February 29, 1988

Re: Indian Point Unit Nos. 1 and 2
Docket Nos. 50-3 and 50-247

SEMI-ANNUAL

EFFLUENT AND WASTE DISPOSAL REPORT

JULY 1, 1987 - DECEMBER 31, 1987

FACILITY: Indian Point Station (Units 1 and 2)

LICENSEE: Consolidated Edison Company of New York, Inc.

This information is provided pursuant to 10 CFR 50.36a(a) (2), and employs certain guidance as set fourth in Regulatory Guide 1.21, Revision 1. The numbered sections of this part of the report reference corresponding sections of the subject Regulatory Guide, pages 1.21-10 through 1.21-12. This Semi-Annual Effluent and Waste Disposal Report for Indian Point Units 1 and 2 covers discharges for the third and fourth quarters of 1987. The New York Power Authority, licensee of Indian Point Unit 3, has chosen to issue a separate semi-annual report.

A. Supplemental Information

1. Regulatory Limits

Indian Point Units 1 and 2 are presently subject to radioactive waste release specifications that are set forth in Appendix A to Facility Operating Licenses DPR-5 and DPR-26 entitled "Technical Specifications and Bases".

2. Maximum Permissible Concentrations

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 dissovled noble gas, of continuous and batch mode discharges for each calendar quarter has been added, and a weighted average fraction of MPC has been calculated for this isotopic mixture. The percent of applicable limit reported in Table 2A of this document is the percent of MPC concentration of the time averaged diluted concentration for each calendar quarter.

The tritium limit has been established in the same manner as the other isotopes in liquid effluents. A derived MPC of $2X10^{-4}$ uCi/ml for dissolved noble gases has been conservatively adopted for the swimming pathway.

3. Average Energy

The average energy ($\bar{E}$) of the radionuclide mixture in releases of fission and activation gases for the third quarter was .056 Mev/Dis. for $\bar{E}\,\gamma$ and .198 Mev/Dis. for $\bar{E}\,\beta$. The corresponding values for the fourth quarter were .052 Mev/Dis. and .196 Mev/Dis., respectively.

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 4.10-3 of the Technical Specifications. In the case of isolated tanks (batch releases) the total activity discharged is based on an isotopic analysis of each batch and the volume of gas in that batch corrected to standard temperature and pressure.

Vapor containment ventilation discharges have been generally treated as batch releases. At least one complete isotopic concentration analysis of containment air is performed per week and this is applied to gross analysis of the ventilation air performed prior to each discharge. 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 the isotopic content determined from weekly samples of ventilation air. This information is combined with total air volume discharged by this route. The accumulation of batch and containment ventilation releases is then used to determine total discharges.

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b&c. Iodines and Particulates

Iodine-131 and particulate releases are quantified by collecting a continuous sample of ventilation air on a potassium-iodine impregnated activated charcoal cartridge and a glass-fiber filter paper. These samples are obtained as required by Table 4.10-3 of the Technical Specifications, 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 by a monthly 24 hour composite sample. This ensures the proper identification of the short-lived I-133 and I-135 isotopes.

d. Liquid Effluents

A sample of each batch discharge is taken and an isotopic analysis is performed in compliance with requirements specified in Table 4.10-1 of the Technical Specifications. This isotopic concentration data is combined with information of volume discharged to determine the amount of each isotope discharged in the period.

Samples of continuous discharges have been taken and analyzed in compliance with Table 4.10-1 of the Technical Specifications. This concentration data is combined with the volume discharged to calculate the total activity discharged.

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5. Batch Releases:

a. Liquid	3rd Qtr.	4th Qtr.
Number of Batch Releases	58	66
Total Time Period Batch Release (Minutes)	6580	16500
Maximum Time Period Batch Release (Minutes)	420	1340
Average Time Period Batch Release (Minutes)	114	249
Minimum Time Period Batch Release (Minutes)	30	65
Average Stream Flow cfs (1)	N/A	N/A
b. Gaseous		
Number of Batch Releases	109	29
Total Time Period Batch Release (Minutes)	16000	22000
Maximum Time Period Batch Release (Minutes)	696	5690
Average Time Period Batch Release (Minutes)	146	759
Minimum Time Period Batch Release (Minutes)	5	3

6. ABNORMAL RELEASES

a. Liquid - One

b. Gaseous - None

(1) This information is obtained from the U. S. Department of Interior. It is not available at this time.

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B - GASOUS EFFLUENTS

SECOND HALF - 1987

CON EDISON
INDIAN POINT 2
QUARTER 3: START DATE 87070101 END DATE 87093024
QUARTER 4: START DATE 87100101 END DATE 87123124

DATE OF REPORT: February 29, 1988
PREPARED BY:

EFFLUENT AND WASTE DISPOSAL REPORT

GASEOUS EFFLUENTS -- SUMMATION OF ALL RELEASES

	UNITS	QUARTER 3	QUARTER 4	EST. TOTAL ERROR, %
A. FISSION AND ACTIVATION GASES				
1. TOTAL RELEASE	CI	1.45E+03	7.99E+02	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	1.83E+02	1.00E+02	
3.				
B. IODINES				
1. TOTAL IODINE-131	CI	4.79E-04	5.87E-04	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	6.03E-05	7.39E-05	
3.				
C. PARTICULATES				
1. PARTICULATES WITH HALF-LIVES >8 DAYS	CI	2.77E-04	1.29E-02	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	3.48E-05	1.62E-03	
3.				
4. GROSS ALPHA RADIOACTIVITY	CI		9.98E-07	
D. TRITIUM				
1. TOTAL RELEASE	CI	1.94E-01	3.79E-01	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	2.44E-02	4.77E-02	
3.				

CON EDISON
3 & 4 Quarter 1987
DATE OF REPORT: February 29, 1988
PREPARED BY:

Total			CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNITS	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4	
1. FISSION AND ACTIVATION GASES						
H3	CI	1.94E-01	3.79E-01			
AR41	CI	2.00E-01	8.76E-04	2.45E-00	1.37E-01	
KR85M	CI	1.25E-01	9.62E-04			
KR85	CI					
KR87	CI	8.33E-02	3.24E-04			
KR88	CI	2.08E-01	1.47E-03	1.57E-00	5.93E-01	
XE131M	CI					
XE133M	CI	7.12E-02	8.35E-04	1.25E-01	6.09E-00	
XE133	CI	1.26E+02	3.95E+01	1.25E+03	7.25E+02	
XE135M	CI	1.05E+00	8.47E-03			
XE135	CI	2.66E+01	1.27E-02	3.17E+01	2.27E+01	
* XE131	CI					
C14	CI	2.00E-00	2.00E-00			
TOTAL FOR PERIOD (ABOVE)	CI	1.56E+02	4.19E+01	1.30E+03	7.58E+02	

al

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4	BATCH MODE QUARTER	BATCH MODE QUARTER
2. IODINES					
I131	CI	4.79E-04	5.87E-04	-	-
I133	CI	4.52E-03	2.72E-04	-	-
I132	CI				
I134	CI				
I135	CI				
TOTAL FOR PERIOD (ABOVE)	CI	4.99E-03	8.59-04	N/A	N/A

CON EDISON
QUARTER 3 & 4 1987
DATE OF REPORT: February 29, 1988

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4	BATCH MODE QUARTER 3	BATCH MODE QUARTER 4
3. PARTICULATES					
CR51	CI		6.59E-03		
MN54	CI		1.92E-03		
FE59	CI		5.02E-04		
CO58	CI	2.06E-04	1.56E-03		
CO60	CI	3.39E-05	1.77E-03		
ZN65	CI		4.27E-04		
CS137	CI	3.63E-05	7.82E-05		
FE55	CI		1.49E-05		
NI63	CI	4.88E-07			
CO57	CI		4.43E-06		
TOTAL FOR PERIOD (ABOVE)	CI	2.77E-04	1.29E-02	N/A	N/A

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C - LIQUID EFFLUENTS

SECOND HALF - 1987

CON EDISON
INDIAN POINT 2

DATE OF REPORT: February 29, 1988

[redacted]UENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS -- SUMMATION OF ALL RELEASES

	UNITS	QUARTER 3	QUARTER 4	EST. TOTAL ERROR, %
A. FISSION AND ACTIVATION PRODUCTS				
1. TOTAL RELEASE (EXCL. TRIT., GASES, ALPHA)	CI	2.38E-00	2.11E-00	2.50E 01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	8.34E-09	1.11E-08	
3. PERCENT OF MPC	%	3.63E-02	2.67E-03	
B. TRITIUM				
1. TOTAL RELEASE	CI	1.77E+02	3.33E+01	2.50E 01
[redacted]. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	6.20E-07	1.74E-07	
3. PERCENT OF MPC	%	2.07E-02	5.81E-03	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	CI	1.75E-00	1.35E-01	2.50E 01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	1.14E-9	7.06E-10	
3. PERCENT OF MPC	%	3.07E-3	3.53E-04	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	CI	0.00E-00	4.62E-04	2.50E 01
[redacted]. VOLUME WASTE RELEASED (PRIOR TO DILUTION)	LITERS	6.01E+07	2.26E+07	1.00E 01
F. VOLUME DILUTION WATER USED DURING PERIOD	LITERS	2.85E+11	1.91E+11	1.00E 01

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4	BATCH MODE QUARTER 3	BATCH MODE QUARTER 4
H3	CI	3.00E 00	1.38E 00	1.74E 02	3.19E 01
CR51	CI	0.00E 00	2.92E-04	0.00E 00	8.30E-02
MN54	CI	0.00E 00	6.49E-05	4.22E-04	5.00E-03
FE55	CI	0.00E 00	0.00E 00	3.92E-02	8.17E-01
FE59	CI	0.00E 00	0.00E 00	0.00E 00	1.43E-02
CO58	CI	0.00E 00	9.19E-05	5.51E-02	4.75E-01
CO60	CI	5.07E-05	6.99E-05	2.47E-01	1.75E-01
NI63	CI	1.35E-03	0.00E 00	9.15E-02	6.59E-02
SR89	CI	2.62E-03	0.00E 00	6.44E-05	0.00E 00
SR90	CI	8.66E-05	0.00E 00	1.00E-04	6.49E-05
ZR95	CI	0.00E 00	0.00E 00	0.00E 00	1.12E-04
NB95	CI	0.00E 00	0.00E 00	0.00E 00	2.77E-03
TC99M	CI	0.00E 00	0.00E 00	0.00E 00	3.15E-05
AG110M	CI	0.00E 00	0.00E 00	1.51E-03	1.22E-03
TE132	CI	0.00E 00	0.00E 00	0.00E 00	3.70E-04
I131	CI	6.62E-02	1.97E-02	6.83E-02	1.03E-02
I132	CI	1.46E-02	2.40E-02	0.00E 00	1.48E-04

ENTER: [RETURN] CONTINUE, [SO] START OVER, [EX] TO EXIT

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4	BATCH MODE QUARTER 3	BATCH MODE QUARTER 4
LIQUID EFFLUENTS (CONTD)					
I133	CI	1.47E 00	7.50E-02	0.00E 00	0.00E 00
I134	CI	6.20E-03	0.00E 00	0.00E 00	0.00E 00
I135	CI	3.61E-02	7.45E-02	0.00E 00	0.00E 00
CS134	CI	3.05E-02	1.60E-03	2.89E-02	3.20E-02
CS137	CI	3.45E-02	6.47E-03	1.55E-01	1.61E-01
BA140	CI	2.71E-03	0.00E 00	0.00E 00	6.32E-04
LA140	CI	5.89E-03	0.00E 00	4.95E-03	8.35E-03
* CO57	CI	0.00E 00	0.00E 00	6.19E-05	1.65E-04
SB125	CI	0.00E 00	0.00E 00	1.29E-02	4.11E-02
* SB124	CI	0.00E 00	0.00E 00	0.00E 00	1.96E-02
TOTAL FOR PERIOD (ABOVE)	CI	4.68E 00	1.58E 00	1.74E 02	3.38E 01

* DENOTES SUPPLEMENTAL ISOTOPES
ENTER: [RETURN] CONTINUE, [SO] START OVER, [EX] TO EXIT

Date: February 29, 1988
PREPARED BY:

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4	BATCH MODE QUARTER 3	BATCH MODE QUARTER 4
XE133	CI	3.67E-02	8.23E-04	9.85E-01	1.34E-01
XE135	CI	7.30E-1	0.00E 00	8.11E-05	0.00E 00
XE135M	CI	1.40E-04	0.00E 00	0.00E 00	0.00E 00
XE133M	CI	0.00E 00	0.00E 00	2.00E-03	0.00E 00

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D - SOLID WASTE

SECOND HALF - 1987

February 12, 1988

Re: Indian Point Unit No. 1 & 2
Docket Nos. 50-3 and 50-247

Solid Radwaste Disposal Report 7/1/87 through 12/31/87

Solid Radwaste Shipped Offsite for Burial or Disposal (No irradiated fuel)

6 MONTH PERIOD

1.	Type of Waste	Units	Class A	Class B	Class C	Total Error, %
a.	Spent Resins,	m^3	43.3	12.3	6.8	-
	sludges, etc.	Ci	65.8	338.6	378.3	1.00E+2
b.	DAW	m^3	142.5	-	-	-
		Ci	5.1	-	-	1.00E+2
c.	Irradiated	m^3	-	-	-	-
	components	Ci	-	-	-	-
	control rods, etc.					

