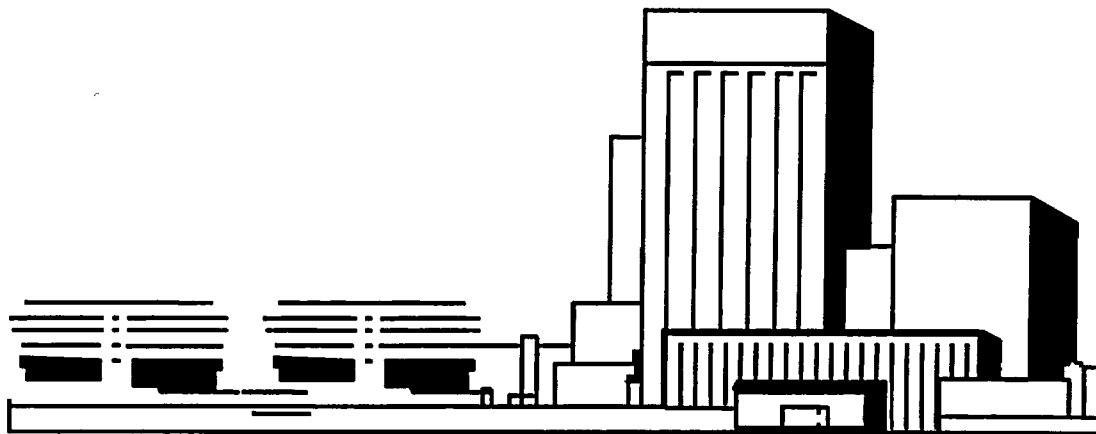


ENERGY NORTHWEST

Columbia Generating Station
Radioactive Effluent Release Report

January through December 2002



REFERENCES:
10 CFR 50.36a(a)(2)
10 CFR 72.44(d)(3)

Columbia Generating Station
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January through December 2002

Energy Northwest

February 2003

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1.0 Introduction

This report is submitted 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 Technical Specification 5.6.3. It includes a summary of the quantities of radioactive liquid and gaseous effluents and solid radwaste released from Columbia Generating Station during calendar year 2002. Effluent data is summarized on a quarterly basis.

The ISFSI facility was completed and five loaded multipurpose containers (MPC) were placed in the facility between 9/20/02 and 12/9/02. The MPCs are performing as designed; consequently, there were no effluents from this facility.

2.0 Liquid Effluents

No contaminated liquids were discharged from Columbia Generating Station during calendar year 2002.

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. 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.

Total error estimates are propagated from individual error estimates of sample volume, sample activity and effluent flow rate measurements. The overriding uncertainty in all cases is in the measurement of the effluent activity and sample volumes. The estimated error was determined to be 36 percent at the 95 percent confidence level.

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 using particulate filters and charcoal cartridges. Both are analyzed using gamma spectroscopy. 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.

Noble gas activities are commonly below detection limits in the building effluent ducts. When no radioactive noble gas was detected in an effluent duct, a value of zero was used for release and dose calculations.

Dose calculations were performed for releases using the NRC GASPAR II computer program and parameters as defined in the ODCM. 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 locations identified in the annual land use census. Comparison of the highest quarterly and annual doses to ODCM effluent limits is summarized in Table 3-0. The ODCM limits are based on 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. 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. The radiochemical hood within the backup chemistry lab contains a HEPA filter and is monitored for radioactive releases when in operation. All liquids are routed to a sump that is monitored for radioactive material prior to release by a lift pump to the sewage treatment facility. No evidence of gaseous or liquid release of licensed radioactive material was noted in 2002.

There were no abnormal releases of gaseous effluent during this reporting period.

Identified Problems with the Effluent Monitoring Program

In July 2002 a problem was encountered with the analysis of a reactor building noble gas sample taken to meet a Requirement for Operability (RFO). The sample was collected on time and the analysis process initiated correctly, however a problem with the gamma analysis equipment appeared to have occurred such that no analytical data was acquired. Review of the compensatory noble gas samples taken before and after this sample indicated only a low level of Ar-41 was being released. The vendor was contacted and asked about possible causes for an intermittent analog to digital converter lockup. A lockup condition was encountered at least once on both of the replacement units. A gamma isotopic review sheet to aid the technicians in reviewing gamma spectrometry isotopic data was developed. (Problem Evaluation Request (PER) 202-2076)

TSW-RIS-5 was declared out of service at 1315 hrs on August 25, 2002 due to spiking and nuisance alarms in the control room. The initial RFO sample for TSW-RIS-5 being declared out of service was not analyzed within 12 hours, as specified by compensatory measure 6.1.1.1 C.1 of the ODCM. Compensatory measure 6.1.1.1.C.1 states, "Analyze a grab sample for radioactivity (beta or gamma) of the associated pathway." Completion time is once per 12 hours. The initial RFO sample was collected at 0030 hrs on 8/26/02 and

analysis begun at 0054, both of which are within the 12-hour timeframe from when the monitor had been declared Out of Service (OOS) on 8/25/02 at 1315. However, the analysis completion time for the initial RFO sample was 0239 hrs on 8/26/02, which was 13 hours and 24 minutes after the monitor was declared OOS. Supervision clarified the fact that the initial RFO sample must be completely analyzed within 12 hours of the monitor being declared OOS and that the RFO buffer of 1.25 times the specified RFO sample frequency only applies to additional samples (PER 202-2479). The monitor was declared operational on 11/13/02, which was greater than 30 days. The single channel analyzer board was replaced and adjusted to discriminate out the noise. (PER 202-2456)

At 0010 hrs 11/21/02, Operations declared the watt transducers for the radwaste building flow rate indications inoperable. On 11/23/02, attempts were made to acquire a new transducer. This failed and renewed troubleshooting was scheduled for 12/16/02. This delay was established so the initial crew could perform the troubleshooting. The renewed troubleshooting determined that the problem was not the watt transducer, but rather the connections. Following repair and calibration, the work was finished on 12/21/02 and at 1511 hrs on 12/21/02 Operations declared the final watt transducer operable. (PER 202-3570)

Problems with the meteorological tower were encountered in 2002. They are summarized in Section 5.

Revision to the Columbia Generating Station Annual Effluent Report for 2000

During the performance of an audit, it was discovered that meteorological data used in calculating dose contained in the 2000 Annual Radiological Effluent Report was inaccurate for the fourth quarter. The error lowered the data recovery percentage for the fourth quarter to less than 90%. Changes in the site boundary and beyond site boundary dose ranged from 0% to 44%. It was determined that the site boundary beta air dose increased from 2.16E-04 to 3.12E-04 mrad, the gamma air dose increased from 6.13E-04 to 8.84E-04 mrad, and the highest organ dose increased from 2.92E-03 to 3.83E-03. It was noted that there were no changes in the location, age group, or highest target organ. Relative to the highest dose beyond the site boundary, the beta air dose stayed the same, the gamma air dose stayed the same, and the highest organ dose increased from 1.30E-03 to 1.57E-03. It was noted that there were no changes in the location, age group, or highest target organ. (PER 201-2638)

Revision to the Columbia Generating Station Annual Effluent Report for 2001

During 2001, the low-range reactor building effluent monitor was out of service for 36 days (5/24/01 at 0300 hrs to 6/29/01 at 1130 hrs). Maintenance activity was postponed until the general area around the detector was decontaminated (thus avoiding contaminating the detector) following the refueling outage. (PER 203-0053)

Gaseous Effluent Tables

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

Report Period: January -- December 2002

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

Gamma Air Dose (mrad)	5.14E-04	6.92E-04	2.25E-04	5.64E-03	4.98E-03
ODCM Limit	5	5	5	5	10
% of Limit	1.03E-02	1.38E-02	4.50E-03	1.13E-01	4.98E-02
Beta Air Dose (mrad)	1.81E-04	1.53E-03	7.95E-05	1.99E-03	1.76E-03
ODCM Limit	10	10	10	10	20
% of Limit	1.81E-03	1.53E-02	7.95E-04	1.99E-02	8.80E-03

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

Organ Dose (mrem)	1.51E-03	1.84E-03	4.25E-03	7.07E-03	1.19E-02
ODCM Limit	7.5	7.5	7.5	7.5	15
% of Limit	2.01E-02	2.45E-02	5.67E-02	9.43E-02	7.93E-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, meteorology (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 2002

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	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-85m	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-87	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-88	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-138	<LLD	<LLD	<LLD	<LLD	<LLD
argon-41	1.01E+01	1.53E+01	1.34E+01	1.74E+01	5.63E+01
Total for period *	1.01E+01	1.53E+01	1.34E+01	1.74E+01	5.63E+01

B. Iodines

iodine-131	3.32E-06	<LLD	<LLD	<LLD	3.32E-06
iodine-132	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-133	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-134	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-135	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period *	3.32E-06	<LLD	<LLD	<LLD	3.32E-06

* Less than (<) values are not included in the totals. See Table 3-6 for LLD values.

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

Report Period: January -- December 2002

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

strontium-89	6.02E-06	2.08E-06	8.35E-06	1.98E-05	3.63E-05
strontium-90	<LLD	<LLD	9.97E-07	<LLD	9.97E-07
cesium-134	<LLD	<LLD	<LLD	<LLD	<LLD
cesium-137	<LLD	<LLD	<LLD	<LLD	<LLD
barium-lanthanum-140	<LLD	<LLD	<LLD	<LLD	<LLD
silver-110m	<LLD	<LLD	4.42E-06	6.75E-06	1.12E-05
cerium-141	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-144	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-58	<LLD	1.62E-05	1.70E-04	2.40E-04	4.26E-04
cobalt-60	<LLD	1.28E-05	1.12E-04	1.34E-04	2.59E-04
iron-59	<LLD	<LLD	<LLD	<LLD	<LLD
manganese-54	<LLD	4.56E-06	3.76E-05	4.56E-05	8.78E-05
zinc-65	<LLD	3.06E-05	2.55E-04	3.07E-04	5.93E-04
chrome-51	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period*	6.02E-06	6.62E-05	5.88E-04	7.53E-04	1.41E-03
Others with T^{1/2} < 8 days					
arsenic-76	<LLD	<LLD	1.79E-05	7.63E-05	9.41E-05
copper-64	<LLD	<LLD	3.15E-02	4.23E-02	7.38E-02
sodium-24	<LLD	2.69E-04	1.49E-03	1.36E-03	3.12E-03
technetium-99m	<LLD	2.51E-05	2.28E-03	2.56E-03	4.87E-03
zinc-69m	<LLD	<LLD	1.74E-05	2.15E-04	2.33E-04
bromine-82	<LLD	2.94E-05	8.31E-05	<LLD	1.13E-04
Total with T^{1/2} < 8 days*	<LLD	3.23E-04	3.53E-02	4.65E-02	8.22E-02

D. Tritium

tritium	2.16E+00	5.08E+00	4.05E+00	3.89E+00	1.52E+01
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* Less than (<) values are not included in the totals. See Table 3-6 for LLD values.

