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

THREE MILE ISLAND NUCLEAR STATION  
UNITS 1 AND 2 ( TMI-1 & TMI-2 )  
OPERATING LICENSE NO. DPR-50 AND POSSESSION ONLY LICENSE NO. DPR-73  
DOCKET NOS. 50-289 AND 50-320

SUBJECT: 2003 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM REPORT

In accordance with TMI-1 Technical Specification 6.9.3.1 and TMI-2 Technical Specification 6.8.1.1, enclosed is the Annual Radiological Environmental Operating Report covering the time-period of January 1 through December 31, 2003, for the Three Mile Island Nuclear Station.

Please contact Laura Weber of TMI-1 Chemistry at (717) 948-8947 if you have any questions regarding this submittal.

Sincerely,



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GHG/awm

Enclosure

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File 04011

IE25  
NMS301

Docket No: 50-289  
50-320

# THREE MILE ISLAND NUCLEAR STATION UNITS 1 and 2

Annual Radiological  
Environmental Operating Report

1 January Through 31 December 2003

Prepared By  
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Environmental Services

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Three Mile Island Nuclear Station  
Middletown, PA 17057

April 2004

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## I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program conducted for the Three Mile Island Nuclear Station (TMINS) by AmerGen covers the period 1 January 2003 through 31 December 2003. During that time period, 1,713 analyses were performed on 1338 samples. In assessing all the data gathered for this report and comparing these results with preoperational data, it was concluded that the operation of TMINS had no adverse radiological impact on the environment.

Surface, drinking, effluent, storm, and well water samples were analyzed for concentrations of tritium and gamma emitting nuclides. Surface, drinking, and effluent water samples were also analyzed for concentrations of I-131. Drinking and effluent water samples were also analyzed for concentrations of gross beta. Effluent water samples were also analyzed for concentrations of Sr-89 and Sr-90. Well water samples were also analyzed for concentrations of Sr-90. No Sr-89 and Sr-90 activities were detected. Gross beta, I-131, and tritium activities detected were consistent with those detected in previous years. Iodine-131 detected was from upstream medical sources. No other fission or activation products attributed to TMI release were detected.

Fish (predator and bottom feeder) and sediment samples were analyzed for concentrations of gamma emitting nuclides. Fish samples were also analyzed for concentrations of Sr-89 and Sr-90. No Sr-89 and Sr-90 activity was detected. No fission or activation products were detected in fish. Cesium-137 levels detected in sediment were consistent with levels detected in previous years and were due to previous plant releases and fallout from nuclear weapons testing. No other TMINS-produced fission or activation products were detected in sediment.

Air particulate samples were analyzed for concentrations of gross beta and gamma emitting nuclides. Cosmogenic Be-7 was detected at levels consistent with those detected in previous years. No fission or activation products were detected.

High sensitivity I-131 analyses were performed on weekly air samples. All results were less than the minimum detectable activity.

Cow milk samples were analyzed for concentrations of I-131, gamma emitting nuclides, Sr-89 and Sr-90. No I-131 and Sr-89 activities were detected. Concentrations of naturally occurring K-40 were consistent with those detected in previous years. Sr-90 activities detected were consistent with those detected in previous years. No other fission or activation products were found.

Food Product samples were analyzed for concentrations of gamma emitting nuclides (including I-131) and Sr-90. No Sr-90 activity was detected. Concentrations of naturally occurring K-40 were consistent with those detected in previous years. No fission or activation products were detected.

Environmental gamma radiation measurements were performed quarterly using thermoluminescent dosimeters. Levels detected were consistent with those observed in previous years.

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## II. Introduction

The Three Mile Island Nuclear Station (TMINS), consisting of two pressurized water reactors (PWR), is located on the northern one-half of Three Mile Island in the Susquehanna River approximately 2.5 miles south of Middletown in Londonderry Township, Dauphin County, Pennsylvania. TMI-1 is owned and operated by AmerGen and became operational in 1974. TMI-2 is operated by GPU Nuclear, Inc. and owned by Metropolitan Edison (50%), Pennsylvania Electric (25%) and Jersey Central Power & Light (25%). TMI-2 became operational in 1978 and was shut down following the 1979 accident. At the end of 1993, TMI-2 was placed in a condition called Post-Defueling Monitored Storage. TMI-2 is maintained by Amergen under contract with GPU Nuclear.

A Radiological Environmental Monitoring Program (REMP) for TMINS was initiated in 1974. This report covers those analyses performed by Teledyne Brown Engineering (TBE), ICN Pharmaceutical, and Environmental Inc. (Midwest Labs) on samples collected during the period 1 January 2003 through 31 December 2003.

### A. Objective of the REMP

The objectives of the REMP are to:

1. Evaluate the relationship between quantities of radioactive material released from the plant and resultant radiation doses to individuals from principal pathways of exposure.
2. Provide data on measurable levels of radiation and radioactive materials in the site environs.
3. To verify inplant controls for the containment of radioactive materials.
4. To determine buildup of long-lived radionuclides in the environment and changes in background radiation levels.
5. To provide reassurance to the public that the program is capable of adequately assessing impacts and identifying noteworthy changes in the radiological status of the environment.
6. To fulfill the requirements of the TMI-1 and TMI-2 Technical Specifications.

## B. Implementation of the Objectives

The implementation of the objectives is accomplished by:

1. Identifying significant exposure pathways.
2. Establishing baseline radiological data of media within those pathways.
3. Continuously monitoring those media before and during Station operation to assess Station radiological effects (if any) on man and the environment.

## III. Program Description

### A. Sample Collection

Samples for the TMINS REMP were collected for AmerGen by Normandeau Associates, RMC Environmental Services Division (RMC). This section describes the general collection methods used by RMC to obtain environmental samples for the TMINS REMP in 2003. Sample locations and descriptions can be found in Tables B-1 and B-2, and Figures B-1 through B-3, Appendix B. The collection procedures used by RMC are listed in Table B-3.

#### Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, drinking water, effluent water, storm water, ground water, fish, and sediment. Two gallon water samples were collected monthly from continuous samplers located at three surface water locations (A3-2, J1-2 and Q9-1), three drinking water locations (G15-2, G15-3 and Q9-1), and one effluent water location (K1-1). Control locations were A3-2 and Q9-1. Monthly grab water samples were taken from one storm water runoff location (EDCB). Grab ground water samples were collected quarterly at seven locations (48S, GP-1, GP-6, GP-8, MS-22, OSF and OS-18), semiannually at 12 locations (GP-9, GP-12, MS-2, MS-5, MS-20, NW-A, NW-B, NW-C, NW-CW, OS-14, RW-1 and RW-2) and annually at eight locations (E1-2, MS-1, MS-4, MS-7, MS-8, MS-19, MS-21 and N2-1). All water samples were collected in new unused plastic bottles, which were rinsed at least twice with source water prior to collection. Fish samples comprising the flesh of two groups, bottom feeder and predator, were collected semiannually at an upstream control (BKG) and a downstream Indicator (IND) location. Location IND could be

affected by TMINS' effluent releases. Sediment samples composed of recently deposited substrate were collected semiannually at three locations (J2-1, K1-3 and A1-3). In addition, one sediment sample was collected annually at the EDCB. Location A1-3 was the control.

#### Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on samples of air particulate, airborne iodine, milk, and Food Product. Airborne iodine and particulate samples were collected and analyzed weekly at seven locations (A3-1, E1-2, F1-3, G2-1, H3-1, M2-1, and Q15-1). The control location was Q15-1. Airborne iodine and particulate samples were obtained at each location, using a vacuum pump with charcoal and glass fiber filters attached. The pumps were run continuously and sampled air at the rate of approximately one cubic foot per minute. The filters were replaced weekly and sent to the laboratory for analysis.

Milk samples were collected biweekly at four locations (K15-3, D2-1, E2-2, and G2-1) from March through November, and monthly from December through February. The control location was K15-3. All samples were collected in new unused two gallon plastic bottles from the bulk tank at each location, preserved with sodium bisulfite, and shipped promptly to the laboratory.

Food Products were collected annually at two locations (B10-2 and E1-2). The control location was B10-2. Four different kinds of vegetables were collected near the site boundary in the southeast (SE) and east-southeast (ESE) meteorological sectors, placed in new unused plastic bags, and sent to the laboratory for analysis.

#### Ambient Gamma Radiation

Direct radiation measurements were made using Panasonic 814 calcium sulfate ( $\text{CaSO}_4$ ) thermoluminescent dosimeters (TLD). The TLD locations were placed on and around the TMINS site as follows:

A site boundary ring consisting of 21 locations (A1-4, B1-1, B1-2, C1-2, D1-1, E1-4, F1-2, F1-4, G1-3, G1-5, G1-6, H1-1, J1-1, J1-3, K1-4, L1-1, M1-1, N1-3, P1-2, Q1-2, and R1-1) near and within the site perimeter representing fence post doses (i.e., at locations where the doses will be potentially greater than maximum annual off-site doses) from TMINS release.

An offsite ring consisting of 58 locations (A3-1, A5-1, A9-3, B2-1, B5-1, B10-1, C1-1, C2-1, C5-1, C8-1, D1-2, D2-2, D6-1, E1-2, E2-3, E5-1, E7-1, F1-1, F2-1, F5-1, F10-1, G1-2, G2-4, G5-1, H3-1, H5-1, H8-1, J3-1, J5-1, J7-1, K2-1, K3-1, K5-1, K8-1, L1-2, L2-1, L5-1, L8-1, M1-2, M2-1, M5-1, M9-1, N1-1, N2-1, N5-1, N8-1, P1-1, P2-1, P5-1, P8-1, Q1-1, Q2-1, Q5-1, Q9-1, R1-2, R3-1, R5-1, and R9-1) extending to approximately 5 miles from the site designed to measure possible exposures to close-in population.

The balance of 11 locations (D15-1, F25-1, G10-1, G15-1, H15-1, J15-1, K15-1, L15-1, N15-2, Q15-1, and R15-1) represent control areas.

The specific TLD locations were determined by the following criteria:

1. The presence of relatively dense population;
2. Site meteorological data taking into account distance and elevation for each of the sixteen-22 1/2 degree sectors around the site, where estimated annual dose from TMINS, if any, would be most significant;
3. On hills free from local obstructions and within sight of the vents (where practical);
4. And near the closest dwelling to the vents in the prevailing downwind direction.

Each TLD station consists of two primary program TLD badges, each of which has three  $\text{CaSO}_4$  thermoluminescent phosphors enclosed in plastic, placed at each location in a frame located approximately three feet above ground level. Since each TLD responds to radiation independently, this provides six independent detectors at each station. The TLDs were exchanged quarterly and sent to ICN for analysis.

## B. Sample Analysis

This section describes the general analytical methods used by TBE and Midwest Labs to analyze the environmental samples for radioactivity for the TMINS REMF in 2003. The analytical procedures used by the laboratories are listed in Table B-3.

In order to achieve the stated objectives, the current program includes the following analyses:

1. Concentrations of beta emitters in drinking and effluent water, and air particulates.
2. Concentrations of gamma emitters in surface, drinking, effluent, storm, and ground water, air particulates, milk, fish, sediment, and Food Product.
3. Concentrations of tritium in surface, drinking, effluent, storm, and ground water.
4. Concentrations of I-131 in surface, drinking, and effluent water, air, milk and Food Product.
5. Concentrations of strontium in effluent and ground water, fish, milk, and Food Product.
6. Ambient gamma radiation levels at various site environs.

C. Data Interpretation

The radiological and direct radiation data collected prior to TMINS becoming operational was used as a baseline with which these operational data were compared. For the purpose of this report, TMINS was considered operational at initial criticality. In addition, data were compared to previous years' operational data for consistency and trending. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Activity

The lower limit of detection (LLD) was defined as the smallest concentration of radioactive material in a sample that would yield a net count (above background) that would be detected with only a 5% probability of falsely concluding that a blank observation represents a "real" signal. The LLD was intended as a before the fact estimate of a system (including instrumentation, procedure and sample type) and not as an after the fact criteria for the presence of activity. All analyses were designed to achieve the required TMINS detection capabilities for environmental sample analysis.

The minimum detectable activity (MDA) is defined above with the exception that the measurement is an after the fact estimate of the presence of activity.

## 2. Net Activity Calculation and Reporting of Results

Net activity for a sample was calculated by subtracting background activity from the sample activity. Since the REMP measures extremely small changes in radioactivity in the environment, background variations may result in sample activity being lower than the background activity effecting a negative number. An MDA was reported in all cases where positive activity was not detected.

Gamma spectroscopy results for each type of sample were grouped as follows:

For surface, drinking, effluent, storm, and ground water 11 nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Zr-95, Nb-95, Cs-134, Cs-137, Ba-140 and La-140 were reported.

For fish eight nuclides, K-40, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Cs-134 and Cs-137 were reported.

For sediment six nuclides, K-40, Mn-54, Co-58, Co-60, Cs-134 and Cs-137 were reported.

For air particulate six nuclides, Be-7, Mn-54, Co-58, Co-60, Cs-134 and Cs-137 were reported.

For milk five nuclides, K-40, Cs-134, Cs-137, Ba-140 and La-140 were reported.

For Food Products four nuclides, K-40, I-131, Cs-134 and Cs-137 were reported.

Means and standard deviations of the results were calculated. The standard deviations represent the variability of measured results for different samples rather than single analysis uncertainty.

### D. Program Exceptions

For 2003 the TMINS REMP had a sample recovery rate in excess of 99%. Exceptions are listed below:

1. There were nonrepresentative hourly aliquots due to interrupted flow to the to the sample collection bucket for the weekly collection periods:  
01/02/2003 – 01/08/2003, Location Q9-1  
02/12/2003 – 02/19/2003, Location Q9-1

2. Due to an ice-blocked sample line due to freezing temperatures some or all of the hourly aliquots were missed for J1-2 during the following weeks:  
01/29/2003 – 03/27/2003, Location J1-2  
12/03/2003 – 12/23/2003, Location J1-2
3. Due to the laboratory accidentally analyzing a storm water sample for iodine instead of tritium, there was not enough sample left for a tritium analysis.  
07/26/2003 – 09/30/2003, Location EDCB
4. Ground water samples were not collected. Sample collection personnel were unable to remove the cap from the well.  
06/05/2003, Location GP-8  
09/11/2003, Location GP-8
5. Air particulate and air iodine samples were not available for the following periods and locations, due to pump failures:  
04/09/2003 – 04/16/2003 (week 15), Location E1-2
6. Air particulate and air iodine sample volumes were low for the following periods and locations, due to pump malfunction:  
08/06/2003 – 08/13/2003 (week 32), Location G2-1
7. Air particulate and air iodine samples volumes were low from the air sample station only running for 54.4 hours due to power outage from Hurricane Isabel:  
09/17/2003 – 09/24/2003 (week 38), Location G2-1
8. TLD sample lost due to vandalism:  
Apr – July, Location K15-1
9. TLD sample lost due to a replaced fence:  
Oct – Jan, Location F1-4

Each program exception was reviewed to understand the causes of the program exception. Sampling and maintenance errors were reviewed with the personnel involved to prevent recurrence. Occasional equipment breakdowns and power outages were unavoidable.

The overall sample recovery rate indicates that the appropriate procedures and equipment are in place to assure reliable program implementation.

## E. Program Changes

Station F1-1 was added as a backup milk sample station in 2003.

ICN Pharmaceutical was renamed to Global Dosimetry in 2003.

## IV. Results and Discussion

### A. Aquatic Environment

#### 1. Surface Water

Samples were taken from a continuous sampler at three locations (A3-2, J1-2, and Q9-1) on a monthly schedule. Of these locations only J1-2 located downstream, could be affected by TMINS' effluent releases. The following analyses were performed.

##### Tritium

Monthly samples from all locations were analyzed for tritium activity (Table C-1.1, Appendix C). Positive tritium activity was detected in eight of 25 samples, primarily at location J1-2 which is located immediately downstream of the TMINS effluent outfall. All samples ranged from <156 to 9,310 pCi/l. Concentrations detected were consistent with those detected in previous years and were well below any regulatory limits. (Figures C-1 and C-2, Appendix C).

##### Iodine

Monthly samples from location A3-2 were analyzed for iodine-131 activity (Table C-1.2, Appendix C). Iodine-131 activity was detected in three samples. The values ranged from <0.3 to 1.6 pCi/l. Concentrations detected were consistent with those detected in previous years. Iodine-131 activity was the result of medical treatments.

##### Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides (Table C-1.3, Appendix C). All nuclides were less than the MDA.

## 2. Drinking Water

Monthly samples were collected from continuous water samplers at three locations (G15-2, G15-3, and Q9-1). Two locations (G15-2 and G15-3) could be affected by TMINS' effluent releases. The following analyses were performed:

### Gross Beta

Monthly samples from all locations were analyzed for concentrations of gross beta. (Tables C-II.1, Appendix C). Gross beta activity was detected in 29 of 36 samples. The values ranged from <1.6 to 4.3 pCi/l. Concentrations detected were consistent with those detected in previous years (Figures C-3, Appendix C).

### Iodine-131

Monthly samples from all locations were analyzed for concentrations of iodine-131. (Tables C-II.2, Appendix C). Iodine-131 activity was not detected in the samples.

### Tritium

Monthly samples from all locations were analyzed for tritium activity (Table C-II.3, Appendix C). Tritium activity was detected in two of 36 samples. The values ranged from <131 to 397 pCi/l. Concentrations detected were consistent with those detected in previous years (Figures C-4, Appendix C).

### Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides (Table C-II.4, Appendix C). All nuclides were less than the MDA.

## 3. Effluent Water

Monthly samples were collected from continuous water samplers at one location (K1-1). The following analyses were performed:

### Gross Beta

Monthly samples from location K1-1 were analyzed for concentrations of gross beta. (Tables C-III.1, Appendix C). Gross beta was detected in all 12 samples. The values ranged from 2.3

to 6.7 pCi/l. Concentrations detected were consistent with those detected in previous years.

#### Iodine-131

Monthly samples from location K1-1 were analyzed for concentrations of iodine-131. (Tables C– III.1, Appendix C). Iodine activity was detected in one sample. The values ranged from <0.3 to 0.6 pCi/l. Concentrations detected were consistent with those detected in previous years.

#### Tritium

Monthly samples from location K1-1 were analyzed for tritium activity (Table C– III.1, Appendix C). Tritium activity was detected in 10 samples. The values ranged from <171 to 91,500 pCi/l. Concentrations detected were consistent with those detected in previous years.

#### Strontium

Semiannual samples from location K1-1 were analyzed for Sr-89 and Sr-90 (Table C– III.1, Appendix C). No strontium activity was detected. The highest MDA was calculated at 1.7 pCi/l for Sr-89 and at 0.5 pCi/l for Sr-90.

#### Gamma Spectrometry

Samples from location K1-1 were analyzed for gamma emitting nuclides (Table C– III.2, Appendix C). All nuclides were less than the MDA.

#### 4. Storm Water

Monthly grabs from the storm water collection basin (EDCB) were composited quarterly. The following analyses were performed:

#### Tritium

All samples from location EDCB were analyzed for tritium activity (Table C–IV.1, Appendix C). Tritium activity was detected in three samples. The values ranged from 467 to 985 pCi/l. Concentrations detected were consistent with those detected in previous years.

### Gamma Spectrometry

Samples from location EDCB were analyzed for gamma emitting nuclides (Table C-IV.1, Appendix C). All nuclides were less than the MDA.

## 5. Ground Water

Quarterly, semiannual and annual grab samples were collected at 27 locations (48S, GP-1, GP-6, GP-8, MS-22, OSF, OS-18, GP-9, GP-12, MS-2, MS-5, MS-20, NW-A, NW-B, NW-C, NW-CW, OS-14, RW-1, RW-2, E1-2, MS-1, MS-4, MS-7, MS-8, MS-19, MS-21 and N2-1). The following analyses were performed:

### Tritium

All samples from the locations were analyzed for tritium activity (Table C-V.1, Appendix C). Tritium activity was detected in 51 of 61 samples. The values ranged from <164 to 5,210 pCi/l. Concentrations detected were consistent with those detected in previous years.

### Strontium

Annual samples from four locations (48S, MS-2, MS-8 and OS-14) were analyzed for Sr-90 (Table C-V.2, Appendix C). No Sr-90 activity was detected. The highest MDA was calculated at <0.7 pCi/l.

### Gamma Spectrometry

Quarterly samples from two locations (48S and OSF) and annual samples from 10 locations (E1-2, MS-2, MS-5, MS-8, MS-20, MS-22, N2-1, OS-14, RW-1 and RW-2) were analyzed for gamma emitting nuclides (Table C-V.2, Appendix C). All nuclides were less than the MDA.

## 6. Fish

Fish samples comprised of bottom feeder and predator were collected at two locations (IND and BKG) semiannually. Location IND could be affected by TMINS' effluent releases. The following analysis was performed:

### Strontium

The edible portion of fish samples from both locations were analyzed for Sr-89 and Sr-90. (Table C-VI.1, Appendix C). No strontium activity was detected. The highest MDA was calculated at <13 pCi/kg wet for Sr-89 and at <3 pCi/kg wet for Sr-90.

### Gamma Spectrometry

The edible portion of fish samples from both locations was analyzed for gamma emitting nuclides (Table C-VI.2, Appendix C). Naturally occurring K-40 was found at all stations and ranged from 2,800 to 3,210 pCi/kg wet and was consistent with levels detected in previous years. No fission or activation products were found.

## 7. Sediment

Aquatic sediment samples were collected at three locations (A1-3, J2-1 and K1-3) semiannually. In addition, location EDCB was sampled annually. Of these locations two (J2-1 and K1-3) could be affected by TMINS' effluent releases. The following analysis was performed:

### Gamma Spectrometry

Sediment samples from all four locations were analyzed for gamma emitting nuclides (Table C-VII.1, Appendix C). Nuclides detected were naturally occurring K-40, and the fission product Cs-137. K-40 was found at all stations and ranged from 10,100 to 22,300 pCi/kg dry. Concentrations of the fission product Cs-137 were found in all samples. Location EDCB had the highest average concentration of 254 pCi/kg dry. The activity detected was consistent with those detected in the pre-operational years (Figure C-5, Appendix C). No other TMINS fission or activation products were found.

## B. Atmospheric Environment

### 1. Airborne

#### a. Air Particulates

Continuous air particulate samples were collected from seven locations on a weekly basis. The seven locations

were separated into three groups: Group I represents locations within the TMINS site boundary (E1-2 and F1-3), Group II represents the location at an intermediate distance from the TMINS site (A3-1, G2-1, M2-1, AND H3-1), and Group III represents the control location at a remote distance from TMINS (Q15-1). The following analyses were performed:

#### Gross Beta

Weekly samples were analyzed for concentrations of beta emitters (Table C-VIII.1 and C-VIII.2, Appendix C).

Detectable gross beta activity was observed at all locations. Comparison of results among the three groups aid in determining the effects, if any, resulting from the operation of TMINS. The results from the On-Site locations (Group I) ranged from <4 to 41 E-3 pCi/m<sup>3</sup> with a mean of 16 E-3 pCi/m<sup>3</sup>. The results from the Offsite location (Group II) ranged from <4 to 49 E-3 pCi/m<sup>3</sup> with a mean of 16 E-3 pCi/m<sup>3</sup>. The results from the Control locations (Group III) ranged from <4 to 30 E-3 pCi/m<sup>3</sup> with a mean of 16 E-3 pCi/m<sup>3</sup>. Comparison of the 2003 air particulate data with previous years data indicate no effects from the operation of TMINS (Figure C-6, Appendix C). In addition a comparison of the weekly mean values for 2003 indicate no notable differences among the three groups (Figure C-7, Appendix C).

#### Gamma Spectrometry

Weekly samples were composited quarterly and analyzed for gamma emitting nuclides (Table C-VIII.3, Appendix C). Naturally occurring Be-7 due to cosmic ray activity was detected in all samples. These values ranged from 22 to 83 E-3 pCi/m<sup>3</sup>. All other nuclides were less than the MDA.

#### b. Airborne Iodine

Continuous air samples were collected from seven (A3-1, E1-2, F1-3, G2-1, H3-1, M2-1, and Q15-1) locations and analyzed weekly for I-131 (Table C-IX.1, Appendix C). All results were less than the MDA.

## 2. Terrestrial

a. Milk

Samples were collected from four locations (K15-3, D2-1, E2-2, and G2-1) biweekly March through November and monthly December through February. The following analyses were performed:

Iodine-131

Milk samples from all locations were analyzed for concentrations of I-131 (Table C-X.1, Appendix C). All results were less than the MDA.

Strontium

Milk samples from all locations were composited quarterly and analyzed for Sr-89 and Sr-90 (Table C-X.2, Appendix C). No Sr-89 activity was detected. Sr-90 activity was detected. The values ranged from <0.5 to 1.3 pCi/l. The activity detected was consistent with those detected in the pre-operational years (Figure C-8, Appendix C).

Gamma Spectrometry

Milk samples from all locations were analyzed for concentrations of gamma emitting nuclides (Table C-X.3, Appendix C).

Naturally occurring K-40 activity was found in all samples. The values ranged from 1,020 to 1,590 pCi/l. All other nuclides were less than the MDA.

b. Food Product

Samples were collected from two locations (B10-2 and E1-2) annually. The following analyses were performed:

Strontium

Each Food Product sample was analyzed for concentrations of Sr-90 (Table C-XI.1, Appendix C). Sr-90 activity was detected in one sample at 17 pCi/kg wet.

### Gamma Spectrometry

Each Food Product sample was analyzed for concentrations of gamma emitting nuclides (Table C–XI.1, Appendix C).

Naturally occurring K-40 activity was found in all samples. The values ranged from 1,820 to 5,270 pCi/l. All other nuclides were less than the MDA.

#### C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured utilizing Panasonic 814 (CaSO<sub>4</sub>) thermoluminescent dosimeters. Fifty-eight TLD locations were established around the site. Results of TLD measurements are listed in Tables C–XII.1 to C–XII.3, Appendix C.

TLD measurements were below 10 mR/standard month, with a range of 2.6 to 6.8 mR/standard month. A comparison of the Site Boundary and Intermediate Distance data to the Control Location data, indicate that the ambient gamma radiation levels from the Control Locations D15-1, F25-1, G10-1, G15-1, H15-1, J15-1, K15-1, L15-1, N15-2, Q15-1, and R15-1 were consistently higher. The historical ambient gamma radiation data from Locations D15-1, F25-1, G10-1, G15-1, H15-1, J15-1, K15-1, L15-1, N15-2, Q15-1, and R15-1 were plotted along with similar data from the Site, Intermediate Distance and Outer Ring Locations (Figure C–9, Appendix C). Locations D15-1, F25-1, G10-1, G15-1, H15-1, J15-1, K15-1, L15-1, N15-2, Q15-1, and R15-1 have a historical high bias, but tracked with the data from all three groups, this bias is most likely due to radon emanating from the ground.

#### D. Land Use Survey

A Land Use Survey conducted in the September and October 2003 growing season around the Three Mile Island Nuclear Station (TMINS) was performed by Normandeau Associates, RMC Environmental Services Division for AmerGen to comply with Sections 2.15 and 3.4.2 of the Plant's Offsite Dose Calculation Manual. The purpose of the survey was to document the nearest resident and milk-producing animal in each of the sixteen 22 ½ degree sectors around the site. There were no changes required to the TMINS REMP, as a result of this survey. The results of this survey are summarized below.

<u>Distance in Miles from the TMINS Reactor Buildings</u>		
<u>Sector</u>	<u>Residence</u>	<u>Milk Farm</u>
1 N	1.1	2.1
2 NNE	0.7	-
3 NE	0.5	4.1
4 ENE	0.5	1.1
5 E	0.4	1.1
6 ESE	1.1	3.2
7 SE	0.7	1.4
8 SSE	0.7	-
9 S	2.3	-
10 SSW	0.6	4.9
11 SW	0.5	-
12 WSW	0.5	-
13 W	0.4	-
14 WNW	0.4	3.7
15 NW	0.4	-
16 NNW	0.7	-

**2003 RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT**

**2003 Broad Leaf Vegetation Sampling Results<sup>(1)</sup>**

Collection Date	Sample Location	Vegetation Type	Gamma Result (pCi/kg, wet)	Sr-90 Result (pCi/kg, wet)
10/02/03	TM-FPL-ESE1	Beech Leaves	Be-7: 3510 ± 217 K-40: 3770 ± 314	4 ± 1
10/02/03	TM-FPL-ESE2	Sycamore Leaves	Be-7: 2520 ± 234 K-40: 1860 ± 288	22 ± 2
10/02/03	TM-FPL-ESE3	Maple Leaves	Be-7: 2960 ± 155 K-40: 2870 ± 223	19 ± 2
10/02/03	TM-FPL-SE1	Maple Leaves	Be-7: 1970 ± 181 K-40: 3030 ± 266	17 ± 2
10/02/03	TM-FPL-SE2	Sycamore Leaves	Be-7: 3040 ± 272 K-40: 3390 ± 425	10 ± 2
10/02/03	TM-FPL-SE3	Grape Leaves	Be-7: 1080 ± 143 K-40: 2090 ± 245	68 ± 3
10/02/03	TM-FPL-B10-2 <sup>(2)</sup>	Sycamore, Maple and Oak Leaves	Be-7: 2470 ± 148 K-40: 4960 ± 250	82 ± 4

(1) Collection and analysis of broadleaf vegetation was performed in lieu of a garden census.

(2) Control Sample

V. References

1. Three Mile Island Nuclear Station, Unit 1, Technical Specifications, DPR 50.
2. Three Mile Island Nuclear Station, Unit 2, PDMS Technical Specifications, DPR 73.
3. Radiation Management Corporation. "Three Mile Island Nuclear Station, Preoperational Radiological Environmental Monitoring Program, January 1, 1974 - June 5, 1974." RMC-TR-75-17, January 1975.
4. AmerGen. "Three Mile Island Nuclear Station Offsite Dose Calculation Manual (ODCM)."

