

SEMIANNUAL RADIOACTIVE EFFLUENT
RELEASE REPORT

3rd and 4th Quarters of 1991
1991 Meteorological Summary and Offsite Dose Assessment

Facility: Shoreham Nuclear Power Station, Unit 1

Licensee: Long Island Lighting Company, Inc.

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INTRODUCTION

This Semiannual Radioactive Effluent Release Report, submitted in accordance with Technical Specification 6.8.1.4, Offsite Dose Calculation Manual (ODCM) Sections 6.8.1.4 and 6.15.1, and Process Control Program (PCP) Sections 9.3 and 9.4, covers the period from July 1, 1991 through December 31, 1991. Meteorological data summaries for the whole of 1991 are included, as is an assessment of offsite doses due to liquid and gaseous effluents for the whole year.

By contractual agreement with New York State, the Long Island Lighting Company (LILCO) will transfer the Shoreham Nuclear Power Station to the Long Island Power Authority (LIPA). LILCO cannot operate the plant in the interim. In order to ready the plant for decommissioning and to protect plant systems, the fuel was transferred to the Spent Fuel Storage Pool in August 1989, and plant layup activities began. Prior to defueling, the plant was in a cold shutdown condition for almost two years.

In July 1991, the Nuclear Regulatory Commission (NRC) granted LILCO a Possession Only Amendment to its previously obtained full power operating license for the Shoreham plant. This amended license, or the Possession Only License (POL), was implemented by LILCO in August 1991 and, with it, all POL related changes in the Technical Specifications, ODCM and PCP.

A. SUPPLEMENTAL INFORMATION

1. Regulatory Limits

Shoreham's effluent regulatory limits are defined in Facility Operating License NPF-82, Shoreham Nuclear Power Station, Appendix A, Technical Specifications.

- a) Limits for gaseous effluents and noble gases are covered by Technical Specification 6.7.4 and ODCM Controls 3.11.2.1 and 3.11.2.2.
- b&c) Radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents are addressed in Technical Specification 6.7.4 and ODCM Control 3.11.2.3.
- d) Liquid effluent limits are described in Technical Specification 6.7.4 and ODCM Controls 3.11.1.1 and 3.11.1.2.
- e) In addition, with Shoreham's sampling and analysis program the following typical minimum detectable activities (MDA's) were achieved. These MDA's are less than the required lower limits of detection (LLD's):

Liquid:

Ce-141	3.63 E-08	uCi/ml
Ce-144	1.68 E-07	uCi/ml
Co-58	3.58 E-08	uCi/ml
Co-60	4.80 E-08	uCi/ml
Cs-134	4.04 E-08	uCi/ml
Cs-137	3.61 E-08	uCi/ml
Mn-54	4.28 E-08	uCi/ml
Mo-99	2.01 E-08	uCi/ml
Zn-65	4.53 E-07	uCi/ml

Gaseous:

Cs-134	2.33 E-14	uCi/cc
Cs-137	4.42 E-14	uCi/cc
Mn-54	6.12 E-14	uCi/cc
Xe-133	2.91 E-08	uCi/cc
Zn-65	1.33 E-13	uCi/cc
Co-60	7.48 E-14	uCi/cc
Ce-144	1.79 E-13	uCi/cc

2. Maximum Permissible Concentrations

a-d) Maximum permissible liquid effluent concentrations (MPC's) are those specified in 10 CFR 20, Appendix B, Table II, Column 2. If an isotope is listed with values for SOLUBLE and INSOLUBLE states, the more conservative value is utilized. For gaseous effluents, MPC's were not used. Direct calculations of dose were utilized to satisfy the dose rate limitations of Technical Specification 6.7.4 and ODCM Control 3.11.2.1.

3. Average Energy

No isotopes above minimum detectable activities were measured in gaseous effluents. Therefore, there is no reportable average energy for this time period.

4. Measurements and Approximations of Total Radioactivity

a-d) Samples were collected in the manner and with the frequency prescribed in Technical Specifications Surveillance Requirement 6.7.4 and ODCM Controls 4.11.1.1.1 and 4.11.2.1.2. Samples were analyzed in accordance with ODCM Controls Tables 4.11.1.1.1-1 and 4.11.2.1.2-1 regarding both type of analysis and level of sensitivity. Most samples were analyzed by gamma spectroscopy with a Germanium detector. A liquid scintillation counter was used to analyze for H-3 and Fe-55 while Sr-89, -90 analyses were done by proportional counter. Samples analyzed for iron and strontium underwent a chemical separation prior to counting. Approved sample collection and analysis procedures were followed.

Analytical results are examined to ensure that the minimum sensitivity levels required by ODCM lower limits of detection (LLD's) have been met. Any identifiable peaks above background are quantified.

The methods above were used for batch releases. The same methods were used for continuous discharges, but were combined with gross activity measurements on process streams and total flow for these streams.

No estimate of percent total error is provided in Table 1A because all values for gaseous effluents were determined to be less than required LLD's. Basis for the estimated percent total error for entries in Table 2A is given in Section C.

5. Batch Releases

a) Liquid

	<u>3rd Qtr.</u>	<u>4th Qtr.</u>
1. Number of batches	13	22
2. Total Time (minutes)	1,987	3,069
3. Maximum Time (minutes)	188	178
4. Average Time (minutes)	153	139
5. Minimum Time (minutes)	90	30
6. Average Flow (gpm) (Dilution)	143,550	90,050

b) Gaseous - None

6. Abnormal Releases

a) Liquid - None

b) Caseous - None

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B - GASEOUS EFFLUENTS

3rd and 4th Quarters of 1991

All samples of gaseous effluents were analyzed and determined to be at or below minimum detectable activities (MDA's) for all radionuclides listed in Shoreham's ODCM. These MDA's were below the lower limits of detection required in ODCM Controls Table 4.11.2.1.2-1. In addition, no other radionuclides were identified. Therefore, no entries were made in Tables 1A, 1B or 1C that follow.

Composite sample results for the third and fourth quarters of this reporting period are all at or below MDA's.

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1991

GASEOUS EFFLUENTS—SUMMATION OF ALL RELEASES

	Unit	Quarter	Quarter	Est. Total
	1	3	4	Error, %

A. Fission & activation gases

1. Total release	Ci	. E	. E	. E
2. Average release rate for period	$\mu\text{Ci/sec}$. E	. E	
3. Percent of Technical specification limit	%	. E	. E	

B. Iodines

1. Total iodine-131	Ci	. E	. E	. E
2. Average release rate for period	$\mu\text{Ci/sec}$. E	. E	
3. Percent of technical specification limit	%	. E	. E	

C. Particulates

1. Particulates with half-lives >8 days	Ci	. E	. E	. E
2. Average release rate for period	$\mu\text{Ci/sec}$. E	. E	
3. Percent of technical specification limit	%	. E	. E	
4. Gross alpha radioactivity	Ci	. E	. E	

D. Tritium

1. Total release	Ci	. E	. E	. E
2. Average release rate for period	$\mu\text{Ci/sec}$. E	. E	
3. Percent of technical specification limit	%	. E	. E	

TABLE 1B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1991

GASEOUS EFFLUENTS—ELEVATED RELEASE

Nuclides Released	Unit 1	CONTINUOUS MODE		BATCH MODE	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4

1. Fission gases

krypton-85	Ci	. E	. E	. E	. E
krypton-85m	Ci	. E	. E	. E	. E
krypton-87	Ci	. E	. E	. E	. E
krypton-88	Ci	. E	. E	. E	. E
xenon-133	Ci	. E	. E	. E	. E
xenon-135	Ci	. E	. E	. E	. E
xenon-135m	Ci	. E	. E	. E	. E
xenon-138	Ci	. E	. E	. E	. E
Others (specify)	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
unidentified	Ci	. E	. E	. E	. E
Total for period	Ci	. E	. E	. E	. E

2. Iodines

iodine-131	Ci	. E	. E	. E	. E
iodine-133	Ci	. E	. E	. E	. E
iodine-135	Ci	. E	. E	. E	. E
Total for period	Ci	. E	. E	. E	. E

3. Particulates

strontium-89	Ci	. E	. E	. E	. E
strontium-90	Ci	. E	. E	. E	. E
cesium-134	Ci	. E	. E	. E	. E
cesium-137	Ci	. E	. E	. E	. E
barium-lanthanum-140	Ci	. E	. E	. E	. E
Others (specify)	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
unidentified	Ci	. E	. E	. E	. E

TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1991

GASEOUS EFFLUENTS—GROUND-LEVEL RELEASES

		CONTINUOUS MODE		BATCH MODE	
Nuclides Released	Unit 1	Quarter 3	Quarter 4	Quarter 3	Quarter 4

1. Fission gases

krypton-85	Ci	. E	. E	. E	. E
krypton-85m	Ci	. E	. E	. E	. E
krypton-87	Ci	. E	. E	. E	. E
krypton-88	Ci	. E	. E	. E	. E
xenon-133	Ci	. E	. E	. E	. E
xenon-135	Ci	. E	. E	. E	. E
xenon-135m	Ci	. E	. E	. E	. E
xenon-138	Ci	. E	. E	. E	. E
Others (specify)	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
unidentified	Ci	. E	. E	. E	. E
Total for period	Ci	. E	. E	. E	. E

2. Iodines

iodine-131	Ci	. E	. E	. E	. E
iodine-133	Ci	. E	. E	. E	. E
iodine-135	Ci	. E	. E	. E	. E
Total for period	Ci	. E	. E	. E	. E

3. Particulates

strontium-89	Ci	. E	. E	. E	. E
strontium-90	Ci	. E	. E	. E	. E
cesium-134	Ci	. E	. E	. E	. E
cesium-137	Ci	. E	. E	. E	. E
barium-lanthanum-140	Ci	. E	. E	. E	. E
Others (specify)	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
unidentified	Ci	. E	. E	. E	. E

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C - LIQUID EFFLUENT

3rd and 4th Quarters of 1991

All samples of liquid effluents were analyzed and, except one instance as noted below, determined to be at or below minimum detectable activities (MDA's) for all radionuclides listed in the ODCM. These MDA's were below the LLQ's required in ODCM Controls Table 4.11.1.1.1-1. In addition, no other radionuclides were identified.

Composite sample results from both batch and continuous discharges for tritium, alpha, noble gases, Sr-89, Sr-90, and Fe-55 in this reporting period are all at or below MDA's.

For the principal gamma emitter category, however, a measurement of Zn-65 at $(2.45 \pm 0.11)E-06$ uCi/ml (MDA: $5.0E-07$), undiluted, was found in Batch Discharge #91D-055, occurring on July 25, 1991. The batch waste volume was 18,755 gallons and was diluted to $2.37E+07$ gallons before release. The total activity released was 174 uCi. The Zn-65 in this batch release has a concentration that is 50,000 times below the most stringent release concentration limit given in 10CFR20 Appendix E for Zn-65, and was traced to a contamination in a vendor's equipment.

The plant contractor Chem Nuclear to dewater Shoreham's radwaste liners. The vendor brought in a dewatering skid which had been used at PSE&G's Hope Creek Station to dewater its waste that contained Zn-65. The residual Zn-65 found its way to SNPS's radwaste treatment system and was released with diluting water volumes at a concentration well below the regulatory allowable limit.

The dewatering process was completed on August 5, 1991. Subsequently, Floor Drains Collection Tanks were processed through demineralizers, and the processing area has been decontaminated. The dewatering skid has been removed from service and packaged for offsite shipment.

Because of the extremely low level of the release concentration, the resultant whole body and organ doses evaluated as fractions of the quarterly and annual Technical Specifications limits are at or below $1E-04$. See Section E for more details.

The total error percentage entered into Table 2A for liquid measurements was estimated from the tank sampling error and from counting error at values close to minimum detectable activities. This overall error is estimated to be approximately 50%.

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1991

LIQUID EFFLUENTS—SUMMATION OF ALL RELEASES

Unit 1	Quarter 3	Quarter 4	Est. Total Error, %
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A. Fission and activation products

1. Total release (not including tritium, gases, alpha)	Ci	1.74 E-4	. E	5.00 E+1
2. Average diluted concentration during period	μCi/ml	1.61 E-10	. E	
3. Percent of applicable limit	%	1.61 E-4	. E	

B. Tritium

1. Total release	Ci	. E	. E	. E
2. Average diluted concentration during period	μCi/ml	. E	. E	
3. Percent of applicable limit	%	. E	. E	

C. Dissolved and entrained gases

1. Total release	Ci	. E	. E	. E
2. Average diluted concentration during period	μCi/ml	. E	. E	
3. Percent of applicable limit	%	. E	. E	

D. Gross alpha radioactivity

1. Total release	Ci	. E	. E	. E
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E. Volume of waste released (prior to dilution)	liters	8.71 E+5	. E	1.00 E+1
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F. Volume of dilution water used during period	liters	1.08 E+9	. E	2.00 E+1
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TABLE 2B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1991

LIQUID EFFLUENTS

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
strontium-89	Ci	. E	. E	. E	. E
strontium-90	Ci	. E	. E	. E	. E
cesium-134	Ci	. E	. E	. E	. E
cesium-137	Ci	. E	. E	. E	. E
iodine-131	Ci	. E	. E	. E	. E
cobalt-58	Ci	. E	. E	. E	. E
cobalt-60	Ci	. E	. E	. E	. E
iron-59	Ci	. E	. E	. E	. E
zinc-65	Ci	. E	. E	1.74 E-4	. E
manganese-54	Ci	. E	. E	. E	. E
chromium-51	Ci	. E	. E	. E	. E
zirconium-niobium-95	Ci	. E	. E	. E	. E
molybdenum-99	Ci	. E	. E	. E	. E
technetium-99m	Ci	. E	. E	. E	. E
barium-lanthanum-140	Ci	. E	. E	. E	. E
cerium-141	Ci	. E	. E	. E	. E
Other (specify)	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
	Ci	. E	. E	. E	. E
unidentified	Ci	. E	. E	. E	. E
Total for period (above)	Ci	. E	. E	1.74 E-4	. E
xenon-133	Ci	. E	. E	. E	. E
xenon-135	Ci	. E	. E	. E	. E

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D - SOLID WASTE

3rd and 4th Quarters of 1991

Table 3 provides information on shipments of solid waste for the third and fourth quarters of 1991. These shipments consisted of dewatered Class A Resins, Class A Dry Active Waste (DAW), and Class A Irradiated Components. There were no irradiated fuel shipments. The resins were shipped in 158.1 ft³ DOT Spec 7A High Integrity Containers (HIC's), approved by the South Carolina Department of Health and Environmental Conservation, and in CNSI L21-300 and L14-195 liners. DAW was shipped in 55 gallon drums and a B-25 box, whereas the Irradiated Components were shipped in a lead-lined B-25 box in a special box cask.

TABLE 3

*** REGULATORY GUIDE 1.21 REPORT ***
 SOLID WASTE SHIPPED OFFSITE FOR DISPOSAL
 ** DURING PERIOD FROM 7/1/91 to 12/31/91**

WASTE STREAM: Resins, Filters, & Evaporator Bottoms

<u>WASTE CLASS</u>	<u>CUBIC METERS</u>	<u>CURIES</u>	<u>% ERROR (CI)</u>
A	53.6	8.09E-03	±25%

** ESTIMATES OF MAJOR NUCLIDES BY WASTE CLASS & STREAM **
 WASTE STREAM: Resins, Filters & Evaporator Bottoms with .0% CUTOFF

<u>WASTE CLASS</u>	<u>NUCLIDE</u>	<u>ABUNDANCE</u>	<u>CURIES</u>
A	Fe-55	31.591%	2.56E-03
	Co-60	18.605%	1.51E-03
	Co-58	14.913%	1.21E-03
	Mn-54	11.832%	9.58E-04
	Zn-65	7.312%	5.92E-04
	Cr-51	6.296%	5.09E-04
	Ni-63	3.673%	2.97E-04
	Ag-110m	1.643%	1.33E-04
	Fe-59	1.638%	1.33E-04
	Pu-241	.996%	8.06E-05
	H-3	.565%	4.57E-05
	Ce-144	.472%	3.82E-05
	Nb-95	.183%	1.48E-05
	Cs-137	.172%	1.39E-05
	Co-57	.051%	4.10E-06
	Sb-124	.037%	2.99E-06
	Ni-59	.010%	8.29E-07
	Sr-90	.008%	6.41E-07
	Ce-141	.002%	1.68E-07
	Nb-94	.000%	1.72E-08
	C-14	.000%	6.58E-09
	Ga-242	.000%	0.00E+00
	I-129	.000%	0.00E+00
	Tc-99	.000%	0.00E+00

