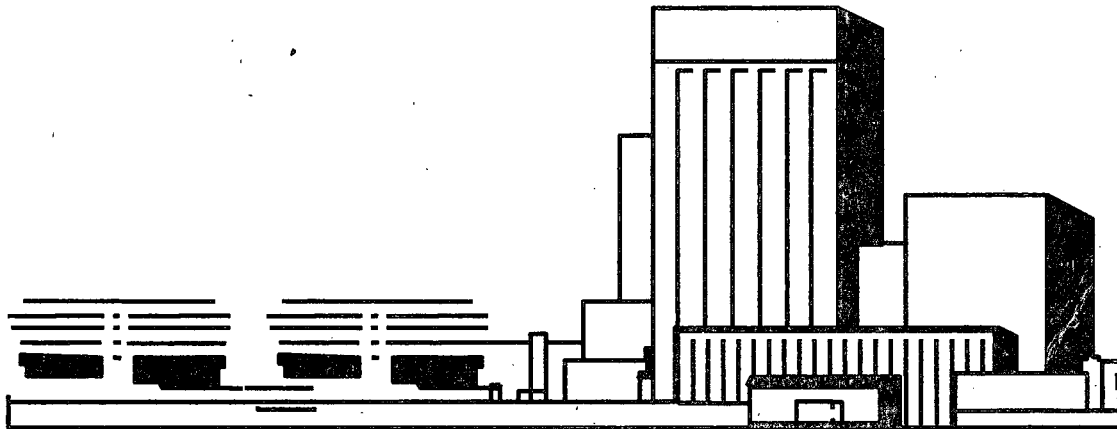


ENERGY NORTHWEST

Columbia Generating Station Radioactive Effluent Release Report

January through December 2008



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
Radioactive Effluent Release Report**

January through December 2008

Energy Northwest

**Submitted
February 2009**

Table of Contents

1.0 INTRODUCTION.....	1
2.0 LIQUID EFFLUENTS.....	1
3.0 GASEOUS EFFLUENTS	1
Gaseous Effluent Tables	4
Table 3-0 10 CFR Part 50 Appendix I Dose Compliance.....	4
Table 3-1 Main Plant Vent Releases.....	5
Table 3-2 Turbine Building Releases	7
Table 3-3 Radwaste Building Releases	9
Table 3-4 Summation of Releases	11
Table 3-5 Gaseous Purges and Vents	12
Table 3-6 Lower Limits of Detection.....	13
4.0 SOLID RADWASTE.....	14
Solid Radwaste Information required by the Offsite Dose Calculation Manual .	14
Class A	14
Class B	15
Class C	15
Solid Radwaste Information required by NRC Regulatory Guide 1.21	16
Solid waste shipped offsite for burial or disposal (not irradiated fuel).....	16
Irradiated Fuel Shipments (Disposition)	18
5.0 METEOROLOGICAL DATA	19
Joint Frequency Distribution Tables for 2008	20
Table 5-1 1st Quarter Average, 33 Ft Above Ground Level (AGL)	20
Table 5-2 1st Quarter Average, 245 Ft AGL	22
Table 5-3 2nd Quarter Average, 33 Ft AGL.....	24
Table 5-4 2nd Quarter Average, 245 Ft AGL	26
Table 5-5 3rd Quarter Average, 33 Ft AGL	28
Table 5-6 3rd Quarter Average, 245 Ft AGL.....	30
Table 5-7 4th Quarter Average, 33 Ft AGL.....	32
Table 5-8 4th Quarter Average, 245 Ft AGL.....	34
Table 5-9 Year 2008, 33 Ft AGL	36
Table 5-10 Year 2008, 245 Ft AGL	38

6.0 DOSE ASSESSMENT -- IMPACT ON MAN.....40
 Dose Tables 42
 Table 6-1 Summary of Doses from Gaseous Effluents..... 42
 Table 6-2 50-Mile Population Dose from Gaseous Effluents 45

7.0 REVISIONS TO THE ODCM 46

8.0 REVISIONS TO THE PROCESS CONTROL PROGRAM (PCP)..... 46

**9.0 NEW OR DELETED LOCATIONS FOR DOSE ASSESSMENTS
AND/OR ENVIRONMENTAL MONITORING LOCATIONS 46**

**10.0 MAJOR CHANGES TO RADIOACTIVE LIQUID, GASEOUS, AND
SOLID WASTE TREATMENT SYSTEMS 46**

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 2008. 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 2008. 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.

The Kootenai building is located approximately 0.75 miles from the Reactor building. Within this building are the Emergency Operations Facility (EOF) and a backup chemistry laboratory. During 2005, the laboratory liquid release path was physically blocked and the liquid release monitor deactivated. The release path for the fume hood within the laboratory contains a high-efficiency particulate air (HEPA) filter and was monitored for radioactive releases even though no radiochemical work was routinely performed in this laboratory. In August of 2008, the fume hood and heating, ventilation, and air conditioning (HVAC) ducting was surveyed and radiological controls removed. No evidence of gaseous or liquid release of licensed radioactive material was noted in 2008 and no further routine effluent release monitoring is planned.

It is estimated that approximately $1.76\text{E-}03$ 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).

Twelve spent fuel storage containers (SFSC) were added to the ISFSI facility in calendar year 2008 (between February and May). A total of twenty seven (27) SFSCs were in place in the ISFSI facility at the end of 2008. The SFSCs are performing as designed; consequently, there are no effluents from this facility.

In July, a Seal Steam relief valve lifted for 4.7 hours before being reseated and resulted in 0.0239 Curies of activity being released to the atmosphere. This amounted to 0.05% of the quarterly releases and 0.02% of the activity released during the year.

There were no incidents of effluent monitor inoperability greater than 30 days.

Gaseous Effluent Tables

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

Report Period: January -- December 2008

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

Gamma Air Dose (mrad)	1.52E-03	1.41E-03	2.31E-03	2.59E-03	7.46E-03
ODCM Limit	5	5	5	5	10
% of Limit	3.04E-02	2.82E-02	4.62E-02	5.18E-02	7.46E-02
Beta Air Dose (mrad)	5.35E-04	4.98E-04	9.64E-04	9.14E-04	2.78E-03
ODCM Limit	10	10	10	10	20
% of Limit	5.35E-03	4.98E-03	9.64E-03	9.14E-03	1.39E-02

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

Organ Dose (mrem)	2.54E-03	2.46E-03	7.02E-03	6.05E-03	1.44E-02
ODCM Limit	7.5	7.5	7.5	7.5	15
% of Limit	3.39E-02	3.27E-02	9.36E-02	8.07E-02	9.61E-02

* 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 2008

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	8.80E+00	<MDA	8.80E+00
xenon-135m	<MDA	<MDA	<MDA	<MDA	<MDA
xenon-138	<MDA	<MDA	<MDA	<MDA	<MDA
Others					
argon-41	1.47E+01	1.33E+01	2.43E+01	3.03E+01	8.25E+01
Total for period *	1.47E+01	1.33E+01	3.31E+01	3.03E+01	9.13E+01

B. Iodines

iodine-131	<MDA	<MDA	4.80E-06	<MDA	4.80E-06
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 *	0.00E+00	0.00E+00	4.80E-06	0.00E+00	4.80E-06

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 2008

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

C. Particulates

strontium-89	5.81E-07	6.51E-07	1.32E-06	1.12E-06	3.67E-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
silver-110m	<MDA	<MDA	<MDA	<MDA	<MDA
cerium-141	<MDA	<MDA	<MDA	<MDA	<MDA
cerium-144	<MDA	<MDA	<MDA	<MDA	<MDA
cobalt-58	<MDA	2.78E-06	1.29E-05	3.40E-06	1.90E-05
cobalt-60	<MDA	1.11E-05	1.49E-05	6.61E-06	3.26E-05
iron-59	<MDA	<MDA	<MDA	<MDA	<MDA
manganese-54	<MDA	<MDA	1.00E-06	<MDA	1.00E-06
zinc-65	<MDA	7.60E-06	2.57E-05	1.30E-05	4.63E-05
chrome-51	<MDA	<MDA	<MDA	<MDA	<MDA
antimony-125	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period*	5.81E-07	2.21E-05	5.58E-05	2.41E-05	1.03E-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	9.01E-05	6.39E-04	2.34E-04	9.63E-04
zinc-69m	<MDA	<MDA	<MDA	<MDA	<MDA
Total with T 1/2 < 8 days*	0.00E+00	9.01E-05	6.39E-04	2.34E-04	9.63E-04

D. Tritium

tritium	6.99E-01	6.35E-01	5.76E-01	5.49E-01	2.46E+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 2008

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	3.99E-05	7.75E-05	1.91E-04	8.13E-05	3.89E-04
iodine-132	<MDA	<MDA	<MDA	<MDA	<MDA
iodine-133	2.07E-04	3.66E-04	1.09E-03	4.41E-04	2.10E-03
iodine-134	<MDA	<MDA	<MDA	<MDA	<MDA
iodine-135	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period *	2.47E-04	4.43E-04	1.28E-03	5.23E-04	2.49E-03

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 2008

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

C. Particulates

strontium-89	1.75E-05	1.71E-05	3.06E-05	2.52E-05	9.04E-05
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	1.36E-05	2.72E-05	1.49E-04	2.83E-05	2.19E-04
iron-59	<MDA	<MDA	<MDA	<MDA	<MDA
manganese-54	<MDA	<MDA	<MDA	<MDA	<MDA
zinc-65	<MDA	5.00E-05	1.18E-04	1.84E-05	1.87E-04
chrome-51	<MDA	<MDA	<MDA	<MDA	<MDA
Total for period*	3.11E-05	9.43E-05	2.99E-04	7.19E-05	4.96E-04
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	6.05E+00	5.87E+00	9.65E+00	9.21E+00	3.08E+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 2008

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	<MDA	<MDA	<MDA	<MDA	<MDA
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 *	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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 2008

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

strontium-89	2.95E-08	6.80E-07	<MDA	1.31E-06	2.02E-06
strontium-90	1.54E-08	<MDA	<MDA	<MDA	1.54E-08
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	<MDA	5.99E-07	5.99E-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*	4.49E-08	6.80E-07	0.00E+00	1.91E-06	2.63E-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	2.39E-01	3.53E-01	8.50E-01	1.33E-01	1.58E+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 3-4 Summation of Releases
Gaseous Effluents**

Report Period: January -- December 2008

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year	Est* Total %Error
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A. Fission and activation gases

Total release (Ci)	1.47E+01	1.33E+01	3.31E+01	3.03E+01	9.13E+01	4.20E+01
Average release rate (μCi/s)	1.87E+00	1.69E+00	4.20E+00	3.85E+00	2.90E+00	
Percent of ODCM limit (%)	5.95E-04	4.78E-04	9.96E-04	1.98E-03	9.48E-04	

B. Iodines

Total I-131 (Ci)	3.99E-05	7.75E-05	1.95E-04	8.13E-05	3.94E-04	4.60E+01
Average release rate (μCi/s)	5.08E-06	9.85E-06	2.49E-05	1.03E-05	1.25E-05	
Percent of ODCM limit (%)	5.03E-05	3.99E-05	1.16E-04	1.43E-04	1.03E-04	

C. Particulates

Particulates with half-lives >8 days (Ci)	3.17E-05	1.17E-04	3.54E-04	9.79E-05	6.01E-04	4.50E+01
Average release rate (μCi/s)	4.03E-06	1.49E-05	4.51E-05	1.25E-05	1.91E-05	
Percent of ODCM limit (%)	1.06E-05	9.13E-06	4.72E-05	3.09E-05	3.20E-05	
Gross alpha radioactivity (Ci)	8.23E-07	1.89E-05	1.16E-06	1.47E-06	2.23E-05	7.30E+01