## **APPENDIX A**

# **RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY**

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION		DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003		LOCATION WITH HIGHEST ANNUAL MEAN		
Location of Facility: MIDDLETOWN COUNTY, PA								
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR MEAN (F) RANGE	CONTROL MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	TRITIUM	25	2000	1885 (8/12) (<165/9310)	179 (0/13) (<156/<199)	1885 (8/12) (<165/9310)	J1-2 INDICATOR WEST SHORE, TMI 0.5 MILES S OF SITE	0
	I-131	12	N/A	N/A	0.7 (3/12) (<0.3/1.6)	0.7 (3/12) (<0.3/1.6)	A3-2 CONTROL SWATARA CREEK 2.5 MILES N OF SITE	0
	GAMMA MN-54	12	15	3 (0/12) (<2/<6)	3 (0/12) (<2/<6)	3 (0/12) (<2/<6)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	CO-58		15	3 (0/12) (<2/<6)	3 (0/12) (<2/<6)	3 (0/12) (<2/<6)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	CO-60		15	4 (0/12) (<2/<10)	4 (0/12) (<2/<7)	4 (0/12) (<2/<10)	J1-2 INDICATOR WEST SHORE, TMI 0.5 MILES S OF SITE	0
	FE-59		30	9 (0/12) (<4/<27)	8 (0/12) (<4/<14)	9 (0/12) (<4/<27)	J1-2 INDICATOR WEST SHORE, TMI 0.5 MILES S OF SITE	0
	ZN-65		30	9 (0/12) (<5/<23)	8 (0/12) (<4/<14)	9 (0/12) (<5/<23)	J1-2 INDICATOR WEST SHORE, TMI 0.5 MILES S OF SITE	0
	ZR-95		30	5 (0/12) (<3/<11)	6 (0/12) (<4/<11)	6 (0/12) (<4/<11)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION		DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003		INDICATOR CONTROL LOCATION WITH HIGHEST ANNUAL MEAN			
Location of Facility: MIDDLETOWN COUNTY, PA									
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (F) RANGE	MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS	
	NB-95		15	3 (0/12) (<2/<7)	4 (0/12) (<2/<7)	4 (0/12) (<2/<7)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0	
	CS-134		15	3 (0/12) (<1/<6)	3 (0/12) (<2/<6)	3 (0/12) (<2/<6)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0	
	CS-137		18	3 (0/12) (<2/<6)	4 (0/12) (<2/<7)	4 (0/12) (<2/<7)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0	
	BA-140		60	16 (0/12) (<7/<30)	18 (0/12) (<10/<30)	18 (0/12) (<10/<30)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0	
	LA-140		15	5 (0/12) (<2/<11)	6 (0/12) (<4/<11)	6 (0/12) (<4/<11)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0	
DRINKING WATER (PCI/LITER)	GROSS BETA	36	4	2.9 (21/24) (<1.9/4.3)	2.1 (8/12) (<1.6/2.8)	3.1 (11/12) (<2.0/4.3)	G15-2 INDICATOR WRIGHTSVILLE WATER SUPPLY 13.6 MILES SE OF SITE	0	
	I-131	36	1	0.5 (0/24) (<0.2/<0.9)	0.6 (0/12) (<0.2/<1.0)	0.6 (0/12) (<0.2/<0.9)	G15-2 INDICATOR WRIGHTSVILLE WATER SUPPLY 13.6 MILES SE OF SITE	0	
	TRITIUM	36	2000	194 (2/24) (<154/397)	173 (0/12) (<131/<194)	215 (2/12) (<168/397)	G15-3 INDICATOR LANCASTER WATER AUTHORITY 14.8 MILES SE OF SITE	0	

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FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: <b>THREE MILE ISLAND NUCLEAR STATION</b>		DOCKET NUMBER: <b>50-289 &amp; 50-320</b>						
Location of Facility: <b>MIDDLETOWN COUNTY, PA</b>		REPORTING PERIOD: <b>2003</b>						
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR	CONTROL	LOCATION WITH HIGHEST ANNUAL MEAN		NUMBER OF NONROUTINE REPORTED MEASUREMENTS
				LOCATIONS MEAN (F) RANGE	LOCATION MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	
	GAMMA MN-54	36	15	4 (0/24) (<2/<8)	5 (0/12) (<2/<9)	5 (0/12) (<2/<9)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	CO-58		15	4 (0/24) (<2/<7)	4 (0/12) (<2/<9)	4 (0/12) (<2/<9)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	CO-60		15	4 (0/24) (<2/<8)	5 (0/12) (<3/<10)	5 (0/12) (<3/<10)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	FE-59		30	9 (0/24) (<4/<19)	11 (0/12) (<6/<18)	11 (0/12) (<6/<18)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	ZN-65		30	9 (0/24) (<4/<17)	11 (0/12) (<6/<20)	11 (0/12) (<6/<20)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	ZR-95		30	7 (0/24) (<3/<12)	8 (0/12) (<4/<15)	8 (0/12) (<4/<15)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	NB-95		15	4 (0/24) (<2/<8)	5 (0/12) (<2/<9)	5 (0/12) (<2/<9)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	CS-134		15	3 (0/24) (<2/<7)	4 (0/12) (<2/<8)	4 (0/12) (<2/<8)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: <b>THREE MILE ISLAND NUCLEAR STATION</b>				DOCKET NUMBER: <b>50-289 &amp; 50-320</b>		REPORTING PERIOD: <b>2003</b>		
Location of Facility: <b>MIDDLETOWN COUNTY, PA</b>				INDICATOR CONTROL LOCATION WITH HIGHEST ANNUAL MEAN				
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (I.L.D)	MEAN (F) RANGE	MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	CS-137		18	4 (0/24) (<2/<7)	5 (0/12) (<2/<9)	5 (0/12) (<2/<9)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	BA-140		60	19 (0/24) (<9/<36)	23 (0/12) (<9/<40)	23 (0/12) (<9/<40)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
	LA-140		15	6 (0/24) (<3/<13)	8 (0/12) (<3/<15)	8 (0/12) (<3/<15)	Q9-1 CONTROL STEELTON WATER AUTHORITY 8.5 MILES NW OF SITE	0
EFFLUENT WATER (PCI/LITER)	GROSS BETA	12	N/A	5.7 (12/12) (2.3/6.7)	N/A	5.7 (12/12) (2.3/6.7)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	I-131	12	N/A	0.5 (1/12) (<0.3/0.6)	N/A	0.5 (1/12) (<0.3/0.6)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	H-3	12	N/A	20444 (10/12) (<171/91500)	N/A	20444 (10/12) (<171/91500)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	SR-89	2	N/A	1.6 (0/2) (<1.6/<1.7)	N/A	1.6 (0/2) (<1.6/<1.7)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	SR-90	2	N/A	0.4 (0/2) (<0.3/<0.5)	N/A	0.4 (0/2) (<0.3/<0.5)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

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**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION				DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003		
Location of Facility: MIDDLETOWN COUNTY, PA				INDICATOR	CONTROL	LOCATION WITH HIGHEST ANNUAL MEAN		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (F) RANGE	MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	GAMMA MN-54	12	N/A	4 (0/12) (<2/<7)	N/A	4 (0/12) (<2/<7)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	CO-58		N/A	4 (0/12) (<2/<6)	N/A	4 (0/12) (<2/<6)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	CO-60		N/A	5 (0/12) (<2/<12)	N/A	5 (0/12) (<2/<12)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	FE-59		N/A	10 (0/12) (<5/<21)	N/A	10 (0/12) (<5/<21)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	ZN-65		N/A	10 (0/12) (<5/<20)	N/A	10 (0/12) (<5/<20)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	ZR-95		N/A	7 (0/12) (<4/<11)	N/A	7 (0/12) (<4/<11)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	NB-95		N/A	4 (0/12) (<2/<7)	N/A	4 (0/12) (<2/<7)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	CS-134		N/A	4 (0/12) (<2/<6)	N/A	4 (0/12) (<2/<6)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION				DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003		
Location of Facility: MIDDLETOWN COUNTY, PA				INDICATOR CONTROL LOCATION	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN	STATION #	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (I.L.D)	MEAN (F) RANGE	MEAN (F) RANGE	MEAN (F) RANGE	NAME DISTANCE AND DIRECTION	
STORM WATER (PCI/LITER)	CS-137		N/A	4 (0/12) (<2/<6)	N/A	4 (0/12) (<2/<6)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	BA-140		N/A	19 (0/12) (<12/<33)	N/A	19 (0/12) (<12/<33)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	LA-140		N/A	6 (0/12) (<4/<12)	N/A	6 (0/12) (<4/<12)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE 0.2 MILES SSW ON SITE	0
	TRITIUM	3	N/A	650 (3/3) (467/985)	N/A	650 (3/3) (467/985)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	GAMMA MN-54	4	N/A	4 (0/4) (<2/<7)	N/A	4 (0/4) (<2/<7)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	CO-58		N/A	4 (0/4) (<2/<6)	N/A	4 (0/4) (<2/<6)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	CO-60		N/A	5 (0/4) (<2/<10)	N/A	5 (0/4) (<2/<10)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION				DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003		
Location of Facility: MIDDLETOWN COUNTY, PA				INDICATOR	CONTROL	LOCATION WITH HIGHEST ANNUAL MEAN		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (F) RANGE	MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	FE-59		N/A	8 (0/4) (<5/<12)	N/A	8 (0/4) (<5/<12)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	ZN-65		N/A	8 (0/4) (<5/<14)	N/A	8 (0/4) (<5/<14)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	ZR-95		N/A	6 (0/4) (<4/<10)	N/A	6 (0/4) (<4/<10)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	NB-95		N/A	4 (0/4) (<2/<6)	N/A	4 (0/4) (<2/<6)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	CS-134		N/A	3 (0/4) (<2/<6)	N/A	3 (0/4) (<2/<6)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	CS-137		N/A	4 (0/4) (<2/<7)	N/A	4 (0/4) (<2/<7)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	BA-140		N/A	17 (0/4) (<11/<24)	N/A	17 (0/4) (<11/<24)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0
	LA-140		N/A	7 (0/4) (<4/<13)	N/A	7 (0/4) (<4/<13)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE ON SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION				DOCKET NUMBER: 50-289 & 50-320				
Location of Facility: MIDDLETOWN COUNTY, PA				REPORTING PERIOD: 2003				
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR MEAN (F) RANGE	CONTROL MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
GROUND WATER (PCI/LITER)	II-3	61	N/A	759 (49/61) (<164/5210)	N/A	5090 (2/2) (5210/4970)	NW-C ONSITE WELL	0
	SR-90	6	N/A	0.6 (0/6) (<0.5/<0.7))	N/A	0.7 (0/1) (<0.7)	MS-2 ONSITE WELL	0
	GAMMA MN-54	18	N/A	4 (0/18) (<2/<7)	N/A	6 (0/1) (<6)	RW-2 ONSITE WELL	0
	CO-58		N/A	4 (0/18) (<2/<7)	N/A	7 (0/1) (<7)	RW-2 ONSITE WELL	0
	CO-60		N/A	6 (0/18) (<2/<12)	N/A	7 (0/1) (<7)	MS-2 ONSITE WELL	0
	FE-59		N/A	11 (0/18) (<5/<26)	N/A	17 (0/1) (<17)	OS-14 ONSITE WELL	0
	ZN-65		N/A	11 (0/18) (<5/<28)	N/A	17 (0/1) (<17)	OS-14 ONSITE WELL	0

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**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION				DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003		
Location of Facility: MIDDLETOWN COUNTY, PA				INDICATOR	CONTROL	LOCATION WITH HIGHEST ANNUAL MEAN		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (F) RANGE	MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	ZR-95		N/A	8 (0/18) (<4/<13)	N/A	13 (0/1) (<13)	RW-2 ONSITE WELL	0
	NB-95		N/A	5 (0/18) (<3/<8)	N/A	7 (0/1) (<7)	MS-20 ONSITE WELL	0
	CS-134		N/A	4 (0/18) (<2/<7)	N/A	7 (0/1) (<7)	RW-2 ONSITE WELL	0
	CS-137		N/A	5 (0/18) (<3/<8)	N/A	7 (0/1) (<7)	RW-2 ONSITE WELL	0
	BA-140		N/A	24 (0/18) (<12/<43)	N/A	43 (0/1) (<43)	RW-2 ONSITE WELL	0
	LA-140		N/A	8 (0/18) (<2/<13)	N/A	13 (0/1) (<13)	MS-20 ONSITE WELL	0
BOTTOM FEEDER (FISH) (PCI/KG WET)	SR-89	4	N/A	11 (0/2) (<10/<11)	11 (0/2) (<9/<13)	11 (0/2) (<9/<13)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	SR-90	4	10	3 (0/2) (<2/<3)	2 (0/2) (<2)	3 (0/2) (<2/<3)	INDB INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION				DOCKET NUMBER: 50-289 & 50-320				
Location of Facility: MIDDLETOWN COUNTY, PA				REPORTING PERIOD: 2003				
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	GAMMA K-40	4	N/A	3150 (2/2) (3140/3160)	2925 (2/2) (2870/2980)	3150 (2/2) (3140/3160)	INDB INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0
	MN-54		130	10 (0/2) (<8/<13)	18 (0/2) (<13/<22)	18 (0/2) (<13/<22)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	CO-58		130	11 (0/2) (<8/<13)	21 (0/2) (<16/<27)	21 (0/2) (<16/<27)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	CO-60		130	11 (0/2) (<8/<14)	17 (0/2) (<13/<22)	17 (0/2) (<13/<22)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	FE-59		260	25 (0/2) (<20/<30)	54 (0/2) (<39/<68)	54 (0/2) (<39/<68)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	ZN-65		260	23 (0/2) (<18/<28)	37 (0/2) (<27/<47)	37 (0/2) (<27/<47)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	CS-134		130	11 (0/2) (<9/<13)	16 (0/2) (<11/<21)	16 (0/2) (<11/<21)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	CS-137		150	11 (0/2) (<9/<12)	18 (0/2) (<14/<22)	18 (0/2) (<14/<22)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION				DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003		
Location of Facility: MIDDLETOWN COUNTY, PA				INDICATOR	CONTROL	LOCATION WITH HIGHEST ANNUAL MEAN		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (F) RANGE	MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
PREDATOR (FISH) (PCI/KG WET)	SR-89	4	N/A	9 (0/2) (<8/<11)	12 (0/2) (<12)	12 (0/2) (<12)	BKGP CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	SR-90	4	10	2 (0/2) (<2/<3)	2 (0/2) (<2/<3)	2 (0/2) (<2/<3)	BKGP CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	GAMMA K-40	4	N/A	3185 (2/2) (3160/3210)	2900 (2/2) (2800/3000)	3185 (2/2) (3160/3210)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0
	MN-54		130	20 (0/2) (<14/<25)	14 (0/2) (<12/<16)	20 (0/2) (<14/<25)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0
	CO-58		130	20 (0/2) (<14/<26)	16 (0/2) (<15/<17)	20 (0/2) (<14/<26)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0
	CO-60		130	20 (0/2) (<15/<26)	12 (0/2) (<11/<14)	20 (0/2) (<15/<26)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0
	FE-59		260	46 (0/2) (<32/<60)	39 (0/2) (<36/<43)	46 (0/2) (<32/<60)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0
	ZN-65		260	44 (0/2) (<31/<58)	29 (0/2) (<27/<32)	44 (0/2) (<31/<58)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION		DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003		LOCATION WITH HIGHEST ANNUAL MEAN		
Location of Facility: MIDDLETOWN COUNTY, PA				INDICATOR CONTROL LOCATION	MEAN LOCATION	MEAN LOCATION	STATION #	NUMBER OF
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (F) RANGE	MEAN (F) RANGE	MEAN (F) RANGE	NAME DISTANCE AND DIRECTION	NONROUTINE REPORTED MEASUREMENTS
SEDIMENT (PCI/KG DRY)	CS-134		130	18 (0/2) (<12/<23)	12 (0/2) (<10/<13)	18 (0/2) (<12/<23)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0
	CS-137		150	21 (0/2) (<16/<26)	14 (0/2) (<13/<15)	21 (0/2) (<16/<26)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0
	GAMMA K-40	7	N/A	15560 (5/5) (10100/22300)	13550 (2/2) (11000/16100)	20250 (2/2) (18200/22300)	J2-1 INDICATOR YORK HAVEN DAM 1.5 MILES S OF SITE	0
	MN-54		N/A	48 (0/5) (<34/<57)	37 (0/2) (<22/<51)	54 (0/1) (<54)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0
	CO-58		N/A	45 (0/5) (<34/<56)	34 (0/2) (<20/<48)	50 (0/1) (<50)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0
	CO-60		N/A	47 (0/5) (<34/<56)	34 (0/2) (<19/<49)	54 (0/1) (<54)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0
	CS-134		150	41 (0/5) (<31/<50)	32 (0/2) (<19/<46)	48 (0/1) (<48)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0
	CS-137		180	163 (5/5) (85/254)	94 (2/2) (83/104)	254 (1/1) (254)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION				DOCKET NUMBER: 50-289 & 50-320				
Location of Facility: MIDDLETOWN COUNTY, PA				REPORTING PERIOD: 2003				
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR	CONTROL	LOCATION WITH HIGHEST ANNUAL MEAN		NUMBER OF NONROUTINE REPORTED MEASUREMENTS
				LOCATIONS MEAN (F) RANGE	LOCATION MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	
AIR PARTICULATE (E-3 PCI/CU.METER)	GROSS BETA	363	10	16 (298/311) (<4/49)	16 (50/52) (<4/30)	17 (52/52) (8/49)	A3-1 INDICATOR MIDDLETOWN 2.6 MILES N OF SITE	0
	GAMMA BE-7	28	N/A	51 (24/24) (22/83)	55 (4/4) (44/62)	55 (4/4) (44/62)	Q15-1 CONTROL WEST FAIRVIEW 13.5 MILES NW OF SITE	0
	MN-54		N/A	0.7 (0/24) (<0.3/<1.3)	0.8 (0/4) (<0.5/<1.3)	0.8 (0/4) (<0.5/<1.3)	Q15-1 CONTROL WEST FAIRVIEW 13.5 MILES NW OF SITE	0
	CO-58		N/A	0.8 (0/24) (<0.3/<1.2)	0.9 (0/4) (<0.7/<1.5)	0.9 (0/4) (<0.5/<1.2)	A3-1 INDICATOR MIDDLETOWN 2.6 MILES N OF SITE	0
	CO-60		N/A	0.8 (0/24) (<0.3/<1.5)	0.8 (0/4) (<0.6/<1.1)	0.9 (0/4) (<0.5/<1.5)	G2-1 INDICATOR BECKER FARM 1.4 MILES SE OF SITE	0
	CS-134		50	0.6 (0/24) (<0.3/<1.2)	0.7 (0/4) (<0.4/<1.2)	0.7 (0/4) (<0.4/<1.2)	Q15-1 CONTROL WEST FAIRVIEW 13.5 MILES NW OF SITE	0
	CS-137		60	0.7 (0/24) (<0.3/<1.3)	0.8 (0/4) (<0.6/<1.3)	0.8 (0/4) (<0.6/<1.3)	Q15-1 CONTROL WEST FAIRVIEW 13.5 MILES NW OF SITE	0
AIR IODINE (E-3 PCI/CU.METER)	I-131	363	70	12 (0/311) (<3/<39)	12 (0/52) (<4/<22)	13 (0/52) (<5/<39)	G2-1 INDICATOR BECKER FARM 1.4 MILES SE OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
THE THREE MILE ISLAND NUCLEAR STATION, 2003**

Name of Facility: THREE MILE ISLAND NUCLEAR STATION				DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003			
Location of Facility: MIDDLETOWN COUNTY, PA				INDICATOR	CONTROL	LOCATION WITH HIGHEST ANNUAL MEAN			
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (F) RANGE	MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS	
MILK (PCI/LITER)	I-131	94	1	0.5 (0/71) (<0.2/<0.9)	0.5 (0/23) (<0.1/<0.9)	0.6 (0/23) (<0.3/<0.9)	E2-2 INDICATOR NISSLEY FARM 1.1 MILES E OF SITE	0	
	SR-89	18	N/A	2.7 (0/14) (<1.8/<3.6)	2.7 (0/4) (<2.6/<2.9)	3.4 (0/2) (<3.1/<3.6)	F4-1 CONTROL TURNPIKE ROAD FARM 3.2 MILES ESE OF SITE	0	
	SR-90	18	2	0.9 (9/14) (<0.5/1.3)	1.1 (4/4) (0.7/1.3)	1.1 (4/4) (0.7/1.3)	K15-3 CONTROL MYERS FARM 14.5 MILES SSW OF SITE	0	
	GAMMA K-40	94	N/A	1326 (71/71) (1020/1590)	1321 (23/23) (1150/1450)	1355 (23/23) (1110/1530)	D2-1 CONTROL ALWINE FARM 1.1 MILES ENE OF SITE	0	
	CS-134		15	4 (0/71) (<1/<8)	4 (0/23) (<2/<9)	4 (0/2) (<2/<6)	F4-1 CONTROL TURNPIKE ROAD FARM 3.2 MILES ESE OF SITE	0	
	CS-137		18	4 (0/71) (<2/<10)	4 (0/23) (<2/<10)	4 (0/2) (<2/<6)	F4-1 CONTROL TURNPIKE ROAD FARM 3.2 MILES ESE OF SITE	0	
	BA-140		60	17 (0/71) (<7/<37)	19 (0/23) (<8/<45)	19 (0/23) (<8/<45)	K15-3 INDICATOR MYERS FARM 14.5 MILES SSW OF SITE	0	

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

**TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR  
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Name of Facility: THREE MILE ISLAND NUCLEAR STATION		DOCKET NUMBER: 50-289 & 50-320		REPORTING PERIOD: 2003		LOCATION WITH HIGHEST ANNUAL MEAN		
Location of Facility: MIDDLETOWN COUNTY, PA								
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR MEAN (F) RANGE	CONTROL MEAN (F) RANGE	MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
FOOD PRODUCT (PCI/KG WET)	LA-140		15	6 (0/71) (<2/<12)	6 (0/23) (<2/<13)	6 (0/23) (<3/<11)	D2-1 CONTROL ALWINE FARM 1.1 MILES ENE OF SITE	0
	SR-90	2	10	17 (1/1) (17)	5 (0/1) (<5)	17 (1/1) (17)	E1-2 INDICATOR TMI VISITORS CENTER 0.4 MILES E OF SITE	0
	GAMMA K-40	8	N/A	3630 (4/4) (1820/5270)	2788 (4/4) (1830/3750)	3630 (4/4) (1820/5270)	E1-2 INDICATOR TMI VISITORS CENTER 0.4 MILES E OF SITE	0
	I-131		60	12 (0/4) (<5/<23)	11 (0/4) (<7/<15)	12 (0/4) (<5/<23)	E1-2 INDICATOR TMI VISITORS CENTER 0.4 MILES E OF SITE	0
	CS-134		60	8 (0/4) (<4/<14)	7 (0/4) (<6/<10)	8 (0/4) (<4/<14)	E1-2 INDICATOR TMI VISITORS CENTER 0.4 MILES E OF SITE	0
	CS-137		80	8 (0/4) (<4/<15)	8 (0/4) (<7/<11)	8 (0/4) (<7/<11)	B10-2 CONTROL MILTON HERSHEY SCHOOL 10.1 MILES NNE OF SITE	0
DIRECT RADIATION (MILLI-ROENTGEN/STD.MO.)	TLD-QUARTERLY	357	N/A	3.9 (314/314) (2.6/6.8)	4.5 (43/43) (3.5/6.4)	6.5 (4/4) (5.9/6.8)	H8-1 INDICATOR SAGINAW ROAD 7.4 MILES SSE OF SITE	0

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FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

## **APPENDIX B**

### **LOCATION DESIGNATION, DISTANCE & DIRECTION, AND SAMPLE COLLECTION & ANALYTICAL METHODS**

TABLE B-1: Location Designation and Identification System for the Three Mile Island Nuclear Station

- XYZ- General code for identification of locations, where:
- X - Angular Sector of Sampling Location. The compass is divided into 16 sectors of 22 1/2 degrees each with center at Three Mile Island's Units 1 and 2 off-gas vents. Sector A is centered due North, and others are alphabetical in a clockwise direction.
  - Y - Radial Zone of Sampling Location in miles.
  - Z - Station's Numerical Designation within sector and zone, using 1, 2, 3... in each sector and zone.

TABLE B-2: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Three Mile Island Nuclear Generating Station, 2003

Sample Medium	Station Code	Map Number	Distance*	Azimuth	Description
AQS	A1-3	16	0.5 mi	0°	N of site off north tip of TMI in Susquehanna River
ID	A1-4	113	0.3	5	N of Reactor Building on W fence adjacent to North Weather Station, TMI
AP, AI, ID	A3-1	39	2.6	358	N of site at Mill Street Substation
SW	A3-2	40	2.5	355	N of site at Swatara Creek, Middletown
ID	A5-1	44	4.3	3	N of site on Vine Street Exit off Route 283
ID	A9-3	127	8.1	3	N of site at Duke Street Pumping Station, Hummelstown
ID	B1-1	2	0.6	25	NNE of site on light pole in middle of North Bridge, TMI
ID	B1-2	114	0.4	26	NNE of Reactor Building on top of dike, TMI
ID	B2-1	132	1.9	16	NNE of site on Sunset Dr. (off Hillsdale Rd.)
ID	B5-1	45	4.8	18	NNE of site at intersection of School House and Miller Roads
ID	B10-1	61	9.4	21	NNE of site at intersection of West Areba Avenue and Mill Street, Hershey
FP	B10-2	1	10.1	28	NNE of site at Milton Hershey School, Hershey
ID	C1-1	17	0.7	35	NE of site along Route 441 N
ID	C1-2	116	0.3	54	NE of Reactor Building on top of dike, TMI
ID	C2-1	43	1.6	48	NE of site at Middletown Junction
ID	C5-1	46	4.5	42	NE of site on Kennedy Lane
ID	C8-1	62	7.2	48	NE of site at Schenk's Church on School House Road
AQF	Control	-	-	-	All locations where finfish are collected upstream of the TMINS liquid discharge outfall (above Dock St. Dam, Harrisburg) are grouped together and referred to as "control"
GAD	Control	-	-	-	All locations greater than 10 miles from TMINS
ID	D1-1	3	0.2	74	ENE of Reactor Building on top of dike, TMI
ID	D1-2	18	0.6	60	ENE of site on Laurel Road
M	D2-1	29	1.1	65	ENE of site at farm on Gingrich Road
ID	D2-2	133	1.7	73	ENE of site along Hillsdale Rd. (S of Zion Rd.)
ID	D6-1	47	5.2	65	ENE of site off Beagle Road
ID	D15-1	80	10.9	63	ENE of site along Route 241, Lawn, PA
AP, AI, ID, GW, FP	E1-2	19	0.4	95	E of site at TMI Visitor's Center
ID	E1-4	117	0.2	98	E of Reactor Building on top of dike, TMI
M	E2-2	109	1.1	93	E of site at farm on Pecks Road
ID	E2-3	134	1.9	96	E of site along Hillsdale Rd. (N of Creek Rd.)
ID	E5-1	48	4.6	81	E of site at intersection of North Market Street (Route 230) and Zeager Road
ID	E7-1	64	6.8	86	E of site along Hummelstown Street, Elizabethtown
ID	F1-1	20	0.5	117	ESE of site near entrance to 500 kV Substation
ID	F1-2	118	0.2	109	ESE of Reactor Building on top of dike midway within Interim Solid Waste Staging Facility, TMI
AP, AI	F1-3	149	0.6	105	ESE of site in 500 kV Substation
ID	F1-4	154	0.3	115	ESE of Reactor Building on top of dike, TMI
ID	F2-1	135	1.2	120	ESE of site along Engle Road
ID	F5-1	49	4.7	107	ESE of site along Amosite Road
ID	F10-1	66	9.4	112	ESE of site along Donegal Springs Road, Donegal Springs
ID	F25-1	82	21.1	113	ESE of site at intersection of Steel Way and Loop Roads, Lancaster
ID	G1-2	22	0.6	143	SE of site along Route 441 S
ID	G1-3	119	0.3	129	SE of Reactor Building on top of dike, TMI
ID	G1-5	139	0.3	144	SE of Reactor Building on top of dike, TMI
ID	G1-6	140	0.3	141	SE of Reactor Building on top of dike, TMI
AI, AP, M	G2-1	104	1.4	125	SE of site at farm on Becker Road
ID	G2-4	136	1.7	135	SE of site on Becker Road
ID	G5-1	50	4.8	131	SE of site at intersection of Bainbridge and Risser Roads
ID	G10-1	67	9.8	127	SE of site at farm along Engles Tollgate Road, Marietta
ID	G15-1	84	14.4	124	SE of site at Columbia Water Treatment Plant
DW	G15-2	85	13.6	128	SE of site at Wrightsville Water Treatment Plant
DW	G15-3	86	14.8	124	SE of site at Lancaster Water Treatment Plant
ID	H1-1	5	0.5	167	SSE of site, TMI

TABLE B-2: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Three Mile Island Nuclear Generating Station, 2003

