

Dominion Nuclear Connecticut, Inc.  
Millstone Power Station  
Rope Ferry Road  
Waterford, CT 06385



**Dominion**<sup>SM</sup>

APR 30 2003

Docket Nos. 50-245

50-336

50-423

B18888

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Millstone Power Station, Unit Nos. 1, 2 and 3  
2002 Annual Radiological Environmental Operating Report


This letter transmits the Annual Radiological Environmental Operating Report for the Millstone Power Station, for the period January 1, 2002, through December 31, 2002. This report satisfies the requirements of Section 5.7.2 of the Millstone Unit No. 1 Permanently Defueled Technical Specifications, and of Sections 6.9.1.6a and 6.9.1.3 of the Unit No. 2 and Unit No. 3 Technical Specifications, respectively.

There are no regulatory commitments contained within this submittal.

If you should have any questions concerning this submittal, please contact Mr. David W. Dodson at (860) 447-1791, extension 2346.

Very truly yours,

DOMINION NUCLEAR CONNECTICUT, INC.

  
\_\_\_\_\_  
J. Alan Price  
Site Vice President - Millstone

Enclosure (1)

cc: H. J. Miller, Region I Administrator  
D. G. Holland, NRC Project Manager, Millstone Unit No. 1  
J. R. Wray, NRC Inspector, Region I, Millstone Unit No. 1  
R. B. Ennis, NRC Senior Project Manager, Millstone Unit No. 2  
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3  
Millstone Senior Resident Inspector

IE25

Docket Nos. 50-245  
50-336  
50-423  
B18888

Enclosure 1

Millstone Power Station, Unit Nos. 1, 2 and 3

Annual Radiological Environmental Operating Report  
Radiological Environmental Monitoring Program  
January 1, 2002 - December 31, 2002

# Millstone Power Station

## *Annual Radiological Environmental Operating Report*

January 1, 2002 – December 31, 2002



By  
Dominion Nuclear Connecticut, Inc.  
Waterford, Connecticut



**Dominion**

**ANNUAL  
RADIOLOGICAL ENVIRONMENTAL  
OPERATING REPORT**

**MILLSTONE POWER STATION**

**RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**

**2002**

**MILLSTONE UNIT 1, DOCKET NO. 50-245  
MILLSTONE UNIT 2, DOCKET NO. 50-336  
MILLSTONE UNIT 3, DOCKET NO. 50-423**

**By the**

**Dominion Nuclear Connecticut, Inc.  
Waterford, Connecticut**



*~ TABLE OF CONTENTS ~*

<b>1. EXECUTIVE SUMMARY</b>	<b>1-1</b>
<b>2. PROGRAM DESCRIPTION</b>	<b>2-1</b>
2.1. Sampling Schedule and Locations	2-1
2.2. Samples Collected During Report Period	2-7
<b>3. RADIOCHEMICAL RESULTS</b>	<b>3-1</b>
3.1. Summary Table	3-1
3.2. Data Tables	3-19
<b>4. DISCUSSION OF RESULTS</b>	<b>4-1</b>
4.1. Gamma Exposure Rate (Table 1)	4-1
4.2. Air Particulate Gross Beta Radioactivity (Table 2)	4-3
4.3. Airborne Iodine (Table 3)	4-3
4.4. Air Particulate Gamma (Table 4A-D)	4-5
4.5. Air Particulate Strontium (Table 5)	4-5
4.6. Soil (Table 6)	4-5
4.7. Cow Milk (Table 7)	4-6
4.8. Goat Milk (Table 8)	4-6
4.9. Pasture Grass and Feed (Table 9)	4-7
4.10. Well Water (Table 10)	4-7
4.11. Reservoir Water (Table 11)	4-7
4.12. Fruits and Vegetables (Table 12)	4-3
4.13. Broad Leaf Vegetation (Table 13)	4-3
4.14. Seawater (Table 14)	4-3
4.15. Bottom Sediment (Table 15)	4-3
4.16. Aquatic Flora (Table 16)	4-4
4.17. Fish (Tables 17A and 17B)	4-4
4.18. Mussels (Table 18)	4-4
4.19. Oysters (Table 19)	4-5
4.20. Clams (Table 20)	4-6
4.21. Scallops (Table 21)	4-6
4.22. Lobsters (Table 22)	4-6
<b>5. OFFSITE DOSE EQUIVALENT COMMITMENTS</b>	<b>5-1</b>
<b>6. DISCUSSION</b>	<b>6-1</b>
<b>APPENDIX A - LAND USE CENSUS FOR 2002</b>	<b>A-1</b>
<b>APPENDIX B - DNC QA PROGRAM</b>	<b>B-1</b>
<b>APPENDIX C - SUMMARY OF INTERLABORATORY COMPARISONS</b>	<b>C-1</b>

## ***Executive Summary***



## **1. EXECUTIVE SUMMARY**

The radiological environmental monitoring program for the Millstone Power Station was continued for the period January through December 2002, in compliance with the Technical Specifications and the Radiological Effluent Monitoring and Offsite Dose Calculation Manual. The Nuclear Fuel Engineering group of Dominion Nuclear Connecticut, Inc. (DNC) prepared this annual report. Millstone staff performed sample collection and preparation. Framatome ANP DE&S Environmental Laboratory performed gamma exposure rate measurements and laboratory analyses.

Thermoluminescent dosimeters (TLDs) were used to measure direct gamma exposure in the vicinity of the station and as far away as 14 miles. Radiochemical and radiological counting analyses of samples were performed to detect the presence of any station related radioactivity. Samples included air particulate and iodine filters, soil, goat milk, pasture grass, broad leaf vegetation, fruits, vegetables, sea water, bottom sediment, aquatic flora, fish, mussels, oysters, clams, and lobsters. In evaluating the results of these analyses it is necessary to consider the variability of natural and man-made sources of radioactivity, distribution in the environment and uptake in environmental media. This variability is dependent on many factors including station release rates, past spatial variability of radioactive fallout from nuclear weapons tests and on-going redistribution of the fallout, contribution from cosmically produced radioactivity, soil characteristics, farming practices, and feed type. Significant variations in measured levels of radioactivity could be caused by any one of these factors. Therefore, these factors need to be considered in order to properly explain any variations in radiation detected and to distinguish between natural and nuclear station related radioactivity.

Millstone Unit 1 is permanently shutdown. The annual capacity factor for Millstone Unit 2 was 81.25% based on Design Electrical Rating (DER). Unit 2 was shutdown in the first quarter for 2R14 refueling and maintenance. In August, Unit 2 was temporarily shutdown due to a leak in the charging system. The annual capacity factor for Unit 3 was 86.35% based on Design Electrical Rating (DER). Unit 3 was shutdown in the third quarter for refueling (3R08) and restarted in October 2002. In December, Unit 3 was temporarily shutdown due to a ground fault in the Turbine Main Generator. The radioactive releases of gaseous effluents in 2002 were comparable to years when one or more units operated for the majority of the year. Radioactive releases in liquid effluents continue to be low.

No station effects were detected in terrestrial media. The predominant radioactivity, except for a few aquatic sample results, was that from outside sources, such as fallout from nuclear weapons tests and naturally occurring radionuclides. Monitoring of the aquatic environment in the area of the discharge indicated the presence of the following station related radionuclides: Cobalt-60, Cesium-137, Silver-110m and Tritium. Due to the decreasing trend in liquid effluent releases, a corresponding decrease is observed in measured levels of radionuclides in the environment. Doses from the 2002 measured levels are well below those required by each Unit's Safety Technical Specifications (10CFR50 Appendix I, Design Guidelines).

Cesium-137 and Strontium-90 were measured in goat milk as a result of nuclear weapons testing in the 1960's and not the result of station operation. This can be concluded because insufficient quantities of these isotopes have been released by the station to account for the measured concentrations and the presence of these isotopes have been consistently declining since the early 1960's after signing of the Nuclear Test Ban Treaty.

The radiation dose (dose equivalent commitment) to the general public from the station's discharges has been evaluated by two methods. One method utilizes the measured station's discharges and conservative transport models and the other utilizes the measured concentrations of radioactivity in the environmental media. The maximum whole body dose (station boundary) that could occur to a member of the general public as a result of station operation was 0.08 millirem. This dose is 0.3 percent of the standard (i.e., 25 millirem to the whole body at the station site boundary) as set by the Environmental Protection Agency on the maximum allowable dose to an individual of the general public. Historically, the average whole body dose for a member of the public residing within 50 miles of the station is generally three orders of magnitude less than the maximum individual whole body dose. The standards of the Environmental Protection Agency are a small fraction (less than 10 percent) of the 284 mrem per year normal Connecticut resident background radiation (NCRP94) and are designed to be inconsequential in regard to public health and safety. Station related doses are even a smaller fraction of the natural background. Therefore, the station related doses have insignificant public health consequences.

## **2. PROGRAM DESCRIPTION**

### **2.1. *Sampling Schedule and Locations***

The sample locations and the sample types and frequency of analysis are given in Tables 2-1 and 2-2 and Figures 2.1-1 and 2.1-2. The program as described here includes both required samples as specified in the Radiological Effluent Monitoring and Offsite Dose Calculation Manual and any extra samples.

**Table 2-1 Environmental Monitoring Program Sampling Types and Locations**

Location Number*	Location Name	Direction & Distance From Release Point**	Sample Types
1-I	On-site - Old Millstone Rd.	0.6 Mi, NNW	TLD, Air Particulate, Iodine, Vegetation
2-I	On-site - Weather Shack	0.3 Mi, S	TLD, Air Particulate, Iodine
3-I	On-site - Bird Sanctuary	0.3 Mi, NE	TLD, Air Particulate, Iodine, Soil
4-I	On-site - Albacore Drive	1.0 Mi, N	TLD, Air Particulate, Iodine, Soil
5-I	MP3 Discharge	0.1 Mi, SSE	TLD
6-I	Quarry Discharge	0.3 Mi, SSE	TLD
7-I	Environmental Lab Dock	0.3 Mi, SE	TLD
8-I	Environmental Lab	0.3 Mi, SE	TLD
9-I	Bay Point Beach	0.4 Mi, W	TLD
10-I	Pleasure Beach	1.2 Mi, E	TLD, Air Particulate, Iodine, Vegetation
11-I	New London Country Club	1.6 Mi, ENE	TLD, Air Particulate, Iodine
12-C	Fisher's Island, NY	8.7 Mi, ESE	TLD
12-X	Fisher's Island, NY	8.7 Mi, ESE	Air Particulate
13-C	Mystic, CT	11.5 Mi, ENE	TLD
14-C	Ledyard, CT	12.0 Mi, NE	TLD, Soil
15-C	Norwich, CT	14.0 Mi, N	TLD, Air Particulate, Iodine
16-C	Old Lyme, CT	8.8 Mi, W	TLD
17-I	Site Boundary	0.5 Mi, NE	Vegetation
21-I	Goat Location #1	2.0 Mi, N	Milk
22-I	Goat Location #2	5.2 Mi, NNE	Milk
24-C	Goat Location #4	29.0 Mi, NNW	Milk
25-I	Within 10 Miles	Within 10 Miles	Fruits & Vegetables
26-C	Beyond 10 Miles	Beyond 10 Miles	Fruits & Vegetables
27-I	Niantic	1.7 Mi, WNW	TLD, Air Particulate, Iodine
28-I	Two Tree Island	0.8 Mi, SSE	Mussels
29-I	West Jordan Cove	0.4 Mi, NNE	Clams
30-I	Niantic Shoals	1.5 Mi, NNW	Mussels
31-I	Niantic Shoals	1.8 Mi, NW	Bottom Sediment, Oysters
31-X	Niantic Shoals	1.8 Mi, NW	Scallops
32-I	Vicinity of Discharge	-----	Bottom Sediment, Oysters, Lobster, Fish, Seawater
32-X	Vicinity of Discharge	-----	Fucus
33-I	Seaside Point	1.8 Mi, ESE	Bottom Sediment
33-X	Seaside Point	1.8 Mi, ESE	Fucus
34-I	Thames River Yacht Club	4.0 Mi, ENE	Bottom Sediment
34-X	Thames River Yacht club	4.0 Mi, ENE	Oysters

\*Key: I - Indicator C - Control X - Extra - sample not required by REMODCM

\*\*The release points are the MP1 stack for terrestrial locations and the quarry cut for aquatic locations.

Location Number*	Location Name	Direction & Distance From Release Point**	Sample Types
35-I	Niantic Bay	0.3 Mi, WNW	Lobster, Fish
35-X	Niantic Bay	0.3 Mi, WNW	Bottom Sediment, Seawater, Clams, Fucus
36-I	Black Point	3.0 Mi, WSW	Oysters
36-X	Black Point	3.0 Mi, WSW	Bottom Sediment, Fucus
37-C	Giant's Neck	3.5 Mi, WSW	Bottom Sediment, Oysters, Seawater
37-X	Giant's Neck	3.5 Mi, WSW	Lobster
38-I	Waterford Shellfish Bed #1	1.0 Mi, NW	Clams
39-X	Jordon Cove Bar	0.8 Mi, NE	Bottom Sediment, Clams, Seawater, Fucus
40-X	Quarry	-----	Fish, Oysters
41-I	Myrock Avenue	3.2 Mi, ENE	TLD
42-I	Billow Road	2.4 Mi, WSW	TLD
43-I	Black Point	2.6 Mi, SW	TLD
44-I	Onsite - Schoolhouse	0.1 Mi, NNE	TLD
45-I	Onsite Access Road	0.5 Mi, NNW	TLD
46-I	Old Lyme - Hillcrest Ave.	4.6 Mi, WSW	TLD
47-I	East Lyme - W. Main St.	4.5 Mi, W	TLD
48-I	East Lyme - Corey Rd.	3.4 Mi, WNW	TLD
49-I	East Lyme - Society Rd.	3.6 Mi, NW	TLD
50-I	East Lyme - Manwaring Rd.	2.1 Mi, W	TLD
51-I	East Lyme - Smith Ave.	1.5 Mi, NW	TLD
52-I	Waterford - River Rd.	1.1 Mi, NNW	TLD
53-I	Waterford - Gardiners Wood Rd.	1.4 Mi, NNE	TLD
55-I	Waterford - Magonk Point	1.8 Mi, ESE	TLD
56-I	New London - Mott Ave.	3.7 Mi, E	TLD
57-I	New London - Ocean Ave.	3.6 Mi, ENE	TLD
59-I	Waterford - Miner Ave.	3.4 Mi, NNE	TLD
60-I	Waterford - Parkway South	4.0 Mi, N	TLD
61-I	Waterford - Boston Post Rd.	4.3 Mi, NNW	TLD
62-I	East Lyme - Columbus Ave.	1.9 Mi, WNW	TLD
63-I	Waterford - Jordon Cove Rd.	0.8 Mi, NE	TLD
64-I	Waterford - Shore Rd.	1.1 Mi, ENE	TLD
65-I	Waterford - Bank St.	3.2 Mi, NE	TLD
66-X	NAP Parking Lot - Fitness Center	0.4 Mi, NW	TLD
67-X	Golden Spur	4.7 Mi, NNW	Bottom Sediment

\*Key: I - Indicator C - Control X - Extra - sample not required

\*\*The release points are the MP1 stack for terrestrial locations and the quarry cut for aquatic locations.

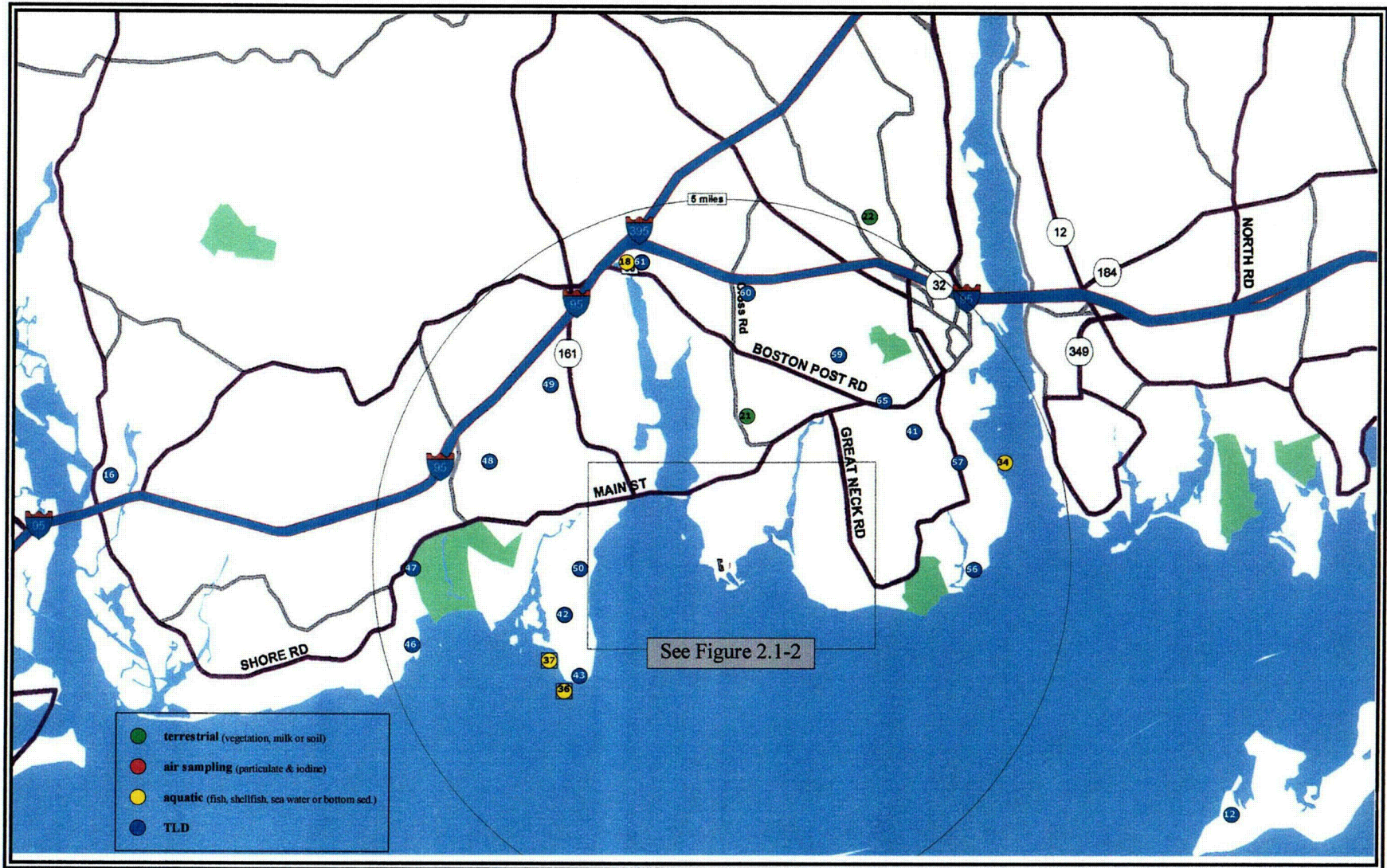
**Table 2-2 Sampling Frequency & Type of Analysis**

	Exposure Pathway and/or Sample	No. of Locations	Sampling & Collection Frequency	Type of Analysis
1.	Gamma Dose - Environmental TLD	40 <sup>a</sup>	Quarterly	Gamma Dose - Quarterly
2.	Airborne Particulate	8	Continuous sampler - weekly filter change	Gross Beta - Weekly Gamma Spectrum - Quarterly on composite (by location), and on individual sample if gross beta is greater than 10 times the mean of the weekly control station's gross beta results
3.	Airborne Iodine	8	Continuous sampler - weekly canister change	I-131 - Weekly
4.	Vegetation	5	One sample near middle and one near end of growing season	Gamma Isotopic on each sample
5.	Milk	3	Semimonthly when animals are on pasture; monthly at other times.	Gamma Isotopic and I-131 on each sample; Sr-89 and Sr-90 on quarterly composite
5a.	Pasture Grass	4	Sample as necessary to substitute for unavailable milk	Gamma Isotopic and I-131 on each sample
6.	Sea Water	2	Continuous sampler with a monthly collection at indicator location. Quarterly at control location - Composite of 6 weekly grab samples.	Gamma Isotopic and Tritium on each sample.
7.	Bottom Sediment	5	Semiannual	Gamma Isotopic on each sample
7a.	Soil	3	Quarterly	Gamma Isotopic on each sample
8.	Fin Fish-Flounder and one other type of edible fin fish	2	Quarterly	Gamma Isotopic on each sample
9.	Mussels (edible portion)	2	Quarterly	Gamma Isotopic on each sample
10.	Oysters (edible portion)	4	Quarterly	Gamma Isotopic on each sample
11.	Clams (edible portion)	2	Quarterly	Gamma Isotopic on each sample
12.	Lobster (edible portion)	2	Quarterly	Gamma Isotopic on each sample

(a) Two or more TLDs or TLD with two or more elements per location.

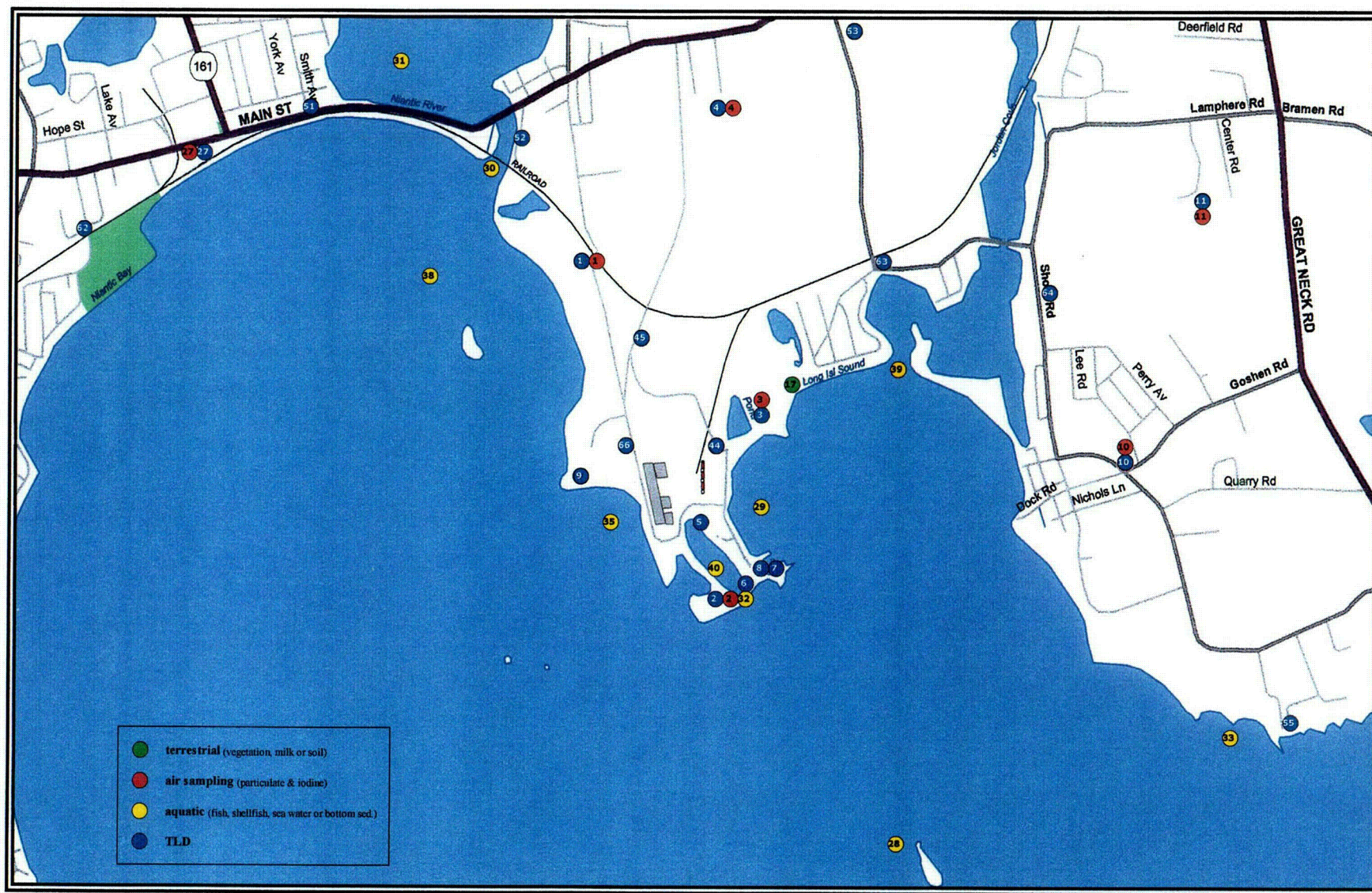


**Figure 2.1-1 Millstone Sampling Locations**





**Figure 2.1-2 Millstone Sampling Locations (Within 2 miles)**



## 2.2. *Samples Collected During Report Period*

The following table summarizes the number of samples of each type collected and analyzed during 2002:

<u>Sample Type</u>	<u>Number of Technical Specification Required Samples</u>	<u>Number of Technical Specification Required Samples Analyzed</u>	<u>Number of Extra Samples Analyzed</u>
Gamma Exposure (Environmental TLD)	160	160	4
Air Particulates	416	416	0
Air Iodine	416	416	0
Soil	12	12	0
Goat Milk	57	30 <sup>1,2</sup>	0
Pasture Grass	Variable <sup>2</sup>	27	0
Fruit and Vegetables	8	8	0
Broad Leaf Vegetation	6	6	12
Sea Water	16	16	8
Bottom Sediment	10	10	14
Aquatic Flora	0	0	16
Fish	16	16	4
Mussels	8	8	0
Oysters	16	16	8
Clams	8	8	8
Lobster	8	8	4
<b>Total All Types</b>	<b>1,157</b>	<b>1,157</b>	<b>78</b>

<sup>1</sup>Pasture grass sampled as necessary to substitute for unavailable milk.

<sup>2</sup>Due to sample unavailability, less than required milk samples were collected

### **3. RADIOCHEMICAL RESULTS**

#### **3.1. *Summary Table***

In accordance with the Radiological Effluent Monitoring Manual (REMM), Section I.F.1, a summary table of the radiochemical results has been prepared and is presented in Table 3-1.

In the determination of the mean, the data was handled as recommended by the Health and Safety Laboratory, Idaho and NUREG/CR-4007 (Sept. 1984): all valid data, including negative values and zeros were used in the determination of the mean (see Part 3.2).

A more detailed analysis of the data is given in Section 4.0 where a discussion of the variations in the data explains many aspects that are not evident in the Summary Table because of the basic limitation of data summaries. The data summaries include the extra 'X' samples collected throughout the year. These samples are taken in an effort to enhance program monitoring effectiveness or are the results of special studies.

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR LOCATIONS MEAN RANGE (B)	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	CONTROL LOCATIONS MEAN (RANGE) (B)	# OF NRM (C)
GAMMA DOSE (UR/HR)	164, 20 GAMMA DOSE	1.5 (E)	7.987 ( 4.79 - 12.09 )	LOC # 08 0.3 MILES SE	11.815 ( 11.60 - 12.09 )	7.914 ( 5.72 - 9.82 )	0
	BETA 363, 52 GROSS BETA	0.01 (F)	0.0193 ( 0.002 - 0.033 )	LOC # 11 1.6 MILES ENE	0.0204 ( 0.010 - 0.032 )	0.0202 ( 0.008 - 0.034 )	0
AIR PARTICULATE AND IODINE (PCI/M3)	IODINE 363, 52 I-131	0.07	-0.0001 ( -0.030 - 0.033 )	LOC # 15C 14.0 MILES N	0.0029 ( -0.017 - 0.032 )	0.0029 ( -0.017 - 0.032 )	0
	GAMMA 28, 4 BE-7	--	0.1014 ( 0.044 - 0.188 )	LOC # 04 1.0 MILES N	0.1135 ( 0.094 - 0.169 )	0.1035 ( 0.066 - 0.176 )	0
	CO-60	--	-0.000063 ( -0.00070 - 0.00070 )	LOC # 10 1.2 MILES E	0.000293 ( -0.00010 - 0.00062 )	0.000245 ( 0.00000 - 0.00041 )	0
	ZR-95	--	0.00012 ( -0.0023 - 0.0031 )	LOC # 15C 14.0 MILES N	0.00248 ( -0.0003 - 0.0057 )	0.00248 ( -0.0003 - 0.0057 )	0
	NB-95	--	-0.00100 ( -0.0090 - 0.0047 )	LOC # 11 1.6 MILES ENE	0.00150 ( 0.0002 - 0.0030 )	-0.00083 ( -0.0066 - 0.0034 )	0
	RU-103	--	0.00027 ( -0.0021 - 0.0036 )	LOC # 15C 14.0 MILES N	0.00078 ( 0.0000 - 0.0013 )	0.00078 ( 0.0000 - 0.0013 )	0
	CS-134	0.05 (F)	-0.000099 ( -0.00120 - 0.00060 )	LOC # 11 1.6 MILES ENE	0.000163 ( -0.00039 - 0.00060 )	0.000003 ( -0.00047 - 0.00071 )	0
	CS-137	0.06	-0.000009 ( -0.00060 - 0.00092 )	LOC # 11 1.6 MILES ENE	0.000125 ( -0.00034 - 0.00092 )	-0.000200 ( -0.00085 - 0.00052 )	0
SOIL (PCI/G DRY)	GAMMA 12, 0 K-40	--	10.978 ( 8.10 - 13.04 )	LOC # 14 12.0 MILES NE	12.080 ( 11.40 - 13.04 )	--	0
	MN-54	--	0.007 ( -0.02 - 0.04 )	LOC # 14 12.0 MILES NE	0.019 ( -0.01 - 0.04 )	--	0
	CO-58	--	-0.012 ( -0.05 - 0.01 )	LOC # 04 1.0 MILES N	-0.010 ( -0.04 - 0.01 )	--	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM (C)
			LOCATIONS MEAN RANGE (B)	LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	LOCATIONS MEAN (RANGE) (B)	
	CO-60	--	0.003 ( -0.02 - 0.05 )	LOC # 04 1.0 MILES N	0.005 ( -0.01 - 0.01 )	--	0
	ZR-95	--	-0.0053 ( -0.160 - 0.055 )	LOC # 03 0.3 MILES NE	0.0218 ( -0.010 - 0.055 )	--	0
	NB-95	--	-0.0005 ( -0.035 - 0.049 )	LOC # 14 12.0 MILES NE	0.0065 ( -0.014 - 0.026 )	--	0
	CS-134	0.15	0.0136 ( -0.034 - 0.079 )	LOC # 03 0.3 MILES NE	0.0280 ( -0.027 - 0.079 )	--	0
	CS-137	0.18	0.882 ( 3.02 - 1.80 )	LOC # 14 12.0 MILES NE	1.394 ( 0.96 - 1.80 )	--	0
	TH-228	--	0.957 ( 0.42 - 1.34 )	LOC # 14 12.0 MILES NE	1.255 ( 1.13 - 1.34 )	--	0
GOAT MILK (PCI/L)	SR 4, 3 SR-89	--	3.68 ( -5.0 - 8.6 )	LOC # 22 5.2 MILES NNE	7.50 ( 6.4 - 8.6 )	-7.13 ( -15.6 - 0.3 )	0
	SR-90	--	2.470 ( 0.99 - 5.80 )	LOC # 24C 29.0 MILES NNW	6.167 ( 1.77 - 14.30 )	6.167 ( 1.77 - 14.30 )	0
	IODINE 18, 12 I-131	1	0.199 ( -0.15 - 0.68 )	LOC # 24C 29.0 MILES NNW	0.214 ( -0.06 - 0.80 )	0.214 ( -0.06 - 0.80 )	0
	GAMMA 17, 11 CS-134	15	-0.37 ( -5.3 - 2.2 )	LOC # 22 5.2 MILES NNE	0.57 ( -0.9 - 2.2 )	0.35 ( 2.7 - 4.5 )	0
	CS-137	18	6.49 ( -0.6 - 17.3 )	LOC # 22 5.2 MILES NNE	9.05 ( -0.6 - 17.3 )	4.72 ( -1.9 - 13.5 )	0
	BA-140	70	0.38 ( -2.8 - 4.6 )	LOC # 22 5.2 MILES NNE	0.48 ( -2.7 - 4.6 )	-0.49 ( -4.1 - 2.4 )	0
	LA-140	25	0.43 ( -3.2 - 5.3 )	LOC # 22 5.2 MILES NNE	0.56 ( -3.1 - 5.3 )	-0.60 ( -4.9 - 2.7 )	0



TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM  (C)
			LOCATIONS	LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	LOCATIONS MEAN (RANGE) (B)	
			MEAN RANGE (B)				
<u>GAMMA 20, 7</u>							
PASTURE GRASS (PCI/G WET)	I-131	0.06	0.0079 ( -0.006 - 0.055 )	LOC # 22 5.2 MILES NNE	0.0100 ( -0.003 - 0.055 )	0.0088 ( -0.002 - 0.034 )	0
	CS-134	0.06	0.0137 ( -0.010 - 0.039 )	LOC # 21 2.0 MILES N	0.0138 ( -0.010 - 0.031 )	0.0064 ( -0.017 - 0.024 )	0
	CS-137	0.08	0.0094 ( -0.029 - 0.072 )	LOC # 24C 29.0 MILES NNW	0.0182 ( -0.001 - 0.036 )	0.0182 ( -0.001 - 0.036 )	0
	BA-140	--	-0.0135 ( -0.076 - 0.020 )	LOC # 21 2.0 MILES N	-0.0085 ( -0.057 - 0.020 )	-0.0099 ( -0.062 - 0.015 )	0
	LA-140	--	-0.0158 ( -0.090 - 0.020 )	LOC # 21 2.0 MILES N	-0.0101 ( -0.066 - 0.020 )	-0.0117 ( -0.072 - 0.017 )	0
<u>GAMMA 4, 4</u>							
FRUITS AND VEGETABLES (PCI/G WET)	BE-7	--	0.0555 ( -0.004 - 0.107 )	LOC # 25 WITHIN 10 MILES	0.0555 ( -0.004 - 0.107 )	0.0130 ( -0.008 - 0.033 )	0
	K-40	--	2.1958 ( 1.199 - 4.060 )	LOC # 25 WITHIN 10 MILES	2.1958 ( 1.199 - 4.060 )	1.6863 ( 1.027 - 2.399 )	0
	MN-54	--	-0.0015 ( -0.005 - 0.000 )	LOC # 26C BEYOND 10 MILES	0.0007 ( -0.001 - 0.003 )	0.0007 ( -0.001 - 0.003 )	0
	CO-58	--	-0.0005 ( -0.005 - 0.003 )	LOC # 26C BEYOND 10 MILES	-0.0004 ( -0.003 - 0.001 )	-0.0004 ( -0.003 - 0.001 )	0
	CO-60	--	0.0000 ( -0.001 - 0.002 )	LOC # 26C BEYOND 10 MILES	0.0008 ( -0.001 - 0.002 )	0.0008 ( -0.001 - 0.002 )	0
	ZR-95	--	0.0003 ( -0.003 - 0.003 )	LOC # 26C BEYOND 10 MILES	0.0014 ( -0.002 - 0.004 )	0.0014 ( -0.002 - 0.004 )	0
	NB-95	--	-0.0016 ( -0.004 - 0.001 )	LOC # 26C BEYOND 10 MILES	0.0011 ( -0.003 - 0.005 )	0.0011 ( -0.003 - 0.005 )	0
	RU-103	--	-0.0003 ( -0.004 - 0.003 )	LOC # 26C BEYOND 10 MILES	-0.0002 ( -0.004 - 0.003 )	-0.0002 ( -0.004 - 0.003 )	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR LOCATIONS MEAN RANGE (B)	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE) (B)	# OF NRM (C)
				LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)		
	I-131	0.06 (G)	0.0195 ( -0.002 - 0.038 )	LOC # 25 WITHIN 10 MILES	0.0195 ( -0.002 - 0.038 )	0.0075 ( -0.009 - 0.022 )	0
	SB-125	--	0.0018 ( -0.003 - 0.010 )	LOC # 25 WITHIN 10 MILES	0.0018 ( -0.003 - 0.010 )	-0.0021 ( -0.004 - 0.001 )	0
	CS-134	0.06	0.0015 ( 0.001 - 0.003 )	LOC # 25 WITHIN 10 MILES	0.0015 ( 0.001 - 0.003 )	-0.0004 ( -0.003 - 0.002 )	0
	CS-137	0.08	0.0003 ( -0.004 - 0.006 )	LOC # 25 WITHIN 10 MILES	0.0003 ( -0.004 - 0.006 )	-0.0010 ( -0.002 - 0.000 )	0
	TH-228	--	0.0095 ( -0.003 - 0.016 )	LOC # 25 WITHIN 10 MILES	0.0095 ( -0.003 - 0.016 )	0.0025 ( -0.008 - 0.011 )	0
BROADLEAF VEGETATION (PCI/G WET)	GAMMA 18, 0 BE-7	--	0.584 ( 0.24 - 1.72 )	LOC # 01 0.6 MILES NNW	0.725 ( 0.24 - 1.72 )	--	0
	K-40	--	3.658 ( 1.90 - 5.71 )	LOC # 10 1.2 MILES E	4.517 ( 2.91 - 5.71 )	--	0
	MN-54	--	0.0014 ( -0.012 - 0.021 )	LOC # 17 0.5 MILES NE	0.0020 ( -0.009 - 0.021 )	--	0
	CO-58	--	-0.0001 ( -0.012 - 0.015 )	LOC # 01 0.6 MILES NNW	0.0025 ( -0.008 - 0.008 )	--	0
	CO-60	--	0.0002 ( -0.013 - 0.022 )	LOC # 17 0.5 MILES NE	0.0027 ( -0.008 - 0.022 )	--	0
	ZR-95	--	-0.0013 ( -0.019 - 0.027 )	LOC # 01 0.6 MILES NNW	0.0025 ( -0.007 - 0.027 )	--	0
	NB-95	--	-0.0005 ( -0.019 - 0.013 )	LOC # 01 0.6 MILES NNW	0.0025 ( -0.006 - 0.013 )	--	0
	RU-103	--	0.0020 ( -0.014 - 0.017 )	LOC # 10 1.2 MILES E	0.0054 ( -0.001 - 0.013 )	--	0



TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR LOCATIONS MEAN RANGE (B)	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE) (B)	# OF NRM (C)
				LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)		
	I-131	0.06	0.0130 ( -0.005 - 0.035 )	LOC # 17 0.5 MILES NE	0.0202 ( 0.005 - 0.035 )	--	0
	SB-125	--	0.0117 ( -0.014 - 0.058 )	LOC # 01 0.6 MILES NNW	0.0170 ( -0.013 - 0.058 )	--	0
	CS-134	0.06	0.0056 ( -0.014 - 0.029 )	LOC # 01 0.6 MILES NNW	0.0123 ( -0.002 - 0.029 )	--	0
	CS-137	0.08	0.0058 ( -0.019 - 0.067 )	LOC # 17 0.5 MILES NE	0.0172 ( -0.003 - 0.067 )	--	0
	TH-228	--	0.0444 ( -0.031 - 0.150 )	LOC # 01 0.6 MILES NNW	0.0970 ( 0.040 - 0.150 )	--	0
SEAWATER (PCI/L)	TRITIUM 20, 4						
	H-3	2000	156.4 ( -540 - 1030 )	LOC # 32 VIC DISCHARGE	449.2 ( -200 - 960 )	-27.5 ( -490 - 290 )	0
	GAMMA 20, 4						
	K-40	--	305.0 ( 222 - 373 )	LOC # 39X JORDAN COVE BAR	321.5 ( 285 - 360 )	282.3 ( 269 - 308 )	0
	MN-54	15	0.19 ( -3.3 - 1.1 )	LOC # 39X JORDAN COVE BAR	0.58 ( 0.0 - 1.0 )	0.20 ( -1.0 - 1.9 )	0
	CO-58	15	0.16 ( -1.9 - 2.1 )	LOC # 32 VIC DISCHARGE	0.68 ( 0.0 - 2.1 )	-0.55 ( -1.1 - 0.0 )	0
	FE-59	30	-0.05 ( -5.0 - 3.1 )	LOC # 39X JORDAN COVE BAR	1.08 ( -1.1 - 1.9 )	-2.70 ( -7.2 - 0.1 )	0
	CO-60	15	0.36 ( -1.9 - 2.7 )	LOC # 39X JORDAN COVE BAR	0.78 ( 0.0 - 1.7 )	0.23 ( -0.2 - 0.7 )	0
	ZN-65	30	-0.92 ( -7.7 - 7.8 )	LOC # 39X JORDAN COVE BAR	-0.05 ( -2.4 - 3.5 )	-1.65 ( -3.7 - 3.7 )	0
	ZR-95	30	-0.60 ( -5.1 - 3.9 )	LOC # 32 VIC DISCHARGE	0.24 ( -1.9 - 3.9 )	-0.85 ( -2.4 - 1.4 )	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM (C)
			LOCATIONS MEAN RANGE (B)	LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	LOCATIONS MEAN (RANGE) (B)	
	NB-95	15	0.19 ( -2.1 - 3.1 )	LOC # 35X 0.3 MILES WNW	1.20 ( -0.2 - 3.1 )	0.10 ( -0.5 - 1.3 )	0
	I-131	15 (H)	-0.29 ( -5.7 - 4.0 )	LOC # 39X JORDAN COVE BAR	0.28 ( -3.6 - 1.8 )	-0.68 ( -4.7 - 3.3 )	0
	CS-134	15	0.19 ( -1.7 - 1.6 )	LOC # 35X 0.3 MILES WNW	0.55 ( -1.1 - 1.6 )	0.15 ( -0.7 - 1.4 )	0
	CS-137	18	-0.26 ( -2.8 - 1.7 )	LOC # 37C 3.5 MILES WSW	0.45 ( -0.1 - 0.8 )	0.45 ( -0.1 - 0.8 )	0
	BA-140	60 (H)	-0.78 ( -7.6 - 4.3 )	LOC # 35X 0.3 MILES WNW	0.70 ( 0.0 - 1.6 )	0.60 ( -1.7 - 2.4 )	0
	LA-140	15 (H)	-0.89 ( -8.7 - 4.9 )	LOC # 35X 0.3 MILES WNW	0.83 ( 0.0 - 1.9 )	0.70 ( -1.9 - 2.8 )	0
BOTTOM SEDIMENT (PCI/G DRY)	GAMMA 22, 2 K-40	--	15.53 ( 10.8 - 22.1 )	LOC # 33 1.8 MILES ESE	20.85 ( 20.4 - 21.3 )	14.65 ( 14.2 - 15.1 )	0
	MN-54	--	0.0073 ( -0.028 - 0.053 )	LOC # 31 1.8 MILES NW	0.0205 ( -0.001 - 0.042 )	-0.0025 ( -0.007 - 0.002 )	0
	CO-58	--	-0.0026 ( -0.046 - 0.020 )	LOC # 33 1.8 MILES ESE	0.0145 ( 0.014 - 0.015 )	-0.0075 ( -0.013 - -0.002 )	0
	CO-60	--	0.0042 ( -0.017 - 0.059 )	LOC # 32 VIC DISCHARGE	0.0188 ( -0.005 - 0.059 )	-0.0040 ( -0.011 - 0.003 )	0
	ZR-95	--	0.0167 ( -0.052 - 0.099 )	LOC # 36X 3.0 MILES WSW	0.0445 ( 0.024 - 0.065 )	0.0060 ( 0.003 - 0.009 )	0
	NB-95	--	-0.0057 ( -0.186 - 0.058 )	LOC # 67X 4.5 MILES NNW	0.0125 ( 0.007 - 0.018 )	-0.0095 ( -0.012 - -0.007 )	0
	I-131	--	0.0124 ( -0.290 - 0.410 )	LOC # 36X 3.0 MILES WSW	0.2070 ( 0.004 - 0.410 )	-0.0520 ( -0.100 - 0.004 )	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM (C)
			LOCATIONS MEAN RANGE (B)	LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	LOCATIONS MEAN (RANGE) (B)	
	SB-125	--	0.0098 ( -0.080 - 0.100 )	LOC # 33 1.8 MILES ESE	0.0450 ( -0.010 - 0.100 )	-0.0175 ( -0.039 - 0.004 )	0
	CS-134	0.15	0.0025 ( -0.031 - 0.053 )	LOC # 32 VIC DISCHARGE	0.0215 ( -0.003 - 0.053 )	0.0030 ( 0.001 - 0.007 )	0
	CS-137	0.18	0.0256 ( -0.042 - 0.218 )	LOC # 67X 4.5 MILES NNW	0.1505 ( 0.083 - 0.218 )	-0.0115 ( -0.020 - -0.003 )	0
	TH-228	--	1.2020 ( -0.120 - 4.150 )	LOC # 31 1.8 MILES NW	3.8200 ( 3.490 - 4.150 )	0.4435 ( 0.407 - 0.480 )	0
AQUATIC FLORA (FUCUS) (PCI/G WET)	GAMMA 16, 0						
	BE-7	--	0.0344 ( -0.030 - 0.120 )	LOC # 35X 0.3 MILES WNW	0.0608 ( -0.013 - 0.101 )	--	0
	K-40	--	5.779 ( 4.61 - 7.87 )	LOC # 32X VIC DISCHARGE	6.768 ( 5.46 - 7.87 )	--	0
	CR-51	--	-0.0079 ( -0.071 - 0.069 )	LOC # 39X JORDAN COVE BAR	0.0288 ( -0.020 - -0.069 )	--	0
	MN-54	--	-0.0011 ( -0.009 - 0.007 )	LOC # 32X VIC DISCHARGE	0.0027 ( 0.000 - 0.007 )	--	0
	CO-58	--	0.00072 ( -0.0075 - 0.0111 )	LOC # 32X VIC DISCHARGE	0.00728 ( -0.0010 - 0.0111 )	--	0
	FE-59	--	0.0037 ( -0.019 - 0.040 )	LOC # 32X VIC DISCHARGE	0.0158 ( -0.003 - 0.040 )	--	0
	CO-60	--	0.00203 ( -0.0050 - 0.0100 )	LOC # 33X 1.8 MILES ESE	0.00380 ( 0.0007 - 0.0069 )	--	0
	ZN-65	--	-0.0061 ( -0.046 - 0.030 )	LOC # 33X 1.8 MILES ESE	0.0040 ( -0.005 - 0.013 )	--	0
	ZR-95	--	0.0022 ( -0.015 - 0.016 )	LOC # 32X VIC DISCHARGE	0.0080 ( 0.000 - 0.016 )	--	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR LOCATIONS MEAN RANGE (B)	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE) (B)	# OF NRM (C)
				LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)		
	NB-95	--	-0.0004 ( -0.015 - 0.012 )	LOC # 32X VIC DISCHARGE	0.0028 ( -0.004 - 0.012 )	--	0
	RU-103	--	-0.0009 ( -0.015 - 0.021 )	LOC # 32X VIC DISCHARGE	0.0019 ( -0.015 - 0.021 )	--	0
	RU-106	--	-0.0107 ( -0.100 - 0.083 )	LOC # 39X JORDAN COVE BAR	0.0025 ( -0.050 - 0.069 )	--	0
	AG-110M	--	-0.00055 ( -0.0110 - 0.0070 )	LOC # 32X VIC DISCHARGE	0.00285 ( 0.0007 - 0.0050 )	--	0
	I-131	--	0.0358 ( -0.014 - 0.260 )	LOC # 36X 3.0 MILES WSW	0.1380 ( 0.016 - 0.260 )	--	0
	SB-125	--	0.0011 ( -0.015 - 0.019 )	LOC # 33X 1.8 MILES ESE	0.0065 ( 0.005 - 0.008 )	--	0
	CS-134	--	0.00286 ( -0.0050 - 0.0100 )	LOC # 32X VIC DISCHARGE	0.00680 ( 0.0012 - 0.0100 )	--	0
	CS-137	--	0.00074 ( -0.0070 - 0.0100 )	LOC # 35X 0.3 MILES WNW	0.00400 ( 0.0013 - 0.0100 )	--	0
	TH-228	--	0.0393 ( 0.018 - 0.090 )	LOC # 32X VIC DISCHARGE	0.0453 ( 0.016 - 0.066 )	--	0
	GAMMA 20, 0						
FISH (ALL TYPES) (PCI/G WET)	BE-7	--	-0.010 ( -0.19 - 0.16 )	LOC # 32 VIC DISCHARGE	0.010 ( -0.19 - 0.16 )	--	0
	K-40	--	3.625 ( 1.78 - 4.70 )	LOC # 40X ONSITE QUARRY	3.890 ( 3.27 - 4.53 )	--	0
	CR-51	--	0.006 ( -0.17 - 0.17 )	LOC # 35 0.3 MILES WNW	0.034 ( -0.07 - 0.17 )	--	0
	MN-54	0.13	0.0005 ( -0.017 - 0.022 )	LOC # 35 0.3 MILES WNW	0.0021 ( -0.006 - 0.022 )	--	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS	# OF NRM (C)
			MEAN RANGE (B)	LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	MEAN (RANGE) (B)	
	CO-58	0.13	-0.0018 ( -0.028 - 0.017 )	LOC # 35 0.3 MILES WNW	-0.0003 ( -0.010 - 0.013 )	--	0
	FE-59	0.26	-0.0052 ( -0.069 - 0.071 )	LOC # 32 VIC DISCHARGE	0.0109 ( -0.051 - 0.071 )	--	0
	CO-60	0.13	0.0003 ( -0.017 - 0.021 )	LOC # 35 0.3 MILES WNW	0.0059 ( -0.006 - 0.021 )	--	0
	ZN-65	0.26	-0.0143 ( -0.058 - 0.035 )	LOC # 40X ONSITE QUARRY	-0.0108 ( -0.031 - 0.011 )	--	0
	ZR-95	--	0.0067 ( -0.028 - 0.039 )	LOC # 32 VIC DISCHARGE	0.0130 ( -0.019 - 0.039 )	--	0
	NB-95	--	-0.0004 ( -0.027 - 0.015 )	LOC # 40X ONSITE QUARRY	0.0033 ( -0.010 - 0.015 )	--	0
	RU-103	--	-0.0057 ( -0.033 - 0.010 )	LOC # 40X ONSITE QUARRY	0.0000 ( -0.006 - 0.006 )	--	0
	RU-106	--	-0.013 ( -0.19 - 0.16 )	LOC # 35 0.3 MILES WNW	0.003 ( -0.19 - 0.16 )	--	0
	AG-110M	--	-0.0010 ( -0.022 - 0.019 )	LOC # 40X ONSITE QUARRY	0.0030 ( -0.014 - 0.019 )	--	0
	I-131	--	-0.0282 ( -0.500 - 0.200 )	LOC # 40X ONSITE QUARRY	-0.0048 ( -0.054 - 0.035 )	--	0
	SB-125	--	0.0078 ( -0.045 - 0.064 )	LOC # 40X ONSITE QUARRY	0.0290 ( 0.000 - 0.064 )	--	0
	CS-134	0.13	0.0013 ( -0.011 - 0.032 )	LOC # 40X ONSITE QUARRY	0.0088 ( -0.005 - 0.032 )	--	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR LOCATIONS MEAN RANGE (B)	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE) (B)	# OF NRM (C)
				LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)		
MUSSELS (PCI/G WET)	CS-137	0.15	-0.0010 ( -0.022 - 0.014 )	LOC # 35 0.3 MILES WNW	0.0006 ( -0.022 - 0.014 )	--	0
	TH-228	--	-0.0068 ( -0.064 - 0.053 )	LOC # 35 0.3 MILES WNW	0.0068 ( -0.034 - 0.053 )	--	0
	GAMMA 8, 0						
	BE-7	--	0.138 ( -0.14 - 0.14 )	LOC # 35 0.3 MILES WNW	0.053 ( -0.05 - 0.14 )	--	0
	K-40	--	1.630 ( 1.25 - 1.95 )	LOC # 35 0.3 MILES WNW	1.770 ( 1.56 - 1.95 )	--	0
	CR-51	--	-0.003 ( -0.12 - 0.09 )	LOC # 35 0.3 MILES WNW	0.000 ( -0.04 - 0.04 )	--	0
	MN-54	0.13	-0.0113 ( -0.025 - 0.005 )	LOC # 35 0.3 MILES WNW	-0.0110 ( -0.018 - -0.006 )	--	0
	CO-58	0.13	-0.0029 ( -0.024 - 0.009 )	LOC # 35 0.3 MILES WNW	0.0035 ( -0.002 - 0.009 )	--	0
	FE-59	0.26	-0.0158 ( -0.085 - 0.048 )	LOC # 35 0.3 MILES WNW	0.0008 ( -0.039 - 0.048 )	--	0
	CO-60	0.13	0.0010 ( -0.014 - 0.017 )	LOC # 35 0.3 MILES WNW	0.0033 ( -0.013 - 0.017 )	--	0
	ZN-65	0.26	-0.023 ( -0.07 - 0.05 )	LOC # 32 VIC DISCHARGE	-0.013 ( -0.05 - 0.05 )	--	0
	ZR-95	--	0.0079 ( -0.010 - 0.030 )	LOC # 32 VIC DISCHARGE	0.0130 ( -0.003 - 0.030 )	--	0
	NB-95	--	-0.0005 ( -0.045 - 0.034 )	LOC # 32 VIC DISCHARGE	0.0028 ( -0.045 - 0.034 )	--	0
	RU-103	--	-0.0010 ( -0.010 - 0.011 )	LOC # 35 0.3 MILES WNW	-0.0008 ( -0.010 - 0.011 )	--	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM
			LOCATIONS MEAN RANGE (B)	LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	LOCATIONS MEAN (RANGE) (B)	
	RU-106	--	-0.033 ( -0.15 - 0.14 )	LOC # 35 0.3 MILES WNW	0.013 ( -0.15 - 0.14 )	--	0
	AG-110M	--	0.0009 ( -0.012 - 0.014 )	LOC # 32 VIC DISCHARGE	0.0043 ( -0.004 - 0.014 )	--	0
	I-131	--	0.044 ( -0.14 - 0.22 )	LOC # 32 VIC DISCHARGE	0.063 ( -0.14 - 0.22 )	--	0
	SB-125	--	0.0063 ( -0.012 - 0.033 )	LOC # 35 0.3 MILES WNW	0.0108 ( -0.003 - 0.033 )	--	0
	CS-134	0.13	-0.0049 ( -0.031 - 0.002 )	LOC # 32 VIC DISCHARGE	0.0003 ( 0.000 - 0.001 )	--	0
	CS-137	0.15	-0.0071 ( -0.023 - 0.007 )	LOC # 32 VIC DISCHARGE	-0.0055 ( -0.009 - 0.004 )	--	0
	TH-228	--	0.0075 ( -0.043 - 0.083 )	LOC # 32 VIC DISCHARGE	0.0428 ( 0.011 - 0.083 )	--	0
OYSTERS (PCI/G WET)	GAMMA 20, 4 BE-7	--	0.016 ( -0.11 - 0.30 )	LOC # 31 1.8 MILES NW	0.073 ( -0.06 - 0.30 )	0.068 ( -0.04 - 0.14 )	0
	K-40	--	1.723 ( 1.13 - 2.28 )	LOC # 37C 3.5 MILES WSW	1.895 ( 1.46 - 2.48 )	1.895 ( 1.46 - 2.48 )	0
	CR-51	--	0.039 ( -0.13 - 0.26 )	LOC # 32 VIC DISCHARGE	0.148 ( 0.00 - 0.26 )	0.100 ( -0.03 - 0.26 )	0
	MN-54	0.13	0.0000 ( -0.023 - 0.011 )	LOC # 32 VIC DISCHARGE	0.0063 ( 0.000 - 0.011 )	0.0055 ( -0.016 - 0.026 )	0
	CO-58	0.13	0.0005 ( -0.024 - 0.023 )	LOC # 32 VIC DISCHARGE	0.0075 ( -0.003 - 0.023 )	0.0028 ( -0.005 - 0.010 )	0
	FE-59	0.26	0.0095 ( -0.035 - 0.100 )	LOC # 34X 4.0 MILES ENE	0.0300 ( 0.001 - 0.100 )	0.0050 ( -0.021 - 0.031 )	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM (C)
			LOCATIONS MEAN RANGE (B)	LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	LOCATIONS MEAN (RANGE) (B)	
	CO-60	0.13	0.0008 ( -0.028 - 0.017 )	LOC # 32 VIC DISCHARGE	0.0125 ( 0.007 - 0.017 )	0.0118 ( 0.000 - 0.024 )	0
	ZN-65	0.26	-0.0140 ( -0.074 - 0.081 )	LOC # 37C 3.5 MILES WSW	0.0428 ( -0.037 - 0.210 )	0.0428 ( -0.037 - 0.210 )	0
	ZR-95	--	-0.0024 ( -0.031 - 0.027 )	LOC # 36 3.0 MILES WSW	0.0103 ( -0.015 - 0.027 )	-0.0035 ( -0.055 - 0.026 )	0
	NB-95	--	0.0024 ( -0.028 - 0.022 )	LOC # 40X ONSITE QUARRY	0.0118 ( 0.000 - 0.018 )	0.0050 ( -0.009 - 0.017 )	0
	RU-103	--	0.0005 ( -0.022 - 0.020 )	LOC # 40X ONSITE QUARRY	0.0078 ( -0.002 - 0.015 )	-0.0010 ( -0.008 - 0.005 )	0
	RU-106	--	0.003 ( -0.20 - 0.20 )	LOC # 34X 4.0 MILES ENE	0.080 ( -0.07 - 0.20 )	0.010 ( -0.07 - 0.20 )	0
	AG-110M	--	0.0200 ( -0.021 - 0.076 )	LOC # 40X ONSITE QUARRY	0.0535 ( 0.027 - 0.076 )	-0.0045 ( -0.017 - 0.008 )	0
	I-131	--	-0.0372 ( -0.280 - 0.090 )	LOC # 32 VIC DISCHARGE	0.0188 ( -0.070 - 0.090 )	-0.0558 ( -0.100 - -0.005 )	0
	SB-125	--	0.0071 ( -0.056 - 0.086 )	LOC # 36 3.0 MILES WSW	0.0198 ( -0.007 - 0.065 )	-0.0023 ( -0.025 - 0.037 )	0
	CS-134	0.13	0.0019 ( -0.012 - 0.028 )	LOC # 40X ONSITE QUARRY	0.0158 ( 0.006 - 0.028 )	-0.0028 ( -0.009 - 0.008 )	0
	CS-137	0.15	-0.0091 ( -0.040 - 0.016 )	LOC # 34X 4.0 MILES ENE	0.0065 ( -0.003 - 0.016 )	-0.0018 ( -0.022 - 0.018 )	0
	TH-228	--	0.0147 ( -0.063 - 0.080 )	LOC # 36 3.0 MILES WSW	0.0463 ( 0.017 - 0.080 )	-0.0003 ( -0.070 - 0.046 )	0
	GAMMA 16, 0						
CLAMS (PCI/G WET)	BE-7	--	0.009 ( -0.10 - 0.21 )	LOC # 29 0.4 MILES NNE	0.075 ( -0.05 - 0.21 )	--	0



TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR LOCATIONS MEAN RANGE (B)	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	CONTROL LOCATIONS MEAN (RANGE) (B)	# OF NRM (C)
K-40	--	--	2.009 ( 1.40 - 2.64 )	LOC # 29 0.4 MILES NNE	2.255 ( 2.03 - 2.62 )	--	0
CR-51	--	--	-0.009 ( -0.24 - 0.26 )	LOC # 29 0.4 MILES NNE	0.083 ( -0.12 - 0.26 )	--	0
MN-54	0.13	0.13	0.0026 ( -0.030 - 0.016 )	LOC # 38 1.0 MILES NW	0.0075 ( 0.003 - 0.016 )	--	0
CO-58	0.13	0.13	0.0006 ( -0.015 - 0.020 )	LOC # 39X JORDAN COVE BAR	0.0075 ( -0.003 - 0.020 )	--	0
FE-59	0.26	0.26	-0.0028 ( -0.061 - 0.059 )	LOC # 39X JORDAN COVE BAR	0.0115 ( -0.033 - 0.059 )	--	0
CO-60	0.13	0.13	0.0006 ( -0.024 - 0.021 )	LOC # 35X 0.3 MILES WNW	0.0043 ( 0.000 - 0.008 )	--	0
ZN-65	0.26	0.26	-0.0089 ( -0.075 - 0.074 )	LOC # 38 1.0 MILES NW	0.0165 ( -0.015 - 0.074 )	--	0
ZR-95	--	--	-0.0001 ( -0.030 - 0.034 )	LOC # 39X JORDAN COVE BAR	0.0103 ( -0.010 - 0.026 )	--	0
NB-95	--	--	-0.0036 ( -0.034 - 0.024 )	LOC # 39X JORDAN COVE BAR	-0.0005 ( -0.016 - 0.008 )	--	0
RU-103	--	--	-0.0008 ( -0.026 - 0.026 )	LOC # 39X JORDAN COVE BAR	0.0020 ( -0.011 - 0.012 )	--	0
RU-106	--	--	-0.019 ( -0.19 - 0.14 )	LOC # 35X 0.3 MILES WNW	0.025 ( -0.06 - 0.14 )	--	0
AG-110M	--	--	0.0012 ( -0.017 - 0.019 )	LOC # 38 1.0 MILES NW	0.0078 ( 0.001 - 0.013 )	--	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM (C)
			LOCATIONS MEAN RANGE (B)	LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	LOCATIONS MEAN (RANGE) (B)	
LOBSTERS (PCI/G WET)	I-131	--	0.0344 ( -0.040 - 0.300 )	LOC # 29 0.4 MILES NNE	0.0778 ( -0.008 - 0.300 )	--	0
	SB-125	--	0.0039 ( -0.026 - 0.037 )	LOC # 29 0.4 MILES NNE	0.0125 ( -0.002 - 0.024 )	--	0
	CS-134	0.13	-0.0003 ( -0.021 - 0.016 )	LOC # 29 0.4 MILES NNE	0.0030 ( -0.002 - 0.016 )	--	0
	CS-137	0.15	-0.0011 ( -0.017 - 0.018 )	LOC # 29 0.4 MILES NNE	0.0010 ( -0.017 - 0.018 )	--	0
	TH-228	--	-0.0030 ( -0.080 - 0.051 )	LOC # 35X 0.3 MILES WNW	0.0215 ( -0.009 - 0.051 )	--	0
	GAMMA 12, 0						
	BE-7	--	-0.007 ( -0.11 - 0.10 )	LOC # 35 0.3 MILES WNW	0.048 ( 0.01 - 0.10 )	--	0
	K-40	--	2.305 ( 1.71 - 2.91 )	LOC # 37X 3.5 MILES WSW	2.415 ( 2.04 - 2.91 )	--	0
	CR-51	--	0.053 ( -0.21 - 0.39 )	LOC # 35 0.3 MILES WNW	0.180 ( 0.00 - 0.39 )	--	0
	MN-54	0.13	-0.0013 ( -0.018 - 0.019 )	LOC # 37X 3.5 MILES WSW	0.0045 ( -0.002 - 0.011 )	--	0
	CO-58	0.13	0.0010 ( -0.012 - 0.012 )	LOC # 35 0.3 MILES WNW	0.0050 ( -0.002 - 0.012 )	--	0
	FE-59	0.26	0.0014 ( -0.035 - 0.046 )	LOC # 32 VIC DISCHARGE	0.0130 ( -0.020 - 0.046 )	--	0
	CO-60	0.13	0.0008 ( -0.011 - 0.021 )	LOC # 37X 3.5 MILES WSW	0.0093 ( -0.003 - 0.021 )	--	0
	ZN-65	0.26	-0.0200 ( -0.083 - 0.041 )	LOC # 32 VIC DISCHARGE	-0.0058 ( -0.039 - 0.041 )	--	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 & 50-339  
JANUARY-DECEMBER 2002

MEDIUM OR PATHWAY SAMPLED	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED (D)	LOWER LIMIT OF DETECTION (LLD) (A)	INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM
			LOCATIONS MEAN RANGE (B)	LOCATION #, DISTANCE & DIRECTION	MEAN (RANGE) (B)	LOCATIONS MEAN (RANGE) (B)	
	ZR-95	--	0.0043 ( -0.035 - 0.047 )	LOC # 32 VIC DISCHARGE	0.0100 ( -0.009 - 0.047 )	--	0
	NB-95	--	-0.0016 ( -0.029 - 0.017 )	LOC # 32 VIC DISCHARGE	0.0063 ( -0.006 - 0.017 )	--	0
	RU-103	--	-0.0027 ( -0.021 - 0.021 )	LOC # 35 0.3 MILES WNW	0.0108 ( 0.003 - 0.021 )	--	0
	RU-106	--	0.008 ( -0.24 - 0.12 )	LOC # 35 0.3 MILES WNW	0.040 ( -0.05 - 0.12 )	--	0
	AG-110M	--	-0.0071 ( -0.042 - 0.012 )	LOC # 32 VIC DISCHARGE	0.0000 ( -0.006 - 0.005 )	--	0
	I-131	--	-0.017 ( -0.20 - 0.22 )	LOC # 32 VIC DISCHARGE	0.041 ( -0.03 - 0.22 )	--	0
	SB-125	--	0.0043 ( -0.031 - 0.030 )	LOC # 37X 3.5 MILES WSW	0.0185 ( -0.004 - 0.030 )	--	0
	CS-134	0.13	0.0027 ( -0.011 - 0.012 )	LOC # 37X 3.5 MILES WSW	0.0060 ( -0.002 - 0.011 )	--	0
	CS-137	0.15	0.0003 ( -0.032 - 0.020 )	LOC # 37X 3.5 MILES WSW	0.0053 ( -0.001 - 0.011 )	--	0
	SB-125	--	0.0043 ( -0.031 - 0.030 )	LOC # 37X 3.5 MILES WSW	0.0185 ( -0.004 - 0.030 )	--	0
	TH-228	--	-0.0108 ( -0.086 - 0.069 )	LOC # 32 VIC DISCHARGE	0.0118 ( -0.066 - 0.069 )	--	0

### **NOTES FOR TABLE 3-1**

- A. For gamma measurements the (Minimum Detectable Level) MDL's  $\approx$  LLD  $\times$  2.33. For all others, MDL = 2  $\times$  (the standard deviation of the background). These MDL's are based on the absence of large amounts of interfering activity (excluding naturally occurring radionuclides). Deviations by about factors of 3 to 4 can occur.

The LLD at a confidence level of 95% is the smallest concentration of radioactive material in a sample that will be detected with a 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66 S_b}{E * V * 2.22 * Y * \exp(-\lambda \Delta t)}$$

where,

- LLD* is the lower limit of detection as defined above (as pCi per unit mass or volume)  
*S<sub>b</sub>* is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute)  
*E* is the counting efficiency (as counts per transformation)  
*V* is the sample size (in units of mass or volume)  
*2.22* is the number of transformation per minute per picocurie  
*Y* is the fractional radiochemical yield (when applicable)  
 $\lambda$  is the radioactive decay constant for the particular radionuclide  
 $\Delta t$  is the elapsed time between sample collection (or end of the sample collection period) and time of counting

It should be recognized that LLD is a defined *a priori* (before the fact) limit representing the capability of a measurement system and not an *a posteriori* (after the fact) limit for a particular measurement.

Analyses shall be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally background fluctuations, unavoidably small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these *a priori* LLDs unachievable. In such cases, the contributing factors will be identified and described in the *Annual Radiological Environmental Operating Report*. As shown in the

equation above, for composite samples taken over a period of time, the LLD is decayed to the end of the sample period.

- B.** Analytical results are handled as recommended by HASL ("*Reporting of Analytical Results from HASL*," letter by Leo B. Higginbotham) and NUREG/CR-4007 (Sept. 1984). Negative values were used in the determination of mean.
- C.** Nonroutine reported measurements (NRM's). These are results of samples that exceed the report levels of Table E-2 of the *Radiological Effluent Monitoring Manual*.
- D.** First number is the number of indicator measurements, the second is the number of control measurements.
- E.** Assuming 270 m<sup>3</sup>
- F.** Assuming 1080 m<sup>3</sup>
- G.** LLD for leafy vegetables.
- H.** LLD from the end of the sample period.

### **3.2. Data Tables**

The data reported in this section are strictly counting statistics. The reported error is two times the standard deviation ( $2\sigma$ ) of the net activity. Unless otherwise noted, the overall error (counting, sample size, chemistry, errors, etc.) is estimated to be 2 to 5 times that listed. Results are considered positive when the measured value exceeds 1.5 times the listed  $2\sigma$  error (i.e., the measured value exceeds  $3\sigma$ ).