D. Tritium

Total release (Ci)	6.99E+00	6.86E+00	1.11E+01	9.89E+00	3.48E+01	2.50E+01
Average release rate (μCi/s)	8.89E-01	8.73E-01	1.41E+00	1.26E+00	1.11E+00	
Percent of ODCM limit (%)	3.95E-04	1.32E-04	2.53E-04	6.50E-04	3.38E-04	

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 2008

Type	Number	Total Time (hr.)	Maximum Time (hr.)	Minimum Time (hr.)	Mean Time (hr.)
Purge	2.00E+00	4.75E+01	3.37E+01	1.38E+01	2.38E+01
Vent	3.00E+01	3.38E+01	1.85E+00	2.83E-01	1.13E+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 2008

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 2008

Class A

1. Container Volumes

5 GAL PAIL	1 ft3
16 GAL DRUM	2.23 ft3
8 GAL DRUM	1.6 ft3
30 GAL DRUM	4.0 ft3
55 GAL DRUM	7.5 ft3
B-25 Steel Box	96 ft3
B-88 Steel Box	109 ft3
EL-142 Polyethylene HIC	132.4 ft3
B-25 Overpack Steel Box	138 ft3
ES-190 Steel Liner	170.2 ft3
EL-190 Polyethylene HIC	174.3 ft3

2. Total Curies

8.03E+02 Ci

3. Principal Radionuclides

Nuclide	Curies	Percent
Co-60	3.28E+02	4.08E+01
Zn-65	2.45E+02	3.06E+01
Fe-55	1.33E+02	1.66E+01
Mn-54	4.03E+01	5.02E+00
Co-58	2.35E+01	2.93E+00
Ni-63	1.23E+01	1.53E+00
Cr-51	1.17E+01	1.46E+00
Ag-110m	3.96E+00	4.93E-01
Fe-59	1.25E+00	1.56E-01
C-14	1.23E+00	1.53E-01

Cs-137	9.38E-01	1.17E-01
Ni-59	5.75E-01	7.16E-02
Nb-95	3.13E-01	3.90E-02
Sr-89	2.43E-01	3.03E-02
Zr-95	2.40E-01	2.99E-02
H-3	1.01E-01	1.25E-02
Co-57	6.57E-02	8.18E-03
Sb-125	3.70E-02	4.61E-03
La-140	3.24E-02	4.03E-03

4. Source

Resins	8.02E+02 Ci
DAW	1.77E+00 Ci
Irradiated Components	0.00E+00 Ci
Other (Sealed Source & Mixed Waste)	1.02E-04 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 2008.

Class C

There were no Class C shipments made during calendar year 2008.

Solid Radwaste Information required by NRC Regulatory Guide 1.21

January -- December 2008

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	1.31E+02	
	Ci	8.02E+02	2.5E+01%
b. Dry Active Waste	m ³	7.74E+01	
	Ci	1.77E+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	3.07E+00	
	Ci	1.02E-04	2.5E+01%

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

a. Dewatered Spent Resins -- All Classes

Nuclide	Curies	Percent
Co-60	3.27E+02	4.08E+01
Zn-65	2.45E+02	3.06E+01
Fe-55	1.33E+02	1.66E+01
Mn-54	4.03E+01	5.03E+00
Co-58	2.33E+01	2.91E+00
Ni-63	1.23E+01	1.53E+00
Cr-51	1.14E+01	1.42E+00
Ag-110m	3.95E+00	4.93E-01
Fe-59	1.25E+00	1.55E-01
C-14	1.23E+00	1.54E-01
Cs-137	9.18E-01	1.14E-01
Ni-59	5.72E-01	7.13E-02
Nb-95	2.99E-01	3.73E-02
Sr-89	2.38E-01	2.96E-02
Zr-95	2.26E-01	2.82E-02
H-3	1.00E-01	1.25E-02
Co-57	6.57E-02	8.19E-03
La-140	3.24E-02	4.04E-03

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

Nuclide	Curies	Percent
Co-60	5.83E-01	3.29E+01
Zn-65	4.76E-01	2.69E+01
Cr-51	3.07E-01	1.73E+01
Co-58	2.32E-01	1.31E+01
Mn-54	4.98E-02	2.81E+00
Fe-55	3.33E-02	1.88E+00
Cs-137	1.95E-02	1.10E+00
Nb-95	1.41E-02	7.98E-01
Zr-95	1.40E-02	7.90E-01
Sb-125	1.27E-02	7.19E-01
Ni-63	1.07E-02	6.01E-01
Ag-110m	6.66E-03	3.76E-01
Sr-89	5.06E-03	2.86E-01
Sb-124	4.47E-03	2.52E-01
Ni-59	2.90E-03	1.64E-01
H-3	6.81E-04	3.84E-02
C-14	2.92E-04	1.65E-02
Sr-90	1.14E-04	6.41E-03

c. Irradiated Components

None

d. Other Waste (Sealed Source & Mixed Waste)

Nuclide	Curies	Percent
Co-60	9.67E-05	9.50E+01
Zn-65	2.60E-06	2.55E+00
Mn-54	1.10E-06	1.08E+00
Cs-137	8.22E-07	8.07E-01
Ra-226	3.73E-07	3.66E-01
Co-58	1.18E-07	1.15E-01
Sb-125	1.13E-07	1.11E-01
Na-24	2.51E-10	2.47E-04

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
19	Tractor - Trailer via Public Highway	US Ecology, Inc. P.O. Box 638 Hanford Reservation Richland, WA. 99352
3*	Tractor - Trailer via Public Highway	Perma-Fix Northwest 2025 Battelle Blvd. Richland, WA 99354
2*	Tractor - Trailer via Public Highway	Perma-Fix of Florida 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 2008. Data is archived on the Energy Northwest Local Area Network.

Joint data recovery for 2008 was 98.7% from the 33-foot level and 99.1% 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 2008. 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 2008.

Wind speed is measured in miles per hour in the following tables and speeds below 1.00 MPH were recorded as calms.

Atmospheric factors which affect dispersion and deposition of gaseous effluents as measured on the Hanford Site were snow (30.6 inches total which fell in January, February, and December), total precipitation (5.49 inches), dust or blowing dust (3 days), fog (39 days), and thunderstorms (6 days). No atmospheric smoke was noted on the Hanford Site in 2008.

Joint Frequency Distribution Tables for 2008

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

Joint Frequency Distribution			
(version 4.0)			
Sensor Criteria	Time Frame	Data Recovery Rate	
Wind Speed: 33 Foot Sensors	Starting Date: 1/1/08	Maximum Hours In Period:	2184
Wind Direction: 33 Foot Sensors	Ending Date: 3/31/08	Hours Missing:	27
Delta T: 245 Foot - 33 Foot Sensors		Hours Used:	2157
Signal Path: Mixed-bba		Recovery Rate:	98.8%
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	8.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	11.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
224	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
291	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
403	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
22	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	8.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	11.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	17.9	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
179	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
224	29.1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
291	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
403	90	0	0	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	0	1	3	0	0	0	0	0	0	5

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	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
22	4.5	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
45	6.7	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
67	8.9	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
89	11.2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
112	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	17.9	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	4	4
179	22.4	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	4	4
224	29.1	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4	4
291	40.3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
403	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		10	4	3	0	0	0	0	0	0	2	5	3	0	1	2	1	1	31	31

Wind Speed		STABILITY CLASS: D															TOTAL		
		Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W		WNW	NW
1	2.2	6	5	6	5	0	0	2	1	2	2	3	3	3	8	5	9	9	60
22	4.5	25	14	7	7	0	1	1	2	12	11	8	8	6	3	9	23	23	137
45	6.7	14	11	5	0	0	1	1	14	11	15	4	4	4	4	13	13	114	114
67	8.9	3	2	0	0	0	0	0	7	12	10	3	2	2	7	4	12	64	64
89	11.2	2	2	0	0	0	0	1	3	16	10	4	3	0	5	3	3	52	52
112	13.4	0	1	0	0	0	0	0	2	6	10	11	2	0	3	0	0	35	35
134	17.9	0	6	0	0	0	0	0	6	22	19	5	3	4	4	4	3	72	72
179	22.4	1	3	0	0	0	0	0	1	0	2	11	3	0	0	3	0	24	24
224	29.1	0	0	0	0	0	0	0	0	0	1	1	2	2	0	0	0	6	6
291	40.3	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	5	5
403	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		51	44	18	12	0	2	5	30	65	83	64	33	24	34	41	63	569	569

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	2.2	3	3	3	1	3	2	3	3	1	2	3	6	5	8	3	12	61
2.2	4.5	16	14	7	6	2	1	2	4	14	6	6	7	10	9	23	19	146
4.5	6.7	5	10	1	1	0	1	6	10	22	8	7	3	5	6	26	11	122
6.7	8.9	2	0	3	0	0	0	4	8	24	14	14	3	3	3	15	12	105
8.9	11.2	1	2	0	0	0	0	3	6	11	12	11	0	5	0	9	1	61
11.2	13.4	1	1	0	0	0	0	0	12	7	19	12	5	4	5	3	1	70
13.4	17.9	1	5	0	0	0	0	0	2	7	22	23	4	2	4	6	0	76
17.9	22.4	1	6	0	0	0	0	0	0	3	17	5	7	7	0	0	0	46
22.4	29.1	0	0	0	0	0	0	0	0	1	4	3	1	0	0	0	0	9
29.1	40.3	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	0	4
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		30	41	14	8	5	4	18	45	90	105	84	38	42	35	85	56	700

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	11	4	10	2	1	1	1	3	5	9	6	4	5	8	9	9	88
2.2	4.5	28	22	11	2	1	0	0	7	7	10	12	4	12	12	9	39	176
4.5	6.7	6	4	7	1	0	0	1	8	11	12	3	4	5	4	13	20	99
6.7	8.9	0	1	1	0	0	0	3	14	19	6	5	2	4	1	8	5	69
8.9	11.2	0	0	0	0	0	0	0	4	5	0	4	1	2	2	1	1	20
11.2	13.4	0	0	0	0	0	0	0	1	4	4	3	0	0	0	0	0	12
13.4	17.9	0	0	0	0	0	0	0	1	3	8	1	0	1	0	1	0	15
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		45	31	29	5	2	1	5	38	55	49	34	15	29	27	41	74	480

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	10	5	9	2	0	0	0	1	4	2	0	2	3	6	5	4	53
2.2	4.5	15	6	12	0	0	0	0	1	11	10	2	1	4	3	8	22	95
4.5	6.7	6	0	3	0	0	0	0	4	13	3	2	0	1	5	3	14	54
6.7	8.9	0	0	1	0	0	0	0	4	9	0	3	0	0	0	1	0	18
8.9	11.2	0	1	1	0	0	0	0	4	2	0	0	0	1	0	0	9	
11.2	13.4	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	1	
17.9	22.4	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	
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		31	12	26	2	0	0	0	14	40	15	7	3	9	14	17	40	230

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	30	18	29	10	4	3	6	8	12	15	12	15	16	30	22	36	265
2.2	4.5	87	58	39	15	3	2	3	14	44	37	28	20	32	27	49	103	561
4.5	6.7	36	26	16	2	0	2	8	36	57	38	16	11	15	19	55	58	395
6.7	8.9	6	4	5	0	0	0	7	33	64	30	25	7	9	11	28	29	258
8.9	11.2	4	5	1	0	0	0	4	17	34	22	19	4	8	7	13	5	143
11.2	13.4	1	2	0	0	0	0	0	15	17	33	26	7	4	8	3	1	117
13.4	17.9	1	11	0	0	0	0	0	3	17	54	45	11	6	8	11	3	170
17.9	22.4	2	9	0	0	0	0	0	1	4	19	16	11	7	1	5	0	75
22.4	29.1	0	0	0	0	0	0	0	0	1	5	8	5	2	0	0	0	21
29.1	40.3	0	0	0	0	0	0	0	0	0	1	0	4	5	0	0	0	10
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		167	133	90	27	7	7	28	127	250	254	195	95	104	111	186	234	2015

