Effluent and Waste Disposal

Semi-Annual Report

July 1 - December 31, 1979

Facility Indian Point 3

Licensee Power Authority of the State of New York

This information is provided in accordance with the requirements of Regulatory Guide 1.21. The numbered sections of this report reference corresponding sections of the subject Regulatory Guide, pages 1.21-10 to 12.

A. Supplemental Information

1. Regulatory Limits

Indian Point Unit 3 is presently subject to limits on radioactive waste releases that are set forth in sections 2.4 and 3.4 of Appendix B to Docket # 50-286 entitled "Environmental Technical Specification Requirements for Once-Through Cooling" (T.S.). The percent of technical specification limit reported in Table 1A and the percent of applicable limit reported in Table 2A are the percent of one half of the quarterly limit specified in the ETSR.

2. Maximum Permissible Concentrations

a. Fission and Activation Gases

The quarterly limits for those specifications stated in the ETSR have been used to calculate the percent of technical specification limit. The K, L, M, N values for vent release points are based on the isotopic concentrations reported in Table 1C and on the individual isotopic K, L, M, N values in Table 2.4-5 of the ETSR. The percent of permissible discharges reported for IP-3 are based on assuming that IP-3 can use only 50% of the T.S. limits measured in Curies/ second and detailed in Memorandum of Understanding between PASNY and Con Edison.

b&.. Iodines & Pariculates

The quarterly limits for iodine-131 and particulates with half-lives greater than 8 days in section 2.4.2.b.3 of the ETSR have been used as the maximum permissible concentration for the purpose of calculating the percent of technical specification limit. Again only one half of the permissible limit is used for IP-3 as stated in 2(a) above.

Docket # 50-286
Control # 8003050490
Date 2-29-80 of Document
REGULATORY DOCKET FILE

d. Liquid Effluents

All liquid discharges from Indian Point are made through a common discharge canal with a minimum of 100,000 gpm dilution water. The isotopic content, excluding tritium and dissolved noble gas, of continuous and batch mode discharges from the site for the first and second calendar quarters have been added and a weighted average fraction of MPC has been caluculated for this isotopic mixture as described in 10 CFR 20. The percent of applicable limit reported is the percent of MPC concentration of the time averaged diluted concentration for the calendar quarter.

The tritium limit has been established in the same manner as the other isotopes in liquid effluents.

Since there is no limit stated for dissolved noble gases in 10 CFR 20, we have established a limit of 2.55×10^{-3} uCi/cc based on a dose calculation that has been provided to USNRC inspectors.

3. Average Energy

The average energy (E) of the radionuclide mixture in releases of fission and activation gases was as follows:

3rd Quarter:	E = 5.18 E-2 MeV/dis	EB = 1.61 E-1 MeV/dis
4th Quarter:	E = 8.86 E-1 MeV/dis	EB = 6.33 E-1 MeV/dis

4. Measurements and Approximations of Total Radioactivity

a. Fission and Activation Gases

Analysis of effluent gases has been performed in compliance with the requirements of Table 2.4-2 of the ETSR. In the case of isolated tanks (batch release) the total activity discharged is based on an isotopic analysis of each batch and the volume of gas in the batch corrrected to standard temperature and pressure.

Vapor containment ventilation discharges have been treated as batch releases. At least one complete isotopic concentration analysis of containment air is performed per month and this is applied to a gross analysis of the ventilation air performed prior to each pressure relief. This information is combined with the volume of air in each discharge to calculate the radionuclide composition of these discharges.

The continuous discharges are based on weekly samples of ventilation air for isotopic content. This information is combined with total air volume discharged by this route. The batch and containment ventilation releases are then used to determine continuous discharges.

b&c Iodines and Particulates

Iodine-131 and particulate releases are quantified by collecting a continuous sample of ventilation air on a potassium-iodide impregnated activated charcoal cartridge and a glass-fiber filter paper. These samples are changed weekly as required in Table 2.4-2 of the ETSR and the concentration of isotopes found by analysis of these samples is combined with the volume of air discharged during the sampling period to calculate the amount of activity discharged.

For other iodine isotopes the ratio of each isotope to iodine-131 is determined for a minthly 24 hour sample. These ratios are then used, along with the total monthly discharge of iodine-131, to calculate the amount of these other isotopes discharged in this monthly period.

d. Liquid Effluents

A proportional composite sample of each batch discharge is taken and an isotopic analysis is performed in compliance with requirements specified in Table 2.4-1 of the ETSR. This isotopic concentration data is combined with information on volume discharged to determine the amount of each isotope discharged in this period.

Samples of continuous discharges have been taken and analyzed in compliance with Table 2.4-1 of the ETSR. This concentration data is combined with the volume discharged to calculate the total activity discharged.

5. Batch Releases

a. Liquid

	3rd Quarter	4th Quarter
Number of Batch Releases	19	9
Total Time Period Batch Releases	6278	2880
Maximum " " " "	3095	330
Average " " " "	330	320
Minimum " " " "	25	240
Average Stream Flow		

b. Gaseous

Number of Batch Releases	46	2
Total Time Period Batch Releases	12340	115
Maximum " " " "	5960	95
Average " " " "	268	58
Minimum " " " "	2	20

6. Abnormal Releases

a. Liquid
None

b. Gaseous
None

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EFFLUENT AND WASTE DISPOSAL

SEMI - ANNUAL REPORT

B. GASEOUS EFFLUENTS
THIRD AND FOURTH
QUARTERS, 1979

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (YEAR) 1979

GASEOUS EFFLUENTS–SUMMATION OF ALL RELEASES

	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
A. Fission & activation gases				
1. Total release	Ci	1.91 E+2	5.59 E+1	2.5 E+1
2. Average release rate for period	μCi/sec	2.40 E+1	7.03 E+0	
3. Percent of Technical specification limit	%	6.94 E-1	5.39 E-1	
B. Iodines				
1. Total iodine-131	Ci	5.77 E-4	1.28 E-3	2.5 E+1
2. Average release rate for period	μCi/sec	7.26 E-5	1.61 E-4	
3. Percent of technical specification limit	%	6.32 E-2	1.30 E-1	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	6.66 E-4	1.37 E-3	2.5 E+1
2. Average release rate for period	μCi/sec	8.38 E-4	1.72 E-4	
3. Percent of technical specification limit	%	6.32 E-2	1.30 E-1	
4. Gross alpha radioactivity	Ci	<1.96 E-7	<2.34 E-7	
D. Tritium				
1. Total release	Ci	2.56 E0	5.30 E0	2.5 E+1
2. Average release rate for period	μCi/sec	3.22 E-1	6.67 E-1	
3. Percent of technical specification limit	%	. E	. E	

TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (YEAR)

GASEOUS EFFLUENTS–GROUND-LEVEL RELEASES

Nuclides Released	Unit	CONTINUOUS MODE Quarter 3rd	CONTINUOUS MODE Quarter 4th	BATCH MODE Quarter 3rd	BATCH MODE Quarter 4th
1. Fission gases					
krypton-85	Ci	2.78 E-2	2.50 E+1	4.19 E 0	3.88 E-4
krypton-85m	Ci	6.55 E-1	8.97 E-2	3.39 E-1	. E
krypton-87	Ci	. E	3.42 E-1	1.02 E-1	. E
krypton-88	Ci	. E	3.24 E-1	2.84 E-1	. E
xenon-133	Ci	3.02 E+1	1.26 E-1	1.27 E+2	. E
xenon-135	Ci	. E	7.57 E-2	4.99 E 0	. E
xenon-135m	Ci	. E	5.56 E 0	3.44 E-1	. E
xenon-138	Ci	. E	2.16 E+1	. E	. E
Others (specify)	Ci	. E	. E	. E	. E
Xe 131 m	Ci	2.01 E+1	2.29 E 0	2.10 E 0	8.21 E-6
Xe 133 m	Ci	. E	4.80 E-1	1.30 E 0	. E
unidentified	Ci	. E	. E	. E	. E
Total for period	Ci	5.10 E+1	5.59 E+1	1.41 E+2	3.96 E-4
2. Iodines					
iodine-131	Ci	5.77 E-4	1.28 E-3	. E	. E
iodine-133	Ci	1.71 E-4	<1.94 E-4	. E	. E
iodine-135	Ci	<1.35 E-3	<3.00 E-3	. E	. E
Total for period	Ci	7.48 E-4	1.28 E-3	. E	. E
3. Particulates					
strontium-89	Ci	7.61 E-7	2.77 E-7	. E	. E
strontium-90	Ci	6.09 E-6	1.70 E-6	. E	. E
cesium-134	Ci	1.25 E-5	2.07 E-7	. E	. E
cesium-137	Ci	1.84 E-5	1.16 E-6	. E	. E
barium-lanthanum-140	Ci	. E	. E	. E	. E
Others (specify) Iron-55	Ci	1.29 E-5	1.03 E-5	. E	. E
Cobalt-57	Ci	2.56 E-7	1.25 E-6	. E	. E
Cobalt-58	Ci	7.73 E-6	1.07 E-5	. E	. E
Cobalt-60	Ci	7.21 E-6	8.53 E-6	. E	. E
Nickel-63	Ci	3.88 E-6	3.72 E-5	E	E
Zinc-65	Ci	E	3.35 E-6	E	E
Strontium-85	Ci	6.83 E-7	E	E	E
Rutheniun-103	Ci	E	4.70 E-7	E	E
Cadmium-109	Ci	7.08 E-6	6.45 E-6	E	E
Tin-113	Ci	E	2.71 E-7	E	E
Antimony-125	Ci	4.50 E-6	E	E	E
Barium-133	Ci	8.87 E-7	E	E	E
Cerium-139	Ci	6.95 E-7	1:01 E-6	E	E
Cerium-141	Ci	3.01 E-7	3.83 E-6	E	E
Cerium-144	Ci	5.05 E-6	E	E	E
Mercury-203	Ci	8.19 E-8	E	E	E
Unidentified	Ci	E	E	E	E

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C. LIQUID EFFLUENTS
THIRD AND FOURTH
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TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (YEAR) 1979

LIQUID EFFLUENTS—SUMMATION OF ALL RELEASES

	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	1.32E-1	2.70E-1	2.5 E+1
2. Average diluted concentration during period	μCi/ml	5.79E-10	1.67E-9	
3. Percent of applicable limit	%	5.31E-3	1.19E-1	
B. Tritium				
1. Total release	Ci	5.24E+1	6.21E+1	2.5 E+1
2. Average diluted concentration during period	μCi/ml	2.30E-7	3.83E-7	
3. Percent of applicable limit	%	7.67E-3	1.28E-2	
C. Dissolved and entrained gases				
1. Total release	Ci	1.13E-1	1.09E-2	2.5 E+1
2. Average diluted concentration during period	μCi/ml	4.96E-10	6.73E-11	
3. Percent of applicable limit	%	1.95E-5	2.64E-6	
D. Gross alpha radioactivity				
1. Total release	Ci	<5.62E-4	1.60E-4	2.5 E+1
E. Volume of waste released (prior to dilution)	liters	5.37E+6	4.49E+6	1.0 E+1
F. Volume of dilution water used during period	liters	2.28E+11	1.62E+11	1.0 E+1

TABLE 2B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (YEAR) 1979

LIQUID EFFLUENTS

Nuclides Released	Unit	CONTINUOUS MODE 3rd Quarter	CONTINUOUS MODE 4th Quarter	BATCH MODE 3rd Quarter	BATCH MODE 4th Quarter
strontium-89	Ci	. E	. E	2.0 E-4	1.41 E-4
strontium-90	Ci	. E	. E	8.20 E-4	4.54 E-4
cesium-134	Ci	. E	. E	7.07 E-3	4.42 E-3
cesium-137	Ci	. E	. E	2.15 E-2	1.37 E-2
iodine-131	Ci	. E	. E	2.33 E-3	5.65 E-2
cobalt-58	Ci	. E	. E	2.10 E-2	5.50 E-2
cobalt-60	Ci	. E	. E	1.59 E-2	1.15 E-2
iron-59	Ci	. E	. E	1.05 E-3	4.32 E-4
zinc-65	Ci	. E	. E	1.07 E-3	4.27 E-4
manganese-54	Ci	. E	. E	5.55 E-3	2.05 E-3
chromium-51	Ci	. E	. E	6.30 E-3	3.10 E-3
zirconium-niobium-95	Ci	. E	. E	8.59 E-4	5.39 E-4
molybdenum-99	Ci	. E	. E	3.73 E-3	6.63 E-2
technetium-99m	Ci	. E	. E	4.18 E-4	5.15 E-4
barium-lanthanum-140	Ci	. E	. E	2.49 E-3	2.42 E-3
cerium-141	Ci	. E	. E	9.03 E-4	9.30 E-4
rubidium - 88	Ci	. E	. E	6.87 E-4	. E
yttrium - 88	Ci	. E	. E	3.50 E-5	. E
iodine - 133	Ci	. E	. E	1.02 E-4	. E
iodine - 132	Ci	. E	. E	2.55 E-5	. E
cobalt - 57	Ci	. E	. E	1.94 E-6	3.34 E-6
unidentified	Ci	. E	. E	. E	. E
Total for period (above)	Ci	. E	. E	1.32 E-1	2.70 E-1
xenon-133	Ci	. E	. E	1.06 E-1	1.04 E-2
xenon-135	Ci	. E	. E	6.83 E-3	5.57 E-4
cerium - 139				1.51E-5	7.90E-4
cerium - 144				2.20E-4	3.96E-5
antimony - 122				6.67E-4	1.64E-4
antimony - 124				2.04E-4	
antimony - 125				3.14E-4	
neptunium - 239				1.20E-5	1.86E-4
strontium - 85				9.12E-5	
ruthenium - 103				1.06E-5	
iron - 55				3.34E-2	4.38E-2
nickel - 63				3.79E-3	4.96E-3
phosphorus - 32				1.02E-3	1.39E-3
mercury - 203					3.31E-5
tin - 113					1.06E-4
barium - 133					3.72E-5