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

a.	Co-58	-	5.75%	Mn-54	-	2.57%
	Co-60	-	27.73%	H-3	-	9.13%
	Cs-137	-	16.0 %	C-14	-	2.28%
	Fe-55	-	10.5 %	Sr-90	-	1.40%
	Cr-51	-	.29%	Zr-95	-	2.43%
	NI-63	-	9.51%	Nb-95	-	1.41%
	Tc-99	-	.08%	I-129	-	.03%
	Cs-134	-	6.98%	Pu-241	-	1.79%
b.	Cs-137	-	11 %	Co-60	-	40.6%
	Cs-134	-	4.6 %	Co-58	-	12.7%
	Mn-54	-	2.5 %	Cr-51	-	3.2%
	Fe-55	-	2.6 %	Ni-63	-	19.7%
	Fe-59	-	.38%			
	Other (H^3, I-129, Tc-99, C-14 included)		2.72%			
c.	Cs-137	-	23.1 %			
	Co-60	-	17.6 %			
	Cs-134	-	42 %			
	Co-58	-	.35 %			
	Mn-54	-	6.9 %			
	Fe-55	-	8.1 %			
	Ni-63	-	1 %			
	Other	-	.95%			

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3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
13	Truck	Barnwell, S. C.

4. Solid Waste Containers

a. 7 High integrity containers
6 Carbon steel containers - cement used for solidification

b. 653 Drums

5. Waste Class

No irradiated fuel shipments

Container	Class A	Class B	Class C
High Integrity Container	2	3	2
Steel Liners	6	3	2
Steel Drums	653	-	-

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SEMI-ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

E - RADIOLOGICAL IMPACT ON MAN

SECOND HALF - 1987

February 29, 1988

Re: Indian Point Unit No. 2
Docket No. 50-247

RADIOLOGICAL IMPACT EVALUATION

Doses from noble gas immersion, inhalation, ground deposition, and vegetation ingestion were evaluated for the nearest residence likely to be occupied in the critical sector for each pathway and were combined to provide a conservative determination of the maximum individual offsite radiation dose from these pathways. Calculations were performed for members of the public on site for this reporting period. Doses to such individuals were found to be significantly less than one percent of the maximum individual offsite dose. Doses were also evaluated for an individual ingesting milk and meat from a cow located at a 5.0 mile distance, for all sectors. In all cases these evaluations were performed using the models presented in Regulatory Guide 1.109.

All releases were evaluated using actual meteorological conditions existing during the release period.

Integrated doses from the population within 50 miles of Indian Point from gaseous effluents were computed based on the most current population data.

Dose calculations for liquid pathways to individuals and populations are computed for a year. The LADTAP II computer program that is utilized for these calculations incorporated the calculational model and parameters that are presented in Regulatory Guide 1.109.

The fish, invertebrate, algae, drinking, shoreline, swimming and boating pathways are calculated for the adult, teenager, child and infant. These calculations are performed for reasons such as estimating the population water consumption dose, the population recreation dose, and cost-benefit analysis.

NUREG-0017, "Calculation of Release of Radioactive Materials in Gaseous and Liquid effluents from Pressurized Water Reactors", assumes an annual release of 8.0 Ci/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.

Indian Point Units 1 & 2

RADIOLOGICAL IMPACT ON MAN

(Reference Regulatory Guide 1.21, Page 12)

A. Maximum Individual Doses

(1) Pathways (Gaseous)	Total Body mRem	Skin mRem	Thyroid mRem	Bone	Source Information (MIDAS File)
a) Noble Gas Immersion	1.75E-1	4.79E-1	N/A	N/A	MIDASDM
(b) Inhalation***	2.14E-4	N/A	6.90E-3	3.56E-5	
(c) Ground Deposition	2.48E-2	2.92E-2	2.41E-2	2.48E-2	
(d) Milk Ingestion*	1.91E-4	N/A	1.41E-2	1.62E-4	MIDASDM
(e) Meat Ingestion***	2.64E-5	N/A	7.40E-5	1.28E-5	
(f) Vegetable Ingestion***	2.28E-3	N/A	1.18E-2	8.63E-4	

2) Pathways (Liquid)

(a) All — See Attached "LADTAP" printout Attachment I

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

NA = Not Applicable

B. [redacted]lation

(1) Pathways (Gaseous)

	Total Body (man-rem)	Thyroid (man-thyroid rem)	Source Information (MIDAS File)
(a) Noble Gas Immersion	4.8E+0	4.8E+0	
(b) Inhalation	1.4E-2	2.0E-2	MIDASPP
(c) Ground Deposition	4.6E-1	4.6E-1	
(d) Totals	5.3E+0	5.3E+0	

(2) Pathways (Liquid)

(a) All — See attached "LADTAP" printout Attachment I

C. Average Doses to Individuals

(1) Pathways

(a) Liquid-Total Body 1.53E-4 millirem — LADTAP2

(b) Gaseous-Total Body 2.56E-4 millirem

IP2 SE[redacted]NUAL EFFLUENT REPORT 2ND HALF 1987 - USNRC LADTA[redacted]CODE

DISCHARGE=2.12E+03 CFS SOURCE TERM MULTIPLIER=1.00E+00

50-MILE POPULATION=2.05E+07 FRACTION --- CATEGORY I=0.71
CATEGORY II=0.11
CATEGORY III=0.18

FRESHWATER SITE

SOURCE TERM FOLLOWS
NO INTERNAL RECONCENTRATION/MODEL EMPLOYED

* * * CATEGORY I DOSE FACTORS * * *

NUCLIDE	CURIE/YEAR	INGESTION DOSE FACTORS (MREM/PCI INTAKE) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SHORELINE (MREM/HR)/(PCI/M**2) SKIN	TOTAL BODY	RECON
1H	3	2.10E+02 0.0	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	0.0	0.0	1.00E+00
24CR	51	8.33E-02 0.0	0.0	2.66E-09	1.59E-09	5.86E-10	3.53E-09	6.69E-07	2.60E-10	2.20E-10	1.00E+00
25MN	54	5.49E-03 0.0	4.57E-06	8.72E-07	0.0	1.36E-06	0.0	1.40E-05	6.80E-09	5.80E-09	1.00E+00
26FE	55	8.56E-01 2.75E-06	1.90E-06	4.43E-07	0.0	0.0	1.06E-06	1.09E-06	0.0	0.0	1.00E+00
26FE	59	1.43E-02 4.34E-06	1.02E-05	3.91E-06	0.0	0.0	2.85E-06	3.40E-05	9.40E-09	8.00E-09	1.00E+00
27CO	57	2.27E-04 0.0	1.75E-07	2.91E-07	0.0	0.0	0.0	4.44E-06	1.00E-09	9.10E-10	1.00E+00
27CO	58	5.30E-01 0.0	7.45E-07	1.67E-06	0.0	0.0	0.0	1.51E-05	8.20E-09	7.00E-09	1.00E+00
27CO	60	4.22E-01 0.0	2.14E-06	4.72E-06	0.0	0.0	0.0	4.02E-05	2.00E-08	1.70E-08	1.00E+00
28NI	63	1.59E-01 1.30E-04	9.01E-06	4.36E-06	0.0	0.0	0.0	1.83E-06	0.0	0.0	1.00E+00
38SR	89	2.68E-03 3.08E-04	0.0	8.84E-06	0.0	0.0	0.0	4.94E-05	6.50E-13	5.60E-13	1.00E+00
38SR	90	2.52E-04 3.84E-03	0.0	1.03E-03	0.0	0.0	0.0	2.19E-04	0.0	0.0	1.00E+00
40ZR	95	1.12E-04 3.04E-08	9.75E-09	6.60E-09	0.0	1.53E-08	0.0	3.09E-05	5.80E-09	5.00E-09	1.00E+00
41NB	95	2.77E-03 6.22E-09	3.46E-09	1.86E-09	0.0	3.42E-09	0.0	2.10E-05	5.10E-09	6.00E-09	1.00E+00
43TC	99M	3.15E-05 2.47E-10	6.96E-10	8.89E-09	0.0	1.06E-08	3.42E-10	4.13E-07	1.10E-09	9.60E-10	1.00E+00
47AG	110M	2.73E-03 1.60E-07	1.46E-07	8.79E-08	0.0	2.91E-07	0.0	6.04E-05	2.10E-08	1.80E-08	1.00E+00
52TE	132	3.70E-04 2.52E-06	1.63E-06	1.53E-06	1.80E-06	1.57E-05	0.0	7.71E-05	2.00E-09	1.70E-09	1.00E+00
53I	131	1.65E-01 4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	0.0	1.57E-06	3.40E-09	2.80E-09	1.00E+00
53I	132	3.87E-02 2.03E-07	5.43E-07	1.90E-07	1.90E-05	8.65E-07	0.0	1.02E-07	1.70E-08	2.00E-08	1.00E+00
53I	133	1.55E+00 1.42E-06	2.47E-06	7.53E-07	3.63E-04	4.31E-06	0.0	2.22E-06	4.50E-09	3.70E-09	1.00E+00
53I	134	6.20E-03 1.06E-07	2.86E-07	1.03E-07	4.99E-06	4.50E-07	0.0	2.51E-10	1.90E-08	1.60E-08	1.00E+00
53I	135	1.11E-01 4.43E-07	1.16E-06	4.26E-07	7.65E-05	1.66E-06	0.0	1.31E-06	1.20E-08	1.40E-08	1.00E+00
55CS	134	9.30E-02 6.22E-05	1.46E-04	1.21E-04	0.0	4.79E-05	1.59E-05	2.59E-06	1.40E-08	1.20E-08	1.00E+00
55CS	137	3.57E-01 7.97E-05	1.09E-04	7.14E-05	0.0	3.70E-05	1.23E-05	2.11E-06	4.90E-09	4.20E-09	1.00E+00
56BA	140	3.34E-03 2.03E-05	2.55E-08	1.32E-06	0.0	8.67E-09	1.46E-09	4.18E-05	2.40E-09	2.10E-09	1.00E+00
57LA	140	1.92E-02 2.50E-09	1.26E-09	3.33E-10	0.0	0.0	0.0	9.25E-05	1.50E-08	1.70E-08	1.00E+00
51SB	124	1.96E-02 2.80E-06	5.29E-08	1.11E-06	6.79E-09	0.0	2.18E-06	7.95E-05	1.50E-08	1.30E-08	1.00E+00
51SB	125	5.40E-02 1.79E-06	2.00E-08	4.26E-07	1.82E-09	0.0	1.38E-06	1.97E-05	3.50E-09	3.10E-09	1.00E+00

* * * CATEGORY II DOSE FACTORS * * *

NUCLIDE	CURIE/YEAR	INGESTION DOSE FACTORS (MREM/PCI INTAKE) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SHORELINE (MREM/HR)/(PCI/M**2) SKIN	TOTAL BODY	RECON
1H	3	2.10E+02 0.0	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07			
24CR	51	8.33E-02 0.0	0.0	3.60E-09	2.00E-09	7.89E-10	5.24E-09	6.05E-07			
25MN	54	5.49E-03 0.0	5.90E-06	1.17E-06	0.0	1.76E-06	0.0	1.21E-05			
26FE	55	8.56E-01 3.78E-06	2.68E-06	6.25E-07	0.0	0.0	1.70E-06	1.16E-06			
26FE	59	1.43E-02 5.87E-06	1.37E-05	5.29E-06	0.0	0.0	4.32E-06	3.24E-05			
27CO	57	2.27E-04 0.0	2.38E-07	3.99E-07	0.0	0.0	0.0	4.44E-06			
27CO	58	5.30E-01 0.0	9.72E-07	2.24E-06	0.0	0.0	0.0	1.34E-05			
27CO	60	4.22E-01 0.0	2.81E-06	6.32E-06	0.0	0.0	0.0	3.66E-05			
28NI	63	1.59E-01 1.77E-04	1.25E-05	6.00E-06	0.0	0.0	0.0	1.99E-06			
38SR	89	2.66E-03 4.40E-04	0.0	1.26E-05	0.0	0.0	0.0	5.24E-05			
38SR	90	2.52E-04 4.48E-03	0.0	1.20E-03	0.0	0.0	0.0	2.33E-04			
40ZR	95	1.12E-04 4.12E-08	1.30E-08	8.94E-09	0.0	1.91E-08	0.0	3.00E-05			
41NB	95	2.77E-03 8.22E-09	4.56E-09	2.51E-09	0.0	4.42E-09	0.0	1.95E-05			
43TC	99M	3.15E-05 3.32E-10	9.26E-10	1.20E-08	0.0	1.38E-08	5.14E-10	6.08E-07			
47AG	110M	2.73E-03 2.05E-07	1.94E-07	1.18E-07	0.0	3.70E-07	0.0	5.45E-05			
52TE	132	3.70E-04 3.49E-06	2.21E-06	2.08E-06	2.33E-06	2.12E-05	0.0	7.00E-05			
53I	131	1.65E-01 5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	0.0	1.62E-06			
53I	132	3.87E-02 2.79E-07	7.30E-07	2.62E-07	2.46E-05	1.15E-06	0.0	3.18E-07			

53I	133	1.55E+00	2.01E-06	3.41E-06	1.04E-06	4.76E-04	5.98E-08	0.0	2.58E-06
53I	134	6.20E-03	1.46E-07	3.67E-07	1.39E-07	6.45E-06	6.10E-07	0.0	5.10E-09
53I	135	1.11E-01	6.10E-07	1.57E-06	5.82E-07	1.01E-04	2.48E-06	0.0	1.74E-06
55CS	134	9.30E-02	8.37E-05	1.97E-04	9.14E-05	0.0	6.26E-05	2.39E-05	2.45E-06
55CS	137	3.57E-01	1.12E-04	1.49E-04	5.19E-05	0.0	5.07E-05	1.97E-05	2.12E-06
56BA	140	3.34E-03	2.84E-05	3.48E-08	1.83E-04	0.0	1.16E-08	2.34E-08	4.38E-05
57LA	140	1.92E-02	3.48E-09	1.71E-09	4.55E-10	0.0	0.0	0.0	9.82E-05
51SB	124	1.96E-02	3.87E-06	7.13E-08	1.51E-06	8.78E-09	0.0	3.30E-06	7.60E-05
51SB	125	5.40E-02	2.48E-06	2.71E-08	5.80E-07	2.37E-09	0.0	2.18E-06	1.93E-05

