INDIANA MICHIGAN POWER®
A unit of American Electric Power

Indiana Michigan Power
One Cook Place
Bridgman, MI 49106
IndianaMichiganPower.com

April 29, 2011

AEP-NRC-2011-27
10 CFR 50.4

Docket Nos.: 50-315
50-316

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

Donald C. Cook Nuclear Plant Units 1 and 2
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 1, 2010, THROUGH DECEMBER 31, 2010

In accordance with Technical Specification 5.6.3, Indiana Michigan Power Company, the licensee for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2, hereby submits the Annual Radioactive Effluent Release Report. This report covers the period January 1, 2010, through December 31, 2010.

The calculations in this report were performed in accordance with the CNP Offsite Dose Calculation Manual (ODCM). There has been no revision made to the ODCM during this reporting period.

This letter contains no new or modified regulatory commitments. Should you have any questions, please contact Mr. Michael K. Scarpello, Regulatory Affairs Manager, at (269) 466-2649.

Sincerely,

Joel P. Gebbie
Site Vice President

DMB/jmr

Attachment: Annual Radioactive Effluent Release Report

c: J. T. King, MPSC
S. M. Krawec, AEP Ft. Wayne, w/o attachment
MDNRE – WHMD/RPS
NRC Resident Inspector
M. A. Satorius, NRC Region III
P. S. Tam, NRC Washington DC

IE48

NMR

ATTACHMENT TO AEP-NRC-2011-27

DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 1, 2010, THROUGH DECEMBER 31, 2010

TABLE OF CONTENTS

LIST OF APPENDICES

I. INTRODUCTION

This report discusses the radioactive discharges from Unit 1 and Unit 2 of the Donald C. Cook Nuclear Plant (CNP) during 2010. This is in accordance with the requirements of CNP Technical Specification 5.6.3.

The table below summarizes the pertinent statistics concerning the Plant's operation during the period from January 1, 2010, to December 31, 2010. The data in this table and the descriptive information on plant operation are based upon the respective Unit's Monthly Operating Reports, Performance Indicators and Control Room Logs for 2010.

Parameter	Unit 1	Unit 2
Gross Electrical Energy Generation (Megawatt Hour (MWH))	8,078,628	8,097,054
Unit Service Factor (Percent (%))	89.7	83.4
Unit Capacity Factor (Maximum Dependable Capacity (MDC)) Net (%)	86.5	83.1

Unit 1 entered the reporting period in Mode 1 at Nominal Full Power (NFP). Small power adjustments were made to facilitate main turbine valve testing throughout the year. The unit was manually tripped on March 3, 2010, and entered the scheduled U1C23 refueling outage. The unit attained criticality on April 9, 2010, and attained NFP on April 12, 2010. The unit performed a rapid downpower to approximately 50% power on May 2, 2010 due to an oil leak and high vibrations on the East Main Feed Pump (MFP). The unit returned to NFP on May 16, 2010 after MFP repairs. The unit performed a rapid downpower to approximately 50% power on December 13, 2010, due to lowering vacuum on the East MFP. The unit returned to NFP on December 15, 2010, after MFP condenser cleaning actions. The unit exited the reporting period at NFP.

Unit 2 entered the reporting period in Mode 1 at NFP. Small power adjustments were made to facilitate main turbine valve testing throughout the year and a moderator temperature coefficient test. The unit was manually tripped on October 6, 2010, and entered the scheduled U2C19 refueling outage. The unit attained criticality on December 5, 2010, and attained NFP on December 9, 2010. The unit exited the reporting period at NFP.

II. RADIOACTIVE RELEASES AND RADIOLOGICAL IMPACT ON MAN

Since a number of release points are common to both units, the release data from both units are combined to form this two-unit, Annual Radioactive Effluent Release Report. Appendix A1.1 through A2.4 of this report present the information in accordance with Section 5.6.3 of Appendix A to the Facility Operating Licenses, as specified in the Technical Specifications, Regulatory Guide 1.21, and 10 CFR Part 50, Appendix I.

The "MIDAS System" is a computer code that calculates doses due to radionuclides that were released from the CNP.

All liquid and gaseous releases were well within Offsite Dose Calculation Manual (ODCM) limits and Federal Limits.

There were no abnormal liquid releases and no abnormal gaseous releases in 2010.

Liquid Releases

During 2010 there were 89 liquid batch releases performed. The number of liquid batch releases for the four quarters in 2010 was 24, 15, 19, and 31, respectively.

Estimated doses (in millirem) to maximally exposed individuals via the liquid release pathways are given in Appendix A1.2 of this report.

Gaseous Releases

During the first quarter of 2010 there were six batch releases from Waste Gas Decay Tanks (GDT), two containment purges, and 72 Containment Pressure Reliefs (CPR). During the second quarter there were two batch releases from GDT and 83 CPR. During the third quarter there was one batch release from GDT and 108 CPR. During the fourth quarter there were five batch releases from GDT, one containment purge, and 62 CPR. The CPR continue to be listed as batch releases as described in Nuclear Regulatory Commission Inspections 50-315/89016 (DRSS) and 50-316/89017 (DRSS). Doses continue to be calculated utilizing continuous criteria as allowed by NUREG-0133. There were a total of 14 GDT, three containment purges, and 325 CPR gaseous batch releases made during 2010.

In calculating the dose consequences for continuous and batch gaseous releases during 2010, the meteorological data measured at the time of the release were used.

The estimated doses (in millirem) to maximally exposed individuals via the gaseous release pathways are given in Appendix A1.2 of this report. For individuals that are within the site boundary, the occupancy time is sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the site boundary.

Solid Waste Disposition

There were 19 shipments of radioactive waste made during 2010. These included shipments made from the site to various radioactive waste processors for ultimate disposal.

III. METEOROLOGICAL

Appendices A2.1, A2.2, A2.3, and A2.4 of this report contain the cumulative joint frequency distribution tables of wind speed and wind direction, corresponding to the various atmospheric stability classes for the first, second, third and fourth quarters of 2010. Hourly meteorological data is available for review and/or inspection upon request.

IV. OFFSITE DOSE CALCULATION MANUAL (ODCM) CHANGES

The Offsite Dose Calculation Manual, PMP-6010-OSD-001, was not revised during the report period.

V. TOTAL DOSE

Section 3.2.5 of the ODCM requires that the dose or dose commitment to a real individual from all uranium fuel cycle sources in Berrien County be limited to no more than 25 millirem to the total body or any organ (except the thyroid, which is limited to no more than 75 millirem) over a period of 12 consecutive months to show conformance with the requirements of 40 CFR Part 190. The maximum cumulative dose to an individual from liquid and gaseous effluents during 2010 was well within the ODCM limits. Measurements using thermoluminescent dosimeters (TLD) at 12 onsite stations indicate that the dose due to direct radiation is consistent with preoperational and current control (background) levels. This is fully evaluated in the Annual Radiological Environmental Operating Report.

The annual dose to the maximum individual will be estimated by first, summing the quarterly total body air dose, the quarterly skin air dose, the quarterly critical organ dose from iodines and particulates (I&P), the quarterly total body dose from liquid effluents, the quarterly critical organ dose from liquid effluents, and the Radiological Environmental Monitoring Program onsite direct radiation TLD data. These quarterly values are summed with the annual C-14 dose and compared to the annual total body limit for conservative reasons. The table that follows here represents the above written description:

Dose (mrem)	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
I & P	3.00E-02	2.98E-02	6.30E-02	9.88E-02
Total Body Air	2.60E-04	7.10E-04	1.90E-03	1.30E-03
Skin	5.00E-03	7.10E-03	3.20E-03	5.30E-03
Liquid TB	9.04E-03	8.36E-03	1.69E-02	1.74E-02
Liquid Organ	9.07E-03	8.37E-03	1.69E-02	1.75E-02
C14 (Annual)				2.74E+00
Direct Radiation	0	0	0	0
Total	5.34E-02	5.43E-02	1.02E-01	2.88E+00
Grand Total Dose (Total Body or any other Organ) mrem				3.09E+00
Annual Dose Limit (mrem)				25
Percent of limit				1.24E+01

The following data reflects a comparison with 2009 annual dose data, 2010 annual dose data and 2010 annual dose data with C-14 added. This indicates that 2010 was a 'normal' dual unit outage year with respect to radioactive effluents and allows for easier comparison. The table is presented as follows:

	Annual Dose (mrem)	% of limit
2009	2.60E-01	1.04
2010	3.50E-01	1.4
2010 with C-14	3.09	12.4

VI. RADIATION MONITORS INOPERABLE GREATER THAN 30 DAYS

There were no release pathways unmonitored for greater than 30 days.

VII. NOTEWORTHY CONDITIONS IDENTIFIED IN 2010

1.) A tritium excursion in the Turbine Room Sump (TRS), an approved release pathway, commenced on October 29, 2010, with the discovery occurring via daily Absorption Pond samples. The sample result was above the Lower Limit of Detection (LLD) used for tritium (8.50E-7 micro curie/ml, uCi/ml) and resulted in additional grab samples taken to validate the results. The subsequent grab samples of the Absorption Pond indicated tritium levels between <8.50E-7 and 6.55E-6 uCi/ml. A TRS grab sample obtained on 10/29/11 indicated 1.90E-6 uCi/ml. The TRS composite sample from the previous 24 hours obtained at 0105 on 10/30/10 indicated 7.26E-6 uCi/ml. A TRS grab sample obtained at 0209 on 10/30/10 indicated 1.31E-4 uCi/ml with a subsequent TRS grab sample at 0300 indicating a decrease to 3.83E-5 uCi/ml. No gamma activity was detected.