TABLE 3 (Con 'd)

*** REGULATORY GUIDE 1.21 REPORT ****
 SOLID WASTE SHIPPED OFFSITE FOR DISPOSAL
 ** DURING PERIOD FROM 7/1/91 to 12/31/91**

WASTE STREAM: Dry Active Waste

<u>WASTE CLASS</u>	<u>CUBIC METERS</u>	<u>CURIES</u>	<u>% ERROR (CI)</u>
A	8.0	1.95E-01	±25%

** ESTIMATES OF MAJOR NUCLIDES BY WASTE CLASS & STREAM **
 WASTE STREAM: Dry Active Waste with .0% CUTOFF

<u>WASTE CLASS</u>	<u>NUCLIDE</u>	<u>ABUNDANCE</u>	<u>CURIES</u>
A	Mn-54	23.641%	4.61E-02
	Co-60	22.604%	4.41E-02
	Fe-55	18.460%	3.60E-02
	Cr-51	15.248%	2.97E-02
	Co-58	10.832%	2.11E-02
	Zn-65	3.737%	7.29E-03
	Avg-110m	3.039%	5.93E-03
	Fe-59	1.299%	2.53E-03
	Ni-63	.871%	1.70E-03
	Sb-124	.116%	2.25E-04
	Co-57	.093%	1.81E-04
	Cs-137	.038%	7.39E-05
	Ni-59	.016%	3.14E-05
	Ce-141	.003%	5.31E-06
	H-3	.002%	3.77E-06
	Sr-90	.001%	1.29E-06
	Pu-241	.001%	1.78E-06
	Nb-94	.000%	6.49E-07
	C-14	.000%	2.49E-07
	Ce-144	.000%	5.35E-07
	Cm-242	.000%	0.00E+00
	I-129	.000%	0.00E+00
	Tc-99	.000%	0.00E+00

TABLE 3 (Cont'd)

*** REGULATORY GUIDE 1.21 REPORT ****
 SOLID WASTE SHIPPED OFFSITE FOR DISPOSAL
 ** DURING PERIOD FROM 7/1/91 to 12/31/91**

WASTE STREAM: Irradiated Components

<u>WASTE CLASS</u>	<u>CUBIC METERS</u>	<u>CURIES</u>	<u>% ERROR (CI)</u>
A	8.3	2.72E+00	±25%

** ESTIMATES OF MAJOR NUCLIDES BY WASTE CLASS & STREAM **
 WASTE STREAM: Irradiated Components with .0% CUTOFF

<u>WASTE CLASS</u>	<u>NUCLIDE</u>	<u>ABUNDANCE</u>	<u>CURIES</u>
A	Fe-55	64.164%	1.74E-00
	Co-60	31.953%	8.68E-01
	Ni-63	2.673%	7.26E-02
	Mn-54	1.188%	3.23E-02
	Ni-59	.018%	5.01E-04
	C-14	.004%	1.09E-04
	Tc-99	.000%	1.01E-06
	Nb-94	.000%	6.68E-07
	Qm-242	.000%	0.00E+00
	Pu-241	.000%	0.00E+00
	Cs-137	.000%	0.00E+00
	I-129	.000%	0.00E+00
	Sr-90	.000%	0.00E+00
	H-3	.000%	0.00E+00

TABLE 3 (Cont'd)

*** REGULATORY GUIDE 1.21 REPORT ***
 SOLID WASTE SHIPPED OFFSITE FOR DISPOSAL
 ** DURING PERIOD FROM 7/1/91 to 12/31/91**

WASTE STREAM: Sum of All Categories

<u>WASTE CLASS</u>	<u>CUBIC METERS</u>	<u>CURIES</u>	<u>% ERROR (CI)</u>
A	69.9	2.92E+00	±25%

** ESTIMATES OF MAJOR NUCLIDES BY WASTE CLASS & STREAM **
 WASTE STREAM: Sum of All Categories with .0% CUTOFF

<u>WASTE CLASS</u>	<u>NUCLIDE</u>	<u>ABUNDANCE</u>	<u>CURIES</u>
A	Fe-55	61.021%	1.78E+00
	Co-60	31.292%	9.14E-01
	Mn-54	2.717%	7.93E-02
	Ni-63	2.555%	7.46E-02
	Cr-51	1.036%	3.02E-02
	Co-58	.765%	2.23E-02
	Zn-65	.270%	7.88E-03
	Ag-110m	.208%	6.06E-03
	Fe-59	.091%	2.67E-03
	Ni-59	.018%	5.33E-04
	Sb-124	.008%	2.28E-04
	Co-57	.006%	1.85E-04
	C-14	.004%	1.09E-04
	Cs-137	.003%	8.78E-05
	Pu-241	.003%	8.24E-05
	H-3	.002%	4.95E-05
	Ce-144	.001%	3.87E-05
	Nb-95	.001%	1.48E-05
	Ce-141	.000%	5.48E-06
	Sr-90	.000%	1.93E-06
	Nb-94	.000%	1.33E-06
	Tc-99	.000%	1.01E-06
	Cm-242	.000%	0.00E+00
	I-129	.000%	0.00E+00

** SOLID WASTE DISPOSITION SUMMARY**

<u>NUMBER OF SHIPMENTS</u>	<u>MODE OF TRANSPORTATION</u>	<u>DESTINATION</u>
6	Truck	Barnwell
0	Truck	Richland
0	Truck	Beatty
0	Truck	Other

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E - RADIOLOGICAL IMPACT ON MAN

1991

1. Direct radiation (as measured on quarterly TLD's) made no statistically significant contribution to offsite doses based on a comparison of 1991 dose rates with 1984 (pre-operational) dose rates. The highest dose measured in 1991 was 5.5 mrem/standard month (30.4 days) at indicator location CA1 compared to the 1984 dose at the same maximum location of 5.1 mrem/standard month. Similarly, the 1991 average for all indicator locations was 3.5 mrem/standard month compared to a 1984 value of 3.9 mrem/standard month.
2. Doses from Liquid Effluent Discharges

As a result of the detection of the minute amount of Zn-65 released on July 25, 1991, in the batch liquid discharge #91D-055, the following dose calculations and results were performed and obtained:

A. Input Data

- a. Release start time (batch): 07/25/91 08:20 AM
- b. Release stop time (batch): 07/25/91 11:05 AM
- c. Release duration (minutes): 165
- d. Effluent volume (gallons): 18,755
- e. Number of pumps used for dilution: 1
- f. Effluent Isotopic Concentration (uCi/cc) = $2.5E-06$ (Zn-65)
(undiluted)

B. Assumptions and Methodology

Dose commitments were calculated using the backup method described in ODCM for computing doses from liquid effluent discharges. The spreadsheet developed inhouse from a LILCO calculation #C-RPD-489 was employed to aid the computations.

It is assumed that doses to the public are primarily due to the ingestion of fish and seafood removed from the Long Island Sound. Doses due to other liquid pathways (shoreline deposits and land based food chain) are assumed to be negligible from SNPS' Appendix I study and the fact that water from the Sound is not used for irrigation purposes.

Other assumptions and generic input data are taken consistently from SNPS Station Procedures SP74.020.12 (Rev. 7), SP74.020.02 (Rev. 21), and SP 74.020.10 (Rev. 18), in addition to those specified in the ODCM. These are described in detail in Calculation #C-RPD-489.

C. Summary of Results

Because the primary pathway considered is through internal exposure, the doses calculated are dose commitments. Dose commitments to a member of the public for the surveillance period June 24, 1991 through July 28, 1991, encompassing the release date, are presented below:

Dose Commitments for the Surveillance Interval

Organ	mrem			Fractions Due to Composited Isotopes		
	Adult	Teen	Child	Adult	Teen	Child
W Body	1.4E-04	1.4E-04	1.5E-04	0.0E+00	0.0E+00	0.0E+00
Bone	1.0E-04	9.0E-05	9.5E-05	0.0E+00	0.0E+00	0.0E+00
Liver	2.1E-04	3.1E-04	2.5E-04	0.0E+00	0.0E+00	0.0E+00
Thyroid	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Kidney	2.1E-04	2.0E-04	1.6E-04	0.0E+00	0.0E+00	0.0E+00
Lung	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
GI-LLI	2.0E-04	1.3E-04	4.4E-05	0.0E+00	0.0E+00	0.0E+00

The maximum whole body and organ dose commitments are:

	Dose (mrem)	Critical Group	Organ
Whole Body Dose	1.5E-04	Child	-
Organ Dose	3.1E-04	Adult	Liver

Comparing these to the ODCM limits:

	Fraction of Tech Spec Limits	
	Quarterly	Annual
Whole Body Dose	1.03E-04	5.16E-05
Organ Dose	6.20E-05	3.10E-05

D. Conclusion

The calculated maximal whole body dose commitment for the surveillance period is 1.5E-04 mrem for a child; and the maximal organ dose commitment, 3.1E-04 mrem, for an adult's liver. Both are below either the quarterly or the annual Technical Specification limit by a factor of 10,000 or greater. Since there had been no other releases above the MDA's during this reporting period in the liquid effluent discharges, all contributions from composited isotopes are zero. The total radiological impact on the general public is thus negligible.