Sample Medium	Station Code	Map Number	Distance*	Azimuth	Description
AP, AI, ID	H3-1	41	2.3 mi	159°	SSE of site in Falmouth-Collins Substation
ID	H5-1	52	4.1	157	SSE of site by Guard Shack at Brunner Island Steam Electric Station
ID	H8-1	68	7.4	163	SSE of site along Saginaw Road, Starview
ID	H15-1	87	13.2	157	SSE of site at intersection of Orchard and Stonewood Roads, Wilshire Hills
AQF	Indicator	-	-	-	All locations where finfish are collected downstream of the TMINS liquid discharge outfall are grouped together and referred to as "indicator"
GAD	Indicator	-	-	-	All locations within ten miles of TMINS
ROD	Indicator	-	-	-	All locations where rodents are collected within the owner controlled area, TMI
ID	J1-1	6	0.8	182	S of site, TMI
SW	J1-2	23	0.5	188	S of site downstream of the TMINS liquid discharge outfall in Susquehanna River
ID	J1-3	121	0.3	189	S of Reactor Building on wooden post of Building 221, just S of Unit 2 Admin. Building, TMI
AQS	J2-1	31	1.5	182	S of site in Susquehanna River just upstream of the York Haven Dam
ID	J3-1	141	2.7	178	S of site at York Haven/Cly
ID	J5-1	53	4.9	182	S of site along Canal Road, Conewago Heights
ID	J7-1	69	6.5	177	S of site off of Maple Street, Manchester
ID	J15-1	88	12.6	180	S of site in Met-Ed York Load Dispatch Station
EW	K1-1	7	0.2	209	On site at RML-7 Main Station Discharge Building
AQS	K1-3	24	0.3	202	SSW of site in Susquehanna River
ID	K1-4	123	0.2	208	SSW of Reactor Building on top of dike behind Warehouse 2, TMI
ID	K2-1	32	1.1	200	SSW of site on S Shelley Island
ID	K3-1	142	2.1	202	SSW of site along Rt. 262, N of Cly
ID	K5-1	54	5.0	200	SSW of site along Conewago Creek Road, Strinestown
ID	K8-1	70	7.4	196	SSW of site at intersection of Coppenhaffer Road and Route 295, Zions View
ID	K15-1	90	12.7	204	SSW of site on the Bird's Nest Child Care Center Building, Weiglestown
M	K15-3	151	14.5	205	SSW of site at farm along S Salem Church Rd, Dover
ID	L1-1	9	0.1	235	SW of site on top of dike W of Mech. Draft Cooling Tower, TMI
ID	L1-2	26	0.5	221	SW of site on Beech Island
ID	L2-1	33	1.9	227	SW of site along Route 262
ID	L5-1	55	4.1	228	SW of site at intersection of Stevens and Wilson Roads
ID	L8-1	71	8.0	225	SW of site along Rohlers Church Rd., Andersontown
ID	L15-1	91	11.7	225	SW of site on W side of Route 74, rear of church, Mt. Royal
ID	M1-1	129	0.1	249	WSW of Reactor Building on SE corner of U-2 Screenhouse fence, TMI
ID	M1-2	143	0.5	241	WSW of site on W side of unnamed island between N tip of Beech Island and Shelley Island
AP, AI, ID	M2-1	34	1.3	253	WSW of site adjacent to Fishing Creek, Goldsboro
ID	M5-1	56	4.3	249	WSW of site at intersection of Lewisberry and Roxberry Roads, Newberrytown
ID	M9-1	72	8.6	242	WSW of site along Alpine Road, Maytown
ID	N1-1	10	0.7	270	W of site on Shelley Island
ID	N1-3	124	0.1	270	W of Reactor Building on fence adjacent to Screenhouse entrance gate, TMI
ID, GW	N2-1	35	1.2	262	W of site at Goldsboro Marina
ID	N5-1	57	4.9	268	W of site off of Old York Road along Robin Hood Drive
ID	N8-1	73	7.8	260	W of site along Route 382, 1/2 mile north of Lewisberry
ID	N15-2	95	10.4	274	W of site at intersection of Lisburn Road and Main Street, Lisburn
ID	P1-1	12	0.4	293	WNW of site on Shelley Island

TABLE B-2: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Three Mile Island Nuclear Generating Station, 2003

<u>Sample Medium</u>	<u>Station Code</u>	<u>Map Number</u>	<u>Distance*</u>	<u>Azimuth</u>	<u>Description</u>
ID	P1-2	38	0.2 mi	290°	WNW of Reactor Building on fence N of Unit 1 Screenhouse, TMI
ID	P2-1	36	1.9	283	WNW of site along Route 262
ID	P5-1	58	4.9	285	WNW of site at intersection of Valley Road (Route 262) and Beinhower Road
ID	P8-1	74	8.0	292	WNW of site along Evergreen Road, Reesers Summit
ID	Q1-1	13	0.5	317	NW of site on Shelley Island
ID	Q1-2	125	0.2	318	NW of Reactor Building on fence W of Warehouse 1, TMI
ID	Q2-1	37	1.8	310	NW of site along access road along river
ID	Q5-1	59	5.0	318	NW of site along Lumber Street, Highspire
SW,DW,ID	Q9-1	76	8.5	308	NW of site at the Steelton Water Company
AP,AI,ID	Q15-1	97	13.5	305	NW of site behind West Fairview Fire Dept. Social Hall
ID	R1-1	14	0.2	335	NNW of Reactor Building along W fence, TMI
ID	R1-2	27	0.7	332	NNW of site on Henry Island
ID	R3-1	107	2.6	338	NNW of site at Crawford Station, Middletown
ID	R5-1	60	4.9	339	NNW of site at interstecion of Spring Garden Drive and Route 441
ID	R9-1	77	8.1	340	NNW of site at intersection of Derry and 66th Streets, Rutherford Heights
ID	R15-1	99	11.2	330	NNW of site at intersection of Route 22 and Colonial Road, Colonial Park

#### IDENTIFICATION KEY

ID = Immersion Dose (TLD)  
 SW = Surface Water  
 AI = Air Iodine  
 AP = Air Particulate  
 FP = Food Products (Green Leafy Vegetation, Fruits, Vegetables)

GW = Ground Water (offsite)  
 DW = Drinking Water  
 M = Milk (Cow)  
 GAD = Meat (Game)

AQF = Finfish  
 AQS = Aquatic Sediment  
 EW = Effluent Water  
 ROD = Rodents

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2003

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Surface Water	Gamma Spectroscopy	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Surface Water	Tritium	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-052-35 Determination of tritium in water by liquid scintillation  Env. Inc., T-02 Determination of tritium in water (direct method)
Surface Water	Iodine- 131	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-032-20 Radiometric determination of I-131 by the beta-gamma coincidence counting technique  Env. Inc., I-131-01 Determination of I-131 in milk by anion exchange
Drinking Water	Gross Beta	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-032-41 Gross Alpha and/or gross beta activity in water samples (suspended and dissolved fractions)  Env. Inc., W(DS)-01 Determination of gross alpha and/or gross beta in water (dissolved solids or total residue)  Env. Inc., W(SS)-02 Determination of gross alpha and/or gross beta in water (suspended solids)
Drinking Water	Gamma Spectroscopy	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Drinking Water	Tritium	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-052-35 Determination of tritium in water by liquid scintillation  Env. Inc., T-02 Determination of tritium in water (direct method)
Drinking Water	Iodine-131	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-032-20 Radiometric determination of I-131 by the beta-gamma coincidence counting technique  Env. Inc., I-131-01 Determination of I-131 in milk by anion exchange

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2003

Effluent Water	Iodine-131	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-032-20 Radiometric determination of I-131 by the beta-gamma coincidence counting technique  Env. Inc., I-131-01 Determination of I-131 in milk by anion exchange
Effluent Water	Gross Beta	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-032-41 Gross Alpha and/or gross beta activity in water samples (suspended and dissolved fractions)  Env. Inc., W(DS)-01 Determination of gross alpha and/or gross beta in water (dissolved solids or total residue)  Env. Inc., W(SS)-02 Determination of gross alpha and/or gross beta in water (suspended solids)
Effluent Water	Gamma Spectroscopy	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Effluent Water	Tritium	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-052-35 Determination of tritium in water by liquid scintillation  Env. Inc., T-02 Determination of tritium in water (direct method)
Effluent Water	Strontium 89/90	Semi-annual composite from monthly samples.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-032-16 Determination of radiostrontium in water samples
Storm Water	Gamma Spectroscopy	Quarterly grab sample	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1 gallon	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Storm Water	Tritium	Quarterly grab sample	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1 gallon	TBE, PRO-052-35 Determination of tritium in water by liquid scintillation  Env. Inc., T-02 Determination of tritium in water (direct method)
Ground Water	Gamma Spectroscopy	Monthly, Quarterly, Semi-Annual and Annual samples	ER-TMI-10 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1 gallon	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2003

Ground Water	Tritium	Monthly, Quarterly, Semi-Annual and Annual samples	EM-TMI-10 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1 gallon	TBE, PRO-052-35 Determination of tritium in water by liquid scintillation  Env. Inc., T-02 Determination of tritium in water (direct method)
Ground Water	Strontium 89/90	Monthly, Quarterly, Semi-Annual and Annual samples	ER-TMI-10 Collection of water samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1 gallon	TBE, PRO-032-16 Determination of radiostrontium in water samples
Fish	Gamma Spectroscopy	Semi-annual samples collected via electroshocking or other techniques	ER-TMI-13 Collection of fish samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1000 grams (wet)	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Fish	Strontium 89/90	Semi-annual samples collected via electroshocking or other techniques	ER-TMI-13 Collection of fish samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1000 grams (wet)	TBE, PRO-032-85 Determination of radiostrontium in fish and shellfish
Sediment	Gamma Spectroscopy	Semi-annual grab samples	ER-TMI-03 Collection of sediment samples for radiological analysis (Three Mile Island Nuclear Generating Station)	500 grams (dry)	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Air Particulates	Gross Beta	One-week composite of continuous air sampling through glass fiber filter paper	ER-TMI-14 Collection of air particulate and air iodine samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1 filter (approximately 280 cubic meters weekly)	TBE, PRO-032-10 Gross beta and/or alpha activity in air particulate filters (direct count method)  Env. Inc., AP-02 Determination of gross alpha and/or gross beta in air particulate filters

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2003

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, PRO-032-122 Procedure for the compositing of samples	13 filters (approximately 3600 cubic meters)	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Air Iodine	Gamma Spectroscopy	One-week composite of continuous air sampling through charcoal filter	RMC-ER8 Collection of air particulate and air iodine samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1 filter (approximately 280 cubic meters weekly)	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., I-131-02 Determination of I-131 in charcoal canisters by gamma spectroscopy (batch method)
Milk	I-131	Bi-weekly grab sample when cows are on pasture. Monthly all other times	ER-TMI-01 Collection of milk samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-032-20 Radiometric determination of I-131 by the beta-gamma coincidence counting technique  Env. Inc., I-131-01 Determination of I-131 in milk by anion exchange
Milk	Strontium-89/90	Quarterly composite of Bi-weekly and monthly grab samples	ER-TMI-01 Collection of milk samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-032-105 Determination of radiostrontium in milk (Argonne Strontium Extraction Method)
Vegetation	Gamma Spectroscopy	Annual grab sample	ER-TMI-04 Collection of vegetation samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1000 grams	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Vegetation	Strontium-89/90	Annual grab sample	ER-TMI-04 Collection of vegetation samples for radiological analysis (Three Mile Island Nuclear Generating Station)	1000 grams	TBE, PRO-032-23R Determination of radiostrontium in feedstuff and forage
Milk	Gamma Spectroscopy	Bi-weekly grab sample when cows are on pasture. Monthly all other times	ER-TMI-01 Collection of milk samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 gallon	TBE, PRO-042-5 Determination of gamma emitting radioisotopes  Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
TLD	Thermoluminescence Dosimetry	Quarterly TLDs comprised of two Panasonic 814 (containing 4 each CaSO <sub>4</sub> elements)	ER-TMI-02 Collection of TLD samples for radiological analysis (Three Mile Island Nuclear Generating Station)	2 dosimeters	ICN Pharmaceutical

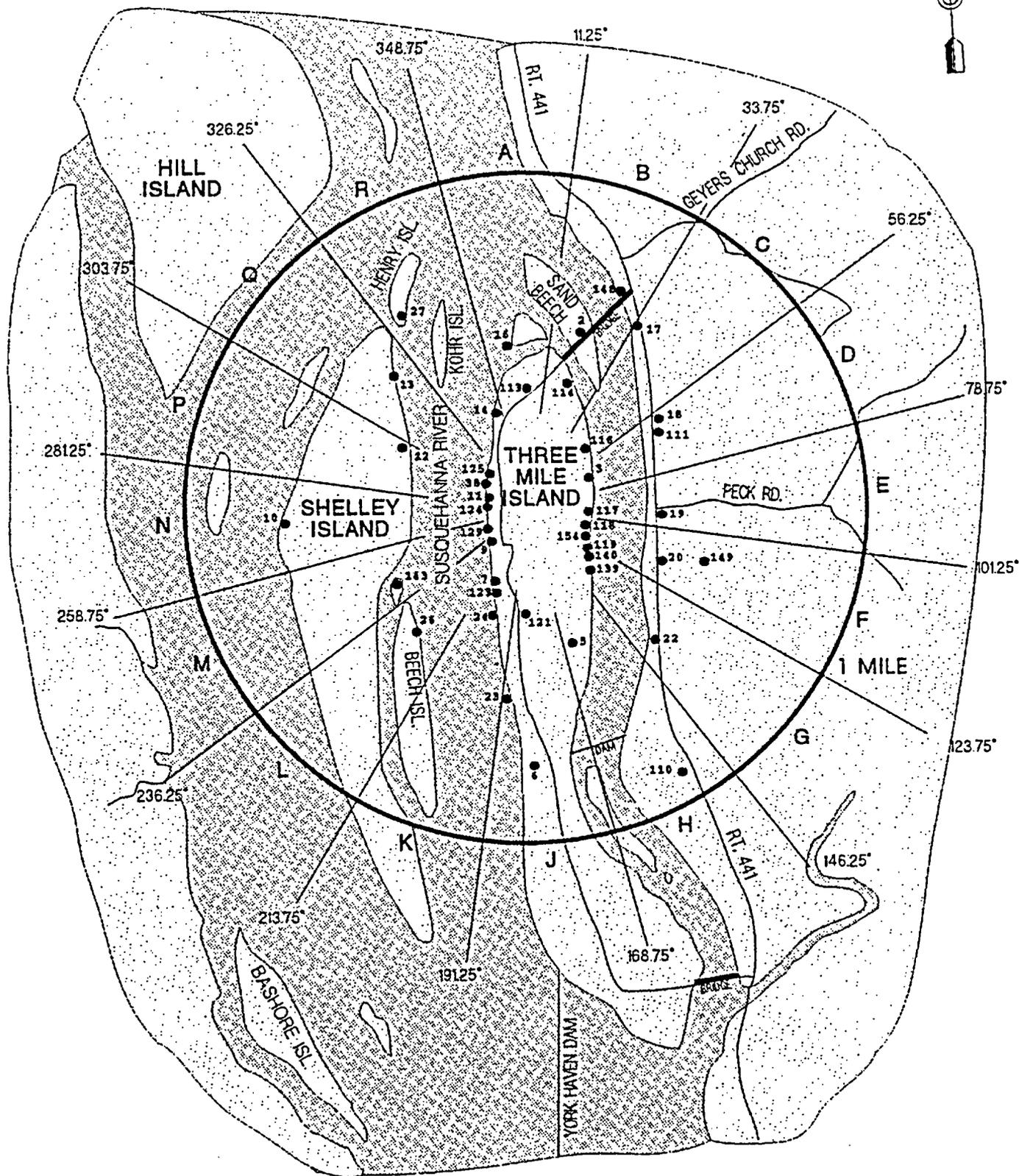


Figure B-1  
Locations of REMP Stations  
Within 1 Mile of TMINS

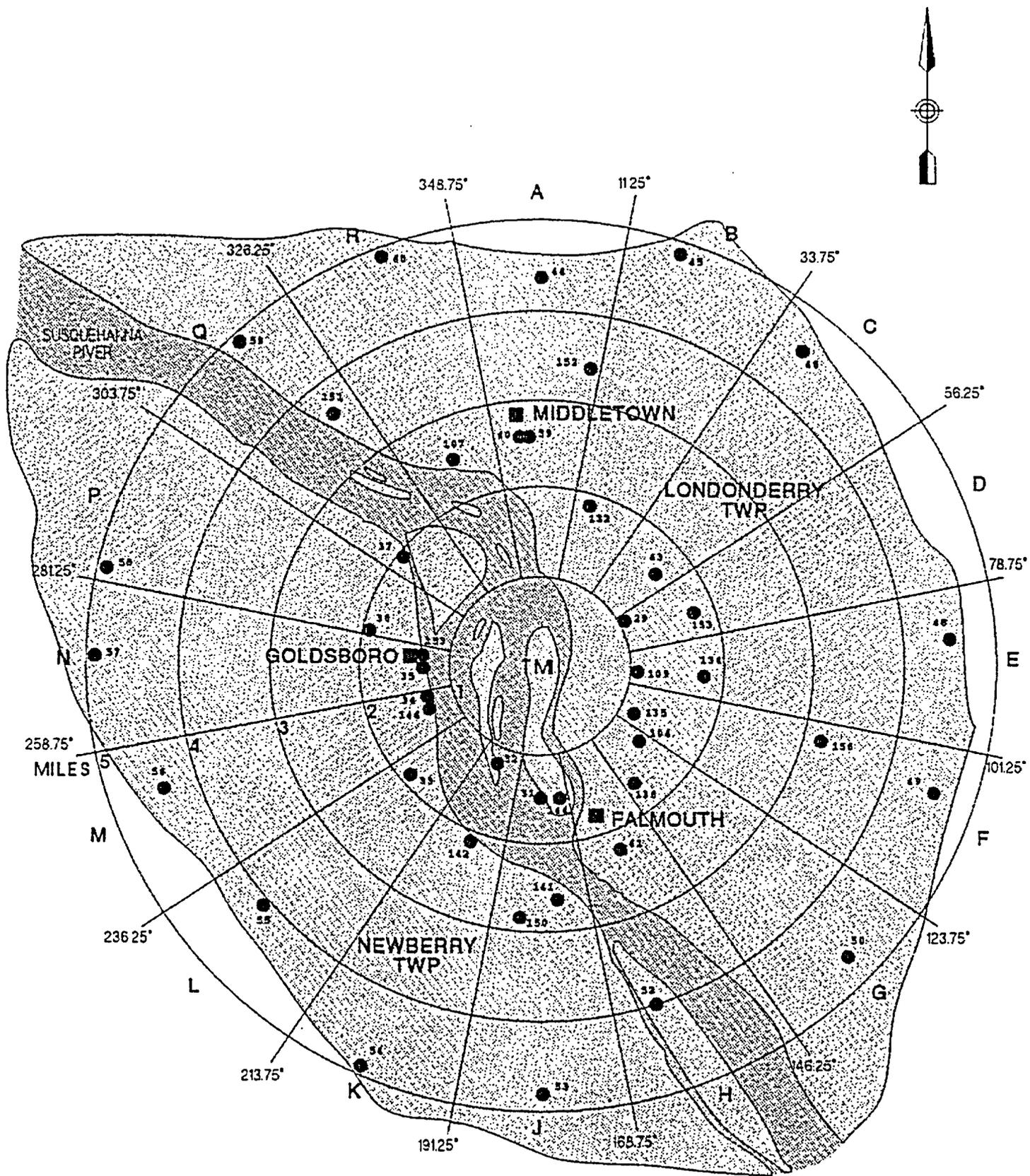


Figure B-2  
 Locations of REMP Stations  
 1 to 5 Miles of TMINS

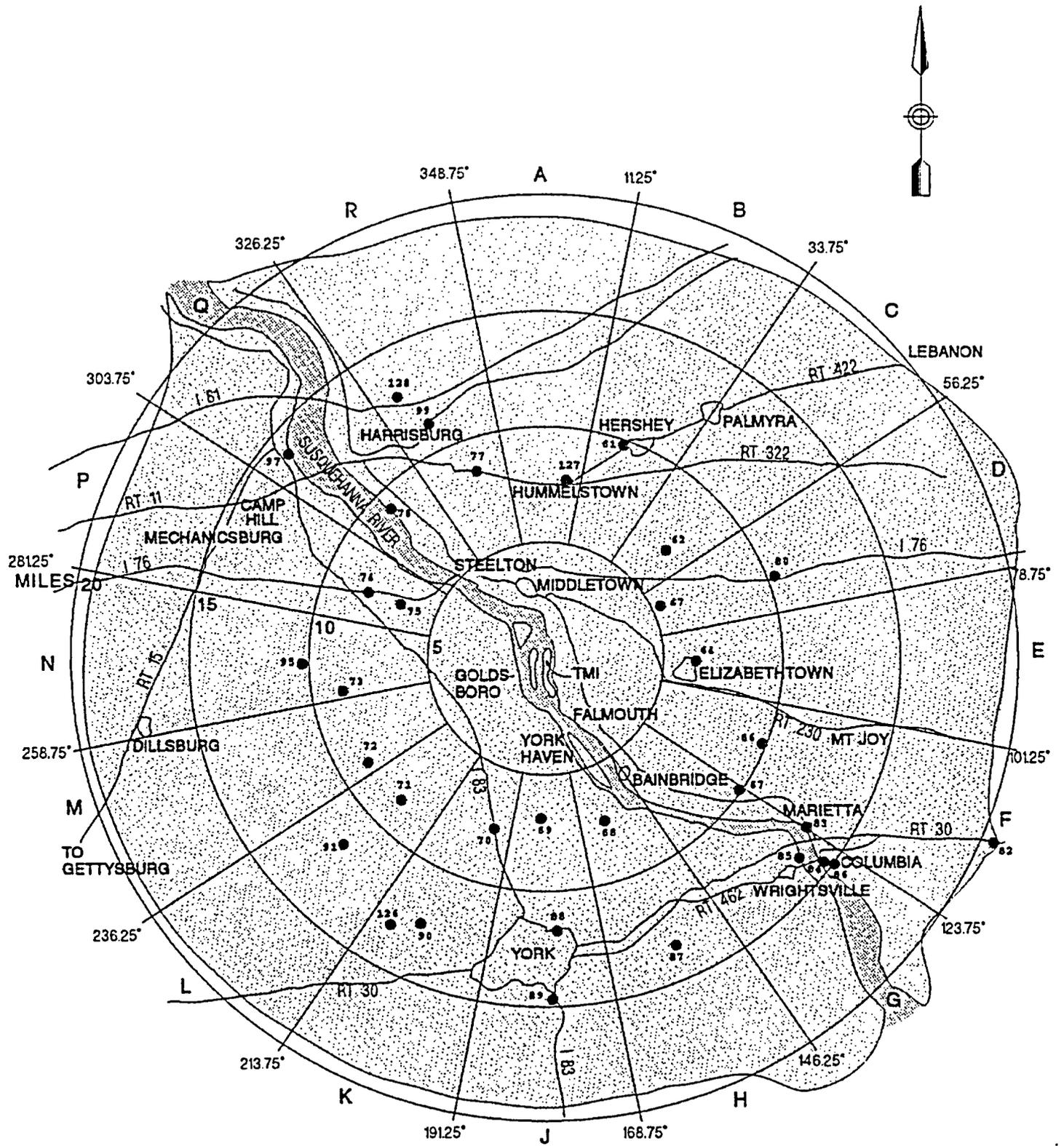


Figure B-3  
 Locations of REMP Stations  
 Greater Than 5 Miles of TMI

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## **APPENDIX C**

### **DATA TABLES AND FIGURES PRIMARY LABORATORY**

**TABLE C-1.1      CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED  
IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

COLLECTION PERIOD	A3-2	J1-2	Q9-1
01/02/03 - 01/29/03	< 175	< 165	< 172
01/29/03 - 02/26/03		< 174	< 175
02/26/03 - 04/02/03		2380 $\pm$ 176	< 171
04/02/03 - 04/29/03		3220 $\pm$ 197	< 180
04/29/03 - 06/03/03		3310 $\pm$ 201	< 184
06/03/03 - 07/01/03		298 $\pm$ 109	< 156
07/01/03 - 07/29/03		9310 $\pm$ 310	< 184
07/29/03 - 09/02/03		< 186	< 187
09/02/03 - 09/30/03		2780 $\pm$ 198	< 199
09/30/03 - 10/28/03		< 172	< 172
10/28/03 - 12/02/03		285 $\pm$ 121	< 177
12/02/03 - 12/30/03		341 $\pm$ 130	< 193
MEAN		1885 $\pm$ 5365	179 $\pm$ 23

**TABLE C-1.2      CONCENTRATIONS OF I-131 IN SURFACE WATER SAMPLES COLLECTED  
IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

COLLECTION PERIOD	A3-2
01/02/03 - 01/29/03	1.1 $\pm$ 0.4
01/29/03 - 02/26/03	< 0.7
02/26/03 - 04/02/03	< 0.6
04/02/03 - 04/29/03	< 0.4
04/29/03 - 06/03/03	< 0.4
06/03/03 - 07/01/03	1.6 $\pm$ 0.9
07/01/03 - 07/29/03	0.9 $\pm$ 0.3
07/29/03 - 09/02/03	< 0.7
09/02/03 - 09/30/03	< 0.8
09/30/03 - 10/28/03	< 0.6
10/28/03 - 12/02/03	< 0.9
12/02/03 - 12/30/03	< 0.3
MEAN	0.7 $\pm$ 0.7

TABLE C-I.3

**CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES  
COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140	
J1-2	01/02/03 - 01/29/03	< 3	< 2	< 11	< 4	< 11	< 4	< 2	< 2	< 3	< 11	< 3	
	01/29/03 - 02/26/03	< 4	< 4	< 8	< 4	< 8	< 6	< 4	< 3	< 4	< 18	< 6	
	02/26/03 - 04/02/03	< 2	< 2	< 4	< 2	< 5	< 4	< 2	< 2	< 2	< 12	< 3	
	04/02/03 - 04/29/03	< 5	< 5	< 27	< 10	< 23	< 8	< 5	< 4	< 6	< 25	< 7	
	04/29/03 - 06/03/03	< 3	< 3	< 6	< 3	< 6	< 5	< 3	< 3	< 3	< 15	< 5	
	06/03/03 - 07/01/03	< 3	< 3	< 7	< 3	< 6	< 5	< 3	< 3	< 3	< 22	< 6	
	07/01/03 - 07/29/03	< 2	< 2	< 8	< 4	< 8	< 3	< 2	< 1	< 2	< 7	< 2	
	07/29/03 - 09/02/03	< 2	< 2	< 8	< 4	< 9	< 3	< 2	< 2	< 2	< 8	< 3	
	09/02/03 - 09/30/03	< 4	< 3	< 7	< 3	< 7	< 6	< 4	< 3	< 4	< 19	< 7	
	09/30/03 - 10/28/03	< 6	< 6	< 15	< 6	< 13	< 11	< 7	< 6	< 6	< 30	< 11	
	10/28/03 - 12/02/03	< 3	< 3	< 7	< 3	< 7	< 6	< 4	< 3	< 4	< 16	< 5	
	12/02/03 - 12/30/03	< 3	< 3	< 6	< 3	< 6	< 5	< 3	< 3	< 3	< 14	< 5	
		MEAN	3 $\pm$ 2	3 $\pm$ 3	9 $\pm$ 12	4 $\pm$ 4	9 $\pm$ 10	5 $\pm$ 5	3 $\pm$ 3	3 $\pm$ 3	3 $\pm$ 3	16 $\pm$ 14	5 $\pm$ 5
	Q9-1	01/02/03 - 01/29/03	< 2	< 3	< 5	< 3	< 5	< 4	< 2	< 2	< 3	< 12	< 4
01/29/03 - 02/26/03		< 6	< 6	< 12	< 6	< 12	< 10	< 7	< 6	< 7	< 29	< 9	
02/26/03 - 04/02/03		< 3	< 3	< 6	< 3	< 7	< 6	< 3	< 3	< 3	< 16	< 5	
04/02/03 - 04/29/03		< 3	< 3	< 6	< 3	< 7	< 5	< 3	< 3	< 3	< 16	< 6	
04/29/03 - 06/03/03		< 2	< 2	< 4	< 2	< 4	< 4	< 2	< 2	< 2	< 10	< 4	
06/03/03 - 07/01/03		< 3	< 3	< 14	< 5	< 14	< 5	< 3	< 2	< 3	< 18	< 6	
07/01/03 - 07/29/03		< 5	< 5	< 11	< 6	< 11	< 10	< 5	< 5	< 5	< 27	< 8	
07/29/03 - 09/02/03		< 2	< 2	< 5	< 4	< 5	< 4	< 3	< 2	< 3	< 12	< 4	
09/02/03 - 09/30/03		< 6	< 6	< 14	< 7	< 13	< 11	< 7	< 6	< 6	< 30	< 11	
09/30/03 - 10/28/03		< 3	< 2	< 5	< 3	< 5	< 5	< 3	< 3	< 3	< 13	< 4	
10/28/03 - 12/02/03		< 3	< 3	< 6	< 3	< 6	< 5	< 3	< 3	< 3	< 13	< 4	
12/02/03 - 12/30/03		< 4	< 4	< 8	< 4	< 8	< 7	< 4	< 4	< 4	< 18	< 7	
		MEAN	3 $\pm$ 3	3 $\pm$ 3	8 $\pm$ 7	4 $\pm$ 3	8 $\pm$ 7	6 $\pm$ 5	4 $\pm$ 3	3 $\pm$ 3	4 $\pm$ 3	18 $\pm$ 14	6 $\pm$ 5

**TABLE C-II.1 CONCENTRATIONS OF GROSS BETA IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	G15-2	G15-3	Q9-1
01/02/03 - 01/29/03	2.9 ± 1.4	3.2 ± 1.4	1.9 ± 1.3
01/29/03 - 02/26/03	3.4 ± 1.4	3.8 ± 1.5	2.5 ± 1.3
02/26/03 - 04/02/03	3.6 ± 1.5	< 1.9	< 1.8
04/02/03 - 04/30/03	< 2.0	< 2.0	< 1.9
04/30/03 - 06/03/03	2.7 ± 1.4	3.0 ± 1.4	2.7 ± 1.4
06/03/03 - 07/01/03	3.1 ± 1.3	2.8 ± 1.3	< 1.6
07/01/03 - 07/29/03	2.6 ± 1.3	3.5 ± 1.4	2.5 ± 1.3
07/29/03 - 09/02/03	2.5 ± 1.3	2.2 ± 1.3	2.4 ± 1.3
09/02/03 - 09/30/03	3.2 ± 1.6	2.5 ± 1.4	2.8 ± 1.4
09/30/03 - 10/28/03	3.6 ± 1.4	2.4 ± 1.3	< 1.8
10/28/03 - 12/02/03	4.3 ± 1.4	3.3 ± 1.3	1.8 ± 1.2
12/02/03 - 12/30/03	3.9 ± 1.4	2.3 ± 1.2	1.7 ± 1.1
MEAN	3.1 ± 1.3	2.7 ± 1.3	2.1 ± 0.8

