Environmental Radiation Monitoring Program

SEMIANNUAL REPORT NO. 6

BOSTON Edison COMPANY

PILGRIM NUCLEAR POWER STATION
RFD #1 ROCKY HILL ROAD
PLYMOUTH, MASSACHUSETTS 02360

September 9, 1975

Director, Division of Reactor Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Docket No. 50-293
License No. DPR-35

Semi-Annual Report No. 6
Environmental Radiation Monitoring Program

Gentlemen:

In accordance with Pilgrim Station, Technical Specification 6.6.D.1.h, we are hereby submitting our sixth Semi-Annual Report. A separate report covering Technical Specifications 6.6.D.1.a through 6.6.D.1.g and entitled, "Operating and Maintenance Report" has been sent under separate cover.

Very truly yours,

J. E. Larson
Nuclear Licensing Administrator -
Operations

Courtesy copy to:
Director
Region I, Inspection and Enforcement
U. S. Nuclear Regulatory Commission
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BOSTON EDISON COMPANY

PILGRIM NUCLEAR GENERATING STATION

Environmental Radiation Monitoring Program

SEMIANNUAL REPORT NO. 6
JANUARY 1, 1975 THROUGH JUNE 30, 1975

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September 1975

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TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

LIST OF TABLES - Continued

I. INTRODUCTION AND SUMMARY

This report describes the data accumulated in the Environmental Radiation Surveillance Program during the semiannual period January 1 through June 30, 1975.

Plant operation during the reporting period is detailed in a separate report entitled "Operating and Maintenance Semiannual Report No. 6". Power levels during this period were limited, administratively, to 80 percent of full power from February through May and 70 percent of full power during June. These limits on power level were set by Boston Edison Company for reasons of operation and maintenance. Plant capacity factors (a measure of electrical output) during the reporting period were: January, 36 percent; February, 34 percent; March 76 percent; April, 42 percent; May, 55 percent; and June, 65 percent.

The Environmental Radiation Surveillance Program was implemented during the reporting period as required by the Nuclear Regulatory Commission. Plant-related radioactivity levels decreased from 1974 levels in molluscs, algae, and sediment. The current levels of Mn-54, Co-60 and Cs-137 in these media are less than 1 picocurie per gram.

Weapons test fallout was detected in air particulates, specifically Nb-95, Ce-144 and Cs-137. These elements were also detected in various other media. Gaseous radio-iodine was detected onsite at

levels less than 1 picocurie per cubic meter. This I-131 was attributed to releases from the reactor building vent.

Finally, marine media data from 1974 were reviewed and calculations showed that the seafood ingestion dose to an individual was less than 1 millirem per year.

II. DESCRIPTION OF MONITORING PROGRAM

The Environmental Radiation and Radioactivity Surveillance Program is being performed in accordance with the requirements specified in the Pilgrim Facility Operating License (DPR-35). Summaries of the sampling media, locations, frequencies of collection, analyses and detection sensitivity are given in Tables 1 through 5. Sampling locations are shown in Figures 1, 2, and 3. Semi-annual Report No. 2 (August 29, 1973) describes the program in detail; however, the following discussion is provided to update that program description.

A. Atmospheric and Terrestrial Monitoring

Beginning this reporting period airborne radioiodine levels are computed for each sample. Previously, samples with activities less than one picocurie per cubic meter were reported as "less than". The gaseous radioiodine sampling filters currently in use are activated charcoal impregnated felt (Barnaby Cheney "VA").

During this reporting period, the environmental dosimeters (TLD's) were replaced with calcium sulphate (dysprosium) TLD's supplied by Teledyne Isotopes. The Teledyne "Radiguard" dosimeters provide four readout areas per location which are averaged after a one month exposure. The dosimeters are initially preselected by discarding those which are outside a designated range following controlled irradiation. They are also calibrated by controlled

irradiation each month. Typical accuracy is plus or minus three percent (90 percent confidence level). Sample collection in the atmospheric and terrestrial areas continues to be performed by Boston Edison Company personnel.

B. Marine Monitoring

Since July of 1973, an additional seawater sample has been taken monthly at a control location in Duxbury (see Figure 3). This is in addition to sampling of the intake and discharge canals and summer sampling of the area beaches.

The sampling of marine life continues to focus on species representing pathways to man. That is, the sampling is focused on edible species (by humans) including soft shelled clams, blue mussels, lobster, Irish moss and finfish. Shellfish, sediment and algae are sampled at shoreline locations by Battelle-Clapp Laboratories, Duxbury, Mass. Lobsters are collected from commercial lobstermen at the time the traps are hauled. The lobsters taken weigh about 450 gms (age about 6 years). Finfish are caught in gill nets and otter trawls in the vicinity of the station by the Massachusetts Division of Marine Fisheries.

C. Radioactivity Analyses

Laboratory analyses continue to be performed by Interex Corporation, Natick, Mass. with analyses of selected media by Teledyne Isotopes, Westwood, N.J. Details of the laboratory procedures

can be found in Section 6.1.5.2 of the Pilgrim 2 Environmental Report.[1] The following are modifications of these procedures.

The analysis for gamma emitting isotopes (gamma spectrum) is done with a Ge(Li) spectrometer[2] rather than by the radiochemical methods used prior to July 1974. The spectrometer has the advantages of detecting nearly all the gamma emitting isotopes in a single analysis and doing it non-destructively. This analysis effectively replaces the gross gamma analysis.

The radiochemical procedures used to measure strontium-89 and strontium-90 are those recommended in the NRC Regulatory Guide 4.6.

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(1) Originally submitted to the AEC by Boston Edison Company in June 1973.

(2) The spectrometer at Interex is a Nuclear Data 4420 with a Princeton Gamma-Tech detector. Teledyne utilizes the Princeton Gamma-Tech/Tracor Northern (NS636 and TN11) systems.

III. MONITORING DATA AND RESULTS

A. Air Surveillance

Weekly air surveillance samples were analyzed for gross beta activity and radioiodine activity. The results are presented in Tables 6, 8 and 8A. Variations in radioiodine levels correlate to plant releases from the building vent (see Appendix A). These levels have a computed dose equivalent of 0.9 millirem to a continuous occupant at the "warehouse" onsite location. The offsite radioiodine inhalation dose is less than 0.5 millirem. Monthly gross gamma results and quarterly gamma spectra are presented in Tables 7 and 7A respectively. These data show the presence of Nb-95, Cs-137 and Ce-144, typical of weapons test fallout. The April samples from Plymouth Center, Manomet, and pedestrian bridge (onsite) were reanalyzed with greater sensitivity and all showed the presence of Ce-144 and Cs-137. Comparisons of beta radioactivity with preoperational levels are shown in Figures 4 and 5.

B. External Gamma Exposure Rates

During this reporting period Teledyne Radiguard TLD's were introduced into the program. Before phasing out the EGG TL-15 TLD's, overlapping data was obtained. Table 9 presents data taken with the TL-15 TLD's, Table 9A presents data taken with the Radiguard and also presents the ratios of the overlapping results. Ratios were also obtained at nine locations beginning July 1974. These

earlier ratios (Radiguard:TL-15) ranged from 0.60 to 0.86 and averaged 0.71. The combined January and February exposure reported in Table 9 was due to inclement weather which persisted for several weeks.

C. Milk

Milk was sampled from three locations and was analyzed monthly for Cs-137, Sr-90, Ba/La-140 and I-131. The results obtained during the reporting period are presented in Table 10. The levels of strontium and cesium measured in Plymouth milk do not exceed the levels measured prior to station operation, as shown in Figure 6.

D. Crops

Commercial produce was sampled subsequent to the end of the reporting period and the results will be reported in the next report.

E. Domestic and Recreational Water

Monthly composites of weekly water samples were analyzed for gross radioactivity and the isotopes H-3, Sr-90 and I-131. Results are shown in Table 12. The May sample from Manomet Well was reanalyzed to check the anomolous tritium result and the result was verified. Although the activity remains unexplained, it is 1/100th of the level permitted by Federal Regulations (10CFR20 App. B). The next sample taken in June contained no detectable tritium.

F. Precipitation

A precipitation collection station in Plymouth, five miles from the plant, was sampled during the reporting period. The radioactivity found in the monthly samples is reported in Table 13.

G. Seawater

Monthly samples were taken from the intake channel, discharge channel, and a control location 7.5 miles NNW of the station. These were analyzed for fractional gross beta (explained in Table 14), gross gamma, tritium and iodine-131. The results of these analyses and of quarterly analyses of intake and discharge seawater are presented in Table 14.

H. Marine Life

The results of Ge(Li) and Sr-89, 90 analyses of marine life samples are presented in Table 15. Missing values indicate incomplete analyses and will be reported in a later report. Several samples carried over from the previous reporting period showed plant-related radioactivity. Two Atlantic cod contained low levels of Mn-54, Co-60, Zn-65 and Cs-137. Out of a sampling of ten bluefish, one group of two contained Co-58 and Co-60 activity. This radiocobalt can probably be attributed to one cobalt particle ingested by one of the fish. (Plant discharges are filtered through a 10μ filter.)

Finfish (pollock, flounder) from the reporting period showed no plant-produced radioactivity except low levels of Cs-137. This nuclide is present due to weapons test fallout (see Table 7A) and was detected in finfish before the plant began operation.

Irish moss (Chondrus crispus) and rockweed (Ascophyllum nodosum) sampled in the vicinity of the station showed plant-related radioactivity (Mn, Co, Zn, Cs). No plant-related nuclides were detected at the control location, Ellisville, except Ce-144, which can be attributed to weapons test fallout (see Table 7A), and Be-7, a cosmic ray produced nuclide.[3]

Plant-related activity was not found in clams (Mya arenaria) but was found in mussels (Mytulis edulis) taken from the area of the discharge breakwater only. These mussels contained low levels of Mn-54 and Co-60.

Radiation doses to humans resulting from these levels of radioactivity will be discussed in the next report. The results of dose calculations using 1974 marine life data is presented in Section IV.

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[3] The reaction is C-14 (He-3, 2α) Be-7.

I. Bottom Sediment

Results of analyses of ocean bottom sediments in the vicinity of the plant are presented in Table 16. Sediment is sampled to approximately 1-2 cm depth, and is taken in shellfish bed areas, if possible. Potassium-40 is the predominant isotope and no plant-related isotopes were detected.

IV. 1974 SEAFOOD INGESTION DOSES

Estimation of doses to man from marine life ingestion pathways were made in Report No. 5 and presented in Table 18 of that report. These have been modified as follows, and are presented in Table 17.

Samples taken in 1974, found to contain plant-related nuclides were grouped by species, and activities were averaged. These mean activities were converted to ingestion doses using Draft Regulatory Guide 1.AA. These doses were then averaged among all species within each of the four groups: fish, crustacea, molluscs and algae. The averaging is done to maintain consumption rates of 18 kg/yr for fish, 9 kg/yr for mollusc and crustacea, and 0.73 kg/yr for algae.

Table 17 shows that seafood ingestion doses resulting from 1974 liquid releases totaling 4.2 curies were much less than 1 mrem/year to an average individual.