3. Doses from Gaseous Effluent Discharges

During 1991, there were no radioactive isotopes identified within the limits of detection in any of the gaseous streams discharged. Therefore, no dose calculation was performed. Radiological impact from the gaseous effluents is insignificant.

SEMIANNUAL RADIOACTIVE EFFLUENT
RELEASE REPORT

F - METEOROLOGICAL DATA

1991

Tables of cumulative joint frequency distribution of wind speed, wind direction, and atmospheric stability are given by quarter for release heights of 33 feet and 150 feet. The joint frequency distributions reflect all data that was determined to be valid by a meteorological consultant and are given in the tables that follow.

Some of the 33-foot level wind speed data was recovered from strip charts at the offsite tower. The offsite tower data are considered representative of the site and this tower was used for the collection of the original licensing meteorological data base, which has been reviewed and accepted by the NRC. Although the calibration and maintenance of the strip chart recorders at the offsite tower is not included in the Plant's Surveillance Program, they are maintained by LILCO's Environmental Engineering Department (ENVED), in accordance with ENVED's procedures. A quarterly calibration and maintenance program for the meteorological instruments, including these recorders, is in effect and performed by TRC Environmental Consultants.

The SNPS POL became effective on July 20, 1991, and was implemented on August 7, 1991. Under the POL Technical Specifications, the SNPS Onsite Meteorological Tower is no longer needed. The actual 33-foot level data used in the generation of the following tables were switched from the onsite to the offsite tower on August 2, 1991, when the hardware transition and rewiring between the plant RMS computer and the 33-foot offsite tower instrumentation was completed.

Hurricane BOB was onsite on August 19, 1991. As a result of the gale wind force, the 33-foot onsite tower toppled before an End-of-Period (EOP) calibration could be done. The uncertified data range was, however, limited to the period June 4, 1991 - August 2, 1991 (Second quarter EOP was done on June 4, 1991; and on August 2, 1991, the offsite 33-foot level data became effective and official). The 33-foot tower, not being required under the POL plant status, will be taken down and not be repaired.

The data gathered within this period was sent to an offsite project meteorologist for careful review and it was concluded that both the hourly wind speed and wind direction values as recorded by the onsite tower during that period are meteorologically acceptable.

The percent recovery for joint wind speed, wind direction and delta temperature was 93% for the year.

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: A
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	2	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	3	1	0	0	4
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	3	0	0	0	3
SSW	0	0	0	0	0	0	0
SW	0	1	2	0	0	0	3
WSW	0	0	0	0	0	0	0
W	0	0	0	1	0	0	1
WNW	0	0	7	3	0	0	10
WW	0	0	12	18	0	0	30
NWW	0	0	7	21	0	0	28
VARIABLE							

TOTAL 81
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: B
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	1	2	0	0	0	3
SSW	0	0	1	0	0	0	1
SW	0	1	1	0	0	0	2
WSW	0	1	1	0	0	0	2
W	0	0	2	3	0	0	5
WSW	0	1	5	2	0	0	8
NW	0	0	2	1	0	0	3
NNW	0	0	1	6	0	0	7
VARIABLE							

TOTAL 32
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: C
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	1	0	0	0	1
NNE	0	0	3	0	0	0	3
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	1	0	0	0	1
SSE	0	0	1	0	0	0	1
S	0	0	1	0	0	0	1
SSW	0	0	4	0	0	0	4
SW	0	2	3	0	0	0	5
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	3	5	1	0	0	9
NW	0	2	5	0	0	0	7
NNW	0	1	2	3	0	0	6
VARIABLE							

TOTAL 38
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: D
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	6	9	5	6	1	0	27
NNE	1	5	9	0	0	0	15
NE	1	15	5	8	0	0	29
ENE	2	5	18	1	0	0	26
E	2	5	3	0	0	0	10
ESE	3	2	1	0	0	0	6
SE	1	5	0	0	0	0	6
SSE	1	11	9	0	0	0	21
S	1	6	4	0	0	0	11
SSW	0	17	16	1	0	0	34
SW	0	18	7	0	0	0	25
WSW	0	4	5	0	0	0	9
W	0	10	28	2	0	0	40
WNW	2	17	46	20	0	0	85
NW	1	27	8	9	0	0	45
NNW	4	13	10	33	12	0	72
VARIABLE							

TOTAL 461
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: E
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	7	12	20	5	0	0	44
NNE	1	13	21	11	0	0	46
NE	7	21	17	7	0	0	52
ENE	1	20	28	5	0	0	55
E	7	18	16	0	0	0	41
ESE	9	3	2	0	0	0	14
SE	8	3	0	0	0	0	11
SSE	3	15	8	0	0	0	26
S	10	15	10	0	0	0	55
SSW	9	45	20	0	0	0	74
SW	6	48	8	0	0	0	62
WSW	8	23	14	0	0	0	45
W	3	20	21	0	0	0	44
WNW	6	25	42	39	0	0	112
NW	7	21	19	27	0	0	75
NNW	7	31	34	54	11	0	138
VARIABLE							

TOTAL E 24
 PERIODS OF CALM (HOURS): 3

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: F
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	6	8	4	1	0	0	19
NNE	3	4	3	0	0	0	10
NE	3	5	2	0	0	0	10
ENE	1	0	0	0	0	0	2
E	3	3	1	2	0	0	9
ESE	4	4	0	0	0	0	9
SSE	3	2	0	0	0	0	5
S	6	14	2	0	0	0	22
SSE	9	23	2	0	0	0	35
SSW	4	23	15	0	0	0	42
SW	4	28	0	0	0	0	32
WSW	5	9	0	0	0	0	14
W	2	1	1	0	0	0	5
WSW	4	4	0	0	0	0	8
W	2	2	3	1	0	0	8
NW	3	3	6	1	0	0	13
VARIABLE							

TOTAL 243
 PERIODS OF CALM (HOURS): 3

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: G
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	1
NE	0	0	1	0	0	0	2
ENE	0	2	5	0	0	0	8
E	3	0	1	0	0	0	4
ESE	3	2	0	0	0	0	5
SE	4	0	0	0	0	0	4
SSE	4	3	3	1	0	0	11
S	9	10	3	0	0	0	22
SSW	14	26	7	0	0	0	47
SW	3	48	0	0	0	0	51
WSW	1	2	0	0	0	0	4
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE							

TOTAL 160
 PERIODS OF CALM (HOURS): 4

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: A
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	2	2	0	0	0	4
NE	0	7	11	3	0	0	21
ENE	0	2	7	5	0	0	14
E	0	2	1	0	0	0	3
ESE	0	1	1	0	0	0	2
SE	0	0	0	0	0	0	0
SSE	0	1	1	0	0	0	2
S	0	4	3	0	0	0	7
SSW	0	5	33	11	0	0	49
SW	0	1	5	1	0	0	7
WSW	0	0	2	0	0	0	2
W	0	3	5	0	0	0	8
WSH	0	0	17	9	1	0	27
NW	0	2	21	3	0	0	26
NNW	0	0	10	9	2	0	21
VARIABLE							

TOTAL 193
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: B
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	1	0	0	0	0	1
NNE	0	1	1	0	0	0	2
NE	0	1	4	0	0	0	5
ENE	0	2	1	0	0	0	3
E	0	1	3	0	0	0	4
ESE	0	0	0	0	0	0	0
SE	0	1	0	0	0	0	1
SSE	0	1	0	1	0	0	2
S	0	1	4	0	0	0	5
SSW	0	1	6	1	0	0	8
SW	0	2	0	0	0	0	2
WSW	0	0	1	0	0	0	1
W	0	0	3	0	0	0	3
WNW	0	1	10	2	0	0	13
NW	0	3	6	1	0	0	12
NNW	0	0	3	0	0	0	3
VARIABLE							