**TABLE C-II.2 CONCENTRATIONS OF I-131 IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	G15-2	G15-3	Q9-1
01/02/03 - 01/29/03	< 0.2	< 0.4	< 0.5
01/29/03 - 02/26/03	< 0.7	< 0.7	< 0.6
02/26/03 - 04/02/03	< 0.9	< 0.9	< 0.8
04/02/03 - 04/30/03	< 0.4	< 0.2	< 0.3
04/30/03 - 06/03/03	< 0.3	< 0.3	< 0.3
06/03/03 - 07/01/03	< 0.7	< 0.5	< 0.6
07/01/03 - 07/29/03	< 0.4	< 0.4	< 0.4
07/29/03 - 09/02/03	< 0.7	< 0.6	< 0.9
09/02/03 - 09/30/03	< 0.9	< 0.8	< 0.7
09/30/03 - 10/28/03	< 0.7	< 0.6	< 0.5
10/28/03 - 12/02/03	< 0.8	< 0.4	< 1.0
12/02/03 - 12/30/03	< 0.2	< 0.2	< 0.2
MEAN	0.6 ± 0.5	0.5 ± 0.4	0.6 ± 0.5

**TABLE C-II.3 CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	G15-2	G15-3	Q9-1
01/02/03 - 01/29/03	< 174	< 174	< 176
01/29/03 - 02/26/03	< 172	< 172	< 170
02/26/03 - 04/02/03	< 174	< 168	< 172
04/02/03 - 04/30/03	< 178	< 179	< 176
04/30/03 - 06/03/03	< 185	< 183	< 184
06/03/03 - 07/01/03	< 154	< 185	< 153
07/01/03 - 07/29/03	< 179	397 ± 103	< 131
07/29/03 - 09/02/03	< 196	< 187	< 186
09/02/03 - 09/30/03	< 195	286 ± 125	< 194
09/30/03 - 10/28/03	< 197	< 172	< 171
10/28/03 - 12/02/03	< 199	< 177	< 181
12/02/03 - 12/30/03	< 186	< 188	< 187
MEAN	182 ± 27	215 ± 155	173 ± 34

TABLE C-II.4

**CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED  
IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
G15-2	01/02/03 - 01/29/03	< 5	< 4	< 19	< 8	< 17	< 6	< 4	< 4	< 5	< 19	< 5
	01/29/03 - 02/26/03	< 3	< 3	< 7	< 4	< 7	< 6	< 4	< 3	< 4	< 16	< 6
	02/26/03 - 04/02/03	< 4	< 4	< 8	< 4	< 8	< 7	< 4	< 4	< 4	< 20	< 7
	04/02/03 - 04/30/03	< 4	< 3	< 7	< 4	< 8	< 6	< 4	< 3	< 4	< 18	< 6
	04/30/03 - 06/03/03	< 2	< 3	< 5	< 2	< 5	< 4	< 3	< 2	< 3	< 13	< 4
	06/03/03 - 07/01/03	< 3	< 4	< 9	< 4	< 7	< 7	< 4	< 3	< 3	< 26	< 9
	07/01/03 - 07/29/03	< 4	< 5	< 9	< 4	< 11	< 9	< 5	< 4	< 5	< 21	< 8
	07/29/03 - 09/02/03	< 5	< 5	< 10	< 5	< 10	< 9	< 6	< 5	< 5	< 26	< 8
	09/02/03 - 09/30/03	< 4	< 5	< 9	< 4	< 9	< 8	< 5	< 4	< 5	< 24	< 8
	09/30/03 - 10/28/03	< 4	< 4	< 8	< 4	< 7	< 6	< 4	< 3	< 4	< 16	< 6
	10/28/03 - 12/02/03	< 8	< 7	< 14	< 7	< 17	< 12	< 8	< 7	< 7	< 36	< 13
	12/02/03 - 12/30/03	< 2	< 2	< 4	< 2	< 4	< 4	< 2	< 2	< 2	< 9	< 3
		MEAN	4 $\pm$ 3	4 $\pm$ 3	9 $\pm$ 8	4 $\pm$ 3	9 $\pm$ 8	7 $\pm$ 4	4 $\pm$ 3	4 $\pm$ 3	4 $\pm$ 2	20 $\pm$ 14
G15-3	01/02/03 - 01/29/03	< 2	< 2	< 4	< 2	< 4	< 4	< 2	< 2	< 2	< 11	< 3
	01/29/03 - 02/26/03	< 4	< 3	< 7	< 4	< 7	< 6	< 3	< 3	< 4	< 16	< 5
	02/26/03 - 04/02/03	< 7	< 6	< 13	< 6	< 12	< 11	< 6	< 5	< 7	< 32	< 12
	04/02/03 - 04/30/03	< 2	< 2	< 4	< 2	< 5	< 4	< 2	< 2	< 3	< 11	< 4
	04/30/03 - 06/03/03	< 4	< 4	< 8	< 4	< 7	< 7	< 4	< 4	< 4	< 21	< 6
	06/03/03 - 07/01/03	< 4	< 3	< 19	< 7	< 17	< 7	< 3	< 3	< 4	< 24	< 6
	07/01/03 - 07/29/03	< 3	< 3	< 7	< 3	< 7	< 6	< 3	< 3	< 3	< 14	< 5
	07/29/03 - 09/02/03	< 3	< 3	< 6	< 3	< 6	< 5	< 3	< 3	< 3	< 15	< 5
	09/02/03 - 09/30/03	< 3	< 4	< 8	< 4	< 8	< 6	< 4	< 3	< 4	< 18	< 7
	09/30/03 - 10/28/03	< 4	< 4	< 8	< 4	< 8	< 8	< 4	< 4	< 4	< 19	< 6
	10/28/03 - 12/02/03	< 4	< 4	< 8	< 4	< 8	< 7	< 4	< 4	< 4	< 19	< 7
	12/02/03 - 12/30/03	< 2	< 2	< 11	< 4	< 10	< 3	< 2	< 2	< 2	< 9	< 3
		MEAN	3 $\pm$ 2	3 $\pm$ 2	8 $\pm$ 8	4 $\pm$ 3	8 $\pm$ 7	6 $\pm$ 4	4 $\pm$ 2	3 $\pm$ 2	4 $\pm$ 2	17 $\pm$ 12

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TABLE C-II.4

**CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED  
IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
Q9-1	01/02/03 - 01/29/03	< 4	< 4	< 8	< 4	< 8	< 8	< 5	< 4	< 5	< 21	< 7
	01/29/03 - 02/26/03	< 5	< 5	< 10	< 5	< 11	< 9	< 5	< 5	< 5	< 25	< 6
	02/26/03 - 04/02/03	< 4	< 5	< 11	< 5	< 11	< 9	< 6	< 4	< 5	< 30	< 8
	04/02/03 - 04/30/03	< 6	< 5	< 12	< 7	< 13	< 12	< 6	< 6	< 6	< 32	< 10
	04/30/03 - 06/03/03	< 4	< 4	< 7	< 4	< 7	< 6	< 4	< 3	< 4	< 19	< 6
	06/03/03 - 07/01/03	< 4	< 3	< 18	< 7	< 18	< 6	< 4	< 3	< 4	< 22	< 9
	07/01/03 - 07/29/03	< 3	< 3	< 6	< 3	< 6	< 6	< 3	< 3	< 3	< 15	< 5
	07/29/03 - 09/02/03	< 3	< 3	< 7	< 3	< 6	< 6	< 3	< 3	< 3	< 16	< 5
	09/02/03 - 09/30/03	< 5	< 6	< 13	< 6	< 12	< 8	< 6	< 5	< 6	< 29	< 11
	09/30/03 - 10/28/03	< 2	< 2	< 10	< 5	< 11	< 4	< 2	< 2	< 2	< 9	< 3
	10/28/03 - 12/02/03	< 9	< 9	< 18	< 10	< 20	< 15	< 9	< 8	< 9	< 40	< 15
	12/02/03 - 12/30/03	< 4	< 4	< 8	< 4	< 8	< 7	< 4	< 4	< 4	< 19	< 6
	MEAN	5 $\pm$ 4	4 $\pm$ 3	11 $\pm$ 8	5 $\pm$ 4	11 $\pm$ 9	8 $\pm$ 6	5 $\pm$ 4	4 $\pm$ 3	5 $\pm$ 3	23 $\pm$ 17	8 $\pm$ 6

**TABLE C-III.1 CONCENTRATIONS OF GROSS BETA, IODINE-131, TRITIUM, AND STRONTIUM IN EFFLUENT WATER SAMPLES FOR STATION K1-1 COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

COLLECTION PERIOD	Gross Beta	I-131	H-3	Sr-89	Sr-90
01/02/03 - 01/29/03	4.8 $\pm$ 1.6	0.6 $\pm$ 0.3	< 175		
01/29/03 - 02/26/03	3.5 $\pm$ 1.5	< 0.8	< 171		
02/26/03 - 04/02/03	4.4 $\pm$ 1.6	< 0.7	17900 $\pm$ 410		
04/02/03 - 04/29/03	2.3 $\pm$ 1.4	< 0.3	18900 $\pm$ 414		
04/29/03 - 06/03/03	3.7 $\pm$ 1.6	< 0.4	42400 $\pm$ 610		
06/03/03 - 07/01/03	5.7 $\pm$ 1.6	< 0.5	1860 $\pm$ 163	< 1.6	< 0.5
07/01/03 - 07/29/03	10 $\pm$ 2.1	< 0.3	91500 $\pm$ 922		
07/29/03 - 09/02/03	6.7 $\pm$ 1.8	< 0.6	36200 $\pm$ 591		
09/02/03 - 09/30/03	11 $\pm$ 2.2	< 0.6	29300 $\pm$ 550		
09/30/03 - 10/28/03	3.4 $\pm$ 1.5	< 0.4	203 $\pm$ 117		
10/28/03 - 12/02/03	2.6 $\pm$ 1.3	< 0.6	1120 $\pm$ 142		
12/02/03 - 12/30/03	11 $\pm$ 1.8	< 0.6	5600 $\pm$ 257	< 1.7	< 0.3
MEAN	5.7 $\pm$ 6.4	0.5 $\pm$ 0.3	20444 $\pm$ 54061	1.6 $\pm$ 0.18	0.4 $\pm$ 0.2

TABLE C-III.2

**CONCENTRATIONS OF GAMMA EMITTERS IN EFFLUENT WATER SAMPLES COLLECTED  
IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140	
C-8 K1-1	01/02/03 - 01/29/03	< 6	< 6	< 13	< 5	< 14	< 10	< 6	< 6	< 6	< 29	< 9	
	01/29/03 - 02/26/03	< 3	< 3	< 5	< 3	< 6	< 4	< 3	< 3	< 3	< 13	< 4	
	02/26/03 - 04/02/03	< 7	< 6	< 15	< 7	< 14	< 11	< 7	< 6	< 6	< 33	< 12	
	04/02/03 - 04/29/03	< 3	< 2	< 13	< 5	< 12	< 4	< 3	< 2	< 3	< 12	< 4	
	04/29/03 - 06/03/03	< 4	< 3	< 15	< 7	< 15	< 5	< 3	< 3	< 4	< 15	< 4	
	06/03/03 - 07/01/03	< 2	< 2	< 6	< 2	< 5	< 4	< 2	< 2	< 2	< 2	< 17	< 6
	07/01/03 - 07/29/03	< 6	< 5	< 21	< 12	< 20	< 9	< 5	< 4	< 5	< 5	< 18	< 7
	07/29/03 - 09/02/03	< 4	< 4	< 9	< 4	< 9	< 7	< 4	< 4	< 4	< 4	< 20	< 8
	09/02/03 - 09/30/03	< 4	< 5	< 9	< 5	< 9	< 8	< 5	< 4	< 5	< 5	< 23	< 7
	09/30/03 - 10/28/03	< 4	< 4	< 8	< 4	< 8	< 7	< 4	< 4	< 4	< 4	< 20	< 6
	10/28/03 - 12/02/03	< 4	< 4	< 7	< 4	< 8	< 6	< 4	< 4	< 4	< 4	< 16	< 5
12/02/03 - 12/30/03	< 3	< 3	< 6	< 3	< 5	< 5	< 3	< 3	< 3	< 3	< 13	< 4	
MEAN		4 $\pm$ 3	4 $\pm$ 3	10 $\pm$ 9	5 $\pm$ 5	10 $\pm$ 9	7 $\pm$ 5	4 $\pm$ 3	4 $\pm$ 2	4 $\pm$ 3	19 $\pm$ 13	6 $\pm$ 5	

**TABLE C-IV.1 CONCENTRATIONS OF TRITIUM AND GAMMA EMITTERS IN STORM WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

**RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA**

STC	COLLECTION PERIOD	H-3	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
EDCB	01/29/03 - 04/02/03	985 ± 139	< 4	< 4	< 8	< 4	< 8	< 7	< 4	< 4	< 4	< 19	< 7
	04/29/03 - 07/01/03	467 ± 119	< 2	< 2	< 5	< 2	< 5	< 4	< 2	< 2	< 2	< 14	< 4
	07/29/03 - 09/30/03	(1)	< 3	< 3	< 5	< 2	< 5	< 4	< 2	< 2	< 3	< 11	< 4
	10/28/03 - 12/30/03	499 ± 144	< 7	< 6	< 12	< 10	< 14	< 10	< 6	< 6	< 7	< 24	< 13
	MEAN	650 ± 581	4 ± 4	4 ± 3	8 ± 7	5 ± 7	8 ± 8	6 ± 5	4 ± 3	3 ± 3	4 ± 4	17 ± 11	7 ± 8

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

**TABLE CV.1 CONCENTRATIONS OF TRITIUM IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STATION CODE	03/13/03	06/05/03	09/11/03	12/11/03	MEAN
48S	< 178	194 $\pm$ 115	191 $\pm$ 119	< 174	184 $\pm$ 19
GP-1	829 $\pm$ 141	515 $\pm$ 126	524 $\pm$ 153	812 $\pm$ 139	670 $\pm$ 348
GP-6	564 $\pm$ 128	1470 $\pm$ 155	892 $\pm$ 143	647 $\pm$ 129	893 $\pm$ 818
GP-8	607 $\pm$ 131	(1)	(1)	599 $\pm$ 141	603 $\pm$ 11
MS-22	1550 $\pm$ 155	1420 $\pm$ 152	1180 $\pm$ 164	685 $\pm$ 133	1209 $\pm$ 763
OSF	262 $\pm$ 116	290 $\pm$ 118	445 $\pm$ 128	358 $\pm$ 121	339 $\pm$ 163
OS-18	859 $\pm$ 137	1270 $\pm$ 149	386 $\pm$ 183	568 $\pm$ 143	771 $\pm$ 771
GP-9	906 $\pm$ 139	773 $\pm$ 135	512 $\pm$ 135	379 $\pm$ 130	643 $\pm$ 480
GP-12		310 $\pm$ 122		372 $\pm$ 129	341 $\pm$ 88
MS-2		416 $\pm$ 122		378 $\pm$ 120	397 $\pm$ 54
MS-5		< 176		295 $\pm$ 120	236 $\pm$ 168
MS-20		512 $\pm$ 126		812 $\pm$ 142	662 $\pm$ 424
NW-A		761 $\pm$ 135		803 $\pm$ 132	782 $\pm$ 59
NW-B		1820 $\pm$ 164		1590 $\pm$ 167	1705 $\pm$ 325
NW-C		5210 $\pm$ 234		4970 $\pm$ 238	5090 $\pm$ 339
NW-CW		2300 $\pm$ 175		1810 $\pm$ 171	2055 $\pm$ 693
OS-14		310 $\pm$ 118		< 187	249 $\pm$ 174
RW-1		< 180		256 $\pm$ 119	218 $\pm$ 107
RW-2		190 $\pm$ 116		< 164	177 $\pm$ 37
E1-2		< 184			
MS-1		< 179			
MS-4		643 $\pm$ 136			
MS-7		< 178			
MS-8		394 $\pm$ 121		328 $\pm$ 121	361 $\pm$ 93
MS-19		< 176			
MS-21		< 179			
N2-1		< 184			

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

**TABLE C-V.2 CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003.**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	Sr-90	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
48S	03/13/03	< 0.5	< 6	< 6	< 13	< 6	< 15	< 11	< 8	< 6	< 6	< 30	< 9
	06/05/03		< 2	< 3	< 5	< 2	< 5	< 5	< 3	< 2	< 3	< 14	< 5
	09/11/03		< 3	< 3	< 6	< 4	< 7	< 6	< 4	< 3	< 3	< 17	< 6
	12/11/03		< 7	< 6	< 15	< 7	< 15	< 13	< 8	< 6	< 8	< 28	< 12
	MEAN		5 $\pm$ 4	5 $\pm$ 4	10 $\pm$ 10	5 $\pm$ 4	10 $\pm$ 10	9 $\pm$ 9	6 $\pm$ 6	5 $\pm$ 4	5 $\pm$ 5	22 $\pm$ 16	8 $\pm$ 6
OSF	03/13/03	< 0.5	< 2	< 2	< 5	< 3	< 5	< 4	< 3	< 2	< 3	< 12	< 4
	06/05/03		< 2	< 3	< 5	< 3	< 5	< 5	< 3	< 2	< 3	< 14	< 4
	09/11/03		< 3	< 3	< 6	< 4	< 7	< 6	< 3	< 3	< 3	< 16	< 5
	12/11/03		< 6	< 6	< 26	< 12	< 28	< 10	< 6	< 5	< 6	< 25	< 10
	MEAN		4 $\pm$ 3	4 $\pm$ 3	11 $\pm$ 21	5 $\pm$ 9	11 $\pm$ 22	6 $\pm$ 5	4 $\pm$ 3	3 $\pm$ 3	4 $\pm$ 3	17 $\pm$ 11	6 $\pm$ 5
E1-2	06/04/03		< 4	< 3	< 8	< 4	< 8	< 7	< 4	< 3	< 4	< 19	< 6
MS-2	06/05/03	< 0.7	< 3	< 4	< 10	< 7	< 8	< 7	< 4	< 3	< 4	< 23	< 4
MS-5	06/05/03	< 0.5	< 6	< 6	< 14	< 7	< 11	< 10	< 7	< 5	< 6	< 33	< 12
MS-8	06/05/03	< 0.6	< 4	< 4	< 10	< 5	< 9	< 9	< 5	< 4	< 5	< 27	< 10
MS-20	06/05/03		< 6	< 5	< 14	< 5	< 10	< 10	< 7	< 5	< 6	< 36	< 13
MS-22	03/13/03		< 5	< 6	< 11	< 7	< 13	< 9	< 7	< 5	< 7	< 35	< 11
N2-1	06/04/03		< 3	< 3	< 11	< 7	< 13	< 6	< 3	< 2	< 3	< 14	< 2
OS-14	06/05/03	< 0.5	< 4	< 3	< 17	< 7	< 17	< 5	< 4	< 3	< 4	< 22	< 7
RW-1	06/06/03		< 4	< 6	< 10	< 4	< 8	< 9	< 5	< 3	< 5	< 29	< 5
RW-2	06/05/03		< 6	< 7	< 16	< 7	< 15	< 13	< 7	< 7	< 7	< 43	< 13

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**TABLE C-VI.1 CONCENTRATIONS OF STRONTIUM IN PREDATOR & BOTTOM FEEDER (FISH) SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	Sr-89	Sr-90
INDP	PREDATOR		
	06/13/03	< 11	< 3
	10/23/03	< 8	< 2
	MEAN	9 $\pm$ 5	2 $\pm$ 1
INDB	BOTTOM FEEDER		
	06/13/03	< 11	< 3
	10/23/03	< 10	< 2
	MEAN	11 $\pm$ 2	3 $\pm$ 0.2
BKGP	PREDATOR		
	06/17/03	< 12	< 3
	10/13/03	< 12	< 2
	MEAN	12 $\pm$ 0	2 $\pm$ 1
BKGB	BOTTOM FEEDER		
	06/17/03	< 9	< 2
	10/13/03	< 13	< 2
	MEAN	11 $\pm$ 6	2 $\pm$ 0

TABLE C-VI.2

**CONCENTRATIONS OF GAMMA EMITTERS IN PREDATOR & BOTTOM FEEDER (FISH)  
SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/KG WET  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137
INDP	PREDATOR								
	06/13 - 06/13/03	3160 $\pm$ 265	< 14	< 14	< 32	< 15	< 31	< 12	< 16
	10/23 - 11/05/03	3210 $\pm$ 380	< 25	< 26	< 60	< 26	< 58	< 23	< 26
	MEAN	3185 $\pm$ 71	20 $\pm$ 15	20 $\pm$ 17	46 $\pm$ 40	20 $\pm$ 15	44 $\pm$ 39	18 $\pm$ 16	21 $\pm$ 14
INDB	BOTTOM FEEDER								
	06/13 - 06/13/03	3160 $\pm$ 323	< 8	< 8	< 20	< 8	< 18	< 9	< 9
	10/23 - 11/05/03	3140 $\pm$ 263	< 13	< 13	< 30	< 14	< 28	< 13	< 12
	MEAN	3150 $\pm$ 28	10 $\pm$ 7	11 $\pm$ 7	25 $\pm$ 15	11 $\pm$ 7	23 $\pm$ 14	11 $\pm$ 6	11 $\pm$ 5
BKGP	PREDATOR								
	06/17 - 06/17/03	3000 $\pm$ 305	< 16	< 17	< 43	< 14	< 32	< 13	< 15
	10/13 - 10/13/03	2800 $\pm$ 300	< 12	< 15	< 36	< 11	< 27	< 10	< 13
	MEAN	2900 $\pm$ 283	14 $\pm$ 5	16 $\pm$ 3	39 $\pm$ 10	12 $\pm$ 4	29 $\pm$ 8	12 $\pm$ 4	14 $\pm$ 4
BKGB	BOTTOM FEEDER								
	06/17 - 06/17/03	2980 $\pm$ 254	< 13	< 16	< 39	< 13	< 27	< 11	< 14
	10/13 - 10/14/03	2870 $\pm$ 396	< 22	< 27	< 68	< 22	< 47	< 21	< 22
	MEAN	2925 $\pm$ 156	18 $\pm$ 13	21 $\pm$ 16	54 $\pm$ 41	17 $\pm$ 13	37 $\pm$ 29	16 $\pm$ 13	18 $\pm$ 11

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**TABLE C-VII.1 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/KG DRY  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	K-40	Mn-54	Co-58	Co-60	Cs-134	Cs-137
A1-3	06/13/03	11000 $\pm$ 637	< 22	< 20	< 19	< 19	83 $\pm$ 25
	10/23/03	16100 $\pm$ 1150	< 51	< 48	< 49	< 46	104 $\pm$ 51
	MEAN	13550 $\pm$ 7212	37 $\pm$ 41	34 $\pm$ 39	34 $\pm$ 42	32 $\pm$ 38	94 $\pm$ 29
J2-1	06/13/03	18200 $\pm$ 959	< 46	< 43	< 43	< 40	172 $\pm$ 50
	10/23/03	22300 $\pm$ 1360	< 57	< 56	< 56	< 50	161 $\pm$ 52
	MEAN	20250 $\pm$ 5798	51 $\pm$ 15	49 $\pm$ 19	49 $\pm$ 19	45 $\pm$ 14	167 $\pm$ 16
K1-3	06/13/03	10100 $\pm$ 716	< 34	< 34	< 34	< 31	143 $\pm$ 31
	10/23/03	11300 $\pm$ 1100	< 49	< 45	< 48	< 37	85 $\pm$ 58
	MEAN	10700 $\pm$ 1697	42 $\pm$ 21	39 $\pm$ 16	41 $\pm$ 20	34 $\pm$ 8	114 $\pm$ 82
EDCB	10/23/03	15900 $\pm$ 1150	< 54	< 50	< 54	< 48	254 $\pm$ 55

TABLE C-VIII.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

COLLECTION PERIOD	GROUP I		GROUP II				GROUP III
	E1-2	F1-3	A3-1	G2-1	M2-1	H3-1	Q15-1
01/02/03 - 01/08/03	12 ± 4	12 ± 4	15 ± 5	13 ± 5	15 ± 5	15 ± 5	15 ± 5
01/08/03 - 01/15/03	29 ± 5	24 ± 5	22 ± 5	26 ± 5	24 ± 5	25 ± 5	20 ± 4
01/15/03 - 01/22/03	27 ± 5	30 ± 5	25 ± 5	26 ± 5	24 ± 5	23 ± 5	23 ± 5
01/22/03 - 01/29/03	13 ± 4	16 ± 4	14 ± 4	11 ± 4	15 ± 4	9 ± 4	13 ± 4
01/29/03 - 02/05/03	19 ± 5	22 ± 5	24 ± 5	20 ± 5	23 ± 5	18 ± 4	18 ± 4
02/05/03 - 02/12/03	20 ± 5	20 ± 5	20 ± 5	21 ± 5	21 ± 5	19 ± 4	21 ± 5
02/12/03 - 02/19/03	10 ± 4	16 ± 4	15 ± 4	11 ± 4	13 ± 4	14 ± 4	13 ± 4
02/19/03 - 02/26/03	15 ± 5	16 ± 5	18 ± 5	20 ± 5	12 ± 4	13 ± 4	14 ± 5
02/26/03 - 03/05/03	24 ± 5	17 ± 4	20 ± 4	24 ± 5	21 ± 4	19 ± 4	18 ± 4
03/05/03 - 03/12/03	22 ± 5	20 ± 5	17 ± 5	21 ± 5	21 ± 5	16 ± 5	22 ± 5
03/12/03 - 03/19/03	18 ± 4	18 ± 4	20 ± 4	23 ± 5	20 ± 4	21 ± 4	23 ± 4
03/19/03 - 03/27/03	15 ± 4	17 ± 4	16 ± 4	14 ± 3	12 ± 3	15 ± 4	15 ± 4
03/27/03 - 04/02/03	11 ± 4	12 ± 4	15 ± 5	14 ± 5	15 ± 5	12 ± 4	13 ± 5
04/02/03 - 04/09/03	9 ± 4	11 ± 4	12 ± 4	15 ± 4	13 ± 4	11 ± 4	11 ± 4
04/09/03 - 04/16/03	(1)	9 ± 4	10 ± 4	10 ± 4	15 ± 5	13 ± 4	16 ± 5
04/16/03 - 04/23/03	16 ± 4	18 ± 4	13 ± 4	15 ± 4	12 ± 4	12 ± 4	15 ± 4
04/23/03 - 04/30/03	17 ± 4	14 ± 4	14 ± 4	11 ± 4	14 ± 4	15 ± 4	13 ± 4
04/30/03 - 05/07/03	14 ± 4	15 ± 4	15 ± 4	16 ± 4	14 ± 4	13 ± 4	10 ± 4
05/07/03 - 05/14/03	11 ± 4	12 ± 4	13 ± 4	13 ± 4	9 ± 4	9 ± 3	12 ± 4
05/14/03 - 05/21/03	10 ± 4	8 ± 4	10 ± 4	6 ± 4	12 ± 4	7 ± 4	7 ± 4
05/21/03 - 05/28/03	< 4	< 4	8 ± 3	< 4	5 ± 3	< 4	< 4
05/28/03 - 06/04/03	7 ± 4	9 ± 4	10 ± 4	8 ± 4	8 ± 4	9 ± 4	11 ± 4
06/04/03 - 06/11/03	7 ± 4	10 ± 4	7 ± 4	7 ± 4	10 ± 4	10 ± 4	8 ± 4
06/11/03 - 06/18/03	12 ± 4	11 ± 4	11 ± 4	11 ± 4	12 ± 4	10 ± 4	10 ± 4
06/18/03 - 06/25/03	12 ± 4	10 ± 4	10 ± 4	8 ± 4	11 ± 4	7 ± 4	9 ± 4
06/25/03 - 07/02/03	20 ± 5	28 ± 9	20 ± 5	18 ± 5	20 ± 5	22 ± 5	23 ± 5
07/02/03 - 07/09/03	10 ± 5	< 7	10 ± 5	15 ± 5	11 ± 5	7 ± 5	10 ± 5
07/09/03 - 07/16/03	10 ± 5	< 7	9 ± 5	< 7	< 7	< 7	< 7
07/16/03 - 07/23/03	14 ± 5	18 ± 5	13 ± 5	21 ± 5	17 ± 5	19 ± 5	14 ± 5
07/23/03 - 07/30/03	15 ± 5	16 ± 5	16 ± 5	12 ± 5	17 ± 5	18 ± 6	21 ± 5
07/30/03 - 08/06/03	9 ± 5	12 ± 5	13 ± 5	9 ± 5	9 ± 5	12 ± 5	12 ± 5
08/06/03 - 08/13/03	15 ± 5	13 ± 5	14 ± 5	< 20 (1)	11 ± 5	< 7	15 ± 5
08/13/03 - 08/20/03	18 ± 5	24 ± 6	20 ± 5	22 ± 5	16 ± 5	19 ± 5	25 ± 5
08/20/03 - 08/27/03	28 ± 5	25 ± 6	25 ± 5	24 ± 6	22 ± 5	26 ± 6	25 ± 5
08/27/03 - 09/03/03	18 ± 5	14 ± 5	11 ± 5	15 ± 5	21 ± 5	19 ± 6	16 ± 5
09/03/03 - 09/10/03	15 ± 5	15 ± 5	12 ± 5	12 ± 5	12 ± 5	8 ± 5	13 ± 5
09/10/03 - 09/17/03	10 ± 4	15 ± 5	17 ± 5	16 ± 5	16 ± 5	16 ± 5	14 ± 5
09/17/03 - 09/24/03	18 ± 6	23 ± 6	18 ± 5	27 ± 15	20 ± 6	16 ± 5	17 ± 5
09/24/03 - 10/01/03	10 ± 6	< 9	15 ± 6	10 ± 6	< 9	13 ± 6	8 ± 5
10/01/03 - 10/08/03	17 ± 5	13 ± 5	16 ± 5	13 ± 5	13 ± 5	16 ± 5	17 ± 5
10/08/03 - 10/15/03	40 ± 7	41 ± 7	41 ± 7	29 ± 7	39 ± 7	42 ± 8	29 ± 7
10/15/03 - 10/22/03	28 ± 6	23 ± 6	25 ± 5	23 ± 6	23 ± 5	29 ± 6	30 ± 6
10/22/03 - 10/29/03	15 ± 5	17 ± 5	9 ± 4	14 ± 5	15 ± 5	17 ± 5	13 ± 5
10/29/03 - 11/05/03	22 ± 5	19 ± 5	16 ± 5	22 ± 6	22 ± 5	23 ± 6	21 ± 5
11/05/03 - 11/12/03	21 ± 5	19 ± 5	25 ± 5	21 ± 5	22 ± 5	22 ± 6	20 ± 5
11/12/03 - 11/19/03	20 ± 5	22 ± 6	20 ± 5	23 ± 6	18 ± 5	23 ± 6	23 ± 6
11/19/03 - 11/25/03	22 ± 6	17 ± 6	49 ± 7	19 ± 6	24 ± 6	26 ± 7	25 ± 6
11/25/03 - 12/03/03	12 ± 4	15 ± 5	16 ± 4	15 ± 5	18 ± 5	15 ± 5	17 ± 4
12/03/03 - 12/10/03	12 ± 5	15 ± 5	18 ± 5	12 ± 5	15 ± 5	12 ± 5	16 ± 5
12/10/03 - 12/16/03	13 ± 5	11 ± 5	12 ± 5	13 ± 5	13 ± 5	13 ± 6	14 ± 5
12/16/03 - 12/23/03	21 ± 5	20 ± 5	21 ± 5	22 ± 5	22 ± 5	19 ± 5	21 ± 5
12/23/03 - 12/31/03	18 ± 4	18 ± 5	16 ± 4	18 ± 5	16 ± 4	20 ± 5	18 ± 4
MEAN	16 ± 13	16 ± 13	17 ± 15	16 ± 12	16 ± 12	16 ± 14	16 ± 12