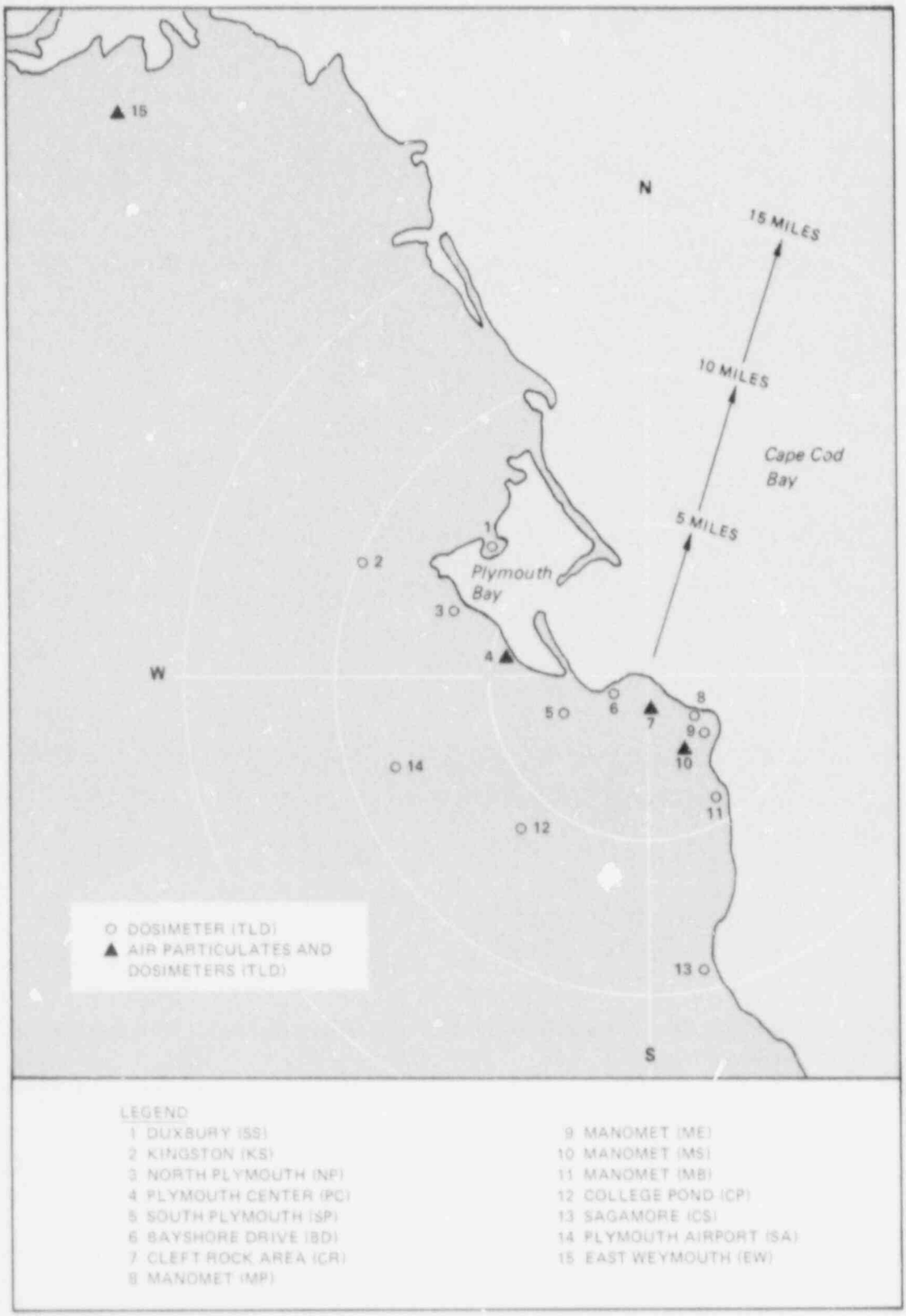
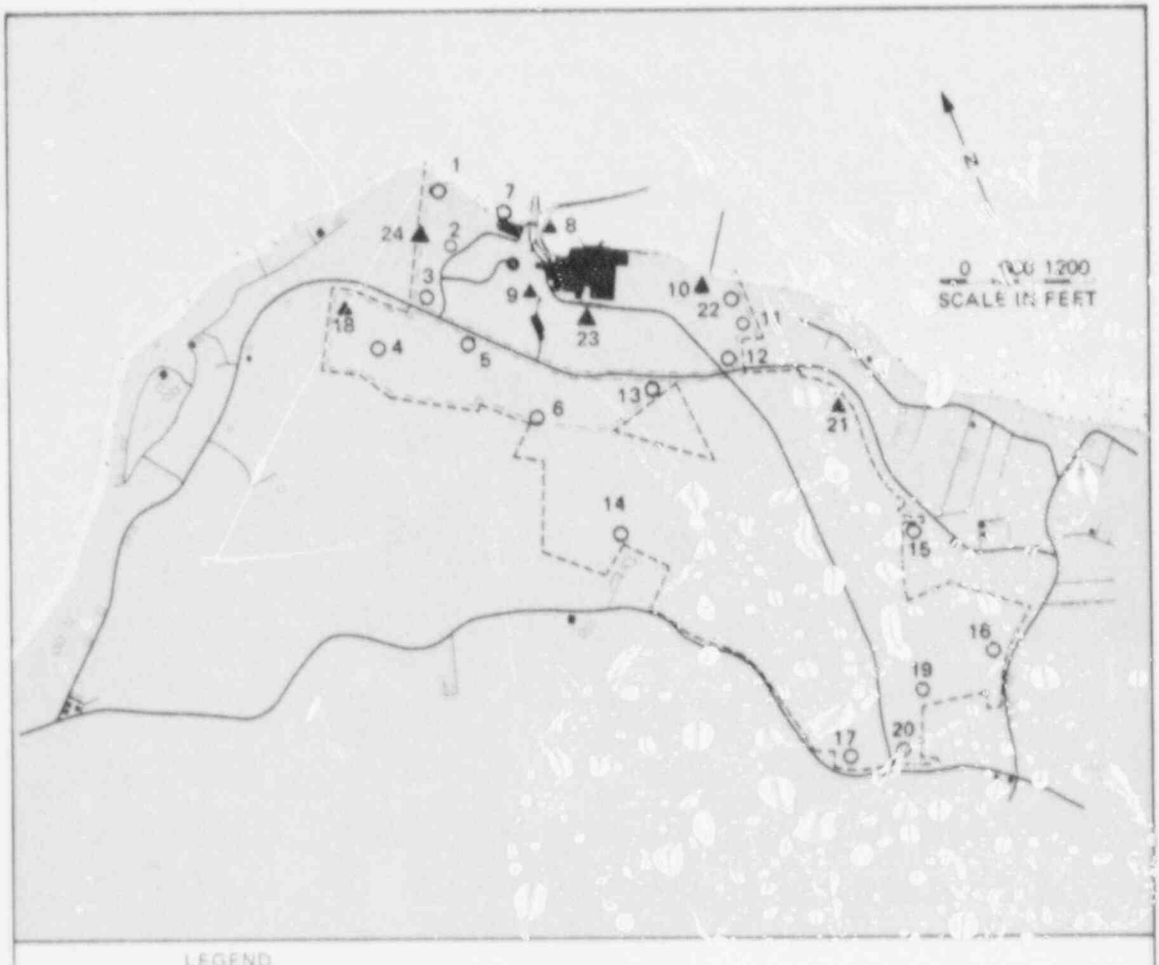


Figure 1. Location of Offsite Radiological Monitoring Stations



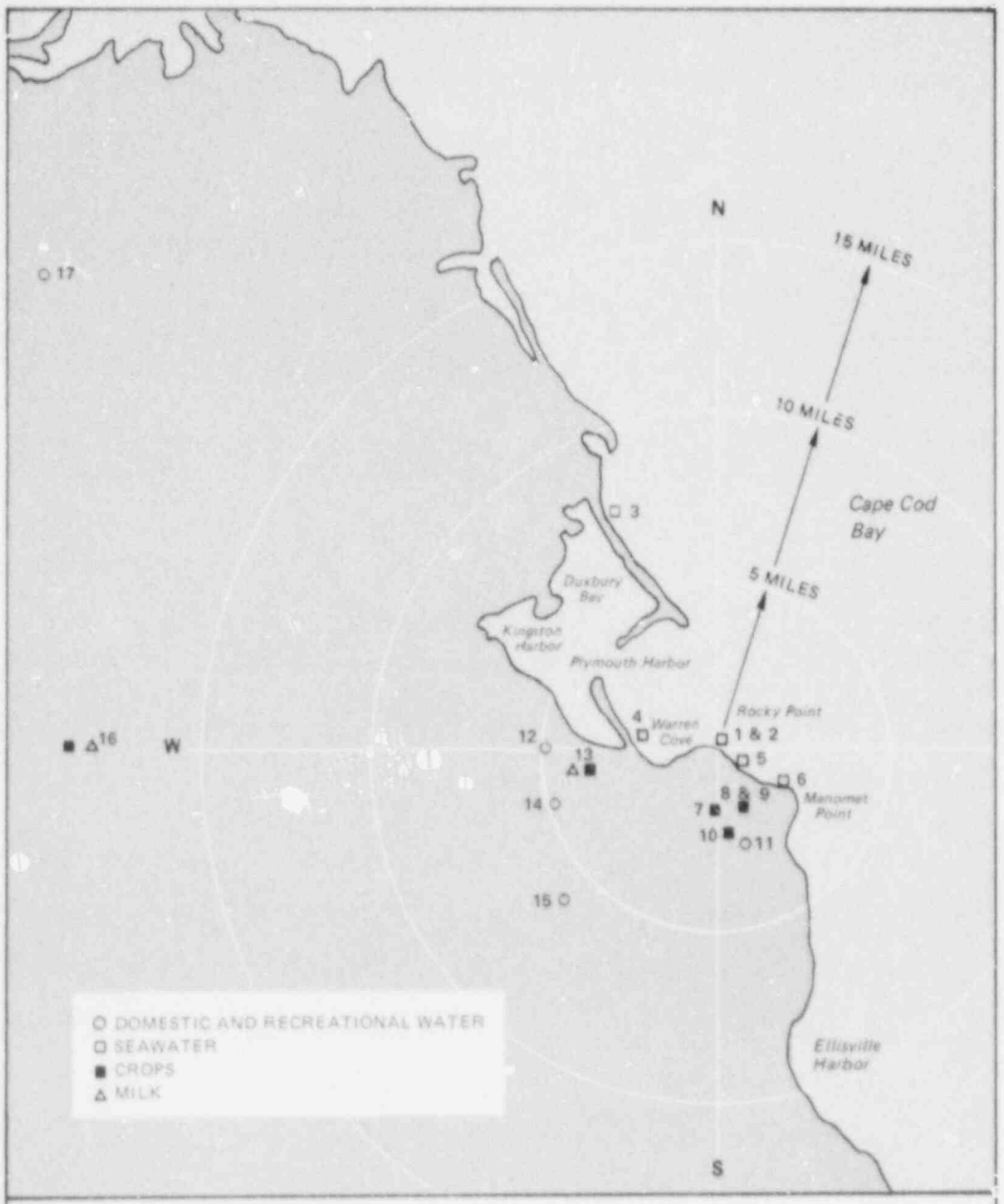
LEGEND

1 PROPERTY LINE (D)
2 PROPERTY LINE (F)
3 PROPERTY LINE (I)
4 PROPERTY LINE (G)
5 ROCKY HILL ROAD (A)
6 PROPERTY LINE (H)
7 PUBLIC PARKING AREA (PA)
8 PEDESTRIAN BRIDGE (PB)
9 OVERLOOK AREA (OA)
10 EAST BREAKWATER (EB)
11 PROPERTY LINE (C)
12 PROPERTY LINE (HB)
13 ROCKY HILL ROAD (B)
14 MICROWAVE TOWER (MT)
15 EMERY ROAD (E)
16 WHITE HORSE ROAD (WH)
17 PROPERTY LINE (E)
18 ROCKY HILL ROAD (WR)
19 PROPERTY LINE (J)
20 PROPERTY LINE (K)
21 ROCKY HILL ROAD (RR)
22 PROPERTY LINE (L)
23 WAREHOUSE (WS)
24 PROPERTY LINE (PL)

○ DOSIMETER (TLD)
▲ AIR PARTICULATES AND DOSIMETERS (TLD)

Figure 2. Location of Onsite Radiological Monitoring Stations

REVISED



LEGEND

1 DISCHARGE CHANNEL (DC)
2 COOLING WATER INTAKE (IC)
3 POWDER POINT - DUXBURY (PP)
4 PLYMOUTH BEACH (PLB)
PRISCILLA BEACH (PRB)
6 WHITE HORSE BEACH (WHB)
7 BEAVER DAM ROAD BOG (BR)
8 ROBB[illegible]OG (RB)
9 MANOMET (MF)
10 BARNEY'S JOY ROAD BOG (BR)
11 WARNER'S POND PUMPING STATION - MANOMET WELL (MW)
12 DEEP WATER PUMPING STATION - LOUT POND WELL AND LITTLE SOUTH POND (LW) - PLYMOUTH
13 PLYMOUTH COUNTY FARM (CF)
14 SOUTH PLYMOUTH
15 COLLEGE POND (CP)
16 BRIDGEGATE STATE FARM (BF)
17 GREAT POND PUMPING STATION (GP) - SOUTH WELLMOUTH