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

Report Period: January -- December 2002

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	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-85m	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-87	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-88	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-138	<LLD	<LLD	<LLD	<LLD	<LLD
argon-41	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period *	<LLD	<LLD	<LLD	<LLD	<LLD

B. Iodines

iodine-131	1.08E-04	2.28E-04	1.00E-04	1.69E-04	6.06E-04
iodine-132	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-133	3.90E-04	1.08E-03	8.30E-04	1.35E-03	3.65E-03
iodine-134	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-135	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period *	4.99E-04	1.31E-03	9.31E-04	1.52E-03	4.26E-03

* Less than (<) values are not included in the totals. See Table 3-6 for LLD values.

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

Report Period: January -- December 2002

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

C. Particulates

strontium-89	2.47E-06	<LLD	3.82E-06	5.28E-05	5.90E-05
strontium-90	3.76E-07	<LLD	5.55E-07	5.67E-06	6.60E-06
cesium-134	<LLD	<LLD	<LLD	<LLD	<LLD
cesium-137	<LLD	<LLD	<LLD	<LLD	<LLD
barium-lanthanum-140	<LLD	<LLD	<LLD	<LLD	<LLD
molybdenum-99	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-141	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-144	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-58	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-60	<LLD	<LLD	<LLD	<LLD	<LLD
iron-59	<LLD	<LLD	<LLD	<LLD	<LLD
manganese-54	<LLD	<LLD	<LLD	<LLD	<LLD
zinc-65	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period*	2.84E-06	<LLD	4.37E-06	5.84E-05	6.56E-05

Others with $T^{1/2} < 8$ days

None					
Total with $T^{1/2} < 8$ days*	No nuclides with half-lives < 8 days were identified				

D. Tritium

tritium	3.27E-01	1.14E+00	9.57E-01	7.89E-01	3.21E+00
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* Less than (<) values are not included in the totals. See Table 3-6 for LLD values.

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

Report Period: January -- December 2002

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

A. Fission gases

krypton-85	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-85m	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-87	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-88	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-138	<LLD	<LLD	<LLD	<LLD	<LLD
argon-41	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period *	<LLD	<LLD	<LLD	<LLD	<LLD

B. Iodines

iodine-131	1.08E-04	2.28E-04	1.00E-04	1.69E-04	6.06E-04
iodine-132	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-133	3.90E-04	1.08E-03	8.30E-04	1.35E-03	3.65E-03
iodine-134	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-135	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period *	4.99E-04	1.31E-03	9.31E-04	1.52E-03	4.26E-03

*Less than (<) values are not included in the totals. See Table 3-6 for LLD values.

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

Report Period: January -- December 2002

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

C. Particulates

strontium-89	2.47E-06	<LLD	3.82E-06	5.28E-05	5.90E-05
strontium-90	3.76E-07	<LLD	5.55E-07	5.67E-06	6.60E-06
cesium-134	<LLD	<LLD	<LLD	<LLD	<LLD
cesium-137	<LLD	<LLD	<LLD	<LLD	<LLD
barium-lanthanum-140	<LLD	<LLD	<LLD	<LLD	<LLD
molybdenum-99	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-141	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-144	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-58	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-60	<LLD	<LLD	<LLD	<LLD	<LLD
iron-59	<LLD	<LLD	<LLD	<LLD	<LLD
manganese-54	<LLD	<LLD	<LLD	<LLD	<LLD
zinc-65	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period*	2.84E-06	<LLD	4.37E-06	5.84E-05	6.56E-05

Others with $T^{1/2} < 8$ days

None					
Total with $T^{1/2} < 8$ days*	No nuclides with half-lives < 8 days were identified				

D. Tritium

tritium	3.27E-01	1.14E+00	9.57E-01	7.89E-01	3.21E+00
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* Less than (<) values are not included in the totals. See Table 3-6 for LLD values.

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

Report Period: January -- December 2002

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year	Est* Total %Error
----------------	----------------	----------------	----------------	------	-------------------------

A. Fission and activation gases

Total release (Ci)	1.01E+01	1.53E+01	1.34E+01	1.74E+01	5.63E+01	3.60E+01
Average release rate ($\mu\text{Ci/s}$)	1.30E+00	1.95E+00	1.69E+00	2.19E+00	1.78E+00	
Percent of ODCM limit (%)	**	**	**	**	**	

B. Iodines

Total I-131 (Ci)	1.12E-04	2.28E-04	1.00E-04	1.86E-04	6.27E-04	3.60E+01
Average release rate ($\mu\text{Ci/s}$)	1.44E-05	2.90E-05	1.26E-05	2.34E-05	1.99E-05	
Percent of ODCM limit (%)	**	**	**	**	**	

C. Particulates

Particulates with half-lives >8 days (Ci)	5.29E-05	1.17E-04	6.32E-04	9.06E-04	1.71E-03	3.60E+01
Average release rate ($\mu\text{Ci/s}$)	6.80E-06	1.49E-05	7.95E-05	1.14E-04	5.42E-05	
Percent of ODCM limit (%)	**	**	**	**	**	
Gross alpha radioactivity (Ci)	7.33E-06	6.91E-06	6.79E-06	2.84E-05	4.94E-05	

D. Tritium

Total release (Ci)	1.69E+01	1.92E+01	3.20E+01	4.23E+01	1.10E+02	3.60E+01
Average release rate ($\mu\text{Ci/s}$)	2.17E+00	2.44E+00	4.03E+00	5.33E+00	3.50E+00	
Percent of ODCM limit (%)	**	**	**	**	**	

* At 95% confidence level

** ODCM limits are based on dose. See Table 3-0 for percent of ODCM limits.

Table 3-5 Gaseous Purges and Vents

Report Period: January -- December 2002

Type	Number	Total Time (hr.)	Maximum Time (hr.)	Minimum Time (hr.)	Mean Time (hr.)
Purge	2.00E+00	9.98E+00	9.83E+00	1.50E-01	4.99E+00
Vent	1.70E+01	1.25E+01	1.53E+00	1.83E-01	7.37E-01

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

Report Period: January -- December 2002

Fission Gases

Nuclide	LLD ($\mu\text{Ci/cc}$)
krypton-85	2.60E-07
krypton-85m	2.15E-09
krypton-87	5.72E-09
krypton-88	1.02E-08
xenon-133	8.37E-09
xenon-135	2.72E-09
xenon-135m	1.76E-10
xenon-138	3.50E-08
argon-41	3.60E-09
xenon-137	1.99E-06

Iodines

Nuclide	LLD ($\mu\text{Ci/cc}$)
iodine-131	3.45E-14
iodine-132	3.90E-13
iodine-133	3.50E-13
iodine-134	5.60E-13
iodine-135	1.60E-12

Particulates

Nuclide	LLD ($\mu\text{Ci/cc}$)
strontium-89	5.50E-15
strontium-90	4.20E-15
cesium-134	2.37E-14
cesium-137	2.31E-14
barium-lanthanum-140	1.32E-13
molybdenum-99	3.62E-13
cerium-141	2.62E-14
cerium-144	1.14E-13
cobalt-58	1.82E-14
cobalt-60	2.44E-14
iron-59	4.77E-14
manganese-54	2.47E-14
zinc-65	5.15E-14
Gross Alpha	4.3E-16

4.0 Solid Radwaste

Information required by Columbia Generating Station Offsite Dose Calculation Manual

January -- December 2002.

Class A

1. Container Volumes

B-25 Steel Box	92.5 ft ³
ES-190 Steel Liner	170.2 ft ³
EL-142 Polyethylene HIC	132.4 ft ³
EL-190 Polyethylene HIC	174.3 ft ³

2. Total Curies

1.49E+02 Ci

3. Principal Radionuclides

Nuclide	Curies	Percent
Co-60	6.24E+01	4.18E+01
Zn-65	5.79E+01	3.88E+01
Mn-54	9.17E+00	6.15E+00
Ni-63	7.69E+00	5.16E+00
Fe-55	4.71E+00	3.16E+00
Cs-137	2.64E+00	1.77E+00
Co-58	1.73E+00	1.16E+00
C-14	1.27E+00	8.52E-01
Ag-110m	6.11E-01	4.10E-01
Cr-51	2.55E-01	1.71E-01
Ni-59	2.30E-01	1.54E-01
H-3	1.40E-01	9.37E-02
Sb-125	8.72E-02	5.85E-02
Nb-95	8.07E-02	5.41E-02
Cs-134	4.60E-02	3.09E-02

4. Source
- | | |
|-----------------------|-------------|
| Resins | 1.48E+02 Ci |
| DAW | 6.64E-01 Ci |
| Irradiated Components | None |
| Other (Sealed Source) | None |
5. Type of Container
- All containers shipped as Limited Quantity, LSA, SCO or Radioactive material, n.o.s. in IP-1, IP-2 or Type A (including casks) as appropriate.
6. Solidification Agent
- None

Information required by Reg. Guide 1.21

January -- December 2002.

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	1.53+02	
	Ci	1.48E+02	2.5E+01%
b. Dry Active Waste	m ³	9.69E+01	
	Ci	6.64E-01	2.5E+01%
c. Irradiated Components	m ³	0	
	Ci	0	None
d. Other Waste (Sealed Source)	m ³	0	
	Ci	0	None

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

a. Dewatered Spent Resins -- All Classes

Nuclide	Curies	Percent
Co-60	6.22E+01	4.19E+01
Zn-65	5.78E+01	3.89E+01
Mn-54	9.15E+00	6.16E+00
Ni-63	7.69E+00	5.18E+00
Fe-55	4.69E+00	3.16E+00
Cs-137	2.64E+00	1.78E+00
Co-58	1.71E+00	1.15E+00
C-14	1.27E+00	8.55E-01
Ag-110m	6.11E-01	4.12E-01
Ni-59	2.13E-01	1.43E-01
H-3	1.39E-01	9.34E-02
Sb-125	8.22E-02	5.54E-02
Nb-95	7.17E-02	4.83E-02
Cs-134	4.38E-02	2.95E-02
Sr-90	3.20E-02	2.16E-02

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

Nuclide	Curies	Percent
Cr-51	2.49E-01	3.75E+01
Co-60	1.96E-01	2.94E+01
Zn-65	1.13E-01	1.71E+01
Fe-55	1.97E-02	2.97E+00
Co-58	1.94E-02	2.92E+00
Ni-59	1.72E-02	2.60E+00
Mn-54	1.59E-02	2.40E+00
Nb-95	9.03E-03	1.36E+00
Zr-95	5.44E-03	8.19E-01
Sb-125	4.98E-03	7.50E-01
Ni-63	4.11E-03	6.19E-01
Sr-89	4.11E-03	6.19E-01
Cs-137	2.45E-03	3.68E-01

c. Irradiated Components
None

d. Other Waste (Sealed Source)
None

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
26	Tractor – Trailer or Flatbed Truck via Public Highway	US Ecology, Inc. P.O. Box 638 Hanford Reservation Richland, WA. 99352

Irradiated Fuel Shipments (Disposition)

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

5.0 Meteorology

The meteorological data contained in Tables 5-1 through 5-10 was obtained from the meteorological tower located 2500 ft (762 m) west of Columbia Generating Station. Data was recovered from instruments at the 33-ft (10 m) and 245-ft (75 m) levels. The meteorological data is a composite file from the automated data recovery systems for calendar year 2002. Data is archived on the Energy Northwest Local Area Network.