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D. SOLID WASTE
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EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of waste	Unit	6-month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3	1.2 E+1	
	Ci	1.3 E+2	1.0 E+2
b. Dry compressible waste, contaminated equip, etc.	m^3	2.1 E+2	
	Ci	6.4 E0	1.0 E+2
c. Irradiated components, control rods, etc.	m^3	. E	
	Ci	. E	. E
d. Other (describe)	m^3	2.6 E0	
	Ci	2.7 E+1	1.0 E+2

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

a.	Cobalt-60	%	3.7 E+1
	Cobalt-58	%	3.0 E+1
	Cesium-137	%	1.1 E+1
	Manganese-54	%	9.0 E0
	Cesium-134	%	8.0 E0
	Zinc-65	%	5.0 E0
b.	Cobalt-58	%	8.1 E+1
	Cobalt-60	%	1.1 E+1
	Cesium-137	%	6.0 E0
d.	Cobalt-58	%	8.1 E+1
	Cobalt-60	%	1.2 E+1
	Chromium-51	%	7.0 E0

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
12	Truck	Barnwell, South Carolina

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

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E. RADIOLOGIAL IMPACT ON MAN
THIRD AND FOURTH
QUARTERS, 1979

RADIOLOGICAL IMPACT EVALUATION

Doses from noble gas immersion, inhalation, ground deposition, and vegetation ingestion were evaluated for the residence located 730 meters east of Indian Point Unit No.3, which is the point of maximum offsite radiation dose (all pathways considered) likely to be occupied. Doses were evaluated for an individual ingesting milk and meat from a cow located about 8.9 miles to the ESE. In all cases, these evaluations were performed using the models presented in Regulatory Guide 1.109. Noble gas releases were considered to be either batch or continuous, while all iodine and particulate release were considered to be continuous. Noble gas release from containment pressure reliefs and purges were treated as a continuous release, because of the large number of such releases. Other releases (e.g. gas decay tank releases) were considered as batch and were evaluated using actual meterological conditions existing during the release period. Continuous releases were evaluated using average meteorological conditions based on the six month release period. Estimates of relative deposition per unit area were obtained from the numerical approximation presented in the NRC computer program XOQDOQ for ground releases. Values of atmospheric dispersion factors (X/Q) were computed using the Sagendorf straight line air flow model, assuming a ground level release, and the subroutine POLYN (from XOQDOQ) for computing standard deviations in the horizontal direction (σ_y) and vertical direction (σ_z).

Integrated doses for the population within 50 miles of Indian Point from gaseous effluents were computed based on linear interpolation of 1970 - 2010 population data contained in the Indian Point Unit No. 3 FSAR.

NUREG-0017, "Calculation of Release of Radioactive Materials in Gaseous and Liquid effluents from Pressurized Water Reactors", assumes an annual release of 8.0Ci/yr of Carbon-14. Therefore, to be consistent with NUREG-0017, a release of 4.0 Curies of Carbon-14 was assumed for the six month period in addition to the radioactive materials measured in Indian Point gaseous effluents.

GASEOUS RELEASES

Indian Point Unit 3

RADIOLOGICAL IMPACT ON MAN

(Reference regulatory guide 1.21, page 12)

A, Maximum Individual Doses

Pathways (Gaseous)	Total Body (mr)	Skin (mr)	Thyroid (mr)	Bone (mr)
Noble Gas Immersion				
a) Batch Releases	8.61×10^{-4}	2.25×10^{-3}		
b) Continuous Releases	3.68×10^{-2}	8.16×10^{-2}		
Inhalation	5.25×10^{-3}*	-	1.15×10^{-2}*	1.11×10^{-2}**
Ground Deposition	2.39×10^{-4}	2.81×10^{-4}	-	-
Milk Ingestion*	2.25×10^{-3}	-	2.96×10^{-3}	2.24×10^{-3}
Meat Ingestion	3.38×10^{-4}***	-	3.42×10^{-4}***	1.13×10^{-3}**
Vegetable Ingestion	2.04×10^{-2}***	-	3.06×10^{-2}***	6.25×10^{-2}**

* Infants are critical age group
** Adults are critical age group
*** Children are critical age group

Pathways (Liquid)

All — See Attached "LADTAP: printout Attachment I

B. Population Doses

Pathways (Gaseous)	Total Body (man-rem)	Thyroid (man-thyroid rem)
Noble Gas Immersion		
a) Batch Release	.0481	
b) Continuous Release	1.38	
Inhalation	0.174	0.374
Ground Deposition	4.29×10^{-3}	
Totals	1.606	0.374

Pathways (Liquid)

All — See attached "LADTAP" printout Attachment I

C. Average Doses to Individuals

1. Liquid-Total Body
   2.35×10^{-5} mr

2. Gaseous-Total Body
   8.45×10^{-5} mr

LIQUID RELEASES

* * * AS LOW AS REASONABLY ACHIEVABLE * * *

ADULT DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		2.77E-01	7.57E-02	5.19E-02	8.42E-03	2.01E-02	7.93E-03	2.92E-02
INVERTEBRATE		1.52E-02	1.46E-02	4.53E-03	6.68E-04	1.62E-03	1.03E-02	1.80E-02
ALGAE		5.82E-07	5.01E-08	3.21E-08	1.07E-08	3.47E-09	7.43E-09	7.19E-08
DRINKING		3.96E-13	2.09E-13	1.86E-13	1.96E-12	5.82E-14	8.10E-14	9.89E-14
SHORELINE	4.13E-04	3.52E-04	3.52E-04	3.52E-04	3.52E-04	3.52E-04	3.52E-04	3.52E-04
SWIMMING	0.0	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06
BOATING	0.0	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06
TOTAL	4.13E-04	2.93E-01	9.06E-02	5.68E-02	9.45E-03	2.21E-02	1.85E-02	4.76E-02