Figure 3. Aquatic and Terrestrial Surveillance Stations

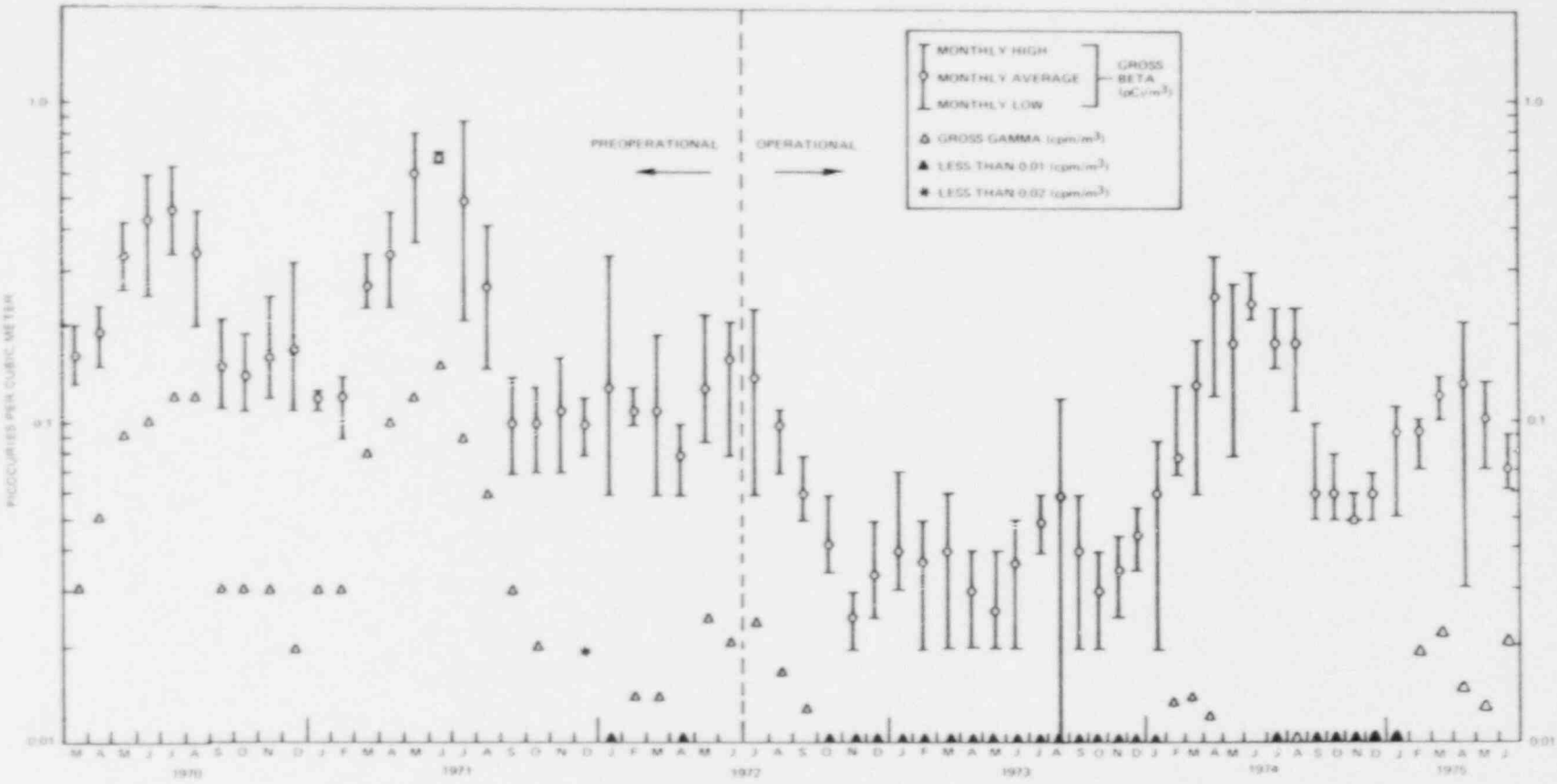


Figure 4. Radioactivity in Air Particulates - East Weymouth (EW)

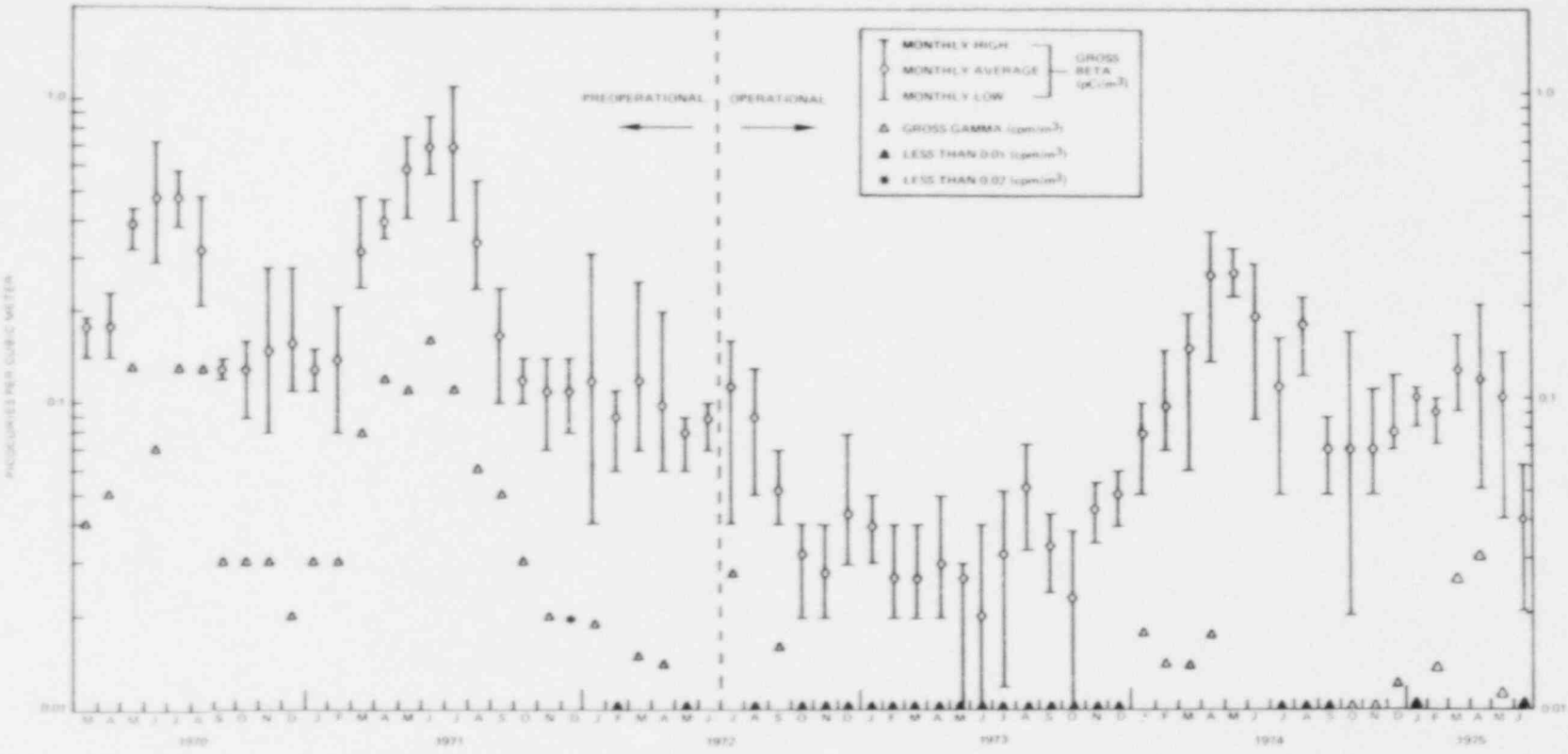


Figure 5. Radioactivity in Air Particulates - Overlook Area (OA)

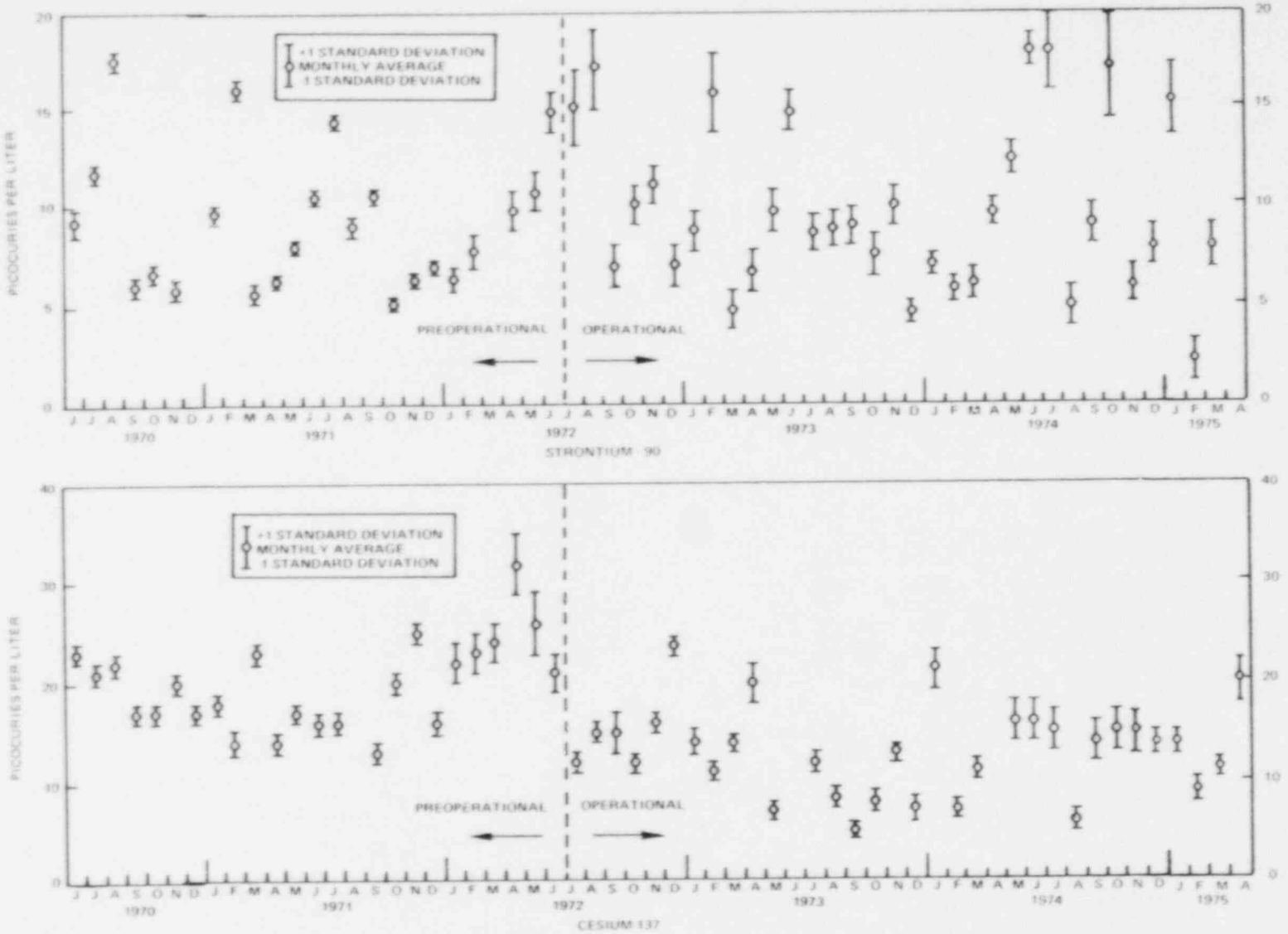


Figure 6. Concentrations of Strontium-90 and Cesium-137 in Milk (Plymouth)

TABLE 1

AIR PARTICULATES AND GASEOUS RADIOIODINE SURVEILLANCE STATIONS

Surveillance Stations				Station Code	Station Location**			
Req'd by Operating License		Not Req'd by Operating License			See Fig.	Item No.	Direction	Distance
Onsite	Offsite	Onsite	Offsite					
Rocky Hill Road				ER	2	21	SE	0.8 m
Overlook Area				OA	2	9	W	0.03 m
Rocky Hill Road				WR	2	18	W-WNW	0.3 m
	Cleft Rock Area			CR	1	7	S	0.9 m
	East Weymouth*			EW	1	15	NW	23 m
	Manomet			MS	1	10	SE	2.5 m
	Plymouth Center			PC	1	14	W-WNW	4.5 m
		East Breakwater		EB	2	10	ESE	0.35 m
		Pedestrian Bridge		PB	2	8	N	0.14 m
		Property Line		PL	2	24	NW	0.34 m
		Warehouse		WS	2	23	SSE	0.03 m

* Control Station.

**Distances in miles, measured from Unit 1 Reactor Building.

TABLE 2

EXTERNAL GAMMA EXPOSURE SURVEILLANCE STATIONS (TLD)

Surveillance Stations				Station Code	Station Location**			
Req'd by Operating License		Not Req'd by Operating License			See Fig.	Item No.	Direction	Distance
Onsite	Offsite	Onsite	Offsite					
Microwave Tower				MT	2	14	S	0.38 m
Overlook Area				OA	2	9	W	0.03 m
Property Line				H	2	6	SSW	0.21 m
Property Line				I	2	3	W	0.14 m
Public Parting Area				PA	2	7	W-NNE	0.07 m
Rocky Hill Road				B	2	13	SSE	0.26 m
Rocky Hill Road				ER	2	21	SE	0.8 m
Rocky Hill Road				WR	2	18	W-WNW	0.3 m
	Cleft Rock Area			CR	1	7	S	0.9 m
	East Weymouth*			EW	1	15	NW	23 m
	Kingston			KS	1	2	WNW	10 m
	Manomet			ME	1	9	SE	2.5 m
	Manomet			MP	1	8	ESE-S	2.25 m
	Manomet			MS	1	10	SSE	2.5 m
	North Plymouth			NP	1	3	WNW	5.5 m
	Plymouth Airport			SA	1	14	WSW	8 m
	Plymouth Center			PC	1	4	W-WNW	4.5 m
	Sagamore			CS	1	13	SSE-S	10 m
	South Plymouth			SP	1	5	WSW	3 m
		East Breakwater		EB	2	10	ESE	0.35 m
		Pedestrian Bridge		PB	2	8	N	0.14 m
		Property Line		C	2	11	SE	0.35 m
		Property Line		D	2	1	NNW	0.37 m
		Property Line		E	2	17	S	1.6 m
		Property Line		F	2	2	NW	0.25 m
		Property Line		G	2	4	W	0.4 m
		Property Line		HB	2	12	SE-SSE	0.35 m
		Property Line		J	2	19	S-SSE	1.6 m
		Property Line		K	2	20	S-SSE	1.7 m
		Property Line		L	2	22	ESE-SE	0.35 m
		Property Line		PL	2	24	NW	0.34 m
		Warehouse		WS	2	23	SSE	0.03 m
			Bayshore Drive	BD	1	6	WNW	0.8 m
			College Pond	CP	1	12	SW	6.5 m
			Duxbury	SS	1	1	NW	5.9 m
			Emerson Road	EM	2	15	SSE	0.96 m
			Manomet	MB	1	11	SSE	3.5 m

* Control Station.