TOTAL 65
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: C
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	4	0	0	0	0	5
NNE	0	2	3	0	0	0	5
NE	0	2	2	1	0	0	5
NNE	0	1	1	1	0	0	3
E	0	1	1	0	0	0	2
ESE	1	0	2	0	0	0	3
SE	0	1	2	0	0	0	3
SSE	0	1	2	0	0	0	3
S	0	1	4	1	0	0	6
SSW	0	4	6	2	0	0	12
SW	0	1	1	0	0	0	2
WSW	0	2	2	0	0	0	4
W	0	1	0	0	0	0	1
WSW	0	6	5	0	1	0	12
WN	0	6	2	0	0	0	8
WNW	0	2	1	0	0	0	3
VARIABLE							

TOTAL 77
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: D
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	3	23	2	0	0	0	28
NNE	2	22	2	0	0	0	26
NW	2	30	13	11	0	0	56
ENE	2	8	3	1	0	0	14
E	6	4	1	0	0	0	11
ESE	4	15	3	0	0	0	22
SE	1	21	8	0	0	0	30
SSE	3	11	8	0	0	0	22
S	0	13	18	2	0	0	33
SSW	0	19	27	7	0	0	53
SW	0	15	9	0	0	0	24
WSW	3	9	4	0	0	0	16
W	0	14	5	1	0	0	20
WNW	3	24	10	5	1	0	43
NW	4	34	11	3	0	0	52
NNW	3	27	5	0	2	0	37
VARIABLE							

TOTAL 487
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: E
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	10	10	5	1	0	0	26
N/E	8	13	7	13	0	0	41
NE	10	24	10	2	8	0	74
E/NE	15	16	11	7	0	0	50
E	14	11	1	0	0	0	29
E/SE	5	11	0	0	0	0	16
SE	5	22	2	0	0	0	29
S/SE	6	11	9	0	0	0	26
S	10	53	45	9	0	0	116
S/SW	12	69	78	17	0	0	176
SW	6	13	2	0	0	0	21
W/SW	12	13	1	0	0	0	27
W	8	25	7	1	0	0	41
W/NW	7	24	14	10	3	0	59
NW	18	9	6	16	2	0	52
N/NW	3	6	16	3	4	0	32
VARIABLE							

TOTAL 820
 PERIODS OF CALM (HOURS): 11

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: F
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	2	2	1	0	0	0	5
NNE	3	2	1	0	0	0	6
NE	1	0	1	0	0	0	3
ENE	1	0	0	0	0	0	3
E	3	0	0	0	0	0	3
ESE	2	0	0	0	0	0	2
SE	4	0	0	0	0	0	4
SSE	1	4	1	0	0	0	6
S	4	19	10	0	0	0	33
SSW	14	38	10	1	0	0	63
SW	14	21	7	0	0	0	43
WSW	7	6	0	0	0	0	13
W	7	5	1	0	0	0	14
WSW	9	9	2	1	0	0	22
W	8	3	0	0	0	0	12
WSW	4	3	2	0	0	0	9
VARIABLE							

TOTAL 241
 PERIODS OF CALM (HOURS): 7

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: G
 ELEVATION: 35

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	1	0	0	0	0	0	1
SSE	2	0	0	0	0	0	3
S	12	13	3	0	0	0	30
SSW	19	16	6	0	0	0	41
SW	6	18	2	0	0	0	26
WSW	6	1	0	0	0	0	9
W	7	0	0	0	0	0	8
WNW	2	1	0	0	0	0	6
NW	0	0	0	0	0	0	3
NNW	0	0	0	0	0	0	0
VARIABLE							

TOTAL 130
 PERIODS OF CALM (HOURS): 15

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: A
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	5	1	0	0	0	6
NNE	0	14	2	0	0	0	16
NE	0	12	4	0	0	0	16
ENE	1	2	7	0	0	0	10
E	0	3	0	0	0	0	3
ESE	1	0	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	3	0	0	0	0	3
S	0	0	3	0	0	0	3
SSW	0	7	10	0	0	0	17
SW	0	2	4	0	0	0	6
WSW	0	0	0	0	0	0	0
W	0	3	0	0	0	0	3
WNW	1	4	3	0	0	0	10
NNW	0	8	4	0	0	0	12
NNN	0	5	3	0	0	0	8
VARIABLE							

TOTAL 116
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: B
 ELEVATION: 33

WIND DIRECTION -----	WIND SPEED (MPH)						TOTALS -----
	1-3	4-7	8-12	13-16	19-24	>24	
N	2	2	0	0	0	0	4
NNE	0	8	1	0	0	0	9
NE	0	5	0	0	0	0	5
ENE	0	0	0	0	0	0	0
E	0	1	0	0	0	0	1
ESE	1	0	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	2	0	0	0	0	2
S	0	0	1	0	0	0	1
SSW	1	3	2	0	0	0	6
SW	0	1	2	0	0	0	3
WSW	0	3	1	0	0	0	3
W	0	2	0	0	0	0	2
WNW	0	3	15	0	0	0	18
NW	0	7	3	0	0	0	10
NNW	0	4	1	0	0	0	5
VARIABLE							

TOTAL 70
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: C
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	1	0	0	0	1
NNE	1	9	0	0	0	0	10
NE	1	4	0	0	0	0	5
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	2	1	0	0	0	3
S	0	0	1	0	0	0	1
SSW	0	2	2	0	0	0	4
SW	0	1	2	0	0	0	3
WSW	0	1	0	0	0	0	1
W	0	2	0	1	0	0	2
WNW	0	9	9	0	0	0	18
W	0	16	0	0	0	0	16
WNW	0	4	0	0	0	0	4
VARIABLE							

TOTAL 69
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: D
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	8	15	0	0	0	0	24
NNE	6	31	2	0	0	0	40
NE	11	26	0	0	0	0	38
ENE	5	12	0	0	0	0	17
E	7	1	0	0	0	0	8
ESE	6	7	0	0	0	0	13
SE	2	10	0	0	0	0	12
SSE	2	18	4	0	0	0	24
S	3	24	7	0	0	0	34
SSW	2	25	25	0	0	0	55
SW	1	18	6	0	0	0	25
WSW	6	15	1	0	0	0	22
W	1	16	4	0	0	0	22
WNW	8	51	19	0	0	0	78
NW	15	53	6	0	0	0	74
NNW	12	28	0	0	0	0	40
VARIABLE							

TOTAL 527
 PERIODS OF CALM (HOURS): 5

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: E
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	27	17	0	0	0	45
NNE	3	24	13	1	0	0	41
NE	12	29	7	1	0	0	50
ENE	22	12	2	0	0	0	34
E	9	5	0	0	0	0	14
ESE	6	7	0	0	0	0	13
SE	18	17	3	0	0	0	38
SSE	25	24	8	0	0	0	57
S	13	79	11	3	0	0	106
SSW	11	127	40	1	0	0	181
SW	8	36	2	1	0	0	47
WSW	2	14	0	0	0	0	16
W	11	21	1	1	0	0	34
WNW	14	34	14	0	0	0	62
WW	16	24	11	0	0	0	51
WNW	8	31	14	1	0	0	54
VARIABLE							

TOTAL 859
 PERIODS OF CALM (HOURS): 19

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: F
 ELEVATION: 33

WIND DIRECTION -----	WIND SPEED (MPH)						TOTALS -----
	1-3	4-7	8-12	13-16	17-24	>24	
N	4	1	0	0	0	0	5
NNE	4	2	0	0	0	0	6
NE	1	2	0	0	0	0	3
NNE	1	4	0	0	0	0	5
E	2	2	0	0	0	0	7
ESE	4	0	0	0	0	0	4
SE	11	2	0	0	0	0	13
SSE	11	16	0	0	0	0	29
S	12	20	0	0	0	0	35
SSW	21	36	0	0	0	0	60
SW	9	24	0	0	0	0	34
WSW	7	12	0	0	0	0	21
W	8	18	0	0	0	0	29
WNW	12	3	0	0	0	0	16
NW	11	1	0	0	0	0	12
NNW	4	5	0	0	0	0	10
VARIABLE							