Subsequent investigation revealed that Operations personnel had drained approximately 150 gallons of Unit 2 Component Cooling Water (CCW) through a floor drain to the TRS. This clearance activity (2-C19-R-CCW-CCWC-0815) was performed to allow work on 2-CCR-460, Excess Letdown HX 2-HE-13 CCW Return Containment Isolation Valve, and was done under the direction of the clearance permit process and occurred late in the evening on 10/29/10. Unit 2 CCW contained a tritium concentration of 1.64E-1 uCi/ml. This volume of CCW is sufficient to cause these elevated levels in the TRS and the TRS discharges to the Absorption Pond. The Absorption Pond flows through the groundwater aquifer to Lake Michigan and there are groundwater monitoring wells in this pathway that have indicated tritium from the Absorption Pond historically. No drinking water is impacted by releases into the Absorption Pond.

This draining activity resulted in elevated tritium levels of approximately 1.31 E-04 uCi/ml in the TRS, an approved release pathway, and the sump was pumped to the site absorption pond. The 10 CFR 20, Appendix B, limit of 1.0 E-3 micro curie/ml was challenged but not exceeded. This release pathway is not the preferred path for CCW draining as it has the potential to impact groundwater via the Absorption pond. No adverse groundwater impacts are expected, though increased well monitoring is being performed to track any potential plume as the water percolates naturally from the Absorption Pond to Lake Michigan per design. No reporting levels were met, and it is not expected that any downstream wells will indicate any reportable concentrations in tritium levels. It would be anticipated that wells similar to those impacted by the 2009 release of CCW to the TRS and Absorption Pond should see comparable sample results early in 2011 and continue to observed as the plume passes into Lake Michigan per design.

Various procedural enhancements for Operations and Chemistry procedures were identified and provided with actions to complete. Training to Operators was identified and documented with an action on the significance of draining CCW to the

TRS. An action was provided to add postings or labeling to all Auxiliary Building drains that provide a flow path to the TRS denying draining of CCW without Environmental concurrence. There was also an industry Operating Experience distributed through INPO documenting this event. There were no reportability concerns or notifications required during this event, since the releases were through licensed pathways and all dose fully accounted for. These actions are designed to prevent a future repeat of this condition. All radioactive liquids released during this condition were released through licensed release pathways (the TRS is such a pathway) and at no time posed any threat to the health and safety of the public. This issue is documented in CNP's Corrective Action Program under AR 2010-11695.

2.) A greater number of containment pressure reliefs were performed in 2010 as seen in the increased number of gaseous batch releases. This was the result of maintaining a narrower containment pressure band to improve reactor coolant pump seal leakoff performance. This is not abnormal, but was a notable change from last year.

Carbon-14 Supplemental Information for the 2010 Annual Radioactive Effluent Release Report.

Carbon-14 (C-14) has a 5730 year half-life and is a naturally occurring radionuclide produced by cosmic ray interactions in the atmosphere. C-14 is a relatively low energy beta emitter. Nuclear weapons testing in the 1950s and 1960s significantly increased the amount of C-14 in the atmosphere. C-14 is also produced in commercial nuclear reactors, but the amounts produced are much less than those produced naturally, from weapons testing, or coal burning power plants. The inventory of carbon-14 in Earth's biosphere is about 300 million Curies, of which most is in the oceans.

Since the NRC published Regulatory Guide 1.21, Revision 1, in 1974, the analytical methods for determining C-14 have improved. Coincidentally the radioactive effluents from commercial nuclear power plants over the same period have decreased to the point that C-14 is likely to be a principal radionuclide in gaseous effluents. Based on these reasons and a desire to adjust policy to align with international standards, starting in 2010 the nuclear industry will be required to report the quantity and dose impact of C-14 here in the United States. This year's report will be the first report by CNP including C-14, but the dose will be reported both with and without C-14 so a comparison to 2009 can be made keeping in mind the differing standards.

The quantity of C-14 released to the environment can be estimated by use of a C-14 source term scaling factor based on power generation (Ref. RG 1.21, Rev 2). A recent study recommends a source term scaling factor of approximately 9.0 to 9.8 Curies/GWe-yr for a Westinghouse Pressurized Water Reactor (Ref. EPRI 1021106). A scaling factor of 9.4 Curies/GWe-yr was assumed for this report. Using this source term scaling factor and actual electrical generation (MWH) produced during 2010 results in a site total of 17.4 Curies released.

C-14 releases from PWRs occur primarily as a mix of organic carbon (methane) and inorganic (carbon dioxide). As a general rule, C-14 in the primary coolant is essentially all organic with a large fraction as gas. Any time the primary coolant is exposed to an

oxidizing environment (during shutdown or refueling), a slow transformation from an organic to an inorganic species occurs. Various studies documenting measured C-14 releases from PWRs suggest an average 80% organic fraction with the remainder being carbon dioxide. This equates to 3.47 Curies released as carbon dioxide which is available for the food pathway through photosynthesis to vegetation.

Dose is calculated utilizing the methodology prescribed in RG 1.109, Appendix C with the vegetation dose being the most predominant. A 'p' factor of 0.33 is determined utilizing the 171 hours of batch gaseous releases performed during 2010 and the assumption that 70% of the C-14 released is from gaseous batch releases. A further reduction to the vegetation and leafy vegetable dose is warranted due to the limited growing season in Michigan, which was conservatively limited to nine months. This results in a calculated organ dose to a child at the site boundary of 1.37 mrem to the bone and a whole body dose of 0.272 mrem. These are per unit dose results so the total dose to a child would be 2.74 mrem to the bone and 0.544 mrem to the total body. This is less than the dose limit of 15 mrem/unit to any organ prescribed in 10 CFR 50, Appendix I, and the 40 CFR Part 190 limit of 25 mrem for total body and 75 mrem for any organ.

VIII. CONCLUSION

Based on the information presented in this report, it is concluded that CNP Units 1 and 2 performed their intended design function with no demonstrable adverse affect on the health and safety of the general public.

SUPPLEMENTAL INFORMATION

Facility: Donald C. Cook Nuclear Plant
Licensee: Indiana Michigan Power Company

1 REGULATORY LIMITS

1.1 Noble Gases

The air dose in unrestricted areas due to noble gases released in gaseous effluents shall be limited to the following:

1.1.1 During any calendar quarter, to ≤ 5 mrad/unit for gamma radiation and ≤ 10 mrad/unit for beta radiation.

1.1.2 During any calendar year, to ≤ 10 mrad/unit for gamma radiation and ≤ 20 mrad/unit for beta radiation.

1.2 Iodines - Particulates

The dose to a member of the public from radioiodines, radioactive materials in particulate form, and radionuclides other than noble gases with half-lives greater than eight days in gaseous effluents released to unrestricted areas shall be limited to the following:

1.2.1 During any calendar quarter to ≤ 7.5 mrem/unit to any organ.

1.2.2 During any calendar year to ≤ 15 mrem/unit to any organ.

1.3 Liquid Effluents

The dose or dose commitment to an individual from radioactive material in liquid effluents released to unrestricted areas shall be limited:

1.3.1 During any calendar quarter to ≤ 1.5 mrem/unit to the total body and to ≤ 5 mrem/unit to any organ.

1.3.2 During any calendar year to ≤ 3 mrem/unit to the total body and to ≤ 10 mrem/unit to any organ.

1.4 Total Dose

The dose or dose commitment to a real individual from all uranium fuel cycle sources is limited to ≤ 25 mrem to the total body or any organ (except the thyroid, which is limited to ≤ 75 mrem) over a period of 12 consecutive months.

2 MAXIMUM PERMISSIBLE CONCENTRATIONS

2.1 Gaseous Effluents

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

2.1.1 For noble gases: ≤ 500 mrem/yr to the total body and ≤ 3000 mrem/yr to the skin.

2.1.2 For all radioiodines and for all radioactive materials in particulate form and radionuclides (other than noble gases) with half-lives greater than eight days: ≤ 1500 mrem/yr to any organ.

The above limits are provided to insure that radioactive material discharged in gaseous effluents will not result in the exposure of an individual in an unrestricted area to annual average concentrations exceeding the limits in 10 CFR Part 20, Appendix B, Table 2, Column 1.

2.2 Liquid Effluents

The concentration of radioactive material released at any time from the site to unrestricted areas shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table 2, Column 2, for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} µCi/ml total activity.

3 AVERAGE ENERGY

The average energy ($\bar{E}$) of the radionuclide mixture in releases of fission and activation gases as defined in Regulatory Guide 1.21, Appendix B, Section A.3 is not applicable because the limits used for gaseous releases are based on calculated dose to members of the public. Release rates are calculated using an isotopic mix from actual samples rather than average energy.

4 MEASUREMENTS and APPROXIMATIONS of TOTAL RADIOACTIVITY

4.1 Fission and Activation Gases

Sampled and analyzed on a 4096 channel analyzer and HpGe detector. Tritium analysis is performed using liquid scintillation counter.

4.2 Iodines

Sampled on iodine adsorbing media and analyzed on a 4096 channel analyzer and HpGe detector.

4.3 Particulates

Sampled on a glass filter and analyzed on a 4096 channel analyzer and HpGe detector. Sr-89 and Sr-90 analyses performed by offsite vendor.

4.4 Liquid Effluents

Sampled and analyzed on a 4096 channel analyzer and HpGe detector. Tritium analysis is performed using liquid scintillation counter. Fe-55, Sr-89 and Sr-90 analyses performed by offsite vendor. Ni-63 is also currently being analyzed by the offsite vendor in response to evaluation of the 10 CFR 61 sample results.

