05	2.50E+01
Cm-242	1.28E-04	3.63E-05	2.50E+01
Sr-89	2.59E-05	7.31E-06	2.50E+01
	Total	2.83E+01	

2.c. Irradiated Components, control rods, etc. (NONE)

2.d. Other (NONE)

3.0 Solid Waste Disposition

3.a

Number of Shipments	Mode Of Transport	Destination
26	Highway	EnergySolutions, UT (BWF)
12	Highway	EnergySolutions, UT (Treatment Facility)
6	Highway	EnergySolutions, UT (CWF)
24	Highway	Waste Control Specialist, TX (CWDF)
5	Highway	Waste Control Specialist, TX (TSD)

BWF = Bulk Waste Facility

CWF = Containerized Waste Facility

CWDF = Containerized Waste Dispoal Facility

TSD = Treatment, Storage, Disposal

3.b Irradiated Fuel Shipments: None

3.c Supplemental Information:

1) Container Volume in M3 by Waste Class

	Waste Class A	Waste Class B	Waste Class C
a. material	1.72E+02	8.69E+01	1.09E+01
b. material	7.71E+02	0.00E+00	0.00E+00

2) Container Activity in Ci by Waste Class (calculated)

	Waste Class A	Waste Class B	Waste Class C
a. material	3.05E+01	1.01E+03	4.58E+02
b. material	2.83E+01	0.00E+00	0.00E+00

3) Principal Radionuclides

a. material See section 2.0 of the report

b. material See section 2.0 of the report

4) Source of waste and processing employed

a. material spent resin-dewatered/dried, mechanical filters-no processing, concentrates-dried, concentrates as a liquid-no processing employed

b. material non-compacted dry active waste - no processing employed

5) Type of Container

a. material (9) poly liners transported as Exempt, (2) poly liners transported as LSA-I,

(1) poly liner transported as LSA-II, (1) 20' sea land container transported as LSA-II,

(4) Type A transportation casks transported as LSA-I, (36) Type A transportation casks transported as LSA-II, and (3) Type A transporation casks transported as Type A

b. material (8) 20' sea land containers transported as Exempt, (2) 20' sea land containers transported as Limited Quanitity, (20) 20' sea land containers transported as LSA-I, (1) Type A transportation cask transported as LSA-II, (3) Type A transportation casks transported as Type A, (1) metal box transpoted as LSA-I, (4) metal boxes transported as Type A

6) Solidification agent or absorbent

a. material No solidification agents or absorbents used to process material

b. material No solidification agents or absorbents used to process material

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 2015. 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 2015 Joint Frequency Distribution (JFD) shows a somewhat typical, but variable year. Of the 8760 hours available, 12 hours of data were lost due to data logger overwriting for an effective 99 % data recovery.

The average 35 foot mean wind speed was 6.6 mph. Distribution of directions was spread over the compass with a predominant direction (3 sectors of 22.5 degrees each) centered on southwest. (31.9%) A secondary maximum of three sectors centered on the north contained 22.2% of the total. Southwesterly flow winds averaged higher speeds with the most frequent speed at 7 mph. With the northerly directions, the highest frequency occurred at 4.0 mph.

Stability class summary:

Stability class E, F, G, (stable categories) 58.1%.
Stability class G, (extremely stable) 23.8%.
Stability class A, B, C, (unstable categories) 20.2%.
Stability class D, (neutral category) 21.7%.

Overall stable conditions (E,F,G) existed for the year.

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2015 TO 3/31/2015

*** 1ST 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	1	0	0	1	0	0	0	1	1	1	0	0	5
4.51- 5.50	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	3
5.51- 6.50	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
6.51- 8.50	0	0	1	0	0	0	0	1	4	2	0	1	1	1	0	0	11
8.51-11.50	0	1	0	0	1	0	0	0	0	1	2	1	0	2	0	0	8
11.51-14.50	0	1	1	0	0	0	0	0	0	3	3	0	0	1	2	0	11
14.51-20.50	0	0	1	0	0	0	0	0	0	0	5	0	0	0	0	0	6
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	2	3	0	2	0	0	2	4	7	11	4	2	5	2	2	46

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	1	0	0	0	0	1
3.51- 4.50	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
4.51- 5.50	0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	1	5
5.51- 6.50	0	0	0	0	0	0	1	0	0	1	1	0	1	0	0	0	4
6.51- 8.50	0	1	3	3	3	1	0	1	2	1	4	1	1	0	1	0	22
8.51-11.50	0	1	5	2	3	0	0	0	0	2	2	2	1	1	1	0	20
11.51-14.50	0	0	0	1	2	0	0	0	0	0	3	0	0	0	1	0	7
14.51-20.50	0	1	0	1	0	0	0	0	0	0	2	0	0	0	0	0	4
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	3	8	7	8	2	2	2	2	5	12	4	3	2	3	1	65

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	0	0	0	0	0
3.51- 4.50	1	2	1	0	2	0	0	1	1	1	1	0	0	0	0	2	12
4.51- 5.50	0	2	2	3	1	1	0	2	6	2	2	1	1	1	0	1	25
5.51- 6.50	1	6	4	2	0	1	1	3	5	2	3	1	0	1	0	0	30
6.51- 8.50	0	4	20	7	4	2	1	1	4	4	2	1	0	3	0	0	53
8.51-11.50	0	3	3	5	4	0	0	0	1	1	1	0	0	0	1	1	20
11.51-14.50	0	0	0	4	3	1	0	0	1	0	3	1	0	1	1	0	15
14.51-20.50	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	2	17	30	23	15	5	2	7	18	10	12	4	1	6	2	4	158

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2015 TO 3/31/2015

*** 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
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
1.51- 2.50	2	0	2	1	1	2	1	1	4	2	2	4	2	3	1	4	32
2.51- 3.50	6	5	5	4	3	1	5	4	11	10	8	5	7	1	8	9	92
3.51- 4.50	12	5	12	10	4	0	6	3	13	8	10	7	4	6	8	8	116
4.51- 5.50	1	8	10	3	2	0	0	2	7	6	2	3	3	3	3	4	57
5.51- 6.50	3	9	13	1	1	3	0	1	1	3	2	4	2	1	2	3	49
6.51- 8.50	3	6	13	8	2	6	0	2	3	1	4	9	2	1	3	1	64
8.51-11.50	0	2	13	4	6	3	1	1	4	12	3	2	3	2	2	0	58
11.51-14.50	0	1	2	9	10	0	0	1	1	1	2	0	1	0	2	0	30
14.51-20.50	0	0	0	2	7	0	0	1	2	2	1	0	0	0	0	0	15
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	27	36	70	42	36	15	13	16	46	45	34	34	24	17	30	30	515

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	1	0	1	0	0	0	1	0	1	0	0	1	5
1.51- 2.50	5	0	2	0	2	0	0	1	6	2	3	5	4	3	6	6	45
2.51- 3.50	2	0	0	0	1	2	0	4	4	1	2	3	10	5	11	4	49
3.51- 4.50	8	2	2	1	0	1	1	0	1	4	6	3	4	5	4	6	48
4.51- 5.50	3	5	3	0	1	1	0	0	5	0	2	1	2	0	6	4	33
5.51- 6.50	2	6	2	0	0	0	0	1	3	1	4	3	2	1	1	1	27
6.51- 8.50	2	4	1	3	1	0	0	2	1	8	10	3	1	2	4	2	44
8.51-11.50	1	4	5	5	2	1	1	1	7	10	10	2	0	5	2	1	57
11.51-14.50	0	0	0	5	0	2	0	0	0	3	4	0	0	1	0	0	15
14.51-20.50	0	0	0	1	9	0	0	0	0	1	2	0	0	0	0	0	13
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	23	21	15	15	18	7	3	9	27	30	44	20	24	22	34	25	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
.76- 1.50	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
1.51- 2.50	1	3	1	1	2	0	0	1	0	0	1	2	5	4	4	3	28
2.51- 3.50	5	5	0	2	0	0	0	0	0	3	5	4	6	12	10	11	63
3.51- 4.50	5	2	3	1	1	1	0	0	1	5	1	0	2	3	5	12	42
4.51- 5.50	3	3	3	1	0	0	0	0	1	1	3	1	1	3	2	7	29
5.51- 6.50	2	4	0	0	0	0	0	0	0	4	3	2	5	1	1	5	27
6.51- 8.50	6	2	2	2	0	0	0	0	0	12	7	1	6	2	1	2	43
8.51-11.50	1	7	1	6	0	0	0	0	0	2	3	0	0	2	0	1	23
11.51-14.50	1	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	5
14.51-20.50	0	0	0	0	1	0	0	0	0	0	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	24	26	11	16	4	1	1	1	2	27	23	10	25	27	23	41	262

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2015 TO 3/31/2015

*** 1ST 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	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
1.51- 2.50	5	3	3	2	0	1	0	0	1	3	3	2	9	4	15	7	58
2.51- 3.50	38	12	4	2	2	0	0	0	1	1	3	7	9	15	35	44	173
3.51- 4.50	61	17	3	1	0	0	0	1	0	2	2	3	4	7	40	62	203
4.51- 5.50	71	20	2	0	0	0	0	0	0	1	1	0	1	5	12	38	151
5.51- 6.50	37	10	4	1	1	0	0	0	0	0	1	1	0	1	6	19	81
6.51- 8.50	35	27	3	0	0	0	0	0	0	2	0	0	0	1	2	9	79
8.51-11.50	8	15	1	0	0	0	0	0	0	0	0	0	0	0	0	4	28
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	255	107	20	6	3	1	0	2	2	9	10	13	23	33	110	183	777

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	1	0	0	1	0	2	1	0	0	1	0	1	0	1	2	10
1.51- 2.50	13	6	8	4	5	3	1	3	11	7	9	13	20	14	26	20	163
2.51- 3.50	51	22	9	8	6	3	5	8	16	15	18	20	32	33	64	68	378
3.51- 4.50	88	28	21	13	8	3	7	6	16	20	20	14	15	22	57	90	428
4.51- 5.50	78	38	20	7	4	2	1	5	19	11	10	7	8	13	23	57	303
5.51- 6.50	45	35	23	4	2	4	2	5	9	12	15	11	10	5	10	28	220
6.51- 8.50	46	44	43	23	10	9	1	7	14	30	27	16	11	10	11	14	316
8.51-11.50	10	33	28	22	16	4	2	2	12	28	21	7	4	12	6	7	214
11.51-14.50	1	4	4	22	15	3	0	1	2	7	15	1	1	3	6	0	85
14.51-20.50	0	1	1	6	18	0	0	1	2	3	10	0	0	0	0	0	42
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	332	212	157	109	86	31	21	39	101	133	146	89	102	112	204	286	2160

TOTAL NUMBER OF OBSERVATIONS: 2160
TOTAL NUMBER OF VALID OBSERVATIONS: 2160
TOTAL NUMBER OF MISSING OBSERVATIONS: 0
PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %
MEAN WIND SPEED FOR THIS PERIOD: 5.7 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
2.13	3.01	7.31	23.84	15.60	12.13	35.97

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	0	2	0	0	2	4	7	11	4	2	5	2	2	0
B	1	3	8	7	8	2	2	2	2	5	12	4	3	2	3	1	0
C	2	17	30	23	15	5	2	7	18	10	12	4	1	6	2	4	0
D	27	36	70	42	36	15	13	16	46	45	34	34	24	17	30	30	0
E	23	21	15	15	18	7	3	9	27	30	44	20	24	22	34	25	0
F	24	26	11	16	4	1	1	1	2	27	23	10	25	27	23	41	0
G	255	107	20	6	3	1	0	2	2	9	10	13	23	33	110	183	0
TOTAL	332	212	157	109	86	31	21	39	101	133	146	89	102	112	204	286	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2015 TO 6/30/2015

*** 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	1	0	2	0	0	2	2	1	0	0	1	0	9
5.51- 6.50	0	0	0	0	0	1	3	5	15	10	7	2	0	1	0	0	44
6.51- 8.50	1	0	0	1	1	3	1	9	13	23	24	16	2	4	3	0	101
8.51-11.50	0	0	3	0	4	1	2	4	15	30	36	19	19	9	2	2	146
11.51-14.50	0	0	0	1	2	0	0	0	1	16	25	4	6	8	1	2	66
14.51-20.50	0	0	0	0	2	0	0	2	2	9	21	3	2	1	1	5	48
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	0	3	2	10	5	8	20	46	90	115	45	29	23	8	9	414

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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3.51- 4.50	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
4.51- 5.50	0	0	0	0	1	1	0	2	8	2	4	2	1	1	0	0	22
5.51- 6.50	1	0	0	0	1	3	1	2	11	4	7	0	1	1	0	0	32
6.51- 8.50	1	0	1	1	0	2	2	5	14	7	21	5	1	1	1	1	63
8.51-11.50	1	0	0	2	0	2	1	1	2	2	11	6	1	0	1	0	30
11.51-14.50	0	0	0	0	1	0	0	0	4	2	4	0	2	2	0	0	15
14.51-20.50	0	0	0	0	1	0	0	0	1	2	5	0	1	0	0	0	10
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	2	1	3	4	8	4	10	40	19	53	13	7	5	2	1	175

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	1	0	0	0	0	0	0	1
3.51- 4.50	0	0	0	0	0	0	1	2	1	2	1	2	0	1	0	0	10
4.51- 5.50	0	1	0	0	0	0	1	8	13	5	4	2	1	1	0	1	37
5.51- 6.50	1	0	0	1	0	0	2	5	8	5	7	3	1	0	0	0	33
6.51- 8.50	1	0	3	0	0	1	1	0	10	10	4	3	2	1	1	0	37
8.51-11.50	1	0	0	1	1	0	0	1	0	5	5	5	1	0	1	0	21
11.51-14.50	0	1	0	0	0	0	0	0	0	0	3	1	0	1	0	0	6
14.51-20.50	0	0	0	1	1	0	1	0	1	1	1	0	1	0	0	0	7
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	2	3	3	2	1	6	16	33	29	25	16	6	4	2	1	152

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2015 TO 6/30/2015

*** 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
.76- 1.50	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
1.51- 2.50	1	2	2	1	2	2	0	1	0	0	0	2	3	2	1	0	19
2.51- 3.50	3	0	3	6	0	0	3	2	3	5	3	2	2	1	3	1	37
3.51- 4.50	0	2	2	4	1	1	2	2	7	2	7	6	0	1	1	3	41
4.51- 5.50	3	1	1	0	0	1	0	4	9	14	10	2	2	2	1	1	51
5.51- 6.50	1	0	3	1	0	0	2	4	4	8	8	9	0	1	0	0	41
6.51- 8.50	1	1	0	0	0	2	2	0	2	7	22	10	6	1	0	0	54
8.51-11.50	0	0	0	0	0	2	0	0	0	2	13	11	5	2	1	3	39
11.51-14.50	0	1	0	0	2	1	0	0	1	2	13	3	1	3	3	1	31
14.51-20.50	0	0	0	0	5	0	0	2	3	5	18	3	3	2	0	0	41
>20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
TOTAL	9	7	11	12	10	9	9	15	29	45	96	48	22	16	10	9	357