	A	B	C	D	E	F	G TOTALS
CALM	0	0	0	35	29	51	27 142

Table 5-2 1st 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: 1/1/08	Maximum Hours In Period:	2184
Wind Direction: 245 Foot Sensors	Ending Date: 3/31/08	Hours Missing:	27
Delta T: 245 Foot - 33 Foot Sensors		Hours Used:	2157
Signal Path: Mixed		Recovery Rate:	98.8%
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	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	0	0	0	0
8.9	11.2	0	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	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	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	0
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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	0	0	0	0
8.9	11.2	0	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	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	1	1	0	0	0	0	0	2
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	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		0	0	0	1	0	0	0	0	0	0	1	3	0	0	0	0	0	5

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	1	0	1	1	2	0	2	0	0	0	0	0	0	0	0	0	0	7
4.5	6.7	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	3
6.7	8.9	1	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0	5
8.9	11.2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3
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	2	0	0	0	0	0	0	0	2
17.9	22.4	0	0	0	0	0	0	0	0	0	0	1	1	0	0	3	0	0	5
22.4	29.1	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	3
29.1	40.3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
40.3	90	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTALS		2	1	2	3	2	0	3	1	0	4	6	4	0	0	3	0	0	31

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	3	1	0	2	4	3	5	1	4	3	3	2	2	5	40
2.2	4.5	9	11	6	7	3	1	6	4	10	7	6	8	5	4	8	10	105
4.5	6.7	11	15	4	5	1	2	2	7	9	12	15	7	6	4	7	13	120
6.7	8.9	7	4	5	0	0	0	0	9	9	14	5	4	7	3	4	9	80
8.9	11.2	3	3	0	0	0	0	0	5	5	10	4	2	3	4	5	6	50
11.2	13.4	1	2	0	0	0	0	0	2	9	9	5	4	2	3	4	1	42
13.4	17.9	0	4	0	0	0	0	0	2	6	22	23	2	2	6	3	0	70
17.9	22.4	0	1	0	0	0	0	0	0	1	8	17	4	1	4	2	0	38
22.4	29.1	0	4	1	0	0	0	0	0	1	2	14	5	1	0	5	0	33
29.1	40.3	0	0	0	0	0	0	0	0	0	0	2	2	4	0	0	0	8
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
TOTALS		32	45	19	13	4	5	12	32	55	85	95	41	36	30	40	44	588

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	1	1	2	3	0	0	4	0	2	0	0	2	1	0	3	1	20
2.2	4.5	6	8	3	3	9	7	5	5	3	2	6	8	2	4	11	7	89
4.5	6.7	6	9	7	1	1	2	2	2	8	3	4	5	2	6	10	6	74
6.7	8.9	4	5	4	0	0	1	1	8	11	13	5	4	4	2	15	15	92
8.9	11.2	2	2	2	0	1	0	4	3	8	11	7	3	2	4	16	15	80
11.2	13.4	2	0	2	1	0	0	3	3	5	12	6	4	6	1	12	8	65
13.4	17.9	1	2	0	0	0	0	0	2	18	30	27	8	3	1	12	6	110
17.9	22.4	1	4	1	0	0	0	0	2	5	10	37	10	3	4	11	2	90
22.4	29.1	0	9	3	0	0	0	0	0	2	7	26	8	6	4	4	0	69
29.1	40.3	0	0	0	0	0	0	0	0	2	5	10	5	7	0	0	0	29
40.3	90	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	3
TOTALS		23	40	24	8	11	10	19	25	64	94	128	57	38	26	94	60	721

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	1	2	2	1	1	1	4	4	0	1	1	2	0	1	26
2.2	4.5	4	8	4	10	4	6	5	11	9	11	7	5	8	5	5	3	105
4.5	6.7	10	9	16	9	3	1	4	7	9	5	5	6	4	2	5	8	103
6.7	8.9	11	8	16	3	0	0	0	6	14	6	7	3	3	2	6	11	96
8.9	11.2	3	1	6	2	0	0	2	7	11	7	3	6	0	6	5	6	65
11.2	13.4	3	0	1	1	0	0	1	1	3	6	3	1	1	0	9	16	46
13.4	17.9	1	0	0	0	0	0	0	1	5	9	9	3	1	12	4	7	52
17.9	22.4	0	0	0	0	0	0	0	0	1	8	4	1	1	5	3	0	23
22.4	29.1	0	0	0	0	0	0	0	0	0	3	6	1	1	0	1	0	12
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	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		34	29	44	27	9	8	13	34	56	59	45	27	20	34	38	52	529

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	1	0	3	0	3	2	2	3	1	2	1	1	2	1	0	2	24
2.2	4.5	2	2	1	4	6	1	4	11	3	6	2	5	7	3	1	2	60
4.5	6.7	2	4	5	3	2	0	2	6	7	6	4	3	1	1	2	1	49
6.7	8.9	2	1	4	1	0	1	0	6	6	2	6	1	0	0	1	10	41
8.9	11.2	2	0	1	1	0	0	0	1	6	4	4	0	1	1	2	6	29
11.2	13.4	0	0	0	1	0	0	0	4	2	2	3	2	0	2	3	6	25
13.4	17.9	0	0	1	0	0	0	0	2	4	2	1	0	0	2	5	2	19
17.9	22.4	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	4
22.4	29.1	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	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	15	10	11	4	8	33	29	26	21	12	11	13	14	29	252

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	5	5	9	6	5	5	11	7	12	7	5	7	7	5	5	9	110
2.2	4.5	22	29	15	26	24	15	22	31	25	26	21	26	22	16	25	22	367
4.5	6.7	29	37	32	19	7	5	11	22	33	26	29	21	13	13	24	28	349
6.7	8.9	25	18	30	5	0	2	1	29	40	36	23	13	14	7	26	45	314
8.9	11.2	10	7	9	3	1	0	6	17	30	33	18	11	6	15	28	33	227
11.2	13.4	6	2	3	3	0	0	4	10	19	29	17	11	9	6	28	31	178
13.4	17.9	2	6	1	0	0	0	7	33	65	60	13	6	21	24	15	253	
17.9	22.4	1	5	1	0	0	0	2	7	27	60	17	5	16	19	2	162	
22.4	29.1	0	13	4	0	0	0	0	3	13	48	16	8	4	10	0	119	
29.1	40.3	0	0	0	0	0	0	0	2	5	15	8	11	0	0	0	41	
40.3	90	0	0	0	0	0	0	0	0	1	0	1	4	0	0	0	6	
TOTALS		100	122	104	62	37	27	55	125	204	268	296	144	105	103	189	185	2126

	A	B	C	D	E	F	G TOTALS
CALM	0	0	0	16	8	2	5 31

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: 4/1/08	Maximum Hours In Period:	2184
Wind Direction: 33 Foot Sensors	Ending Date: 6/30/08	Hours Missing:	75
Data T: 245 Foot - 33 Foot Sensors		Hours Used:	2109
Signal Path: Mixed-aaa		Recovery Rate:	96.6%
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	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
4.5	6.7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
6.7	8.9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8.9	11.2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
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	2	4	0	1	0	0	0	0	7
17.9	22.4	0	0	0	0	0	0	0	0	1	4	1	1	0	0	4	1	12
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	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	0	1	0	0	0	0	0	3	8	3	2	0	0	6	1	29

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4.5	6.7	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
6.7	8.9	3	3	0	0	0	0	0	0	2	0	0	0	0	0	1	1	10
8.9	11.2	3	2	1	1	0	0	0	0	2	4	0	0	1	1	0	0	15
11.2	13.4	0	1	0	0	0	0	0	0	1	3	0	0	2	0	0	0	7
13.4	17.9	0	0	0	0	0	0	0	0	4	4	4	2	1	0	3	0	18
17.9	22.4	0	0	0	0	0	0	0	0	0	2	1	3	0	0	2	0	8
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	3	1	6
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	10	1	1	0	0	0	0	9	13	6	6	4	1	9	2	73

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	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3
2.2	4.5	4	5	8	1	2	1	0	0	0	1	1	3	0	1	1	4	32
4.5	6.7	0	6	4	2	0	0	0	0	2	2	5	0	2	1	1	1	26
6.7	8.9	2	3	2	0	0	0	0	1	7	3	3	4	4	2	1	2	34
8.9	11.2	1	2	1	1	0	0	0	0	5	4	1	4	5	3	1	0	28
11.2	13.4	1	1	0	0	0	0	0	0	3	6	1	2	0	0	3	0	17
13.4	17.9	0	0	0	0	0	0	0	0	1	6	5	4	6	3	3	1	29
17.9	22.4	0	0	0	0	0	0	0	0	0	3	3	5	1	0	4	1	17
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	5
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	17	15	4	2	1	0	1	18	25	19	24	18	11	17	10	191

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	2	3	4	4	2	2	2	2	2	3	2	2	3	2	1	2	38
2.2	4.5	5	10	12	8	7	7	9	20	12	16	8	8	10	6	9	3	150
4.5	6.7	5	9	15	9	7	5	15	35	22	25	10	12	6	8	7	7	197
6.7	8.9	2	7	3	6	0	2	4	18	26	23	8	6	11	3	4	2	125
8.9	11.2	3	2	3	2	1	0	4	7	17	20	7	8	7	4	7	5	97
11.2	13.4	3	2	1	0	0	0	3	2	2	8	4	1	7	3	8	2	46
13.4	17.9	0	1	2	0	0	0	0	0	5	13	14	4	10	7	16	17	89
17.9	22.4	0	0	0	0	0	0	0	0	0	2	2	4	3	1	20	5	37
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	1	4	0	8	2	15
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		20	34	40	29	17	16	37	84	86	110	55	46	61	34	81	45	795

Table 5-3 2nd 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	0	4	1	0	3	0	4	1	1	1	2	3	1	5	5	32
2.2	4.5	8	6	2	4	0	3	3	9	10	9	5	5	4	6	12	4	90
4.5	6.7	4	3	1	1	0	0	2	5	9	5	7	5	10	7	7	2	68
6.7	8.9	3	3	0	1	0	0	0	7	14	6	8	3	8	7	8	7	75
8.9	11.2	1	0	0	0	0	0	1	6	12	3	2	2	5	14	21	8	75
11.2	13.4	0	0	1	0	1	0	0	1	8	2	7	3	5	7	18	6	59
13.4	17.9	0	0	0	0	0	0	1	1	1	3	3	6	5	11	22	5	58
17.9	22.4	0	0	0	0	0	0	0	0	0	1	0	1	4	1	6	0	13
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	1	1	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		17	12	8	7	1	6	7	33	55	30	33	28	45	54	99	37	472

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	7	1	2	1	0	2	2	2	4	3	2	4	1	3	5	41
2.2	4.5	11	3	3	2	0	1	4	14	12	13	7	5	5	3	5	4	92
4.5	6.7	2	2	3	1	0	0	1	15	16	13	11	0	5	4	2	7	82
6.7	8.9	1	0	0	2	0	0	1	9	17	2	4	3	1	5	2	2	49
8.9	11.2	0	0	0	0	0	0	2	4	4	3	1	0	0	4	0	18	
11.2	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	
13.4	17.9	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	3	
17.9	22.4	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	
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		16	12	7	7	1	1	10	44	51	37	27	10	15	17	16	18	289

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	6	8	3	2	0	1	1	5	1	4	4	4	3	3	0	6	51
2.2	4.5	9	14	7	0	0	0	1	9	10	3	3	0	1	0	2	6	65
4.5	6.7	12	2	9	0	0	0	0	5	6	9	3	0	0	0	2	5	53
6.7	8.9	0	0	3	2	0	0	0	4	10	6	1	0	0	1	1	1	29
8.9	11.2	0	0	0	0	0	0	0	0	1	0	3	0	0	0	1	0	5
11.2	13.4	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	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		27	24	22	4	0	1	2	23	29	22	15	4	4	4	6	18	205