5 BATCH RELEASES

5.1 Liquid

5.1.1 Number of batch releases:

24 releases in the 1st quarter, 2010
15 releases in the 2nd quarter, 2010
19 releases in the 3rd quarter, 2010
31 releases in the 4th quarter, 2010

5.1.2 Total time period for batch releases:

24,383 minutes

5.1.3 Maximum time for a batch release:

354 minutes

5.1.4 Average time period for batch release:

274 minutes

5.1.5 Minimum time period for a batch release:

144 minutes

5.1.6 Average stream flow during periods of release of effluent into a flowing stream:

7.46E+5 gpm circulating water

5.2 Gaseous

5.2.1 Number of batch releases:

80 releases in the 1st quarter, 2010
85 releases in the 2nd quarter, 2010
109 releases in the 3rd quarter, 2010
68 releases in the 4th quarter, 2010

5.2.2 Total time period for batch releases:

10,253 minutes

5.2.3 Maximum time for a batch release:

354 minutes

5.2.4 Average time period for batch release:

30.0 minutes

5.2.5 Minimum time period for a batch release:

6 minutes

6 ABNORMAL RELEASES

6.1 Liquid

6.1.1 Number of Releases:

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
0	0	0	0

6.1.2 Total activity released (Ci):

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
0	0	0	0

6.2 Gaseous

6.2.1 Number of Releases:

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
0	0	0	0

6.2.2 Total activity released (Ci):

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
0	0	0	0

2010 EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

CONTINUOUS MODE

Nuclides Released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1. FISSION GASES					
H3	Ci	5.35E+01	2.66E+01	2.98E+01	7.58E+01
KR85m	Ci	--------	--------	--------	--------
KR85	Ci	--------	--------	--------	--------
XE131m	Ci	--------	--------	--------	--------
XE133m	Ci	--------	--------	--------	--------
XE133	Ci	8.66E-02	--------	--------	--------
XE135	Ci	--------	--------	--------	--------
Total for Period	Ci	5.36E+01	2.66E+01	2.98E+01	7.58E+01
2. IODINES					
I131	Ci	3.40E-06	--------	--------	9.82E-04
I132	Ci	9.51E-06	--------	--------	2.15E-05
I133	Ci	--------	--------	--------	--------
Total for Period	Ci	1.29E-05	--------	--------	1.00E-03
3. PARTICULATES					
MN54	Ci	--------	--------	--------	--------
CO60	Ci	--------	--------	--------	--------
CS137	Ci	--------	--------	--------	--------
Total for Period	Ci	--------	--------	--------	--------

* DENOTES SUPPLEMENTAL ISOTOPES

2010 EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

BATCH MODE

Nuclides Released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1. FISSION GASES					
H3	Ci	2.21E-02	2.00E-02	2.66E-02	1.78E-01
AR41	Ci	3.55E-01	3.81E-01	3.81E-01	2.10E-01
KR85	Ci	1.52E+00	5.16E-01	2.47E-01	1.14E+00
XE131M	Ci	--------	--------	--------	2.14E-04
XE133M	Ci	--------	--------	--------	2.29E-05
XE133	Ci	1.74E-01	3.59E-01	7.00E-01	4.01E-01
XE135	Ci	2.96E-03	4.78E-03	6.65E-03	1.68E-03
Total for Period	Ci	2.07E+00	1.28E+00	1.36E+00	1.93E+00
2. IODINES					
I131	Ci	--------	--------	--------	--------
I133	Ci	--------	--------	--------	--------
Total for Period	Ci	--------	--------	--------	--------
3. PARTICULATES					
CO60	Ci	1.63E-05	--------	--------	--------
* BR82	Ci	2.97E-06	--------	--------	3.72E-06
Total for Period	Ci	1.93E-05	--------	--------	3.72E-06

* DENOTES SUPPLEMENTAL ISOTOPES

2010 EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

		Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Est. Total Error, %
A.	FISSION AND ACTIVATION GASES						
1.	Total Release	Ci	2.14E+00	1.26E+00	1.33E+00	1.74E+00	12.8
2.	Average release rate for period	uCi/sec	2.75E-01	1.60E-01	1.68E-01	2.19E-01	
3.	Percent of applicable limit*	% Gamma	2.10E-02	2.46E-02	6.56E-02	5.46E-02	
		Beta	1.62E-01	9.46E-02	1.87E-02	7.18E-02	
B.	IODINES						
1.	Total I-131	Ci	3.40E-06	0.00E+00	0.00E+00	9.82E-04	11.6
2.	Average release rate for period	uCi/sec	4.37E-07	0.00E+00	0.00E+00	1.24E-04	
3.	Percent of applicable limit*	%	4.00E-01	0.00E+00	0.00E+00	1.32E+00	
C.	PARTICULATES						
1.	Particulates with half lives>8 days	Ci	1.63E-05	0.00E+00	0.00E+00	0.00E+00	13.1
2.	Average release rate for period	uCi/sec	2.10E-06	0.00E+00	0.00E+00	0.00E+00	
3.	Percent of applicable limit*	%	4.00E-01	0.00E+00	0.00E+00	0.00E+00	
4.	Gross alpha radioactivity	Ci	<8.30E-07	<6.43E-07	<8.65E-07	<8.74E-07	
D.	TRITIUM						
1.	Total Release	Ci	5.35E+01	1.79E+01	2.98E+01	7.60E+01	11.3
2.	Average release rate for period	uCi/sec	6.88E+00	2.27E+00	3.75E+00	9.56E+00	
3.	Percent of applicable limit*	%	4.00E-01	3.97E-01	8.40E-01	1.32E+00	

* Applicable limits are expressed in terms of dose. See Appendices A1.2-1 through A1.2-4

2010 EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
LIQUID EFFLUENTS
CONTINUOUS MODE

Nuclides Released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
H3	Ci	--------	4.81E-04	3.48E-02	5.90E-02
CS137	Ci	--------	--------	--------	--------

BATCH MODE

Nuclides Released	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
H3	Ci	2.85E+02	3.57E+02	7.01E+02	6.00E+02
CR51	Ci	--------	3.08E-05	--------	--------
MN54	Ci	1.37E-05	2.57E-05	2.79E-06	8.61E-06
FE55	Ci	--------	--------	--------	--------
CO58	Ci	6.76E-05	2.57E-04	9.37E-05	2.95E-04
CO60	Ci	1.17E-03	4.05E-04	6.17E-05	3.38E-04
NI63	Ci	4.40E-04	6.15E-04	5.43E-04	--------
ZN65	Ci	--------	1.27E-05	--------	--------
ZR95	Ci	--------	--------	--------	1.01E-05
NB95	Ci	--------	7.79E-06	--------	9.14E-06
MO99	Ci	--------	--------	--------	--------
TC99m	Ci	--------	--------	--------	2.95E-06
AG110m	Ci	2.28E-04	4.94E-05	2.68E-05	4.22E-05
SB124	Ci	--------	1.08E-05	--------	8.74E-05
SB125	Ci	2.01E-05	1.05E-04	8.08E-06	3.83E-04
CS134	Ci	--------	--------	--------	1.23E-06
CS137	Ci	1.06E-05	--------	--------	2.14E-05
CE144	Ci	--------	--------	--------	--------
*XE131m	Ci	--------	--------	--------	--------
*XE133	Ci	1.62E-04	4.78E-06	1.60E-04	9.47E-04
*XE133m	Ci	--------	--------	--------	5.10E-06

* DENOTES SUPPLEMENTAL ISOTOPES
• Only Non-Zero Batch or Continuous Releases are Printed

2010 EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES
BATCH MODE

		Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Est. Total Error,%
A.	FISSION AND ACTIVATION PRODUCTS						
1.	Total Release	Ci	1.95E-03	1.52E-03	7.36E-04	1.20E-03	16.3
2.	Average diluted concentration during period	uCi/ml	1.48E-10	1.07E-10	4.13E-11	5.08E-11	
3.	Percent of applicable limit	%	3.40E-03	1.20E-03	1.99E-04	7.77E-04	
B.	TRITIUM						
1.	Total Release	Ci	2.85E+02	3.57E+02	7.01E+02	6.00E+02	10.1
2.	Average diluted concentration during period	uCi/ml	2.16E-05	2.51E-05	3.94E-05	2.54E-05	
3.	Percent of applicable limit	%	2.16E+00	2.51E+00	3.94E+00	2.54E+00	
C.	DISSOLVED AND ENTRAINED GASES						
1.	Total Release	Ci	1.62E-04	4.78E-06	1.60E-04	9.52E-04	11.5
2.	Average diluted concentration during period	uCi/ml	1.23E-11	3.37E-13	8.99E-12	4.03E-11	
3.	Percent of applicable limit	%	6.14E-06	1.68E-07	4.49E-06	2.02E-05	
D.	GROSS ALPHA RADIOACTIVITY TOTAL RELEASE	Ci	<1.24E-04	<7.72E-05	<1.04E-04	<1.75E-04	N/A
E.	VOLUME OF WASTE RELEASED	Liters	1.39E+06	8.64E+05	1.13E+06	1.82E+06	2.00
F.	VOLUME OF DILUTION WATER USED DURING PERIOD	Liters	1.32E+10	1.42E+10	1.78E+10	2.36E+10	3.48