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	1	1	0	0	0	0	0	0	0	0	2	2	2	3	1	3	15
2.51- 3.50	4	1	4	0	0	1	1	2	3	3	2	3	8	8	5	3	48
3.51- 4.50	5	3	0	0	0	0	0	0	1	8	7	4	3	0	0	2	33
4.51- 5.50	2	4	2	3	1	0	1	1	5	7	5	6	6	1	3	0	47
5.51- 6.50	1	0	0	0	0	0	0	1	4	9	8	8	2	0	0	2	35
6.51- 8.50	2	0	1	2	2	0	1	1	4	19	20	12	6	2	2	1	75
8.51-11.50	0	0	0	1	1	3	3	0	3	24	47	27	3	4	1	1	118
11.51-14.50	0	1	0	0	2	2	0	0	2	7	25	8	1	5	0	2	55
14.51-20.50	0	1	1	1	1	0	0	0	1	4	18	0	0	1	1	0	29
>20.50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	15	11	8	8	7	6	6	5	23	81	134	70	31	24	13	14	456

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	2	0	2	0	0	1	0	1	1	4	1	1	2	2	1	2	20
2.51- 3.50	8	5	0	2	1	0	0	0	2	3	3	4	9	3	5	13	58
3.51- 4.50	7	4	2	1	1	0	0	0	1	4	10	5	3	5	3	4	50
4.51- 5.50	2	0	0	0	0	0	0	0	0	3	8	9	2	1	2	3	30
5.51- 6.50	0	0	0	0	0	0	0	0	0	10	7	13	3	1	1	1	36
6.51- 8.50	1	1	0	0	1	0	1	1	0	12	34	17	10	5	0	4	87
8.51-11.50	0	0	0	0	0	0	0	0	0	4	11	7	0	2	2	3	29
11.51-14.50	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	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	20	10	4	3	3	2	1	2	4	40	76	56	29	19	14	30	313

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 4/01/2015 TO 6/30/2015

*** 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
.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	0	0	1	1	1	0	0	1	1	0	2	2	3	1	4	21
2.51- 3.50	15	3	3	2	1	0	0	0	0	1	2	2	3	7	10	17	66
3.51- 4.50	33	6	3	0	1	0	1	2	0	0	6	6	5	9	9	20	101
4.51- 5.50	24	13	2	0	0	0	1	1	0	0	4	3	4	5	2	15	74
5.51- 6.50	14	5	2	0	0	0	0	0	0	0	3	1	0	2	1	2	30
6.51- 8.50	1	6	0	0	0	0	0	0	0	2	5	2	1	0	0	3	20
8.51-11.50	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	2	5
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	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	91	33	10	4	3	1	2	3	1	5	21	16	15	26	23	63	317

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	0	0	0	0	0	0	0	0	1	0	0	1
1.51- 2.50	8	3	4	2	3	4	0	2	2	5	3	7	9	10	4	9	75
2.51- 3.50	30	10	10	10	2	1	4	4	8	13	10	11	22	19	23	34	211
3.51- 4.50	45	16	7	5	3	1	4	6	10	16	32	23	11	16	13	29	237
4.51- 5.50	31	19	5	3	3	2	5	16	35	33	37	25	16	11	9	20	270
5.51- 6.50	18	5	5	2	1	4	8	17	42	46	47	36	7	6	2	5	251
6.51- 8.50	8	8	5	4	4	8	8	16	43	80	130	65	28	14	7	9	437
8.51-11.50	2	0	3	5	6	8	6	6	20	68	124	75	29	17	8	11	388
11.51-14.50	0	3	0	1	7	4	0	0	8	27	72	16	10	19	4	5	176
14.51-20.50	0	1	1	2	10	0	1	4	8	21	63	6	7	4	2	5	135
>20.50	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	3
TOTAL	142	65	40	35	39	32	36	71	176	309	520	264	139	117	72	127	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
18.96	8.01	6.96	16.35	20.88	14.33	14.51

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	3	2	10	5	8	20	46	90	115	45	29	23	8	9	0
B	3	2	1	3	4	8	4	10	40	19	53	13	7	5	2	1	0
C	3	2	3	3	2	1	6	16	33	29	25	16	6	4	2	1	0
D	9	7	11	12	10	9	9	15	29	45	96	48	22	16	10	9	0
E	15	11	8	8	7	6	6	5	23	81	134	70	31	24	13	14	0
F	20	10	4	3	3	2	1	2	4	40	76	56	29	19	14	30	0
G	91	33	10	4	3	1	2	3	1	5	21	16	15	26	23	63	0
TOTAL	142	65	40	35	39	32	36	71	176	309	520	264	139	117	72	127	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2015 TO 6/30/2015

*** 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	1	0	0	1	0	0	0	1	1	1	0	0	5
4.51- 5.50	0	0	0	0	1	0	2	0	0	2	2	2	0	0	1	2	12
5.51- 6.50	0	0	0	0	0	1	3	5	15	11	8	2	0	1	0	0	46
6.51- 8.50	1	0	1	1	1	3	1	10	17	25	24	17	3	5	3	0	112
8.51-11.50	0	1	3	0	5	1	2	4	15	31	38	20	19	11	2	2	154
11.51-14.50	0	1	1	1	2	0	0	0	1	19	28	4	6	9	3	2	77
14.51-20.50	0	0	1	0	2	0	0	2	2	9	26	3	2	1	1	5	54
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	2	6	2	12	5	8	22	50	97	126	49	31	28	10	11	460

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	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
3.51- 4.50	1	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	4
4.51- 5.50	0	0	0	0	1	1	1	3	8	3	4	2	1	2	0	1	27
5.51- 6.50	1	0	0	0	1	3	2	2	11	5	8	0	2	1	0	0	36
6.51- 8.50	1	1	4	4	3	3	2	6	16	8	25	6	2	1	2	1	85
8.51-11.50	1	1	5	4	3	2	1	1	2	4	13	8	2	1	2	0	50
11.51-14.50	0	0	0	1	3	0	0	0	4	2	7	0	2	2	1	0	22
14.51-20.50	0	1	0	1	1	0	0	0	1	2	7	0	1	0	0	0	14
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	4	5	9	10	12	10	6	12	42	24	65	17	10	7	5	2	240

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	1	0	0	0	0	0	0	1
3.51- 4.50	1	2	1	0	2	0	1	3	2	3	2	2	0	1	0	2	22
4.51- 5.50	0	3	2	3	1	1	1	10	19	7	6	3	2	2	0	2	62
5.51- 6.50	2	6	4	3	0	1	3	8	13	7	10	4	1	1	0	0	63
6.51- 8.50	1	4	23	7	4	3	2	1	14	14	6	4	2	4	1	0	90
8.51-11.50	1	3	3	6	5	0	0	1	1	6	6	5	1	0	2	1	41
11.51-14.50	0	1	0	4	3	1	0	0	1	0	6	2	0	2	1	0	21
14.51-20.50	0	0	0	3	2	0	1	0	1	1	1	0	1	0	0	0	10
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	5	19	33	26	17	6	8	23	51	39	37	20	7	10	4	5	310

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2015 TO 6/30/2015

*** 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	1	1	1	3
1.51- 2.50	3	2	4	2	3	4	1	2	4	2	2	6	5	5	2	4	51
2.51- 3.50	9	5	8	10	3	1	8	6	14	15	11	7	9	2	11	10	129
3.51- 4.50	12	7	14	14	5	1	8	5	20	10	17	13	4	7	9	11	157
4.51- 5.50	4	9	11	3	2	1	0	6	16	20	12	5	5	5	4	5	108
5.51- 6.50	4	9	16	2	1	3	2	5	5	11	10	13	2	2	2	3	90
6.51- 8.50	4	7	13	8	2	8	2	2	5	8	26	19	8	2	3	1	118
8.51-11.50	0	2	13	4	6	5	1	1	4	14	16	13	8	4	3	3	97
11.51-14.50	0	2	2	9	12	1	0	1	2	3	15	3	2	3	5	1	61
14.51-20.50	0	0	0	2	12	0	0	3	5	7	19	3	3	2	0	0	56
>20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
TOTAL	36	43	81	54	46	24	22	31	75	90	130	82	46	33	40	39	872

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	1	0	1	0	0	0	1	0	1	0	0	1	5
1.51- 2.50	6	1	2	0	2	0	0	1	6	2	5	7	6	6	7	9	60
2.51- 3.50	6	1	4	0	1	3	1	6	7	4	4	6	18	13	16	7	97
3.51- 4.50	13	5	2	1	0	1	1	0	2	12	13	7	7	5	4	8	81
4.51- 5.50	5	9	5	3	2	1	1	1	10	7	7	7	8	1	9	4	80
5.51- 6.50	3	6	2	0	0	0	0	2	7	10	12	11	4	1	1	3	62
6.51- 8.50	4	4	2	5	3	0	1	3	5	27	30	15	7	4	6	3	119
8.51-11.50	1	4	5	6	3	4	4	1	10	34	57	29	3	9	3	2	175
11.51-14.50	0	1	0	5	2	4	0	0	2	10	29	8	1	6	0	2	70
14.51-20.50	0	1	1	2	10	0	0	0	1	5	20	0	0	1	1	0	42
>20.50	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	38	32	23	23	25	13	9	14	50	111	178	90	55	46	47	39	793

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	1	0	0	0	0	0	0	0	0	0	1
1.51- 2.50	3	3	3	1	2	1	0	2	1	4	2	3	7	6	5	5	48
2.51- 3.50	13	10	0	4	1	0	0	0	2	6	8	8	15	15	15	24	121
3.51- 4.50	12	6	5	2	2	1	0	0	2	9	11	5	5	8	8	16	92
4.51- 5.50	5	3	3	1	0	0	0	0	1	4	11	10	3	4	4	10	59
5.51- 6.50	2	4	0	0	0	0	0	0	0	14	10	15	8	2	2	6	63
6.51- 8.50	7	3	2	2	1	0	1	1	0	24	41	18	16	7	1	6	130
8.51-11.50	1	7	1	6	0	0	0	0	0	6	14	7	0	4	2	4	52
11.51-14.50	1	0	1	3	0	1	0	0	0	0	2	0	0	0	0	0	8
14.51-20.50	0	0	0	0	1	0	0	0	0	0	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	44	36	15	19	7	3	2	3	6	67	99	66	54	46	37	71	575

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2015 TO 6/30/2015

*** 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
.76- 1.50	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
1.51- 2.50	9	3	3	3	1	2	0	0	2	4	3	4	11	7	16	11	79
2.51- 3.50	53	15	7	4	3	0	0	0	1	2	5	9	12	22	45	61	239
3.51- 4.50	94	23	6	1	1	0	1	3	0	2	8	9	9	16	49	82	304
4.51- 5.50	95	33	4	0	0	0	1	1	0	1	5	3	5	10	14	53	225
5.51- 6.50	51	15	6	1	1	0	0	0	0	0	4	2	0	3	7	21	111
6.51- 8.50	36	33	3	0	0	0	0	0	0	4	5	2	1	1	2	12	99
8.51-11.50	8	15	1	1	0	0	0	0	0	1	1	0	0	0	0	6	33
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	346	140	30	10	6	2	2	5	3	14	31	29	38	59	133	246	1094

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	1	0	0	1	0	2	1	0	0	1	0	1	1	1	2	11
1.51- 2.50	21	9	12	6	8	7	1	5	13	12	12	20	29	24	30	29	238
2.51- 3.50	81	32	19	18	8	4	9	12	24	28	28	31	54	52	87	102	589
3.51- 4.50	133	44	28	18	11	4	11	12	26	36	52	37	26	38	70	119	665
4.51- 5.50	109	57	25	10	7	4	6	21	54	44	47	32	24	24	32	77	573
5.51- 6.50	63	40	28	6	3	8	10	22	51	58	62	47	17	11	12	33	471
6.51- 8.50	54	52	48	27	14	17	9	23	57	110	157	81	39	24	18	23	753
8.51-11.50	12	33	31	27	22	12	8	8	32	96	145	82	33	29	14	18	602
11.51-14.50	1	7	4	23	22	7	0	1	10	34	87	17	11	22	10	5	261
14.51-20.50	0	2	2	8	28	0	1	5	10	24	73	6	7	4	2	5	177
>20.50	0	0	0	1	1	0	0	0	0	0	2	0	0	0	0	0	4
TOTAL	474	277	197	144	125	63	57	110	277	442	666	353	241	229	276	413	4344

TOTAL NUMBER OF OBSERVATIONS: 4344
TOTAL NUMBER OF VALID OBSERVATIONS: 4344
TOTAL NUMBER OF MISSING OBSERVATIONS: 0
PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %
MEAN WIND SPEED FOR THIS PERIOD: 6.6 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
10.59	5.52	7.14	20.07	18.26	13.24	25.18

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	6	2	12	5	8	22	50	97	126	49	31	28	10	11	0
B	4	5	9	10	12	10	6	12	42	24	65	17	10	7	5	2	0
C	5	19	33	26	17	6	8	23	51	39	37	20	7	10	4	5	0
D	36	43	81	54	46	24	22	31	75	90	130	82	46	33	40	39	0
E	38	32	23	23	25	13	9	14	50	111	178	90	55	46	47	39	0
F	44	36	15	19	7	3	2	3	6	67	99	66	54	46	37	71	0
G	346	140	30	10	6	2	2	5	3	14	31	29	38	59	133	246	0
TOTAL	474	277	197	144	125	63	57	110	277	442	666	353	241	229	276	413	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2015 TO 9/30/2015

*** 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
.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	1	0	0	0	2	0	0	0	0	0	0	0	3
5.51- 6.50	0	0	1	0	0	0	1	2	3	3	3	2	1	1	0	0	17
6.51- 8.50	0	1	1	1	3	1	7	5	17	12	11	7	3	0	1	1	71
8.51-11.50	1	0	0	0	0	0	2	1	19	22	35	14	5	3	1	0	103
11.51-14.50	0	0	0	0	0	0	0	0	2	7	10	7	1	0	1	1	29
14.51-20.50	0	0	0	0	0	0	0	0	0	8	7	2	0	0	0	0	17
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	1	2	1	4	1	10	8	43	52	66	32	10	4	3	2	240

