



Public Service

Public Service
Company of Colorado
P.O. Box 840
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Fort St. Vrain Nuclear Station
16805 WCR 19-1/2, Platteville, Colorado 80651

August 28, 1992
Fort St. Vrain
Unit No. 1
P-92271

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Docket No. 50-267

SUBJECT: SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

Gentlemen:

Attached please find the Semi-Annual Radioactive Effluent Release Report for the Fort St. Vrain Nuclear Station.

This report covers the period January 1, 1992, through June 30, 1992, and is submitted pursuant to Section 7.5.1.e of the Fort St. Vrain Technical Specifications.

Please contact Mr. M. H. Holmes at (303) 620-1701 if you have questions regarding this report.

Sincere

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Attachments

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SEMI-ANNUAL RADIOACTIVE EFFLUENT
RELEASE REPORT

January - June

1992

Public Service Company of Colorado

Fort St. Vrain
Nuclear Station

August, 1992

1.0 SUMMARY

This report summarizes radiological effluent released from the Fort St. Vrain Nuclear Generating Station for the period of January through June, 1992. This information is provided pursuant to the requirements of Sections 7.5.1.e, 8.1.2.d, e, and j, 8.1.3.e and f, and 8.2.1.h.1 of the Fort St. Vrain Technical Specifications.

This report follows the reporting format recommended by Regulatory Guide 1.22 as well as the requirements of the aforementioned sections of our Technical Specifications.

The following tables with a supplemental information section are included with this report:

<u>Table</u>	<u>Description</u>
1A	Gaseous Effluents - Summation of All Releases
1C	Gaseous Effluents - Ground-Level Releases
2A	Liquid Effluents - Summation of All Releases
2B	Liquid Effluents
3	Solid Waste and Irradiated Fuel Shipments
4A	Hourly Meteorological Data

Please note that Table 1B (of Regulatory Guide 1.21) has been omitted from this report because all of our gaseous effluents are assumed to be ground-level releases as opposed to being elevated releases.

Fort St. Vrain Technical Specifications apply exclusively to the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 for gaseous emissions, and Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144 for particulate emissions. This list does not mean that only these nuclides are considered. Other gamma emitting nuclides that are identifiable, together with the above nuclides, are analyzed and included in this report.

Sample activities that are less than the detection capabilities of our equipment are entered in this report using the value resulting from the calculation of the lower limit of detection (LLD) or minimum detectable activity (MDA). This results in reporting upper limit values that are in excess of true activities. Where limit values are a combination of positive and MDA values, the results are footnoted and differentiated from limit values produced from only MDA values.

The lower limit of detection (LLD), for the purposes of this report, is defined as the smallest concentration of radioactive material in a sample that will yield a net count above the system background, that will be detected with a 95% probability of being correct and only a 5% probability of falsely concluding that a blank observation represents a real signal. The LLD values specified in our Technical Specifications are as follows:

Liquid

Principal Gamma Emitters	5.00E-07 $\mu\text{Ci/ml}$
Dissolved Noble Gases	1.00E-05 $\mu\text{Ci/ml}$
Tritium	1.00E-05 $\mu\text{Ci/ml}$
Iodine-131	1.00E-06 $\mu\text{Ci/ml}$
Gross Alpha	1.00E-07 $\mu\text{Ci/ml}$
Strontium-89, 90 (Composite)	5.00E-08 $\mu\text{Ci/ml}$

Gaseous

Principal Gamma Emitters (Gas)	1.00E-04 $\mu\text{Ci/cc}$
Principal Gamma Emitters (Particulate)	1.00E-11 $\mu\text{Ci/cc}$
Tritium (Gas)	1.00E-06 $\mu\text{Ci/cc}$
Iodine-131 (Charcoal)	1.00E-12 $\mu\text{Ci/cc}$
Gross Alpha (Particulate)	1.00E-11 $\mu\text{Ci/cc}$
Strontium-89, 90 (Particulate)	1.00E-11 $\mu\text{Ci/cc}$
Gross Beta (Particulate)	1.00E-11 $\mu\text{Ci/cc}$

Where applicable, we have listed "less than" values for those nuclides listed specifically in our Technical Specifications. These "less than" values were calculated using the observed LLD values and the total volume of the media. The "less than" values were not included in the total values for the pathway.

The percent of Technical Specification limit on Table 1A is blank in some cases because this value could not be calculated from data which were at or below the minimum detectable activity. On Table 1C, the continuous release mode values are not reported because this release pathway is the same as the batch mode. All other blanks on Tables 1C and 2B occur because no LLD values for these nuclides are required to be calculated per Technical Specifications.

There has been some confusion in the past as to the total volume of water used for dilution of radioactive liquid effluent. All average diluted concentrations are based on the activity at the unrestricted area. Although this effluent could eventually reach one of two rivers (St. Vrain Creek and South Platte River) which converge approximately one and one-half miles downstream of the plant, no further dilutions were assumed. Additional discussion on river flow is contained in Section 4d of the Supplemental Information Section.

There were no abnormal or unplanned radioactive gaseous or liquid waste releases made during this reporting period.

During the NRC inspection on February 18-21, 1992, (G-92084) PSC committed to perform additional calculations regarding tritium released from the Turbine Building Sump (TBS) and report the results in the next Semi-Annual Effluent Report (G-92084).

The annual amount of tritium released from the TBS from 1985 to 1991 has been calculated and is provided below. Data was not available for 1984. These calculations are based on (1) the average TBS tritium concentration for the year determined through sampling and (2) the volume of liquid effluent discharged from the TBS each year as determined from the TBS sump pump run timers.

TURBINE BUILDING SUMP TRITIUM DISCHARGES

Year	Turbine Bldg Sump Discharge from Pump Timers	Avg H3 Concentration in TBS for Year through Sampling	Total H3 Curies Released from TBS for the Year
1985	16,160,697 (Gal) 61,087,436 (L)	1.11E-9 Ci/L	0.068 Ci
1986	16,905,516 (Gal) 63,902,850 (L)	2.63E-8 Ci/L	1.68 Ci
1987	18,783,579 (Gal) 71,001,928 (L)	1.52E-8 Ci/L	1.08 Ci
1988	22,457,455 (Gal) 84,889,179 (L)	5.50E-8 Ci/L	4.67 Ci
1989	17,142,558 (Gal) 64,798,869 (L)	2.77E-8 Ci/L	1.80 Ci
1990	12,444,342 (Gal) 47,039,612 (L)	1.67E-9 Ci/L	0.079 Ci
1991	5,920,073 (Gal) 22,377,875 (L)	5.21E-10 Ci/L	0.012 Ci

The amount of tritium calculated above is compared below to the amount of tritium reported in Semi-Annual Effluent Reports to the NRC for each year.

Year	Total Curies of H3 Reported as Being Released from TBS (Ci)	Total Curies of H3 Calculated as Being Released from TBS (Ci)
1985	0.066	0.068
1986	1.30	1.68
1987	1.02	1.08
1988	14.56	4.67
1989	1.37	1.80
1990	0.049	0.079
1991	0.011	0.012

Four (4) shipments of solid wastes were made during this reporting period. Only one (1) of these shipments was directly for disposal/burial.

Irradiated components included irradiated, non-fuel bearing control rods, control rod drive assemblies, and region constraint devices. Dry compressible wastes included routine paper and plastic trash, resins, contaminated equipment and hardware, wood and radioactive check sources.

Technical Specifications require that "...shall include the following information for each class of solid waste (as defined by 10CFR Part 61) shipped off site..." The information below satisfies this requirement for wastes for which waste classification is performed (i.e., wastes sent directly for disposal and not those sent to an offsite vendor for processing). Accordingly, the activity, volume, and number of shipments will not agree with information supplied in Table 3 which is prepared in accordance with Regulatory Guide 1.21.

CLASS A:

None

CLASS B:

1. Container Volume: 125.2 ft³.
2. Total Curie Quantity: 7496.824 Ci (estimated).
3. Principal Radionuclides (estimated): H-3, C-14, Mn-54, Fe-55, Co-60, Ni-59, Ni-63, Sr-90, I-129, Cs-134, Cs-137, S-35, Sr-89, and Co-58.
4. Source of Waste and Processing Employed: Irradiated reactor hardware, no processing.
5. Type of Container: Type B.
6. Solidification Agent or Absorbent: None.

CLASS C:

None.

The last two (2) previous reports did not include all information as required by FSV Technical Specifications. Accordingly, the below corrections are made.

Technical Specifications require that "...shall include the following information for each class of solid waste (as defined by 10CFR Part 61) shipped off site..." The information below satisfies this requirement for wastes for which waste classification is performed (i.e., wastes sent directly for disposal and not those sent to an offsite vendor for processing). Accordingly, the activity, volume, and number of shipments will not agree with information supplied in Table 3 which is prepared in accordance with Regulatory Guide 1.21. Please note that the information in Table 3 includes all shipments made from FSV which includes shipments to off site radioactive waste processors and the below information is for only those shipments made directly from FSV to a disposal site (i.e., no report is made of shipments by offsite vendors to disposal sites after waste processing).

For the period of January 1 through June 30, 1991:

CLASS A:

None

CLASS B:

1. Container Volume: 125.2 ft³.
2. Total Curie Quantity: 4750.837 Ci (estimated).
3. Principal Radionuclides (estimated): H-3, C-14, Mn-54, Fe-55, Co-60, Ni-59, Ni-63, Sr-90, I-129, Cs-134, Cs-137, S-35, Sr-89, and Co-58.
4. Source of Waste and Processing Employed: Irradiated reactor hardware, no processing.
5. Type of Container: Type B.
6. Solidification Agent or Absorbent: None.

CLASS C:

1. Container Volume: 26.2 ft³.
2. Total Curie Quantity: 360.19 Ci (estimated).
3. Principal Radionuclides (estimated): H-3, C-14, Mn-54, Fe-55, Co-60, Ni-59, Ni-63, Sr-90, I-129, Cs-134, Cs-137, S-35, Sr-89, and Co-58.