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	21.0	5.0	25.00
INVERTEBRATE	5.0	5.0	25.00
ALGAE	0.0	5.0	25.00
DRINKING	0.0	500.0	112.00
SHORELINE	50.0	5.0	1.00
SWIMMING	50.0	5.0	1.00
BOATING	100.0	5.0	1.00

SHOREWIDTH FACTOR=0.2

TEENAGER DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		2.21E-01	7.20E-02	3.08E-02	7.47E-03	1.53E-02	8.70E-03	2.21E-02
INVERTEBRATE		1.20E-02	1.12E-02	3.44E-03	5.91E-04	1.23E-03	7.83E-03	1.36E-02
ALGAE		5.89E-07	5.23E-08	3.19E-08	1.24E-08	3.47E-09	7.84E-09	7.17E-08
DRINKING		5.19E-13	2.57E-13	1.85E-13	2.28E-12	5.82E-14	8.93E-14	9.05E-14
SHORELINE	5.53E-04	4.72E-04	4.72E-04	4.72E-04	4.72E-04	4.72E-04	4.72E-04	4.72E-04
SWIMMING	0.0	1.02E-05	1.02E-05	1.02E-05	1.02E-05	1.02E-05	1.02E-05	1.02E-05
BOATING	0.0	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06
TOTAL	5.53E-04	2.34E-01	8.38E-02	3.47E-02	8.54E-03	1.70E-02	1.70E-02	3.63E-02

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	16.0	5.0	25.00
INVERTEBRATE	3.8	5.0	25.00
ALGAE	0.0	5.0	25.00
DRINKING	0.0	500.0	112.00
SHORELINE	67.0	5.0	1.00
SWIMMING	100.0	5.0	1.00
BOATING	100.0	5.0	1.00

SHOREWIDTH FACTOR=0.2

CHILD DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.27E-01	5.81E-02	1.24E-02	7.70E-03	6.61E-03	6.52E-03	9.50E-03
INVERTEBRATE		6.17E-03	5.37E-03	1.67E-03	6.33E-04	5.51E-04	3.54E-03	6.07E-03
ALGAE		6.12E-04	6.22E-05	3.48E-05	2.98E-05	3.47E-06	8.85E-06	7.16E-05
DRINKING		9.88E-10	4.64E-10	2.56E-10	5.44E-09	5.82E-11	1.09E-10	8.30E-11
SHORELINE	1.16E-04	9.86E-05	9.86E-05	9.86E-05	9.86E-05	9.86E-05	9.86E-05	9.86E-05
SWIMMING	0.0	2.55E-06	2.55E-06	2.55E-06	2.55E-06	2.55E-06	2.55E-06	2.55E-06
BOATING	0.0	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06	5.10E-06
TOTAL	1.16E-04	1.34E-01	6.36E-02	1.42E-02	8.47E-03	7.27E-03	1.02E-02	1.58E-02

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	6.9	5.0	25.00
INVERTEBRATE	1.7	5.0	25.00
ALGAE	0.0	5.0	25.00
DRINKING	0.0	500.0	112.00
SHORELINE	14.0	5.0	1.00
SWIMMING	25.0	5.0	1.00
BOATING	100.0	5.0	1.00

SHOREWIDTH FACTOR=0.2

INFANT DOSES

PATHWAY	DOSE (MREM PER YEAR INTAKE)							
	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.30E-02	9.37E-03	8.52E-04	1.35E-03	4.79E-04	1.10E-03	6.88E-04
INVERTEBRATE		4.30E-04	3.69E-04	1.07E-04	8.98E-05	3.24E-05	2.14E-04	3.57E-04
ALGAE		6.44E-07	8.83E-08	3.82E-08	7.18E-08	3.47E-09	1.20E-08	7.16E-08
DRINKING		1.66E-12	1.01E-12	3.42E-13	1.31E-11	5.82E-14	1.72E-13	7.99E-14
SHORELINE	2.48E-05	2.11E-05	2.11E-05	2.11E-05	2.11E-05	2.11E-05	2.11E-05	2.11E-05
SWIMMING	0.0	1.02E-12	1.02E-12	1.02E-12	1.02E-12	1.02E-12	1.02E-12	1.02E-12
BOATING	0.0	2.55E-08	2.55E-08	2.55E-08	2.55E-08	2.55E-08	2.55E-08	2.55E-08
TOTAL	2.48E-05	1.34E-02	9.76E-03	9.81E-04	1.46E-03	5.32E-04	1.33E-03	1.07E-03

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	0.5	5.0	25.00
INVERTEBRATE	0.1	5.0	25.00
ALGAE	0.0	5.0	25.00
DRINKING	0.0	500.0	112.00
SHORELINE	3.0	5.0	1.00
SWIMMING	0.0	5.0	1.00
BOATING	0.5	5.0	1.00

SHOREWIDTH FACTOR=0.2

* * * SELECTED LOCATION * * *

LOCATION IS DOWNSTREAM

ADULT DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.96E-01	5.39E-02	3.70E-02	5.88E-03	1.44E-02	5.66E-03	2.07E-02
INVERTEBRATE		1.08E-02	1.04E-02	3.23E-03	4.67E-04	1.16E-03	7.33E-03	1.29E-02
ALGAE		4.11E-07	3.55E-08	2.28E-08	7.47E-09	2.48E-09	5.30E-09	5.08E-08
DRINKING		2.86E-11	1.51E-11	1.34E-11	1.95E-10	4.45E-12	5.80E-12	7.30E-12
SHORELINE	2.95E-04	2.51E-04	2.51E-04	2.51E-04	2.51E-04	2.51E-04	2.51E-04	2.51E-04
SWIMMING	0.0	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06
BOATING	0.0	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06
TOTAL	2.95E-04	2.07E-01	6.46E-02	4.05E-02	6.61E-03	1.58E-02	1.32E-02	3.38E-02

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	21.0	7.0	31.00
INVERTEBRATE	5.0	7.0	31.00
ALGAE	0.0	7.0	31.00
DRINKING	0.0	7.0	19.00
SHORELINE	50.0	7.0	7.00
SWIMMING	50.0	7.0	7.00
BOATING	100.0	7.0	7.00