**Distance in miles measured from Unit 1 Reactor Building.

TABLE 3

TERRESTRIAL AND AQUATIC SURVEILLANCE STATIONS

Sample Type	Sample Location	Distance and Direction From Station	Refer to Fig. 3, Item No.
Milk	Plymouth County Farm (CF)	3.5 miles W	13
	Local store[a]	---	
	Bridgewater State Farm (BF)	20 miles W	16
Cranberries	Beaver Dam Road Bog	2 miles S	7
	Robbins Bog (RB)	2 miles SSE	8
	Bartlett Road Bog (BR)	2.75 miles SSE-S	10
Crops (potatoes, cabbage, lettuce and hay)	Plymouth County Farm (CF)	3.5 miles W	13
	Manomet (RF)	2 miles SSE	9
	Bridgewater State Farm (BF)	20 miles W	16
Precipitation	South Plymouth[a]	4.75 miles WSW-W	14
Domestic and recreational water	Deep Water Pumping Station (Lout Pond Well and Little South Pond)--Plymouth (LW)	4.75 miles W	12
	Warner's Pond Pumping Station Manomet Well (MW)	2.75 miles SSE	11
	Great Pond Pumping Station South Weymouth[b] (GP)	24 miles WNW-NW	17
	College Pond[a] (CP)	6.5 miles SW	15
Seawater	Discharge channel (DC)	Onsite	1
	Cooling water intake (IC)	Onsite	2
	Priscilla Beach (PRB)	0.8 to 1.6 miles ESE-SE	5
	White Horse Beach (WHB)	1.6 to 2.7 miles ESE-SE	6
	Plymouth Beach (PLB)	3.5 miles WNW	4
	Powder Point - Duxbury (PP)	7.5 miles NNW	3
Marine life (lobster, fish, mollusks)	Marine waters in station vicinity	Sampling ranges from 2.4 miles W-WNW to 2.9 miles ESE-SE	-
Bottom sediment	Area in vicinity of discharge channel outfall		-

(a) Additional stations operated during reporting period although not required by operating license.
(b) Central station.

TABLE 4

TYPES AND FREQUENCIES OF ANALYSES

Sample Type and Number	Analysis	Planned Frequency of Analysis	Collection Type
Air Particulates (11)	Gross beta	Weekly	Continuous
	Gross gamma on filter composites from each station	Monthly	
	Gamma spectrum	(a)	
	I-131	Weekly	
Gaseous iodine (11)	I-131	Weekly	Continuous
Gamma exposure (39)	Dosimeter reading	Monthly	Continuous
Domestic water (5)	Gross beta and gross gamma	Monthly	Grab
	Gamma spectrum	(a)	
	I-131, Sr-90, H-3	Monthly	
Precipitation (1)	Gross beta and gross gamma	Monthly	Continuous
	Gamma spectrum	(a)	
	I-131, Sr-90, H-3	Monthly	
Seawater (3)	Fractional gross beta and gross gamma	Monthly	Continuous (DC)*
	Gamma spectrum		
	I-131	Monthly	Grab (others)
	Sr-90, Cs-137, H-3, Mn-54, Zn-65, Co-58, and Co-60	Quarterly	
Marine life[c]	Gross beta and gross gamma	Each sample	
	Gamma spectrum	(b)	
	I-131, Sr-90, Cs-137, Mn-54, Zn-65, Co-58, and Co-60	Each sample	
Bottom sediment (2)	Gross beta, gross gamma, and gamma spectrum	Semiannually	Grab
Milk (3)	I-131, Sr-90, Cs-137, Ba/La-140	Monthly	
Crops	Gross beta, gross gamma, and gamma spectrum	Annually	
	Sr-90, Cs-137	Annually	

(a) Selective gamma analysis will be made based on gross gamma results, with at least one gamma spectrum analysis made each quarter.
(b) A gamma spectrum analysis will be made at least once during each sampling period.
(c) Samples collected during their commercial harvesting season.
* DC = discharge channel.

TABLE 5

ENVIRONMENTAL SAMPLE ANALYSIS PARAMETERS

Sample Type	Analysis	Detection Limit	Aliquot	± Error
Air Particulate	Gross beta	4×10^{-3} pCi/m^3	10,080 ft^3	±10
	Gross gamma	2×10^{-3} cpm/m^3 (a)	10,080 ft^3	±10
	^{131}I	2×10^{-2} pCi/m^3	10,080 ft^3	±10
Nonsaline Water	Gross beta	1 pCi/liter	1,000 ml	±10
	Gross gamma	5 cpm/liter (c)	4,000 ml	±10
	Gamma spectrum	(d)	4,000 ml	
	^{90}Sr	0.5 pCi/liter	1,000 ml	±15
	^{3}H	2.5 pCi/ml 2500 pCi/l	4 ml	±10
Crops and Marine Life	Gross beta	0.2 pCi/g	20 g	±10
	Gross gamma	0.01 cpm/g (c)	1,000 g	±10
	Gamma spectrum	(d)	1,000 g	
	^{90}Sr	0.005 pCi/g	100 g	±10
Seawater	Fractional gross beta	5 pCi/liter	500 ml	±20
	Gross gamma	5 cpm/liter (c)	4,000 ml	±10
	Gamma spectrum	(d)	4,000 ml	
	^{3}H	2.5 pCi/ml	4 ml	±10
	^{90}Sr	0.5 pCi/liter	15,000 ml	±15
	^{137}Cs	0.05 pCi/liter	15,000 ml	±15
	^{54}Mn	5 pCi/liter	1,000 ml	±20
	^{58}Co	5 pCi/liter	1,000 ml	±20
	^{60}Co	5 pCi/liter	1,000 ml	±20
	^{65}Zn	5 pCi/liter	1,000 ml	±20
	^{131}I	5 pCi/liter	1,000 ml	±15
Milk	^{90}Sr	2 pCi/liter	1,000 ml	±15
	^{137}Cs	1 pCi/liter	1,000 ml	±15
	^{140}Ba	5 pCi/liter	1,000 ml	±15
	^{131}I	2 pCi/liter	2,000 ml	±25
Bottom Sediment	Gross beta	2 pCi/g	1 g	±15
	Gamma Spectrum	(d)	1,000 g	
	^{90}Sr	0.005 pCi/g	100 g	±20
Background Radiation	Gamma exposure rate (a)	1 μR/hr	1-month exposure	±10

NOTE: Provided by Interex Corp., Natick, Massachusetts

(a) Measured with thermoluminescent dosimeter.
(b) In the counter used, 1 cpm corresponds to 2.2 pCi of ^{137}Cs.
(c) In the counter used, 1 cpm corresponds to 9 pCi of ^{137}Cs.
(d) Ge(Li) detection sensitivities are given in Table 5A.

TABLE 5A

DETECTION SENSITIVITIES BY HIGH RESOLUTION Ge(Li) GAMMA SPECTROSCOPIC ANALYSIS OF ENVIRONMENTAL SAMPLES

Nuclide	Water (1 liter) pCi/I	Soil & Vegetation (400 gm) pCi/gm	Filters pCi/total filter
Be-7	8E+01	2E-01	2E+01
K-40	2E+02	5E-01	5E+01
Cr-51	8E+01	2E-01	8E+01
Mn-54	8	2E-02	2
Co-58	8	2E-02	2
Fe-59	1E+01	4E-02	3
Co-60	8	2E-02	2
Zr-95	1E+01	4E-02	3
Ru-103	8	2E-02	2
Ru-106	8E+01	2E-01	8E+01
I-131	1E+01	3E-02	2
Cs-134	9	2E-02	2
Cs-137	9	2E-02	2
Ba-140	3E+01	8E-02	6
La-140	2E+01	4E-02	2E+01
Ce-141	2E+01	4E-02	3
Ce-144	8E+01	2E-01	2E+01
Ra-226	6E+01	1E-01	1E+01
Th-228	1E+01	2E-02	1E+01
Zn-65	2E+01	3E-02	3

LLD = .004

TABLE 6

AIR PARTICULATES - GROSS BETA CONCENTRATIONS IN WEEKLY SAMPLES (pCi/m^3)

Sampling Period (1975)	East Weymouth	Plymouth Center	Cleft Rock Area	Manomet Substation	Rocky Hill Road (West)	Property Line*	Overlook Area	Pedestrian Bridge*	East Breakwater	Rocky Hill Road (East)	Warehouse
Jan 2 - Jan 9	0.05	0.05	0.04	0.04	0.08	0.08	0.08	0.07	0.09	0.04	0.08
Jan 9 - Jan 16	0.10	0.10	0.09	0.11	0.10	0.11	0.09	0.11	0.10	0.09	0.11
Jan 16 - Jan 23	0.11	0.13	0.09	0.10	0.12	0.09	0.11	0.10	0.11	0.10	0.09
Jan 23 - Jan 30	0.10	0.09	0.09	0.08	0.13	0.10	0.10	0.10	0.09	0.09	0.11
Jan 30 - Feb 6	(a)	0.09	0.08	0.07	0.10	(a)	(a)	(b)	(a)	0.08	0.09
Feb 6 - Feb 13	(a)	0.13	0.09	0.07	0.09	(a)	(a)	(a)	(a)	0.09	0.09
Feb 13 - Feb 18	0.07	0.12	0.07	0.06	0.08	0.06	0.07	0.07	0.06	0.06	0.10
Feb 18 - Feb 27	0.10	0.11	0.11	0.04	0.11	0.10	0.10	0.09	0.11	0.11	0.12
Feb 27 - Mar 6	0.11	0.12	0.09	0.02	0.11	0.12	0.09	0.10	0.14	0.10	0.11
Mar 6 - Mar 13	0.12	0.13	0.10	(b)	0.14	0.03	0.11	0.10	0.13	0.12	0.17
Mar 13 - Mar 20	0.14	0.09	0.13	0.11	0.15	0.13	0.17	0.13	0.13	0.10	0.19
Mar 20 - Mar 27	0.10	0.14	0.11	0.12	0.13	0.13	0.14	0.11	0.13	(b)	(b)
Mar 27 - Apr 3	0.03	0.18	0.05	0.13	0.18	0.16	0.13	0.15	0.15	0.16	0.15
Apr 3 - Apr 10	0.06	0.06	0.07	0.06	0.07	0.07	0.05	0.06	0.08	0.08	0.16
Apr 10 - Apr 17	0.20	0.20	0.19	0.18	0.17	0.21	0.18	0.21	0.22	0.19	0.20
Apr 17 - Apr 24	0.19	0.17	0.13	0.19	0.18	0.14	0.20	0.18	0.14	0.13	0.19
Apr 24 - May 1	0.17	0.07	0.06	0.08	0.07	0.05	0.05	0.07	0.06	0.04	0.08
May 1 - May 8	0.12	0.11	0.10	0.11	0.12	0.12	0.12	0.13	0.12	0.07	0.15
May 8 - May 15	0.08	0.09	0.08	0.09	0.07	0.08	(b)	0.08	0.08	(b)	0.06
May 15 - May 22	0.13	0.11	0.13	0.10	0.13	0.12	0.15	0.15	0.17	0.14	0.13
May 22 - May 29	0.07	0.07	0.07	0.05	0.06	0.06	0.04	0.05	0.06	0.06	0.03
May 29 - June 5	0.07	0.08	0.08	0.07	0.08	0.08	0.05	0.07	0.04	0.07	0.07
June 5 - June 12	0.06	0.06	0.07	0.02	0.07	0.09	0.06	0.07	0.07	0.06	0.06
June 12 - June 19	0.06	0.08	0.05	0.05	0.06	0.07	0.02	0.08	0.06	0.07	0.07
June 19 - June 26	0.07	0.07	0.05	0.08	0.09	0.10	0.03	0.09	0.08	0.08	0.09

(a) Station inaccessable - no sample until following week.
(b) Instrument out of service.