2010 EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES
CONTINUOUS MODE

		Units	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Est. Total Error, %
A.	FISSION AND ACTIVATION PRODUCTS						
1.	Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
2.	Average diluted concentration during period	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3.	Percent of applicable limit	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
B.	TRITIUM						
1.	Total Release	Ci	0.00E+00	4.81E-04	3.48E-02	5.90E-02	18.5
2.	Average diluted concentration during period	uCi/ml	0.00E+00	1.83E-12	4.31E-11	9.80E-11	
3.	Percent of applicable limit	%	0.00E+00	1.83E-07	4.31E-06	9.80E-06	
C.	DISSOLVED AND ENTRAINED GASES						
1.	Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
2.	Average diluted concentration during period	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3.	Percent of applicable limit	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
D.	GROSS ALPHA RADIOACTIVITY TOTAL RELEASE	Ci	0.00E+00	<3.41E-05	<2.29E-03	<3.19E-03	N/A
E.	VOLUME OF WASTE RELEASED	Liters	0.00E+00	3.82E+05	2.56E+07	3.56E+07	2.00
F.	VOLUME OF DILUTION WATER USED DURING PERIOD	Liters	0.00E+00	2.63E+11	8.09E+11	6.01E+11	3.48

2010 Effluent and Waste Disposal Annual Report
Solid Waste and Irradiated Fuel Shipments

Solid Waste Shipped Offsite for Burial or Disposal			
1) Type of Waste	Unit	Estimated amount	Estimated Total Error, %
a) Spent resins, filters, sludge, evaporator bottoms, etc.	m^3 Curies	1.69E+01 2.69E+01	1.00E+00 3.75E+00
b) Dry compressible waste, contaminated equipment, etc.	m^3 Curies	5.96E+02 5.90E+00	1.00E+00 6.48E+00
c) Irradiated components, control rods, etc.	m^3 Curies		
d) Other (contaminated soil)	m^3 Curies		

2) Estimate of Principle Radionuclide Composition								
a)	H-3	57 %	Co-58	3 %	Sb-125	2 %	Cs-137	1 %
	C-14	1 %	Co-60	8 %	Kr-85	4 %		
	Fe-55	9 %	Ni-63	13 %	Zr/Nb-95	2 %		
b)	Ni-59	1 %	Co-58	28 %	Cs-134	1 %		
	Mn-54	3 %	Co-60	16 %	Zr/Nb-95	18 %		
	Fe-55	22 %	Ni-63	10 %	Cs-137	1 %		
d)								

3) Solid Waste Disposition		
No. of Shipments	Mode of Transportation	Destination
13	Truck	Memphis, TN
6	Truck	Erwin, TN

4) Type of Containers used for Shipment: Containers used are excepted packages, Type A, Sea Land, metal boxes, drums and high integrity containers.

5) Solidification Agent: There were no solidifications performed during this report period.

2010 Effluent and Waste Disposal Annual Report Yearly Release Rates

GASES		
Fission and Activation Gases	Total Release	6.47E+00 Curies
	Average Release Rate	2.05E-01 µCi/sec
	% of Applicable Limits*	γ 4.15E-02 % β 8.68E-02 %
Iodines	Total I-131 Release	3.40E-06 Curies
	Average Release Rate	1.08E-07 µCi/sec
	% of Applicable Limit*	7.39-01 %
Particulates	Total Release	1.63E-05 Curies
	Average Release Rate	5.17E-07 µCi/sec
	% of Applicable Limit*	7.39E-01 %
LIQUIDS		
Fission and Activation Products	Total Release	5.41E-03 Curies
	Average Diluted Concentration	7.86E-11 µCi/ml
	% of Applicable Limits*	Total Body 8.62E-01 % Organ 2.59E-01 %

* Applicable limits are expressed in terms of the annual 10 CFR 50, Appendix I, dose limits.

Site Boundary and Nearest Residence Listing

The following distances were used in the calculation of the maximum individual doses:

Sector	Direction	Boundary (Meters)	Nearest Residence (Meters)
A	N	651	659
B	NNE	617	660
C	NE	789	943
D	ENE	1497	1747
E	E	1274	1716
F	ESE	972	1643
G	SE	629	1640
H	SSE	594	964
J	S	594	997
K	SSW	629	942

Summary of Maximum Individual Doses

First Quarter 2010

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (mrem)	AGE GROUP	LOCATION DIST DIR (M) (Toward)	% OF APPLICABLE LIMIT	LIMIT (mrem) QTR
Liquid	Total Body	9.04E-03	Child	Receptor 1	6.03E-01	1.5E+0
Liquid	Liver	9.07E-03	Child	Receptor 1	1.81E-01	5.0E+0
Noble Gas	Air Dose (Gamma-mrad)	1.05E-03	Any Age	594 (S)	2.10E-02	5.0E+0
Noble Gas	Air dose (Beta-mrad)	1.62E-02	Any Age	594 (S)	1.62E-01	1.0E+1
Iodines and Particulates	GI Tract	3.00E-02	Child	964 (SSE)	4.00E-01	7.5E+0

Summary of Maximum Individual Doses

Second Quarter 2010

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (mrem)	AGE GROUP	LOCATION DIST DIR (M) (Toward)	% OF APPLICABLE LIMIT	LIMIT (mrem) QTR
Liquid	Total Body	8.36E-03	Child	Receptor 1	5.57E-01	1.5E+0
Liquid	GI - Tract	8.37E-03	Child	Receptor 1	1.67E-01	5.0E+0
Noble Gas	Air Dose (Gamma-mrad)	1.23E-03	Any Age	651 (N)	2.46E-02	5.0E+0
Noble Gas	Air dose (Beta-mrad)	9.46E-03	Any Age	651 (N)	9.46E-02	1.0E+1
Iodines and Particulates	Total Body	2.98E-02	Child	659 (N)	3.97E-01	7.5E+0

Summary of Maximum Individual Doses

Third Quarter 2010

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (mrem)	AGE GROUP	LOCATION DIST DIR (M) (Toward)	% OF APPLICABLE LIMIT	LIMIT (mrem) QTR
Liquid	Total Body	1.69E-02	Child	Receptor 1	1.13E+00	1.5E+0
Liquid	Liver	1.69E-02	Child	Receptor 1	3.38E-01	5.0E+0
Noble Gas	Air Dose (Gamma-mrad)	3.28E-03	Any Age	651 (N)	6.56E-02	5.0E+0
Noble Gas	Air dose (Beta-mrad)	1.87E-03	Any Age	651 (N)	1.87E-02	1.0E+1
Iodines and Particulates	Total Body	6.30E-02	Child	659 (N)	8.40E-01	7.5E+0

Summary of Maximum Individual Doses

Fourth Quarter 2010

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (mrem)	AGE GROUP	LOCATION DIST DIR (M) (Toward)	% OF APPLICABLE LIMIT	LIMIT (mrem) QTR
Liquid	Total Body	1.74E-02	Child	Receptor 1	1.16E+00	1.5E+0
Liquid	Liver	1.75E-02	Child	Receptor 1	3.50E-01	5.0E+0
Noble Gas	Air Dose (Gamma-mrad)	2.73E-03	Any Age	617 (NNE)	5.46E-02	5.0E+0
Noble Gas	Air dose (Beta-mrad)	7.18E-03	Any Age	651 (N)	7.18E-02	1.0E+1
Iodines and Particulates	Thyroid	9.88E-02	Child	659 (N)	1.32E+00	7.5E+0

2010 GPI Sample Data

Samples analyzed for tritium. Values noted are in microcuries per milliliter (uCi/mL)
Lower Limit of Detection = LLD

Date	MW-22D	MW-22M	MW-22S	MW-24D	MW-24M	MW-24S	MW-25D	MW-25M
01/14/2010	<LLD	<LLD	<LLD					
01/20/2010	<LLD	<LLD	<LLD					
01/26/2010	<LLD	<LLD	<LLD					
02/02/2010	<LLD	<LLD	<LLD	8.72E-7	1.26E-6	<LLD		
02/05/2010				<LLD	<LLD	<LLD		
02/10/2010				<LLD	<LLD	<LLD	<LLD	<LLD
02/19/2010	<LLD	<LLD	<LLD					
03/09/2010				<LLD	<LLD	<LLD		
03/10/2010							<LLD	<LLD
03/13/2010	<LLD	<LLD	<LLD					
04/27/2010	<LLD	<LLD	<LLD					
04/29/2010				9.09E-6	<LLD	<LLD		
04/30/2010							<LLD	<LLD
05/03/2010				7.49E-6	<LLD	<LLD		
05/04/2010				7.93E-6	<LLD	<LLD		
05/06/2010				6.87E-6	<LLD	<LLD		
05/14/2010				5.19E-6	<LLD	<LLD		
05/17/2010				5.10E-6	<LLD	<LLD	<LLD	<LLD
05/18/2010				5.80E-6	<LLD	<LLD		
05/19/2010	<LLD	<LLD	<LLD					
05/26/2010				2.62E-6	<LLD	<LLD		
06/04/2010				1.77E-6	<LLD	<LLD		
06/10/2010				2.88E-6	<LLD	<LLD		
06/18/2010				1.96E-6	<LLD	<LLD		
06/25/2010				<LLD	<LLD	<LLD	<LLD	<LLD
06/30/2010	<LLD	<LLD	<LLD					
07/06/2010				<LLD	<LLD	<LLD		
07/21/2010	<LLD	<LLD	<LLD					
07/26/2010							<LLD	<LLD
07/30/2010				<LLD	<LLD	<LLD		
08/06/2010				<LLD	<LLD	<LLD		
08/10/2010	<LLD		<LLD					
08/11/2010				<LLD	<LLD	<LLD		
08/12/2010							<LLD	<LLD
08/21/2010				<LLD	<LLD	<LLD		
08/24/2010				<LLD	<LLD	<LLD		
08/30/2010	<LLD	<LLD	<LLD					
09/02/2010				<LLD	<LLD	<LLD		

(Note: Wells MW-22 through MW 27 are multi-port wells installed in the Fall of 2009, with three sample points placed at different depths. S= Shallow M= Middle D= Deep.)
(Note: A "*" symbol following a sample result denotes a gamma count was performed. Any gamma results above LLD will be additionally flagged and documented in the analysis section.)