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	0	0	0	0	0	1	0	1	0	1	0	3
4.51- 5.50	0	1	0	0	0	0	1	1	3	3	2	3	0	0	0	0	14
5.51- 6.50	0	0	0	0	0	0	1	1	2	8	0	5	0	1	1	0	19
6.51- 8.50	0	0	1	2	8	1	1	2	4	6	11	4	2	0	0	0	42
8.51-11.50	1	0	1	0	5	2	0	0	3	5	13	5	4	1	0	0	40
11.51-14.50	0	0	0	1	1	0	0	0	0	2	7	1	0	0	0	0	12
14.51-20.50	0	0	0	0	3	0	0	0	0	1	3	1	0	0	0	0	8
>20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
TOTAL	1	1	2	3	17	3	3	4	12	25	39	19	7	2	2	0	140

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	0	0	0	0	0
3.51- 4.50	2	0	2	0	0	0	0	1	3	1	0	1	0	0	0	1	11
4.51- 5.50	0	1	6	0	1	0	0	1	3	3	6	5	2	0	1	1	30
5.51- 6.50	0	1	2	2	0	2	0	2	10	6	3	3	1	2	1	1	36
6.51- 8.50	1	1	4	3	4	3	4	4	7	6	8	10	0	1	0	2	58
8.51-11.50	0	0	0	0	2	4	1	0	1	3	6	2	1	0	0	1	21
11.51-14.50	0	0	0	0	4	1	0	0	1	1	2	0	0	0	0	0	9
14.51-20.50	0	1	0	0	2	0	0	1	0	1	0	0	0	0	0	0	5
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	4	14	5	13	10	5	9	25	21	25	21	4	3	2	6	170

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2015 TO 9/30/2015

*** 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	1	0	0	1	0	0	2	1	0	3	0	0	1	2	0	1	12
2.51- 3.50	7	5	2	0	2	0	1	1	2	4	4	2	6	4	5	5	50
3.51- 4.50	10	5	5	3	0	1	1	1	4	7	7	8	5	4	6	3	70
4.51- 5.50	5	0	2	4	2	1	2	2	16	5	11	6	6	6	1	4	73
5.51- 6.50	4	3	4	1	2	0	0	4	11	8	16	8	4	2	0	0	67
6.51- 8.50	3	3	4	5	2	2	8	5	11	7	14	5	6	2	3	1	81
8.51-11.50	0	0	4	7	9	8	3	2	5	4	19	9	3	1	0	2	76
11.51-14.50	0	1	0	2	11	2	2	1	1	3	14	2	1	0	0	0	40
14.51-20.50	1	0	0	0	7	1	2	1	2	6	14	1	0	0	0	0	35
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2
TOTAL	31	17	21	23	36	15	21	18	52	47	99	41	32	21	15	17	506

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	0	0	1	0	0	0	0	0	0	0	0	0	0	2
1.51- 2.50	4	2	0	1	0	0	0	0	2	1	1	3	2	6	4	3	29
2.51- 3.50	3	2	0	2	1	2	0	0	1	2	2	4	6	8	8	5	46
3.51- 4.50	3	6	6	1	1	0	1	1	2	7	1	9	7	3	4	4	56
4.51- 5.50	2	5	3	2	0	3	1	2	4	2	9	6	3	1	4	4	51
5.51- 6.50	1	7	3	2	0	3	1	1	9	4	19	5	2	3	1	2	63
6.51- 8.50	3	6	7	2	4	2	2	3	9	22	35	20	4	1	2	2	124
8.51-11.50	2	2	2	8	6	10	7	1	2	20	46	18	3	4	3	3	137
11.51-14.50	0	0	2	4	10	4	6	2	2	12	42	3	0	1	0	2	90
14.51-20.50	1	1	0	0	14	0	2	0	1	4	11	4	0	0	0	0	38
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	20	31	23	22	37	25	20	10	32	74	166	72	27	27	26	25	637

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	0	0	0	1
1.51- 2.50	1	0	2	1	0	1	0	0	0	3	0	2	5	4	3	2	24
2.51- 3.50	7	2	6	1	0	1	0	0	0	1	2	6	3	13	16	9	67
3.51- 4.50	14	4	1	1	0	0	0	1	2	2	5	8	9	4	12	11	74
4.51- 5.50	5	5	1	1	0	0	0	0	2	4	8	9	5	4	0	7	51
5.51- 6.50	1	4	3	1	0	0	0	0	0	0	12	4	0	2	0	0	27
6.51- 8.50	3	7	4	1	0	0	0	0	2	2	18	4	2	0	0	0	43
8.51-11.50	0	1	1	1	2	0	0	0	1	0	9	2	0	0	0	0	17
11.51-14.50	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	1	5
14.51-20.50	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	31	23	19	8	3	2	0	1	7	13	55	36	25	27	31	30	311

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2015 TO 9/30/2015

*** 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	0	0	0
1.51- 2.50	1	1	2	0	0	0	3	0	0	0	0	1	6	1	3	2	20
2.51- 3.50	5	1	1	1	0	0	0	0	0	1	1	5	3	4	5	7	34
3.51- 4.50	17	9	2	0	2	0	0	0	0	0	1	3	2	7	6	14	63
4.51- 5.50	18	9	2	0	0	0	0	0	0	0	2	2	0	1	3	5	42
5.51- 6.50	7	12	0	0	0	0	0	0	0	0	1	0	1	0	0	3	24
6.51- 8.50	0	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	9
8.51-11.50	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
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	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	48	41	10	1	2	0	3	0	0	1	5	11	12	13	17	31	195

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	0	0	1	0	0	0	0	0	0	1	0	0	0	3
1.51- 2.50	7	3	4	3	0	1	5	1	2	7	1	6	14	13	10	8	85
2.51- 3.50	22	10	9	4	3	3	1	1	3	8	9	17	18	29	34	26	197
3.51- 4.50	46	24	16	5	3	1	2	4	11	17	15	29	24	18	29	33	277
4.51- 5.50	30	21	14	7	4	4	4	6	30	17	38	31	16	12	9	21	264
5.51- 6.50	13	27	13	6	2	5	3	10	35	29	54	27	9	11	3	6	253
6.51- 8.50	10	25	23	14	21	9	22	19	50	55	97	50	17	4	6	6	428
8.51-11.50	4	5	9	16	24	24	13	4	31	54	128	50	16	9	4	6	397
11.51-14.50	0	1	3	8	27	7	8	3	6	25	76	13	2	1	1	4	185
14.51-20.50	2	2	0	0	26	1	4	2	3	21	35	9	0	0	0	0	105
>20.50	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	1	5
TOTAL	135	118	91	63	112	56	62	50	171	233	455	232	117	97	96	111	2199

TOTAL NUMBER OF OBSERVATIONS: 2206
TOTAL NUMBER OF VALID OBSERVATIONS: 2199
TOTAL NUMBER OF MISSING OBSERVATIONS: 7
PERCENT DATA RECOVERY FOR THIS PERIOD: 99.7 %
MEAN WIND SPEED FOR THIS PERIOD: 7.3 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
10.91	6.37	7.73	23.01	28.97	14.14	8.87

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	1	4	1	10	8	43	52	66	32	10	4	3	2	0
B	1	1	2	3	17	3	3	4	12	25	39	19	7	2	2	0	0
C	3	4	14	5	13	10	5	9	25	21	25	21	4	3	2	6	0
D	31	17	21	23	36	15	21	18	52	47	99	41	32	21	15	17	0
E	20	31	23	22	37	25	20	10	32	74	166	72	27	27	26	25	0
F	31	23	19	8	3	2	0	1	7	13	55	36	25	27	31	30	0
G	48	41	10	1	2	0	3	0	0	1	5	11	12	13	17	31	0
TOTAL	135	118	91	63	112	56	62	50	171	233	455	232	117	97	96	111	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2015 TO 12/31/2015

*** 4TH 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	1	0	0	0	0	0	0	0	0	0	0	0	1
5.51- 6.50	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	3
6.51- 8.50	0	0	0	0	0	2	0	1	0	0	0	1	1	0	0	1	6
8.51-11.50	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4
11.51-14.50	0	0	0	1	1	0	0	0	0	0	1	1	0	3	2	0	9
14.51-20.50	1	0	0	2	0	0	0	0	2	1	3	1	1	5	0	1	17
>20.50	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	5
TOTAL	3	1	0	4	2	2	0	1	2	1	5	4	3	8	2	7	45

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	0	0	1	0	0	0	0	0	1	0	0	2
4.51- 5.50	1	0	0	2	0	1	0	0	2	1	0	0	0	0	0	0	7
5.51- 6.50	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3
6.51- 8.50	1	0	3	2	0	1	0	4	0	0	1	0	0	1	1	2	16
8.51-11.50	1	0	0	3	2	2	0	0	1	1	0	1	1	0	0	0	12
11.51-14.50	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	0	4
14.51-20.50	2	0	0	0	2	0	0	0	1	0	2	1	1	1	0	0	10
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TOTAL	5	1	3	7	5	4	0	5	5	3	5	2	3	3	2	2	55

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	1	0	0	0	0	0	0	0	1
3.51- 4.50	1	0	0	0	1	1	1	2	5	2	3	3	0	1	1	0	21
4.51- 5.50	0	1	3	1	0	0	0	0	1	3	2	0	1	0	0	0	12
5.51- 6.50	0	3	3	0	0	0	0	1	1	1	2	3	2	0	1	0	17
6.51- 8.50	1	3	2	3	2	1	1	1	0	0	3	1	1	2	0	0	21
8.51-11.50	0	0	0	1	4	1	1	0	0	2	0	0	0	1	1	0	11
11.51-14.50	1	1	1	0	2	1	0	0	0	1	3	0	0	3	0	0	13
14.51-20.50	1	0	0	1	3	0	0	1	0	5	1	0	1	0	0	1	14
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	4	8	9	6	12	4	3	5	8	14	14	7	5	7	3	1	110

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2015 TO 12/31/2015

*** 4TH 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	1	0	0	1	1	0	3	1	1	2	2	2	5	0	0	2	21
2.51- 3.50	5	1	2	1	6	1	7	9	15	11	22	11	6	4	7	2	110
3.51- 4.50	6	5	11	8	8	4	6	6	21	15	7	7	2	0	3	4	113
4.51- 5.50	4	3	7	7	6	7	5	4	5	6	6	3	2	3	2	0	70
5.51- 6.50	1	6	8	4	2	2	0	4	5	4	6	5	1	0	0	0	48
6.51- 8.50	1	1	10	5	5	4	4	4	2	4	7	1	3	0	0	2	53
8.51-11.50	1	0	3	4	12	9	1	1	2	4	1	4	5	0	2	1	50
11.51-14.50	0	0	1	0	7	3	0	0	0	1	4	3	3	3	2	2	29
14.51-20.50	1	0	0	0	9	1	0	0	0	0	5	1	1	4	0	1	23
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
TOTAL	20	16	42	30	56	31	26	29	51	47	60	37	28	14	16	16	519

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	1	0	0	0	0	0	1	2
1.51- 2.50	3	2	1	2	1	1	1	1	2	2	6	4	0	5	4	4	39
2.51- 3.50	6	1	2	1	3	2	1	4	5	1	0	3	1	6	6	5	47
3.51- 4.50	5	1	3	2	1	1	1	3	2	3	6	4	6	3	1	3	45
4.51- 5.50	3	5	1	4	1	3	1	2	4	4	2	3	1	2	0	4	40
5.51- 6.50	4	2	2	1	3	3	2	1	2	2	5	4	3	5	0	1	40
6.51- 8.50	0	2	5	2	6	3	1	4	7	1	7	7	1	3	0	2	51
8.51-11.50	2	1	0	2	12	3	1	1	1	5	0	2	4	5	3	0	42
11.51-14.50	1	0	0	1	7	1	0	0	1	1	1	0	1	2	0	4	20
14.51-20.50	0	0	0	0	5	1	0	0	0	0	2	2	0	3	0	2	15
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	24	14	14	15	39	18	8	16	24	20	29	29	17	34	14	26	341

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	1	0	0	0	0	0	0	0	0	2	0	0	0	3
1.51- 2.50	6	1	4	1	0	1	0	1	1	0	3	3	1	5	7	4	38
2.51- 3.50	10	8	2	0	2	0	1	0	1	1	4	9	3	7	6	12	66
3.51- 4.50	11	6	5	3	1	0	0	0	1	5	9	5	5	6	6	12	75
4.51- 5.50	6	5	4	0	0	0	0	0	0	2	6	4	3	2	4	4	40
5.51- 6.50	2	5	1	0	0	2	0	0	6	1	4	1	2	2	5	4	35
6.51- 8.50	2	5	1	1	2	2	0	0	1	5	4	6	5	5	4	3	46
8.51-11.50	2	3	2	4	2	0	0	0	1	0	2	2	3	2	8	3	34
11.51-14.50	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2	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	40	33	19	10	8	5	1	1	11	14	32	31	24	29	40	44	342

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 10/01/2015 TO 12/31/2015

*** 4TH 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	1	0	0	0	1	1	1	0	0	0	4
1.51- 2.50	11	9	6	5	3	2	1	0	3	2	8	6	5	8	11	18	98
2.51- 3.50	45	23	7	3	3	3	0	1	1	4	5	11	8	13	24	44	195
3.51- 4.50	75	26	12	2	1	1	0	0	0	5	3	3	2	5	29	57	221
4.51- 5.50	49	21	4	1	0	0	0	0	0	0	0	2	1	3	5	38	124
5.51- 6.50	36	15	2	0	0	0	0	0	0	2	0	2	0	0	4	15	76
6.51- 8.50	27	16	0	0	0	0	0	0	0	0	0	0	0	0	5	17	65
8.51-11.50	1	6	0	0	0	0	0	0	0	1	0	0	0	0	1	1	10
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	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	244	116	31	11	7	6	2	1	4	14	17	25	17	29	79	190	793

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	1	0	0	1	0	0	1	1	1	3	0	0	1	9
1.51- 2.50	21	12	11	9	5	4	5	3	7	6	19	15	11	18	22	28	196
2.51- 3.50	66	33	13	5	14	6	9	14	23	17	31	34	18	30	43	63	419
3.51- 4.50	98	38	31	15	12	7	8	12	29	30	28	22	15	16	40	76	477
4.51- 5.50	63	35	19	15	8	11	6	6	12	16	16	12	8	10	11	46	294
5.51- 6.50	43	32	16	6	5	7	2	6	15	10	18	15	9	7	10	21	222
6.51- 8.50	32	27	21	13	15	13	6	14	10	10	22	16	11	11	10	27	258
8.51-11.50	8	11	5	14	32	15	3	2	5	13	3	9	14	8	15	6	163
11.51-14.50	3	1	2	2	19	5	0	0	1	4	11	5	4	11	4	8	80
14.51-20.50	5	0	0	3	19	2	0	1	3	6	13	5	4	13	0	5	79
>20.50	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	5	8
TOTAL	340	189	118	83	129	70	40	58	105	113	162	135	97	124	156	286	2205