4. Source of Waste and Processing Employed: Irradiated reactor hardware, no processing.
5. Type of Container: Type B.
6. Solidification Agent or Absorbent: None.

For the period of July 1 through December 31, 1991:

CLASS A:

None

CLASS B:

1. Container Volume: 125.2 ft³.
2. Total Curie Quantity: 2719.872 Ci (estimated).
3. Principal Radionuclides (estimated): H-3, C-14, Mn-54, Fe-55, Co-60, Ni-59, Ni-63, Sr-90, I-129, Cs-134, Cs-137, S-35, Sr-89, and Co-58.
4. Source of Waste and Processing Employed: Irradiated reactor hardware, no processing.
5. Type of Container: Type B.
6. Solidification Agent or Absorbent: None.

CLASS C:

None.

Table 3

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1991)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

FIRST QUARTER, 1991

A. SOLID WASTE SHIPPED OFF-SITE FOR BURIAL OR DISPOSAL

1. Type of Waste	Unit	6-Month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	0.00 E+00 0.00 E+00	0.00 E+00
b. Dry compressible waste, contaminated equip, etc.	m ³ Ci	2.77 E+00 5.63 E-02	2.00 E+01
c. Irradiated components, control rods, etc.	m ³ Ci	7.42 E-01 3.60 E+02	2.00 E+01
d. Other (describe)	m ³ Ci	0.00 E+00 0.00 E-00	0.00 E+00

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

a. N/A	0.0 %	0.00 E+00
b. Fe-55	89.1 %	2.00 E+01
Co-60	5.8 %	2.00 E+01
H-3	3.4 %	2.00 E+01
All others	1.7 %	2.00 E+01
c. Fe-55	73.3 %	2.00 E+01
Ni-63	10.5 %	2.00 E+01
Co-60	7.5 %	2.00 E+01
H-3	5.4 %	2.00 E+01
Mn-54	3.3 %	2.00 E+01
All Others	<0.1%	2.00 E+01
d. N/A	0.0 %	0.00 E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Public Highway	RAMP Industries Denver, CO
1	Public Highway	Barnwell Waste Management Barnwell, SC

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
-0-		

Table 3

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1991)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

SECOND QUARTER, 1991

A. SOLID WASTE SHIPPED OFF-SITE FOR BURIAL OR DISPOSAL

1. Type of Waste	Unit	6-Month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	0.00 E+00 0.00 E+00	0.00 E+00
b. Dry compressible waste, contaminated equip, etc.	m ³ Ci	5.32 E+00 1.68 E-01	2.00 E+01
c. Irradiated components, control rods, etc.	m ³ Ci	1.54 E+01 4.78 E+03	2.00 E+01
d. Other (describe)	m ³ Ci	0.00 E+00 0.00 E-00	0.00 E+00

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

a. N/A	0.0 %	0.00 E+00
b. Fe-55	89.1 %	2.00 E+01
Co-60	5.8 %	2.00 E+01
H-3	3.4 %	2.00 E+01
All others	1.7 %	2.00 E+01
c. Fe-55	73.3 %	2.00 E+01
Ni-63	10.5 %	2.00 E+01
Co-60	7.5 %	2.00 E+01
H-3	5.4 %	2.00 E+01
Mn-54	3.3 %	2.00 E+01
All Others	<0.1%	2.00 E+01
d. N/A	0.0 %	0.00 E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Public Highway	U.S. Ecology Beatty, NV
2	Public Highway	Quadrex Recycle Center Oak Ridge, TN
2	Public Highway	RAMP Industries, Inc. Denver, CO

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
-0-		

Table 3

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1991)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

THIRD QUARTER, 1991

A. SOLID WASTE SHIPPED OFF-SITE FOR BURIAL OR DISPOSAL

1. Type of Waste	Unit	6-Month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	0.00 E+00 0.00 E+00	0.00 E+00
b. Dry compressible waste, contaminated equip, etc.	m ³ Ci	2.55 E+00 1.11 E-02	2.00 E+01
c. Irradiated components, control rods, etc.	m ³ Ci	1.77 E+01 3.59 E+01	2.00 E+01
d. Other (describe)	m ³ Ci	0.00 E+00 0.00 E-00	0.00 E+00

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

a. N/A	0.0 %	0.00 E+00
b. Fe-55	89.1 %	2.00 E+01
Co-60	5.8 %	2.00 E+01
H-3	3.4 %	2.00 E+01
All others	1.7 %	2.00 E+01
c. Fe-55	73.3 %	2.00 E+01
Ni-63	10.5 %	2.00 E+01
Co-60	7.5 %	2.00 E+01
H-3	5.4 %	2.00 E+01
Mn-54	3.3 %	2.00 E+01
All Others	<0.1%	2.00 E+01
d. N/A	0.0 %	0.00 E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Public Highway	RAMP Industries Denver, CO
1	Public Highway	Quadrex Recycle Center Oak Ridge, TN

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
-0-		

Table 3

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1991)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

FOURTH QUARTER, 1991

A. SOLID WASTE SHIPPED OFF-SITE FOR BURIAL OR DISPOSAL

1. Type of Waste	Unit	6-Month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	0.00 E+00 0.00 E+00	0.00 E+00
b. Dry compressible waste, contaminated equip, etc.	m ³ Ci	1.94 E+01 1.48 E-01	2.00 E+01
c. Irradiated components, control rods, etc.	m ³ Ci	3.55 E+00 2.92 E+03	2.00 E+01
d. Other (describe)	m ³ Ci	0.00 E+00 0.00 E-00	0.00 E+00

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

a. N/A	0.0 %	0.00 E+00
b. Fe-55	89.1 %	2.00 E+01
Co-60	5.8 %	2.00 E+01
H-3	3.4 %	2.00 E+01
All others	1.7 %	2.00 E+01
c. Fe-55	73.3 %	2.00 E+01
Ni-63	10.5 %	2.00 E+01
Co-60	7.5 %	2.00 E+01
H-3	5.4 %	2.00 E+01
Mn-54	3.3 %	2.00 E+01
All Others	<0.1%	2.00 E+01
d. N/A	0.0 %	0.00 E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Public Highway	U.S. Ecology Beatty, NV
7	Public Highway	RAMP Ind'u Inc. Denver, CO

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
3	Public Highway	INEL Scoville, ID

There have been no major design changes to the radioactive waste systems reviewed by the Plant Operations Review Committee (PORC) during the period covered by this report.

There were no changes to the Process Control Program (SUSMAP-3), Issue 2, effective date November 13, 1984, during this reporting period.

Issue 19 of the Offsite Dose Calculation Manual (SUSMAP-2) was reviewed by the Plant Operations Review Committee (PORC) on April 2, 1992 and became effective April 22, 1992. This issue permanently incorporated the changes from PDR's 91-0200 and 91-0206 which were described in the previous semi-annual effluent report, P-92061, covering the period from July 1, 1991, through December 31, 1991.

On August 14, 1989, Amendment No. 71 to the FSV Technical Specifications became effective which revised ELCO 8.1.1.g, deleting the requirement to report gaseous effluent activity monitors or flow instruments inoperable over thirty days in the Semi-Annual Effluent Report. The reporting requirements were changed to require a Special Report if less than the minimum required gaseous effluent activity monitors are operable for over seven days. It has not been necessary to issue any such Special Reports since the requirement became effective.

There were no liquid effluent activity monitors or their associated recorders inoperable for more than thirty days during this reporting period.

Effluent and Waste Disposal Semi-Annual ReportSupplemental Information

Facility: Fort St. Vrain Nuclear Generating Station

Licensee: Public Service Company of Colorado

1. Regulatory Limits

All results of radioactivity analyses of gaseous and liquid effluent are used in accordance with the methodology and parameters listed in the Offsite Dose Calculation Manual (SUSMAP-2) to assure that the concentrations at the point of release are maintained within the limits set forth in the Technical Specifications. These limits will ensure the quantity of radioactive effluent released from the plant is maintained as low as reasonably achievable and in any event, within the limits of 10CFR20 and in accordance with 10CFR50.

The air dose due to noble gases released in gaseous effluent at the unrestricted area is limited to:

- a) 5 millirads gamma and 10 millirads beta during any calendar quarter, and,
- b) 10 millirads gamma and 20 millirads beta during any calendar year.

The dose to a member of the public due to I-131, tritium, and radioactive particulates with half-lives longer than eight days in gaseous effluents will be limited to:

- a) 7.5 millirems to any organ during any calendar quarter, and,
- b) 15 millirems to any organ during any calendar year.

The dose rate due to radioactive gaseous effluent is limited to the following:

- a) For noble gases, less than or equal to 500 millirems per year to the total body and less than or equal to 3000 millirems per year to the skin, and,

- b) For I-131, tritium, and radioactive particulates with half-lives greater than eight days, less than or equal to 1500 millirems per year to any organ.

The dose or dose commitment to a member of the public from radioactive materials in liquid effluents released to unrestricted areas is limited as follows:

- a) During any calendar quarter to less than or equal to 1.5 millirems to the total body and to less than or equal to 5 millirems to any organ, and,
- b) During any calendar year to less than or equal to 3 millirems to the total body and to less than or equal to 10 millirems to any organ.

2. Maximum Permissible Concentrations (MPC's)

All MPC's used in determining allowable release rates from the gas and liquid waste systems are those listed in Table II, Columns 1 and 2 respectively, of Appendix B to 10CFR20. In addition, for the MPC of dissolved noble gases in liquid effluent, the value of $2.00\text{E}-04$ microcuries per milliliter was used.

For the purposes of calculating allowable release rates, the MPC for halogens and particulates with half-lives longer than eight days are reduced by a factor of 700 from their listed value in Table II, Column 1, of Appendix B to 10CFR20.

3. Average Energy

The average energy ($E\text{-Bar}$) of the radionuclide mixture in releases of fission and activation gases is not calculated or used at this facility.

4. Measurements and Approximations of Total Radioactivity

a) Fission and Activation Gases

Batch releases from the gas waste holdup system are performed after sampling and analyses for noble gases and tritium. These analytical results are used (along with atmospheric dilution factors) to determine the allowable release rate. The gas is then released on a continuous basis through a gas waste header which is monitored by a noble gas monitor and an iodine monitor. In the event of high activity in the continuous release, header control functions are initiated which divert the gas back to the gas waste holdup system.