SHOREWIDTH FACTOR=0.2

LOCATION IS DOWNSTREAM

TEENAGER DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.56E-01	5.14E-02	2.19E-02	5.22E-03	1.09E-02	6.22E-03	1.56E-02
INVERTEBRATE		8.52E-03	8.02E-03	2.46E-03	4.13E-04	8.79E-04	5.59E-03	9.72E-03
ALGAE		4.16E-07	3.71E-08	2.26E-08	8.70E-09	2.48E-09	5.60E-09	5.07E-08
DRINKING		3.75E-11	1.86E-11	1.34E-11	2.27E-10	4.45E-12	6.39E-12	6.63E-12
SHORELINE	3.95E-04	3.37E-04	3.37E-04	3.37E-04	3.37E-04	3.37E-04	3.37E-04	3.37E-04
SWIMMING	0.0	7.25E-06	7.25E-06	7.25E-06	7.25E-06	7.25E-06	7.25E-06	7.25E-06
BOATING	0.0	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06
TOTAL	3.95E-04	1.65E-01	5.97E-02	2.47E-02	5.98E-03	1.22E-02	1.22E-02	2.57E-02

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	16.0	7.0	31.00
INVERTEBRATE	3.8	7.0	31.00
ALGAE	0.0	7.0	31.00
DRINKING	0.0	7.0	19.00
SHORELINE	67.0	7.0	7.00
SWIMMING	100.0	7.0	7.00
BOATING	100.0	7.0	7.00

SHOREWIDTH FACTOR=0.2

LOCATION IS DOWNSTREAM

CHILD DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		9.00E-02	4.14E-02	8.80E-03	5.38E-03	4.72E-03	4.65E-03	6.71E-03
INVERTEBRATE		4.38E-03	3.84E-03	1.19E-03	4.42E-04	3.93E-04	2.53E-03	4.33E-03

ALGAE		4.32E-04	4.41E-05	2.46E-05	2.08E-05	2.48E-06	6.32E-06	5.06E-05
DRINKING		7.14E-08	3.37E-08	1.87E-08	5.43E-07	4.45E-09	7.82E-09	6.08E-09
SHORELINE	8.25E-05	7.04E-05	7.04E-05	7.04E-05	7.04E-05	7.04E-05	7.04E-05	7.04E-05
SWIMMING	0.0	1.81E-06	1.81E-06	1.81E-06	1.81E-06	1.81E-06	1.81E-06	1.81E-06
BOATING	0.0	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06	3.63E-06
TOTAL	8.25E-05	9.49E-02	4.54E-02	1.01E-02	5.92E-03	5.19E-03	7.26E-03	1.12E-02

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	6.9	7.0	31.00
INVERTEBRATE	1.7	7.0	31.00
ALGAE	0.0	7.0	31.00
DRINKING	0.0	7.0	19.00
SHORELINE	14.0	7.0	7.00
SWIMMING	25.0	7.0	7.00
BOATING	100.0	7.0	7.00

SHOREWIDTH FACTOR=0.2

LOCATION IS DOWNSTREAM

I N F A N T D O S E S

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
	DOSE (MREM PER YEAR INTAKE)							
FISH		9.23E-03	6.69E-03	6.07E-04	9.41E-04	3.42E-04	7.84E-04	4.86E-04
INVERTEBRATE		3.05E-04	2.64E-04	7.66E-05	6.28E-05	2.31E-05	1.53E-04	2.54E-04
ALGAE		4.55E-07	6.28E-08	2.71E-08	5.02E-08	2.48E-09	8.55E-09	5.06E-08
DRINKING		1.20E-10	7.35E-11	2.52E-11	1.31E-09	4.45E-12	1.23E-11	5.86E-12
SHORELINE	1.77E-05	1.51E-05	1.51E-05	1.51E-05	1.51E-05	1.51E-05	1.51E-05	1.51E-05
SWIMMING	0.0	7.25E-13	7.25E-13	7.25E-13	7.25E-13	7.25E-13	7.25E-13	7.25E-13
BOATING	0.0	1.81E-08	1.81E-08	1.81E-08	1.81E-08	1.81E-08	1.81E-08	1.81E-08
TOTAL	1.77E-05	9.55E-03	6.97E-03	6.99E-04	1.02E-03	3.80E-04	9.52E-04	7.55E-04

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)
FISH	0.5	7.0	31.00
INVERTEBRATE	0.1	7.0	31.00
ALGAE	0.0	7.0	31.00
DRINKING	0.0	7.0	19.00
SHORELINE	3.0	7.0	7.00
SWIMMING	0.0	7.0	7.00
BOATING	0.5	7.0	7.00

SHOREWIDTH FACTOR=0.2

* * * FISH CONSUMPTION POPULATION DOSES * * *
MAN-REM

SPORTFISH HARVEST

PATHWAY	AGE GROUP	USAGE	DOSE (MAN-REM) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	ADULT	7.24E+04	5.27E-01	1.74E-01	1.20E-01	1.22E-02	4.86E-02	1.92E-02	5.45E-02
FISH	TEENAGER	1.16E+04	8.93E-02	3.51E-02	1.47E-02	2.27E-03	7.76E-03	4.41E-03	8.65E-03
FISH	CHILD	7.00E+03	7.65E-02	4.04E-02	8.24E-03	3.28E-03	4.69E-03	4.63E-03	5.20E-03
FISH	TOTAL	9.10E+04	6.92E-01	2.49E-01	1.43E-01	1.78E-02	6.10E-02	2.82E-02	6.84E-02

DILUTION 7.00E+00 CATCH 9.10E+04 TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 1.68E+02 HR 1.68E+02 POPULATION=1.59E+04

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) ADULT=6.90E+00 TEEN=5.20E+00 CHILD=2.20E+00

* * * FISH CONSUMPTION POPULATION DOSES * * *
MAN-REM

COMMERCIAL HARVEST

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
			DOSE (MAN-REM)						
FISH	ADULT	8.65E+07	1.97E+00	7.16E-01	4.94E-01	3.96E-02	2.04E-01	8.05E-02	2.02E-01
FISH	TEENAGER	1.38E+07	3.37E-01	1.45E-01	6.04E-02	7.38E-03	3.26E-02	1.86E-02	3.20E-02
FISH	CHILD	8.36E+06	2.98E-01	1.68E-01	3.37E-02	1.07E-02	1.97E-02	1.95E-02	1.92E-02
FISH	TOTAL	1.09E+08	2.61E+00	1.03E+00	5.89E-01	5.77E-02	2.56E-01	1.19E-01	2.53E-01

DILUTION	CATCH	TIME(HR)
7.00E+00	1.55E+05	2.40E+02

TIME(HR)=INCLUDES FOOD PROCESSING TIME OF 2.40E+02 HR

POPULATION=1.90E+07

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) ADULT=6.90E+00 TEEN=5.20E+00 CHILD=2.20E+00