TOTAL NUMBER OF OBSERVATIONS: 2205
TOTAL NUMBER OF VALID OBSERVATIONS: 2205
TOTAL NUMBER OF MISSING OBSERVATIONS: 0
PERCENT DATA RECOVERY FOR THIS PERIOD: 100.0 %
MEAN WIND SPEED FOR THIS PERIOD: 5.7 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
2.04	2.49	4.99	23.54	15.46	15.51	35.96

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	1	0	4	2	2	0	1	2	1	5	4	3	8	2	7	0
B	5	1	3	7	5	4	0	5	5	3	5	2	3	3	2	2	0
C	4	8	9	6	12	4	3	5	8	14	14	7	5	7	3	1	0
D	20	16	42	30	56	31	26	29	51	47	60	37	28	14	16	16	0
E	24	14	14	15	39	18	8	16	24	20	29	29	17	34	14	26	0
F	40	33	19	10	8	5	1	1	11	14	32	31	24	29	40	44	0
G	244	116	31	11	7	6	2	1	4	14	17	25	17	29	79	190	0
TOTAL	340	189	118	83	129	70	40	58	105	113	162	135	97	124	156	286	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2015 TO 12/31/2015

*** 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	0	0	0	0	0
4.51- 5.50	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	4
5.51- 6.50	0	0	1	1	0	0	1	2	3	3	4	2	1	1	0	1	20
6.51- 8.50	0	1	1	1	3	3	7	6	17	12	11	8	4	0	1	2	77
8.51-11.50	2	1	0	0	0	0	2	1	19	22	35	14	6	3	1	1	107
11.51-14.50	0	0	0	1	1	0	0	0	2	7	11	8	1	3	3	1	38
14.51-20.50	1	0	0	2	0	0	0	0	2	9	10	3	1	5	0	1	34
>20.50	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	5
TOTAL	4	2	2	5	6	3	10	9	45	53	71	36	13	12	5	9	285

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	0	0	1	0	0	1	0	1	1	1	0	5
4.51- 5.50	1	1	0	2	0	1	1	1	5	4	2	3	0	0	0	0	21
5.51- 6.50	0	1	0	0	0	0	1	1	3	8	0	5	1	1	1	0	22
6.51- 8.50	1	0	4	4	8	2	1	6	4	6	12	4	2	1	1	2	58
8.51-11.50	2	0	1	3	7	4	0	0	4	6	13	6	5	1	0	0	52
11.51-14.50	0	0	0	1	2	0	0	0	0	3	9	1	0	0	0	0	16
14.51-20.50	2	0	0	0	5	0	0	0	1	1	5	2	1	1	0	0	18
>20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
TOTAL	6	2	5	10	22	7	3	9	17	28	44	21	10	5	4	2	195

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	1	0	0	0	0	0	0	0	1
3.51- 4.50	3	0	2	0	1	1	1	3	8	3	3	4	0	1	1	1	32
4.51- 5.50	0	2	9	1	1	0	0	1	4	6	8	5	3	0	1	1	42
5.51- 6.50	0	4	5	2	0	2	0	3	11	7	5	6	3	2	2	1	53
6.51- 8.50	2	4	6	6	6	4	5	5	7	6	11	11	1	3	0	2	79
8.51-11.50	0	0	0	1	6	5	2	0	1	5	6	2	1	1	1	1	32
11.51-14.50	1	1	1	0	6	2	0	0	1	2	5	0	0	3	0	0	22
14.51-20.50	1	1	0	1	5	0	0	2	0	6	1	0	1	0	0	1	19
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	7	12	23	11	25	14	8	14	33	35	39	28	9	10	5	7	280

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2015 TO 12/31/2015

*** 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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.51- 2.50	2	0	0	2	1	0	5	2	1	5	2	2	6	2	0	3	33
2.51- 3.50	12	6	4	1	8	1	8	10	17	15	26	13	12	8	12	7	160
3.51- 4.50	16	10	16	11	8	5	7	7	25	22	14	15	7	4	9	7	183
4.51- 5.50	9	3	9	11	8	8	7	6	21	11	17	9	8	9	3	4	143
5.51- 6.50	5	9	12	5	4	2	0	8	16	12	22	13	5	2	0	0	115
6.51- 8.50	4	4	14	10	7	6	12	9	13	11	21	6	9	2	3	3	134
8.51-11.50	1	0	7	11	21	17	4	3	7	8	20	13	8	1	2	3	126
11.51-14.50	0	1	1	2	18	5	2	1	1	4	18	5	4	3	2	2	69
14.51-20.50	2	0	0	0	16	2	2	1	2	6	19	2	1	4	0	1	58
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	4
TOTAL	51	33	63	53	92	46	47	47	103	94	159	78	60	35	31	33	1025

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	0	0	1	0	0	0	1	0	0	0	0	0	1	4
1.51- 2.50	7	4	1	3	1	1	1	1	4	3	7	7	2	11	8	7	68
2.51- 3.50	9	3	2	3	4	4	1	4	6	3	2	7	7	14	14	10	93
3.51- 4.50	8	7	9	3	2	1	2	4	4	10	7	13	13	6	5	7	101
4.51- 5.50	5	10	4	6	1	6	2	4	8	6	11	9	4	3	4	8	91
5.51- 6.50	5	9	5	3	3	6	3	2	11	6	24	9	5	8	1	3	103
6.51- 8.50	3	8	12	4	10	5	3	7	16	23	42	27	5	4	2	4	175
8.51-11.50	4	3	2	10	18	13	8	2	3	25	46	20	7	9	6	3	179
11.51-14.50	1	0	2	5	17	5	6	2	3	13	43	3	1	3	0	6	110
14.51-20.50	1	1	0	0	19	1	2	0	1	4	13	6	0	3	0	2	53
>20.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	44	45	37	37	76	43	28	26	56	94	195	101	44	61	40	51	978

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	1	0	0	0	0	0	0	0	0	3	0	0	0	4
1.51- 2.50	7	1	6	2	0	2	0	1	1	3	3	5	6	9	10	6	62
2.51- 3.50	17	10	8	1	2	1	1	0	1	2	6	15	6	20	22	21	133
3.51- 4.50	25	10	6	4	1	0	0	1	3	7	14	13	14	10	18	23	149
4.51- 5.50	11	10	5	1	0	0	0	0	2	6	14	13	8	6	4	11	91
5.51- 6.50	3	9	4	1	0	2	0	0	6	1	16	5	2	4	5	4	62
6.51- 8.50	5	12	5	2	2	2	0	0	3	7	22	10	7	5	4	3	89
8.51-11.50	2	4	3	5	4	0	0	0	2	0	11	4	3	2	8	3	51
11.51-14.50	1	0	1	1	2	0	0	0	0	0	1	1	0	0	0	3	10
14.51-20.50	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	71	56	38	18	11	7	1	2	18	27	87	67	49	56	71	74	653

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 7/01/2015 TO 12/31/2015

*** 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
.76- 1.50	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	4
1.51- 2.50	12	10	8	5	3	2	4	0	3	2	8	7	11	9	14	20	118
2.51- 3.50	50	24	8	4	3	3	0	1	1	5	6	16	11	17	29	51	229
3.51- 4.50	92	35	14	2	3	1	0	0	0	5	4	6	4	12	35	71	284
4.51- 5.50	67	30	6	1	0	0	0	0	0	0	2	4	1	4	8	43	166
5.51- 6.50	43	27	2	0	0	0	0	0	0	2	1	2	1	0	4	18	100
6.51- 8.50	27	23	2	0	0	0	0	0	0	0	0	0	0	0	5	17	74
8.51-11.50	1	8	1	0	0	0	0	0	0	1	0	0	0	0	1	1	13
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	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	292	157	41	12	9	6	5	1	4	15	22	36	29	42	96	221	988

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	1	0	1	1	0	0	1	1	1	4	0	0	1	12
1.51- 2.50	28	15	15	12	5	5	10	4	9	13	20	21	25	31	32	36	281
2.51- 3.50	88	43	22	9	17	9	10	15	26	25	40	51	36	59	77	89	616
3.51- 4.50	144	62	47	20	15	8	10	16	40	47	43	51	39	34	69	109	754
4.51- 5.50	93	56	33	22	12	15	10	12	42	33	54	43	24	22	20	67	558
5.51- 6.50	56	59	29	12	7	12	5	16	50	39	72	42	18	18	13	27	475
6.51- 8.50	42	52	44	27	36	22	28	33	60	65	119	66	28	15	16	33	686
8.51-11.50	12	16	14	30	56	39	16	6	36	67	131	59	30	17	19	12	560
11.51-14.50	3	2	5	10	46	12	8	3	7	29	87	18	6	12	5	12	265
14.51-20.50	7	2	0	3	45	3	4	3	6	27	48	14	4	13	0	5	184
>20.50	1	0	0	0	2	0	0	0	0	0	2	1	0	0	1	6	13
TOTAL	475	307	209	146	241	126	102	108	276	346	617	367	214	221	252	397	4404

TOTAL NUMBER OF OBSERVATIONS: 4411
TOTAL NUMBER OF VALID OBSERVATIONS: 4404
TOTAL NUMBER OF MISSING OBSERVATIONS: 7
PERCENT DATA RECOVERY FOR THIS PERIOD: 99.8 %
MEAN WIND SPEED FOR THIS PERIOD: 6.5 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
6.47	4.43	6.36	23.27	22.21	14.83	22.43

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	4	2	2	5	6	3	10	9	45	53	71	36	13	12	5	9	0
B	6	2	5	10	22	7	3	9	17	28	44	21	10	5	4	2	0
C	7	12	23	11	25	14	8	14	33	35	39	28	9	10	5	7	0
D	51	33	63	53	92	46	47	47	103	94	159	78	60	35	31	33	0
E	44	45	37	37	76	43	28	26	56	94	195	101	44	61	40	51	0
F	71	56	38	18	11	7	1	2	18	27	87	67	49	56	71	74	0
G	292	157	41	12	9	6	5	1	4	15	22	36	29	42	96	221	0
TOTAL	475	307	209	146	241	126	102	108	276	346	617	367	214	221	252	397	0

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2015 TO 12/31/2015

*** 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	1	0	0	1	0	0	0	1	1	1	0	0	5
4.51- 5.50	0	0	0	0	3	0	2	0	2	2	2	2	0	0	1	2	16
5.51- 6.50	0	0	1	1	0	1	4	7	18	14	12	4	1	2	0	1	66
6.51- 8.50	1	1	2	2	4	6	8	16	34	37	35	25	7	5	4	2	189
8.51-11.50	2	2	3	0	5	1	4	5	34	53	73	34	25	14	3	3	261
11.51-14.50	0	1	1	2	3	0	0	0	3	26	39	12	7	12	6	3	115
14.51-20.50	1	0	1	2	2	0	0	2	4	18	36	6	3	6	1	6	88
>20.50	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	5
TOTAL	5	4	8	7	18	8	18	31	95	150	197	85	44	40	15	20	745

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	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
3.51- 4.50	1	1	0	0	0	1	0	1	0	0	2	0	1	1	1	0	9
4.51- 5.50	1	1	0	2	1	2	2	4	13	7	6	5	1	2	0	1	48
5.51- 6.50	1	1	0	0	1	3	3	3	14	13	8	5	3	2	1	0	58
6.51- 8.50	2	1	8	8	11	5	3	12	20	14	37	10	4	2	3	3	143
8.51-11.50	3	1	6	7	10	6	1	1	6	10	26	14	7	2	2	0	102
11.51-14.50	0	0	0	2	5	0	0	0	4	5	16	1	2	2	1	0	38
14.51-20.50	2	1	0	1	6	0	0	0	2	3	12	2	2	1	0	0	32
>20.50	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
TOTAL	10	7	14	20	34	17	9	21	59	52	109	38	20	12	9	4	435

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	1	1	0	0	0	0	0	0	2
3.51- 4.50	4	2	3	0	3	1	2	6	10	6	5	6	0	2	1	3	54
4.51- 5.50	0	5	11	4	2	1	1	11	23	13	14	8	5	2	1	3	104
5.51- 6.50	2	10	9	5	0	3	3	11	24	14	15	10	4	3	2	1	116
6.51- 8.50	3	8	29	13	10	7	7	6	21	20	17	15	3	7	1	2	169
8.51-11.50	1	3	3	7	11	5	2	1	2	11	12	7	2	1	3	2	73
11.51-14.50	1	2	1	4	9	3	0	0	2	2	11	2	0	5	1	0	43
14.51-20.50	1	1	0	4	7	0	1	2	1	7	2	0	2	0	0	1	29
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	12	31	56	37	42	20	16	37	84	74	76	48	16	20	9	12	590

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2015 TO 12/31/2015

*** 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	0	0	0	0	0	0	0	0	0	0	1	1	1	3
1.51- 2.50	5	2	4	4	4	4	6	4	5	7	4	8	11	7	2	7	84
2.51- 3.50	21	11	12	11	11	2	16	16	31	30	37	20	21	10	23	17	289
3.51- 4.50	28	17	30	25	13	6	15	12	45	32	31	28	11	11	18	18	340
4.51- 5.50	13	12	20	14	10	9	7	12	37	31	29	14	13	14	7	9	251
5.51- 6.50	9	18	28	7	5	5	2	13	21	23	32	26	7	4	2	3	205
6.51- 8.50	8	11	27	18	9	14	14	11	18	19	47	25	17	4	6	4	252
8.51-11.50	1	2	20	15	27	22	5	4	11	22	36	26	16	5	5	6	223
11.51-14.50	0	3	3	11	30	6	2	2	3	7	33	8	6	6	7	3	130
14.51-20.50	2	0	0	2	28	2	2	4	7	13	38	5	4	6	0	1	114
>20.50	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	3	6
TOTAL	87	76	144	107	138	70	69	78	178	184	289	160	106	68	71	72	1897