2010 GPI Sample Data

Samples analyzed for tritium. Values noted are in microcuries per milliliter (uCi/mL)
Lower Limit of Detection = LLD

MW-22D through MW-25M continued

Date	MW-22D	MW-22M	MW-22S	MW-24D	MW-24M	MW-24S	MW-25D	MW-25M
09/08/2010				<LLD	<LLD	<LLD		
09/10/2010							<LLD	<LLD
09/14/2010				<LLD	<LLD	<LLD		
09/22/2010				<LLD	<LLD	<LLD		
09/30/2010	<LLD	<LLD	<LLD					
10/01/2010				<LLD	<LLD	<LLD		
10/04/2010				<LLD	<LLD	<LLD		
10/19/2010							<LLD	<LLD
10/20/2010							<LLD	<LLD
10/23/2010							8.56E-7	<LLD
10/28/2010				<LLD	<LLD	<LLD		
10/29/2010	<LLD	<LLD	<LLD					
10/30/2010							<LLD	<LLD
11/06/2010							<LLD	<LLD
11/08/2010							<LLD	8.57E-7
11/11/2010				<LLD	<LLD	<LLD		
11/15/2010							<LLD	8.56E-7
11/16/2010				<LLD	<LLD	<LLD		
11/19/2010	<LLD	<LLD	<LLD					
11/26/2010							<LLD	<LLD
12/01/2010				<LLD	<LLD	<LLD	<LLD	<LLD
12/06/2010							<LLD	<LLD
12/17/2010	<LLD	<LLD	<LLD					
12/20/2010							<LLD	<LLD
12/27/2010				<LLD	<LLD	<LLD	<LLD	<LLD

(Note: Wells MW-22 through MW 27 are multi-port wells installed in the Fall of 2009, with three sample points placed at different depths. S= Shallow M= Middle D= Deep.)

(Note: A "*" symbol following a sample result denotes a gamma count was performed. Any gamma results above LLD will be additionally flagged and documented in the analysis section.)

2010 GPI Sample Data

Samples analyzed for tritium. Values noted are in microcuries per milliliter (uCi/mL)
Lower Limit of Detection = LLD

Date	MW-25S	MW-26D	MW-26M	MW-26S	MW-27D	MW-27M	MW-27S
02/10/2010	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
03/10/2010	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
04/30/2010	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
05/17/2010	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
06/25/2010	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
07/26/2010	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
08/12/2010	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
09/10/2010	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
10/19/2010	9.50E-7	<LLD	<LLD	<LLD	9.85E-7	<LLD	1.04E-6
10/20/2010	9.93E-7	<LLD	8.52E-7	<LLD	2.43E-6	<LLD	<LLD
10/23/2010	<LLD	<LLD	<LLD	<LLD	2.42E-6	1.09E-6	1.31E-6
10/28/2010		<LLD	<LLD	<LLD			
10/30/2010	<LLD	<LLD	<LLD	<LLD	3.06E-6	1.46E-6	1.13E-6
11/06/2010	<LLD	<LLD	<LLD	<LLD	2.56E-6	1.68E-6	<LLD
11/08/2010	<LLD	<LLD	<LLD	<LLD	3.66E-6	1.68E-6	1.22E-6
11/11/2010					3.39E-6	2.20E-6	1.09E-6
11/15/2010	<LLD	<LLD	<LLD	<LLD	3.36E-6	1.83E-6	1.55E-6
11/19/2010					1.85E-6	<LLD	<LLD
11/22/2010					1.47E-6	<LLD	<LLD
11/26/2010	<LLD	<LLD	<LLD	<LLD	1.73E-6	<LLD	<LLD
12/01/2010	<LLD	<LLD	<LLD	<LLD	2.08E-6	1.42E-6	1.32E-6
12/04/2010					<LLD	<LLD	<LLD
12/06/2010	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
12/09/2010					2.02E-6	9.93E-7	1.81E-6
12/13/2010					1.92E-6	9.89E-7	1.67E-6
12/20/2010	1.36E-6	8.54E-7	<LLD	<LLD	2.38E-6	1.50E-6	1.36E-6
12/23/2010					1.18E-6	<LLD	1.04E-6
12/27/2010	1.22E-6	<LLD	<LLD	8.53E-7	1.31E-6	1.18E-6	1.17E-6
12/30/2010					1.22E-6	1.18E-6	<LLD

Date	MW-23S	MW-23D	MW-23M
09/16/2010	<LLD	<LLD	<LLD *

(Note: Wells MW-22 through MW 27 are multi-port wells installed in the Fall of 2009, with three sample points placed at different depths. S= Shallow M= Middle D= Deep.)

(Note: A "*" symbol following a sample result denotes a gamma count was performed. Any gamma results above LLD will be additionally flagged and documented in the analysis section.)

2010 GPI Sample Data

Samples analyzed for tritium. Values noted are in microcuries per milliliter (uCi/mL)
Lower Limit of Detection = LLD

Date	W-9	W-10	W-11	W-12	W-13	W-14	W-15	OW-1
01/05/2010			<LLD				<LLD	
01/14/2010					<LLD	<LLD		
01/15/2010							<LLD	
01/20/2010					<LLD			
01/26/2010		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
01/27/2010	<LLD							<LLD
02/02/2010						<LLD		
02/18/2010							<LLD	
02/19/2010					<LLD	<LLD		
03/09/2010							<LLD	
03/13/2010					<LLD	<LLD		
04/26/2010		<LLD			<LLD	<LLD	<LLD	
04/27/2010	<LLD		<LLD	<LLD				
05/04/2010							8.38E-7	
05/06/2010							<LLD	
05/14/2010							<LLD	
05/17/2010							9.05E-7	
05/18/2010							<LLD	
05/19/2010					<LLD	<LLD		
05/26/2010							<LLD	
06/04/2010							9.01E-7	
06/11/2010							1.20E-6	
06/18/2010							1.48E-6	
06/25/2010							8.70E-7	
06/30/2010					<LLD	<LLD		
07/06/2010							<LLD	
07/21/2010					<LLD	<LLD		
07/30/2010							1.16E-6	
08/06/2010							1.29E-6	
08/10/2010		<LLD	<LLD	<LLD	<LLD	<LLD		
08/11/2010	<LLD						1.55E-6	
08/21/2010							2.49E-6	
08/24/2010							2.87E-6	
09/02/2010							3.62E-6	
09/08/2010							2.93E-6	
09/14/2010							2.47E-6	
09/22/2010							2.55E-6 *	
09/30/2010					<LLD	<LLD		
10/12/2010							<LLD	
10/13/2010							9.47E-7	
10/27/2010		<LLD			<LLD	<LLD	<LLD	

(Note: A "*" symbol following a sample result denotes a gamma count was performed. Any gamma results above LLD will be additionally flagged and documented in the analysis section.)

2010 GPI Sample Data

Samples analyzed for tritium. Values noted are in microcuries per milliliter (uCi/mL)
Lower Limit of Detection = LLD

W-9 through OW-1 continued

Date	W-9	W-10	W-11	W-12	W-13	W-14	W-15	OW-1
11/02/2010	<LLD	<LLD	<LLD	<LLD				
11/03/2010					<LLD	<LLD	8.53E-7	
11/11/2010							<LLD	
11/16/2010							<LLD	
11/23/2010							<LLD	
12/01/2010							<LLD	
12/09/2010							<LLD	
12/17/2010					<LLD	<LLD		
12/20/2010							<LLD	
12/27/2010							<LLD	

2010 GPI Sample Data

Samples analyzed for tritium. Values noted are in microcuries per milliliter (uCi/mL)
Lower Limit of Detection = LLD

Date	OW-2	OW-3	OW-4	EW-18	EW-19	MW-20	MW-21	95-11A
01/05/2010							<LLD	
01/14/2010							<LLD	
01/26/2010					<LLD		<LLD	
01/27/2010				<LLD		<LLD		
04/26/2010					<LLD			
04/27/2010				<LLD		<LLD	<LLD	
04/29/2010	1.00E-6							
05/04/2010								<LLD
08/10/2010						<LLD	<LLD	
10/20/2010	9.58E-7							
10/27/2010				<LLD				
11/02/2010						<LLD	<LLD	
11/08/2010	1.04E-6							

(Note: A "*" symbol following a sample result denotes a gamma count was performed. Any gamma results above LLD will be additionally flagged and documented in the analysis section.)

2010 GPI Sample Data

Samples analyzed for tritium. Values noted are in microcuries per milliliter (uCi/mL)
Lower Limit of Detection = LLD

Date	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8
01/26/2010			<LLD				<LLD	
01/27/2010	<LLD	<LLD						<LLD
01/28/2010				8.39E-7	9.24E-7	1.07E-6		
04/26/2010			<LLD					<LLD
04/27/2010		<LLD					<LLD	
04/29/2010	<LLD			<LLD	<LLD	<LLD		
08/08/2010		<LLD						
08/10/2010			<LLD				<LLD	
08/11/2010				<LLD	9.12E-7	9.70E-7		<LLD
11/02/2010	<LLD		<LLD					<LLD
11/03/2010		<LLD					<LLD	
11/04/2010				<LLD	1.55E-6	1.04E-6		

(Note: A "*" symbol following a sample result denotes a gamma count was performed on site for informational purposes. Any gamma results above LLD will be additionally flagged and documented in the analysis section.)