Total precipitation measured at the Hanford Meteorology Station (located approximately 14 miles northwest of Columbia) was 5.41 inches, 78% of the normal annual rainfall (6.98 inches). December was the wettest month with 2.36 inches of precipitation, 213% of the normal 1.11 inches. September was the driest month with only a trace of precipitation. There was no snowfall in January; February received 0.2 inches and March received 1.4 inches. Snowfall for the period January through March was 1.6 inches. Normal snowfall for the period of January through March is 7.2 inches. There was a trace of snow in November and 0.6 inches fell in December. The normal total snowfall for the November-December period is 8.1 inches.

Calendar year 2002 was warmer than normal, averaging 54.4°F (12.4°C) or 0.8°F above normal. The warmest day occurred on July 13 with high temperature of 113°F (45°C). The coldest day occurred on October 31, with a low temperature of 7°F (-13.9°C). The occurrence of fog and haze and blowing dust in 2002 was similar to that observed in previous years. In summary, the dispersive environment for Columbia Generating Station for 2002 was near normal.

Joint data recovery for 2002 was 99.2% from both the 245-foot level and the 33-foot level. In November 2001, the instrumentation at the meteorological tower was updated and duplicate sensors added at each level. These sensors were labeled System 'A' and System 'B'. The System 'A' temperature sensor at the 245-foot level was inoperable from the start of July to the first part of September due to a lightning strike. For the calculation of the third quarter joint frequency distribution for the 245-foot level, System 'B' data was substituted for the missing System 'A' data.

The data in tables 5-1 through 5-8 lists the joint frequency distributions at the 33-ft and 245-ft levels by quarter for 2002. Table 5-9 and 5-10 list the annual joint frequency distributions for those levels for 2002. The NRC stability classes A through G and seven wind categories along with the 16 wind sectors were used to prepare each joint frequency table. The annual joint frequency tables should be used to evaluate any vents and purges during 2002 as the releases were random in time.

Calibrations performed in 2002 required no corrections be applied to the raw data. Data below 0.07 MPH has been determined to result from system malfunction and is not included in the results.

Joint Frequency Distribution Tables for 2002

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

JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 01/01/02 TO HOUR 23 ON 03/31/02

The total hours are 2160, 2149 hours read and 11 missing

NRC CATEGORY A

deg	MPH						
	>0 07	>0 60	>3.00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146.25	0	0	0	0	1	0	0
168.75	0	0	0	0	0	0	0
191.25	0	0	0	0	0	0	0
213.75	0	0	0	0	0	0	0
236.25	0	0	0	0	0	0	0
258.75	0	0	0	0	0	0	0
281.25	0	0	0	0	0	0	0
303.75	0	0	0	0	0	0	0
326.25	0	0	0	0	0	0	0

NRC CATEGORY B

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0.00	0	0	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146.25	0	0	0	0	0	0	0
168.75	0	0	0	0	0	0	0
191.25	0	0	0	0	0	0	0
213.75	0	0	0	0	0	0	0
236.25	0	0	0	0	0	0	0
258.75	0	0	1	0	0	0	0
281.25	0	0	0	0	0	0	0
303.75	0	0	0	0	0	0	0
326.25	0	0	0	0	0	0	0

NRC CATEGORY C

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146.25	0	0	0	0	0	0	0
168.75	0	0	0	0	0	0	0
191.25	0	0	0	0	0	0	0
213.75	0	0	0	0	0	0	0
236.25	0	0	0	0	0	0	0
258.75	0	0	0	0	0	0	0
281.25	0	0	0	0	0	0	0
303.75	0	0	0	0	0	0	0
326.25	0	0	0	0	0	0	0

NRC CATEGORY D

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	1	0	4	5	20	3	0
11 25	1	0	0	1	9	0	0
33 75	0	0	0	0	0	0	0
56.25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	1	1	2	2	1	0	0
168.75	0	0	3	0	5	0	0
191 25	0	1	4	7	11	3	3
213 75	0	1	1	5	16	18	8
236 25	0	1	1	3	7	4	0
258 75	0	0	2	0	0	0	0
281.25	0	0	1	0	0	0	0
303 75	0	2	1	4	2	1	0
326 25	0	0	7	6	2	0	0

NRC CATEGORY E

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	39	35	29	10	0	0
11 25	1	8	23	8	2	0	0
33 75	1	7	15	1	0	0	0
56 25	2	12	3	2	0	0	0
78.75	0	11	4	1	0	0	0
101 25	1	5	6	0	0	0	0
123 75	0	11	15	10	1	0	0
146 25	2	12	23	46	7	0	0
168 75	1	17	36	52	24	3	0
191.25	1	14	34	60	53	28	10
213 75	1	3	35	38	46	24	12
236 25	1	6	9	23	19	10	3
258 75	1	12	13	16	9	3	1
281 25	1	5	18	15	10	0	0
303 75	0	21	33	31	17	3	0
326 25	1	28	57	36	10	0	0

NRC CATEGORY F

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	1	20	21	1	0	0	0
11 25	1	16	5	0	0	0	0
33 75	2	21	15	1	0	0	0
56 25	0	5	3	1	0	0	0
78 75	0	5	0	0	0	0	0
101.25	1	9	1	0	0	0	0
123 75	0	6	1	1	1	0	0
146 25	0	15	21	17	3	0	0
168 75	0	26	40	21	7	1	0
191 25	3	14	18	7	2	1	0
213 75	2	6	4	3	0	0	0
236 25	0	7	5	5	0	0	0
258 75	1	10	5	4	0	0	0
281 25	3	11	4	7	0	0	0
303 75	1	13	22	16	0	0	0
326 25	3	16	31	8	0	0	0

NRC CATEGORY G

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	1	4	12	0	0	0	0
11.25	0	9	3	0	0	0	0
33.75	0	7	5	0	0	0	0
56.25	1	2	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	1	0	0	0	0	0
123.75	0	3	0	0	0	0	0
146.25	0	3	7	4	0	0	0
168.75	0	1	9	9	0	0	0
191.25	0	4	7	4	0	0	0
213.75	0	3	2	3	0	0	0
236.25	0	3	1	1	0	0	0
258.75	0	4	3	0	0	0	0
281.25	0	4	3	0	1	0	0
303.75	1	7	6	4	0	0	0
326.25	0	12	11	5	0	0	0

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

**JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 01/01/02 TO HOUR 23 ON 03/31/02**

The total hours are 2160, 2149 hours read and 11 missing.

NRC CATEGORY A

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33 75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	0	0	0	0
191 25	0	0	0	0	1	0	0
213 75	0	0	0	0	0	0	0
236 25	0	0	0	0	0	0	0
258 75	0	0	0	0	0	0	0
281 25	0	0	0	0	0	0	0
303.75	0	0	0	0	0	0	0
326 25	0	0	0	0	0	0	0

NRC CATEGORY B

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11 25	0	0	0	0	0	0	0
33 75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168.75	0	0	0	0	0	0	0
191 25	0	0	0	0	0	0	0
213 75	0	0	0	0	0	0	0
236 25	0	0	0	0	0	0	0
258 75	0	0	1	0	0	0	0
281 25	0	0	0	0	0	0	0
303 75	0	0	0	0	0	0	0
326 25	0	0	0	0	0	0	0

NRC CATEGORY C

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11 25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	0	0	0	0
191 25	0	0	0	0	0	0	0
213 75	0	0	0	0	0	0	0
236 25	0	0	0	0	0	0	0
258 75	0	0	0	0	0	0	0
281 25	0	0	0	0	0	0	0
303 75	0	0	0	0	0	0	0

NRC CATEGORY D

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	1	4	5	9	12	0
11.25	1	0	0	2	4	8	0
33.75	0	0	0	1	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	1	0	0	0	0	0
146.25	0	2	3	0	3	2	0
168.75	0	0	4	2	7	2	0
191.25	1	1	3	5	3	2	2
213.75	0	0	1	1	9	6	16
236.25	0	1	0	4	6	7	13
258.75	0	1	1	0	2	5	5
281.25	0	1	1	1	0	1	0
303.75	0	0	1	0	5	0	1
326.25	0	0	3	10	5	2	0

NRC CATEGORY E

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	15	38	42	38	2	1
11.25	1	9	23	26	4	4	0
33.75	0	4	13	7	0	0	0
56.25	0	4	10	7	0	0	0
78.75	0	6	6	1	0	0	0
101.25	1	4	9	0	1	0	0
123.75	0	7	13	4	3	1	0
146.25	0	9	8	14	7	3	0
168.75	0	7	26	36	25	0	1
191.25	0	5	16	45	38	12	9
213.75	1	7	27	26	28	31	37
236.25	0	9	15	25	29	31	45
258.75	2	5	11	16	14	13	24
281.25	0	8	5	11	14	10	5
303.75	0	9	18	27	31	17	10
326.25	0	13	31	42	32	12	1

NRC CATEGORY F

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	4	9	16	7	1	0
11.25	1	2	19	5	0	0	0
33.75	0	6	16	5	2	0	0
56.25	1	5	8	7	3	0	0
78.75	0	8	7	1	0	0	0
101.25	0	7	5	2	0	0	0
123.75	1	10	2	4	2	0	0
146.25	0	8	14	11	3	1	0
168.75	1	11	22	15	13	0	0
191.25	0	13	14	10	12	4	3
213.75	0	12	15	11	8	6	1
236.25	0	4	18	4	2	1	0
258.75	0	2	4	3	2	0	0
281.25	0	4	8	2	5	0	0
303.75	0	5	5	8	13	2	0
326.25	0	6	12	12	20	5	0

NRC CATEGORY G

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	1	2	4	1	0	0
11.25	0	0	5	0	0	0	0
33.75	0	0	1	3	0	0	0
56.25	0	0	3	1	0	0	0
78.75	0	1	9	4	0	0	0
101.25	0	2	1	1	0	0	0
123.75	0	3	0	1	0	0	0
146.25	0	0	3	3	0	1	0
168.75	0	0	11	6	6	0	0
191.25	0	2	6	7	3	1	0
213.75	0	4	6	4	5	0	0
236.25	0	2	5	3	0	0	0
258.75	0	0	1	6	0	0	0
281.25	0	1	1	2	0	0	0
303.75	0	2	3	2	4	1	0
326.25	0	0	1	7	15	3	0