* * * CATEGORY III DOSE FACTORS * * *

			INGESTION DOSE FACTORS (MREM/PCI INTAKE)						SHORELINE (MREM/HR)/(PCI/M**2)		
NUCLIDE		CURIE/YEAR	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY	RECON
1H	3	2.10E+02	0.0	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07			
24CR	51	8.33E-02	0.0	0.0	8.90E-09	4.94E-09	1.35E-09	9.02E-09	4.72E-07			
25MN	54	5.49E-03	0.0	1.07E-05	2.85E-06	0.0	3.00E-06	0.0	8.98E-06			
26FE	55	8.56E-01	1.15E-05	6.10E-06	1.89E-06	0.0	0.0	3.45E-06	1.13E-06			
26FE	59	1.43E-02	1.65E-05	2.67E-05	1.33E-05	0.0	0.0	7.74E-06	2.78E-05			
27CO	57	2.27E-04	0.0	4.93E-07	9.98E-07	0.0	0.0	0.0	4.04E-06			
27CO	58	5.30E-01	0.0	1.80E-06	5.51E-06	0.0	0.0	0.0	1.05E-05			
27CO	60	4.22E-01	0.0	5.29E-06	1.56E-05	0.0	0.0	0.0	2.93E-05			
28NI	63	1.59E-01	5.38E-04	2.89E-05	1.83E-05	0.0	0.0	0.0	1.94E-06			
38SR	89	2.68E-03	1.32E-03	0.0	3.77E-05	0.0	0.0	0.0	5.11E-05			
38SR	90	2.52E-04	1.13E-02	0.0	3.03E-03	0.0	0.0	0.0	2.29E-04			
40ZR	95	1.12E-04	1.16E-07	2.55E-08	2.27E-08	0.0	3.65E-08	0.0	2.66E-05			
41NB	95	2.77E-03	2.25E-08	8.76E-09	6.26E-09	0.0	8.23E-09	0.0	1.62E-05			
43TC	99M	3.15E-05	9.23E-10	1.81E-09	3.00E-08	0.0	2.63E-08	9.19E-10	1.03E-06			
47AG	110M	2.73E-03	5.39E-07	3.64E-07	2.91E-07	0.0	6.78E-07	0.0	4.33E-05			
52TE	132	3.70E-04	1.01E-05	4.47E-06	5.40E-06	6.51E-06	4.15E-05	0.0	4.50E-05			
53I	131	1.65E-01	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	0.0	1.54E-06			
53I	132	3.87E-02	8.00E-07	1.47E-06	6.76E-07	6.82E-05	2.25E-06	0.0	1.73E-06			
53I	133	1.55E+00	5.92E-06	7.32E-06	2.77E-06	1.36E-03	1.22E-05	0.0	2.95E-06			
53I	134	6.20E-03	4.19E-07	7.78E-07	3.58E-07	1.79E-05	1.19E-06	0.0	5.16E-07			
53I	135	1.11E-01	1.75E-06	3.15E-06	1.49E-06	2.79E-04	4.83E-06	0.0	2.40E-06			
55CS	134	9.30E-02	2.34E-04	3.84E-04	8.10E-05	0.0	1.19E-04	4.27E-05	2.07E-06			
55CS	137	3.57E-01	3.27E-04	3.13E-04	4.62E-05	0.0	1.02E-04	3.67E-05	1.96E-06			
56BA	140	3.34E-03	8.31E-05	7.28E-08	4.85E-06	0.0	2.37E-08	4.34E-08	4.21E-05			
57LA	140	1.92E-02	1.01E-08	3.53E-09	1.19E-09	0.0	0.0	0.0	9.84E-05			
51SB	124	1.96E-02	1.11E-05	1.44E-07	3.89E-06	2.45E-08	0.0	6.16E-06	6.94E-05			
51SB	125	5.40E-02	7.16E-06	5.52E-08	1.50E-06	6.63E-09	0.0	3.99E-06	1.71E-05			

* * * CATEGORY IV DOSE FACTORS * * *

			INGESTION DOSE FACTORS (MREM/PCI INTAKE)						SHORELINE (MREM/HR)/(PCI/M**2)		
NUCLIDE		CURIE/YEAR	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY	RECON
1H	3	2.10E+02	0.0	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07			
24CR	51	8.33E-02	0.0	0.0	1.41E-08	9.20E-09	2.01E-09	1.79E-08	4.11E-07			
25MN	54	5.49E-03	0.0	1.99E-05	4.51E-06	0.0	4.41E-06	0.0	7.31E-06			
26FE	55	8.56E-01	1.39E-05	8.98E-06	2.40E-06	0.0	0.0	4.39E-06	1.14E-06			
26FE	59	1.43E-02	3.08E-05	5.36E-05	2.12E-05	0.0	0.0	1.59E-05	2.57E-05			
27CO	57	2.27E-04	0.0	1.15E-06	1.87E-06	0.0	0.0	0.0	3.92E-06			
27CO	58	5.30E-01	0.0	3.60E-06	8.98E-06	0.0	0.0	0.0	8.97E-06			
27CO	60	4.22E-01	0.0	1.08E-05	2.55E-05	0.0	0.0	0.0	2.57E-05			
28NI	63	1.59E-01	6.34E-04	3.92E-05	2.20E-05	0.0	0.0	0.0	1.95E-06			
38SR	89	2.68E-03	2.51E-03	0.0	7.20E-05	0.0	0.0	0.0	5.16E-05			
38SR	90	2.52E-04	1.25E-02	0.0	3.37E-03	0.0	0.0	0.0	2.31E-04			
40ZR	95	1.12E-04	2.06E-07	5.02E-06	3.56E-08	0.0	5.41E-08	0.0	2.50E-05			

41NB	95	[illegible]7E-03	4.20E-08	1.73E-08	1.00E-08	0.0	1.24E-[illegible]0		1.46E-05
43TC	99M	[illegible]5E-05	1.92E-09	3.96E-09	5.10E-08	0.0	4.26E-0[illegible]	[illegible].07E-09	1.15E-06
47AG	110M	2.73E-03	9.96E-07	7.27E-07	4.81E-07	0.0	1.04E-06	0.0	3.77E-05
52TE	132	3.70E-04	2.08E-05	1.03E-05	9.61E-06	1.52E-05	6.44E-05	0.0	3.81E-05
53I	131	1.65E-01	3.59E-05	4.23E-05	1.86E-05	1.39E-02	4.94E-05	0.0	1.51E-06
53I	132	3.87E-02	1.66E-06	3.37E-06	1.20E-06	1.58E-04	3.76E-06	0.0	2.73E-06
53I	133	1.55E+00	1.25E-05	1.82E-05	5.33E-06	3.31E-03	2.14E-05	0.0	3.08E-06
53I	134	6.20E-03	8.69E-07	1.78E-06	6.33E-07	4.15E-05	1.99E-06	0.0	1.84E-06
53I	135	1.11E-01	3.64E-06	7.24E-06	2.64E-06	6.49E-04	6.07E-06	0.0	2.62E-06
55CS	134	9.30E-02	3.77E-04	7.03E-04	7.10E-05	0.0	1.81E-04	7.42E-05	1.91E-06
55CS	137	3.57E-01	5.22E-04	6.11E-04	4.33E-05	0.0	1.64E-04	6.64E-05	1.91E-06
56BA	140	3.34E-03	1.71E-04	1.71E-07	8.81E-06	0.0	4.04E-08	1.05E-07	4.20E-05
57LA	140	1.92E-02	2.11E-08	8.32E-09	2.14E-09	0.0	0.0	0.0	9.77E-05
51SB	124	1.96E-02	2.14E-05	3.15E-07	6.63E-06	5.68E-08	0.0	1.34E-05	6.60E-05
51SB	125	5.40E-02	1.23E-05	1.19E-07	2.53E-06	1.54E-08	0.0	7.12E-06	1.64E-05

TOTAL NUMBER IN SOURCE TERM IS 27 TOTAL RELEASE IS 2.1450E+02

* * * AS LOW AS RE[illegible]BLY ACHIEVABLE * * *

CATEGORY I DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.57E-01	2.35E-01	1.64E-01	1.80E-02	7.86E-02	2.63E-02	1.16E-02
INVERTEBRATE		7.13E-03	7.22E-03	3.29E-03	1.46E-03	1.56E-03	1.92E-03	1.07E-02
ALGAE		2.30E-08	3.04E-08	2.06E-08	2.28E-08	9.62E-09	4.31E-09	1.89E-08
DRINKING		6.31E-13	8.44E-13	6.70E-13	2.65E-12	4.33E-13	3.06E-13	5.60E-13
SHORELINE	2.19E-03	1.87E-03	1.87E-03	1.87E-03	1.87E-03	1.87E-03	1.87E-03	1.87E-03
SWIMMING	0.0	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05
BOATING	0.0	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05
TOTAL	2.19E-03	1.66E-01	2.44E-01	1.69E-01	2.14E-02	8.21E-02	3.01E-02	2.43E-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

CATEGORY II DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.67E-01	2.43E-01	9.20E-02	1.73E-02	8.11E-02	3.16E-02	8.44E-03
INVERTEBRATE		7.45E-03	7.49E-03	2.50E-03	1.41E-03	1.53E-03	2.33E-03	7.57E-03
ALGAE		3.19E-08	4.14E-08	1.62E-08	2.89E-08	1.30E-08	6.80E-09	1.86E-08
DRINKING		8.71E-13	1.07E-12	5.87E-13	3.21E-12	5.05E-13	3.51E-13	5.37E-13
SHORELINE	2.94E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03
SWIMMING	0.0	5.57E-05	5.57E-05	5.57E-05	5.57E-05	5.57E-05	5.57E-05	5.57E-05
BOATING	0.0	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05
TOTAL	2.94E-03	1.77E-01	2.53E-01	9.71E-02	2.13E-02	8.52E-02	3.65E-02	1.86E-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

CATEGORY III DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		2.09E-01	2.16E-01	3.58E-02	1.95E-02	6.94E-02	2.51E-02	3.14E-03
INVERTEBRATE		1.00E-02	7.04E-03	2.17E-03	1.64E-03	1.36E-03	2.07E-03	2.75E-03
ALGAE		9.30E-05	8.57E-05	1.78E-05	7.54E-05	2.58E-05	1.28E-05	1.68E-05
DRINKING		2.57E-09	2.17E-09	8.76E-10	7.65E-09	9.89E-10	6.66E-10	6.98E-10
SHORELINE	6.13E-04	5.23E-04	5.23E-04	5.23E-04	5.23E-04	5.23E-04	5.23E-04	5.23E-04
SWIMMING	0.0	1.39E-05	1.39E-05	1.39E-05	1.39E-05	1.39E-05	1.39E-05	1.39E-05
BOATING	0.0	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05

TOTAL	6.13E-04	2.20E-01	2.24E-01	[redacted]E-02	2.18E-02	7.13E-02	2.78E-02	6.47E-03

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
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	

C A T E G O R Y I V D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		2.40E-02	3.01E-02	2.41E-03	3.44E-03	7.98E-03	3.26E-03	2.12E-04
INVERTEBRATE		7.76E-04	7.14E-04	1.68E-04	2.34E-04	1.25E-04	1.68E-04	1.45E-04
ALGAE		1.43E-07	1.62E-07	1.92E-08	1.83E-07	4.11E-08	2.15E-08	1.60E-08
DRINKING		3.69E-12	3.95E-12	1.18E-12	1.82E-11	1.54E-12	1.05E-12	9.05E-13
SHORELINE	1.31E-04	1.12E-04	1.12E-04	1.12E-04	1.12E-04	1.12E-04	1.12E-04	1.12E-04
SWIMMING	0.0	5.57E-12	5.57E-12	5.57E-12	5.57E-12	5.57E-12	5.57E-12	5.57E-12
BOATING	0.0	1.39E-07	1.39E-07	1.39E-07	1.39E-07	1.39E-07	1.39E-07	1.39E-07
TOTAL	1.31E-04	2.49E-02	3.09E-02	2.69E-03	3.78E-03	8.22E-03	3.54E-03	4.69E-04

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
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	

* * * SELECTED LOCA[redacted] * * *

LOCATION [redacted] DOWNSTREAM

C A T E G O R Y I D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.12E-01	1.68E-01	1.17E-01	1.16E-02	5.61E-02	1.83E-02	8.29E-03
INVERTEBRATE		5.09E-03	5.15E-03	2.35E-03	9.49E-04	1.10E-03	1.37E-03	7.57E-03
ALGAE		1.64E-08	2.17E-08	1.49E-08	1.48E-08	6.85E-09	3.09E-09	1.31E-08
DRINKING		4.61E-11	6.20E-11	4.65E-11	4.70E-10	3.39E-11	2.19E-11	4.25E-11
SHORELINE	1.56E-03	1.33E-03	1.33E-03	1.33E-03	1.33E-03	1.33E-03	1.33E-03	1.33E-03
SWIMMING	0.0	1.88E-05	1.88E-05	1.88E-05	1.86E-05	1.88E-05	1.88E-05	1.88E-05
BOATING	0.0	1.68E-05	1.88E-05	1.68E-05	1.88E-05	1.88E-05	1.88E-05	1.68E-05
TOTAL	1.56E-03	1.19E-01	1.74E-01	1.21E-01	1.40E-02	5.86E-02	2.15E-02	1.72E-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

