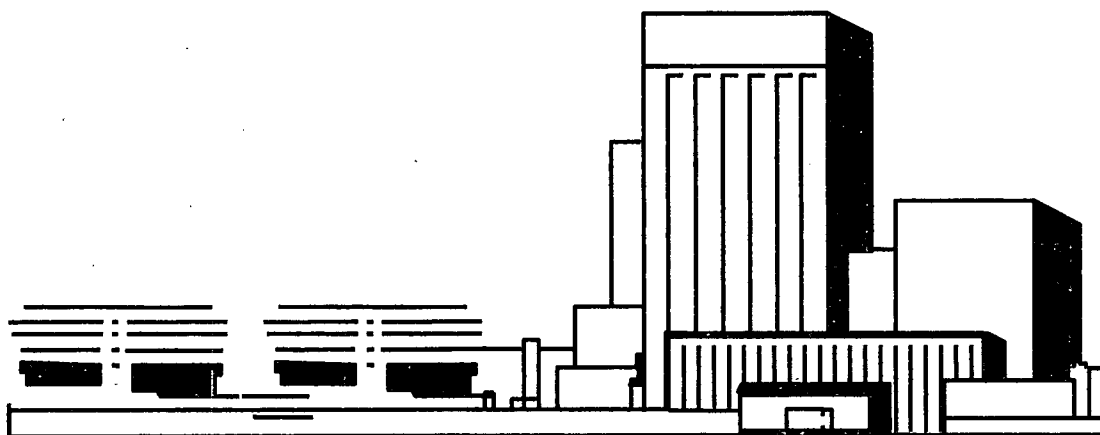


ENERGY NORTHWEST

Columbia Generating Station Annual Radioactive Effluent Release Report

January through December 2009



REFERENCES:
10 CFR 50.36a(a)(2)
10 CFR 72.44(d)(3)
CGS Technical Specification 5.6.2
ISFSI Technical Specification 5.4.c

**Columbia Generating Station
Annual Radioactive Effluent Release Report**

January through December 2009

Energy Northwest

**Submitted
February 2010**

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1.0 Introduction

This report has been prepared in compliance with 10 CFR 50.36a(a)(2), 10 CFR 72.44(d)(3), Independent Spent Fuel Storage Installation (ISFSI) Technical Specification 5.4.c, and Columbia Generating Station Technical Specification 5.6.2. It includes a summary of the quantities of radioactive liquid and gaseous effluents and solid radwaste released from Columbia Generating Station during calendar year 2009. Effluent data is summarized on a quarterly basis.

2.0 Liquid Effluents

No planned releases of contaminated liquids from the liquid radwaste processing system were discharged to the Columbia River from Columbia Generating Station during calendar year 2009. The last planned discharge took place in 1998. There were no known releases of liquid effluents to ground or groundwater.

3.0 Gaseous Effluents

The gaseous radwaste effluents from Columbia Generating Station were released from three (3) release points:

- Main Plant Vent -- mixed mode release
- Turbine Building -- ground level release
- Radwaste Building -- ground level release

The gaseous source terms from each release point are listed in Tables 3-1, 3-2, and 3-3. The activation gas argon-41 is included in these tables under fission gases to allow a match with the fission and activation gas totals of Table 3-4. Table 3-4 provides a summation of the total activity released, the average release rate, gross alpha radioactivity, and the estimated total error associated with the measurements of radioactivity in the gaseous effluents.

Radioactivity measurements for gaseous effluent releases are performed for fission and activation gases by collecting the samples in a Marinelli beaker and analyzing them using gamma spectroscopy. Air is analyzed for tritium by collection of water vapor on a desiccant with subsequent distillation and liquid scintillation counting. Particulates and iodines are sampled continuously and the sample media (particulate filters and charcoal cartridges) are analyzed weekly using gamma spectroscopy. Each quarter a chemical separation process is used to isolate strontium from the composite particulate filters and quantification is accomplished with liquid scintillation detection. The average energy per disintegration of fission and activation gases is not included in this report as it is not required by Technical Specifications and is not used for gaseous effluent release rate limit calculations.

When a radioisotope is not positively identified at levels greater than the Minimum Detectable Activity (MDA), a value of zero is used for release concentrations and offsite dose assessments. Table 3-6 contains the Lower Limit of Detection (LLD) values corresponding to the sampling methods and analytical instruments used for each principal radioisotope.

Dose calculations were performed for releases using the NRC GASPAR II computer program and parameters as defined in the Offsite Dose Calculation Manual (ODCM). Desert sigmas were not used in gaseous plume growth calculations. Throughout this report, the term 'dose' is used as defined in NRC Regulatory Guide 1.109-1977. Quarterly and annual doses to the potentially highest-exposed Member of the Public at and beyond the site boundary were calculated. In addition, quarterly and annual doses were calculated at actual resident locations identified in the annual land use census. ODCM limits are based on Part 20 and Appendix I to Part 50 of Title 10 of the Code of Federal Regulations. The threshold for air dose applies to fission and activation gases and is ten (10) millirad for beta and five (5) millirad for gamma quarterly and twenty (20) millirad for beta and ten (10) millirad for gamma annually. The threshold for organ dose applies to iodine, tritium, and particulates with half-lives greater than eight days and is seven and a half (7.5) millirem quarterly and fifteen (15) millirem annually. For fission and activation gases the dose rate limits are less than or equal to 500 mrem per year to the whole body and less than or equal to 3000 mrem per year to the skin. For iodines, particulates, and tritium the dose rate limit is less than or equal to 1500 mrem/year to any organ.

Dose calculations were also conducted for Members of the Public within the site boundary. The results are discussed and tabulated in Section 6.0.

It is estimated that approximately $3.25E-03$ Curies of tritium were released through unmonitored vents of the heating steam system within and outside the main power block (Turbine, Radwaste, Reactor, and General Services buildings).

No additional spent fuel storage containers (SFSC) were added to the ISFSI facility in calendar year 2009. A total of twenty seven (27) SFSCs were in place in the ISFSI facility at the end of 2009. All SFSCs are Operable and as such are performing as designed. Based on ISFSI Technical Specification 3.1.1, there are no effluents from this facility. There were twelve SFSCs loaded in 2008 that are considered Operable but nonconforming based on communication with the vendor.

Incidents of effluent monitor inoperability greater than 30 days:

During an electrical maintenance and refueling outage in 2009, a large number of effluent monitors were taken out of service. All the monitors were returned to service in about five days except the reactor building effluent monitor. This monitor remained out of service for about 40 days following discovery that the inverter and batteries in the uninterruptible power supply needed to be replaced.

The United States National Council on Radiation Protection published Report #160 in 2009 which can serve to put radiation dose into perspective for the reader of this report. It was determined that the average dose to an individual is 620 mrem/yr. Of this, ~50% is attributed to natural sources (radiation from gaseous radon, cosmic or space radiation, natural radioactive material in the ground, and natural radioactive materials in our bodies). About 48% is attributed to diagnostic and therapeutic medical exposure. Radiation dose from nuclear power was grouped into a category comprising <0.1% of the total.

Gaseous Effluent Tables

Table 3-0 10 CFR Part 50 Appendix I Dose Compliance

Report Period: January -- December 2009

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year*
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Noble Gas

Gamma Air Dose (mrad)	1.24E-02	2.27E-03	1.41E-03	5.35E-03	1.54E-02
ODCM Limit	5	5	5	5	10
% of Limit	2.48E-01	4.54E-02	2.82E-02	1.07E-01	1.54E-01
Beta Air Dose (mrad)	4.57E-03	8.40E-04	4.99E-04	2.10E-03	5.83E-03
ODCM Limit	10	10	10	10	20
% of Limit	4.57E-02	8.40E-03	4.99E-03	2.10E-02	2.92E-02

Iodine-131, Iodine-133, Tritium, and Particulates with half-lives greater than eight days.

Organ Dose (mrem)	1.36E-02	3.06E-03	1.79E-03	6.08E-03	1.84E-02
ODCM Limit	7.5	7.5	7.5	7.5	15
% of Limit	1.82E-01	4.07E-02	2.39E-02	8.11E-02	1.22E-01

* Calculated quarterly doses cannot be directly compared to the annual doses. Each above listed quarterly dose is the highest calculated dose based on a number of variables. Variables that make comparison difficult include location, meteorological data (quarterly joint frequency distribution (JFD) tables vs. annual JFD tables), receptor age, target organ, and characteristics of the emitted radionuclides.

**Table 3-1 Main Plant Vent Releases
Fission Gases and Iodines**

Report Period: January -- December 2009

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
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A. Fission gases

krypton-85	<MDA	<MDA	<MDA	<MDA	<MDA
krypton-85m	1.39E+00	<MDA	<MDA	<MDA	1.39E+00
krypton-87	<MDA	<MDA	<MDA	<MDA	<MDA
krypton-88	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-133	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-133m	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-135	3.27E+00	1.04E+00	2.32E-02	3.36E+00	7.70E+00
xenon-135m	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-138	<MDA	<MDA	<MDA	<MDA	<MDA
Others					
argon-41	4.81E+01	1.11E+01	5.77E+00	1.58E+01	8.08E+01
Total for period *	5.28E+01	1.22E+01	5.79E+00	1.92E+01	8.99E+01

B. Iodines

iodine-131	4.43E-06	5.46E-07	2.55E-06	2.16E-06	9.69E-06
iodine-132	<MDA	<MDA	<MDA	<MDA	<MDA
iodine-133	1.61E-05	<MDA	<MDA	<MDA	1.61E-05
iodine-134	<MDA	<MDA	<MDA	<MDA	<MDA
iodine-135	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period *	2.05E-05	5.46E-07	2.55E-06	2.16E-06	2.57E-05

MDA = Less than the "a posteriori" minimal detectable activity (microcuries per unit mass or volume).

* MDA values are not included in the totals.

**Table 3-1 Main Plant Vent Releases (Continued)
Particulates and Tritium**

Report Period: January -- December 2009

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
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C. Particulates

strontium-89	<MDA	<MDA	8.27E-08	1.30E-06	1.39E-06
strontium-90	<MDA	<MDA	3.96E-07	<MDA	3.96E-07
cesium-134	<MDA	<MDA	<MDA	<MDA	<MDA
cesium-137	2.60E-06	<MDA	<MDA	<MDA	2.60E-06
barium-lanthanum-140	<MDA	<MDA	<MDA	<MDA	<MDA
silver-110m	<MDA	<MDA	<MDA	<MDA	<MDA
cerium-141	<MDA	<MDA	<MDA	<MDA	<MDA
cerium-144	<MDA	<MDA	<MDA	<MDA	<MDA
cobalt-58	3.26E-06	1.65E-05	<MDA	<MDA	1.98E-05
cobalt-60	2.54E-05	1.06E-04	1.85E-05	6.71E-06	1.57E-04
iron-59	<MDA	<MDA	<MDA	<MDA	<MDA
manganese-54	<MDA	1.83E-05	8.59E-07	<MDA	1.92E-05
zinc-65	1.93E-05	7.60E-05	4.37E-05	2.00E-06	1.41E-04
chrome-51	<MDA	4.75E-05	<MDA	<MDA	4.75E-05
antimony-125	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period*	5.06E-05	2.65E-04	6.36E-05	1.00E-05	3.89E-04
Others with T 1/2 < 8 days					
arsenic-76	<MDA	<MDA	<MDA	<MDA	<MDA
bromine-82	<MDA	<MDA	<MDA	<MDA	<MDA
copper-64	<MDA	<MDA	<MDA	<MDA	<MDA
molybdenum-99	<MDA	<MDA	<MDA	<MDA	<MDA
rhenium-188	<MDA	<MDA	<MDA	<MDA	<MDA
sodium-24	<MDA	<MDA	<MDA	<MDA	<MDA
technetium-99m	<MDA	<MDA	<MDA	<MDA	<MDA
zinc-69m	<MDA	<MDA	<MDA	<MDA	<MDA
Total with T 1/2 < 8 days*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

D. Tritium

tritium	4.34E-01	3.55E-01	4.35E-01	4.87E-01	1.71E+00
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MDA = Less than the "a posteriori" minimal detectable activity (microcuries per unit mass or volume).

* MDA values are not included in the totals.

**Table 3-2 Turbine Building Releases
Fission Gases and Iodines**

Report Period: January -- December 2009

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
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A. Fission gases

krypton-85	<MDA	<MDA	<MDA	<MDA	<MDA
krypton-85m	<MDA	<MDA	<MDA	<MDA	<MDA
krypton-87	<MDA	<MDA	<MDA	<MDA	<MDA
krypton-88	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-133	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-133m	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-135	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-135m	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-138	<MDA	<MDA	<MDA	<MDA	<MDA
Others					
argon-41	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period *	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

B. Iodines

iodine-131	4.26E-05	4.13E-05	<MDA	<MDA	8.39E-05
iodine-132	<MDA	<MDA	<MDA	<MDA	<MDA
iodine-133	1.11E-04	5.66E-05	<MDA	<MDA	1.68E-04
iodine-134	<MDA	<MDA	<MDA	<MDA	<MDA
iodine-135	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period *	1.54E-04	9.79E-05	0.00E+00	0.00E+00	2.52E-04

MDA = Less than the "a posteriori" minimal detectable activity (microcuries per unit mass or volume).

* MDA values are not included in the totals.

**Table 3-2 Turbine Building Releases (Continued)
Particulates and Tritium**

Report Period: January -- December 2009

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
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C. Particulates

strontium-89	1.81E-05	2.40E-06	5.91E-06	9.86E-06	3.63E-05
strontium-90	<MDA	1.17E-06	<MDA	<MDA	1.17E-06
cesium-134	<MDA	<MDA	<MDA	<MDA	<MDA
cesium-137	<MDA	<MDA	<MDA	<MDA	<MDA
barium-lanthanum-140	<MDA	<MDA	<MDA	<MDA	<MDA
cerium-141	<MDA	<MDA	<MDA	<MDA	<MDA
cerium-144	<MDA	<MDA	<MDA	<MDA	<MDA
cobalt-58	<MDA	<MDA	<MDA	<MDA	<MDA
cobalt-60	<MDA	2.22E-05	1.93E-05	<MDA	4.15E-05
iron-59	<MDA	<MDA	<MDA	<MDA	<MDA
manganese-54	<MDA	<MDA	<MDA	<MDA	<MDA
zinc-65	<MDA	8.09E-06	<MDA	<MDA	8.09E-06
chrome-51	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period*	1.81E-05	3.39E-05	2.52E-05	9.86E-06	8.70E-05
Others with T 1/2 < 8 days molybdenum-99	<MDA	<MDA	<MDA	<MDA	<MDA
Total with T 1/2 < 8 days*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

D. Tritium

tritium	6.36E+00	4.15E+00	1.80E+00	5.85E+00	1.82E+01
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MDA = Less than the "a posteriori" minimal detectable activity (microcuries per unit mass or volume).

* MDA values are not included in the totals.