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	0	1	1	1	0	0	1	1	0	1	0	0	2	9
1.51- 2.50	13	5	3	3	3	1	1	2	10	5	12	14	8	17	15	16	128
2.51- 3.50	15	4	6	3	5	7	2	10	13	7	6	13	25	27	30	17	190
3.51- 4.50	21	12	11	4	2	2	3	4	6	22	20	20	20	11	9	15	182
4.51- 5.50	10	19	9	9	3	7	3	5	18	13	18	16	12	4	13	12	171
5.51- 6.50	8	15	7	3	3	6	3	4	18	16	36	20	9	9	2	6	165
6.51- 8.50	7	12	14	9	13	5	4	10	21	50	72	42	12	8	8	7	294
8.51-11.50	5	7	7	16	21	17	12	3	13	59	103	49	10	18	9	5	354
11.51-14.50	1	1	2	10	19	9	6	2	5	23	72	11	2	9	0	8	180
14.51-20.50	1	2	1	2	29	1	2	0	2	9	33	6	0	4	1	2	95
>20.50	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
TOTAL	82	77	60	60	101	56	37	40	106	205	373	191	99	107	87	90	1771

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	1	0	0	1	0	0	0	0	0	3	0	0	0	5
1.51- 2.50	10	4	9	3	2	3	0	3	2	7	5	8	13	15	15	11	110
2.51- 3.50	30	20	8	5	3	1	1	0	3	8	14	23	21	35	37	45	254
3.51- 4.50	37	16	11	6	3	1	0	1	5	16	25	18	19	18	26	39	241
4.51- 5.50	16	13	8	2	0	0	0	0	3	10	25	23	11	10	8	21	150
5.51- 6.50	5	13	4	1	0	2	0	0	6	15	26	20	10	6	7	10	125
6.51- 8.50	12	15	7	4	3	2	1	1	3	31	63	28	23	12	5	9	219
8.51-11.50	3	11	4	11	4	0	0	0	2	6	25	11	3	6	10	7	103
11.51-14.50	2	0	2	4	2	1	0	0	0	0	3	1	0	0	0	3	18
14.51-20.50	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	3
>20.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	115	92	53	37	18	10	3	5	24	94	186	133	103	102	108	145	1228

ARIZONA PUBLIC SERVICE CO. - PALO VERDE NUCLEAR GENERATING STATION

JOINT FREQUENCY DISTRIBUTION FOR THE PERIOD 1/01/2015 TO 12/31/2015

*** 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	1	0	0	0	0	1	1	0	0	1	1	1	0	0	0	6
1.51- 2.50	21	13	11	8	4	4	4	0	5	6	11	11	22	16	30	31	197
2.51- 3.50	103	39	15	8	6	3	0	1	2	7	11	25	23	39	74	112	468
3.51- 4.50	186	58	20	3	4	1	1	3	0	7	12	15	13	28	84	153	588
4.51- 5.50	162	63	10	1	0	0	1	1	0	1	7	7	6	14	22	96	391
5.51- 6.50	94	42	8	1	1	0	0	0	0	2	5	4	1	3	11	39	211
6.51- 8.50	63	56	5	0	0	0	0	0	0	4	5	2	1	1	7	29	173
8.51-11.50	9	23	2	1	0	0	0	0	0	2	1	0	0	0	1	7	46
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	638	297	71	22	15	8	7	6	7	29	53	65	67	101	229	467	2082

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	1	0	1	1	1	3	1	0	1	2	1	5	1	1	3	23
1.51- 2.50	49	24	27	18	13	12	11	9	22	25	32	41	54	55	62	65	519
2.51- 3.50	169	75	41	27	25	13	19	27	50	53	68	82	90	111	164	191	1205
3.51- 4.50	277	106	75	38	26	12	21	28	66	83	95	88	65	72	139	228	1419
4.51- 5.50	202	113	58	32	19	19	16	33	96	77	101	75	48	46	52	144	1131
5.51- 6.50	119	99	57	18	10	20	15	38	101	97	134	89	35	29	25	60	946
6.51- 8.50	96	104	92	54	50	39	37	56	117	175	276	147	67	39	34	56	1439
8.51-11.50	24	49	45	57	78	51	24	14	68	163	276	141	63	46	33	30	1162
11.51-14.50	4	9	9	33	68	19	8	4	17	63	174	35	17	34	15	17	526
14.51-20.50	7	4	2	11	73	3	5	8	16	51	121	20	11	17	2	10	361
>20.50	1	0	0	1	3	0	0	0	0	0	4	1	0	0	1	6	17
TOTAL	949	584	406	290	366	189	159	218	553	788	1283	720	455	450	528	810	8748

TOTAL NUMBER OF OBSERVATIONS: 8755
TOTAL NUMBER OF VALID OBSERVATIONS: 8748
TOTAL NUMBER OF MISSING OBSERVATIONS: 7
PERCENT DATA RECOVERY FOR THIS PERIOD: 99.9 %
MEAN WIND SPEED FOR THIS PERIOD: 6.6 MPH
TOTAL NUMBER OF OBSERVATIONS WITH BACKUP DATA: 0

PERCENTAGE OCCURRENCE OF STABILITY CLASSES

A	B	C	D	E	F	G
8.52	4.97	6.74	21.68	20.24	14.04	23.80

DISTRIBUTION OF WIND DIRECTION VS STABILITY

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM
A	5	4	8	7	18	8	18	31	95	150	197	85	44	40	15	20	0
B	10	7	14	20	34	17	9	21	59	52	109	38	20	12	9	4	0
C	12	31	56	37	42	20	16	37	84	74	76	48	16	20	9	12	0
D	87	76	144	107	138	70	69	78	178	184	289	160	106	68	71	72	0
E	82	77	60	60	101	56	37	40	106	205	373	191	99	107	87	90	0
F	115	92	53	37	18	10	3	5	24	94	186	133	103	102	108	145	0
G	638	297	71	22	15	8	7	6	7	29	53	65	67	101	229	467	0
TOTAL	949	584	406	290	366	189	159	218	553	788	1283	720	455	450	528	810	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 μR/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 2014 Land Use Census.
>
> 0 to 10 mile population from the PVNGS Emergency Plan, Rev 47.
>
> The 10 to 50 mile population distribution from the PVNGS UFSAR, Figure 2.1-12.
>
> 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^3 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 calculation 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, Rev. 1.

Table 43:
Doses To Special Locations For 2015

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
1ST QUARTER								
ADULT	5.56E-01	5.56E-01	9.87E-04	5.56E-01	5.56E-01	5.56E-01	5.56E-01	5.56E-01
TEEN	5.59E-01	5.59E-01	9.87E-04	5.59E-01	5.59E-01	5.59E-01	5.59E-01	5.59E-01
CHILD	4.95E-01	4.95E-01	9.87E-04	4.95E-01	4.95E-01	4.95E-01	4.95E-01	4.96E-01
INFANT	2.85E-01	2.85E-01	9.87E-04	2.85E-01	2.85E-01	2.85E-01	2.85E-01	2.85E-01
2ND QUARTER								
ADULT	2.94E-01	2.94E-01	2.26E-02	2.94E-01	2.94E-01	2.94E-01	2.96E-01	2.99E-01
TEEN	2.95E-01	2.95E-01	2.26E-02	2.95E-01	2.95E-01	2.95E-01	2.98E-01	3.01E-01
CHILD	2.63E-01	2.63E-01	2.26E-02	2.63E-01	2.63E-01	2.64E-01	2.66E-01	2.69E-01
INFANT	1.61E-01	1.61E-01	2.26E-02	1.61E-01	1.61E-01	1.61E-01	1.63E-01	1.67E-01
1ST SEMI-ANNUAL								
ADULT	8.49E-01	8.49E-01	2.36E-02	8.49E-01	8.49E-01	8.49E-01	8.51E-01	8.56E-01
TEEN	8.54E-01	8.54E-01	2.36E-02	8.54E-01	8.54E-01	8.54E-01	8.57E-01	8.60E-01
CHILD	7.58E-01	7.58E-01	2.36E-02	7.58E-01	7.58E-01	7.59E-01	7.61E-01	7.65E-01
INFANT	4.46E-01	4.46E-01	2.36E-02	4.46E-01	4.46E-01	4.46E-01	4.48E-01	4.52E-01
3RD QUARTER								
ADULT	8.83E-02	8.83E-02	3.71E-04	8.83E-02	8.83E-02	8.83E-02	8.83E-02	8.86E-02
TEEN	8.90E-02	8.90E-02	3.71E-04	8.90E-02	8.90E-02	8.90E-02	8.90E-02	8.92E-02
CHILD	7.88E-02	7.88E-02	3.71E-04	7.88E-02	7.88E-02	7.88E-02	7.88E-02	7.90E-02
INFANT	4.54E-02	4.54E-02	3.71E-04	4.54E-02	4.54E-02	4.54E-02	4.54E-02	4.56E-02
4TH QUARTER								
ADULT	7.55E-01	7.55E-01	4.75E-02	7.55E-01	7.55E-01	7.55E-01	7.55E-01	7.83E-01
TEEN	7.60E-01	7.61E-01	4.75E-02	7.60E-01	7.60E-01	7.61E-01	7.61E-01	7.88E-01
CHILD	6.77E-01	6.77E-01	4.75E-02	6.77E-01	6.77E-01	6.77E-01	6.77E-01	7.06E-01
INFANT	4.10E-01	4.10E-01	4.75E-02	4.10E-01	4.10E-01	4.10E-01	4.10E-01	3.98E-01
2ND SEMI-ANNUAL								
ADULT	8.44E-01	8.44E-01	4.78E-02	8.44E-01	8.44E-01	8.44E-01	8.44E-01	8.72E-01
TEEN	8.49E-01	8.50E-01	4.78E-02	8.49E-01	8.49E-01	8.50E-01	8.50E-01	8.77E-01
CHILD	7.56E-01	7.56E-01	4.78E-02	7.56E-01	7.56E-01	7.56E-01	7.56E-01	7.85E-01
INFANT	4.56E-01	4.56E-01	4.78E-02	4.56E-01	4.56E-01	4.56E-01	4.56E-01	4.43E-01
ANNUAL								
ADULT	1.69E+00	1.69E+00	7.14E-02	1.69E+00	1.69E+00	1.69E+00	1.69E+00	1.73E+00
TEEN	1.70E+00	1.70E+00	7.14E-02	1.70E+00	1.70E+00	1.70E+00	1.71E+00	1.74E+00
CHILD	1.51E+00	1.51E+00	7.14E-02	1.51E+00	1.51E+00	1.52E+00	1.52E+00	1.55E+00
INFANT	9.02E-01	9.02E-01	7.14E-02	9.02E-01	9.02E-01	9.02E-01	9.03E-01	8.96E-01

Table 44:
Integrated Population Dose for 2015

January to March

PLUME	9.78E-05	9.78E-05	9.78E-05	9.78E-05	9.78E-05	9.78E-05	9.78E-05	1.74E-04
	0.00%	0.00%	99.90%	0.00%	0.00%	0.00%	0.00%	0.00%
GROUND	9.50E-08	9.50E-08	9.50E-08	9.50E-08	9.50E-08	9.50E-08	9.50E-08	1.11E-07
	0.00%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%
INHAL	2.15E+00	2.15E+00	0.00E+00	2.15E+00	2.15E+00	2.15E+00	2.15E+00	2.15E+00
	28.08%	28.08%	0.00%	28.08%	28.08%	28.08%	28.08%	28.08%
VEGET	4.68E+00	4.68E+00	0.00E+00	4.68E+00	4.68E+00	4.68E+00	4.68E+00	4.68E+00
	61.19%	61.19%	0.00%	61.19%	61.19%	61.19%	61.19%	61.19%
COW MILK	5.95E-01	5.95E-01	0.00E+00	5.95E-01	5.95E-01	5.95E-01	5.95E-01	5.95E-01
	7.79%	7.79%	0.00%	7.79%	7.79%	7.79%	7.79%	7.79%
MEAT	2.25E-01	2.25E-01	0.00E+00	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01
	2.94%	2.94%	0.00%	2.94%	2.94%	2.94%	2.94%	2.94%
TOTAL	7.64E+00	7.64E+00	9.79E-05	7.64E+00	7.64E+00	7.64E+00	7.64E+00	7.64E+00
PER CAPITA DOSE (REM)	3.90E-06	3.90E-06	5.00E-11	3.90E-06	3.90E-06	3.90E-06	3.90E-06	3.90E-06

April through June

PLUME	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.85E-03
	0.02%	0.02%	11.81%	0.02%	0.02%	0.02%	0.02%	0.04%
GROUND	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	8.99E-03
	0.16%	0.16%	86.75%	0.16%	0.16%	0.16%	0.16%	0.19%
INHAL	1.67E+00	1.67E+00	9.21E-05	1.67E+00	1.67E+00	1.67E+00	1.68E+00	1.67E+00
	35.02%	35.02%	1.05%	35.02%	35.02%	35.03%	35.12%	35.01%
VEGET	2.55E+00	2.55E+00	3.25E-05	2.55E+00	2.55E+00	2.55E+00	2.55E+00	2.55E+00
	53.51%	53.52%	0.37%	53.51%	53.51%	53.50%	53.43%	53.48%
COW MILK	4.24E-01	4.24E-01	1.21E-06	4.24E-01	4.24E-01	4.25E-01	4.24E-01	4.24E-01
	8.91%	8.90%	0.01%	8.91%	8.91%	8.91%	8.89%	8.90%
MEAT	1.13E-01	1.13E-01	8.91E-07	1.13E-01	1.13E-01	1.13E-01	1.13E-01	1.13E-01
	2.38%	2.38%	0.01%	2.38%	2.38%	2.38%	2.38%	2.38%
TOTAL	4.76E+00	4.77E+00	8.81E-03	4.76E+00	4.76E+00	4.77E+00	4.77E+00	4.77E+00
PER CAPITA DOSE (REM)	2.43E-06	2.43E-06	4.50E-09	2.43E-06	2.43E-06	2.43E-06	2.43E-06	2.43E-06

Table 44: (continued) Integrated Population Dose for 2015

January through June

PLUME	1.14E-03	1.14E-03	1.14E-03	1.14E-03	1.14E-03	1.14E-03	1.14E-03	2.02E-03
	0.01%	0.01%	12.78%	0.01%	0.01%	0.01%	0.01%	0.02%
GROUND	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	7.64E-03	8.99E-03
	0.06%	0.06%	85.80%	0.06%	0.06%	0.06%	0.06%	0.07%
INHAL	3.81E+00	3.81E+00	9.21E-05	3.81E+00	3.81E+00	3.81E+00	3.82E+00	3.81E+00
	30.75%	30.74%	1.03%	30.75%	30.75%	30.75%	30.79%	30.74%
VEGET	7.22E+00	7.23E+00	3.25E-05	7.22E+00	7.22E+00	7.23E+00	7.22E+00	7.22E+00
	58.24%	58.24%	0.37%	58.24%	58.24%	58.24%	58.21%	58.23%
COW MILK	1.02E+00	1.02E+00	1.21E-06	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00
	8.22%	8.22%	0.01%	8.22%	8.22%	8.22%	8.21%	8.22%
MEAT	3.38E-01	3.38E-01	8.91E-07	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01
	2.72%	2.72%	0.01%	2.72%	2.72%	2.72%	2.72%	2.72%
TOTAL	1.24E+01	1.24E+01	8.91E-03	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
PER CAPITA DOSE (REM)	6.33E-06	6.33E-06	4.55E-09	6.33E-06	6.33E-06	6.33E-06	6.33E-06	6.33E-06