C A T E G O R Y I I D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.19E-01	1.73E-01	6.57E-02	1.12E-02	5.79E-02	2.26E-02	6.01E-03
INVERTEBRATE		5.32E-03	5.35E-03	1.78E-03	9.08E-04	1.12E-03	1.66E-03	5.34E-03
ALGAE		2.23E-08	2.95E-08	1.16E-08	1.86E-08	9.28E-09	4.86E-09	1.23E-08
DRINKING		6.37E-11	7.85E-11	4.28E-11	5.92E-10	4.02E-11	2.51E-11	4.11E-11
SHORELINE	2.10E-03	1.79E-03	1.79E-03	1.79E-03	1.79E-03	1.79E-03	1.79E-03	1.79E-03
SWIMMING	0.0	3.77E-05	3.77E-05	3.77E-05	3.77E-05	3.77E-05	3.77E-05	3.77E-05
BOATING	0.0	1.88E-05	1.88E-05	1.88E-05	1.88E-05	1.88E-05	1.88E-05	1.88E-05
TOTAL	2.10E-03	1.26E-01	1.91E-01	6.94E-02	1.39E-02	6.08E-02	2.61E-02	1.32E-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

C A T E G O R Y I I I D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.49E-01	1.54E-01	2.56E-02	1.25E-02	4.95E-02	1.80E-02	2.23E-03

INVERTEBRATE		7.14E-03	5.03E-03	2.55E-03	1.05E-03	9.61E-04	1.48E-03	1.94E-03
ALGAE		6.64E-05	5.12E-05	1.27E-05	4.82E-05	1.84E-05	9.16E-06	1.16E-05
DRINKING		1.65E-07	1.60E-07	6.47E-09	1.55E-06	7.90E-08	4.76E-08	5.28E-09
SHORELINE	4.38E-04	3.74E-04	3.74E-04	3.74E-04	3.74E-04	3.74E-04	3.74E-04	3.74E-04
SWIMMING	0.0	9.42E-06	9.42E-06	9.42E-06	9.42E-06	9.42E-06	9.42E-06	9.42E-06
BOATING	0.0	1.88E-05	1.88E-05	1.88E-05	1.88E-05	1.88E-05	1.88E-05	1.88E-05
TOTAL	4.38E-04	1.57E-01	1.60E-01	2.75E-02	1.40E-02	5.09E-02	1.93E-02	4.59E-03

	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

C A T E G O R Y I V D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.72E-02	2.15E-02	1.72E-03	2.20E-03	5.70E-03	2.33E-03	1.51E-04
INVERTEBRATE		5.54E-04	5.09E-04	1.20E-04	1.50E-04	8.81E-05	1.20E-04	1.02E-04
ALGAE		1.02E-07	1.16E-07	1.37E-08	1.17E-07	2.92E-08	1.53E-08	1.10E-08
DRINKING		2.73E-10	2.95E-10	8.81E-11	3.73E-09	1.25E-10	7.54E-11	6.75E-11
SHORELINE	9.39E-05	8.00E-05	8.00E-05	8.00E-05	8.00E-05	8.00E-05	8.00E-05	8.00E-05
SWIMMING	0.0	3.77E-12	3.77E-12	3.77E-12	3.77E-12	3.77E-12	3.77E-12	3.77E-12
BOATING	0.0	9.42E-08	9.42E-08	9.42E-08	9.42E-08	9.42E-08	9.42E-08	9.42E-08
TOTAL	9.39E-05	1.73E-02	2.21E-02	1.92E-03	2.43E-03	5.87E-03	2.53E-03	3.33E-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

SPORT HARVEST

			DOSE (MAN-REM)						
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	CATEGORY I	7.60E+04	3.99E-01	5.95E-01	4.15E-01	1.52E-02	1.99E-01	6.67E-02	2.80E-02
FISH	CATEGORY II	8.87E+03	6.49E-02	9.43E-02	3.58E-02	2.17E-03	3.15E-02	1.23E-02	3.11E-03
FISH	CATEGORY III	6.14E+03	1.31E-01	1.35E-01	2.23E-02	3.60E-03	4.32E-02	1.57E-02	1.96E-03
FISH	TOTAL	9.10E+04	5.94E-01	8.24E-01	4.73E-01	2.09E-02	2.74E-01	9.47E-02	3.30E-02

LOCATION	DILUTION	CATCH	TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 1.68E+02 HR	POPULATION=1.55E+04
	7.00E+00	9.10E+04	1.68E+02	

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=6.90E+00 CATEGORY II=5.20E+00 CATEGORY IV=2.20E+00

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

----------COMMERCIAL HARVEST----------

			DOSE (MAN-REM)						
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	CATEGORY I	1.00E+09	1.86E+00	2.77E+00	1.93E+00	5.41E-02	9.26E-01	3.10E-01	1.28E-01
FISH	CATEGORY II	1.17E+07	3.02E-01	4.39E-01	1.66E-01	7.73E-03	1.46E-01	5.71E-02	1.42E-02
FISH	CATEGORY III	8.12E+06	6.07E-01	6.27E-01	1.04E-01	1.28E-02	2.01E-01	7.20E-02	8.47E-03
FISH	TOTAL	1.20E+09	2.76E+00	3.83E+00	2.20E+00	7.46E-02	1.27E+00	4.40E-01	1.50E-01

LOCATION DILUTION CATCH TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 2.40E+02 HR POPULATION=2.05E+07
7.00E+00 1.55E+05 2.40E+02

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=6.90E+00 CATEGORY II=5.20E+00 CATEGORY IV=2.20E+00

----------NEPA DOSES----------

NOTE--TOTAL NEPA DOSE INCLUDES SPORT CATCH

			DOSE (MAN-REM)						
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	CATEGORY I	2.05E+05	1.09E+00	1.61E+00	1.12E+00	3.50E-02	5.38E-01	1.80E-01	7.47E-02
FISH	CATEGORY II	2.40E+04	1.75E-01	2.55E-01	9.66E-02	5.00E-03	8.50E-02	3.32E-02	8.29E-03
FISH	CATEGORY III	1.66E+04	3.53E-01	3.64E-01	6.03E-02	8.28E-03	1.17E-01	4.24E-02	4.95E-03
FISH	TOTAL	2.46E+05	1.61E+00	2.23E+00	1.28E+00	4.82E-02	7.39E-01	2.56E-01	8.79E-02

* * * INVERTEBRATE CONSU[redacted] POPULATION DOSES * * *
MAN-REM

SPORT HARVEST

PATHWAY	AGE GROUP	USAGE	DOSE (MAN-REM) BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	CATEGORY I	8.33E+03	8.26E-03	8.35E-03	3.81E-03	5.72E-04	1.60E-03	2.23E-03	1.07E-02
INVER	CATEGORY II	9.68E+02	1.32E-03	1.33E-03	4.39E-04	8.13E-05	2.45E-04	4.14E-04	1.14E-03
INVER	CATEGORY III	5.97E+02	2.85E-03	2.01E-03	6.11E-04	1.40E-04	3.41E-04	5.93E-04	6.70E-04
INVER	TOTAL	1.00E+04	1.24E-02	1.17E-02	4.86E-03	7.94E-04	2.19E-03	3.24E-03	1.25E-02

LOCATION DILUTION 7.00E+00 CATCH 1.00E+04 TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 1.68E+02 HR 1.68E+02 POPULATION=1.17E+04

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=1.00E+00 CATEGORY II=7.50E-01 CATEGORY IV=3.30E-01

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

_____COMMERCIAL HARVEST_____

		DOSE (MAN-REM)							
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	CATEGORY I	1.46E+07	6.26E-03	6.32E-03	2.88E-03	3.32E-04	1.18E-03	1.69E-03	7.83E-03
INVER	CATEGORY II	1.69E+06	1.00E-03	1.00E-03	3.31E-04	4.72E-05	1.83E-04	3.13E-04	8.39E-04
INVER	CATEGORY III	1.22E+06	2.16E-03	1.52E-03	4.60E-04	8.11E-05	2.52E-04	4.49E-04	4.94E-04
INVER	TOTAL	1.75E+07	9.42E-03	8.84E-03	3.67E-03	4.61E-04	1.61E-03	2.45E-03	9.17E-03

LOCATION DILUTION CATCH TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 2.40E+02 HR POPULATION=2.05E+07
7.00E+00 1.00E+03 2.40E+02

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=1.00E+00 CATEGORY II=7.50E-01 CATEGORY IV=3.30E-01

_____NEPA DOSES_____

NOTE--TOTAL NEPA DOSE INCLUDES SPORT CATCH

		DOSE (MAN-REM)							
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	CATEGORY I	9.17E+03	9.99E-03	9.19E-03	4.18E-03	6.16E-04	1.75E-03	2.44E-03	1.17E-02
INVER	CATEGORY II	1.07E+03	1.45E-03	1.46E-03	4.83E-04	8.75E-05	2.72E-04	4.55E-04	1.25E-03
INVER	CATEGORY III	7.67E+02	3.14E-03	2.21E-03	6.72E-04	1.51E-04	3.75E-04	6.52E-04	7.35E-04
INVER	TOTAL	1.10E+04	1.37E-02	1.29E-02	5.34E-03	8.54E-04	2.40E-03	3.56E-03	1.37E-02

* * * POPULATION WATER CONSUMPTION DOSES * * *

SUPPLIER-

			DOSE (MAN-REM)						
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
DRINKING	CATEGORY I	2.63E+02	1.55E-09	4.94E-09	3.06E-09	5.04E-11	1.38E-09	4.92E-10	3.13E-10
DRINKING	CATEGORY II	2.86E+01	2.31E-09	7.20E-10	2.75E-10	5.54E-12	2.04E-10	8.26E-11	3.53E-11
DRINKING	CATEGORY III	4.68E+01	1.14E-08	2.52E-09	6.40E-10	1.74E-11	6.70E-10	2.52E-10	6.42E-11
DRINKING	TOTAL	3.38E+02	2.92E-08	8.07E-09	3.97E-09	7.34E-11	2.25E-09	8.27E-10	4.13E-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) CATEGORY I =3.70E+02 CATEGORY II=2.60E+02 CATEGORY III=2.60E+02

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

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
DRINKING	CUMUL TOTAL	3.38E+02	2.92E-08	8.07E-09	3.97E-09	7.34E-11	2.25E-09	8.27E-10	4.13E-10

HYDROSPHERE TRITIUM DOSE

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
WATER	TOTAL	2.20E+00	1.72E-03	1.72E-03	1.72E-03	1.72E-03	1.72E-03	1.72E-03	1.72E-03

LOCATION- DOWNSTREAM

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

PATHWAY	AGE GROUP	USAGE	DOSE(MAN-REM) SKIN	TOTAL BODY	THYROID
SHORELINE	TOTAL POPUL	1.66E+07	5.20E-01	4.43E-01	4.43E-01

LOCATION- 0.200

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

PATHWAY	AGE GROUP	USAGE	DOSE(MAN-REM) SKIN	TOTAL BODY	THYROID
SWIMMING	TOTAL POPUL	1.65E+07	0.0	6.42E-03	6.42E-03

LOCATION- 0.200

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	3.21E-03	3.21E-03

* * * DOSE TO BIOTA * * *

MRADS PER YEAR

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

	INTERNAL	EXTERNAL	TOTAL
FISH	3.78E-01	1.17E+00	1.55E+00
INVERTEBRATE	1.93E-01	2.34E+00	2.53E+00
ALGAE	3.16E-01	3.39E-03	3.19E-01
MUSKRAT	2.09E+00	7.81E-01	2.87E+00
RACCOON	1.35E-01	5.85E-01	7.20E-01
HERON	1.16E+01	7.80E-01	1.23E+01
DUCK	1.87E+00	1.17E+00	3.04E+00

* * * COST-BENEFIT ANALYSIS * * *

NUCLIDE		RELEASE	MAN-REM DOSE		MAN-REM PER CURIE	
		CI/YR	TOTAL BODY	THYROID	TOTAL BODY	THYROID
1H	3	2.10E+02	8.33E-04	8.33E-04	3.97E-06	3.97E-06
24CR	51	8.33E-02	2.00E-05	1.91E-05	2.40E-04	2.29E-04
25MN	54	5.49E-03	9.98E-04	2.55E-04	1.82E-01	4.65E-02
26FE	55	9.56E-01	3.81E-03	6.86E-08	4.45E-03	8.02E-08
26FE	59	1.43E-02	6.32E-04	1.65E-04	4.42E-02	1.15E-02
27CO	57	2.27E-04	1.61E-06	1.44E-06	7.09E-03	6.35E-03
27CO	58	5.30E-01	9.75E-03	7.67E-03	1.84E-02	1.45E-02
27CO	60	4.22E-01	3.00E-01	2.95E-01	7.10E-01	6.99E-01
28NI	63	1.59E-01	3.43E-03	0.0	2.16E-02	0.0
38SR	89	2.68E-03	3.36E-05	1.73E-08	1.25E-02	6.44E-06
38SR	90	2.52E-04	3.80E-04	1.70E-10	1.51E+00	6.77E-07
40ZR	95	1.12E-04	1.09E-06	1.09E-06	9.77E-03	9.76E-03
41NB	95	2.77E-03	2.02E-05	1.44E-05	7.29E-03	5.18E-03
43TC	99M	3.15E-05	6.09E-09	6.09E-09	1.93E-04	1.93E-04
47AG	110M	2.73E-03	3.20E-04	3.20E-04	1.17E-01	1.17E-01
52TE	132	3.70E-04	1.73E-05	2.09E-05	4.80E-02	5.64E-02
53I	131	1.65E-01	4.17E-04	9.58E-02	2.52E-03	5.81E-01
53I	132	3.87E-02	5.47E-07	5.47E-07	1.41E-05	1.41E-05
53I	133	1.55E+00	1.74E-03	2.12E-03	1.12E-03	1.36E-03
53I	134	6.20E-03	1.38E-06	1.38E-06	2.22E-04	2.22E-04
53I	135	1.11E-01	6.91E-06	6.91E-06	6.22E-05	6.22E-05
55CS	134	9.30E-02	8.35E-01	2.08E-02	8.98E+00	2.24E-01
55CS	137	3.57E-01	1.97E+00	1.19E-01	5.52E+00	3.33E-01
56BA	140	3.34E-03	5.62E-06	4.22E-06	1.68E-03	1.26E-03
57LA	140	1.92E-02	1.26E-05	1.26E-05	6.56E-04	6.56E-04
51SB	124	1.96E-02	4.67E-04	4.66E-04	2.38E-02	2.38E-02
51SB	125	5.40E-02	4.12E-03	4.12E-03	7.63E-02	7.63E-02
TOTAL			3.13E+00	5.46E-01		

NOTE ON AGE GROUP:

CATEGORY I (17 YEARS OLD OR OLDER)
CATEGORY II (11 TO 17 YEARS OLD)
CATEGORY III (1 TO 11 YEARS OLD)
CATEGORY IV (0 TO 1 YEAR OLD)

TABLE 4A

HOURS AT EACH WIND SPEED AND DIRECTION [a]

PERIOD OF RECORD: July - Sept 1987

STABILITY CLASS: A

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	26.	93.	2.	0.	0.	0.	121.
NNE	11.	19.	0.	0.	0.	0.	30.
NE	6.	1.	0.	0.	0.	0.	7.
ENE	2.	0.	0.	0.	0.	0.	2.
E	2.	0.	0.	0.	0.	0.	2.
ESE	6.	1.	0.	0.	0.	0.	7.
SE	10.	0.	0.	0.	0.	0.	10.
SSE	26.	63.	5.	0.	0.	0.	94.
S	32.	64.	9.	0.	0.	0.	105.
SSW	16.	20.	0.	0.	0.	0.	36.
SW	8.	14.	0.	0.	0.	0.	22.
WSW	10.	12.	0.	0.	0.	0.	22.
W	6.	18.	0.	0.	0.	0.	24.
WNW	9.	22.	0.	0.	0.	0.	31.
NW	7.	29.	0.	0.	0.	0.	36.
NNW	11.	16.	0.	0.	0.	0.	27.
VARIABLE							
Total	188	372.	16.	0.	0.	0.	576.