**Table 3-3 Radwaste Building Releases
Fission Gases and Iodines**

Report Period: January -- December 2009

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
-------------------	------------------------	------------------------	------------------------	------------------------	--------------

A. Fission gases

krypton-85	<MDA	<MDA	<MDA	<MDA	<MDA
krypton-85m	<MDA	<MDA	<MDA	<MDA	<MDA
krypton-87	<MDA	<MDA	<MDA	<MDA	<MDA
krypton-88	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-133	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-133m	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-135	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-135m	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-138	<MDA	<MDA	<MDA	<MDA	<MDA
Others					
argon-41	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period *	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

B. Iodines

iodine-131	5.69E-07	<MDA	<MDA	<MDA	5.69E-07
iodine-132	<MDA	<MDA	<MDA	<MDA	<MDA
iodine-133	<MDA	<MDA	<MDA	<MDA	<MDA
iodine-134	<MDA	<MDA	<MDA	<MDA	<MDA
iodine-135	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period *	5.69E-07	0.00E+00	0.00E+00	0.00E+00	5.69E-07

MDA = Less than the "a posteriori" minimal detectable activity (microcuries per unit mass or volume).

* MDA values are not included in the totals.

**Table 3-3 Radwaste Building Releases (Continued)
Particulates and Tritium**

Report Period: January -- December 2009

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
-------------------	------------------------	------------------------	------------------------	------------------------	--------------

C. Particulates

strontium-89	3.60E-07	1.97E-07	1.05E-06	2.32E-07	1.84E-06
strontium-90	<MDA	<MDA	<MDA	<MDA	<MDA
cesium-134	<MDA	<MDA	<MDA	<MDA	<MDA
cesium-137	<MDA	<MDA	<MDA	<MDA	<MDA
barium-lanthanum-140	<MDA	<MDA	<MDA	<MDA	<MDA
cerium-141	<MDA	<MDA	<MDA	<MDA	<MDA
cerium-144	<MDA	<MDA	<MDA	<MDA	<MDA
cobalt-58	<MDA	<MDA	<MDA	<MDA	<MDA
cobalt-60	<MDA	<MDA	5.04E-07	4.29E-07	9.33E-07
iron-59	<MDA	<MDA	<MDA	<MDA	<MDA
manganese-54	<MDA	<MDA	<MDA	<MDA	<MDA
zinc-65	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period*	3.60E-07	1.97E-07	1.55E-06	6.60E-07	2.77E-06
Others with T 1/2 < 8 days molybdenum-99	<MDA	<MDA	<MDA	<MDA	<MDA
Total with T 1/2 < 8 days*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

D. Tritium

tritium	8.43E-02	6.43E-02	5.38E-02	6.95E-02	2.72E-01
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MDA = Less than the "a posteriori" minimal detectable activity (microcuries per unit mass or volume).

* MDA values are not included in the totals.

**Table 3-4 Summation of Releases
Gaseous Effluents**

Report Period: January -- December 2009

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year	Est* Total %Error
A. Fission and activation gases						
Total release (Ci)	5.28E+01	1.22E+01	5.79E+00	1.92E+01	8.99E+01	4.30E+01
Average release rate (µCi/s)	6.71E+00	1.55E+00	7.36E-01	2.44E+00	2.86E+00	
Percent of ODCM limit (%)	1.00E-02	1.76E-03	1.08E-03	4.08E-03	4.08E-03	
B. Iodines						
Total I-131 (Ci)	4.76E-05	4.19E-05	2.55E-06	2.16E-06	9.42E-05	4.60E+01
Average release rate (µCi/s)	6.05E-06	5.33E-06	3.24E-07	2.75E-07	2.99E-06	
Percent of ODCM limit (%)	6.96E-06	3.53E-06	2.87E-07	3.23E-07	2.35E-06	
C. Particulates						
Particulates with half-lives >8 days (Ci)	6.90E-05	2.99E-04	9.03E-05	2.05E-05	4.79E-04	4.50E+01
Average release rate (µCi/s)	8.78E-06	3.80E-05	1.15E-05	2.61E-06	1.52E-05	
Percent of ODCM limit (%)	1.97E-06	6.22E-06	2.50E-06	1.02E-06	3.23E-06	
Gross alpha radioactivity (Ci)	1.10E-06	4.09E-06	1.43E-06	7.74E-07	7.40E-06	7.30E+01
D. Tritium						
Total release (Ci)	6.88E+00	4.57E+00	2.29E+00	6.40E+00	2.01E+01	2.60E+01
Average release rate (µCi/s)	8.75E-01	5.81E-01	2.91E-01	8.14E-01	6.40E-01	
Percent of ODCM limit (%)	7.68E-05	3.37E-05	1.03E-05	3.33E-05	2.11E-05	

MDA = Less than the "a posteriori" minimal detectable activity (microcuries per unit mass or volume).

ODCM release rate limits are based on dose rate. For fission and activation gases the dose rate limits are less than or equal to 500 mrem/year to the whole body and less than or equal to 3000 mrem/year to the skin. For I-131, particulates, and tritium the dose rate limit is less than or equal to 1500 mrem/year to any organ. The ODCM dose factors and the highest site boundary dispersion value for each period were used in the calculation.

* Measurement errors are sample-specific. The values reported represent an approximate overall error. The major contributors of this error are measurements associated with sample volume and release point flow rates and estimates of plateout factors.

Table 3-5 Gaseous Purges and Vents

Report Period: January -- December 2009

Type	Number	Total Time (hr.)	Maximum Time (hr.)	Minimum Time (hr.)	Mean Time (hr.)
Purge	5.00E+00	1.60E+02	4.08E+01	2.42E+01	3.20E+01
Vent	1.10E+01	2.12E+01	6.20E+00	7.33E-01	1.92E+00

Columbia Generating Station is a continuous release plant. All purges and vents are discharged through the Standby Gas Treatment System and released through the reactor building stack that is sampled and continuously monitored for radioactive gaseous waste.

**Table 3-6 Lower Limits of Detection
Gaseous Effluents**

Report Period: January -- December 2009

Fission Gases

Nuclide	Required LLD [†] ($\mu\text{Ci/cc}$)	Achieved Analysis LLD ($\mu\text{Ci/cc}$)
krypton-87	1.00E-04	1.05E-08
krypton-88	1.00E-04	1.29E-08
xenon-133	1.00E-04	1.00E-08
xenon-133m	1.00E-04	3.25E-08
xenon-135	1.00E-04	3.77E-09
xenon-138	1.00E-04	4.48E-08

Iodines

iodine-131	1.00E-12	6.04E-14
iodine-133	1.00E-10	1.28E-12

Particulates

strontium-89	1.00E-11	1.16E-14
strontium-90	1.00E-11	5.12E-15
cesium-134	1.00E-11	5.11E-14
cesium-137	1.00E-11	4.70E-14
molybdenum-99	1.00E-11	9.12E-13
cerium-141	1.00E-11	4.88E-14
cerium-144	1.00E-11	1.97E-13
cobalt-58	1.00E-11	4.44E-14
cobalt-60	1.00E-11	7.86E-14
iron-59	1.00E-11	1.07E-13
manganese-54	1.00E-11	4.56E-14
zinc-65	1.00E-11	1.01E-13
Gross Alpha	1.00E-11	9.01E-16

Tritium

hydrogen-3	1.00E-06	5.85E-11
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[†] From ODCM Table 6.2.2.1-1

4.0 Solid Radwaste

This section of the annual effluent report provides information required by both the Columbia Generating Station Offsite Dose Calculation Manual and by Nuclear Regulatory Commission Regulatory Guide 1.21-1974.

Solid Radwaste Information required by the Offsite Dose Calculation Manual

January -- December 2009

Class A

1. Container Volumes

5 GAL PAIL	1 ft ³
8 GAL DRUM	1.6 ft ³
30 GAL DRUM	4.0 ft ³
55 GAL DRUM	7.5 ft ³
B-25 Steel Box	96 ft ³
B-88 Steel Box	109 ft ³
EL-142 Polyethylene HIC	132.4 ft ³
B-25 Overpack Steel Box	138 ft ³
ES-190 Steel Liner	170.2 ft ³
14-170 WM Steel Liner	180.0 ft ³

2. Total Curies

3.12E+02 Ci

3. Principal Radionuclides

Nuclide	Curies	Percent
Co-60	1.27E+02	4.05E+01
Zn-65	9.32E+01	2.98E+01
Fe-55	5.04E+01	1.61E+01
Mn-54	1.48E+01	4.75E+00
Ni-63	1.29E+01	4.14E+00
Co-58	5.88E+00	1.88E+00
C-14	3.44E+00	1.10E+00
Cr-51	2.29E+00	7.33E-01
Cs-137	8.52E-01	2.73E-01
Ag-110m	6.85E-01	2.19E-01
Ni-59	4.21E-01	1.35E-01

Fe-59	2.77E-01	8.87E-02
Nb-95	1.06E-01	3.39E-02
Sr-89	1.03E-01	3.28E-02
H-3	8.65E-02	2.77E-02
Zr-95	6.95E-02	2.22E-02
La-140	6.18E-02	1.98E-02
Ba-140	5.84E-02	1.87E-02
Sb-124	5.70E-02	1.82E-02
I-131	4.70E-02	1.50E-02
Sb-125	3.76E-02	1.20E-02
Sr-90	2.59E-02	8.29E-03
Pu-241	4.26E-03	1.36E-03

4. Source

Resins	3.07E+02 Ci
DAW	5.05E+00 Ci
Irradiated Components	0.00E+00 Ci
Other (Sealed Source & Mixed Waste)	2.58E-03 Ci

5. Type of Container

All containers shipped as Limited Quantity, LSA, SCO or Radioactive material in IP-1, IP-2, Type A, or Type B (including casks) as appropriate.

6. Solidification Agent

None

Class B

There were no Class B shipments made during calendar year 2009

Class C

There were no Class C shipments made during calendar year 2009

Solid Radwaste Information required by NRC Regulatory Guide 1.21

January -- December 2009

Solid waste shipped offsite for burial or disposal (not irradiated fuel).

1. Type of Waste

Waste Stream	Unit	Annual Cumulative	Est. Total Error %
a. Spent resins, filter sludge, evaporator bottoms, etc.	m ³	2.04E+02	
	Ci	3.07E+02	2.5E+01%
b. Dry Active Waste	m ³	2.56E+02	
	Ci	5.05E+00	2.5E+01%
c. Irradiated Components	m ³	0.00E+00	
	Ci	0.00E+00	None
d. Other Waste (Sealed Source & mixed waste)	m ³	7.11E-01	
	Ci	2.57E-03	2.5E+01%

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

a. Dewatered Spent Resins -- All Classes

Nuclide	Curies	Percent
Co-60	1.25E+02	4.07E+01
Zn-65	9.18E+01	2.98E+01
Fe-55	5.03E+01	1.63E+01
Mn-54	1.47E+01	4.77E+00
Ni-63	1.29E+01	4.21E+00
Co-58	5.21E+00	1.69E+00
C-14	3.44E+00	1.12E+00
Cr-51	1.38E+00	4.47E-01
Cs-137	7.96E-01	2.59E-01
Ag-110m	6.66E-01	2.16E-01
Ni-59	4.21E-01	1.37E-01
Fe-59	2.77E-01	8.99E-02
Sr-89	8.78E-02	2.85E-02
H-3	8.46E-02	2.75E-02
Nb-95	6.61E-02	2.15E-02
La-140	6.18E-02	2.01E-02
Ba-140	5.84E-02	1.90E-02
I-131	4.70E-02	1.53E-02

b. Dry Active Waste (DAW) -- All Classes

Nuclide	Curies	Percent
Co-60	1.63E+00	3.23E+01
Zn-65	1.35E+00	2.67E+01
Cr-51	9.10E-01	1.80E+01
Co-58	6.73E-01	1.33E+01
Mn-54	1.41E-01	2.79E+00
Fe-55	9.53E-02	1.89E+00
Cs-137	5.61E-02	1.11E+00
Zr-95	4.08E-02	8.08E-01
Nb-95	3.98E-02	7.88E-01
Sb-125	3.58E-02	7.10E-01
Ni-63	2.97E-02	5.88E-01
Ag-110m	1.88E-02	3.72E-01
Sr-89	1.47E-02	2.90E-01
Sb-124	1.36E-02	2.69E-01
H-3	1.94E-03	3.84E-02
C-14	8.06E-04	1.60E-02
Sr-90	3.16E-04	6.26E-03
Am-241	3.20E-05	6.33E-04

c. Irradiated Components
None

d. Other Waste (Sealed Source & Mixed Waste)

Nuclide	Curies	Percent
Co-60	2.29E-03	8.89E+01
Fe-55	1.34E-04	5.19E+00
Zn-65	8.54E-05	3.32E+00
Ni-63	4.17E-05	1.62E+00
Sr-89	1.95E-05	7.58E-01
H-3	2.67E-06	1.04E-01
Mn-54	1.18E-06	4.60E-02
C-14	1.14E-06	4.43E-02

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
31	Tractor - Trailer via Public Highway	US Ecology, Inc. P.O. Box 638 Hanford Reservation Richland, WA. 99352
1*	Tractor - Trailer via Public Highway	Perma-Fix of Fla 1940 N.W. 67th Pl Gainesville, FL 32653

(* After processing portions of this shipment may be forwarded for disposal.)

Irradiated Fuel Shipments (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
None	N/A	N/A

5.0 Meteorological Data

The meteorological data contained in Tables 5-1 through 5-10 was obtained from the meteorological tower located 2500 feet (762 m) west of Columbia Generating Station. Data was recovered from instruments at the 33-foot (10 meter) and 245-foot (75 meter) levels. The meteorological data is a composite file generated from the automated data recovery systems for the calendar year 2009. Data is archived on the Energy Northwest Local Area Network.

Joint data recovery for 2009 was 91.1% from the 33-foot level and 97.4% from the 245-foot level. Redundant wind and temperature sensors are installed at both levels of the meteorological tower. Data from the two systems is mixed to permit maximum data recovery for defined date ranges.

The data in Tables 5-1 through 5-8 lists the joint frequency distributions at the 33-foot and 245-foot levels by quarter for 2009. These tables show the total hours at various wind speeds for each sector and stability class. The NRC stability classes A through G and eleven wind speed categories along with the 16 wind direction sectors were used to prepare each joint frequency table. Table 5-9 and 5-10 list the annual joint frequency distributions for those levels for 2009.

Wind speed is measured in miles per hour in the following tables and speeds below 1.0MPH were recorded as calms.

Atmospheric factors which affect dispersion and deposition of gaseous effluents as measured or documented at the Hanford Meteorological Station were snow (13.9 inches total which fell in January, February, and December), total precipitation (5.47 inches), dust or blowing dust (3 days), fog (42 days), and thunderstorms (3 days). No atmospheric smoke was noted on the Hanford Site in 2009.

Rainfall as recorded at the Columbia Generating Station meteorological tower was 3.13 inches.