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

**JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 04/01/02 TO HOUR 23 ON 06/30/02**

The total hours are 2184, 2176 read and 8 missing

NRC CATEGORY A

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	1	0	0	0	0	0
11 25	0	0	0	0	0	0	0
33 75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146 25	0	0	0	1	0	0	0
168 75	0	0	1	0	0	0	0
191.25	0	0	1	1	0	0	0
213.75	0	0	0	1	1	0	0
236 25	0	0	1	0	0	0	0
258 75	0	0	0	0	0	0	0
281.25	0	0	0	0	0	0	0
303.75	0	0	0	0	0	0	0
326 25	0	0	0	0	0	0	0

NRC CATEGORY B

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0.00	0	0	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	0	0	0	0
191.25	0	0	0	0	0	0	0
213.75	0	0	1	0	0	0	0
236 25	0	0	0	0	0	0	0
258 75	0	0	0	1	0	0	0
281.25	0	0	0	0	1	0	0
303 75	0	0	0	0	0	0	0
326 25	0	0	0	0	0	0	0

NRC CATEGORY C

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123 75	0	1	0	0	0	0	0
146.25	0	0	0	0	0	0	0
168.75	0	0	0	0	0	0	0
191.25	0	0	0	0	0	0	0
213 75	0	0	0	0	0	0	0
236 25	0	0	1	0	0	0	0
258 75	0	0	0	0	0	0	0
281.25	0	0	0	0	0	0	0
303.75	0	0	0	0	0	0	0
326.25	0	0	0	0	0	0	0

NRC CATEGORY D

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	1	5	22	3	0	0
11.25	0	1	10	20	2	0	0
33.75	0	0	6	4	1	0	0
56.25	0	2	3	9	1	0	0
78.75	0	1	4	3	0	0	0
101.25	0	2	1	5	0	0	0
123.75	0	1	3	7	0	0	0
146.25	0	1	2	10	4	0	0
168.75	0	3	1	16	10	0	0
191.25	0	3	3	4	8	1	0
213.75	0	1	2	4	5	7	6
236.25	1	3	6	3	4	12	3
258.75	0	2	1	4	7	8	1
281.25	0	2	0	7	12	1	1
303.75	0	1	3	5	24	21	3
326.25	0	0	6	5	12	8	0

NRC CATEGORY E

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	1	17	41	12	1	0	0
11.25	1	9	46	12	1	0	0
33.75	0	18	47	17	0	0	0
56.25	0	8	36	10	0	0	0
78.75	2	10	14	11	1	0	0
101.25	0	15	9	6	1	0	0
123.75	0	6	17	9	0	0	0
146.25	0	9	47	46	1	0	0
168.75	0	9	59	58	10	0	0
191.25	0	14	37	49	35	1	0
213.75	0	7	27	30	17	1	2
236.25	0	9	12	21	7	6	2
258.75	0	6	11	27	13	4	3
281.25	3	8	28	29	14	4	0
303.75	0	12	43	61	46	3	0
326.25	0	9	41	33	21	2	0

NRC CATEGORY F

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	1	9	23	4	0	0	0
11.25	1	7	15	0	0	0	0
33.75	0	10	13	0	0	0	0
56.25	3	7	6	6	0	0	0
78.75	0	3	0	0	0	0	0
101.25	0	3	0	0	0	0	0
123.75	1	5	2	0	0	0	0
146.25	1	11	23	13	0	0	0
168.75	1	13	28	14	0	0	0
191.25	0	5	23	10	0	0	0
213.75	0	4	3	5	0	0	0
236.25	0	6	5	3	0	0	0
258.75	0	2	3	3	0	0	0
281.25	2	6	3	3	0	0	0
303.75	0	3	11	8	0	0	0
326.25	0	8	20	2	2	0	0

NRC CATEGORY G

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	1	3	12	0	0	0	0
11.25	0	4	11	0	0	0	0
33.75	1	1	13	0	0	0	0
56.25	1	3	2	0	0	0	0
78.75	0	2	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	1	2	0	0	0	0	0
146.25	0	1	4	0	0	0	0
168.75	0	6	9	3	0	0	0
191.25	0	1	1	0	0	0	0
213.75	0	1	1	0	0	0	0
236.25	0	2	0	0	0	0	0
258.75	1	0	0	0	0	0	0
281.25	1	1	1	0	0	0	0
303.75	1	1	3	0	0	0	0
326.25	0	5	10	1	0	0	0

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

**JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 04/01/02 TO HOUR 23 ON 06/30/02**

The total hours are 2184, 2175 read and 9 missing

NRC CATEGORY A

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11 25	0	0	0	0	0	0	0
33 75	0	0	0	0	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	1	1	0	0
191.25	0	0	0	0	0	0	0
213.75	0	0	0	1	2	0	0
236 25	0	0	0	0	1	1	0
258 75	0	0	0	0	0	0	0
281 25	0	0	0	1	0	0	0
303 75	0	0	0	0	0	0	0
326 25	0	0	0	0	0	0	0

NRC CATEGORY B

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168.75	0	0	0	0	0	0	0
191.25	0	0	0	0	0	0	0
213 75	0	0	0	0	0	0	0
236 25	0	0	1	0	0	0	0
258 75	0	0	0	0	0	1	0
281 25	0	0	0	0	0	1	0
303.75	0	0	0	0	0	0	0
326.25	0	0	0	0	0	0	0

NRC CATEGORY C

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146.25	0	0	0	0	0	0	0
168.75	0	0	0	0	0	0	0
191 25	0	0	0	0	0	0	0
213 75	0	0	1	0	0	0	0
236 25	0	0	0	0	0	0	0
258 75	0	0	1	0	0	0	0
281.25	0	0	0	0	0	0	0
303.75	0	0	0	0	0	0	0
326 25	0	0	0	0	0	0	0

NRC CATEGORY D

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	2	2	11	8	0	0
11.25	0	0	10	28	5	0	0
33.75	0	0	2	7	1	0	0
56.25	0	2	2	4	4	0	0
78.75	0	0	1	8	1	0	0
101.25	0	2	2	0	4	0	0
123.75	0	0	2	4	1	0	0
146.25	0	1	0	3	7	0	0
168.75	0	1	4	7	6	2	0
191.25	0	0	2	6	12	10	1
213.75	0	1	2	2	3	9	10
236.25	0	1	3	4	2	6	13
258.75	0	2	2	3	6	9	9
281.25	0	4	2	1	9	8	1
303.75	0	1	4	5	17	25	21
326.25	0	0	1	1	3	7	2

NRC CATEGORY E

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	1	9	16	15	3	0	0
11.25	1	10	30	25	7	0	0
33.75	0	6	34	24	5	0	0
56.25	0	8	29	14	3	2	0
78.75	0	11	22	13	1	1	0
101.25	0	5	6	7	5	0	0
123.75	0	7	14	10	3	0	0
146.25	0	7	29	49	6	0	0
168.75	1	8	33	47	20	0	0
191.25	0	5	24	48	44	13	0
213.75	1	7	14	19	35	14	4
236.25	0	5	10	14	14	5	8
258.75	0	2	18	19	27	9	6
281.25	0	8	20	29	38	16	5
303.75	0	6	24	42	67	54	16
326.25	0	6	28	21	17	3	0

NRC CATEGORY F

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	5	8	7	5	0	0
11.25	0	2	12	6	2	0	0
33.75	0	4	5	9	1	0	0
56.25	0	4	3	9	4	3	0
78.75	1	0	4	1	2	0	0
101.25	2	3	0	0	0	0	0
123.75	0	2	4	4	3	0	0
146.25	0	3	9	5	1	0	0
168.75	0	10	26	16	3	0	0
191.25	2	4	19	14	9	0	0
213.75	0	7	5	6	1	1	0
236.25	0	3	9	4	2	0	0
258.75	0	4	2	1	1	0	0
281.25	0	3	1	2	9	3	0
303.75	0	1	6	13	15	8	1
326.25	0	1	6	11	1	0	0

NRC CATEGORY G

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	1	8	14	2	0	0
11.25	0	2	2	7	0	0	0
33 75	0	0	1	3	0	0	0
56 25	0	1	6	3	1	1	0
78 75	0	0	0	1	1	0	0
101 25	0	1	0	0	0	0	0
123 75	0	0	5	2	0	0	0
146 25	0	0	5	4	0	0	0
168.75	0	3	4	2	0	0	0
191.25	0	3	1	2	1	0	0
213.75	0	2	2	0	0	0	0
236 25	0	0	2	0	0	0	0
258 75	0	0	0	0	0	0	0
281 25	0	2	0	1	0	0	0
303 75	0	0	1	0	0	0	0
326 25	0	0	3	10	0	0	0

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

**JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 07/01/02 TO HOUR 23 ON 09/30/02**

The total hours are 2208, 2170 read and 38 missing

NRC CATEGORY A

deg	MPH						
	0 07	0 60	3.00	7 00	12 00	18 00	24 00
0 00	0	0	1	5	1	0	0
11.25	0	0	4	17	7	0	0
33 75	0	0	16	24	1	0	0
56 25	0	0	6	0	0	0	0
78 75	0	0	3	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	1	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	0	0	0	0
191.25	0	0	0	0	7	0	0
213.75	0	0	0	0	2	0	0
236.25	0	0	0	0	0	0	0
258.75	0	0	0	0	0	0	0
281.25	0	0	0	0	0	1	0
303 75	0	0	0	0	2	0	0
326 25	0	0	0	0	0	2	1

NRC CATEGORY B

deg	MPH						
	0 07	0 60	3 00	7 00	12 00	18 00	24 00
0 00	0	1	5	3	1	0	0
11.25	0	7	26	14	0	0	0
33 75	0	4	15	8	0	0	0
56 25	0	0	16	4	0	0	0
78.75	0	2	6	3	0	0	0
101.25	0	1	7	1	0	0	0
123.75	0	0	1	2	0	0	0
146 25	0	1	1	4	0	0	0
168 75	0	0	0	12	3	1	0
191.25	0	0	3	11	11	1	0
213.75	0	0	0	2	3	0	0
236.25	0	0	0	0	0	0	0
258.75	0	0	0	2	1	1	0
281.25	0	0	1	1	0	1	0
303.75	0	0	0	1	1	2	0
326.25	0	0	3	0	3	3	1

NRC CATEGORY C

deg	MPH						
	0 07	0 60	3.00	7 00	12.00	18.00	24 00
0 00	1	7	7	3	2	0	0
11.25	0	6	8	5	1	0	0
33.75	0	4	11	2	0	0	0
56.25	0	3	6	3	0	0	0
78 75	0	4	8	1	0	0	0
101.25	0	3	8	1	0	0	0
123.75	0	2	6	3	0	0	0
146 25	0	2	6	15	0	0	0
168.75	0	0	9	22	5	0	0
191.25	0	2	6	13	3	0	0
213 75	0	1	4	9	3	0	0
236.25	0	0	5	4	2	0	0
258.75	0	1	4	5	2	0	0
281.25	0	1	4	3	1	1	0
303.75	0	0	6	4	1	1	1
326 25	0	0	8	2	5	2	0