Periods of calm (hours): 0
Hours of missing data: None

[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 - Sept 1987

STABILITY CLASS: B

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3.	9.	1.	0.	0.	0.	13.
NNE	2.	6.	0.	0.	0.	0.	8.
NE	2.	1.	0.	0.	0.	0.	3.
ENE	0.	0.	0.	0.	0.	0.	0.
E	1.	0.	0.	0.	0.	0.	1.
ESE	1.	1.	0.	0.	0.	0.	2.
SE	2.	0.	0.	0.	0.	0.	2.
SSE	5.	7.	0.	0.	0.	0.	12.
S	9.	1.	1.	0.	0.	0.	11.
SSW	3.	3.	0.	0.	0.	0.	6.
SW	2.	1.	0.	0.	0.	0.	3.
WSW	1.	0.	0.	0.	0.	0.	1.
W	1.	3.	0.	0.	0.	0.	4.
WNW	1.	0.	1.	0.	0.	0.	2.
NW	2.	2.	0.	0.	0.	0.	4.
NNW	5.	0.	0.	0.	0.	0.	5.
VARIABLE							
Total	40.	34.	3.	0.	0.	0.	77.

Periods of calm (hours): 0
Hours of missing data: None

[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 - Sept 1987

STABILITY CLASS: C

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2.	5.	2.	0.	0.	0.	9.
NNE	5.	6.	0.	0.	0.	0.	11.
NE	2.	2.	0.	0.	0.	0.	4.
ENE	1.	0.	0.	0.	0.	0.	1.
E	1.	0.	0.	0.	0.	0.	1.
ESE	0.	0.	0.	0.	0.	0.	0.
SE	3.	0.	0.	0.	0.	0.	3.
SSE	2.	2.	0.	0.	0.	0.	4.
S	3.	5.	2.	0.	0.	0.	10.
SSW	1.	2.	0.	0.	0.	0.	3.
SW	0.	2.	0.	0.	0.	0.	2.
WSW	0.	1.	0.	0.	0.	0.	1.
W	2.	2.	0.	0.	0.	0.	4.
WNW	0.	2.	0.	0.	0.	0.	2.
NW	0.	1.	0.	0.	0.	0.	1.
NNW	0.	1.	0.	0.	0.	0.	1.
VARIABLE							
Total	22.	31.	4.	0.	0.	0.	57.

Periods of calm (hours): 0
Hours of missing data: None

[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 - Sept 1987

STABILITY CLASS: D

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	23.	43.	14.	0.	0.	0.	80.
NNE	61.	110.	8.	0.	0.	0.	179.
NE	45.	5.	0.	0.	0.	0.	50.
ENE	28.	0.	0.	0.	0.	0.	28.
E	27.	0.	0.	0.	0.	0.	27.
ESE	19.	1.	0.	0.	0.	0.	20.
SE	25.	0.	0.	0.	0.	0.	25.
SSE	19.	25.	6.	0.	0.	0.	50.
S	30.	45.	0.	0.	0.	0.	81.
SSW	21.	8.	0.	0.	0.	0.	29.
SW	5.	2.	0.	0.	0.	0.	7.
WSW	7.	2.	0.	0.	0.	0.	9.
W	4.	4.	0.	0.	0.	0.	8.
WNW	3.	2.	0.	0.	0.	0.	5.
NW	5.	7.	0.	0.	0.	0.	12.
NNW	4.	12.	0.	0.	0.	0.	16.
VARIABLE							
Total	326.	266.	34.	0.	0.	0.	626.

Periods of calm (hours): 2
Hours of missing data: None

[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 - Sept 1987

STABILITY CLASS: E

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	45.	19.	1.	0.	0.	0.	65.
NNE	95.	61.	1.	0.	0.	0.	157.
NE	80.	20.	0.	0.	0.	0.	100.
ENE	40.	1.	0.	0.	0.	0.	41.
E	25.	0.	0.	0.	0.	0.	25.
ESE	26.	0.	0.	0.	0.	0.	26.
SE	21.	0.	0.	0.	0.	0.	21.
SSE	31.	6.	1.	0.	0.	0.	38.
S	57.	22.	4.	0.	0.	0.	83.
SSW	24.	5.	0.	0.	0.	0.	29.
SW	15.	0.	0.	0.	0.	0.	15.
WSW	7.	0.	0.	0.	0.	0.	7.
W	11.	0.	0.	0.	0.	0.	11.
WNW	9.	4.	0.	0.	0.	0.	13.
NW	10.	1.	0.	0.	0.	0.	11.
NNW	17.	4.	0.	0.	0.	0.	21.
VARIABLE							
Total	513.	143.	7.	0.	0.	0.	663.

Periods of calm (hours): 0
Hours of missing data: None

[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 - Sept 1987

STABILITY CLASS: F

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	22.	0.	0.	0.	0.	0.	22.
NNE	46.	22.	0.	0.	0.	0.	68.
NE	27.	5.	0.	0.	0.	0.	32.
ENE	9.	0.	0.	0.	0.	0.	9.
E	12.	0.	0.	0.	0.	0.	12.
ESE	6.	0.	0.	0.	0.	0.	6.
SE	4.	0.	0.	0.	0.	0.	4.
SSE	10.	0.	0.	0.	0.	0.	10.
S	3.	1.	0.	0.	0.	0.	4.
SSW	4.	0.	0.	0.	0.	0.	4.
SW	5.	0.	0.	0.	0.	0.	5.
WSW	1.	0.	0.	0.	0.	0.	1.
W	1.	0.	0.	0.	0.	0.	1.
WNW	2.	0.	0.	0.	0.	0.	2.
NW	4.	0.	0.	0.	0.	0.	4.
NNW	4.	0.	0.	0.	0.	0.	4.
VARIABLE							
Total	160.	28.	0.	0.	0.	0.	188.

Periods of calm (hours): 2
Hours of missing data: None

[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 - Sept

STABILITY CLASS: G

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1.	0.	0.	0.	0.	0.	1.
NNE	2.	0.	0.	0.	0.	0.	2.
NE	1.	0.	0.	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.	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	1.	0.	0.	0.	0.	0.	1.
WNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	1.	0.	0.	0.	0.	0.	0.
VARIABLE							
Total	6.	0.	0.	0.	0.	0.	6.

Periods of calm (hours): 0
Hours of missing data: None

[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 - December 1987

STABILITY CLASS: A

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0.	9.	7.	0.	0.	0.	16.
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	1.	9.	1.	1.	0.	0.	12.
S	0.	4.	5.	1.	0.	0.	10.
SSW	0.	1.	0.	0.	0.	0.	1.
SW	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	0.	0.	0.
W	0.	3.	2.	0.	0.	0.	5.
WNW	1.	3.	3.	0.	0.	0.	7.
NW	0.	12.	4.	4.	0.	0.	20.
NNW	2.	12.	0.	0.	0.	0.	14.
VARIABLE							
Total	4.	53.	22.	6.	0.	0.	85.

Periods of calm (hours): 0
Hours of missing data: None

[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 - December 1987

STABILITY CLASS: B

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0.	5.	3.	0.	0.	0.	8.
NNE	0.	2.	0.	0.	0.	0.	2.
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.	3.	0.	0.	0.	0.	0.
SSE	0.	4.	1.	1.	0.	0.	6.
S	0.	4.	1.	1.	0.	0.	6.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	0.	2.	0.	0.	0.	0.	2.
WSW	1.	1.	0.	0.	0.	0.	2.
W	0.	5.	1.	0.	0.	0.	6.
WNW	1.	3.	4.	1.	0.	0.	9.
NW	1.	8.	11.	0.	0.	0.	20.
NNW	1.	6.	2.	0.	0.	0.	9.
VARIABLE							
Total	4.	43.	23.	3.	0.	0.	73.

Periods of calm (hours): 0
Hours of missing data: None

[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 - December 1987

STABILITY CLASS: B

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0.	5.	3.	0.	0.	0.	8.
NNE	0.	2.	0.	0.	0.	0.	2.
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.	3.	0.	0.	0.	0.	3.
SSE	0.	4.	1.	1.	0.	0.	6.
S	0.	4.	1.	1.	0.	0.	6.
SSW	0.	0.	0.	0.	0.	0.	0.
SW	0.	2.	0.	0.	0.	0.	2.
WSW	1.	1.	0.	0.	0.	0.	2.
W	0.	5.	1.	0.	0.	0.	6.
WNW	1.	3.	4.	1.	0.	0.	9.
NW	1.	8.	11.	0.	0.	0.	20.
NNW	1.	6.	2.	0.	0.	0.	9.
VARIABLE							
Total	4.	43.	23.	3.	0.	0.	73.

Periods of calm (hours): 0
Hours of missing data: None

[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 - December 1987

STABILITY CLASS: C

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2.	10.	2.	0.	0.	0.	14.
NNE	2.	0.	0.	0.	0.	0.	2.
NE	0.	0.	0.	0.	0.	0.	0.
ENE	1.	0.	0.	0.	0.	0.	1.
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	2.	7.	2.	1.	0.	0.	12.
S	4.	16.	1.	0.	0.	0.	21.
SSW	0.	1.	0.	0.	0.	0.	1.
SW	1.	0.	0.	0.	0.	0.	1.
WSW	0.	3.	1.	0.	0.	0.	4.
W	1.	4.	0.	0.	0.	0.	5.
WNW	2.	8.	8.	0.	0.	0.	18.
NW	0.	7.	9.	1.	0.	0.	17.
NNW	2.	6.	2.	0.	0.	0.	10.
VARIABLE							
Total	18.	62.	25.	2.	0.	0.	107.

Periods of calm (hours): 0
Hours of missing data: None

[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 - December 1987

STABILITY CLASS: D

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	21.	84.	78.	10.	0.	0.	193.
NNE	31.	51.	15.	1.	0.	0.	98.
NE	11.	11.	0.	0.	0.	0.	22.
ENE	9.	0.	0.	0.	0.	0.	9.
E	7.	0.	0.	0.	0.	0.	7.
ESE	6.	0.	0.	0.	0.	0.	6.
SE	3.	0.	0.	0.	0.	0.	3.
SSE	18.	29.	6.	1.	0.	0.	54.
S	17.	53.	8.	0.	0.	0.	78.
SSW	15.	7.	1.	0.	0.	0.	23.
SW	6.	9.	0.	0.	0.	0.	15.
WSW	9.	11.	7.	0.	0.	0.	27.
W	9.	30.	16.	0.	0.	0.	55.
WNW	6.	54.	23.	0.	0.	0.	83.
NW	7.	67.	55.	6.	0.	0.	135.
NNW	6.	48.	15.	1.	0.	0.	70.
VARIABLE							
Total	181.	454.	224.	19.	0.	0.	878.

Periods of calm (hours): 13
Hours of missing data: None

[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 - December

STABILITY CLASS: E

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	42.	9.	0.	7.	0.	0.	58.
NNE	81.	24.	1.	0.	0.	0.	106.
NE	39.	5.	0.	0.	0.	0.	44.
ENE	15.	0.	0.	0.	0.	0.	15.
E	19.	1.	0.	0.	0.	0.	20.
ESE	20.	0.	0.	0.	0.	0.	20.
SE	22.	1.	0.	0.	0.	0.	23.
SSE	47.	37.	7.	3.	0.	0.	94.
S	42.	41.	7.	1.	0.	0.	91.
SSW	37.	8.	0.	0.	0.	0.	45.
SW	20.	7.	0.	0.	0.	0.	27.
WSW	19.	6.	0.	0.	0.	0.	25.
W	20.	18.	1.	0.	0.	0.	39.
WNW	22.	8.	0.	0.	0.	0.	30.
NW	22.	15.	0.	0.	0.	0.	37.
NNW	18.	11.	3.	0.	0.	0.	32.
VARIABLE							
Total	485.	191.	19.	11.	0.	0.	706.