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	12	18	12	9	3	6	5	13	6	12	10	10	13	8	10	18	165
2.2	4.5	40	36	32	15	9	12	17	52	44	42	24	21	20	16	29	21	432
4.5	6.7	26	26	32	13	7	5	18	60	55	54	36	17	23	20	20	22	434
6.7	8.9	13	16	8	11	0	2	5	39	76	40	24	16	24	18	17	15	324
8.9	11.2	10	6	6	4	1	0	7	17	41	34	14	14	18	22	34	13	241
11.2	13.4	4	4	2	0	1	0	3	3	15	19	13	6	14	14	29	8	135
13.4	17.9	0	1	2	0	0	0	1	1	13	32	27	17	22	21	44	23	204
17.9	22.4	0	0	0	0	0	0	0	0	1	12	7	14	8	2	36	7	87
22.4	29.1	0	0	0	0	0	0	0	0	0	2	5	5	0	14	4	30	
29.1	40.3	0	0	0	0	0	0	0	0	0	1	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	
TOTALS		105	109	94	52	21	25	56	185	251	245	158	120	147	121	234	131	2054

	A	B	C	D	E	F	G TOTALS
CALM	0	0	1	11	12	16	55

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: 4/1/08	Maximum Hours In Period:	2184
Wind Direction: 245 Foot Sensors	Ending Date: 6/30/08	Hours Missing:	35
Delta T: 245 Foot - 33 Foot Sensors		Hours Used:	2149
Signal Path: Mixed		Recovery Rate:	98.4%
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	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
4.5	6.7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6.7	8.9	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
8.9	11.2	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4
11.2	13.4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2
13.4	17.9	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
17.9	22.4	0	0	0	0	0	0	0	0	5	0	2	2	0	1	0	0	10
22.4	29.1	0	0	0	0	0	0	0	0	4	1	0	1	0	4	1	1	12
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		2	1	4	0	0	0	0	0	9	2	5	3	0	6	1	3	36

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	1	1	3	0	0	1	0	0	0	0	0	0	0	0	0	1	7
4.5	6.7	0	4	1	3	0	1	0	0	0	0	0	0	0	0	0	1	10
6.7	8.9	4	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	8
8.9	11.2	2	0	3	0	0	0	0	0	1	1	1	1	0	1	0	1	11
11.2	13.4	2	0	0	0	0	0	0	0	2	5	1	0	0	0	0	1	11
13.4	17.9	0	1	0	0	0	0	0	0	4	4	2	0	1	0	2	0	14
17.9	22.4	0	0	0	0	0	0	0	0	0	1	1	4	3	1	1	0	11
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	4
29.1	40.3	0	0	0	0	0	0	0	0	0	0	2	0	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		9	8	7	3	0	2	0	0	7	12	7	5	4	4	7	4	79

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	0	2	0	0	0	0	0	0	0	0	0	1	0	1	0	5
2.2	4.5	4	7	1	1	1	0	0	0	0	0	1	1	1	1	2	2	22
4.5	6.7	1	3	1	0	0	0	0	0	0	2	2	1	1	2	0	1	14
6.7	8.9	3	4	2	1	0	0	0	3	4	2	2	1	1	2	2	0	27
8.9	11.2	0	4	2	0	1	0	0	1	6	6	3	0	2	1	0	2	28
11.2	13.4	1	0	1	0	0	0	0	0	1	7	2	2	4	1	0	2	21
13.4	17.9	0	1	0	0	1	0	0	0	4	8	7	4	7	5	3	1	41
17.9	22.4	0	0	0	0	0	0	0	0	0	1	0	5	1	0	1	1	9
22.4	29.1	0	0	0	0	0	0	0	0	1	3	3	2	0	3	3	0	15
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	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		10	19	9	2	3	0	0	4	16	29	21	16	18	15	13	9	184

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	3	2	3	1	4	1	3	2	3	2	2	1	1	0	1	30
2.2	4.5	5	11	5	10	2	11	7	9	11	8	6	6	4	6	4	3	108
4.5	6.7	4	6	10	7	3	5	14	23	15	15	14	8	10	11	6	4	155
6.7	8.9	4	5	8	6	3	7	16	18	23	19	9	13	3	5	6	2	147
8.9	11.2	6	1	3	4	0	1	8	10	24	21	8	9	9	7	2	2	115
11.2	13.4	1	2	0	1	1	0	3	4	5	14	5	6	4	8	1	1	56
13.4	17.9	3	2	1	0	0	0	3	2	15	7	9	9	8	9	13	3	84
17.9	22.4	0	0	0	0	0	0	0	0	3	6	7	4	5	9	13	1	48
22.4	29.1	0	0	1	0	0	0	0	0	1	2	5	4	6	15	17	2	53
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	1	2	4	6	0	14
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		24	30	30	31	10	28	52	69	99	95	66	62	52	75	68	19	810

Table 5-4 2nd 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	2	0	2	0	2	0	0	4	0	1	1	1	0	0	2	18
2.2	4.5	3	1	2	2	1	0	2	0	1	3	6	5	6	3	2	2	39
4.5	6.7	2	3	2	1	1	4	2	4	3	6	3	2	3	5	7	5	53
6.7	8.9	0	4	1	0	0	2	1	4	3	2	6	1	6	12	9	2	53
8.9	11.2	1	0	2	0	0	0	1	2	7	5	6	3	6	9	9	2	53
11.2	13.4	0	0	0	0	0	0	1	2	9	4	5	2	4	9	8	2	46
13.4	17.9	1	2	0	0	0	1	1	2	15	6	8	5	4	17	19	7	88
17.9	22.4	0	0	1	1	0	0	0	0	5	2	4	7	9	28	22	3	82
22.4	29.1	0	0	0	0	0	0	0	0	1	3	1	4	7	20	15	0	51
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	2	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
TOTALS		10	12	8	6	2	9	8	14	48	31	41	32	46	104	91	25	487

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	0	1	0	0	1	2	2	2	1	1	3	1	1	2	2	19
2.2	4.5	2	1	0	4	1	4	7	1	3	10	5	5	5	6	2	1	57
4.5	6.7	6	0	3	2	0	2	4	6	5	6	7	7	5	1	1	6	61
6.7	8.9	2	1	2	1	0	0	3	3	8	3	8	3	5	2	7	2	50
8.9	11.2	0	0	3	0	0	1	3	7	9	5	2	2	1	4	3	5	45
11.2	13.4	0	0	0	0	1	0	1	3	3	4	0	1	2	5	2	3	25
13.4	17.9	0	0	0	0	0	0	5	1	5	4	2	2	3	6	8	0	36
17.9	22.4	0	0	0	0	0	0	0	0	0	0	2	0	1	2	6	0	11
22.4	29.1	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	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		10	2	9	7	2	8	25	23	35	34	27	23	23	27	31	19	305

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	1	1	3	1	1	1	0	0	1	1	0	1	1	0	1	16
2.2	4.5	1	4	3	0	0	1	1	2	5	8	4	4	2	5	2	4	46
4.5	6.7	7	4	4	2	5	0	2	6	6	6	4	4	2	0	1	3	56
6.7	8.9	4	8	8	1	0	0	4	2	6	6	7	3	1	1	3	5	59
8.9	11.2	2	1	2	1	0	0	0	3	4	3	1	1	0	2	0	1	21
11.2	13.4	0	0	0	1	0	0	1	2	1	1	0	2	1	0	0	1	10
13.4	17.9	0	0	0	2	0	0	0	3	0	0	1	0	0	2	3	3	14
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		17	18	18	10	6	2	9	18	22	25	18	14	7	11	10	18	223

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	8	6	6	8	2	8	4	5	8	5	5	6	5	3	3	6	88
2.2	4.5	16	25	14	17	5	17	17	12	20	29	22	21	18	21	12	13	279
4.5	6.7	20	20	22	15	9	12	22	39	29	35	30	22	21	19	15	20	350
6.7	8.9	17	25	21	9	3	9	24	30	44	33	32	21	16	24	27	12	347
8.9	11.2	13	6	17	5	1	2	12	23	51	41	21	16	18	24	14	13	277
11.2	13.4	4	2	2	2	2	0	6	11	21	35	13	13	15	23	11	11	171
13.4	17.9	4	6	1	2	1	1	9	8	43	30	30	20	23	39	48	14	279
17.9	22.4	0	0	1	1	0	0	0	0	13	10	16	22	19	41	44	5	172
22.4	29.1	0	0	1	0	0	0	0	0	7	10	9	11	13	43	39	3	136
29.1	40.3	0	0	0	0	0	0	0	0	0	7	3	2	5	8	0	25	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		82	90	85	59	23	49	94	128	236	228	185	155	150	242	221	97	2124

	A	B	C	D	E	F	G TOTALS
CALM	0	0	0	10	4	6	5 25

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: 7/1/08	Maximum Hours In Period:	2208
Wind Direction: 33 Foot Sensors	Ending Date: 9/30/08	Hours Missing:	9
Delta T: 245 Foot - 33 Foot Sensors		Hours Used:	2199
Signal Path: Mixed-bbb		Recovery Rate:	99.6%
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	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2.2	4.5	3	16	12	7	3	1	0	0	0	0	0	0	0	0	0	0	42
4.5	6.7	5	16	12	3	1	2	0	2	0	0	0	0	0	0	0	0	41
6.7	8.9	5	7	2	0	1	0	1	1	1	0	0	0	0	0	0	0	18
8.9	11.2	1	10	0	2	0	0	2	0	4	0	3	0	3	0	0	0	25
11.2	13.4	1	5	2	0	0	0	2	1	1	5	1	2	0	2	0	1	23
13.4	17.9	0	1	0	0	0	0	1	0	2	4	0	0	0	0	4	0	12
17.9	22.4	0	0	0	0	0	0	0	0	0	1	1	0	2	3	0	0	7
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	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		16	56	28	12	5	3	6	4	8	10	6	2	5	6	5	2	174

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	2	4	6	5	3	0	0	0	0	0	0	0	0	0	0	0	20
2.2	4.5	8	16	21	12	5	2	2	1	0	1	0	0	1	0	0	1	70
4.5	6.7	11	6	6	3	0	1	4	3	2	3	1	1	0	0	2	2	45
6.7	8.9	7	2	2	0	0	0	3	3	6	8	4	1	2	0	0	0	38
8.9	11.2	2	0	0	3	0	0	3	7	8	9	2	1	1	1	0	0	37
11.2	13.4	1	1	0	0	0	0	2	2	2	3	1	3	1	1	1	0	18
13.4	17.9	1	0	0	0	0	0	0	1	0	2	4	4	0	0	2	0	14
17.9	22.4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4
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		32	29	35	23	8	3	14	17	18	26	13	10	5	2	9	3	247

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	4	7	1	4	0	1	1	0	1	2	1	1	0	1	2	27
2.2	4.5	3	7	7	4	2	2	1	10	4	6	4	1	3	2	5	6	67
4.5	6.7	1	4	3	2	0	1	2	15	9	3	3	2	2	3	4	56	
6.7	8.9	3	1	2	3	0	1	0	2	8	7	1	1	1	2	2	36	
8.9	11.2	2	1	0	0	0	0	1	3	6	6	2	4	2	2	1	30	
11.2	13.4	1	0	1	0	0	0	2	0	2	1	1	2	1	4	0	15	
13.4	17.9	0	0	0	0	0	0	0	0	1	2	0	3	3	0	1	11	
17.9	22.4	0	0	0	0	0	0	0	0	0	0	0	3	1	0	1	5	
22.4	29.1	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	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS		11	17	20	10	6	4	7	31	28	27	13	16	15	9	18	15	247