NEPA DOSES

NOTE--TOATL NEPA DOSE MUST INCLUDE SPORT CATCH, DOSES BELOW ARE FOR COMMERCIAL CATCH ONLY

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
			DOSE (MAN-REM)						
FISH	ADULT	1.23E+05	7.98E-01	2.90E-01	2.00E-01	1.60E-02	8.26E-02	3.26E-02	8.17E-02
FISH	TEENAGER	1.97E+04	1.36E-01	5.87E-02	2.44E-02	2.99E-03	1.32E-02	7.51E-03	1.29E-02
FISH	CHILD	1.19E+04	1.21E-01	6.81E-02	1.36E-02	4.32E-03	7.98E-03	7.88E-03	7.77E-03
FISH	TOTAL	1.55E+05	1.05E+00	4.17E-01	2.38E-01	2.33E-02	1.04E-01	4.80E-02	1.02E-01

* * * INVERTEBRATE CONSUMPTION POPULATION DOSES * * *
MAN-REM

SPORTFISH HARVEST

PATHWAY	AGE GROUP	USAGE	DOSE (MAN-REM) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	ADULT	7.94E+03	1.38E-02	1.59E-02	4.90E-03	4.46E-04	1.78E-03	1.14E-02	1.95E-02
INVER	TEENAGER	1.26E+03	2.30E-03	2.58E-03	7.79E-04	8.26E-05	2.84E-04	1.82E-03	3.09E-03
INVER	CHILD	7.94E+02	1.70E-03	1.73E-03	5.32E-04	1.24E-04	1.78E-04	1.16E-03	1.93E-03
INVER	TOTAL	1.00E+04	1.78E-02	2.02E-02	6.21E-03	6.53E-04	2.25E-03	1.44E-02	2.45E-02

DILUTION 7.00E+00 CATCH 1.00E+04 TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 1.68E+02 HR 1.68E+02 POPULATION=1.20E+04

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) ADULT=1.00E+00 TEEN=7.50E-01 CHILD=3.30E-01

* * * INVERTEBRATE CONSUMPTION POPULATION DOSES * * *
MAN-REM

COMMERCIAL HARVEST

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
			DOSE (MAN-REM)						
INVER	ADULT	1.25E+07	8.58E-03	1.08E-02	3.32E-03	2.36E-04	1.22E-03	7.80E-03	1.32E-02
INVER	TEENAGER	1.99E+06	1.44E-03	1.75E-03	5.28E-04	4.38E-05	1.94E-04	1.25E-03	2.09E-03
INVER	CHILD	1.25E+06	1.08E-03	1.18E-03	3.61E-04	6.56E-05	1.22E-04	7.91E-04	1.31E-03
INVER	TOTAL	1.58E+07	1.11E-02	1.38E-02	4.21E-03	3.46E-04	1.53E-03	9.84E-03	1.66E-02

DILUTION 7.00E+00 CATCH 1.00E+03 TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 2.40E+02 HR 2.40E+02 POPULATION=1.90E+07

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) ADULT=1.00E+00 TEEN=7.50E-01 CHILD=3.30E-01

NEPA DOSES

NOTE--TOATL NEPA DOSE MUST INCLUDE SPORT CATCH, DOSES BELOW ARE FOR COMMERCIAL CATCH ONLY

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
			DOSE (MAN-REM)						
INVER	ADULT	7.94E+02	1.25E-03	1.58E-03	4.83E-04	3.44E-05	1.77E-04	1.14E-03	1.92E-03
INVER	TEENAGER	1.26E+02	2.10E-04	2.55E-04	7.69E-05	6.38E-06	2.82E-05	1.82E-04	3.04E-04
INVER	CHILD	7.94E+01	1.57E-04	1.72E-04	5.25E-05	9.59E-06	1.77E-05	1.15E-04	1.91E-04
INVER	TOTAL	1.00E+03	1.62E-03	2.01E-03	6.13E-04	5.04E-05	2.23E-04	1.43E-03	2.42E-03

* * * POPULATION WATER CONSUMPTION DOSES * * *

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
			DOSE (MAN-REM)						
DRINKING	ADULT	2.44E+02	4.20E-09	9.71E-10	1.10E-09	0.0	2.92E-10	9.70E-11	6.61E-11
DRINKING	TEENAGER	3.64E+01	7.65E-10	1.86E-10	1.66E-10	0.0	4.36E-11	2.24E-11	1.42E-11
DRINKING	CHILD	5.20E+01	1.81E-09	5.31E-10	3.27E-10	0.0	6.23E-11	5.94E-11	2.06E-11
DRINKING	TOTAL	3.33E+02	6.77E-09	1.69E-09	1.59E-09	0.0	3.98E-10	1.79E-10	1.01E-10

POPULATION=1.00E+00 DILUTION=1.00E+02 TRANSIT TIME=1.00E+06 HR (INCLUDING 24 HR FOR TREATMENT FACILITY)

AVERAGE INDIVIDUAL CONSUMPTION (L/YR) ADULT=3.70E+02 TEEN=2.60E+02 CHILD=2.60E+02

-----CUMULATIVE TOTAL-----

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
DRINKING	CUMUL TOTAL	3.33E+02	6.77E-09	1.69E-09	1.59E-09	0.0	3.98E-10	1.79E-10	1.01E-10

HYDROSPHERE TRITIUM DOSE

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI

* * * RECREATION POPULATION DOSES * * *

PATHWAY	AGE GROUP	USAGE	DOSE(MAN-REM) SKIN	TOTAL BODY	THYROID
SHORELINE	TOTAL POPUL	1.66E+07	9.79E-02	8.35E-02	8.35E-02

LOCATION- DOWNSTREAM

DILUTION=0.70E+01 TRANSIT TIME=0.40E+01 HR SWF=0.2

PATHWAY	AGE GROUP	USAGE	DOSE(MAN-REM) SKIN	TOTAL BODY	THYROID
SWIMMING	TOTAL POPUL	1.66E+07	0.0	1.21E-03	1.21E-03

LOCATION- DOWNSTREAM

DILUTION=0.70E+01 TRANSIT TIME=0.40E+01 HR

PATHWAY	AGE GROUP	USAGE	DOSE(MAN-REM) SKIN	TOTAL BODY	THYROID
BOATING	TOTAL POPUL	1.66E+07	0.0	6.03E-04	6.03E-04

LOCATION- DOWNSTREAM

DILUTION=0.70E+01 TRANSIT TIME=0.40E+01 HR

* * * DOSE TO BIOTA * * *

MRADS PER YEAR

ILUTION= 7.00E+00 TRANSIT TIME= 4.00E+00 HR

	INTERNAL	EXTERNAL	TOTAL
FISH	6.57E-01	2.21E-01	8.78E-01
INVERTEBRATE	2.63E-01	4.41E-01	7.04E-01
ALGAE	2.91E+00	6.37E-04	2.91E+00
MUSKRAT	5.51E+00	1.47E-01	5.66E+00
RACCOON	2.32E-01	1.10E-01	3.43E-01
HERON	4.09E+00	1.47E-01	4.24E+00
DUCK	5.44E+00	2.21E-01	5.66E+00