Periods of calm (hours): 20
Hours of missing data: None

[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 - December 1987

STABILITY CLASS: F

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	38.	1.	0.	0.	0.	0.	39.
NNE	107.	25.	0.	0.	0.	0.	132.
NE	19.	8.	0.	0.	0.	0.	27.
ENE	8.	0.	0.	0.	0.	0.	8.
E	4.	0.	0.	0.	0.	0.	4.
ESE	3.	0.	0.	0.	0.	0.	3.
SE	3.	0.	0.	0.	0.	0.	3.
SSE	10.	1.	0.	0.	0.	0.	11.
S	14.	2.	0.	0.	0.	0.	16.
SSW	8.	0.	0.	0.	0.	0.	8.
SW	4.	0.	0.	0.	0.	0.	4.
WSW	2.	0.	0.	0.	0.	0.	2.
W	4.	1.	0.	0.	0.	0.	5.
WNW	2.	0.	0.	0.	0.	0.	2.
NW	3.	0.	0.	0.	0.	0.	3.
NNW	6.	0.	0.	0.	0.	0.	6.
VARIABLE							
Total	235.	38.	0.	0.	0.	0.	273.

Periods of calm (hours): 7
Hours of missing data: None

[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 - December 1987

STABILITY CLASS: G

ELEVATION: 10 Meter

Wind Direction	Wind Speed (mph) at 10m Level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	10.	0.	0.	0.	0.	0.	10.
NNE	17.	8.	0.	0.	0.	0.	25.
NE	1.	4.	0.	0.	0.	0.	5.
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	0.	0.	0.	0.	0.	0.	0.
SSE	1.	0.	0.	0.	0.	0.	1.
S	0.	0.	0.	0.	0.	0.	0.
SSW	1.	0.	0.	0.	0.	0.	1.
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	1.	0.	0.	0.	0.	0.	1.
NW	0.	0.	0.	0.	0.	0.	0.
NNW	2.	0.	0.	0.	0.	0.	2.
VARIABLE							
Total	34.	12.	0.	0.	0.	0.	46.

Periods of calm (hours): 0
Hours of missing data: None

[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.

February 29, 1988

Re: Indian Point Unit Nos. 1 and 2
Docket No. 50-247

SEMI-ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

F - REPORTABLE CHANGES

TO THE PROCESS CONTROL ROOM (PCP)

OFFSITE DOSE CALCULATION MANUAL (ODCM)

AND RADIOACTIVE WASTE SYSTEMS

G - REPORTABLE ITEMS

THE RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

H - UNPLANNED RELEASES

SECOND HALF - 1987

February 29, 1988

Re: Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 and 50-247

SECTION G

Reportable Items

A. Radioactive Liquid Effluent Monitoring Instrumentation

The steam generator blowdown effluent line flow rate measurement device has been inoperable for greater than 30 days and is being reported pursuant to Indian Point 2 Technical Specification 3.9.A.2.C. Prior to the issuance of the radiological effluent Technical Specifications, Amendment 90 to Indian Point Facility Operating License No. DPR-26 on June 20, 1984, the provisions to measure steam generator blowdown flow had been disconnected to establish sampling connections outside containment. Installation of new steam generator blowdown flow measurement devices is complete. Pre-occupational testing is underway.

B. Radioactive Gaseous Effluent Monitoring Instrumentation

(1) The Waste Gas Hold-up System Explosive Oxygen Recorder (ALARM) Monitor, Table 8.9-2.2B of the Technical Specifications was out of service and inoperable in excess of thirty days. It has been replaced by new instrumentation and is now in service.

(2) The Stack Vent monitor associated with Indian Point Unit No. 1 was inoperable more than 30 days during this reporting period. Repairs were made to the pump and motor and the monitor was placed back in service prior to the end of the reporting period. Repair of this monitor was hindered by equipment obsolescence and a lack of easily obtainable spare parts. The next phase of an ongoing program for replacement of the station radiation monitoring system is planned to include this equipment.

February 29, 1988

Re: Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 and 50-247

SECTION H

Unplanned Releases

A. Unplanned Liquid Releases

There was one unplanned liquid release during the 4th quarter of 1987. The values have been integrated into the releases reported for this period. This release was < 0.1% of MPC as per 10CFR20 Appendix B, Table II, Column 2.

B. Unplanned Gaseous Releases

During this reporting period there were no unplanned gaseous releases.

February 29, 1988

Re: Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 and 50-247

SECTION F

Reportable Changes

A. Process Control Program (PCP)

Section 6.14.1 of the Indian Point Unit No. 2 Technical Specifications addresses licensee initiated changes to a Process Control Program (PCP). During the 2nd half of 1987, there were no changes made.

B. Offsite Dose Calculation Manual (ODCM)

In reference to the reportable changes to the Offsite Dose Calculation Manual and pursuant to Indian Point Unit No. 2 Technical Specifications 6.15.2 (1A, B and C). During the 2nd half of 1987, there were no changes made.

C. Radioactive Waste Systems

For the period reported there were no major changes made to any of the radioactive waste systems.

February 19, 1988

Re: Indian Point Unit Nos. 1 and 2
Docket Nos. 50-03 and 50-247

SEMI-ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT

Addendum to 1st and 2nd

Quarter 1987

Changes to the report are indicated by margin bars

bar 1 = Carbon-14 is now being Reported as fission and activation gaseous release instead of gaseous particulate

bar 2 = Computational change

LS0411A.2.19.1

CON EDISON
INDIAN POINT 2
QUARTER : START DATE
QUARTER : START DATE

DATE OF REPORT:
PREPARED BY:
END DATE
END DATE

[redacted]UENT AND WASTE DISPOSAL REPORT

GASEOUS EFFLUENTS -- SUMMATION OF ALL RELEASES

	UNITS	QUARTER 1	QUARTER 2	EST. TOTAL ERROR, %
A. FISSION AND ACTIVATION GASES				
1. TOTAL RELEASE	CI	2.05E 03	3.85E 02	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	2.63E 02	4.90E 01	
B. IODINES				
1. TOTAL IODINE-131	CI	1.39E-04	5.59E-04	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	1.79E-05	7.11E-05	
3.				
C. PARTICULATES				
1. PARTICULATES WITH HALF-LIVES >8 DAYS	CI	$2.30E^{-4}$	$5.19E^{-4}$	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	$2.89E^{-5}$	$6.53E^{-5}$	
3.				
4. GROSS ALPHA RADIOACTIVITY	CI	0.00E 00	0.00E 00	
D. TRITIUM				
1. TOTAL RELEASE	CI	1.95E-01	8.13E-02	5.00E 01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	2.51E-02	1.03E-02	
3.				

1

DATE OF REPORT:
PREPARED BY:

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 1	CONTINUOUS MODE QUARTER 2	BATCH MODE QUARTER 1	BATCH MODE QUARTER 2
1. FISSION AND ACTIVATION GASES (Plant Vent)					
H3	CI	1.87E-01	7.33E-02		
AR41	CI			4.79E00	1.51E00
KR85M	CI				
KR85	CI				
KR87	CI				
KR88	CI			2.87E-01	4.02E-01
XE131M	CI				
XE133M	CI			8.34E00	2.38E00
XE133	CI	1.23E02	8.91E01	1.10E03	2.67E02
XE135M	CI				
XE135	CI	7.88E02	1.39E01	2.07E01	5.65E00
XE131	CI				
C14	CI	2.00E00	2.00E00		
TOTAL FOR PERIOD (ABOVE)	CI	9.13E02	1.05E02	1.13E03	2.77E02

1

QUARTER : START DATE END DATE
DATE OF REPORT:
PREPARED BY:

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 1	CONTINUOUS MODE QUARTER 2	BATCH MODE QUARTER 1	BATCH MODE QUARTER 2
3. PARTICULATES (Plant Vent)					
CR51	CI				
MN54	CI				
FE59	CI				
CO58	CI	0.00E 00	2.48E-05	0.00E 00	0.00E 00
CO60	CI	1.63E-05	1.47E-05	0.00E 00	0.00E 00
ZN65	CI				
CS134	CI				
CS137	CI	6.32E-05	5.76E-05	0.00E 00	0.00E 00
[redacted]E55	CI	$1.00E^{-5}$	$6.09E^{-6}$	0.00E 00	0.00E 00
MI63	CI	3.07^{-5}	0.00E 00	0.00E 00	0.00E 00
CO57	CI				
TOTAL FOR PERIOD (ABOVE)	CI	$1.20E^{-4}$	$1.03E^{-4}$	0.00E 00	0.00E 00

2

CON EDISON

PREPARED BY:

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 1	CONTINUOUS MODE QUARTER 2	BATCH MODE QUARTER 1	BATCH MODE QUARTER 2
H3	CI	9.36E 00	4.56E 01	1.89E 02	1.09E 02
NA24	CI	0.00E 00	1.14E-02	0.00E 00	0.00E 00
FE55	CI	2.49E-02	2.19E-03	1.65E-02	4.18E-03
CO58	CI	4.18E-03	0.00E 00	1.30E-02	6.02E-03
CO60	CI	6.16E-02	7.90E-05	1.58E-01	6.14E-02
NI63	CI	3.08E-02	0.00E 00	6.20E-02	4.01E-02
SR90	CI	2.21E-04	0.00E 00	4.48E-04	1.40E-04
I131	CI	2.03E-02	1.32E-02	4.34E-02	2.76E-02
[illegible]33	CI	1.74E-01	2.24E-01	0.00E 00	0.00E 00
CS134	CI	5.57E-02	1.29E-02	4.62E-02	2.66E-02
CS137	CI	1.37E-01	1.97E-02	1.29E-01	9.48E-02
SB125	CI	0.00E 00	0.00E 00	9.43E-03	4.38E-03
SB124	CI	0.00E 00	0.00E 00	0.00E 00	6.43E-05
TOTAL FOR PERIOD (ABOVE)	CI	9.87E 00	4.59E 01	1.89E 02	1.10E 02

2

QUARTER : START DATE END DATE
DATE OF REPORT:
PREPARED BY:

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE QUARTER 1	CONTINUOUS MODE QUARTER 2	BATCH MODE QUARTER 1	BATCH MODE QUARTER 2
3. PARTICULATES (Stack Vent Unit #1)					
CR51	CI				
MN54	CI				
FE59	CI				
CO58	CI	0.00E 00	$1.53E^{-5}$	0.00E 00	0.00E 00
CO60	CI	1.92E-05	3.59E-06	0.00E 00	0.00E 00
ZN65	CI				
CS134	CI				
CS137	CI	3.51E-05	$3.96E^{-4}$	0.00E 00	0.00E 00
FE55	CI				
NI63	CI	$5.57E^{-5}$	$1.45E^{-6}$	0.00E 00	0.00E 00
CO57	CI				
TOTAL FOR PERIOD (ABOVE)	CI	$1.10E^{-4}$	$4.16E^{-4}$	0.00E 00	0.00E 00

2

QUARTER : START DATE END DATE
QUARTER : START DATE END DATE

EF[redacted]ENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS -- SUMMATION OF ALL RELEASES

	UNITS	QUARTER 1	QUARTER 2	EST. TOTAL ERROR, %
A. FISSION AND ACTIVATION PRODUCTS				
1. TOTAL RELEASE (EXCL. TRIT., GASES, ALPHA)	CI	9.86E-01	5.48E-01	2.50E 01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	4.03E-09	2.57E-09	
3. PERCENT OF MPC	%	7.75E-03	1.11E-02	
B. TRITIUM				
1. TOTAL RELEASE	CI	1.98E 02	1.55E 02	2.50E 01
2. [redacted]AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	8.08E-07	7.27E-07	
3. PERCENT OF MPC	%	2.69E-02	2.42E-02	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	CI	5.59E-01	1.19E00	2.50E 01
2. AVERAGE DILUTED CONC. DURING PERIOD	UCI/ML	2.28E-09	5.60E-09	
3. PERCENT OF MPC	%	1.14E-03	2.80E-03	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	CI	0.00E 00	0.00E 00	2.50E 01
E. [redacted]LUME WASTE RELEASED (PRIOR TO DILUTION)	LITERS	3.59E 07	1.58E 07	1.00E 01
F. VOLUME DILUTION WATER USED DURING PERIOD	LITERS	2.45 E 11	2.13E 11	1.00E 01

ENTER: [RETURN] CONTINUE, [SO] START OVER, [EX] TO EXIT

Indian Point Units 1 & 2

RADIOLOGICAL IMPACT ON MAN

(Reference Regulatory Guide 1.21, Page 12)

A. Maximum Individual Doses

(1) Pathways (Gaseous) mRem	Total Body mRem	Skin mRem	Thyroid mRem	Bone	Source Information (MIDAS File)
a) Noble Gas Immersion	2.69E-1	7.14E-1	N/A	N/A	MIDASDM
(b) Inhalation***	4.17E-3	N/A	2.12E-3	8.72E-3	
(c) Ground Deposition	6.61E-1	7.73E-2	6.61E-1	6.61E-1	
(d) Milk Ingestion*	1.36E-2	N/A	5.68E-3	1.06E-1	MIDASDM
(e) Meat Ingestion***	1.63E-3	N/A	2.91E-5	2.75E-3	
(f) Vegetable Ingestion***	2.21E-1	N/A	4.29E-3	9.26E-1	

2) Pathways (Liquid)

(a) All — See Attached "LADTAP" printout Attachment I

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

NA = Not Applicable

B. Population

(1) Pathways (Gaseous)

	Total Body (man-rem)	Thyroid (man-thyroid rem)	Source Information (MIDAS File)
(a) Noble Gas Immersion	7.2E+0	7.2E+0	
(b) Inhalation	1.5E-1	1.2E-2	MIDASPP
(c) Ground Deposition	9.8E+0	9.8E+0	
(d) Totals	1.7E+1	1.7E+1	

(2) Pathways (Liquid)