Joint Frequency Distribution Tables for 2009

Table 5-1 1st Quarter Average, 33 Ft Above Ground Level AGL)

Sensor Criteria		Time Frame	Data Recovery Rate		
Wind Speed:	33 Foot Sensors	Starting Date:	1/1/2009	Maximum Hours In Period:	2160
Wind Direction:	33 Foot Sensors	Ending Date:	3/31/2009	Hours Missing:	31
Delta T:	245 Foot - 33 Foot Sensors			Hours Used:	2129
Signal Path:	MET B			Recovery Rate:	98.6%
Processing:	Instantaneous				

Wind Speed		STABILITY CLASS: A														TOTAL		
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW		NW	NNW
1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.5	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.7	9	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
8.9	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.2	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.4	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17.9	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.4	29	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
29.1	40	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	4
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		0	1	0	0	0	0	0	0	0	1	1	0	1	3	1	0	8

Wind Speed		STABILITY CLASS: B														TOTAL		
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW		NW	NNW
1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2.2	5	1	3	1	0	0	0	0	0	0	0	1	0	0	0	0	0	6
4.5	7	0	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	4
6.7	9	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6
8.9	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.2	13	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13.4	18	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
17.9	22	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	5
22.4	29	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	3
29.1	40	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		5	7	4	0	0	0	0	0	0	2	6	1	2	1	0	0	28

Wind Speed		STABILITY CLASS: C														TOTAL		
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW		NW	NNW
1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4
2.2	5	3	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1	7
4.5	7	1	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	13
6.7	9	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8.9	11	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
11.2	13	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
13.4	18	2	0	0	0	0	0	0	0	0	2	3	0	0	0	2	2	11
17.9	22	0	0	0	0	0	0	0	0	0	2	1	1	1	0	2	0	7
22.4	29	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
29.1	40	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		11	10	8	2	0	0	0	0	0	7	5	2	1	0	5	3	54

Wind Speed		STABILITY CLASS: D														TOTAL		
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW		NW	NNW
1	2	5	8	9	7	1	6	2	4	4	2	1	3	1	3	5	15	76
2.2	5	25	14	11	2	2	0	6	8	9	9	5	5	5	12	28	50	191
4.5	7	31	9	6	0	0	0	0	9	10	13	2	3	6	7	27	41	164
6.7	9	14	5	1	0	0	0	3	12	13	11	2	1	2	5	11	34	114
8.9	11	5	0	1	0	0	0	1	6	7	13	3	1	1	4	9	13	64
11.2	13	2	0	0	0	0	0	0	0	9	12	3	0	1	1	6	3	37
13.4	18	1	0	0	0	0	0	0	3	3	11	6	4	3	1	2	9	43
17.9	22	0	0	0	0	0	0	0	0	0	7	6	2	1	1	1	0	18
22.4	29	0	0	0	0	0	0	0	0	0	4	3	1	1	2	3	0	14
29.1	40	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		83	36	28	9	3	6	12	42	55	83	31	20	21	36	93	165	723

Table 5-1 1st Quarter Average, 33 Ft AGL (Continued)

Wind Speed		STABILITY CLASS: E																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2	4	5	3	4	1	1	3	1	4	5	0	3	6	8	8	6	62
2.2	5	30	7	8	3	0	0	3	5	14	12	3	6	8	10	21	37	167
4.5	7	6	5	8	2	0	0	3	8	13	6	5	7	2	1	33	23	122
6.7	9	4	0	0	3	0	0	3	10	11	6	4	5	5	6	18	6	81
8.9	11	0	0	1	0	0	0	1	8	14	8	8	3	3	10	16	8	80
11.2	13	0	0	1	0	0	0	0	6	3	14	5	0	1	2	1	4	37
13.4	18	0	0	0	0	0	0	0	4	4	17	12	3	1	5	6	2	54
17.9	22	0	0	0	0	0	0	0	0	0	14	7	1	0	5	4	0	31
22.4	29	0	0	0	0	0	0	0	0	0	6	6	3	0	0	0	0	15
29.1	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		44	17	21	12	1	1	13	42	63	88	52	31	26	47	107	86	651

Wind Speed		STABILITY CLASS: F																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2	4	4	6	1	2	0	0	4	4	2	2	6	5	4	15	12	71
2.2	5	16	5	4	0	0	0	2	3	10	10	6	2	3	6	13	18	98
4.5	7	5	8	4	3	0	0	1	5	13	9	2	5	2	3	8	10	78
6.7	9	0	0	2	1	0	0	0	4	13	5	3	0	2	7	5	3	45
8.9	11	2	0	1	0	0	0	1	6	11	3	2	1	1	3	7	2	40
11.2	13	0	0	0	0	0	0	0	7	5	1	1	0	0	0	0	0	14
13.4	18	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	4
17.9	22	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
22.4	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		27	17	17	5	2	0	4	29	57	33	17	14	13	23	48	45	351

Wind Speed		STABILITY CLASS: G																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2	10	2	1	0	0	0	2	1	3	4	1	2	0	2	8	13	49
2.2	5	6	1	1	0	0	0	2	5	6	5	2	2	0	2	7	18	57
4.5	7	1	0	0	0	0	0	0	3	10	1	3	0	0	1	6	4	29
6.7	9	0	1	5	0	0	0	0	4	5	3	1	0	0	1	2	1	23
8.9	11	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	14
11.2	13	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
13.4	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17.9	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.4	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		17	4	7	0	0	0	4	21	32	13	7	4	0	6	23	36	174

Wind Speed		STABILITY CLASS: ALL																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2	25	20	20	13	4	7	7	10	15	13	4	14	12	17	36	46	263
2.2	5	81	32	25	5	2	0	13	21	39	37	17	15	16	30	69	124	526
4.5	7	44	30	24	6	0	0	4	25	46	29	12	15	11	12	74	78	410
6.7	9	23	8	11	4	0	0	6	30	42	25	10	6	9	20	36	44	274
8.9	11	9	0	4	0	0	0	3	27	39	24	13	5	5	17	32	23	201
11.2	13	2	2	1	0	0	0	0	14	18	29	9	0	2	3	7	7	94
13.4	18	3	0	0	0	0	0	0	7	8	32	23	7	4	6	10	13	113
17.9	22	0	0	0	0	0	0	0	0	0	26	17	4	2	6	7	0	62
22.4	29	0	0	0	0	0	0	0	0	0	11	9	6	2	4	3	0	35
29.1	40	0	0	0	0	0	0	0	0	0	1	5	0	1	1	3	0	11
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		187	92	85	28	6	7	33	134	207	227	119	72	64	116	277	335	1989

	A	B	C	D	E	F	G	TOTALS
CALM	0	0	0	44	38	38	20	140

Occurrence of stability class on a percentage basis

- A. 0.4%
- B. 1.3%
- C. 2.5%
- D. 36.0%
- E. 32.4%
- F. 18.3%
- G. 9.1%

Table 5-2 1st Quarter Average, 245 Ft AGL

Sensor Criteria		Time Frame	Data Recovery Rate		
Wind Speed:	245 Foot Sensors	Starting Date:	1/1/2009	Maximum Hours In Period:	2160
Wind Direction:	245 Foot Sensors	Ending Date:	3/31/2009	Hours Missing:	12
Delta T:	245 Foot - 33 Foot Sensors			Hours Used:	2148
Signal Path:	MET B			Recovery Rate:	99.4%
Processing:	Instantaneous				

Wind Speed		STABILITY CLASS: A																	TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.5	6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.7	8.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
8.9	11.2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11.2	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	3
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	2
TOTALS		0	1	0	0	0	0	0	0	0	0	0	2	0	1	3	1	0	8

Wind Speed		STABILITY CLASS: B																	TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2.2	4.5	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4.5	6.7	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	4
6.7	8.9	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8.9	11.2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
11.2	13.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17.9	22.4	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	5
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	2
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	3
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		4	6	5	1	0	0	0	0	0	0	2	5	2	2	1	0	0	28

Wind Speed		STABILITY CLASS: C																	TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2.2	4.5	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	5
4.5	6.7	2	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	12
6.7	8.9	1	2	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	6
8.9	11.2	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
11.2	13.4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
13.4	17.9	1	1	0	0	0	0	0	0	0	0	2	0	0	0	0	2	3	9
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	5	1	1	0	1	0	8
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	4
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		8	7	11	3	0	0	0	0	0	0	5	6	3	1	0	5	5	54

Wind Speed		STABILITY CLASS: D																	TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	3	5	8	7	3	0	6	2	3	6	2	1	2	3	2	6	59	
2.2	4.5	26	14	8	5	4	6	4	7	4	9	5	7	3	10	14	25	151	
4.5	6.7	38	15	8	1	0	0	0	4	11	13	5	4	5	4	20	50	178	
6.7	8.9	20	5	2	2	0	0	1	9	15	7	3	3	2	4	12	38	123	
8.9	11.2	9	1	2	0	0	0	3	5	5	16	4	2	1	4	19	21	92	
11.2	13.4	6	0	0	0	0	0	0	1	5	12	4	0	2	4	7	6	47	
13.4	17.9	5	0	0	0	0	0	0	1	6	11	8	1	2	2	9	7	52	
17.9	22.4	0	0	0	0	0	0	0	2	2	4	7	6	1	3	1	2	28	
22.4	29.1	0	0	0	0	0	0	0	0	0	5	5	2	2	2	2	0	18	
29.1	40.3	0	0	0	0	0	0	0	0	0	1	2	2	0	0	3	0	8	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS		107	40	28	15	7	6	14	31	51	84	45	28	20	36	89	155	756	

Table 5-2 1st Quarter Average, 245 Ft AGL (Continued)

Wind Speed			STABILITY CLASS: E															
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	3	1	2	3	4	2	5	2	2	2	0	3	0	2	1	2	34
2.2	4.5	10	6	4	4	4	0	2	6	8	8	5	8	0	5	9	12	91
4.5	6.7	16	9	10	5	1	0	1	1	8	5	5	4	4	3	12	23	107
6.7	8.9	10	4	2	2	0	0	1	5	5	6	3	2	2	3	16	14	75
8.9	11.2	6	3	1	0	0	0	1	1	5	8	4	2	4	3	20	12	70
11.2	13.4	5	2	1	0	0	0	3	2	3	11	5	2	6	2	27	7	76
13.4	17.9	1	0	1	0	0	0	0	4	10	16	17	2	3	10	25	14	103
17.9	22.4	2	0	0	0	0	0	0	3	4	18	21	3	0	4	5	1	61
22.4	29.1	0	0	0	0	0	0	0	0	0	7	21	2	2	9	8	0	49
29.1	40.3	0	0	0	0	0	0	0	0	0	0	10	3	0	0	0	0	13
40.3	90	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTALS		53	25	21	14	9	2	13	24	45	81	92	31	21	41	123	85	680

Wind Speed			STABILITY CLASS: F															
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	3	2	1	2	2	1	2	3	2	0	5	1	2	0	1	3	30
2.2	4.5	9	7	5	4	1	4	5	8	8	3	2	1	6	3	3	9	78
4.5	6.7	3	8	12	4	0	0	1	4	7	8	5	3	1	2	5	0	63
6.7	8.9	5	8	9	3	0	0	1	3	11	7	4	1	3	3	2	6	66
8.9	11.2	3	3	5	0	0	0	1	4	9	3	0	1	2	2	5	8	46
11.2	13.4	2	0	0	0	0	0	0	3	2	11	3	1	0	4	5	4	35
13.4	17.9	2	0	2	0	0	0	0	2	9	10	2	0	1	9	8	6	51
17.9	22.4	0	0	0	0	0	0	0	2	2	4	2	0	0	1	3	0	14
22.4	29.1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		27	28	34	13	3	5	10	29	50	46	26	8	15	24	32	36	386

Wind Speed			STABILITY CLASS: G															
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	0	1	0	0	1	0	0	0	0	2	1	1	1	0	0	0	8
2.2	4.5	3	7	6	2	1	1	4	7	3	11	1	3	2	3	1	1	56
4.5	6.7	5	9	3	0	1	0	0	5	6	7	4	0	0	0	0	6	46
6.7	8.9	4	3	2	1	0	0	0	5	4	2	4	0	0	0	1	5	31
8.9	11.2	3	0	0	1	0	0	0	0	4	4	0	1	1	0	1	1	16
11.2	13.4	0	0	1	0	0	0	0	0	1	5	2	0	1	1	3	3	17
13.4	17.9	0	0	0	0	0	0	0	2	5	6	1	0	0	0	2	0	16
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		15	20	12	4	3	1	4	19	25	36	13	5	5	4	9	16	191

Wind Speed			STABILITY CLASS: ALL															
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	9	11	11	13	10	3	13	7	9	9	8	6	5	5	4	11	134
2.2	4.5	50	35	26	17	10	11	15	28	23	31	13	19	11	21	27	48	385
4.5	6.7	65	44	40	10	2	0	2	14	32	33	19	12	11	9	37	80	410
6.7	8.9	42	24	17	9	0	0	3	22	35	23	14	6	7	11	31	63	307
8.9	11.2	24	9	12	1	0	0	5	10	23	31	8	6	8	9	45	42	233
11.2	13.4	13	3	2	0	0	0	3	6	11	40	14	3	9	11	42	20	177
13.4	17.9	9	1	3	0	0	0	0	9	30	45	28	3	6	21	46	30	231
17.9	22.4	2	0	0	0	0	0	0	7	8	27	39	10	2	8	11	3	117
22.4	29.1	0	0	0	0	0	0	0	0	0	14	31	5	5	11	11	0	77
29.1	40.3	0	0	0	0	0	0	0	0	0	1	14	7	1	2	4	0	29
40.3	90	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	3
TOTALS		214	127	111	50	22	14	41	103	171	254	189	77	65	109	259	297	2103

CALM	A	B	C	D	E	F	G	TOTALS
	0	0	0	14	15	10	6	45

Occurrence of stability class on a percentage basis

- A 0.4%
- B 1.3%
- C 2.5%
- D 35.8%
- E 32.4%
- F 18.4%
- G 9.2%

Table 5-3 2nd Quarter Average, 33 Ft AGL

Joint Frequency Distribution (version 4.0)			
Sensor Criteria		Time Frame	Data Recovery Rate
Wind Speed:	33 Foot Sensors	Starting Date:	4/1/2009
Wind Direction:	33 Foot Sensors	Ending Date:	6/30/2009
Delta T:	245 Foot - 33 Foot Sensors	Maximum Hours In Period:	2184
Signal Path:	MET B	Hours Missing:	21
Processing:	Instantaneous	Hours Used:	2163
		Recovery Rate:	99.0%