Because of counting statistics, negative values, zeros and numbers below the Minimum Detectable Level (MDL) are statistically valid pieces of data. For the purposes of this report, in order to indicate any background biases, all the valid data are presented. In instances where zeros are listed after significant digits, this is an artifact of the computer data handling program.

Data are given according to sample type as indicated below.

1. Gamma Exposure Rate
2. Air Particulates, Gross Beta Radioactivity
3. Air Particulates, Weekly I-131
4. Air Particulates, Quantitative Gamma Spectra
5. Air Particulates, Quarterly Strontium\*
6. Soil
7. Milk - Dairy Farms\*
8. Milk - Goat Farms
9. Pasture Grass
10. Well Water\*
11. Reservoir Water\*
12. Fruits & Vegetables
13. Broad Leaf Vegetation
14. Seawater
15. Bottom Sediment
16. Aquatic Flora
17. Fin Fish
18. Mussels
19. Oysters
20. Clams
21. Scallops\*
22. Lobster (and Crabs)

\* This type of sampling or analysis was not performed, therefore there is no table.

TABLE 1  
QUARTERLY TLD  
GAMMA EXPOSURE RATE (UR/HR) \*

L O C A T I O N S

PERIOD	01	02	03	04	05	06	07	08	09	10	11
	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)
1Q	8.7 0.3	9.8 0.6	7.2 0.3	8.7 0.5	9.9 0.4	8.5 0.5	5.6 0.3	12.1 0.7	9.3 0.3	8.7 0.3	7.2 0.4
2Q	8.2 0.4	9.4 0.3	6.9 0.3	8.0 0.4	9.0 0.3	8.2 0.3	5.1 0.2	11.6 0.3	9.4 0.6	8.2 0.2	6.7 0.3
3Q	8.6 0.4	9.7 0.6	7.0 0.4	8.5 0.4	9.7 0.4	8.2 0.3	4.8 0.3	11.8 0.7	9.6 0.4	8.1 0.4	6.6 0.4
4Q	8.5 0.5	9.8 0.3	6.3 0.2	8.2 0.3	9.5 0.3	8.8 0.3	5.2 0.3	11.8 0.5	9.3 0.3	8.5 0.3	7.4 0.3
PERIOD	12C	13C	14C	15C	16C	27	41	42	43	44	45
	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)
1Q	7.5 0.5	9.0 0.5	9.4 0.4	7.9 0.3	6.1 0.2	7.5 0.2	6.9 0.3	8.0 0.4	6.9 0.2	8.9 0.4	8.3 0.4
2Q	8.0 0.3	8.4 0.3	9.3 0.3	7.7 0.4	5.7 0.2	8.7 0.3	6.7 0.3	7.9 0.4	6.6 0.2	9.0 0.5	7.2 0.4
3Q	7.6 0.6	8.2 0.4	9.8 0.4	8.2 0.5	6.2 0.2	9.0 0.4	6.9 0.4	8.2 0.4	6.8 0.4	9.2 0.4	7.8 0.3
4Q	7.5 0.3	8.3 0.3	9.6 0.4	7.9 0.3	6.2 0.2	9.0 0.3	6.7 0.3	8.0 0.3	6.9 0.2	9.3 0.4	7.7 0.3
PERIOD	46	47	48	49	50	51	52	53	55	56	57
	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)
1Q	8.5 0.4	8.1 0.3	10.2 0.5	7.5 0.3	8.3 0.3	6.3 0.5	7.4 0.3	8.0 0.3	7.5 0.6	6.9 0.3	7.5 0.6
2Q	7.7 0.2	7.6 0.3	9.7 0.4	7.2 0.2	7.9 0.4	6.2 0.2	7.0 0.3	7.6 0.3	7.4 0.2	6.4 0.2	7.0 0.2
3Q	7.6 0.5	7.8 0.3	10.2 0.4	7.3 0.3	8.1 0.6	6.3 0.4	7.2 0.3	8.1 0.4	7.5 0.4	6.7 0.5	7.1 0.4
4Q	8.2 0.4	8.0 0.4	9.8 0.3	7.2 0.4	8.0 0.4	6.3 0.3	7.3 0.2	7.9 0.2	7.8 0.4	6.7 0.3	7.2 0.2
PERIOD	59	60	61	62	63	64	65	66X			
	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)			
1Q	8.5 0.5	7.4 0.3	8.0 0.5	8.4 0.5	9.4 0.4	7.9 0.3	8.4 0.4	7.6 0.3			
2Q	8.0 0.2	7.3 0.6	7.7 0.5	7.8 0.2	8.4 0.4	7.4 0.4	7.7 0.2	7.1 0.2			
3Q	8.7 0.4	7.3 0.5	7.7 0.3	8.2 0.3	9.3 0.5	7.7 0.3	8.2 0.6	7.3 0.3			
4Q	8.3 0.3	7.0 0.3	7.5 0.3	8.2 0.3	9.0 0.3	7.9 0.3	7.9 0.3	7.1 0.4			

\* READINGS ARE THE AVERAGE OF MULTI CAS04™ PHOSPHOR ELEMENTS WITHIN ONE PANASONIC TLD BADGE  
ERRORS ARE 1-SIGMA AND INCLUDE COUNTING, TRANSIT, READER AND FADE UNCERTAINTIES

TABLE 2  
AIR PARTICULATES  
GROSS BETA RADIOACTIVITY  
(PCI/M3)

PERIOD ENDING -----	L O C A T I O N S															
	01		02		03		04		10		11		15C		27	
	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
JAN 08	0.016	0.005	0.021	0.005	0.024	0.005	0.028	0.005	0.024	0.005	0.024	0.005	0.026	0.005	0.026	0.005
JAN 15	0.021	0.004			A 0.021	0.004	0.024	0.004	0.021	0.004	0.024	0.004	0.022	0.004	0.022	0.004
JAN 22	0.023	0.004	0.020	0.004	0.022	0.004	0.024	0.004	0.025	0.004	0.024	0.004	0.019	0.004	0.024	0.004
JAN 29	0.019	0.004	0.021	0.004	0.022	0.004	0.025	0.005	0.020	0.004	0.025	0.004	0.022	0.005	0.023	0.004
FEB 05	0.018	0.004	0.017	0.004	0.023	0.004	0.023	0.005	0.022	0.004	0.031	0.033	0.024	0.005	0.023	0.004
FEB 12	0.025	0.004	0.028	0.004	0.025	0.004	0.026	0.004	0.008	0.027	0.029	0.004	0.025	0.004	0.027	0.004
FEB 19	0.012	0.003	0.011	0.003	0.016	0.003	0.014	0.004	0.012	0.003	0.013	0.003	0.017	0.004	0.016	0.003
FEB 26	0.017	0.004	0.018	0.004	0.021	0.004	0.025	0.004	0.021	0.004	0.020	0.004	0.023	0.004	0.002	0.004
MAR 05	0.013	0.004	0.012	0.004	0.016	0.004	0.017	0.004	0.012	0.004	0.015	0.004	0.020	0.005	0.017	0.004
MAR 12	0.025	0.004	0.025	0.004	0.027	0.004	0.028	0.005	0.024	0.004	0.028	0.004	0.029	0.005	0.030	0.004
MAR 19	0.019	0.004	0.018	0.004	0.021	0.004	0.021	0.004	0.025	0.004	0.023	0.004	0.022	0.005	0.025	0.004
MAR 26	0.019	0.004	0.020	0.004	0.025	0.004	0.022	0.005	0.024	0.004	0.027	0.004	0.022	0.005	0.022	0.004
APR 02	0.014	0.004	0.014	0.004	0.014	0.004	0.016	0.004	0.017	0.004	0.019	0.004	0.016	0.004	0.019	0.003
APR 09	0.023	0.004	0.023	0.004	0.020	0.004	0.022	0.004	0.021	0.004	0.020	0.004	0.018	0.004	0.022	0.004
APR 16	0.012	0.004	0.017	0.004	0.013	0.004	0.016	0.004	0.014	0.004	0.017	0.004	0.018	0.004	0.016	0.004
APR 23	0.020	0.004	0.019	0.004	0.023	0.004	0.017	0.004	0.020	0.004	0.020	0.004	0.022	0.004	0.025	0.004
APR 30	0.014	0.003	0.015	0.003	0.018	0.003	0.016	0.004	0.018	0.004	0.017	0.003	0.014	0.003	0.015	0.003
MAY 07	0.017	0.003	0.018	0.004	0.017	0.003	0.019	0.004	0.020	0.004	0.018	0.003	0.019	0.004	0.018	0.003
MAY 14	0.012	0.003	0.011	0.003	0.014	0.003	0.014	0.004	0.014	0.003	0.013	0.003	0.014	0.004	0.014	0.003
MAY 21	0.016	0.003	0.016	0.003	0.016	0.003	0.014	0.004	0.016	0.003	0.015	0.003	0.018	0.004	0.017	0.003
MAY 28	0.013	0.003	0.011	0.003	0.014	0.003	0.018	0.004	0.013	0.003	0.013	0.003	0.016	0.004	0.013	0.003
JUN 04	0.023	0.004	0.022	0.004	0.019	0.004	0.023	0.004	0.023	0.004	0.021	0.004	0.022	0.004	0.022	0.004
JUN 11	0.012	0.004	0.013	0.004	0.012	0.003	0.013	0.004	0.011	0.003	0.011	0.004	0.008	0.004	0.011	0.003
JUN 18	0.008	0.003	0.009	0.003	0.009	0.003	0.011	0.003	0.012	0.003	0.010	0.003	0.012	0.003	0.008	0.003
JUN 25	0.018	0.004	0.015	0.004	0.019	0.004	0.022	0.005	0.019	0.004	0.017	0.004	0.016	0.004	0.015	0.004

SAMPLE DATES MAY VARY BY A FEW DAYS

A: NO SAMPLE WAS COLLECTED DUE TO PUMP FAILURE FROM BLOWN FUSE



TABLE 2  
AIR PARTICULATES  
GROSS BETA RADIOACTIVITY  
(PCI/M3)

PERIOD ENDING	L O C A T I O N S															
	01		02		03		04		10		11		15C		27	
	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
JUL 02	0.018	0.004	0.017	0.004	0.018	0.004	0.020	0.005	0.020	0.004	0.018	0.004	0.018	0.005	0.017	0.004
JUL 09	0.029	0.004	0.025	0.004	0.029	0.004	0.028	0.005	0.031	0.004	0.032	0.004	0.024	0.005	0.026	0.004
JUL 16	0.023	0.004	0.016	0.003	0.019	0.003	0.021	0.003	0.018	0.003	0.019	0.003	0.022	0.004	0.018	0.003
JUL 23	0.026	0.004	0.022	0.004	0.027	0.004	0.025	0.004	0.027	0.004	0.025	0.004	0.027	0.005	0.025	0.004
JUL 30	0.017	0.004	0.018	0.004	0.017	0.004	0.020	0.004	0.017	0.004	0.016	0.004	0.019	0.004	0.017	0.004
AUG 06	0.032	0.004	0.027	0.004	0.030	0.004	0.033	0.004	0.030	0.004	0.030	0.004	0.031	0.004	0.032	0.004
AUG 13	0.015	0.003	0.013	0.003	0.017	0.003	0.015	0.003	0.016	0.003	0.017	0.003	0.016	0.004	0.016	0.003
AUG 20	0.030	0.004	0.028	0.004	0.026	0.004	0.032	0.004	0.032	0.004	0.030	0.004	0.034	0.004	0.030	0.004
AUG 27	0.021	0.004	0.017	0.004	0.021	0.004	0.019	0.004	0.022	0.004	0.019	0.004	0.020	0.004	0.018	0.004
SEP 03	0.013	0.003	0.012	0.003	0.013	0.003	0.013	0.003	0.010	0.003	0.013	0.003	0.012	0.003	0.012	0.003
SEP 10	0.019	0.004	0.016	0.004	0.019	0.003	0.018	0.004	0.019	0.004	0.019	0.004	0.023	0.004	0.019	0.003
SEP 17	0.017	0.003	0.019	0.004	0.018	0.003	0.017	0.004	0.020	0.004	0.020	0.004	0.021	0.004	0.017	0.003
SEP 24	0.025	0.004	0.022	0.004	0.019	0.004	0.023	0.004	0.022	0.004	0.025	0.004	0.023	0.004	0.026	0.004
OCT 01	0.022	0.004	0.018	0.004	0.019	0.004	0.020	0.004	0.021	0.004	0.024	0.004	0.021	0.004	0.020	0.004
OCT 08	0.019	0.004	0.026	0.005	0.018	0.004	0.025	0.005	0.024	0.004	0.025	0.004	0.028	0.004	0.027	0.004
OCT 15	0.013	0.004	0.008	0.004	0.014	0.004	0.013	0.004	0.015	0.004	0.015	0.004	0.015	0.003	0.012	0.004
OCT 22	0.014	0.004	0.010	0.004	0.015	0.004	0.014	0.004	0.016	0.004	0.017	0.004	0.017	0.004	0.011	0.004
OCT 29	0.010	0.004	0.010	0.004	0.016	0.004	0.015	0.004	0.013	0.004	0.016	0.004	0.017	0.004	0.013	0.004
NOV 05	0.019	0.004	0.015	0.004	0.023	0.004	0.021	0.004	0.022	0.004	0.020	0.004	0.022	0.004	0.017	0.004
NOV 12	0.027	0.005	0.027	0.005	0.025	0.004	0.025	0.004	0.027	0.004	0.027	0.004	0.026	0.004	0.027	0.004
NOV 19	0.017	0.004	0.017	0.004	0.016	0.003	0.017	0.004	0.016	0.004	0.018	0.004	0.016	0.003	0.017	0.003
NOV 26	0.019	0.004	0.018	0.005	0.026	0.004	0.025	0.004	0.023	0.004	0.024	0.004	0.019	0.004	0.024	0.004
DEC 03	0.016	0.004	0.022	0.004	0.019	0.004	0.019	0.004	0.021	0.004	0.020	0.004	0.020	0.004	0.020	0.004
DEC 10	0.022	0.004	0.023	0.004	0.023	0.004	0.027	0.004	0.025	0.004	0.030	0.005	0.023	0.004	0.023	0.004
DEC 17	0.017	0.004	0.016	0.004	0.016	0.004	0.016	0.004	0.017	0.004	0.014	0.003	0.017	0.004	0.014	0.004
DEC 23	0.018	0.004	0.015	0.003	0.018	0.003	0.017	0.004	0.018	0.003	0.015	0.004	0.018	0.004	0.016	0.004
DEC 31	0.017	0.004	0.019	0.003	0.019	0.003	0.020	0.004	0.019	0.003	0.020	0.004	0.019	0.003	0.019	0.003

SAMPLE DATES MAY VARY BY A FEW DAYS

TABLE 3  
AIRBORNE IODINE  
I-131 (PCI/M3)

PERIOD ENDING	L O C A T I O N S																	
	01		02		03		04		10		11		15C		27			
	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
JAN 08	0.009	0.026	0.010	0.024	0.004	0.023	-0.005	0.024	-0.023	0.023	-0.006	0.021	0.005	0.027	-0.015	0.024		
JAN 15	-0.012	0.022			A -0.012	0.016	0.002	0.022	0.005	0.022	0.017	0.017	0.005	0.022	-0.004	0.015		
JAN 22	-0.007	0.018	0.014	0.025	0.007	0.020	-0.005	0.016	-0.005	0.020	-0.005	0.020	0.019	0.021	0.000	0.019		
JAN 29	-0.005	0.022	0.006	0.021	-0.009	0.020	0.003	0.021	0.020	0.020	0.004	0.018	-0.005	0.022	-0.004	0.018		
FEB 05	-0.008	0.021	-0.003	0.020	-0.008	0.019	0.006	0.020	-0.008	0.021	-0.022	0.035	-0.005	0.019	0.003	0.020		
FEB 12	-0.016	0.024	-0.011	0.024	-0.003	0.022	0.008	0.022	0.009	0.035	-0.005	0.024	-0.004	0.024	-0.003	0.023		
FEB 19	-0.016	0.024	-0.006	0.019	0.012	0.020	0.013	0.019	-0.002	0.024	-0.012	0.021	0.011	0.023	0.000	0.021		
FEB 26	0.015	0.027	-0.025	0.028	0.031	0.027	-0.028	0.027	-0.026	0.025	0.019	0.028	0.010	0.027	0.012	0.025		
MAR 05	-0.002	0.022	-0.005	0.018	0.012	0.016	-0.011	0.017	-0.005	0.017	0.001	0.017	0.001	0.018	-0.004	0.015		
MAR 12	0.017	0.020	0.013	0.021	0.003	0.017	0.022	0.020	0.002	0.016	-0.005	0.014	0.017	0.016	0.009	0.014		
MAR 19	0.011	0.020	-0.014	0.019	0.012	0.020	0.014	0.026	-0.003	0.021	0.011	0.019	0.016	0.018	0.022	0.020		
MAR 26	0.001	0.015	-0.005	0.015	0.002	0.014	0.008	0.016	-0.004	0.016	0.004	0.017	-0.017	0.017	-0.004	0.016		
APR 02	0.009	0.023	-0.006	0.022	0.018	0.024	-0.016	0.026	-0.008	0.031	-0.022	0.026	0.004	0.027	-0.008	0.025		
APR 09	0.000	0.015	0.014	0.014	-0.014	0.020	0.013	0.021	-0.009	0.018	0.001	0.017	0.013	0.020	0.001	0.012		
APR 16	-0.009	0.017	0.005	0.016	-0.004	0.014	-0.003	0.019	0.011	0.017	0.000	0.018	0.023	0.020	-0.006	0.017		
APR 23	0.001	0.015	-0.008	0.015	0.006	0.014	0.000	0.015	0.010	0.016	-0.010	0.015	0.004	0.017	-0.004	0.012		
APR 30	0.006	0.015	0.005	0.018	0.011	0.016	0.010	0.017	0.009	0.018	-0.007	0.019	-0.002	0.019	-0.004	0.015		
MAY 07	0.011	0.018	0.002	0.019	0.016	0.016	0.015	0.020	0.014	0.018	0.002	0.014	-0.003	0.018	0.011	0.014		
MAY 14	0.003	0.019	0.028	0.022	0.018	0.020	0.000	0.024	0.002	0.020	0.005	0.022	-0.002	0.021	0.026	0.019		
MAY 21	0.015	0.015	-0.004	0.015	-0.018	0.017	-0.007	0.018	0.007	0.014	-0.011	0.017	-0.009	0.015	0.018	0.014		
MAY 28	0.011	0.017	-0.014	0.021	-0.002	0.018	-0.017	0.021	0.003	0.016	-0.007	0.018	-0.002	0.021	-0.011	0.018		
JUN 04	0.000	0.020	-0.011	0.021	0.013	0.026	-0.005	0.020	0.010	0.020	-0.003	0.016	0.001	0.021	0.006	0.021		
JUN 11	0.012	0.022	0.000	0.014	0.007	0.014	-0.014	0.022	0.012	0.020	0.008	0.016	-0.003	0.020	0.011	0.017		
JUN 18	0.000	0.014	-0.008	0.020	-0.004	0.016	0.019	0.020	-0.007	0.016	-0.001	0.017	0.005	0.019	-0.004	0.017		
JUN 25	-0.003	0.022	-0.009	0.020	0.005	0.021	-0.010	0.024	-0.003	0.020	0.003	0.021	-0.004	0.023	-0.003	0.019		

SAMPLE DATES MAY VARY BY A FEW DAYS

A: NO SAMPLE WAS COLLECTED DUE TO PUMP FAILURE FROM BLOWN FUSE

TABLE 3  
AIRBORNE IODINE  
I-131 (PCI/M3)

L O C A T I O N S

PERIOD ENDING	01		02		03		04		10		11		15C		27	
-----	-----		-----		-----		-----		-----		-----		-----		-----	
	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
JUL 02	0.008	0.020	-0.009	0.027	0.003	0.029	0.001	0.027	0.011	0.020	0.018	0.024	-0.002	0.031	-0.002	0.026
JUL 09	0.010	0.022	0.000	0.021	-0.011	0.017	-0.011	0.024	0.007	0.021	0.002	0.021	-0.009	0.026	0.019	0.017
JUL 16	-0.004	0.025	-0.016	0.024	-0.006	0.020	0.009	0.022	0.009	0.020	0.009	0.025	0.000	0.026	-0.002	0.024
JUL 23	0.005	0.019	0.010	0.017	0.001	0.017	-0.005	0.015	-0.008	0.016	-0.002	0.019	0.000	0.022	0.003	0.015
JUL 30	0.003	0.021	-0.016	0.021	-0.002	0.016	0.000	0.018	0.008	0.018	0.011	0.018	-0.006	0.021	0.009	0.018
AUG 06	-0.002	0.020	-0.004	0.021	-0.012	0.018	-0.002	0.021	0.003	0.019	-0.007	0.022	-0.009	0.017	-0.009	0.016
AUG 13	-0.007	0.015	0.005	0.018	-0.009	0.017	-0.009	0.016	0.000	0.015	0.009	0.020	-0.002	0.017	-0.013	0.014
AUG 20	-0.002	0.024	0.024	0.028	0.026	0.024	-0.010	0.026	0.033	0.031	0.025	0.023	0.015	0.023	0.000	0.020
AUG 27	0.003	0.021	0.011	0.017	0.005	0.018	0.007	0.019	-0.010	0.020	-0.004	0.014	0.005	0.015	-0.002	0.014
SEP 03	-0.004	0.020	0.005	0.025	0.002	0.022	0.002	0.022	0.006	0.022	-0.006	0.019	-0.004	0.022	-0.011	0.022
SEP 10	-0.005	0.030	-0.002	0.023	-0.029	0.022	-0.011	0.031	0.003	0.030	-0.010	0.027	0.026	0.037	-0.016	0.023
SEP 17	0.015	0.025	0.003	0.029	-0.024	0.029	-0.005	0.033	-0.007	0.033	-0.025	0.030	0.022	0.032	0.008	0.027
SEP 24	-0.006	0.024	-0.023	0.027	-0.012	0.023	0.011	0.025	-0.015	0.026	-0.004	0.023	0.032	0.028	-0.028	0.026
OCT 01	-0.008	0.019	-0.004	0.019	-0.013	0.018	-0.002	0.018	-0.016	0.018	-0.003	0.018	-0.002	0.021	0.008	0.018
OCT 08	-0.004	0.018	-0.010	0.021	-0.001	0.019	0.002	0.020	-0.010	0.021	0.017	0.025	0.004	0.025	-0.019	0.021
OCT 15	-0.009	0.019	-0.020	0.020	-0.020	0.020	0.002	0.018	-0.004	0.019	-0.003	0.018	-0.011	0.017	-0.003	0.014
OCT 22	0.018	0.018	-0.006	0.020	0.007	0.018	-0.013	0.023	0.008	0.023	-0.014	0.022	0.008	0.026	-0.024	0.026
OCT 29	0.003	0.024	-0.007	0.026	0.018	0.031	0.023	0.031	0.011	0.023	0.008	0.017	-0.016	0.021	0.014	0.030
NOV 05	0.002	0.024	-0.015	0.028	0.012	0.025	-0.004	0.024	0.006	0.016	0.000	0.016	0.002	0.015	0.002	0.014
NOV 12	0.007	0.021	0.000	0.024	0.007	0.020	0.011	0.022	0.002	0.022	-0.011	0.019	-0.006	0.021	0.012	0.018
NOV 19	0.003	0.020	0.001	0.016	0.010	0.015	-0.011	0.020	-0.003	0.017	0.019	0.016	-0.003	0.017	-0.001	0.016
NOV 26	0.003	0.015	0.004	0.018	-0.005	0.015	-0.017	0.016	0.001	0.013	-0.004	0.016	0.009	0.014	-0.005	0.016
DEC 03	0.026	0.019	0.010	0.019	0.004	0.016	-0.005	0.020	0.015	0.016	0.008	0.019	0.006	0.019	0.006	0.017
DEC 10	-0.030	0.023	0.002	0.023	0.000	0.018	0.006	0.021	-0.005	0.024	-0.008	0.025	0.006	0.017	0.010	0.018
DEC 17	-0.010	0.019	-0.002	0.012	-0.017	0.018	-0.008	0.016	-0.001	0.012	-0.006	0.014	-0.001	0.017	-0.018	0.014
DEC 23	0.005	0.018	0.013	0.017	0.023	0.021	-0.015	0.025	-0.018	0.021	-0.002	0.022	0.007	0.020	-0.008	0.018
DEC 31	0.003	0.027	-0.009	0.026	-0.018	0.026	0.000	0.037	0.012	0.022	0.003	0.032	0.000	0.030	-0.002	0.027

SAMPLE DATES MAY VARY BY A FEW DAYS

TABLE 4A  
AIR PARTICULATES  
GAMMA SPECTRA - QTR 1  
(PCI/M3)

A N A L Y S E S

LOCATION	BE-7		CO-60		ZR-95		NB-95		RU-103	
-----	-----		-----		-----		-----		-----	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
01	0.071	0.042	0.0006	0.0010	-0.0007	0.0046	0.0002	0.0081	0.0018	0.0047
02	0.081	0.045	0.0007	0.0013	0.0018	0.0039	-0.0044	0.0072	-0.0021	0.0031
03	0.084	0.039	-0.0005	0.0011	0.0006	0.0048	0.0047	0.0068	0.0000	0.0036
04	0.094	0.055	0.0000	0.0007	0.0000	0.0058	0.0019	0.0095	0.0000	0.0064
10	0.097	0.051	-0.0001	0.0013	-0.0023	0.0056	-0.0090	0.0100	0.0035	0.0055
11	0.084	0.059	-0.0007	0.0017	0.0005	0.0058	0.0007	0.0087	0.0000	0.0060
15C	0.072	0.047	0.0000	0.0011	0.0057	0.0071	0.0034	0.0085	0.0008	0.0050
27	0.071	0.046	-0.0006	0.0008	0.0031	0.0059	-0.0027	0.0033	0.0029	0.0046

LOCATION	RU-106		CS-134		CS-137		BA-140		CE-141	
-----	-----		-----		-----		-----		-----	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
01	0.006	0.008	-0.0002	0.0010	-0.0001	0.0007	-0.010	0.170	0.0053	0.0090
02	0.002	0.008	0.0002	0.0009	0.0005	0.0007	-0.150	0.210	0.0018	0.0071
03	-0.004	0.008	-0.0001	0.0008	-0.0005	0.0010	-0.060	0.290	-0.0013	0.0062
04	0.002	0.010	-0.0006	0.0008	-0.0006	0.0008	-0.010	0.230	-0.0020	0.0100
10	-0.005	0.009	0.0005	0.0010	0.0003	0.0007	0.000	0.370	0.0037	0.0084
11	-0.001	0.011	0.0000	0.0011	-0.0003	0.0009	0.100	0.330	0.0017	0.0057
15C	0.000	0.012	-0.0002	0.0010	-0.0005	0.0012	0.150	0.330	0.0030	0.0110
27	-0.004	0.006	0.0000	0.0005	-0.0001	0.0006	0.080	0.270	-0.0028	0.0069

TABLE 4B  
AIR PARTICULATES  
GAMMA SPECTRA - QTR 2  
(PCI/M3)

A N A L Y S E S

LOCATION	BE-7		CO-60		ZR-95		NB-95		RU-103	
	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
01	0.132	0.047	0.0000	0.0008	0.0019	0.0033	0.0002	0.0052	0.0010	0.0053
02	0.079	0.037	0.0004	0.0008	0.0003	0.0033	-0.0006	0.0041	0.0000	0.0037
03	0.074	0.037	-0.0002	0.0005	0.0006	0.0020	-0.0021	0.0048	-0.0004	0.0031
04	0.097	0.043	0.0002	0.0011	0.0012	0.0045	-0.0036	0.0064	-0.0019	0.0039
10	0.093	0.040	0.0006	0.0008	-0.0001	0.0030	-0.0059	0.0052	-0.0008	0.0031
11	0.127	0.043	-0.0006	0.0008	0.0013	0.0040	0.0002	0.0062	0.0036	0.0047
15C	0.100	0.043	0.0004	0.0009	0.0018	0.0037	-0.0066	0.0058	0.0013	0.0040
27	0.053	0.031	0.0001	0.0008	-0.0002	0.0023	-0.0034	0.0040	-0.0019	0.0032

LOCATION	RU-106		CS-134		CS-137		BA-140		CE-141	
	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
01	-0.006	0.008	0.0000	0.0008	0.0009	0.0009	0.030	0.120	0.0051	0.0077
02	-0.001	0.001	0.0002	0.0009	0.0002	0.0008	0.080	0.110	0.0020	0.0056
03	-0.002	0.007	-0.0001	0.0005	-0.0003	0.0005	0.000	0.096	-0.0017	0.0045
04	0.006	0.011	-0.0012	0.0011	0.0001	0.0007	0.000	0.130	-0.0016	0.0063
10	-0.001	0.007	-0.0002	0.0004	0.0003	0.0006	-0.051	0.073	0.0015	0.0056
11	0.009	0.009	0.0006	0.0012	-0.0003	0.0008	0.020	0.220	0.0034	0.0081
15C	-0.004	0.013	0.0000	0.0005	0.0005	0.0008	-0.130	0.150	0.0002	0.0059
27	0.001	0.005	0.0000	0.0007	0.0001	0.0006	-0.024	0.084	0.0021	0.0047

TABLE 4C  
AIR PARTICULATES  
GAMMA SPECTRA - QTR 3  
(PCI/M3)

A N A L Y S E S

LOCATION	BE-7		CO-60		ZR-95		NB-95		RU-103	
-----	-----		-----		-----		-----		-----	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
01	0.133	0.037	-0.0005	0.0007	-0.0011	0.0023	-0.0014	0.0019	0.0006	0.0017
02	0.154	0.040	0.0002	0.0009	-0.0023	0.0031	-0.0010	0.0039	0.0009	0.0028
03	0.188	0.039	-0.0001	0.0011	0.0005	0.0009	0.0018	0.0028	0.0012	0.0020
04	0.169	0.039	-0.0005	0.0007	-0.0007	0.0026	0.0002	0.0027	0.0003	0.0019
10	0.155	0.033	0.0005	0.0011	-0.0003	0.0027	-0.0030	0.0021	-0.0005	0.0017
11	0.148	0.039	-0.0002	0.0010	-0.0013	0.0020	0.0021	0.0033	0.0000	0.0024
15C	0.176	0.042	0.0003	0.0005	0.0021	0.0021	0.0012	0.0035	0.0010	0.0022
27	0.161	0.036	0.0002	0.0004	-0.0007	0.0021	-0.0006	0.0027	0.0003	0.0021

LOCATION	RU-106		CS-134		CS-137		BA-140		CE-141	
-----	-----		-----		-----		-----		-----	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
01	0.006	0.006	-0.0010	0.0009	-0.0005	0.0008	0.006	0.021	-0.0008	0.0028
02	0.005	0.010	0.0003	0.0012	0.0000	0.0008	0.005	0.020	-0.0025	0.0036
03	0.003	0.007	0.0000	0.0006	0.0001	0.0006	-0.012	0.017	0.0018	0.0027
04	0.004	0.008	0.0001	0.0009	0.0000	0.0008	-0.006	0.028	0.0001	0.0028
10	0.002	0.009	-0.0004	0.0005	-0.0001	0.0007	-0.008	0.022	-0.0021	0.0021
11	0.004	0.010	0.0004	0.0010	0.0009	0.0009	0.010	0.022	-0.0013	0.0041
15C	0.005	0.007	-0.0005	0.0005	0.0000	0.0008	0.014	0.033	-0.0015	0.0033
27	-0.001	0.007	0.0002	0.0005	-0.0003	0.0008	-0.006	0.011	-0.0002	0.0028

TABLE 4D  
AIR PARTICULATES  
GAMMA SPECTRA - QTR 4  
(PCI/M3)

A N A L Y S E S

LOCATION	BE-7		CO-60		ZR-95		NB-95		RU-103	
-----	-----		-----		-----		-----		-----	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
01	0.080	0.021	-0.0003	0.0007	-0.0006	0.0019	-0.0010	0.0019	-0.0003	0.0017
02	0.067	0.023	-0.0003	0.0009	0.0000	0.0029	-0.0033	0.0033	-0.0010	0.0023
03	0.080	0.023	-0.0003	0.0006	-0.0006	0.0015	-0.0003	0.0024	0.0012	0.0017
04	0.094	0.027	-0.0003	0.0006	0.0021	0.0025	-0.0006	0.0028	-0.0007	0.0021
10	0.074	0.020	0.0002	0.0007	-0.0012	0.0016	0.0006	0.0023	-0.0003	0.0015
11	0.055	0.026	-0.0002	0.0010	0.0006	0.0030	0.0030	0.0057	-0.0006	0.0030
15C	0.066	0.023	0.0003	0.0005	0.0003	0.0021	-0.0013	0.0038	0.0000	0.0019
27	0.044	0.021	0.0000	0.0004	0.0011	0.0023	-0.0006	0.0026	0.0008	0.0019

LOCATION	RU-106		CS-134		CS-137		BA-140		CE-141	
-----	-----		-----		-----		-----		-----	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
01	0.002	0.004	0.0000	0.0005	0.0000	0.0005	0.005	0.037	0.0000	0.0026
02	-0.003	0.007	-0.0002	0.0008	-0.0003	0.0007	-0.045	0.041	0.0017	0.0034
03	0.004	0.005	-0.0002	0.0006	-0.0002	0.0006	0.000	0.019	0.0007	0.0023
04	-0.003	0.007	-0.0004	0.0006	0.0003	0.0007	0.015	0.021	0.0009	0.0028
10	0.002	0.005	-0.0003	0.0005	-0.0003	0.0004	0.000	0.019	-0.0021	0.0024
11	0.009	0.007	-0.0004	0.0008	0.0002	0.0007	-0.005	0.054	0.0036	0.0040
15C	0.002	0.005	0.0007	0.0007	-0.0009	0.0006	-0.007	0.041	-0.0009	0.0028
27	-0.001	0.005	-0.0001	0.0005	-0.0003	0.0007	0.007	0.024	-0.0014	0.0024

Dominion Nuclear Connecticut, Inc.  
Millstone Station

Annual Radiological Environmental Operating Report 2002

TABLE 6  
SOIL  
(PCI/G DRY WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59		CO-60	
-----	-----	-----		-----		-----		-----		-----		-----		-----	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
03	03/19/02	0.21	0.18	8.78	0.78	0.10	0.15	-0.008	0.017	0.005	0.013	-0.028	0.041	-0.006	0.017
	05/08/02	-0.09	0.47	9.20	1.50	-0.08	0.53	0.014	0.049	-0.027	0.031	0.050	0.130	-0.017	0.048
	09/28/02	0.40	0.38	9.63	0.88	0.11	0.31	-0.013	0.026	0.005	0.023	0.008	0.061	-0.010	0.031
	11/20/02	0.28	0.48	8.10	1.60	-0.15	0.50	0.007	0.044	-0.046	0.046	0.050	0.100	0.054	0.049
04	03/19/02	-0.05	0.21	12.00	1.10	-0.06	0.23	0.003	0.026	-0.004	0.021	-0.051	0.077	0.011	0.026
	05/08/02	0.07	0.17	11.96	0.85	0.04	0.19	-0.017	0.023	0.003	0.018	-0.015	0.064	0.009	0.019
	09/28/02	0.31	0.24	11.35	0.76	0.01	0.29	0.016	0.023	0.006	0.019	0.010	0.053	-0.006	0.020
	11/20/02	0.28	0.44	12.40	1.60	0.11	0.47	0.013	0.044	-0.043	0.036	0.056	0.098	0.007	0.033
14C	03/19/02	0.37	0.40	12.40	1.10	-0.12	0.26	-0.007	0.027	-0.015	0.027	-0.011	0.069	0.000	0.024
	05/08/02	-0.03	0.24	13.04	0.96	-0.13	0.25	0.021	0.027	0.008	0.022	-0.004	0.078	0.002	0.025
	09/28/02	0.00	0.29	11.48	0.78	0.18	0.33	0.021	0.022	0.003	0.024	-0.008	0.054	-0.004	0.022
	11/20/02	0.24	0.45	11.40	1.50	-0.10	0.58	0.039	0.045	-0.037	0.042	-0.026	0.091	-0.006	0.047
LOCATION	COLLECTION DATE	ZN-65		ZR-95		NB-95		RU-103		RU-106		CS-134		CS-137	
-----	-----	-----		-----		-----		-----		-----		-----		-----	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
03	03/19/02	-0.026	0.081	0.010	0.031	-0.011	0.020	0.020	0.017	0.04	0.14	0.022	0.019	0.677	0.059
	05/08/02	0.000	0.130	0.055	0.075	0.049	0.062	0.035	0.056	0.14	0.39	-0.027	0.068	0.950	0.140
	09/28/02	0.100	0.120	0.032	0.051	0.008	0.050	0.005	0.033	0.11	0.23	0.038	0.026	1.069	0.080
	11/20/02	-0.190	0.130	-0.010	0.150	-0.033	0.063	0.015	0.054	0.38	0.45	0.079	0.085	0.760	0.150
04	03/19/02	-0.030	0.130	0.038	0.044	0.009	0.027	0.000	0.023	0.01	0.21	-0.021	0.038	0.400	0.062
	05/08/02	-0.055	0.092	0.023	0.036	0.009	0.027	0.007	0.021	0.03	0.17	0.020	0.081	0.302	0.044
	09/28/02	0.065	0.091	0.018	0.043	-0.028	0.031	0.015	0.029	0.10	0.20	0.047	0.083	0.358	0.045
	11/20/02	0.020	0.100	-0.100	0.130	-0.035	0.058	-0.032	0.049	-0.47	0.42	-0.034	0.045	0.490	0.100
14C	03/19/02	-0.080	0.120	0.007	0.046	0.014	0.030	-0.006	0.029	0.00	0.24	0.020	0.027	1.800	0.110
	05/08/02	0.100	0.120	0.023	0.042	0.000	0.045	-0.010	0.026	0.06	0.22	-0.012	0.023	1.258	0.081
	09/28/02	0.030	0.110	0.000	0.048	0.026	0.049	-0.014	0.034	-0.14	0.23	-0.033	0.032	1.556	0.084
	11/20/02	-0.050	0.230	-0.160	0.150	-0.014	0.088	0.010	0.052	0.41	0.45	0.064	0.050	0.960	0.140



TABLE 6  
SOIL  
(PCI/G DRY WT.)