All radioactive gases are released to the Reactor Building exhaust ventilation system which has a flow rate of approximately 20,000 cubic feet per minute. The full-flow of this exhaust is directed through high efficiency particulate filters (HEPA) and activated charcoal beds prior to the release to the environment.

Downstream of the activated charcoal beds, the gas stream radioactivity is continuously monitored and recorded by noble gas monitors, particulate monitors, and iodine monitors.

b) Iodines

For gaseous iodine, the Reactor Building exhaust ventilation is monitored and recorded on a continuous basis. The 2-inch iodine cartridges used in these monitors are removed from service after one week of service and quantitatively analyzed on a gamma spectroscopy system. The quantity of radioiodine released during the period is calculated based on the integrated flow during the collection period.

c) Particulates

As in the case of iodine, discussed in b) above, a 2-inch particulate filter is removed and analyzed each week. Gross beta analysis, as well as gamma spectral analyses, is performed to identify and quantify any radionuclides. The quantity of any radionuclides on this filter with half-lives greater than eight days is similarly correlated to total flow during the collection period.

d) Liquid Effluents

All liquid effluent discharged from the site reaches the unrestricted area at the Goosequill Ditch. From that point, the effluent can be diverted to the St. Vrain Creek via the St. Vrain Slough or, more commonly, diverted to the Goosequill Pond which is approximately one mile north of the plant site. Outfall from the Goosequill Pond reaches the South Platte River. Both rivers converge approximately 1-1/2 miles from the plant site. The average stream flow reported in section 5a of this supplemental report is a summation of both rivers, and was received and tabulated from data provided by the Colorado Department of Natural Resources in Greeley, Colorado.

Liquid effluent is released from the site using both continuous and batch mode. The continuous mode (automatic discharge mode) is used on the Turbine Building Sump effluent where the only released radionuclide is tritium. This discharge path utilizes a continuous sampler and an aliquot of this composite sampler is taken three times per week and analyzed for gross beta, gross alpha, tritium, and gamma emitters. Calculations utilizing pump run timers and measured discharge rates enable us to calculate the total activity released via this pathway based on composite sample results. Discharge from the Turbine Building Sump is made directly to the unrestricted area with no dilution.

The batch release mode is used on the Reactor Building Sump effluent and the liquid waste system. The Reactor Building Sump area can hold several hundred thousand gallons of waste water from various sources which could be contaminated. The liquid waste system consists of two 2000 gallon receivers, one 2000 gallon monitoring tank, and associated filters and demineralizers. This system is designed to collect and process contaminated waste water resulting from reactor and laboratory operations.

Prior to each liquid batch release, duplicate samples are quantitatively analyzed for their radioactive constituents. These analyses include gross beta, gross alpha, tritium, and gamma spectral analyses. The results of these analyses, and other analyses as dictated by the gross beta results, are used to determine the maximum release rate from the site. The liquid effluent, normally released at or less than 60 gallons per minute, is diluted with cooling tower blowdown which runs at or more than 1100 gallons per minute. The resulting mixture is sampled during the release period to confirm compliance with regulatory limits.

The liquid effluent from the batch release mode is monitored continuously by redundant gamma activity monitors.

All tank level indicating devices, flow monitoring and recording devices, and radiation monitoring equipment are calibrated and maintained at scheduled intervals in accordance with established procedures.

Composite samples from batch releases and continuous releases are analyzed quarterly for Sr-89 and Sr-90. All sample results are conservatively decay-corrected to the start of the composite period. Sulfur-35 analysis was discontinued beginning with Quarter 1. The reactor has been shut down since 1989 and any sulfur produced prior to that time has undergone a decay of over 12 halflives. No positive S-35 results have been observed since the fourth quarter of 1989.

e) Overall Errors

The overall error associated with determining the total activity released from the site for both gaseous and liquid effluent is estimated to be 17.3 percent. This value is the square root of the sum of squares of counting statistics and associated calibration errors, sampling errors, and tank volume estimates, each considered to be plus or minus 10 percent.

5. Batch Releases

a) Liquid

Number of Batch Releases	42
Total Time Period for Batch Releases	2.34E+02 HOURS
Maximum Time Period for a Batch Release	9.03E+01 HOURS
Average Time Period for a Batch Release	5.58E+00 HOURS
Minimum Time Period for a Batch Release	1.62E+00 HOURS
Average Stream Flow During Periods of Release of Effluent into a Flowing Stream	1.74E+05 GPM*

* Gallons Per Minute

b) Gaseous

Number of Batch Releases	23
Total Time Period for Batch Release	6.16E+01 HOURS
Maximum Time Period for Batch Release	4.13E+00 HOURS
Average	2.68E+00 HOURS
Minimum	1.75E+00 HOURS

6. Abnormal Releasesa) Liquid

Number of Releases	-0-
Total Activity Released	N/A CURIES

b) Gaseous

Number of Releases	-0-
Total Activity Released	N/A CURIES

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1992)

GASEOUS EFFLUENT - SUMMATION OF ALL RELEASES

	Unit	Quarter 1	Quarter 2	Estimated Total Error %
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A. Fission and activation gases

1. None detected

B. Iodine

1. Total iodine-131	Ci	<3.53E-06	<3.53E-06	1.73E+01
2. Average release rate for period	Ci/sec	<4.49E-07	<4.49E-07	
3. Percent of Technical Specification Limit	%			

C. Particulates

1. Particulates with half-lives >8 days	Ci	<1.18E-07	<1.30E-07	1.73E+01
2. Average release rate for period	Ci/sec	<1.50E-08	<1.66E-08	
3. Percent of Technical Specification Limit	%			
3. Gross alpha radioactivity		<2.70E-08	<3.00E-08	

TABLE 1A (Continued)

	Unit	Quarter 1	Quarter 2	Estimated Total Error %
--	------	--------------	--------------	----------------------------------

D. Tritium

1. Total Release	Ci	1.83E-02	1.44E-02	1.73E+01
2. Average release rate for period	Ci/sec	2.33E-03	1.83E-03	
3. Percent of Technical Specification Limit	%	3.88E-05	3.05E-05	

TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1992)

GASEOUS EFFLUENTS -- GROUND-LEVEL RELEASE

CONTINUOUS
MODE

BATCH MODE

Nuclides Released	Unit			Quarter 1	Quarter 2
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1. Fission Gases

krypton-85	Ci			<6.94E-01	<8.79E-01
krypton-85m	Ci				
krypton-87	Ci			<5.28E-03	<6.69E-03
krypton-88	Ci			<6.64E-03	<8.41E-03
xenon-133	Ci			<6.79E-03	<8.60E-04
xenon-135	Ci			<1.82E-03	<2.31E-04
xenon-135m	Ci				
xenon-138	Ci			<3.01E-02	<3.81E-02
xenon-133m	Ci			<1.69E-02	<2.13E-02
xenon-131m	Ci				
argon-41	Ci				
Total for period **	Ci			**	**

Iodines

iodine-131	Ci			<1.59E-10	<2.02E-10
iodine-133	Ci				
iodine-135	Ci				
Total for Period **				**	**

** Total values do not include "<" data.

TABLE 1C (Continued)

CONTINUOUS
MODE

BATCH MODE

Nuclides Released	Unit			Quarter 1	Quarter 2
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Particulates

strontium-89	Ci				
strontium-90	Ci				
cesium-134	Ci			<1.67E-10	<2.11E-10
cesium-137	Ci			<1.80E-10	<2.27E-10
barium-lanthanum-140	Ci				

TABLE 2A
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1992)
LIQUID EFFLUENT - SUMMATION OF ALL RELEASES

	Units	Qtr 1	Qtr 2	Est. Total Error %
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A. Fission and Activation Products

1. Total Release	Ci	3.39E-05*	6.88E-05*	1.73E+01
2. Average diluted concentration	μCi/ml	6.21E-11	1.26E-10	
3. % of Applicable Limit	%	2.07E-04	4.20E-04	

B. Tritium

1. Total Release	Ci	2.72E+00*	1.20E+00*	1.73E+01
2. Average diluted concentration	μCi/ml	4.99E-06	2.20E-06	
3. % of Applicable Limit	%	1.66E-01	7.33E-02	

* Combination of analysis results of less than MDA values and positive values.

TABLE 2A (Continued)

	Units	Qtr 1	Qtr 2	Est. Total Error %
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C. Gross Alpha Radioactivity

1. Total Release	Ci	1.54E-05*	6.58E-06*	1.73E+01
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D. Volume of Waste Released

prior to dilution	Liters	6.87E+06	6.34E+06	1.00E+01
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E. Volume of Dilution Water Used During Release

	Liters	5.46E+08	5.46E+08	1.00E+01
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* Combination of analysis results of less than MDA values and positive values.

TABLE 2B
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1992)
LIQUID EFFLUENTS

CONTINUOUS MODE

BATCH MODE

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
strontium-89	Ci	<3.91E-05	<2.22E-05	<3.63E-06	<3.82E-06
strontium-90	Ci	<1.19E-05	<8.94E-06	<1.09E-06	<1.54E-06
cesium-134	Ci	<3.64E-04	<3.09E-04	<2.57E-05	<5.05E-05
cesium-137	Ci	<3.84E-04	<3.27E-04	<2.72E-05	<5.35E-05
iodine-131	Ci	<2.81E-04	<2.39E-04	<1.99E-05	<3.90E-05

uranium-238	Ci	<3.49E-04	<2.97E-04	<2.47E-05	<4.86E-05
uranium-235	Ci	<4.84E-04	<4.12E-04	3.39E-05*	6.88E-05*
uranium-234	Ci	<7.82E-04	<6.65E-04	<5.53E-05	<1.09E-04
uranium-234m	Ci	<8.78E-04	<7.47E-04	<6.22E-05	<1.22E-04
uranium-234e-54	Ci	<3.67E-04	<3.12E-04	<2.59E-05	<5.10E-05
chromium-51	Ci				

zirconium-niobium-95	Ci				
molybdenum-99	Ci	<2.49E-03	<2.12E-03	<1.77E-04	<3.47E-04
technetium-99m	Ci				
barium-lanthanum-140	Ci				
cerium-141	Ci	<4.65E-04	<3.95E-04	<3.29E-05	<6.46E-05

tritium	Ci	2.53E-03*	2.21E-03*	2.72E+00	1.20E+00
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Total for period (above)	Ci	2.53E-03*	2.21E-03*	2.72E+00	1.20E+00
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* Combination of analysis results of less than MDA values and positive values.