Wind Speed		STABILITY CLASS: A																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	0	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	6	
2.2	4.5	0	2	3	2	4	2	0	0	0	0	0	0	0	0	0	0	13	
4.5	6.7	3	9	7	0	1	1	2	0	0	0	0	0	0	0	0	0	23	
6.7	8.9	6	9	2	0	0	0	1	1	3	0	0	0	0	0	0	0	22	
8.9	11.2	1	10	0	0	0	0	2	0	0	3	0	1	0	1	0	0	18	
11.2	13.4	1	5	0	0	0	0	1	0	3	1	0	1	0	1	0	0	13	
13.4	17.9	1	9	0	0	0	0	0	0	2	3	0	5	4	2	3	0	29	
17.9	22.4	0	1	0	0	0	0	0	0	0	0	0	4	1	0	0	0	6	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	4	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			12	48	13	4	5	3	6	1	8	7	0	14	5	4	3	1	134

Wind Speed		STABILITY CLASS: B																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	3	3	0	0	0	2	2	0	0	0	0	1	0	1	0	0	12	
2.2	4.5	7	6	5	9	3	5	5	0	0	2	0	1	2	1	0	1	47	
4.5	6.7	10	6	2	2	5	1	2	2	1	3	1	0	0	1	0	3	39	
6.7	8.9	4	5	1	3	0	0	2	2	9	3	0	1	0	0	3	0	33	
8.9	11.2	0	0	1	3	1	0	3	1	6	4	1	1	0	1	1	0	23	
11.2	13.4	2	0	1	0	0	0	2	1	1	0	3	1	3	2	0	3	19	
13.4	17.9	0	2	0	0	0	0	2	1	0	2	3	1	3	1	3	1	19	
17.9	22.4	0	1	0	0	0	0	0	0	0	1	0	1	1	0	1	0	5	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			28	23	10	17	9	8	18	7	17	15	8	8	9	7	9	8	199

Wind Speed		STABILITY CLASS: C																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	4	1	1	0	2	3	0	0	1	0	0	1	1	3	2	2	21	
2.2	4.5	4	3	2	3	3	10	8	5	1	3	0	3	2	4	5	3	59	
4.5	6.7	6	3	4	2	1	0	7	11	7	9	3	1	4	2	2	9	71	
6.7	8.9	7	2	2	5	0	0	2	3	7	7	1	6	1	2	4	4	53	
8.9	11.2	1	0	0	0	1	0	2	4	1	4	2	1	1	5	3	2	27	
11.2	13.4	0	0	2	0	0	0	1	1	5	2	0	0	2	2	0	0	15	
13.4	17.9	1	3	0	0	0	0	0	0	1	1	0	3	2	2	4	1	18	
17.9	22.4	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			23	12	11	10	7	13	20	24	23	26	8	15	14	20	20	21	267

Wind Speed		STABILITY CLASS: D																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	1	1	2	2	5	5	8	6	5	4	1	2	2	4	0	2	50	
2.2	4.5	1	3	5	4	6	5	10	22	21	9	3	6	4	7	4	3	113	
4.5	6.7	9	4	5	4	5	7	10	24	21	18	7	4	6	2	8	7	141	
6.7	8.9	1	3	2	4	1	3	8	13	17	6	0	2	6	4	4	7	81	
8.9	11.2	4	4	4	2	0	0	2	2	9	7	1	0	3	5	7	6	56	
11.2	13.4	2	0	3	0	0	1	1	2	4	3	3	1	0	2	8	3	33	
13.4	17.9	4	5	3	2	0	0	0	3	3	6	5	8	2	8	24	3	76	
17.9	22.4	0	0	0	2	0	0	0	0	0	0	0	2	3	1	5	3	16	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			22	20	24	20	17	21	39	72	80	53	21	25	26	33	63	34	570

Table 5-3 2nd Quarter Average, 33 Ft AGL (Continued)

Wind Speed		STABILITY CLASS: E														TOTAL		
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW		NW	NNW
1	2.2	5	1	3	1	1	2	3	6	0	3	4	3	1	4	2	2	41
2.2	4.5	8	3	0	2	1	2	5	12	7	8	12	7	3	12	3	9	94
4.5	6.7	6	6	0	1	0	2	5	12	11	4	1	7	8	12	8	13	96
6.7	8.9	2	2	3	2	0	0	5	11	7	5	2	5	5	9	16	9	83
8.9	11.2	1	1	4	2	0	0	1	5	3	7	1	3	3	16	16	4	67
11.2	13.4	1	0	0	0	0	0	3	4	2	2	7	2	3	3	10	2	39
13.4	17.9	0	0	2	0	0	0	0	0	0	2	2	4	2	4	7	0	23
17.9	22.4	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	3
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		23	13	13	8	2	6	22	50	30	32	31	31	25	60	62	39	447

Wind Speed		STABILITY CLASS: F														TOTAL		
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW		NW	NNW
1	2.2	0	2	5	3	0	0	0	5	5	5	1	2	0	2	1	4	35
2.2	4.5	8	6	8	3	0	2	2	17	18	4	4	1	3	3	6	6	91
4.5	6.7	5	1	4	0	0	0	6	13	14	5	3	1	3	2	5	6	68
6.7	8.9	2	2	1	0	0	0	0	5	8	4	1	2	2	4	3	3	37
8.9	11.2	0	0	0	0	0	0	0	0	7	3	1	0	0	5	2	0	18
11.2	13.4	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
13.4	17.9	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		15	11	18	6	0	2	8	40	54	22	10	6	8	16	17	19	252

Wind Speed		STABILITY CLASS: G														TOTAL		
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW		NW	NNW
1	2.2	10	10	8	1	1	1	3	1	2	0	3	0	0	2	1	3	46
2.2	4.5	14	13	10	2	0	0	3	12	3	4	3	0	0	4	8	12	88
4.5	6.7	4	0	7	0	0	0	0	16	5	4	1	0	0	1	7	45	
6.7	8.9	0	0	0	0	0	0	0	3	3	0	1	0	0	1	4	1	13
8.9	11.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.2	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		28	23	25	3	1	1	6	32	13	8	8	0	0	7	14	23	192

Wind Speed		STABILITY CLASS: ALL														TOTAL		
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW		NW	NNW
1	2.2	23	21	20	9	9	13	16	18	13	12	9	9	4	16	6	13	211
2.2	4.5	42	36	33	25	17	26	33	68	50	30	22	18	14	31	26	34	505
4.5	6.7	43	29	29	9	12	11	32	78	59	43	16	13	21	19	24	45	483
6.7	8.9	22	23	11	14	1	3	18	38	54	25	5	16	14	20	34	24	322
8.9	11.2	7	15	9	7	2	0	10	12	26	28	6	6	7	33	29	12	209
11.2	13.4	6	5	6	0	0	1	8	8	17	8	13	5	8	10	18	8	121
13.4	17.9	6	19	5	2	0	0	2	4	6	15	10	21	13	17	41	5	166
17.9	22.4	0	2	1	2	0	0	0	0	0	2	3	7	6	1	6	3	33
22.4	29.1	0	0	0	0	0	0	0	0	0	0	2	4	0	4	1	11	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS		149	150	114	68	41	54	119	226	225	163	86	99	87	147	188	145	2061

	A	B	C	D	E	F	G	TOTALS
CALM	0	1	4	21	13	25	38	102

Occurrence of stability class on a percentage basis

- A 6.2%
- B 9.2%
- C 12.5%
- D 27.3%
- E 21.3%
- F 12.8%
- G 10.6%

Table 5-4 2nd Quarter Average, 245 Ft AGL

Joint Frequency Distribution (version 4.0)			
Sensor Criteria		Time Frame	Data Recovery Rate
Wind Speed:	245 Foot Sensors	Starting Date:	4/1/2009
Wind Direction:	245 Foot Sensors	Ending Date:	6/30/2009
Delta T:	245 Foot - 33 Foot Sensors	Maximum Hours In Period:	2184
Signal Path:	MET B	Hours Missing:	12
Processing:	Instantaneous	Hours Used:	2172
		Recovery Rate:	99.5%

Wind Speed		STABILITY CLASS: A																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	4
2.2	4.5	1	1	2	2	3	0	0	0	0	0	0	0	0	0	0	0	9
4.5	6.7	3	8	1	3	0	2	1	0	0	0	0	0	0	0	0	0	18
6.7	8.9	5	11	1	0	1	0	1	1	0	0	0	0	0	0	0	1	21
8.9	11.2	4	8	1	0	0	1	2	1	2	0	0	0	0	0	0	1	20
11.2	13.4	3	5	0	0	0	0	0	0	2	2	0	1	1	0	0	0	14
13.4	17.9	3	6	0	0	0	0	1	0	2	4	0	1	0	3	0	0	20
17.9	22.4	2	3	0	0	0	0	0	0	0	2	0	5	5	1	2	0	20
22.4	29.1	0	1	0	0	0	0	0	0	0	0	0	5	0	0	1	0	7
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		22	43	6	7	4	3	5	2	6	8	0	14	6	4	3	2	135

Wind Speed		STABILITY CLASS: B																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	3	1	0	0	1	1	0	0	0	0	0	0	0	1	1	2	10
2.2	4.5	7	1	5	3	4	4	2	0	1	1	0	2	2	1	0	2	35
4.5	6.7	10	3	1	6	1	6	2	2	0	0	1	0	0	1	0	2	35
6.7	8.9	4	2	2	1	3	0	2	1	5	4	0	0	0	1	2	2	29
8.9	11.2	4	4	1	3	0	1	1	2	4	8	2	1	0	1	0	1	33
11.2	13.4	0	0	1	2	1	1	1	0	1	2	0	2	2	1	0	0	14
13.4	17.9	2	0	1	1	0	0	5	2	0	2	4	3	7	1	3	4	35
17.9	22.4	0	1	0	0	0	0	0	0	0	1	1	0	1	0	2	0	6
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	3
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		30	12	11	16	10	13	13	7	11	18	9	9	12	7	10	13	201

Wind Speed		STABILITY CLASS: C																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	4	0	0	1	1	2	0	0	1	0	0	1	0	1	0	4	15
2.2	4.5	2	0	0	2	4	7	5	2	3	1	0	1	4	7	3	1	42
4.5	6.7	5	4	6	2	2	1	10	10	5	4	1	4	2	3	5	8	72
6.7	8.9	5	3	1	1	1	0	5	3	8	6	1	2	5	0	3	8	52
8.9	11.2	4	1	0	4	1	0	3	2	6	3	1	3	2	0	4	1	35
11.2	13.4	0	0	0	0	0	0	2	1	4	3	0	1	3	3	1	3	21
13.4	17.9	2	2	1	1	0	0	1	0	3	2	0	1	4	1	0	0	18
17.9	22.4	0	1	0	0	0	0	0	0	0	1	0	3	1	3	3	0	12
22.4	29.1	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		22	11	8	11	9	10	26	18	30	20	5	16	22	18	19	25	270

Wind Speed		STABILITY CLASS: D																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	0	2	4	1	1	4	6	3	6	3	1	1	4	0	1	0	37
2.2	4.5	1	2	0	6	6	2	9	20	14	5	5	4	7	7	4	1	93
4.5	6.7	3	5	5	2	1	8	19	17	12	15	5	5	2	5	3	4	111
6.7	8.9	2	3	2	7	2	2	6	11	13	9	5	1	6	4	4	6	83
8.9	11.2	5	3	3	1	1	4	8	9	13	5	2	3	3	2	3	5	70
11.2	13.4	1	1	1	1	2	0	1	1	7	4	0	1	3	4	1	2	30
13.4	17.9	2	4	4	0	1	0	1	4	7	10	4	3	1	10	13	5	69
17.9	22.4	4	3	3	1	1	0	0	0	0	1	4	7	1	12	15	2	54
22.4	29.1	0	2	2	0	0	0	0	0	0	0	1	1	2	4	12	0	24
29.1	40.3	0	0	2	0	0	0	0	0	0	0	1	0	1	0	4	0	8
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		18	25	26	19	15	20	50	65	72	52	28	26	30	48	60	25	579

Table 5-4 2nd Quarter Average, 245 Ft AGL (Continued)

Wind Speed		STABILITY CLASS: E																TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
1	2.2	0	1	0	0	0	1	1	1	3	3	1	1	0	1	1	1	16	
2.2	4.5	1	0	2	1	1	3	4	1	3	2	2	4	6	0	6	3	39	
4.5	6.7	2	1	0	0	2	3	3	6	4	2	1	9	4	7	8	4	56	
6.7	8.9	5	4	1	1	0	3	3	2	6	5	2	2	6	10	13	4	67	
8.9	11.2	4	3	2	0	1	0	2	8	6	3	2	3	8	10	4	8	64	
11.2	13.4	1	1	0	0	0	2	0	3	4	3	1	2	5	10	6	6	44	
13.4	17.9	1	2	2	0	0	1	1	5	9	8	9	4	8	19	24	4	97	
17.9	22.4	0	0	3	1	0	0	1	1	0	1	4	4	3	21	16	0	55	
22.4	29.1	0	0	3	1	0	0	0	0	0	1	3	4	1	2	3	0	18	
29.1	40.3	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			14	12	14	4	5	13	15	29	35	27	25	33	41	80	81	30	458

Wind Speed		STABILITY CLASS: F																TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
1	2.2	2	0	0	0	0	1	1	1	2	5	2	1	3	0	0	2	1	21
2.2	4.5	2	2	4	3	1	1	2	3	4	3	5	1	3	6	4	5	49	
4.5	6.7	4	3	2	2	0	1	2	1	7	2	3	3	0	1	2	2	35	
6.7	8.9	2	2	1	0	0	1	1	4	8	6	3	1	0	6	5	2	42	
8.9	11.2	2	2	1	1	0	0	4	7	9	6	0	0	3	6	5	3	49	
11.2	13.4	1	1	2	1	0	0	2	3	3	2	2	0	1	1	8	0	27	
13.4	17.9	1	1	1	0	0	0	0	1	7	3	4	1	1	8	9	1	38	
17.9	22.4	0	0	0	0	0	0	0	1	0	0	1	0	1	8	0	0	11	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			14	11	11	7	2	4	12	22	43	24	19	9	9	36	36	14	273

Wind Speed		STABILITY CLASS: G																TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
1	2.2	1	1	0	2	1	1	1	3	2	3	2	2	0	2	1	1	23	
2.2	4.5	10	3	5	2	3	3	2	5	8	1	2	6	1	0	4	2	57	
4.5	6.7	10	2	3	3	1	1	5	5	8	1	2	3	0	0	2	10	56	
6.7	8.9	6	2	0	1	0	0	1	6	5	2	0	1	0	1	2	2	29	
8.9	11.2	1	1	2	2	0	0	1	1	1	1	0	0	0	1	6	6	23	
11.2	13.4	0	0	1	1	0	0	0	6	2	0	0	0	0	0	6	2	18	
13.4	17.9	0	0	0	0	0	0	2	0	1	0	1	0	0	1	3	1	9	
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	7	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			28	9	11	11	5	5	12	26	27	8	7	12	1	11	25	24	222