TOTAL 291
 PERIODS OF CALM (HOURS): 21

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: G
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	1	0	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	4	0	0	0	0	0	4
SSE	22	3	0	0	0	0	28
S	17	5	0	0	0	0	27
SSW	20	14	0	0	0	0	34
SW	36	28	0	0	0	0	71
WSW	18	4	0	0	0	0	28
W	4	2	0	0	0	0	10
WSW	2	1	0	0	0	0	7
WNW	1	0	0	0	0	0	1
NNW	0	0	0	0	0	0	0
VARIABLE							

TOTAL 217
 PERIODS OF CALM (HOURS): 34

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: A
 ELEVATION: 33

WIND DIRECTION -----	WIND SPEED (MPH)						TOTALS -----
	1-3	4-7	8-12	13-16	19-24	>24	
N	0	0	5	0	0	0	5
NNE	0	0	5	0	0	0	5
NE	0	0	2	0	0	0	2
NNE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	2	0	0	0	2
NW	0	3	2	0	0	0	5
NNW	0	2	3	0	0	0	5
VARIABLE							

TOTAL 24
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: B
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	2	2	0	0	0	4
NE	0	0	1	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	1	2	0	0	0	3
SW	0	3	0	0	0	0	3
WSW	0	1	0	0	0	0	1
W	0	1	2	0	0	0	3
WNW	0	1	8	0	0	0	9
NW	0	0	6	0	0	0	6
NNW	0	0	0	0	0	0	0
VARIABLE							

TOTAL 31
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: C
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	2	1	0	0	0	3
NNE	0	1	0	0	0	0	1
NE	0	0	2	0	0	0	2
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	1	1	0	0	0	2
SSW	0	2	8	0	0	0	10
SW	0	0	2	0	0	0	2
WSW	0	0	1	0	0	0	1
W	0	1	4	1	0	0	6
WSW	0	2	11	0	0	0	13
W	0	1	4	0	0	0	5
WNW	0	0	2	0	0	0	2
VARIABLE							

TOTAL 47
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: D
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	26	16	0	0	0	42
NNE	2	18	5	4	0	0	29
NE	0	13	12	3	0	0	28
ENE	1	5	0	0	0	0	6
E	0	1	0	0	0	0	1
ESE	0	2	0	0	0	0	2
SE	0	8	9	0	0	0	17
SSE	0	7	1	0	0	0	8
S	2	10	13	0	0	0	25
SSW	0	11	28	2	0	0	41
SW	0	7	11	0	0	0	18
WSW	0	9	7	0	0	0	16
W	0	9	16	15	0	0	40
WNW	0	30	24	19	1	0	74
NW	1	16	15	4	0	0	36
NNW	3	17	17	6	0	0	43
VARIABLE							

TOTAL 426
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: E
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	5	33	20	2	0	0	60
NNE	8	42	53	9	0	0	112
NE	7	26	54	34	0	0	121
ENE	4	9	9	1	0	0	23
E	4	7	8	2	0	0	21
ESE	1	18	4	0	0	0	23
SE	5	20	19	0	0	0	44
SSE	11	19	10	0	0	0	40
S	2	31	21	1	0	0	55
SSW	12	59	67	12	0	0	150
SW	17	70	22	0	0	0	109
WSW	6	34	22	3	0	0	65
W	5	24	24	19	3	0	75
WNW	6	34	61	23	3	0	147
NW	4	58	54	8	0	0	124
NNW	3	40	31	8	1	0	83
VARIABLE							

TOTAL 1252
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: F
 ELEVATION: 33

WIND DIRECTION -----	WIND SPEED (MPH)						TOTALS -----
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	3	2	0	0	0	6
NNE	1	0	2	0	0	0	3
NE	1	0	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	1	0	0	0	0	0	1
ESE	2	1	0	0	0	0	3
SE	1	4	0	0	0	0	5
SSE	7	14	0	0	0	0	21
S	9	12	0	0	0	0	21
SSW	8	17	5	0	0	0	32
SW	4	40	2	0	0	0	46
WSW	5	24	1	0	0	0	30
W	4	8	1	0	0	0	13
WNW	2	5	0	0	0	0	7
NW	4	1	0	0	0	0	5
NNW	3	0	0	0	0	0	3
VARIABLE							

TOTAL 198
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: G
 ELEVATION: 33

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	3	19	0	0	0	0	22
S	9	17	0	0	0	0	26
SSW	21	19	0	0	0	0	40
SW	22	35	0	0	0	0	57
WSW	10	4	0	0	0	0	20
W	11	0	0	0	0	0	11
WNW	1	0	0	0	0	0	1
NW	2	0	0	6	0	0	2
NNW	0	0	0	0	0	0	0
VARIABLE							

TOTAL 180
 PERIODS OF CALM (HOURS): 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: 4
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-16	19-24	>24	
N	0	0	1	3	1	0	5
NNE	0	0	0	0	0	0	0
NE	0	0	1	3	0	0	4
ENE	0	0	1	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	2	0	0	2
SSW	0	0	0	1	0	0	1
SW	0	0	1	0	2	0	3
WSW	0	0	0	0	0	0	0
W	0	0	0	0	1	0	1
WNW	0	0	0	7	3	0	10
NW	0	0	2	17	7	0	26
NNW	0	0	2	12	15	0	29
VARIABLE							

TOTAL 82
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: B
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	2	1	0	0	3
SSW	0	0	0	1	0	0	1
SW	0	0	1	1	0	0	2
WSW	0	0	1	0	2	0	3
W	0	0	2	0	2	2	6
WNW	0	0	1	4	0	1	6
NW	0	0	2	0	2	0	4
NNW	0	0	1	3	2	1	7
VARIABLE							

TOTAL 32
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: C
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	1	2	0	0	3
E	0	0	1	0	0	0	1
ESE	0	0	1	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	1	0	0	1
SSW	0	0	0	1	0	0	1
SW	0	0	2	4	3	0	9
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	5	2	1	0	8
NW	0	0	4	2	1	0	7
NNW	0	0	2	2	2	0	6
VARIABLE							

TOTAL 38
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: D
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	3	3	5	6	5	3	25
NNE	0	12	1	7	0	0	20
NE	0	9	2	11	0	0	22
ENE	0	5	5	13	3	0	26
E	0	3	5	8	0	0	16
ESE	0	4	2	1	0	0	7
SE	1	1	0	0	0	0	2
SSE	0	6	4	5	0	0	15
S	0	3	8	6	0	0	17
SSW	0	8	9	10	4	0	31
SW	0	0	11	11	7	0	29
WSW	1	1	4	8	0	0	14
W	0	4	9	23	10	1	47
WNW	0	5	22	21	23	8	79
NW	0	9	17	6	7	1	40
NNW	1	11	11	16	22	10	71
VARIABLE							

TOTAL 461
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: E
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-16	19-24	>24	
N	4	8	34	23	6	0	75
NNE	1	9	17	18	7	0	53
NE	0	12	16	10	5	0	43
ENE	0	2	18	22	4	0	46
E	1	2	25	23	4	0	55
ESE	0	2	6	4	1	0	13
SE	0	5	2	0	0	0	7
SSE	0	4	8	10	0	0	22
S	0	5	16	11	1	0	33
SSW	0	7	12	29	9	2	59
SW	0	8	15	42	1	0	66
WSW	1	3	24	29	1	0	58
W	0	5	20	32	8	0	65
WNW	1	1	18	34	16	19	91
W	2	10	22	19	25	0	78
NW	3	9	25	37	39	11	124
VARIABLE							

TOTAL 888
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: F
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-16	19-24	>24	
N	0	1	11	4	2	0	18
NNE	2	2	5	1	0	0	10
NE	1	4	5	1	0	0	11
ENE	1	4	0	0	0	0	5
E	1	1	4	0	2	1	9
ESE	0	3	3	1	0	0	7
SE	0	7	3	0	0	0	10
SSE	0	3	8	3	0	0	14
S	0	1	7	6	0	0	14
SSW	0	1	14	21	3	0	39
SW	0	4	9	16	0	0	29
WSW	1	1	13	15	0	0	30
W	1	5	8	3	0	0	17
WNW	0	2	8	0	0	0	10
NW	0	1	2	1	1	0	5
NNW	1	3	2	6	0	0	12
VARIABLE							