LOCATION	COLLECTION DATE	CE-141		CE-144		SB-125		TH-228	
		----- (+/-)		----- (+/-)		----- (+/-)		----- (+/-)	
03	03/19/02	0.024	0.027	0.120	0.110	-0.009	0.050	0.501	0.080
	05/08/02	0.030	0.100	-0.090	0.350	0.040	0.130	0.720	0.220
	09/28/02	0.032	0.048	0.100	0.150	-0.039	0.075	0.650	0.110
	11/20/02	-0.042	0.078	-0.080	0.280	-0.060	0.130	0.420	0.300
04	03/19/02	-0.020	0.039	-0.030	0.150	0.078	0.064	1.060	0.120
	05/08/02	-0.024	0.033	-0.070	0.120	0.018	0.051	1.130	0.091
	09/28/02	0.052	0.048	0.080	0.150	0.019	0.057	0.996	0.091
	11/20/02	-0.060	0.085	0.120	0.290	0.090	0.130	0.990	0.210
14C	03/19/02	-0.031	0.045	-0.160	0.350	0.018	0.080	1.130	0.120
	05/08/02	0.022	0.041	0.030	0.150	0.079	0.072	1.340	0.110
	09/28/02	-0.021	0.057	-0.040	0.170	-0.019	0.080	1.330	0.110
	11/20/02	-0.033	0.099	0.140	0.330	-0.020	0.140	1.220	0.230

TABLE 8  
GOAT MILK  
(PCI/L)

LOCATION	COLLECTION DATE	K-40		SR-89		SR-90		I-131		CS-134		CS-137		BA-140		LA-140	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
21	06/19/02	1041	84	4.7	9.8	1.29	0.87	0.53	0.51	-1.2	2.9	2.4	3.1	-1.7	5.3	-2.0	6.1
	07/11/02	1790	170					0.13	0.26	-5.3	3.9	5.6	4.9	4.1	5.9	4.7	6.8
	07/24/02	1660	130					0.04	0.14	-3.0	3.4	1.6	3.7	-2.8	5.4	-3.2	6.2
	08/07/02	1860	130					0.08	0.34	-0.5	3.3	3.7	4.2	1.3	4.8	1.5	5.6
	08/14/02		A					0.05	0.19		A		A		A		
	09/04/02	931	59					0.28	0.53	1.5	1.7	2.9	2.0	-0.6	2.9	-0.7	3.3
	09/25/02	1790	97	-5.0	3.3	0.99	0.97	0.63	0.71	-1.2	2.7	7.2	3.0	-0.7	4.8	-0.9	5.5
	10/09/02	583	61		C		C	-0.15	0.06	0.5	2.0	4.1	2.9	2.4	3.7	2.7	4.3
22	04/10/02	1740	110					0.04	0.21	1.2	2.5	-0.6	2.7	-2.7	3.7	-3.1	4.2
	04/24/02	1640	150					-0.03	0.06	1.8	3.5	5.0	4.1	-0.5	6.1	-0.6	7.0
	05/08/02	1880	140					0.20	0.35	2.2	5.4	-0.3	4.0	-0.6	6.5	-0.7	7.5
	05/22/02	1790	130					0.24	0.49	-0.2	3.8	5.4	3.9	1.6	4.5	1.8	5.2
	06/05/02	1760	140					0.06	0.25	-0.8	3.5	15.4	5.3	4.6	5.0	5.3	5.8
	06/19/02	1620	120	8.6	6.2	5.80	1.20	0.68	0.70	-0.9	2.9	4.0	4.5	1.8	4.1	2.1	4.7
	07/10/02	1910	130					0.06	0.25	0.6	2.7	17.3	4.7	0.5	3.2	0.6	3.7
	07/24/02	1680	110					0.01	0.13	0.6	2.7	17.3	4.7	0.5	3.2	0.6	3.7
	08/07/02	1420	130					0.68	0.66	1.4	3.3	14.7	5.2	0.4	5.4	0.5	6.2
	08/21/02	1380	130	6.4	6.3	1.80	1.10	0.06	0.38	-0.2	3.3	12.3	4.7	-0.8	3.7	-0.9	4.3
24C	04/24/02	1270	130					0.07	0.12	4.5	5.9	2.4	3.9	-2.5	5.2	-2.9	6.0
	05/08/02	1550	100					0.10	0.28	-1.6	2.6	3.8	2.9	1.1	4.1	1.2	4.7
	05/22/02	1830	150					0.15	0.42	-0.5	3.5	5.9	4.3	2.4	5.6	2.7	6.5
	06/05/02	1850	150					-0.02	0.14	0.2	3.6	-1.9	3.9	2.3	6.0	2.6	6.9
	06/19/02	1750	120	0.3	3.9	2.43	0.83	0.80	0.81	-2.7	3.0	13.5	4.3	0.3	3.9	0.3	4.5
	07/11/02	1580	160					0.07	0.25	3.2	4.3	2.3	4.3	-1.8	6.2	-2.1	7.1
	07/24/02	1650	120					0.01	0.11	0.4	2.6	1.2	3.3	1.0	3.9	1.1	4.5
	08/07/02	1470	110					-0.06	0.02	0.0	2.4	6.5	3.6	0.2	3.2	0.3	3.7
	08/21/02	1770	170					0.69	0.70	2.5	3.8	9.5	5.3	-2.5	4.7	-2.9	5.4
	09/04/02		B					0.05	0.35		B		B		B		
	09/25/02	1810	110	-6.1	5.0	14.30	1.70	0.68	0.69	-1.7	2.7	5.6	3.4	-4.1	5.5	-4.9	6.3
	10/09/02	1980	150	-15.6	9.4	1.77	0.83	0.03	0.33	-0.5	3.4	3.1	4.3	-1.8	4.8	-2.0	5.6

PASTURE GRASS, HAY OR FEED WAS SAMPLED AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK

STRONTIUM ANALYSES ARE COMPOSITES OF ALL MILK SAMPLED FROM A GIVEN LOCATION DURING THE QUARTER

A: GAMMA ANALYSIS NOT PERFORMED DUE TO TECHNICIAN ERROR

B: GAMMA ANALYSIS NOT PERFORMED DUE TO LAB ERROR

C: STRONTIUM ANALYSIS NOT PERFORMED DUE TO LAB ERROR

TABLE 9  
PASTURE GRASS \*  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59		CO-60	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
21	01/16/02	0.37	0.24	6.79	0.74	-0.050	0.160	-0.023	0.024	-0.011	0.020	0.018	0.072	-0.019	0.028
	02/13/02	0.16	0.24	14.50	1.00	0.010	0.250	0.001	0.029	-0.026	0.026	-0.090	0.096	-0.006	0.034
	03/13/02	0.03	0.17	18.13	0.86	0.080	0.190	0.009	0.023	-0.007	0.022	-0.025	0.061	0.000	0.023
	04/10/02	0.13	0.22	18.20	1.20	0.200	0.230	-0.015	0.032	-0.030	0.029	0.040	0.100	0.003	0.037
	04/24/02	0.13	0.21	16.72	0.97	0.070	0.230	-0.031	0.028	0.013	0.027	0.004	0.075	-0.010	0.027
	05/08/02	1.07	0.18	4.86	0.47	-0.020	0.110	-0.003	0.013	-0.012	0.012	0.022	0.043	0.022	0.015
	05/22/02	2.28	0.20	3.89	0.39	-0.065	0.096	-0.018	0.012	0.004	0.010	0.009	0.039	0.003	0.012
	06/05/02	0.31	0.25	6.09	0.65	-0.120	0.240	0.002	0.019	0.000	0.021	0.006	0.055	0.000	0.018
	10/23/02	3.35	0.34	5.26	0.53	0.010	0.180	0.012	0.017	0.001	0.017	0.042	0.046	-0.024	0.021
	11/20/02	4.40	0.48	3.43	0.72	0.080	0.190	0.020	0.024	0.016	0.022	-0.004	0.051	0.015	0.029
	12/11/02	0.30	0.38	13.00	1.20	-0.090	0.320	0.021	0.033	-0.005	0.034	-0.018	0.088	-0.014	0.045
22	01/16/02	0.32	0.45	11.25	0.86	-0.110	0.210	0.007	0.027	0.014	0.026	-0.012	0.067	-0.003	0.026
	02/13/02	0.04	0.21	13.92	0.68	-0.030	0.240	-0.002	0.024	-0.006	0.024	0.014	0.071	0.025	0.025
	03/13/02	0.02	0.14	16.39	0.74	-0.060	0.170	-0.001	0.020	0.008	0.019	0.024	0.053	-0.005	0.020
	09/05/02	5.95	0.46	2.51	0.50	0.000	0.240	-0.010	0.022	0.001	0.021	0.036	0.051	0.010	0.020
	09/25/02	1.37	0.37	2.70	0.56	-0.020	0.230	0.007	0.018	0.002	0.022	0.046	0.063	-0.011	0.025
	10/09/02	1.86	0.16	6.01	0.37	-0.018	0.084	0.012	0.011	0.004	0.010	-0.014	0.025	-0.001	0.015
	10/23/02	2.94	0.22	4.67	0.39	0.000	0.110	-0.001	0.012	0.001	0.011	0.006	0.029	0.011	0.015
	11/20/02	5.08	0.44	4.21	0.61	-0.100	0.180	0.000	0.019	-0.004	0.019	0.050	0.049	0.019	0.022
	12/11/02	0.13	0.23	18.10	1.00	-0.020	0.290	0.012	0.028	0.001	0.028	0.029	0.074	0.004	0.035
24C	01/16/02	0.91	0.27	9.17	0.71	0.070	0.180	-0.010	0.023	0.014	0.021	0.024	0.059	0.006	0.022
	02/13/02	0.31	0.28	12.66	0.77	-0.090	0.230	-0.001	0.022	-0.001	0.024	0.007	0.067	-0.022	0.023
	03/13/02	0.02	0.18	12.53	0.89	0.008	0.021	-0.005	0.024	0.008	0.021	0.053	0.080	0.013	0.029
	04/10/02	0.12	0.17	13.89	0.80	0.040	0.190	-0.016	0.023	-0.012	0.023	-0.024	0.060	-0.002	0.022
	10/23/02	1.54	0.12	4.37	0.26	0.011	0.064	-0.003	0.006	0.001	0.006	0.015	0.017	0.003	0.009
	11/20/02	3.02	0.31	3.27	0.46	0.060	0.130	0.004	0.014	-0.005	0.015	-0.005	0.028	-0.001	0.018
	12/11/02	0.17	0.29	9.76	0.89	-0.380	0.340	0.010	0.030	-0.032	0.033	0.031	0.079	-0.001	0.036

\* SAMPLES TAKEN AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK

TABLE 9  
PASTURE GRASS \*  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	ZN-65		ZR-95		NB-95		RU-103		RU-106		I-131		CS-134	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
21	01/16/02	-0.053	0.075	-0.010	0.037	-0.012	0.022	-0.027	0.021	-0.220	0.210	0.004	0.010	0.014	0.023
	02/13/02	-0.059	0.070	-0.042	0.049	-0.004	0.033	-0.020	0.028	0.070	0.240	-0.002	0.005	0.030	0.029
	03/13/02	-0.053	0.059	-0.034	0.037	-0.017	0.038	-0.004	0.020	-0.040	0.210	0.017	0.030	0.031	0.025
	04/10/02	0.000	0.076	-0.004	0.050	-0.031	0.033	0.009	0.028	0.230	0.270	0.005	0.017	0.029	0.035
	04/24/02	0.011	0.097	0.031	0.046	-0.031	0.045	0.003	0.025	0.230	0.260	0.020	0.020	0.018	0.030
	05/08/02	-0.031	0.032	-0.009	0.022	0.002	0.014	-0.007	0.012	0.020	0.110	0.005	0.017	0.008	0.012
	05/22/02	-0.003	0.038	-0.018	0.016	-0.003	0.014	-0.006	0.010	-0.120	0.110	-0.002	0.018	0.011	0.011
	06/05/02	-0.002	0.045	0.014	0.036	-0.036	0.030	-0.021	0.024	-0.020	0.017	0.005	0.021	0.004	0.020
	10/23/02	-0.057	0.063	-0.014	0.032	-0.019	0.021	0.007	0.019	0.080	0.150	-0.006	0.025	-0.010	0.017
	11/20/02	0.140	0.120	0.001	0.034	-0.008	0.026	0.012	0.019	-0.080	0.210	0.003	0.015	0.018	0.024
	12/11/02	-0.050	0.110	0.020	0.063	0.030	0.043	-0.008	0.034	-0.270	0.310	0.014	0.018	-0.001	0.032
22	01/16/02	-0.061	0.092	0.000	0.042	-0.020	0.045	-0.031	0.024	-0.270	0.260	0.000	0.006	0.024	0.029
	02/13/02	0.009	0.053	-0.013	0.042	-0.056	0.043	0.015	0.024	-0.120	0.240	0.003	0.013	0.008	0.025
	03/13/02	-0.025	0.071	0.027	0.032	0.015	0.038	-0.019	0.018	-0.050	0.170	0.001	0.011	0.010	0.021
	09/05/02	-0.003	0.055	0.025	0.039	-0.034	0.031	-0.015	0.023	-0.010	0.190	0.024	0.036	0.000	0.022
	09/25/02	0.040	0.100	-0.019	0.037	-0.019	0.027	0.025	0.023	-0.070	0.190	0.055	0.048	0.007	0.020
	10/09/02	-0.008	0.035	0.018	0.017	-0.010	0.013	0.014	0.009	0.049	0.098	0.010	0.026	0.007	0.012
	10/23/02	-0.019	0.028	0.005	0.021	-0.002	0.016	-0.003	0.011	-0.114	0.094	0.001	0.018	0.014	0.012
	11/20/02	-0.005	0.070	-0.003	0.032	0.023	0.021	0.011	0.018	0.110	0.170	-0.003	0.001	0.013	0.019
	12/11/02	0.140	0.130	0.011	0.050	-0.031	0.038	-0.017	0.029	-0.060	0.240	0.000	0.006	0.039	0.027
24C	01/16/02	0.011	0.079	0.000	0.035	-0.015	0.037	0.006	0.020	-0.180	0.210	0.000	0.008	0.012	0.024
	02/13/02	0.017	0.081	0.015	0.037	0.042	0.028	-0.011	0.024	-0.060	0.200	0.007	0.017	-0.002	0.024
	03/13/02	0.007	0.078	-0.016	0.036	-0.001	0.024	-0.007	0.019	0.100	0.200	-0.002	0.007	0.016	0.025
	04/10/02	0.009	0.079	0.013	0.037	-0.004	0.038	-0.006	0.020	-0.060	0.210	0.004	0.020	0.012	0.025
	10/23/02	0.041	0.028	-0.003	0.012	-0.001	0.010	0.000	0.007	-0.036	0.056	0.012	0.026	-0.001	0.007
	11/20/02	-0.019	0.038	-0.009	0.025	-0.002	0.014	0.004	0.014	0.010	0.140	0.034	0.035	-0.017	0.015
	12/11/02	-0.064	0.084	0.047	0.055	-0.071	0.039	-0.019	0.032	-0.030	0.270	0.006	0.011	0.024	0.033

\* SAMPLES TAKEN AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK

TABLE 9  
PASTURE GRASS \*  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CS-137		BA-140		LA-140		CE-141		CE-144		SB-125		TH-228	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
21	01/16/02	0.072	0.029	-0.027	0.031	-0.031	0.036	0.033	0.023	0.002	0.087	-0.082	0.067	0.040	0.130
	02/13/02	0.022	0.029	-0.057	0.066	-0.066	0.076	0.035	0.032	0.070	0.110	-0.025	0.062	0.100	0.120
	03/13/02	0.024	0.026	0.013	0.031	0.015	0.035	-0.084	0.045	0.000	0.100	-0.056	0.054	0.120	0.130
	04/10/02	-0.016	0.032	-0.021	0.052	-0.024	0.060	0.028	0.031	-0.110	0.120	-0.035	0.070	0.050	0.190
	04/24/02	-0.029	0.027	-0.011	0.033	-0.013	0.038	-0.005	0.033	-0.030	0.120	-0.045	0.067	0.123	0.089
	05/08/02	0.005	0.013	0.006	0.025	0.007	0.029	0.009	0.023	0.033	0.047	0.002	0.027	0.041	0.048
	05/22/02	0.004	0.011	0.005	0.021	0.006	0.024	-0.015	0.014	-0.049	0.041	-0.017	0.026	0.046	0.057
	06/05/02	0.008	0.021	-0.014	0.064	-0.016	0.073	0.035	0.037	0.035	0.090	0.015	0.043	-0.032	0.071
	10/23/02	0.016	0.017	-0.012	0.043	-0.014	0.050	-0.001	0.026	-0.076	0.076	-0.003	0.042	0.061	0.061
	11/20/02	0.012	0.029	0.004	0.036	0.005	0.042	-0.008	0.024	-0.043	0.094	0.036	0.054	0.010	0.100
	12/11/02	0.021	0.031	0.020	0.097	0.020	0.110	-0.010	0.041	0.070	0.120	-0.039	0.065	0.130	0.140
22	01/16/02	0.030	0.028	0.001	0.034	0.001	0.039	0.006	0.032	-0.070	0.120	-0.082	0.067	0.140	0.140
	02/13/02	0.031	0.025	-0.008	0.047	-0.009	0.054	-0.011	0.071	-0.040	0.110	-0.016	0.059	0.140	0.140
	03/13/02	0.001	0.019	-0.016	0.028	-0.018	0.032	0.011	0.044	-0.039	0.084	-0.004	0.044	0.200	0.120
	09/05/02	-0.005	0.020	-0.005	0.060	-0.006	0.069	0.002	0.030	-0.007	0.083	0.014	0.047	0.050	0.100
	09/25/02	-0.008	0.022	-0.028	0.046	-0.032	0.053	0.018	0.032	-0.010	0.100	0.002	0.051	0.042	0.086
	10/09/02	0.014	0.011	-0.008	0.017	-0.009	0.020	0.000	0.011	-0.012	0.038	0.000	0.023	0.105	0.048
	10/23/02	0.001	0.013	-0.021	0.031	-0.025	0.036	0.005	0.016	-0.003	0.042	-0.012	0.024	0.010	0.054
	11/20/02	-0.006	0.022	-0.005	0.026	-0.006	0.030	-0.058	0.044	0.024	0.092	0.019	0.049	0.090	0.100
	12/11/02	-0.002	0.028	-0.076	0.087	-0.090	0.100	0.009	0.036	0.013	0.095	-0.006	0.059	0.110	0.100
24C	01/16/02	0.032	0.027	-0.022	0.031	-0.026	0.035	0.011	0.053	0.016	0.099	0.025	0.053	0.170	0.130
	02/13/02	0.007	0.024	0.007	0.050	0.008	0.057	-0.008	0.033	-0.010	0.100	-0.068	0.054	0.170	0.130
	03/13/02	0.036	0.018	0.003	0.036	0.004	0.041	0.013	0.024	-0.004	0.083	0.010	0.052	0.080	0.170
	04/10/02	0.023	0.025	-0.014	0.031	-0.017	0.036	-0.105	0.043	-0.101	0.099	0.031	0.052	0.102	0.076
	10/23/02	0.011	0.008	0.015	0.019	0.017	0.022	-0.005	0.008	0.015	0.024	0.003	0.014	0.010	0.038
	11/20/02	-0.001	0.017	0.004	0.020	0.004	0.023	-0.012	0.019	0.014	0.069	0.012	0.037	0.060	0.070
	12/11/02	0.020	0.030	-0.062	0.069	-0.072	0.079	-0.022	0.052	0.070	0.130	0.009	0.069	0.000	0.130

\* SAMPLES TAKEN AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK

TABLE 12  
FRUITS & VEGETABLES  
(PCI/G WET WT.)

LOCATION	COLLECTION		BE-7		K-40		CR-51		MN-54		CO-58		FE-59		CO-60	
	DATE	TYPE	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
25	06/05/02	STRAWBERRIES	-0.004	0.033	1.199	0.056	0.003	0.031	-0.001	0.002	0.000	0.002	0.004	0.008	0.000	0.002
	06/05/02	LETTUCE	0.089	0.028	2.097	0.065	-0.007	0.035	0.000	0.002	-0.001	0.003	-0.005	0.008	0.002	0.002
	09/20/02	APPLES	0.030	0.034	1.427	0.068	-0.023	0.059	0.000	0.003	0.003	0.004	0.001	0.007	0.000	0.005
	09/21/02	COLLARD GREENS	0.107	0.083	4.060	0.320	0.045	0.069	-0.005	0.006	-0.005	0.007	0.007	0.019	-0.001	0.010
26C	06/05/02	STRAWBERRIES	0.033	0.039	1.245	0.072	0.008	0.043	0.003	0.003	0.001	0.003	-0.003	0.010	0.001	0.003
	06/05/02	LETTUCE	-0.008	0.032	2.399	0.078	0.013	0.034	-0.001	0.002	0.001	0.003	0.001	0.009	0.002	0.002
	09/20/02	APPLES	0.021	0.026	1.027	0.059	-0.006	0.037	0.002	0.004	-0.003	0.003	0.000	0.008	0.002	0.003
	09/21/02	CABBAGE	0.006	0.024	2.074	0.064	0.004	0.034	-0.001	0.002	-0.001	0.003	0.003	0.006	-0.001	0.002
LOCATION	COLLECTION		ZN-65		ZR-95		NB-95		RU-103		RU-106		I-131		CS-134	
	DATE	TYPE	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
25	06/05/02	STRAWBERRIES	0.002	0.004	0.001	0.004	-0.004	0.005	-0.004	0.003	-0.005	0.019	0.038	0.033	0.001	0.002
	06/05/02	LETTUCE	0.009	0.008	0.000	0.004	-0.003	0.005	0.000	0.003	-0.004	0.019	-0.002	0.035	0.001	0.002
	09/20/02	APPLES	-0.006	0.010	-0.003	0.008	0.001	0.006	0.000	0.005	-0.001	0.037	0.023	0.033	0.003	0.033
	09/21/02	COLLARD GREENS	-0.008	0.018	0.003	0.012	0.000	0.010	0.003	0.007	0.012	0.054	0.019	0.044	0.001	0.006
26C	06/05/02	STRAWBERRIES	-0.003	0.009	0.002	0.006	-0.003	0.006	0.003	0.004	0.012	0.026	0.022	0.035	-0.003	0.003
	06/05/02	LETTUCE	0.000	0.007	0.002	0.005	-0.002	0.004	0.002	0.003	-0.005	0.022	0.018	0.029	-0.001	0.002
	09/20/02	APPLES	-0.016	0.014	0.004	0.005	0.005	0.004	-0.004	0.004	-0.002	0.025	-0.001	0.028	0.002	0.003
	09/21/02	CABBAGE	0.004	0.011	-0.002	0.005	0.005	0.006	-0.001	0.003	-0.011	0.022	-0.009	0.025	0.000	0.002
LOCATION	COLLECTION		CS-137		BA-140		LA-140		CE-141		CE-144		SB-125		TH-228	
	DATE	TYPE	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
25	06/05/02	STRAWBERRIES	-0.001	0.002	-0.006	0.010	-0.007	0.012	0.003	0.006	0.003	0.010	0.000	0.006	0.011	0.011
	06/05/02	LETTUCE	0.001	0.002	-0.004	0.011	-0.005	0.013	-0.023	0.008	0.002	0.011	0.000	0.005	-0.003	0.013
	09/20/02	APPLES	-0.004	0.003	-0.009	0.014	-0.010	0.016	0.002	0.009	-0.005	0.019	-0.003	0.009	0.014	0.021
	09/21/02	COLLARD GREENS	0.006	0.007	-0.005	0.028	-0.006	0.032	0.000	0.008	-0.015	0.022	0.010	0.013	0.016	0.026
26C	06/05/02	STRAWBERRIES	0.000	0.003	-0.006	0.013	-0.007	0.015	-0.019	0.010	-0.013	0.014	0.001	0.007	0.005	0.016
	06/05/02	LETTUCE	-0.001	0.002	-0.006	0.011	-0.007	0.012	-0.007	0.008	0.001	0.011	-0.004	0.007	0.011	0.012
	09/20/02	APPLES	-0.001	0.003	-0.014	0.013	-0.016	0.015	0.004	0.008	0.004	0.013	-0.002	0.011	0.002	0.016
	09/21/02	CABBAGE	-0.002	0.002	-0.003	0.010	-0.003	0.011	-0.007	0.008	0.003	0.013	-0.003	0.006	-0.008	0.015

TABLE 13  
BROADLEAF VEGETATION  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59		CO-60	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
1	05/08/02	0.33	0.16	4.10	0.40	0.05	0.13	0.004	0.013	0.005	0.014	-0.032	0.039	-0.002	0.013
	06/24/02	0.24	0.26	2.42	0.54	-0.12	0.29	0.005	0.024	-0.008	0.026	0.017	0.070	0.003	0.020
	07/17/02	0.27	0.24	3.29	0.61	0.08	0.18	0.012	0.021	0.008	0.021	0.046	0.071	-0.004	0.023
	08/07/02	0.59	0.17	3.36	0.35	-0.04	0.13	0.003	0.012	0.001	0.013	0.005	0.037	0.003	0.014
	09/19/02	1.20	0.37	4.07	0.66	0.04	0.28	-0.012	0.021	0.004	0.026	0.013	0.080	-0.005	0.028
	10/28/02	1.72	0.17	2.82	0.34	0.03	0.09	-0.004	0.012	0.005	0.011	0.010	0.024	0.012	0.014
10	05/08/02	0.34	0.20	4.05	0.60	0.05	0.15	0.009	0.018	-0.001	0.016	-0.014	0.055	-0.013	0.021
	06/24/02	0.30	0.14	2.91	0.29	-0.01	0.13	0.003	0.010	-0.005	0.013	0.003	0.033	-0.004	0.010
	07/17/02	0.49	0.19	4.70	0.46	-0.01	0.13	0.001	0.014	0.003	0.015	0.007	0.045	0.004	0.014
	08/07/02	0.25	0.15	4.73	0.48	-0.01	0.12	-0.001	0.013	-0.012	0.014	0.027	0.050	-0.004	0.015
	09/19/02	0.39	0.23	5.71	0.76	0.02	0.19	-0.005	0.021	0.015	0.019	-0.042	0.080	-0.007	0.026
	10/28/02	0.62	0.11	5.00	0.36	-0.03	0.07	-0.002	0.010	0.000	0.010	-0.009	0.022	0.005	0.013
17	05/22/02	1.04	0.29	4.58	0.69	-0.07	0.16	0.011	0.021	-0.012	0.019	-0.066	0.074	0.022	0.023
	06/24/02	0.30	0.23	1.90	0.50	-0.05	0.19	0.021	0.017	0.004	0.021	-0.035	0.061	-0.005	0.020
	07/17/02	0.36	0.17	2.31	0.39	-0.16	0.12	-0.002	0.014	-0.002	0.013	0.008	0.048	0.005	0.015
	08/07/02	0.74	0.17	2.76	0.34	-0.02	0.13	-0.001	0.012	-0.011	0.013	-0.018	0.047	-0.008	0.014
	09/19/02	0.61	0.20	2.30	0.34	-0.08	0.14	-0.008	0.013	-0.010	0.013	0.047	0.050	0.003	0.015
	10/28/02	0.72	0.23	4.83	0.64	0.04	0.16	-0.009	0.020	0.014	0.016	-0.021	0.045	-0.001	0.024

TABLE 13  
BROADLEAF VEGETATION  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	ZN-65		ZR-95		NB-95		RU-103		RU-106		I-131		CS-134	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
1	05/08/02	-0.020	0.032	-0.002	0.023	0.013	0.015	-0.009	0.014	-0.12	0.13	0.003	0.014	-0.002	0.015
	06/24/02	-0.045	0.056	0.001	0.042	0.009	0.034	0.000	0.029	0.01	0.21	0.015	0.022	0.009	0.024
	07/17/02	-0.016	0.049	-0.007	0.033	-0.005	0.024	-0.014	0.020	0.01	0.20	0.023	0.029	0.022	0.022
	08/07/02	0.039	0.050	0.000	0.021	-0.006	0.017	-0.001	0.013	0.02	0.10	-0.005	0.018	0.009	0.012
	09/19/02	-0.091	0.070	0.027	0.047	0.010	0.035	0.017	0.026	-0.02	0.24	0.002	0.031	0.029	0.027
	10/28/02	-0.025	0.033	-0.004	0.019	-0.006	0.012	0.012	0.011	-0.01	0.11	0.015	0.032	0.007	0.011
10	05/08/02	-0.026	0.046	0.007	0.035	-0.008	0.022	0.013	0.017	0.04	0.15	0.011	0.027	0.001	0.018
	06/24/02	-0.005	0.039	-0.010	0.020	0.012	0.023	0.007	0.013	0.01	0.10	0.002	0.016	0.006	0.011
	07/17/02	0.051	0.063	0.004	0.025	-0.019	0.018	0.002	0.015	0.08	0.13	0.031	0.029	0.003	0.016
	08/07/02	0.055	0.066	-0.001	0.023	0.012	0.028	0.011	0.013	0.05	0.11	0.007	0.025	0.008	0.012
	09/19/02	-0.059	0.051	-0.018	0.038	-0.019	0.027	-0.001	0.019	0.09	0.17	0.008	0.029	-0.014	0.016
	10/28/02	-0.017	0.031	0.003	0.016	0.007	0.010	0.000	0.008	-0.04	0.09	0.001	0.015	0.004	0.009
17	05/22/02	-0.052	0.049	-0.007	0.031	0.000	0.023	-0.005	0.019	0.11	0.17	0.025	0.033	-0.002	0.020
	06/24/02	-0.063	0.053	-0.019	0.036	-0.012	0.026	0.005	0.020	0.11	0.16	0.008	0.018	0.016	0.020
	07/17/02	-0.038	0.031	-0.005	0.022	-0.002	0.016	-0.001	0.012	0.02	0.13	0.035	0.034	-0.008	0.014
	08/07/02	0.041	0.062	-0.009	0.023	0.001	0.027	0.003	0.013	0.02	0.10	0.005	0.020	0.010	0.013
	09/19/02	-0.013	0.050	0.012	0.025	0.001	0.019	-0.003	0.014	-0.05	0.12	0.022	0.035	0.006	0.014
	10/28/02	-0.009	0.051	0.004	0.033	0.003	0.022	0.000	0.017	-0.09	0.16	0.026	0.036	-0.003	0.020