July through September

PLUME	6.75E-05	6.75E-05	6.75E-05	6.75E-05	6.75E-05	6.75E-05	6.75E-05	1.20E-04
	0.00%	0.00%	99.90%	0.00%	0.00%	0.00%	0.00%	0.01%
GROUND	6.56E-08	6.56E-08	6.56E-08	6.56E-08	6.56E-08	6.56E-08	6.56E-08	7.69E-08
	0.00%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%
INHAL	5.96E-01	5.96E-01	0.00E+00	5.96E-01	5.96E-01	5.96E-01	5.96E-01	5.96E-01
	38.60%	38.60%	0.00%	38.60%	38.60%	38.60%	38.60%	38.60%
VEGET	7.58E-01	7.58E-01	0.00E+00	7.58E-01	7.58E-01	7.58E-01	7.58E-01	7.58E-01
	49.06%	49.06%	0.00%	49.06%	49.06%	49.06%	49.06%	49.05%
COW MILK	1.60E-01	1.60E-01	0.00E+00	1.60E-01	1.60E-01	1.60E-01	1.60E-01	1.60E-01
	10.35%	10.35%	0.00%	10.35%	10.35%	10.35%	10.35%	10.35%
MEAT	3.06E-02	3.06E-02	0.00E+00	3.06E-02	3.06E-02	3.06E-02	3.06E-02	3.06E-02
	1.98%	1.98%	0.00%	1.98%	1.98%	1.98%	1.98%	1.98%
TOTAL	1.54E+00	1.54E+00	6.76E-05	1.54E+00	1.54E+00	1.54E+00	1.54E+00	1.54E+00
PER CAPITA DOSE (REM)	7.86E-07	7.86E-07	3.45E-11	7.86E-07	7.86E-07	7.86E-07	7.86E-07	7.86E-07

Table 44: (continued) Integrated Population Dose for 2015

October through December

PLUME	3.70E-03	3.70E-03	3.70E-03	3.70E-03	3.70E-03	3.70E-03	3.70E-03	6.58E-03
	0.04%	0.04%	95.18%	0.04%	0.04%	0.04%	0.04%	0.07%
GROUND	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	2.16E-04
	0.00%	0.00%	4.73%	0.00%	0.00%	0.00%	0.00%	0.00%
INHAL	2.61E+00	2.61E+00	1.92E-06	2.61E+00	2.61E+00	2.61E+00	2.61E+00	2.61E+00
	28.42%	28.42%	0.05%	28.42%	28.42%	28.42%	28.42%	28.41%
VEGET	5.66E+00	5.66E+00	1.53E-06	5.66E+00	5.66E+00	5.66E+00	5.66E+00	5.66E+00
	61.70%	61.70%	0.04%	61.70%	61.70%	61.70%	61.70%	61.68%
COW MILK	6.35E-01	6.35E-01	1.74E-07	6.35E-01	6.35E-01	6.36E-01	6.35E-01	6.35E-01
	6.92%	6.92%	0.00%	6.92%	6.92%	6.92%	6.92%	6.92%
MEAT	2.68E-01	2.68E-01	5.29E-10	2.68E-01	2.68E-01	2.68E-01	2.68E-01	2.68E-01
	2.92%	2.92%	0.00%	2.92%	2.92%	2.92%	2.92%	2.91%
TOTAL	9.18E+00	9.18E+00	3.89E-03	9.18E+00	9.18E+00	9.18E+00	9.18E+00	9.18E+00
PER CAPITA DOSE (REM)	4.69E-06	4.69E-06	1.99E-09	4.69E-06	4.69E-06	4.69E-06	4.69E-06	4.69E-06

July through December

PLUME	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03	6.70E-03
	0.04%	0.04%	95.26%	0.04%	0.04%	0.04%	0.04%	0.06%
GROUND	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	2.17E-04
	0.00%	0.00%	4.65%	0.00%	0.00%	0.00%	0.00%	0.00%
INHAL	3.20E+00	3.20E+00	1.92E-06	3.20E+00	3.20E+00	3.21E+00	3.21E+00	3.20E+00
	29.88%	29.88%	0.05%	29.88%	29.88%	29.89%	29.89%	29.88%
VEGET	6.42E+00	6.42E+00	1.53E-06	6.42E+00	6.42E+00	6.42E+00	6.42E+00	6.42E+00
	59.88%	59.88%	0.04%	59.88%	59.88%	59.88%	59.88%	59.86%
COW MILK	7.95E-01	7.95E-01	1.74E-07	7.95E-01	7.95E-01	7.95E-01	7.95E-01	7.95E-01
	7.42%	7.42%	0.00%	7.42%	7.42%	7.42%	7.42%	7.41%
MEAT	2.98E-01	2.98E-01	5.29E-10	2.98E-01	2.98E-01	2.98E-01	2.98E-01	2.98E-01
	2.78%	2.78%	0.00%	2.78%	2.78%	2.78%	2.78%	2.78%
TOTAL	1.07E+01	1.07E+01	3.96E-03	1.07E+01	1.07E+01	1.07E+01	1.07E+01	1.07E+01
PER CAPITA DOSE (REM)	5.46E-06	5.46E-06	2.02E-09	5.46E-06	5.46E-06	5.46E-06	5.46E-06	5.46E-06

Table 44: (continued)
Integrated Population Dose for 2015

January through December

PLUME	4.91E-03	4.91E-03	4.91E-03	4.91E-03	4.91E-03	4.91E-03	4.91E-03	8.72E-03
	0.02%	0.02%	38.16%	0.02%	0.02%	0.02%	0.02%	0.04%
GROUND	7.83E-03	7.83E-03	7.83E-03	7.83E-03	7.83E-03	7.83E-03	7.83E-03	9.20E-03
	0.03%	0.03%	60.83%	0.03%	0.03%	0.03%	0.03%	0.04%
INHAL	7.02E+00	7.02E+00	9.40E-05	7.02E+00	7.02E+00	7.02E+00	7.03E+00	7.02E+00
	30.35%	30.35%	0.73%	30.35%	30.35%	30.35%	30.37%	30.34%
VEGET	1.36E+01	1.36E+01	3.41E-05	1.36E+01	1.36E+01	1.36E+01	1.36E+01	1.36E+01
	59.00%	59.00%	0.26%	59.00%	59.00%	59.00%	58.98%	58.99%
COW	1.81E+00	1.81E+00	1.39E-06	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00
	7.85%	7.85%	0.01%	7.85%	7.85%	7.85%	7.84%	7.84%
MEAT	6.36E-01	6.36E-01	8.92E-07	6.36E-01	6.36E-01	6.36E-01	6.36E-01	6.36E-01
	2.75%	2.75%	0.01%	2.75%	2.75%	2.75%	2.75%	2.75%
TOTAL	2.31E+01	2.31E+01	1.29E-02	2.31E+01	2.31E+01	2.31E+01	2.31E+01	2.31E+01
PER CAPITA DOSE (REM)	1.18E-05	1.18E-05	6.58E-09	1.18E-05	1.18E-05	1.18E-05	1.18E-05	1.18E-05

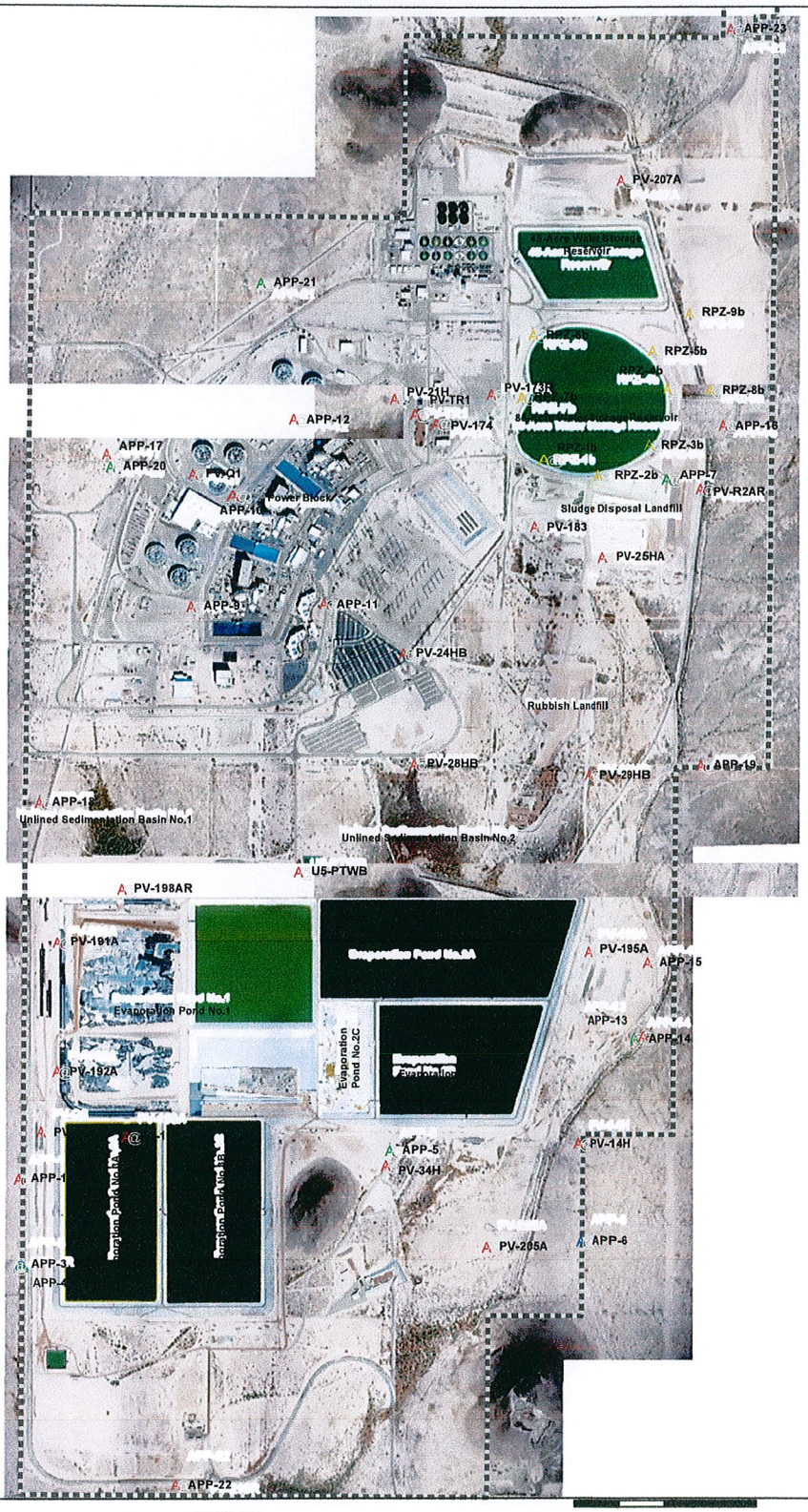
Table 45: Summary of Individual Doses for 2015						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	**mrad**	4.86E-04	1.63E-03	1.27E-04	1.48E-02	1.70E-02
ODCM Req. 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	9.72E-03	3.26E-02	2.54E-03	2.96E-01	1.70E-01
Beta Air Dose	**mrad**	1.71E-04	5.78E-04	4.49E-05	5.23E-03	6.01E-03
ODCM Req. 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	1.71E-03	5.78E-03	4.49E-04	5.23E-02	3.01E-02
Maximum Individual						
Total Body	mrem	3.24E-04	1.09E-03	8.47E-05	9.88E-03	1.13E-02
Skin	mrem	5.18E-04	1.75E-03	1.36E-04	1.58E-02	1.82E-02
Site Boundary Location						
Unit 1	miles	1.27 SE	1.70 SSE	1.40 SSW	1.70 SSE	1.70 SSE
Unit 2	miles	1.31 SE	1.88 SSE	1.14 SSW	1.88 SSE	1.88 SSE
Unit 3	miles	1.40 SE	1.73 SSE	1.00 SSW	1.73 SSE	1.73 SSE
Maximum Organ Dose (excluding skin)	Age	Teen	Infant	Infant	Teen	Infant
	Organ	Thyroid (2)	Bone	Bone	Thyroid (2)	Bone
	mrem	1.57E-01	1.39E-01	7.64E-02	1.90E-01	4.85E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit (1)	%	2.09E+00	1.85E+00	1.02E+00	2.53E+00	3.23E+00
Location						
Unit 1	miles	2.84 NNE	2.84 NNE	2.84 NNE	2.84 NNE	2.84 NNE
Unit 2	miles	3.05 NNE	3.05 NNE	3.05 NNE	3.05 NNE	3.05 NNE
Unit 3	miles	3.28 NNE	3.28 NNE	3.28 NNE	3.28 NNE	3.28 NNE
Maximum Organ Dose excluding C-14 (3) (excluding skin)	Age	Teen	Infant	Infant	Teen	Teen
	Organ	Thyroid (2)	Thyroid	Thyroid (2)	Thyroid (2)	Thyroid (2)
	mrem	1.57E-01	8.80E-02	1.83E-02	1.90E-01	4.34E-01
ODCM Req. 4.2 Limit		7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit (1)		2.09E+00	1.17E+00	2.44E-01	2.53E+00	2.89E+00
Organ dose from tritium only for Unit 2 location above	**mrem**	1.57E-01	8.55E-02	1.82E-02	1.82E-01	4.24E-01
Fraction of organ dose from tritium only for Unit 2 location above(2,3)	%	100	97.16	99.45	95.79	97.7
X/Q for Unit 2 location above	sec/m^3	6.10E-07	6.52E-07	3.61E-07	6.66E-07	5.72E-07
D/Q for Unit 2 location above	m^{-2}	8.75E-10	2.01E-09	1.51E-09	7.28E-10	1.28E-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: All organs except bone
Note 3 Refer to discussion in section 10.4

APPENDIX D

NEI 07-07 GROUNDWATER PROTECTION INITIATIVE SAMPLING

3



AERIAL PHOTO: HELICOPTER PHOTOS, FEBRUARY 2014

0 0.25 0.5 Miles

EXPLANATION

PVNGS Well Locations and Aquifer Monitored

- Shallow Aquifer Well
- 85-Acre WSR Piezometer
- Palo Verde Clay Aquifer Well
- Regional Aquifer Well
- PVNGS Boundary