Wind Speed		STABILITY CLASS: ALL																TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
1	2.2	11	5	5	6	6	10	9	11	17	9	5	8	4	5	6	9	126	
2.2	4.5	24	9	18	19	22	20	24	31	33	13	14	18	23	21	21	14	324	
4.5	6.7	37	26	18	18	7	22	42	41	36	24	13	24	8	17	20	30	383	
6.7	8.9	29	27	8	11	7	6	19	28	45	32	11	7	17	22	29	25	323	
8.9	11.2	24	22	10	11	3	6	21	30	41	26	7	10	16	20	22	25	294	
11.2	13.4	6	8	5	5	3	3	6	14	23	16	3	7	15	19	22	13	168	
13.4	17.9	11	15	9	2	1	1	11	12	29	29	22	13	21	43	52	15	286	
17.9	22.4	6	8	6	2	1	0	1	2	0	6	10	19	12	51	39	2	165	
22.4	29.1	0	3	5	1	0	0	0	0	1	7	11	4	6	18	0	0	56	
29.1	40.3	0	0	3	0	0	0	0	0	1	1	2	1	0	5	0	0	13	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			148	123	87	75	50	68	133	169	224	157	93	119	121	204	234	133	2138

	A	B	C	D	E	F	G TOTALS	
CALM	0	0	4	13	4	5	8	34

Occurrence of stability class on a percentage basis

- A 6.2%
- B 9.3%
- C 12.6%
- D 27.3%
- E 21.3%
- F 12.8%
- G 10.6%

Table 5-5 3rd Quarter Average, 33 Ft AGL

Joint Frequency Distribution (version 4.0)			
Sensor Criteria		Time Frame	Data Recovery Rate
Wind Speed:	33 Foot Sensors	Starting Date:	7/1/2009
Wind Direction:	33 Foot Sensors	Ending Date:	9/30/2009
Delta T:	245 Foot - 33 Foot Sensors	Maximum Hours In Period:	2208
Signal Path:	MET B	Hours Missing:	7
Processing:	Instantaneous	Hours Used:	2201
		Recovery Rate:	99.7%

Wind Speed		STABILITY CLASS: A																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	2	5	8	12	3	1	2	0	0	0	0	0	0	0	0	0	33
4.5	6.7	4	11	13	8	2	1	0	0	0	0	0	0	0	0	0	1	40
6.7	8.9	1	6	6	5	1	2	1	0	0	2	0	1	0	0	0	0	25
8.9	11.2	4	6	2	1	0	0	1	0	1	5	1	0	0	0	0	0	21
11.2	13.4	1	3	0	0	0	0	1	0	2	6	4	0	0	0	1	0	18
13.4	17.9	0	1	0	0	0	0	0	0	1	8	2	0	3	0	1	0	16
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		12	32	29	26	6	4	5	0	4	21	7	1	3	0	5	1	156

Wind Speed		STABILITY CLASS: B																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	1	2	0	4	3	2	0	1	0	0	0	0	0	0	0	0	13
2.2	4.5	2	5	7	14	15	19	10	2	2	0	0	0	0	0	0	0	76
4.5	6.7	4	8	2	17	3	6	8	3	3	2	1	0	0	1	0	0	58
6.7	8.9	1	5	4	5	5	0	2	3	6	7	0	0	0	1	1	0	40
8.9	11.2	3	0	0	1	1	0	3	0	6	7	2	0	1	2	1	0	27
11.2	13.4	0	0	0	0	0	0	0	3	3	2	2	0	1	1	3	0	15
13.4	17.9	0	0	0	0	0	0	0	1	1	2	1	0	0	1	1	1	8
17.9	22.4	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	4
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		11	20	13	41	27	27	23	13	21	21	6	2	2	6	6	2	241

Wind Speed		STABILITY CLASS: C																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	2	1	3	2	2	8	2	1	1	0	0	1	1	0	0	2	26
2.2	4.5	4	2	1	6	5	14	15	8	5	0	6	0	1	2	0	1	70
4.5	6.7	0	2	4	4	4	6	10	6	8	7	1	0	3	3	0	0	58
6.7	8.9	1	2	3	1	2	0	2	3	7	7	2	0	1	2	0	0	33
8.9	11.2	1	0	0	2	0	0	1	1	4	5	4	2	3	1	3	2	29
11.2	13.4	1	0	0	0	0	1	2	0	2	2	3	2	2	0	2	0	17
13.4	17.9	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	3
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		9	7	11	15	13	29	32	19	27	21	17	5	12	8	7	6	238

Wind Speed		STABILITY CLASS: D																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	1	0	2	1	1	2	7	6	6	2	0	1	3	0	1	1	34
2.2	4.5	1	2	2	11	9	11	7	17	11	8	4	3	2	4	2	3	97
4.5	6.7	0	6	2	10	6	5	7	23	25	7	7	7	5	2	7	1	120
6.7	8.9	2	3	3	3	1	1	1	18	17	4	4	1	5	4	2	1	70
8.9	11.2	4	1	1	0	0	0	2	5	7	6	4	1	5	9	9	5	59
11.2	13.4	0	0	0	0	0	0	1	0	4	4	2	3	4	4	6	3	31
13.4	17.9	0	0	0	0	0	0	1	0	1	2	1	0	3	2	23	4	37
17.9	22.4	0	0	0	0	0	0	0	0	1	0	0	1	1	0	7	5	15
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		8	12	10	25	17	19	26	69	72	33	22	17	28	25	60	23	466

Table 5-5 3rd Quarter Average, 33 Ft AGL (Continued)

Wind Speed		STABILITY CLASS: E																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	1	1	1	0	6	2	2	4	1	6	2	1	1	4	1	1	3	36
2.2	4.5	3	3	3	5	4	6	5	15	24	7	3	3	5	4	8	7	105	
4.5	6.7	4	6	3	4	1	3	8	12	9	3	1	2	8	4	9	6	83	
6.7	8.9	0	1	0	0	1	0	1	5	12	3	1	5	4	6	13	8	60	
8.9	11.2	0	0	0	0	0	0	0	1	4	6	4	0	0	1	9	16	3	44
11.2	13.4	0	0	0	0	0	0	0	0	1	1	1	0	0	4	16	1	24	
13.4	17.9	0	0	0	1	0	0	0	0	1	1	2	0	0	1	6	0	12	
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			8	11	6	18	8	11	19	37	59	21	9	11	22	29	71	28	366

Wind Speed		STABILITY CLASS: F																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	2	3	6	7	1	5	4	3	2	1	0	2	1	1	3	3	44	
2.2	4.5	10	4	9	9	5	4	4	14	18	13	9	2	2	2	4	9	118	
4.5	6.7	3	2	3	8	1	0	1	14	26	12	5	2	1	1	6	5	90	
6.7	8.9	0	0	1	4	0	0	1	6	13	3	1	3	0	0	7	3	42	
8.9	11.2	0	0	0	0	0	0	0	1	5	0	2	0	1	0	2	0	11	
11.2	13.4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2	
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			15	9	19	28	7	9	10	38	64	30	17	9	5	4	23	20	307

Wind Speed		STABILITY CLASS: G																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	3	5	14	8	8	5	4	7	8	9	1	2	3	0	0	1	78	
2.2	4.5	5	18	49	15	4	8	11	24	19	11	6	5	4	0	0	3	182	
4.5	6.7	1	5	13	8	1	1	2	9	15	3	1	1	1	2	1	4	68	
6.7	8.9	0	0	1	2	0	0	0	3	6	1	1	0	0	0	3	2	19	
8.9	11.2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	4	
11.2	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			9	28	77	33	13	14	17	43	48	24	9	8	8	5	4	11	351

Wind Speed		STABILITY CLASS: ALL																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	10	12	25	28	17	24	21	19	23	14	2	7	12	2	5	10	231	
2.2	4.5	27	39	79	72	45	63	54	80	79	39	28	13	14	12	14	23	681	
4.5	6.7	16	40	40	59	18	22	36	67	86	34	16	12	18	13	23	17	517	
6.7	8.9	5	17	18	20	10	3	8	38	61	27	9	10	10	13	26	14	289	
8.9	11.2	12	7	3	4	1	0	8	11	29	27	13	3	11	24	31	11	195	
11.2	13.4	2	3	0	0	0	1	4	3	12	16	12	5	7	9	29	4	107	
13.4	17.9	0	1	0	1	0	0	1	1	4	13	7	0	7	4	32	5	76	
17.9	22.4	0	0	0	0	0	0	0	0	1	1	0	3	1	0	12	7	25	
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS			72	119	165	184	91	113	132	219	295	171	87	53	80	77	176	91	2125

	A	B	C	D	E	F	G	TOTALS
CALM	0	2	3	14	11	18	28	76

Occurrence of stability class on a percentage basis

- A 7.1%
- B 11.0%
- C 10.9%
- D 21.8%
- E 17.1%
- F 14.8%
- G 17.2%

Table 5-6 3rd Quarter Average, 245 Ft AGL

Joint Frequency Distribution (version 4.0)			
Sensor Criteria		Time Frame	Data Recovery Rate
Wind Speed:	245 Foot Sensors	Starting Date:	7/1/2009
Wind Direction:	245 Foot Sensors	Ending Date:	9/30/2009
Delta T:	245 Foot - 33 Foot Sensors	Maximum Hours In Period:	2208
Signal Path:	MET B	Hours Missing:	7
Processing:	Instantaneous	Hours Used:	2201
		Recovery Rate:	99.7%

Wind Speed		STABILITY CLASS: A																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	3	2	3	6	0	1	0	0	0	0	0	0	0	0	0	0	0
4.5	6.7	6	11	11	6	6	1	0	0	0	0	0	0	0	0	0	0	1
6.7	8.9	6	15	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8.9	11.2	6	10	0	0	0	0	1	0	1	3	0	1	0	0	0	0	0
11.2	13.4	3	3	0	0	0	0	1	0	1	5	2	0	0	0	0	0	0
13.4	17.9	0	3	0	0	0	0	1	0	1	10	3	0	1	0	1	0	0
17.9	22.4	0	0	0	0	0	0	0	0	1	5	0	1	1	0	2	0	0
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		24	44	21	14	6	2	3	0	4	23	5	2	2	0	5	1	156

Wind Speed		STABILITY CLASS: B																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	4	13	7	10	10	12	1	0	0	0	0	0	0	0	0	0	4
4.5	6.7	7	9	7	16	2	8	4	3	1	2	0	0	1	0	0	0	60
6.7	8.9	7	6	2	8	1	3	5	1	4	4	0	0	0	0	1	1	43
8.9	11.2	4	4	0	2	0	0	1	1	7	6	0	0	1	1	0	2	29
11.2	13.4	1	0	0	0	0	0	2	2	4	4	2	1	0	2	0	0	18
13.4	17.9	0	0	0	0	0	0	0	2	3	3	2	0	2	2	2	0	16
17.9	22.4	0	0	0	0	0	0	0	0	0	2	1	0	0	0	2	0	5
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	3
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		24	33	16	37	14	23	13	9	19	21	5	3	4	5	6	7	239

Wind Speed		STABILITY CLASS: C																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	4	3	1	1	1	6	4	1	0	1	0	0	1	0	2	2	27
2.2	4.5	5	3	5	2	3	8	8	3	3	0	3	1	1	1	2	3	51
4.5	6.7	3	4	2	6	3	6	6	5	7	5	2	0	2	0	0	0	51
6.7	8.9	0	2	6	3	4	4	3	3	8	3	2	1	5	0	0	1	45
8.9	11.2	0	1	0	1	1	1	1	1	5	8	2	2	1	2	2	1	29
11.2	13.4	1	0	0	1	0	0	0	0	2	2	3	1	2	1	1	2	16
13.4	17.9	1	0	0	0	0	1	1	0	1	2	1	3	1	1	1	0	13
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	3
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		14	13	14	14	12	26	23	13	26	21	13	8	14	6	10	9	236

Wind Speed		STABILITY CLASS: D																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	0	2	1	1	2	3	5	7	1	1	2	2	2	0	2	0	31
2.2	4.5	1	3	3	3	3	5	7	17	8	7	3	2	2	2	3	2	71
4.5	6.7	4	2	5	8	7	3	6	17	14	6	4	5	3	1	5	6	96
6.7	8.9	0	2	2	7	7	2	3	13	13	5	4	3	5	0	3	1	70
8.9	11.2	5	3	2	1	1	2	1	6	12	6	2	1	1	1	1	2	47
11.2	13.4	2	1	2	0	0	0	3	4	4	6	3	2	5	3	0	3	38
13.4	17.9	0	0	0	0	0	1	2	0	3	4	3	4	5	11	14	3	50
17.9	22.4	0	0	0	0	0	0	0	0	1	0	1	0	4	4	17	0	27
22.4	29.1	0	0	0	0	0	0	0	0	2	0	0	1	1	3	21	0	28
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		12	13	15	20	20	16	27	64	58	35	22	20	28	25	69	17	461

Table 5-6 3rd Quarter Average, 245 Ft AGL (Continued)

Wind Speed		STABILITY CLASS: E																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	0	0	1	3	0	1	1	0	1	0	1	0	1	2	1	0	0	13
2.2	4.5	3	2	1	2	3	2	2	6	3	3	1	7	3	2	2	3	9	52
4.5	6.7	4	1	2	3	4	1	1	6	6	5	1	2	1	8	6	3	54	
6.7	8.9	1	1	1	7	1	4	4	8	5	1	2	3	2	4	9	3	56	
8.9	11.2	3	5	1	2	0	0	1	2	7	3	2	1	3	7	15	3	55	
11.2	13.4	1	0	0	0	0	0	1	0	7	3	3	0	0	7	12	0	34	
13.4	17.9	0	0	0	0	0	0	1	0	5	7	2	0	7	18	14	5	59	
17.9	22.4	0	0	0	0	0	0	0	0	1	2	2	0	1	19	15	0	40	
22.4	29.1	0	0	0	1	0	0	0	0	0	0	1	0	0	2	5	0	9	
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS		12	9	6	18	8	8	15	19	35	22	21	11	18	69	80	23	374	

Wind Speed		STABILITY CLASS: F																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	0	1	1	0	1	0	0	2	1	4	2	1	0	1	1	3	18
2.2	4.5	4	2	1	4	5	3	6	7	6	2	5	1	5	2	3	3	59
4.5	6.7	4	4	6	1	4	3	1	9	11	7	6	6	5	1	3	5	76
6.7	8.9	4	4	1	5	0	0	1	6	12	6	4	2	1	1	6	7	60
8.9	11.2	1	0	1	0	0	0	1	6	10	4	2	0	1	1	12	8	47
11.2	13.4	0	0	0	1	0	0	1	5	6	5	2	0	0	5	4	1	30
13.4	17.9	0	0	0	2	0	0	0	0	4	3	1	0	0	3	7	1	21
17.9	22.4	0	0	0	0	0	0	0	0	0	0	1	0	1	3	2	0	7
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		13	11	10	13	10	6	10	35	50	31	23	10	13	17	40	28	320