TABLE 13  
BROADLEAF VEGETATION  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CS-137		BA-140		LA-140		CE-141		CE-144		SB-125		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	05/08/02	0.010	0.014	0.008	0.024	0.009	0.028	0.007	0.031	0.001	0.060	0.004	0.032	0.071	0.063
	06/24/02	-0.009	0.023	-0.015	0.077	-0.017	0.089	-0.007	0.038	-0.030	0.110	0.003	0.052	0.040	0.080
	07/17/02	0.015	0.024	0.000	0.030	0.000	0.035	0.009	0.022	-0.025	0.077	0.043	0.052	0.150	0.120
	08/07/02	0.001	0.011	-0.009	0.029	-0.010	0.034	-0.053	0.030	0.001	0.054	0.007	0.027	0.057	0.049
	09/19/02	-0.019	0.026	-0.054	0.084	-0.062	0.096	-0.056	0.041	0.010	0.110	0.058	0.062	0.130	0.120
	10/28/02	-0.010	0.011	-0.019	0.022	-0.022	0.025	0.014	0.012	-0.055	0.043	-0.013	0.025	0.134	0.052
10	05/08/02	-0.004	0.017	0.019	0.044	0.022	0.051	-0.011	0.024	-0.016	0.063	0.019	0.038	0.095	0.071
	06/24/02	0.008	0.011	-0.004	0.038	-0.005	0.044	-0.020	0.030	-0.016	0.049	0.005	0.024	0.000	0.048
	07/17/02	0.009	0.017	-0.011	0.024	-0.012	0.028	0.008	0.020	-0.026	0.066	0.006	0.036	0.053	0.066
	08/07/02	0.001	0.015	-0.010	0.038	-0.011	0.043	-0.023	0.017	-0.023	0.047	0.003	0.030	-0.027	0.052
	09/19/02	-0.010	0.021	0.014	0.051	0.016	0.058	0.015	0.023	0.015	0.069	0.011	0.037	0.012	0.082
	10/28/02	0.009	0.011	-0.006	0.016	-0.007	0.019	-0.006	0.010	0.004	0.034	0.027	0.021	-0.002	0.046
17	05/22/02	0.016	0.022	-0.016	0.052	-0.019	0.059	-0.003	0.023	-0.048	0.080	0.016	0.050	0.018	0.085
	06/24/02	0.008	0.016	-0.007	0.068	-0.009	0.079	0.000	0.025	-0.013	0.073	0.037	0.038	0.017	0.074
	07/17/02	0.013	0.016	-0.005	0.025	-0.006	0.029	-0.001	0.015	0.046	0.054	0.020	0.031	0.000	0.057
	08/07/02	0.067	0.018	0.013	0.038	0.015	0.043	-0.005	0.018	-0.020	0.045	-0.010	0.029	-0.031	0.051
	09/19/02	0.002	0.013	0.034	0.043	0.039	0.049	-0.001	0.018	0.034	0.052	-0.012	0.030	0.025	0.060
	10/28/02	-0.003	0.019	-0.023	0.044	-0.027	0.050	0.000	0.022	0.015	0.068	-0.014	0.041	0.057	0.087

TABLE 14  
SEA WATER  
(PCI/L)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59		CO-60	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
32	01/29/02	-3	23	282	72	5	27	-1.7	2.6	2.1	2.6	-5.0	6.6	-1.1	2.9
	02/27/02	-5	16	367	60	9	21	0.0	2.0	1.5	2.0	-0.8	5.3	1.2	2.0
	03/27/02	10	14	317	52	11	18	-0.8	1.8	1.3	1.6	1.6	4.2	2.2	1.8
	04/30/02	-9	18	344	65	-2	22	-1.2	2.6	1.1	2.0	0.0	7.8	0.8	2.8
	05/28/02	0	20	222	58	2	28	1.1	2.4	0.5	2.4	-3.7	8.5	0.8	2.6
	06/26/02	-23	25	335	81	6	25	-3.3	2.8	0.6	3.1	-3.0	8.3	-0.4	3.4
	07/30/02	6	16	249	50	-4	20	0.8	1.8	0.1	1.8	-2.9	4.0	0.3	2.4
	08/27/02	-5	18	305	50	-5	23	-1.3	1.4	0.1	1.9	-1.3	6.7	-0.7	2.0
	09/24/02	1	21	284	59	-11	23	-0.2	2.4	0.0	2.1	-0.8	4.7	1.0	2.2
	10/29/02	-4	17	289	58	-3	20	0.1	2.1	0.1	1.9	0.8	4.9	0.0	2.2
	11/26/02	-6	18	373	63	11	19	0.4	2.0	0.1	1.9	-4.1	4.4	0.6	2.2
	12/31/02	13	19	299	58	-1	25	1.0	1.9	0.6	2.3	2.0	5.5	0.6	2.4
35X	03/05/02	-22	26	276	64	-9	23	1.1	2.7	2.1	2.6	0.0	7.1	-0.5	3.1
	05/23/02	15	26	266	70	-1	27	0.9	2.3	-1.5	2.6	3.1	8.0	-0.8	2.9
	08/13/02	-7	17	298	53	2	19	0.3	1.6	-0.5	1.9	-3.0	5.8	2.7	2.2
	12/10/02	-7	18	312	61	-14	20	-0.6	2.1	0.7	2.3	0.7	5.2	-1.9	2.6
37C	02/19/02	-16	19	282	56	10	25	1.9	2.1	-1.1	2.4	-2.2	6.3	0.3	1.9
	05/28/02	1	18	270	52	7	26	0.6	2.5	0.0	2.4	-7.2	6.2	0.1	1.8
	08/27/02	-1	16	308	43	-7	20	-1.0	1.6	-0.1	1.5	0	6	-0.2	2.0
	11/26/02	3	18	269	51	-5	20	-0.7	2.0	-1.0	1.9	-2	5	0.7	2.3
39X	03/05/02	-14	24	334	81	9	25	0.0	2.9	0.9	2.4	1.8	8.1	1.7	3.5
	05/23/02	-14	21	360	74	3	28	1.0	2.9	-1.9	2.5	-1.1	7.8	0.0	2.3
	08/13/02	10	17	307	61	-21	21	0.8	1.7	-0.8	2.0	2	4	0.5	1.8
	12/10/02	-6	17	285	60	-2	21	0.5	2.0	0.2	2.1	1.7	4.6	0.9	2.5

TABLE 14  
SEA WATER  
(PCI/L)

LOCATION	COLLECTION DATE	ZN-65		ZR-95		NB-95		RU-103		RU-106		I-131		CS-134	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	01/29/02	-7.7	6.3	-1.8	4.6	0.2	2.8	-0.3	3.1	-6	22	-0.6	5.0	0.7	2.8
	02/27/02	1.4	4.9	2.6	3.7	0.6	2.0	0.5	2.1	10	20	-2.6	3.8	-1.5	2.1
	03/27/02	-2.3	3.9	3.9	2.9	1.7	1.9	-1.8	2.0	-5	18	-1.2	3.7	0.2	1.8
	04/30/02	-1.7	4.5	-0.1	3.8	-0.7	2.5	0.2	2.7	-3	19	4.0	5.4	0.5	2.4
	05/28/02	-3.4	6.2	2.0	4.5	-1.5	3.1	-1.9	2.8	-2	25	-5.4	6.7	-0.8	2.6
	06/26/02	-2.5	6.2	-1.9	5.4	-2.1	3.7	-2.4	3.2	12	24	0.4	6.2	-0.2	3.1
	07/30/02	0.0	5.1	-0.4	3.5	0.7	2.4	-0.6	2.2	-7	15	1.3	4.2	-0.4	1.9
	08/27/02	-3.2	4.6	-1.0	3.3	-1.7	2.4	-2.4	2.2	7	15	-5.7	9.7	0.3	1.8
	09/24/02	-4.1	5.3	-0.6	3.8	1.1	2.5	-0.3	2.4	-9	19	0.0	4.9	-0.7	1.8
	10/29/02	-0.4	4.7	0.7	3.6	1.8	1.9	-2.9	2.2	3	19	-2.0	4.1	-0.4	1.9
	11/26/02	7.8	9.2	-0.1	3.3	-1.7	2.2	-1.8	2.1	17	17	0.6	4.3	0.8	2.1
	12/31/02	1.2	4.9	-0.4	4.1	-1.1	2.3	-1.7	2.2	-5	19	0.0	6.7	1.4	2.1
35X	03/05/02	-1.1	5.6	-3.2	4.6	1.7	3.1	-2.6	2.8	-9	20	1.8	4.5	-1.1	2.6
	05/23/02	2.4	6.0	2.7	5.0	0.2	3.4	-1.1	3.4	-5	23	-3.2	8.0	0.7	2.7
	08/13/02	0.0	5.0	-1.3	3.2	3.1	2.4	-1.6	1.9	-16	18	-2.2	4.4	1.0	1.8
	12/10/02	-7.2	6.2	0.1	3.4	-0.2	2.5	-1.5	2.5	19	21	2.7	3.9	1.6	2.2
37C	02/19/02	-3.0	5.4	1.4	3.7	-0.4	2.6	0.0	2.4	1	17	-4.7	8.5	1.4	2.4
	05/28/02	-3.7	4.5	-1.8	3.9	0.0	2.8	-1.0	2.4	-26	20	0.6	7.2	0.2	2.4
	08/27/02	-3.6	3.6	-0.6	2.6	-0.5	2.1	-0.9	2.0	8	15	-1.9	8.0	-0.7	1.5
	11/26/02	3.7	3.8	-2.4	3.1	1.3	2.3	1.0	2.1	15	19	3.3	3.9	-0.3	2.1
39X	03/05/02	-2.4	7.0	0.9	4.5	-0.4	3.3	-0.4	2.6	4	30	1.8	5.6	-0.8	2.5
	05/23/02	3.5	5.2	-5.1	4.0	-0.4	3.0	0.5	2.8	-17	24	-3.6	8.3	1.3	2.9
	08/13/02	-1.5	4.6	0.2	3.4	0.1	2.4	0.0	2.5	-1	20	1.3	4.6	-1.7	2.1
	12/10/02	0.2	4.7	-2.5	3.5	-0.9	2.4	-0.6	1.9	9	17	1.6	4.4	1.3	2.2

TABLE 14  
SEA WATER  
(PCI/L)

LOCATION	COLLECTION DATE	CS-137		BA-140		LA-140		SB-125		TH-228		H-3	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	01/29/02	1.0	2.9	1.5	4.0	1.7	4.6	-0.3	6.6	2.0	11.0	860	790
	02/27/02	-0.2	2.3	0.0	3.3	0.0	3.7	-0.3	5.4	1.8	7.2	330	900
	03/27/02	0.1	2.0	-1.9	2.9	-2.2	3.3	4.8	4.8	3.8	6.8	200	680
	04/30/02	-0.4	2.5	-1.7	3.8	-2.0	4.4	6.0	5.9	2.2	9.8	960	940
	05/28/02	-2.8	2.7	4.3	5.6	4.9	6.4	2.2	6.7	5.0	12.0	-40	850
	06/26/02	1.0	2.6	-1.4	5.0	-1.7	5.7	-2.9	6.0	4.0	11.0	440	870
	07/30/02	0.4	2.1	0.5	2.4	0.6	2.7	4.2	5.2	4.6	7.5	620	840
	08/27/02	-0.5	2.0	1.3	3.9	1.5	4.5	2.2	4.3	2.5	7.2	500	860
	09/24/02	-1.1	2.3	1.2	3.7	1.3	4.2	0.4	5.7	-6.7	8.7	600	1100
	10/29/02	-0.9	2.3	-0.7	2.9	-0.8	3.3	1.3	5.7	1.1	7.7	-200	780
	11/26/02	-1.8	2.1	-0.9	3.0	-1.1	3.4	2.0	5.5	6.5	7.7	760	870
	12/31/02	-0.6	2.0	-0.5	3.8	-0.5	4.3	-5.0	5.4	-0.6	8.0	360	830
35X	03/05/02	-0.7	2.7	1.6	4.5	1.9	5.1	1.0	6.9	7.0	11.0	-30	620
	05/23/02	-1.0	2.6	0.0	6.0	0.0	6.9	0.4	7.2	4.0	11.0	-540	840
	08/13/02	1.7	2.1	0.9	2.6	1.0	3.0	2.0	5.9	4.6	7.4	260	800
	12/10/02	0.3	2.3	0.3	2.1	0.4	2.4	-0.3	5.4	1.6	8.9	170	890
37C	02/19/02	0.8	2.3	1.4	4.1	1.6	4.8	1.8	5.5	2.7	8.3	-30	890
	05/28/02	0.1	2.0	-1.7	4.4	-1.9	5.1	-0.9	5.7	0.6	7.3	-490	830
	08/27/02	0.1	1.6	2.4	4.6	2.8	5.3	2.4	4.1	-2.3	5.6	120	840
	11/26/02	0.8	2.0	0.3	3.3	0.3	3.7	0.6	5.0	-8.2	6.9	290	870
39X	03/05/02	-0.2	3.4	-2.8	4.4	-3.2	5.0	3.3	7.0	11.0	12.0	-280	600
	05/23/02	-1.0	2.4	-7.6	4.7	-8.7	5.5	0.8	6.6	4.0	10.0	-440	840
	08/13/02	0.2	2.3	-1.6	2.6	-1.8	2.9	-3.0	5.5	-1.9	7.6	-90	810
	12/10/02	-0.5	2.4	-0.7	2.6	-0.8	3.0	-1.4	5.8	0.3	7.9	1030	930

TABLE 15  
BOTTOM SEDIMENT  
(PCI/G DRY WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
31	04/17/02	0.05	0.32	12.39	0.97	0.24	0.41	0.04	0.04	0.02	0.03	0.07	0.09
	08/15/02	0.25	0.36	13.93	0.78	-0.31	0.61	0.00	0.04	-0.03	0.03	-0.03	0.10
32	03/07/02	0.00	0.39	13.00	1.60	0.12	0.48	0.05	0.04	-0.04	0.04	-0.07	0.12
	06/17/02	-0.19	0.35	13.90	1.20	-0.03	0.52	-0.01	0.04	-0.01	0.04	0.00	0.12
	08/27/02	0.13	0.53	13.30	2.00	-0.19	0.68	0.01	0.05	0.02	0.06	-0.06	0.18
	12/17/02	-0.01	0.13	12.29	0.66	0.19	0.16	0.01	0.02	-0.02	0.01	-0.01	0.03
33	04/16/02	-0.22	0.26	21.30	1.50	0.03	0.30	0.00	0.03	0.02	0.03	0.01	0.10
	08/14/02	0.01	0.16	20.40	1.20	0.12	0.16	0.01	0.02	0.01	0.02	0.06	0.08
34	04/16/02	0.07	0.24	18.60	1.20	0.21	0.25	-0.01	0.02	0.00	0.03	-0.02	0.09
	08/14/02	-0.03	0.13	22.10	1.20	0.09	0.16	0.01	0.02	0.01	0.02	-0.01	0.07
35X	01/28/02	0.02	0.49	13.20	1.30	-0.32	0.69	-0.03	0.05	0.01	0.05	-0.01	0.12
	06/17/02	0.02	0.45	10.80	1.20	0.29	0.67	0.05	0.04	-0.05	0.05	0.05	0.16
	08/22/02	0.00	0.24	11.85	0.56	-0.30	0.36	-0.02	0.02	0.00	0.02	-0.05	0.07
	10/15/02	0.21	0.29	11.06	0.84	0.03	0.37	-0.01	0.03	0.01	0.03	-0.06	0.06
36X	04/17/02	-0.12	0.21	15.90	1.40	-0.07	0.29	0.03	0.04	0.00	0.03	0.00	0.11
	08/15/02	0.07	0.26	15.90	1.20	0.05	0.43	0.01	0.03	0.00	0.03	0.07	0.12
37C	04/17/02	0.10	0.21	15.10	1.30	0.22	0.28	0.00	0.03	0.00	0.03	0.01	0.09
	08/14/02	0.05	0.16	14.19	0.74	-0.23	0.25	-0.01	0.02	-0.01	0.02	-0.01	0.07
39X	03/07/02	0.28	0.37	14.00	1.60	-0.05	0.47	0.01	0.04	-0.01	0.04	-0.05	0.12
	06/17/02	0.29	0.32	15.00	1.10	0.08	0.47	0.04	0.03	-0.03	0.03	-0.06	0.11
	08/27/02	-0.02	0.22	14.51	0.85	-0.16	0.32	0.00	0.02	-0.02	0.02	0.04	0.08
	12/17/02	0.04	0.24	14.75	0.94	-0.03	0.29	0.01	0.03	-0.02	0.03	-0.04	0.06
67X	04/16/02	-0.07	0.28	15.80	1.50	-0.30	0.39	-0.01	0.04	0.01	0.03	0.06	0.12
	08/14/02	0.15	0.18	13.39	0.91	0.02	0.20	-0.02	0.02	0.00	0.02	0.00	0.07

TABLE 15  
BOTTOM SEDIMENT  
(PCI/G DRY WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
31	04/17/02	-0.02	0.03	-0.04	0.14	0.09	0.07	-0.01	0.04	0.00	0.04	0.31	0.36
	08/15/02	0.00	0.03	-0.01	0.11	-0.02	0.08	0.02	0.08	0.01	0.05	0.18	0.27
32	03/07/02	-0.01	0.03	-0.13	0.11	-0.05	0.08	0.00	0.06	0.00	0.05	-0.11	0.40
	06/17/02	0.06	0.04	0.12	0.15	0.00	0.08	-0.05	0.06	0.02	0.05	0.10	0.27
	08/27/02	0.01	0.06	-0.12	0.16	0.05	0.10	0.06	0.08	0.07	0.06	-0.14	0.47
	12/17/02	0.02	0.02	0.04	0.07	-0.04	0.06	-0.01	0.02	0.00	0.02	0.04	0.14
33	04/16/02	-0.01	0.03	0.14	0.15	-0.03	0.05	-0.02	0.04	-0.01	0.03	0.01	0.29
	08/14/02	0.02	0.02	-0.03	0.11	0.01	0.03	-0.01	0.02	0.00	0.02	0.04	0.16
34	04/16/02	0.00	0.03	0.13	0.11	-0.01	0.04	0.01	0.03	0.03	0.03	0.10	0.23
	08/14/02	0.00	0.02	-0.05	0.06	0.00	0.03	-0.01	0.02	0.01	0.02	-0.03	0.16
35X	01/28/02	0.01	0.03	0.10	0.15	0.05	0.10	0.06	0.07	-0.01	0.06	0.11	0.40
	06/17/02	0.01	0.04	-0.01	0.18	0.10	0.10	0.04	0.07	-0.01	0.06	-0.31	0.39
	08/22/02	0.00	0.02	-0.07	0.08	0.00	0.06	-0.19	0.06	-0.02	0.03	-0.02	0.20
	10/15/02	0.00	0.03	-0.04	0.11	0.02	0.06	0.00	0.04	-0.01	0.04	-0.20	0.27
36X	04/17/02	-0.01	0.03	-0.06	0.08	0.07	0.06	-0.03	0.04	0.00	0.03	0.11	0.28
	08/15/02	0.01	0.03	-0.02	0.07	0.02	0.06	-0.02	0.05	-0.02	0.04	-0.16	0.25
37C	04/17/02	-0.01	0.03	-0.01	0.07	0.00	0.05	-0.01	0.03	-0.03	0.03	-0.15	0.25
	08/14/02	0.00	0.01	-0.04	0.08	0.01	0.03	-0.01	0.03	0.01	0.02	0.01	0.12
39X	03/07/02	0.05	0.04	-0.11	0.20	-0.05	0.07	0.02	0.06	-0.02	0.04	0.18	0.35
	06/17/02	0.02	0.03	-0.05	0.14	0.01	0.06	0.00	0.07	-0.03	0.04	-0.06	0.26
	08/27/02	-0.02	0.02	-0.04	0.10	0.03	0.04	-0.04	0.05	-0.01	0.03	-0.11	0.22
	12/17/02	-0.01	0.03	-0.04	0.11	0.01	0.05	0.03	0.05	0.02	0.03	-0.17	0.21
67X	04/16/02	0.00	0.04	0.07	0.16	0.07	0.07	0.02	0.07	0.01	0.04	-0.01	0.36
	08/14/02	0.00	0.02	-0.09	0.06	0.01	0.04	0.01	0.02	0.01	0.02	-0.05	0.19

TABLE 15  
BOTTOM SEDIMENT  
(PCI/G DRY WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		SB-125		TH-228	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
31	04/17/02	0.01	0.04	0.05	0.11	0.01	0.04	0.00	0.04	0.01	0.10	4.15	0.19
	08/15/02	0.00	0.04	-0.29	0.60	0.01	0.03	0.01	0.03	0.03	0.08	3.49	0.13
32	03/07/02	-0.03	0.07	0.02	0.13	0.02	0.06	-0.04	0.05	0.04	0.11	0.82	0.21
	06/17/02	-0.04	0.05	-0.01	0.38	0.00	0.03	0.03	0.03	-0.07	0.08	0.90	0.14
	08/27/02	0.02	0.06	-0.08	0.26	0.05	0.08	-0.02	0.05	-0.03	0.13	0.75	0.33
	12/17/02	0.00	0.02	0.01	0.04	0.02	0.05	0.02	0.02	0.03	0.04	0.62	0.07
33	04/16/02	-0.04	0.04	0.02	0.09	-0.02	0.03	0.01	0.03	0.10	0.08	-0.12	0.23
	08/14/02	0.00	0.03	0.00	0.04	0.01	0.02	0.01	0.02	-0.01	0.04	0.34	0.10
34	04/16/02	0.04	0.04	0.02	0.07	0.00	0.02	0.00	0.03	0.03	0.06	0.19	0.12
	08/14/02	-0.02	0.03	0.02	0.03	-0.02	0.02	0.01	0.02	0.02	0.04	0.18	0.08
35X	01/28/02	-0.02	0.06	0.04	0.46	-0.01	0.04	0.00	0.04	-0.05	0.11	1.66	0.18
	06/17/02	-0.04	0.05	0.11	0.51	-0.01	0.04	-0.02	0.05	0.04	0.10	2.93	0.20
	08/22/02	0.00	0.02	-0.15	0.25	-0.01	0.02	0.00	0.02	0.03	0.06	3.80	0.10
	10/15/02	0.02	0.04	-0.10	0.12	-0.03	0.04	0.01	0.03	0.00	0.08	2.16	0.14
36X	04/17/02	0.01	0.05	0.00	0.07	0.02	0.04	0.00	0.04	0.00	0.07	0.48	0.12
	08/15/02	0.02	0.04	0.41	0.47	0.00	0.02	0.00	0.03	0.03	0.06	0.42	0.10
37C	04/17/02	0.02	0.04	0.00	0.07	0.01	0.03	-0.02	0.03	-0.04	0.07	0.48	0.13
	08/14/02	0.00	0.02	-0.10	0.27	0.00	0.01	0.00	0.02	0.00	0.03	0.41	0.06
39X	03/07/02	0.04	0.05	0.10	0.14	0.05	0.05	0.04	0.06	0.06	0.10	0.88	0.19
	06/17/02	-0.01	0.04	-0.10	0.36	0.00	0.03	0.05	0.04	0.02	0.08	1.06	0.13
	08/27/02	-0.01	0.03	0.04	0.16	0.00	0.02	0.06	0.04	0.03	0.06	1.02	0.10
	12/17/02	-0.01	0.04	-0.01	0.07	-0.01	0.04	0.02	0.03	0.01	0.06	1.04	0.11
67X	04/16/02	0.00	0.05	0.06	0.12	-0.01	0.04	0.22	0.06	-0.08	0.10	0.94	0.17
	08/14/02	-0.01	0.03	-0.03	0.05	0.00	0.02	0.08	0.03	-0.02	0.05	0.35	0.08

TABLE 16  
AQUATIC FLORA-FUCUS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32X	02/28/02	0.089	0.071	5.46	0.52	-0.054	0.089	0.003	0.010	-0.001	0.011	0.008	0.035
	05/23/02	-0.030	0.110	6.83	0.71	-0.060	0.140	0.007	0.014	0.011	0.017	0.040	0.059
	08/13/02	0.043	0.068	6.91	0.47	-0.018	0.076	0.000	0.008	0.011	0.009	0.018	0.027
	12/10/02	0.048	0.091	7.87	0.52	-0.040	0.110	0.001	0.010	0.008	0.011	-0.003	0.032
33X	04/16/02	0.064	0.061	4.80	0.27	0.043	0.055	-0.003	0.006	-0.001	0.006	0.014	0.021
	08/14/02	0.031	0.062	6.14	0.43	-0.071	0.061	-0.008	0.007	-0.008	0.008	0.008	0.020
35X	03/05/02	0.101	0.084	5.07	0.51	0.000	0.067	-0.003	0.009	-0.001	0.010	-0.017	0.029
	05/23/02	0.076	0.081	4.84	0.56	0.000	0.099	-0.009	0.012	-0.001	0.012	-0.005	0.035
	08/13/02	-0.013	0.084	5.48	0.53	0.035	0.096	-0.001	0.011	-0.006	0.009	-0.019	0.028
	12/10/02	0.079	0.094	6.04	0.46	0.020	0.110	-0.005	0.011	-0.001	0.011	-0.013	0.029
36X	04/17/02	0.028	0.042	4.86	0.29	-0.020	0.044	-0.003	0.006	0.002	0.006	-0.002	0.019
	08/15/02	-0.014	0.079	5.30	0.39	-0.030	0.140	0.004	0.009	0.006	0.010	0.002	0.040
39X	03/05/02	0.120	0.110	7.37	0.73	0.069	0.091	-0.002	0.012	-0.002	0.010	-0.013	0.033
	05/23/02	-0.030	0.140	4.61	0.77	0.050	0.150	-0.002	0.017	0.000	0.015	0.004	0.054
	08/13/02	-0.002	0.064	5.32	0.49	0.016	0.082	0.003	0.010	-0.001	0.010	0.016	0.023
	12/10/02	-0.012	0.099	7.57	0.52	-0.020	0.110	0.006	0.012	-0.001	0.012	0.013	0.031



TABLE 16  
AQUATIC FLORA-FUCUS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32X	02/28/02	-0.005	0.010	0.010	0.024	0.016	0.017	-0.004	0.013	-0.004	0.010	-0.001	0.082
	05/23/02	0.001	0.014	-0.013	0.038	0.010	0.021	0.012	0.019	0.021	0.016	0.030	0.110
	08/13/02	-0.004	0.008	-0.018	0.025	0.006	0.014	0.003	0.010	-0.015	0.008	0.009	0.071
	12/10/02	0.010	0.017	-0.014	0.029	0.000	0.020	0.000	0.013	0.005	0.011	-0.047	0.096
33X	04/16/02	0.001	0.006	0.013	0.025	-0.001	0.011	-0.001	0.007	-0.001	0.006	-0.002	0.049
	08/14/02	0.007	0.009	-0.005	0.033	0.010	0.014	-0.002	0.008	-0.004	0.006	-0.042	0.068
35X	03/05/02	-0.002	0.008	-0.004	0.029	-0.007	0.014	-0.004	0.010	0.000	0.008	-0.030	0.091
	05/23/02	0.005	0.011	-0.023	0.033	0.006	0.017	-0.002	0.013	0.003	0.010	0.083	0.099
	08/13/02	0.003	0.012	-0.004	0.032	0.004	0.019	-0.007	0.011	-0.002	0.008	-0.100	0.100
	12/10/02	0.002	0.015	-0.017	0.030	0.008	0.020	-0.005	0.014	-0.003	0.012	-0.049	0.092
36X	04/17/02	-0.002	0.006	0.022	0.030	-0.001	0.009	-0.002	0.007	0.003	0.005	0.001	0.042
	08/15/02	0.008	0.012	-0.029	0.023	-0.015	0.020	0.006	0.018	-0.003	0.012	-0.016	0.064
39X	03/05/02	0.004	0.014	-0.046	0.035	0.004	0.021	0.008	0.014	0.002	0.012	-0.046	0.087
	05/23/02	0.001	0.019	-0.014	0.048	0.000	0.026	-0.015	0.023	-0.009	0.014	-0.050	0.130
	08/13/02	0.002	0.007	-0.011	0.050	0.008	0.016	0.000	0.010	-0.003	0.008	0.069	0.079
	12/10/02	-0.005	0.016	0.030	0.057	0.003	0.020	0.001	0.015	-0.004	0.012	0.037	0.098

TABLE 16  
AQUATIC FLORA-FUCUS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		SB-125		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32X	02/28/02	-0.005	0.012	0.032	0.039	0.010	0.012	0.002	0.010	0.004	0.023	0.041	0.046
	05/23/02	-0.004	0.020	0.031	0.076	0.009	0.016	-0.004	0.013	0.003	0.030	0.016	0.060
	08/13/02	0.002	0.012	0.002	0.019	0.001	0.010	0.004	0.008	0.011	0.020	0.066	0.035
	12/10/02	0.007	0.016	-0.014	0.047	0.007	0.011	-0.004	0.011	-0.007	0.021	0.058	0.062
33X	04/16/02	0.001	0.008	0.018	0.015	0.009	0.006	0.003	0.006	0.005	0.012	0.039	0.030
	08/14/02	0.005	0.010	-0.013	0.015	-0.002	0.008	0.002	0.008	0.008	0.018	0.033	0.023
35X	03/05/02	0.004	0.013	0.018	0.019	-0.005	0.009	0.001	0.009	0.006	0.020	-0.018	0.047
	05/23/02	-0.002	0.011	0.016	0.045	0.008	0.010	0.003	0.010	0.008	0.021	0.038	0.047
	08/13/02	0.000	0.013	-0.006	0.019	0.000	0.010	0.010	0.011	0.019	0.020	0.032	0.038
	12/10/02	-0.001	0.015	-0.008	0.045	-0.002	0.012	0.002	0.010	-0.010	0.023	0.090	0.044
36X	04/17/02	0.001	0.009	0.016	0.013	0.005	0.006	0.003	0.006	-0.009	0.011	0.038	0.029
	08/15/02	-0.002	0.012	0.260	0.450	0.003	0.007	0.003	0.008	-0.005	0.015	0.044	0.031
39X	03/05/02	-0.011	0.018	0.022	0.026	0.004	0.010	-0.001	0.013	-0.013	0.028	0.039	0.057
	05/23/02	-0.008	0.019	0.030	0.057	-0.003	0.016	-0.007	0.013	0.016	0.030	0.010	0.060
	08/13/02	0.000	0.013	0.011	0.018	-0.004	0.009	-0.007	0.011	-0.015	0.024	0.034	0.039
	12/10/02	-0.002	0.015	0.020	0.047	0.002	0.011	-0.006	0.010	0.002	0.023	0.072	0.048

TABLE 17A  
FISH-FLounder  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
32	02/27/02	0.01	0.15	3.2	0.5	-0.06	0.20	-0.007	0.012	0.000	0.012	0.019	0.045
	05/07/02	0.06	0.24	4.0	0.8	-0.12	0.36	0.011	0.029	0.006	0.030	0.024	0.096
	07/15/02	0.16	0.22	4.1	0.5	0.10	0.45	-0.006	0.017	0.017	0.027	-0.051	0.087
	11/05/02	-0.19	0.20	4.0	0.6	-0.05	0.24	-0.004	0.050	-0.028	0.018	-0.007	0.049
35	03/27/02	-0.08	0.18	3.7	0.8	0.05	0.20	-0.003	0.030	0.010	0.021	0.000	0.076
	04/23/02	0.15	0.14	3.5	0.6	-0.05	0.17	-0.003	0.018	-0.002	0.017	0.013	0.052
	07/15/02	0.04	0.22	3.7	0.6	0.17	0.42	0.010	0.019	0.013	0.025	-0.010	0.120
	11/04/02	-0.10	0.14	3.9	0.5	-0.04	0.17	-0.006	0.015	0.004	0.018	-0.012	0.043

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
32	02/27/02	-0.004	0.017	-0.014	0.041	0.009	0.031	0.007	0.018	0.001	0.020	0.09	0.15
	05/07/02	-0.010	0.026	-0.033	0.063	0.021	0.052	0.005	0.037	-0.006	0.033	-0.16	0.21
	07/15/02	-0.002	0.017	-0.046	0.046	-0.019	0.042	-0.026	0.039	-0.033	0.033	0.02	0.14
	11/05/02	-0.008	0.021	-0.050	0.051	0.020	0.039	-0.004	0.026	0.001	0.022	0.04	0.18
35	03/27/02	0.007	0.023	0.035	0.057	0.000	0.045	0.000	0.025	-0.004	0.022	-0.13	0.19
	04/23/02	0.010	0.020	-0.056	0.047	0.007	0.033	-0.017	0.018	0.001	0.017	0.07	0.16
	07/15/02	0.000	0.019	0.013	0.045	0.025	0.041	-0.027	0.040	-0.031	0.035	0.00	0.16
	11/04/02	-0.006	0.019	-0.033	0.040	-0.006	0.026	0.001	0.019	-0.002	0.018	-0.19	0.14

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		SB-125		TH-228	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
32	02/27/02	0.006	0.022	-0.02	0.07	-0.010	0.016	-0.004	0.017	0.017	0.038	-0.007	0.053
	05/07/02	-0.001	0.035	0.00	0.26	-0.004	0.029	0.002	0.028	-0.041	0.056	-0.010	0.110
	07/15/02	0.008	0.024	-0.50	1.70	-0.007	0.018	-0.013	0.015	0.032	0.038	0.033	0.056
	11/05/02	-0.014	0.027	0.05	0.08	-0.007	0.021	0.007	0.019	0.000	0.046	-0.024	0.076
35	03/27/02	-0.004	0.030	0.04	0.05	0.000	0.022	-0.009	0.018	-0.045	0.059	0.007	0.095
	04/23/02	0.002	0.022	-0.01	0.04	0.003	0.021	0.012	0.016	0.033	0.042	-0.001	0.071
	07/15/02	-0.008	0.024	0.20	2.00	0.017	0.017	0.004	0.017	0.004	0.033	0.049	0.055
	11/04/02	-0.009	0.023	0.02	0.06	0.011	0.017	-0.006	0.017	-0.006	0.036	-0.004	0.057

TABLE 17B  
FISH-OTHER  
(PCI/G WET WT.)