Brown AND Caldwell

FIGURE 1
SITE MAP

Monitoring Well	Sample Name	Date Sampled	Parameter Name	x	Concentration (pCi/L)	Purpose
APP-10	PV-APP-10-0115	1/14/2015	Tritium	<	291	routine
APP-10	PV-APP-10-0115	1/14/2015	Cesium-137	<	2.1	routine
APP-10	PV-APP-10-0115	1/14/2015	Cobalt-60	<	1.9	routine
APP-10	PV-APP-10-0115	1/14/2015	Cesium-134	<	2	routine
APP-10	PV-APP-10-0415	4/10/2015	Tritium	<	271	routine
APP-10	PV-APP-10-0415	4/10/2015	Cesium-137	<	2.4	routine
APP-10	PV-APP-10-0415	4/10/2015	Cobalt-60	<	2.4	routine
APP-10	PV-APP-10-0415	4/10/2015	Cesium-134	<	2.3	routine
APP-10	PV-APP-10-0715	7/21/2015	Tritium	<	242	routine
APP-10	PV-APP-10-0715	7/21/2015	Cesium-137	<	1.7	routine
APP-10	PV-APP-10-0715	7/21/2015	Cobalt-60	<	1.9	routine
APP-10	PV-APP-10-0715	7/21/2015	Cesium-134	<	1.9	routine
APP-10	PV-APP-10-1215	12/8/2015	Tritium	<	307	routine
APP-10	PV-APP-10-1215	12/8/2015	Cesium-137	<	0.6	routine
APP-10	PV-APP-10-1215	12/8/2015	Cobalt-60	<	0.9	routine
APP-10	PV-APP-10-1215	12/8/2015	Cesium-134	<	1.5	routine
APP-12	PV-APP-12-0115	1/14/2015	Tritium	<	291	routine
APP-12	PV-APP-12-0115	1/14/2015	Cesium-137	<	2.2	routine
APP-12	PV-APP-12-0115	1/14/2015	Cobalt-60	<	2.4	routine
APP-12	PV-APP-12-0115	1/14/2015	Cesium-134	<	2.4	routine
APP-12	PV-APP-12-0415	4/10/2015	Tritium	<	271	routine
APP-12	PV-APP-12-0415	4/10/2015	Cesium-137	<	2.2	routine
APP-12	PV-APP-12-0415	4/10/2015	Cobalt-60	<	2.2	routine
APP-12	PV-APP-12-0415	4/10/2015	Cesium-134	<	2.5	routine
APP-12	PV-APP-12-0715	7/21/2015	Tritium	<	242	routine
APP-12	PV-APP-12-0715	7/21/2015	Cesium-137	<	2.4	routine
APP-12	PV-APP-12-0715	7/21/2015	Cobalt-60	<	2.4	routine
APP-12	PV-APP-12-0715	7/21/2015	Cesium-134	<	2.3	routine
APP-12	PV-APP-12-1015	10/27/2015	Tritium	<	242	routine
APP-12	PV-APP-12-1015	10/27/2015	Cesium-137	<	2.4	routine
APP-12	PV-APP-12-1015	10/27/2015	Cobalt-60	<	2.4	routine
APP-12	PV-APP-12-1015	10/27/2015	Cesium-134	<	2.6	routine
APP-15	PV-APP-15-0515	5/19/2015	Tritium	<	324	routine
APP-15	PV-APP-15-0515	5/19/2015	Cesium-137	<	1.9	routine
APP-15	PV-APP-15-0515	5/19/2015	Cobalt-60	<	2.1	routine
APP-15	PV-APP-15-0515	5/19/2015	Cesium-134	<	2.1	routine
APP-15	PV-APP-15-1215	12/14/2015	Tritium	<	301	routine
APP-15	PV-APP-15-1215	12/14/2015	Cesium-137	<	1.2	routine
APP-15	PV-APP-15-1215	12/14/2015	Cobalt-60	<	1.3	routine
APP-15	PV-APP-15-1215	12/14/2015	Cesium-134	<	1.4	routine
APP-18	PV-APP-18-0515	5/12/2015	Tritium	<	267	routine
APP-18	PV-APP-18-0515	5/12/2015	Cesium-137	<	2.3	routine
APP-18	PV-APP-18-0515	5/12/2015	Cobalt-60	<	2.3	routine
APP-18	PV-APP-18-0515	5/12/2015	Cesium-134	<	2.4	routine
APP-18	PV-APP-18-1215	12/1/2015	Tritium	<	304	routine
APP-18	PV-APP-18-1215	12/1/2015	Cesium-137	<	0.2	routine
APP-18	PV-APP-18-1215	12/1/2015	Cobalt-60	<	0.2	routine
APP-18	PV-APP-18-1215	12/1/2015	Cesium-134	<	0.3	routine

Monitoring Well	Sample Name	Date Sampled	Parameter Name	x	Concentration (pCi/L)	Purpose
APP-19	PV-APP-19-0415	4/28/2015	Cesium-137	<	1.8	routine
APP-19	PV-APP-19-0415	4/28/2015	Cobalt-60	<	1.8	routine
APP-19	PV-APP-19-0415	4/28/2015	Cesium-134	<	1.8	routine
APP-19	PV-APP-19-1215	12/8/2015	Tritium	<	307	routine
APP-19	PV-APP-19-1215	12/8/2015	Cesium-137	<	0.6	routine
APP-19	PV-APP-19-1215	12/8/2015	Cobalt-60	<	0.9	routine
APP-19	PV-APP-19-1215	12/8/2015	Cesium-134	<	1.3	routine
APP-20	PV-APP-20-0415	4/28/2015	Tritium	<	267	routine
APP-20	PV-APP-20-0415	4/28/2015	Cesium-137	<	2.5	routine
APP-20	PV-APP-20-0415	4/28/2015	Cobalt-60	<	2.3	routine
APP-20	PV-APP-20-0415	4/28/2015	Cesium-134	<	2.3	routine
APP-20	PV-APP-20-1215	12/1/2015	Tritium	<	304	routine
APP-20	PV-APP-20-1215	12/1/2015	Cesium-137	<	2.3	routine
APP-20	PV-APP-20-1215	12/1/2015	Cobalt-60	<	2.3	routine
APP-20	PV-APP-20-1215	12/1/2015	Cesium-134	<	2.3	routine
APP-21	PV-APP-21-0115	1/14/2015	Tritium	<	291	quarterly contingency
APP-21	PV-APP-21-0115	1/14/2015	Cesium-137	<	2.2	quarterly contingency
APP-21	PV-APP-21-0115	1/14/2015	Cobalt-60	<	2.7	quarterly contingency
APP-21	PV-APP-21-0115	1/14/2015	Cesium-134	<	2.5	quarterly contingency
APP-21	PV-APP-21-0415	4/10/2015	Tritium	<	271	routine
APP-21	PV-APP-21-0415	4/10/2015	Cesium-137	<	2	routine
APP-21	PV-APP-21-0415	4/10/2015	Cobalt-60	<	2.1	routine
APP-21	PV-APP-21-0415	4/10/2015	Cesium-134	<	1.9	routine
APP-21	PV-APP-21-0715	7/27/2015	Tritium	<	268	quarterly contingency
APP-21	PV-APP-21-0715	7/27/2015	Cesium-137	<	2.3	quarterly contingency
APP-21	PV-APP-21-0715	7/27/2015	Cobalt-60	<	2.7	quarterly contingency
APP-21	PV-APP-21-0715	7/27/2015	Cesium-134	<	2.5	quarterly contingency
APP-21	PV-APP-21-1215	12/1/2015	Tritium	<	304	routine
APP-21	PV-APP-21-1215	12/1/2015	Cesium-137	<	2.2	routine
APP-21	PV-APP-21-1215	12/1/2015	Cobalt-60	<	2.3	routine
APP-21	PV-APP-21-1215	12/1/2015	Cesium-134	<	2.4	routine
APP-22	PV-APP-22-0415	4/28/2015	Tritium	<	267	routine
APP-22	PV-APP-22-0415	4/28/2015	Cesium-137	<	1.9	routine
APP-22	PV-APP-22-0415	4/28/2015	Cobalt-60	<	1.9	routine
APP-22	PV-APP-22-0415	4/28/2015	Cesium-134	<	1.9	routine
APP-22	PV-APP-22-1115	11/30/2015	Tritium	<	304	routine
APP-22	PV-APP-22-1115	11/30/2015	Cesium-137	<	2.3	routine
APP-22	PV-APP-22-1115	11/30/2015	Cobalt-60	<	2.3	routine
APP-22	PV-APP-22-1115	11/30/2015	Cesium-134	<	2.4	routine

Monitoring Well	Sample Name	Date Sampled	Parameter Name	x	Concentration (pCi/L)	Purpose
APP-23	PV-APP-23-0515	5/12/2015	Cesium-137	<	1.9	routine
APP-23	PV-APP-23-0515	5/12/2015	Cobalt-60	<	2	routine
APP-23	PV-APP-23-0515	5/12/2015	Cesium-134	<	1.9	routine
APP-23	PV-APP-23-1215	12/7/2015	Tritium	<	307	routine
APP-23	PV-APP-23-1215	12/7/2015	Cesium-137	<	0.7	routine
APP-23	PV-APP-23-1215	12/7/2015	Cobalt-60	<	0.9	routine
APP-23	PV-APP-23-1215	12/7/2015	Cesium-134	<	1.4	routine
APP-3	PV-APP-3-1115	11/13/2015	Tritium	<	302	routine
APP-3	PV-APP-3-1115	11/13/2015	Cesium-137	<	2.3	routine
APP-3	PV-APP-3-1115	11/13/2015	Cobalt-60	<	2.3	routine
APP-3	PV-APP-3-1115	11/13/2015	Cesium-134	<	2.5	routine
APP-4R	PV-APP-4R-0515	5/19/2015	Tritium	<	324	routine
APP-4R	PV-APP-4R-0515	5/19/2015	Cesium-137	<	2.3	routine
APP-4R	PV-APP-4R-0515	5/19/2015	Cobalt-60	<	2.4	routine
APP-4R	PV-APP-4R-0515	5/19/2015	Cesium-134	<	2.4	routine
APP-4R	PV-APP-4R-1115	11/13/2015	Tritium	<	302	routine
APP-4R	PV-APP-4R-1115	11/13/2015	Cesium-137	<	0.4	routine
APP-4R	PV-APP-4R-1115	11/13/2015	Cobalt-60	<	0.1	routine
APP-4R	PV-APP-4R-1115	11/13/2015	Cesium-134	<	0.3	routine
APP-5	PV-APP-5-0515	5/12/2015	Tritium	<	267	routine
APP-5	PV-APP-5-0515	5/12/2015	Cesium-137	<	2.2	routine
APP-5	PV-APP-5-0515	5/12/2015	Cobalt-60	<	2.4	routine
APP-5	PV-APP-5-0515	5/12/2015	Cesium-134	<	2.3	routine
APP-7	PV-APP-7-1215	12/7/2015	Tritium	<	307	routine
APP-7	PV-APP-7-1215	12/7/2015	Cesium-137	<	1.3	routine
APP-7	PV-APP-7-1215	12/7/2015	Cobalt-60	<	0.9	routine
APP-7	PV-APP-7-1215	12/7/2015	Cesium-134	<	1.1	routine
APP-9	PV-APP-9-0115	1/14/2015	Tritium	<	291	routine
APP-9	PV-APP-9-0115	1/14/2015	Cesium-137	<	1.8	routine
APP-9	PV-APP-9-0115	1/14/2015	Cobalt-60	<	1.9	routine
APP-9	PV-APP-9-0115	1/14/2015	Cesium-134	<	2	routine
APP-9	PV-APP-9-0415	4/10/2015	Tritium	<	271	routine
APP-9	PV-APP-9-0415	4/10/2015	Cesium-137	<	1.7	routine
APP-9	PV-APP-9-0415	4/10/2015	Cobalt-60	<	1.8	routine
APP-9	PV-APP-9-0415	4/10/2015	Cesium-134	<	1.9	routine
APP-9	PV-APP-9-0715	7/21/2015	Tritium	<	242	routine
APP-9	PV-APP-9-0715	7/21/2015	Cesium-137	<	1.7	routine
APP-9	PV-APP-9-0715	7/21/2015	Cobalt-60	<	2	routine
APP-9	PV-APP-9-0715	7/21/2015	Cesium-134	<	2.1	routine
APP-9	PV-APP-9-1015	10/27/2015	Tritium	<	242	routine
APP-9	PV-APP-9-1015	10/27/2015	Cesium-137	<	0.3	routine
APP-9	PV-APP-9-1015	10/27/2015	Cobalt-60	<	0.1	routine
APP-9	PV-APP-9-1015	10/27/2015	Cesium-134	<	0.4	routine