LLD = .002

TABLE 7

AIR PARTICULATES - GROSS GAMMA CONCENTRATION IN MONTHLY COMPOSITES ($cpm/m^3 \times 10^{-3}$) (a)

	Control	Offsite			Onsite						
Collection Period (1975)	East Weymouth	Plymouth Center	Cleft Rock Area	Manomet Substation	Rocky Hill Road (West)	Property Line	Overlook Area	Pedestrian Bridge	East Breakwater	Rocky Hill Road (East)	Warehouse
Jan	5	6	< 3	3	9	3	4	10	6	4	7
Feb	19	19	17	14	23	7	14	8	16	12	32
Mar	21	15	17	14	28	20	25	19	19	8	12
Apr	15	26	15	22	26	22	30	25	28	36	22
May	12	15	16	14	12	11	11	15	16	9	8
June	20	17	14	15	18	16	6	14	21	9	20

(a) Error is ±2 or 10%, whichever is larger.

TABLE 7A

AIR PARTICULATES - GAMMA ISOTOPE CONCENTRATION IN MONTHLY COMPOSITES (pCi/m^3) (a)

Collection Period (1975)	Control	Offsite			Onsite						
	East Weymouth	Plymouth Center	Cleft Rock Area	Manomet Substation	Rocky Hill Road (West)	Property Line	Overlook Area	Pedestrian Bridge	East Breakwater	Rocky Hill Road (East)	Warehouse
January											
Nb-95	0.013 ±0.007	0.018 ±0.007	(b)	0.022 ±0.007	0.026 ±0.007	0.024 ±0.007	0.013 ±0.007	(b)	0.018 ±0.007	0.015 ±0.007	0.015 ±0.007
April											
Nb-95	0.013 ±0.006	0.011 ±0.008	(b)	(b)	0.009 ±0.005	0.013 ±0.006	(b)	(b)	(b)	(b)	(b)
Cs-137	(b)	0.003 ±0.002	(b)	0.004 ±0.002	(b)	(b)	(b)	0.004 ±0.002	(b)	(b)	(b)
Ce-144	(b)	0.051 ±0.021	(b)	0.044 ±0.017	(b)	(b)	(b)	0.035 ±0.012	(b)	(b)	(b)

(a) Results of Ge(Li) spectrometry. Analysis required quarterly. Nominal MDA's (minimum detectable activities) for these isotopes are:

Nb-95 - 0.006 pCi/m^3
Ce-144- 0.03
Cs-137- 0.007

(b) Less than MDA.

LLD = .002

TABLE 8

PARTICULATE IODINE-131 IN AIR SAMPLES (pCi/m^3)
JANUARY - JUNE 1975

Collection Period	Control	Offsite			Onsite						
	East Weymouth	Plymouth Center	Cleft Rock Area	Manomet Substation	Rocky Hill Road (West)	Property Line	Overlook Area	Pedestrian Bridge	East Breakwater	Rocky Hill Road (East)	Warehouse
Jan 2 - Jan 9	0.03±0.03	<0.03	<0.03	<0.02	<0.02	<0.02	<0.03	<0.02	<0.02	<0.02	<0.03
Jan 9 - Jan 16	<0.01	<0.01	<0.01	<0.01	0.01±0.01	0.01±0.01	<0.01	<0.01	<0.02	<0.01	<0.01
Jan 16 - Jan 23	<0.09	0.09±0.09	<0.09	<0.08	0.11±0.09	<0.08	<0.09	<0.08	0.09±0.09	<0.08	0.12±0.10
Jan 23 - Jan 30	<0.03	<0.03	<0.03	<0.02	0.02±0.02	<0.02	<0.03	<0.02	0.03±0.03	<0.03	<0.03
Jan 30 - Feb 6	(a)	<0.03	<0.03	<0.02	0.02±0.02	(a)	(a)	(b)	(a)	<0.03	<0.03
Feb 6 - Feb 13	(a)	<0.03	<0.04	0.04±0.03	0.04±0.03	(a)	(a)	(a)	(a)	<0.02	<0.02
Feb 13 - Feb 20	0.02±0.02	0.06±0.04	<0.03	<0.03	<0.03	<0.01	0.02±0.02	0.02±0.02	<0.02	<0.03	<0.04
Feb 20 - Feb 27	<0.02	0.02±0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.01±0.01	<0.02	<0.02	0.02±0.02
Feb 27 - Mar 6	0.04±0.04	0.03±0.03	0.04±0.04	<0.03	0.03±0.03	<0.03	<0.05	0.03±0.03	0.04±0.03	<0.03	<0.04
Mar 6 - Mar 13	<0.03	0.03±0.03	<0.03	(b)	0.05±0.03	<0.02	<0.03	<0.02	<0.03	<0.03	0.04±0.03
Mar 13 - Mar 20	<0.02	0.02±0.02	0.04±0.03	<0.03	0.03±0.02	<0.02	0.02±0.02	<0.02	0.03±0.02	<0.02	<0.12(c)
Mar 20 - Mar 27	<0.02	<0.02	0.02±0.02	<0.02	<0.02	<0.02	0.02±0.02	0.02±0.02	0.04±0.02	(b)	(b)
Mar 27 - Apr 3	<0.02	0.02±0.02	0.02±0.02	0.04±0.02	0.03±0.02	0.02±0.02	0.02±0.02	0.02±0.02	<0.02	0.02±0.02	0.03±0.02
Apr 3 - Apr 10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02±0.02	0.05±0.02
Apr 10 - Apr 17	0.06±0.03	0.05±0.04	0.05±0.04	0.03±0.03	0.05±0.03	0.05±0.03	0.05±0.03	0.03±0.03	0.05±0.03	0.07±0.03	0.07±0.04
Apr 17 - Apr 24	<0.02	<0.02	<0.02	0.03±0.02	0.04±0.02	<0.02	0.04±0.02	0.02±0.02	0.04±0.02	0.03±0.02	0.03±0.02
Apr 24 - May 1	<0.01	<0.02	0.08±0.04 (c)	0.01±0.01	0.03±0.01	0.02±0.01	0.01±0.01	0.01±0.01	0.01±0.01	0.02±0.01	0.02±0.01
May 1 - May 8	0.02±0.01	0.01±0.01	0.02±0.01	<0.01	0.02±0.01	0.01±0.01	0.02±0.01	0.01±0.01	0.02±0.01	<0.01	0.02±0.01
May 8 - May 15	<0.02	<0.02	0.02±0.02	0.02±0.02	0.02±0.02	0.02±0.02	(b)	0.02±0.02	<0.02	(b)	<0.02
May 15 - May 22	0.03±0.02	<0.02	<0.02	0.01±0.01	0.01±0.01	<0.01	0.02±0.02	0.02±0.02	<0.01	<0.02	<0.01
May 22 - May 29	0.03±0.03	<0.03	<0.03	0.02±0.02	<0.02	<0.02	<0.03	0.04±0.03	<0.02	0.02±0.02	<0.03
May 29 - June 5	0.02±0.01	0.03±0.02	0.02±0.02	0.02±0.01	0.02±0.01	0.03±0.01	0.03±0.02	0.02±0.02	0.03±0.02	0.03±0.01	0.02±0.01
June 5 - June 12	<0.02	0.03±0.02	0.10±0.04 (c)	<0.01	0.02±0.02	<0.02	<0.02	<0.02	<0.02	0.02±0.02	0.02±0.02
June 12 - June 19	<0.02	<0.02	<0.02	<0.02	0.02±0.02	<0.02	<0.02	<0.02	<0.02	0.02±0.02	<0.02
June 19 - June 26	<0.02	<0.01	<0.01	<0.01	<0.01	0.01±0.01	<0.01	<0.01	<0.01	<0.01	0.01±0.01

(a) Station inaccessable - no sample until following week.
(b) Instrument out of service.
(c) Instrument malfunction - partial sample.

TABLE 8A

GASEOUS IODINE-131 IN AIR SAMPLES (pCi/m^3)
JANUARY - JUNE 1975

Collection Period	Control	Offsite			Onsite						
	East Weymouth	Plymouth Center	Cleft Rock Area	Manomet Substation	Rocky Hill Road (West)	Property Line	Overlook Area	Pedestrian Bridge	East Breakwater	Rocky Hill Road (East)	Warehouse
Jan 1 - Jan 9	<0.02	<0.02	0.02±0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05±0.02	0.03±0.02	0.05±0.03
Jan 9 - Jan 16	<0.02	<0.02	<0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03	<0.02	0.04±0.03
Jan 16 - Jan 23	<0.04	<0.04	<0.04	0.04±0.04	<0.04	<0.03	0.07±0.04	<0.03	<0.04	<0.04	<0.04
Jan 23 - Jan 30	0.02±0.02	0.03±0.02	<0.02	<0.02	<0.02	0.02±0.02	0.04±0.02	0.05±0.02	0.10±0.02	0.05±0.02	0.10±0.02
Jan 30 - Feb 6	(a)	<0.05	<0.08	<0.05	<0.05	(a)	(a)	(b)	(a)	<0.05	0.17±0.06
Feb 6 - Feb 13	(a)	<0.03	<0.03	<0.02	<0.03	(a)	(a)	(a)	(a)	<0.03	0.05±0.03
Feb 13 - Feb 20	0.02±0.02	0.04	0.04±0.04	<0.03	<0.04	<0.01	0.04±0.02	0.02±0.02	0.03±0.02	<0.04	0.06±0.04
Feb 20 - Feb 27	0.02±0.02	0.02	0.04±0.02	<0.01	0.03±0.02	0.02±0.02	0.02±0.02	<0.02	0.02±0.02	0.04±0.02	0.04±0.02
Feb 27 - Mar 6	<0.03	0.03±0.03	<0.03	0.05±0.02	0.03±0.03	0.02±0.02	0.05±0.04	0.04±0.02	0.06±0.03	0.06±0.03	0.08±0.03
Mar 6 - Mar 13	<0.02	<0.02	<0.02	(b)	<0.02	<0.02	0.02±0.02	<0.02	0.02±0.02	0.04±0.02	0.02±0.02
Mar 13 - Mar 20	0.03±0.03	<0.03	0.06±0.03	<0.03	<0.03	0.07±0.03	0.14±0.04	0.07±0.03	0.06±0.03	0.04±0.03	0.22±0.16 (c)
Mar 20 - Mar 27	0.02±0.02	<0.02	<0.02	<0.02	<0.02	0.02±0.02	<0.02	<0.02	0.08±0.02	0.04±0.02	(b)
Mar 27 - Apr 3	<0.02	0.03±0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02±0.02	0.04±0.02	<0.02	0.04±0.02
Apr 3 - Apr 10	<0.03	<0.03	<0.03	<0.03	0.03±0.03	<0.03	<0.03	<0.02	0.06±0.03	0.11±0.03	0.47±0.04
Apr 10 - Apr 17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08±0.05
Apr 17 - Apr 24	<0.03	<0.03	<0.03	<0.03	<0.03	0.05±0.03	<0.03	0.11±0.03	0.08±0.03	0.07±0.03	0.17±0.03
Apr 24 - May 1	<0.02	<0.03	<0.07 (c)	<0.02	0.04±0.02	0.02±0.02	0.04±0.02	0.02±0.02	0.03±0.02	0.04±0.02	0.09±0.02
May 1 - May 8	0.02±0.02	<0.02	0.02±0.02	<0.02	0.03±0.02	<0.02	0.05±0.02	0.02±0.02	<0.02	<0.02	0.12±0.02
May 8 - May 15	0.04±0.04	0.03±0.04	0.08±0.04	<0.04	0.05±0.04	0.03±0.04	(b)	0.11±0.05	<0.04	(b)	0.04±0.04
May 15 - May 22	<0.02	0.02±0.02	<0.02	<0.02	0.05±0.02	0.08±0.02	0.03±0.02	0.10±0.02	0.04±0.02	0.03±0.02	0.03±0.02
May 22 - May 29	<0.03	<0.03	0.03±0.03	0.02±0.02	<0.03	<0.03	0.14±0.04	0.03±0.03	0.08±0.03	0.04±0.03	0.07±0.04
May 29 - June 5	<0.03	<0.03	<0.03	<0.02	0.03±0.03	0.04±0.03	0.03±0.03	0.06±0.03	<0.03	0.05±0.03	0.07±0.03
June 5 - June 12	<0.03	<0.03	<0.06 (c)	<0.02	<0.03	<0.03	<0.03	<0.03	0.05±0.03	0.03±0.02	<0.03
June 12 - June 19	0.05±0.03	0.04±0.03	0.04±0.04	0.02±0.02	0.06±0.03	0.04±0.03	<0.03	0.22±0.03	0.03±0.03	0.02±0.03	0.03±0.03
June 19 - June 26	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03±0.03	<0.02	0.06±0.03

(a) Station inaccessable - no sample until following week.
(b) Instrument out of service.
(c) Instrument malfunction - partial sample.