Wind Speed		STABILITY CLASS: G																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	4	4	3	4	2	5	0	2	4	3	0	1	2	0	2	0	36
2.2	4.5	7	3	8	13	3	2	5	9	7	11	6	2	1	2	4	3	86
4.5	6.7	13	10	6	7	1	1	3	6	13	7	6	1	3	0	4	6	87
6.7	8.9	9	4	9	6	1	0	1	8	9	5	2	2	1	0	1	12	70
8.9	11.2	4	4	1	2	0	0	0	5	5	1	0	1	0	0	1	15	39
11.2	13.4	0	0	0	0	0	0	0	4	5	2	0	0	0	2	10	2	25
13.4	17.9	2	0	0	2	0	0	0	4	0	1	0	0	0	1	8	2	20
17.9	22.4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	4
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		39	25	27	35	7	8	9	38	43	30	14	7	7	5	33	40	367

Wind Speed		STABILITY CLASS: ALL																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	9	11	7	10	7	15	10	12	7	9	5	6	7	2	7	5	129
2.2	4.5	27	28	28	40	27	33	33	39	27	21	24	9	11	9	15	24	395
4.5	6.7	41	41	39	47	27	23	21	46	52	32	19	14	15	10	18	21	466
6.7	8.9	27	34	28	38	14	13	17	39	51	24	14	11	14	5	20	25	374
8.9	11.2	23	27	5	8	2	3	6	21	47	31	8	6	7	12	31	31	268
11.2	13.4	8	4	2	2	0	0	8	15	29	27	15	4	7	20	27	8	176
13.4	17.9	3	3	0	4	0	2	5	6	17	30	12	7	16	36	47	11	199
17.9	22.4	0	0	0	1	0	0	0	0	3	9	5	1	8	27	42	0	96
22.4	29.1	0	0	0	1	0	0	0	0	2	0	1	3	1	5	32	0	45
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	5
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		138	148	109	151	77	89	100	178	235	183	103	61	86	127	243	125	2153

	A	B	C	D	E	F	G	TOTALS
CALM	0	4	5	19	3	5	12	48

Occurrence of stability class on a percentage basis

- A 7.1%
- B 11.0%
- C 10.9%
- D 21.8%
- E 17.1%
- F 14.8%
- G 17.2%

Table 5-7 4th Quarter Average, 33 Ft AGL

Joint Frequency Distribution (version 4.0)					
Sensor Criteria		Time Frame		Data Recovery Rate	
Wind Speed:	33 Foot Sensors	Starting Date:	10/1/2009	Maximum Hours In Period:	2208
Wind Direction:	33 Foot Sensors	Ending Date:	12/31/2009	Hours Missing:	197
Delta T:	245 Foot - 33 Foot Sensors			Hours Used:	2011
Signal Path:	MET B			Recovery Rate:	91.1%
Processing:	15 Minute Averaged				

Wind Speed		STABILITY CLASS: A																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
4.5	6.7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6.7	8.9	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
8.9	11.2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
11.2	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.4	29.1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
29.1	40.3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		3	1	0	0	0	0	0	0	1	1	3	1	0	0	0	0	10

Wind Speed		STABILITY CLASS: B																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2.2	4.5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
4.5	6.7	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6
6.7	8.9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8.9	11.2	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9
11.2	13.4	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	3
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2
17.9	22.4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
22.4	29.1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		12	5	1	0	0	0	0	0	1	2	2	0	1	0	2	6	32

Wind Speed		STABILITY CLASS: C																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	5
2.2	4.5	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	9
4.5	6.7	1	5	2	0	0	0	0	0	1	0	0	0	0	0	0	0	9
6.7	8.9	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	5
8.9	11.2	3	4	0	0	0	0	1	0	1	1	0	0	0	0	0	2	12
11.2	13.4	3	0	0	0	0	0	0	0	3	2	0	0	0	0	1	0	9
13.4	17.9	0	0	0	0	0	0	0	0	1	2	0	2	0	0	2	0	7
17.9	22.4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
22.4	29.1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
29.1	40.3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		13	13	6	1	1	0	1	4	5	5	2	2	0	0	3	5	61

Wind Speed		STABILITY CLASS: D																
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	12	3	1	4	2	3	1	2	8	2	6	0	4	5	5	8	66
2.2	4.5	15	7	6	2	1	3	7	17	21	3	2	2	6	7	12	26	137
4.5	6.7	9	15	5	1	0	0	3	17	13	8	1	1	1	1	15	20	110
6.7	8.9	7	6	0	0	0	0	1	17	25	3	2	1	1	1	10	8	82
8.9	11.2	5	1	0	0	0	0	4	14	10	4	4	0	0	2	6	2	52
11.2	13.4	1	2	1	0	0	0	2	5	9	4	3	0	0	3	1	1	32
13.4	17.9	0	3	0	0	0	0	0	3	8	8	2	1	2	3	2	0	32
17.9	22.4	0	1	1	0	0	0	0	0	0	6	7	1	1	1	0	0	18
22.4	29.1	0	3	13	0	0	0	0	0	0	1	2	0	0	0	0	0	19
29.1	40.3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		49	41	30	7	3	6	18	75	94	39	29	6	15	23	51	65	551

Table 5-7 4th Quarter Average, 33 Ft AGL (Continued)

Wind Speed			STABILITY CLASS: E														TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW
1	2.2	5	1	3	2	2	0	1	3	9	6	5	5	4	2	9	11	68
2.2	4.5	16	5	2	3	0	2	7	2	19	12	6	5	2	14	15	29	139
4.5	6.7	8	4	4	2	0	2	9	15	20	3	6	9	3	3	16	19	123
6.7	8.9	2	3	1	1	0	2	6	28	11	7	2	3	3	5	5	10	89
8.9	11.2	2	1	0	0	0	1	8	14	10	5	3	2	1	3	1	3	54
11.2	13.4	1	0	0	0	0	0	3	7	8	10	4	1	1	7	2	2	46
13.4	17.9	0	0	0	0	0	1	2	9	7	6	8	1	3	0	0	0	37
17.9	22.4	0	0	1	0	0	0	0	0	1	8	1	0	0	0	0	0	11
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		34	14	11	8	2	8	36	78	85	57	35	26	17	34	48	74	567

Wind Speed			STABILITY CLASS: F														TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW
1	2.2	9	9	8	1	1	2	2	4	4	8	8	3	5	8	9	14	95
2.2	4.5	19	9	4	1	0	3	3	4	16	14	11	5	3	5	26	26	149
4.5	6.7	0	2	2	1	0	2	3	13	16	6	4	2	3	4	14	8	80
6.7	8.9	0	0	1	0	0	0	0	14	10	4	1	1	1	2	4	5	43
8.9	11.2	0	0	0	0	0	0	1	17	13	1	1	1	0	3	3	1	41
11.2	13.4	0	0	0	0	0	0	4	7	3	0	1	0	0	0	0	0	15
13.4	17.9	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	0	4
17.9	22.4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		28	20	15	3	1	7	13	61	64	33	26	12	13	22	56	54	428

Wind Speed			STABILITY CLASS: G														TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW
1	2.2	4	3	8	1	0	0	1	2	5	2	3	3	9	6	16	15	78
2.2	4.5	9	5	5	0	0	0	0	2	9	4	3	1	6	8	20	33	105
4.5	6.7	4	0	1	0	0	0	0	4	5	4	0	0	0	4	7	5	34
6.7	8.9	0	0	0	0	0	0	1	5	4	0	0	1	0	0	4	1	16
8.9	11.2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
11.2	13.4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		17	8	14	1	0	0	2	14	24	10	6	5	15	18	47	54	235

Wind Speed			STABILITY CLASS: ALL														TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW
1	2.2	31	18	21	8	6	5	5	11	26	18	22	11	22	21	39	49	313
2.2	4.5	68	28	18	7	1	8	17	25	65	33	23	13	17	34	73	118	548
4.5	6.7	27	27	15	4	0	4	15	49	55	21	11	12	7	12	52	52	363
6.7	8.9	12	11	3	1	0	2	8	65	51	14	5	6	5	8	23	25	239
8.9	11.2	13	9	0	0	0	1	14	46	35	11	8	3	1	8	10	11	170
11.2	13.4	5	2	1	0	0	0	9	23	23	15	8	1	1	10	5	3	106
13.4	17.9	0	3	0	0	0	1	2	14	17	16	10	4	7	3	5	0	82
17.9	22.4	0	1	2	0	0	0	0	2	17	8	1	1	1	0	0	0	33
22.4	29.1	0	3	13	0	0	0	0	0	3	6	0	0	0	0	0	0	25
29.1	40.3	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	5
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		156	102	77	20	7	21	70	233	274	149	101	51	61	97	207	258	1884

	A	B	C	D	E	F	G	TOTALS
CALM	0	1	1	24	33	43	25	127

Occurrence of stability class on a percentage basis

- A 0.5%
- B 1.6%
- C 3.1%
- D 28.6%
- E 29.8%
- F 23.4%
- G 12.9%

Table 5-8 4th Quarter Average, 245 Ft AGL

Sensor Criteria		Time Frame		Data Recovery Rate	
Wind Speed:	245 Foot Sensors	Starting Date:	10/1/2009	Maximum Hours In Period:	2208
Wind Direction:	245 Foot Sensors	Ending Date:	12/31/2009	Hours Missing:	197
Delta T:	245 Foot - 33 Foot Sensors			Hours Used:	2011
Signal Path:	MET B			Recovery Rate:	91.1%
Processing:	Instantaneous				

Wind Speed		STABILITY CLASS: A																TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.5	6.7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6.7	8.9	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8.9	11.2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
11.2	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.4	17.9	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		2	1	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	7

Wind Speed		STABILITY CLASS: B																TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2.2	4.5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4.5	6.7	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
6.7	8.9	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8.9	11.2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
11.2	13.4	2	1	0	0	0	0	0	0	2	0	0	0	0	0	1	2	0	8
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
22.4	29.1	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	5
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		12	4	1	0	0	0	0	0	2	3	2	1	0	0	3	8	36	

Wind Speed		STABILITY CLASS: C																TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6
2.2	4.5	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10
4.5	6.7	1	3	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	9
6.7	8.9	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8.9	11.2	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	7
11.2	13.4	3	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	8
13.4	17.9	1	1	0	0	0	0	0	0	2	3	2	0	0	0	0	1	1	11
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	3
22.4	29.1	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	3
29.1	40.3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		12	8	7	2	0	0	0	1	3	5	4	2	3	0	0	3	13	63

Wind Speed		STABILITY CLASS: D																TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	4	0	1	6	5	2	2	5	4	6	1	4	3	1	3	3	0	50
2.2	4.5	8	5	4	3	4	5	5	9	19	3	5	1	4	6	18	16	0	115
4.5	6.7	8	7	2	2	0	1	3	17	12	5	2	2	0	2	18	10	0	91
6.7	8.9	5	7	5	0	0	0	2	12	14	3	1	0	0	2	13	11	0	75
8.9	11.2	5	4	0	0	0	0	4	7	19	5	0	0	1	1	6	8	0	60
11.2	13.4	2	2	0	0	0	0	5	9	11	5	8	1	2	0	9	5	0	59
13.4	17.9	3	1	0	0	0	0	9	8	9	2	2	1	7	4	1	0	47	
17.9	22.4	0	3	0	0	0	0	0	0	6	3	5	2	0	2	1	0	22	
22.4	29.1	0	1	1	0	0	0	0	0	2	8	6	0	2	2	0	0	20	
29.1	40.3	0	5	16	0	0	0	0	0	0	1	2	0	0	0	0	0	24	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		35	35	29	11	9	8	21	68	95	46	32	12	13	23	72	54	563	

Table 5-8 4th Quarter Average, 245 Ft AGL (Continued)

Wind Speed		N	STABILITY CLASS: E															TOTAL
Min	Max		NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	2	0	1	1	2	3	1	3	3	2	1	1	4	4	2	1	31
2.2	4.5	2	5	2	5	3	4	6	6	9	7	5	10	6	11	10	13	104
4.5	6.7	5	8	2	2	2	1	3	5	8	4	0	1	1	1	12	15	70
6.7	8.9	5	0	2	3	0	0	6	20	9	2	3	0	3	1	8	15	77
8.9	11.2	4	3	0	0	0	0	6	11	6	5	4	1	2	2	10	8	62
11.2	13.4	0	1	2	1	0	1	5	11	10	11	4	1	3	7	5	1	63
13.4	17.9	6	0	0	1	0	0	3	15	15	14	8	4	2	6	8	5	87
17.9	22.4	0	1	1	0	0	1	5	4	5	9	8	1	3	11	1	0	50
22.4	29.1	0	0	0	0	0	0	1	3	2	8	5	2	2	0	0	0	23
29.1	40.3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		24	18	10	13	7	10	36	78	67	63	38	21	26	43	56	58	568

Wind Speed		N	STABILITY CLASS: F															TOTAL
Min	Max		NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	2	1	4	5	4	2	2	6	2	1	1	1	3	3	1	2	40
2.2	4.5	11	11	11	6	3	4	2	3	1	6	6	4	5	8	9	7	95
4.5	6.7	3	9	8	4	0	1	2	9	5	5	1	4	2	1	12	13	79
6.7	8.9	3	4	3	1	0	1	8	8	6	4	2	1	0	1	9	15	66
8.9	11.2	3	2	2	0	0	0	7	14	8	4	2	2	1	2	8	3	58
11.2	13.4	2	0	1	0	0	0	6	6	5	3	2	0	1	3	2	7	38
13.4	17.9	0	0	0	0	0	0	3	13	16	9	2	0	4	8	9	1	65
17.9	22.4	0	0	0	0	0	1	3	3	3	1	0	0	1	2	3	0	17
22.4	29.1	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0	0	4
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		24	27	29	16	7	9	33	62	48	34	16	12	18	26	53	48	462

Wind Speed		N	STABILITY CLASS: G															TOTAL
Min	Max		NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	3	4	0	0	2	5	1	2	9	1	1	1	2	5	1	2	39
2.2	4.5	6	8	8	7	2	5	5	2	6	5	2	3	2	1	2	3	67
4.5	6.7	10	7	7	1	0	0	2	6	4	4	2	3	1	3	5	7	62
6.7	8.9	0	1	2	0	0	0	1	4	5	2	2	2	0	0	3	11	33
8.9	11.2	4	1	1	0	0	1	2	3	3	1	0	0	0	3	4	6	29
11.2	13.4	1	0	0	0	0	0	0	2	3	0	1	0	0	0	2	2	11
13.4	17.9	0	0	0	0	0	0	0	1	6	0	0	0	0	2	4	0	13
17.9	22.4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		24	21	18	8	4	11	11	20	37	13	8	9	5	14	21	31	255