NRC CATEGORY D

deg	MPH						
	0 07	0 60	3 00	7 00	12 00	18 00	24 00
0 00	1	8	6	11	4	0	0
11.25	0	4	4	6	0	0	0
33.75	1	6	4	3	0	0	0
56.25	2	3	9	5	0	0	0
78.75	0	9	10	5	0	0	0
101.25	0	4	3	1	0	0	0
123.75	0	10	7	11	1	0	0
146.25	0	9	46	22	1	0	0
168.75	1	12	45	12	0	0	0
191.25	0	4	26	23	3	0	0
213.75	0	4	11	17	3	0	0
236.25	0	5	8	5	2	0	0
258.75	0	3	3	5	4	1	0
281.25	0	5	8	6	0	0	0
303.75	0	5	4	8	5	10	3
326.25	0	2	5	9	18	11	5

NRC CATEGORY E

deg	MPH						
	0 07	0 60	3.00	7 00	12 00	18 00	24 00
0 00	1	4	11	7	0	0	0
11.25	1	6	9	2	0	0	0
33.75	1	3	3	0	0	0	0
56.25	0	2	7	0	0	0	0
78.75	1	3	0	0	0	0	0
101.25	0	1	1	0	0	0	0
123.75	0	3	1	6	0	0	0
146.25	0	2	6	8	0	0	0
168.75	1	3	15	14	3	0	0
191.25	0	0	10	7	0	0	0
213.75	1	4	7	6	1	0	0
236.25	0	1	9	3	1	0	0
258.75	0	3	4	7	2	0	0
281.25	2	3	11	13	2	0	0
303.75	0	13	21	45	43	7	0
326.25	0	7	21	33	13	5	0

NRC CATEGORY F

deg	MPH						
	0 07	0.60	3 00	7.00	12 00	18 00	24.00
0 00	0	10	22	2	0	0	0
11.25	0	7	18	0	0	0	0
33.75	1	4	7	1	0	0	0
56.25	0	8	6	0	0	0	0
78.75	2	2	3	1	0	0	0
101.25	0	3	1	0	0	0	0
123.75	2	5	0	0	0	0	0
146.25	1	5	13	16	0	0	0
168.75	1	3	46	16	0	0	0
191.25	0	6	28	7	0	0	0
213.75	3	1	7	3	0	0	0
236.25	1	3	5	0	0	0	0
258.75	0	3	2	2	0	0	0
281.25	0	2	2	2	0	0	0
303.75	0	2	6	7	0	0	0
326.25	1	3	17	3	0	0	0

NRC CATEGORY G

deg	MPH						
	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	17	29	1	0	0	0
11.25	1	23	22	0	0	0	0
33.75	1	13	21	0	0	0	0
56.25	1	13	8	0	0	0	0
78.75	2	5	1	0	0	0	0
101.25	1	5	0	0	0	0	0
123.75	3	5	0	0	0	0	0
146.25	2	6	7	1	0	0	0
168.75	1	12	20	24	0	0	0
191.25	0	6	10	2	0	0	0
213.75	2	3	3	0	0	0	0
236.25	1	5	1	0	0	0	0
258.75	1	4	1	0	0	0	0
281.25	1	4	2	0	0	0	0
303.75	1	2	7	1	0	0	0
326.25	1	11	15	1	0	0	0

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

**JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 07/01/02 TO HOUR 23 ON 09/30/02**

The total hours are 2208; 2171 read and 37 missing

NRC CATEGORY A

deg	MPH						
	0 07	0 60	3 00	7 00	12 00	18 00	24 00
0 00	0	0	2	6	10	1	0
11 25	0	0	7	20	12	0	0
33 75	0	0	5	13	1	0	0
56.25	0	0	3	2	0	0	0
78 75	0	0	1	1	0	0	0
101 25	0	0	2	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	0	0	0	0
191.25	0	0	0	0	8	1	0
213.75	0	0	0	0	0	0	0
236 25	0	0	0	0	0	0	0
258 75	0	0	0	0	0	0	1
281 25	0	0	0	0	0	0	0
303 75	0	0	0	0	2	1	2
326 25	0	0	0	0	0	0	0

NRC CATEGORY B

deg	MPH						
	0 07	0 60	3 00	7 00	12 00	18.00	24 00
0 00	0	1	12	9	3	0	0
11 25	0	7	7	4	1	0	0
33.75	0	2	7	5	0	0	0
56.25	0	3	4	7	0	0	0
78.75	0	3	6	3	0	0	0
101 25	0	0	7	2	0	0	0
123 75	0	3	5	12	0	0	0
146 25	0	1	5	11	2	0	0
168 75	0	1	3	25	4	0	0
191.25	0	1	4	11	7	0	0
213.75	0	0	3	9	3	1	0
236.25	0	0	1	7	4	0	0
258.75	0	1	5	4	3	0	1
281 25	0	1	1	4	3	1	0
303 75	0	2	7	6	3	0	3
326 25	0	2	6	1	4	0	0

NRC CATEGORY C

deg	MPH						
	0 07	0 60	3.00	7 00	12.00	18 00	24 00
0 00	0	3	7	6	3	0	0
11 25	0	7	7	4	1	0	0
33 75	0	2	7	5	0	0	0
56 25	0	3	4	7	0	0	0
78.75	0	3	6	3	0	0	0
101.25	0	0	7	2	0	0	0
123 75	0	3	5	12	0	0	0
146 25	0	1	5	11	2	0	0
168 75	0	1	3	25	4	0	0
191 25	0	1	4	11	7	0	0
213 75	0	0	3	9	3	1	0
236.25	0	0	1	7	4	0	0
258.75	0	1	5	4	3	0	1
281 25	0	1	1	4	3	1	0
303 75	0	2	7	6	3	0	3
326 25	0	2	6	1	4	0	0

NRC CATEGORY D

deg	MPH						
	0 07	0 60	3 00	7.00	12.00	18.00	24 00
0 00	0	6	4	4	7	1	0
11.25	1	3	4	3	2	0	0
33.75	0	4	4	5	1	0	0
56.25	0	3	10	8	0	0	0
78.75	1	3	3	7	1	0	0
101.25	0	10	3	4	0	0	0
123.75	0	6	10	19	6	0	0
146.25	0	15	48	11	0	0	0
168.75	0	9	33	18	3	0	0
191.25	1	5	17	28	7	1	0
213.75	0	3	4	8	7	0	0
236.25	0	5	9	8	4	0	0
258.75	0	3	5	5	3	1	2
281.25	0	1	7	6	6	1	2
303.75	0	4	3	3	9	15	28
326.25	0	4	7	7	5	3	0

NRC CATEGORY E

deg	MPH						
	0 07	0 60	3.00	7.00	12.00	18.00	24.00
0 00	0	2	1	5	4	0	0
11.25	0	3	0	1	1	0	0
33.75	0	4	2	1	1	0	0
56.25	0	4	5	3	0	0	0
78.75	1	2	2	0	1	0	0
101.25	0	2	1	0	0	0	0
123.75	0	1	3	7	3	0	0
146.25	1	0	3	5	3	0	0
168.75	0	3	2	8	7	1	0
191.25	0	1	1	10	6	2	0
213.75	0	0	3	3	6	1	0
236.25	1	1	7	6	2	1	0
258.75	0	2	6	4	6	5	1
281.25	0	1	7	14	21	25	6
303.75	0	2	3	29	39	51	26
326.25	0	5	5	13	13	2	0

NRC CATEGORY F

deg	MPH						
	0 07	0 60	3 00	7.00	12.00	18.00	24.00
0 00	0	4	7	5	1	0	0
11.25	0	1	2	1	1	0	0
33.75	0	0	5	13	2	0	0
56.25	0	1	3	3	2	0	0
78.75	0	1	0	0	1	0	0
101.25	0	6	3	0	0	0	0
123.75	0	4	4	3	2	0	0
146.25	0	5	10	8	8	0	0
168.75	0	3	12	22	10	0	0
191.25	1	6	13	9	3	1	0
213.75	0	2	10	8	0	0	0
236.25	0	1	6	1	0	0	0
258.75	0	2	3	2	2	0	0
281.25	0	2	3	4	10	6	0
303.75	1	1	4	13	20	2	0
326.25	0	7	6	12	8	0	0

NRC CATEGORY G

deg	MPH						
	0 07	0 60	3.00	7 00	12 00	18.00	24 00
0 00	0	3	17	16	6	0	0
11 25	0	7	14	0	0	0	0
33.75	0	5	12	5	0	0	0
56 25	0	3	7	1	3	0	0
78 75	0	2	3	0	0	0	0
101 25	0	0	0	0	0	0	0
123.75	0	4	7	0	0	0	0
146.25	1	7	18	8	2	0	0
168.75	0	7	17	14	4	0	0
191 25	0	10	11	7	4	0	0
213 75	0	2	5	3	3	0	0
236 25	0	3	6	0	0	0	0
258 75	0	3	2	0	0	0	0
281.25	0	2	3	1	4	0	0
303.75	0	3	4	7	12	0	0
326 25	0	5	9	22	8	0	0

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

**JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 10/1/02 TO HOUR 23 ON 12/31/02**

The total hours are 2208, 2193 read and 15 missing

NRC CATEGORY A

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	0	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146.25	0	0	0	0	0	0	0
168.75	0	0	0	0	0	0	0
191.25	0	0	0	0	0	0	0
213.75	0	0	0	0	0	0	0
236.25	0	0	0	0	0	0	0
258.75	0	0	0	0	0	0	0
281.25	0	0	1	1	0	0	0
303.75	0	0	0	0	0	0	0
326.25	0	0	0	0	0	0	0

NRC CATEGORY B

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	1	1	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146.25	0	0	0	0	0	0	0
168.75	0	0	0	0	0	0	0
191.25	0	0	0	0	0	0	0
213.75	0	0	0	0	0	0	0
236.25	0	0	0	0	0	0	0
258.75	0	0	0	0	0	0	0
281.25	0	0	0	0	0	0	0
303.75	0	0	0	0	0	0	0
326.25	0	1	0	0	0	0	0

NRC CATEGORY C

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	3	8	3	2	0	0
11.25	0	0	2	4	0	0	0
33.75	0	0	0	0	0	1	0
56.25	0	0	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146.25	0	0	0	0	0	0	0
168.75	0	0	0	3	1	0	0
191.25	0	0	0	0	2	0	0
213.75	0	0	0	0	0	0	0
236.25	0	0	0	0	0	0	0
258.75	0	0	0	0	0	0	0
281.25	0	0	0	0	0	0	0
303.75	0	0	0	2	1	0	0
326.25	0	1	0	0	0	0	0