TABLE 9

EXTERNAL GAMMA EXPOSURE RATES, JANUARY-JUNE 1975 (μR/hr) [a]

Onsite Monitoring Locations	Jan/Feb	March	April	May	June
Overlook Area (OA)	19.0	19.3	18.9	27.7	32.4
Public Parking Area (PA)	15.1	15.0	14.3	16.9	15.6
Pedestrian Bridge (PB)	17.0	17.8(b)	14.9	21.4(b)	17.4
Rocky Hill Road (A)	(c)	14.3	(c)	15.1	(c)
Rocky Hill Road (B)	16.1	15.2	15.7	16.4	15.9
East Breakwater (EB)	15.6	15.5	14.9	17.6	16.2
Microwave Tower (MT)	15.7	14.6	15.1	16.5	16.5
Property Line (C)	(c)	(c)	(c)	(c)	(c)
Property Line (HB)	15.3	14.4	(c)	(c)	(c)
Property Line (WH)	14.0	13.8	13.3	15.9	14.3
Property Line (EM)	14.4	(c)	14.9	(c)	15.7
Property Line (E)	(c)	12.4	(c)	14.5	(c)
Property Line (H)	15.5	15.7	15.8	17.2	17.4
Property Line (G)	12.1	14.5	(d)	14.5	10.8
Property Line (I)	15.8	14.4	15.3	17.0	16.1
Property Line (F)	14.1	14.2	14.7	17.7	15.5
Property Line (D)	13.0	15.0	11.8	16.3	13.3
Property Line (J)	(c)	13.6	(c)	17.0	(c)
Property Line (K)	14.2	12.7	13.9	15.8	14.8
Property Line (PL)	15.2	13.1(b)	15.2	16.0(b)	16.1
Warehouse (WS)	14.3	13.7(b)	15.3	19.7(b)	19.3
Average Onsite Dose Rates per Month	16.0	14.7	14.9	17.4	16.7
Offsite Monitoring Locations					
East Weymouth (EW)	11.9	14.1	10.4	16.2	10.6
Kingston (KS)	(d)	13.3	(c)	15.9	(c)
Sagamore (CS)	14.5	15.4	14.3	17.2	14.9
Plymouth Airport (SA)	12.3	13.7	11.5	13.8	12.3
Duxbury (SS)	12.5	14.2	12.7	15.0	13.3
Plymouth (CP)	(c)	14.5	(c)	18.2	(c)
North Plymouth (NP)	15.9	14.6	14.9	16.5	15.7
Plymouth Center (PC)	(c)	13.4	(c)	12.7	(c)
South Plymouth (SP)	14.1	14.7	14.1	16.2	15.3
Manomet (MB)	14.2	12.5	14.6	15.2	14.7
Manomet (MS)	14.8	14.8	14.8	17.0	15.3
Manomet (ME)	16.7	15.2	16.1	18.0	17.0
Manomet (MP)	12.3	13.1	10.5	16.0	12.8
Cleft Rock Area (CR)	14.3	(c)	14.8	(c)	15.3
Rocky Hill Road (ER)	15.8	15.3	15.1	17.7	16.5
Bayshore Drive (BD)	15.7	15.2	15.9	18.3	16.8
Rocky Hill Road (WR)	16.4	15.3	15.9	16.0	17.9
Average Offsite Dose Rates per Month	14.4	14.3	14.0	16.2	14.9

(a) Gross Exposure Rates which include inherent dosimeter background dose rates. Measured with CaF_2 (Mn) dosimeters (EG&G TL-15).
(b) New Dosimeter - not normalized.
(c) Dosimeter stolen.
(d) Reading lost in readout.

TABLE 9A

RADIGUARD TLD DATA AND COMPARISONS

Onsite Locations	April μR/hr	April Radiguard/ TL-15	May μR/hr	May Radiguard/ TL-15	June μR/hr	June Radiguard/ TL-15
Overlook Area (OA)	11.2	0.59	26.4	0.95	31.3	0.97
Public Parking Area (PA)	7.2	0.50	5.6	0.33	9.9	0.63
Pedestrian Bridge (PB)	10.3	0.69	10.1	0.47	13.9	0.80
Rocky Hill Road (A)	7.4	-	4.6	0.30	10.2	-
Rocky Hill Road (B)	8.6	0.55	6.5	0.40	9.6	0.60
East Breakwater (EB)	-	-	5.2	0.30	9.6	0.59
Microwave Tower (MT)	7.1	0.47	5.0	0.30	8.4	0.51
roperty Line (C)	-	-	5.0	-	9.0	-
roperty Line (HB)	-	-	-	-	10.2	-
Property Line (WH)	6.6	0.50	4.6	0.29	7.5	0.52
Property Line (EM)	6.6	0.44	4.2	-	9.2	0.59
Property Line (E)	6.3	-	4.2	0.29	8.0	-
Property Line (H)	9.1	0.58	6.3	0.31	10.6	0.61
Property Line (G)	8.6	-	6.0	0.41	9.7	0.90
Property Line (I)	7.7	0.50	4.8	0.28	8.6	0.53
Property Line (F)	8.4	0.57	6.5	0.37	10.0	0.65
Property Line (D)	7.5	0.64	5.6	0.34	9.7	0.73
Property Line (J)	6.5	-	3.4	0.20	7.2	-
Property Line (K)	5.4	0.39	3.6	0.23	7.4	0.50
Property Line (L)	7.7	0.54	6.0	0.37	9.9	0.66
Property Line (PL)	7.7	0.51	5.8	0.36	9.0	0.56
Warehouse (WS)	9.6	0.63	12.3	0.62	16.9	0.88
Average Onsite Dose Rates per Month	7.9	0.54	6.7	0.37	10.7	0.66
Offsite Locations						
East Weymouth (EW)	-	-	3.4	0.21	9.0	0.85
Kingston (KS)	-	-	2.0	0.13	8.0	-
Sagamore (CS)	-	-	5.0	0.29	9.9	0.66
Plymouth Airport (SA)	5.9	0.51	3.8	0.28	7.7	0.63
Duxbury (SS)	5.7	0.45	3.6	0.24	7.7	0.58
Plymouth (CP)	-	-	3.2	0.18	7.8	-
North Plymouth (NP)	8.0	0.50	5.2	0.32	8.0	0.51
Plymouth Center (PC)	5.7	-	3.2	0.25	7.4	-
South Plymouth (SP)	7.2	0.51	5.0	0.31	7.8	0.51
Manomet (MB)	-	-	2.4	0.16	7.2	0.49
Manomet (MS)	7.5	0.51	5.8	0.34	8.6	0.56
Manomet (ME)	-	-	5.0	0.28	10.9	0.64
Manomet (MP)	5.7	0.54	3.8	0.24	8.4	0.66
Cleft Rock Area (CR)	-	-	4.2	-	9.0	0.59
Rocky Hill Road (ER)	-	-	4.6	0.26	9.9	0.60
Bayshore Drive (BD)	-	-	7.1	0.39	9.6	0.57
Rocky Hill Road (WR)	7.5	0.47	5.4	0.34	8.9	0.50
Average Offsite Dose Rates per Month	6.7	0.50	4.3	0.26	8.6	0.60

TABLE 10

RADIONUCLIDE CONCENTRATIONS IN MILK (pCi/l)

Analysis	Collection Period	Plymouth (County Farm)	Bridgewater	Local Store
Cs-137	Nov (a)	15 ± 2	12 ± 1	5 ± 1
	Dec 1974(a)	14 ± 1	11 ± 1	6 ± 1
	Jan 1975	14 ± 1	13 ± 2	16 ± 2
	Feb	9 ± 1	31 ± 3	29 ± 3
	Mar	11 ± 1	13 ± 1	9 ± 1
	Apr	20 ± 2	9 ± 1	14 ± 1
	May	7 ± 1	12 ± 1	7 ± 1
	June	16 ± 1	13 ± 1	7 ± 1
Sr-90	Oct (a)	17 ± 3	2 ± 1	2 ± 1
	Nov (a)	6 ± 1	<2	4 ± 1
	Dec 1974(a)	8 ± 1	4 ± 1	3 ± 1
	Jan 1975	15 ± 2	3 ± 1	26 ± 3
	Feb	2 ± 1	5 ± 1	7 ± 1
	Mar	8 ± 1	6 ± 1	6 ± 1
	Apr	(b)	(b)	10 ± 1
	May	8 ± 1	9 ± 1	8 ± 1
	June	7 ± 1	14 ± 1	13 ± 2
I-131	Jan 1975	<2	<2	<2
	Feb	<2	<2	<2
	Mar	<2	<2	<2
	Apr	<2	<2	<2
	May	<2	<2	<2
	June	<2	<2	<2
Ba/La-140	Jan	<5	<5	<5
	Feb	<5	<5	<5
	Mar	<5	<5	<5
	Apr	<5	<5	<5
	May	<5	<5	<5
	June	<5	<5	<5

(a) Data reported as incomplete in previous report.
(b) Missing data indicates analysis incomplete, results will appear in a later report.

TABLE 11

RADIOACTIVITY IN CROPS

(No data was obtained during this reporting period.)

TABLE 12

RADIOACTIVITY IN DOMESTIC AND RECREATIONAL WATER

Analysis	Collection Date (1975)	Great Pond	Little South Pond	College Pond	Lout Pond Well	Manomet Well
Gross Beta (pCi/l)	Jan	2.8 ±1.0	<1.0	2.6 ±1.0	2.3 ±1.0	13 ±1
	Feb	5.1 ±1.0	1.8 ±1.0	2.2 ±1.0	1.0 ±1.0	4.1 ±1.0
	Mar	6.0 ±1.0	2.5 ±1.0	2.2 ±1.0	<1.0	5.2 ±1.0
	Apr	5.5 ±1.0	1.8 ±1.0	2.5 ±1.0	<1.0	1.9 ±1.0
	May	3.6 ±1.0	2.2 ±1.0	4.4 ±1.0	<1.0	1.0 ±1.0
	June	4.3 ±1.0	2.0 ±1.0	1.0 ±1.0	<1.0	1.1 ±1.0
Gross Gamma (cpm/l)	Jan	<5	<5	<5	<5	8 ±5
	Feb	6 ±5	<5	<5	8 ±5	13 ±5
	Mar	<5	<5	<5	22 ±5	10 ±5
	Apr	<5	<5	<5	<5	<5
	May	<5	<5	<5	17 ±5	15 ±5
	June	<5	<5	<5	9 ±5	<5
Strontium-90 (pCi/l)	Jan	<0.5	<0.7	<0.5	<0.5	<0.5
	Feb	0.7 ±0.5	<0.5	<0.5	<0.5	<0.5
	Mar	<0.5	<0.7	0.5 ±0.5	<0.5	<0.5
	Apr	<0.5	<0.5	<0.5	<0.5	<0.6
	May	<0.5	<0.5	<0.5	<0.5	<0.5
	June	1.0 ±0.5	<0.5	<0.5	<0.5	<0.5
Tritium (pCi/ml)	Jan	<2.5	<2.5	<2.5	<2.5	<2.5
	Feb	<2.5	<2.5	<2.5	<2.5	<2.5
	Mar	<2.5	<2.5	<2.5	<2.5	<2.5
	Apr	<2.5	<2.5	<2.5	<2.5	<2.5
	May	<2.5	<2.5	<2.5	<2.5	20 ±2
	June	<2.5	<2.5	<2.5	<2.5	<2.5
Iodine-131 (pCi/l)	Jan	<5	<5	<5	<5	<5
	Feb	<5	<5	<5	<5	<5
	Mar	<5	<5	<5	<5	<5
	Apr	<5	<5	<5	<5	<5
	May	<5	<5	<5	<5	<5
	June	<5	<5	<5	<5	<5

TABLE 13

RADIOACTIVITY IN PRECIPITATION - PLYMOUTH MASSACHUSETTS[a]

Collection Period	Gross Beta (pCi/m^2)	Gross Gamma (cpm/m^2)	Sr-90 (pCi/m^2)	H-3 (pCi/m^2)
October 1974	70 ±50	160 ±120	80 ±20[b]	<150
November	690 ±70	<120	<40[b]	<110
December	670 ±190	<400	<10[b]	<220
January 1975	910 ±110	<190	<120	<440
February	1240 ±180	<120	<30	<210
March	1030 ±200	<120	<130	<210
April	440 ±130	<120	230 ±40	<190

(a) Analysis not required by operating license.

(b) Results listed as incomplete in previous report.