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	1	2	6	6	4	5	3	3	1	2	0	3	1	1	1	39
2.2	4.5	6	3	6	4	1	2	4	9	15	8	1	4	5	5	4	6	83
4.5	6.7	6	2	3	6	1	1	3	11	10	7	0	8	3	1	3	2	67
6.7	8.9	1	3	3	2	1	0	2	9	5	5	4	5	3	3	1	3	50
8.9	11.2	0	0	0	0	0	0	4	6	9	2	2	2	6	2	4	7	44
11.2	13.4	1	0	0	0	0	0	2	0	7	1	2	5	3	1	10	3	35
13.4	17.9	0	0	0	0	0	0	0	1	0	5	3	1	7	2	27	2	48
17.9	22.4	0	0	0	0	0	0	0	0	0	2	1	1	1	0	12	0	17
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		14	9	14	18	9	7	20	39	49	31	15	26	31	15	65	24	386

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	2	3	1	2	2	4	0	2	4	6	1	3	3	1	2	3	39
22	4.5	7	4	6	5	1	1	7	7	10	5	6	7	2	3	5	13	89
45	6.7	3	2	4	2	0	0	4	10	13	3	3	5	6	5	11	12	83
67	8.9	4	1	2	0	0	0	4	9	9	5	1	1	2	8	17	12	75
89	11.2	1	0	0	1	0	0	0	3	5	5	1	1	2	10	19	2	50
112	13.4	0	0	1	0	0	0	0	1	5	9	1	3	1	10	17	5	53
134	17.9	1	0	0	0	0	0	0	1	0	2	1	2	1	8	23	3	42
179	22.4	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2
224	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
291	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
403	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		18	10	14	10	3	5	15	33	46	35	14	23	18	45	94	50	433

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	3	8	5	2	1	4	6	3	2	1	2	2	1	3	1	44
22	4.5	9	7	11	4	1	0	3	11	14	8	1	2	1	3	5	9	89
45	6.7	4	3	3	2	0	0	3	11	10	8	1	0	0	2	6	6	59
67	8.9	0	0	0	1	0	0	3	8	9	8	1	2	3	4	5	6	50
89	11.2	0	0	0	0	0	0	2	3	2	3	0	0	1	5	6	1	23
112	13.4	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
134	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
224	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
291	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
403	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		14	13	22	12	3	1	15	39	38	31	4	6	7	15	25	23	268

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	8	15	19	4	2	3	2	8	2	7	1	0	1	2	4	6	84
22	4.5	20	22	28	8	0	0	3	9	17	3	1	1	0	0	2	13	127
45	6.7	6	3	15	4	0	0	0	13	17	3	0	1	0	2	3	8	75
67	8.9	0	0	2	1	0	0	0	3	4	4	1	0	0	0	2	4	21
89	11.2	0	0	0	0	0	0	0	0	4	0	1	0	1	0	0	0	6
112	13.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
224	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
291	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
403	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		34	40	64	17	2	3	5	33	44	17	4	2	2	4	11	31	313

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	14	31	43	23	19	12	12	20	12	17	7	6	10	5	11	13	255
22	4.5	56	75	91	44	13	8	20	47	60	31	13	15	12	13	21	48	567
45	6.7	36	36	46	22	2	5	16	65	61	27	8	17	11	12	28	34	426
67	8.9	20	14	13	7	2	1	13	35	42	37	12	10	11	17	27	27	288
89	11.2	6	11	0	6	0	0	12	22	38	25	11	8	16	20	30	10	215
112	13.4	5	6	4	0	0	0	8	4	15	22	6	14	7	15	32	9	147
134	17.9	2	1	0	0	0	0	1	3	3	15	8	10	11	10	57	6	127
179	22.4	0	0	0	0	0	0	0	0	0	3	3	5	5	3	16	0	35
224	29.1	0	0	0	0	0	0	0	0	0	1	0	0	1	4	1	7	7
291	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
403	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		139	174	197	102	36	26	82	196	231	177	69	85	83	96	227	148	2068

	A	B	C	D	E	F	G TOTALS
CALM	0	4	8	21	15	25	58 131

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: 7/1/08	Maximum Hours In Period:	2208
Wind Direction: 245 Foot Sensors	Ending Date: 9/30/08	Hours Missing:	9
Delta T: 245 Foot - 33 Foot Sensors		Hours Used:	2199
Signal Path: Mixed		Recovery Rate:	99.6%
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	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2.2	4.5	1	8	2	4	0	1	0	0	0	0	0	0	0	0	0	0	16
4.5	6.7	3	15	14	4	1	1	0	0	0	0	0	0	0	0	0	0	38
6.7	8.9	3	10	9	5	0	2	2	1	0	0	0	0	0	0	0	0	32
8.9	11.2	4	6	3	1	0	0	1	0	1	0	0	0	0	0	0	0	16
11.2	13.4	1	4	2	2	1	1	1	0	3	0	1	1	2	0	0	0	19
13.4	17.9	0	9	2	0	0	0	3	0	5	4	1	3	1	2	0	1	31
17.9	22.4	0	0	0	0	0	0	1	0	0	4	0	0	1	2	1	1	10
22.4	29.1	0	0	0	0	0	0	0	0	0	0	2	1	1	3	0	0	7
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	1	0	1
TOTALS		12	54	32	16	2	5	8	1	9	8	4	5	5	8	3	2	174

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	5	4	1	0	0	0	0	0	0	0	0	0	0	0	13
2.2	4.5	3	8	13	12	6	1	0	1	0	0	0	0	0	0	0	2	46
4.5	6.7	9	5	14	6	3	2	0	1	0	3	0	1	0	0	1	1	46
6.7	8.9	7	6	3	3	1	0	4	1	6	1	2	1	0	0	0	2	37
8.9	11.2	3	2	3	1	0	0	3	3	6	4	3	1	2	0	0	0	31
11.2	13.4	3	0	0	1	0	1	5	5	3	10	3	0	0	0	0	0	31
13.4	17.9	1	2	0	1	1	1	1	2	1	6	3	8	3	1	1	0	32
17.9	22.4	0	0	0	0	0	0	0	0	0	1	2	3	0	0	1	1	8
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	1	4
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		27	25	38	28	12	5	13	13	16	25	14	14	5	1	6	7	249

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	5	3	1	3	1	0	1	1	0	1	0	0	2	1	1	21
2.2	4.5	0	3	5	4	3	0	2	2	1	5	4	1	1	1	3	4	39
4.5	6.7	3	4	1	3	0	1	6	5	6	4	3	3	3	3	4	1	50
6.7	8.9	4	4	2	3	1	1	1	11	8	1	3	1	1	1	2	3	47
8.9	11.2	3	0	2	1	0	1	0	1	4	6	4	0	1	1	1	0	25
11.2	13.4	1	0	0	0	2	0	2	2	6	5	4	3	1	1	0	0	27
13.4	17.9	2	1	1	0	0	2	0	1	0	3	0	6	1	4	4	0	25
17.9	22.4	0	0	0	0	0	0	0	0	0	1	0	2	2	0	1	1	7
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	1	4	0	1	0	6
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	17	14	12	9	6	11	23	26	25	19	17	14	13	17	10	247

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	0	3	3	3	2	1	4	1	2	1	0	0	1	2	25
2.2	4.5	3	1	2	2	0	1	6	3	12	4	3	3	2	3	3	2	50
4.5	6.7	5	4	4	5	1	1	2	7	9	7	1	4	3	5	3	5	66
6.7	8.9	3	4	1	4	0	1	1	6	11	5	1	4	2	2	1	2	48
8.9	11.2	2	3	2	2	0	0	3	3	4	4	3	3	3	2	1	1	36
11.2	13.4	0	1	0	0	2	1	3	4	7	1	5	1	4	1	2	4	36
13.4	17.9	3	1	0	0	0	1	1	1	2	7	4	7	8	2	4	3	44
17.9	22.4	0	0	0	0	0	0	0	0	1	4	2	0	7	4	16	1	35
22.4	29.1	0	0	0	0	0	0	0	0	0	0	3	1	4	3	21	4	36
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	1	0	1	6	0	8
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		17	15	9	16	6	8	18	25	50	33	24	25	33	23	58	24	384

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	2	2	0	1	2	4	0	2	1	0	2	3	0	1	2	22
2.2	4.5	3	1	0	4	1	1	0	3	4	2	1	5	2	2	3	3	35
4.5	6.7	1	4	3	2	2	0	2	2	2	7	3	3	6	1	7	2	47
6.7	8.9	7	1	0	1	0	1	1	2	6	6	2	0	3	8	6	7	51
8.9	11.2	1	0	1	0	1	0	1	3	3	5	0	2	3	2	13	5	40
11.2	13.4	2	0	1	1	1	0	1	0	5	4	1	2	3	3	3	4	31
13.4	17.9	6	1	2	0	0	0	1	5	6	5	7	1	2	12	26	6	80
17.9	22.4	1	0	0	0	0	0	0	0	3	2	10	2	2	21	31	2	74
22.4	29.1	0	0	1	1	0	0	0	0	1	1	1	3	3	9	35	4	59
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	1	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		21	9	10	9	6	4	10	15	32	33	25	20	28	58	125	35	440

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	0	1	0	1	3	4	2	2	0	2	2	0	1	2	21
2.2	4.5	2	2	2	2	1	1	5	3	3	2	4	1	3	3	0	1	35
4.5	6.7	8	2	1	0	0	2	3	7	3	4	5	1	2	2	3	3	46
6.7	8.9	5	5	2	0	0	0	0	5	8	8	1	2	1	3	2	5	47
8.9	11.2	3	1	3	1	2	0	1	5	7	2	3	0	0	2	3	5	38
11.2	13.4	1	0	0	1	0	0	0	6	4	6	2	0	2	2	5	3	32
13.4	17.9	4	0	1	1	0	0	1	1	0	3	3	0	1	4	8	10	37
17.9	22.4	2	0	0	1	0	0	0	0	1	0	3	0	0	6	4	4	21
22.4	29.1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	5
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		26	11	10	7	3	4	13	31	28	27	21	6	11	23	28	33	282

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	1	2	4	2	1	4	3	3	3	2	1	1	0	4	32
2.2	4.5	3	5	3	9	5	2	4	11	8	8	5	3	2	2	0	2	72
4.5	6.7	8	4	5	12	5	0	1	6	4	8	3	0	0	2	1	5	64
6.7	8.9	6	3	4	4	2	0	1	10	13	2	2	0	1	0	3	7	58
8.9	11.2	12	0	1	5	1	0	1	5	8	1	3	0	1	1	3	11	53
11.2	13.4	6	2	1	0	0	0	0	4	3	3	1	0	0	0	3	9	32
13.4	17.9	4	0	0	0	0	0	0	1	3	0	1	0	1	0	7	10	27
17.9	22.4	0	0	0	2	0	0	0	0	0	0	1	0	0	0	1	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	15	15	34	17	4	8	41	42	25	19	5	6	6	18	48	342

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	3	14	11	11	12	9	10	10	12	7	6	7	6	3	4	11	136
2.2	4.5	15	28	27	37	16	7	17	23	28	21	17	13	10	11	9	14	293
4.5	6.7	37	38	42	32	12	7	14	28	24	33	15	12	14	13	19	17	357
6.7	8.9	35	33	21	20	4	5	10	36	52	23	11	8	8	14	14	26	320
8.9	11.2	28	12	15	11	4	1	10	20	33	22	16	6	10	8	21	22	239
11.2	13.4	14	7	4	5	6	3	12	21	31	29	17	7	12	7	13	20	208
13.4	17.9	20	14	6	2	1	4	7	11	17	28	19	25	17	25	50	30	276
17.9	22.4	3	0	0	3	0	0	1	0	5	12	18	7	12	33	55	10	159
22.4	29.1	1	0	2	1	0	0	0	0	1	1	7	6	12	16	61	9	117
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	1	1	2	8	0	12
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TOTALS		156	146	128	122	55	36	81	149	203	176	126	92	102	132	255	159	2118