NRC CATEGORY D

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	17	27	6	5	0	0
11.25	4	22	14	16	4	4	2
33.75	2	19	8	1	1	2	0
56.25	2	18	3	0	0	0	0
78.75	3	15	3	0	0	0	0
101.25	0	8	2	1	0	0	0
123.75	2	7	2	2	2	0	0
146.25	1	7	19	10	1	0	0
168.75	1	9	25	28	14	0	0
191.25	0	8	14	21	8	1	0
213.75	1	9	10	6	8	4	2
236.25	2	7	6	6	1	1	0
258.75	1	9	2	5	3	2	0
281.25	2	14	7	12	1	0	0
303.75	0	16	12	17	5	2	0
326.25	4	18	36	15	4	0	0

NRC CATEGORY E

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	3	19	25	2	0	0	0
11.25	3	10	12	7	7	2	0
33.75	2	6	8	4	2	1	0
56.25	1	9	3	0	0	0	0
78.75	2	2	1	0	0	0	0
101.25	0	1	0	0	0	0	0
123.75	1	9	4	8	3	1	0
146.25	1	13	13	28	3	4	1
168.75	1	10	33	45	13	2	2
191.25	2	10	27	12	17	0	1
213.75	0	15	14	9	12	9	1
236.25	0	13	9	2	5	3	1
258.75	0	20	5	3	0	0	0
281.25	3	23	12	6	1	0	0
303.75	1	29	29	16	1	2	0
326.25	2	32	52	32	0	0	0

NRC CATEGORY F

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	3	11	10	1	0	0	0
11.25	1	15	6	1	0	0	0
33.75	3	11	6	0	0	0	0
56.25	0	7	4	0	0	0	0
78.75	1	1	1	0	0	0	0
101.25	2	2	1	0	0	0	0
123.75	0	2	1	1	1	0	0
146.25	1	6	13	18	0	0	0
168.75	0	5	26	21	4	0	0
191.25	0	7	15	11	1	0	0
213.75	0	5	5	5	2	0	0
236.25	1	10	3	0	0	0	0
258.75	1	6	8	0	0	0	0
281.25	0	4	7	2	0	0	0
303.75	0	15	16	5	0	0	0
326.25	0	14	22	14	0	0	0

NRC CATEGORY G

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	0	23	21	0	0	0	0
11.25	1	28	6	0	0	0	0
33.75	1	33	19	0	0	0	0
56.25	2	11	4	0	0	0	0
78.75	1	5	0	0	0	0	0
101.25	1	3	0	0	0	0	0
123.75	1	5	1	0	0	0	0
146.25	1	8	7	2	0	0	0
168.75	1	13	26	8	1	0	0
191.25	2	9	8	2	0	0	0
213.75	0	7	1	3	0	0	0
236.25	3	7	1	0	0	0	0
258.75	2	6	4	0	0	0	0
281.25	0	11	5	0	0	0	0
303.75	0	16	11	0	0	0	0
326.25	2	18	32	8	0	0	0

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

**JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 10/1/02 TO HOUR 23 ON 12/31/02**

The total hours are 2208, 2193 read and 15 missing

NRC CATEGORY A

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	0	0	0	0	0	0
11 25	0	0	0	0	0	0	0
33 75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	0	0	0	0
191 25	0	0	0	0	0	0	0
213 75	0	0	0	0	0	0	0
236 25	0	0	0	0	0	0	0
258 75	0	0	1	1	0	0	0
281 25	0	0	0	0	0	0	0
303 75	0	0	0	0	0	0	0
326 25	0	0	0	0	0	0	0

NRC CATEGORY B

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	1	0	0	0	0	0
11 25	0	0	1	0	0	0	0
33 75	0	0	0	0	0	0	0
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123 75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	0	0	0	0
191 25	0	0	0	0	0	0	0
213 75	0	0	0	0	0	0	0
236 25	0	0	0	0	0	0	0
258 75	0	0	0	0	0	0	0
281 25	0	0	0	0	0	0	0
303 75	0	0	0	0	0	0	0
326 25	0	0	1	0	0	0	0

NRC CATEGORY C

deg	MPH						
	>0 07	>0 60	>3 00	>7 00	>12 00	>18 00	>24 00
0 00	0	3	7	3	1	0	0
11.25	0	0	1	5	2	0	0
33 75	0	0	0	0	0	0	1
56 25	0	0	0	0	0	0	0
78 75	0	0	0	0	0	0	0
101 25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	3	0	0	0
191 25	0	0	0	0	2	1	0
213 75	0	0	0	0	0	0	0
236 25	0	0	0	0	0	0	0
258 75	0	0	0	0	0	0	0
281 25	1	0	0	0	0	0	0
303.75	0	0	0	1	2	0	0
326 25	0	0	0	0	0	0	0

NRC CATEGORY D

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	3	16	19	8	1	0	0
11.25	2	18	13	20	3	3	4
33.75	3	10	6	3	1	0	4
56.25	2	11	4	1	0	0	0
78.75	2	14	1	0	0	0	0
101.25	1	10	3	1	0	0	0
123.75	1	11	4	2	0	0	0
146.25	0	12	12	7	2	0	0
168.75	2	7	28	24	12	5	0
191.25	0	10	10	22	14	2	0
213.75	0	6	11	6	10	7	7
236.25	0	7	9	5	2	1	2
258.75	0	13	3	6	6	0	1
281.25	2	9	5	7	3	4	0
303.75	0	9	21	9	21	4	2
326.25	2	16	33	10	7	1	0

NRC CATEGORY E

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	1	28	18	7	3	0	0
11.25	0	10	11	3	4	2	3
33.75	3	4	10	6	5	3	4
56.25	0	10	5	2	1	0	0
78.75	0	6	3	0	0	0	0
101.25	1	1	2	0	0	0	0
123.75	2	8	3	4	3	1	7
146.25	1	11	7	21	10	1	5
168.75	1	5	15	24	13	4	3
191.25	3	10	16	17	27	16	3
213.75	0	10	10	11	8	17	15
236.25	0	11	6	7	5	6	5
258.75	1	14	8	4	0	0	0
281.25	1	19	12	4	5	5	0
303.75	0	18	20	15	25	8	3
326.25	3	18	26	21	19	1	0

NRC CATEGORY F

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	1	2	4	14	1	0	0
11.25	0	2	10	0	1	0	0
33.75	0	5	8	1	0	1	0
56.25	0	4	11	2	0	0	0
78.75	1	6	3	3	0	0	0
101.25	0	8	1	0	1	0	0
123.75	0	6	2	0	0	0	0
146.25	0	3	7	13	5	0	0
168.75	0	6	7	10	16	1	1
191.25	0	6	20	16	9	0	0
213.75	0	2	12	7	6	2	0
236.25	0	2	6	5	1	0	0
258.75	0	4	4	2	1	0	0
281.25	1	3	9	4	3	2	0
303.75	1	3	12	6	13	4	0
326.25	1	2	10	11	8	0	0

NRC CATEGORY G

deg	MPH						
	>0.07	>0.60	>3.00	>7.00	>12.00	>18.00	>24.00
0.00	1	3	12	10	2	0	0
11.25	0	8	8	0	0	0	0
33.75	2	4	14	6	0	0	0
56.25	0	9	14	8	0	0	0
78.75	0	13	9	0	0	0	0
101.25	3	8	2	0	0	0	0
123.75	1	7	10	0	0	0	0
146.25	1	12	17	7	0	0	0
168.75	0	9	27	7	1	1	0
191.25	2	7	14	5	5	1	0
213.75	0	8	9	4	0	0	0
236.25	0	6	10	3	1	0	0
258.75	2	7	7	1	0	0	0
281.25	0	2	4	2	1	0	0
303.75	1	5	4	3	0	0	0
326.25	0	4	9	18	10	0	0

Table 5-9 Year 2002, 33 Ft AGL

**JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 01/01/02 TO HOUR 23 ON 12/31/02**

The total hours are 8760, 8688 read and 72 missing

NRC CATEGORY A

deg	MPH						
	0 07	0.60	3 00	7.00	12 00	18 00	24 00
0 00	0	1	1	5	1	0	0
11.25	0	0	4	17	7	0	0
33.75	0	0	16	24	1	0	0
56.25	0	0	6	0	0	0	0
78.75	0	0	3	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	1	0	0	0	0
146.25	0	0	0	1	1	0	0
168.75	0	0	1	0	0	0	0
191.25	0	0	1	1	7	0	0
213.75	0	0	0	1	3	0	0
236.25	0	0	1	0	0	0	0
258.75	0	0	0	0	0	0	0
281.25	0	0	1	1	0	1	0
303.75	0	0	0	0	2	0	0
326.25	0	0	0	0	0	2	1

NRC CATEGORY B

deg	MPH						
	0 07	0.60	3 00	7 00	12.00	18 00	24 00
0 00	0	2	6	3	1	0	0
11.25	0	7	26	14	0	0	0
33.75	0	4	15	8	0	0	0
56.25	0	0	16	4	0	0	0
78.75	0	2	6	3	0	0	0
101.25	0	1	7	1	0	0	0
123.75	0	0	1	2	0	0	0
146.25	0	1	1	4	0	0	0
168.75	0	0	0	12	3	1	0
191.25	0	0	3	11	11	1	0
213.75	0	0	1	2	3	0	0
236.25	0	0	0	0	0	0	0
258.75	0	0	1	3	1	1	0
281.25	0	0	1	1	1	1	0
303.75	0	0	0	1	1	2	0
326.25	0	1	3	0	3	3	1

NRC CATEGORY C

deg	MPH						
	0.07	0 60	3.00	7.00	12 00	18 00	24.00
0.00	1	10	15	6	4	0	0
11.25	0	6	10	9	1	0	0
33.75	0	4	11	2	0	1	0
56.25	0	3	6	3	0	0	0
78.75	0	4	8	1	0	0	0
101.25	0	3	8	1	0	0	0
123.75	0	3	6	3	0	0	0
146.25	0	2	6	15	0	0	0
168.75	0	0	9	25	6	0	0
191.25	0	2	6	13	5	0	0
213.75	0	1	4	9	3	0	0
236.25	0	0	6	4	2	0	0
258.75	0	1	4	5	2	0	0
281.25	0	1	4	3	1	1	0
303.75	0	0	6	6	2	1	1
326.25	0	1	8	2	5	2	0

NRC CATEGORY D

deg	MPH						
	0 07	0 60	3 00	7 00	12 00	18 00	24 00
0 00	2	269	42	44	32	3	0
11 25	5	27	28	43	15	4	2
33.75	3	25	18	8	2	2	0
56.25	4	23	15	14	1	0	0
78 75	3	25	17	8	0	0	0
101 25	0	14	6	7	0	0	0
123 75	3	19	14	22	4	0	0
146 25	1	17	70	43	14	0	0
168.75	2	26	74	62	27	0	0
191.25	0	16	47	55	30	5	3
213 75	1	15	24	32	32	29	16
236 25	3	16	21	17	14	17	3
258 75	1	14	8	14	14	11	1
281 25	2	21	16	25	13	1	1
303.75	0	24	20	34	36	34	6
326.25	4	20	54	35	36	19	5