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

**TABLE C-VIII.2 MONTHLY AND YEARLY MEAN VALUES OF GROSS BETA CONCENTRATIONS (E-3 PCI/CU METER) IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

GROUP I - SITE LOCATIONS				GROUP II - OFFSITE LOCATIONS				GROUP III - CONTROL LOCATIONS			
COLLECTION PERIOD	MIN.	MAX.	MEAN ± 2 SD	COLLECTION PERIOD	MIN.	MAX.	MEAN ± 2 SD	COLLECTION PERIOD	MIN.	MAX.	MEAN ± 2 SD
01/02/03 - 01/29/03	12	30	20 ± 16	01/02/03 - 01/29/03	9	26	19 ± 12	01/02/03 - 01/29/03	13	23	18 ± 9
01/29/03 - 02/26/03	10	22	17 ± 8	01/29/03 - 02/26/03	11	24	18 ± 8	01/29/03 - 02/26/03	13	21	16 ± 7
02/26/03 - 04/02/03	11	24	17 ± 8	02/26/03 - 04/02/03	12	24	18 ± 7	02/26/03 - 04/02/03	13	23	18 ± 9
04/02/03 - 04/30/03	9	18	12 ± 7	04/02/03 - 04/30/03	10	15	13 ± 4	04/02/03 - 04/30/03	11	16	14 ± 5
04/30/03 - 05/28/03	< 4	15	10 ± 8	04/30/03 - 05/28/03	< 4	16	10 ± 8	04/30/03 - 05/28/03	< 4	12	8 ± 7
05/28/03 - 07/02/03	7	28	13 ± 13	05/28/03 - 07/02/03	7	22	12 ± 9	05/28/03 - 07/02/03	8	23	12 ± 12
07/02/03 - 07/30/03	< 7	18	12 ± 8	07/02/03 - 07/30/03	< 7	21	13 ± 9	07/02/03 - 07/30/03	< 7	21	13 ± 12
07/30/03 - 09/03/03	9	28	18 ± 12	07/30/03 - 09/03/03	< 7	26	17 ± 12	07/30/03 - 09/03/03	12	25	18 ± 12
09/03/03 - 10/01/03	< 9	23	14 ± 9	09/03/03 - 10/01/03	8	27	15 ± 9	09/03/03 - 10/01/03	8	17	13 ± 7
10/01/03 - 10/29/03	13	41	24 ± 22	10/01/03 - 10/29/03	9	42	23 ± 21	10/01/03 - 10/29/03	13	30	22 ± 17
10/29/03 - 12/03/03	12	22	19 ± 7	10/29/03 - 12/03/03	15	49	22 ± 14	10/29/03 - 12/03/03	17	25	21 ± 6
12/03/03 - 12/31/03	11	21	16 ± 8	12/03/03 - 12/31/03	12	22	16 ± 8	12/03/03 - 12/31/03	14	21	17 ± 6
01/02/03 - 01/02/04	< 4	41	16 ± 8	01/02/03 - 01/02/04	< 4	49	16 ± 8	01/02/03 - 01/02/04	< 4	30	16 ± 8

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**TABLE C-VIII.3 CONCENTRATION OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

STC	COLLECTION PERIOD	Be-7	Mn-54	Co-58	Co-60	Cs-134	Cs-137
A3-1	01/02 - 04/02/03	63 ± 6	< 0.4	< 0.5	< 0.5	< 0.4	< 0.5
	04/02 - 07/02/03	51 ± 10	< 0.8	< 1.0	< 0.9	< 0.7	< 0.8
	07/02 - 10/01/03	< 22	< 0.9	< 1.0	< 0.9	< 0.7	< 0.8
	10/01 - 12/31/03	51 ± 12	< 1.0	< 1.2	< 1.0	< 0.8	< 1.0
MEAN	51 ± 50	0.8 ± 0.5	0.9 ± 0.7	0.8 ± 0.5	0.7 ± 0.4	0.8 ± 0.4	
E1-2	01/02 - 04/02/03	70 ± 5	< 0.4	< 0.4	< 0.4	< 0.3	< 0.4
	04/02 - 07/02/03	46 ± 9	< 0.6	< 0.8	< 0.7	< 0.6	< 0.6
	07/02 - 10/01/03	45 ± 11	< 0.6	< 0.8	< 0.8	< 0.6	< 0.6
	10/01 - 12/31/03	47 ± 11	< 0.6	< 1.0	< 0.8	< 0.8	< 0.8
MEAN	52 ± 24	0.6 ± 0.2	0.8 ± 0.5	0.7 ± 0.4	0.6 ± 0.4	0.6 ± 0.3	
F1-3	01/02 - 04/02/03	71 ± 4	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
	04/02 - 07/02/03	52 ± 11	< 0.9	< 1.2	< 1.0	< 0.8	< 0.9
	07/02 - 10/01/03	53 ± 11	< 1.0	< 0.8	< 0.8	< 0.8	< 0.8
	10/01 - 12/31/03	40 ± 10	< 0.8	< 0.5	< 0.7	< 0.6	< 0.8
MEAN	54 ± 25	0.8 ± 0.7	0.7 ± 0.8	0.7 ± 0.6	0.6 ± 0.5	0.7 ± 0.5	
G2-1	01/02 - 04/02/03	63 ± 7	< 0.6	< 0.6	< 0.6	< 0.5	< 0.5
	04/02 - 07/02/03	53 ± 9	< 0.5	< 0.6	< 0.5	< 0.4	< 0.4
	07/02 - 10/01/03	43 ± 11	< 0.8	< 1.0	< 1.5	< 0.6	< 0.6
	10/01 - 12/31/03	38 ± 11	< 1.0	< 0.9	< 1.1	< 0.7	< 0.8
MEAN	49 ± 23	0.7 ± 0.4	0.8 ± 0.4	0.9 ± 1.0	0.6 ± 0.2	0.6 ± 0.4	
H3-1	01/02 - 04/02/03	64 ± 8	< 0.6	< 0.6	< 0.7	< 0.5	< 0.6
	04/02 - 07/02/03	46 ± 13	< 0.8	< 1.1	< 0.9	< 0.8	< 0.8
	07/02 - 10/01/03	39 ± 12	< 0.7	< 1.0	< 0.7	< 0.6	< 0.7
	10/01 - 12/31/03	48 ± 6	< 0.5	< 0.5	< 0.6	< 0.5	< 0.5
MEAN	49 ± 21	0.7 ± 0.3	0.8 ± 0.5	0.7 ± 0.3	0.6 ± 0.3	0.6 ± 0.2	
M2-1	01/02 - 04/02/03	68 ± 8	< 0.6	< 0.6	< 0.7	< 0.6	< 0.7
	04/02 - 07/02/03	53 ± 5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
	07/02 - 10/01/03	53 ± 7	< 0.7	< 0.9	< 0.7	< 0.6	< 0.7
	10/01 - 12/31/03	39 ± 14	< 1.3	< 1.0	< 1.5	< 1.2	< 1.3
MEAN	53 ± 24	0.7 ± 0.8	0.7 ± 0.6	0.8 ± 1.0	0.7 ± 0.8	0.7 ± 0.9	
Q15-1	01/02 - 04/02/03	60 ± 7	< 0.6	< 0.7	< 0.6	< 0.6	< 0.6
	04/02 - 07/02/03	54 ± 9	< 0.5	< 0.7	< 0.7	< 0.4	< 0.6
	07/02 - 10/01/03	62 ± 14	< 0.9	< 0.8	< 0.8	< 0.8	< 0.8
	10/01 - 12/31/03	44 ± 15	< 1.3	< 1.5	< 1.1	< 1.2	< 1.3
MEAN	55 ± 16	0.8 ± 0.7	0.9 ± 0.7	0.8 ± 0.4	0.7 ± 0.6	0.8 ± 0.7	

TABLE C-IX.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

COLLECTION PERIOD	GROUP I		GROUP II				GROUP III
	E1-2	F1-3	A3-1	G2-1	H3-1	M2-1	Q15-1
01/02/03 - 01/08/03	< 11	< 11	< 15	< 11	< 11	< 14	< 14
01/08/03 - 01/15/03	< 10	< 10	< 15	< 11	< 10	< 14	< 14
01/15/03 - 01/22/03	< 5	< 5	< 8	< 5	< 5	< 8	< 8
01/22/03 - 01/29/03	< 12	< 12	< 13	< 12	< 12	< 12	< 12
01/29/03 - 02/05/03	< 5	< 5	< 12	< 5	< 5	< 5	< 12
02/05/03 - 02/12/03	< 7	< 7	< 11	< 8	< 7	< 7	< 10
02/12/03 - 02/19/03	< 12	< 11	< 9	< 12	< 8	< 8	< 8
02/19/03 - 02/26/03	< 9	< 8	< 7	< 9	< 6	< 6	< 6
02/26/03 - 03/05/03	< 10	< 9	< 14	< 10	< 10	< 13	< 13
03/05/03 - 03/12/03	< 13	< 13	< 10	< 13	< 13	< 9	< 9
03/12/03 - 03/19/03	< 12	< 12	< 11	< 12	< 12	< 11	< 10
03/19/03 - 03/27/03	< 13	< 6	< 8	< 5	< 6	< 9	< 10
03/27/03 - 04/02/03	< 13	< 13	< 15	< 13	< 13	< 14	< 14
04/02/03 - 04/09/03	< 9	< 8	< 9	< 9	< 8	< 9	< 9
04/09/03 - 04/16/03	(1)	< 11	< 10	< 11	< 11	< 9	< 9
04/16/03 - 04/23/03	< 11	< 11	< 11	< 11	< 11	< 10	< 10
04/23/03 - 04/30/03	< 10	< 9	< 10	< 10	< 10	< 9	< 9
04/30/03 - 05/07/03	< 11	< 11	< 7	< 11	< 11	< 7	< 7
05/07/03 - 05/14/03	< 6	< 6	< 3	< 6	< 6	< 4	< 4
05/14/03 - 05/21/03	< 15	< 15	< 15	< 16	< 15	< 14	< 14
05/21/03 - 05/28/03	< 8	< 8	< 6	< 8	< 8	< 6	< 6
05/28/03 - 06/04/03	< 13	< 13	< 11	< 13	< 13	< 11	< 11
06/04/03 - 06/11/03	< 16	< 16	< 20	< 17	< 16	< 11	< 19
06/11/03 - 06/18/03	< 5	< 5	< 9	< 5	< 8	< 8	< 8
06/18/03 - 06/25/03	< 9	< 9	< 13	< 9	< 9	< 13	< 12
06/25/03 - 07/02/03	< 9	< 19	< 23	< 9	< 23	< 22	< 22
07/02/03 - 07/09/03	< 9	< 9	< 18	< 10	< 9	< 18	< 18
07/09/03 - 07/16/03	< 16	< 15	< 12	< 16	< 12	< 11	< 11
07/16/03 - 07/23/03	< 8	< 8	< 6	< 8	< 8	< 6	< 6
07/23/03 - 07/30/03	< 14	< 15	< 14	< 15	< 16	< 15	< 15
07/30/03 - 08/06/03	< 11	< 12	< 13	< 12	< 15	< 14	< 14
08/06/03 - 08/13/03	< 15	< 14	< 11	< 38	< 15	< 11	< 11
08/13/03 - 08/20/03	< 5	< 5	< 7	< 5	< 6	< 8	< 8
08/20/03 - 08/27/03	< 17	< 18	< 20	< 18	< 22	< 21	< 20
08/27/03 - 09/03/03	< 8	< 8	< 6	< 8	< 9	< 6	< 6
09/03/03 - 09/10/03	< 10	< 11	< 14	< 11	< 11	< 14	< 14
09/10/03 - 09/17/03	< 11	< 12	< 9	< 12	< 12	< 9	< 9
09/17/03 - 09/24/03	< 13	< 13	< 18	< 39	< 13	< 21	< 18
09/24/03 - 10/01/03	< 9	< 9	< 7	< 10	< 10	< 8	< 7
10/01/03 - 10/08/03	< 16	< 17	< 14	< 17	< 17	< 14	< 14
10/08/03 - 10/15/03	< 17	< 18	< 17	< 18	< 19	< 18	< 18
10/15/03 - 10/22/03	< 16	< 17	< 15	< 17	< 17	< 15	< 15
10/22/03 - 10/29/03	< 7	< 8	< 7	< 8	< 8	< 7	< 7
10/29/03 - 11/05/03	< 14	< 15	< 12	< 15	< 13	< 12	< 12
11/05/03 - 11/12/03	< 5	< 5	< 6	< 5	< 6	< 6	< 6
11/12/03 - 11/19/03	< 12	< 13	< 10	< 13	< 13	< 11	< 10
11/19/03 - 11/25/03	< 23	< 24	< 20	< 25	< 22	< 20	< 20
11/25/03 - 12/03/03	< 13	< 13	< 11	< 14	< 12	< 11	< 11
12/03/03 - 12/10/03	< 10	< 11	< 11	< 11	< 11	< 12	< 11
12/10/03 - 12/16/03	< 14	< 14	< 12	< 15	< 15	< 12	< 12
12/16/03 - 12/23/03	< 16	< 17	< 16	< 17	< 17	< 16	< 16
12/23/03 - 12/31/03	< 16	< 17	< 18	< 17	< 20	< 19	< 18
MEAN	11 ± 8	12 ± 8	12 ± 9	13 ± 13	12 ± 9	12 ± 9	12 ± 9

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

**TABLE C-X.1 CONCENTRATIONS OF IODINE I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

COLLECTION PERIOD	CONTROL FARM	INDICATOR FARMS			
	K15-3	D2-1	E2-2	F4-1	G2-1
01/15/03	< 0.3	< 0.3	< 0.3		< 0.3
02/12/03	< 0.2	< 0.2	< 0.9		< 0.8
03/05/03	< 0.9	< 0.7	< 0.5		< 0.7
03/19/03	< 0.8	< 0.6	< 0.7		< 0.7
04/02/03	< 0.8	< 0.7	< 0.6		< 0.7
04/16/03	< 0.4	< 0.7	< 0.4		< 0.5
04/30/03	< 0.3	< 0.3	< 0.4		< 0.2
05/14/03	< 0.7	< 0.8	< 0.7		< 0.7
05/28/03	< 0.6	< 0.3	< 0.7		< 0.5
06/11/03	< 0.8	< 0.6	< 0.5		< 0.6
06/25/03	< 0.6	< 0.5	< 0.4		< 0.4
07/09/03	< 0.7	< 0.6	< 0.6		< 0.8
07/23/03	< 0.5	< 0.6	< 0.5		< 0.6
08/06/03	< 0.7	< 0.7	< 0.6		< 0.5
08/20/03	< 0.4	< 0.5	< 0.5		< 0.4
09/03/03	< 0.6	< 0.5	< 0.6		< 0.5
09/17/03	< 0.1	< 0.4	< 0.3	< 0.2	< 0.2
10/01/03	< 0.6	< 0.7	< 0.7		< 0.8
10/15/03	< 0.5	< 0.3	< 0.5		< 0.4
10/29/03	< 0.4	< 0.4	< 0.5		< 0.5
11/12/03	< 0.3	< 0.5	< 0.9		< 0.2
11/25/03	< 0.7	< 0.7	< 0.7		< 0.5
12/10/03	< 0.5	< 0.6	< 0.6	< 0.5	< 0.6
MEAN	0.5 $\pm$ 0.4	0.5 $\pm$ 0.3	0.6 $\pm$ 0.3	0.3 $\pm$ 0.5	0.5 $\pm$ 0.4

**TABLE C-X.2 CONCENTRATIONS OF STRONTIUM IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

COLLECTION PERIOD	CONTROL FARM		INDICATOR FARMS								
	K15-3		D2-1		E2-2		F4-1		G2-1		
	Sr-89	Sr-90	Sr-89	Sr-90	Sr-89	Sr-90	Sr-89	Sr-90	Sr-89	Sr-90	
01/15/03 - 03/19/03	< 2.6	0.7 $\pm$ 0.4	< 1.8	< 0.5	< 2.7	< 0.7				< 3.0	< 0.7
04/02/03 - 06/25/03	< 2.9	1.3 $\pm$ 0.5	< 2.4	0.9 $\pm$ 0.4	< 2.1	0.7 $\pm$ 0.3				< 2.4	< 0.6
07/09/03 - 09/17/03	< 2.6	1.1 $\pm$ 0.3	< 2.5	1.3 $\pm$ 0.4	< 2.4	0.6 $\pm$ 0.3	< 3.1	0.8 $\pm$ 0.6		< 3.6	0.7 $\pm$ 0.4
10/01/03 - 12/10/03	< 2.6	1.3 $\pm$ 0.6	< 2.6	1.1 $\pm$ 0.5	< 2.7	1.3 $\pm$ 0.6	< 3.6	< 0.9		< 2.9	1.3 $\pm$ 0.6
MEAN	2.7 $\pm$ 0.3	1.1 $\pm$ 0.5	2.3 $\pm$ 0.7	0.9 $\pm$ 0.7	2.5 $\pm$ 0.6	0.8 $\pm$ 0.6	3.4 $\pm$ 0.7	0.9 $\pm$ 0.04		3.0 $\pm$ 1.0	0.8 $\pm$ 0.7

TABLE C-X.3 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
D2-1	01/15/03	1430 ± 85	< 3	< 4	< 17	< 6
	02/12/03	1410 ± 102	< 4	< 5	< 21	< 7
	03/05/03	1410 ± 80	< 2	< 3	< 11	< 3
	03/19/03	1430 ± 88	< 4	< 4	< 18	< 7
	04/02/03	1420 ± 161	< 5	< 5	< 20	< 8
	04/16/03	1350 ± 91	< 3	< 4	< 17	< 5
	04/30/03	1400 ± 74	< 2	< 3	< 11	< 3
	05/14/03	1400 ± 94	< 4	< 4	< 17	< 6
	05/28/03	1380 ± 85	< 3	< 4	< 17	< 6
	06/11/03	1440 ± 92	< 4	< 4	< 20	< 7
	06/25/03	1350 ± 81	< 2	< 3	< 12	< 3
	07/09/03	1380 ± 73	< 1	< 2	< 8	< 3
	07/23/03	1530 ± 81	< 3	< 4	< 16	< 5
	08/06/03	1370 ± 118	< 5	< 6	< 25	< 8
	08/20/03	1230 ± 90	< 4	< 4	< 17	< 5
	09/03/03	1340 ± 77	< 3	< 4	< 14	< 5
	09/17/03	1400 ± 80	< 3	< 4	< 15	< 4
	10/01/03	1110 ± 197	< 8	< 8	< 37	< 10
	10/15/03	1190 ± 101	< 4	< 5	< 20	< 7
	10/29/03	1200 ± 152	< 4	< 5	< 23	< 8
11/12/03	1390 ± 73	< 2	< 3	< 9	< 3	
11/25/03	1280 ± 80	< 2	< 3	< 12	< 3	
12/10/03	1320 ± 188	< 8	< 10	< 37	< 11	
	MEAN	1355 ± 192	4 ± 3	4 ± 4	18 ± 15	6 ± 5
E2-2	01/15/03	1350 ± 77	< 2	< 2	< 8	< 2
	02/12/03	1320 ± 81	< 4	< 4	< 19	< 6
	03/05/03	1320 ± 87	< 4	< 4	< 17	< 6
	03/19/03	1410 ± 89	< 4	< 4	< 19	< 6
	04/02/03	1300 ± 142	< 7	< 7	< 32	< 7
	04/16/03	1480 ± 101	< 4	< 4	< 19	< 5
	04/30/03	1360 ± 87	< 3	< 3	< 13	< 4
	05/14/03	1310 ± 92	< 4	< 4	< 16	< 5
	05/28/03	1340 ± 99	< 4	< 4	< 19	< 6
	06/11/03	1410 ± 118	< 3	< 4	< 16	< 6
	06/25/03	1180 ± 53	< 2	< 3	< 11	< 4
	07/09/03	1250 ± 80	< 2	< 3	< 16	< 5
	07/23/03	1320 ± 100	< 4	< 5	< 19	< 6
	08/06/03	1330 ± 72	< 3	< 3	< 13	< 4
	08/20/03	1230 ± 92	< 4	< 4	< 17	< 6
	09/03/03	1250 ± 75	< 2	< 2	< 7	< 2
	09/17/03	1200 ± 83	< 3	< 3	< 12	< 3
	10/01/03	1150 ± 101	< 4	< 5	< 20	< 6
	10/15/03	1570 ± 89	< 4	< 4	< 16	< 5
	10/29/03	1240 ± 78	< 2	< 3	< 11	< 3
11/12/03	1350 ± 82	< 2	< 3	< 10	< 3	
11/25/03	1340 ± 82	< 3	< 4	< 18	< 6	
12/10/03	1160 ± 154	< 5	< 6	< 17	< 6	
	MEAN	1312 ± 200	3 ± 2	4 ± 2	16 ± 10	5 ± 3

**TABLE C-X.3 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
F4-1	09/17/03	1350 $\pm$ 73	< 2	< 2	< 10	< 3
	12/10/03	1240 $\pm$ 182	< 6	< 6	< 25	< 8
	MEAN	1295 $\pm$ 156	4 $\pm$ 5	4 $\pm$ 5	17 $\pm$ 21	5 $\pm$ 6
G2-1	01/15/03	1250 $\pm$ 83	< 3	< 4	< 18	< 6
	02/12/03	1390 $\pm$ 90	< 3	< 3	< 15	< 4
	03/05/03	1580 $\pm$ 91	< 2	< 2	< 10	< 3
	03/19/03	1460 $\pm$ 79	< 3	< 3	< 15	< 5
	04/02/03	1280 $\pm$ 127	< 4	< 5	< 18	< 6
	04/16/03	1280 $\pm$ 77	< 3	< 4	< 16	< 5
	04/30/03	1400 $\pm$ 88	< 4	< 4	< 18	< 6
	05/14/03	1460 $\pm$ 78	< 3	< 4	< 15	< 5
	05/28/03	1290 $\pm$ 78	< 3	< 3	< 15	< 5
	06/11/03	1440 $\pm$ 114	< 5	< 6	< 28	< 7
	06/25/03	1300 $\pm$ 74	< 3	< 3	< 14	< 4
	07/09/03	1550 $\pm$ 95	< 4	< 4	< 27	< 9
	07/23/03	1330 $\pm$ 169	< 4	< 4	< 16	< 5
	08/06/03	1220 $\pm$ 84	< 4	< 4	< 19	< 5
	08/20/03	1390 $\pm$ 84	< 4	< 4	< 16	< 6
	09/03/03	1120 $\pm$ 78	< 4	< 4	< 17	< 5
	09/17/03	1130 $\pm$ 84	< 3	< 3	< 13	< 4
	10/01/03	1130 $\pm$ 156	< 7	< 8	< 34	< 12
	10/15/03	1590 $\pm$ 85	< 4	< 4	< 18	< 6
	10/29/03	1020 $\pm$ 65	< 3	< 3	< 14	< 4
11/12/03	1350 $\pm$ 78	< 3	< 4	< 15	< 5	
11/25/03	1090 $\pm$ 93	< 4	< 5	< 22	< 7	
12/10/03	1180 $\pm$ 152	< 7	< 8	< 27	< 9	
MEAN		1314 $\pm$ 318	4 $\pm$ 2	4 $\pm$ 3	18 $\pm$ 11	6 $\pm$ 4
K15-3	01/15/03	1380 $\pm$ 103	< 4	< 5	< 21	< 6
	02/12/03	1360 $\pm$ 85	< 4	< 4	< 19	< 6
	03/05/03	1390 $\pm$ 76	< 3	< 3	< 14	< 5
	03/19/03	1400 $\pm$ 83	< 4	< 4	< 17	< 5
	04/02/03	1320 $\pm$ 166	< 4	< 4	< 18	< 5
	04/16/03	1450 $\pm$ 91	< 2	< 2	< 10	< 3
	04/30/03	1220 $\pm$ 79	< 4	< 4	< 17	< 5
	05/14/03	1450 $\pm$ 79	< 3	< 3	< 14	< 4
	05/28/03	1280 $\pm$ 93	< 2	< 2	< 10	< 3
	06/11/03	1370 $\pm$ 93	< 4	< 5	< 21	< 7
	06/25/03	1160 $\pm$ 84	< 2	< 2	< 8	< 2
	07/09/03	1150 $\pm$ 122	< 3	< 3	< 22	< 6
	07/23/03	1400 $\pm$ 77	< 3	< 3	< 13	< 4
	08/06/03	1270 $\pm$ 93	< 4	< 4	< 17	< 5
	08/20/03	1170 $\pm$ 98	< 4	< 4	< 18	< 6
	09/03/03	1210 $\pm$ 85	< 2	< 2	< 8	< 2
	09/17/03	1330 $\pm$ 75	< 3	< 3	< 13	< 4
	10/01/03	1390 $\pm$ 209	< 9	< 10	< 45	< 12
	10/15/03	1420 $\pm$ 114	< 4	< 5	< 23	< 7
	10/29/03	1350 $\pm$ 84	< 2	< 3	< 12	< 4
11/12/03	1250 $\pm$ 139	< 5	< 5	< 21	< 7	
11/25/03	1360 $\pm$ 205	< 5	< 7	< 36	< 13	
12/10/03	1310 $\pm$ 180	< 7	< 8	< 32	< 9	
MEAN		1321 $\pm$ 183	4 $\pm$ 4	4 $\pm$ 4	19 $\pm$ 18	6 $\pm$ 6

TABLE C-XI.1

CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN  
FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF THREE  
MILE ISLAND NUCLEAR STATION, 2003

RESULTS IN UNITS OF PCI/KG WET  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	Sr-90	K-40	I-131	Cs-134	Cs-137
B10-2 Beets	08/14/03		3750 $\pm$ 186	< 13	< 7	< 8
B10-2 Cabbage	08/14/03	< 5	2350 $\pm$ 221	< 15	< 10	< 11
B10-2 Corn	08/14/03		3220 $\pm$ 305	< 10	< 6	< 7
B10-2 Tomatoes	08/25/03		1830 $\pm$ 142	< 7	< 6	< 7
	MEAN		2788 $\pm$ 1721	11 $\pm$ 6	7 $\pm$ 4	8 $\pm$ 3
E1-2 Beets	08/14/03		4370 $\pm$ 171	< 10	< 6	< 6
E1-2 Cabbage	08/14/03	17 $\pm$ 3	5270 $\pm$ 332	< 23	< 14	< 15
E1-2 Corn	08/14/03		3060 $\pm$ 163	< 10	< 6	< 7
E1-2 Tomatoes	08/25/03		1820 $\pm$ 99	< 5	< 4	< 4
	MEAN		3630 $\pm$ 3020	12 $\pm$ 16	8 $\pm$ 9	8 $\pm$ 9