TOTAL 240
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1/ 1/91 TO 3/31/91
 STABILITY CLASS: G
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-16	19-24	>24	
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
ENE	1	1	0	0	2	0	4
E	0	0	1	1	0	0	2
ESE	0	5	3	0	0	0	8
SE	0	4	2	0	0	0	6
SSE	0	2	5	2	1	0	10
S	0	2	5	6	2	0	15
SSW	0	3	7	15	0	0	25
SW	0	4	16	10	0	0	30
WSW	0	2	14	21	0	0	37
W	0	2	8	0	0	0	10
WSW	0	1	1	0	0	0	2
NW	0	2	0	0	0	0	2
NNW	1	1	0	0	0	0	2
VARIABLE							

TOTAL 160
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: A
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	0	3	0	0	0	4
NE	0	1	12	2	0	0	15
NNE	0	1	8	14	0	0	23
E	0	0	3	3	0	0	6
ESE	0	0	0	2	0	0	2
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	1	0	0	0	1
SSW	0	1	10	15	0	0	26
SW	0	0	12	22	3	0	37
WSW	0	0	3	1	0	0	4
W	0	0	2	9	0	0	11
WSW	0	0	10	21	8	0	39
WN	0	0	14	3	1	0	18
NNW	0	0	5	13	1	0	19
VARIABLE							

TOTAL 206
 PERIODS OF CALM (HOURS): 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: B
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	1	0	0	0	0	1
NNE	0	1	0	0	0	0	1
NE	0	1	3	0	0	0	4
NNE	0	0	4	0	0	0	4
E	0	0	3	1	0	0	4
ESE	0	0	1	0	0	0	1
SE	0	0	1	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	2	4	2	0	0	8
SSW	0	0	2	1	0	0	3
SW	0	0	0	3	1	0	4
WSW	0	0	4	1	0	0	5
W	0	0	0	2	0	0	2
WNW	0	1	16	5	1	0	23
NN	0	1	2	2	0	0	5
NNW	0	1	2	0	0	0	3
VARIABLE							

TOTAL 69
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: C
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	2	0	0	0	0	2
NNE	0	3	1	0	0	0	4
NE	0	5	3	1	1	0	10
ENE	0	2	1	2	0	0	5
E	0	0	2	1	0	0	3
ESE	0	1	2	0	0	0	3
SE	0	1	2	0	0	0	3
SSE	0	0	2	0	0	0	2
S	0	0	3	1	0	0	4
SSW	0	0	3	7	1	0	11
SW	0	0	4	3	0	0	7
WSW	0	2	1	0	0	0	3
W	0	0	1	1	0	0	2
WNW	0	2	11	4	1	0	18
NW	0	5	5	0	0	0	10
NNW	0	3	1	0	0	0	4
VARIABLE							

TOTAL 91
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: D
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	16	2	0	0	0	19
NNE	4	23	0	1	0	0	28
NE	1	23	6	6	1	0	37
ENE	0	10	24	8	0	0	42
E	0	5	10	2	0	0	17
ESE	0	8	10	2	0	0	20
SE	1	22	11	0	0	0	34
SSE	0	12	2	1	0	0	15
S	0	2	14	2	0	0	18
SSW	1	2	21	34	0	0	58
SW	0	1	16	20	0	0	37
WSW	0	1	19	7	0	0	27
W	0	4	20	8	0	0	32
WWN	2	13	51	11	4	0	81
NW	1	23	9	4	2	0	39
NNW	4	27	5	2	2	0	40
VARIABLE							

TOTAL 544
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: E
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	6	8	3	0	0	18
NNE	2	7	4	17	4	0	34
NE	1	12	11	14	14	5	57
ENE	5	12	28	24	4	0	73
E	0	13	26	4	0	0	43
ESE	1	13	4	0	0	0	18
SE	3	27	6	0	0	0	36
SSE	3	13	13	3	0	0	32
S	0	4	14	5	3	0	26
SSW	1	4	38	86	1	0	130
SW	1	3	42	90	2	0	138
WSW	3	4	14	3	0	0	24
W	4	8	30	16	0	0	58
WNW	0	7	36	18	7	3	71
NW	2	9	15	8	7	2	43
NNW	1	10	11	10	9	0	41
VARIABLE							

TOTAL 842
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: F
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-	4-7	8-12	13-18	19-24	>24	
N	0	5	3	4	0	0	12
NNE	0	3	3	0	0	0	6
NE	0	3	5	0	0	0	8
ENE	0	3	1	1	0	0	5
E	0	2	4	0	0	0	6
ESE	0	1	2	0	0	0	3
SE	0	2	0	0	0	0	2
SSE	0	2	3	2	0	0	7
S	0	1	1	8	0	0	10
SSW	0	4	6	15	0	0	25
SW	1	0	12	37	0	0	50
WSW	0	0	15	28	0	0	43
W	0	3	14	3	0	0	20
WNW	2	4	13	0	0	0	19
NW	0	9	11	0	0	0	20
NNW	0	7	7	0	0	0	14
VARIABLE							

TOTAL 250
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4/ 1/91 TO 6/30/91
 STABILITY CLASS: G
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	4	1	0	0	0	5
NNE	1	5	0	0	0	0	6
NE	0	2	0	0	0	0	2
ENE	0	1	0	0	0	0	1
E	0	2	0	0	0	0	2
ESE	1	2	0	0	0	0	3
SE	1	5	0	0	0	0	6
SSE	2	2	1	0	0	0	5
S	0	3	2	3	0	0	8
SSW	0	3	4	6	0	0	13
SW	0	4	10	14	0	0	28
WSW	0	2	12	3	0	0	17
W	0	2	11	0	0	0	13
WSW	0	5	6	0	0	0	11
NW	0	2	2	0	0	0	4
NNW	3	5	0	0	0	0	8
VARIABLE							

TOTAL 132
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: A
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	3	2	0	0	5
NNE	0	0	9	2	0	0	11
NE	0	6	14	0	0	0	20
ENE	0	0	7	7	0	0	14
E	0	0	3	0	0	0	3
ESE	0	1	2	0	0	0	3
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	2	0	0	0	2
SSW	0	0	1	11	1	0	13
SW	0	1	4	7	1	0	13
WSW	0	0	1	0	0	0	1
W	0	0	2	0	0	0	2
WNW	0	1	15	2	0	0	18
NW	0	1	2	0	0	0	3
NNW	0	1	4	2	0	0	7
VARIABLE							

TOTAL 116
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: G
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	4	2	1	0	0	7
NNE	0	2	4	0	1	0	7
NE	0	2	4	0	0	0	6
ENE	0	1	1	0	0	0	2
E	0	0	1	0	0	0	1
ESE	0	0	1	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	0	1	0	0	1
SSW	0	0	1	2	1	0	4
SW	0	1	3	2	0	0	6
WSW	0	0	2	1	0	0	3
W	0	0	0	0	0	0	0
WNW	0	0	14	8	0	0	22
NW	0	5	3	0	0	0	8
NNW	0	0	0	1	0	0	1
VARIABLE							

TOTAL 70
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: C
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	1	0	0	4
NNE	0	7	0	0	0	0	8
NE	0	7	1	0	0	0	8
ENE	0	1	3	0	0	0	4
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	0	0	1	0	1
SSW	0	0	2	3	0	0	5
SW	0	0	2	2	0	0	4
WSW	0	0	1	0	0	0	1
W	0	0	1	0	0	0	1
WNW	0	1	14	3	0	0	18
NW	0	5	8	1	0	0	14
NNW	0	6	1	0	0	0	7
VARIABLE							

TOTAL 69
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: D
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	3	21	3	1	0	0	28
NNE	3	18	5	1	2	0	29
NE	2	31	5	1	0	0	39
NNE	2	7	16	2	0	0	27
E	0	5	4	0	0	0	9
ESE	3	7	4	0	0	0	14
SE	0	8	1	0	0	0	9
SSE	1	11	4	2	1	0	19
S	0	6	10	4	3	0	23
SSW	1	4	23	28	0	0	56
SW	0	8	13	16	0	0	37
WSW	0	4	17	0	0	0	21
W	0	7	14	2	0	0	23
WNW	0	28	43	10	0	0	81
NW	5	52	10	3	1	0	71
NNW	3	31	2	5	0	0	41
VARIABLE							