* * * COST-BENEFIT ANALYSIS * * *

NUCLIDE	RELEASE CI/YR	MAN-REM DOSE TOTAL BODY	MAN-REM DOSE THYROID	MAN-REM PER CURIE TOTAL BODY	MAN-REM PER CURIE THYROID
38SR 89	3.41E-04	1.01E-05	5.30E-09	2.95E-02	1.55E-05
38SR 90	1.27E-03	7.74E-03	2.07E-09	6.10E+00	1.63E-06
55CS 134	1.15E-02	2.27E-01	6.21E-03	1.97E+01	5.40E-01
55CS 137	3.52E-02	4.28E-01	2.83E-02	1.21E+01	8.04E-01
53I 131	5.88E-02	3.59E-04	7.67E-02	6.11E-03	1.30E+00
27CO 58	7.60E-02	3.36E-03	2.67E-03	4.42E-02	3.52E-02
27CO 60	2.74E-02	4.70E-02	4.62E-02	1.71E+00	1.09E+00
26FE 59	1.48E-03	1.33E-04	4.11E-05	8.98E-02	2.78E-02
30ZN 65	1.50E-03	2.13E-03	9.13E-05	1.42E+00	6.09E-02
25MN 54	7.60E-03	2.84E-03	8.52E-04	3.74E-01	1.12E-01
24CR 51	9.40E-03	5.33E-06	5.14E-06	5.67E-04	5.47E-04
40ZR 95	1.40E-03	3.36E-05	3.36E-05	2.40E-02	2.40E-02
43TC 99M	9.33E-04	4.36E-07	4.36E-07	4.67E-04	4.67E-04
56BA 140	4.91E-03	1.98E-05	1.50E-05	4.04E-03	3.05E-03
58CE 141	1.83E-03	2.66E-06	2.65E-06	1.45E-03	1.45E-03
93NP 239	1.98E-04	1.62E-07	1.62E-07	8.17E-04	8.17E-04
26FE 55	7.72E-02	1.02E-02	1.49E-08	1.32E-01	1.93E-07
28NI 63	8.75E-03	3.35E-04	0.0	3.83E-02	0.0
15P 32	2.41E-03	9.76E-02	4.62E-08	4.05E+01	1.92E-05
27CO 57	5.28E-06	8.78E-08	8.06E-08	1.66E-02	1.53E-02
44RU 103	1.05E-05	1.19E-07	1.17E-07	1.13E-02	1.12E-02
51SB 125	3.14E-04	5.70E-05	5.70E-05	1.82E-01	1.82E-01
58CE 144	2.60E-04	1.50E-06	1.47E-06	5.75E-03	5.65E-03
53I 133	1.02E-04	2.76E-07	3.55E-07	2.71E-03	3.48E-03
53I 132	2.55E-05	1.02E-07	1.02E-07	3.98E-03	3.98E-03
51SB 124	2.04E-04	1.17E-05	1.17E-05	5.75E-02	5.74E-02
TOTAL		8.27E-01	1.61E-01		

Indian Point 3

EFFLUENT AND WASTE DISPOSAL

SEMI - ANNUAL REPORT

F. METEOROLOGICAL DATA
THIRD AND FOURTH
QUARTERS, 1979

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: July 1 - September 30, 1979

STABILITY CLASS: A

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	23	18	0	0	0	0	41
NNE	25	66	1	0	0	0	92
NE	7	17	0	0	0	0	24
ENE	4	2	0	0	0	0	6
E	1	1	0	0	0	0	2
ESE	1	0	0	0	0	0	1
SE	2	0	0	0	0	0	2
SSE	1	0	0	0	0	0	1
S	39	18	0	0	0	0	57
SSW	85	49	0	0	0	0	134
SW	24	19	4	0	0	0	47
WSW	9	5	0	0	0	0	14
W	6	9	0	0	0	0	15
WNW	4	7	0	0	0	0	11
NW	4	12	1	0	0	0	17
NNW	4	6	0	0	0	0	10
Total	239	229	6	0	0	0	474

Periods of calm (hours): 0

Hours of missing data: Total hours of missing data for all stability classes this quarter = 42.

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: July 1 - September 30, 1979

STABILITY CLASS: B

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	4	0	0	0	0	0	4
NNE	4	3	0	0	0	0	7
NE	2	5	0	0	0	0	7
ENE	4	1	0	0	0	0	5
E	4	1	0	0	0	0	5
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	1	0	0	0	0	0	1
S	6	1	0	0	0	0	7
SSW	18	5	0	0	0	0	23
SW	7	5	3	0	0	0	15
WSW	4	1	0	0	0	0	5
W	6	0	0	0	0	0	6
WNW	0	1	0	0	0	0	1
NW	1	4	0	0	0	0	5
NNW	1	2	0	0	0	0	3
Total	62	29	3	0	0	0	94

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: July 1 - September 30, 1979

STABILITY CLASS: C

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3	2	0	0	0	0	5
NNE	4	7	0	0	0	0	11
NE	5	1	1	0	0	0	7
ENE	5	0	0	0	0	0	5
E	1	0	0	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	1	0	0	0	0	0	1
S	8	2	0	0	0	0	10
SSW	17	3	0	0	0	0	20
SW	8	5	1	0	0	0	14
WSW	2	1	0	0	0	0	3
W	5	1	0	0	0	0	6
WNW	1	4	0	0	0	0	5
NW	0	1	0	0	0	0	1
NNW	3	2	0	0	0	0	5
Total	63	29	2	0	0	0	94

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: July 1 - September 30, 1979

STABILITY CLASS: D

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3	6	0	0	0	0	9
NNE	27	36	12	0	0	0	75
NE	25	73	16	2	0	0	116
ENE	20	9	0	0	0	0	29
E	16	1	0	0	0	0	17
ESE	6	0	0	0	0	0	6
SE	6	0	0	0	0	0	6
SSE	5	1	0	0	0	0	6
S	48	8	0	0	0	0	56
SSW	69	24	3	0	0	0	96
SW	34	22	1	0	0	0	57
WSW	13	2	0	0	0	0	15
W	17	4	0	0	0	0	21
WNW	5	14	0	0	0	0	19
NW	4	11	1	0	0	0	16
NNW	3	2	0	0	0	0	5
Total	301	213	33	2	0	0	549

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: July 1 - September 30, 1979