TABLE C-XII.1 QUARTERLY TLD RESULTS FOR THREE MILE ISLAND NUCLEAR STATION, 2003

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MONTH

STATION CODE	MEAN ± 2 S. D.	01/10 - 04/10/03	04/10 - 07/10/03	07/10 - 10/10/03	10/10 - 01/10/04
A1-4	3.2 ± 0.5	2.9	3.0	3.4	3.3
A3-1	4.1 ± 0.5	3.3	2.9	3.9	3.4
A5-1	4.5 ± 0.9	4.2	4.2	5.1	4.4
A9-3	3.5 ± 0.6	3.4	3.2	3.9	3.3
B1-1	3.3 ± 0.3	3.2	3.1	3.5	3.2
B1-2	3.3 ± 0.7	3.2	2.9	3.4	3.7
B2-1	3.3 ± 0.4	3.2	3.2	3.6	3.3
B5-1	4.2 ± 0.6	4.1	3.9	4.6	4.1
B10-1	3.9 ± 0.6	4.2	3.7	4.1	3.6
C1-1	3.9 ± 0.6	3.9	3.7	4.3	3.6
C1-2	3.3 ± 0.7	3.1	3.0	3.8	3.3
C2-1	3.7 ± 0.6	3.7	3.3	4.0	3.6
C5-1	4.2 ± 0.6	4.0	3.9	4.6	4.1
C8-1	4.4 ± 1.0	4.1	4.3	5.1	4.1
D1-1	3.5 ± 0.3	3.4	3.3	3.6	3.6
D1-2	4.1 ± 0.6	3.7	4.1	4.4	4.0
D2-2	4.8 ± 0.5	4.8	4.6	5.2	4.7
D6-1	4.8 ± 0.6	4.5	4.7	5.2	4.7
D15-1	4.3 ± 0.4	4.1	4.3	4.6	4.2
E1-2	3.7 ± 0.3	3.6	3.5	3.8	3.8
E1-4	3.5 ± 0.7	3.1	3.4	3.5	3.9
E2-3	4.3 ± 0.6	3.9	4.3	4.6	4.4
E5-1	4.0 ± 0.3	3.9	4.0	4.3	4.2
E7-1	4.1 ± 0.5	3.8	4.1	4.1	4.4
F1-1	4.0 ± 0.6	3.7	3.8	4.1	4.3
F1-2	3.8 ± 1.0	3.4	3.6	3.8	4.5
F1-4	3.6 ± 0.8	3.2	3.6	4.0	(1)
F2-1	4.8 ± 1.2	4.4	4.2	5.5	4.9
F5-1	4.9 ± 0.9	4.6	4.7	5.6	4.8
F10-1	5.3 ± 1.0	4.8	5.1	6.0	5.4
F25-1	4.5 ± 0.4	4.3	4.4	4.7	4.6
G1-2	4.1 ± 0.6	3.9	4.0	4.6	4.0
G1-3	3.5 ± 0.7	3.3	3.3	4.0	3.5
G1-5	3.7 ± 0.7	3.3	3.6	4.1	3.9
G1-6	3.8 ± 0.8	3.6	3.7	3.6	4.4
G2-4	4.9 ± 1.0	4.5	4.8	5.6	4.7
G5-1	3.7 ± 0.1	3.7	3.6	3.6	3.7
G10-1	6.1 ± 0.7	5.8	5.7	6.4	6.3
G15-1	4.3 ± 1.1	4.2	3.8	5.0	4.0
H1-1	4.0 ± 1.2	3.5	3.6	4.8	4.0
H3-1	3.0 ± 0.4	3.1	2.8	3.3	2.9
H5-1	3.3 ± 1.2	3.0	2.8	4.1	3.1
H8-1	6.5 ± 0.8	5.9	6.7	6.8	6.6
H15-1	4.8 ± 0.5	4.4	4.7	4.9	5.0
J1-1	3.4 ± 0.4	3.1	3.3	3.5	3.6

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-XII.1 QUARTERLY TLD RESULTS FOR THREE MILE ISLAND NUCLEAR STATION, 2003

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MONTH

STATION CODE	MEAN ± 2 S. D.	01/10 - 04/10/03	04/10 - 07/10/03	07/10 - 10/10/03	10/10 - 01/10/04
J1-3	2.9 ± 0.4	2.6	2.8	3.0	3.1
J3-1	3.7 ± 0.4	3.6	3.4	3.9	3.7
J5-1	4.6 ± 0.6	4.2	4.5	4.6	4.9
J7-1	4.6 ± 0.8	4.9	4.3	5.0	4.3
J15-1	4.5 ± 0.4	4.6	4.2	4.7	4.5
K1-4	3.6 ± 0.8	3.3	3.2	3.7	4.1
K2-1	4.4 ± 1.0	3.9	4.0	4.9	4.6
K3-1	3.6 ± 0.9	3.2	3.2	4.2	3.6
K5-1	4.6 ± 0.7	4.4	4.3	5.1	4.7
K8-1	4.5 ± 0.8	4.3	4.1	5.0	4.6
K15-1	3.9 ± 0.8	3.7	(1)	4.3	4.1
L1-1	3.6 ± 0.7	3.2	3.4	3.9	3.9
L1-2	3.7 ± 0.5	3.3	3.5	3.8	3.7
L2-1	4.0 ± 1.2	3.7	3.9	4.6	4.4
L5-1	3.8 ± 0.7	3.2	3.3	3.9	3.9
L8-1	4.0 ± 0.6	3.7	4.0	4.4	4.1
L15-1	3.9 ± 1.1	3.6	3.8	4.5	4.3
M1-1	3.5 ± 0.7	3.2	3.3	3.6	3.9
M1-2	3.5 ± 0.6	3.3	3.1	3.7	3.7
M2-1	3.3 ± 0.7	3.0	3.1	3.5	3.1
M5-1	4.2 ± 1.0	3.5	3.7	4.3	4.4
M9-1	4.5 ± 2.1	4.4	4.7	5.3	5.3
N1-1	3.6 ± 0.6	3.4	3.1	4.0	3.7
N1-3	3.5 ± 0.7	3.3	3.4	3.9	3.7
N2-1	3.3 ± 0.6	2.9	3.1	3.6	3.4
N5-1	3.5 ± 0.8	3.3	3.1	3.5	3.1
N8-1	4.2 ± 0.8	3.7	4.0	4.6	4.1
N15-2	4.1 ± 1.3	3.9	4.4	4.5	4.7
P1-1	3.7 ± 0.7	3.4	3.3	4.1	3.8
P1-2	3.9 ± 1.2	3.4	3.3	3.4	4.5
P2-1	4.4 ± 1.3	4.0	4.4	5.3	4.5
P5-1	3.6 ± 0.7	3.5	3.8	3.8	4.0
P8-1	3.5 ± 0.4	3.3	3.2	3.7	3.4
Q1-1	3.5 ± 0.8	3.6	3.6	3.7	3.8
Q1-2	3.3 ± 0.8	2.8	2.9	3.8	3.3
Q2-1	3.8 ± 1.1	3.3	3.3	4.5	3.7
Q5-1	3.6 ± 0.3	3.4	3.5	3.8	3.6
Q9-1	4.2 ± 0.9	3.7	3.7	4.7	4.0
Q15-1	4.1 ± 1.2	3.9	4.5	4.8	4.4
R1-1	3.3 ± 0.8	3.0	3.4	3.5	3.8
R1-2	3.6 ± 1.2	2.9	2.9	3.6	3.4
R3-1	4.5 ± 0.8	4.4	4.4	4.9	4.7
R5-1	4.3 ± 0.8	4.0	4.0	4.6	4.6
R9-1	4.3 ± 1.1	4.3	3.9	4.7	4.7
R15-1	3.8 ± 0.1	3.7	3.5	3.8	3.8

**TABLE C-XII.2 MEAN QUARTERLY TLD RESULTS FOR THE SITE BOUNDARY, MIDDLE AND CONTROL LOCATIONS FOR THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF MILLI-ROENTGEN PER STD. MONTH  $\pm 2$  STANDARD DEVIATIONS OF THE STATION DATA

STATION CODE	SITE BOUNDARY $\pm 2$ S. D.	OFFSITE	CONTROL
JAN-MAR	3.2 $\pm$ 0.5	3.8 $\pm$ 1.2	4.2 $\pm$ 1.2
APR-JUN	3.3 $\pm$ 0.5	3.8 $\pm$ 1.4	4.3 $\pm$ 1.2
JUL-SEP	3.7 $\pm$ 0.7	4.4 $\pm$ 1.4	4.7 $\pm$ 1.3
OCT-DEC	3.8 $\pm$ 0.8	4.1 $\pm$ 1.3	4.5 $\pm$ 1.4

**TABLE C-XII.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MONTH

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN $\pm 2$ S. D.	PRE-OP MEAN $\pm 2$ S. D.
SITE BOUNDARY	83	2.6	4.8	3.5 $\pm$ 0.8	4.8 $\pm$ 1.5
OFFSITE	231	2.8	6.8	4.0 $\pm$ 1.4	5.2 $\pm$ 1.5
CONTROL	43	3.5	6.4	4.5 $\pm$ 1.3	5.8 $\pm$ 1.7

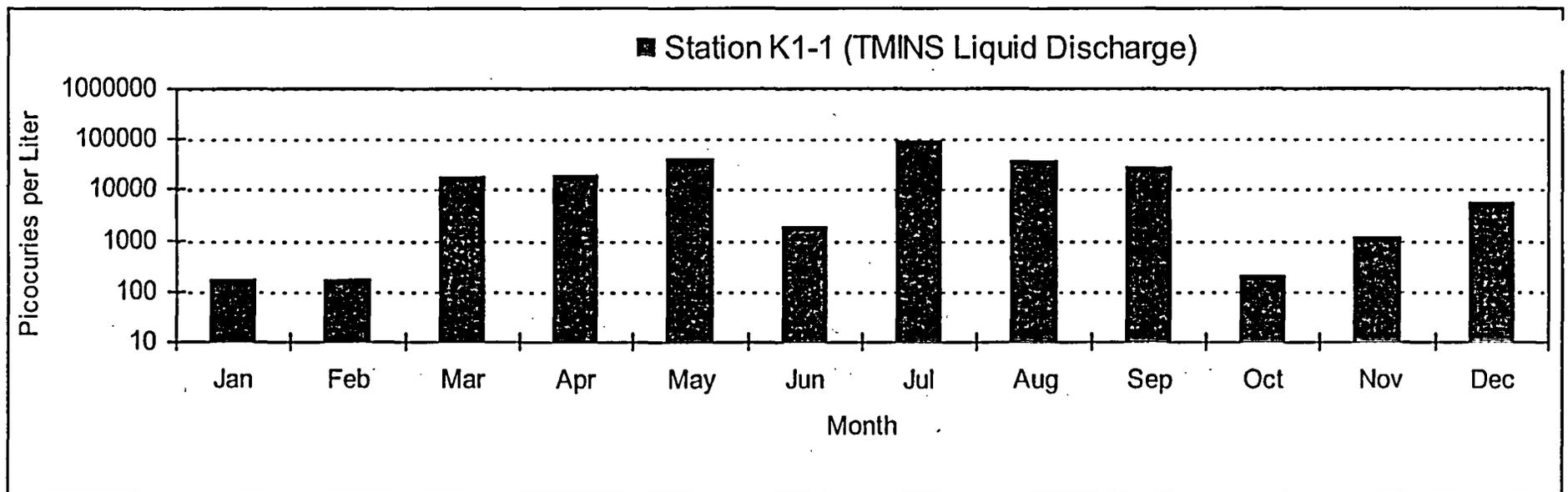
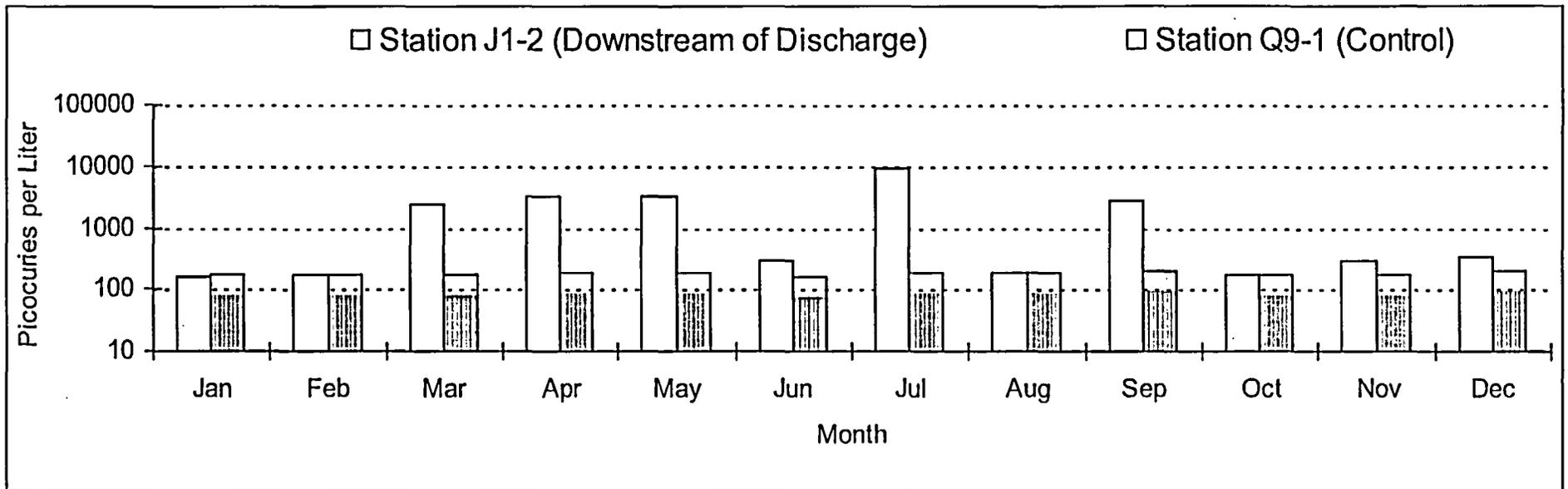
THE PRE-OPERATIONAL MEAN WAS CALCULATED FROM MONTHLY TLD READINGS 1980 TO 1985.

SITE BOUNDARY STATIONS - A1-4, B1-1, B1-2, C1-2, D1-1, E1-4, F1-2, F1-4, G1-3, G1-5, G1-6, H1-1, J1-1, J1-3, K1-4, L1-1, M1-1, N1-3, P1-2, Q1-2, R1-1

OFFSITE STATIONS - A3-1, A5-1, A9-3, B2-1, B5-1, B10-1, C1-1, C2-1, C5-1, C8-1, D1-2, D2-2, D6-1, E1-2, E2-3, E5-1, E7-1, F1-1, F2-1, F5-1, F10-1, G1-2, G2-4, G5-1, H3-1, H5-1, H8-1, J3-1, J5-1, J7-1, K2-1, K3-1, K5-1, K8-1, L1-2, L2-1, L5-1, L8-1, M1-2, M2-1, M5-1, M9-1, N1-1, N2-1, N5-1, N8-1, P1-1, P2-1, P5-1, P8-1, Q1-1, Q2-1, Q5-1, Q9-1, R1-2, R3-1, R5-1, R9-1

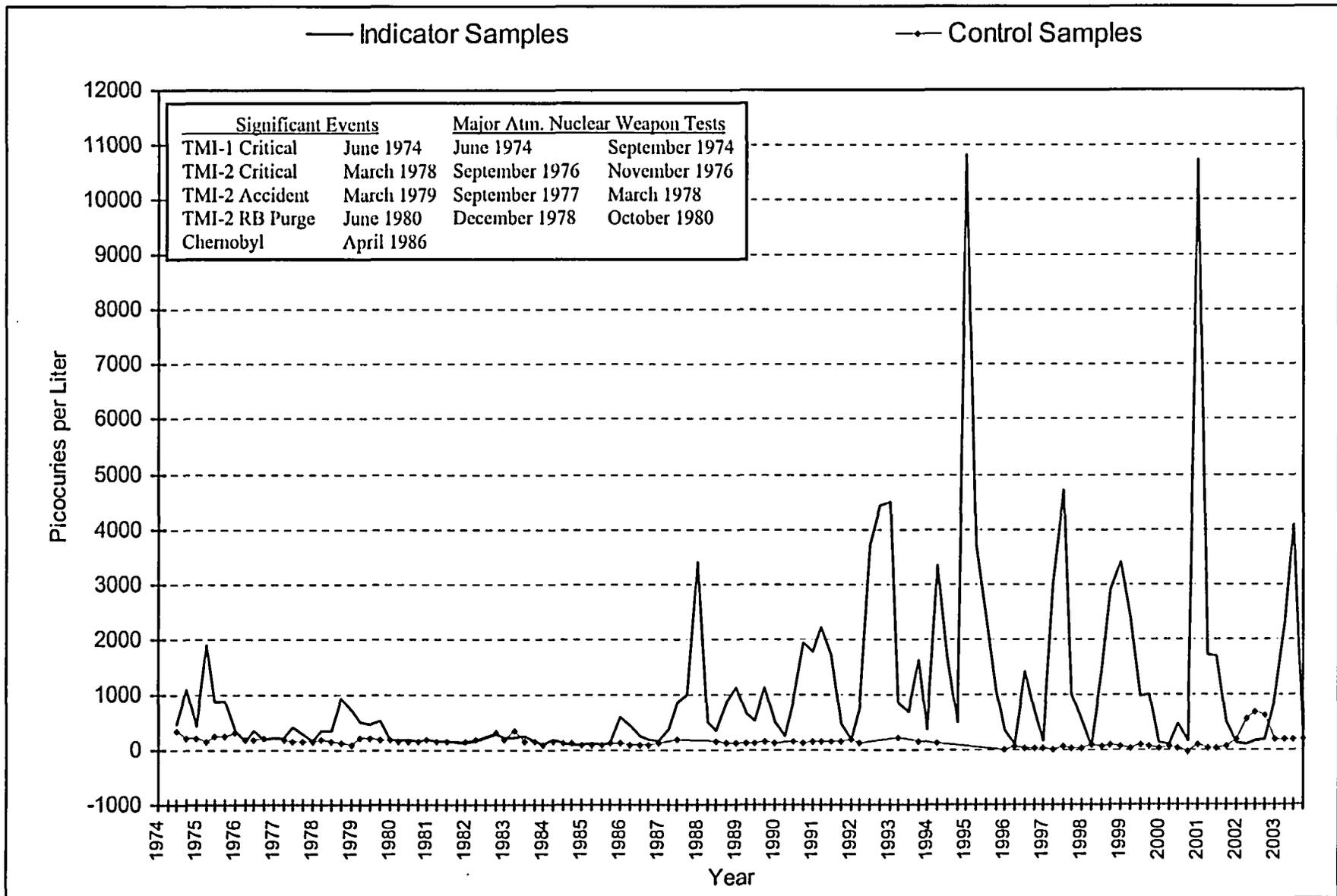
CONTROL STATIONS - D15-1, F25-1, G10-1, G15-1, H15-1, J15-1, K15-1, L15-1, N15-2, Q15-1, R15-1

**FIGURE C-1**  
**Monthly Tritium Concentrations in Surface Water**  
**Three Mile Island Nuclear Station, 2003**

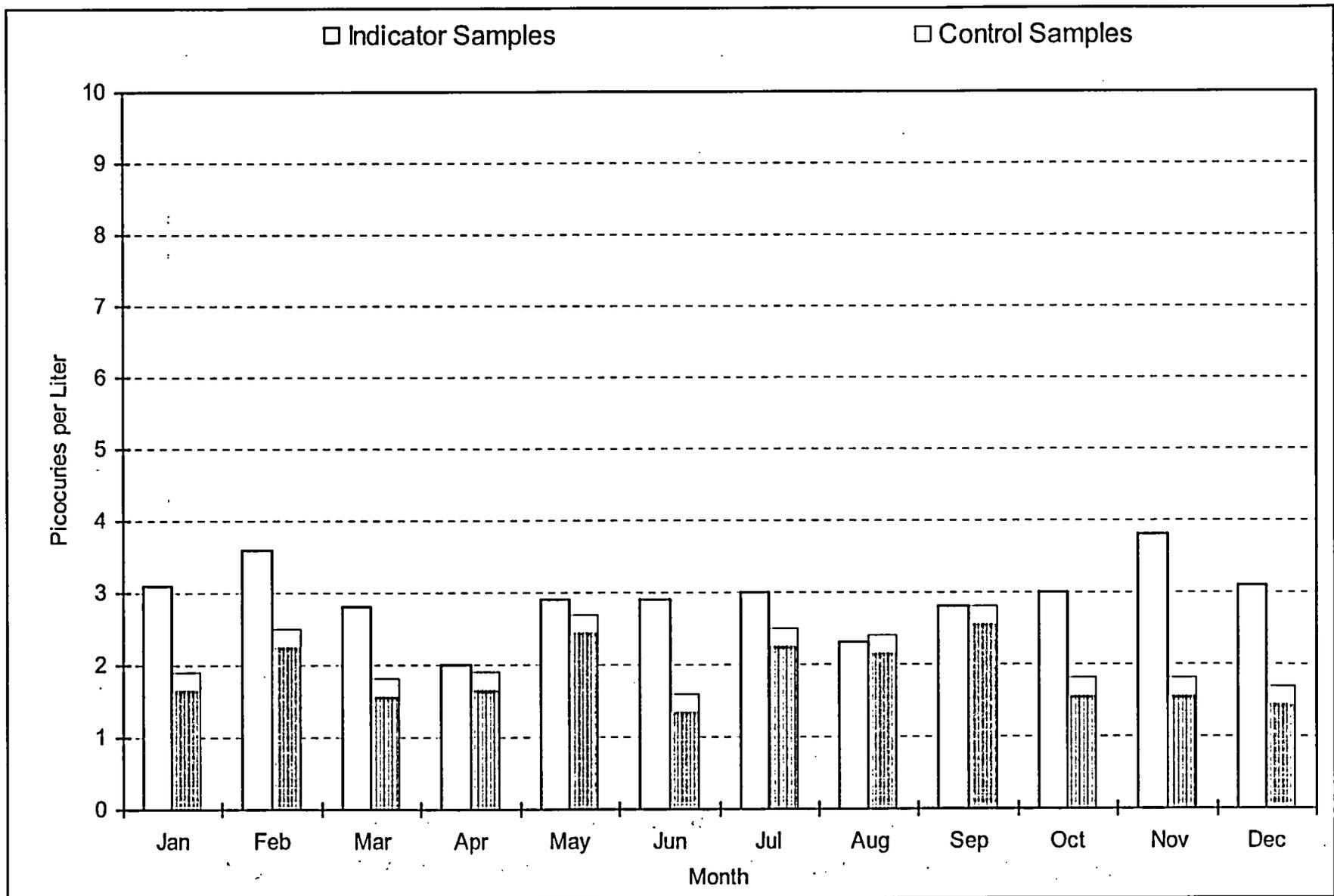


# FIGURE C-2

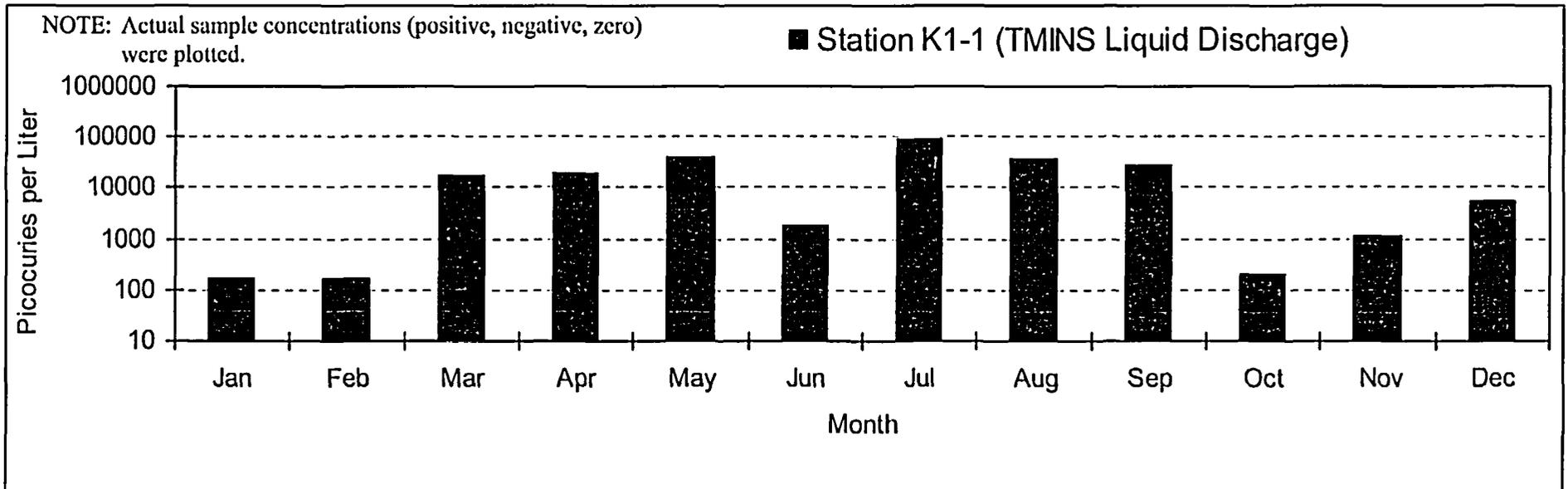
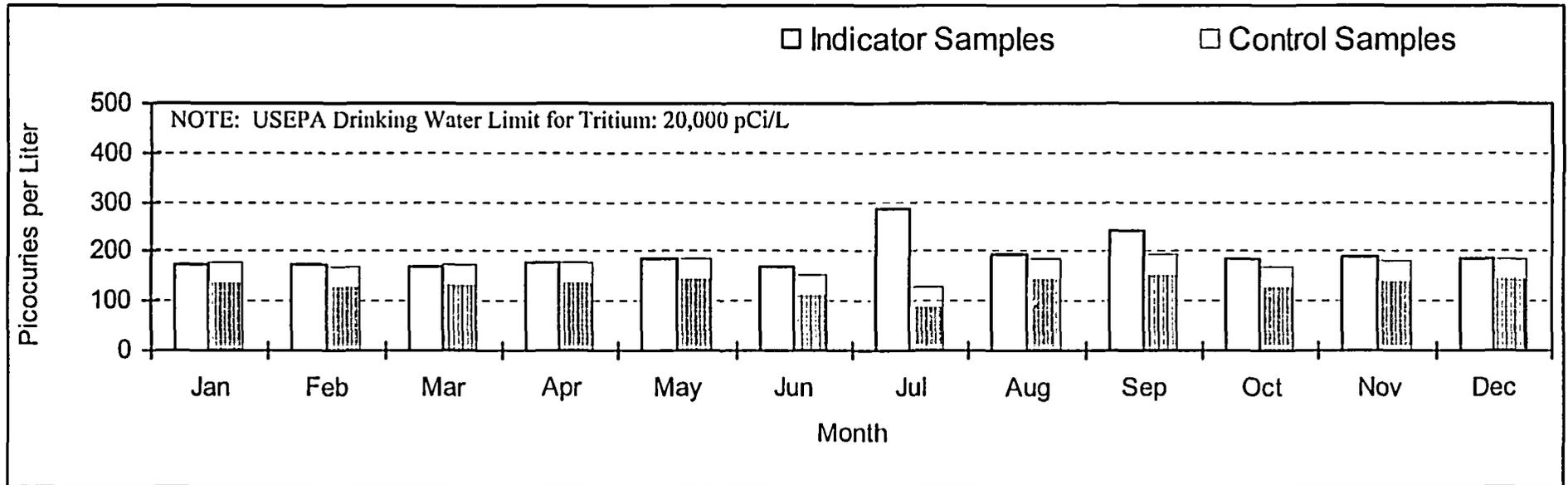
## Mean Quarterly Tritium Concentrations in Surface Water Three Mile Island Nuclear Station, 1974 - 2003



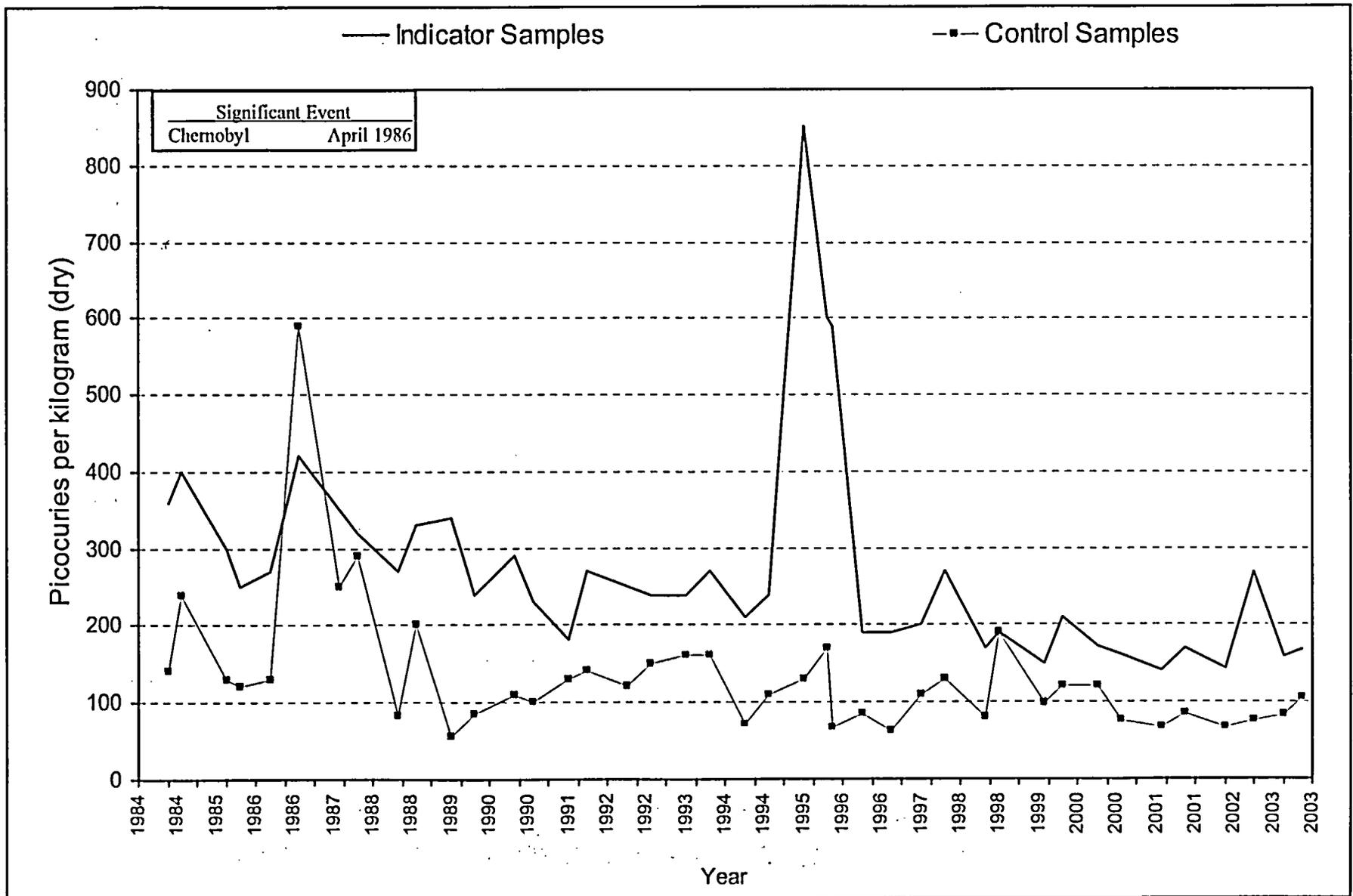
**FIGURE C-3**  
**Mean Monthly Gross Beta Concentrations in Drinking Water**  
**Three Mile Island Nuclear Station, 2003**