TABLE 14

RADIOACTIVITY IN SEAWATER[b]
JANUARY - JUNE 1975

Location	Collection Date	Fractional Gross Beta (pCi/l)[a] Frac I	Frac II	Frac III	Frac IV	Gross Gamma (cpm/l)	Concentration H-3 (pCi/ml)	I-131 (pCi/l)
Intake Channel	Jan	<5	<5	<5	<5	<5	<2.5	<5
	Feb	<5	<5	<5	<5	<5	<2.5	<5
	Mar	<5	<5	<5	<5	<5	<2.5	<5
	Apr	<5	<5	<5	<5	<5	<2.5	<5
	May	-	-	-	-	7 ±5	<2.5	<5
	June	-	-	-	-	9 ±5	<2.5	<5
Discharge Channel	Jan	<5	<5	<5	<5	<5	<2.5	<5
	Feb	<5	<5	<5	<5	5 ±5	<2.5	<5
	Mar	<5	<5	<5	<5	5 ±5	<2.5	<5
	Apr	<5	<5	<5	<5	6 ±5	<2.5	<5
	May					14 ±5	<2.5	<5
	June					9 ±5	<2.5	<5
Powder Point (Control)	Jan	<5	<5	<5	<5	6 ±5	<2.5	<5
	Feb	<5	<5	<5	<5	5 ±5	<2.5	<5
	Mar	<5	<5	<5	<5	7 ±5	<2.5	<5
	Apr	<5	<5	<5	<5	<5	<2.5	<5
	May	-	-	-	-	9 ±5	<2.5	<5
	June	-	-	-	-	11 ±5	<2.5	<5
Priscilla Beach	June 2	-	-	-	-	7 ±5	<2.5	-
White Horse Beach	June 2	-	-	-	-	9 ±5	<2.5	-

QUARTERLY ANALYSIS OF RADIONUCLIDES (pCi/l)[b]

Location	Collection Date	Co-58	Co-60	Zn-65	Sr-90	Cs-137	Mn-54
Intake Channel	4th quarter (1974)	<14	<16	<30	<.09	(c)	<15
	1st quarter (1975)	-	-	<22	0.18 ±0.11	0.60 ±0.07	<11
	2nd quarter (1975)	-	-	-	-	-	-
Discharge Channel	4th quarter (1974)	<14	<16	<30	<.06	0.72 ±0.27	<15
	1st quarter (1975)	-	-	<30	0.47 ±0.42	0.25 ±0.08	<17
	2nd quarter (1975)	-	-	-	-	-	-

(a) The four fractions contain essentially:
1. Insolubles 2. Ru, Cr, Co. Zn 3. Ra, Sr, Ba 4. Cs

(b) Incorporates data listed as incomplete in previous report.

(c) Aliquot lost in analysis.

TABLE 15

RADIOACTIVITY IN MARINE LIFE
JANUARY - JUNE 1975

Sample Type	Location	Date (1975)	Gross Beta (pCi/g)	Sr-89	Sr-90	Mn-54	Co-58	Co-60	Zn-65	Cs-137	Other
						(pCi/g - wet weight)					
Bluefish(2)	Rocky Point	Oct 1 (b)	5.2±0.2	(a)	<0.007	<0.02	<0.02	<0.02	<0.03	<0.02	
Bluefish(2)	Rocky Point	Oct 1 (b)	6.4±0.2	(a)	<0.007	<0.02	<0.02	<0.02	<0.03	<0.02	
Bluefish(2)	Rocky Point	Oct 1 (b)	1.6±0.1	(a)	<0.007	<0.02	13.6±1.4	0.49±0.10	<0.03	<0.02	
Bluefish(2)	Rocky Point	Oct 1 (b)	4.5±0.2	(a)	<0.007	<0.02	<0.02	<0.02	<0.03	0.09±0.07	
Bluefish(2)	Rocky Point	Oct 1 (b)	1.6±0.1	(a)	<0.007	<0.02	<0.02	<0.02	<0.03	<0.02	
Clams (Mya)	Plymouth Harbor	Apr 8	0.41±0.06	<0.09	<0.007	<0.02	<0.02	<0.02	<0.03	<0.02	
Clams	Kingston	Apr 17	1.0±0.1	<0.06	<0.007	<0.02	<0.02	<0.02	<0.03	<0.02	
Clams	Warren Cove	Apr 21	0.98±0.08	<0.08	<0.007	<0.02	<0.02	<0.02	<0.03	<0.02	
Clams	Duxbury Bay	Apr 30	0.73±0.07	<0.07	<0.007	<0.02	<0.02	<0.02	<0.03	<0.02	
Clams	Warren Cove	June 19	-	-	-	<0.01	<0.009	<0.01	<0.02	<0.01	
Clams	Plymouth Harbor	June 19	-	-	-	<0.02	<0.02	<0.02	<0.04	<0.02	
Clams	Kingston	June 20	1.1 ±0.2	-	-	<0.01	<0.01	<0.01	<0.03	<0.01	
Clams	Duxbury Bay	June 20	1.4 ±0.2	-	-	<0.01	<0.01	<0.01	<0.02	<0.01	
Clams	Warren Cove	May 15	1.5 ±0.2	-	-	<0.01	<0.01	<0.01	<0.02	<0.01	
Clams	Plymouth Harbor	May 20	1.0 ±0.2	-	-	<0.01	<0.01	<0.01	<0.02	<0.01	
Clams	Kingston	May 28	1.3 ±0.2	-	-	<0.01	<0.01	<0.01	<0.02	<0.01	
Clams	Duxbury Bay	May 28 (b)	1.2 ±0.2	-	-	<0.01	<0.01	<0.01	<0.02	<0.01	
Cod	Rocky Point	Oct 2	3.9 ±0.4	(a)	<0.005	0.011±0.004	<0.01	0.024±0.005	0.01±0.01	0.013±0.004	
Cod	Rocky Point	Oct 2 (b)	4.3 ±0.4	(a)	0.005±0.005	0.011±0.005	<0.01	0.018±0.005	0.02±0.01	<0.01	
Flounder (winter)	Rocky Point	Nov 1 (b)	3.6 ±0.4	(a)	<0.005	<0.01	<0.01	<0.01	<0.02	<0.01	
Flounder (winter)	Rocky Point	Dec 6 (b)	4.8 ±0.5	(a)	<0.005	<0.01	<0.01	<0.01	<0.02	<0.01	
Flounder (winter)	Rocky Point	May 8	4.4 ±0.4	-	-	<0.01	<0.01	<0.02	<0.04	<0.02	
Flounder (winter)	Rocky Point	May 8	4.6 ±0.5	-	-	<0.009	<0.01	<0.01	<0.02	<0.01	
Irish Moss	Manomet Point	Mar 18	27 ±1	<2.0	<0.07	<0.02	<0.02	<0.02	<0.03	<0.02	
Irish Moss	Manomet Point	Mar 29	25 ±2	<2.0	<0.09	<0.02	<0.02	<0.02	<0.03	<0.02	(c)
Irish Moss	Manomet Point	Apr 16	19 ±1	<0.7	<0.06	<0.02	<0.02	<0.02	<0.03	0.06±0.04	(d)
Irish Moss	Manomet Point	Apr 29	18 ±1	<0.7	<0.06	<0.02	<0.02	<0.02	<0.03	0.09±0.05	(e)
Irish Moss	Manomet Point	Mar 18	33 ±2	<2.0	<0.08	<0.02	<0.02	<0.02	<0.03	<0.02	
Irish Moss	Manomet Point	Mar 29	15 ±1	<2.0	<0.01	<0.02	<0.02	<0.0.	<0.03	0.20±0.12	
Irish Moss	Manomet Point	Apr 16	33 ±1	<0.8	<0.06	<0.02	<0.02	<0.02	<0.03	0.15±0.11	

TABLE 15 - Continued

Sample Type	Location	Date (1975)	Gross Beta (pCi/g)	Sr-89	Sr-90	Mn-54 (pCi/g - wet weight)	Co-58	Co-60	Zn-65	Cs-137	Other
Irish Moss	Manomet Point	Apr 29	25 ±1	<0.6	<0.06	<0.02	<0.02	<0.02	<0.03	<0.02	(f)
Irish Moss	Rocky Point	Mar 21	24 ±1	<2.0	<0.07	<0.02	<0.02	<0.02	<0.03	<0.02	
Irish Moss	Rocky Point	Mar 31	33 ±1	<1.0	<0.06	0.33±0.13	<0.02	0.61±0.15	<0.03	<0.02	
Irish Moss	Rocky Point	Apr 15	29 ±1	<0.8	<0.06	0.23±0.12	<0.02	0.40±0.14	<0.03	0.14 ±0.09	
Irish Moss	Rocky Point	Apr 23	22 ±1	<1.0	<0.08	0.13±0.09	<0.02	0.48±0.11	<0.03	<0.02	
Irish Moss	White Horse Beach	Mar 21	13 ±1	<2.0	<0.07	0.32 ±0.13	<0.02	0.47±0.17	<0.03	<0.02	
Irish Moss	White Horse Beach	Mar 29	23 ±1	<2.0	<0.07	<0.02	<0.02	<0.02	<0.03	<0.02	(g)
Irish Moss	White Horse Beach	Apr 14	21 ±1	<1.0	<0.08	<0.02	<0.02	<0.02	<0.03	<0.02	(h)
Irish Moss	White Horse Beach	Apr 24	23 ±1	<1.0	<0.08	<0.02	<0.02	0.27 ±0.10	<0.03	<0.02	
Irish Moss	Ellisville	Mar 19	37 ±2	<2.0	<0.08	<0.02	<0.02	<0.02	<0.03	<0.02	(i)
Irish Moss	Ellisville	Mar 25	29 ±1	<1.0	<0.06	<0.02	<0.02	<0.02	<0.03	<0.02	(j)
Irish Moss	Ellisville	Apr 18	13 ±1	<2.0	<0.01	<0.02	<0.02	<0.02	<0.03	<0.02	(k)
Irish Moss	Ellisville	Apr 22	31 ±2	<0.8	<0.08	<0.02	<0.02	<0.02	<0.03	<0.02	
Irish Moss	Ellisville	June 17	-	-	-	<0.04	<0.05	<0.04	<0.01	<0.04	
Irish Moss	Manomet Point	June 18	-	-	-	<0.04	<0.04	<0.04	<0.09	<0.03	
Irish Moss	Manomet Point	June 18	-	-	-	<0.05	<0.05	<0.05	<0.1	0.07 ±0.04	
Irish Moss	White Horse Beach	June 18	-	-	-	<0.03	<0.03	<0.03	<0.07	<0.03	
Irish Moss	Rocky Point	June 18	-	-	-	0.13 ±0.04	<0.05	0.31 ±0.06	0.25±0.09	<0.04	
Mussels	Plymouth Harbor	Apr 8	1.0±0.1	<0.05	<0.004	<0.02	<0.02	0.1±0.03	<0.03	<0.02	
Mussels	Rocky Point	Apr 18	0.8 ±0.06	<0.05	<0.004	<0.02	<0.02	<0.02	<0.03	<0.02	
Mussels	Discharge Breakwater	June 18	0.3±0.2	-	-	<0.2	<0.02	0.04±0.01	<0.04	<0.02	
Mussels	Plymouth Harbor	June 19	-	-	-	<0.004	<0.005	<0.005	<0.01	<0.004	
Mussels	Discharge Breakwater	May 21	0.5±0.2	-	-	0.024±0.009	<0.01	0.04±0.01	<0.02	<0.01	
Mussels	Plymouth Harbor	May 21	0.7±0.2	-	-	<0.01	<0.02	<0.01	<0.03	<0.01	
Pollock	Rocky Point	Oct (b) 2	4.4±0.4	(a)	0.01±0.005	<0.01	<0.01	<0.01	<0.02	<0.01	
Pollock	Rocky Point	Dec (b) 12	2.7 ±0.3	(a)	<0.005	<0.01	<0.01	<0.01	<0.02	<0.01	
Pollock	Rocky Point	May 8	3.2±0.3	-	-	<0.01	<0.01	<0.01	<0.03	0.02±0.01	
Pollock	Rocky Point	May 8	4.3±0.4	-	-	<0.02	<0.02	<0.02	<0.03	0.03±0.01	
Pollock	Rocky Point	May 8	4.7 ±0.5	-	-	<0.02	<0.02	<0.02	<0.04	<0.02	
Rockweed	Rocky Point	June 2	8.6±0.9	-	-	0.04±0.01	<0.01	0.62±0.06	0.10±0.03	<0.01	
Rockweed	Discharge Breakwater	June 2	7.5±0.8	-	-	0.05±0.01	<0.01	0.41±0.02	0.05±0.02	<0.01	
Rockweed	East Breakwater	June 2	6.7±0.7	-	-	<0.01	<0.01	0.12±0.02	<0.04	0.027±0.007	
Rockweed	Manomet Point	June 2	7.5±0.8	-	-	<0.01	<0.01	0.02±0.01	<0.02	<0.01	

TABLE 15 - Continued

Legend:

(a) Not analyzed for this isotope.
(b) Sample listed as incomplete in previous report (1974).
(c) Ce-144 detected at 0.64 ±0.43 pCi/g.
(d) Ce-144 detected at 1.1 ±0.6 pCi/g and Ru-106 at 0.57 ±0.31 pCi/g.
(e) Ce-144 detected at 1.4 ±0.5 pCi/g and Ru-106 at 0.68 ±0.48 pCi/g.
(f) Be-7 detected at 0.56 ±0.35 pCi/g, Ru-106 at 0.41 ±0.26 pCi/g, and Ce-144 at 0.76 ±0.32 pCi/g.
(g) Ce-144 detected at 0.62 ±0.27 pCi/g.
(h) Th-228 detected at 0.22 ±0.02 pCi/g.
(i) Be-7 detected at 2.89 ±2.2 pCi/g.
(j) Ce-144 detected at 1.24 ±0.61 pCi/g.
(k) Ce-144 detected at 0.58 ±0.35 pCi/g.