TABLE 2B (Continued)

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
xenon-133	Ci	<7.89E-04	<6.70E-04	<5.58E-05	<1.10E-04
xenon-135	Ci	<2.48E-04	<2.11E-04	<1.76E-05	<3.46E-05

Table 3

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1992)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

FIRST QUARTER, 1992

A. SOLID WASTE SHIPPED OFF-SITE FOR BURIAL OR DISPOSAL

1. Type of Waste	Unit	6-Month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	0.00 E+00 0.00 E+00	0.00 E+00
b. Dry compressible waste, contaminated equip, etc.	m ³ Ci	1.12 E+02 3.36 E-01	2.00 E+01
c. Irradiated components, control rods, etc.	m ³ Ci	1.18 E+01 2.50 E+01	2.00 E+01
d. Other (describe) Contaminated Oil	m ³ Ci	1.91 E+00 2.66 E-02	0.00 E+00

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

a. N/A	0.0 %	0.00 E+00
b. Fe-55	89.1 %	2.00 E+01
Co-60	5.8 %	2.00 E+01
H-3	3.4 %	2.00 E+01
All others	1.7 %	2.00 E+01
c. Fe-55	73.3 %	2.00 E+01
Ni-63	10.5 %	2.00 E+01
Co-60	7.5 %	2.00 E+01
H-3	5.4 %	2.00 E+01
Mn-54	3.3 %	2.00 E+01
All others	<0.1 %	2.00 E+01
d. N/A	0.0 %	0.00 E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
3	Public Highway	RAMP Industries Denver, CO
4	Public Highway	Quadrex Recycle Center Oak Ridge, TN

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
-0-		

Table 3

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1992)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

SECOND QUARTER, 1992

A. SOLID WASTE SHIPPED OFF-SITE FOR BURIAL OR DISPOSAL

1. Type of Waste	Unit	6-Month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	0.00 E+00 0.00 E+00	0.00 E+00
b. Dry compressible waste, contaminated equip, etc.	m ³ Ci	0.00 E+00 0.00 E+00	0.00 E+00
c. Irradiated components, control rods, etc.	m ³ Ci	2.13 E+01 7.54 E+03	2.00 E+01
d. Other (describe)	m ³ Ci	0.00 E+00 0.00 E-02	0.00 E+00

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

a. N/A	0.0 %	0.00 E+00
b. N/A	0.0 %	0.00 E+00
c. Fe-55	73.3 %	2.00 E+01
Ni-63	10.5 %	2.00 E+01
Co-60	7.5 %	2.00 E+01
H-3	5.4 %	2.00 E+01
Mn-54	3.3 %	2.00 E+01
All others	<0.1 %	2.00 E+01
d. N/A	0.0 %	0.00 E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Public Highway	U.S. Ecology Beatty, NV
3	Public Highway	Quadrex Recycle Center Oak Ridge, TN

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
-0-		

TABLE 4A
HOURLY METEOROLOGICAL DATA

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS: A

WIND DIRECTION	WIND SPEED - MPH						TOTAL
	0-75-3	4-7	8-12	13-18	19-24	24	
N	41.34	61.43	61.34	11.08	12.34	3.03	220.55
NNE	44.70	73.82	38.59	22.95	8.83	2.78	191.63
NE	48.67	89.01	35.80	14.63	0.76	0.25	189.13
ENE	42.16	92.29	30.51	3.54	0.25	0.00	168.75
E	32.52	90.72	24.43	7.32	0.00	0.00	155.49
ESE	31.52	83.40	35.54	4.79	0.50	0.00	155.75
SE	32.60	85.62	34.54	4.77	0.25	0.25	158.24
SSE	39.39	62.03	26.24	7.56	1.01	0.25	136.48
S	18.74	86.00	21.20	4.29	0.00	0.00	160.23
SSW	47.16	74.41	10.61	0.75	0.00	0.00	132.93
SW	40.68	73.73	11.09	1.77	0.25	0.00	127.52
WSW	32.85	53.22	14.37	3.28	0.50	0.00	104.72
W	14.37	17.37	8.89	3.53	1.01	0.50	45.68
WNW	6.57	8.59	6.06	8.57	1.52	2.27	33.56
WW	11.09	27.95	12.12	4.81	3.03	0.76	59.76
NNW	22.69	44.38	37.03	33.06	9.32	1.01	147.49
TOTAL	537.24	1023.11	408.85	167.19	39.57	11.11	2187.93

TIME DURATION OF CALMS = 35.07 HRS.

TIME IN STABILITY CLASS = 2223.00 HRS.

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS: B

WIND DIRECTION	0.75-3	4-7	WIND SPEED - MPH				TOTAL
			8-12	13-19	19-24	24	
N	1.52	1.77	1.76	3.25	0.00	0.00	5.30
NNE	2.26	2.52	0.25	0.00	0.00	0.00	5.03
N E	1.77	3.52	0.25	0.00	0.00	0.00	5.54
ENE	1.26	1.76	0.00	0.00	0.00	0.00	3.02
E	1.26	0.75	0.00	0.00	0.00	0.00	2.02
ESE	0.50	0.25	0.00	0.00	0.00	0.00	0.75
SE	1.00	1.26	1.01	0.00	0.00	0.00	3.28
SSE	0.25	0.50	0.25	0.00	0.00	0.00	1.01
S	1.26	2.26	0.00	0.00	0.00	0.00	3.52
SSW	1.26	2.27	0.25	0.00	0.00	0.00	3.73
SW	1.26	2.52	0.00	0.00	0.00	0.00	3.78
WSW	2.52	2.02	0.25	0.00	0.00	0.00	4.77
W	0.75	0.76	0.00	0.00	0.00	0.00	1.51
WNW	1.01	0.50	0.25	0.00	0.00	0.00	1.76
W	0.76	1.51	0.51	0.00	0.00	0.00	2.77
NNW	2.02	1.51	0.51	0.75	0.00	0.00	4.77
TOTAL	29.60	25.76	5.30	1.00	0.00	0.00	52.66

TIME DURATION OF CALMS = 1.76 HRS.

TIME IN STABILITY CLASS = 54.42 HRS.

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

WIND DIRECTION	STABILITY CLASS	C	WIND SPEED - MPH	13-18	19-24	24	TOTAL
4-7	0.75-3	4-7	8-12	13-18	19-24	24	TOTAL
4	3.53	3.29	2.77	0.00	0.00	0.00	9.59
NNE	2.52	2.01	0.25	0.00	0.00	0.00	4.78
NE	2.22	3.03	0.00	0.00	0.00	0.00	5.25
ENE	1.26	1.52	0.25	0.00	0.00	0.00	3.03
E	1.01	0.00	0.00	0.00	0.00	0.00	1.01
ESE	1.01	0.00	0.00	0.00	0.00	0.00	1.01
SE	2.28	1.76	0.50	0.00	0.00	0.00	4.54
SSE	1.27	0.75	0.00	0.00	0.00	0.00	2.02
S	1.01	2.02	0.00	0.00	0.00	0.00	3.62
SSW	3.01	1.02	0.00	0.00	0.00	0.00	4.03
SW	2.78	3.28	0.00	0.00	0.00	0.00	6.06
WSW	2.52	1.77	0.76	0.00	0.00	0.00	5.05
W	1.51	1.01	0.00	0.00	0.00	0.00	2.52
WNW	0.76	0.76	0.00	0.00	0.00	0.00	1.52
WW	1.00	1.26	0.00	0.00	0.00	0.00	2.26
NNW	1.51	1.57	0.75	0.50	0.25	0.00	3.59
TOTAL	29.19	25.04	5.29	0.50	0.25	0.00	60.28

TIME DURATION OF CALMS = 2.02 HRS.

TIME IN STABILITY CLASS = 62.30 HRS.

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

WIND DIRECTION	0.75-3	4-7	8-12	13-17	17-24	24	TOTAL
N	5.30	8.06	3.78	0.25	0.00	0.00	17.40
NNE	7.57	9.32	0.50	0.00	0.00	0.00	17.40
NE	9.08	9.09	0.25	0.00	0.00	0.00	18.41
ENE	8.05	4.54	0.25	0.00	0.00	0.00	12.84
E	5.00	1.91	0.25	0.25	0.00	0.00	7.32
ESE	4.28	2.77	0.51	0.00	0.00	0.00	7.56
SE	5.05	2.02	0.50	0.00	0.00	0.00	7.57
SSE	7.57	2.77	1.01	0.25	0.00	0.00	11.62
S	7.56	5.39	0.51	0.00	0.00	0.00	13.86
SSW	12.08	7.37	0.25	0.00	0.00	0.00	19.70
SW	12.92	10.99	0.25	0.00	0.00	0.00	24.17
WSW	10.84	10.35	1.26	0.25	0.00	0.00	22.70
W	3.52	2.26	0.19	0.25	0.00	0.00	6.23
WNW	2.53	3.28	1.01	0.00	0.00	0.00	6.82
NW	5.64	5.53	1.26	0.25	0.25	0.00	12.33
NNW	4.77	7.30	2.51	0.76	0.25	0.00	15.62
TOTAL	112.62	92.45	14.31	2.27	6.59	0.00	221.55

TIME DURATION OF CALMS = 8.84 HRS.

TIME IN STABILITY CLASS = 230.38 HRS.