STABILITY CLASS: E

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	18	6	0	0	0	0	24
NNE	22	12	0	0	0	0	34
NE	81	31	0	0	0	0	112
ENE	80	13	0	0	0	0	93
E	35	1	0	0	0	0	36
ESE	21	0	0	0	0	0	21
SE	17	0	0	0	0	0	17
SSE	33	2	0	0	0	0	35
S	69	6	2	1	0	0	78
SSW	105	27	8	0	0	0	140
SW	45	7	1	0	0	0	53
WSW	21	0	0	0	0	0	21
W	22	5	1	0	0	0	28
WNW	6	2	0	0	0	0	8
NW	3	3	0	0	0	0	6
NNW	5	1	0	0	0	0	6
Total	583	116	12	1	0	0	712

Periods of calm (hours): 1

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: July 1 - September 30, 1979

STABILITY CLASS: F

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	14	0	0	0	0	0	14
NNE	23	0	0	0	0	0	23
NE	51	9	0	0	0	0	60
ENE	48	17	0	0	0	0	65
E	10	1	0	0	0	0	11
ESE	2	0	0	0	0	0	2
SE	5	0	0	0	0	0	5
SSE	2	0	0	0	0	0	2
S	9	0	0	0	0	0	9
SSW	15	0	1	0	0	0	16
SW	6	0	0	0	0	0	6
WSW	7	0	0	0	0	0	7
W	4	0	0	0	0	0	4
WNW	1	0	0	0	0	0	1
NW	2	0	0	0	0	0	2
NNW	1	0	0	0	0	0	1
Total	200	27	1	0	0	0	228

Periods of calm (hours): 2
Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: July 1 - September 30, 1979

STABILITY CLASS: G

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
NE	2	0	0	0	0	0	2
ENE	5	2	0	0	0	0	7
E	1	0	0	0	0	0	1
ESE	1	0	0	0	0	0	1
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	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Total	10	2	0	0	0	0	12

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: October 1 - December 31, 1979

STABILITY CLASS: A

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2	6	3	1	0	0	12
NNE	1	1	1	0	0	0	3
NE	0	1	1	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	20	2	0	0	0	0	22
SSW	7	15	0	0	0	0	22
SW	0	8	2	0	0	0	10
WSW	0	3	0	0	0	0	3
W	0	5	2	0	0	0	7
WNW	3	5	3	0	0	0	11
NW	0	13	2	0	0	0	15
NNW	0	6	1	0	0	0	7
Total	33	65	15	1	0	0	114

Periods of calm (hours): 0

Hours of missing data: Total hours of missing data for all stability classes this quarter = 57.

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: October 1 - December 31, 1979

STABILITY CLASS: B

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	3	1	4	0	0	8
NNE	0	1	0	0	0	0	1
NE	0	4	1	0	0	0	5
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	4	2	0	0	0	0	6
SSW	11	3	0	0	0	0	14
SW	3	4	1	0	0	0	8
WSW	1	6	0	0	0	0	7
W	0	3	0	0	0	0	3
WNW	1	6	1	0	0	0	8
NW	0	6	2	0	0	0	8
NNW	1	4	5	0	0	0	10
Total	21	42	11	4	0	0	78

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: October 1 - December 31, 1979

STABILITY CLASS: C

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	5	4	1	0	0	11
NNE	3	2	1	0	0	0	6
NE	1	10	2	0	0	0	13
ENE	1	3	0	0	0	0	4
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	0	0	0	0	0	0	0
S	2	2	0	0	0	0	4
SSW	6	1	0	0	0	0	7
SW	8	3	1	0	0	0	12
WSW	1	2	0	0	0	0	3
W	1	3	0	0	0	0	4
WNW	2	7	0	0	0	0	9
NW	0	8	3	0	0	0	11
NNW	2	8	5	0	0	0	15
Total	29	54	16	1	0	0	100

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION[a]

PERIOD OF RECORD: October 1 - December 31, 1979

STABILITY CLASS: D

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	15	58	49	4	0	0	126
NNE	14	30	13	1	0	0	58
NE	22	95	11	1	0	0	129
ENE	13	54	3	0	0	0	70
E	9	12	0	0	0	0	21
ESE	4	0	0	0	0	0	4
SE	4	0	0	0	0	0	4
SSE	3	0	0	0	0	0	3
S	22	8	0	0	0	0	30
SSW	19	14	1	0	0	0	34
SW	30	36	3	0	0	0	69
WSW	21	25	2	0	0	0	48
W	28	33	1	0	0	0	62
WNW	8	50	6	0	0	0	64
NW	4	46	13	0	0	0	63
NNW	8	57	21	5	0	0	91
Total	224	518	123	11	0	0	876

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 7A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: October 1 - December 31, 1979

STABILITY CLASS: E

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	14	5	0	0	0	0	19
NNE	23	3	0	0	0	0	26
NE	39	11	0	0	0	0	50
ENE	46	17	0	0	0	0	63
E	52	5	0	0	0	0	57
ESE	10	2	0	0	0	0	12
SE	9	2	0	0	0	0	11
SSE	17	1	0	0	0	0	18
S	63	23	1	0	0	0	87
SSW	84	31	6	0	0	0	121
SW	76	29	3	0	0	0	108
WSW	50	8	1	0	0	0	59
W	35	4	1	0	0	0	40
WNW	11	16	1	0	0	0	28
NW	8	5	2	0	0	0	15
NNW	9	2	1	0	0	0	12
Total	546	164	16	0	0	0	726

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: October 1 - December 31, 1979

STABILITY CLASS: F

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	13	0	0	0	0	0	13
NNE	9	0	0	0	0	0	9
NE	29	14	0	0	0	0	43
ENE	27	8	0	0	0	0	35
E	12	9	0	0	0	0	21
ESE	1	0	0	0	0	0	1
SE	8	0	0	0	0	0	8
SSE	4	0	0	0	0	0	4
S	20	2	0	0	0	0	22
SSW	25	1	0	0	0	0	26
SW	17	3	0	0	0	0	20
WSW	12	0	0	0	0	0	12
W	12	1	0	0	0	0	13
WNW	4	0	0	0	0	0	4
NW	2	0	0	0	0	0	2
NNW	5	0	0	0	0	0	5
Total	200	38	0	0	0	0	238

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: October 1 - December 31, 1979

STABILITY CLASS: G

ELEVATION: 10 Meters

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
NE	4	1	0	0	0	0	5
ENE	2	2	0	0	0	0	4
E	3	2	0	0	0	0	5
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	1	0	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	1	0	0	0	0	0	0
WSW	1	0	0	0	0	0	1
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	1	0	0	0	0	0	1
Total	14	5	0	0	0	0	19

Periods of calm (hours): 0

Hours of missing data:

[a] In the table, record the total number of hours of each category of wind direction for each calendar quarter. Provide similar tables separately for each atmospheric stability class and elevation.