(a) All — See attached "LADTAP" printout Attachment I

C. Average Doses to Individuals

(1) Pathways

(a) Liquid-Total Body 1.29E-4 millirem — LADTAP2

(b) Gaseous-Total Body 8.29E-4 millirem

IP2 SEMI-ANNUAL EFFLUENT REPORT 1ST HALF 1987 - USNRC LADTAP II CODE

DISCHARGE=2.86E+03 CFS SOURCE TERM MULTIPLIER=1.00E+00

50-MILE POPULATION=2.05E+07 FRACTION --- CATEGORY I=0.71
CATEGORY II=0.11
CATEGORY III=0.18

FRESHWATER SITE

SOURCE TERM FOLLOWS
GRIEF XE133 5.80E-01
GRIEF XE135 1.17E+00
NO INTERNAL RECONCENTRATION MODEL EMPLOYED

* * * CATEGORY I DOSE FACTORS * * *

			INGESTION DOSE FACTORS (MREM/PCI INTAKE)							SHORELINE (MREM/HR)/(PCI/M**2)		
NUCLIDE		CURIE/YEAR	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY	RECON
1H	3	3.53E+02	0.0	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	0.0	0.0	1.00E+00
11NA	24	1.14E-02	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	2.90E-08	2.50E-08	1.00E+00
26FE	55	4.78E-02	2.75E-06	1.90E-06	4.43E-07	0.0	0.0	1.06E-06	1.09E-06	0.0	0.0	1.00E+00
27CO	58	2.32E-02	0.0	7.45E-07	1.67E-06	0.0	0.0	0.0	1.51E-05	8.20E-09	7.00E-09	1.00E+00
27CO	60	2.81E-01	0.0	2.14E-06	4.72E-06	0.0	0.0	0.0	4.02E-05	2.00E-08	1.70E-08	1.00E+00
28NI	63	1.33E-01	1.30E-04	9.01E-06	4.36E-06	0.0	0.0	0.0	1.88E-06	0.0	0.0	1.00E+00
38SR	90	8.09E-04	3.84E-03	0.0	1.03E-03	0.0	0.0	0.0	2.19E-04	0.0	0.0	1.00E+00
53I	131	1.05E-01	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	0.0	1.57E-06	3.40E-09	2.80E-09	1.00E+00
53I	133	3.98E-01	1.42E-06	2.47E-06	7.53E-07	3.63E-04	4.31E-06	0.0	2.22E-06	4.50E-09	3.70E-09	1.00E+00
55CS	134	1.41E-01	6.22E-05	1.48E-04	1.21E-04	0.0	4.79E-05	1.59E-05	2.59E-06	1.40E-08	1.20E-08	1.00E+00
55CS	137	3.81E-01	7.97E-05	1.09E-04	7.14E-05	0.0	3.70E-05	1.23E-05	2.11E-06	4.90E-09	4.20E-09	1.00E+00
51SB	125	1.38E-02	1.79E-06	2.00E-08	4.26E-07	1.82E-09	0.0	1.38E-06	1.97E-05	3.50E-09	3.10E-09	1.00E+00
51SB	124	6.43E-05	2.80E-06	5.29E-08	1.11E-06	6.79E-09	0.0	2.18E-06	7.95E-05	1.50E-08	1.30E-08	1.00E+00

* * * CATEGORY II DOSE FACTORS * * *

			INGESTION DOSE FACTORS (MREM/PCI INTAKE)							SHORELINE (MREM/HR)/(PCI/M**2)		
NUCLIDE		CURIE/YEAR	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY	RECON
1H	3	3.53E+02	0.0	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07			
11NA	24	1.14E-02	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06			
26FE	55	4.78E-02	3.78E-06	2.68E-06	6.25E-07	0.0	0.0	1.70E-06	1.16E-06			
27CO	58	2.32E-02	0.0	9.72E-07	2.24E-06	0.0	0.0	0.0	1.34E-05			
27CO	60	2.81E-01	0.0	2.81E-06	6.33E-06	0.0	0.0	0.0	3.66E-05			
28NI	63	1.33E-01	1.77E-04	1.25E-05	6.00E-06	0.0	0.0	0.0	1.99E-06			
38SR	90	8.09E-04	4.48E-03	0.0	1.20E-03	0.0	0.0	0.0	2.33E-04			
53I	131	1.05E-01	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	0.0	1.62E-06			
53I	133	3.98E-01	2.01E-06	3.41E-06	1.04E-06	4.76E-04	5.98E-06	0.0	2.58E-06			
55CS	134	1.41E-01	8.37E-05	1.97E-04	9.14E-05	0.0	6.26E-05	2.39E-05	2.45E-06			
55CS	137	3.81E-01	1.12E-04	1.49E-04	5.19E-05	0.0	5.07E-05	1.97E-05	2.12E-06			
51SB	125	1.38E-02	2.48E-06	2.71E-08	5.80E-07	2.37E-09	0.0	2.18E-06	1.93E-05			
51SB	124	6.43E-05	3.87E-06	7.13E-08	1.51E-06	8.78E-09	0.0	3.38E-06	7.80E-05			

* * * CATEGORY III DOSE FACTORS * * *

			INGESTION DOSE FACTORS (MREM/PCI INTAKE)							SHORELINE (MREM/HR)/(PCI/M**2)		
NUCLIDE		CURIE/YEAR	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY	RECON
1H	3	3.53E+02	0.0	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07			
11NA	24	1.14E-02	5.80E-06	5.80E-06	5.80E-06	5.80E-06	5.80E-06	5.80E-06	5.80E-06			
26FE	55	4.78E-02	1.15E-05	6.10E-06	1.89E-06	0.0	0.0	3.45E-06	1.13E-06			
27CO	58	2.32E-02	0.0	1.80E-06	5.51E-06	0.0	0.0	0.0	1.05E-05			
27CO	60	2.81E-01	0.0	5.29E-06	1.56E-05	0.0	0.0	0.0	2.93E-05			
28NI	63	1.33E-01	5.38E-04	2.88E-05	1.83E-05	0.0	0.0	0.0	1.94E-06			
38SR	90	8.09E-04	1.13E-02	0.0	3.03E-03	0.0	0.0	0.0	2.29E-04			
53I	131	1.05E-01	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	0.0	1.54E-06			
53I	133	3.98E-01	5.92E-06	7.32E-06	2.77E-06	1.36E-03	1.22E-05	0.0	2.95E-06			
55CS	134	1.41E-01	2.34E-04	3.84E-04	8.10E-05	0.0	1.19E-04	4.27E-05	2.07E-06			
55CS	137	3.81E-01	3.27E-04	3.13E-04	4.62E-05	0.0	1.02E-04	3.67E-05	1.96E-06			

51SB	125	[illegible]38E-02	7.16E-06	5.52E-08	1.50E-06	6.63E-09	0.0	[illegible].99E-06	1.71E-05		
51S3	124	6.43E-05	1.11E-05	1.44E-07	3.89E-06	2.45E-08	0.0	6.16E-06	6.94E-05		

* * * CATEGORY IV DOSE FACTORS * * *

			INGESTION DOSE FACTORS (MREM/PCI INTAKE)							SHORELINE (MREM/HR)/(PCI/M**2)		
NUCLIDE		CURIE/YEAR	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY	RECON
1H	3	3.53E+02	0.0	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07			
11NA	24	1.14E-02	1.01E-05	1.01E-05	1.01E-05	1.01E-05	1.01E-05	1.01E-05	1.01E-05			
26FE	55	4.78E-02	1.39E-05	8.98E-06	2.40E-06	0.0	0.0	4.39E-06	1.14E-06			
27CO	58	2.32E-02	0.0	3.60E-06	8.98E-06	0.0	0.0	0.0	8.97E-06			
27CO	60	2.81E-01	0.0	1.08E-05	2.55E-05	0.0	0.0	0.0	2.57E-05			
28NI	63	1.33E-01	6.34E-04	3.92E-05	2.20E-05	0.0	0.0	0.0	1.95E-06			
38SR	90	8.09E-04	1.25E-02	0.0	3.37E-03	0.0	0.0	0.0	2.31E-04			
53I	131	1.05E-01	3.59E-05	4.23E-05	1.86E-05	1.39E-02	4.94E-05	0.0	1.51E-06			
53I	133	3.98E-01	1.25E-05	1.82E-05	5.33E-06	3.31E-03	2.14E-05	0.0	3.08E-06			
55CS	134	1.41E-01	3.77E-04	7.03E-04	7.10E-05	0.0	1.81E-04	7.42E-05	1.91E-06			
55CS	137	3.81E-01	5.22E-04	6.11E-04	4.33E-05	0.0	1.64E-04	6.64E-05	1.91E-06			
51SB	125	1.38E-02	1.23E-05	1.19E-07	2.53E-06	1.54E-08	0.0	7.12E-06	1.64E-05			
51SB	124	6.43E-05	2.14E-05	3.15E-07	6.63E-06	5.68E-08	0.0	1.34E-05	6.60E-05			

TOTAL NUMBER IN SOURCE TERM IS 13 TOTAL RELEASE IS 3.5453E+02

* * * AS LOW AS REASONABLY ACHIEVABLE * * *

CATEGORY I DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.32E-01	2.05E-01	1.46E-01	6.22E-03	6.86E-02	2.28E-02	4.93E-03
INVERTEBRATE		2.50E-03	2.66E-03	1.93E-03	5.03E-04	8.32E-04	3.48E-04	1.05E-03
ALGAE		1.74E-08	2.47E-08	1.79E-08	7.85E-09	8.24E-09	2.80E-09	2.77E-09
DRINKING		4.69E-13	7.96E-13	6.59E-13	1.39E-12	4.59E-13	3.45E-13	3.97E-13
SHORELINE	1.29E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03
SWIMMING	0.0	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05
BOATING	0.0	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05
TOTAL	1.29E-03	1.35E-01	2.09E-01	1.49E-01	7.85E-03	7.06E-02	2.43E-02	7.10E-03

	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

CATEGORY II DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.39E-01	2.12E-01	8.21E-02	5.90E-03	7.05E-02	2.73E-02	3.65E-03
INVERTEBRATE		2.60E-03	2.75E-03	1.17E-03	4.74E-04	8.51E-04	4.11E-04	7.42E-04
ALGAE		2.39E-08	3.34E-08	1.36E-08	9.79E-09	1.11E-08	4.38E-09	2.60E-09
DRINKING		6.43E-13	9.78E-13	5.79E-13	1.64E-12	5.21E-13	3.78E-13	3.91E-13
SHORELINE	1.73E-03	1.48E-03	1.48E-03	1.48E-03	1.48E-03	1.48E-03	1.48E-03	1.48E-03
SWIMMING	0.0	2.09E-05	2.09E-05	2.09E-05	2.09E-05	2.09E-05	2.09E-05	2.09E-05
BOATING	0.0	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05
TOTAL	1.73E-03	1.44E-01	2.16E-01	8.47E-02	7.88E-03	7.29E-02	2.92E-02	5.90E-03

	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

CATEGORY III DOSES

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.74E-01	1.88E-01	3.17E-02	6.39E-03	6.01E-02	2.16E-02	1.41E-03
INVERTEBRATE		3.41E-03	2.53E-03	6.19E-04	5.31E-04	7.52E-04	3.45E-04	2.78E-04
ALGAE		6.87E-05	6.86E-05	1.33E-05	2.46E-05	2.20E-05	8.08E-06	2.22E-06
DRINKING		1.88E-09	1.97E-09	8.67E-10	3.80E-09	1.01E-09	7.18E-10	6.41E-10
SHORELINE	3.62E-04	3.09E-04	3.09E-04	3.09E-04	3.09E-04	3.09E-04	3.09E-04	3.09E-04
SWIMMING	0.0	5.23E-06	5.23E-06	5.23E-06	5.23E-06	5.23E-06	5.23E-06	5.23E-06
BOATING	0.0	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05

TOTAL	3.62E-04	1.79E-01	1.90E-01	[redacted]E-02	7.27E-03	6.12E-02	2.23E-02	[redacted]02E-03

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
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	

C A T E G O R Y I V D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		2.01E-02	2.60E-02	2.11E-03	1.12E-03	6.89E-03	2.80E-03	9.83E-05
INVERTEBRATE		2.88E-04	2.80E-04	4.05E-05	7.54E-05	7.00E-05	3.41E-05	1.50E-05
ALGAE		1.07E-07	1.31E-07	1.30E-08	5.98E-08	3.48E-08	1.44E-08	2.06E-09
DRINKING		2.74E-12	3.54E-12	1.17E-12	8.73E-12	1.57E-12	1.13E-12	9.23E-13
SHORELINE	7.76E-05	6.62E-05	6.62E-05	6.62E-05	6.62E-05	6.62E-05	6.62E-05	6.62E-05
SWIMMING	0.0	2.09E-12	2.09E-12	2.09E-12	2.09E-12	2.09E-12	2.09E-12	2.09E-12
BOATING	0.0	5.23E-08	5.23E-08	5.23E-08	5.23E-08	5.23E-08	5.23E-08	5.23E-08
TOTAL	7.76E-05	2.04E-02	2.63E-02	2.22E-03	1.27E-03	7.03E-03	2.90E-03	1.80E-04

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
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	

* * * SELECTED LOCATION * * *

LOCATION IS DOWNSTREAM

C A T E G O R Y I D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		9.40E-02	1.47E-01	1.04E-01	4.17E-03	4.90E-02	1.63E-02	3.52E-03
INVERTEBRATE		1.78E-03	1.90E-03	1.38E-03	3.37E-04	5.94E-04	2.48E-04	7.53E-04
ALGAE		1.24E-08	1.76E-08	1.28E-08	5.27E-09	5.88E-09	2.00E-09	1.98E-09
DRINKING		3.38E-11	5.73E-11	4.73E-11	1.71E-10	3.34E-11	2.46E-11	2.86E-11
SHORELINE	9.24E-04	7.88E-04	7.98E-04	7.88E-04	7.88E-04	7.88E-04	7.88E-04	7.88E-04
SWIMMING	0.0	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06
BOATING	0.0	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06
TOTAL	9.24E-04	9.66E-02	1.49E-01	1.06E-01	5.31E-03	5.04E-02	1.74E-02	5.07E-03