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

WIND DIRECTION	0-75-3	4-7	8-12	13-13	17-24	24	TOTAL
N	5.79	3.57	2.52	0.50	0.00	0.00	17.39
NNE	7.96	8.57	0.25	0.00	0.00	0.00	16.63
NE	10.10	7.57	0.00	0.00	0.00	0.00	17.67
ENE	8.36	5.56	0.50	0.00	0.00	0.00	14.43
E	7.68	2.27	0.25	0.00	0.00	0.00	9.60
ESE	6.06	1.26	0.00	0.00	0.00	0.00	7.32
SE	6.00	3.76	0.25	0.00	0.00	0.00	10.02
SSE	9.08	1.76	0.00	0.00	0.00	0.00	10.84
S	14.86	9.33	0.76	0.00	0.00	0.00	24.95
SSW	18.56	11.07	0.00	0.00	0.00	0.00	29.63
SW	20.40	21.95	0.51	0.00	0.00	0.00	42.85
WSW	17.16	24.72	0.76	0.00	0.00	0.00	42.64
W	7.07	3.63	0.50	0.00	0.00	0.00	11.20
WPN	2.02	4.03	0.50	1.01	0.25	0.00	7.81
WN	4.30	6.55	1.51	0.25	0.00	0.00	12.62
WNW	7.56	4.62	1.26	0.00	0.00	0.00	13.44
TOTAL	153.00	125.23	9.58	1.77	0.25	0.00	289.83

TIME DURATION OF CALMS = 13.61 HRS.

TIME IN STABILITY CLASS = 303.44 HRS.

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD 72/ 1/ 1 THRU 72/ 6/30

STABILITY CLASS F

WIND DIRECTION 0.75-3 WIND SPEED - MPH

	4-7	8-12	13-18	19-24	25	TOTAL
N	1.01	0.00	0.00	0.00	0.00	1.01
NNE	5.05	0.00	0.00	0.00	0.00	5.05
NE	4.04	0.00	0.00	0.00	0.00	4.04
ENE	2.72	0.25	0.00	0.00	0.00	2.97
E	1.26	0.00	0.00	0.00	0.00	1.26
ESE	0.25	0.00	0.00	0.00	0.00	0.25
SE	1.26	0.25	0.00	0.00	0.00	1.51
SSE	2.53	1.01	0.00	0.00	0.00	3.54
S	13.98	0.76	0.00	0.00	0.00	14.74
SSW	16.20	0.50	0.00	0.00	0.00	16.70
SW	28.07	0.25	0.00	0.00	0.00	28.32
WSW	21.70	0.51	0.00	0.00	0.00	22.21
W	3.79	1.26	0.00	0.00	0.00	5.05
WNW	4.28	1.01	0.25	0.00	0.00	5.54
W	6.39	2.27	0.00	0.00	0.00	8.66
NNW	3.28	1.51	0.00	0.00	0.00	4.79
TOTAL	114.88	9.59	0.25	0.00	0.00	124.72

TIME DURATION OF CALMS = 14.13 HRS.

TIME IN STABILITY CLASS = 290.70 HRS.

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD 92/ 1/ ' THRU 92/ 6/30

STABILITY CLASS	6	WIND SPEED - MPH					TOTAL
WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	24	
H	16.13	28.24	17.90	5.95	1.26	0.00	68.58
NNE	21.46	32.04	14.13	4.32	0.50	0.00	72.45
NE	22.18	41.60	13.86	2.02	0.76	0.00	80.43
ENE	13.87	35.05	13.08	0.00	0.50	0.00	63.11
E	13.10	31.89	7.59	9.75	0.00	0.00	53.32
ESE	11.85	34.05	13.11	4.78	0.50	0.00	64.29
SE	15.67	27.21	16.96	0.58	2.52	0.76	71.70
SSE	19.33	20.17	8.08	2.78	1.26	0.00	51.62
S	36.04	31.48	8.32	1.25	0.51	0.00	77.60
SSW	48.41	58.48	6.06	1.26	0.25	0.00	114.46
SW	60.68	96.68	6.81	1.51	0.76	0.00	166.43
WSW	47.69	56.26	6.26	0.25	0.00	0.25	110.72
W	16.17	11.64	2.77	1.51	0.25	0.00	32.33
WNW	10.59	8.26	2.28	1.52	0.00	0.11	22.65
W	17.85	20.41	5.35	1.26	0.75	0.00	40.53
WNW	15.33	26.47	6.30	4.29	0.75	0.00	53.14
TOTAL	381.35	559.95	149.44	41.13	10.58	1.01	1143.46

TIME DURATION OF CALMS = 48.66 HRS.

TIME IN STABILITY CLASS = 1192.12 HRS.

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS: TOTAL - ALL CLASSES

WIND SPEED - MPH

WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	24	TOTAL
H	76.63	112.37	90.08	47.13	13.60	3.03	342.84
NNE	92.60	133.33	53.98	27.27	9.34	2.79	319.30
N	100.35	157.84	50.16	16.65	1.51	0.25	326.78
ENE	80.26	143.51	45.45	3.54	0.75	0.00	273.52
E	68.32	127.90	32.50	8.83	0.00	0.00	237.56
ESE	58.50	122.00	49.15	9.57	1.01	0.00	240.22
SE	69.65	122.89	54.03	13.35	2.77	1.01	263.71
SSE	87.25	90.52	36.59	10.59	2.27	0.25	227.46
S	125.59	149.97	31.55	5.54	6.51	0.00	313.15
SSW	162.55	170.82	17.67	2.02	0.25	0.00	353.31
SW	161.93	237.21	18.91	3.29	1.01	0.00	422.34
WSW	129.30	170.03	24.67	3.78	0.50	0.25	328.53
W	49.94	40.47	13.61	5.29	1.26	0.50	111.07
WNW	27.00	29.71	11.11	11.35	1.77	2.27	63.19
NW	38.33	69.53	23.02	6.56	4.03	0.76	142.23
NNW	57.17	89.12	49.88	39.38	10.57	1.01	247.13
TOTAL	1385.30	1967.22	602.37	214.12	51.15	12.12	4232.35

TIME DURATION OF CALMS = 124.09 HRS.

TIME IN STABILITY CLASS = 4356.44 HRS.

LOST TIME ALL CLASSES = 11.55 HRS.

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS		WIND SPEED - MPH					TOTAL	
WIND DIRECTION	A	4-7	8-12	13-18	19-24	24		
N	0.75-3	1.861E-02	2.764E-02	2.766E-02	1.849E-02	5.554E-03	1.364E-03	9.926E-02
NNE		2.012E-02	3.322E-02	1.737E-02	1.033E-02	3.974E-03	1.252E-03	8.626E-02
NE		2.190E-02	4.006E-02	1.611E-02	6.566E-03	3.409E-04	1.143E-04	8.511E-02
ENE		1.897E-02	4.153E-02	1.373E-02	1.593E-03	1.129E-04	0.000E+00	7.594E-02
E		1.463E-02	4.083E-02	1.099E-02	3.519E-03	0.000E+00	0.000E+00	6.997E-02
ESE		1.419E-02	3.753E-02	1.599E-02	2.154E-03	2.268E-04	0.000E+00	7.009E-02
SE		1.476E-02	3.853E-02	1.554E-02	2.147E-03	1.125E-04	1.144E-04	7.121E-02
SSE		1.773E-02	2.791E-02	1.181E-02	3.402E-03	4.532E-04	1.143E-04	6.142E-02
S		2.194E-02	3.870E-02	9.540E-03	1.928E-03	0.000E+00	0.000E+00	7.211E-02
SSW		2.122E-02	3.349E-02	4.774E-03	3.393E-04	0.000E+00	0.000E+00	5.982E-02
SW		1.831E-02	3.318E-02	4.998E-03	7.963E-04	1.143E-04	0.000E+00	5.739E-02
WSW		1.478E-02	2.395E-02	6.692E-03	1.475E-03	2.269E-04	0.000E+00	4.713E-02
W		6.466E-03	7.818E-03	4.002E-03	1.588E-03	4.538E-04	2.271E-04	2.056E-02
WNW		2.955E-03	3.865E-03	2.725E-03	3.856E-03	6.823E-04	1.020E-03	1.510E-02
WW		4.997E-03	1.258E-02	5.455E-03	2.164E-03	1.363E-03	3.412E-04	2.689E-02
WNW		1.021E-02	1.977E-02	1.667E-02	1.488E-02	4.193E-03	4.525E-04	6.637E-02
TOTAL		2.410E-01	4.680E-01	1.940E-01	7.524E-02	7.781E-02	5.000E-03	9.846E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 1.570E-02

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS: B		WIND SPEED - MPH					TOTAL
WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	24	
N	2.786E-02	3.254E-02	3.238E-02	4.604E-03	0.000E+00	0.000E+00	9.739E-02
NNE	4.145E-02	4.636E-02	4.594E-03	0.000E+00	0.000E+00	0.000E+00	9.235E-02
NE	3.252E-02	6.472E-02	4.594E-03	0.000E+00	0.000E+00	0.000E+00	1.018E-01
ENE	2.317E-02	3.239E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.556E-02
E	2.322E-02	1.386E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.708E-02
ESE	9.249E-03	4.671E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.392E-02
SE	1.838E-02	2.325E-02	1.859E-02	0.000E+00	0.000E+00	0.000E+00	6.021E-02
SSE	4.594E-03	9.255E-03	4.666E-03	0.000E+00	0.000E+00	0.000E+00	1.051E-02
S	2.317E-02	4.148E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.465E-02
SSW	2.366E-02	4.166E-02	4.666E-03	0.000E+00	0.000E+00	0.000E+00	6.939E-02
SW	2.313E-02	4.636E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.949E-02
WSW	4.633E-02	3.707E-02	4.671E-03	0.000E+00	0.000E+00	0.000E+00	8.007E-02
W	1.382E-02	1.394E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.776E-02
WNW	1.859E-02	9.193E-03	4.594E-03	0.000E+00	0.000E+00	0.000E+00	3.238E-02
NW	1.388E-02	2.779E-02	9.285E-03	0.000E+00	0.000E+00	0.000E+00	5.095E-02
NNW	3.719E-02	2.773E-02	9.306E-03	1.386E-02	0.000E+00	0.000E+00	8.008E-02
TOTAL	3.796E-01	4.722E-01	9.735E-02	1.046E-02	0.000E+00	0.000E+00	9.676E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 3.238E-02