	A	B	C	D	E	F	G TOTALS
CALM	0	2	8	23	8	11	29 81

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: 10/1/08	Maximum Hours In Period:	2208
Wind Direction: 33 Foot Sensors	Ending Date: 12/31/08	Hours Missing:	6
Delta T: 245 Foot - 33 Foot Sensors		Hours Used:	2202
Signal Path: Mixed-aaa		Recovery Rate:	99.7%
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	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
4.5	6.7	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	0	0	0
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	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
17.9	22.4	0	1	0	0	0	0	0	0	0	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		0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
2.2	4.5	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	2	3
6.7	8.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13.4	17.9	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	5
17.9	22.4	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	1	5
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		3	3	1	0	0	0	0	0	0	0	0	2	1	0	0	5	15

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	11
4.5	6.7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5
6.7	8.9	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
8.9	11.2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
11.2	13.4	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
13.4	17.9	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	4	7
17.9	22.4	1	1	0	0	0	0	0	0	0	0	0	2	0	0	1	0	5
22.4	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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		11	3	0	0	0	0	0	0	1	1	0	3	0	1	2	12	34

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	6	9	7	7	7	3	6	4	5	7	3	4	4	4	6	10	92
2.2	4.5	27	15	10	6	1	1	2	13	11	11	2	7	5	8	19	32	170
4.5	6.7	15	5	6	2	0	0	1	19	19	2	3	1	4	4	26	37	144
6.7	8.9	15	4	0	1	0	0	5	7	13	2	2	3	1	3	9	4	69
8.9	11.2	0	6	1	0	0	0	0	6	8	5	0	2	1	3	2	3	37
11.2	13.4	14	0	0	0	0	0	0	1	7	2	1	2	0	1	2	6	36
13.4	17.9	28	3	0	0	0	0	0	0	3	5	3	4	3	0	4	3	56
17.9	22.4	5	6	0	0	0	0	0	0	0	4	2	4	0	0	2	0	23
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		110	48	24	16	8	4	14	50	66	38	16	27	18	23	71	95	628

Table 5-7 4th 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	10	8	6	1	0	2	3	7	8	11	3	10	9	9	6	13	106
2.2	4.5	14	7	1	2	0	1	5	10	11	6	7	12	10	20	26	33	165
4.5	6.7	13	2	2	3	0	0	4	8	24	9	3	6	5	7	18	29	133
6.7	8.9	2	1	0	1	0	2	12	19	11	5	5	2	4	4	12	9	89
8.9	11.2	1	1	0	0	0	0	1	14	3	2	2	3	1	2	8	6	44
11.2	13.4	2	0	0	0	0	0	1	2	4	1	6	5	2	2	1	1	27
13.4	17.9	1	0	0	0	0	0	0	2	1	1	11	2	1	0	2	2	23
17.9	22.4	0	0	0	0	0	0	0	0	0	2	6	7	1	0	0	0	16
22.4	29.1	0	0	0	0	0	0	0	0	0	4	0	2	0	0	0	0	6
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		43	19	9	7	0	5	26	62	62	41	43	49	33	44	73	93	609

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	7	7	8	4	2	2	2	4	5	7	5	4	4	8	20	11	100
2.2	4.5	17	7	4	2	0	1	1	12	13	9	9	4	5	6	19	28	137
4.5	6.7	22	4	2	0	0	0	2	15	14	11	2	2	0	2	5	11	92
6.7	8.9	3	2	1	0	0	0	3	19	8	4	2	0	1	1	9	3	56
8.9	11.2	2	0	2	0	0	0	0	6	5	2	1	2	2	2	1	0	25
11.2	13.4	1	0	0	0	0	0	0	4	2	1	0	0	0	1	4	1	14
13.4	17.9	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
17.9	22.4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	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		52	20	17	6	2	3	8	60	47	36	23	12	12	20	58	54	430

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	12	10	5	2	1	1	0	5	3	4	3	4	3	6	11	19	89
2.2	4.5	25	11	9	0	0	0	1	12	13	4	7	5	3	7	15	33	145
4.5	6.7	6	1	1	0	0	0	0	6	4	7	0	1	0	1	5	21	53
6.7	8.9	2	0	0	0	0	0	1	5	1	1	0	2	1	1	5	2	21
8.9	11.2	0	0	0	0	0	0	1	5	1	0	0	0	0	0	4	1	12
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		45	22	15	2	1	1	3	33	22	16	10	12	7	15	40	76	320

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	35	34	26	14	10	8	11	20	21	29	14	22	20	27	43	54	388
2.2	4.5	89	40	24	10	1	3	9	47	48	30	25	28	23	41	80	130	628
4.5	6.7	60	12	11	5	0	0	7	48	61	29	8	10	9	14	54	102	430
6.7	8.9	22	7	1	2	0	2	21	50	33	12	9	7	7	10	35	19	237
8.9	11.2	3	7	3	0	0	0	2	31	17	10	3	7	4	7	15	10	119
11.2	13.4	18	1	0	0	0	0	1	7	14	4	7	7	2	4	7	8	80
13.4	17.9	31	6	1	0	0	0	0	2	4	8	16	8	5	0	6	10	97
17.9	22.4	6	10	0	0	0	0	0	0	0	6	10	15	1	0	3	1	52
22.4	29.1	0	0	0	0	0	0	0	0	0	4	0	2	0	0	1	1	8
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		264	117	66	31	11	13	51	205	198	132	92	106	71	103	244	335	2039

	A	B	C	D	E	F	G TOTALS
CALM	0	0	0	39	31	52	41 163

Table 5-8 4th 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: 10/1/08	Maximum Hours In Period: 2208			
Wind Direction: 245 Foot Sensors	Ending Date: 12/31/08	Hours Missing: 6			
Delta T: 245 Foot - 33 Foot Sensors		Hours Used: 2202			
Signal Path: Mixed		Recovery Rate: 99.7%			
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4.5	6.7	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	0	0	0
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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
22.4	29.1	0	1	0	0	0	0	0	0	0	0	0	1	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		0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	4

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	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	0	0	0	0	0	1
4.5	6.7	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	0	2	2
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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13.4	17.9	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17.9	22.4	0	3	1	0	0	0	0	0	0	0	0	0	1	0	0	0	5
22.4	29.1	1	1	0	0	0	0	0	0	0	0	0	2	0	0	0	1	5
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		3	5	1	0	0	0	0	0	0	0	0	2	1	0	0	3	15

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2	4.5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4.5	6.7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3	5
6.7	8.9	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	8
8.9	11.2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	4
11.2	13.4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
13.4	17.9	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
17.9	22.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3
22.4	29.1	4	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	8
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		11	6	1	0	0	0	0	0	1	1	0	2	1	1	3	8	35

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	3	2	0	3	1	1	2	3	2	0	2	2	2	1	5	2	31
2.2	4.5	14	9	16	13	5	1	3	7	11	7	3	7	5	5	9	17	132
4.5	6.7	20	11	5	2	1	2	1	9	11	4	3	3	4	3	18	22	119
6.7	8.9	10	13	3	2	0	0	2	10	15	7	4	2	3	2	11	21	105
8.9	11.2	6	10	2	0	0	0	2	9	11	5	0	2	0	2	10	11	70
11.2	13.4	9	3	3	0	0	0	0	1	9	11	4	0	0	4	2	4	50
13.4	17.9	16	3	2	1	0	0	0	0	11	5	0	2	2	3	4	9	58
17.9	22.4	16	11	0	0	0	0	0	0	2	3	2	2	4	0	6	1	47
22.4	29.1	1	10	0	0	0	0	0	0	5	3	7	0	0	0	0	2	28
29.1	40.3	0	0	0	0	0	0	0	0	0	1	3	2	1	0	3	0	10
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		95	72	31	21	7	4	10	39	72	48	24	29	21	20	68	89	650

Table 5-8 4th 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	TOTAL
1	2.2	2	1	2	1	3	1	1	3	0	1	2	0	4	2	1	1	25
2.2	4.5	8	8	4	1	6	3	3	4	12	6	5	3	9	5	7	9	93
4.5	6.7	9	8	7	6	3	2	3	7	11	5	2	0	2	5	13	22	105
6.7	8.9	12	5	5	3	1	0	1	7	7	8	6	3	2	3	7	22	92
8.9	11.2	5	3	4	4	0	1	4	4	10	5	2	1	4	5	4	10	66
11.2	13.4	2	3	0	0	1	0	4	8	9	10	4	1	4	2	9	19	76
13.4	17.9	4	0	2	1	1	0	3	5	11	9	2	4	3	6	7	15	73
17.9	22.4	4	0	1	0	0	0	1	1	5	7	11	4	4	2	3	10	53
22.4	29.1	0	0	0	0	0	0	0	1	2	2	5	6	5	2	3	1	27
29.1	40.3	0	0	0	0	0	0	0	0	1	1	9	8	0	0	1	0	20
40.3	90	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTALS		46	28	25	16	15	7	20	40	68	54	49	30	37	32	55	109	631

Wind Speed		STABILITY CLASS: F																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	2	1	1	1	0	4	2	2	1	1	3	3	1	0	1	0	23
2.2	4.5	5	6	8	6	2	3	4	9	6	5	2	4	3	1	4	6	74
4.5	6.7	11	6	2	5	2	2	4	13	8	7	5	2	3	4	3	7	84
6.7	8.9	13	5	3	1	3	0	3	10	7	5	2	2	2	1	6	10	73
8.9	11.2	12	5	2	3	1	0	2	12	9	4	7	1	1	1	6	6	72
11.2	13.4	5	0	0	1	0	0	0	8	8	4	1	2	1	2	7	4	43
13.4	17.9	5	1	3	0	0	0	0	11	7	6	5	0	1	1	8	16	64
17.9	22.4	1	1	4	0	0	0	0	1	4	6	3	1	1	3	5	0	30
22.4	29.1	0	0	1	0	0	0	0	0	0	4	0	2	0	4	2	13	13
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	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		54	25	24	17	8	9	15	66	50	38	32	16	15	13	44	51	477

Wind Speed		STABILITY CLASS: G																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	2	1	0	0	1	1	0	0	2	0	0	9
2.2	4.5	5	9	5	4	5	2	6	5	6	4	5	4	4	0	4	5	73
4.5	6.7	4	7	8	3	1	0	2	9	10	5	4	6	4	0	3	3	69
6.7	8.9	7	6	7	2	0	1	4	6	10	4	6	1	5	2	3	6	70
8.9	11.2	3	5	2	1	1	0	2	4	11	3	1	1	2	3	2	14	55
11.2	13.4	2	2	2	1	0	0	0	4	2	2	3	2	1	0	5	7	33
13.4	17.9	4	0	0	0	0	0	0	3	6	2	2	0	0	1	3	6	27
17.9	22.4	2	0	0	0	0	0	2	0	2	0	0	0	0	0	3	6	15
22.4	29.1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	4	7
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	30	24	12	7	5	17	32	47	21	22	14	16	8	25	51	358

Wind Speed		STABILITY CLASS: ALL																TOTAL
Min	Max	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1	2.2	7	5	3	6	4	8	6	8	3	3	8	5	7	5	7	3	88
2.2	4.5	34	33	33	25	18	9	16	25	35	22	15	18	21	11	24	37	376
4.5	6.7	44	33	22	16	7	6	10	38	40	21	14	11	13	12	38	57	382
6.7	8.9	47	29	19	8	4	1	10	33	39	24	18	8	12	8	27	63	350
8.9	11.2	27	24	10	8	2	1	10	29	41	17	10	5	7	12	23	41	267
11.2	13.4	19	8	5	2	1	0	4	21	28	28	12	5	6	8	23	34	204
13.4	17.9	29	7	7	2	1	0	3	19	36	22	9	6	6	11	22	46	226
17.9	22.4	23	17	6	0	0	0	3	2	13	16	16	7	10	5	17	19	154
22.4	29.1	6	12	1	0	0	0	0	2	7	12	18	8	2	10	10	90	90
29.1	40.3	0	0	0	0	0	0	0	0	1	2	12	11	1	0	4	1	32
40.3	90	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTALS		236	168	106	67	37	25	62	177	238	162	127	94	91	74	195	311	2170