Note: Missing values indicate incomplete analyses, results will appear in a later report.

TABLE 16

RADIONUCLIDES IN BOTTOM SEDIMENT (pCi/g) [a]

Location	Date (1975)	K-40	Zn-65	Mn-54	Co-58	Co-60	Cs-137	Ra-226	Sr-89	Sr-90
Intake Canal	Apr 23	11 ±1	<0.2	<0.05	<0.05	<0.06	<0.06	0.2 ±0.1	<0.04	<0.006
Intake Canal	Apr 23	14 ±1	<0.1		<0.05	<0.05	<0.04	0.3 ±0.1	<0.01	<0.002
East Breakwater	Apr 23	15 ±1	<0.1		<0.05	<0.06	<0.05	0.3 ±0.1	<0.08	<0.003
Discharge Breakwater	Apr 23	12 ±1	<0.1		<0.05	<0.06	<0.05	0.15 ±0.06	<0.01	<0.010
Manomet Point	Mar 21	12 ±1	<0.1	<0.05	<0.05	<0.06	<0.05	0.27 ±0.07	-	-
Warren Cove	Mar 21	12 ±1	<0.1	<0.05	<0.05	<0.06	<0.05	0.25 ±0.06	-	<0.003
Discharge Breakwater	Mar 21	18 ±2	<0.1	<0.05	<0.05	<0.06	<0.05	0.33 ±0.05	-	<0.009
Discharge Breakwater	June 18	19 ±2	<0.2	<0.06	<0.07	<0.07	<0.06	0.4 ±0.1	<0.08	0.08 ±0.02
Manomet Point	June 17	10 ±1	<0.1	<0.04	<0.05	<0.04	<0.04	0.18 ±0.08	<0.01	0.003 ±0.003
Warren Cove	June 17	10 ±1	<0.08	<0.03	<0.04	<0.03	<0.03	0.21 ±0.07	0.01 ±0.01	<0.002

(a) Results of Ge(Li) spectroscopy. Missing values indicate incomplete analyses, results will appear in a later report.

TABLE 17

1974 SEAFOOD PATHWAY DOSES TO MAN (mrem)

Ingestion of[a]:

Dose to:	Fish	Crustacea	Mollusc	Algae[b]	Totals
Whole Body	0.11	0.002	0.023	0.001	0.14
GI Tract	0.22	0.033	0.17	0.007	0.43
Bone	0.006	-	0.004	0.0003	0.01

(a) Ingestion rates and computation methods described in text.
(b) Includes 1/20 processing dilation.

APPENDIX A

SUMMARY OF RADIOACTIVE EFFLUENTS

JANUARY - JUNE 1975

TABLE A-1

SEMI-ANNUAL SUMMARY OF RADIOACTIVE LIQUID EFFLUENTS
JANUARY - JUNE 1975

		Jan	Feb	Mar	Apr	May	June	Total
1. Gross Radioactivity								
(a) Total Released	(Ci)	4.89 E-1	4.34 E-2	4.33 E-2	5.32 E-3	3.70 E-2	4.32 E-2	6.41 E-1
(b) Avg. Conc. Released	(uCi/ml)	1.78 E-7	5.17 E-8	3.26 E-8	1.41 E-8	2.61 E-8	1.35 E-8	7.41 E-8
(c) Max. Conc. Released	(uCi/ml)	5.88 E-7	9.76 E-8	6.14 E-8	5.84 E-8	6.70 E-8	8.27 E-8	5.88 E-7
2. Tritium								
(a) Total Released	(Ci)	5.29 E-2	1.88 E-4	3.02 E-4	3.76 E-5	1.98 E-2	8.23 E-3	6.10 E-2
(b) Avg. Conc. Released	(uCi/ml)	1.93 E-8	2.24 E-10	2.27 E-10	9.94 E-11	1.36 E-8	3.72 E-9	9.06 E-9
3. Dissolved Noble Gases								
(a) Total Released	(Ci)	(a)	(a)	(a)	(a)	(a)	(a)	
(b) Avg. Conc. Released	(uCi/ml)							
4. Gross Alpha Radioactivity								
(a) Total Released	(Ci)	1.15 E-7	1.25 E-5	9.25 E-5	<1.09 E-7	<6.96 E-7	<2.18 E-6	<1.08 E-4
(b) Avg. Conc. Released	(uCi/ml)	4.18 E-14	1.49 E-11	6.95 E-11	<2.88 E-13	<4.90 E-13	<9.86 E-13	<1.21 E-10
5. Volume of Liquid Waste to Discharge Canal	(Liters)	1.91 E+4	8.95 E+3	1.36 E+4	5.45 E+3	1.74 E+4	1.09 E+4	7.54 E+4
6. Volume of Dilution Water	(Liters)	2.74 E+9	8.39 E+8	1.33 E+9	3.78 E+8	1.42 E+9	2.21 E+9	8.95 E+9
7. Isotopes Released	(Ci)							
Chromium-51		6.37 E-3	4.38 E-4	4.72 E-3	1.35 E-4	9.05 E-4		1.26 E-2
Manganese-54		5.93 E-3	1.07 E-3	1.38 E-3	1.54 E-4	1.77 E-3	3.73 E-4	9.78 E-3
Cobalt-58		1.69 E-3	4.39 E-4	6.39 E-4	5.19 E-5	3.11 E-4	1.38 E-4	3.27 E-3
Iron-59		1.39 E-3	3.51 E-4	2.89 E-4	3.97 E-5	3.76 E-4	2.59 E-5	2.47 E-3
Cobalt-60		7.90 E-3	1.81 E-3	2.44 E-3	3.85 E-4	2.54 E-3	1.00 E-3	1.61 E-2
Zinc-65		3.63 E-4	1.27 E-4	3.40 E-4	3.48 E-5	2.88 E-4	1.56 E-4	1.31 E-3
Zirconium-Niobium-95		2.12 E-4	1.31 E-4	1.02 E-4	3.44 E-5	1.12 E-4	1.94 E-5	6.11 E-4
Molybdenum-99/Technecium-99m		1.10 E-3	-	1.25 E-3	3.22 E-5	1.92 E-6	-	2.38 E-3
Silver-110m		1.49 E-5	-	-	-	-	-	1.49 E-5
Iodine-131		1.95 E-1	1.06 E-2	7.62 E-3	8.88 E-4	1.17 E-3	4.49 E-4	2.16 E-1
Iodine-133		3.79 E-4	-	1.14 E-4	6.54 E-6	8.25 E-6	-	5.08 E-4
Cesium-134		6.60 E-2	7.50 E-3	5.92 E-3	8.27 E-4	5.81 E-3	7.16 E-3	9.32 E-2
Cesium-137		1.60 E-1	1.86 E-2	1.45 E-2	2.11 E-3	1.47 E-2	2.84 E-2	2.38 E-1
Barium-Lanthanum-140		2.85 E-3	8.79 E-5	1.45 E-3	5.31 E-5	2.21 E-4	7.26 E-6	4.67 E-3
Cerium-141		9.79 E-5	5.46 E-5	8.02 E-5	3.85 E-5	1.35 E-4	4.39 E-7	4.07 E-4
Cerium-144		-	-	-	-	1.19 E-5	-	1.19 E-5
Neptunium-239		6.05 E-5	-	5.84 E-4	-	2.43 E-5	-	6.69 E-4
Strontium-89		1.60 E-3	1.79 E-4	6.80 E-4	4.85 E-5	8.35 E-4	1.96 E-4	3.54 E-3
Strontium-90		3.25 E-4	4.56 E-5	9.25 E-5	1.04 E-5	2.09 E-4	6.98 E-5	7.52 E-4
Unidentified		3.83 E-2	1.97 E-3	1.10 E-3	4.69 E-4	7.53 E-3	5.10 E-3	5.45 E-2
8. Percent of Tech. Spec. Limit For Total Activity Released	(b)	-	-	5.76	-	-	0.86	3.31

(a) No detectable activity.

(b) Based on 10 Ci/quarter limits.

TABLE A-2

SEMI-ANNUAL SUMMARY OF RADIOACTIVE GASEOUS EFFLUENTS
JANUARY - JUNE 1975

	Jan	Feb	Mar	Apr	May	June	Total
1. Total Noble Gases (Ci)							
(a) Main Stack	9.87 E+3	5.37 E+3	9.13 E+2	2.30 E+3	3.38 E+3	4.03 E+3	2.59 E+4
(b) Reactor Building Vent	2.06 E+3	1.15 E+3	3.27 E+3	3.97 E+3	4.37 E+3	5.30 E+3	2.01 E+4
2. Total Halogens (a)							
(a) Main Stack	3.35 E-1	3.12 E-2	1.88 E-2	7.95 E-2	4.31 E-2	3.27 E-2	5.40 E-1
(b) Reactor Building Vent	1.09 E-1	5.54 E-2	6.62 E-2	1.26 E-1	1.63 E-1	1.13 E-1	6.33 E-1
3. Total Particulates (a) (Ci)							
(a) Main Stack	4.01 E-4	4.61 E-4	5.94 E-4	1.04 E-3	1.82 E-3	4.24 E-3	8.56 E-3
(b) Reactor Building Vent	1.10 E-3	1.72 E-3	2.62 E-3	3.37 E-3	3.81 E-3	5.21 E-3	1.78 E-2
4. Total Particulate Gross Alpha Radioactivity (Ci)							
(a) Main Stack	(b)	(b)	2.16 E-8	(b)	1.51 E-7	(b)	
(b) Reactor Building Vent	(b)	(b)	<6.59 E-8	(b)	<1.75 E-8	(b)	
5. Total Tritium (Ci)							
(a) Main Stack	5.60 E-1	5.70 E-1	8.30 E-1	5.10 E-1	1.21 E+0	1.34 E+0	5.02 E+0
(b) Reactor Building Vent	3.40 E+0	3.81 E+0	5.91 E+0	5.75 E+0	4.11 E+0	8.53 E+0	3.15 E+1
6. Maximum 24-hr Noble Gas Release (Date)	1-26	2-17	3-26	4-10	5-3	6-30	
	2.35 E+3	1.15 E+3	5.03 E+2	1.08 E+3	4.57 E+2	5.26 E+2	
7. Percent of Applicable Limit for Noble Gases	2.24	1.37	1.23	1.89	2.12	2.64	1.95
8. Percent of Applicable Limit for Halogens and Particulates	77.46	39.76	42.69	84.23	(c)	12.82	
9. Isotopes Released (Ci)							
A. Halogens							
Iodine-131	4.44 E-1	8.66 E-2	8.50 E-2	2.06 E-1	2.06 E-1	1.46 E-1	1.17 E+0
Iodine-133	(b)	7.75 E-2	(b)	1.96 E-1	(b)	(b)	
Iodine-135	(b)	1.35 E-1	(b)	2.39 E-1	(b)	(b)	
B. Particulates							
Chromium-51	2.88 E-5	-	-	-	-	-	2.88 E-5
Manganese-54	3.66 E-5	2.19 E-5	1.39 E-5	1.40 E-5	7.51 E-6	5.48 E-6	9.93 E-5
Cobalt-58	6.18 E-5	7.56 E-6	5.06 E-7	1.37 E-6	-	6.15 E-6	7.74 E-5
Iron-59	1.17 E-5	-	-	-	-	-	1.17 E-5
Cobalt-60	6.45 E-5	4.80 E-5	2.89 E-5	3.51 E-5	2.95 E-5	8.57 E-6	1.74 E-4
Zirc/Niob-95	2.24 E-6	1.61 E-7	-	5.84 E-7	-	6.22 E-6	9.21 E-6
Silver-110m	-	-	-	-	-	1.13 E-4	1.13 E-4
Cesium-134	5.79 E-5	2.96 E-5	5.17 E-6	2.47 E-5	3.59 E-5	2.87 E-5	1.94 E-4
Cesium-136	-	2.63 E-6	-	-	-	-	2.63 E-6
Cesium-137	1.54 E-4	1.61 E-4	4.71 E-5	8.99 E-5	1.19 E-4	1.03 E-4	6.73 E-4
Barium-Lanth.-140	1.06 E-3	1.87 E-3	2.99 E-3	4.08 E-3	5.23 E-3	8.96 E-3	2.42 E-2
Cerium-141	2.27 E-5	3.59 E-5	1.31 E-4	1.56 E-4	2.09 E-4	2.19 E-4	7.74 E-4
Cerium-144	-	-	-	-	2.40 E-5	-	2.40 E-5
Strontium-89	(b)	(b)	1.58 E-3	(b)	2.04 E-3	-	-
Strontium-90	(b)	(b)	7.37 E-6	(b)	1.17 E-5	-	-
C. Gases (d)							

(a) With half-lives greater than 8 days.
(b) Quarterly analysis - Tech. Specs.
(c) Tech. Spec. change to quarterly limit.
(d) Unable to predict due to Augmented Off-Gas System.