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS: C		WIND SPEED - MPH					
WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	25	TOTAL
H	5.458E-02	5.274E-02	4.453E-02	0.000E+00	0.000E+00	0.000E+00	1.537E-01
NNE	4.040E-02	3.232E-02	4.013E-03	0.000E+00	0.000E+00	0.000E+00	7.673E-02
NE	3.566E-02	4.856E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.422E-02
ENE	2.024E-02	2.443E-02	4.031E-03	0.000E+00	0.000E+00	0.000E+00	4.870E-02
E	1.616E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.616E-02
ESE	1.620E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.620E-02
SE	3.657E-02	2.023E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.209E-02
SSE	2.032E-02	1.211E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.242E-02
S	1.614E-02	3.230E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.852E-02
SSW	4.833E-02	1.631E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.464E-02
SW	4.467E-02	5.264E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.731E-02
WSW	4.051E-02	2.834E-02	1.217E-02	0.000E+00	0.000E+00	0.000E+00	8.103E-02
W	2.426E-02	1.626E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.053E-02
WNW	1.220E-02	1.222E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.443E-02
HW	1.606E-02	2.027E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.633E-02
NNW	2.425E-02	2.516E-02	1.212E-02	0.000E+00	4.026E-03	0.000E+00	7.364E-02
TOTAL	4.686E-01	4.020E-01	8.495E-02	8.000E-03	4.026E-03	0.000E+00	9.676E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 3.242E-02

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

WIND DIRECTION	STABILITY CLASS	B	WIND SPEED - MPH					TOTAL
			0-75-3	4-7	8-12	13-18	19-24	124
N	2.300E-02	3.499E-02	1.643E-02	1.643E-02	1.643E-02	1.643E-02	0.000E+00	7.552E-02
NNE	3.287E-02	4.046E-02	2.188E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.552E-02
NE	3.943E-02	3.940E-02	1.085E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.972E-02
ENE	3.494E-02	1.971E-02	1.102E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.575E-02
E	2.510E-02	4.378E-03	1.086E-03	1.100E-03	0.000E+00	0.000E+00	0.000E+00	3.175E-02
ESE	1.859E-02	1.204E-02	2.192E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.282E-02
SE	2.191E-02	8.748E-03	2.191E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.284E-02
SSE	3.295E-02	1.203E-02	4.388E-03	1.085E-03	0.000E+00	0.000E+00	0.000E+00	5.045E-02
S	3.288E-02	2.518E-02	2.197E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.017E-02
SSW	5.244E-02	3.199E-02	1.101E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.553E-02
SW	5.618E-02	4.776E-02	1.102E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.049E-01
WSW	4.703E-02	4.492E-02	5.479E-03	1.088E-03	0.000E+00	0.000E+00	0.000E+00	9.853E-02
W	1.529E-02	9.826E-03	8.115E-04	1.161E-03	0.000E+00	0.000E+00	0.000E+00	2.703E-02
WNW	1.097E-01	1.423E-02	4.389E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.961E-02
NW	2.180E-02	2.402E-02	5.462E-03	1.085E-03	1.085E-03	1.085E-03	0.000E+00	5.353E-02
NNW	2.068E-02	3.168E-02	1.091E-02	3.294E-03	1.102E-03	1.102E-03	0.000E+00	6.779E-02
TOTAL	4.862E-01	4.013E-01	6.210E-02	9.855E-03	2.187E-03	0.000E+00	0.000E+00	9.617E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 3.836E-02

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

WIND DIRECTION	STABILITY CLASS	E	WIND SPEED - MPH					TOTAL
			0.75-3	4-7	8-12	13-18	19-24	24
N	1.909E-02	2.024E-02	0.310E-03	0.310E-03	1.663E-03	0.000E+00	0.000E+00	5.730E-02
NNE	2.572	2.026E-02	0.377E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.481E-02
NE	3.329E-02	2.493E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.823E-02
ENE	2.756E-02	1.034E-02	1.652E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.755E-02
E	2.332E-02	7.400E-03	0.249E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.162E-02
ESE	1.997E-02	4.164E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.413E-02
SE	2.242E-02	1.240E-02	0.359E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.566E-02
SSE	2.973E-02	5.000E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.574E-02
S	4.098E-02	3.074E-02	2.511E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.223E-02
SSW	6.116E-02	3.649E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.765E-02
SW	6.723E-02	7.234E-02	1.664E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.412E-01
WSW	5.656E-02	8.147E-02	2.499E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.405E-01
W	2.330E-02	1.190E-02	1.640E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.692E-02
WNW	6.644E-03	1.329E-02	1.661E-03	3.333E-03	8.240E-04	0.000E+00	0.000E+00	2.575E-02
NW	1.410E-02	2.160E-02	4.905E-03	8.259E-04	0.000E+00	0.000E+00	0.000E+00	4.159E-02
NNW	2.491E-02	1.523E-02	4.160E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.430E-02
TOTAL	5.043E-01	4.120E-01	3.159E-02	5.022E-03	8.240E-04	0.000E+00	0.000E+00	9.552E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 4.405E-02

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS: F		WIND SPEED - MPH					TOTAL
WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	24	
N	1.041E-02	3.486E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.390E-02
NNE	2.166E-02	1.735E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.902E-02
NE	2.173E-02	1.390E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.563E-02
ENE	1.021E-02	9.566E-03	8.598E-04	0.000E+00	0.000E+00	0.000E+00	2.864E-02
E	2.599E-02	4.341E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.033E-02
ESE	1.127E-02	8.703E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.214E-02
SE	2.002E-02	4.339E-03	8.732E-04	0.000E+00	0.000E+00	0.000E+00	2.603E-02
SSE	3.556E-02	8.687E-03	3.468E-03	0.000E+00	0.000E+00	0.000E+00	4.772E-02
S	5.547E-02	4.499E-02	2.609E-03	0.000E+00	0.000E+00	0.000E+00	1.031E-01
SSW	1.103E-01	5.572E-02	1.733E-03	0.000E+00	0.000E+00	0.000E+00	1.678E-01
SW	7.980E-02	9.655E-02	8.600E-04	0.000E+00	0.000E+00	0.000E+00	1.772E-01
WSW	5.402E-02	7.463E-02	1.747E-03	0.000E+00	0.000E+00	0.000E+00	1.304E-01
W	2.252E-02	1.302E-02	4.340E-03	0.000E+00	0.000E+00	0.000E+00	3.989E-02
WNW	1.212E-02	1.473E-02	3.467E-03	8.598E-04	0.000E+00	0.000E+00	3.117E-02
NW	1.130E-02	2.167E-02	7.820E-03	0.000E+00	0.000E+00	0.000E+00	4.079E-02
NNW	1.127E-02	1.127E-02	5.198E-03	0.000E+00	0.000E+00	0.000E+00	2.773E-02
TOTAL	5.225E-01	3.951E-01	3.298E-02	8.598E-04	0.000E+00	0.000E+00	9.515E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 4.861E-02

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS:	6	WIND SPEED - MPH					TOTAL
WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	324	TOTAL
N	1.353E-02	2.370E-02	1.502E-02	4.230E-03	1.055E-03	0.000E+00	5.755E-02
NNE	1.001E-02	2.688E-02	1.186E-02	3.623E-03	4.233E-04	0.000E+00	6.079E-02
NE	1.062E-02	3.491E-02	1.163E-02	1.676E-03	6.354E-04	0.000E+00	6.749E-02
ENE	1.164E-02	2.941E-02	1.148E-02	0.000E+00	4.203E-04	0.000E+00	5.296E-02
E	1.099E-02	2.676E-02	6.357E-03	6.336E-04	0.000E+00	0.000E+00	4.474E-02
ESE	9.943E-03	2.850E-02	1.100E-02	4.012E-03	4.231E-04	0.000E+00	5.395E-02
SE	1.315E-02	2.283E-02	1.423E-02	7.201E-03	2.117E-03	6.359E-04	6.017E-02
SSE	1.622E-02	1.693E-02	6.780E-03	2.334E-03	1.057E-03	0.000E+00	4.332E-02
S	3.024E-02	2.642E-02	6.904E-03	1.052E-03	4.261E-04	0.000E+00	6.512E-02
SSW	4.063E-02	4.900E-02	5.001E-03	1.059E-03	2.098E-04	0.000E+00	9.605E-02
SW	5.092E-02	8.113E-02	5.718E-03	1.265E-03	6.338E-04	0.000E+00	1.397E-01
WSW	4.002E-02	4.721E-02	5.251E-03	2.098E-04	0.000E+00	2.120E-04	9.291E-02
W	1.357E-02	9.766E-03	2.322E-03	1.264E-03	2.131E-04	0.000E+00	2.713E-02
WNW	0.887E-03	6.935E-03	1.913E-03	1.272E-03	0.000E+00	0.000E+00	1.901E-02
NW	1.079E-02	1.713E-02	4.480E-03	1.054E-03	6.326E-04	0.000E+00	3.409E-02
NNW	1.206E-02	2.221E-02	5.285E-03	3.604E-03	6.298E-04	0.000E+00	4.459E-02
TOTAL	3.200E-01	4.699E-01	1.254E-01	3.452E-02	8.076E-03	0.487E-04	9.595E-01