	A	B	C	D	E	F	G TOTALS
CALM	0	0	0	11	10	7	4 32

Table 5-9 Year 2008, 33 Ft AGL

Joint Frequency Distribution			
(version 4.0)			
Sensor Criteria	Time Frame	Data Recovery Rate	
Wind Speed: 33 Foot Sensors	Starting Date: 1/1/08	Maximum Hours In Period:	8784
Wind Direction: 33 Foot Sensors	Ending Date: 12/31/08	Hours Missing:	117
Delta T: 245 Foot - 33 Foot Sensors		Hours Used:	8667
Signal Path: Mixed Signals		Recovery Rate:	98.7%
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	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2.2	4.5	3	16	12	7	3	1	0	0	0	0	0	0	0	0	0	0	42
4.5	6.7	6	16	12	3	1	2	0	2	0	0	0	0	0	0	1	0	43
6.7	8.9	7	7	2	0	1	0	1	1	1	0	0	0	0	0	0	0	20
8.9	11.2	3	10	1	2	0	0	2	0	4	0	3	0	3	0	0	0	28
11.2	13.4	1	5	2	0	0	0	2	1	1	5	1	2	0	2	0	1	23
13.4	17.9	0	2	0	0	0	0	1	0	4	8	0	2	0	0	4	0	21
17.9	22.4	0	1	0	0	0	0	0	0	1	5	2	1	2	3	4	1	20
22.4	29.1	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1	1	5
29.1	40.3	0	0	0	0	0	0	0	0	0	0	1	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		21	58	29	12	5	3	6	4	11	18	9	5	5	6	11	3	206

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	2	5	6	5	3	0	0	0	0	0	0	0	0	0	0	1	22
2.2	4.5	11	16	21	12	5	2	2	1	0	1	0	0	1	0	0	1	73
4.5	6.7	14	10	6	3	0	1	4	3	2	3	1	1	0	0	2	4	54
6.7	8.9	10	5	2	0	0	0	3	3	8	8	4	1	2	0	1	1	48
8.9	11.2	5	2	1	4	0	0	3	7	10	13	2	1	2	2	0	0	52
11.2	13.4	2	2	0	0	0	0	2	2	3	6	1	3	3	1	1	0	26
13.4	17.9	2	1	1	0	0	0	0	1	4	6	9	7	2	0	5	1	39
17.9	22.4	0	2	0	0	0	0	0	0	0	2	2	5	0	0	5	1	17
22.4	29.1	0	0	0	0	0	0	0	0	0	0	1	3	0	0	4	1	9
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		46	43	37	24	8	3	14	17	27	39	20	21	10	3	18	10	340

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	4	8	1	4	0	1	1	0	1	2	1	1	1	2	3	32
2.2	4.5	16	14	17	5	4	3	1	10	4	7	5	4	3	3	7	14	117
4.5	6.7	9	11	7	4	0	1	2	15	11	5	8	2	4	3	4	7	93
6.7	8.9	6	5	4	3	0	1	0	3	15	10	4	5	5	5	3	5	74
8.9	11.2	4	3	1	1	0	0	1	3	11	11	3	8	7	5	2	0	60
11.2	13.4	2	2	1	0	0	0	2	0	4	8	2	3	2	1	7	0	34
13.4	17.9	1	1	0	0	0	0	0	0	2	10	6	9	9	3	4	6	51
17.9	22.4	1	1	0	0	0	0	0	0	0	3	3	11	2	1	8	1	31
22.4	29.1	0	0	0	0	0	0	0	0	0	0	4	2	0	0	2	2	10
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	1	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		41	41	38	14	8	5	7	32	47	55	37	46	33	22	39	38	503

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	14	18	19	22	15	9	15	10	12	13	10	9	13	15	13	22	229
2.2	4.5	63	42	35	25	9	11	16	44	50	46	19	27	26	22	41	64	540
4.5	6.7	40	27	29	17	8	7	20	79	62	49	17	25	17	17	49	59	522
6.7	8.9	21	16	6	9	1	2	11	41	56	40	17	16	17	16	18	21	308
8.9	11.2	5	10	4	2	1	0	9	22	50	37	13	15	14	14	16	18	230
11.2	13.4	18	3	1	0	0	0	5	5	22	21	18	10	10	8	20	11	152
13.4	17.9	28	10	2	0	0	0	0	1	14	45	39	14	23	13	51	25	265
17.9	22.4	6	9	0	0	0	0	0	1	0	10	16	12	4	1	37	5	101
22.4	29.1	0	0	0	0	0	0	0	0	0	1	1	3	6	0	12	2	25
29.1	40.3	0	0	0	0	0	0	0	0	0	0	0	1	4	0	1	0	6
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		195	135	96	75	34	29	76	203	266	262	150	132	134	106	258	227	2378

Table 5-9 Year 2008, 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	16	14	14	5	5	11	6	16	14	20	8	21	20	19	16	33	238
2.2	4.5	45	31	16	17	3	6	17	30	45	26	24	31	26	38	66	69	490
4.5	6.7	25	17	8	7	0	1	16	33	68	25	20	19	26	25	62	54	406
6.7	8.9	11	5	5	2	0	2	20	43	58	30	28	9	17	22	52	40	344
8.9	11.2	4	3	0	1	0	0	5	29	31	22	16	6	13	26	57	17	230
11.2	13.4	3	1	2	0	1	0	1	16	24	31	26	16	12	24	39	13	209
13.4	17.9	3	5	0	0	0	0	1	6	9	28	38	14	9	23	53	10	199
17.9	22.4	1	6	0	0	0	0	0	0	3	20	11	16	13	1	6	0	77
22.4	29.1	0	0	0	0	0	0	0	0	1	8	3	4	1	0	0	0	17
29.1	40.3	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	0	4
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		108	82	45	32	9	20	66	173	253	211	174	138	138	178	351	236	2214

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	20	21	27	13	6	4	9	15	15	22	15	12	15	18	35	26	273
2.2	4.5	65	39	29	10	2	2	8	44	46	40	29	15	23	24	38	80	494
4.5	6.7	34	13	15	4	0	0	7	49	51	44	17	6	10	12	26	44	332
6.7	8.9	4	3	2	3	0	0	10	50	53	20	12	7	9	11	24	16	224
8.9	11.2	2	0	2	0	0	0	4	17	16	8	6	3	5	9	12	2	86
11.2	13.4	2	0	0	0	0	0	0	5	6	7	3	0	0	5	4	1	33
13.4	17.9	0	0	0	0	0	0	0	1	3	12	4	0	1	0	1	0	22
17.9	22.4	0	0	0	0	0	0	0	0	1	0	2	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		127	76	75	30	8	6	38	181	191	153	88	43	63	79	140	169	1467

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	36	38	36	10	3	5	3	19	10	17	8	10	10	17	20	35	277
2.2	4.5	69	53	56	8	0	0	5	31	51	20	13	7	8	10	27	74	432
4.5	6.7	30	6	28	4	0	0	0	28	40	22	5	2	1	8	13	48	235
6.7	8.9	2	0	6	3	0	0	1	16	24	11	5	2	1	2	9	7	89
8.9	11.2	0	1	1	0	0	0	1	9	8	0	4	0	2	0	5	1	32
11.2	13.4	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
13.4	17.9	0	0	0	0	0	0	0	0	1	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
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		137	98	127	25	3	5	10	103	135	70	36	21	22	37	74	165	1068

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	91	101	110	56	36	29	34	61	51	73	43	53	59	70	86	120	1073
2.2	4.5	272	211	186	84	26	25	49	160	196	140	90	84	87	97	179	302	2188
4.5	6.7	158	100	105	42	9	12	49	209	234	148	68	55	58	65	157	216	1685
6.7	8.9	61	41	27	20	2	5	46	157	215	119	70	40	51	56	107	90	1107
8.9	11.2	23	29	10	10	1	0	25	87	130	91	47	33	46	56	92	38	718
11.2	13.4	28	13	6	0	1	0	12	29	61	78	52	34	27	41	71	26	479
13.4	17.9	34	19	3	0	0	0	2	9	37	109	96	46	44	39	118	42	598
17.9	22.4	8	19	0	0	0	0	0	1	5	40	36	45	21	6	60	8	249
22.4	29.1	0	0	0	0	0	0	0	0	1	9	11	12	7	1	19	6	66
29.1	40.3	0	0	0	0	0	0	0	0	0	1	1	4	5	0	2	0	13
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		675	533	447	212	75	71	217	713	930	808	514	406	405	431	891	848	8176

	A	B	C	D	E	F	G	TOTALS
CALM	0	4	9	106	87	144	141	491

Table 5-10 Year 2008, 245 Ft AGL

Joint Frequency Distribution			
(version 4.0)			
Sensor Criteria	Time Frame	Data Recovery Rate	
Wind Speed: 245 Foot Sensors	Starting Date: 1/1/08	Maximum Hours In Period:	8784
Wind Direction: 245 Foot Sensors	Ending Date: 12/31/08	Hours Missing:	77
Delta T: 245 Foot - 33 Foot Sensors		Hours Used:	8707
Signal Path: Mixed		Recovery Rate:	99.1%
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	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2.2	4.5	1	8	2	5	0	1	0	0	0	0	0	0	0	0	0	0	17
4.5	6.7	3	15	15	4	1	1	0	0	0	0	0	0	0	0	0	0	39
6.7	8.9	3	11	9	5	0	2	2	1	0	0	0	0	0	1	0	1	35
8.9	11.2	6	6	5	1	0	0	1	0	1	0	0	0	0	0	0	0	20
11.2	13.4	1	4	3	2	1	1	1	0	3	0	1	1	2	0	0	1	21
13.4	17.9	0	9	2	0	0	0	3	0	5	5	2	3	1	2	0	1	33
17.9	22.4	0	1	0	0	0	0	1	0	5	4	2	2	1	3	1	1	21
22.4	29.1	0	1	0	0	0	0	0	0	4	1	2	3	1	7	1	1	21
29.1	40.3	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1	0	4
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TOTALS		14	57	36	17	2	5	8	1	18	10	9	9	5	14	4	5	214

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	5	4	1	0	0	0	0	0	0	0	0	0	0	0	13
2.2	4.5	5	9	16	13	6	2	0	1	0	0	0	0	0	0	0	3	55
4.5	6.7	9	9	15	9	3	3	0	1	0	3	0	1	0	0	1	2	56
6.7	8.9	11	8	3	3	1	0	4	1	6	2	2	1	0	1	0	4	47
8.9	11.2	5	2	6	1	0	0	3	3	7	5	4	2	2	1	0	1	42
11.2	13.4	6	0	0	1	0	1	5	5	5	15	4	0	0	0	0	1	43
13.4	17.9	1	4	0	1	1	1	1	2	5	10	5	8	4	1	3	0	47
17.9	22.4	0	3	1	0	0	0	0	0	2	4	8	4	1	2	1	2	26
22.4	29.1	1	1	0	0	0	0	0	0	0	1	3	0	1	5	2	1	14
29.1	40.3	0	0	0	0	0	0	0	0	0	0	2	1	0	0	2	0	5
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS		39	38	46	32	12	7	13	13	23	37	22	24	10	5	13	14	348

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	5	5	1	3	1	0	1	1	0	1	0	1	2	2	1	26
2.2	4.5	6	11	7	6	6	0	4	2	1	5	5	2	2	2	5	6	70
4.5	6.7	4	8	2	4	0	1	7	5	6	6	6	4	4	5	5	5	72
6.7	8.9	13	8	6	5	1	1	1	14	12	4	5	3	2	3	4	5	87
8.9	11.2	4	6	4	1	1	1	0	3	10	13	7	0	3	3	2	2	60
11.2	13.4	2	0	1	0	2	0	2	2	7	13	6	5	5	2	0	2	49
13.4	17.9	2	4	1	0	1	2	0	1	5	13	7	10	8	9	7	1	71
17.9	22.4	0	1	0	0	0	0	0	0	0	2	1	8	3	0	5	4	24
22.4	29.1	4	0	0	0	0	0	0	0	1	3	5	6	5	3	5	0	32
29.1	40.3	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	1	5
40.3	90	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TOTALS		37	43	26	17	14	6	14	28	43	59	46	39	33	29	36	27	497