Monitoring Well	Sample Name	Date Sampled	Parameter Name	x	Concentration (pCi/L)	Purpose
PV-14H	PV-PV-14H-0415	4/28/2015	Cesium-137	<	1.9	routine
PV-14H	PV-PV-14H-0415	4/28/2015	Cobalt-60	<	1.7	routine
PV-14H	PV-PV-14H-0415	4/28/2015	Cesium-134	<	1.8	routine
PV-14H	PV-PV-14H-1215	12/7/2015	Tritium	<	307	routine
PV-14H	PV-PV-14H-1215	12/7/2015	Cesium-137	<	1.5	routine
PV-14H	PV-PV-14H-1215	12/7/2015	Cobalt-60	<	0.9	routine
PV-14H	PV-PV-14H-1215	12/7/2015	Cesium-134	<	0.9	routine
PV-193A	PV-PV-193A-0415	4/8/2015	Tritium	<	271	routine
PV-193A	PV-PV-193A-0415	4/8/2015	Cesium-137	<	2.3	routine
PV-193A	PV-PV-193A-0415	4/8/2015	Cobalt-60	<	2.5	routine
PV-193A	PV-PV-193A-0415	4/8/2015	Cesium-134	<	2.3	routine
PV-195A	PV-PV-195A-0615	6/9/2015	Tritium	<	267	routine
PV-195A	PV-PV-195A-0615	6/9/2015	Cesium-137	<	2.2	routine
PV-195A	PV-PV-195A-0615	6/9/2015	Cobalt-60	<	2.4	routine
PV-195A	PV-PV-195A-0615	6/9/2015	Cesium-134	<	2.4	routine
PV-195A	PV-PV-195A-1115	11/13/2015	Tritium	<	302	routine
PV-195A	PV-PV-195A-1115	11/13/2015	Cesium-137	<	2.3	routine
PV-195A	PV-PV-195A-1115	11/13/2015	Cobalt-60	<	2.4	routine
PV-195A	PV-PV-195A-1115	11/13/2015	Cesium-134	<	2.4	routine
PV-198AR	PV-PV-198AR-0415	4/8/2015	Tritium	<	271	routine
PV-198AR	PV-PV-198AR-0415	4/8/2015	Cesium-137	<	1.8	routine
PV-198AR	PV-PV-198AR-0415	4/8/2015	Cobalt-60	<	2	routine
PV-198AR	PV-PV-198AR-0415	4/8/2015	Cesium-134	<	2	routine
PV-34H	PV-PV-34H-0515	5/12/2015	Tritium	<	267	routine
PV-34H	PV-PV-34H-0515	5/12/2015	Cesium-137	<	1.8	routine
PV-34H	PV-PV-34H-0515	5/12/2015	Cobalt-60	<	1.8	routine
PV-34H	PV-PV-34H-0515	5/12/2015	Cesium-134	<	2	routine
PV-Q8	PV-PV-Q8-0415	4/8/2015	Tritium	<	249	routine
PV-Q8	PV-PV-Q8-0415	4/8/2015	Cesium-137	<	2.3	routine
PV-Q8	PV-PV-Q8-0415	4/8/2015	Cobalt-60	<	2.4	routine
PV-Q8	PV-PV-Q8-0415	4/8/2015	Cesium-134	<	2.3	routine
PV-R2AR	PV-PV-R2AR-0515	5/19/2015	Tritium	<	324	routine
PV-R2AR	PV-PV-R2AR-0515	5/19/2015	Cesium-137	<	2	routine
PV-R2AR	PV-PV-R2AR-0515	5/19/2015	Cobalt-60	<	2.1	routine
PV-R2AR	PV-PV-R2AR-0515	5/19/2015	Cesium-134	<	2	routine
PV-R2AR	PV-PV-R2AR-1215	12/14/2015	Tritium	<	301	routine
PV-R2AR	PV-PV-R2AR-1215	12/14/2015	Cesium-137	<	1	routine
PV-R2AR	PV-PV-R2AR-1215	12/14/2015	Cobalt-60	<	1.4	routine
PV-R2AR	PV-PV-R2AR-1215	12/14/2015	Cesium-134	<	2.4	routine

APPENDIX E 2014

ARERR CORRECTION

A subsidiary of Pinnacle West Capital Corporation

Company Correspondence

ID #: 218-03990
DATE: 04/24/2016
TO: File
Sta. #
Ext. #

FROM: Joshua McDowell
Sta. #: 7397
Ext. #: 82-5482

McDowell, Joshua (Z08270)

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DN: cn=McDowell, Joshua (Z08270)
Reason: I am the author of this document
Date: 2016.04.24 17:08:08 -07'00'

SUBJECT: Correction to Annual Radioactive Effluent Release Report for 2014 Palo Verde Nuclear Generating Station – Units 1,2, and 3

REFERENCES:
1. PVNGS Annual Radioactive Effluent Release Report for 2014
2. PVNGS Annual Radioactive Effluent Release Report for 2015

Dear Sir or Madam:

In accordance with Palo Verde Nuclear Generating Station (PVNGS) Technical Specification (TS) 5.6.2, PVNGS submitted the Annual Radioactive Effluent Release Report (ARERR) for 2014 via Reference 1. It was discovered that the Maximum Organ Dose (Excluding Skin) on Table 45 – Summary of Individual Doses for 2014, did not include the calculated dose from Carbon 14, contrary to what is stated in section 10.4 of that report.

Table 45 has been updated to include the contribution from this radioisotope and the amended page was included as an appendix at the end of Reference 2, the 2015 report. These deviations were documented through Corrective Action program document Condition Report (CR) 16-03469.

Table 45: Summary of Individual Doses for 2014						
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year total
Gamma Air Dose	**mrad**	3.79E-04	5.39E-03	5.14E-04	8.28E-04	6.20E-03
ODCM Req. 4.1 Limit	mrad	5.00E+00	5.00E+00	5.00E+00	5.00E+00	1.00E+01
% ODCM Limit	%	7.58E-03	1.08E-01	1.03E-02	1.66E-02	6.20E-02
Beta Air Dose	**mrad**	1.36E-04	1.99E-03	1.00E-03	4.58E-04	3.14E-03
ODCM Req. 4.1 Limit	mrad	1.00E+01	1.00E+01	1.00E+01	1.00E+01	2.00E+01
% ODCM Limit	%	1.36E-03	1.99E-02	1.00E-02	4.58E-03	1.57E-02
Maximum Individual						
Total Body	mrem	2.53E-04	3.58E-03	3.11E-04	5.46E-04	4.09E-03
Skin	mrem	4.05E-04	5.77E-03	8.84E-04	9.33E-04	6.98E-03
Site Boundary Location						
Unit 1	miles	1.27 SE	0.66 NNE	0.66 NNE	1.27 SE	0.66 NNE
Unit 2	miles	1.31 SE	0.83 NNE	0.83 NNE	1.31 SE	0.83 NNE
Unit 3	miles	1.40 SE	1.05 NNE	1.05 NNE	1.40 SE	1.05 NNE
Maximum Organ Dose (excluding skin)	Age	Teen	Infant	Infant	Teen	Teen
	Organ	Thyroid	Bone	Bone	Thyroid	Thyroid
	mrem	2.48E-01	2.06E-01	1.31E-01	2.53E-01	6.22E-01
ODCM Req. 4.2 Limit	mrem	7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit (1)	%	3.31E+00	2.75E+00	1.75E+00	3.37E+00	4.15E+00
Location						
Unit 1	miles	2.74 S	2.84 NNE	2.84 NNE	2.74 S	2.74 S
Unit 2	miles	2.56 S	3.05 NNE	3.05 NNE	2.56 S	2.56 S
Unit 3	miles	2.35 S	3.28 NNE	3.28 NNE	2.35 S	2.35 S
Maximum Organ Dose excluding C-14 (3) (excluding skin)	Age	Teen	Infant	Infant	Teen	Teen
	Organ	Thyroid (2)	Thyroid	Thyroid (2)	Thyroid	Thyroid
	mrem	2.48E-01	1.23E-01	8.58E-02	1.31E-01	5.00E-01
ODCM Req. 4.2 Limit		7.50E+00	7.50E+00	7.50E+00	7.50E+00	1.50E+01
% ODCM Limit (1)		3.31E+00	1.64E+00	1.14E+00	1.75E+00	3.33E+00
Organ dose from tritium only for Unit 2 location above	**mrem**	2.47E-01	1.21E-01	8.58E-02	2.53E-01	6.19E-01
Fraction of organ dose from tritium only for Unit 2 location above(2,3)	%	99.6%	58.7%	65.5%	100.0%	99.5%
X/Q for Unit 2 location above	sec/m^3	8.17E-06	9.72E-07	6.22E-07	7.58E-06	5.30E-06
D/Q for Unit 2 location above	m^{-2}	2.50E-09	2.24E-09	1.77E-09	2.56E-09	1.85E-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: All organs except bone
Note 3 Refer to discussion in section 10.4

Appendix F

Palo Verde Nuclear Generating Station
Units 1, 2, & 3

Radioactive Source Leakage Report

A subsidiary of Pinnacle West Capital Corporation

Company Correspondence

ID #: 218-03991
DATE: 04/28/2016
TO: File
Sta. #
Ext. #

FROM: Joshua McDowell
Sta. # 7397
Ext. # 82-5482

McDowell, Joshua (Z08270)

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Reason: I am the author of this document
Date: 2016.04.28 02:21:31 -07'00'

SUBJECT: Annual Radioactive Effluent Release Report for 2014 Palo Verde Nuclear Generating Station – Units 1,2, and 3 Source Leakage Annual Reporting

REFERENCES: 1. PVNGS Annual Radioactive Effluent Release Report for 2015

Dear Sir or Madam:

In accordance with Palo Verde Nuclear Generating Station (PVNGS) Technical Requirements Manual (TRM) 3.7.102 Sealed Source Contamination, a sealed source of greater than 100 microcuries of beta and/or gamma emitting material shall be free of greater than or equal to 0.005 microcuries of removable contamination. Corrective Action Program document CR 15-01831 documents an occurrence where removable contamination levels exceeded the TRM value for a sealed source.

Per procedure 74DP-9CY08, Radiological Monitoring Program, and Technical Specification (TS) 5.6.3, PVNGS will submit the Annual Radioactive Effluent Release Report (ARERR) for 2015 via Reference 1.

The event and information leading to the sealed source removable decontamination level exceedance were documented through Condition Report (CR) 15-01831, which is included as an attachment to this memorandum.

ADVERSE CRDR 4644993

Shelton, Christopher (Z08181)

Digitally signed by Shelton, Christopher (Z08181)
DN: cn=Shelton, Christopher (Z08181)
Reason: I am the author of this document
Date: 2015.05.15 14:30:17-07'00'

Evaluator (print/sign) (date)

Section Leader or above Approval (print/sign) (date)

PROBLEM STATEMENT

While performing source inventory training, Chemistry Technician was putting chemistry source #CH-524 back into the Pb pig and the top of the plastic 15 ml container broke inward onto the solid source pellet like material. Technician was wearing protective gloves. I responded and performed external contamination survey of the container and inside the Pb pig and found no detectable smearable activity. I then took a cotton swab and smeared the inside of the source container which indicated approximately 20,000 dpm/smear on the swab. Source dose rate was 163 mr/hr * and 9 mr/hr +. Compromised container was then wrapped in saran wrap and stowed back into Pb pig. Following is the information relating to subject source:
Mixed Isotope; PV source I.D. CH-524; Manufacturer I.D. # 359-22-1; Initial Activity 1.53E+1 mci with an Assay Date of 4/01/1990.

EVALUATION

The radioactive source ID CH524 was purchased from Isotope Products Laboratories in 1990. The container was a plastic vial of approximately 20 mL volume and contained ~8 mCi of Co-57, 0.08 mCi of Co-60, 7 mCi of Ba-133, and 0.17 mCi of Cs-137. The source was purchased to perform calibrations and verifications of post-accident sample counting geometries and was located in Unit 2 Chemistry source locker, stored inside a

small lead shield. After 25 years of usage, the activity levels have decayed to 0 mCi of Co-57, 0.003 mCi of Co-60, 1 mCi of Ba-133, and 0.1 mCi of Cs-137.

The source was used once each year by the Count Room Advisor to verify the ongoing acceptability of the Unit 2 post-accident geometry, PASSLIQ2. This counting geometry, originally designed to handle high activity samples during an accident, has recently become necessary only for counting RMC waste samples for shipping. The only other time this source is handled is during radioactive source inventories.

A qualified source user Sr. Chemistry technician was performing OJT with a new Chemistry technician on his source user qualification card. When placing the source back into the lead shield, they noted slight resistance and pushed down on the source cap with their finger. Due to the age of the source (25 years), the nature of the container (plastic), and the high activity level of source (15 milliCuries, now decayed to 1 milliCurie), the plastic had become embrittled and the cap cracked under the pressure.

Since the source was manufactured as a liquid equivalent using plastic resin material, there was minimal contamination to the individual's finger, which was covered with a surgeon's glove. This safety precaution by the Chemistry technician prevented a personnel contamination incident.

Procedure 74RP-9RP26, Radioactive Source Control, states:

4.11 Disposition of Damaged Radioactive Source

4.11.1 A radioactive source found with any of the following is considered damaged:

- removable contamination greater than or equal to 0.005 μCi
- scratches or tears to the protective layer of active area of the source
- an activity level less than 80% of the calculated decay corrected activity level

4.11.2 Generate a PVAR or Corrective Action document in accordance with 01DP-0AP12, "Palo Verde Action Request Processing"

4.11.3 Evaluate the impact of the damaged radioactive source considering:

- Estimated duration of use while damaged
- Contamination control actions taken to ensure personnel and the environs were not affected by the contamination
- Dose assessment of personnel handling the damaged source for both potential external and internal exposure

4.11.4 Document the actions taken to repair or dispose of the radioactive source.

4.11.5 Evaluate the reporting requirements in accordance with one of the following:

- 75DP-0RP04, Radiological Reports for radioactive sources maintained under specific license, or
- 10 CFR 31.5 for radioactive sources maintained under general license

Per step 4.11.1, source CH524 meets the definition of a "damaged source." Step 4.11.2 requires a PVAR to be generated – PVAR 4643999 was initiated by the responding RP technician. Step 4.11.3 requires an evaluation of 1) duration of use while damaged – the source was damaged during replacement in the storage lead shield; 2) contamination control actions – PVAR 463999 documents the RP technician's actions to measure contamination and source stabilization efforts; 3) dose assessment – PVAR 463999 documents the evaluation of external and internal exposure assessments. Step 4.11.4 actions are already documented in the CRDR Action Taken page. The source was removed by RP and taken to DAWPS for ultimate disposal. Step 4.11.5 is addressed under CRAI 4644996.

The two personnel who were involved in the source handling event were interviewed by both RP and Chemistry management. A good practice of using gloves when handling sealed radioactive sources was noted. Poor behaviors, such as being unaware of source radiation levels and non-questioning attitude when the source would not easily fit in the shield, were identified. Good practices for handling high activity sources were discussed along with proper use of HU tools, all of which would have prevented this incident.

TRANSPORTABILITY

Over the past 12-18 months, a concerted effort has been made to remove radioactive sources from all four Chemistry source lockers which have decayed beyond their normal useful life. The CH524 source was not part of this effort since it was a specialty source that is not routinely replaced. The degradation of container integrity was not visibly apparent. Taking this into account, there are three similar sources, all used for various post-accident counting geometries, all containing similar radionuclide mixtures and source strength. CH523 is a charcoal cartridge manufactured in 1990 stored in the Unit 2 Chemistry source locker. CH110 is a flame-sealed glass vial containing 10 mL solution manufactured in 1984 stored in the Unit 3 Chemistry source locker. CH111 is a charcoal cartridge manufactured in 1984 stored in the Unit 3 Chemistry source locker. This event is transportable to those three radioactive sources.

CORRECTIVE ACTIONS & ENHANCEMENTS

Immediate corrective actions involved verifying no personnel or equipment were contaminated or exposed to ionizing radiation, placing the CH524 source in a stable configuration, removing the CH524 source from use, and counseling for the technicians involved.

Subsequent corrective actions and enhancements include:

1) Transfer radioactive sources CH110, CH111, and CH523 to DAWPS for ultimate disposal. CRAI 4655361, PRI-3, Due 6/15/2015