Analysis of the Sample Data

The Groundwater Protection Initiative (GPI) Sample Data for 2010 indicates no groundwater contamination in excess of the reporting threshold of 2.00E-5 uCi/mL for tritium. Gamma spectroscopy was performed on all Radiological Environmental Monitoring Program wells quarterly. Those results are not actual GPI results so are not included here, but are part of the Annual Radiological Environmental Operating Report that is submitted to the Nuclear Regulatory Commission. There were no positively identified radionuclides from plant effluents detected in any of the quarterly well sample other than the expected tritium values associated with documented plant events.

The LLD value used for counting of the samples varied between 8.17E-7 and 9.60E-7uCi/mL, depending on which scintillation counter was used. This is well below the required minimum LLD value of 2.00E-6 uCi/mL.

Values found above the LLD were not abnormal, unexpected, or inconsistent with past sampling history. The samples observed above LLD were expected results from the release of tritiated water into the Absorption Pond, a licensed pathway and part of plant design, or the result of recapture deposition of tritium from licensed radioactive gaseous release points. The Introduction contains a section titled Noteworthy Conditions Identified In 2010 which will provide details on the release to the Absorption Pond.

Specifically, tritium results greater than LLD were the results of the 2009 release of radioactive effluent to the Absorption Pond as documented in AR 848816 and the 2009 version of this report or from the recapture of tritium from gaseous effluents. Wells MW-24, MW-25, MW-26, MW-27, W-15, W-11, W-12, W-13 and W-14 are positioned to monitor Absorption Pond percolation. Wells OW-2, W-4, W-5, and W-6 results continue to reflect the recapture of tritium from legally released gaseous effluents are closely monitored for changes indicating some other condition.

The sample data indicates that no radioactive spills or unidentified leaks have occurred in 2010 impacting groundwater. The sample results indicate proper well placement to ensure the protection of the groundwater and early identification of any abnormal conditions involving groundwater. This is validated by the demonstrated ability to monitor percolation from the Absorption Pond, with flow direction and behavior acting as described in the plant licensing documents.

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/1/10 - 3/31/10
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	3	23	15	0	0	0	41
NNE	9	18	2	0	0	0	29
NE	2	20	2	0	0	0	24
ENE	2	16	2	0	0	0	20
E	1	12	2	0	0	0	15
ESE	1	11	0	0	0	0	12
SE	2	13	5	0	0	0	20
SSE	3	13	10	2	0	0	28
S	1	10	10	2	0	0	23
SSW	2	5	1	0	0	0	8
SW	3	10	17	0	0	0	30
WSW	0	17	18	0	0	0	35
W	4	8	0	0	0	0	12
WNW	7	25	0	0	0	0	32
NW	4	37	2	0	0	0	43
NNW	5	66	9	0	0	0	80
TOTAL	49	304	95	4	0	0	452

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 5

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/1/10 - 3/31/10
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	2	5	3	0	0	0	10
NNE	2	4	1	0	0	0	7
NE	1	4	0	0	0	0	5
ENE	1	4	2	0	0	0	7
E	0	2	2	0	0	0	4
ESE	3	0	0	0	0	0	3
SE	2	3	1	0	0	0	6
SSE	2	4	0	0	0	0	6
S	1	7	2	0	0	0	10
SSW	1	2	3	1	0	0	7
SW	1	9	4	0	0	0	14
WSW	3	1	2	0	0	0	6
W	2	5	0	0	0	0	7
WNW	1	2	0	0	0	0	3
NW	3	12	6	0	0	0	21
NNW	2	20	5	0	0	0	27
TOTAL	27	84	31	1	0	0	143

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 5

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/1/10 - 3/31/10
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	1	11	2	0	0	0	14
NNE	1	9	1	0	0	0	11
NE	1	10	3	0	0	0	14
ENE	2	10	2	0	0	0	14
E	3	6	1	0	0	0	10
ESE	3	5	0	0	0	0	8
SE	7	6	1	0	0	0	14
SSE	1	1	0	0	0	0	2
S	2	6	2	0	0	0	10
SSW	2	11	4	0	0	0	17
SW	3	8	9	0	0	0	20
WSW	1	2	11	0	0	0	14
W	2	4	4	0	0	0	10
WNW	2	3	4	0	0	0	9
NW	3	23	5	0	0	0	31
NNW	5	14	3	0	0	0	22
TOTAL	39	129	52	0	0	0	220

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 5

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/1/10 - 3/31/10
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	14	58	17	0	0	0	89
NNE	11	39	6	0	0	0	56
NE	9	27	14	0	0	0	50
ENE	10	12	8	0	0	0	30
E	17	23	13	0	0	0	53
ESE	15	35	4	0	0	0	54
SE	14	9	7	0	0	0	30
SSE	12	8	1	0	0	0	21
S	6	6	11	0	0	0	23
SSW	6	22	11	0	1	0	40
SW	7	24	15	0	0	0	46
WSW	1	23	25	2	0	0	51
W	5	20	5	0	0	0	30
WNW	8	30	8	0	0	0	46
NW	18	63	10	0	0	0	91
NNW	29	82	24	0	0	0	135
TOTAL	182	481	179	2	1	0	845

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 5

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/1/10 - 3/31/10
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	12	3	0	0	0	0	15
NNE	6	6	0	0	0	0	12
NE	16	15	1	0	0	0	32
ENE	15	17	3	0	0	0	35
E	23	4	0	0	0	0	27
ESE	10	7	1	0	0	0	18
SE	9	7	4	0	0	0	20
SSE	11	12	1	1	0	0	25
S	6	14	4	0	0	0	24
SSW	2	1	7	0	0	0	10
SW	3	5	2	0	0	0	10
WSW	6	6	0	0	0	0	12
W	4	2	0	0	0	0	6
WNW	3	0	0	0	0	0	3
NW	8	0	0	0	0	0	8
NNW	12	2	1	0	0	0	15
TOTAL	146	101	24	1	0	0	272

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 5

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/1/10 - 3/31/10
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

	WIND SPEED (MPH)						
WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	2	0	0	0	0	0	2
NNE	1	0	0	0	0	0	1
NE	10	0	0	0	0	0	10
ENE	8	3	0	0	0	0	11
E	12	3	0	0	0	0	15
ESE	13	0	0	0	0	0	13
SE	13	1	0	0	0	0	14
SSE	7	4	0	0	0	0	11
S	4	1	0	0	0	0	5
SSW	4	0	0	0	0	0	4
SW	3	1	0	0	0	0	4
WSW	6	1	0	0	0	0	7
W	3	0	0	0	0	0	3
WNW	5	0	0	0	0	0	5
NW	3	0	0	0	0	0	3
NNW	4	0	0	0	0	0	4
TOTAL	98	14	0	0	0	0	112

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 5

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/1/10 - 3/31/10
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	1	0	0	0	0	0	1
NNE	1	0	0	0	0	0	1
NE	3	0	0	0	0	0	3
ENE	6	0	0	0	0	0	6
E	10	0	0	0	0	0	10
ESE	19	0	0	0	0	0	19
SE	17	0	0	0	0	0	17
SSE	17	0	0	0	0	0	17
S	10	0	0	0	0	0	10
SSW	8	0	0	0	0	0	8
SW	8	0	0	0	0	0	8
WSW	3	0	0	0	0	0	3
W	4	0	0	0	0	0	4
WNW	3	0	0	0	0	0	3
NW	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
TOTAL	111	0	0	0	0	0	111

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 5

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/1/10 - 3/31/10
STABILITY CLASS: All DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	35	100	37	0	0	0	172
NNE	31	76	10	0	0	0	117
NE	42	76	20	0	0	0	138
ENE	44	62	17	0	0	0	123
E	66	50	18	0	0	0	134
ESE	64	58	5	0	0	0	127
SE	64	39	18	0	0	0	121
SSE	53	42	12	3	0	0	110
S	30	44	29	2	0	0	105
SSW	25	41	26	1	1	0	94
SW	28	57	47	0	0	0	132
WSW	20	50	56	2	0	0	128
W	24	39	9	0	0	0	72
WNW	29	60	12	0	0	0	101
NW	39	135	23	0	0	0	197
NNW	58	184	42	0	0	0	284
TOTAL	652	1113	381	8	1	0	2155

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 5

Hours are not adjusted for Daylight Savings Time

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/1/10 - 6/30/10
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	12	43	7	0	0	0	62
NNE	2	3	0	0	0	0	5
NE	2	11	0	0	0	0	13
ENE	1	12	1	0	0	0	14
E	1	9	2	0	0	0	12
ESE	2	9	5	0	0	0	16
SE	4	23	8	0	0	0	35
SSE	6	34	15	2	0	0	57
S	3	19	8	17	0	0	47
SSW	1	1	7	5	0	0	14
SW	2	35	23	0	0	0	60
WSW	2	20	14	1	0	0	37
W	5	24	0	0	0	0	29
WNW	9	21	1	0	0	0	31
NW	14	24	2	0	0	0	40
NNW	29	85	9	0	0	0	123
TOTAL	95	373	102	25	0	0	595