LOCATION	COLLECTION		BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
	DATE	TYPE	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	03/14/02	BLUEFISH	0.09	0.16	3.5	0.6	0.11	0.18	0.003	0.018	-0.011	0.017	0.023	0.070
	04/10/02	SKATE	-0.06	0.17	2.2	0.6	-0.17	0.24	0.005	0.021	-0.005	0.023	-0.017	0.055
	07/31/02	MIXTURE (A)	-0.07	0.20	4.7	0.7	-0.08	0.34	0.000	0.023	0.004	0.025	0.071	0.072
	10/24/02	BASS	0.08	0.20	4.5	0.8	0.05	0.28	-0.017	0.021	-0.007	0.028	0.025	0.066
35	01/14/02	SKATE	0.10	0.16	1.8	0.4	0.14	0.20	0.006	0.013	-0.010	0.017	0.026	0.049
	04/09/02	SKATE	-0.03	0.17	2.5	0.7	0.00	0.15	-0.005	0.019	-0.005	0.019	-0.030	0.082
	08/05/02	BLACKFISH	0.03	0.19	4.3	0.6	-0.07	0.30	-0.004	0.017	-0.002	0.020	-0.003	0.073
	11/04/02	SKATE	-0.07	0.16	2.5	0.6	0.07	0.20	0.022	0.018	-0.010	0.022	-0.069	0.046
40X	01/29/02	BASS	-0.08	0.12	3.4	0.6	-0.03	0.17	0.000	0.015	0.011	0.015	-0.001	0.053
	04/12/02	BASS	0.09	0.22	4.3	0.8	0.02	0.28	0.002	0.023	-0.014	0.030	-0.041	0.097
	07/31/02	BLACKFISH	-0.12	0.22	3.3	0.5	0.15	0.40	-0.004	0.020	-0.012	0.024	0.002	0.077
	11/05/02	BASS	-0.07	0.18	4.5	0.7	-0.09	0.20	0.007	0.020	0.007	0.018	-0.023	0.041

LOCATION	COLLECTION		CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
	DATE	TYPE	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	03/14/02	BLUEFISH	0.014	0.024	-0.004	0.037	0.039	0.030	-0.003	0.022	-0.024	0.019	-0.04	0.18
	04/10/02	SKATE	-0.007	0.024	-0.001	0.066	0.013	0.037	0.003	0.027	-0.008	0.024	0.12	0.19
	07/31/02	MIXTURE (A)	0.008	0.026	-0.037	0.053	-0.012	0.044	0.003	0.040	-0.012	0.033	-0.02	0.19
	10/24/02	BASS	-0.014	0.026	0.025	0.053	0.033	0.049	0.001	0.032	0.000	0.026	-0.13	0.20
35	01/14/02	SKATE	0.008	0.013	-0.010	0.036	-0.007	0.034	0.006	0.022	-0.015	0.021	0.06	0.16
	04/09/02	SKATE	0.007	0.016	0.019	0.059	0.023	0.026	-0.010	0.020	-0.006	0.020	0.04	0.22
	08/05/02	BLACKFISH	0.021	0.022	-0.006	0.056	0.013	0.036	0.014	0.038	0.010	0.028	0.16	0.13
	11/04/02	SKATE	0.000	0.027	-0.058	0.046	0.012	0.040	0.012	0.030	-0.008	0.020	0.01	0.22
40X	01/29/02	BASS	0.000	0.018	0.011	0.044	0.011	0.032	0.010	0.019	-0.006	0.019	-0.12	0.17
	04/12/02	BASS	0.017	0.024	-0.031	0.063	-0.010	0.047	-0.010	0.029	-0.002	0.032	-0.13	0.24
	07/31/02	BLACKFISH	-0.017	0.022	-0.031	0.056	0.022	0.041	-0.002	0.039	0.002	0.032	0.05	0.20
	11/05/02	BASS	-0.008	0.029	0.008	0.046	-0.028	0.036	0.015	0.026	0.006	0.019	0.07	0.17

(A) MIXTURE OF SCUP AND BLACKFISH

TABLE 17B  
FISH-OTHER  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	TYPE	AG-110M		I-131		CS-134		CS-137		SB-125		TH-228	
			(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
32	03/14/02	BLUEFISH	-0.010	0.023	0.003	0.040	0.000	0.020	-0.004	0.019	-0.021	0.044	-0.058	0.065
	04/10/02	SKATE	0.003	0.031	0.009	0.038	-0.005	0.027	0.002	0.025	-0.004	0.060	-0.047	0.089
	07/31/02	MIXTURE (A)	0.003	0.030	-0.100	0.580	-0.009	0.020	-0.005	0.022	0.003	0.044	-0.022	0.084
	10/24/02	BASS	0.008	0.032	0.060	0.230	-0.006	0.021	-0.001	0.022	0.000	0.053	-0.064	0.074
35	01/14/02	SKATE	0.004	0.021	-0.020	0.110	0.004	0.015	0.014	0.017	-0.008	0.038	0.018	0.063
	04/09/02	SKATE	-0.022	0.033	0.006	0.036	-0.011	0.025	0.009	0.021	-0.023	0.052	0.053	0.080
	08/05/02	BLACKFISH	-0.015	0.022	-0.320	0.600	-0.009	0.014	0.003	0.015	-0.004	0.037	-0.034	0.069
	11/04/02	SKATE	0.000	0.025	-0.047	0.076	-0.005	0.020	-0.022	0.022	0.019	0.043	-0.034	0.076
40X	01/29/02	BASS	0.019	0.024	0.035	0.043	-0.002	0.014	0.014	0.018	0.020	0.045	0.024	0.053
	04/12/02	BASS	0.016	0.024	0.030	0.110	0.032	0.026	-0.004	0.025	0.032	0.052	-0.060	0.110
	07/31/02	BLACKFISH	-0.009	0.027	-0.030	0.610	-0.005	0.023	-0.017	0.018	0.000	0.043	0.016	0.062
	11/05/02	BASS	-0.014	0.028	-0.054	0.066	0.010	0.014	0.000	0.016	0.064	0.049	0.011	0.082

(A) MIXTURE OF SCUP AND BLACKFISH

TABLE 18  
MUSSELS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
28	03/20/02	-0.140	0.220	1.3	0.6	-0.03	0.26	-0.018	0.023	-0.024	0.025	-0.085	0.071
	07/01/02	0.000	0.230	1.5	0.5	0.04	0.35	-0.025	0.027	0.001	0.026	0.024	0.078
	08/14/02	0.000	0.160	1.6	0.4	0.09	0.27	-0.008	0.016	-0.004	0.020	-0.028	0.048
	12/10/02	0.040	0.200	1.6	0.5	-0.12	0.26	0.005	0.017	-0.010	0.019	-0.040	0.052
30	03/05/02	0.090	0.170	1.9	0.5	-0.04	0.19	-0.011	0.019	0.004	0.020	0.048	0.056
	06/18/02	0.140	0.230	1.6	0.6	0.04	0.32	-0.018	0.022	0.003	0.024	-0.023	0.090
	08/13/02	0.030	0.190	1.7	0.5	0.02	0.27	-0.006	0.019	-0.002	0.016	0.017	0.058
	10/29/02	-0.050	0.160	2.0	0.4	-0.02	0.20	-0.009	0.015	0.009	0.017	-0.039	0.045

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
28	03/20/02	-0.014	0.022	-0.050	0.110	0.030	0.043	-0.002	0.032	-0.005	0.021	-0.10	0.22
	07/01/02	0.010	0.027	-0.032	0.064	-0.003	0.044	0.024	0.039	0.003	0.024	-0.09	0.18
	08/14/02	0.005	0.015	0.050	0.069	0.004	0.033	-0.045	0.030	0.003	0.022	-0.04	0.15
	12/10/02	-0.006	0.024	-0.021	0.040	0.021	0.039	0.034	0.031	-0.006	0.025	-0.08	0.17
30	03/05/02	-0.002	0.023	-0.060	0.054	-0.001	0.029	-0.015	0.022	0.011	0.020	-0.15	0.19
	06/18/02	0.017	0.021	-0.070	0.058	0.026	0.045	-0.006	0.035	0.000	0.029	0.14	0.21
	08/13/02	-0.013	0.019	0.008	0.042	-0.004	0.033	0.001	0.029	-0.004	0.023	0.04	0.16
	10/29/02	0.011	0.019	-0.010	0.035	-0.010	0.033	0.005	0.022	-0.010	0.230	0.02	0.15

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		SB-125		TH-228	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
28	03/20/02	0.010	0.033	0.050	0.069	0.000	0.025	-0.009	0.024	-0.001	0.060	0.060	0.100
	07/01/02	-0.004	0.024	-0.140	0.170	0.001	0.023	-0.004	0.022	0.018	0.060	0.011	0.098
	08/14/02	-0.003	0.023	0.220	0.280	0.000	0.014	-0.005	0.016	0.002	0.037	0.017	0.052
	12/10/02	0.014	0.027	0.120	0.260	0.000	0.019	-0.004	0.017	-0.012	0.041	0.083	0.073
30	03/05/02	-0.003	0.028	0.012	0.033	-0.006	0.022	0.007	0.020	0.000	0.047	-0.040	0.072
	06/18/02	0.003	0.036	0.040	0.140	-0.031	0.024	-0.023	0.024	0.033	0.055	-0.020	0.110
	08/13/02	-0.012	0.027	0.020	0.330	0.002	0.019	-0.015	0.017	-0.003	0.037	-0.008	0.061
	10/29/02	0.002	0.020	0.030	0.100	-0.005	0.015	-0.004	0.019	0.013	0.043	-0.043	0.059

TABLE 19  
OYSTERS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
31	03/08/02	-0.060	0.170	1.540	0.560	-0.01	0.16	0.000	0.015	0.001	0.020	-0.017	0.072
	06/17/02	0.300	0.230	1.970	0.600	-0.11	0.33	0.002	0.025	-0.024	0.032	0.100	0.100
	08/28/02	0.050	0.120	1.950	0.360	-0.06	0.17	-0.002	0.013	-0.002	0.012	0.016	0.038
	12/16/02	0.000	0.200	1.990	0.520	0.09	0.28	-0.012	0.019	-0.013	0.023	0.012	0.050
32	03/06/02	0.110	0.160	1.970	0.580	0.08	0.19	0.000	0.019	0.002	0.015	-0.009	0.073
	06/18/02	-0.080	0.180	1.350	0.560	0.25	0.25	0.011	0.021	-0.003	0.022	-0.031	0.066
	08/30/02	-0.030	0.120	1.360	0.270	0.00	0.14	0.005	0.011	0.008	0.011	-0.017	0.029
	12/17/02	0.000	0.190	1.630	0.450	0.26	0.29	0.009	0.021	0.023	0.026	-0.018	0.051
34X	03/08/02	-0.090	0.130	2.030	0.460	0.08	0.16	0.003	0.019	0.021	0.019	0.001	0.045
	06/18/02	0.040	0.220	1.640	0.650	0.07	0.29	-0.023	0.019	0.007	0.028	0.100	0.110
	08/28/02	0.040	0.180	2.120	0.490	0.08	0.24	-0.003	0.018	0.015	0.020	0.007	0.046
	12/16/02	0.160	0.240	1.330	0.470	-0.11	0.31	0.004	0.020	-0.013	0.023	0.012	0.053
36	03/07/02	-0.100	0.220	1.600	0.630	-0.01	0.25	-0.018	0.031	-0.013	0.031	0.009	0.081
	06/17/02	-0.100	0.140	1.580	0.440	-0.13	0.21	0.009	0.017	-0.003	0.017	0.002	0.056
	08/27/02	0.210	0.190	1.540	0.430	0.19	0.26	0.003	0.020	-0.011	0.023	-0.035	0.050
	12/10/02	-0.070	0.230	1.640	0.500	-0.02	0.33	0.007	0.020	-0.001	0.023	0.007	0.056
37C	03/07/02	0.050	0.240	2.480	0.710	-0.03	0.26	-0.016	0.030	-0.005	0.030	0.031	0.079
	06/17/02	0.120	0.260	2.110	0.660	0.26	0.28	0.026	0.029	0.006	0.030	0.024	0.082
	08/27/02	-0.040	0.150	1.460	0.360	0.06	0.19	0.001	0.013	0.000	0.014	-0.014	0.039
	12/10/02	0.140	0.240	1.530	0.510	0.11	0.41	0.011	0.022	0.010	0.028	-0.021	0.074
40X	01/29/02	-0.110	0.150	1.780	0.440	-0.10	0.18	0.001	0.016	-0.003	0.020	0.011	0.047
	06/17/02	-0.020	0.170	1.130	0.510	0.10	0.33	-0.006	0.021	0.008	0.029	0.025	0.054
	07/31/02	0.050	0.230	2.030	0.530	0.20	0.34	0.007	0.020	0.001	0.020	0.014	0.075
	11/05/02	0.020	0.160	2.280	0.500	-0.07	0.18	0.002	0.017	0.009	0.021	0.000	0.033

TABLE 19  
OYSTERS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
31	03/08/02	-0.006	0.023	-0.022	0.053	0.006	0.037	-0.012	0.025	0.020	0.020	-0.05	0.05
	06/17/02	0.000	0.026	-0.060	0.054	-0.031	0.047	-0.028	0.039	-0.005	0.035	0.04	0.22
	08/28/02	0.004	0.013	-0.037	0.036	-0.009	0.024	-0.001	0.020	-0.008	0.016	0.02	0.13
	12/16/02	-0.021	0.023	0.081	0.093	-0.012	0.042	0.003	0.031	0.007	0.024	0.10	0.17
32	03/06/02	0.012	0.025	-0.010	0.052	0.002	0.035	0.003	0.025	-0.003	0.024	-0.04	0.20
	06/18/02	0.014	0.028	-0.034	0.057	-0.007	0.032	0.013	0.034	-0.022	0.026	0.08	0.20
	08/30/02	0.007	0.012	-0.017	0.036	0.004	0.021	0.004	0.018	-0.006	0.015	0.04	0.10
	12/17/02	0.017	0.021	-0.044	0.049	-0.002	0.041	0.000	0.031	0.014	0.025	-0.07	0.20
34X	03/08/02	0.001	0.018	-0.046	0.038	-0.004	0.029	-0.001	0.020	0.006	0.018	0.20	0.15
	06/18/02	-0.001	0.026	-0.038	0.045	0.023	0.047	0.014	0.029	-0.003	0.023	0.08	0.23
	08/28/02	-0.008	0.019	0.026	0.072	-0.014	0.037	-0.021	0.029	-0.019	0.023	-0.07	0.16
	12/16/02	-0.004	0.021	-0.074	0.050	-0.019	0.047	0.022	0.031	-0.004	0.029	0.11	0.18
36	03/07/02	-0.028	0.031	0.017	0.098	0.027	0.043	0.008	0.053	0.000	0.027	-0.17	0.24
	06/17/02	0.005	0.018	-0.037	0.038	-0.015	0.027	0.003	0.021	-0.007	0.023	-0.01	0.14
	08/27/02	0.011	0.019	0.081	0.077	0.023	0.041	-0.004	0.030	-0.004	0.025	0.02	0.15
	12/10/02	0.000	0.024	-0.005	0.041	0.006	0.047	-0.003	0.034	0.013	0.028	-0.02	0.19
37C	03/07/02	0.024	0.034	0.210	0.160	-0.055	0.047	0.014	0.052	-0.004	0.029	-0.03	0.22
	06/17/02	0.000	0.027	-0.001	0.048	0.005	0.054	-0.002	0.033	-0.008	0.037	-0.06	0.23
	08/27/02	0.012	0.014	-0.001	0.070	0.010	0.028	-0.009	0.024	0.003	0.019	-0.07	0.13
	12/10/02	0.011	0.020	-0.037	0.047	0.026	0.041	0.017	0.042	0.005	0.031	0.20	0.21
40X	01/29/02	-0.009	0.019	-0.008	0.045	-0.020	0.028	0.013	0.024	0.012	0.017	-0.01	0.15
	06/17/02	0.007	0.024	-0.036	0.062	0.006	0.045	0.000	0.028	0.006	0.029	-0.20	0.23
	07/31/02	0.011	0.023	-0.009	0.043	-0.006	0.046	0.018	0.045	-0.002	0.030	0.05	0.20
	11/05/02	0.003	0.024	-0.008	0.043	-0.006	0.029	0.016	0.023	0.015	0.021	-0.04	0.14



TABLE 19  
OYSTERS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		SB-125		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
31	03/08/02	0.026	0.026	0.017	0.041	0.002	0.023	-0.019	0.025	-0.056	0.050	0.000	0.073
	06/17/02	0.001	0.028	-0.060	0.170	-0.006	0.026	-0.019	0.025	0.086	0.062	0.080	0.100
	08/28/02	-0.015	0.020	-0.012	0.075	-0.007	0.016	-0.015	0.014	0.006	0.035	0.037	0.057
	12/16/02	-0.003	0.026	-0.050	0.190	0.007	0.020	-0.006	0.021	0.011	0.043	0.007	0.081
32	03/06/02	0.053	0.024	0.025	0.053	0.015	0.020	0.005	0.030	0.007	0.049	-0.061	0.074
	06/18/02	0.053	0.022	0.090	0.130	-0.005	0.021	0.010	0.018	0.014	0.052	0.057	0.086
	08/30/02	0.025	0.010	0.030	0.110	-0.006	0.011	-0.006	0.018	-0.010	0.025	0.030	0.045
	12/17/02	0.025	0.027	-0.070	0.160	-0.011	0.023	-0.038	0.028	0.007	0.047	-0.032	0.070
34X	03/08/02	0.006	0.025	-0.005	0.042	0.008	0.016	0.008	0.017	-0.023	0.046	0.052	0.061
	06/18/02	0.022	0.031	-0.180	0.150	-0.006	0.021	-0.003	0.022	-0.011	0.048	0.000	0.090
	08/28/02	0.005	0.023	0.000	0.100	-0.007	0.020	0.005	0.019	0.017	0.043	-0.029	0.069
	12/16/02	0.004	0.028	0.040	0.190	-0.012	0.022	0.016	0.019	-0.004	0.055	-0.061	0.083
36	03/07/02	0.000	0.042	-0.047	0.070	0.002	0.025	-0.019	0.031	0.065	0.070	0.080	0.110
	06/17/02	0.005	0.026	-0.020	0.130	0.004	0.019	-0.003	0.016	0.005	0.040	0.023	0.053
	08/27/02	0.000	0.026	0.090	0.110	-0.005	0.022	-0.001	0.018	-0.007	0.051	0.017	0.077
	12/10/02	-0.021	0.023	-0.280	0.340	0.001	0.019	-0.005	0.018	0.016	0.047	0.065	0.083
37C	03/07/02	-0.003	0.038	-0.038	0.071	0.008	0.029	-0.022	0.027	-0.017	0.068	0.030	0.110
	06/17/02	0.008	0.033	-0.080	0.180	-0.009	0.025	0.000	0.024	0.037	0.062	-0.070	0.110
	08/27/02	-0.006	0.018	-0.005	0.094	-0.009	0.013	-0.003	0.016	-0.004	0.036	-0.007	0.055
	12/10/02	-0.017	0.032	-0.100	0.320	-0.001	0.021	0.018	0.021	-0.025	0.052	0.046	0.089
40X	01/03/00	0.076	0.023	-0.017	0.047	0.008	0.020	-0.017	0.057	0.052	0.044	0.020	0.070
	06/17/02	0.052	0.026	-0.080	0.130	0.028	0.024	-0.040	0.070	0.025	0.055	-0.063	0.099
	07/31/02	0.027	0.016	-0.230	0.580	0.021	0.020	-0.001	0.019	-0.038	0.043	0.041	0.082
	11/05/02	0.059	0.021	0.015	0.061	0.006	0.017	-0.033	0.037	-0.020	0.046	0.030	0.075

TABLE 20  
CLAMS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
29	02/06/02	0.060	0.180	2.6	0.6	0.01	0.17	0.003	0.018	0.000	0.022	0.034	0.043
	04/24/02	0.210	0.200	2.1	0.6	-0.12	0.23	0.010	0.022	-0.007	0.021	-0.061	0.058
	07/23/02	-0.050	0.270	2.0	0.5	0.26	0.44	-0.030	0.019	-0.006	0.025	0.028	0.091
	12/13/02	0.080	0.160	2.3	0.5	0.18	0.21	0.012	0.018	-0.005	0.020	-0.026	0.043
35X	01/28/02	-0.100	0.200	2.1	0.6	-0.11	0.24	0.001	0.020	0.000	0.017	-0.015	0.065
	06/10/02	0.040	0.140	2.0	0.6	-0.24	0.23	0.010	0.021	0.001	0.018	-0.012	0.045
	08/22/02	-0.080	0.140	1.5	0.4	0.13	0.18	-0.003	0.012	0.004	0.014	0.000	0.038
	10/15/02	-0.040	0.170	2.6	0.5	0.00	0.29	0.010	0.018	0.015	0.020	-0.025	0.045
38	01/28/02	0.040	0.150	1.5	0.6	0.03	0.17	0.008	0.019	0.009	0.019	-0.026	0.070
	06/10/02	-0.080	0.200	2.1	0.5	-0.08	0.28	0.003	0.022	-0.014	0.024	0.002	0.048
	08/22/02	-0.030	0.110	2.0	0.4	0.09	0.16	0.003	0.013	-0.003	0.011	0.003	0.037
	10/15/02	0.050	0.200	2.0	0.5	0.10	0.37	0.016	0.022	-0.015	0.023	0.008	0.055
39X	01/25/02	0.000	0.200	1.4	0.6	-0.02	0.21	0.000	0.023	0.020	0.021	0.059	0.066
	04/24/02	0.020	0.120	2.1	0.6	-0.20	0.17	0.002	0.022	-0.003	0.015	0.002	0.073
	07/23/02	0.030	0.210	1.8	0.4	-0.07	0.43	-0.003	0.017	0.013	0.028	-0.033	0.083
	10/28/02	0.000	0.150	2.0	0.4	-0.10	0.21	-0.001	0.013	0.000	0.015	0.018	0.041

TABLE 20  
CLAMS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
29	02/06/02	0.021	0.021	-0.012	0.041	-0.030	0.037	-0.002	0.019	0.009	0.021	-0.19	0.19
	04/24/02	-0.024	0.030	-0.039	0.049	-0.013	0.039	-0.003	0.029	-0.004	0.021	-0.06	0.22
	07/23/02	0.001	0.020	-0.042	0.049	-0.023	0.046	-0.023	0.042	-0.026	0.040	-0.04	0.18
	12/13/02	-0.001	0.023	-0.013	0.039	0.034	0.034	0.024	0.025	-0.005	0.023	-0.01	0.19
35X	01/28/02	0.008	0.020	-0.075	0.049	0.015	0.037	-0.005	0.028	-0.002	0.026	-0.06	0.18
	06/10/02	0.000	0.024	0.030	0.049	-0.020	0.035	-0.008	0.023	-0.004	0.024	0.14	0.17
	08/22/02	0.003	0.015	0.031	0.063	-0.007	0.031	0.003	0.024	-0.017	0.020	-0.03	0.13
	10/15/02	0.006	0.018	-0.029	0.053	0.013	0.035	-0.007	0.027	0.026	0.027	0.05	0.17
38	01/28/02	0.002	0.020	0.005	0.045	-0.009	0.036	-0.008	0.022	0.004	0.020	0.03	0.19
	06/10/02	0.002	0.015	0.002	0.042	-0.017	0.039	-0.010	0.030	0.002	0.023	-0.16	0.18
	08/22/02	0.005	0.016	0.074	0.058	0.014	0.025	0.017	0.021	-0.005	0.017	-0.08	0.12
	10/15/02	-0.004	0.021	-0.015	0.046	0.000	0.039	-0.034	0.035	0.002	0.030	0.04	0.16
39X	01/25/02	-0.013	0.023	-0.018	0.054	0.018	0.038	0.008	0.022	-0.011	0.025	-0.05	0.19
	04/24/02	-0.011	0.028	0.006	0.042	0.026	0.037	-0.016	0.024	0.000	0.021	-0.01	0.17
	07/23/02	0.019	0.019	-0.038	0.052	-0.010	0.042	0.007	0.040	0.012	0.034	0.07	0.16
	10/28/02	-0.004	0.017	-0.010	0.035	0.007	0.029	-0.001	0.019	0.007	0.019	0.06	0.13

TABLE 20  
CLAMS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		SB-125		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
29	02/06/02	-0.004	0.027	-0.001	0.036	-0.002	0.021	0.000	0.021	0.023	0.052	0.002	0.092
	04/24/02	0.009	0.021	-0.008	0.041	0.016	0.024	0.018	0.025	0.005	0.060	-0.020	0.110
	07/23/02	0.015	0.025	0.300	0.890	-0.002	0.021	0.003	0.019	-0.002	0.041	-0.052	0.073
	12/13/02	0.010	0.022	0.020	0.120	0.000	0.020	-0.017	0.019	0.024	0.039	-0.032	0.077
35X	01/28/02	-0.015	0.035	0.049	0.065	0.015	0.021	0.000	0.021	0.037	0.051	-0.009	0.082
	06/10/02	-0.014	0.026	0.030	0.120	-0.003	0.019	-0.006	0.020	-0.007	0.042	0.051	0.073
	08/22/02	0.019	0.018	-0.040	0.140	0.002	0.015	0.000	0.014	0.005	0.032	0.050	0.055
	10/15/02	-0.017	0.020	-0.040	0.310	-0.003	0.017	0.006	0.016	-0.005	0.033	-0.006	0.065
38	06/10/02	0.013	0.028	-0.030	0.140	0.012	0.022	-0.006	0.017	0.003	0.046	-0.016	0.073
	01/28/02	0.012	0.022	-0.016	0.051	-0.010	0.021	-0.004	0.022	-0.004	0.045	0.008	0.068
	08/22/02	0.005	0.017	-0.030	0.110	-0.001	0.012	-0.008	0.012	-0.002	0.029	0.033	0.042
	10/15/02	0.001	0.029	0.190	0.400	0.011	0.021	0.006	0.019	0.006	0.045	-0.056	0.062
39X	01/25/02	-0.011	0.031	0.018	0.073	-0.014	0.020	-0.010	0.025	-0.009	0.043	-0.080	0.074
	04/24/02	-0.007	0.029	-0.022	0.037	-0.021	0.019	0.005	0.018	-0.005	0.053	0.035	0.099
	07/23/02	0.007	0.025	0.100	1.000	-0.005	0.019	-0.009	0.016	0.020	0.051	0.051	0.066
	10/28/02	-0.004	0.021	0.030	0.100	0.001	0.014	0.004	0.013	-0.026	0.030	-0.007	0.050

TABLE 22  
LOBSTERS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	02/04/02	-0.01	0.15	1.9	0.6	-0.06	0.15	-0.012	0.020	-0.002	0.017	-0.020	0.043
	06/03/02	-0.02	0.19	1.7	0.6	0.04	0.30	0.008	0.023	-0.002	0.028	0.046	0.071
	08/07/02	-0.05	0.18	2.7	0.5	-0.21	0.34	-0.008	0.016	-0.005	0.024	-0.005	0.054
	11/01/02	-0.04	0.15	2.4	0.4	-0.11	0.16	-0.004	0.013	0.002	0.018	0.031	0.033
35	02/04/02	0.05	0.18	2.6	0.7	0.11	0.18	0.019	0.026	0.009	0.017	0.001	0.075
	06/03/02	0.10	0.23	2.6	0.6	0.22	0.33	-0.018	0.023	-0.002	0.024	-0.035	0.058
	08/07/02	0.03	0.19	2.2	0.6	0.39	0.33	-0.016	0.018	0.012	0.021	-0.028	0.077
	11/01/02	0.01	0.17	2.0	0.5	0.00	0.18	-0.003	0.019	0.001	0.017	0.024	0.042
37X	02/07/02	-0.04	0.17	2.9	0.6	0.15	0.20	0.000	0.023	0.010	0.021	-0.014	0.055
	05/31/02	-0.11	0.21	2.0	0.6	-0.01	0.29	0.009	0.023	0.003	0.023	0.008	0.066
	08/12/02	0.03	0.23	2.3	0.5	0.06	0.39	0.011	0.023	-0.012	0.026	-0.014	0.070
	11/01/02	-0.03	0.19	2.4	0.5	0.06	0.22	-0.002	0.020	-0.002	0.019	0.023	0.046

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	02/04/02	-0.009	0.021	-0.011	0.043	-0.009	0.031	-0.006	0.024	-0.003	0.017	0.07	0.18
	06/03/02	-0.010	0.024	-0.014	0.041	0.047	0.054	0.016	0.031	-0.021	0.030	0.07	0.16
	08/07/02	0.004	0.020	0.041	0.067	-0.001	0.031	0.017	0.035	-0.017	0.027	0.01	0.14
	11/01/02	-0.009	0.017	-0.039	0.033	0.003	0.026	-0.002	0.022	-0.005	0.017	-0.12	0.14
35	02/04/02	0.009	0.022	-0.012	0.057	-0.004	0.032	0.001	0.024	0.014	0.022	0.12	0.21
	06/03/02	-0.011	0.025	-0.007	0.054	-0.013	0.043	0.009	0.034	0.021	0.029	0.00	0.22
	08/07/02	-0.010	0.023	-0.032	0.054	0.025	0.047	0.013	0.042	0.005	0.031	-0.05	0.20
	11/01/02	0.008	0.022	-0.008	0.046	0.029	0.030	-0.013	0.023	0.003	0.018	0.09	0.17
37X	02/07/02	-0.003	0.018	-0.056	0.046	-0.013	0.034	-0.012	0.026	-0.008	0.021	-0.02	0.18
	05/31/02	0.005	0.022	0.012	0.054	-0.008	0.043	-0.029	0.035	0.003	0.029	0.10	0.18
	08/12/02	0.021	0.021	-0.083	0.047	-0.035	0.052	-0.022	0.046	-0.012	0.035	-0.24	0.20
	11/01/02	0.014	0.021	-0.031	0.047	0.030	0.045	0.009	0.026	-0.012	0.027	0.07	0.18

TABLE 22  
LOBSTERS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		SB-125		TH-228	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
32	02/04/02	-0.006	0.024	-0.003	0.034	0.000	0.017	-0.022	0.018	0.008	0.046	0.069	0.078
	06/03/02	-0.004	0.037	-0.030	0.180	0.005	0.019	0.013	0.021	0.020	0.052	0.018	0.089
	08/07/02	0.005	0.020	0.220	0.530	-0.006	0.016	0.005	0.016	-0.031	0.039	0.026	0.056
	11/01/02	0.005	0.017	-0.024	0.075	0.000	0.015	0.010	0.017	0.012	0.037	-0.066	0.058
35	02/04/02	-0.007	0.024	-0.016	0.041	0.012	0.019	0.020	0.021	-0.031	0.049	-0.026	0.090
	06/03/02	-0.042	0.033	0.080	0.200	0.004	0.027	-0.004	0.024	-0.005	0.053	-0.016	0.078
	08/07/02	-0.008	0.029	-0.200	0.590	-0.011	0.018	-0.032	0.020	0.013	0.041	-0.022	0.074
	11/01/02	0.012	0.024	0.050	0.091	0.004	0.017	-0.008	0.018	-0.009	0.042	-0.011	0.059
37X	02/07/02	0.001	0.032	0.022	0.035	0.008	0.025	0.002	0.023	0.023	0.044	0.003	0.092
	05/31/02	-0.028	0.026	-0.150	0.270	0.007	0.025	0.009	0.022	-0.004	0.046	0.009	0.075
	08/12/02	0.000	0.033	-0.150	0.420	0.011	0.022	0.011	0.021	0.025	0.047	-0.086	0.083
	11/01/02	-0.013	0.031	0.000	0.100	-0.002	0.020	-0.001	0.022	0.030	0.048	-0.028	0.087

## **4. DISCUSSION OF RESULTS**

This section summarizes the results of the analyses of environmental media sampled. DNC has carefully examined the data throughout the year and has presented in this section all cases where station related radioactivity could be detected and compared the results with previous environmental surveillance data. Few impacts of the station operation on the environment were observed. Sub-sections contain a description of each particular media or potential exposure pathway.

Naturally occurring nuclides such as Be-7, K-40, and Th-228 were detected in numerous samples. Be-7, which is produced by cosmic processes, was observed predominantly in airborne and vegetation samples. Th-228 results were variable and are generally at levels higher than plant related radionuclides.

Cs-137 and Sr-90 were observed at levels similar to those of past years. The levels of Cs-137 and Sr-90 detected were the result of atmospheric nuclear weapons testing in the 1960's.

### **4.1. *Gamma Exposure Rate (Table 1)***

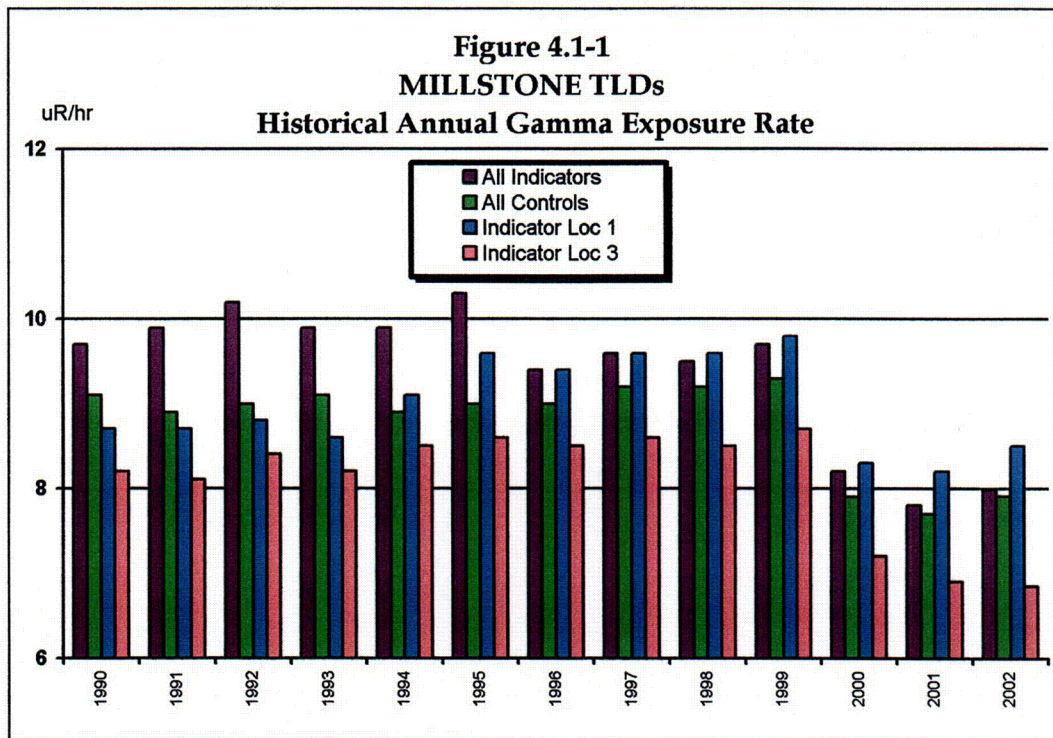
Gamma exposure rate is determined from the integrated exposure measured over a quarter using  $\text{CaSO}_4(\text{Tm})$  Panasonic model UD-804 ASx thermoluminescent dosimeters (TLDs). In 2000, the TLDs (Victoreen glass bulb  $\text{CaF}_2(\text{Mn})$ ), which historically were used to measure radioactivity around Millstone for over 20 years, were replaced with the Panasonic TLDs. The new Panasonic dosimeters have a lower response than the Victoreen dosimeters. Results from 2000 through 2002 show a 15% to 20% lower response when compared to trended results for previous years. This lower response is consistent for all locations, including both indicator and control locations.