	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

C A T E G O R Y I I D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		9.96E-02	1.51E-01	5.86E-02	3.95E-03	5.04E-02	1.95E-02	2.61E-03
INVERTEBRATE		1.86E-03	1.96E-03	8.37E-04	3.17E-04	6.07E-04	2.94E-04	5.30E-04
ALGAE		1.70E-08	2.39E-08	9.68E-09	6.55E-09	7.93E-09	3.13E-09	1.86E-09
DRINKING		4.63E-11	7.05E-11	4.16E-11	2.08E-10	3.81E-11	2.71E-11	2.83E-11
SHORELINE	1.24E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03
SWIMMING	0.0	1.44E-05	1.44E-05	1.44E-05	1.44E-05	1.44E-05	1.44E-05	1.44E-05
BOATING	0.0	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06
TOTAL	1.24E-03	1.03E-01	1.54E-01	6.05E-02	5.34E-03	5.21E-02	2.09E-02	4.21E-03

	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

C A T E G O R Y I I I D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.24E-01	1.34E-01	2.26E-02	4.25E-03	4.30E-02	1.55E-02	1.01E-03

INVERTEBRA		2.43E-03	1.81E-03	[illegible]E-04	3.53E-04	5.37E-04	2.47E-04	[illegible]98E-04
ALGAE		4.90E-05	4.90E-05	9.50E-06	1.64E-05	1.57E-05	5.77E-06	1.58E-06
DRINKING		1.35E-07	1.42E-07	6.25E-08	5.14E-07	7.42E-08	5.14E-08	4.62E-08
SHORELINE	2.59E-04	2.21E-04	2.21E-04	2.21E-04	2.21E-04	2.21E-04	2.21E-04	2.21E-04
SWIMMING	0.0	3.61E-06	3.61E-06	3.61E-06	3.61E-06	3.61E-06	3.61E-06	3.61E-06
BOATING	0.0	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06	7.22E-06
TOTAL	2.59E-04	1.27E-01	1.36E-01	2.33E-02	4.85E-03	4.37E-02	1.59E-02	1.44E-03

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
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	

LOCATION IS DOWNSTREAM

C A T E G O R Y I V D O S E S

DOSE (MREM PER YEAR INTAKE)

PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.43E-02	1.86E-02	1.51E-03	7.47E-04	4.92E-03	2.00E-03	7.02E-05
INVERTEBRATE		2.06E-04	2.00E-04	2.89E-05	5.02E-05	5.00E-05	2.43E-05	1.07E-05
ALGAE		7.62E-08	9.37E-08	9.28E-09	3.97E-08	2.48E-08	1.03E-08	1.47E-09
DRINKING		1.98E-10	2.56E-10	8.46E-11	1.21E-09	1.15E-10	8.09E-11	6.64E-11
SHORELINE	5.54E-05	4.73E-05	4.73E-05	4.73E-05	4.73E-05	4.73E-05	4.73E-05	4.73E-05
SWIMMING	0.0	1.44E-12	1.44E-12	1.44E-12	1.44E-12	1.44E-12	1.44E-12	1.44E-12
BOATING	0.0	3.61E-08	3.61E-08	3.61E-08	3.61E-08	3.61E-08	3.61E-08	3.61E-08
TOTAL	5.54E-05	1.45E-02	1.88E-02	1.58E-03	8.44E-04	3.02E-03	2.07E-03	1.28E-04

	USAGE (KG/YR,HR/YR)	DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.2
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	

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

SPORT HARVEST

			DOSE (MAN-REM)						
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	CATEGORY I	7.69E+04	3.34E-01	5.21E-01	3.69E-01	7.18E-03	1.74E-01	5.79E-02	1.25E-02
FISH	CATEGORY II	8.87E+03	5.42E-02	8.24E-02	3.19E-02	1.02E-03	2.74E-02	1.06E-02	1.41E-03
FISH	CATEGORY III	6.14E+03	1.09E-01	1.17E-01	1.97E-02	1.69E-03	3.75E-02	1.35E-02	8.77E-04
FISH	TOTAL	9.10E+04	4.97E-01	7.20E-01	4.21E-01	9.90E-03	2.39E-01	8.20E-02	1.47E-02

LOCATION	DILUTION	CATCH	TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 1.68E+02 HR	POPULATION
	7.00E+00	9.10E+04	1.68E+02	1.55E+04

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=6.90E+00 CATEGORY II=5.20E+00 CATEGORY IV=2.20E+00

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

_____COMMERCIAL HARVEST_____

			DOSE (MAN-REM)						
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	CATEGORY I	1.00E+08	1.55E+00	2.42E+00	1.72E+00	2.59E-02	8.09E-01	2.69E-01	5.79E-02
FISH	CATEGORY II	1.17E+07	2.52E-01	3.83E-01	1.48E-01	3.69E-03	1.27E-01	4.93E-02	6.58E-03
FISH	CATEGORY III	8.12E+06	5.06E-01	5.44E-01	9.18E-02	6.08E-03	1.74E-01	6.28E-02	4.08E-03
FISH	TOTAL	1.20E+08	2.31E+00	3.35E+00	1.96E+00	3.56E-02	1.11E+00	3.81E-01	6.86E-02

LOCATION	DILUTION	CATCH	TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 2.40E+02 HR	POPULATION=2.05E+07
	7.00E+00	1.55E+05	2.40E+02	

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=6.90E+00 CATEGORY II=5.20E+00 CATEGORY IV=2.20E+00

_____NEPA DOSES_____

NOTE--TOTAL NEPA DOSE INCLUDES SPORT CATCH

			DOSE (MAN-REM)						
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH	CATEGORY I	2.05E+05	9.02E-01	1.41E+00	9.98E-01	1.66E-02	4.70E-01	1.56E-01	3.36E-02
FISH	CATEGORY II	2.40E+04	1.47E-01	2.22E-01	8.61E-02	2.37E-03	7.40E-02	2.86E-02	3.82E-03
FISH	CATEGORY III	1.66E+04	2.94E-01	3.16E-01	5.33E-02	3.92E-03	1.01E-01	3.65E-02	2.37E-03
FISH	TOTAL	2.46E+05	1.34E+00	1.94E+00	1.14E+00	2.29E-02	6.45E-01	2.21E-01	3.98E-02

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

SPORT HARVEST

			DOSE (MAN-REM)						
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	CATEGORY I	8.33E+03	2.92E-03	3.11E-03	2.26E-03	2.73E-04	9.69E-04	4.06E-04	1.23E-03
INVER	CATEGORY II	9.68E+02	4.65E-04	4.90E-04	2.09E-04	3.85E-05	1.51E-04	7.33E-05	1.32E-04
INVER	CATEGORY III	6.97E+02	9.79E-04	7.27E-04	1.78E-04	6.58E-05	2.15E-04	9.91E-05	7.95E-05
INVER	TOTAL	1.00E+04	4.36E-03	4.33E-03	2.64E-03	3.77E-04	1.34E-03	5.78E-04	1.44E-03

LOCATION	DILUTION	CATCH	TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 1.68E+02 HR	POPULATION=1.17E+04
	7.00E+00	1.00E+04	1.68E+02	

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=1.00E+00 CATEGORY II=7.50E-01 CATEGORY IV=3.30E-01

* * * INVERTEBRATE CONSUM POPULATION DOSES * * *
MAN-REM

_____COMMERCIAL HARVEST_____

		DOSE (MAN-REM)							
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	CATEGORY I	1.46E+07	2.21E-03	2.36E-03	1.71E-03	1.62E-04	7.35E-04	3.08E-04	9.30E-04
INVER	CATEGORY II	1.69E+06	3.53E-04	3.72E-04	1.59E-04	2.28E-05	1.15E-04	5.56E-05	1.00E-04
INVER	CATEGORY III	1.22E+06	7.43E-04	5.52E-04	1.35E-04	3.98E-05	1.63E-04	7.51E-05	6.03E-05
INVER	TOTAL	1.75E+07	3.31E-03	3.28E-03	2.00E-03	2.24E-04	1.01E-03	4.38E-04	1.09E-03

LOCATION	DILUTION	CATCH	TIME(HR)-INCLUDES FOOD PROCESSING TIME OF 2.40E+02 HR	POPULATION
	7.00E+00	1.00E+03	2.40E+02	2.05E+07

AVERAGE INDIVIDUAL CONSUMPTION (KG/YR) CATEGORY I=1.00E+00 CATEGORY II=7.50E-01 CATEGORY IV=3.30E-01

_____NEPA DOSES_____

NOTE--TOTAL NEPA DOSE INCLUDES SPORT CATCH .

		DOSE (MAN-REM)							
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
INVER	CATEGORY I	9.17E+03	3.21E-03	3.42E-03	2.48E-03	2.94E-04	1.07E-03	4.46E-04	1.35E-03
INVER	CATEGORY II	1.07E+03	5.11E-04	5.39E-04	2.30E-04	4.15E-05	1.67E-04	8.06E-05	1.45E-04
INVER	CATEGORY III	7.67E+02	1.08E-03	8.00E-04	1.95E-04	7.09E-05	2.37E-04	1.09E-04	8.74E-05
INVER	TOTAL	1.10E+04	4.79E-03	4.76E-03	2.91E-03	4.07E-04	1.47E-03	6.36E-04	1.58E-03

* * * POPULATION WATER CONSUMPTION DOSES * * *

SUPPLIER-

			DOSE (MAN-REM)						
PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
DRINKING	CATEGORY I	2.63E+02	1.03E-08	3.70E-09	2.40E-09	6.28E-11	1.11E-09	4.12E-10	2.47E-10
DRINKING	CATEGORY II	2.86E+01	1.53E-09	5.49E-10	2.13E-10	6.90E-12	1.64E-10	6.78E-11	2.78E-11
DRINKING	CATEGORY III	4.68E+01	7.50E-09	1.91E-09	4.79E-10	2.16E-11	5.37E-10	2.07E-10	5.44E-11
DRINKING	TOTAL	3.38E+02	1.93E-08	6.16E-09	3.10E-09	9.13E-11	1.81E-09	6.87E-10	3.29E-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) CATEGORY I =3.70E+02 CATEGORY II=2.60E+02 CATEGORY III=2.60E+02

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

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
DRINKING	CUMUL TOTAL	3.38E+02	1.93E-08	6.16E-09	3.10E-09	9.13E-11	1.81E-09	6.87E-10	3.29E-10

_____HYDROSPHERE TRITIUM DOSE_____

PATHWAY	AGE GROUP	USAGE	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
WATER	TOTAL	2.20E+00	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03

* * * RECREATION POPUL[redacted] DOSES * * *

LOCATION- DOWNSTREAM

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

			DOSE(MAN-REM)		
PATHWAY	AGE GROUP	USAGE	SKIN	TOTAL BODY	THYROID
SHORELINE	TOTAL POPUL	1.66E+07	3.07E-01	2.62E-01	2.62E-01

LOCATION- 0.200

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

			DOSE(MAN-REM)		
PATHWAY	AGE GROUP	USAGE	SKIN	TOTAL BODY	THYROID
SWIMMING	TOTAL POPUL	1.66E+07	0.0	2.43E-03	2.43E-03

LOCATION- 0.200

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

			DOSE(MAN-REM)		
PATHWAY	AGE GROUP	USAGE	SKIN	TOTAL BODY	THYROID
BOATING	TOTAL POPUL	1.66E+07	0.0	1.22E-03	1.22E-03

* * DOSE TO BIOTA * * *

MRADS PER YEAR

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

	INTERNAL	EXTERNAL	TOTAL
FISH	2.98E-01	6.92E-01	9.90E-01
INVERTEBRATE	3.33E-02	1.38E+00	1.42E+00
ALGAE	1.02E-01	1.28E-03	1.04E-01
MUSKRAT	1.76E+00	4.61E-01	2.22E+00
RACCOON	7.33E-02	3.45E-01	4.19E-01
HERON	1.01E+01	4.61E-01	1.06E+01
DUCK	1.56E+00	6.91E-01	2.26E+00

* * * COST-BENEFIT ANALYSIS * * *

NUCLIDE	RELEASE	MAN-REM DOSE		MAN-REM PER CURIE	
	CI/YR	TOTAL BODY	THYROID	TOTAL BODY	THYROID
1H 3	3.53E+02	1.04E-03	1.04E-03	2.94E-06	2.94E-06
11NA 24	1.14E-02	7.13E-05	7.13E-05	6.26E-03	6.26E-03
26FE 55	4.78E-02	1.58E-04	2.84E-09	3.30E-03	5.94E-08
27CO 58	2.32E-02	3.16E-04	2.49E-04	1.36E-02	1.07E-02
27CO 60	2.81E-01	1.43E-01	1.45E-01	5.26E-01	5.17E-01
28NI 63	1.33E-01	2.12E-03	0.0	1.60E-02	0.0
38SR 90	8.09E-04	9.03E-04	4.05E-10	1.12E+00	5.01E-07
53I 131	1.05E-01	1.96E-04	4.51E-02	1.87E-03	4.30E-01
53I 133	3.98E-01	3.31E-04	4.02E-04	8.31E-04	1.01E-03
55CS 134	1.41E-01	9.37E-01	2.34E-02	6.65E+00	1.66E-01
55CS 137	3.81E-01	1.56E+00	9.40E-02	4.09E+00	2.47E-01
51SB 125	1.38E-02	7.80E-04	7.80E-04	5.65E-02	5.65E-02
51SB 124	6.43E-05	1.14E-06	1.13E-06	1.77E-02	1.76E-02
TOTAL		2.65E+00	3.10E-01		

NOTE ON AGE GROUP:

CATEGORY I (17 YEARS OLD OR OLDER)
CATEGORY II (11 TO 17 YEARS OLD)
CATEGORY III (1 TO 11 YEARS OLD)
CATEGORY IV (0 TO 1 YEAR OLD)