PERIODS OF CALM(HOURS): 28
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 104

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/1/10 - 6/30/10
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	1	3	1	0	0	0	5
NNE	3	0	0	0	0	0	3
NE	1	3	0	0	0	0	4
ENE	1	0	1	0	0	0	2
E	0	2	1	0	0	0	3
ESE	2	6	1	0	0	0	9
SE	1	2	0	0	0	0	3
SSE	5	2	1	0	0	0	8
S	0	1	1	2	1	0	5
SSW	0	1	2	0	0	0	3
SW	0	1	3	0	0	0	4
WSW	1	2	0	0	0	0	3
W	1	2	0	0	0	0	3
WNW	3	2	2	0	0	0	7
NW	2	2	1	0	0	0	5
NNW	6	3	0	0	0	0	9
TOTAL	27	32	14	2	1	0	76

PERIODS OF CALM(HOURS): 28
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 104

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/1/10 - 6/30/10
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	2	3	0	0	0	0	5
NNE	1	2	0	0	0	0	3
NE	1	3	0	0	0	0	4
ENE	0	1	0	0	0	0	1
E	1	3	0	0	0	0	4
ESE	2	3	0	0	0	0	5
SE	2	4	0	0	0	0	6
SSE	1	1	3	1	0	0	6
S	2	0	0	3	0	0	5
SSW	0	1	4	0	0	0	5
SW	0	3	1	0	0	0	4
WSW	1	2	0	0	0	0	3
W	0	0	0	0	0	0	0
WNW	1	0	1	0	0	0	2
NW	2	1	1	0	0	0	4
NNW	8	5	0	0	0	0	13
TOTAL	24	32	10	4	0	0	70

PERIODS OF CALM(HOURS): 28
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 104

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/1/10 - 6/30/10
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	21	22	2	0	0	0	45
NNE	6	6	0	0	0	0	12
NE	3	5	1	0	0	0	9
ENE	5	5	2	0	0	0	12
E	8	16	3	0	0	0	27
ESE	3	25	11	0	0	0	39
SE	9	16	0	0	0	0	25
SSE	10	4	0	0	0	0	14
S	2	8	34	4	0	0	48
SSW	1	10	11	2	0	0	24
SW	2	13	6	0	0	0	21
WSW	3	10	5	3	0	0	21
W	5	5	0	0	0	0	10
WNW	5	6	0	0	0	0	11
NW	8	13	2	0	0	0	23
NNW	16	17	0	0	0	0	33
TOTAL	107	181	77	9	0	0	374

PERIODS OF CALM(HOURS): 28
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 104

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/1/10 - 6/30/10
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	15	9	0	0	0	0	24
NNE	11	5	0	0	0	0	16
NE	22	3	3	0	0	0	28
ENE	7	7	0	0	0	0	14
E	21	6	0	0	0	0	27
ESE	21	17	3	0	0	0	41
SE	21	17	0	0	0	0	38
SSE	17	13	1	0	0	0	31
S	4	38	6	0	0	0	48
SSW	7	16	5	0	0	0	28
SW	9	33	9	0	0	0	51
WSW	8	20	3	0	0	0	31
W	8	8	2	0	0	0	18
WNW	1	9	3	0	0	0	13
NW	13	7	1	0	0	0	21
NNW	15	12	0	0	0	0	27
TOTAL	200	220	36	0	0	0	456

PERIODS OF CALM(HOURS): 28
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 104

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/1/10 - 6/30/10
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

	WIND SPEED (MPH)						
WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	10	3	0	0	0	0	13
NNE	10	1	0	0	0	0	11
NE	12	2	0	0	0	0	14
ENE	14	3	0	0	0	0	17
E	23	4	2	0	0	0	29
ESE	24	14	6	0	0	0	44
SE	25	10	1	0	0	0	36
SSE	18	10	0	0	0	0	28
S	11	4	1	0	0	0	16
SSW	7	7	2	0	0	0	16
SW	7	4	1	0	0	0	12
WSW	6	0	0	0	0	0	6
W	8	0	1	0	0	0	9
WNW	4	1	0	0	0	0	5
NW	10	1	0	0	0	0	11
NNW	7	1	0	0	0	0	8
TOTAL	196	65	14	0	0	0	275

PERIODS OF CALM(HOURS): 28
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 104

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/1/10 - 6/30/10
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	4	1	0	0	0	0	5
NNE	4	1	0	0	0	0	5
NE	13	0	0	0	0	0	13
ENE	20	0	0	0	0	0	20
E	32	0	0	0	0	0	32
ESE	18	0	0	0	0	0	18
SE	18	0	0	0	0	0	18
SSE	17	0	0	0	0	0	17
S	20	3	2	0	0	0	25
SSW	17	3	1	0	0	0	21
SW	5	2	1	0	0	0	8
WSW	4	0	0	0	0	0	4
W	4	0	0	0	0	0	4
WNW	7	1	0	0	0	0	8
NW	3	0	0	0	0	0	3
NNW	4	1	0	0	0	0	5
TOTAL	190	12	4	0	0	0	206

PERIODS OF CALM(HOURS): 28
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 104

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/1/10 - 6/30/10
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	65	84	10	0	0	0	159
NNE	37	18	0	0	0	0	55
NE	54	27	4	0	0	0	85
ENE	48	28	4	0	0	0	80
E	86	40	8	0	0	0	134
ESE	72	74	26	0	0	0	172
SE	80	72	9	0	0	0	161
SSE	74	64	20	3	0	0	161
S	42	73	52	26	1	0	194
SSW	33	39	32	7	0	0	111
SW	25	91	44	0	0	0	160
WSW	25	54	22	4	0	0	105
W	31	39	3	0	0	0	73
WNW	30	40	7	0	0	0	77
NW	52	48	7	0	0	0	107
NNW	85	124	9	0	0	0	218
TOTAL	839	915	257	40	1	0	2052

PERIODS OF CALM(HOURS): 28
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 104

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/1/10 - 9/30/10
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	15	52	1	0	0	0	68
NNE	6	5	0	0	0	0	11
NE	5	4	0	0	0	0	9
ENE	6	7	0	0	0	0	13
E	4	9	0	0	0	0	13
ESE	6	8	0	0	0	0	14
SE	5	8	0	0	0	0	13
SSE	7	15	0	0	0	0	22
S	9	77	27	0	0	0	113
SSW	5	26	21	0	0	0	52
SW	5	70	19	2	0	0	96
WSW	6	44	7	0	0	0	57
W	11	35	1	0	0	0	47
WNW	12	29	2	0	0	0	43
NW	5	24	0	0	0	0	29
NNW	32	32	0	0	0	0	64
TOTAL	139	445	78	2	0	0	664

PERIODS OF CALM(HOURS): 45
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 21

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/1/10 - 9/30/10
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	4	4	0	0	0	0	8
NNE	0	0	0	0	0	0	0
NE	1	1	0	0	0	0	2
ENE	0	0	0	0	0	0	0
E	2	1	0	0	0	0	3
ESE	0	0	0	0	0	0	0
SE	3	1	0	0	0	0	4
SSE	1	1	0	0	0	0	2
S	6	3	2	0	0	0	11
SSW	0	9	3	0	0	0	12
SW	0	5	1	1	0	0	7
WSW	1	4	1	0	0	0	6
W	1	2	0	0	0	0	3
WNW	1	1	1	0	0	0	3
NW	4	2	0	0	0	0	6
NNW	7	0	0	0	0	0	7
TOTAL	31	34	8	1	0	0	74

PERIODS OF CALM(HOURS): 45
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 21

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/1/10 - 9/30/10
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	4	1	0	0	0	0	5
NNE	1	1	0	0	0	0	2
NE	1	0	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	1	2	0	0	0	0	3
SE	0	0	0	0	0	0	0
SSE	0	1	0	0	0	0	1
S	1	3	5	0	0	0	9
SSW	1	5	5	0	0	0	11
SW	3	2	0	0	0	0	5
WSW	2	0	1	0	0	0	3
W	2	1	0	0	0	0	3
WNW	0	1	0	0	0	0	1
NW	1	0	0	0	0	0	1
NNW	2	0	0	0	0	0	2
TOTAL	20	17	11	0	0	0	48

PERIODS OF CALM(HOURS): 45
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 21

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/1/10 - 9/30/10
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	16	16	2	0	0	0	34
NNE	16	2	0	0	0	0	18
NE	9	1	0	0	0	0	10
ENE	1	1	0	0	0	0	2
E	4	0	0	0	0	0	4
ESE	7	8	0	0	0	0	15
SE	12	1	0	0	0	0	13
SSE	7	2	0	0	0	0	9
S	13	32	7	2	0	0	54
SSW	3	23	22	6	0	0	54
SW	9	9	4	0	0	0	22
WSW	3	4	2	0	0	0	9
W	6	4	6	0	0	0	16
WNW	5	8	4	0	0	0	17
NW	6	9	2	0	0	0	17
NNW	10	10	1	0	0	0	21
TOTAL	127	130	50	8	0	0	315

PERIODS OF CALM(HOURS): 45
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 21

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/1/10 - 9/30/10
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	26	14	0	0	0	0	40
NNE	22	0	0	0	0	0	22
NE	17	0	0	0	0	0	17
ENE	8	0	0	0	0	0	8
E	15	0	0	0	0	0	15
ESE	23	5	0	0	0	0	28
SE	22	4	0	0	0	0	26
SSE	47	8	0	0	0	0	55
S	40	61	5	0	0	0	106
SSW	7	16	4	1	0	0	28
SW	5	21	1	0	0	0	27
WSW	7	8	2	0	0	0	17
W	7	11	1	0	0	0	19
WNW	7	7	1	0	0	0	15
NW	2	4	0	0	0	0	6
NNW	9	6	0	0	0	0	15
TOTAL	264	165	14	1	0	0	444