PROBABILITY OF CALM WITHIN STABILITY CLASS = 4.083E-02

PROBABILITY WITHIN STABILITY CLASS FREQUENCY DISTRIBUTION

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS		TOTAL	WIND SPEED - MPH					TOTAL
WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	25		
N	1.761E-02	2.582E-02	2.070E-02	1.083E-02	3.124E-03	9.965E-04	7.077E-02	
NNE	2.128E-02	3.063E-02	1.240E-02	6.265E-03	2.145E-03	6.393E-04	7.336E-02	
NE	2.306E-02	3.626E-02	1.153E-02	3.926E-03	3.480E-04	5.833E-05	7.500E-02	
NNE	1.844E-02	3.297E-02	1.044E-02	8.131E-04	1.727E-04	0.000E+00	6.284E-02	
E	1.570E-02	2.939E-02	7.467E-03	2.028E-03	0.000E+00	0.000E+00	5.458E-02	
ESE	1.344E-02	2.083E-02	1.129E-02	2.198E-03	2.315E-04	0.000E+00	5.519E-02	
SE	1.600E-02	2.823E-02	1.241E-02	3.068E-03	6.370E-04	2.325E-04	6.059E-02	
SSE	2.004E-02	2.009E-02	8.406E-03	2.433E-03	5.206E-04	5.833E-05	5.226E-02	
S	2.885E-02	3.446E-02	7.240E-03	1.272E-03	1.167E-04	0.000E+00	7.194E-02	
SSW	3.735E-02	3.925E-02	4.061E-03	4.631E-04	5.744E-05	0.000E+00	8.117E-02	
SW	3.720E-02	5.450E-02	4.345E-03	7.530E-04	2.319E-04	0.000E+00	9.703E-02	
WSW	2.971E-02	3.906E-02	5.667E-03	8.681E-04	1.150E-04	5.827E-05	7.540E-02	
W	1.147E-02	9.297E-03	3.127E-03	1.215E-03	2.900E-04	1.160E-04	2.552E-02	
WNW	6.203E-03	6.825E-03	2.552E-03	2.606E-03	4.050E-04	5.266E-04	1.911E-02	
NW	8.806E-03	1.597E-02	5.289E-03	1.500E-03	9.267E-04	1.742E-04	3.268E-02	
NNW	1.314E-02	2.047E-02	1.145E-02	9.047E-03	2.429E-03	2.310E-04	5.678E-02	
TOTAL	3.183E-01	4.520E-01	1.384E-01	4.919E-02	1.175E-02	2.785E-03	9.724E-01	

PROBABILITY OF CALM WITHIN STABILITY CLASS = 2.851E-02

OVERALL PROBABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS	A	4-7	8-12	13-18	19-24	24	TOTAL
WIND DIRECTION 0.75-3							
N	9.498E-03	1.411E-02	1.489E-02	9.437E-03	2.835E-03	6.965E-04	5.067E-02
NNE	1.027E-02	1.694E-02	8.866E-03	5.273E-03	2.829E-03	6.393E-04	4.404E-02
NE	1.118E-02	2.045E-02	8.226E-03	3.362E-03	1.740E-04	5.833E-05	4.345E-02
ENE	9.686E-03	2.128E-02	7.011E-03	8.131E-04	5.763E-05	0.000E+00	3.877E-02
E	7.471E-03	2.084E-02	5.612E-03	1.797E-03	0.000E+00	0.000E+00	3.572E-02
ESE	7.242E-03	1.916E-02	8.165E-03	1.099E-03	1.158E-04	0.000E+00	3.578E-02
SE	7.537E-03	1.967E-02	7.935E-03	1.096E-03	5.744E-05	5.839E-05	3.636E-02
SSE	9.050E-03	1.425E-02	6.028E-03	1.737E-03	2.313E-04	5.833E-05	3.135E-02
S	1.128E-02	1.976E-02	4.870E-03	9.841E-04	0.000E+00	0.000E+00	3.281E-02
SSW	1.083E-02	1.710E-02	2.437E-03	1.732E-04	0.000E+00	0.000E+00	3.054E-02
SW	9.346E-03	1.694E-02	2.547E-03	4.065E-04	5.833E-05	0.000E+00	2.930E-02
WSW	7.547E-03	1.223E-02	3.416E-03	7.531E-04	1.158E-04	0.000E+00	2.466E-02
W	3.301E-03	3.991E-03	2.043E-03	8.109E-04	2.317E-04	1.160E-04	1.049E-02
WNW	1.508E-03	1.973E-03	1.391E-03	1.968E-03	3.483E-04	5.206E-04	7.710E-03
HW	2.549E-03	6.422E-03	2.785E-03	1.105E-03	6.961E-04	1.742E-04	1.373E-02
NNW	5.212E-03	1.020E-02	8.508E-03	7.594E-03	2.140E-03	2.310E-04	3.388E-02
TOTAL	1.234E-01	2.353E-01	9.393E-02	3.841E-02	9.091E-03	2.553E-03	5.027E-01

OVERALL PROBABILITY OF CALM OCCURRENCE = 8.058E-03

OVERALL PROBABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS		B		WIND SPEED - MPH				
WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	24	TOTAL	
N	3.483E-04	4.068E-04	4.049E-04	5.756E-05	0.000E+00	0.000E+00	1.218E-03	
NNE	5.183E-04	5.789E-04	5.744E-05	0.000E+00	0.000E+00	0.000E+00	1.155E-03	
NE	4.065E-04	8.092E-04	5.744E-05	0.000E+00	0.000E+00	0.000E+00	1.273E-03	
ENE	2.897E-04	4.049E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.946E-04	
E	2.902E-04	1.733E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.636E-04	
ESE	1.156E-04	5.839E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.740E-04	
SE	2.297E-04	2.906E-04	2.324E-04	0.000E+00	0.000E+00	0.000E+00	7.528E-04	
SSE	5.744E-05	1.157E-04	5.833E-05	0.000E+00	0.000E+00	0.000E+00	2.315E-04	
S	2.897E-04	5.186E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.083E-04	
SSW	2.883E-04	5.209E-04	5.833E-05	0.000E+00	0.000E+00	0.000E+00	8.676E-04	
SW	2.892E-04	5.796E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.688E-04	
WSW	5.792E-04	4.635E-04	5.839E-05	0.000E+00	0.000E+00	0.000E+00	1.101E-03	
W	1.728E-04	1.743E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.470E-04	
WNW	2.324E-04	1.149E-04	5.744E-05	0.000E+00	0.000E+00	0.000E+00	4.048E-04	
NW	1.735E-04	3.474E-04	1.161E-04	0.000E+00	0.000E+00	0.000E+00	6.370E-04	
NNW	4.649E-04	3.467E-04	1.163E-04	1.733E-04	0.000E+00	0.000E+00	1.101E-03	
TOTAL	4.746E-03	5.904E-03	1.217E-03	2.300E-04	0.000E+00	0.000E+00	1.210E-02	

OVERALL PROBABILITY OF CALM OCCURRENCE = 4.049E-04

OVERALL PROBABILITY OF COMBINATION OCCURRENCE

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

WIND DIRECTION	STABILITY CLASS	WIND SPEED - MPH					TOTAL
		0.75-3	4-7	8-12	13-18	19-24	
N	8.099E-04	7.549E-04	6.374E-04	0.000E+00	0.000E+00	0.000E+00	2.202E-03
NNE	5.792E-04	4.626E-04	5.744E-05	0.000E+00	0.000E+00	0.000E+00	1.098E-03
NE	5.104E-04	6.951E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.205E-03
ENE	2.897E-04	3.496E-04	5.769E-05	0.000E+00	0.000E+00	0.000E+00	6.970E-04
E	2.313E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.313E-04
ESE	2.319E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.319E-04
SE	5.234E-04	4.041E-04	1.158E-04	0.000E+00	0.000E+00	0.000E+00	1.043E-03
SSE	2.908E-04	1.733E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.641E-04
S	2.310E-04	4.635E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.945E-04
SSW	6.918E-04	2.334E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.252E-04
SW	6.394E-04	7.534E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.393E-03
WSW	5.799E-04	4.057E-04	1.742E-04	0.000E+00	0.000E+00	0.000E+00	1.160E-03
W	3.473E-04	2.327E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.800E-04
WNW	1.747E-04	1.749E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.496E-04
NW	2.299E-04	2.901E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.200E-04
NNW	3.470E-04	3.601E-04	1.735E-04	1.158E-04	5.763E-05	0.000E+00	1.054E-03
TOTAL	6.707E-03	5.753E-03	1.216E-03	1.158E-04	5.763E-05	0.000E+00	1.385E-02

OVERALL PROBABILITY OF CALM OCCURRENCE = 4.640E-04

OVERALL PROBABILITY OF COMBINATION OCCURRENCE

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS	D	WIND SPEED - MPH					TOTAL
WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	24	TOTAL
N	1.217E-03	1.817E-03	8.695E-04	5.833E-05	0.000E+00	0.000E+00	3.997E-03
NNE	1.740E-03	2.117E-03	1.158E-04	0.000E+00	0.000E+00	0.000E+00	3.997E-03
NE	2.087E-03	2.087E-03	5.744E-05	0.000E+00	0.000E+00	0.000E+00	4.230E-03
NNE	1.849E-03	1.643E-03	5.833E-05	0.000E+00	0.000E+00	0.000E+00	2.951E-03
E	1.333E-03	2.317E-04	5.750E-05	5.820E-05	0.000E+00	0.000E+00	1.681E-03
ESE	9.839E-04	6.373E-04	1.160E-04	0.000E+00	0.000E+00	0.000E+00	1.737E-03
SE	1.159E-03	4.630E-04	1.160E-04	0.000E+00	0.000E+00	0.000E+00	1.730E-03
S	1.744E-03	6.366E-04	2.319E-04	5.744E-05	0.000E+00	0.000E+00	2.670E-03
SSW	1.736E-03	1.333E-03	1.163E-04	0.000E+00	0.000E+00	0.000E+00	3.185E-03
SW	2.775E-03	1.693E-03	5.827E-05	0.000E+00	0.000E+00	0.000E+00	4.527E-03
WSW	2.969E-03	2.525E-03	5.833E-05	0.000E+00	0.000E+00	0.000E+00	5.553E-03
W	2.490E-03	2.377E-03	2.900E-04	5.750E-05	0.000E+00	0.000E+00	5.215E-03
WNW	8.095E-04	5.201E-04	4.295E-05	5.827E-05	0.000E+00	0.000E+00	1.431E-03
WW	5.815E-04	7.532E-04	2.323E-04	0.000E+00	0.000E+00	0.000E+00	1.567E-03
W	1.150E-03	1.271E-03	2.891E-04	5.744E-05	5.744E-05	0.000E+00	2.833E-03
WN	1.101E-03	1.677E-03	5.774E-04	1.744E-04	5.833E-05	0.000E+00	3.580E-03
TOTAL	2.574E-02	2.124E-02	3.287E-03	5.216E-04	1.150E-04	0.000E+00	5.090E-02