TOTAL 527
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: E
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	7	24	32	12	0	76
NNE	0	5	22	20	5	0	52
NE	0	6	17	10	1	1	35
ENE	0	9	21	11	0	0	41
E	0	10	12	1	0	0	23
ESE	0	7	10	0	0	0	17
SE	0	25	7	0	0	0	32
SSE	0	14	7	8	1	0	30
S	2	11	49	17	4	1	84
SSW	0	9	70	89	3	0	171
SW	1	1	40	51	1	0	94
WSW	3	7	16	3	0	0	29
W	1	10	15	2	0	0	28
WNW	0	6	35	15	1	0	57
NW	4	11	20	5	0	0	40
NNW	2	16	17	9	5	0	49
VARIABLE							

TOTAL 858
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: F
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	7	3	0	0	0	10
NNE	1	3	4	0	0	0	8
NE	0	1	3	0	0	0	4
ENE	0	1	7	0	0	0	8
E	0	4	3	0	0	0	7
ESE	0	4	1	0	0	0	5
SE	1	8	6	0	0	0	15
SSE	0	6	6	2	0	0	14
S	0	4	18	6	0	0	28
SSW	1	1	17	13	0	0	32
SW	1	5	27	24	0	0	57
WSW	1	2	20	3	0	0	26
W	0	3	23	1	0	0	27
WNW	1	2	17	0	0	0	20
NW	0	4	7	0	0	0	11
NNW	0	10	12	0	0	0	22
VARIABLE							

TOTAL 294
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 7/ 1/91 TO 9/30/91
 STABILITY CLASS: G
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	10	0	0	0	0	10
NNE	2	3	1	0	0	0	6
NE	1	6	0	0	0	0	7
ENE	1	1	1	0	0	0	3
E	0	3	3	0	0	0	6
ESE	1	2	1	0	0	0	4
SE	1	2	2	0	0	0	5
SSE	2	6	9	2	0	0	19
S	1	7	4	4	0	0	16
SSW	1	9	8	4	0	0	22
SW	1	3	21	21	0	0	46
WSW	3	4	16	7	0	0	30
W	0	5	8	0	0	0	13
WNW	1	10	4	0	0	0	15
NW	2	6	2	0	0	0	10
NNW	2	6	0	0	0	0	8
VARIABLE							

TOTAL 220
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: A
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	2	2	1	5
NNE	0	0	0	4	2	0	6
NE	0	0	0	1	1	0	2
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	2	0	0	0	2
NW	0	0	0	1	0	0	1
NNW	0	0	5	3	0	0	8
VARIABLE							

TOTAL 24
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: B
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	1	1
NNE	0	0	2	1	0	0	3
NE	0	0	0	1	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	3	0	0	0	3
SW	0	1	1	1	0	0	3
WSW	0	0	2	0	0	0	2
W	0	0	0	0	0	0	0
WSW	0	0	7	3	0	0	10
WNW	0	0	2	2	0	0	4
NNW	0	0	0	1	3	0	4
VARIABLE							

TOTAL 31
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: C
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	1	0	1	0	2
NNE	0	2	0	0	0	0	2
NE	0	0	1	1	0	0	2
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	1	1	6	0	0	8
SW	0	0	1	5	0	0	6
WSW	0	0	0	0	0	0	0
W	0	0	2	3	0	0	5
WNW	0	0	7	3	0	0	10
NW	0	1	5	2	0	0	8
NNW	0	0	0	3	1	0	4
VARIABLE							

TOTAL 47
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: 0
 ELEVATION: 150

WIND DIRECTION -----	WIND SPEED (MPH)						TOTALS -----
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	7	14	12	8	3	45
NNE	1	20	5	6	8	2	42
NE	1	8	6	6	6	1	28
ENE	1	3	3	0	0	0	7
E	0	1	0	0	0	0	1
ESE	1	0	1	0	0	0	2
SE	0	6	4	3	0	0	13
SSE	0	3	8	2	0	0	13
S	1	6	5	6	0	0	18
SSW	0	4	7	23	2	0	36
SW	0	1	8	19	0	0	28
WSW	0	1	11	2	0	0	14
W	0	0	11	13	6	0	30
WNW	0	7	30	16	13	5	71
NW	0	7	14	5	2	0	28
NNW	0	11	7	10	17	5	50
VARIABLE							

TOTAL 426
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: E
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	9	31	33	9	6	88
NNE	2	11	35	26	44	13	131
NE	2	11	20	17	37	22	109
ENE	1	14	8	4	4	0	31
E	0	5	5	4	7	0	21
ESE	1	11	13	0	0	0	25
SE	4	20	10	7	0	0	41
SSE	0	5	13	16	0	0	34
S	2	6	22	14	1	0	45
SSW	1	14	36	53	15	0	119
SW	3	12	49	44	12	0	120
WSW	4	11	37	31	1	0	84
W	0	4	13	17	12	4	50
WSW	1	8	26	54	25	8	122
NW	0	4	29	47	23	1	104
NSW	1	4	42	46	24	11	128
VARIABLE							

TOTAL 1252
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: F
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	4	2	1	0	0	7
NNE	0	3	0	4	0	0	7
NE	0	3	2	0	0	0	5
ENE	0		1	0	0	0	1
E	0	1	1	0	0	0	2
ESE	0	1	3	0	0	0	4
SE	0	13	3	0	0	0	16
SSE	0	2	6	1	0	0	9
S	1	2	14	0	0	0	17
SSW	0	2	9	5	0	0	16
SW	0	2	17	21	0	0	40
WSW	0	1	21	10	0	0	32
W	0	5	14	3	0	0	22
WSW	0	2	6	0	0	0	8
WNW	0	2	4	0	0	0	6
NNW	1	4	1	0	0	0	6
VARIABLE							

TOTAL 198
 PERIODS OF CALM (HOURS): 0

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 10/ 1/91 TO 12/31/91
 STABILITY CLASS: G
 ELEVATION: 150

WIND DIRECTION	WIND SPEED (MPH)						TOTALS
	1-3	4-7	8-12	13-18	19-24	>24	
N	2	3	0	0	0	0	5
NNE	1	3	0	0	0	0	4
NE	0	4	0	0	0	0	4
ENE	2	2	0	0	0	0	4
E	0	0	0	0	0	0	0
ESE	1	4	0	0	0	0	5
SE	0	4	1	0	0	0	5
SSE	0	5	5	6	0	0	16
S	0	3	9	6	0	0	18
SSW	0	2	20	13	0	0	35
SW	0	2	12	15	0	0	29
WSW	0	2	11	8	0	0	21
W	0	7	8	0	0	0	15
WNW	2	5	2	0	0	0	9
NW	0	7	1	0	0	0	8
NNW	0	2	0	0	0	0	2
VARIABLE							

TOTAL 180
 PERIODS OF CALM (HOURS): 0

SEMIANNUAL RADIOACTIVE EFFLUENT
RELEASE REPORT

G - ODCM REVISIONS, REMP NON-COMPLIANCES AND
MAJOR CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS

A. Changes to the ODCM:

According to Technical Specification 6.13.c and ODCM Control 6.8.1.4, the Semiannual Radioactive Effluent Release Report shall include any changes to the Offsite Dose Calculation Manual (ODCM) made during the reporting period.

There was a single revision to the ODCM, Rev. 18, that was made during this reporting period.

In this revision, the ODCM was updated to reflect the organizational and licensing commitment changes under the POL. Portions of the Definitions and Administrative Controls Sections in the ODCM were revised to remove operational references which are no longer needed. In addition, references to the Onsite Meteorological Tower were deleted. Such deletions are consistent with the current Technical Specifications. The ground level data collection duty has been transferred from the onsite to the offsite 33 foot level instruments. The 33 foot level data at the offsite tower have been reviewed and accepted by the NRC as representative of the site in the original licensing meteorological data base submittal.

Revision 18 to the ODCM was approved by the Review of Operations Committee on August 1, 1991 and became effective on August 7, 1991 when the POL was implemented. A copy of this revision is attached to this Semiannual Effluent Release Report.

B. REMP Non-compliance:

Action Statements c of ODCM Control 3.12.1 and a and b of ODCM Control 3.12.2 require certain items of REMP noncompliance to be reported in the Semiannual Radioactive Effluent Release Report.

There were no such REMP non-compliances during this reporting period.

C. Major Changes to Radioactive Solid Waste Treatment Systems:

Technical Specification 6.8.1.4 and PCP 9.3.1 and 9.4.4 state that the Semiannual Radioactive Effluent Release Report shall include major changes to radioactive solid waste treatment systems.

There were no major changes to radioactive solid waste treatment systems during this reporting period.