**FIGURE C-4**  
**Mean Monthly Tritium Concentrations in Drinking Water**  
**Three Mile Island Nuclear Station, 2003**

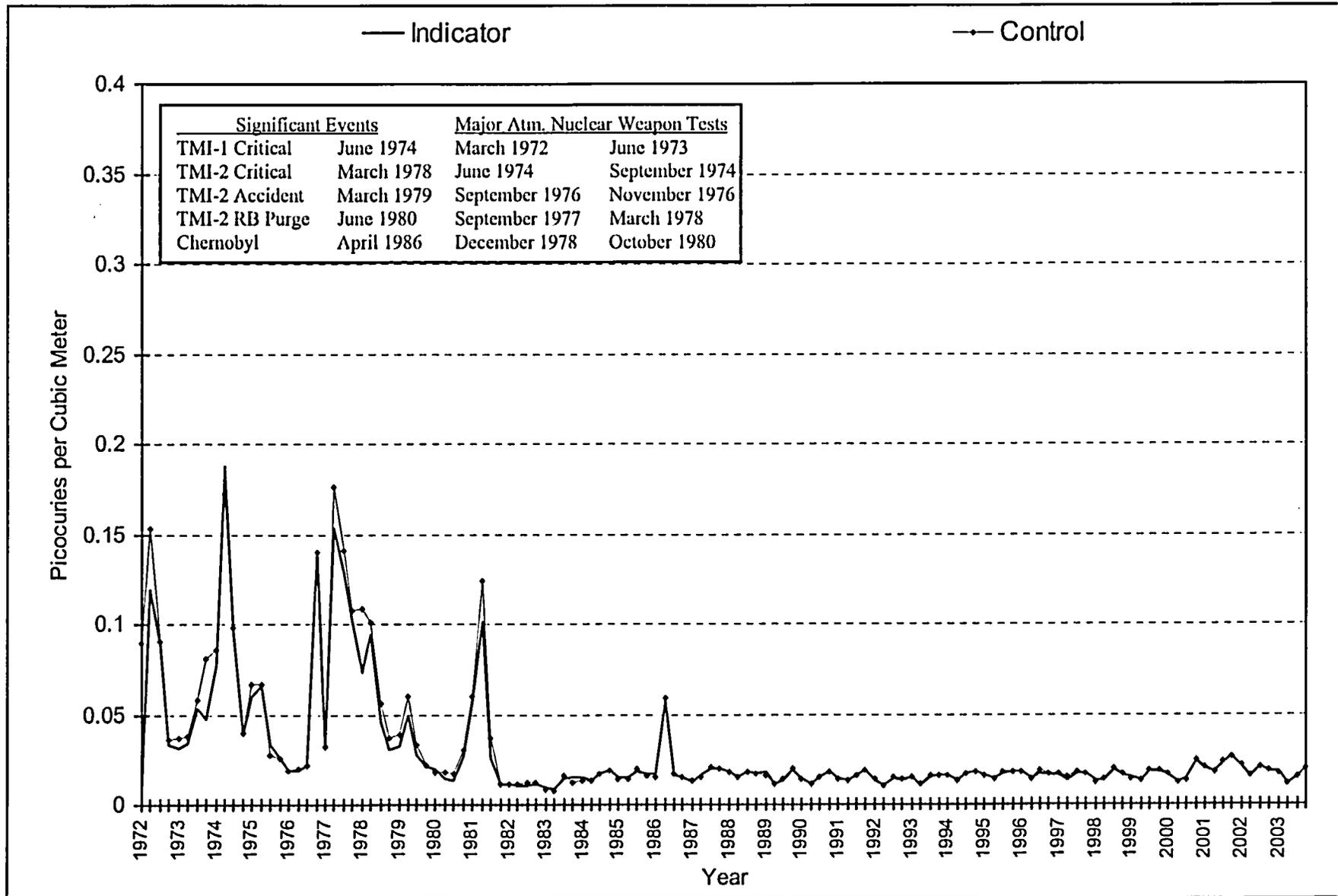


**FIGURE C-5**  
**Mean Cesium-137 Concentrations in Aquatic Sediments**  
**Three Mile Island Nuclear Station, 1984 - 2003**

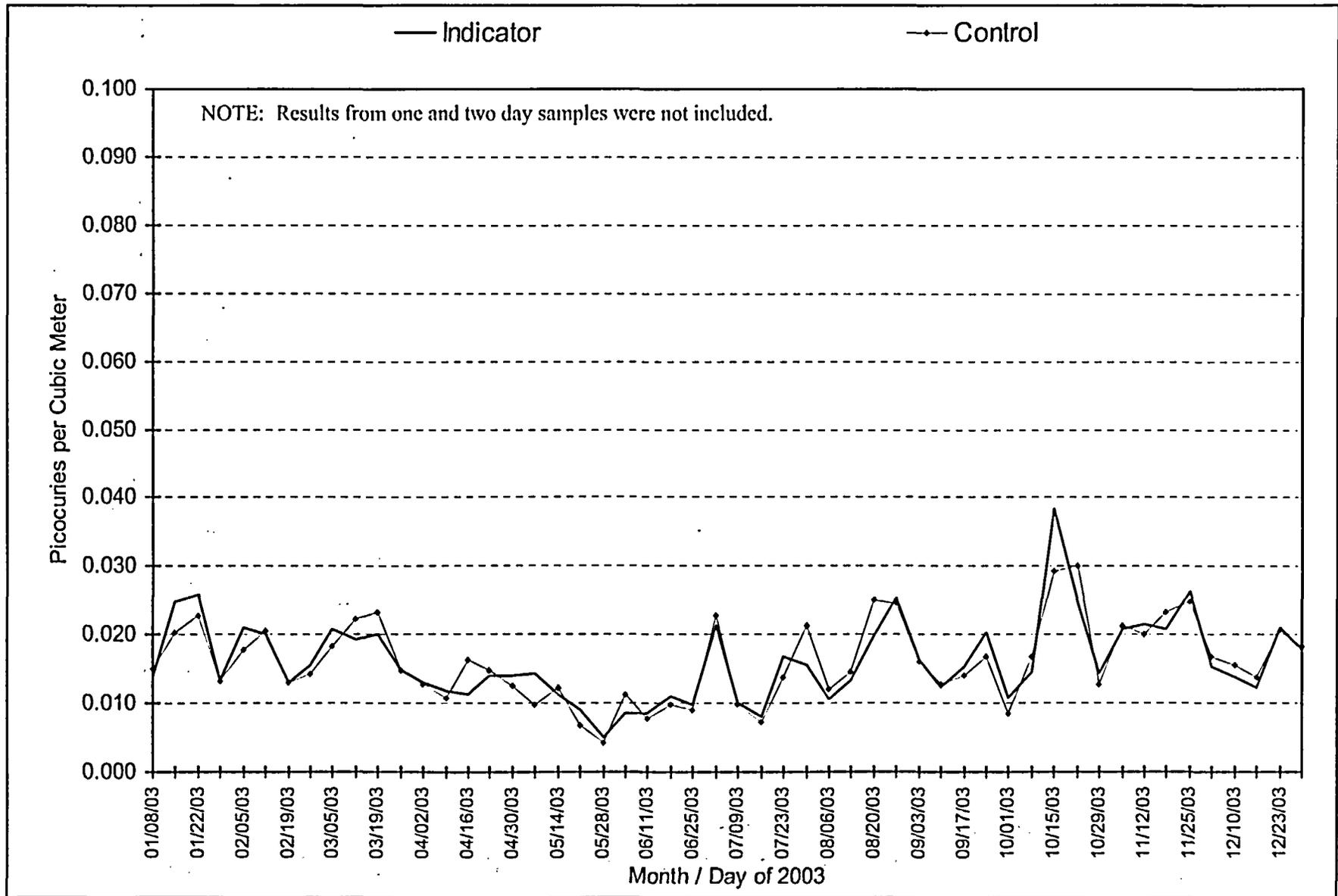


# FIGURE C-6

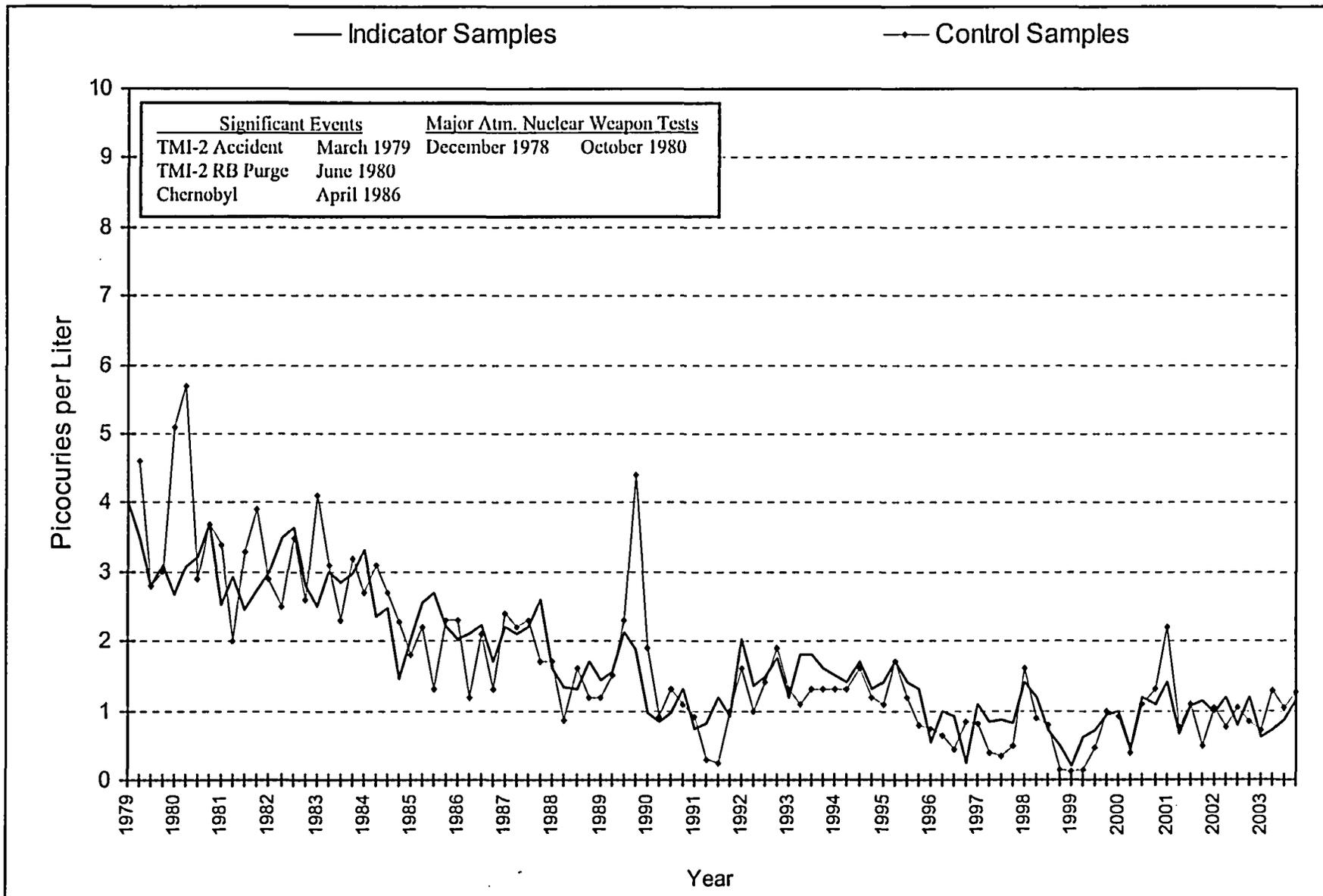
## Mean Quarterly Gross Beta Concentrations in Air Particulates Three Mile Island Nuclear Station, 1972 - 2003



**FIGURE C-7**  
**Mean Weekly Gross Beta Concentrations in Air Particulates**  
**Three Mile Island Nuclear Station, 2003**



**FIGURE C-8**  
**Mean Quarterly Strontium-90 Concentrations in Cow Milk**  
**Three Mile Island Nuclear Station, 1979 - 2003**





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**APPENDIX D**

**DATA TABLES AND FIGURES  
COMPARISON LABORATORY**

The following section contains data and figures illustrating the analyses performed by the quality control laboratory, Environmental Inc. (Env). Duplicate samples were obtained from several locations and media and split between the primary laboratory, Teledyne Brown Engineering (TBE) and Environmental Inc. (Env). Comparison of the results for most media were within expected ranges.

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**TABLE D-I.1 CONCENTRATIONS OF GROSS BETA IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

COLLECTION PERIOD	Q9-1Q
01/02/03 - 01/29/03	< 1.5
01/29/03 - 02/26/03	< 1.6
02/26/03 - 04/02/03	< 1.7
04/02/03 - 04/29/03	< 1.6
04/29/03 - 06/03/03	< 1.5
06/03/03 - 07/01/03	< 1.7
07/01/03 - 07/29/03	< 1.6
07/29/03 - 09/02/03	< 1.7
09/02/03 - 09/30/03	< 1.8
09/30/03 - 10/28/03	< 1.8
10/28/03 - 12/02/03	< 2.1
12/02/03 - 12/30/03	< 2.1

MEAN 1.7  $\pm$  0.4

**TABLE D-I.2 CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

COLLECTION PERIOD	Q9-1Q
01/02/03 - 01/29/03	< 137
01/29/03 - 02/26/03	< 168
02/26/03 - 04/02/03	< 157
04/02/03 - 04/29/03	< 130
04/29/03 - 06/03/03	< 159
06/03/03 - 07/01/03	< 160
07/01/03 - 07/29/03	< 159
07/29/03 - 09/02/03	< 163
09/02/03 - 09/30/03	< 161
09/30/03 - 10/28/03	< 175
10/28/03 - 12/02/03	< 164
12/02/03 - 12/30/03	< 165

MEAN 158  $\pm$  25

**TABLE D-I.3 CONCENTRATIONS OF IODINE-131 IN DRINKING WATER SAMPLES COLLECTED  
IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

**RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA**

<b>COLLECTION PERIOD</b>	<b>Q9-1Q</b>
01/02/03 - 01/29/03	< 0.2
01/29/03 - 02/26/03	< 0.3
02/26/03 - 04/02/03	< 0.3
04/02/03 - 04/29/03	< 0.4
04/29/03 - 06/03/03	< 0.6
06/03/03 - 07/01/03	< 0.4
07/01/03 - 07/29/03	< 0.3
07/29/03 - 09/02/03	< 0.3
09/02/03 - 09/30/03	< 0.4
09/30/03 - 10/28/03	< 0.2
10/28/03 - 12/02/03	< 0.3
12/02/03 - 12/30/03	< 0.3
<b>MEAN</b>	<b>0.3 <math>\pm</math> 0.2</b>

TABLE D-I.4

CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY  
OF THREE MILE ISLAND NUCLEAR STATION, 2003

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
Q9-1Q	01/02/03 - 01/29/03	< 2.1	< 2.5	< 4.6	< 1.9	< 4.9	< 3.2	< 2.4	< 4.4	< 2.8	< 11	< 1.4
	01/29/03 - 02/26/03	< 2.2	< 1.9	< 3.8	< 1.9	< 2.4	< 4.4	< 3.5	< 3.0	< 2.6	< 11	< 3.7
	02/26/03 - 04/02/03	< 3.2	< 1.8	< 5.1	< 3.4	< 6.6	< 8.2	< 2.9	< 2.6	< 4.5	< 22	< 4.5
	04/02/03 - 04/29/03	< 3.0	< 3.2	< 4.7	< 2.8	< 2.9	< 4.6	< 2.2	< 2.5	< 3.2	< 11	< 1.9
	04/29/03 - 06/03/03	< 3.2	< 5.3	< 6.1	< 4.5	< 12	< 11	< 4.9	< 6.2	< 4.3	< 21	< 4.5
	06/03/03 - 07/01/03	< 5.2	< 4.0	< 5.8	< 5.2	< 11	< 7.8	< 4.4	< 5.8	< 3.3	< 37	< 9.1
	07/01/03 - 07/29/03	< 2.1	< 3.5	< 6.5	< 1.8	< 6.4	< 5.7	< 2.9	< 2.5	< 2.4	< 9.2	< 3.3
	07/29/03 - 09/02/03	< 3.3	< 2.7	< 6.7	< 3.4	< 4.0	< 6.2	< 3.3	< 3.5	< 3.8	< 21	< 2.7
	09/02/03 - 09/30/03	< 3.2	< 3.8	< 6.3	< 3.7	< 5.8	< 6.3	< 4.0	< 3.6	< 4.4	< 21	< 7.8
	09/30/03 - 10/28/03	< 3.9	< 4.2	< 7.7	< 3.9	< 4.5	< 7.2	< 3.8	< 2.7	< 5.2	< 18	< 6.7
	10/28/03 - 12/02/03	< 3.1	< 2.3	< 6.5	< 4.6	< 4.1	< 7.4	< 2.1	< 4.8	< 4.9	< 23	< 5.7
	12/02/03 - 12/30/03	< 3.5	< 1.0	< 6.2	< 1.7	< 5.2	< 4.7	< 4.0	< 3.8	< 3.2	< 6.7	< 2.6
		MEAN	3.2 $\pm$ 1.7	3.0 $\pm$ 2.4	5.8 $\pm$ 2.2	3.2 $\pm$ 2.4	5.8 $\pm$ 5.9	6.4 $\pm$ 4.2	3.4 $\pm$ 1.8	3.8 $\pm$ 2.6	3.7 $\pm$ 1.9	18 $\pm$ 17

D-5

**TABLE D-I.5 CONCENTRATIONS OF TRITIUM, STRONTIUM, AND GAMMA EMITTERS IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/LITER  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	H-3	Sr-90	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
MS-2Q	06/05/03	529 $\pm$ 102												
	12/11/03	443 $\pm$ 100	< 0.5	< 1.6	< 2.2	< 5.7	< 2.3	< 2.5	< 3.7	< 2.9	< 3.0	< 3.4	< 18	< 6.7

**TABLE D-1.6 CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF PCI/KG WET  $\pm$  2 SIGMA

STC	COLLECTION PERIOD	Sr-89	Sr-90	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137
INDPQ	11/05/03	< 16	< 6.1	3210 $\pm$ 590	< 23	< 18	< 59	< 12	< 44	< 21	< 17

**TABLE D-I.7      CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES  
 COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR  
 STATION, 2003**

**RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA**

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137
J2-1Q	10/23/03	16778 ± 1031	< 33	124 ± 52

TABLE D-I.8

CONCENTRATIONS OF GAMMA EMITTERS AND STRONTIUM IN  
 FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE  
 ISLAND NUCLEAR STATION, 2003

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	I-131	Cs-134	Cs-137	Sr-89	Sr-90
B10-2Q	08/14/03	2100 ± 407	< 32	< 14	< 20	< 1.5	< 1.1

**TABLE D-II.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF E-3 PCI/CU METER  $\pm$  2 SIGMA

COLLECTION PERIOD	E1-2Q
01/02/03 - 01/08/03	9 $\pm$ 3
01/08/03 - 01/15/03	20 $\pm$ 4
01/15/03 - 01/22/03	27 $\pm$ 4
01/22/03 - 01/29/03	9 $\pm$ 3
01/29/03 - 02/05/03	26 $\pm$ 4
02/05/03 - 02/12/03	23 $\pm$ 4
02/12/03 - 02/19/03	10 $\pm$ 3
02/19/03 - 02/26/03	10 $\pm$ 3
02/26/03 - 03/05/03	15 $\pm$ 3
03/05/03 - 03/12/03	28 $\pm$ 4
03/12/03 - 03/19/03	25 $\pm$ 3
03/19/03 - 03/27/03	15 $\pm$ 3
03/27/03 - 04/02/03	19 $\pm$ 4
04/02/03 - 04/09/03	15 $\pm$ 3
04/09/03 - 04/16/03	19 $\pm$ 3
04/16/03 - 04/23/03	15 $\pm$ 3
04/23/03 - 04/30/03	21 $\pm$ 3
04/30/03 - 05/07/03	17 $\pm$ 4
05/07/03 - 05/14/03	10 $\pm$ 3
05/14/03 - 05/21/03	14 $\pm$ 3
05/21/03 - 05/28/03	5 $\pm$ 2
05/28/03 - 06/04/03	10 $\pm$ 3
06/04/03 - 06/11/03	(1)
06/11/03 - 06/18/03	14 $\pm$ 3
06/18/03 - 06/25/03	17 $\pm$ 3
06/25/03 - 07/02/03	29 $\pm$ 4
07/02/03 - 07/09/03	13 $\pm$ 3
07/09/03 - 07/16/03	16 $\pm$ 4
07/16/03 - 07/23/03	16 $\pm$ 4
07/23/03 - 07/30/03	19 $\pm$ 4
07/30/03 - 08/06/03	14 $\pm$ 3
08/06/30 - 08/13/03	(2)
08/13/03 - 08/20/03	25 $\pm$ 5
08/20/03 - 08/27/03	35 $\pm$ 4
08/27/03 - 09/03/03	20 $\pm$ 4
09/03/03 - 09/10/03	19 $\pm$ 4
09/10/03 - 09/17/03	22 $\pm$ 4
09/17/03 - 09/24/03	25 $\pm$ 5
09/24/03 - 10/01/03	28 $\pm$ 4
10/01/03 - 10/08/03	17 $\pm$ 4
10/08/03 - 10/15/03	39 $\pm$ 5
10/15/03 - 10/22/03	27 $\pm$ 4
10/22/03 - 10/29/03	17 $\pm$ 4
10/29/03 - 11/05/03	24 $\pm$ 4
11/05/03 - 11/12/03	28 $\pm$ 5
11/12/03 - 11/19/03	23 $\pm$ 5
11/19/03 - 11/25/03	35 $\pm$ 6
11/25/03 - 12/03/03	30 $\pm$ 4
12/03/03 - 12/10/03	15 $\pm$ 4
12/10/03 - 12/16/03	16 $\pm$ 5
12/16/03 - 12/23/03	23 $\pm$ 4
12/23/03 - 12/31/03	24 $\pm$ 4
MEAN	20 $\pm$ 15

(1) SAMPLE WAS LOST IN THE MAIL.

(2) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

**TABLE D-II.2 CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

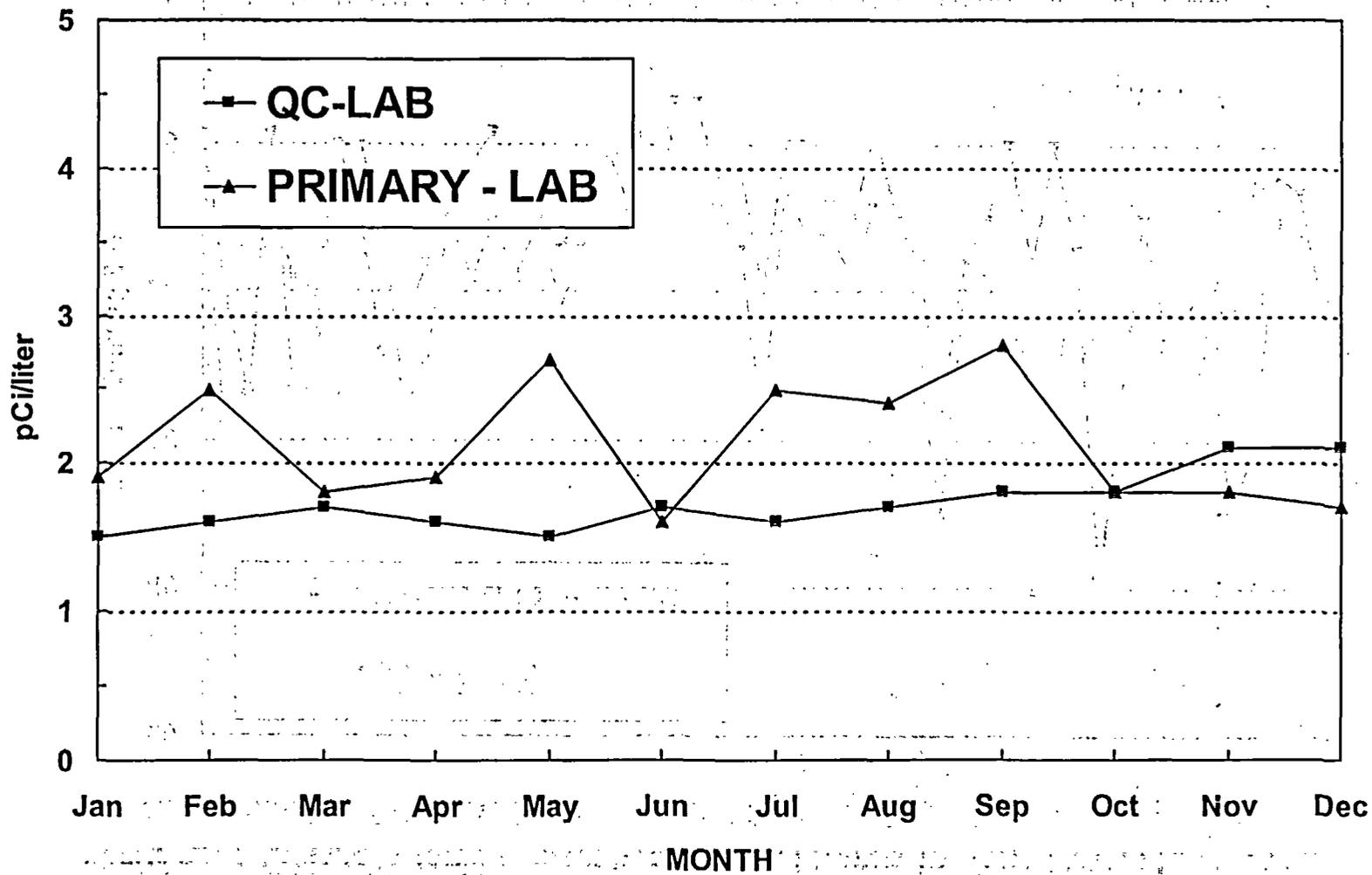
STC	COLLECTION PERIOD	Be-7	Cs-134	Cs-137
E1-2Q	01/02 - 04/02/03	52 ± 12	< 0.6	< 0.6
	04/02 - 07/02/03	76 ± 17	< 0.6	< 0.4
	07/02 - 10/01/03	71 ± 18	< 0.6	< 0.5
	10/01 - 12/31/03	66 ± 16	< 1	< 0.8
MEAN		66 ± 21	0.7 ± 0.4	0.6 ± 0.3

**TABLE D-III.1 CONCENTRATIONS OF I-131 BY CHEMICAL SEPARATION, GAMMA EMITTERS, & STRONTIUM IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2003**