Wind Speed		N	STABILITY CLASS: ALL															TOTAL
Min	Max		NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	13	6	7	13	13	12	6	16	18	10	4	7	12	13	7	10	167
2.2	4.5	31	30	27	22	12	18	18	20	35	21	18	18	17	24	39	45	395
4.5	6.7	33	34	21	9	2	3	10	38	30	18	5	11	4	7	47	48	320
6.7	8.9	16	15	14	4	0	1	17	44	34	11	8	3	3	4	33	53	260
8.9	11.2	20	12	3	0	0	1	19	35	38	15	6	3	4	8	29	29	222
11.2	13.4	10	5	3	1	0	1	17	28	31	20	15	2	6	10	19	19	187
13.4	17.9	10	2	0	1	0	0	6	41	48	34	12	6	7	23	28	8	226
17.9	22.4	0	4	1	0	0	2	8	7	15	13	13	6	4	15	6	0	94
22.4	29.1	0	1	1	0	0	0	1	3	6	20	15	2	5	2	0	0	56
29.1	40.3	0	5	17	0	0	0	0	0	3	2	0	0	0	0	0	0	27
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		133	114	94	50	27	38	102	232	255	165	98	58	62	106	208	212	1954

	A	B	C	D	E	F	G TOTALS
CALM	0	0	1	19	13	13	57

Occurrence By Stability Class
on a percentage basis

A	0.3%
B	1.8%
C	3.2%
D	28.9%
E	28.9%
F	23.6%
G	13.2%

Table 5-9 Year 2009, 33 Ft AGL

Sensor Criteria		Time Frame		Data Recovery Rate	
Wind Speed:	33 Foot Sensors	Starting Date:	1/1/2009	Maximum Hours In Period:	8760
Wind Direction:	33 Foot Sensors	Ending Date:	12/31/2009	Hours Missing:	256
Delta T:	245 Foot - 33 Foot Sensors			Hours Used:	8504
Signal Path:	MET B			Recovery Rate:	97.1%
Processing:	Instantaneous				

Wind Speed		STABILITY CLASS: A																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	0	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6
2.2	4.5	2	7	11	14	7	3	2	2	0	0	0	0	0	0	0	0	0	46
4.5	6.7	8	20	20	8	3	2	2	0	0	0	0	0	0	0	0	0	1	64
6.7	8.9	8	17	8	5	1	2	2	1	4	2	0	1	0	1	0	0	0	52
8.9	11.2	5	16	2	1	0	0	3	1	1	8	1	1	0	1	0	0	0	40
11.2	13.4	2	8	0	0	0	0	2	0	5	7	4	1	0	1	1	0	0	31
13.4	17.9	1	10	0	0	0	0	0	0	3	11	2	5	7	2	4	0	0	45
17.9	22.4	0	1	0	0	0	0	0	0	0	0	0	4	1	0	2	0	0	8
22.4	29.1	0	0	0	0	0	0	0	0	0	2	0	3	0	1	1	1	1	8
29.1	40.3	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	5
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		26	82	42	30	11	7	11	2	13	31	8	15	9	7	9	2	305	

Wind Speed		STABILITY CLASS: B																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	5	6	0	4	3	4	2	1	0	0	0	1	0	1	0	0	0	27
2.2	4.5	17	14	13	23	18	24	15	2	2	2	1	1	2	1	0	2	0	137
4.5	6.7	17	16	7	19	8	7	10	5	4	5	2	0	1	2	0	3	0	106
6.7	8.9	9	12	7	8	5	0	4	5	15	10	0	1	0	1	4	0	0	81
8.9	11.2	6	2	1	4	2	0	6	1	12	11	3	1	1	3	3	3	0	59
11.2	13.4	2	1	1	0	0	0	2	4	5	3	5	1	4	3	4	3	0	38
13.4	17.9	0	2	0	0	0	0	2	2	1	4	5	1	4	2	5	2	0	30
17.9	22.4	0	1	0	0	0	0	0	0	0	6	3	3	1	0	1	1	0	16
22.4	29.1	0	0	0	0	0	0	0	0	0	2	1	2	1	1	1	0	0	8
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		56	54	29	58	36	35	41	20	39	43	21	11	14	14	18	14	503	

Wind Speed		STABILITY CLASS: C																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	9	3	6	4	4	11	2	1	2	0	0	2	2	3	2	6	0	57
2.2	4.5	13	9	5	10	8	24	23	13	6	4	6	3	3	6	5	8	0	146
4.5	6.7	9	14	15	7	5	6	17	18	15	16	4	2	7	5	2	9	0	151
6.7	8.9	12	6	7	6	2	0	4	6	14	14	3	6	2	4	4	7	0	97
8.9	11.2	7	3	1	2	1	0	4	5	6	9	6	3	4	6	6	5	0	68
11.2	13.4	3	2	2	0	0	1	3	4	9	8	3	2	4	2	3	0	0	48
13.4	17.9	3	3	0	0	0	0	0	1	1	4	4	4	4	2	8	3	0	37
17.9	22.4	0	0	0	0	0	0	0	0	0	3	4	1	2	0	3	1	0	14
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
29.1	40.3	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	3
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		56	40	37	29	20	42	53	48	53	58	32	24	28	28	34	39	621	

Wind Speed		STABILITY CLASS: D																	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	
1	2.2	15	12	16	15	8	15	17	24	23	11	5	7	11	9	8	33	0	229
2.2	4.5	41	24	23	19	19	18	34	60	62	29	17	16	19	29	47	84	0	541
4.5	6.7	49	33	21	16	11	12	19	74	71	45	17	15	17	11	56	71	0	538
6.7	8.9	25	15	6	7	2	4	13	59	72	23	8	4	13	14	27	48	0	340
8.9	11.2	18	7	6	2	0	0	9	29	34	30	11	4	10	18	31	26	0	235
11.2	13.4	4	1	3	0	0	1	4	8	25	23	12	5	7	8	22	10	0	133
13.4	17.9	5	9	3	2	0	0	1	9	12	26	16	12	9	14	51	16	0	185
17.9	22.4	0	1	2	2	0	0	0	0	3	12	13	6	5	3	13	8	0	68
22.4	29.1	0	4	14	0	0	0	0	0	0	5	4	1	2	2	9	0	0	41
29.1	40.3	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	4
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		157	106	95	63	40	50	97	263	302	205	104	70	93	108	265	298	0	2314

Table 5-9 Year 2009, 33 Ft AGL (Continued)

Wind Speed		STABILITY CLASS: E																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	14	9	10	14	8	6	12	12	18	17	11	15	17	19	22	213	
2.2	4.5	55	18	14	12	6	10	19	34	63	42	23	25	17	40	46	80	504
4.5	6.7	22	19	14	8	3	7	26	48	52	17	12	20	23	24	62	59	416
6.7	8.9	9	7	4	6	1	1	14	52	43	21	8	20	17	24	52	32	311
8.9	11.2	2	1	5	2	0	2	9	28	36	24	11	9	7	39	51	17	243
11.2	13.4	2	0	1	0	0	0	7	19	11	28	16	2	6	16	28	8	144
13.4	17.9	0	0	2	1	0	1	2	12	8	26	25	9	6	10	19	3	124
17.9	22.4	0	0	1	0	0	0	0	0	3	21	8	1	0	5	6	0	45
22.4	29.1	0	0	0	0	0	0	0	0	0	6	7	3	0	0	0	0	16
29.1	40.3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		104	54	51	43	16	27	89	205	234	202	123	100	91	175	283	221	2018

Wind Speed		STABILITY CLASS: F																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	17	16	21	14	5	5	6	15	17	16	12	13	12	12	27	33	241
2.2	4.5	52	24	25	13	5	7	12	40	59	39	26	11	13	17	51	62	456
4.5	6.7	14	14	12	11	1	2	11	45	69	34	12	12	9	9	36	31	322
6.7	8.9	2	2	5	5	0	0	3	26	47	15	5	6	5	15	20	12	168
8.9	11.2	2	0	1	0	0	0	4	25	33	7	7	2	2	10	14	4	111
11.2	13.4	0	0	0	0	0	0	2	13	11	2	2	0	1	0	1	0	32
13.4	17.9	0	0	0	0	0	0	0	1	1	5	1	0	0	0	0	0	8
17.9	22.4	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	3
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		87	56	64	43	11	14	38	165	239	119	65	44	42	63	149	142	1341

Wind Speed		STABILITY CLASS: G																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	27	23	30	9	9	6	10	10	18	14	10	7	9	12	30	31	255
2.2	4.5	34	37	67	17	4	8	17	43	39	28	14	8	10	13	32	62	433
4.5	6.7	9	5	20	8	1	1	2	31	35	10	5	1	1	7	16	21	173
6.7	8.9	0	1	6	2	0	0	0	16	19	5	3	1	0	2	12	5	72
8.9	11.2	0	0	0	0	0	0	0	7	8	0	0	0	0	3	0	1	19
11.2	13.4	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	4
13.4	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		70	66	123	36	14	15	29	110	120	57	32	17	20	37	90	120	958

Wind Speed		STABILITY CLASS: ALL																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	87	72	84	62	35	47	49	63	78	58	38	41	49	54	86	125	1028
2.2	4.5	214	133	158	108	67	94	122	192	231	144	87	64	64	106	181	298	2263
4.5	6.7	128	121	109	77	32	37	87	221	246	127	52	50	58	58	172	195	1770
6.7	8.9	65	60	43	39	11	7	40	165	214	90	27	39	37	61	119	104	1121
8.9	11.2	40	29	16	11	3	2	35	96	130	89	39	20	24	80	105	56	775
11.2	13.4	13	12	7	0	0	2	20	51	67	71	42	11	22	30	59	21	428
13.4	17.9	9	24	5	3	0	1	5	25	26	76	53	31	30	30	87	24	429
17.9	22.4	0	3	3	2	0	0	0	8	43	28	15	9	8	25	10	154	
22.4	29.1	0	4	14	0	0	0	0	0	15	13	10	3	4	11	1	75	
29.1	40.3	0	0	2	0	0	0	0	0	2	6	0	1	1	3	0	15	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS		556	458	441	302	148	190	358	813	1000	715	385	281	297	432	848	834	8058

	A	B	C	D	E	F	G TOTALS	
CALM	0	4	9	106	89	125	113	446

Occurrence of stability class on a percentage basis

- A 3.6%
- B 8.0%
- C 7.4%
- D 28.5%
- E 24.8%
- F 17.2%
- G 12.6%

Table 5-10 Year 2009, 245 Ft AGL

Sensor Criteria		Time Frame		Data Recovery Rate	
Wind Speed:	245 Foot Sensors	Starting Date:	1/1/2009	Maximum Hours In Period:	8760
Wind Direction:	245 Foot Sensors	Ending Date:	12/31/2009	Hours Missing:	228
Delta T:	245 Foot - 33 Foot Sensors			Hours Used:	8532
Signal Path:	MET B			Recovery Rate:	97.4%
Processing:	Instantaneous				

Wind Speed		STABILITY CLASS: A																TOTAL	
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
1	2.2	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4
2.2	4.5	4	3	5	8	3	1	0	0	0	0	0	0	0	0	0	0	0	24
4.5	6.7	10	19	12	9	6	3	1	0	0	0	0	0	0	0	0	0	1	61
6.7	8.9	12	27	8	2	1	0	1	1	0	0	0	0	0	1	0	1	0	54
8.9	11.2	10	19	1	0	0	1	3	1	4	3	0	1	0	0	0	1	0	44
11.2	13.4	6	8	0	0	0	0	1	0	3	7	2	1	1	0	0	0	0	29
13.4	17.9	3	9	0	0	0	0	2	1	3	14	3	1	1	3	1	0	0	41
17.9	22.4	2	3	0	0	0	0	0	0	1	7	0	6	6	1	4	0	0	30
22.4	29.1	0	1	0	0	0	0	0	0	0	1	1	5	0	0	3	0	0	11
29.1	40.3	0	0	0	0	0	0	0	0	0	1	1	2	1	1	0	0	0	6
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
TOTALS		48	89	27	21	10	5	8	3	11	33	7	16	9	7	9	3	306	

Wind Speed		STABILITY CLASS: B																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	4	4	0	1	2	1	0	0	0	0	0	0	0	1	1	2	16
2.2	4.5	14	15	13	14	14	16	3	0	1	1	0	2	2	1	0	8	104
4.5	6.7	23	12	10	22	3	14	6	5	1	2	1	1	2	1	0	4	107
6.7	8.9	14	11	5	9	4	3	7	2	9	8	0	0	0	1	3	3	79
8.9	11.2	10	10	3	5	0	1	2	3	11	14	2	1	1	2	0	5	70
11.2	13.4	3	2	1	2	1	1	3	2	7	6	2	3	2	3	1	2	41
13.4	17.9	2	0	1	1	0	0	5	4	3	5	6	3	9	3	7	4	53
17.9	22.4	0	1	0	0	0	0	0	0	0	4	6	1	1	0	4	0	17
22.4	29.1	0	0	0	0	0	0	0	0	0	4	3	3	1	0	2	0	13
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	4
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		70	55	33	54	24	36	26	16	32	44	21	15	18	13	19	28	504

Wind Speed		STABILITY CLASS: C																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	10	4	2	4	2	8	4	1	1	1	0	1	1	1	2	8	50
2.2	4.5	10	4	9	6	7	15	13	5	6	1	3	2	5	8	5	9	108
4.5	6.7	11	14	15	8	5	7	18	16	13	9	3	5	4	3	5	10	144
6.7	8.9	7	8	10	5	5	4	8	6	16	10	3	3	10	0	3	10	108
8.9	11.2	9	3	2	5	2	1	4	3	12	11	3	5	3	2	7	4	76
11.2	13.4	4	1	0	1	0	0	3	1	6	7	3	2	5	4	2	7	46
13.4	17.9	5	4	1	1	0	1	2	2	7	8	1	4	5	2	4	4	51
17.9	22.4	0	1	0	0	0	0	0	0	0	1	5	6	3	4	6	0	26
22.4	29.1	0	0	0	0	0	0	0	0	0	2	5	1	1	0	2	0	11
29.1	40.3	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	3
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		56	39	40	30	21	36	50	34	61	50	26	30	37	24	37	52	623

Wind Speed		STABILITY CLASS: D																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	7	9	14	15	11	9	19	17	14	16	6	8	11	4	8	9	177
2.2	4.5	36	24	15	17	17	18	25	53	45	24	18	14	16	25	39	44	430
4.5	6.7	53	29	20	13	8	12	28	55	49	39	16	16	10	12	46	70	476
6.7	8.9	27	17	11	16	9	4	12	45	55	24	13	7	13	10	32	56	351
8.9	11.2	24	11	7	2	2	6	16	27	49	32	8	6	6	8	29	38	269
11.2	13.4	11	4	3	1	2	0	9	15	27	27	15	4	12	11	17	16	174
13.4	17.9	10	5	4	0	1	1	3	14	24	34	17	10	9	30	40	16	218
17.9	22.4	4	6	3	1	1	0	2	9	8	17	15	6	21	34	4	131	
22.4	29.1	0	3	3	0	0	0	0	0	4	11	12	4	7	11	35	0	90
29.1	40.3	0	5	18	0	0	0	0	0	0	2	5	2	1	0	10	0	43
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		172	113	98	65	51	50	112	228	276	217	127	86	91	132	290	251	2359

Table 5-10 Year 2008, 245 Ft AGL (Continued)

Wind Speed		STABILITY CLASS: E																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	5	2	4	7	7	7	8	8	9	5	3	7	6	8	4	4	94
2.2	4.5	16	13	9	12	11	9	18	16	23	18	19	25	14	18	28	37	286
4.5	6.7	27	19	14	10	9	5	8	18	26	16	7	16	10	19	38	45	287
6.7	8.9	21	9	6	13	1	7	14	35	25	14	10	7	13	18	46	36	275
8.9	11.2	17	14	4	2	1	0	10	22	24	19	12	7	17	22	49	31	251
11.2	13.4	7	4	3	1	0	3	9	16	24	28	13	5	14	28	50	14	217
13.4	17.9	8	2	3	1	0	1	5	24	39	45	36	10	20	53	71	28	346
17.9	22.4	2	1	4	1	0	1	6	8	10	30	35	8	7	55	37	1	206
22.4	29.1	0	0	3	2	0	0	1	3	2	16	30	8	5	13	16	0	99
29.1	40.3	0	0	1	0	0	0	0	0	0	2	10	3	0	1	1	0	18
40.3	90	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTALS		103	84	51	49	29	33	79	150	182	193	176	96	106	233	340	198	2080

Wind Speed		STABILITY CLASS: F																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	7	4	6	7	8	4	5	13	10	7	9	6	5	4	5	9	109
2.2	4.5	26	22	21	17	10	12	15	21	19	14	18	7	19	17	19	24	281
4.5	6.7	14	24	28	11	4	5	8	23	30	22	15	16	8	5	22	20	253
6.7	8.9	14	18	14	9	0	2	11	21	37	23	13	5	4	11	22	30	234
8.9	11.2	9	7	9	1	0	0	13	31	36	17	4	3	7	11	30	22	200
11.2	13.4	5	1	3	2	0	0	9	17	16	21	9	1	2	13	19	12	130
13.4	17.9	3	1	3	2	0	0	3	16	36	25	9	1	6	28	33	9	175
17.9	22.4	0	0	0	0	0	1	3	6	5	5	4	0	3	14	8	0	49
22.4	29.1	0	0	0	0	0	0	0	0	2	1	3	0	1	0	3	0	10
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		78	77	84	49	22	24	65	148	191	135	84	39	55	103	161	128	1441

Wind Speed		STABILITY CLASS: G																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	8	10	3	6	6	11	2	7	17	8	4	5	7	4	3	106	
2.2	4.5	26	21	27	24	9	11	16	23	24	28	11	14	6	6	11	9	266
4.5	6.7	38	28	19	11	3	2	10	22	31	19	14	7	4	3	11	29	251
6.7	8.9	19	10	13	8	1	0	3	23	23	11	8	5	1	1	7	30	163
8.9	11.2	12	6	4	5	0	1	3	9	13	7	0	2	1	4	12	28	107
11.2	13.4	1	0	2	1	0	0	0	12	11	7	3	0	1	3	21	9	71
13.4	17.9	2	0	0	2	0	0	2	7	12	7	2	0	0	4	17	3	58
17.9	22.4	0	0	0	1	0	0	0	0	1	0	0	0	0	6	5	0	13
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		106	75	68	58	19	25	36	103	132	87	42	33	18	34	88	111	1035

Wind Speed		STABILITY CLASS: ALL																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1	2.2	42	33	30	42	36	40	38	46	51	37	22	27	28	25	24	35	556
2.2	4.5	132	102	99	98	71	82	90	118	118	86	69	64	62	75	102	131	1499
4.5	6.7	176	145	118	84	38	48	75	139	150	107	56	61	38	43	122	179	1579
6.7	8.9	114	100	67	62	21	20	56	133	165	90	47	27	41	42	113	166	1264
8.9	11.2	91	70	30	20	5	10	51	96	149	103	29	25	35	49	127	127	1017
11.2	13.4	37	20	12	8	3	4	34	63	94	103	47	16	37	60	110	60	708
13.4	17.9	33	21	12	7	1	3	22	68	124	138	74	29	50	123	173	84	942
17.9	22.4	8	12	7	3	1	2	9	16	26	55	67	36	26	101	98	5	472
22.4	29.1	0	4	6	2	0	0	1	3	8	35	54	21	15	24	61	0	234
29.1	40.3	0	5	20	0	0	0	0	0	5	17	9	2	3	13	0	0	74
40.3	90	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	3
TOTALS		633	512	401	326	176	209	378	682	885	759	483	315	334	546	944	767	8348

CALM	A	B	C	D	E	F	G	TOTALS
	0	4	10	65	35	33	37	184

Occurrence of stability class on a percentage basis

A	3.6%
B	6.0%
C	7.4%
D	28.4%
E	24.8%
F	17.3%
G	12.6%

6.0 DOSE ASSESSMENT -- IMPACT ON MAN

Liquid Effluents - There were no liquid discharges from the radwaste processing system to the Columbia River during calendar year 2009.

Gaseous Effluents - The NRC GASPAR II computer code was used to calculate doses at and beyond the site boundary using quarterly and annual meteorological data and site-specific variables as required and defined in the ODCM. Table 6-1 shows the highest calculated doses at the site boundary and beyond the site boundary. Table 6-1 also shows the quarterly and annual dose for the nearest and highest exposed resident identified in the land use census. Table 6-2 lists the annual 50-mile dose using values obtained from the ALARA annual integrated population dose summary (person-rem). Table 6-2 also provides the annual individual doses associated with each pathway. These values were obtained by dividing the ALARA integrated dose (person-rem) by the estimated year 2000 50-mile population (356,993) and converting to mrem.

The highest calculated dose to a child living at locations identified in the most recent land use census was 6.59E-04 mrem to the total body, 6.67E-04 mrem to the thyroid, and 1.03E-03 mrem to the skin. This location was at 4.24 miles in the East South East sector.

Periodically, Columbia Generating Station offers public tours of selected locations within the site boundary. Calculations assumed an eight (8) hour per year exposure to the plume, ground shine, and inhalation pathways. The organ with the highest dose was the skin at 6.16E-04 mrem.

During 2009, Members of the Public worked at the Industrial Development area in the E and ESE sectors of the owner controlled area. The maximum dose to these individuals was also calculated assuming adult exposure to the plume, inhalation, and ground deposition pathways.

The following table shows dose to Members of the Public from gaseous effluents within the site boundary of Columbia Generating Station for the total indicated hours spent at each location.

Location	Hours Spent	Total Body Dose (mrem)	Thyroid Dose (mrem)	Highest Other Organ Dose (mrem)	Beta Air Dose (mrad)	Gamma Air Dose (mrad)
Tour Visitors	8.00E+00	3.84E-04	3.84E-04	6.16E-04	2.07E-04	5.56E-04
WNP-4 Whse.2-4	1.30E+03	3.45E-03	3.45E-03	5.43E-03	9.16E-04	2.46E-03
WNP-1 Bldg 121	2.60E+03	3.67E-03	3.68E-03	5.78E-03	3.50E-03	9.37E-03

There was no measurable direct radiation contribution from Columbia Generating Station to the tour visitors or to the workers at the WNP-1 or WNP-4 industrial areas.

During the growing season, Columbia Generating Station conducts a five-mile land use census to determine the locations of nearest residents, gardens, and farm animals out to five miles in each sector. No change to land usage was found.

The following table provides the results of annual dose calculations for the highest dose age group for each identified land use census location from gaseous effluents.

Location	Total Body Dose (mrem)	Thyroid Dose (mrem)	Highest Other Organ Dose (mrem)	Beta Air Dose (mrad)	Gamma Air Dose (mrad)	Age Group
Resident (4.47 miles NE)	5.83E-04	5.86E-04	9.22E-04	3.00E-04	8.03E-04	Teen
Resident (4.01 miles ENE)	5.91E-04	5.94E-04	9.29E-04	3.00E-04	8.03E-04	Adult
Resident (4.59 miles E)	6.34E-04	6.40E-04	9.98E-04	3.26E-04	8.36E-04	Teen
Resident (4.24 miles ESE)	6.66E-04	6.73E-04	1.04E-03	3.34E-04	8.56E-04	Teen

The highest 'Other Organ' in all cases was the skin.

For environmental thermoluminescent dosimeter (TLD) stations at or beyond the site boundary where preoperational (background) data was acquired, no increase in the average ambient exposure was observed in 2009 from the preoperational values.

Dose Tables

Table 6-1 Summary of Doses from Gaseous Effluents

The first six tables in this section show maximum estimated exposure and dose at and beyond the site boundary although no real person is resident in these areas. The remaining tables contain exposure and dose estimates for locations with real residents.

1. Maximum Air Dose at the Site Boundary (1.2 miles)

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta air dose (mrad)	4.57E-03	8.40E-04	4.99E-04	2.10E-03	5.83E-03
Gamma air dose (mrad)	1.24E-02	2.27E-03	1.41E-03	5.35E-03	1.54E-02

2. Maximum Air Dose Beyond the Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta air dose (mrad)	2.75E-03	3.46E-04	2.05E-04	5.91E-04	3.27E-03
Gamma air dose (mrad)	7.51E-03	9.34E-04	5.79E-04	1.51E-03	8.76E-03

3. Maximum Annual Dose at the Site Boundary

	Annual Dose
Annual total body dose (mrem)	1.17E-02
Annual skin dose (mrem)	1.84E-02

4. Maximum Annual Dose Beyond the Site Boundary

	Annual Dose
Annual total body dose (mrem)	6.33E-03
Annual skin dose (mrem)	1.00E-02

Table 6-1 Summary of Doses from Gaseous Effluents (Continued)

5. Maximum Organ Dose at the Site Boundary (1.2 miles)

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Maximum Organ dose (mrem)	1.36E-02	3.06E-03	1.79E-03	6.08E-03	1.84E-02

6. Maximum Organ Dose Beyond the Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Maximum Organ dose (mrem)	8.23E-03	1.23E-03	7.05E-04	1.72E-03	1.00E-02

7. Dose to Nearest Residents within 5-Miles in each Sector with Residents

4.47 Miles NE

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta Air Dose (mrad)	2.75E-04	3.71E-05	1.50E-05	4.83E-05	3.00E-04
Gamma Air Dose (mrad)	7.51E-04	1.00E-04	4.26E-05	1.16E-04	8.03E-04
Maximum Organ dose (mrem)	8.23E-04	1.28E-04	5.16E-05	1.43E-04	9.22E-04

4.01 Miles ENE

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta Air Dose (mrad)	2.20E-04	4.45E-05	5.77E-06	6.10E-05	3.00E-04
Gamma Air Dose (mrad)	6.01E-04	1.20E-04	1.63E-05	1.56E-04	8.03E-04
Maximum Organ dose (mrem)	6.64E-04	1.63E-04	2.40E-05	1.84E-04	9.29E-04

4.59 Miles E

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta Air Dose (mrad)	3.22E-04	1.76E-05	2.14E-05	2.48E-04	3.26E-04
Gamma Air Dose (mrad)	8.60E-04	4.52E-05	6.06E-05	6.32E-04	8.36E-04
Maximum Organ dose (mrem)	9.57E-04	7.97E-05	7.60E-05	7.19E-04	9.98E-04

Table 6-1 Summary of Doses from Gaseous Effluents (Continued)

7. Dose to Nearest Residents within 5-Miles in each Sector with Residents
(Continued)

4.24 Miles ESE

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta Air Dose (mrad)	5.10E-04	7.56E-05	1.24E-05	1.10E-04	3.34E-04
Gamma Air Dose (mrad)	1.38E-03	2.01E-04	3.51E-05	2.66E-04	8.56E-04
Maximum Organ dose (mrem)	1.52E-03	2.72E-04	4.82E-05	3.26E-04	1.04E-03

* Rather than the sum of the quarters, these values are based on annual meteorological data and total annual effluents. For each time period, the dose estimate uses the radionuclide mix and release rate for that period along with an estimate of the dispersion in air and deposition on ground and vegetation calculated by the NRC computer code XOQDOQ using actual meteorological conditions as measured at the release point. The dose estimate of the NRC computer code GASPAR uses NRC Regulatory Guide 1.109 (1974) which includes the prospective dose component arising from retention in the body beyond the period of environmental exposure. In the case of the resident at 4.24 miles ESE, the 'maximum organ' was the skin for each period of dose estimation. Contributions to skin dose results from three major pathways; direct radiation exposure from the plume and nuclides deposited on the ground and exposure from inhaled activity (primarily tritium). Of these, the major contributor to dose was exposure of the skin to the plume, primarily Ar-41. Due to differences in atmospheric stability factors and wind conditions during the year, the estimated concentration of Ar-41 at 4.24 miles ESE resulted in a lower estimate of skin dose for the annual cumulative dose estimation.

Table 6-2 50-Mile Population Dose from Gaseous Effluents

A. 50-mile population collective dose

Exposure Pathway	Total Body (person-rem)	Max. Organ (person-rem)
Plume	5.90E-03	1.15E-02
Ground	9.31E-04	1.09E-03
Inhalation	3.09E-03	3.09E-03
Vegetables	2.25E-03	2.21E-03
Milk	8.13E-04	7.74E-04
Meat	4.10E-04	3.96E-04
Total	1.34E-02	1.90E-02

B. Average Individual*

Exposure Pathway	Total Body (mrem)	Max. Organ (mrem)
Plume	1.65E-05	3.22E-05
Ground	2.61E-06	3.05E-06
Inhalation	8.66E-06	8.66E-06
Vegetables	6.30E-06	6.19E-06
Milk	2.28E-06	2.17E-06
Meat	1.15E-06	1.11E-06
Total	3.75E-05	5.34E-05

* These values are derived by dividing the 50-mile population collective doses by the population within 50 miles of Columbia Generating Station (356,993). The population estimate is based on the 2000 census conducted by the United States Census Bureau and documented in the Columbia Generating Station Final Safety Analysis Report. The Maximum Organ was the thyroid.

7.0 REVISIONS TO THE ODCM

No revisions were made to the ODCM in 2009.

8.0 REVISIONS TO THE PROCESS CONTROL PROGRAM (PCP)

There were no revisions to the Process Control Program in 2009.

9.0 NEW OR DELETED LOCATIONS FOR DOSE ASSESSMENTS AND/OR ENVIRONMENTAL MONITORING LOCATIONS

- 9.1 No new locations were identified for dose assessments as the 2009 Five-Mile Land Use Census showed no changes.
- 9.2 There were no new locations for environmental monitoring formally adopted into the program based on the 2009 Land Use Census.
- 9.3 No dose assessment or environmental monitoring locations were deleted.

10.0 MAJOR CHANGES TO RADIOACTIVE LIQUID, GASEOUS, AND SOLID WASTE TREATMENT SYSTEMS

No major changes (as defined by ODCM Section 6.4.3) were made to the radioactive waste systems (liquid, gaseous, or solid) during this reporting period.