The dosimeters are strategically placed at a number of on-site locations, as well as at inner and outer off-site locations. Starting in 2001, the collection of TLDs was changed from monthly to quarterly and additional locations were incorporated into the REMODCM for measurement. The exposure rate measurements in Table 1 show the results for all 41 locations measured. Trends similar to those of past years are observed. These measurements demonstrate the general variations in background radiation between the various on-site and off-site locations and include gamma exposure from all sources of radioactivity. For example, the Weather Shack (location 02), MP3 Discharge (location 05), Environmental Laboratory (location 08), and Corey Road (location 48) experience higher exposure rates due to their

proximity to granite beds and stonewall fences. In addition, the Ledyard control location (location 14C) experiences relatively higher background exposure rates than the other control locations at Mystic, Norwich, and Old Lyme (locations 13C, 15C, and 16C). The only appreciable effect seen in the TLD data is that attributable to the variation in the background radiation that is consistent with previous years.

Figure 4.1-1 shows a historical trend of TLD exposure rate measurements, comparing an annual average of all indicator TLDs, an annual average of all control TLDs, and the annual average of the two most critical indicator locations which are used to represent the two closest site boundary residences in the North-northwest and Northeast directions. Examination of the average measurements since 1990 show interesting site changes and site characteristics. For example, the average of all indicator locations up through 1995 when Unit 1 was still in operation display the effects of N-16 BWR turbine building skyshine to immediate areas onsite. As discussed in previous annual reports, the effects of skyshine at onsite monitoring stations were increases as high as 6 uR/hr at certain onsite locations. Skyshine decreased rapidly with distance and was indistinguishable from normal background measurements at the closest offsite monitoring stations. Also apparent in Figure 4.1-1 is the replacement of the historical Victoreen TLD monitoring system with the Panasonic system in year 2000. The difference in response between the two systems is very apparent with the new Panasonic TLDs reading 15% to 20% lower. The figure also relates the difference in critical indicator locations (1) and (3) and the annual average of all indicator TLDs to the annual average of the control TLDs collected and measured during coincident periods throughout the year. The exposure measurements of many indicator locations onsite are under the influence of natural background exposure differences caused by the many granite outcroppings typical of the Millstone area. Historical data evaluation has shown that TLD sample locations in the vicinity of granite can be dramatically influenced by natural radioactivity contained within the granite. As shown in Figure 4.1-1, the annual average of the indicator TLDs and one of the critical indicator locations are slightly higher in gamma exposure rate than the average control gamma exposure rate. This difference is the result of the nearby granite. For conservatism, if the difference were the result of plant operation (e.g., storage of radioactive waste on-site, gaseous effluents, etc.) an assessment of the resulting dose consequences assuming constant year-round residency is shown in Section 5 as not exceeding 5.2 mrem.



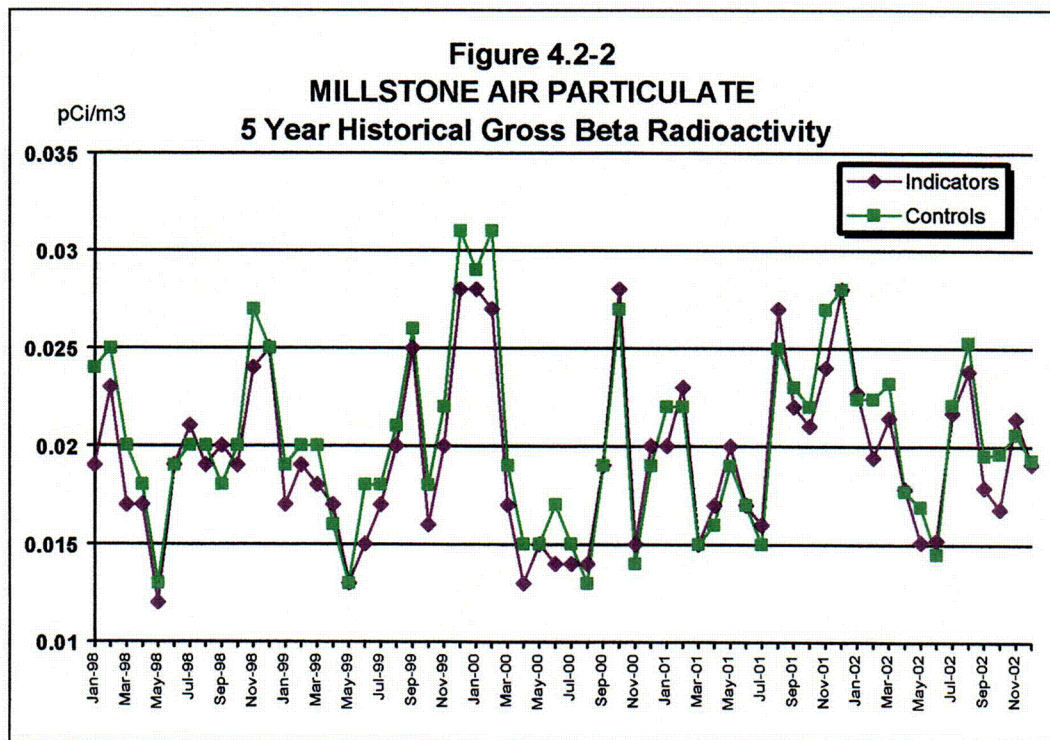
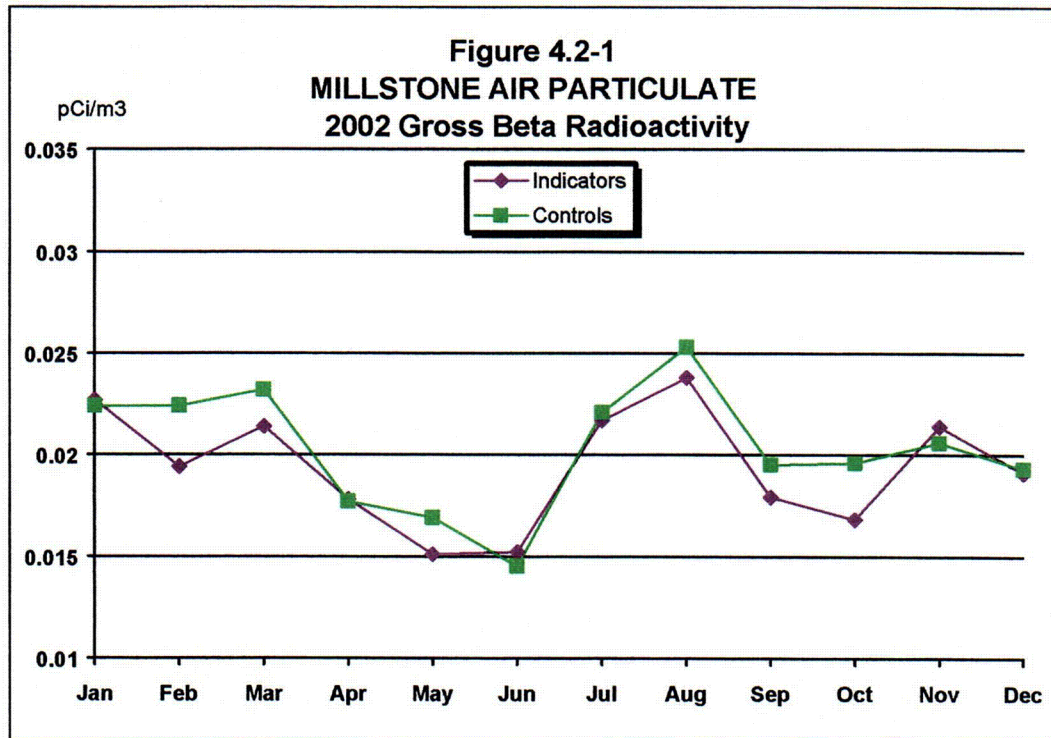


#### 4.2. Air Particulate Gross Beta Radioactivity (Table 2)

Air is continuously sampled at one outer ring and seven inner ring locations by passing it through glass fiber particulate filters. These are collected weekly and analyzed for gross beta radioactivity. Results are shown on Figure 4.2-1 and Table 2. Gross beta activity remained at levels similar to that seen over the last decade. Inner and outer ring monitoring locations continue to show no significant variation in measured activities (see Figure 4.2-2). This indicates that any station contribution is not measurable.

#### 4.3. Airborne Iodine (Table 3)

Charcoal cartridges are included at all of the Radiological Effluent Monitoring Manual (REMM) required air particulate stations for the collection of atmospheric iodine. These cartridges are analyzed on a weekly basis for I-131. No detectable levels of I-131 were seen in the 2002 charcoal samples.



#### **4.4. Air Particulate Gamma (Table 4A-D)**

The air particulate samples that are utilized for the weekly gross beta analyses are composited and analyzed quarterly for gamma emitting isotopes. The results, as shown in Tables 4A - 4D, indicate the presence of naturally occurring Be-7, which is produced by cosmic processes. No other positive results were seen. These analyses indicate the lack of station effects.

#### **4.5. Air Particulate Strontium (Table 5)**

Table 5 in past years was used to report the measurement of Sr-89 and Sr-90 in quarterly composited air particulate filters. Because previous data has shown the lack of detectable station activity in this media, the requirement for these measurements was removed from the Radiological Effluent Monitoring Manual (REMM) and analyses have been discontinued. The fact that milk samples are a much more sensitive indicator of fission product existence in the environment, prompted the decision for discontinuation. In the event of widespread station related contamination or special events such as the Chernobyl incident, these measurements may be made. Historically, when world events created conditions to cause these measurements to be detectable, no difference was noted between indicator and control locations. This further confirms that detectable levels were not plant related.

#### **4.6. Soil (Table 6)**

Millstone resumed collection of soil as a required media type in the fourth quarter of 2001. Prior to then, it had not been sampled for over fifteen years largely due to the fact that when it was previously sampled, no detectable station activity was observed. No station detectable activity is seen in Table 6 soil samples taken in 2002. It is anticipated that baseline activity levels in soil will be developed for isotopes such as Cs-137, that are the result of past weapons testing fallout, and will prove useful years into the future when site characterization and decommissioning of the station become the focus after License termination. This media is collected quarterly from one control and two indicator locations.

#### **4.7. Cow Milk (Table 7)**

The most sensitive indicator of fission product existence in the terrestrial environment is usually milk samples. This, in combination with the fact that milk is a widely consumed food, results in this pathway usually being the most critical. Unfortunately, since 1996 all dairy (cow) farms close enough (i.e. within 10 miles) to Millstone to be considered an indicator location have been out of business. Therefore, the sampling of cow milk has stopped until such time that a new dairy farm goes into business. Each year a Land Use Census is used to identify locations of milk animals that should be included in the monitoring program. It is performed annually and is maintained by observations, door-to-door surveys and consulting with local agriculture authorities. The 2002 census can be seen in Appendix A. If and when a new dairy farm business starts within a distance to be considered an indicator location to measure levels of station radioactivity, the collection of cow milk will resume.

#### **4.8. Goat Milk (Table 8)**

Goat milk samples can be a more sensitive indicator of fission products in the terrestrial environment than cow milk samples. This is dependent on a number of parameters, including: metabolism of these animals, feeding habits, and feed type. During past weapons testing periods, samples taken at certain locations indicated higher uptake than others. This was especially apparent in past samples collected in the immediate area around Millstone (see previous Annual Operating Reports). One of these sites, location 22 (5.2 Mi. NNE), sampled only since 1994, exhibits this trend showing higher Sr-90 and Cs-137 concentrations. See **Section 6.0** for further discussion of Sr-90 and Cs-137 in goat milk.

Goat milk was unavailable at all locations both early and late in the year. Per requirements, pasture grass or feed is collected as a substitute when milk cannot be collected (see **4.9. Pasture Grass and Feed**).

As in years past, Cs-137 and Sr-90 were observed in goat milk. Their presence is the result of residual radioactivity deposited into the environment from past nuclear weapons testing fallout. The facts that lead to this conclusion are presented in Section 6.0, and include: effluent release totals for these isotopes show insufficient quantities to account for such measurements; Sr-89 and Cs-134

which are chemically similar and generally release in comparable quantities were not detected, and a trend since the early 1960's shows a consistent declining presence of Cs-137 and Sr-90 in milk from Connecticut. Strontium analysis frequency is quarterly. The samples collected within each quarter from each sample location are composited and analyzed at the end of each quarter.

No station related I-131 was seen in this media. For over a decade, no detectable levels of I-131 have been seen in goat milk samples. Not since the period immediately following the Chernobyl accident has I-131 been detected in any milk samples.

#### **4.9. Pasture Grass and Feed (Table 9)**

When the routine milk samples are unavailable, samples of pasture grass are required as a replacement. These samples may also be taken to further investigate the levels of radioactivity in milk. During the winter months and early spring, insufficient growth prohibits sampling of pasture grass as a replacement sample. Feed (e.g., hay) is sampled whenever pasture grass is unavailable.

No station effects were seen in pasture grass and feed samples. Similar to that observed in goat milk, the Cs-137 values at indicator and control locations are comparable and would indicate that the levels observed are the result of residual weapons testing fallout.

#### **4.10. Well Water (Table 10)**

Well water samples are not required by the REMM. Data from 1973-1985 showed the lack of detectable station activity in this media. The sampling of well water was discontinued in 1985.

#### **4.11. Reservoir Water (Table 11)**

Reservoir water samples are special samples not required by the REMM. Previous data has shown the lack of detectable station activity in this media. This fact and the extremely unlikely possibility of observing routine station effluents in this media have resulted in discontinuing these samples. In the event of widespread station related contamination, these samples may be collected.



#### **4.12. Fruits and Vegetables (Table 12)**

Consistent with past years, this media did not show any station effects. Naturally occurring K-40 was detected in all samples.

#### **4.13. Broad Leaf Vegetation (Table 13)**

Consistent with past years, this media did not show any station effects. Positive indications of Cs-137 were observed in one sample. The level is comparable to those observed in past years and is due to fallout.

This media can show early and sensitive indication of releases from the station from both unplanned releases and normal operations. Therefore, to enhance program-monitoring effectiveness, samples of broadleaf vegetation are collected monthly during the growing season, April - October, even though requirements are to collect twice a year.

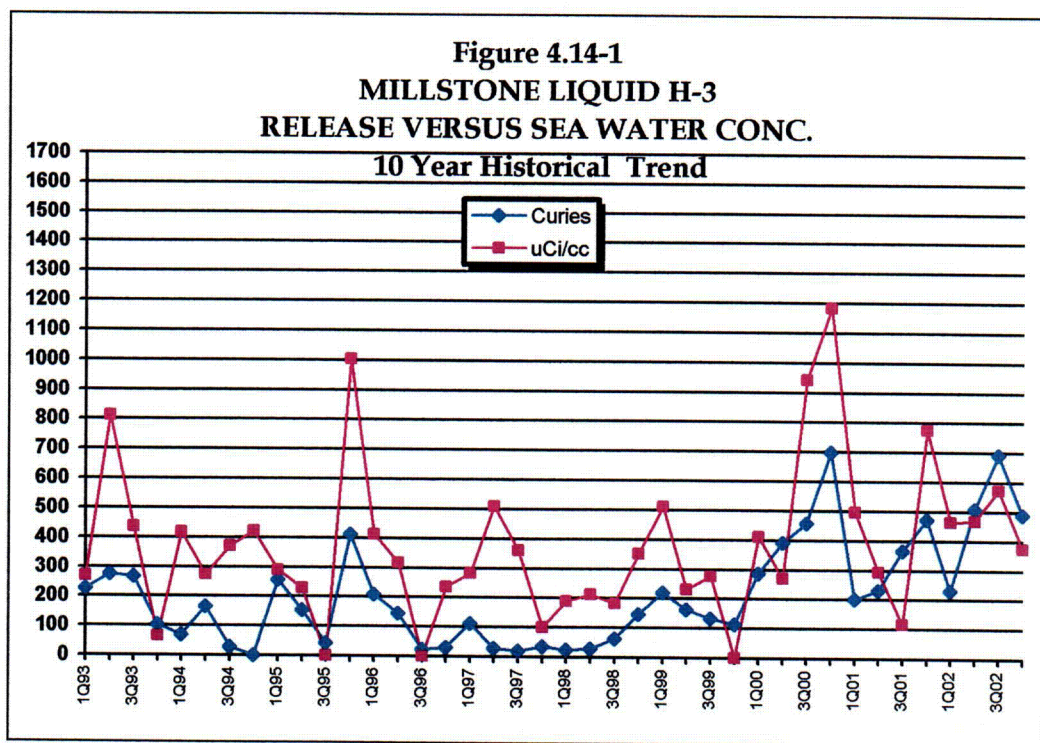
Due to a minor fuel pin failure in Unit 2, higher concentrations of iodine were measured in the unit's gaseous effluent discharge pathways during periods when the unit was shutdown. At no time during the year did any samples that would be used to detect iodine in the environment (i.e., air iodine samples, goat milk or broadleaf vegetation) show any detectable I-131.

#### **4.14. Seawater (Table 14)**

Samples from the vicinity of discharge (32) are continuous composites collected monthly and samples from Giants Neck (37C) are quarterly composites of weekly grab samples. Millstone increased the required sampling frequency for composite samples from the vicinity of discharge to a monthly basis to increase monitoring effectiveness.

Naturally occurring K-40 was seen in all samples. Station related tritium (H-3) was observed from the vicinity of discharge sample location (32) during various periods throughout the year. Figure 4.14-1 shows a ten-year trend of tritium releases in Millstone liquid effluents versus measured environmental concentrations from the vicinity of discharge location. As can be noted from the figure, since the restart of Unit 3 in 1998 and Unit 2 in 1999, tritium releases in liquid effluents have risen to levels at or above those observed during the pre-shutdown period. Tritium is generated during operation from fission and neutron reactions.

Tritium builds up in the reactor coolant in each fuel cycle. Measured plant related levels of H-3 in sea water from the immediate vicinity of discharge have been observed throughout the operation of Millstone's nuclear units. The sample is taken directly from liquid effluent flow prior to dilution into Long Island Sound. Dilution studies performed on this discharge have determined that a dilution factor of 3 is appropriate to estimate concentrations immediately outside the quarry within a near-field area. After dilution, the concentration of tritium expected in the immediate area of the Sound would approach undetectable levels at the required LLD.



#### 4.15. Bottom Sediment (Table 15)

Similar to last year, Cs-137 was detected in two samples from Golden Spur (30X). The Golden Spur area is a fresh water area and the levels of Cs-137 at this location are comparable to those observed in past river water sediments taken from up the Connecticut River. Due to this and the relative distance and direction of the Golden Spur location, the Cs-137 detected at Golden Spur is not plant related.

Cs-137 was also detected in one of the extra samples from Jordon Cove Bar (39X) in the third quarter. Co-60 was detected in one sample from the Vicinity of Discharge (32) in the second quarter. Both are considered plant related activity, which has not been detected in bottom sediment for over a decade. The levels detected are comparable to the levels observed in 1990. Bottom sediment is not a dose pathway to man and therefore the presence of radioactivity in bottom sediment does not pose any dose consequences. Examinations of aquatic media sampled from the same sampling locations (discussions that follow) do not show any detectable Co-60 or Cs-137.

#### **4.16. Aquatic Flora (Table 16)**

Sampling of this media provides useful information because it is very sensitive to station discharges. However, no station related radioactivity was detected in aquatic flora in 2002.

#### **4.17. Fish (Tables 17A and 17B)**

##### **4.17.1. Flounder (Table 17A)**

The activity in Flounder is the same as that seen for the past decade. No activity was observed except for the naturally occurring radionuclides.

##### **4.17.2. Fish - Other (Table 17B)**

The activity in other fish is the same as that seen for the past decade. No activity was observed in this media except for naturally occurring radionuclides, including samples taken from within the quarry.

#### **4.18. Mussels (Table 18)**

Like last year, this sampling media showed no station related radioactivity at all locations.



#### **4.19. Oysters (Table 19)**

All locations, except for the quarry, utilize stocked oysters. Trays are kept at these sampling areas to guarantee samples and facilitate sample collection. Native oysters are sampled at the quarry (location 40X), which is an extra location.

Station related Ag-110m was observed in samples from within the station discharge area (locations 32 and 40X). In general, the quarry oysters show the highest activity. Although location 32 is labeled as vicinity of the discharge, it is actually at the end of the quarry. No station related activity was observed in samples from beyond the station discharge area.

In years past, high levels of Zn-65 were typically observed in oysters caused by their distinct capacity to accumulate zinc. Studies have shown that oysters can accumulate as much as 50 times or more the amount of zinc compared to most other sea foods (Wolfe, 1979). A remarkable dependency exists between the Zn-65 concentration measured in the native quarry oysters and the amount of Zn-65 discharged into the environment. However, since the permanent shutdown of Millstone Unit 1 in 1996, the discharges of Zn-65 in liquid effluents have dropped to no detectable activity in station discharges. Starting in 2001, no Zn-65 has been released in liquid effluents and no Zn-65 has been detected in oysters. Figure 4.19-1, shows the incredible historical trend that existed between Zn-65 releases and measured concentrations in quarry oysters. The decreasing trend in effluent radioactive releases is apparent in both the curies released and the measured concentrations in oysters.

Figure 4.19-2 shows a similar trend of Ag-110m concentration in quarry oysters compared with liquid effluent curies of Ag-110m discharged. Again, the dependency between Ag-110m discharged and the Ag-110m concentration measured in the native quarry oysters is apparent. The historical sensitivity between station measured effluent discharges of Zn-65 and Ag-110m when compared to environmental measured concentrations has provided a basis for Millstone to adjust the bio-accumulation factors for Zn-65 and Ag-110m used in the standard industry effluent dose consequence codes. See **Section 5** of this year's and previous years' Annual Radiological Environmental Operating Reports for a comparison of the two methods which has allowed for such adjustments in the past (i.e., dose from the station's measured radioactive discharges input into conservative models versus

actual measurements of the concentrations of radioactivity in environmental media to calculate annual dose commitment from consumption).

Because no station activity was observed at locations beyond the station discharge area and since the two locations in the quarry are on-site and not available for public use, the actual concentration of radionuclides in oysters available for public consumption is much less. The near-field dilution factor for liquid discharges from the Millstone quarry discharge is a factor of 3. The dose consequence of the station related radioactivity via this pathway is discussed in **Section 5.0**.

#### **4.20. Clams (Table 20)**

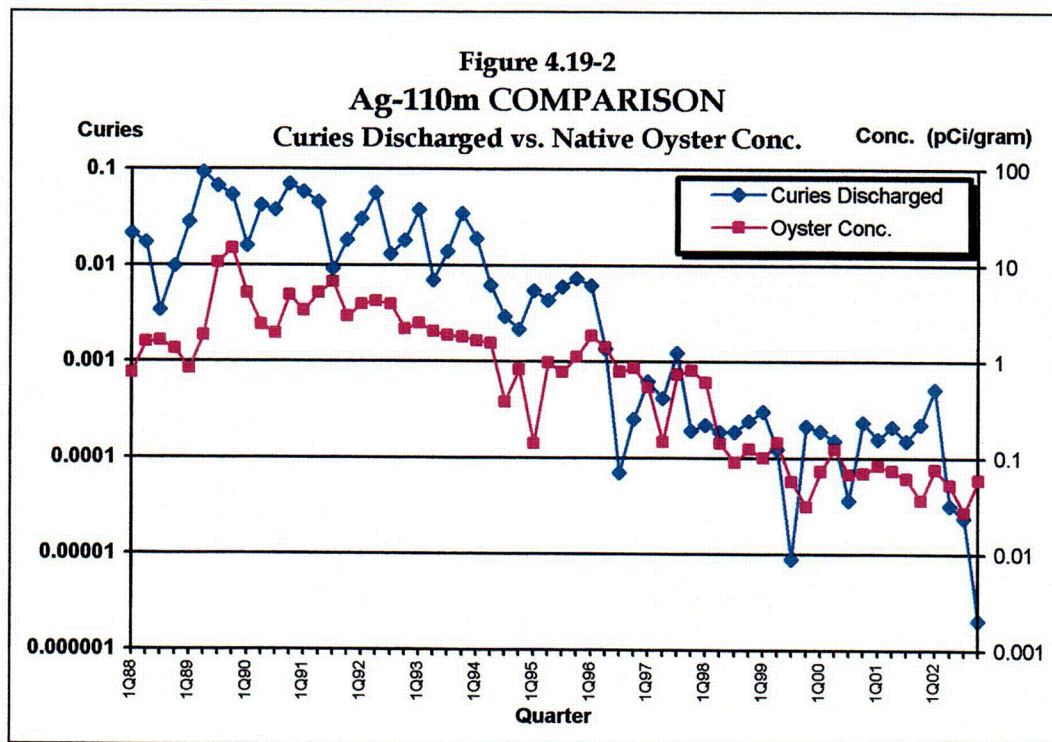
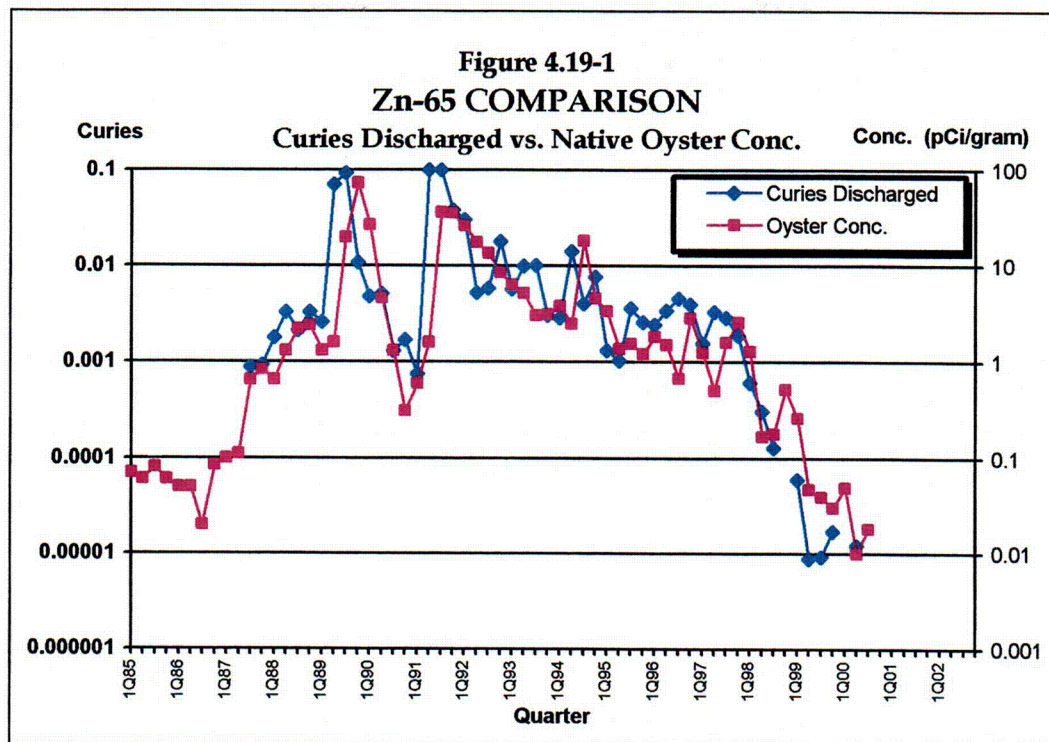
Occasionally this media indicates the presence of station related radioactivity. No station related radioactivity was observed in any of the clam samples taken in 2002.

#### **4.21. Scallops (Table 21)**

Scallops are not required by the REMM. However, attempts are made to sample this media to confirm station effects because scallops are available for public consumption. No scallop samples were available in 2002.

#### **4.22. Lobsters (Table 22)**

Like last year, no station related radioactivity was detected in this sample media in 2002.



## **5. OFFSITE DOSE EQUIVALENT COMMITMENTS**

The off-site dose consequences (dose equivalent commitments) of the stations' radioactive liquid and airborne effluents have been evaluated using two methods.

The first method utilizes calculations of direct dose from sources onsite and the stations' measured radioactive discharges as input parameters into conservative models to simulate the transport mechanism through the environment to man. This results in the calculation of the maximum dose consequences to individuals. The results of these computations have been submitted to the NRC in the Radioactive Effluent Release Report written in accordance with the Radiological Effluent Monitoring Manual, Section I.F.2. This method, which is usually conservative (i.e., computes higher doses than that which actually occur) has the advantage of approximating an upper bound to the dose consequences. This is important in those cases where the actual dose consequence cannot be measured because they are so small as to be well below the capabilities of conventional monitoring techniques.

The second method utilizes the actual measurements of the concentrations of radioactivity in various environmental media (e.g., fish, shellfish) and then computes the dose consequences resulting from the consumption of these foods.

The results of both methods are compared in Table 5.1 for those pathways where a potential dose consequence exists and a comparison is possible. The doses presented in this table are calculated at the location of maximum effect from the station effluents for that pathway and for the critical age group. For example, the external gamma dose from gaseous effluents is calculated for the site boundary location which is not only the nearest but also has the greatest directional wind frequency and fish and shellfish doses are calculated assuming they are from an area within 500 feet of the station discharge.

Summarizing the data in Table 5.1:

### **MAXIMUM TOTAL INDIVIDUAL DOSES :**

WHOLE BODY = 0.08 mrem

GI(LLI) = 0.015 mrem

The organ GI(LLI) dose is essentially all attributable to the liquid pathway. More than half of the whole body dose is due to a conservative determination of dose (~0.05 mrem) to the nearest resident as a result of direct radiation from on-site radioactive waste operation/storage facilities and continuous occupancy. The whole body and maximum organ dose

attributable from station effluents includes conservative assessments using Method 2.

Since the maximum dose consequence to an individual is at the location of highest dose consequence, doses will be less for all other locations. The average whole body dose to an individual within 50 miles historically is on the order of 1000 times less than the maximum individual whole body dose.

In order to provide perspective on the doses in Table 5.1, the standards for 2002 on the allowable maximum dose to an individual of the general public are given in 40CFR190 as 25 mrem whole body, 75 mrem thyroid, and 25 mrem to any other organ. These standards are a fraction of the normal background radiation dose of approximately 284 mrem per year and are designed to be inconsequential in regard to public health and safety. Since station related doses are even a smaller fraction of natural background, they have insignificant public health consequences. In fact, the station related doses to the maximum individual are less than 10% of the variation in natural background in Connecticut.

**TABLE 5.1**  
**COMPARISON OF DOSE CALCULATION METHODS**  
**MILLSTONE POWER STATION**  
**2002 Annual Dose (millirem)**

Pathway	Individual	Organ	Method 1 <sup>(1)</sup>				Method 2 <sup>(1)</sup>
			Unit 1 (BWR)	Unit 2 (PWR)	Unit 3 (PWR)	Station Total	Station
<i>Airborne Effluents</i>							
1. External Gamma Dose	Max <sup>(2)</sup>	Whole Body	0.0017	0.016	0.010	0.028	ND <sup>(7)</sup>
<i>Direct Dose</i>							
Nearest Residence	Max <sup>(2)</sup>	Whole Body	N/A	N/A	N/A	~0.05 <sup>(4)</sup>	<5.2k <sup>(5)</sup>

**TABLE 5.1 (Cont.)**  
**COMPARISON OF DOSE CALCULATION METHODS**  
**MILLSTONE POWER STATION**  
**2002 Annual Dose (millirem)**

Pathway	Max Individual	Organ	Method 1 <sup>(1)</sup>				Method 2 <sup>(1)</sup>
			Unit 1 (BWR)	Unit 2 (PWR)	Unit 3 (PWR)	Station Total	Station
<i>Liquid Effluents</i>			(9)				
1. Fish	* Adult	Whole Body	-	0.00021	0.00065	0.00086	ND <sup>(3)</sup>
	Teen	"	-	0.00019	0.00057	0.00076	
	Child	"	-	0.00020	0.00058	0.00078	
	* Adult	GI(LLI) <sup>(6)</sup>	-	0.0039	0.0055	0.0094	ND
	Teen	"	-	0.0028	0.0040	0.0068	
	Child	"	-	0.0010	0.0016	0.0026	
	Adult	Liver	-	0.00046	0.0013	0.0018	ND
	* Teen	"	-	0.00047	0.0013	0.0018	
	Child	"	-	0.00043	0.0012	0.0016	
	Adult	Whole Body	-	0.00023	0.00054	0.00077	0.000008 <sup>(8)</sup>
	Teen	"	-	0.00024	0.00054	0.00078	0.000008
	* Child	"	-	0.00028	0.00066	0.00094	0.000009
2. Shellfish	* Adult	GI(LLI)	-	0.0028	0.0021	0.0049	0.0054 <sup>(8)</sup>
	Teen	"	-	0.0020	0.0015	0.0035	0.0037
	Child	"	-	0.0007	0.0006	0.0013	0.0013
	Adult	Liver	-	0.00059	0.0016	0.0022	0.00001 <sup>(8)</sup>
	* Teen	"	-	0.00062	0.0016	0.0022	0.00001
	Child	"	-	0.00060	0.0016	0.0022	0.00001

Notes:

1. Except for direct dose, method 1 uses measured station discharges and meteorological data as input parameters to transport-to-man models that conservatively calculate dose to people; method 2 uses actual measured concentrations in environmental media to estimate the dose.
2. Maximum individual - The maximum individual dose is the dose to the most critical age group at the location of maximum concentration of station related activity. The dose to the average individual is much less than the maximum individual dose.
3. ND - Not Detectable - No station related activity could be detected above natural background or above the minimum detectable level (MDL).
4. The dominant source of direct dose from the station is from operation/storage of radioactive waste facilities. Storage of radioactive waste in areas designated onsite is limited by design and operation to ensure that the maximum direct dose from each area at the site boundary does not exceed one millirem. Actual exposure from each throughout the year was maintained much less than this operational limit. Each facility is monitored onsite by the Radiation Protection Department using TLDs. The exposure measured for each facility TLD was corrected for distance to the nearest site boundary residence. The resultant exposure was conservatively multiplied by 1.5 to account for skyshine. These maximum estimated doses from each facility were summed for a cumulative site commitment of approximately 0.05 millirem.
5. Measured dose was derived from monthly TLD readings. There are two residences that qualify as the closest residence, each has a TLD near enough to use as an estimate to each residence. The one with the highest average dose rate was used to estimate the direct dose to the closest residence. A background dose rate was subtracted. This background was derived from the average of the five control TLD locations. This method is very conservative assuming natural exposure influences, such as granite, are actually plant related exposure. This method provides a bounding high value. The exposure measurements of the select indicator locations are influenced by natural background exposure differences caused by the many granite out-croppings typical of the Millstone area. Historical data evaluation has shown that TLD sample locations in the vicinity of granite can be dramatically influenced by natural radioactivity contained within the granite.
6. GI (LLI) - Gastrointestinal Tract - Lower Large Intestine.
7. ND - Not Detectable - measurements for 2002 show no detectable station related activity. TLD's cannot detect levels that are such a small fraction of natural background.
8. Based on measured levels in vicinity of discharge and quarry oysters. A measured near field dilution factor of 3 was used to adjust for the fact that these oysters are on-site and inaccessible to the public. This factor adjusts the measured on-site concentration to that which could occur to a public accessible off-site location after dilution of the effluent by the Long Island Sound.
9. There were no liquid discharges from Unit 1 in 2002.