OVERALL PROBABILITY OF CALM OCCURRENCE = 2.030E-03

OVERALL PROBABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

WIND DIRECTION	STABILITY CLASS	E	WIND SPEED - MPH					TOTAL
			0-75-3	4-7	8-12	13-18	19-24	
N	1.331E-03	1.968E-03	5.793E-04	1.159E-04	0.000E+00	0.000E+00	0.000E+00	3.994E-03
NNE	1.793E-03	1.970E-03	5.831E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.821E-03
NE	2.321E-03	1.738E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.059E-03
ENE	1.921E-03	1.278E-03	1.152E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.315E-03
E	1.626E-03	5.214E-04	5.758E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.294E-03
ESE	1.392E-03	2.982E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.682E-03
SE	1.563E-03	8.644E-04	5.827E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.486E-03
SSE	2.086E-03	4.049E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.491E-03
S	3.414E-03	2.143E-03	1.751E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.732E-03
SSW	4.263E-03	2.544E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.807E-03
SW	4.687E-03	5.043E-03	1.168E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.045E-03
WSW	3.942E-03	5.679E-03	1.742E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.796E-03
W	1.624E-03	8.349E-04	1.149E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.574E-03
WNW	4.631E-04	9.265E-04	1.158E-04	2.324E-04	5.744E-05	0.000E+00	0.000E+00	1.795E-03
NW	9.083E-04	1.506E-03	3.475E-04	5.756E-05	0.000E+00	0.000E+00	0.000E+00	2.899E-03
NNW	1.737E-03	1.061E-03	2.900E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.088E-03
TOTAL	3.515E-02	2.877E-02	2.292E-03	4.058E-04	5.744E-05	0.000E+00	0.000E+00	6.659E-02

OVERALL PROBABILITY OF CALM OCCURRENCE = 3.126E-03

OVERALL PROBABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS	F	WIND SPEED - MPH					TOTAL
WIND DIRECTION	0-3	4-7	8-12	13-18	19-24	25	
N	6.95E-04	2.32E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.28E-04
NNE	1.44E-03	1.15E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.60E-03
NE	1.45E-03	9.23E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.38E-03
ENE	1.21E-03	6.39E-04	5.74E-05	0.000E+00	0.000E+00	0.000E+00	1.91E-03
E	1.73E-03	2.90E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.02E-03
ESE	7.52E-04	5.81E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.11E-04
SE	1.39E-03	2.87E-04	5.83E-05	0.000E+00	0.000E+00	0.000E+00	1.73E-03
SSE	2.37E-03	5.08E-04	2.31E-04	0.000E+00	0.000E+00	0.000E+00	3.10E-03
S	3.70E-03	3.02E-03	1.74E-04	0.000E+00	0.000E+00	0.000E+00	6.85E-03
SSW	7.37E-03	3.72E-03	1.15E-04	0.000E+00	0.000E+00	0.000E+00	1.12E-02
SW	5.33E-03	6.45E-03	5.75E-05	0.000E+00	0.000E+00	0.000E+00	1.10E-02
WSW	3.60E-03	4.98E-03	1.16E-04	0.000E+00	0.000E+00	0.000E+00	8.71E-03
W	1.50E-03	8.67E-04	2.89E-04	0.000E+00	0.000E+00	0.000E+00	2.64E-03
WNW	8.07E-04	9.83E-04	2.31E-04	5.74E-05	0.000E+00	0.000E+00	2.08E-03
NW	7.55E-04	1.44E-03	5.22E-04	0.000E+00	0.000E+00	0.000E+00	2.72E-03
NNW	7.52E-04	7.52E-04	3.47E-04	0.000E+00	0.000E+00	0.000E+00	1.85E-03
TOTAL	3.49E-02	2.63E-02	2.20E-03	5.74E-05	0.000E+00	0.000E+00	6.35E-02

OVERALL PROBABILITY OF CALM OCCURRENCE = 3.24E-03

OVERALL PROBABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS: G

WIND DIRECTION	WIND SPEED - MPH						TOTAL
	0.75-3	4-7	8-12	13-18	19-24	25	
N	3.706E-03	6.488E-03	4.114E-03	1.160E-03	2.890E-04	0.000E+00	1.576E-02
NNE	4.930E-03	7.360E-03	3.246E-03	9.920E-04	1.159E-04	0.000E+00	1.664E-02
NE	5.097E-03	9.550E-03	3.184E-03	1.642E-04	1.740E-04	0.000E+00	1.840E-02
ENE	3.187E-03	8.053E-03	3.143E-03	0.000E+00	1.151E-04	0.000E+00	1.450E-02
E	3.010E-03	7.326E-03	1.740E-03	1.735E-04	0.000E+00	0.000E+00	1.225E-02
ESE	2.722E-03	7.824E-03	3.011E-03	1.098E-03	1.158E-04	0.000E+00	1.477E-02
SE	3.600E-03	6.250E-03	3.897E-03	1.972E-03	5.795E-04	1.741E-04	1.647E-02
SSE	4.440E-03	4.635E-03	1.856E-03	6.390E-04	2.893E-04	0.000E+00	1.186E-02
S	8.279E-03	7.233E-03	1.912E-03	2.881E-04	1.167E-04	0.000E+00	1.783E-02
SSW	1.112E-02	1.344E-02	1.391E-03	2.899E-04	5.744E-05	0.000E+00	2.630E-02
SW	1.394E-02	2.221E-02	1.565E-03	3.465E-04	1.735E-04	0.000E+00	3.824E-02
WSW	1.096E-02	1.293E-02	1.438E-03	5.744E-05	0.000E+00	5.827E-05	2.544E-02
W	3.714E-03	2.674E-03	6.357E-04	3.462E-04	5.833E-05	0.000E+00	7.428E-03
WNW	2.433E-03	1.899E-03	5.237E-04	3.483E-04	0.000E+00	0.000E+00	5.204E-03
NW	2.953E-03	4.670E-03	1.229E-03	2.885E-04	1.732E-04	0.000E+00	9.334E-03
NNW	3.521E-03	6.081E-03	1.440E-03	9.868E-04	1.724E-04	0.000E+00	1.221E-02
TOTAL	8.761E-02	1.286E-01	3.433E-02	9.451E-03	2.430E-03	2.324E-04	2.627E-01

OVERALL PROBABILITY OF CALM OCCURRENCE = 1.118E-02

OVERALL PROBABILITY OF CONDITION OCCURRENCE

PERIOD OF RECORD 92/ 1/ 1 THRU 92/ 6/30

STABILITY CLASS		WIND SPEED - MPH					TOTAL
WIND DIRECTION	0.75-3	4-7	8-12	13-18	19-24	25	TOTAL
N	1.761E-02	2.582E-02	2.070E-02	1.083E-02	3.124E-03	6.965E-04	7.877E-02
NNE	2.120E-02	3.063E-02	1.240E-02	6.265E-03	2.145E-03	6.393E-04	7.336E-02
NE	2.306E-02	3.626E-02	1.153E-02	3.826E-03	3.400E-04	5.833E-05	7.500E-02
ENE	1.844E-02	3.297E-02	1.044E-02	8.131E-04	1.727E-04	0.000E+00	6.284E-02
E	1.570E-02	2.939E-02	7.467E-03	2.020E-03	0.000E+00	0.000E+00	5.450E-02
ESE	1.344E-02	2.803E-02	1.129E-02	2.190E-03	2.316E-04	0.000E+00	5.517E-02
SE	1.600E-02	2.823E-02	1.241E-02	3.060E-03	6.370E-04	2.325E-04	6.059E-02
SSE	2.004E-02	2.000E-02	8.406E-03	2.433E-03	5.206E-04	5.833E-05	5.226E-02
S	2.885E-02	3.446E-02	7.240E-03	1.272E-03	1.167E-04	0.000E+00	7.194E-02
SSW	3.755E-02	3.925E-02	4.061E-03	4.631E-04	5.744E-05	0.000E+00	8.117E-02
SW	3.720E-02	5.450E-02	4.345E-03	7.530E-04	2.319E-04	0.000E+00	9.703E-02
WSW	2.971E-02	3.906E-02	5.667E-03	8.681E-04	1.158E-04	5.827E-05	7.540E-02
W	1.147E-02	9.297E-03	3.127E-03	1.215E-03	2.900E-04	1.160E-04	2.552E-02
WNW	6.203E-03	6.825E-03	2.552E-03	2.606E-03	4.950E-04	5.206E-04	1.911E-02
NW	8.006E-03	1.597E-02	5.289E-03	1.500E-03	9.267E-04	1.743E-04	3.260E-02
NNW	1.314E-02	2.047E-02	1.146E-02	9.047E-03	2.429E-03	2.310E-04	5.670E-02
TOTAL	3.183E-01	4.520E-01	1.304E-01	4.919E-02	1.175E-02	2.785E-03	9.724E-01

OVERALL PROBABILITY OF CALM OCCURRENCE = 2.851E-02

PERIOD OF RECORD: 92/ 1/ 1 THRU 92/ 6/30

NUMBER OF RECORDS IN SELECTED TIME PERIOD = 17374
NUMBER OF OBSERVATIONS TAKEN FROM PRIMARY LOCATION = 17356
NUMBER OF OBSERVATIONS TAKEN FROM THE NOAA TOWER = 0
NUMBER OF OBSERVATIONS TAKEN FROM THE SON LEVEL = 0
NO. OF OBSERVATIONS WITH NO VALID WIND SPEED/DIR. = 10
NO. OF OBSERVATIONS WITH OUT-OF-RANGE DELTA TEMP. = 3278
MOST CONSERVATIVE STABILITY CATEGORY (G) ASSUMED = 3278

LOST TIME = 11.55 HRS TOTAL TIME = 4368.00 HRS

DATA AVAILABILITY = 99.74 %