PERIODS OF CALM(HOURS): 45
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 21

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/1/10 - 9/30/10
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	4	0	0	0	0	0	4
NNE	1	0	0	0	0	0	1
NE	11	0	0	0	0	0	11
ENE	23	0	0	0	0	0	23
E	24	0	0	0	0	0	24
ESE	32	0	0	0	0	0	32
SE	26	1	0	0	0	0	27
SSE	45	0	0	0	0	0	45
S	42	8	0	0	0	0	50
SSW	13	7	0	0	0	0	20
SW	10	7	0	0	0	0	17
WSW	6	3	2	0	0	0	11
W	5	0	0	0	0	0	5
WNW	3	0	0	0	0	0	3
NW	1	0	0	0	0	0	1
NNW	2	0	0	0	0	0	2
TOTAL	248	26	2	0	0	0	276

PERIODS OF CALM(HOURS): 45
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 21

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/1/10 - 9/30/10
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	5	0	0	0	0	0	5
NNE	4	0	0	0	0	0	4
NE	10	0	0	0	0	0	10
ENE	29	0	0	0	0	0	29
E	28	0	0	0	0	0	28
ESE	40	0	0	0	0	0	40
SE	39	0	0	0	0	0	39
SSE	63	1	0	0	0	0	64
S	53	3	0	0	0	0	56
SSW	19	1	1	0	0	0	21
SW	4	0	0	0	0	0	4
WSW	6	1	0	0	0	0	7
W	7	0	0	0	0	0	7
WNW	4	0	0	0	0	0	4
NW	2	0	0	0	0	0	2
NNW	1	0	0	0	0	0	1
TOTAL	314	6	1	0	0	0	321

PERIODS OF CALM(HOURS): 45
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 21

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/1/10 - 9/30/10
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	74	87	3	0	0	0	164
NNE	50	8	0	0	0	0	58
NE	54	6	0	0	0	0	60
ENE	68	8	0	0	0	0	76
E	77	10	0	0	0	0	87
ESE	109	23	0	0	0	0	132
SE	107	15	0	0	0	0	122
SSE	170	28	0	0	0	0	198
S	164	187	46	2	0	0	399
SSW	48	87	56	7	0	0	198
SW	36	114	25	3	0	0	178
WSW	31	64	15	0	0	0	110
W	39	53	8	0	0	0	100
WNW	32	46	8	0	0	0	86
NW	21	39	2	0	0	0	62
NNW	63	48	1	0	0	0	112
TOTAL	1143	823	164	12	0	0	2142

PERIODS OF CALM(HOURS): 45
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 21

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/1/10 - 12/31/10
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	1	31	7	10	0	0	49
NNE	0	7	0	0	0	0	7
NE	1	13	0	0	0	0	14
ENE	0	3	0	0	0	0	3
E	0	7	0	0	0	0	7
ESE	1	1	0	0	0	0	2
SE	2	18	1	0	0	0	21
SSE	0	17	14	0	0	0	31
S	0	20	14	3	0	0	37
SSW	0	2	9	2	1	0	14
SW	1	30	15	3	0	0	49
WSW	0	26	12	0	0	0	38
W	2	14	3	0	0	0	19
WNW	1	12	1	0	0	0	14
NW	1	9	1	0	0	0	11
NNW	3	25	1	2	0	0	31
TOTAL	13	235	78	20	1	0	347

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 0

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/1/10 - 12/31/10
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	1	8	2	1	0	0	12
NNE	0	0	0	0	0	0	0
NE	3	2	0	0	0	0	5
ENE	0	2	0	0	0	0	2
E	2	0	0	0	0	0	2
ESE	0	4	0	0	0	0	4
SE	0	8	0	0	0	0	8
SSE	0	4	4	0	0	0	8
S	2	3	2	1	0	0	8
SSW	1	7	6	0	0	0	14
SW	0	7	8	2	0	0	17
WSW	0	2	4	0	0	0	6
W	0	3	0	0	0	0	3
WNW	0	5	0	0	0	0	5
NW	1	4	2	0	0	0	7
NNW	1	9	1	0	0	0	11
TOTAL	11	68	29	4	0	0	112

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 0

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/1/10 - 12/31/10
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	2	6	3	0	0	0	11
NNE	1	7	0	0	0	0	8
NE	1	1	0	0	0	0	2
ENE	3	0	0	0	0	0	3
E	1	0	0	0	0	0	1
ESE	0	4	3	0	0	0	7
SE	4	8	4	0	0	0	16
SSE	2	12	4	0	0	0	18
S	1	6	6	0	0	0	13
SSW	1	5	3	1	0	0	10
SW	2	5	3	0	0	0	10
WSW	1	4	5	0	0	0	10
W	0	1	1	0	0	0	2
WNW	0	3	2	0	0	0	5
NW	1	9	1	0	0	0	11
NNW	1	8	0	0	0	0	9
TOTAL	21	79	35	1	0	0	136

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 0

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/1/10 - 12/31/10
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	13	39	5	3	0	0	60
NNE	9	27	0	0	0	0	36
NE	9	16	0	0	0	0	25
ENE	11	7	0	0	0	0	18
E	7	5	0	0	0	0	12
ESE	12	23	2	0	0	0	37
SE	12	19	14	1	0	0	46
SSE	11	30	29	2	0	0	72
S	4	30	30	7	0	0	71
SSW	4	24	41	9	0	0	78
SW	2	13	16	5	0	0	36
WSW	3	24	49	9	0	0	85
W	4	8	23	1	0	0	36
WNW	2	30	17	0	0	0	49
NW	9	63	15	0	0	0	87
NNW	8	69	11	0	0	0	88
TOTAL	120	427	252	37	0	0	836

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 0

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/1/10 - 12/31/10
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	24	12	1	1	0	0	38
NNE	18	4	0	0	0	0	22
NE	8	7	0	0	0	0	15
ENE	10	2	0	0	0	0	12
E	11	2	0	0	0	0	13
ESE	7	13	2	0	0	0	22
SE	13	37	17	1	0	0	68
SSE	20	33	4	0	0	0	57
S	8	46	5	2	0	0	61
SSW	3	8	5	2	0	0	18
SW	5	16	3	0	0	0	24
WSW	4	1	0	0	0	0	5
W	1	2	0	0	0	0	3
WNW	4	7	0	0	0	0	11
NW	5	2	0	0	0	0	7
NNW	5	7	0	0	0	0	12
TOTAL	146	199	37	6	0	0	388

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 0

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/1/10 - 12/31/10
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND DIRECTION	WIND SPEED (MPH) 1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	2	1	0	0	0	0	3
NNE	8	0	0	0	0	0	8
NE	15	0	0	0	0	0	15
ENE	13	1	0	0	0	0	14
E	17	0	0	0	0	0	17
ESE	15	2	0	0	0	0	17
SE	20	2	0	0	0	0	22
SSE	27	6	0	0	0	0	33
S	10	21	0	0	0	0	31
SSW	6	0	0	0	0	0	6
SW	2	4	0	0	0	0	6
WSW	1	0	0	0	0	0	1
W	3	0	0	0	0	0	3
WNW	2	0	0	0	0	0	2
NW	1	0	0	0	0	0	1
NNW	2	0	0	0	0	0	2
TOTAL	144	37	0	0	0	0	181

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 0

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/1/10 - 12/31/10
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	4	0	0	0	0	0	4
NNE	1	0	0	0	0	0	1
NE	5	0	0	0	0	0	5
ENE	23	0	0	0	0	0	23
E	21	0	0	0	0	0	21
ESE	14	0	0	0	0	0	14
SE	42	1	0	0	0	0	43
SSE	44	0	0	0	0	0	44
S	28	7	0	0	0	0	35
SSW	8	1	0	0	0	0	9
SW	4	0	0	0	0	0	4
WSW	1	0	0	0	0	0	1
W	2	0	0	0	0	0	2
WNW	1	0	0	0	0	0	1
NW	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
TOTAL	199	9	0	0	0	0	208

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 0

SITE: AEP COOK

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/1/10 - 12/31/10
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED:SP10M DIRECTION:DIR10M LAPSE:DT60M

WIND SPEED (MPH)

WIND DIRECTION	1-4	4-8	8-13	13-19	19-25	>25	TOTAL
N	47	97	18	15	0	0	177
NNE	37	45	0	0	0	0	82
NE	42	39	0	0	0	0	81
ENE	60	15	0	0	0	0	75
E	59	14	0	0	0	0	73
ESE	49	47	7	0	0	0	103
SE	93	93	36	2	0	0	224
SSE	104	102	55	2	0	0	263
S	53	133	57	13	0	0	256
SSW	23	47	64	14	1	0	149
SW	16	75	45	10	0	0	146
WSW	10	57	70	9	0	0	146
W	12	28	27	1	0	0	68
WNW	10	57	20	0	0	0	87
NW	18	87	19	0	0	0	124
NNW	21	118	13	2	0	0	154
TOTAL	654	1054	431	68	1	0	2208

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION: 0
HOURS OF MISSING DATA: 0

Hours are not adjusted for Daylight Savings Time

OFF-SITE DOSE CALCULATION MANUAL

The Off-Site Dose Calculation Manual, PMP-6010-OSD-001, was not revised during this reporting period.