NRC CATEGORY E

deg	MPH						
	0 07	0.60	3 00	7 00	12.00	18 00	24 00
0 00	5	79	112	50	11	0	0
11.25	6	33	90	29	10	2	0
33 75	4	34	73	22	2	1	0
56 25	3	31	49	12	0	0	0
78 75	5	26	19	12	1	0	0
101 25	1	22	16	6	1	0	0
123.75	1	29	37	33	4	1	0
146.25	3	36	89	128	11	4	1
168.75	3	39	143	169	50	5	2
191 25	3	38	108	128	105	29	11
213 75	2	29	83	83	76	34	15
236 25	1	29	39	49	32	19	6
258 75	1	41	33	53	24	7	4
281.25	9	39	69	63	27	4	0
303.75	1	75	126	153	107	15	0
326 25	3	76	171	134	44	7	0

NRC CATEGORY F

deg	MPH						
	0 07	0 60	3 00	7 00	12 00	18 00	24 00
0.00	5	50	76	8	0	0	0
11 25	3	45	44	1	0	0	0
33 75	6	46	41	2	0	0	0
56 25	3	27	19	7	0	0	0
78 75	3	11	4	1	0	0	0
101.25	3	17	3	0	0	0	0
123.75	3	18	4	2	2	0	0
146 25	3	37	70	64	3	0	0
168 75	2	47	140	72	11	1	0
191 25	3	32	84	35	3	1	0
213 75	5	16	19	16	2	0	0
236 25	2	26	18	8	0	0	0
258.75	2	21	18	9	0	0	0
281.25	5	23	16	14	0	0	0
303 75	1	33	55	36	0	0	0
326 25	4	41	90	27	2	0	0

NRC CATEGORY G

deg	MPH						
	0.07	0 60	3.00	7.00	12 00	18.00	24.00
0 00	3	47	74	1	0	0	0
11 25	2	64	42	0	0	0	0
33 75	3	54	58	0	0	0	0
56 25	5	29	14	0	0	0	0
78 75	3	12	1	0	0	0	0
101.25	2	9	0	0	0	0	0
123 75	5	15	1	0	0	0	0
146.25	3	18	25	7	0	0	0
168.75	2	32	64	44	1	0	0
191.25	2	20	26	8	0	0	0
213.75	2	14	7	6	0	0	0
236 25	4	17	3	1	0	0	0
258 75	4	14	8	0	0	0	0
281 25	2	20	11	0	1	0	0
303 75	3	26	27	5	0	0	0
326.25	3	46	68	15	0	0	0

Table 5-10 Year 2002, 245 Ft AGL

**JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD
FROM HOUR 00 ON 01/01/02 TO HOUR 23 ON 12/31/02**

The total hours are 8760; 8688 read and 72 missing

NRC CATEGORY A

deg	MPH						
	0 07	0 60	3 00	7 00	12 00	18 00	24 00
0 00	0	0	2	6	10	1	0
11.25	0	0	7	20	12	0	0
33 75	0	0	5	13	1	0	0
56 25	0	0	3	2	0	0	0
78 75	0	0	1	1	0	0	0
101.25	0	0	2	0	0	0	0
123.75	0	0	0	0	0	0	0
146 25	0	0	0	0	0	0	0
168 75	0	0	0	1	1	0	0
191 25	0	0	0	0	9	1	0
213 75	0	0	0	1	2	0	0
236.25	0	0	0	0	1	1	0
258.75	0	0	1	1	0	0	1
281 25	0	0	0	1	0	0	0
303 75	0	0	0	0	2	1	2
326 25	0	0	0	0	0	0	0

NRC CATEGORY B

deg	MPH						
	0 07	0 60	3 00	7 00	12.00	18 00	24 00
0 00	0	2	12	9	3	0	0
11 25	0	4	17	24	3	0	0
33 75	0	1	9	8	1	0	0
56.25	0	0	14	6	0	0	0
78 75	0	1	1	2	0	0	0
101 25	0	1	4	4	0	0	0
123 75	0	0	1	2	0	0	0
146 25	0	0	1	1	2	0	0
168.75	0	0	1	6	13	2	0
191.25	0	0	1	4	15	1	0
213 75	0	0	1	0	2	1	0
236 25	0	0	1	0	1	0	0
258 75	0	0	1	1	1	3	0
281 25	0	0	0	2	1	1	0
303.75	0	0	2	0	2	2	5
326.25	0	0	2	1	2	0	0

NRC CATEGORY C

deg	MPH						
	0 07	0 60	3 00	7.00	12 00	18.00	24 00
0 00	0	6	14	9	4	0	0
11.25	0	7	8	9	3	0	0
33 75	0	2	7	5	0	0	1
56 25	0	3	4	7	0	0	0
78 75	0	3	6	3	0	0	0
101 25	0	0	7	2	0	0	0
123.75	0	3	5	12	0	0	0
146 25	0	1	5	11	2	0	0
168 75	0	1	3	28	4	0	0
191 25	0	1	4	11	9	1	0
213.75	0	0	4	9	3	1	0
236.25	0	0	1	7	4	0	0
258.75	0	1	6	4	3	0	1
281 25	1	1	1	4	3	1	0
303 75	0	2	7	7	5	0	3
326 25	0	2	6	1	4	0	0

NRC CATEGORY D

deg	MPH						
	0 07	0 60	3 00	7.00	12.00	18.00	24 00
0.00	3	25	29	28	25	13	0
11.25	4	21	27	53	14	11	4
33.75	3	14	12	16	3	0	4
56.25	2	16	16	13	4	0	0
78.75	3	17	5	15	2	0	0
101.25	1	22	8	5	4	0	0
123.75	1	18	16	25	7	0	0
146.25	0	30	63	21	12	2	0
168.75	2	17	69	51	28	9	0
191.25	2	16	32	61	36	15	3
213.75	0	10	18	17	29	22	33
236.25	0	14	21	21	14	14	28
258.75	0	19	11	14	17	15	17
281.25	2	15	15	15	18	14	3
303.75	0	14	29	17	52	44	52
326.25	2	20	44	28	20	13	2

NRC CATEGORY E

deg	MPH						
	0 07	0 60	3 00	7.00	12.00	18.00	24 00
0 00	2	54	73	69	48	2	1
11.25	2	32	64	55	16	6	3
33.75	3	18	59	38	11	3	4
56.25	0	26	49	26	4	2	0
78.75	1	25	33	14	2	1	0
101.25	2	12	18	7	6	0	0
123.75	2	23	33	25	12	2	7
146.25	2	27	47	89	26	4	5
168.75	2	23	76	115	65	5	4
191.25	3	21	57	120	115	43	12
213.75	2	24	54	59	77	63	56
236.25	1	26	38	52	50	43	58
258.75	3	23	43	43	47	27	31
281.25	1	36	44	58	78	56	16
303.75	0	35	65	113	162	130	55
326.25	3	45	90	97	81	18	1

NRC CATEGORY F

deg	MPH						
	0.07	0.60	3 00	7.00	12.00	18.00	24.00
0 00	1	15	28	42	14	1	0
11.25	1	7	43	12	4	0	0
33.75	0	15	34	28	5	1	0
56.25	1	14	25	21	9	3	0
78.75	2	15	14	5	3	0	0
101.25	2	24	9	2	1	0	0
123.75	1	22	12	11	7	0	0
146.25	0	19	40	37	17	1	0
168.75	1	30	67	63	42	1	1
191.25	3	29	66	49	33	5	3
213.75	0	23	42	32	15	9	1
236.25	0	10	39	14	5	1	0
258.75	0	12	13	8	6	0	0
281.25	1	12	21	12	27	11	0
303.75	2	10	27	40	61	16	1
326.25	1	16	34	46	37	5	0

NRC CATEGORY G

deg	MPH						
	0 07	0 60	3 00	7 00	12 00	18 00	24.00
0 00	1	8	39	44	11	0	0
11 25	0	17	29	7	0	0	0
33 75	2	9	28	17	0	0	0
56 25	0	13	30	13	4	1	0
78 75	0	16	21	5	1	0	0
101.25	3	11	3	1	0	0	0
123 75	1	14	22	3	0	0	0
146 25	2	19	43	22	2	1	0
168 75	0	19	59	29	11	1	0
191 25	2	22	32	21	13	2	0
213.75	0	16	22	11	8	0	0
236 25	0	11	23	6	1	0	0
258 75	2	10	10	7	0	0	0
281 25	0	7	8	6	5	0	0
303 75	1	10	12	12	16	1	0
326.25	0	9	22	57	33	3	0

6.0 DOSE ASSESSMENT -- IMPACT ON MAN

Liquid Effluents - There were no radioactive liquid discharges from Columbia Generating Station in 2002.

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 6-2 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 50-mile population (252,356) and converting to mrem.

The highest calculated dose to a child living at locations identified in the most recent Land Use Census was 4.99E-03 mrem to the total body, 5.47E-03 mrem to the thyroid, and 7.01E-03 mrem to the skin. This location was at 4.5 miles in the SE sector.

Members of the public were not exposed at the Columbia Generating Station Visitor Center because this facility remained closed throughout the year.

Periodically, Columbia Generating Station offers public tours of selected locations within the site boundary. Members of the public walk from the parking lot to the west entrance of the power plant. Calculations assumed an eight (8) hour per year exposure to the plume, ground shine, and inhalation pathways. The highest organ doses calculated were in the teen age group and the organ with the highest dose was the skin. The dose assessment results for this group are tabulated below.

During 2002, members of the public worked at the WNP-1 industrial area. The maximum dose to these individuals was also calculated for the plume, inhalation, and ground deposition pathways. The maximum doses received by the adult and teen age groups (full-time employees) are shown below.

The following table shows dose to members of the public 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	1.66E-03	2.12E-03	1.68E-03	1.61E-05	4.54E-05
WNP-1 Industrial Area	2.08E+03	3.82E-03	4.70E-03	4.08E-03	2.22E-04	6.31E-04

During the growing season, Columbia Generating Station conducts a Land Use Census to determine the locations of nearest residents, gardens, and farm animals out to five miles in each sector. In 2002, no gardens or livestock (including dairy animals) were found within five miles of the station.

The following table provides the results of dose calculations for each identified location.