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	6	7	5	10	5	10	9	10	13	5	10	8	6	4	8	10	126
2.2	4.5	31	32	29	32	10	14	22	23	44	26	18	24	16	18	24	32	395
4.5	6.7	40	36	23	19	6	10	19	46	44	38	33	22	23	23	34	44	460
6.7	8.9	24	26	17	12	3	8	19	43	58	45	19	23	15	12	22	34	380
8.9	11.2	17	17	7	6	0	1	13	27	44	40	15	16	15	15	18	20	271
11.2	13.4	11	8	3	1	3	1	6	11	30	35	19	11	10	16	9	10	184
13.4	17.9	22	10	3	1	0	1	4	5	34	41	36	20	20	20	24	15	256
17.9	22.4	16	12	0	0	0	0	0	0	7	21	28	10	17	17	37	3	168
22.4	29.1	1	14	2	0	0	0	0	0	2	9	25	17	11	18	43	8	150
29.1	40.3	0	0	0	0	0	0	0	0	0	1	6	6	7	5	15	0	40
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
TOTALS		168	162	89	81	27	45	92	165	276	261	209	157	142	148	234	176	2432

Table 5-10 Year 2008, 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	6	6	6	6	4	5	9	3	8	2	3	5	9	2	5	6	85
2.2	4.5	20	18	9	10	17	11	10	12	20	13	18	21	19	14	23	21	256
4.5	6.7	18	24	19	10	7	8	9	15	24	21	12	10	13	17	37	35	279
6.7	8.9	23	15	10	4	1	4	4	21	27	29	19	8	15	25	37	46	288
8.9	11.2	9	5	9	4	2	1	10	12	28	26	15	9	15	20	42	32	239
11.2	13.4	6	3	3	2	2	0	9	13	28	30	16	9	17	15	32	33	218
13.4	17.9	12	5	4	1	1	1	5	14	50	50	44	18	12	36	64	34	351
17.9	22.4	6	4	3	1	0	0	1	3	18	21	62	23	18	55	67	17	299
22.4	29.1	0	9	4	1	0	0	0	1	6	13	33	21	21	35	57	5	206
29.1	40.3	0	0	0	0	0	0	0	0	3	6	20	15	8	1	1	0	54
40.3	90	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	4
TOTALS		100	89	67	39	34	30	57	94	212	212	243	139	149	220	365	229	2279

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	4	5	3	4	2	7	8	9	9	8	4	9	5	3	4	5	89
2.2	4.5	13	17	14	22	8	14	21	24	21	28	18	15	19	15	11	11	271
4.5	6.7	35	17	22	16	5	7	15	33	25	22	22	16	14	9	12	24	294
6.7	8.9	31	19	23	5	3	0	6	24	37	22	18	10	11	8	21	28	266
8.9	11.2	18	7	14	6	3	1	8	31	36	18	15	9	2	13	17	22	220
11.2	13.4	9	0	1	3	1	0	2	18	18	20	6	4	6	9	23	26	146
13.4	17.9	10	1	4	1	0	0	6	14	17	22	19	5	6	23	28	33	189
17.9	22.4	3	1	4	1	0	0	0	1	6	14	12	2	3	16	18	4	85
22.4	29.1	1	0	2	0	0	0	0	0	4	10	1	3	1	7	2	31	
29.1	40.3	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	
40.3	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS		124	67	87	58	22	29	66	154	169	158	125	72	69	97	141	155	1593

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	3	5	6	8	7	5	7	4	7	6	3	4	5	0	7	81
2.2	4.5	11	20	12	17	16	6	15	29	22	26	16	16	15	10	7	13	251
4.5	6.7	21	19	22	20	13	0	7	27	27	25	15	13	7	3	7	12	238
6.7	8.9	19	18	23	8	2	2	9	24	35	14	21	5	7	3	10	28	228
8.9	11.2	19	6	6	8	2	0	3	13	29	11	9	2	4	7	7	32	158
11.2	13.4	8	4	3	3	0	0	1	14	8	8	7	6	2	2	11	23	100
13.4	17.9	8	0	1	2	0	0	0	9	13	4	5	0	1	5	18	21	87
17.9	22.4	2	0	0	2	0	0	2	0	2	1	1	0	0	3	5	6	24
22.4	29.1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	4	8
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		92	70	72	66	41	15	42	124	140	97	80	45	40	38	67	146	1175

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	23	30	29	31	23	30	31	30	35	22	24	25	25	16	19	29	422
2.2	4.5	87	115	89	105	63	48	72	91	108	98	75	78	71	59	70	86	1315
4.5	6.7	130	128	118	82	35	30	57	127	126	115	88	66	61	57	96	122	1438
6.7	8.9	124	105	91	42	11	17	45	128	175	116	84	50	50	53	94	146	1331
8.9	11.2	78	49	51	27	8	4	38	89	155	113	65	38	41	59	86	109	1010
11.2	13.4	43	19	14	12	9	3	26	63	99	121	59	36	42	44	75	96	761
13.4	17.9	55	33	15	6	3	5	19	45	129	145	118	64	52	96	144	105	1034
17.9	22.4	27	22	8	4	0	0	4	4	38	65	110	53	46	95	135	36	647
22.4	29.1	7	25	8	1	0	0	0	2	13	31	76	51	41	65	120	22	462
29.1	40.3	0	0	0	0	0	0	0	0	3	7	34	23	15	7	20	1	110
40.3	90	0	0	0	0	0	0	0	0	0	1	1	1	4	0	1	0	8
TOTALS		574	526	423	310	152	137	292	579	881	834	734	485	448	551	860	752	8538

	A	B	C	D	E	F	G TOTALS
CALM	0	2	8	60	30	26	43 169

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 2008.

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 1.06E-03 mrem to the total body, 1.13E-03 mrem to the thyroid, and 1.64E-03 mrem to the skin. This location was at 4.59 miles in the 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 thyroid at 7.96E-04 mrem.

During 2008, 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	5.96E-04	7.96E-04	6.30E-04	9.31E-06	2.49E-05
WNP-4 Whse.2-4	1.04E+03	2.38E-03	3.02E-03	2.78E-03	2.97E-04	7.96E-04
WNP-1 Bldg 121	2.08E+03	4.26E-03	5.05E-03	5.11E-03	5.27E-04	1.42E-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)	5.84E-04	6.46E-04	8.38E-04	2.22E-04	5.62E-04	Teen
Resident (4.01 miles ENE)	7.06E-04	7.68E-04	9.83E-04	2.46E-04	6.11E-04	Adult
Resident (4.59 miles E)	1.08E-03	1.14E-03	1.66E-03	5.33E-04	1.29E-03	Teen
Resident (4.24 miles ESE)	8.80E-04	9.73E-04	1.29E-03	3.73E-04	8.76E-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 ambient exposure was observed in 2008 from the preoperational values.

Dose Tables

Table 6-1 Summary of Doses from Gaseous Effluents

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)	5.35E-04	4.98E-04	9.64E-04	9.14E-04	2.78E-03
Gamma air dose (mrad)	1.52E-03	1.41E-03	2.31E-03	2.59E-03	7.46E-03

2. Maximum Air Dose Beyond the Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta air dose (mrad)	1.46E-04	3.04E-04	5.78E-04	3.15E-04	5.33E-04
Gamma air dose (mrad)	4.14E-04	8.63E-04	1.39E-03	8.93E-04	1.29E-03

3. Maximum Annual Dose at the Site Boundary

	Annual Dose
Annual total body dose (mrem)	1.12E-02
Annual skin dose (mrem)	1.36E-02

4. Maximum Annual Dose Beyond the Site Boundary

	Annual Dose
Annual total body dose (mrem)	1.11E-03
Annual skin dose (mrem)	1.54E-03

* Rather than the sum of the quarters, these values are based on annual meteorological data and total annual effluents.

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)	2.54E-03	2.46E-03	7.02E-03	6.05E-03	1.44E-02

6. Maximum Organ Dose Beyond the Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Maximum Organ dose (mrem)	4.88E-04	1.00E-03	1.76E-03	1.16E-03	1.66E-03

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)	5.39E-05	3.57E-05	8.35E-05	5.79E-05	2.22E-04
Gamma Air Dose (mrad)	1.53E-04	1.01E-04	2.00E-04	1.64E-04	5.62E-04
Maximum Organ dose (mrem)	2.06E-04	1.53E-04	2.70E-04	2.34E-04	8.38E-04

4.01 Miles ENE

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta Air Dose (mrad)	4.71E-05	3.67E-05	7.43E-05	1.28E-04	2.46E-04
Gamma Air Dose (mrad)	1.34E-04	1.04E-04	1.50E-04	3.63E-04	6.11E-04
Maximum Organ dose (mrem)	2.04E-04	1.63E-04	2.50E-04	4.98E-04	9.83E-04

4.59 Miles E

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta Air Dose (mrad)	1.46E-04	6.07E-05	3.53E-04	1.95E-04	5.33E-04
Gamma Air Dose (mrad)	4.14E-04	1.72E-04	8.47E-04	5.52E-04	1.29E-03
Maximum Organ dose (mrem)	4.88E-04	2.26E-04	1.00E-03	6.46E-04	1.66E-03

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)	1.35E-04	1.52E-04	1.68E-04	7.68E-05	3.73E-04
Gamma Air Dose (mrad)	3.83E-04	4.31E-04	3.67E-04	2.18E-04	8.76E-04
Maximum Organ dose (mrem)	4.87E-04	4.95E-04	4.92E-04	3.36E-04	1.29E-03

* Rather than the sum of the quarters, these values are based on annual meteorological data and total annual effluents.

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	1.60E-03	1.60E-03
Ground	1.31E-03	1.31E-03
Inhalation	1.29E-02	1.63E-02
Vegetables	1.15E-02	1.16E-02
Milk	4.09E-03	6.95E-03
Meat	2.08E-03	2.19E-03
Total	3.35E-02	3.99E-02

B. Average Individual*

Exposure Pathway	Total Body (mrem)	Max. Organ (mrem)
Plume	4.48E-06	4.48E-06
Ground	3.67E-06	3.67E-06
Inhalation	3.61E-05	4.57E-05
Vegetables	3.22E-05	3.25E-05
Milk	1.15E-05	1.95E-05
Meat	5.83E-06	6.13E-06
Total	9.38E-05	1.12E-04

* 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

The following revisions were made to the ODCM in 2008 as Amendment 47:

- Section 3.1, Tables 3-2, 3-3, and 3-16, and Figure 3-1 revised the site boundary for dose calculation from a circle with radius of 1.21 miles to 1950 meters (approximately 1.212 miles).
- Section 6.0.1 - Revised the definition of VENTILATION EXHAUST TREATMENT SYSTEM to be consistent with NUREG-1302.
- Section 6.2.2.5 and RFO 6.2.2.5 were revised by changing the Reactor Building Sump Vent Exhaust Filter System to VENTILATION EXHAUST TREATMENT SYSTEM.
- SR 6.2.2.5.2 was revised to require that the VENTILATION EXHAUST TREATMENT SYSTEM comply with RFOs 6.2.2.1 and 6.2.2.3 to remain Operable.
- The Bases for RFO 6.2.2.5 was revised to add examples of VENTILATION EXHAUST TREATMENT SYSTEM.

8.0 REVISIONS TO THE PROCESS CONTROL PROGRAM (PCP)

There were no revisions to the Process Control Program in 2008.

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 2008 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 2008 Land Use Census.
- 9.3 No dose assessment or environmental monitoring locations were deleted.

There were four TLD and air sample locations established in the fourth quarter of 2008 within the site boundary to monitor the impact of the planned remediation of the DOE 618-11 burial site. These are not associated with the effluent dose assessment program.

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.