## 6. DISCUSSION

The evaluation of the effects of station operation on the environment requires the careful consideration of many factors. Those factors depend upon the media being affected. They include station release rates, effluent dispersion, occurrence of nuclear weapons tests, seasonal variability of fallout, local environment, and locational variability of fallout. Additional factors affecting the uptake of radionuclides in milk include soil conditions (mineral content, pH, etc.), quality of fertilization, quality of land management (e.g., irrigation), pasturing habits of animals, and type of pasturage. Any of these factors could cause significant variations in the measured radioactivity. A failure to consider these factors could cause erroneous conclusions.

Consider, for example, the problem of deciphering the effect of station releases on the radioactivity measured in milk samples. This is an important problem because this product is widely consumed and fission products readily concentrate in this media. Some of these fission products, such as I-131 and Sr-89 are relatively short-lived. Therefore they result from either station effluents, nuclear weapons tests or nuclear incidents (e.g. Chernobyl). Sr-89's lifetime is longer than I-131's, therefore it must be remembered that it will remain around for much longer periods of time. Problems are caused by the long-lived fission products, Sr-90 and Cs-137. These isotopes are still remaining from the high weapons testing era of the 1960's. This results in measurable amounts of Sr-90 and Cs-137 appearing in milk samples. Distinguishing between this "background" of fallout activity and station effects is a difficult problem.

In reviewing the historical and present Sr-90 and Cs-137 measured in cow and goat milk in the areas around Millstone station, a casual observer could notice that in some cases the levels of these isotopes are higher at farms closer to the station than at those further away from the station. The station's effluents might at first appear to be responsible. However, the investigation of the following facts proves this conclusion wrong.

- (1) The stations accurately measure many fission products, including Sr-90 and Cs-137 in their releases. Based on these measurements and proven models developed by the Nuclear Regulatory Commission, concentrations in the environment can be calculated. These calculations (generally conservative, see **Section 5.0**) show that insufficient quantities of Sr-90 and Cs-137 have been released from the stations to yield the measured concentrations in milk.

- (2) Over the many years of station operation, Sr-89 has often been released in comparable quantity to Sr-90. Since they are chemically similar, comparable levels should have been detected in milk if the Sr-90 was station related. No station related Sr-89 has been detected in milk samples.
- (3) Similar to Sr-89, Cs-134 can be used as an indication of station related Cs-137. Although not as conclusive as Sr-89, the lack of any measurable Cs-134 in any of the milk samples suggests that the Cs-137 is not station related. This is further confirmed by the evaluation of the air particulate data. The only occurrences of detectable Cs-134 in milk resulted from the Chernobyl incident.
- (4) Dairy milk sampling in Connecticut began in the 1960's, several years prior to nuclear station operation. The highest levels of weapons fallout related Sr-90 and Cs-137 (see Figures 6-1 and 6-2), were measured in the years prior to station operation. Samples taken in the immediate station areas have always shown higher levels of weapons related fallout than samples taken from the Central Connecticut Region (CT Pooled Milk). Radioactivity levels of fallout related Sr-90 and Cs-137 have decreased significantly since the 1964 Nuclear Test Ban Treaty due to decay.
- (5) Local variability of Sr-90 and Cs-137 in milk is common throughout the United States. Due to the variability in soil conditions, pasturing methods, rainfall, etc., it is the rule rather than the exception. Therefore, it is not surprising that certain farms have higher levels of radioactivity than other farms. In fact, in the past there are some cases where the farms further from the station have higher Sr-90 and Cs-137 values than the farms that are closer to the station.
- (6) In the past when a goat farm operated near Millstone (2.0 Mi - ENE), the highest levels of Sr-90 and Cs-137 were typically indicated. This same farm also experienced the highest levels of short-lived activity from the 1976 and 1977 Chinese Tests and the 1986 Chernobyl accident. This indicates that for some unknown reason this farm had the ability for higher reconcentration. Special studies performed at this and other farms failed to find any link to the station.

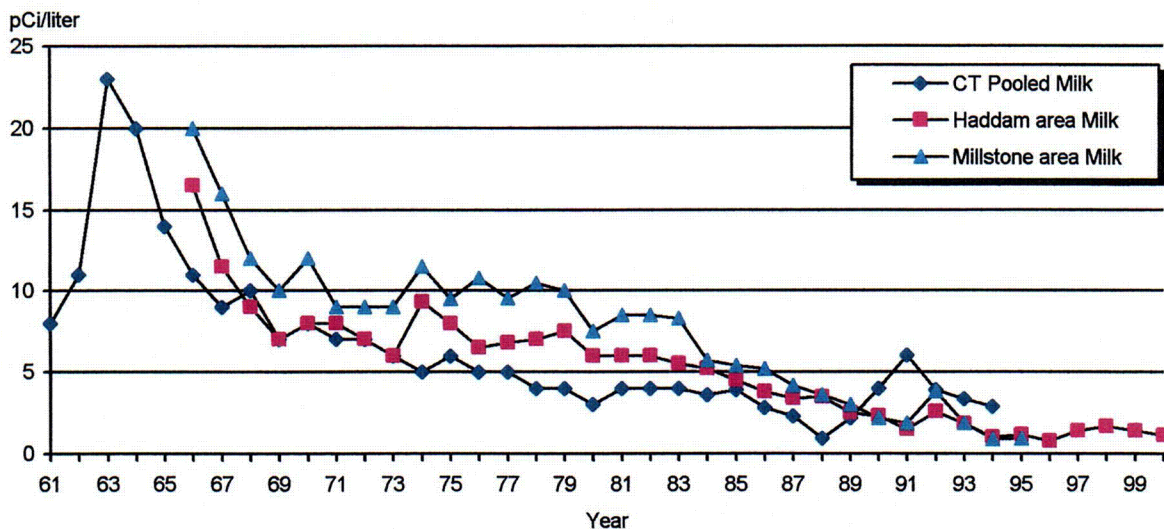
Based on these facts, the observation that the station effluents are responsible is obviously false. The cause must be one or more of the other variables.

Dominion has carefully examined the data throughout the year and has presented in this report all cases where station related radioactivity could be detected. An analysis of the potential exposure to the maximum

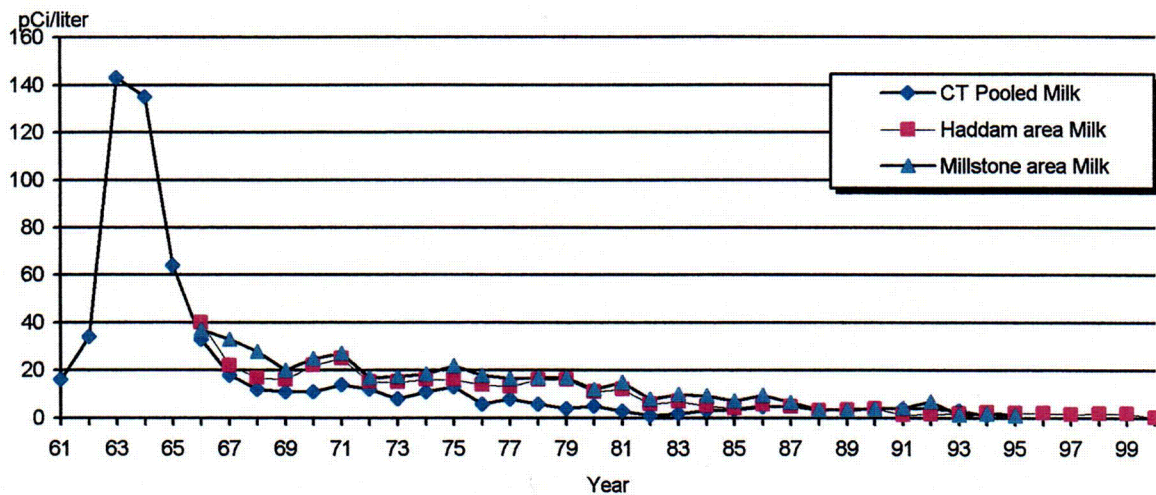
individual from any station related activity has been performed and shows that in all cases the exposure is insignificant.

The Connecticut Department of Environmental Protection performs an independent check on certain environmental program analyses. The results of their analyses are comparable to the results from this program's analyses. These comparisons can be used as a cross-reference to verify measured station activity.

**Figure 6-1 Strontium-90 in Milk**



**Figure 6-2 Cesium-137 in Milk**



Dairy milk is no longer available in the Millstone area, Haddam Neck no longer collects milk, and CT Pooled milk has not been collected by the State of CT since 1994. Graphs provided to show historical trends.

CY Start-up occurred: July 24, 1967  
 MP1 Start-up occurred: October 26, 1970  
 MP2 Start-up occurred: October 17, 1975  
 MP3 Start-up occurred: January 23, 1986

## **APPENDIX A**

### **LAND USE CENSUS FOR 2002**

**TABLE A-1**

**Dairy Cows Within 15 miles of Millstone Point- 2002**

<u>Direction</u>	<u>Distance</u>	<u>Name and Address</u>	<u># of Cows</u>
N	14 M	Kevin Dubicki Wawecus Farm Dairy 226 Wawecus Hill Rd. Norwich, CT 06360	62
NE	13.5 M	Henry Morgan Morgan Farm 512 Shewville Rd. Ledyard, CT 06339	50
WNW	11 M	John Tiffany II Tiffany Farms 156 Sterling City Road Lyme, CT 06371	100
NNW	11.5 M	Eugene Wilczewski Salem Valley Farm Dairy 200 Darling Road Salem, CT 06420	0
NNW	13 M	Stuart Gadbois Maegog Farms 40 Old Colchester Rd. Salem, CT 06420	230
NW	10.3 M	Suzanne Sankow (NEW FARM) Beaver Brook Farm 139 Beaver Brook Rd. Lyme, CT 06371	4

*Note: No cow farms on this list are used for sampling, all farms are greater than ten miles distance from plant.*

**TABLE A-2**

**Dairy Goats Within 20 miles of Millstone Point- 2002**

<b>Direction</b>	<b>Distance</b>	<b>Name and Address</b>	<b># of Goats</b>
N	2 M	Mrs. John Mingo 69 Spithead Road Waterford, CT 06385 LOCATION 21	5/4***
N	17.3 M	Crouch Family (NEW FARM) 17 Goshen Rd. Bozrah, CT 06334	18/7
N	20 M	Babe Farm 13 Jurczyk Rd. North Franklin, CT 06264	1/1
NNE	5.2 M	Allen Moran 122 Dayton Rd. Waterford, CT 06385 LOCATION 22	10/9
NE	10.6 M	Laura Behan 189 Quaker Farm Rd. Mystic, CT 06355	0/0
NE	8.6 M	Arthur Hiles 2 Daboll Rd. Groton, CT 06340	0/0
ENE	2 M	Berton Smith 16 Braman Rd. Waterford, CT 06385	2/0
ENE	13.1 M	Phyllis Borges 212 Deans Mill Road Stonington, CT 06378	5/3
ENE	15.3 M	Veronica Ploof 73 Palmerneck Road Pawcatuck, CT 06379	1/0

\* Unable To Contact As Of This Time

\*\* Control station listed, distance greater than 20 miles from Millstone

\*\*\* Number of Goats/Number of Milkers

**TABLE A-2**

**Dairy Goats Within 20 miles of Millstone Point- 2002**

<u>Direction</u>	<u>Distance</u>	<u>Name and Address</u>	<u># of Goats</u>
ENE	16.4 M	Grace White 1 Providence NL Tpk. North Stonington, CT 06359	12/3
WNW	18.1 M	Virginia Marshall 178 Old Chester Rd. Haddam, CT 06438	7/7
NW	17.3 M	Kelsey Humble 98 Ballahack Rd. East Haddam, CT 06423	6/6
NNW	18.5 M	Theodore Powell 31 O'Connell Road Colchester, CT 06415	15/2
NNW	19.8 M	Russell Baker 187 North Moodus Rd. East Haddam, CT 06423	*
NNW	20.7 M	Barkyoumb (NEW FARM) 188 Windham Ave. Colchester, CT 06415	3/3
NNW	29 M**	Kathy Waters 215 Burnt Hill Road Hebron, CT 06248 <b>LOCATION 24</b>	77/32

\* Unable To Contact As Of This Time

\*\* Control station listed, distance greater than 20 miles from Millstone

\*\*\* Number of Goats/Number of Milkers



**TABLE A-3**  
**2002 Resident Survey<sup>⊖</sup>**

<u>Downwind Direction</u>	<u>Distance to Closest Resident (meters)</u>
N	1500
NNE	860
NE	790
ENE	1580
E	1500
ESE	1690
SE	*
SSE	*
S	*
SSW	*
SW	3700
WSW	3190
W	2870
WNW	2470
NW	2110
NNW	780

\* N/A - not applicable (over water sectors).

---

<sup>⊖</sup> Distances were measured in 2002 using GPS.

**TABLE A-4**  
**2002 Garden Survey<sup>⊙</sup>**

<u>Downwind Direction</u>	<u>Distance to Closest Garden (meters)</u>
N	1495
NNE	875
NE	745
ENE	1625
E	1505
ESE	2005
SE	*
SSE	*
S	*
SSW	*
SW	3845
WSW	3325
W	2955
WNW	2475
NW	2295
NNW	1025

\* N/A - not applicable (over water sectors).

---

<sup>⊙</sup> Distances were measured in 2002 using GPS.

## **APPENDIX B**

### **DNC QA PROGRAM**

## **INTRODUCTION**

DNC maintains an independent non-required quality assurance (QA) program as part of the radiological environmental monitoring program (REMP). The QA program consists of contractor appraisals, quality control samples, and quality control testing of environmental TLDs.

### **DNC QA PROGRAM**

The DNC QA Program includes spikes of various sample media, duplicate samples, and TLD spikes. Sample spikes are a check on the accuracy of results of the contractor's radioanalyses. Duplicate samples tests the contractor's precision, or reproducibility of results, by comparing analytical results of split samples. The number and type of DNC QA Program quality control samples are defined in DNC Radiological Engineering Instructions RAB B-3, "Quality Control of Radiological Environmental Monitoring Program Sample Analyses" and RAB B-2, "Quality Control of the Environmental TLD Monitoring Program." An investigation is conducted on any result or trend that does not satisfy acceptance criteria.

### **OTHER QA PROGRAMS**

The DNC QA Program is not the only QA Program that monitors REMP radioanalysis performance. Other programs include:

1. Contractor lab's internal QA program. In addition to the DNC quality control samples, the radioanalysis contractor has it's own quality control samples. In total, at least five percent of the contractor's sample analyses include quality control samples.
2. Contractor lab's interlaboratory comparison program with an independent third party, Analytics, Inc. Results of the Analytics intercomparison are contained in Appendix C. Primary contractor participation in an interlaboratory comparison program is required by station Technical Specifications. The Analytics comparison satisfies this requirement.
3. Contractor lab's participation in the National Institute of Standards and Technology (NIST) Measurement Assurance Program (MAP), the Environmental Resource Associates (ERA) Proficiency Test (PT)

Program, the Department of Energy (DOE) Quality Assessment Program (QAP), Contractor lab's participation in the National Institute of Standards and Technology (NIST) Measurement Assurance Program (MAP), the Environmental Resource Associates (ERA) Proficiency Test (PT) Program, the Department of Energy (DOE) Quality Assessment Program (QAP), and the Mixed Analyte Performance Evaluation Program (MAPEP). The lab participates in these interlaboratory QA programs because of other clients' needs, not because of nuclear power station environmental sample analyses. However, some of these intercomparison samples are also applicable to nuclear power environmental samples.

### ***RESULTS OF DNC QA PROGRAM FOR CONTRACTOR RADIOANALYSES***

Criteria for passing QA sample analysis is that the result be within 20% of the known spike except in the case of Sr-89 or Sr-90 spikes in milk which have to be within 30% of the known spike. To allow more tolerance for lower activity spikes an alternate criterion is used. If the two sigma error range of the analyzed result includes the known spike value the result passes.

The DNC QA Program indicated that the contractor lab's environmental radiological analysis program was adequate in 2002. Results are shown on Table 2. All of the TLD spike tests satisfied procedural criteria. Of 97 analysis results on QA samples, 77 passed criteria, a 79% success rate. Sample results, which did not pass criteria, failed because of problems with the spike source or with sample preparation. There were no failures in QA sample results associated with contractor lab analyses.

**TABLE B-1**  
**2002 QUALITY CONTROL SAMPLES**

SAMPLE TYPE		QC ANALYSES (Note 1)	ROUTINE ANALYSES
TLD	Spike	12 (Note 2)	160
Milk	- Strontium	3 (Note 3)	12
Milk	- Iodine	4	36
Milk	- Gamma	(Note 4)	36
Water	- Gamma	58	24
Water	- Tritium	4	32
Oysters	- Gamma	5	60
Vegetation/Aquatic Flora/Sediment	- Gamma	0	2079
Air Particulate	- Gross Beta	4	832
	- Iodine	4	416
	- Gamma	15	740

**FOOTNOTES:**

1. All samples are spikes except fish/invertebrate that are duplicate oyster samples from the Millstone quarry.
2. Each TLD spike sample is comprised of a set of 4 TLDs.
3. One sample with Sr-89 and Sr-90 and one sample with Sr-90 only.
4. Gamma in water QA spikes are treated as milk surrogates.

**TABLE B-2**  
**RESULTS OF 2002 QUALITY CONTROL SAMPLE ANALYSES**

SAMPLE TYPE		PASS	FAIL
TLD	Spike	12	0
Milk	- Strontium	3	0
Milk	- Iodine	4	0
Water	- Gamma	49	9
Water	- Tritium	4	0
Oysters	- Gamma	5	0
Air Particulate	- Gross Beta	2	2
	- Iodine	1	3
	- Gamma	9	6
TOTALS		TLDs: 12 Samples: 77	TLDs: 0 Samples: 20*

\* There were no failures in QA sample results associated with contractor lab analyses. Sample results, which did not pass criteria, failed because of problems with the spike source or with sample preparation.

## **APPENDIX C**

### **SUMMARY OF INTERLABORATORY COMPARISONS**

## **INTRODUCTION**

This appendix covers the Intercomparison Program of the Framatome ANP Environmental Laboratory as required by technical specifications. Framatome uses QA/QC samples provided by Analytics, Inc to monitor the quality of analytical processing associated with the Radiological Environmental Monitoring Program (REMP). The suite of Analytics QA/QC samples are designed to be comparable with the pre-1996 US EPA Interlaboratory Cross-Check Program in terms of sample number, matrices, and nuclides. It was modified to more closely match the media mix presently being processed by Framatome and includes:

- milk for gamma (10 nuclides) and low-level (LL) Iodine-131 analyses once per quarter,
- milk for Sr-89 and Sr-90 analyses during the 1st and 3rd quarters,
- water for gamma (9 nuclides) and low-level (LL) Iodine-131 analyses during the 1st and 3rd quarters,
- water tritium analysis during the 2nd and 4th quarters,
- air filter for gamma (9 nuclides) analyses during the 2nd quarter,
- air filter for gross beta analysis during the 1st and 3rd quarters, and
- charcoal air filter for Iodine-131 analyses during 1<sup>st</sup> quarter.

In addition to the Analytics Intercomparison Program, Framatome also participates in other intercomparison programs that include radionuclides and media similar to those required by the station's REMF program. These programs are the National Institute of Standards and Technology (NIST) Measurement Assurance Program (MAP), the Environmental Resource Associates (ERA) Proficiency Test (PT) Program, the Department of Energy (DOE) Quality Assessment Program (QAP), and the Mixed Analyte Performance Evaluation Program (MAPEP).

## **RESULTS**

Intercomparison program results are evaluated using FRAMATOME's internal bias acceptance criterion. The criterion is defined as within 25% of the known strontium value for samples containing both Sr-89 and Sr-90 and within 15% of the known value for other radionuclides, or within two sigma of the known value. Any sample analysis result that does not pass the criteria is investigated by FRAMATOME.

Analytics Intercomparison Program results are included on pages C-3 through C-6 for the fourth quarter of 2001 through the third quarter of 2002. A total of 93 analysis results were obtained with 92 passing criteria, a 98.9% success rate. Investigation is ongoing for the one failed sample analysis (see footnote in table).



**FRAMATOME ANP 2002 ANALYTICS ENVIRONMENTAL CROSS CHECK PROGRAM  
PERFORMANCE EVALUATION**

Sample Number	Quarter/Year	Sample Media	Nuclide	Units	Reported Values	Known Values	Ratio Framatome/Analytics	Evaluation
E2901-162	4th/01	Water	H-3	pCi/L	13510	14060	0.96	Agreement
E2903-162	4th/01	Filter	Gross Alpha	pCi/Filter	14	16	0.88	Agreement
E2903-162	4th/01	Filter	Gross Beta	pCi/Filter	50	48	1.04	Agreement
E2902A-162	4th/01	Filter	Sr-89	pCi	66	82	0.80	Agreement
E2902A-162	4th/01	Filter	Sr-90	pCi	54	61	0.89	Agreement
E2904-162	4th/01	Milk	I-131	pCi/L	62	61	1.02	Agreement
E2904-162	4th/01	Milk	Ce-141	pCi/L	384	379	1.01	Agreement
E2904-162	4th/01	Milk	Cr-51	pCi/L	527	497	1.06	Agreement
E2904-162	4th/01	Milk	Cs-134	pCi/L	198	199	0.99	Agreement
E2904-162	4th/01	Milk	Cs-137	pCi/L	325	318	1.02	Agreement
E2904-162	4th/01	Milk	Co-58	pCi/L	94	90	1.04	Agreement
E2904-162	4th/01	Milk	Mn-54	pCi/L	158	149	1.06	Agreement
E2904-162	4th/01	Milk	Fe-59	pCi/L	109	102	1.07	Agreement
E2904-162	4th/01	Milk	Zn-65	pCi/L	231	206	1.12	Agreement
E2904-162	4th/01	Milk	Co-60	pCi/L	353	353	1.00	Agreement
E3096-186	1st/02	Milk	I-131LL	pCi/L	99	90	1.09	Agreement
E3096-186	1st/02	Milk	Ce-141	pCi/L	32	29	1.10	Agreement
E3096-186	1st/02	Milk	Cr-51	pCi/L	262	241	1.09	Agreement
E3096-186	1st/02	Milk	Cs-134	pCi/L	103	110	0.94	Agreement
E3096-186	1st/02	Milk	Cs-137	pCi/L	248	240	1.08	Agreement
E3096-186	1st/02	Milk	Mn-54	pCi/L	224	202	1.11	Agreement
E3096-186	1st/02	Milk	Fe-59	pCi/L	112	104	1.08	Agreement
E3096-186	1st/02	Milk	Zn-65	pCi/L	215	199	1.08	Agreement
E3096-186	1st/02	Milk	Co-60	pCi/L	144	142	1.01	Agreement
E3097-186	1st/02	Charcoal	I-131	pCi/Filter	74	77	0.96	Agreement
E3098-186	1st/02	Charcoal	I-131	pCi/Filter	65	69	0.94	Agreement
E3099-186	1st/02	Charcoal	I-131	pCi/Filter	91	87	1.05	Agreement

**FRAMATOME ANP 2002 ANALYTICS ENVIRONMENTAL CROSS CHECK PROGRAM  
PERFORMANCE EVALUATION**

Sample Number	Quarter/Year	Sample Media	Nuclide	Units	Reported Values	Known Values	Ratio Framatome/Analytics	Evaluation
E3023-162	1st/02	Water	Gross Alpha	pCi/L	56.7	53	1.08	Agreement
E3023-162	1st/02	Water	Gross Beta	pCi/L	310.3	313	0.99	Agreement
E3024-162	1st/02	Water	I-131	pCi/L	54.5	61	0.90	Agreement
E3024-162	1st/02	Water	I-131LL	pCi/L	63.4	61	1.04	Agreement
E3024-162	1st/02	Water	Ce-141	pCi/L	239.4	242	0.99	Agreement
E3024-162	1st/02	Water	Cr-51	pCi/L	175.7	198	0.89	Agreement
E3024-162	1st/02	Water	Cs-134	pCi/L	87.8	91	0.97	Agreement
E3024-162	1st/02	Water	Cs-137	pCi/L	197.7	197	1.01	Agreement
E3024-162	1st/02	Water	Mn-54	pCi/L	168.5	166	1.02	Agreement
E3024-162	1st/02	Water	Fe-59	pCi/L	87.6	86	1.02	Agreement
E3024-162	1st/02	Water	Zn-65	pCi/L	157.2	164	0.96	Agreement
E3024-162	1st/02	Water	Co-60	pCi/L	114.6	117	0.98	Agreement
E3026-162	1st/02	Filter	Gross Alpha	pCi	21.8	23	0.96	Agreement
E3026-162	1st/02	Filter	Gross Beta	pCi	149	136	1.10	Agreement
E3027-162	1st/02	Milk	I-131	pCi/L	87.9	92	0.96	Agreement
E3027-162	1st/02	Milk	I-131LL	pCi/L	93	92	1.01	Agreement
E3027-162	1st/02	Milk	Ce-141	pCi/L	317.8	326	0.98	Agreement
E3027-162	1st/02	Milk	Cr-51	pCi/L	277	267	1.04	Agreement
E3027-162	1st/02	Milk	Cs-134	pCi/L	119	122	0.98	Agreement
E3027-162	1st/02	Milk	Cs-137	pCi/L	271.2	266	1.02	Agreement
E3027-162	1st/02	Milk	Mn-54	pCi/L	231.2	224	1.03	Agreement
E3027-162	1st/02	Milk	Fe-59	pCi/L	123.6	116	1.07	Agreement
E3027-162	1st/02	Milk	Zn-65	pCi/L	225.9	221	1.02	Agreement
E3027-162	1st/02	Milk	Co-60	pCi/L	152.9	158	0.97	Agreement
E3028-162	1st/02	Milk	Sr-89	pCi/L	79.9	83	0.96	Agreement
E3028-162	1st/02	Milk	Sr-90	pCi/L	24.7	27	0.93	Agreement

**FRAMATOME ANP 2002 ANALYTICS ENVIRONMENTAL CROSS CHECK PROGRAM  
PERFORMANCE EVALUATION**

Sample Number	Quarter/Year	Sample Media	Nuclide	Units	Reported Values	Known Values	Ratio Framatome/Analytics	Evaluation
E3148-162	2nd/02	Water	H-3	pCi/L	6970	6970	1.00	Agreement
E3149-162	2nd/02	Water	Sr-89	pCi/L	42	64	0.66	Non-Agreement See Note 1
E3149-162	2nd/02	Water	Sr-90	pCi/L	36	39	0.92	Agreement
E3150-162	2nd/02	Filter	Gross Alpha	pCi/L	See Note 2	See Note 2	See Note 2	Agreement
E3150-162	2nd/02	Filter	Gross Beta	pCi/L	See Note 2	See Note 2	See Note 2	Agreement
E3151-162	2nd/02	Filter	Ce-141	pCi/Filter	59	61	0.97	Agreement
E3151-162	2nd/02	Filter	Cr-51	pCi/Filter	165	160	1.03	Agreement
E3151-162	2nd/02	Filter	Cs-134	pCi/Filter	77	82	0.94	Agreement
E3151-162	2nd/02	Filter	Cs-137	pCi/Filter	64	62	1.03	Agreement
E3151-162	2nd/02	Filter	Co-58	pCi/Filter	68	68	1.00	Agreement
E3151-162	2nd/02	Filter	Mn-54	pCi/Filter	69	65	1.06	Agreement
E3151-162	2nd/02	Filter	Fe-59	pCi/Filter	62	55	1.13	Agreement
E3151-162	2nd/02	Filter	Zn-65	pCi/Filter	131	131	1.07	Agreement
E3151-162	2nd/02	Filter	Co-60	pCi/Filter	82	85	0.96	Agreement
E3152-162	2nd/02	Filter	Sr-90	pCi/Filter	41	48	0.85	Agreement
E3153-162	2nd/02	Milk	I-131	pCi/L	88	87	1.01	Agreement
E3153-162	2nd/02	Milk	I-131LL	pCi/L	85	87	0.98	Agreement
E3153-162	2nd/02	Milk	Ce-141	pCi/L	86	90	0.96	Agreement
E3153-162	2nd/02	Milk	Cr-51	pCi/L	230	235	0.98	Agreement
E3153-162	2nd/02	Milk	Cs-134	pCi/L	121	120	1.01	Agreement
E3153-162	2nd/02	Milk	Cs-137	pCi/L	89	91	0.98	Agreement
E3153-162	2nd/02	Milk	Co-58	pCi/L	100	100	1.00	Agreement
E3153-162	2nd/02	Milk	Mn-54	pCi/L	97	95	1.02	Agreement
E3153-162	2nd/02	Milk	Fe-59	pCi/L	83	81	1.02	Agreement
E3153-162	2nd/02	Milk	Zn-65	pCi/L	179	180	0.99	Agreement
E3153-162	2nd/02	Milk	Co-60	pCi/L	127	125	1.02	Agreement

Note 1: CR 02-43 issued to investigate failures for Sr-89

Note 2: Filter damaged during sample preparation. No results issued.

**FRAMATOME ANP 2002 ANALYTICS ENVIRONMENTAL CROSS CHECK PROGRAM  
PERFORMANCE EVALUATION**

Sample Number	Quarter/ Year	Sample Media	Nuclide	Units	Reported Values	Known Values	Ratio Framatome/ Analytics	Evaluation
E3288-162	3rd/02	Water	Gross Alpha	pCi/L	73	92	0.79	Agreement
E3288-162	3rd/02	Water	Gross Beta	pCi/L	204	239	0.85	Agreement
E3289-162	3rd/02	Water	I-131	pCi/L	68	79	0.86	Agreement
E3289-162	3rd/02	Water	I-131LL	pCi/L	77	79	0.97	Agreement
E3289-162	3rd/02	Water	Ce-141	pCi/L	209	214	0.98	Agreement
E3289-162	3rd/02	Water	Cr-51	pCi/L	289	304	0.95	Agreement
E3289-162	3rd/02	Water	Cs-134	pCi/L	169	176	0.96	Agreement
E3289-162	3rd/02	Water	Cs-137	pCi/L	167	169	0.99	Agreement
E3289-162	3rd/02	Water	Co-58	pCi/L	129	130	0.99	Agreement
E3289-162	3rd/02	Water	Mn-54	pCi/L	206	204	1.01	Agreement
E3289-162	3rd/02	Water	Fe-59	pCi/L	118	119	0.99	Agreement
E3289-162	3rd/02	Water	Zn-65	pCi/L	251	251	1.00	Agreement
E3289-162	3rd/02	Water	Co-60	pCi/L	187	199	0.94	Agreement
E3291-162	3rd/02	Filter	Gross Alpha	pCi	58	59	0.98	Agreement
E3291-162	3rd/02	Filter	Gross Beta	pCi	144	155	0.93	Agreement
E3292-162	3rd/02	Milk	I-131	pCi/L	79	80	0.99	Agreement
E3292-162	3rd/02	Milk	I-131LL	pCi/L	77	80	0.96	Agreement
E3292-162	3rd/02	Milk	Ce-141	pCi/L	156	160	0.98	Agreement
E3292-162	3rd/02	Milk	Cr-51	pCi/L	231	227	1.02	Agreement
E3292-162	3rd/02	Milk	Cs-134	pCi/L	128	132	0.97	Agreement
E3292-162	3rd/02	Milk	Cs-137	pCi/L	122	127	0.96	Agreement
E3292-162	3rd/02	Milk	Co-58	pCi/L	95	97	0.98	Agreement
E3292-162	3rd/02	Milk	Mn-54	pCi/L	151	152	0.99	Agreement
E3292-162	3rd/02	Milk	Fe-59	pCi/L	94	89	1.06	Agreement
E3292-162	3rd/02	Milk	Zn-65	pCi/L	180	187	0.96	Agreement
E3292-162	3rd/02	Milk	Co-60	pCi/L	142	149	0.95	Agreement
E3293-162	3rd/02	Milk	Sr-89	pCi/L	84	92	0.91	Agreement
E3293-162	3rd/02	Milk	Sr-90	pCi/L	36	39	0.92	Agreement