Location	Total Body Dose (mrem)	Thyroid Dose (mrem)	Highest Other Organ Dose (mrem)	Beta Air Dose (mrad)	Gamma Air Dose (mrad)
Resident (4.3 miles NE)	1.58E-03	1.83E-03	1.83E-03	2.14E-04	6.06E-04
Resident (4.1 miles ENE)	2.53E-03	2.83E-03	3.07E-03	4.62E-04	1.31E-03
Resident (4.45 miles E)	1.95E-03	2.19E-03	2.28E-03	2.83E-04	8.02E-04
Resident (4.2 miles ESE)	2.89E-03	3.20E-03	3.56E-03	5.78E-04	1.64E-03
Resident (4.5 miles SE)	5.20E-03	5.59E-03	7.22E-03	1.76E-03	4.98E-03

The highest 'Other Organ' in all cases was the skin. For all locations, the group with the highest dose was the teen age group.

For environmental TLD stations at or beyond the site boundary where preoperational (background) data was acquired, no increase in ambient exposure was observed in 2002 from the preoperational values. Within the site boundary, the environmental TLD station with the highest direct radiation reading was located 0.1 mi NNW at the ISFSI facility. The annual dose at this location from direct radiation is 316 mrem after subtracting background (Station 9A at 30 miles WSW).

Dose Tables

Table 6-1 Summary of Dose from Gaseous Effluents

1. Location: Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta air dose (mrad)	3.99E-04	5.32E-03	7.94E-04	7.96E-04	2.28E-03
Gamma air dose	1.13E-03	2.70E-03	2.25E-03	2.26E-03	6.47E-03

2. Location: Beyond Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Beta air dose (mrad)	1.81E-04	1.53E-03	7.95E-05	1.99E-03	1.76E-03
Gamma air dose	5.14E-04	6.92E-04	2.25E-04	5.64E-03	4.98E-03

3. Location: Site Boundary

	Annual Dose
Annual Total Body Dose (mrem)	2.90E-02
Annual Skin Dose (mrem)	3.17E-02

4. Location: Beyond Site Boundary

	Annual Dose
Annual Total Body Dose (mrem)	9.59E-03
Annual Skin Dose (mrem)	9.88E-03

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

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

5. Location: Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Maximum Organ dose (mrem)	6.23E-03	6.68E-03	1.18E-02	2.33E-02	3.57E-02

6. Location: Beyond Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Maximum Organ dose (mrem)	1.51E-03	1.84E-03	4.25E-03	7.07E-03	1.19E-02

7. Location: Land Use Census, 4.1 Miles ESE

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative*
Maximum Organ dose (mrem)	6.40E-04	1.01E-03	6.66E-04	1.62E-03	3.07E-03

* Rather than the sum of the quarters, these values are based on average annual meteorological parameters 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	1.55E-03	2.75E-03
Ground	1.11E-03	1.31E-03
Inhalation	8.05E-02	9.11E-02
Vegetables	5.74E-02	5.75E-02
Milk	2.01E-02	2.34E-02
Meat	1.26E-02	1.28E-02
Total	1.73E-01	1.89E-01

B. Average Individual*

Exposure Pathway	Total Body (mrem)	Max. Organ (mrem)
Plume	6.14E-06	1.09E-05
Ground	4.40E-06	5.19E-06
Inhalation	3.19E-04	3.61E-04
Vegetables	2.27E-04	2.28E-04
Milk	7.96E-05	9.27E-05
Meat	4.99E-05	5.07E-05
Total	6.87E-04	7.48E-04

* These values are derived by dividing the 50-mile population collective doses by the population within 50 miles of the Plant.

7.0 REVISIONS TO THE ODCM

This section completes the requirement of Technical Specification 5.5.1. During this calendar year, the ODCM was revised as follows:

- Requirements for Operability (RFO) were revised to the format of the Licensee Controlled Specifications (LCS).
- The Bases were expanded to match the LCS format.
- Regulatory Guide 1.97 instruments (Turbine and Radwaste Building Intermediate Range Monitors) were moved to the Post Accident Monitoring Section of the LCS.
- The Solid Radwaste and Process Control Program RFOs were moved. They are defined in the FSAR and Plant Procedures.
- The newly formatted Chapter 6 (RFOs) are now an appendix to the ODCM.
- Chapter Two references to “Maximum Permissible Concentration (MPC)” were changed to “Effluent Concentration (EC)”.
- Removed the Turbine Building Sump Radioactivity Monitoring System because a design change removed the effluent flow path.

As specified, a complete, legible copy of the entire Offsite Dose Calculation Manual (ODCM) is included as an enclosure to the letter transmitting this Radioactive Effluent Release Report to the Nuclear Regulatory Commission (NRC).

8.0 REVISIONS TO THE PROCESS CONTROL PROGRAM (PCP)

The following changes to the PCP were made:

- Operational Quality Assurance Program Description (OQAPD) requirement (Appendix III, Sections 2.1.6.1 and 4.6) for Plant Operating Committee (POC) review of PCP was added to the Purpose Section.
- Clarifying qualifiers (“routine” wastes, “relatively” small volumes, “typically” very high concentrations, “installed” filter demineralizer systems) were added. Unnecessary verbiage was removed.
- Clarification was provided that compliance with Branch Technical Position (BTP) on Waste Form (January 1991) is a “should” not a “shall” since Columbia is not committed to this BTP. Reference to 10CFR20.2003 was removed concerning discharge into sewers, which is not within the scope of this PCP.

- Clarification was provided that dewatering system operation is controlled by plant procedure, based on vendor procedure, in turn based on NUPAC Topical Report on Dewatering System, TP-02-P-A.
- General wording regarding work-scheduling program was replaced with reference to FSAR Section 11.4.3.7, Maintenance and Calibration, for consistency.
- A reference was added to new Section 2.6.5 (that lists the waste characteristics requirements of the US Ecology Disposal Site License and 10CFR61).
- The stabilization section was expanded to clarify the means for approval of any new wet waste solidification process. The description of the POC PCP review process was expanded to focus on the parameters and purposes of FSAR Sections 11.4.3.1, 11.4.3.2 and ETSB 11-3. Process controls formerly in ODCM (and in Tech Specs before that) that essentially implement the FSAR requirement were added to incorporate applicable parts of NUREG-0800 (SAR SRP), BTP ETSB 11-3 (Design Guidance for Solid Waste Management Systems), and NUREG-0473 (RETS) in the PCP.
- Statements describing two acceptable means of providing waste form stability to better align with the regulatory wording (10CFR61.56(b)), the FSAR, and the US Ecology Disposal Site License were clarified.
- A reference was added identifying the BTP on Radioactive Waste Classification (May 1983) as the source of the statement requiring classification calculations to be based on pre-dilution concentration. Even though this is a de facto requirement, it is listed as a “should” instead of a “shall” because Columbia is not formally committed to this BTP.
- A reference was added identifying the May 1983 BTP as the source of the statements defining the frequency requirement for offsite laboratory analyses and the Lowest Level of Detection (LLD) for these analyses. Even though these are de facto requirements, they are listed as “should” instead of “shall” because Columbia is not formally committed to this BTP.
- Clarification was provided that references to BTP on Radwaste Classification and BTP on Concentration Averaging and Encapsulation (January 1995) are “should” instead of “shall” statements because Columbia is not formerly committed to these BTPs.
- A new Section was added to “Waste Classification” to identify limits imposed by the disposal site license. These limits play the same role as the 10CFR61 class limits in that they dictate stability requirements or prohibit disposal. Existing Washington Administrative Code (WAC) requirements are also indicated.
- A new section was added to identify specific shipping categories requiring quantified determinations or comparisons with limits.

- Reference to 49CFR173.475 requiring inspection of radioactive shipping containers was added and “should” was changed to “shall.”
- Reference to 49CFR173.411 requiring compliance with tests and record retention was added and “should” was changed to “shall.”
- In Section 2.6.3, Type A Quantity Containers, Step a. was divided into steps a. and b. and reworded to better align with requirements in 49CFR173.412 and 49CFR173.415. Step c. was reworded to show what Spec 7A test results must be maintained. In Step d., “should” was changed to “shall.” Redundant step requiring adherence to 49CFR173.410 and the unnecessary direction to certify Type A containers to meet vibration standard (no longer relevant) was removed.
- In Section 2.6.4, Type B Quantity Containers, removed a step that is no longer applicable due to regulation change. NRC no longer approves Certificates of Compliance (CoC) for > Type A LSA or SCO.
- A listing of disposal site license packaging and waste characteristics requirements was added.
- A caveat was added to a statement limiting the total Transport Index (TI) to < 50 to clarify that this limit does not apply to “Exclusive Use” shipments. See 49CFR177.842.
- Added reference to requirement in 49CFR173.423 for multiple hazard excepted packaging and added titles for the previously specified regulations.
- Requirement wording was added to address Bulk Package marking requirements to display orange panel with hazardous identification number as required by 49CFR172.302 and 49CFR172.332.
- A step was added regarding 49CFR171.15(a)(2) requirement for carrier to give notice of incidents involving fire, breakage, spillage or suspected radioactive contamination.
- A step was added regarding 10CFR20.1906(d) requirement for licensees to immediately notify final delivering carrier and NRC Operations Center when surface contamination exceeds limits.
- Identified two additional documents (in addition to RHF-31) that are required by various sections of the Washington Administrative Code to accompany waste for disposal (shipment manifest and safety inspection seal or CVSA).
- References to Technical Specification 5.6.3, 10CFR50.36a and Regulatory Guide 1.21 were added.
- Requirement wording and regulatory reference (see 10CFR20 Appendix G, Section III.E.2) were added for report required when acknowledgement of receipt investigation has been performed.

- A step was added regarding 49CFR171.16 requirement to file report to DOT on Form F-5800.0 within 30 days of discovery of event meeting 49CFR171.15 (fire, breakage, spillage, etc.).
- Requirement words and reference were added for 10CFR71.101(b) requirement to have a Quality Program for transportation.
- Clarification was made that Quality aspects of Type B packages are primarily controlled through NRC approved vendor program and CoC but are also controlled through approved Energy Northwest procedures (or vendor procedures approved by Energy Northwest).
- Words were added suggesting that instructions “should” be provided to guide review of code inputs and outputs. This aligns procedure with current practice and is necessary to assure that reviews are adequate and efficient.
- Clarification was made that disposal shipment errors requiring manifest correction should be reported to the disposal site operator and that errors that would represent violation of 10CFR20 Appendix G required information shall be reported.
- Clarification was made that purchase of items and services supporting radioactive material transport and disposal should be designated as Commercial Grade or Procurement Quality Level (QL) 3 as applicable because QL 3 is not a regulatory requirement.
- Various references were added for requirements specifying record retention for radioactive material transportation and disposal.
- A definition was added for Bulk Package (see 49CFR171.8).

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

Columbia Generating Station deleted eight locations within the site boundary for dose assessments in 2002. Seven locations were drill sites where Department of Energy contractors worked installing groundwater monitoring wells in 2001. This activity terminated in the fall of 2001. The eighth location was the Plant Visitor Center that remained closed in 2002.

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

No major changes were made to the radioactive waste systems (liquid, gaseous, or solid) during this reporting period.