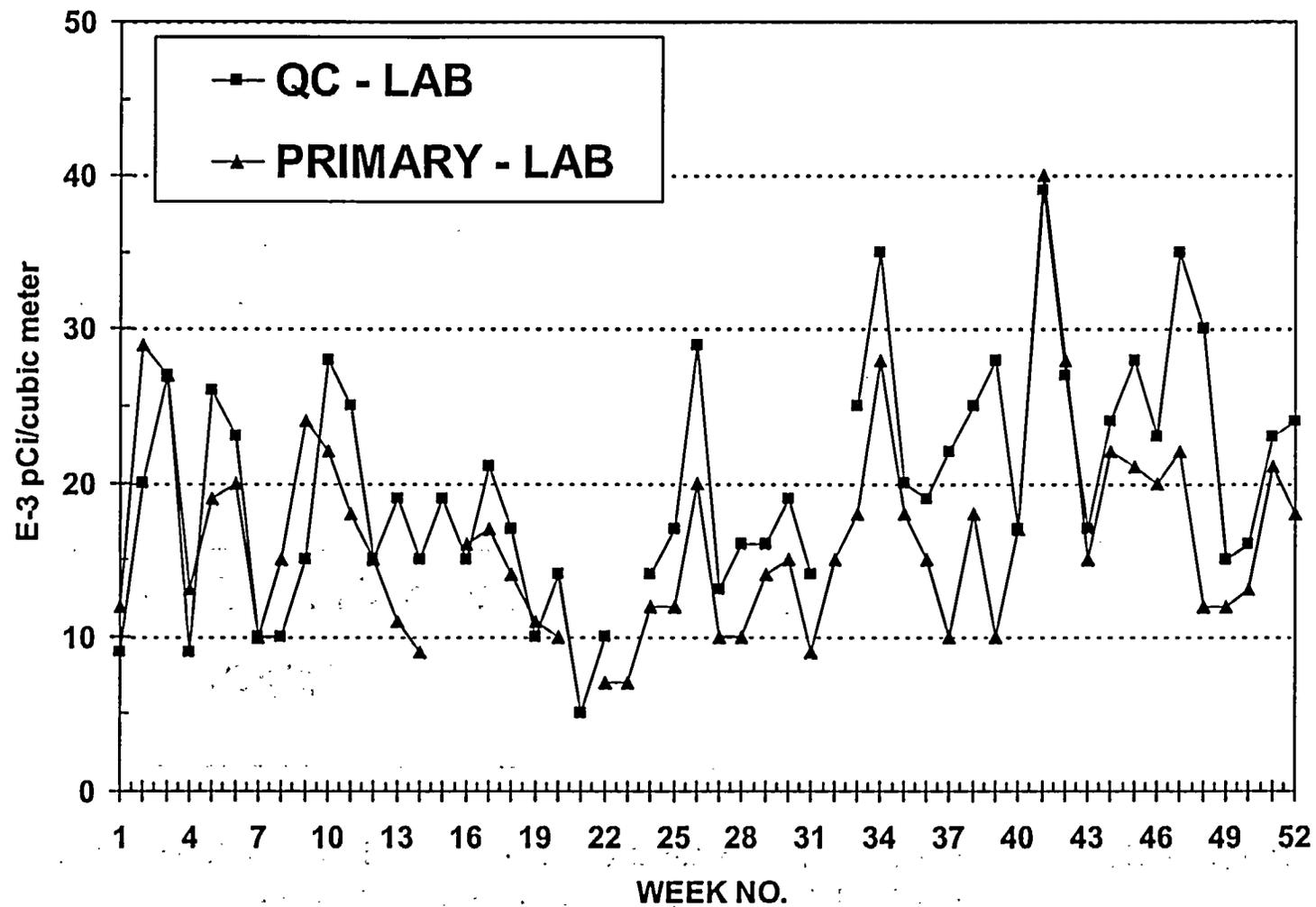
RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	I-131	K-40	Cs-134	Cs-137	Ba-140	La-140	Sr-89	Sr-90
G2-1Q	01/15/03	< 0.3	1204 ± 121	< 4.0	< 3.1	< 16	< 4.5		
	02/12/03	< 0.4	1455 ± 216	< 5.5	< 8.1	< 33	< 4.0		
	03/05/03	< 0.4	1473 ± 181	< 8.7	< 7.7	< 33	< 6.5		
	03/19/03	< 0.3	1265 ± 119	< 4.4	< 4.5	< 18	< 3.4	< 0.9	0.7 ± 0.3
	04/02/03	< 0.3	1396 ± 180	< 1.8	< 4.8	< 20	< 7.2		
	04/16/03	< 0.3	1325 ± 177	< 5.8	< 7.6	< 32	< 7.5		
	04/30/03	< 0.3	1465 ± 193	< 7.0	< 4.1	< 25	< 7.0		
	05/14/03	< 0.4	1419 ± 128	< 2.9	< 2.9	< 14	< 2.1		
	05/28/03	< 0.4	1344 ± 117	< 2.1	< 4.8	< 11	< 3.1		
	06/11/03	< 0.4	1322 ± 112	< 2.0	< 2.3	< 24	< 4.4	< 1.2	1.6 ± 0.6
	07/09/03	< 0.3	1112 ± 110	< 3.3	< 2.9	< 24	< 3.2		
	07/23/03	< 0.3	1384 ± 186	< 4.8	< 4.9	< 20	< 3.2		
	08/06/03	< 0.2	1317 ± 116	< 4.1	< 2.9	< 17	< 5.1		
	08/20/03	< 0.2	1528 ± 178	< 4.9	< 4.4	< 20	< 4.4		
	09/03/03	< 0.4	1023 ± 104	< 5.7	< 2.3	< 15	< 3.3		
	09/17/03	< 0.4	1175 ± 164	< 8.3	< 6.4	< 32	< 6.0	< 0.7	0.7 ± 0.3
	10/01/03	< 0.3	1207 ± 126	< 3.0	< 3.5	< 12	< 4.2		
	10/15/03	< 0.3	1467 ± 176	< 4.5	< 4.5	< 30	< 4.5		
10/29/03	< 0.3	958 ± 99	< 5.4	< 3.5	< 22	< 2.3			
11/12/03	< 0.3	1358 ± 162	< 6.3	< 4.1	< 34	< 7.3			
11/25/03	< 0.4	1278 ± 122	< 4.4	< 4.8	< 20	< 3.8			
12/10/03	< 0.2	1111 ± 108	< 4.6	< 3.3	< 28	< 4.4	< 0.6	0.8 ± 0.5	
	MEAN	0.3 ± 0.1	1299 ± 308	4.7 ± 3.7	4.4 ± 3.4	23 ± 15	4.6 ± 3.3	0.8 ± 0.5	1.0 ± 0.9

**FIGURE D-1**  
**MONTHLY GROSS BETA CONCENTRATIONS IN**  
**DRINKING WATER SAMPLES COLLECTED FROM TMINS LOCATION Q9-1, 2003**



**FIGURE D-2**  
**WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE**  
**SAMPLES COLLECTED FROM TMINS LOCATION E1-2, 2003**



**APPENDIX E**

**INTER-LABORATORY COMPARISON  
PROGRAM**

TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM  
 TELEDYNE BROWN ENGINEERING, 2003  
 (PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March, 2003	E3585-396	Milk	Sr-89	pCi/L	80	133	0.60	N (1)
			Sr-90	pCi/L	11.2	11.8	0.95	A
	E3586-396	Milk	I-131	pCi/L	75	74	1.01	A
			Ce-141	pCi/L	168	173	0.97	A
			Cr-51	pCi/L	243	246	0.99	A
			Cs-134	pCi/L	83	90	0.92	A
			Cs-137	pCi/L	207	200	1.04	A
			Co-58	pCi/L	49	47	1.04	A
			Mn-54	pCi/L	65	64	1.02	A
			Fe-59	pCi/L	53	47	1.13	A
			Zn-65	pCi/L	114	93	1.23	W
			Co-60	pCi/L	169	162	1.04	A
	E3588-396	AP	Ce-141	pCi	239	224	1.07	A
			Cr-51	pCi	348	318	1.09	A
			Cs-134	pCi	101	117	0.86	A
			Cs-137	pCi	277	259	1.07	A
			Co-58	pCi	66	60	1.10	A
			Mn-54	pCi	97	83	1.17	A
			Fe-59	pCi	80	61	1.31	N (2)
			Zn-65	pCi	152	120	1.27	W
E3587-396	Charcoal	I-131	pCi	68	74	0.92	A	
June, 2003	E3747-396	Milk	Sr-89	pCi/L	89	85	1.05	A
			Sr-90	pCi/L	20	23	0.87	A
	E3748-396	Milk	I-131	pCi/L	115	103	1.12	A
			Ce-141	pCi/L	285	283	1.01	A
			Cr-51	pCi/L	266	239	1.11	A
			Cs-134	pCi/L	99	103	0.96	A
			Cs-137	pCi/L	236	230	1.03	A
			Co-58	pCi/L	106	93	1.14	A
			Mn-54	pCi/L	190	186	1.02	A
			Fe-59	pCi/L	108	99	1.09	A
			Zn-65	pCi/L	208	181	1.15	A
			Co-60	pCi/L	142	132	1.08	A
	E3750-396	AP	Ce-141	pCi	238	248	0.96	A
			Cr-51	pCi	239	209	1.14	A
			Cs-134	pCi	79	91	0.87	A
			Cs-137	pCi	189	202	0.94	A
			Co-58	pCi	71	81	0.88	A
			Mn-54	pCi	164	163	1.01	A
			Fe-59	pCi	91	87	1.05	A
			Zn-65	pCi	155	159	0.97	A
Co-60	pCi	109	116	0.94	A			

TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM  
TELEDYNE BROWN ENGINEERING, 2003  
(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)		
June, 2003	E3749-396	Charcoal	I-131	pCi	78	62	1.26	W		
September, 2003	E3898-396	Milk	Sr-89	pCi/L	45	100	0.45	N (1)		
			Sr-90	pCi/L	13	14	0.93	A		
	E3899-396	Milk	I-131	pCi/L	73	74	0.99	A		
			Ce-141	pCi/L	85	86	0.99	A		
			Cr-51	pCi/L	220	233	0.94	A		
			Cs-134	pCi/L	106	119	0.89	A		
			Cs-137	pCi/L	90	88	1.02	A		
			Co-58	pCi/L	96	99	0.97	A		
			Mn-54	pCi/L	95	93	1.02	A		
			Fe-59	pCi/L	84	79	1.06	A		
			Zn-65	pCi/L	187	176	1.06	A		
			Co-60	pCi/L	132	123	1.07	A		
			E3901-396	AP	Ce-141	pCi	79	77	1.03	A
					Cr-51	pCi	227	210	1.08	A
					Cs-134	pCi	93	108	0.86	A
					Cs-137	pCi	70	79	0.89	A
Co-58	pCi	80			89	0.90	A			
Mn-54	pCi	73			84	0.87	A			
Fe-59	pCi	74			71	1.04	A			
Zn-65	pCi	143			158	0.91	A			
E3900-396	Charcoal	I-131	pCi	74	86	0.86	A			
				86	74	1.16	A			
November, 2003	E3790-396	Milk	Sr-89	pCi/L	185	168	1.10	A		
			Sr-90	pCi/L	19	17	1.12	A		
	E3971-396	Milk	I-131	pCi/L	87	90	0.97	A		
			Ce-141	pCi/L	186	202	0.92	A		
			Cr-51	pCi/L	287	280	1.03	A		
			Cs-134	pCi/L	119	135	0.88	A		
			Cs-137	pCi/L	116	129	0.90	A		
			Co-58	pCi/L	111	111	1.00	A		
			Mn-54	pCi/L	176	173	1.02	A		
			Fe-59	pCi/L	94	102	0.92	A		
			Zn-65	pCi/L	190	197	0.96	A		
			Co-60	pCi/L	140	155	0.90	A		

TABLE E-1

ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM  
TELEDYNE BROWN ENGINEERING, 2003

(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
November, 2003	E3973-396	AP	Ce-141	pCi	144	142	1.01	A
			Cr-51	pCi	203	198	1.03	A
			Cs-134	pCi	90	96	0.94	A
			Cs-137	pCi	85	91	0.93	A
			Co-58	pCi	80	78	1.03	A
			Mn-54	pCi	115	122	0.94	A
			Fe-59	pCi	72	72	1.00	A
			Zn-65	pCi	121	139	0.87	A
			Co-60	pCi	102	109	0.94	A
	E3972-396	Charcoal	I-131	pCi	67	77	0.87	A

- (1) Incorrectly calculated. The recalculated March & September Sr-89 results of 138 & 95.8 pCi/L, respectively, are acceptable. The efficiency required for these samples is different than the efficiency for regular samples. NCR 04-02
- (2) Using only the results from the 1099.2 keV photon, the Fe-59 would be 71 pCi, which is acceptable. Coincidental summing occurs only with significant Fe-59 activity levels. Therefore, there is no impact on environmental samples. NCR 04-02
- (a) Teledyne Brown Engineering reported result.
- (b) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.
- (c) Ratio of Teledyne Brown Engineering to Analytics results.
- (d) Analytics evaluation based on TBE internal QC limits: A= Acceptable. Reported result falls within ratio limits of 0.80-1.20. W=Acceptable with warning. Reported result falls within 0.70-0.80 or 1.20-1.30. N = Not Acceptable. Reported result falls outside the ratio limits of < 0.70 and > 1.30.

TABLE E-2 DOE/EML ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM  
 TELEDYNE BROWN ENGINEERING, 2003  
 (PAGE 1 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/EML	Evaluation (d)
March, 2003	QAP 58 (QAP 0303)	AP	Co-60	Bq/filter	35.9	33.5	1.07	A
			Cs-137	Bq/filter	113.7	99.7	1.14	A
			Gr-Beta	Bq/filter	1.6	1.5	1.07	A
			Mn-54	Bq/filter	49.4	43.8	1.13	A
			Sr-90	Bq/filter	2.4	2.8	0.86	A
		Soil	Ac-228	Bq/kg	70.2	57.06	1.23	W
			Bi-212	Bq/kg	72.5	60.6	1.20	W
			Bi-214	Bq/kg	76.2	67.0	1.14	A
			Cs-137	Bq/kg	1883	1450	1.30	N (1)
			K-40	Bq/kg	805.7	636	1.27	W
	Pb-212		Bq/kg	74.8	57.9	1.29	W	
	Vegetation	Pb-214	Bq/kg	79.2	71.1	1.11	A	
		Sr-90	Bq/kg	53.5	64.4	0.83	A	
		Th-234	Bq/kg	169.1	127	1.33	A	
		Co-60	Bq/kg	14.4	12.1	1.19	A	
	Water	Cs-137	Bq/kg	522	444	1.18	A	
		K-40	Bq/kg	1360	1120	1.21	A	
		Sr-90	Bq/kg	498.3	650	0.77	A	
		Co-60	Bq/L	252.3	234	1.08	A	
		Cs-134	Bq/L	31.1	30.5	1.02	A	
		Cs-137	Bq/L	71.5	63.8	1.12	W	
Gr-Beta		Bq/L	821.3	627.5	1.31	W		
September, 2003	QAP 59 (QAP 0309)	AP	H-3	Bq/L	418.3	390	1.07	A
			Sr-90	Bq/L	3.63	4.34	0.84	W
			Mn-54	Bq/filter	54.0	58.0	0.93	A
			Co-60	Bq/filter	53.3	55.1	0.97	A
			Sr-90	Bq/filter	1.7	2.058	0.83	A
	Soil	Cs-137	Bq/filter	51.2	54.8	0.93	A	
		Gr-Beta	Bq/filter	3.4	3.89	0.87	W	
		K-40	Bq/kg	517.0	488.0	1.06	A	
		Sr-90	Bq/kg	70.0	80.3	0.87	A	
		Cs-137	Bq/kg	2127.0	1973.0	1.08	A	
	Bi-212	Bq/kg	56.1	53.9	1.04	A		
	Pb-212	Bq/kg	52.7	50.7	1.04	A		
	Bi-214	Bq/kg	36.4	34.4	1.06	A		
	Pb-214	Bq/kg	41.5	35.2	1.18	A		
	Ac-228	Bq/kg	56.2	50.8	1.11	A		
	Th-234	Bq/kg	145.4	116.0	1.25	A		

TABLE E-2

DOE/EML ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM

TELEDYNE BROWN ENGINEERING, 2003

(PAGE 2 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/EML	Evaluation (d)
September, 2003	QAP 59	Water	H-3	Bq/L	511.0	446.3	1.14	A
	(QAP 0309)		Co-60	Bq/L	491.0	513.0	0.96	A
			Sr-90	Bq/L	5.9	7.04	0.84	W
			Cs-134	Bq/L	62.4	63.0	0.99	A
			Cs-137	Bq/L	74.9	80.3	0.93	A
			Gr-Beta	Bq/L	1663.0	1948.0	0.85	A

(1) Incorrect bottle size used. Sample was placed into a smaller container and recounted. All recount results were acceptable except Bi-212 which was acceptable with warning. Previously analyzed samples were examined and no other incorrect container sizes were noted. NCR 03-07

(a) Teledyne Brown Engineering reported result.

(b) The DOE/EML known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(c) Ratio of Teledyne Brown Engineering to DOE/EML results.

(d) DOE/EML evaluation: A=acceptable, W=acceptable with warning, N=not acceptable.

TABLE E-3

**ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM  
TELEDYNE BROWN ENGINEERING, 2003**

(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Control Limits	Evaluation (c)
May, 2003	Rad 53	Water	I-131	pCi/L	13.6	20.8	15.6 - 26.0	N (1)
			H-3	pCi/L	1200	1250	678 - 1820	A
			Co-60	pCi/L	69.9	63.8	55.1 - 72.5	A
			Cs-134	pCi/L	73.5	75.7	67.0 - 84.4	A
			Cs-137	pCi/L	165	150	141 - 159	N (2)
			Sr-89	pCi/L	37.0	31.3	22.6 - 40.0	A
			Sr-90	pCi/L	23.5	27.4	18.7 - 36.1	A
November, 2003	Rad 55	Water	I-131	pCi/L	22.2	28.2	23.0 - 33.4	N (3)
			H-3	pCi/L	1630	14300	11800 - 16800	N (3)
			Co-60	pCi/L	28.4	27.7	19.0 - 36.4	A
			Cs-134	pCi/L	21.7	23.4	14.7 - 32.1	A
			Cs-137	pCi/L	63.6	64.2	55.5 - 72.9	A
			Sr-89	pCi/L	47.9	50.4	41.7 - 59.1	A
			Sr-90	pCi/L	9.23	10.2	1.54 - 18.9	A
			Gr-Beta	pCi/L	161	168	124 - 212	A

(1) The stable iodine carrier in the sample was unaccounted for in the calculation. When recalculated, the correct result of 20.0 pCi/L was within acceptance criteria. NCR 03-11

(2) Although Cs-137 is evaluated as N, the TBE/ERA ratio of 1.10 falls within limits of 0.80 - 1.20 and is considered by TBE as acceptable.

(3) The decay correction did not take into account the extended count time. When recalculated, the correct result of 23.2 was within acceptance criteria. NCR 04-06

Due to recalculating H-3 to required reporting units, a decimal place was dropped. The correct result of 16300 is within acceptance criteria. NCR 04-06

(a) Teledyne Brown Engineering reported result.

(b) The ERA known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(c) ERA evaluation: A=acceptable. Reported result falls within the Warning Limits. NA=not acceptable. Reported result falls outside of the Control Limits. CE=check for Error. Reported result falls within the Control Limits and outside of the Warning Limit.

**TABLE E-4 MAPEP ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM  
TELEDYNE BROWN ENGINEERING, 2003**

(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Control Limits	Evaluation (c)
February, 2003	02-W10	Water	Cs-134	Bq/L	382.7	421	294.70 - 547.30	A
			Cs-137	Bq/L	329.3	329	230.30 - 427.70	A
			Co-57	Bq/L	58.17	57	39.90 - 74.10	A
			Co-60	Bq/L	41.2	38.2	26.74 - 49.66	A
			Mn-54	Bq/L	35.07	32.9	23.03 - 42.77	A
			Sr-90	Bq/L	11.70	12.31	8.62 - 16.00	A
			Zn-65	Bq/L	566	516	361.20 - 670.80	A
July, 2003	03-S10	Soil	Cs-134	Bq/Kg	204	238	166.60 - 309.40	A
			Cs-137	Bq/Kg	803	832	582.40 - 1081.60	A
			Co-57	Bq/Kg	499	530	371.00 - 689.00	A
			Co-60	Bq/Kg	427	420	294.00 - 546.00	A
			Mn-54	Bq/Kg	136	137	95.90 - 178.10	A
			K-40	Bq/Kg	686	652	456.40 - 847.60	A
			Sr-90	Bq/Kg	651	714	499.80 - 928.20	A
			Zn-65	Bq/Kg	528	490	343.00 - 637.00	A

(a) Teledyne Brown Engineering reported result.

(b) The MAPEP known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(c) DOE/MAPEP evaluation: A=acceptable, W=acceptable with warning, N=not acceptable.

TABLE E-5

**ERA STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM  
ENVIRONMENTAL, INC., 2003**

(Page 1 of 2)

Lab Code	Date	Analysis	Concentration (pCi/L)		
			Laboratory Result <sup>b</sup>	ERA Result <sup>c</sup>	Control Limits
STW-973	02/17/03	Sr-89	17.0 ± 0.5	15.9 ± 5.0	7.2 - 24.6
STW-973	02/17/03	Sr-90	8.9 ± 0.3	9.0 ± 5.0	0.4 - 17.7
STW-974	02/17/03	Ba-133	14.5 ± 0.9	19.5 ± 5.0	10.8 - 28.2
STW-974	02/17/03	Co-60	37.5 ± 0.9	37.4 ± 5.0	28.7 - 46.1
STW-974	02/17/03	Cs-134	18.2 ± 0.6	17.8 ± 5.0	9.1 - 26.5
STW-974	02/17/03	Cs-137	42.7 ± 1.0	44.2 ± 5.0	35.5 - 52.9
STW-974	02/17/03	Zn-65	56.8 ± 2.2	60.3 ± 6.0	49.9 - 70.7
STW-975 <sup>d</sup>	02/17/03	Gr. Alpha	18.4 ± 0.3	37.6 ± 9.4	21.3 - 53.9
STW-975	02/17/03	Gr. Beta	11.7 ± 0.5	8.6 ± 5.0	0.0 - 17.2
STW-976	02/17/03	Ra-226	4.1 ± 0.1	4.7 ± 0.7	3.5 - 6.0
STW-976	02/17/03	Ra-228	7.6 ± 0.5	6.5 ± 1.6	3.7 - 9.3
STW-976	02/17/03	Uranium	52.9 ± 1.9	53.7 ± 5.4	44.4 - 63.0
STW-983	05/19/03	H-3	1290.0 ± 25.0	1250.0 ± 331.0	678.0 - 1820.0
STW-984	05/19/03	I-131	19.7 ± 1.3	20.8 ± 3.0	15.6 - 26.0
STW-985	05/19/03	Gr. Alpha	54.4 ± 3.0	70.3 ± 17.6	39.9 - 101.0
STW-985	05/19/03	Ra-226	14.9 ± 0.2	16.5 ± 2.5	12.2 - 20.8
STW-985	05/19/03	Ra-228	13.1 ± 0.6	10.3 ± 2.6	5.8 - 14.8
STW-985	05/19/03	Uranium	14.5 ± 0.4	15.1 ± 3.0	9.9 - 20.3
STW-986	05/19/03	Co-60	56.9 ± 8.6	63.8 ± 5.0	55.1 - 72.5
STW-986 <sup>e</sup>	05/19/03	Cs-134	61.6 ± 6.6	75.7 ± 5.0	67.0 - 84.4
STW-986	05/19/03	Cs-137	143.0 ± 1.2	150.0 ± 7.5	137.0 - 163.0
STW-986	05/19/03	Gr. Beta	309.0 ± 2.7	363.0 ± 54.5	269.0 - 457.0
STW-986	05/19/03	Sr-89	33.1 ± 0.2	31.3 ± 5.0	22.6 - 40.0
STW-986	05/19/03	Sr-90	28.8 ± 1.3	27.4 ± 5.0	18.7 - 36.1
STW-988	08/18/03	Ra-226	13.3 ± 1.1	13.4 ± 2.0	9.9 - 16.9
STW-988	08/18/03	Ra-228	11.5 ± 1.0	12.5 ± 3.1	7.1 - 17.9
STW-988	08/18/03	Uranium	12.3 ± 0.4	11.4 ± 3.0	6.2 - 16.6
STW-989	08/18/03	Ba-133	18.1 ± 1.9	20.7 ± 5.0	12.0 - 29.4
STW-989	08/18/03	Co-60	35.9 ± 1.3	37.4 ± 5.0	28.7 - 46.1
STW-989	08/18/03	Cs-134	32.6 ± 1.8	32.6 ± 5.0	23.9 - 41.3
STW-989	08/18/03	Cs-137	48.3 ± 0.6	44.3 ± 5.0	35.6 - 53.0
STW-989	08/18/03	Zn-65	58.9 ± 2.1	60.2 ± 6.0	49.8 - 70.6
STW-990	08/18/03	Gr. Alpha	41.8 ± 3.4	56.2 ± 16.3	36.9 - 93.3
STW-990 <sup>f</sup>	08/18/03	Gr. Beta	51.3 ± 3.0	31.6 ± 5.0	22.9 - 40.3
STW-991	08/18/03	Sr-89	57.2 ± 4.3	58.8 ± 5.0	50.1 - 67.5
STW-991	08/18/03	Sr-90	21.2 ± 0.9	20.6 ± 5.0	11.9 - 29.3

TABLE E-5

**ERA STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM  
ENVIRONMENTAL, INC., 2003**

(Page 2 of 2)

Lab Code	Date	Analysis	Concentration (pCi/L)		
			Laboratory Result <sup>b</sup>	ERA Result <sup>c</sup>	Control Limits
STW-997	11/18/03	Gr. Alpha	37.0 ± 2.0	29.5 ± 7.4	16.7 - 42.3
STW-997	11/18/03	Gr. Beta	26.5 ± 0.8	26.3 ± 5.0	17.6 - 35.0
STW-998	11/18/03	I-131	14.8 ± 0.3	16.5 ± 3.0	11.3 - 21.7
STW-999	11/18/03	Ra-226	17.2 ± 1.1	17.8 ± 2.7	13.2 - 22.4
STW-999	11/18/03	Ra-228	6.6 ± 0.3	6.8 ± 1.7	3.8 - 9.7
STW-999	11/18/03	Uranium	11.7 ± 0.3	11.7 ± 3.0	6.5 - 16.9
STW-1000	11/18/03	H-3	15900.0 ± 174.0	14300.0 ± 1430.0	11800.0 - 16800.0
STW-1001	11/18/03	Gr. Alpha	32.9 ± 0.3	54.2 ± 3.0	30.7 - 77.7
STW-1001	11/18/03	Ra-226	16.5 ± 0.9	16.1 ± 2.4	11.9 - 20.3
STW-1001	11/18/03	Ra-228	6.2 ± 0.5	5.5 ± 1.4	3.1 - 7.9
STW-1001	11/18/03	Uranium	9.7 ± 1.5	9.3 ± 13.6	4.1 - 14.5
STW-1002	11/18/03	Co-60	27.7 ± 1.9	27.7 ± 5.0	19.0 - 36.4
STW-1002	11/18/03	Cs-134	21.5 ± 1.1	23.4 ± 5.0	17.6 - 29.2
STW-1002	11/18/03	Cs-137	66.3 ± 2.8	64.2 ± 5.0	55.5 - 72.9
STW-1002	11/18/03	Gr. Beta	159.0 ± 2.5	168.0 ± 5.0	124.0 - 212.0
STW-1002	11/18/03	Sr-89	48.5 ± 0.4	50.4 ± 5.0	41.7 - 59.1
STW-1002	11/18/03	Sr-90	10.1 ± 3.0	10.2 ± 25.2	1.5 - 18.9

Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the environmental samples crosscheck program operated by Environmental Resources Associates (ERA).

- <sup>b</sup> Unless otherwise indicated, the laboratory result is given as the mean ± standard deviation for three determinations.
- <sup>c</sup> Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination) and control limits as provided by ERA.
- <sup>d</sup> Recount of the original sample still low. The ERA blank was spiked in the lab; known value of 20.1 pCi/L, measured 21.5 ± 1.1 pCi/L. No explanation for ERA test failure.
- <sup>e</sup> Lower bias observed for gamma spectroscopic analysis. The undiluted sample was reanalyzed; Results of reanalysis, Co-60: 62.3 pCi/L., Cs-134: 69.2 pCi/L., Cs-137: 152.3 pCi/L.
- <sup>f</sup> Reason for deviation unknown. A recount of the original planchets averaged 43.4 pCi/L. Cs-137 activity by gamma spectroscopy; 28.3 pCi/L. Result of reanalysis; 29.3 pCi/L.

TABLE E-6 DOE's MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)  
ENVIRONMENTAL, INC., 2003

(Page 1 of 1)

Lab Code	Type	Date	Analysis	Concentration <sup>b</sup>		
				Laboratory result	Known Activity	Control Limits <sup>c</sup>
STW-972	water	12/01/02	Am-241	0.56 ± 0.06	0.58 ± 0.09	0.40 - 0.75
STW-972	water	12/01/02	Co-57	57.10 ± 1.90	57.00 ± 5.70	39.90 - 74.10
STW-972	water	12/01/02	Co-60	38.30 ± 0.60	38.20 ± 3.82	26.74 - 49.66
STW-972	water	12/01/02	Cs-134	395.30 ± 10.10	421.00 ± 42.10	294.70 - 547.30
STW-972	water	12/01/02	Cs-137	316.40 ± 5.30	329.00 ± 32.90	230.30 - 427.70
STW-972	water	12/01/02	Fe-55	94.90 ± 24.50	96.00 ± 9.60	67.20 - 124.80
STW-972	water	12/01/02	Mn-54	33.40 ± 0.10	32.90 ± 3.29	23.03 - 42.77
STW-972	water	12/01/02	Ni-63	123.80 ± 5.50	136.50 ± 13.70	95.55 - 177.45
STW-972	water	12/01/02	Pu-238	0.66 ± 0.06	0.83 ± 0.08	0.58 - 1.08
STW-972	water	12/01/02	Pu-239/40	0.001 ± 0.001	0.000 ± 0.000	0.000 - 0.005
STW-972	water	12/01/02	Sr-90	13.80 ± 1.00	12.31 ± 1.23	8.62 - 16.00
STW-972	water	12/01/02	Tc-99	128.10 ± 3.80	132.00 ± 13.20	92.40 - 171.60
STW-972	water	12/01/02	U-233/4	1.60 ± 0.09	1.54 ± 0.15	1.08 - 2.00
STW-972	water	12/01/02	U-238	1.64 ± 0.09	1.60 ± 0.16	1.12 - 2.08
STW-972	water	12/01/02	Zn-65	540.40 ± 9.90	516.00 ± 51.60	361.20 - 670.80
STSO-987	soil	01/01/03	Co-57	534.36 ± 2.61	530.00 ± 53.00	371.00 - 689.00
STSO-987	soil	01/01/03	Co-60	442.16 ± 2.31	420.00 ± 42.00	294.00 - 546.00
STSO-987	soil	01/01/03	Cs-134	211.00 ± 2.30	238.00 ± 23.80	166.60 - 309.40
STSO-987	soil	01/01/03	Cs-137	849.50 ± 3.30	832.00 ± 83.20	582.40 - 1081.60
STSO-987	soil	01/01/03	K-40	716.50 ± 12.80	652.00 ± 65.20	456.40 - 847.60
STSO-987	soil	01/01/03	Mn-54	148.76 ± 2.84	137.00 ± 13.70	95.90 - 178.10
STSO-987	soil	01/01/03	Ni-63	597.10 ± 23.50	770.00 ± 77.00	539.00 - 1001.00
STSO-987	soil	01/01/03	Pu-238	67.05 ± 3.10	66.90 ± 6.70	46.83 - 86.97
STSO-987	soil	01/01/03	Pu-239/40	52.80 ± 3.60	52.70 ± 5.30	36.90 - 68.50
STSO-987	soil	01/01/03	Sr-90	609.50 ± 9.80	714.00 ± 71.40	499.80 - 928.20
STSO-987	soil	01/01/03	U-233/4	99.50 ± 7.60	89.00 ± 8.90	62.30 - 115.70
STSO-987	soil	01/01/03	U-238	508.60 ± 42.20	421.00 ± 42.10	294.70 - 547.30
STSO-987	soil	01/01/03	Zn-65	492.70 ± 28.10	490.00 ± 49.00	343.00 - 637.00

Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the Department of Energy's Mixed Analyte Performance Evaluation Program, Idaho Operations office, Idaho Falls, Idaho

<sup>b</sup> All results are in Bq/kg or Bq/L as requested by the Department of Energy.

<sup>c</sup> MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP.