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THREE MILE ISLAND NUCLEAR STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

1 January Through 31 December 2008

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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 Exelon covers the period 1 January 2008 through 31 December 2008. During that time period, 1,710 analyses were performed on 1,311 samples. In assessing all the data gathered for this report and comparing these results with preoperational data and operational REMP data, it was concluded that the operation of TMINS had no adverse radiological impact on the environment.

Surface, drinking, effluent, and storm 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. All groundwater results are now being reported in the ARGPPR, Appendix F. No Sr-89 and Sr-90 activities were detected. Iodine-131 and gross beta concentrations detected were consistent with those detected in previous years. Tritium activity in several monthly effluent water and storm water samples was due to TMINS activities or releases. No other fission or activation products potentially 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-90. No Sr-90 activity was detected. No fission or activation products were detected in fish samples. Cesuim-137 was detected in sediment samples at very low levels (just above LLD) and are not distinguishable from background levels.

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 and were attributed to fallout from nuclear weapons testing. 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. Sr-90 activities were detected in both the indicator and control samples. This was a result of plant uptake of Sr-90 in soil as a result of past nuclear weapons testing. Concentrations of naturally occurring K-40 were consistent with those detected in previous years. No other 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.

In conclusion, radioactive materials related to TMINS operations were detected in environmental samples, but the measured concentrations were low and consistent with measured effluents. The environmental sample results verified that the doses received by the public from TMINS effluents in 2008 were well below applicable dose limits and only a small fraction of the doses received from natural background radiation. Additionally, the results indicated that there was no permanent buildup of radioactive materials in the environment and no increase in background radiation levels.

Therefore, based on the results of the radiological environmental monitoring program (REMP) and the doses calculated from measured effluents, TMINS operations in 2008 did not have any adverse effects on the health of the public or on the environment.

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 Exelon 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 Exelon 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), Global Dosimetry Solutions, Inc., and Environmental Inc. (Midwest Labs) on samples collected during the period 1 January 2008 through 31 December 2008.

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 Exelon 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 2008. 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, 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. Quarterly water samples were taken from one storm water runoff location (EDCB). All groundwater results are now being reported in the ARGPPR, Appendix F. All water samples were collected in either new amber glass or unused plastic bottles, which were rinsed at least twice with source water prior to collection. Fish samples comprising the flesh of two groups, bottom feeders and predators, 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 particulates, 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 five locations (K15-3, D2-1, E2-2, F4-1, 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 monthly at two locations (B10-2 and H1-2), in lieu of milk sampling, and annually from the four food product groups at two locations (E1-2 and B10-2). B10-2 was the control location for both annual and monthly sampling. Five different kinds of vegetation samples and four different kinds of vegetation leaves were collected and 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 ($CaSO_4$) thermoluminescent dosimeters (TLD). The TLD locations are arranged in generally concentric rings on and around the TMINS site as follows:

A site boundary ring consisting of 19 locations (A1-4, B1-2, C1-2, D1-1, E1-4, F1-2, F1-4, G1-3, G1-5, G1-6, H1-1, 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 indicator ring consisting of 60 locations (A3-1, A5-1, A9-3, B1-1, 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, J1-1,

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 10 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 $CaSO_4$ thermoluminescent phosphors enclosed in plastic, placed at each location in a frame located approximately three to six 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 Global Dosimetry 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 REMP in 2008. 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,

and storm water, air particulates, milk, fish, sediment, and food products.

3. Concentrations of tritium in surface, drinking, effluent, and storm water.

4. Concentrations of I-131 in surface, drinking, and effluent water, air, milk and food products.

5. Concentrations of strontium in effluent water, fish, milk, and food products.

6. Ambient gamma radiation levels at various site environs.

C. Data Interpretation

Data were compared to previous years' operational data for consistency and trending. In addition, comparison to pre-operational data is sometimes made. For the purpose of this report, TMINS was considered operational at initial criticality. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

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 concentration (MDC) 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 MDC

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 2008 the TMINS REMP had a sample recovery rate in excess of 99%. Exceptions are listed below:

<u>AIR</u>

1. The pump was found stopped and a replacement pump was installed for the following samples:

   04/09/08 – 04/16/08, Location M2-1
   07/30/08 – 08/06/08, Location A3-1

2. During the following sampling periods the run time was slightly lower due to a malfunctioning timer. On 12/10/08, an alternate timer was installed to validate the malfunction. This replacement timer was used until the entire unit was replaced on 2/2/09. IR 870855 describes this

issue and the evaluation of the lower volume impact to results for the following samples.

10/22/08 –10/29/08, Location A3-1
11/12/08 –11/19/08, Location A3-1
11/19/08 –11/25/08, Location A3-1
11/25/08 –12/03/08, Location A3-1
12/03/08 –12/10/08, Location A3-1

WATER

1. Surface water - During the following weekly sampling periods some of the hourly composite samples were missed due to weather related conditions, frozen sample lines, the sample suction line detaching from the anchor during ice flows and the failure of the controller to detect liquid. The controller was replaced and returned to service, and the sample line was repositioned. Sufficient sample was available for sampling periods so no grab samples were required, except as noted, for the following samples.

   01/15/08 – 01/21/08, Location J1-2
   01/21/08 – 01/29/08, Location J1-2
   01/29/08 – 02/05/08, Location J1-2
   02/05/08 – 02/12/08, Location J1-2
   02/12/08 – 02/19/08, Location J1-2
   02/26/08 – 03/04/08, Location J1-2
   03/04/08 – 03/12/08, Location J1-2
   03/12/08 – 03/18/08, Location J1-2
   11/18/08 – 11/24/08, Location J1-2
   11/24/08 – 12/02/08, Location J1-2
   12/02/08 – 12/09/08, Location J1-2
   12/16/08 – 12/23/08, Location J1-2
   12/23/08 – 12/30/08, Location J1-2, grab sample required.

2. Drinking water - During the weekly sampling period, 27 hourly composite samples were not collected due to the sampler being moved by the water treatment plant personnel probably for plant maintenance. The relocation caused the strainer to be out of the collection bucket resulting in the missed samples. There was sufficient volume collected so no grab sample was required for the following sample:

   04/22/08 – 4/29/08, Location Q9-1

3. Surface water - During the weekly sampling period, a lower than normal amount of sample was collected or the compositor was found not running. There was sufficient volume collected so no grab sample was required for the following samples:

   09/16/08 – 09/23/08, Location J1-2
   09/03/08 – 09/09/08, Location J1-2

4. Drinking water - During the weekly sampling period, the Steelton water plant had a planned power outage for maintenance. The surface water sampler missed seven hourly samples, but sufficient volume was available for the week so no grab sample was required. For the drinking water sample the same 7 hours were missed and the unit was not returned to service properly, so an additional 120 hourly samples were missed. The environmental sampler returned the unit to service properly. IR 870913 describes this issue. Sufficient volume was not collected for the weekly composite so a grab sample was taken and mixed half and half with the volume available from the sampler for the following sample:

   11/11/08-11/18/08, Location Q9-1, grab sample required

<u>TLD</u>

1. Frozen river condition made it unsafe to travel by boat to the TLDs located on the islands west of the plant. Therefore, the TLD stations were not changed out for the 4th quarter 2008. The TLDs will remain in place and will be changed out for the first quarter 2009 for the following samples:

   10/10/08 – 01/16/09, Location K2-1
   10/10/08 – 01/16/09, Location L1-2
   10/10/08 – 01/16/09, Location M1-2
   10/10/08 – 01/16/09, Location N1-1
   10/10/08 – 01/16/09, Location P1-1
   10/10/08 – 01/16/09, Location Q1-1
   10/10/08 – 01/16/09, Location R1-1

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

There were no program changes in 2008.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken weekly from a continuous sampler at three locations (A3-2, J1-2, and Q9-1) and composited 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 J1-2 and Q9-1 were analyzed for tritium activity (Table C–I.1, Appendix C). Positive tritium activity was detected in five of 24 samples at location J1-2 which is located immediately downstream of the TMINS effluent outfall. The concentrations ranged from 266 to 2,380 pCi/l. The increased tritium concentrations detected were a result of TMINS releasing radwaste treatment system effluent water under permitted discharges in accordance with NRC regulations. The indicator surface water sample is taken just downstream of the liquid discharge outfall where mixing of liquid effluents with the river water is incomplete. More complete mixing is not achieved until liquid effluents pass over the York Haven Dam. This water is normally not consumed by humans. The concentrations detected were well below any regulatory limits. (Figures C–1 and C–2, Appendix C).

Iodine

Monthly samples from location A3-2 were analyzed for I-131 activity (Table C–I.2, Appendix C). This is a control or background station sampled because known medical discharges of radiopharmaceuticals occur into the surface water upstream of TMI from a nearby hospital. Iodine-131 was not detected.

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides (Table C–I.3, Appendix C). All nuclides were less than the MDC.

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 30 of 36 samples. The concentrations ranged from 2.1 to 5.9 pCi/l. Concentrations detected were consistent with those detected in previous years (Figures C–3, Appendix C).

Tritium

Monthly samples from all locations were analyzed for tritium activity (Table C–II.3, Appendix C). Tritium was not detected (Figures C–4, Appendix C).

Exelon specified that its laboratories achieve a lower limit of detection 10 times lower than that required by federal regulation.

Gamma Spectrometry

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

3. Effluent Water

Monthly samples were collected from a continuous water sampler 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 concentrations ranged from 3.5 to 8.7 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-131 was detected in two of 12 samples. The concentrations ranged from 1.2 to 2.0 pCi/L. The positive results are not believed to be due to TMINS effluents. Historically, I-131 has been detected sporadically in effluent water and not in the control stations. No I-131 was identified in any tank effluent pre-release samples, and I-131 was not detected in any other downstream surface or drinking water samples. Effluent water is not consumed by humans.

Tritium

Monthly samples from location K1-1 were analyzed for tritium activity (Table C–III.1, Appendix C). Tritium activity was detected in six samples. The concentrations ranged from 232 to 24,400 pCi/l. The elevated results were a result of TMI releasing radwaste treatment system effluent water under permitted discharges in accordance with NRC regulations. These results are from the liquid discharge mixing basin. The concentrations detected agree with those obtained from the TMINS Effluent Monitoring Program. The concentrations were well below any regulatory limits.

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 MDC was calculated at 3.3 pCi/l for Sr-89 and at 0.8 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 MDC.

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 one sample at a concentration of 424 pCi/l and was due to airborne releases of H-3 from TMI. The concentration detected was 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 MDC.

5. Ground Water

During 2006, Exelon initiated a fleetwide Environmental Assessment program. Comprehensive groundwater studies and reports were developed. As a result of this assessment and the NEI initiative on groundwater protection, TMI developed a new Radiological Groundwater Protection Program (RGPP) that was implemented by the end of the year. For 2008, this more comprehensive groundwater program replaced TMI's previous groundwater monitoring program. The results from these special investigations and studies are discussed in Appendix F.

6. Fish

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

Strontium

The edible portions of fish samples from both locations were analyzed for Sr-90. (Table C–V.1, Appendix C). No strontium activity was detected. The highest MDC was calculated at <5 pCi/kg wet for Sr-90.

Gamma Spectrometry

The edible portions of fish samples from both locations were analyzed for gamma emitting nuclides (Table C–V.2, Appendix C). Naturally occurring K-40 was found at all stations and ranged from 2,160 to 3,390 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–VI.1, Appendix C). Potassium-40 was found at all stations and ranged from 8,080 to 15,700 pCi/kg dry. Cesuim-137 was detected in sediment samples at very low levels (just above LLD) and are not distinguishable from background levels. No other fisson or activation products were found.

B. Atmospheric Environment

1. Airborne Particulates

a. Air Particulates

Continuous air particulate samples were collected from seven locations on a weekly basis. Six locations (E1-2, F1-3, G2-1, A3-1, M2-1 and H3-1) were indicator stations located in the highest D/Q sectors and the nearest communities to TMI. One sample (Q15-1) represents the control location at a remote distance from TMINS . The following analyses were performed:

Gross Beta

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

Detectable gross beta activity was observed at all locations. Comparison of results aid in determining the effects, if any, resulting from the operation of TMINS. The results from the closest to the site boundary locations (Group I) ranged from <7 to 36 E–3 pCi/m^3 with a mean of 18 E–3 pCi/m^3. The results from the intermediate offsite locations (Group II) ranged from <7 to 39 E–3 pCi/m^3 with a mean of 18 E–3 pCi/m^3. The results from the Control location (Group III) ranged from <7 to 37 E–3 pCi/m^3 with a mean of 18 E–3 pCi/m^3. Comparison of the 2008 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 2008 indicate no notable differences between indicator and control stations. (Figure C–7, Appendix C).

Gamma Spectrometry

Weekly samples were composited quarterly and analyzed for gamma emitting nuclides (Table C–VII.3, Appendix C). Naturally occurring Be-7 due to cosmic ray activity was detected in all 28 samples. These concentrations ranged from 43 to 125 E–3 pCi/m^3. All other nuclides were less than the MDC.

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–VIII.1, Appendix C). All results were less than the MDC.

2. Terrestrial

a. Milk

Samples were collected from five locations (K15-3, D2-1, E2-2, F4-1 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–IX.1, Appendix C). All

results were less than the MDC.

Strontium

Milk samples from all locations were composited quarterly and analyzed for Sr-89 and Sr-90 (Table C–IX.2, Appendix C). No Sr-89 activity was detected. Strontium-90 activity was detected in 11 of 21 samples. The concentrations ranged from 0.6 to 1.4 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–IX.3, Appendix C).

Naturally occurring K-40 activity was found in all samples. The concentrations ranged from 627 to 1,570 pCi/l. All other nuclides were less than the MDC.

b. Food Products

Samples were collected from two locations (B10-2 and H1-2) monthly, in lieu of milk sampling. Samples from the four food product groups 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–X.1, Appendix C). Strontium-90 activity was detected in 20 of 20 samples. The concentrations ranged from 6 to 67 pCi/kg wet.

Gamma Spectrometry

Each food product sample was analyzed for concentrations of gamma emitting nuclides (Table C–X.1, Appendix C).

Naturally occurring K-40 activity was found in all samples. The concentrations ranged from 1,520 to 7,090 pCi/l. All other nuclides were less than the MDC.

C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured utilizing Panasonic 814 ($CaSO_4$) thermoluminescent dosimeters. Ninety TLD locations were established around the site. Results of TLD measurements are listed in Tables C–XI.1 to C–XI.3, Appendix C.

All TLD measurements were below 10 mR/standard month, with a range of 3.5 to 8.9 mR/standard month. A comparison of the Site Boundary and Indicator 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, Indicator and Control 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 and other naturally occurring nuclides, e.g. K-40, emanating from the ground.

D. Land Use Survey

A Land Use Survey conducted in the September, October and November 2008 growing season around the Three Mile Island Nuclear Station (TMINS) was performed by Normandeau Associates, RMC Environmental Services Division for Exelon to comply with Sections 2.15 and 3.4.2 of the Plant's Offsite Dose Calculation Manual (ODCM). The purpose of the survey was to document the nearest resident, milk-producing animal and garden of greater than 500 ft2 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. Five gardens from the 2007 census were not established in 2008. As such, five new gardens were identified. The locations where new gardens were identified include sectors F (ESE), G (SE), K (SSW), M (WSW) and Q (NW). Of the five new gardens, none were located closer to TMINS than those identified in 2007. The results of this survey are summarized below.

Distance in Miles from the TMINS Reactor Buildings				
Sector		Residence Miles	Garden Miles	Milk Farm Miles
1	N	1.1	1.6	2.1
2	NNE	0.7	0.9	-
3	NE	0.5	0.8	4.1
4	ENE	0.5	0.5	1.1
5	E	0.4	0.5	1.1
6	ESE	1.1	1.2	3.2
7	SE	0.7	0.9	1.4
8	SSE	0.7	0.8	-
9	S	2.3	2.7	-
10	SSW	0.6	2.5	4.9, 14.5
11	SW	0.5	0.6	
12	WSW	0.5	1.3	-
13	W	0.7	1.4	-
14	WNW	0.4	2.2	3.7
15	NW	0.4	2.2	-
16	NNW	1.1	2.4	-

E. Errata Data

There was not at least one TLD listed for each sector for the site boundary ring. The program description in section III.A has been corrected for the 2008 report and a revised Table C-XI.2 for the 2007 TLD measurement results is included in Appendix E.

F. Radiological Impact of TMINS Operations

An assessment of potential radiological impact indicated that radiation doses to the public from 2008 operations at TMINS were well below all applicable regulatory limits and were significantly less than doses received from natural sources of radiation. The 2008 whole body dose potentially received by an assumed maximum exposed individual from TMI-1 and TMI-2 liquid and airborne effluents was conservatively calculated to be 0.03 mrem. This dose is equivalent to <0.01% of the dose that an individual living in the TMI area receives each year from natural background radiation.

1. Determination of Radiation Doses to the Public

Dose assessments can be performed by using either effluent data and an environmental transport model or environmental sample data. To the extent possible, doses to the public are based on the direct measurement of dose rates from external sources and the measurement of radionuclide concentrations in environmental media

which may contribute to an internal dose of radiation. Thermoluminescent dosimeters (TLDs) positioned in the environment around TMINS provide measurements to determine external radiation doses to humans. Samples of air, water and food products are used to determine internal doses.

The quantity of radioactive materials released during normal operations are typically too small to be measured once distributed in the offsite environment. Therefore, the potential offsite doses are more effectively calculated for TMINS operations using a computerized model that predicts concentrations of radioactive materials in the environment and subsequent radiation doses based on measured effluents.

Doses are calculated using an advanced "class A" dispersion model. This model incorporates the guidelines and methodology set forth by the USNRC in Regulatory Guide 1.109. Due to the conservative assumptions that are used in the model, the calculated doses are generally higher than the doses based on actual environmental sample concentrations.

Therefore, the model predicts doses that are higher than actual doses received by people. The type and amount of radioactivity released from TMINS is calculated using measurements from effluent sample analyses. Once released, the dispersion of radionuclides in the environment is readily determined by computer modeling.

Airborne releases are diluted and carried away from the site by atmospheric diffusion, which continuously acts to disperse radioactivity. Variables that affect atmospheric dispersion include wind speed, temperature at different elevations, terrain, and shift in wind direction. A weather station on the north end of TMI is linked to a data logger that records the meteorological data.

Computer models also are used to predict the downstream dilution and travel times for liquid releases into the Susquehanna River. Actual monthly Susquehanna River flows are obtained from the York Haven Hydroelectric Station.

The human exposure pathways also are included in the model and are depicted in Figure 1. The exposure pathways that are considered for the discharge of TMINS liquid effluents are consumption of drinking water and fish, and shoreline exposure. The exposure pathways considered for the discharge of TMINS airborne effluents are plume exposure, inhalation, cow milk consumption, goat milk

consumption, fruit and vegetable consumption, meat consumption and land deposition.

Numerous data files are used in the calculations that describe the area around TMI in terms of population distribution and foodstuffs production. Data files include such information as the distance from the plant stack to the site boundary in each sector, the population groupings, milk cows, milk goats, gardens of more than 500 square feet, meat animals, downstream drinking water users, and crop yields.

When determining the dose to humans, it is necessary to consider all applicable pathways and all exposed tissues, summing the dose from each to provide the total dose for each organ as well as the whole body from a given radionuclide. Dose calculations involve determining the energy absorbed per unit mass in the various tissues. Thus, for radionuclides taken into the body, the metabolism of the radionuclide in the body must be known along with the physical characteristics of the nuclide such as energies, types of radiations emitted and half-life. The dose assessment model also contains dose conversion factors for the radionuclides for each of four age groups (adults, teenagers, children and infants) and eight organs (total body, thyroid, liver, skin, kidney, lung, bone and GI tract).

Doses are calculated for what is termed the "maximum hypothetical individual". This individual is assumed to be affected by the combined maximum environmental concentrations wherever they occur.
For liquid releases, the maximum hypothetical individual would consume 193 gallons of Susquehanna River water per year from the first downstream drinking water supplier, eat 46 pounds of fish each year that reside in the plant discharge area and stand 67 hours per year on the shoreline influenced by the plant discharge.
For airborne releases, the maximum hypothetical individual would live at the location of highest radionuclide concentration for inhalation and direct plume exposure. Additionally, this individual each year would consume 106 gallons of cow milk, 141 pounds of leafy vegetables, 1389 pounds of non-leafy vegetables and fruits and 243 pounds of meat produced at the locations with the highest predicted radionuclide concentrations. Consumption of goat milk is not included, since this exposure pathway does not currently exist.

2. Result of Dose Calculations

The maximum hypothetical doses due to 2008 TMI-1 and TMI-2 liquid and airborne effluents are summarized in Tables 1 and 2. Table 1 compares the calculated maximum hypothetical individual doses to the USNRC 10 CFR 50 App. I guidelines. This table also compares

the calculated doses (to an individual of the public) from effluents and direct radiation to USEPA 40 CFR 190 dose limits.

Table 2 presents the maximum hypothetical whole body doses to an individual.

As shown in Table 1, the doses calculated for 2008 operations at TMINS were well below the Federal dose limits (USEPA 40 CFR 190) and the guidelines of USNRC 10 CFR 50 App. I. This conclusion was supported by radionuclide concentrations detected in actual environmental samples.

Doses from natural background radiation provide a baseline for assessing the potential public health significance of radioactive effluents. Natural background radiation from cosmic, terrestrial and natural radionuclides in the human body (not including radon), averages about 100 mrem/yr (Ref. 5). Additionally, the average individual living in the United States receives an annual dose of about 2,400 mrem to the lung from natural radon gas. This lung dose is considered to be equivalent to a whole (or total) body dose of 200 mrem (Ref. 5). Therefore, the average person in the United States receives a whole body dose of about 300 mrem/yr from natural background radiation sources.

As shown on Table 2, the maximum hypothetical whole body dose received by an individual from 2008 TMI-1 and TMI-2 liquid and airborne effluents combined was conservatively calculated to be 0.03 mrem. This dose is equivalent to <0.01% percent of the dose that an individual living in the TMI area receives each year from natural background radiation (300 mrem).

The low doses calculated for 2008 TMINS operations were the result of efforts to maintain releases "as low as reasonably achievable" (ALARA).

In conclusion, radioactive materials related to TMINS operations were detected in environmental samples, but the measured concentrations were low and consistent with measured effluents. The environmental sample results verified that the doses received by the public from TMINS effluents in 2008 were well below applicable dose limits and only a small fraction of the doses received from natural background radiation. Additionally, the results indicated that there was no permanent buildup of radioactive materials in the environment and no increase in background radiation levels.

Therefore, based on the results of the radiological environmental monitoring program (REMP) and the doses calculated from measured effluents, TMINS operations in 2008 did not have any adverse effects on the health of the public or on the environment.

TABLE 1

Calculated Maximum Hypothetical Doses to an Individual from 2008 TMI-1 and TMI-2 Liquid and Airborne Effluents

	Maximum Hypothetical Doses To An Individual		
	USNRC 10 CFR 50 APP. I Guidelines (mrem/yr)	Calculated Dose (mrem/yr) TMI-1	TMI-2
From Radionuclides In Liquid Releases	3 total body, or	1.88E-2	3.65E-4
	10 any organ	2.12E-2	5.81E-4
From Radionuclides In Airborne Releases (Noble Gases)	5 total body, or	2.50E-6	0*
	15 skin	2.26E-5	0*
From Radionuclides In Airborne Releases (Iodines, Tritium and Particulates)	15 any organ	6.96E-3	1.72E-3

*No noble gases were released from TMI-2.

	USEPA 40 CFR 190 Limits (mrem/yr)	Calculated Dose (mrem/yr) TMI-1 and TMI-2 Combined**
Total from Site	75 thyroid	0.21
	25 total body or other organs	0.22

* *This sums together TMI-1 and TMI-2 maximum doses regardless of age group for different pathways. The combined doses include those due to radioactive effluents and direct radiation from TMINS. The direct radiation dose is calculated from environmental TLD data. For this calculation, exposure is assumed to be equal to dose.

The direct radiation dose from 2008 TMINS operations was 0.19 mrem. This dose was based on a maximum net fence-line exposure rate of 5.1 mR/std month and a shoreline/fence-line occupancy factor of 67 hours (Regulatory Guide 1.109). The combination of the maximum organ dose from TMI-1 and TMI-2 effluents (0.03 mrem) and the dose from direct radiation (0.19 mrem) yielded a maximum hypothetical dose of 0.22 mrem.

TABLE 2

Calculated Whole Body Doses to the Maximum Individual From 2008 TMI-1 and TMI-2 Liquid and Airborne Effluents

	Calculated Maximum Individual Whole Body Dose (mrem/yr)	
	TMI-1	**TMI-2**
From Radionuclides In Liquid Releases	1.88E-2	3.65E-4
From Radionuclides in Airborne Releases (Noble Gases)	2.50E-6	0*
From Radionuclides In Airborne Releases (Iodines, Tritium and Particulates)	6.75E-3	1.72E-2

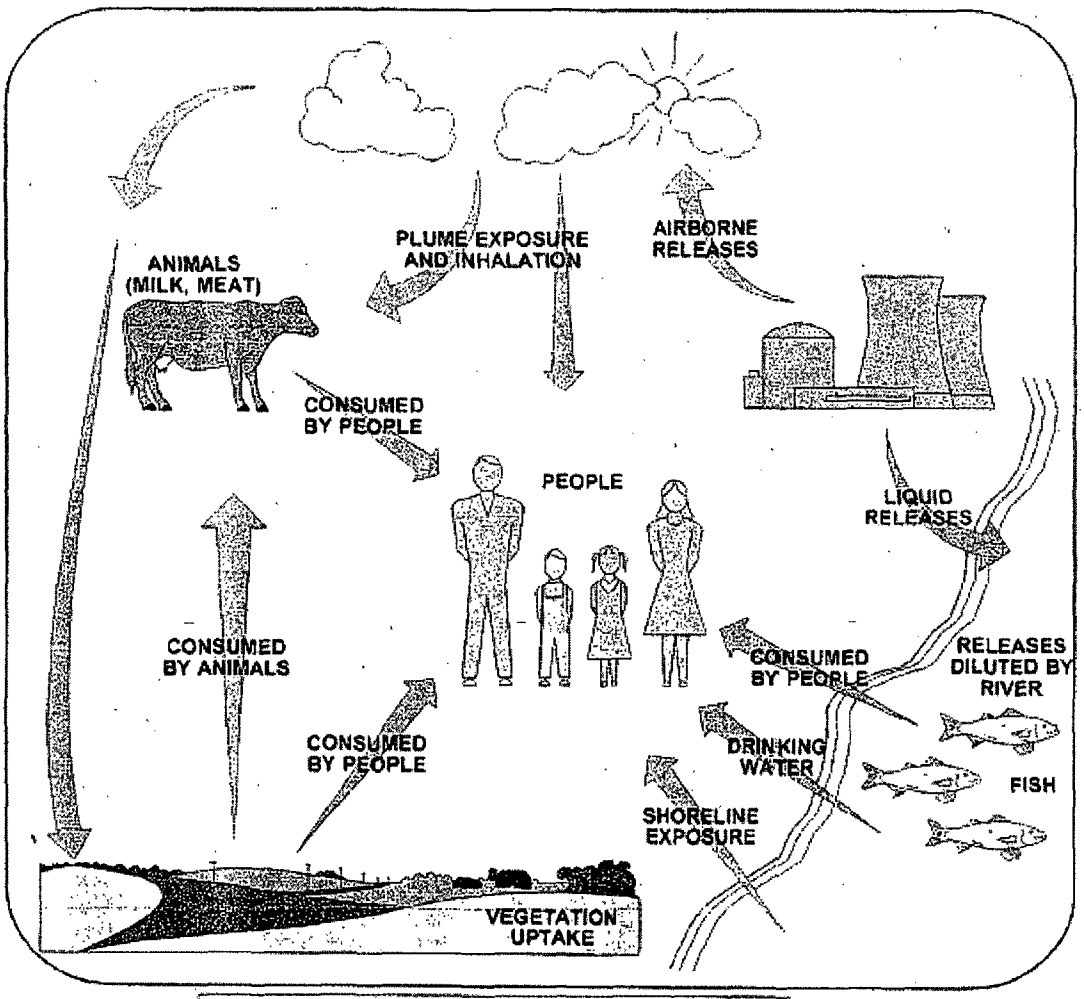
*No noble gases were released from TMI-2.

Individual Whole Body Dose Due to TMI-1 and TMI-2 Operations: 0.03 mrem/yr

Individual Whole Body Dose Due to Natural Background Radiation 300 mrem/yr

Figure 1

Exposure Pathways For Radionuclides Routinely Released From TMINS



PREDOMINANT RADIONUCLIDES

NOBLE GASES (Xe,Kr)
Plume exposure

RADIOIODINES (I-131, I-133)
Inhalation and consumption of milk, water, fruits, and vegetables

RADIOSTRONTIUMS (Sr-89, Sr-90)
Consumption of milk, meat, fruits, and vegetables

ACTIVATION PRODUCTS (Co-60, Mn-54)
Shoreline exposure

RADIOCESIUMS (Cs-134, Cs-137)
Shoreline exposure and consumption of milk, meat, fish, water, fruits, and vegetables

TRITIUM (H-3)
Inhalation and consumption of water, milk, fruits, and vegetables

G. Summary of Results – Inter-Laboratory Comparison Program

The primary and secondary laboratories analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation and water matrices (Appendix E). The PE samples, supplied by Analytics Inc., Environmental Resource Associates (ERA) and DOE's MAPEP, were evaluated against the following pre-set acceptance criteria:

1. Analytics Evaluation Criteria

   Analytics' evaluation report provides a ratio of TBE's result and Analytics' known value. Since flag values are not assigned by Analytics, TBE-ES evaluates the reported ratios based on internal QC requirements, which are based on the DOE MAPEP criteria.

2. ERA Evaluation Criteria

   ERA's evaluation report provides an acceptance range for control and warning limits with associated flag values. ERA's acceptance limits are established per the USEPA, NELAC, state specific PT program requirements or ERA's SOP for the Generation of Performance Acceptance Limits, as applicable. The acceptance limits are either determined by a regression equation specific to each analyte or a fixed percentage limit promulgated under the appropriate regulatory document.

3. DOE Evaluation Criteria

   MAPEP's evaluation report provides an acceptance range with associated flag values.

   The MAPEP defines three levels of performance: Acceptable (flag = "A"), Acceptable with Warning (flag = "W"), and Not Acceptable (flag = "N"). Performance is considered acceptable when a mean result for the specified analyte is ± 20% of the reference value. Performance is acceptable with warning when a mean result falls in the range from ±20% to ±30% of the reference value (i.e., 20% < bias < 30%). If the bias is greater than 30%, the results are deemed not acceptable.

For the primary laboratory, 16 out of 18 analytes met the specified acceptance criteria. Two samples did not meet the specified acceptance criteria for the following reasons:

1. Teledyne Brown Engineering's Analytics December 2008 Sr-89 in milk result of 18.0 pCi/L was higher than the known value of 12.6 pCi/L, resulting in a found to known ratio of 1.43. NCR 09-02 was initiated to investigate this failure.

2. Teledyne Brown Engineering's Analytics' ERA Quik Response water sample January 2008 Sr-89 result of 37.33 pCi/L exceeded the upper acceptance limit of 25.2 pCi/L. No cause could be found for the failure. Studies bracketing these results, RAD 71 and RAD 72 had acceptable Sr-89 results. NCR 08-03

For the secondary laboratory, all of the 15 analytes met the specified acceptance criteria.

The Inter-Laboratory Comparison Program provides evidence of "in control" counting systems and methods, and that the laboratories are producing accurate and reliable data.

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 - June5, 1974." RMC-TR-75-17, January 1975.
4. Exelon. "Three Mile Island Nuclear Station Offsite Dose Calculation Manual (ODCM)."
5. National Council of Radiation Protection and Measurements Report No. 93. "Ionizing Radiation Exposure of the Population of the United States." 1987.

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE THREE MILE ISLAND NUCLEAR STATION, 2008

Name of Facility: THREE MILE ISLAND NUCLEAR STATION **DOCKET NUMBER:** 50-289 & 50-320
Location of Facility: MIDDLETOWN COUNTY PA **REPORTING PERIOD:** 2008

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN(M) (F) RANGE	CONTROL LOCATION MEAN(M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN(M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	H-3	24	2000	1090 (5/12) (266/2380)	<LLD	1090 (5/12) (266/2380)	TM-SW-J1-2 INDICATOR WEST SHORE; TMI 0.5 MILES S OF SITE	0
	I-131	12	1	NA	<LLD	-		0
	GAMMA	24						
	MN-54		15	<LLD	<LLD	-		0
	CO-58		15	<LLD	<LLD	-		0
	FE-59		30	<LLD	<LLD	-		0
	CO-60		15	<LLD	<LLD	-		0

THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES
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, 2008

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Location of Facility: MIDDLETOWN COUNTY PA **REPORTING PERIOD:** 2008

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN(M) (F) RANGE	CONTROL LOCATION MEAN(M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN(M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0
	ZR-95		30	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0

THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES
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, 2008

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Location of Facility: MIDDLETOWN COUNTY PA **REPORTING PERIOD:** 2008

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN(M) (F) RANGE	CONTROL LOCATION MEAN(M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN(M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
DRINKING WATER (PCI/LITER)	GR-B	36	4	3.6 (22/24) (2.1/5.9)	3.1 (8/12) (2.3/4.0)	4.1 (11/12) (2.9/5.9)	G15-2 INDICATOR WRIGHTS WATER SUPPLY 13.6 MILES SE OF SITE	0
	I-131	36	1	<LLD	<LLD	-		0
	H-3	36	2000	<LLD	<LLD	-		0
	GAMMA	36						
	MN-54		15	<LLD	<LLD	-		0
	CO-58		15	<LLD	<LLD	-		0
	FE-59		30	<LLD	<LLD	-		0

THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES
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, 2008

Name of Facility: THREE MILE ISLAND NUCLEAR STATION **DOCKET NUMBER:** 50-289 & 50-320
Location of Facility: MIDDLETOWN COUNTY PA **REPORTING PERIOD:** 2008

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN(M) (F) RANGE	CONTROL LOCATION MEAN(M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN(M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
DRINKING WATER (PCI/LITER)	CO-60		15	<LLD	<LLD	-		0
	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0
	ZR-95		30	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE THREE MILE ISLAND NUCLEAR STATION, 2008

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DRINKING WATER (PCI/LITER)	LA-140		15	<LLD	<LLD	-		0
EFFLUENT WATER (PCI/LITER)	GR-B	12	4	5.5 (12/12) (3.5/8.7)	NA	5.5 (12/12) (3.5/8.7)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE ONSITE	0
	I-131	12	1	1.6 (2/12) (1.2/2.0)	NA	1.6 (2/12) (1.2/2.0)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE ONSITE	0
	H-3	12	2000	10547 (6/12) (232/24400)	NA	10547 (6/12) (232/24400)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE ONSITE	0
	SR-89	2	NA	<LLD	NA	-		0
	SR-90	2	2	<LLD	NA	-		0

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EFFLUENT WATER (PCI/LITER)	GAMMA	12						
	MN-54		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0

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EFFLUENT WATER (PCI/LITER)	ZR-95		30	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
STORM WATER (PCI/LITER)	H-3	4	2000	424 (1/4) -	NA	424 (1/4) -	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0

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STORM WATER (PCI/LITER)	GAMMA	4						
	MN-54		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0

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STORM WATER (PCI/LITER)	ZR-95		30	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
BOTTOM FEEDER (PCI/KG WET)	SR-90	4	10	<LLD	<LLD	-		0

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BOTTOM FEEDER (PCI/KG WET)	GAMMA	4						
	K-40		NA	2760 (2/2) (2160/3360)	2765 (2/2) (2430/3100)	2765 (2/2) (2430/3100)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	MN-54		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	FE-59		260	<LLD	<LLD	-		0
	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0

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BOTTOM FEEDER (PCI/KG WET)	CS-134		130	<LLD	<LLD	-		0
	CS-137		150	<LLD	<LLD	-		0
PREDATOR (PCI/KG WET)	SR-90	4	10	<LLD	<LLD	-		0
	GAMMA	4						
	K-40		NA	3385 (2/2) (3380/3390)	2810 (2/2) (2430/3190)	3385 (2/2) (3380/3390)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0
	MN-54		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0

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PREDATOR (PCI/KG WET)	FE-59		260	<LLD	<LLD	-		0
	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0
	CS-134		130	<LLD	<LLD	-		0
	CS-137		150	<LLD	<LLD	-		0
SEDIMENT (PCI/KG DRY)	GAMMA	7						
	K-40		NA	11584 (5/5) (8080/15700)	9160 (2/2) (9020/9300)	15700 (1/1) -	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0

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SEDIMENT (PCI/KG DRY)	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	CS-134		150	<LLD	<LLD	-		0
	CS-137		180	131 (3/5) (86/194)	<LLD	194 (1/1) -	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0
AIR PARTICULATE (E-3 PCI/CU.METER)	GR-B	363	10	18 (307/311) (7/39)	18 (50/52) (8/37)	18 (50/52) (8/37)	Q15-1 CONTROL WEST FAIRVIEW 13.5 MILES NW OF SITE	0

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AIR PARTICULATE (E-3 PCI/CU.METER)	GAMMA	28						
	BE-7		NA	78 (24/24) (43/125)	78.7 (4/4) (50/97)	85.8 (4/4) (43/125)	M2-1 INDICATOR FISHING CREEK; GOLDSBORO 1.3 MILES WSW OF SITE	0
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	CS-134		50	<LLD	<LLD	-		0
	CS-137		60	<LLD	<LLD	-		0

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AIR IODINE (E-3 PCI/CU.METER)	GAMMA I-131	363	70	<LLD	<LLD	-		0
MILK (PCI/LITER)	I-131	115	1	<LLD	<LLD	-		0
	SR-89	20	NA	<LLD	<LLD	-		0
	SR-90	20	2	.9 (9/16) (0.6/1.1)	1 (2/4) (0.6/1.4)	1 (2/4) (1.0/1.1)	TM-M-F4-1 INDICATOR TURNPIKE ROAD FARM 3.0 MILES ESE OF SITE	0
	GAMMA K-40	115	NA	1256 (92/92) (627/1570)	1339 (23/23) (1210/1560)	1339 (23/23) (1210/1560)	TM-M-K15-3 CONTROL MEYER'S FARM 14.5 MILES SSW OF SITE	0
	CS-134		15	<LLD	<LLD	-		0

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MILK (PCI/LITER)	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
VEGETATION (PCI/KG WET)	SR-90	20	10	28.2 (10/10) (10.5/44.8)	27.3 (10/10) (6.3/66.8)	30.1 (9/9) (12.6/44.8)	H1-2 INDICATOR RED HILL MARKET ALONG ROUTE 441 1.0 MILES SSE OF SITE	0
	GAMMA BE-7	26	NA	688 (8/13) (85/1860)	672 (5/13) (314/1100)	774 (7/9) (194/1860)	H1-2 INDICATOR RED HILL MARKET ALONG ROUTE 441 1.0 MILES SSE OF SITE	0
	K-40		NA	3642 (13/13) (1520/6080)	3375 (13/13) (1600/7090)	3786 (9/9) (1520/6080)	H1-2 INDICATOR RED HILL MARKET ALONG ROUTE 441 1.0 MILES SSE OF SITE	0

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VEGETATION (PCI/KG WET)	I-131		60	<LLD	<LLD	-		0
	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD	-		0
DIRECT RADIATION (MILLI-ROENTGEN/STD.MO.)	TLD-QUARTERLY	353	NA	4.9 (309/309) (3.5/8.9)	5.5 (44/44) (4.3/7.4)	8.0 (4/4) (7.4/8.9)	H8-1 INDICATOR SAGINAW ROAD, STARVIEW 7.4 MILES SSE OF SITE	0

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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

XYY-Z- 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.

YY - 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 Station, 2008

Sample Medium	Station Code	Map Number	Distance (miles)	Azimuth	Description
AQS	A1-3	1	0.5	359°	N of site off north tip of TMI in Susquehanna River
ID	A1-4	1	0.3	6°	N of Reactor Building on W fence adjacent to North Weather Station, TMI
AP,AI,ID	A3-1	2	2.7	357°	N of site at Mill Street Substation
SW	A3-2	2	2.7	356°	N of site at Swatara Creek, Middletown
ID	A5-1	2	4.4	3°	N of site on Vine Street Exit off Route 283
ID	A9-3	3	8.0	2°	N of site at Duke Street Pumping Station, Hummelstown
ID	B1-1	1	0.6	25°	NNE of site on light pole in middle of North Bridge, TMI
ID	B1-2	1	0.4	23°	NNE of Reactor Building on top of dike, TMI
ID	B2-1	2	1.9	17°	NNE of site on Sunset Dr. (off Hillsdale Rd.)
ID	B5-1	2	4.9	19°	NNE of site at intersection of School House and Miller Roads
ID	B10-1	3	9.2	21°	NNE of site at intersection of West Areba Avenue and Mill Street, Hershey
FP	B10-2	3	10	31°	NNE of site at Milton Hershey School, Hershey
ID	C1-1	1	0.7	37°	NE of site along Route 441 N
ID	C1-2	1	0.3	50°	NE of Reactor Building on top of dike, TMI
ID	C2-1	2	1.5	44°	NE of site at Middletown Junction
ID	C5-1	2	4.7	43°	NE of site on Kennedy Lane
ID	C8-1	3	7.1	48°	NE of site at Schenk's Church on School House Road
AQF	Control	-	-	-	All locations where finfish are collected above Dock St. Dam, Harrisburg
ID	D1-1	1	0.2	76°	ENE of Reactor Building on top of dike, TMI
ID	D1-2	1	0.5	67°	ENE of site off Route 441 along lane between garden center and residence
M	D2-1	2	1.1	62°	ENE of site at farm on Gingrich Road
ID	D2-2	2	1.6	74°	ENE of site along Hillsdale Rd. (S of Zion Rd.)
ID	D6-1	3	5.2	66°	ENE of site off Beagle Road
ID	D15-1	3	10.8	64°	ENE of site along Route 241, Lawn
AP,AI,ID,FP	E1-2	1	0.4	97°	E of site at TMI Visitor's Center
ID	E1-4	1	0.2	97°	E of Reactor Building on top of dike, TMI
M	E2-2	2	1.1	96°	E of site at farm on Pecks Road
ID	E2-3	2	2.0	97°	E of site along Hillsdale Rd. (N of Creek Rd.)
ID	E5-1	2	4.7	82°	E of site at intersection of North Market Street (Route 230) and Zeager Road
ID	E7-1	3	6.7	88°	E of site along Hummelstown Street, Elizabethtown
ID	F1-1	1	0.5	117°	ESE of site near entrance to 500 kV Substation
ID	F1-2	1	0.2	112°	ESE of Reactor Building on top of dike midway within ISWSF, TMI
AP,AI	F1-3	1	0.6	112°	ESE of site in 500 kV Substation
ID	F1-4	1	0.2	122°	ESE of Reactor Building on top of dike, TMI
ID	F2-1	2	1.3	119°	ESE of site along Engle Road
M	F4-1	2	3.2	104°	ESE of site at farm on Turnpike Road
ID	F5-1	2	4.7	109°	ESE of site along Amosite Road
ID	F10-1	3	9.4	112°	ESE of site along Donegal Springs Road, Donegal Springs
ID	F25-1	3	22	106°	ESE of site at intersection of Steel Way and Loop Roads, Lancaster
ID	G1-2	1	0.7	145°	SE of site along Route 441 S
ID	G1-3	1	0.2	130°	SE of Reactor Building on top of dike, TMI
ID	G1-5	1	0.3	143°	SE of Reactor Building on top of dike, TMI
ID	G1-6	1	0.3	139°	SE of Reactor Building on top of dike, TMI
AI,AP,M	G2-1	2	1.4	126°	SE of site at farm on Becker Road
ID	G2-4	2	1.7	138°	SE of site on Becker Road
ID	G5-1	2	4.8	131°	SE of site at intersection of Bainbridge and Risser Roads
ID	G10-1	3	9.7	128°	SE of site at farm along Engles Tollgate Road, Marietta
ID	G15-1	3	14.4	126°	SE of site at Columbia Water Treatment Plant
DW	G15-2	3	13.3	129°	SE of site at Wrightsville Water Treatment Plant
DW	G15-3	3	15.7	124	SE of site at Lancaster Water Treatment Plant

TABLE B-2: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Three Mile Island Nuclear Station, 2008

Sample Medium	Station Code	Map Number	Distance (miles)	Azimuth	Description
ID	H1-1	1	0.5	167°	SSE of site, TMI
FP	H1-2	1	1.0	151°	SSE of site along Route 441, Red Hill Market
AP,AI,ID	H3-1	2	2.2	160°	SSE of site in Falmouth-Collins Substation
ID	H5-1	2	4.1	158°	SSE of site by Guard Shack at Brunner Island Steam Electric Station
ID	H8-1	3	7.4	163°	SSE of site along Saginaw Road, Starview
ID	H15-1	3	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
ID	J1-1	1	0.8	176°	S of site, TMI
SW	J1-2	1	0.5	188°	S of site downstream of the TMINS liquid discharge outfall in Susquehanna River
ID	J1-3	1	0.3	189°	S of Reactor Building just S of SOB, TMI
AQS	J2-1	2	1.4	179°	S of site in Susquehanna River just upstream of the York Haven Dam
ID	J3-1	2	2.7	179°	S of site at York Haven/Cly
ID	J5-1	2	4.9	181°	S of site along Canal Road, Conewago Heights
ID	J7-1	3	6.5	176°	S of site off of Maple Street, Manchester
ID	J15-1	3	12.6	183°	S of site in Met-Ed York Load Dispatch Station
EW	K1-1	1	0.2	210°	On site at RML-7 Main Station Discharge Building
AQS	K1-3	1	0.2	212°	SSW of site downstream of the TMINS liquid discharge outfall in the Susquehanna River
ID	K1-4	1	0.2	209°	SSW of Reactor Building on top of dike behind Warehouse 2, TMI
ID	K2-1	2	1.2	200°	SSW of site on S Shelley Island
ID	K3-1	2	2.0	206°	SSW of site along Rt. 262, N of Cly
ID	K5-1	2	4.9	202°	SSW of site along Conewago Creek Road, Strinestown
ID	K8-1	3	7.5	196°	SSW of site at intersection of Coppenhaffer Road and Route 295, Zions View
ID	K15-1	3	12.8	203°	SSW of site behind McDonald's and next to child care center, Weiglestown
M	K15-3	3	14.4	205°	SSW of site at farm along S Salem Church Rd, Dover
ID	L1-1	1	0.1	236°	SW of site on top of dike W of Mech. Draft Cooling Tower, TMI
ID	L1-2	1	0.5	221°	SW of site on Beech Island
ID	L2-1	2	1.8	224°	SW of site along Route 262
ID	L5-1	2	4.1	228°	SW of site at intersection of Stevens and Wilson Roads
ID	L8-1	3	8.0	225°	SW of site along Rohlers Church Rd., Andersontown
ID	L15-1	3	11.8	226°	SW of site on W side of Route 74, rear of church, Mt. Royal
ID	M1-1	1	0.1	250°	WSW of Reactor Building on SE corner of U-2 Screenhouse fence, TMI
ID	M1-2	1	0.4	252°	WSW of site on E side of Shelley Island, Lot #157
AP,AI,ID	M2-1	2	1.3	256°	WSW of site along Route 262 and adjacent to Fishing Creek, Goldsboro
ID	M5-1	2	4.3	249°	WSW of site at intersection of Lewisberry and Roxberry Roads, Newberrytown
ID	M9-1	3	8.7	243°	WSW of site along Alpine Road, Maytown
ID	N1-1	1	0.7	274°	W of site on W side of Shelley Island, between lots #13 and #14
ID	N1-3	1	0.1	274°	W of Reactor Building on fence adjacent to Screenhouse entrance gate, TMI
ID	N2-1	2	1.2	261°	W of site at Goldsboro Marina
ID	N5-1	2	5.0	268°	W of site off of Old York Road along Robin Hood Drive
ID	N8-1	3	7.7	262°	W of site along Route 382, 1/2 mile north of Lewisberry
ID	N15-2	3	10.4	275°	W of site at intersection of Lisburn Road and Main Street, Lisburn
ID	P1-1	1	0.4	303°	WNW of site on Shelley Island

TABLE B-2: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Three Mile Island Nuclear Station, 2008

Sample Medium	Station Code	Map Number	Distance (miles)	Azimuth	Description
ID	P1-2	1	0.1	292°	WNW of Reactor Building on fence N of Unit 1 Screenhouse, TMI
ID	P2-1	2	2.0	283°	WNW of site along Route 262
ID	P5-1	2	5.0	284°	WNW of site at intersection of Valley Road (Route 262) and Beinhower Road
ID	P8-1	3	8.0	292°	WNW of site along Evergreen Road, Reesers Summit
ID	Q1-1	1	0.5	317°	NW of site on E side of Shelley Island
ID	Q1-2	1	0.2	321°	NW of Reactor Building on fence W of Warehouse 1, TMI
ID	Q2-1	2	1.9	310°	NW of site along access road along river
ID	Q5-1	2	5.0	317°	NW of site along Lumber Street, Highspire
SW,DW,ID	Q9-1	3	8.5	310°	NW of site at the Steelton Water Company
AP,AI,ID	Q15-1	3	13.4	309°	NW of site behind West Fairview Fire Dept. Social Hall (abandoned)
ID	R1-1	3	0.2	335°	NNW of Reactor Building along W fence, TMI
ID	R1-2	1	0.7	334°	NNW of site on central Henry Island
ID	R3-1	2	2.6	341°	NNW of site at Crawford Station, Middletown
ID	R5-1	2	4.9	339°	NNW of site at intersection of Spring Garden Drive and Route 441
ID	R9-1	3	8.0	341°	NNW of site at intersection of Derry and 66th Streets, Rutherford Heights
ID	R15-1	3	11.2	332°	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)
EW = Effluent Water
DW = Drinking Water
M = Milk (Cow)
AFT = Finfish
AQS = Aquatic Sediment

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2008

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 Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis 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 Station)	2 gallon	TBE, TBE-2010 Tritium and carbon-14 analysis 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 Station)	2 gallon	TBE, TBE-2012 Radioiodine in various matrices 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 Station)	2 gallon	TBE, TBE-2008 Gross alpha and/or gross beta activity in various matrices Env. Inc., W(DS)-01 Determination of gross alpha and/or gross beta in water (dissolved solids or total residue)
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 Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis 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 Station)	2 gallon	TBE, TBE-2010 Tritium and carbon-14 analysis 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 Station)	2 gallon	TBE, TBE-2012 Radioiodine in various matrices Env. Inc., I-131-01 Determination of I-131 in milk by anion exchange
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 Station)	2 gallon	TBE, TBE-2012 Radioiodine in various matrices 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 Station)	2 gallon	TBE, TBE-2008 Gross alpha and/or gross beta activity in various matrices Env. Inc., W(DS)-01 Determination of gross alpha and/or gross beta in water (dissolved solids or total residue)

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2008

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
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 Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis 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 Station)	2 gallon	TBE, TBE-2010 Tritium and carbon-14 analysis 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.	TBE, TBE-2023 Compositing of samples	2 gallon	TBE, TBE-2019 Radiostrontium analysis by ion exchange
Storm Water	Gamma Spectroscopy	Quarterly composite of monthly grab samples	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	1 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Storm Water	Tritium	Quarterly composite of monthly grab samples	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	1 gallon	TBE, TBE-2010 Tritium and carbon-14 analysis by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
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 Station)	1000 grams (wet)	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Fish	Strontium 90	Semi-annual samples collected via electroshocking or other techniques	ER-TMI-13 Collection of fish samples for radiological analysis (Three Mile Island Nuclear Station)	1000 grams (wet)	TBE, TBE-2019 Radiostrontium analysis by ion exchange

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2008

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Sediment	Gamma Spectroscopy	Semi-annual grab samples	ER-TMI-03 Collection of sediment samples for radiological analysis (Three Mile Island Nuclear Station)	500 grams (dry)	TBE, TBE-2007 Gamma emitting radioisotope analysis 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 Station)	1 filter (approximately 280 cubic meters weekly)	TBE, TBE-2008 Gross alpha and/or gross beta activity in various matrices Env. Inc., AP-02 Determination of gross alpha and/or gross beta in air particulate filters
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2023 Compositing of samples Env. Inc., AP-03 Procedure for compositing air particulate filters for gamma spectroscopic analysis	13 filters (approximately 3600 cubic meters)	TBE, TBE-2007 Gamma emitting radioisotope analysis 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	ER-TMI-14 Collection of air particulate and air iodine samples for radiological analysis (Three Mile Island Nuclear Station)	1 filter (approximately 280 cubic meters weekly)	TBE, TBE-2007 Gamma emitting radioisotope analysis 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 Station)	2 gallon	TBE, TBE-2012 Radioiodine in various matrices 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 Station) TBE, TBE-2023 Compositing of samples	2 gallon	TBE, TBE-2019 Radiostrontium analysis by ion exchange
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 Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Vegetation	Gamma Spectroscopy	Monthly and annual grab sample	ER-TMI-04 Collection of vegetation samples for radiological analysis (Three Mile Island Nuclear Station)	1000 grams	TBE, TBE-2007 Gamma emitting radioisotope analysis 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, 2008

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Vegetation	Gamma Spectroscopy	Monthly and annual grab sample	ER-TMI-04 Collection of vegetation samples for radiological analysis (Three Mile Island Nuclear Station)	1000 grams	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Vegetation	Strontium-89/90	Monthly and annual grab sample	ER-TMI-04 Collection of vegetation samples for radiological analysis (Three Mile Island Nuclear Station)	1000 grams	TBE, TBE-2019 Radiostrontium analysis by ion exchange
TLD	Thermolumines cence Dosimetry	Quarterly TLDs comprised of two Panasonic 814 (containing 4 each $CaSO_4$ elements)	ER-TMI-02 Collection of TLD samples for radiological analysis (Three Mile Island Nuclear Station)	2 badges with 3 dosimeters	Global Dosimetry Solutions, Inc.

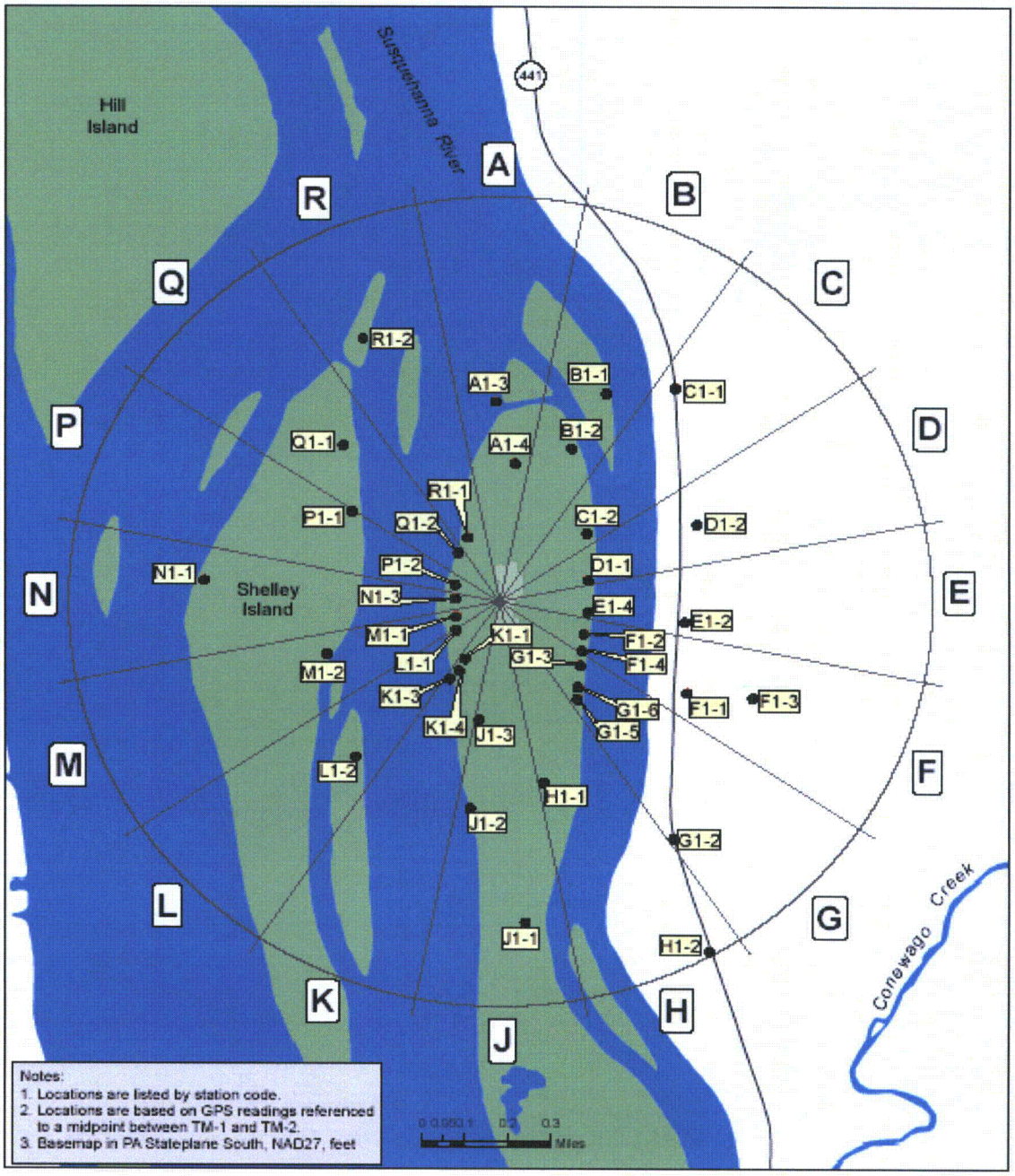

Figure B-1
Environmental Sampling Locations Within One Mile of the Three Mile Island Nuclear Station, 2008

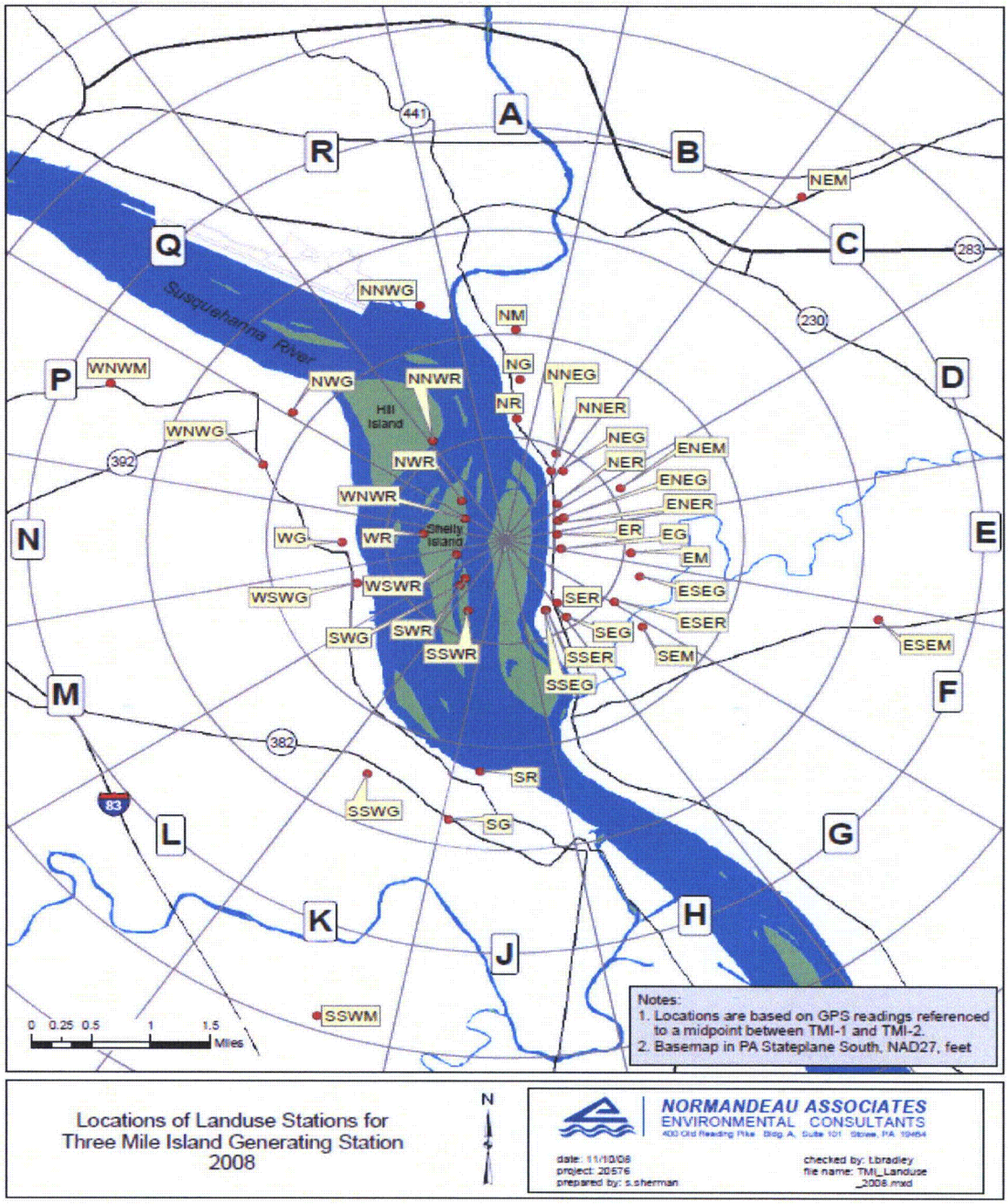

Figure B-1
Environmental Sampling Locations Within One Mile of the Three Mile Island Nuclear Station, 2008

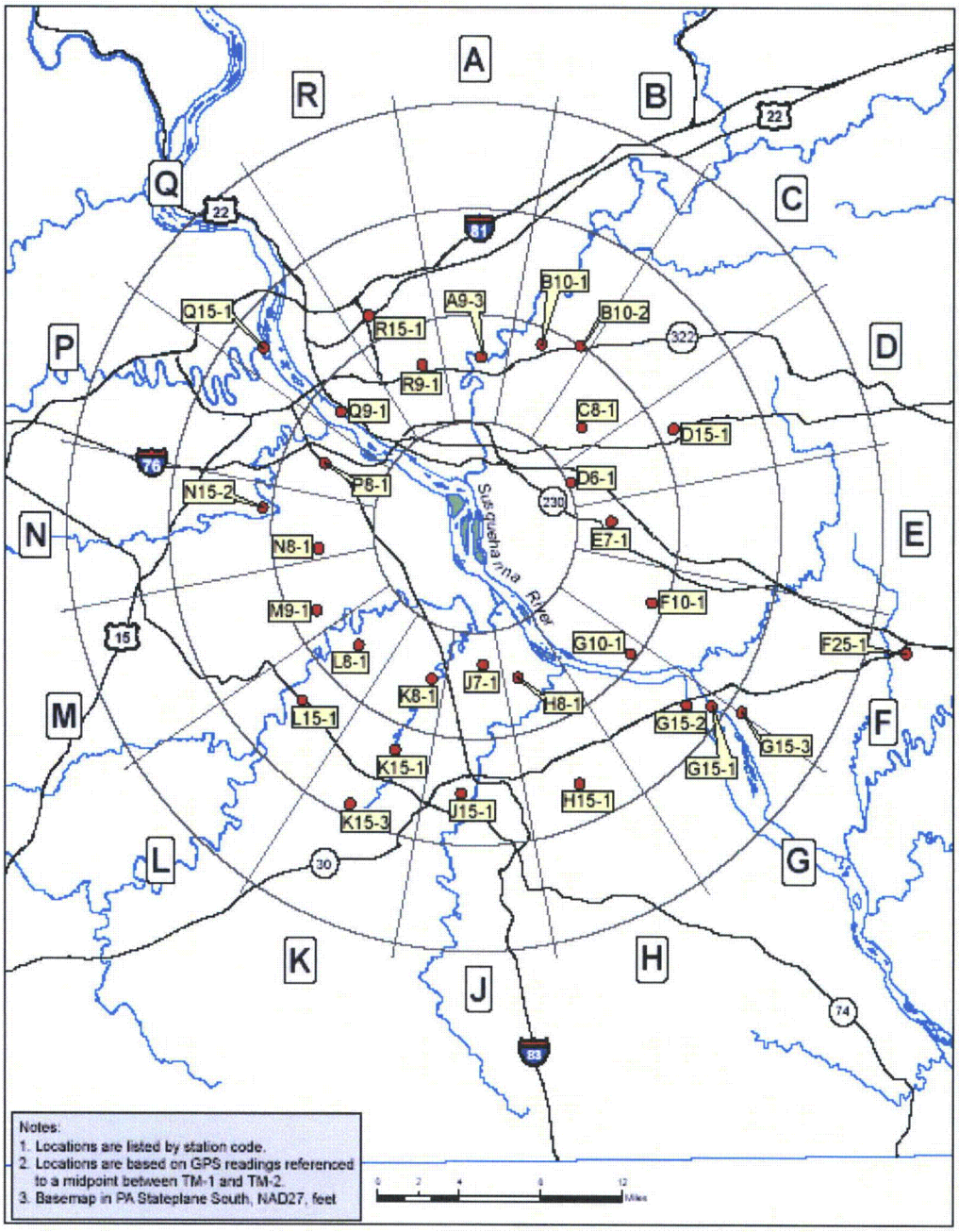

Figure B-3
Environmental Sampling Locations Greater than Five Miles of the Three Mile Island Nuclear Station, 2008

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APPENDIX C

DATA TABLES AND FIGURES - PRIMARY LABORATORY

TABLE C-I.1 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	J1-2	Q9-1
12/31/07 - 01/29/08	< 159	< 156
01/29/08 - 02/26/08	< 170	< 172
02/26/08 - 04/01/08	< 180	< 166
04/01/08 - 04/29/08	266 ± 120	< 193
04/29/08 - 06/03/08	1600 ± 229	< 166
06/03/08 - 07/01/08	516 ± 127	< 165
07/01/08 - 07/29/08	< 171	< 167
07/29/08 - 09/03/08	< 140	< 139
09/03/08 - 09/30/08	2380 ± 291	< 153
09/30/08 - 10/28/08	687 ± 144	< 166
10/28/08 - 12/02/08	< 185	< 191
12/02/08 - 12/30/08	< 173	< 175
MEAN	1090 ± 1759	-

TABLE C-I.2 CONCENTRATIONS OF I-131 IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	A3-2
12/31/07 - 01/29/08	< 0.5
01/29/08 - 02/26/08	< 0.7
02/26/08 - 04/01/08	< 0.6
04/01/08 - 04/29/08	< 0.6
04/29/08 - 06/03/08	< 0.7
06/03/08 - 07/01/08	< 0.8
07/01/08 - 07/29/08	< 0.8
07/29/08 - 09/03/08	< 0.7
09/03/08 - 09/30/08	< 0.6
09/30/08 - 10/28/08	< 0.8
10/28/08 - 12/02/08	< 0.6
12/02/08 - 12/30/08	< 0.5
MEAN	-

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-I.3 CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
J1-2	12/31/07 - 01/29/08	< 5	< 5	< 12	< 6	< 13	< 6	< 9	< 5	< 6	< 22	< 6
	01/29/08 - 02/26/08	< 5	< 6	< 12	< 4	< 11	< 5	< 11	< 5	< 6	< 22	< 7
	02/26/08 - 04/01/08	< 6	< 6	< 10	< 6	< 12	< 6	< 10	< 5	< 6	< 23	< 5
	04/01/08 - 04/29/08	< 6	< 6	< 13	< 5	< 14	< 5	< 10	< 7	< 6	< 28	< 10
	04/29/08 - 06/03/08	< 5	< 6	< 10	< 5	< 11	< 5	< 9	< 4	< 5	< 35	< 12
	06/03/08 - 07/01/08	< 4	< 4	< 8	< 4	< 8	< 5	< 8	< 4	< 5	< 31	< 11
	07/01/08 - 07/29/08	< 4	< 5	< 12	< 6	< 11	< 6	< 9	< 4	< 5	< 34	< 15
	07/29/08 - 09/03/08	< 1	< 1	< 3	< 1	< 3	< 1	< 3	< 1	< 1	< 18	< 6
	09/03/08 - 09/30/08	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 1	< 2	< 18	< 6
	09/30/08 - 10/28/08	< 1	< 1	< 2	< 0	< 1	< 1	< 1	< 0	< 0	< 18	< 5
	10/28/08 - 12/02/08	< 4	< 4	< 9	< 4	< 8	< 4	< 8	< 4	< 4	< 23	< 8
	12/02/08 - 12/30/08	< 4	< 4	< 8	< 4	< 8	< 5	< 7	< 4	< 4	< 26	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q9-1	12/31/07 - 01/29/08	< 4	< 5	< 11	< 6	< 12	< 7	< 10	< 6	< 5	< 22	< 7
	01/29/08 - 02/26/08	< 7	< 5	< 12	< 7	< 14	< 8	< 11	< 6	< 7	< 28	< 9
	02/26/08 - 04/01/08	< 4	< 5	< 8	< 5	< 7	< 4	< 8	< 4	< 5	< 17	< 5
	04/01/08 - 04/29/08	< 6	< 7	< 14	< 8	< 16	< 7	< 11	< 8	< 7	< 34	< 11
	04/29/08 - 06/03/08	< 3	< 4	< 8	< 5	< 8	< 5	< 7	< 4	< 4	< 31	< 11
	06/03/08 - 07/01/08	< 4	< 4	< 9	< 4	< 11	< 4	< 8	< 5	< 4	< 31	< 9
	07/01/08 - 07/29/08	< 5	< 5	< 11	< 5	< 12	< 5	< 8	< 5	< 4	< 26	< 11
	07/29/08 - 09/03/08	< 1	< 1	< 3	< 1	< 2	< 1	< 3	< 1	< 1	< 18	< 6
	09/03/08 - 09/30/08	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 1	< 2	< 19	< 6
	09/30/08 - 10/28/08	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 1	< 1	< 22	< 8
	10/28/08 - 12/02/08	< 4	< 4	< 9	< 4	< 9	< 5	< 8	< 4	< 4	< 25	< 7
	12/02/08 - 12/30/08	< 4	< 4	< 9	< 4	< 8	< 6	< 8	< 4	< 4	< 29	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-II.1 CONCENTRATIONS OF GROSS BETA IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	G15-2	G15-3	Q9-1
12/31/07 - 01/29/08	4.9 ± 1.5	2.9 ± 1.3	3.3 ± 1.3
01/29/08 - 02/26/08	5.9 ± 1.6	2.8 ± 1.3	2.8 ± 1.2
02/26/08 - 04/01/08	3.2 ± 1.5	2.6 ± 1.4	< 1.9
04/01/08 - 04/29/08	< 2.0	2.1 ± 1.4	2.4 ± 1.4
04/29/08 - 06/03/08	2.9 ± 1.5	2.3 ± 1.5	3.6 ± 1.6
06/03/08 - 07/01/08	3.1 ± 1.5	2.7 ± 1.5	2.3 ± 1.4
07/01/08 - 07/29/08	3.3 ± 1.5	4.3 ± 1.6	2.6 ± 1.4
07/29/08 - 09/03/08	4.0 ± 1.8	3.3 ± 1.8	< 2.4
09/03/08 - 09/30/08	3.9 ± 1.7	4.2 ± 1.8	3.4 ± 1.6
09/30/08 - 10/28/08	4.4 ± 1.6	3.6 ± 1.6	4.0 ± 1.6
10/28/08 - 12/02/08	4.0 ± 1.7	3.8 ± 1.6	< 2.2
12/02/08 - 12/30/08	5.1 ± 1.8	< 2.1	< 2.1
MEAN	4.1 ± 1.9	3.1 ± 1.5	3.1 ± 1.2

TABLE C-II.2 CONCENTRATIONS OF I-131 IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	G15-2	G15-3	Q9-1
12/31/07 - 01/29/08	< 0.4	< 0.4	< 0.6
01/29/08 - 02/26/08	< 0.8	< 0.8	< 0.7
02/26/08 - 04/01/08	< 0.9	< 1.0	< 0.9
04/01/08 - 04/29/08	< 0.5	< 0.6	< 0.6
04/29/08 - 06/03/08	< 0.7	< 0.8	< 0.7
06/03/08 - 07/01/08	< 0.8	< 0.8	< 0.7
07/01/08 - 07/29/08	< 0.7	< 0.7	< 0.7
07/29/08 - 09/03/08	< 0.6	< 0.8	< 0.7
09/03/08 - 09/30/08	< 0.9	< 0.6	< 0.7
09/30/08 - 10/28/08	< 0.9	< 0.8	< 0.9
10/28/08 - 12/02/08	< 0.5	< 0.6	< 0.6
12/02/08 - 12/30/08	< 0.6	< 0.4	< 0.6
MEAN	-	-	-

TABLE C-II.3 CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	G15-2	G15-3	Q9-1
12/31/07 - 01/29/08	< 151	< 156	< 156
01/29/08 - 02/26/08	< 172	< 166	< 170
02/26/08 - 04/01/08	< 171	< 172	< 177
04/01/08 - 04/29/08	< 176	< 174	< 175
04/29/08 - 06/03/08	< 170	< 173	< 169
06/03/08 - 07/01/08	< 167	< 165	< 167
07/01/08 - 07/29/08	< 168	< 167	< 173
07/29/08 - 09/03/08	< 141	< 140	< 141
09/03/08 - 09/30/08	< 169	< 169	< 162
09/30/08 - 10/28/08	< 163	< 170	< 169
10/28/08 - 12/02/08	< 188	< 190	< 180
12/02/08 - 12/30/08	< 173	< 174	< 175
MEAN	-	-	-

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-II.4 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
G15-2	12/31/07 - 01/29/08	< 6	< 6	< 11	< 5	< 6	< 6	< 10	< 5	< 7	< 20	< 8
	01/29/08 - 02/26/08	< 5	< 5	< 10	< 4	< 8	< 5	< 9	< 5	< 4	< 20	< 8
	02/26/08 - 04/01/08	< 4	< 3	< 7	< 4	< 8	< 5	< 6	< 3	< 4	< 14	< 6
	04/01/08 - 04/29/08	< 6	< 6	< 14	< 7	< 14	< 7	< 11	< 6	< 7	< 35	< 12
	04/29/08 - 06/03/08	< 4	< 5	< 10	< 5	< 9	< 5	< 8	< 3	< 4	< 31	< 10
	06/03/08 - 07/01/08	< 4	< 4	< 10	< 4	< 7	< 4	< 8	< 4	< 4	< 30	< 9
	07/01/08 - 07/29/08	< 4	< 5	< 11	< 5	< 7	< 5	< 8	< 5	< 5	< 32	< 10
	07/29/08 - 09/03/08	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 1	< 2	< 19	< 6
	09/03/08 - 09/30/08	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 19	< 6
	09/30/08 - 10/28/08	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 1	< 1	< 36	< 13
	10/28/08 - 12/02/08	< 4	< 5	< 9	< 3	< 7	< 4	< 8	< 4	< 4	< 23	< 7
	12/02/08 - 12/30/08	< 3	< 3	< 8	< 3	< 7	< 4	< 6	< 3	< 3	< 21	< 6
	MEAN	-	-	-	-	-	-	-	-	-	-	-
G15-3	12/31/07 - 01/29/08	< 5	< 5	< 10	< 5	< 9	< 4	< 8	< 4	< 5	< 18	< 5
	01/29/08 - 02/26/08	< 5	< 5	< 10	< 6	< 11	< 6	< 10	< 5	< 6	< 20	< 8
	02/26/08 - 04/01/08	< 5	< 5	< 9	< 8	< 10	< 5	< 9	< 5	< 6	< 21	< 7
	04/01/08 - 04/29/08	< 6	< 5	< 12	< 6	< 13	< 6	< 9	< 5	< 5	< 31	< 7
	04/29/08 - 06/03/08	< 4	< 4	< 9	< 4	< 7	< 5	< 7	< 4	< 5	< 29	< 10
	06/03/08 - 07/01/08	< 4	< 5	< 9	< 4	< 8	< 4	< 7	< 3	< 4	< 28	< 8
	07/01/08 - 07/29/08	< 4	< 5	< 9	< 4	< 8	< 5	< 8	< 4	< 5	< 27	< 10
	07/29/08 - 09/03/08	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 2	< 2	< 19	< 7
	09/03/08 - 09/30/08	< 2	< 2	< 5	< 2	< 4	< 2	< 3	< 2	< 2	< 19	< 6
	09/30/08 - 10/28/08	< 1	< 1	< 4	< 2	< 2	< 2	< 3	< 1	< 1	< 37	< 12
	10/28/08 - 12/02/08	< 4	< 4	< 8	< 4	< 8	< 3	< 7	< 3	< 4	< 22	< 6
	12/02/08 - 12/30/08	< 5	< 5	< 13	< 5	< 8	< 5	< 9	< 4	< 5	< 34	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-II.4 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
Q9-1	12/31/07 - 01/29/08	< 5	< 4	< 10	< 5	< 10	< 4	< 9	< 5	< 5	< 21	< 6
	01/29/08 - 02/26/08	< 6	< 6	< 9	< 6	< 11	< 5	< 8	< 5	< 7	< 22	< 8
	02/26/08 - 04/01/08	< 5	< 4	< 8	< 5	< 10	< 5	< 7	< 4	< 5	< 18	< 6
	04/01/08 - 04/29/08	< 6	< 5	< 13	< 7	< 10	< 6	< 9	< 5	< 5	< 29	< 8
	04/29/08 - 06/03/08	< 4	< 4	< 9	< 4	< 8	< 4	< 6	< 3	< 4	< 26	< 7
	06/03/08 - 07/01/08	< 4	< 4	< 10	< 4	< 7	< 4	< 9	< 4	< 4	< 31	< 8
	07/01/08 - 07/29/08	< 6	< 5	< 15	< 6	< 10	< 5	< 11	< 5	< 5	< 37	< 12
	07/29/08 - 09/03/08	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 2	< 2	< 19	< 6
	09/03/08 - 09/30/08	< 2	< 2	< 5	< 1	< 3	< 2	< 4	< 2	< 2	< 19	< 6
	09/30/08 - 10/28/08	< 1	< 1	< 3	< 1	< 2	< 2	< 3	< 1	< 1	< 35	< 10
	10/28/08 - 12/02/08	< 4	< 4	< 10	< 4	< 10	< 5	< 8	< 4	< 5	< 23	< 8
	12/02/08 - 12/30/08	< 4	< 4	< 9	< 4	< 8	< 5	< 8	< 4	< 5	< 26	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-

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, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	GROSS BETA	I-131	H-3	SR-89	SR-90
12/31/07 - 01/29/08	3.5 ± 1.4	< 0.9	< 151		
01/29/08 - 02/26/08	4.5 ± 1.5	< 0.6	< 172		
02/26/08 - 04/01/08	5.0 ± 1.7	< 0.8	< 175		
04/01/08 - 04/29/08	4.7 ± 1.7	< 0.4	3040 ± 370		
04/29/08 - 06/03/08	5.4 ± 1.9	< 0.9	24400 ± 2490		
06/03/08 - 07/01/08	6.4 ± 2.0	< 0.9	9490 ± 1000	< 3.3	< 0.6
07/01/08 - 07/29/08	4.4 ± 1.8	< 0.7	< 166		
07/29/08 - 09/03/08	7.5 ± 2.3	1.2 ± 0.3	< 140		
09/03/08 - 09/30/08	6.2 ± 2.0	< 0.7	19400 ± 2010		
09/30/08 - 10/28/08	8.7 ± 2.1	2.0 ± 0.5	6720 ± 717		
10/28/08 - 12/02/08	5.1 ± 1.9	< 0.6	< 191		
12/02/08 - 12/30/08	4.5 ± 1.7	< 0.6	232 ± 123	< 2.9	< 0.8
MEAN	5.5 ± 2.9	1.6 ± 1.1	10547 ± 18948	-	-

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-III.2 CONCENTRATIONS OF GAMMA EMITTERS IN EFFLUENT WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
K1-1	12/31/07 - 01/29/08	< 4	< 4	< 7	< 4	< 7	< 4	< 6	< 4	< 4	< 16	< 5
	01/29/08 - 02/26/08	< 4	< 4	< 9	< 3	< 8	< 5	< 8	< 5	< 4	< 19	< 4
	02/26/08 - 04/01/08	< 5	< 6	< 9	< 5	< 11	< 6	< 9	< 5	< 6	< 21	< 7
	04/01/08 - 04/29/08	< 5	< 6	< 9	< 6	< 12	< 5	< 8	< 5	< 6	< 25	< 10
	04/29/08 - 06/03/08	< 4	< 5	< 11	< 4	< 10	< 5	< 8	< 4	< 5	< 29	< 10
	06/03/08 - 07/01/08	< 4	< 5	< 11	< 5	< 8	< 5	< 8	< 4	< 4	< 30	< 10
	07/01/08 - 07/29/08	< 4	< 5	< 11	< 3	< 9	< 5	< 10	< 4	< 4	< 31	< 9
	07/29/08 - 09/03/08	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 18	< 5
	09/03/08 - 09/30/08	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 2	< 2	< 21	< 7
	09/30/08 - 10/28/08	< 1	< 1	< 3	< 1	< 2	< 2	< 3	< 1	< 1	< 36	< 10
	10/28/08 - 12/02/08	< 3	< 3	< 6	< 3	< 6	< 3	< 6	< 3	< 3	< 16	< 4
	12/02/08 - 12/30/08	< 3	< 3	< 6	< 3	< 7	< 3	< 6	< 3	< 4	< 21	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-IV.1 CONCENTRATIONS OF TRITIUM AND GAMMA EMITTERS IN STORM WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	H-3	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
EDCB	01/29/08 - 04/01/08	424 ± 123	< 5	< 6	< 12	< 4	< 10	< 5	< 9	< 6	< 6	< 27	< 7
	04/29/08 - 07/01/08	< 164	< 2	< 2	< 5	< 2	< 5	< 3	< 4	< 2	< 2	< 16	< 5
	07/29/08 - 09/30/08	< 161	< 5	< 4	< 11	< 4	< 10	< 6	< 9	< 5	< 5	< 30	< 11
	10/28/08 - 12/30/08	< 192	< 2	< 2	< 6	< 2	< 4	< 3	< 4	< 2	< 2	< 25	< 8
	MEAN	424 ± 0	-	-	-	-	-	-	-	-	-	-	-

TABLE C-V.1 **CONCENTRATIONS OF STRONTIUM IN PREDATOR AND BOTTOM FEEDER (FISH) SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	Sr-90
INDP	PREDATOR	
	06/16/08	< 3
	10/07/08	< 5
	MEAN	-
INDB	BOTTOM FEEDER	
	06/03/08	< 4
	10/07/08	< 3
	MEAN	-
BKGP	BOTTOM FEEDER	
	06/17/08	< 4
	10/20/08	< 3
	MEAN	-
BKGB	BOTTOM FEEDER	
	06/17/08	< 2
	10/20/08	< 4
	MEAN	-

TABLE C-V.2 **CONCENTRATIONS OF GAMMA EMITTERS IN PREDATOR AND BOTTOM FEEDER (FISH) SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137
BKGB	BOTTOM FEEDER								
	06/17/08	3100 ± 638	< 34	< 45	< 88	< 37	< 85	< 32	< 33
	10/20/08	2430 ± 816	< 62	< 57	< 113	< 57	< 76	< 45	< 52
	MEAN	2765 ± 948	-	-	-	-	-	-	-
BKGP	PREDATOR								
	06/17/08	3190 ± 560	< 39	< 42	< 88	< 36	< 80	< 37	< 42
	10/20/08	2430 ± 692	< 49	< 54	< 101	< 48	< 131	< 43	< 47
	MEAN	2810 ± 1075	-	-	-	-	-	-	-
INDB	BOTTOM FEEDER								
	06/03/08	3360 ± 687	< 36	< 49	< 117	< 29	< 94	< 29	< 40
	10/07/08	2160 ± 797	< 41	< 54	< 119	< 60	< 80	< 40	< 57
	MEAN	2760 ± 1697	-	-	-	-	-	-	-
INDP	PREDATOR								
	06/16/08	3380 ± 603	< 37	< 41	< 96	< 42	< 69	< 32	< 35
	10/07/08	3390 ± 660	< 46	< 64	< 130	< 36	< 97	< 38	< 51
	MEAN	3385 ± 14	-	-	-	-	-	-	-

TABLE C-VI.1 **CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/KG DRY ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Mn-54	Co-58	Co-60	Cs-134	Cs-137
A1-3	06/18/08	9020 ± 1300	< 75	< 77	< 75	< 79	< 96
	11/05/08	9300 ± 973	< 57	< 69	< 51	< 47	< 60
	MEAN	9160 ± 396	-	-	-	-	-
J2-1	06/18/08	12100 ± 1390	< 67	< 60	< 60	< 54	86 ± 54
	11/05/08	13900 ± 1410	< 62	< 65	< 47	< 53	< 71
	MEAN	13000 ± 2546	-	-	-	-	86 ± 0
K1-3	06/18/08	8080 ± 1270	< 61	< 71	< 66	< 58	113 ± 52
	11/05/08	8140 ± 982	< 55	< 63	< 49	< 51	< 56
	MEAN	8110 ± 85	-	-	-	-	113 ± 0
EDCB	11/05/08	15700 ± 1240	< 56	< 73	< 55	< 49	194 ± 74
	MEAN	15700 ± 0	-	-	-	-	194 ± 0

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-VII.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

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

	GROUP I		GROUP II				GROUP III
COLLECTION PERIOD	E1-2	F1-3	A3-1	G2-1	H3-1	M2-1	Q15-1
01/01/08 - 01/09/08	24 ± 5	26 ± 5	25 ± 5	22 ± 5	26 ± 5	21 ± 5	25 ± 5
01/09/08 - 01/16/08	18 ± 5	20 ± 5	14 ± 5	20 ± 5	13 ± 5	17 ± 5	16 ± 5
01/16/08 - 01/23/08	18 ± 5	20 ± 5	23 ± 5	22 ± 5	23 ± 5	23 ± 5	23 ± 5
01/23/08 - 01/30/08	33 ± 6	33 ± 6	31 ± 6	37 ± 6	29 ± 6	27 ± 6	30 ± 6
01/30/08 - 02/06/08	19 ± 5	20 ± 5	28 ± 6	24 ± 6	20 ± 5	22 ± 5	25 ± 6
02/06/08 - 02/13/08	18 ± 5	19 ± 5	21 ± 6	21 ± 6	22 ± 5	17 ± 5	15 ± 5
02/13/08 - 02/20/08	22 ± 6	21 ± 6	21 ± 6	21 ± 6	20 ± 5	20 ± 5	22 ± 6
02/20/08 - 02/27/08	16 ± 5	17 ± 5	16 ± 5	17 ± 5	14 ± 5	15 ± 5	14 ± 5
02/27/08 - 03/05/08	12 ± 5	19 ± 5	14 ± 5	18 ± 5	17 ± 5	11 ± 5	11 ± 5
03/05/08 - 03/12/08	18 ± 5	18 ± 5	15 ± 5	16 ± 5	14 ± 5	23 ± 5	16 ± 5
03/12/08 - 03/19/08	16 ± 5	20 ± 6	16 ± 5	15 ± 5	15 ± 5	17 ± 5	14 ± 5
03/19/08 - 03/26/08	15 ± 5	14 ± 5	15 ± 5	16 ± 5	10 ± 5	16 ± 5	16 ± 5
03/26/08 - 04/02/08	13 ± 5	17 ± 5	15 ± 5	15 ± 5	13 ± 5	16 ± 5	15 ± 5
04/02/08 - 04/09/08	9 ± 5	9 ± 5	10 ± 5	8 ± 5	10 ± 5	8 ± 4	11 ± 5
04/09/08 - 04/16/08	8 ± 5	11 ± 5	9 ± 5	9 ± 5	8 ± 5	< 9	< 7
04/16/08 - 04/23/08	23 ± 5	25 ± 6	18 ± 5	24 ± 6	23 ± 5	23 ± 5	26 ± 6
04/23/08 - 04/30/08	15 ± 5	13 ± 5	12 ± 5	15 ± 5	21 ± 6	17 ± 5	15 ± 5
04/30/08 - 05/07/08	18 ± 5	17 ± 5	20 ± 5	23 ± 6	20 ± 5	22 ± 5	21 ± 5
05/07/08 - 05/13/08	14 ± 5	14 ± 5	13 ± 6	15 ± 6	11 ± 5	11 ± 5	15 ± 6
05/13/08 - 05/21/08	11 ± 4	14 ± 5	12 ± 5	14 ± 5	11 ± 4	13 ± 4	11 ± 4
05/21/08 - 05/28/08	8 ± 5	< 7	< 7	9 ± 5	7 ± 5	11 ± 5	< 7
05/28/08 - 06/04/08	9 ± 5	14 ± 5	16 ± 5	12 ± 5	7 ± 4	13 ± 5	13 ± 5
06/04/08 - 06/11/08	15 ± 5	13 ± 5	16 ± 5	18 ± 5	12 ± 5	13 ± 5	18 ± 5
06/11/08 - 06/18/08	19 ± 5	17 ± 5	18 ± 5	16 ± 5	16 ± 5	21 ± 5	18 ± 5
06/18/08 - 06/25/08	10 ± 5	14 ± 5	10 ± 5	17 ± 5	9 ± 5	14 ± 5	11 ± 5
06/25/08 - 07/02/08	16 ± 5	16 ± 5	16 ± 5	14 ± 5	14 ± 5	10 ± 4	13 ± 5
07/02/08 - 07/09/08	17 ± 5	18 ± 5	14 ± 5	20 ± 5	19 ± 5	16 ± 5	20 ± 5
07/09/08 - 07/16/08	19 ± 5	12 ± 5	18 ± 5	17 ± 5	17 ± 5	14 ± 5	19 ± 5
07/16/08 - 07/23/08	30 ± 6	28 ± 6	29 ± 6	26 ± 6	35 ± 6	26 ± 6	30 ± 6
07/23/08 - 07/30/08	21 ± 5	19 ± 5	24 ± 6	17 ± 5	24 ± 6	21 ± 5	22 ± 5
07/30/08 - 08/06/08	21 ± 5	24 ± 5	(1)	20 ± 5	21 ± 5	20 ± 5	23 ± 6
08/06/08 - 08/13/08	15 ± 5	15 ± 5	12 ± 5	14 ± 5	12 ± 5	9 ± 5	12 ± 5
08/13/08 - 08/20/08	24 ± 6	20 ± 5	14 ± 5	18 ± 5	13 ± 5	18 ± 5	20 ± 5
08/20/08 - 08/27/08	22 ± 5	17 ± 5	20 ± 5	18 ± 5	17 ± 5	16 ± 5	20 ± 5
08/27/08 - 09/04/08	23 ± 5	19 ± 5	23 ± 5	16 ± 5	20 ± 5	21 ± 5	22 ± 5
09/04/08 - 09/10/08	20 ± 6	24 ± 6	23 ± 6	23 ± 6	19 ± 6	17 ± 6	23 ± 6
09/10/08 - 09/17/08	15 ± 5	11 ± 5	9 ± 5	12 ± 5	10 ± 5	11 ± 5	9 ± 5
09/17/08 - 09/24/08	23 ± 6	21 ± 5	19 ± 5	27 ± 6	16 ± 5	22 ± 6	24 ± 6
09/24/08 - 10/01/08	13 ± 5	10 ± 5	17 ± 5	14 ± 5	16 ± 5	14 ± 5	14 ± 5
10/01/08 - 10/08/08	14 ± 5	15 ± 5	19 ± 5	17 ± 5	15 ± 5	13 ± 5	16 ± 5
10/08/08 - 10/15/08	27 ± 6	26 ± 6	29 ± 6	30 ± 6	25 ± 6	28 ± 6	29 ± 6
10/15/08 - 10/22/08	12 ± 5	12 ± 5	18 ± 6	17 ± 6	13 ± 5	18 ± 6	16 ± 6
10/22/08 - 10/29/08	9 ± 5	< 7	7 ± 5	9 ± 5	11 ± 5	8 ± 5	8 ± 5
10/29/08 - 11/05/08	26 ± 6	24 ± 5	25 ± 5	23 ± 5	28 ± 6	25 ± 5	26 ± 6
11/05/08 - 11/12/08	18 ± 5	16 ± 5	14 ± 5	13 ± 5	17 ± 5	17 ± 5	13 ± 5
11/12/08 - 11/19/08	11 ± 5	11 ± 5	10 ± 5	12 ± 5	12 ± 5	10 ± 5	9 ± 5
11/19/08 - 11/25/08	11 ± 6	13 ± 6	12 ± 6	12 ± 6	11 ± 6	10 ± 6	10 ± 6
11/25/08 - 12/03/08	17 ± 4	17 ± 4	16 ± 5	20 ± 5	21 ± 5	18 ± 5	21 ± 5
12/03/08 - 12/10/08	21 ± 5	21 ± 5	18 ± 6	15 ± 5	18 ± 5	14 ± 5	19 ± 5
12/10/08 - 12/17/08	16 ± 5	14 ± 5	15 ± 5	20 ± 5	19 ± 5	16 ± 5	15 ± 5
12/17/08 - 12/24/08	21 ± 5	20 ± 5	32 ± 6	20 ± 5	24 ± 6	22 ± 6	23 ± 6
12/24/08 - 12/31/08	36 ± 6	35 ± 6	34 ± 6	30 ± 6	39 ± 6	28 ± 6	37 ± 6
MEAN	18 ± 12	18 ± 11	18 ± 13	18 ± 11	17 ± 13	17 ± 11	18 ± 13

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-VII.2 MONTHLY AND YEARLY MEAN VALUES OF GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

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

GROUP I - CLOSEST TO THE SITE BOUNDARY				GROUP II - INTERMEDIATE OFFSITE				GROUP III - CONTROL LOCATIONS			
COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD
01/01/08 - 01/30/08	18	33	24 ± 12	01/01/08 - 01/30/08	13	37	23 ± 12	01/01/08 - 01/30/08	16	30	23 ± 12
01/30/08 - 02/27/08	16	22	19 ± 4	01/30/08 - 02/27/08	14	28	20 ± 7	01/30/08 - 02/27/08	14	25	19 ± 11
02/27/08 - 04/02/08	12	20	16 ± 5	02/27/08 - 04/02/08	10	23	15 ± 5	02/27/08 - 04/02/08	11	16	14 ± 4
04/02/08 - 04/30/08	8	25	14 ± 13	04/02/08 - 04/30/08	< 9	24	14 ± 12	04/02/08 - 04/30/08	< 7	26	17 ± 15
04/30/08 - 05/28/08	< 7	18	14 ± 7	04/30/08 - 05/28/08	< 7	23	14 ± 10	04/30/08 - 05/28/08	< 7	21	16 ± 9
05/28/08 - 07/02/08	9	19	14 ± 6	05/28/08 - 07/02/08	7	21	14 ± 7	05/28/08 - 07/02/08	11	18	15 ± 7
07/02/08 - 07/30/08	12	30	21 ± 11	07/02/08 - 07/30/08	14	35	21 ± 12	07/02/08 - 07/30/08	19	30	23 ± 10
07/30/08 - 09/04/08	15	24	20 ± 7	07/30/08 - 09/04/08	9	23	17 ± 7	07/30/08 - 09/04/08	12	23	20 ± 9
09/04/08 - 10/01/08	10	24	17 ± 11	09/04/08 - 10/01/08	9	27	17 ± 10	09/04/08 - 10/01/08	9	24	17 ± 14
10/01/08 - 10/29/08	< 7	27	16 ± 14	10/01/08 - 10/29/08	7	30	17 ± 15	10/01/08 - 10/29/08	8	29	17 ± 17
10/29/08 - 12/03/08	11	26	17 ± 11	10/29/08 - 12/03/08	10	28	16 ± 11	10/29/08 - 12/03/08	9	26	16 ± 15
12/03/08 - 12/31/08	14	36	23 ± 17	12/03/08 - 12/31/08	14	39	23 ± 15	12/03/08 - 12/31/08	15	37	23 ± 19
01/01/08 - 12/31/08	< 7	36	18 ± 12	01/01/08 - 12/31/08	< 7	39	18 ± 12	01/01/08 - 12/31/08	< 7	37	18 ± 13

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-VII.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

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	01/01/08 - 04/02/08	70 ± 31	< 3	< 3	< 2	< 3	< 3
	04/02/08 - 07/02/08	81 ± 22	< 2	< 4	< 2	< 3	< 2
	07/02/08 - 10/01/08	80 ± 34	< 3	< 3	< 3	< 3	< 2
	10/01/08 - 12/31/08	61 ± 28	< 3	< 3	< 1	< 3	< 3
	MEAN	73 ± 19	-	-	-	-	-
E1-2	01/01/08 - 04/02/08	72 ± 30	< 3	< 3	< 3	< 2	< 3
	04/02/08 - 07/02/08	78 ± 35	< 4	< 4	< 4	< 4	< 3
	07/02/08 - 10/01/08	89 ± 33	< 3	< 4	< 4	< 3	< 3
	10/01/08 - 12/31/08	68 ± 23	< 3	< 4	< 2	< 4	< 4
	MEAN	77 ± 18	-	-	-	-	-
F1-3	01/01/08 - 04/02/08	76 ± 35	< 4	< 5	< 3	< 3	< 3
	04/02/08 - 07/02/08	98 ± 24	< 2	< 4	< 3	< 2	< 2
	07/02/08 - 10/01/08	95 ± 33	< 3	< 4	< 4	< 3	< 3
	10/01/08 - 12/31/08	44 ± 22	< 3	< 2	< 3	< 2	< 2
	MEAN	78 ± 50	-	-	-	-	-
G2-1	01/01/08 - 04/02/08	56 ± 25	< 2	< 2	< 2	< 3	< 2
	04/02/08 - 07/02/08	68 ± 25	< 4	< 4	< 2	< 3	< 2
	07/02/08 - 10/01/08	93 ± 45	< 2	< 5	< 2	< 2	< 3
	10/01/08 - 12/31/08	72 ± 28	< 4	< 4	< 4	< 3	< 3
	MEAN	72 ± 31	-	-	-	-	-
H3-1	01/01/08 - 04/02/08	60 ± 25	< 4	< 4	< 2	< 3	< 2
	04/02/08 - 07/02/08	100 ± 27	< 3	< 4	< 3	< 3	< 3
	07/02/08 - 10/01/08	107 ± 31	< 3	< 4	< 3	< 4	< 3
	10/01/08 - 12/31/08	62 ± 21	< 3	< 4	< 4	< 3	< 2
	MEAN	82 ± 49	-	-	-	-	-
M2-1	01/01/08 - 04/02/08	65 ± 19	< 3	< 3	< 3	< 2	< 2
	04/02/08 - 07/02/08	125 ± 37	< 3	< 5	< 4	< 4	< 3
	07/02/08 - 10/01/08	110 ± 45	< 2	< 3	< 2	< 2	< 3
	10/01/08 - 12/31/08	43 ± 24	< 3	< 3	< 3	< 3	< 3
	MEAN	86 ± 76	-	-	-	-	-
Q15-1	01/01/08 - 04/02/08	50 ± 27	< 3	< 3	< 3	< 3	< 2
	04/02/08 - 07/02/08	92 ± 27	< 3	< 4	< 3	< 3	< 2
	07/02/08 - 10/01/08	76 ± 38	< 3	< 5	< 3	< 3	< 3
	10/01/08 - 12/31/08	97 ± 28	< 3	< 3	< 3	< 3	< 3
	MEAN	79 ± 42	-	-	-	-	-

TABLE C-VIII.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

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

	GROUP I		GROUP II				GROUP III
COLLECTION PERIOD	E1-2	F1-3	A3-1	G2-1	H3-1	M2-1	Q15-1
01/01/08 - 01/09/08	< 15	< 15	< 30	< 15	< 15	< 28	< 29
01/09/08 - 01/16/08	< 26	< 27	< 26	< 27	< 26	< 25	< 26
01/16/08 - 01/23/08	< 27	< 27	< 29	< 28	< 16	< 27	< 28
01/23/08 - 01/30/08	< 24	< 24	< 24	< 24	< 24	< 23	< 23
01/30/08 - 02/06/08	< 38	< 38	< 41	< 39	< 38	< 38	< 40
02/06/08 - 02/13/08	< 47	< 48	< 45	< 48	< 47	< 43	< 35
02/13/08 - 02/20/08	< 43	< 43	< 52	< 43	< 42	< 49	< 51
02/20/08 - 02/27/08	< 41	< 41	< 42	< 42	< 40	< 40	< 41
02/27/08 - 03/05/08	< 38	< 38	< 44	< 39	< 38	< 42	< 44
03/05/08 - 03/12/08	< 30	< 30	< 30	< 30	< 29	< 28	< 28
03/12/08 - 03/19/08	< 52	< 52	< 46	< 54	< 53	< 44	< 46
03/19/08 - 03/26/08	< 39	< 39	< 41	< 39	< 29	< 39	< 40
03/26/08 - 04/02/08	< 39	< 40	< 29	< 40	< 40	< 35	< 36
04/02/08 - 04/09/08	< 54	< 54	< 45	< 55	< 53	< 43	< 44
04/09/08 - 04/16/08	< 39	< 39	< 36	< 51	< 39	< 44	< 35
04/16/08 - 04/23/08	< 55	< 55	< 49	< 55	< 53	< 48	< 48
04/23/08 - 04/30/08	< 59	< 60	< 65	< 61	< 59	< 62	< 65
04/30/08 - 05/07/08	< 44	< 44	< 62	< 36	< 43	< 58	< 60
05/07/08 - 05/13/08	< 55	< 55	< 50	< 55	< 53	< 50	< 51
05/13/08 - 05/21/08	< 32	< 33	< 54	< 33	< 32	< 50	< 52
05/21/08 - 05/28/08	< 61	< 62	< 64	< 63	< 61	< 61	< 63
05/28/08 - 06/04/08	< 60	< 60	< 66	< 61	< 59	< 65	< 66
06/04/08 - 06/11/08	< 60	< 61	< 38	< 61	< 60	< 35	< 37
06/11/08 - 06/18/08	< 48	< 49	< 39	< 49	< 48	< 37	< 39
06/18/08 - 06/25/08	< 45	< 45	< 43	< 46	< 45	< 41	< 42
06/25/08 - 07/02/08	< 67	< 67	< 63	< 68	< 66	< 60	< 62
07/02/08 - 07/09/08	< 42	< 40	< 50	< 42	< 41	< 51	< 51
07/09/08 - 07/16/08	< 53	< 51	< 42	< 53	< 52	< 42	< 42
07/16/08 - 07/23/08	< 20	< 19	< 17	< 20	< 20	< 17	< 17
07/23/08 - 07/30/08	< 46	< 44	< 45	< 45	< 45	< 45	< 45
07/30/08 - 08/06/08	< 52	< 51	(1)	< 52	< 52	< 55	< 55
08/06/08 - 08/13/08	< 31	< 42	< 49	< 31	< 31	< 48	< 48
08/13/08 - 08/20/08	< 33	< 32	< 42	< 33	< 33	< 42	< 41
08/20/08 - 08/27/08	< 31	< 30	< 57	< 31	< 31	< 58	< 58
08/27/08 - 09/04/08	< 49	< 47	< 43	< 48	< 48	< 44	< 44
09/04/08 - 09/10/08	< 69	< 67	< 60	< 68	< 69	< 61	< 61
09/10/08 - 09/17/08	< 37	< 36	< 33	< 37	< 38	< 33	< 33
09/17/08 - 09/24/08	< 46	< 45	< 58	< 46	< 46	< 58	< 58
09/24/08 - 10/01/08	< 34	< 33	< 32	< 33	< 34	< 32	< 32
10/01/08 - 10/08/08	< 56	< 54	< 57	< 55	< 55	< 57	< 57
10/08/08 - 10/15/08	< 35	< 34	< 42	< 35	< 35	< 43	< 43
10/15/08 - 10/22/08	< 45	< 44	< 49	< 25	< 45	< 50	< 50
10/22/08 - 10/29/08	< 56	< 54	< 59	< 56	< 56	< 57	< 57
10/29/08 - 11/05/08	< 47	< 46	< 35	< 47	< 47	< 36	< 36
11/05/08 - 11/12/08	< 66	< 64	< 56	< 66	< 67	< 57	< 57
11/12/08 - 11/19/08	< 52	< 51	< 47	< 52	< 52	< 46	< 46
11/19/08 - 11/25/08	< 69	< 67	< 67	< 69	< 69	< 63	< 63
11/25/08 - 12/03/08	< 56	< 54	< 51	< 55	< 55	< 46	< 46
12/03/08 - 12/10/08	< 60	< 58	< 70	< 60	< 61	< 59	< 60
12/10/08 - 12/17/08	< 60	< 58	< 66	< 59	< 59	< 66	< 67
12/17/08 - 12/24/08	< 64	< 63	< 67	< 64	< 64	< 67	< 67
12/24/08 - 12/31/08	< 49	< 47	< 58	< 48	< 48	< 58	< 58
MEAN	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-IX.1 CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

	CONTROL FARM	INDICATOR FARM			
COLLECTION PERIOD	K15-3	D2-1	E2-2	F4-1	G2-1
01/09/08	< 1.0	< 0.6	< 0.7	< 0.6	< 0.8
02/06/08	< 0.7	< 0.5	< 0.7	< 0.5	< 0.7
03/05/08	< 0.6	< 0.8	< 0.6	< 0.6	< 0.6
03/19/08	< 0.6	< 0.4	< 0.5	< 0.6	< 0.6
04/02/08	< 0.7	< 0.6	< 0.8	< 0.5	< 0.7
04/16/08	< 0.6	< 0.7	< 0.9	< 0.6	< 0.8
04/30/08	< 0.5	< 0.5	< 0.6	< 0.6	< 0.6
05/14/08	< 0.7	< 0.7	< 0.9	< 0.6	< 0.7
05/28/08	< 0.4	< 0.6	< 0.4	< 0.6	< 0.4
06/11/08	< 0.8	< 0.7	< 0.7	< 0.7	< 0.6
06/25/08	< 0.6	< 0.7	< 0.7	< 0.8	< 0.8
07/09/08	< 0.8	< 0.7	< 0.8	< 0.6	< 0.9
07/23/08	< 0.8	< 0.6	< 0.7	< 0.6	< 0.7
08/06/08	< 0.5	< 0.6	< 0.7	< 0.6	< 0.6
08/20/08	< 0.8	< 0.8	< 0.8	< 0.7	< 0.8
09/03/08	< 0.9	< 0.7	< 0.7	< 0.8	< 0.8
09/17/08	< 0.5	< 0.5	< 0.6	< 0.5	< 0.6
10/01/08	< 0.8	< 0.8	< 0.8	< 0.7	< 0.9
10/15/08	< 0.8	< 0.8	< 0.8	< 0.8	< 0.9
10/29/08	< 0.7	< 0.7	< 0.7	< 0.7	< 0.8
11/12/08	< 0.9	< 0.7	< 0.9	< 0.7	< 0.8
11/25/08	< 0.9	< 0.7	< 0.7	< 0.8	< 0.8
12/10/08	< 0.8	< 0.7	< 0.7	< 0.6	< 0.8
MEAN	-	-	-	-	-

TABLE C-IX.2 CONCENTRATIONS OF STRONTIUM IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	CONTROL FARM K15-3		INDICATOR FARMS 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
01/09/08 - 03/19/08	< 3.6	0.6 ± 0.2	< 3.9	0.8 ± 0.3	< 3.9	1.1 ± 0.3	< 3.7	< 0.5	< 3.2	< 0.7
04/02/08 - 06/25/08	< 2.9	< 0.5	< 3.9	0.7 ± 0.4	< 3.1	0.6 ± 0.4	< 1.7	< 0.5	< 3.3	< 0.7
07/09/08 - 09/17/08	< 3.6	1.4 ± 0.5	< 4.6	0.9 ± 0.5	< 3.6	1.0 ± 0.5	< 3.5	1.1 ± 0.4	< 3.5	< 0.6
10/01/08 - 12/10/08	< 4.4	< 0.6	< 4.3	0.7 ± 0.5	< 3.5	< 0.7	< 4.8	1.0 ± 0.5	< 3.7	< 0.6
MEAN	-	1.0 ± 1.1	-	0.8 ± 0.2	-	0.9 ± 0.6	-	1.0 ± 0.2	-	-

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-IX.3 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
D2-1	01/09/08	1200 ± 109	< 4	< 4	< 20	< 6
	02/06/08	1320 ± 158	< 6	< 7	< 30	< 7
	03/05/08	1160 ± 118	< 4	< 5	< 18	< 5
	03/19/08	1310 ± 153	< 6	< 6	< 34	< 11
	04/02/08	1210 ± 157	< 5	< 6	< 26	< 6
	04/16/08	1300 ± 155	< 6	< 8	< 32	< 11
	04/30/08	1270 ± 146	< 6	< 7	< 28	< 8
	05/14/08	1310 ± 116	< 4	< 5	< 25	< 7
	05/28/08	1190 ± 144	< 6	< 8	< 45	< 12
	06/11/08	1310 ± 146	< 5	< 6	< 34	< 8
	06/25/08	1160 ± 141	< 4	< 5	< 29	< 10
	07/09/08	1330 ± 145	< 7	< 7	< 48	< 14
	07/23/08	1220 ± 146	< 5	< 7	< 39	< 12
	08/06/08	1300 ± 114	< 3	< 4	< 49	< 13
	08/20/08	1360 ± 146	< 5	< 6	< 33	< 10
	09/03/08	1340 ± 137	< 5	< 7	< 53	< 15
	09/17/08	1330 ± 119	< 4	< 5	< 23	< 6
	10/01/08	1300 ± 58	< 2	< 2	< 40	< 12
	10/15/08	1320 ± 126	< 6	< 6	< 60	< 13
	10/29/08	1220 ± 56	< 1	< 1	< 44	< 14
	11/12/08	1270 ± 54	< 1	< 1	< 56	< 14
	11/25/08	1340 ± 28	< 0	< 0	< 16	< 4
	12/10/08	1150 ± 113	< 4	< 4	< 22	< 6
	MEAN	1270 ± 132	-	-	-	-
E2-2	01/09/08	1220 ± 133	< 6	< 6	< 25	< 10
	02/06/08	1350 ± 166	< 6	< 8	< 31	< 7
	03/05/08	1380 ± 142	< 6	< 7	< 29	< 8
	03/19/08	1300 ± 139	< 6	< 7	< 31	< 10
	04/02/08	1130 ± 147	< 5	< 7	< 28	< 9
	04/16/08	1260 ± 146	< 6	< 7	< 30	< 12
	04/30/08	1160 ± 127	< 5	< 6	< 27	< 8
	05/14/08	1210 ± 153	< 6	< 7	< 45	< 14
	05/28/08	1280 ± 121	< 5	< 6	< 34	< 11
	06/11/08	1190 ± 137	< 5	< 6	< 26	< 7
	06/25/08	1360 ± 173	< 8	< 9	< 47	< 13
	07/09/08	1320 ± 151	< 5	< 5	< 33	< 13
	07/23/08	1130 ± 174	< 7	< 8	< 43	< 13
	08/06/08	1230 ± 89	< 3	< 3	< 47	< 12
	08/20/08	1330 ± 140	< 6	< 6	< 41	< 12
	09/03/08	1360 ± 136	< 3	< 3	< 29	< 10
	09/17/08	1290 ± 152	< 7	< 7	< 33	< 9
	10/01/08	1380 ± 60	< 2	< 2	< 45	< 15
	10/15/08	1340 ± 91	< 3	< 4	< 32	< 11
	10/29/08	1380 ± 52	< 1	< 1	< 39	< 13
	11/12/08	1230 ± 42	< 1	< 1	< 49	< 14
	11/25/08	1350 ± 34	< 1	< 1	< 28	< 7
	12/10/08	1370 ± 134	< 5	< 6	< 27	< 7
	MEAN	1285 ± 165	-	-	-	-

TABLE C-IX.3 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
F4-1	01/09/08	1460 ± 126	< 5	< 6	< 26	< 8
	02/06/08	1340 ± 165	< 6	< 7	< 28	< 12
	03/05/08	1240 ± 154	< 6	< 7	< 28	< 8
	03/19/08	1270 ± 119	< 4	< 5	< 24	< 7
	04/02/08	1310 ± 125	< 4	< 4	< 28	< 6
	04/16/08	1290 ± 170	< 5	< 7	< 28	< 12
	04/30/08	1230 ± 129	< 5	< 5	< 23	< 9
	05/14/08	1220 ± 112	< 5	< 5	< 34	< 11
	05/28/08	1150 ± 129	< 5	< 6	< 32	< 10
	06/11/08	1300 ± 127	< 5	< 6	< 28	< 9
	06/25/08	1340 ± 188	< 6	< 8	< 44	< 11
	07/09/08	1360 ± 148	< 5	< 7	< 40	< 10
	07/23/08	1330 ± 134	< 5	< 6	< 38	< 12
	08/06/08	1340 ± 80	< 3	< 3	< 44	< 13
	08/20/08	1300 ± 139	< 5	< 6	< 38	< 15
	09/03/08	1370 ± 111	< 2	< 3	< 29	< 10
	09/17/08	1270 ± 130	< 4	< 5	< 20	< 7
	10/01/08	1350 ± 52	< 2	< 2	< 49	< 14
	10/15/08	1360 ± 107	< 4	< 4	< 45	< 12
	10/29/08	1390 ± 48	< 1	< 1	< 38	< 12
	11/12/08	1350 ± 31	< 1	< 1	< 49	< 14
	11/25/08	1360 ± 54	< 1	< 1	< 42	< 14
	12/10/08	1570 ± 224	< 8	< 10	< 43	< 7
	MEAN	1326 ± 169	-	-	-	-
G2-1	01/09/08	1080 ± 114	< 5	< 6	< 23	< 7
	02/06/08	1140 ± 138	< 7	< 7	< 32	< 9
	03/05/08	1120 ± 113	< 5	< 6	< 27	< 9
	03/19/08	1380 ± 158	< 5	< 6	< 36	< 8
	04/02/08	1220 ± 154	< 7	< 8	< 30	< 8
	04/16/08	989 ± 133	< 6	< 7	< 30	< 10
	04/30/08	1360 ± 125	< 4	< 5	< 22	< 7
	05/14/08	1370 ± 144	< 4	< 6	< 39	< 10
	05/28/08	1030 ± 116	< 5	< 5	< 39	< 10
	06/11/08	1290 ± 155	< 6	< 7	< 33	< 8
	06/25/08	1110 ± 150	< 6	< 8	< 45	< 13
	07/09/08	1310 ± 159	< 5	< 6	< 38	< 9
	07/23/08	1240 ± 118	< 5	< 6	< 39	< 13
	08/06/08	627 ± 86	< 3	< 3	< 36	< 14
	08/20/08	850 ± 125	< 6	< 7	< 50	< 13
	09/03/08	1370 ± 129	< 2	< 3	< 27	< 7
	09/17/08	1470 ± 151	< 8	< 8	< 47	< 12
	10/01/08	978 ± 48	< 2	< 2	< 46	< 14
	10/15/08	963 ± 75	< 3	< 3	< 34	< 9
	10/29/08	1030 ± 49	< 1	< 1	< 36	< 10
	11/12/08	1040 ± 45	< 1	< 1	< 55	< 15
	11/25/08	1190 ± 28	< 0	< 0	< 16	< 4
	12/10/08	1120 ± 106	< 4	< 5	< 22	< 7
	MEAN	1142 ± 395	-	-	-	-

TABLE C-IX.3 **CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
K15-3	01/09/08	1400 ± 148	< 6	< 7	< 27	< 8
	02/06/08	1560 ± 180	< 7	< 7	< 31	< 11
	03/05/08	1380 ± 140	< 6	< 7	< 29	< 8
	03/19/08	1300 ± 128	< 5	< 6	< 26	< 9
	04/02/08	1280 ± 163	< 6	< 7	< 33	< 11
	04/16/08	1330 ± 154	< 6	< 7	< 27	< 8
	04/30/08	1320 ± 143	< 5	< 5	< 28	< 6
	05/14/08	1400 ± 132	< 5	< 5	< 39	< 12
	05/28/08	1510 ± 155	< 7	< 8	< 46	< 12
	06/11/08	1270 ± 157	< 6	< 7	< 31	< 11
	06/25/08	1340 ± 178	< 6	< 7	< 42	< 9
	07/09/08	1260 ± 166	< 6	< 7	< 46	< 13
	07/23/08	1370 ± 155	< 6	< 6	< 44	< 14
	08/06/08	1330 ± 91	< 3	< 3	< 51	< 15
	08/20/08	1330 ± 139	< 6	< 6	< 40	< 12
	09/03/08	1260 ± 136	< 3	< 3	< 37	< 7
	09/17/08	1280 ± 161	< 6	< 8	< 33	< 11
	10/01/08	1280 ± 52	< 2	< 2	< 50	< 14
	10/15/08	1390 ± 107	< 4	< 5	< 42	< 14
	10/29/08	1370 ± 53	< 1	< 1	< 43	< 12
	11/12/08	1300 ± 28	< 1	< 1	< 52	< 14
	11/25/08	1320 ± 42	< 1	< 1	< 46	< 11
	12/10/08	1210 ± 131	< 5	< 6	< 26	< 7
	MEAN	1339 ± 160	-	-	-	-

TABLE C-X.1

CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD		SR-90	Be-7	K-40	I-131	Cs-134	Cs-137
B10-2	07/18/08	Eggplant Leaves	18 ± 1	759 ± 76	7090 ± 205	< 20	< 6	< 7
	07/18/08	Squash Leaves	29 ± 2	823 ± 70	3840 ± 163	< 17	< 6	< 7
	07/18/08	Zucchini Leaves	32 ± 2	314 ± 52	3060 ± 140	< 18	< 5	< 6
	07/30/08	Cabbage	6 ± 2	< 63	2730 ± 146	< 53	< 6	< 6
	08/12/08	Red Beets		< 50	3590 ± 144	< 29	< 5	< 5
	08/12/08	Sweet Corn		< 35	1600 ± 84	< 22	< 3	< 3
	08/12/08	Tomatoes		< 45	2220 ± 102	< 30	< 4	< 4
	08/22/08	Cabbage	11 ± 3	< 57	2990 ± 127	< 32	< 5	< 6
	08/22/08	Eggplant Leaves	46 ± 8	1100 ± 89	5330 ± 184	< 34	< 6	< 7
	08/22/08	Zucchini Leaves	67 ± 2	366 ± 58	3280 ± 130	< 30	< 5	< 6
	09/24/08	Broccoli Leaves	30 ± 2	< 40	2040 ± 107	< 48	< 3	< 10
	09/24/08	Cabbage	11 ± 1	< 30	1950 ± 90	< 36	< 2	< 3
	09/24/08	Turnip Greens	24 ± 2	< 39	4150 ± 152	< 42	< 3	< 3
	MEAN		27 ± 36	672 ± 660	3375 ± 3025	-	-	-

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-X.1

CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD		SR-90	Be-7	K-40	I-131	Cs-134	Cs-137
E1-2	07/30/08	Cabbage	11 ± 2	85 ± 61	3780 ± 142	< 52	< 5	< 6
	08/12/08	Red Beets		< 56	4880 ± 165	< 34	< 5	< 6
	08/12/08	Sweet Corn		< 46	2120 ± 112	< 27	< 4	< 5
	08/12/08	Tomatoes		< 50	2500 ± 114	< 31	< 5	< 5
	MEAN		11 ± 0	85 ± 0	3320 ± 2519	-	-	-
H1-2	07/18/08	Eggplant Leaves	18 ± 2	362 ± 37	6080 ± 131	< 11	< 4	< 4
	07/18/08	Squash Leaves	36 ± 2	757 ± 63	2400 ± 133	< 17	< 6	< 6
	07/18/08	Zucchini Leaves	42 ± 2	730 ± 63	5260 ± 159	< 16	< 5	< 6
	08/22/08	Cabbage	36 ± 2	718 ± 96	5700 ± 232	< 49	< 10	< 10
	08/22/08	Eggplant Leaves	18 ± 1	< 85	4630 ± 201	< 40	< 8	< 9
	08/22/08	Zucchini Leaves	27 ± 10	797 ± 105	2730 ± 199	< 47	< 9	< 9
	09/24/08	Cabbage	13 ± 1	< 35	1520 ± 101	< 51	< 3	< 3
	09/24/08	Eggplant Leaves	45 ± 2	1860 ± 134	2530 ± 178	< 55	< 4	< 4
	09/24/08	Turnip Greens	36 ± 3	194 ± 47	3220 ± 115	< 36	< 2	< 3
	MEAN		30 ± 23	774 ± 1062	3786 ± 3308	-	-	-

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-XI.1 QUARTERLY TLD RESULTS FOR THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF MILLI-ROENTGENS/STD. MONTH

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
A1-4	4.1 ± 1.0	3.6 ± 0.2	4.6 ± 0.4	3.7 ± 0.2	4.4 ± 0.7
A3-1	4.6 ± 1.2	4.1 ± 0.4	5.2 ± 0.5	4.1 ± 0.2	5.0 ± 0.2
A5-1	5.0 ± 1.1	4.6 ± 0.3	5.7 ± 0.4	4.5 ± 0.7	5.3 ± 0.3
A9-3	4.2 ± 0.8	3.7 ± 0.3	4.7 ± 0.4	4.0 ± 0.4	4.2 ± 0.4
B1-1	4.2 ± 1.0	3.8 ± 0.4	4.9 ± 0.6	3.9 ± 0.4	4.3 ± 0.4
B1-2	4.4 ± 0.8	4.0 ± 0.4	4.9 ± 0.6	4.4 ± 0.5	4.2 ± 0.5
B2-1	4.4 ± 0.6	4.0 ± 0.8	4.6 ± 0.4	4.6 ± 0.5	4.5 ± 0.3
B5-1	5.1 ± 1.4	4.1 ± 0.3	5.5 ± 0.3	5.4 ± 0.7	5.5 ± 0.6
B10-1	4.8 ± 1.1	4.0 ± 0.3	5.2 ± 0.8	4.9 ± 0.3	5.0 ± 0.6
C1-1	4.9 ± 1.1	4.1 ± 0.5	5.3 ± 0.3	5.2 ± 1.2	5.0 ± 0.6
C1-2	4.3 ± 0.7	3.8 ± 0.4	4.7 ± 0.6	4.3 ± 0.8	4.4 ± 0.2
C2-1	4.9 ± 0.8	4.3 ± 0.1	5.1 ± 0.5	4.9 ± 0.5	5.2 ± 0.5
C5-1	5.5 ± 0.7	5.2 ± 0.4	6.0 ± 0.3	5.3 ± 0.4	5.4 ± 0.3
C8-1	5.6 ± 0.7	5.1 ± 0.2	5.7 ± 0.5	5.9 ± 1.2	5.5 ± 0.4
D1-1	4.3 ± 0.6	3.9 ± 0.4	4.3 ± 0.2	4.2 ± 1.0	4.6 ± 0.4
D1-2	4.9 ± 0.9	4.6 ± 0.7	5.5 ± 0.2	4.9 ± 0.3	4.5 ± 0.2
D2-2	6.1 ± 0.6	5.6 ± 0.6	6.3 ± 0.5	6.1 ± 0.6	6.2 ± 0.6
D6-1	6.0 ± 0.9	5.5 ± 0.3	6.6 ± 0.8	5.9 ± 0.3	5.8 ± 0.8
D15-1	5.1 ± 0.9	4.9 ± 0.5	5.7 ± 0.6	4.7 ± 0.4	5.1 ± 0.5
E1-2	4.4 ± 1.0	4.2 ± 0.5	5.1 ± 0.4	4.0 ± 0.3	4.4 ± 0.8
E1-4	4.2 ± 1.1	4.0 ± 0.6	4.7 ± 0.6	3.5 ± 0.3	4.5 ± 0.4
E2-3	5.5 ± 0.9	5.4 ± 0.6	6.1 ± 0.7	5.0 ± 0.4	5.3 ± 1.0
E5-1	4.7 ± 1.0	4.5 ± 0.4	5.4 ± 0.7	4.2 ± 0.4	4.8 ± 0.9
E7-1	5.1 ± 0.6	4.9 ± 0.3	5.4 ± 0.4	4.7 ± 0.8	5.2 ± 0.8
F1-1	4.6 ± 0.8	4.5 ± 0.5	5.1 ± 0.2	4.2 ± 0.7	4.7 ± 0.6
F1-2	4.4 ± 0.8	4.3 ± 0.7	4.9 ± 0.4	3.9 ± 0.4	4.5 ± 0.6
F1-4	4.1 ± 0.9	3.8 ± 0.5	4.6 ± 0.5	3.7 ± 0.5	4.4 ± 0.3
F10-1	6.2 ± 0.7	6.3 ± 0.4	6.5 ± 0.4	5.7 ± 0.5	6.4 ± 0.4
F2-1	5.4 ± 0.7	5.2 ± 0.5	5.8 ± 0.3	5.0 ± 0.5	5.5 ± 0.4
F5-1	5.6 ± 0.3	5.7 ± 0.7	5.8 ± 0.5	5.4 ± 0.7	5.6 ± 0.3
F25-1	5.4 ± 0.5	5.3 ± 0.4	5.7 ± 0.4	5.1 ± 0.6	5.3 ± 0.4
G1-2	5.0 ± 0.4	4.9 ± 0.7	5.2 ± 0.3	4.7 ± 0.6	5.1 ± 0.2
G1-3	4.2 ± 0.7	4.1 ± 0.6	4.5 ± 0.4	3.7 ± 0.5	4.4 ± 0.2
G1-5	4.4 ± 0.9	4.3 ± 0.5	4.8 ± 0.5	3.8 ± 0.3	4.7 ± 0.3
G1-6	4.5 ± 0.6	4.4 ± 0.5	4.8 ± 0.5	4.1 ± 0.2	4.6 ± 0.1
G2-4	6.1 ± 0.4	6.1 ± 0.7	6.4 ± 0.4	5.9 ± 0.9	6.0 ± 0.5
G5-1	4.7 ± 0.8	4.6 ± 0.7	4.8 ± 0.4	4.2 ± 0.6	5.2 ± 0.5
G10-1	6.9 ± 0.8	6.7 ± 0.8	7.4 ± 0.4	6.5 ± 0.6	7.1 ± 0.8
G15-1	5.8 ± 1.0	5.7 ± 1.1	6.3 ± 0.5	5.2 ± 0.6	6.1 ± 0.3
H1-1	4.7 ± 0.9	4.5 ± 0.7	5.2 ± 0.2	4.2 ± 0.4	4.9 ± 0.6
H3-1	4.0 ± 0.5	3.8 ± 0.7	4.3 ± 0.3	3.7 ± 0.5	4.0 ± 0.4
H5-1	3.9 ± 0.3	3.8 ± 1.0	4.1 ± 0.2	3.8 ± 0.7	3.8 ± 0.3
H8-1	8.0 ± 1.3	7.6 ± 1.1	8.1 ± 0.9	9 ± 0.8	7.4 ± 0.3
H15-1	5.8 ± 0.7	5.8 ± 0.6	6.0 ± 0.4	6.0 ± 0.4	5.3 ± 0.2
J1-1	4.6 ± 0.2	4.5 ± 0.7	4.7 ± 0.3	4.6 ± 0.3	4.5 ± 0.4

TABLE C-XI.1 QUARTERLY TLD RESULTS FOR THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF MILLI-ROENTGENS/STD. MONTH

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
J1-3	4.1 ± 0.7	3.7 ± 0.6	4.5 ± 0.7	4.0 ± 0.9	4.0 ± 0.3
J3-1	5.0 ± 0.6	4.7 ± 0.6	5.0 ± 0.4	5.4 ± 0.3	4.9 ± 0.4
J5-1	5.8 ± 0.4	5.6 ± 0.6	5.9 ± 0.3	6.1 ± 0.4	5.7 ± 0.3
J7-1	5.9 ± 0.5	5.8 ± 0.8	6.0 ± 0.3	6.2 ± 0.3	5.6 ± 0.2
J15-1	6.1 ± 0.5	5.8 ± 0.5	6.2 ± 0.6	6.3 ± 0.6	5.9 ± 0.6
K1-4	4.6 ± 0.4	4.3 ± 0.4	4.7 ± 0.3	4.6 ± 0.2	4.7 ± 0.6
K2-1	5.8 ± 0.6	5.4 ± 0.5	6.0 ± 0.6	5.9 ± 0.5	(1)
K3-1	4.4 ± 0.6	4.2 ± 0.5	4.7 ± 0.2	4.7 ± 0.7	4.1 ± 0.4
K5-1	5.6 ± 0.4	5.4 ± 0.9	5.8 ± 0.5	5.8 ± 0.2	5.5 ± 1.7
K8-1	5.3 ± 1.0	4.9 ± 0.6	5.7 ± 0.5	5.8 ± 1.1	4.8 ± 0.4
K15-1	5.0 ± 1.0	4.5 ± 0.4	5.3 ± 0.5	5.5 ± 0.4	4.6 ± 0.7
L1-1	4.7 ± 0.6	4.6 ± 0.7	5.1 ± 0.3	4.6 ± 0.5	4.4 ± 0.3
L1-2	4.3 ± 0.3	4.1 ± 0.6	4.4 ± 0.3	4.4 ± 0.7	(1)
L2-1	5.0 ± 0.7	4.5 ± 0.4	5.2 ± 0.5	5.2 ± 1.0	4.9 ± 0.3
L5-1	4.4 ± 0.8	3.8 ± 0.3	4.6 ± 0.3	4.7 ± 0.7	4.4 ± 0.4
L8-1	5.0 ± 1.3	4.2 ± 0.2	5.5 ± 0.4	5.5 ± 0.2	4.8 ± 0.3
L15-1	5.0 ± 0.9	4.4 ± 0.5	5.0 ± 0.3	5.4 ± 0.6	5.3 ± 0.3
M1-1	4.3 ± 0.6	4.0 ± 0.4	4.5 ± 0.3	4.6 ± 0.3	4.2 ± 0.3
M1-2	5.0 ± 1.0	4.5 ± 0.5	4.9 ± 0.2	5.5 ± 0.4	(1)
M2-1	4.1 ± 0.7	3.6 ± 0.6	4.1 ± 0.2	4.4 ± 0.2	4.1 ± 0.3
M5-1	4.9 ± 0.8	4.3 ± 0.3	4.9 ± 0.4	5.3 ± 0.7	4.9 ± 0.6
M9-1	6.0 ± 0.4	5.7 ± 0.9	6.0 ± 0.5	6.2 ± 0.5	6.0 ± 0.4
N1-1	4.9 ± 1.0	4.4 ± 0.3	5.0 ± 1.0	5.4 ± 0.4	(1)
N1-3	4.5 ± 0.5	4.3 ± 0.5	4.6 ± 0.6	4.7 ± 0.5	4.2 ± 0.5
N2-1	5.0 ± 0.8	4.5 ± 0.3	5.4 ± 0.8	5.1 ± 1.0	4.8 ± 0.3
N5-1	4.2 ± 0.6	3.9 ± 0.6	4.3 ± 0.5	4.6 ± 0.2	4.1 ± 0.3
N8-1	5.4 ± 1.0	4.7 ± 0.3	5.5 ± 0.5	5.9 ± 0.3	5.3 ± 0.4
N15-2	5.7 ± 1.1	5.2 ± 0.4	5.7 ± 0.5	6.4 ± 0.4	5.4 ± 0.4
P1-1	4.7 ± 1.6	4.0 ± 0.3	4.6 ± 0.7	5.6 ± 0.6	(1)
P1-2	4.6 ± 0.4	4.7 ± 0.4	4.8 ± 0.4	4.6 ± 1.3	4.3 ± 0.3
P2-1	5.9 ± 1.1	5.4 ± 0.6	5.8 ± 0.3	6.7 ± 1.0	5.6 ± 0.4
P5-1	5.2 ± 0.6	5.0 ± 0.9	5.1 ± 0.2	5.6 ± 0.4	4.9 ± 0.3
P8-1	4.4 ± 1.1	3.8 ± 0.3	4.8 ± 0.4	4.8 ± 1.8	4.0 ± 0.5
Q1-1	5.0 ± 2.1	4.0 ± 0.4	5.0 ± 0.4	6.1 ± 1.4	(1)
Q1-2	3.9 ± 0.5	3.6 ± 0.4	3.9 ± 0.4	4.2 ± 0.4	3.9 ± 0.7
Q2-1	4.5 ± 1.1	3.9 ± 0.3	4.7 ± 0.4	5.2 ± 0.5	4.2 ± 0.3
Q5-1	4.5 ± 0.9	4.1 ± 0.4	5.0 ± 0.8	4.8 ± 0.5	4.2 ± 0.3
Q9-1	4.8 ± 0.9	4.3 ± 0.4	4.8 ± 0.5	5.4 ± 0.5	4.6 ± 0.6
Q15-1	5.4 ± 1.1	4.8 ± 0.4	5.6 ± 0.7	6.0 ± 0.5	5.1 ± 0.7
R1-1	3.9 ± 0.7	3.9 ± 0.3	4.3 ± 0.4	3.5 ± 0.5	4.0 ± 0.5
R1-2	4.0 ± 0.9	3.9 ± 0.4	4.5 ± 0.3	3.6 ± 0.6	(1)
R3-1	5.3 ± 0.9	5.1 ± 0.2	5.7 ± 0.5	4.8 ± 0.5	5.7 ± 0.6
R5-1	5.1 ± 0.8	5.0 ± 0.6	5.6 ± 0.5	4.7 ± 0.2	5.2 ± 0.1
R9-1	5.1 ± 0.7	5.1 ± 0.7	5.5 ± 0.3	4.9 ± 0.3	4.7 ± 0.5
R15-1	4.7 ± 0.8	4.6 ± 0.8	5.2 ± 0.5	4.3 ± 0.7	4.6 ± 0.3

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-XI.2 MEAN QUARTERLY TLD RESULTS FOR THE SITE BOUNDARY, INDICATOR AND CONTROL LOCATIONS FOR THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF MILLI-ROENTGENS/MONTH ± 2 STANDARD DEVIATIONS OF THE STATION DATA

COLLECTION PERIOD	SITE BOUNDARY ± 2 S.D.	INDICATOR	CONTROL
JAN-MAR	4.1 ± 0.7	4.7 ± 1.5	5.2 ± 1.4
APR-JUN	4.7 ± 0.6	5.3 ± 1.4	5.8 ± 1.3
JUL-SEP	4.1 ± 0.8	5.1 ± 1.7	5.6 ± 1.4
OCT-DEC	4.4 ± 0.5	5.0 ± 1.4	5.4 ± 1.4

TABLE C-XI.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MONTH

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.	PRE-OP MEAN ± 2 S.D.
SITE BOUNDARY	76	3.5	5.2	4.3 ± 0.8	4.8 ± 1.5
INDICATOR	233	3.6	8.9	5.0 ± 1.6	5.2 ± 1.5
CONTROL	44	4.3	7.4	5.5 ± 1.4	5.8 ± 1.7

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

INDICATOR STATIONS - A3-1, A5-1, A9-3, B1-1, B10-1, B2-1, B5-1, C1-1, C2-1, C5-1, C8-1, D1-2, D2-2, D6-1, E1-2, E2-3, E5-1, E7-1, F1-1, F10-1, F2-1, F5-1, G1-2, G2-4, G5-1, H3-1, H5-1, H8-1, J1-1, 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

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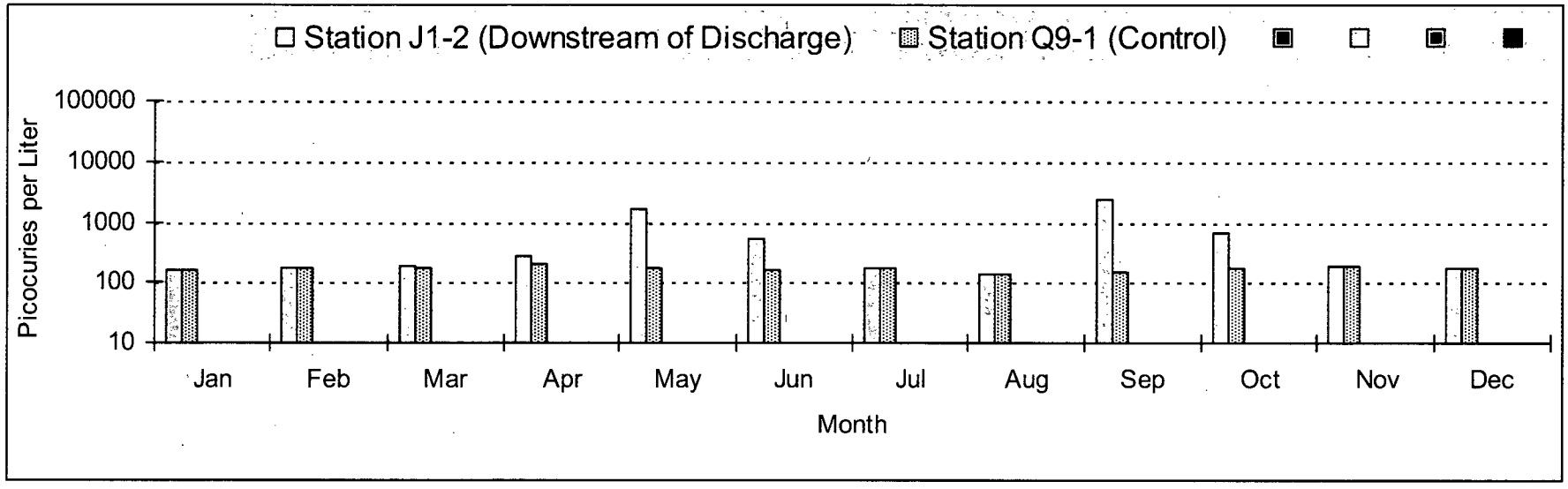
FIGURE C-1
Monthly Tritium Concentrations in Surface Water and Effluent Water
Three Mile Island Nuclear Station, 2008



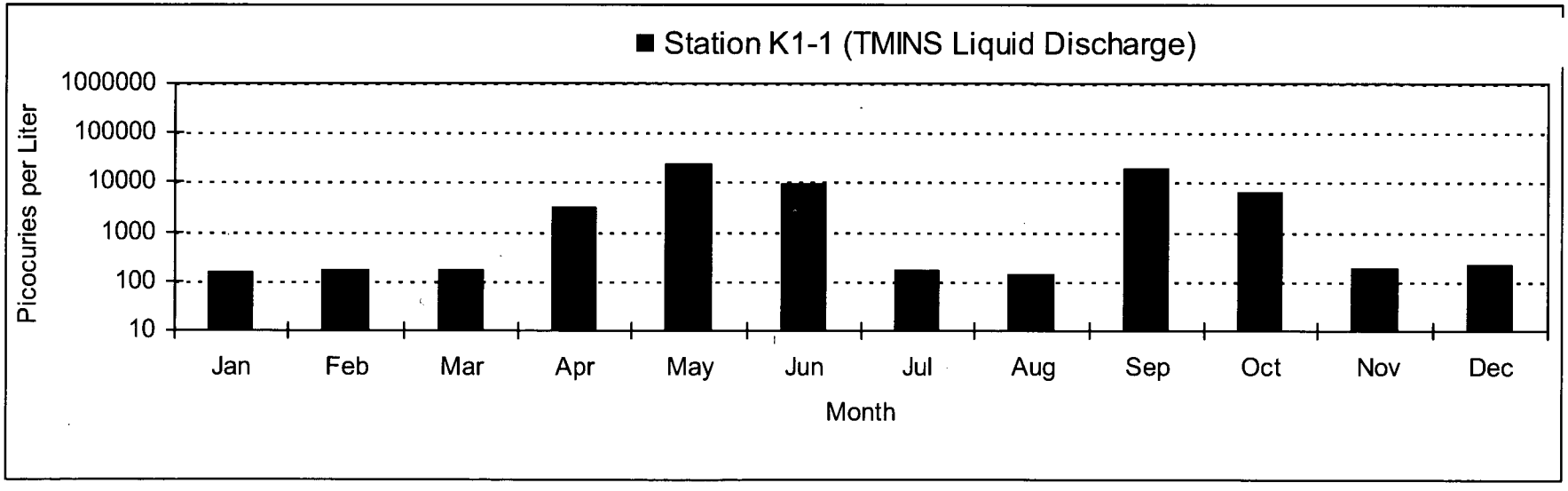


FIGURE C-2
Mean Quarterly Tritium Concentrations in Surface Water
Three Mile Island Nuclear Station, 1974 - 2008

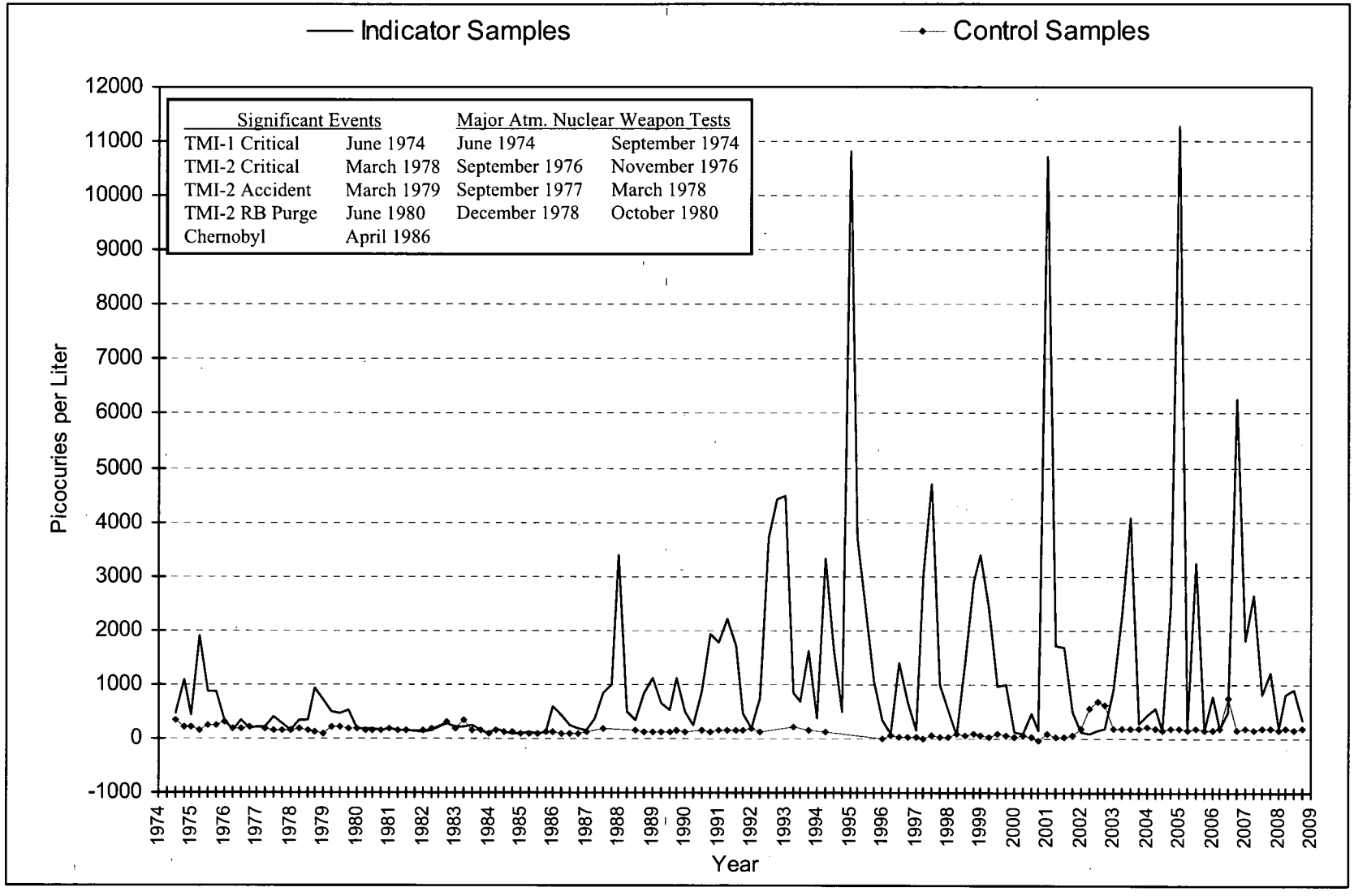


FIGURE C-3
Mean Monthly Gross Beta Concentrations in Drinking Water
Three Mile Island Nuclear Station, 2008

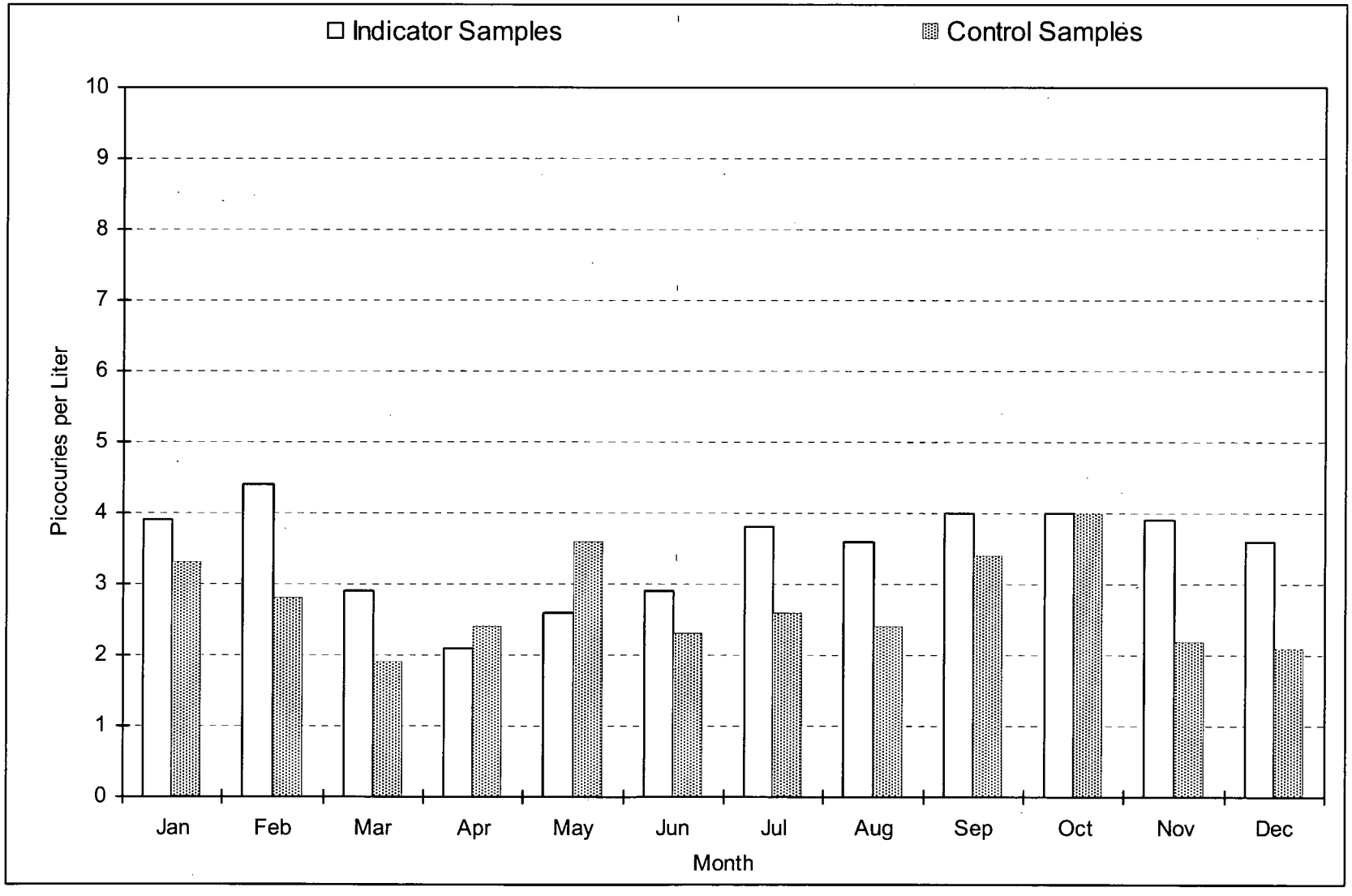
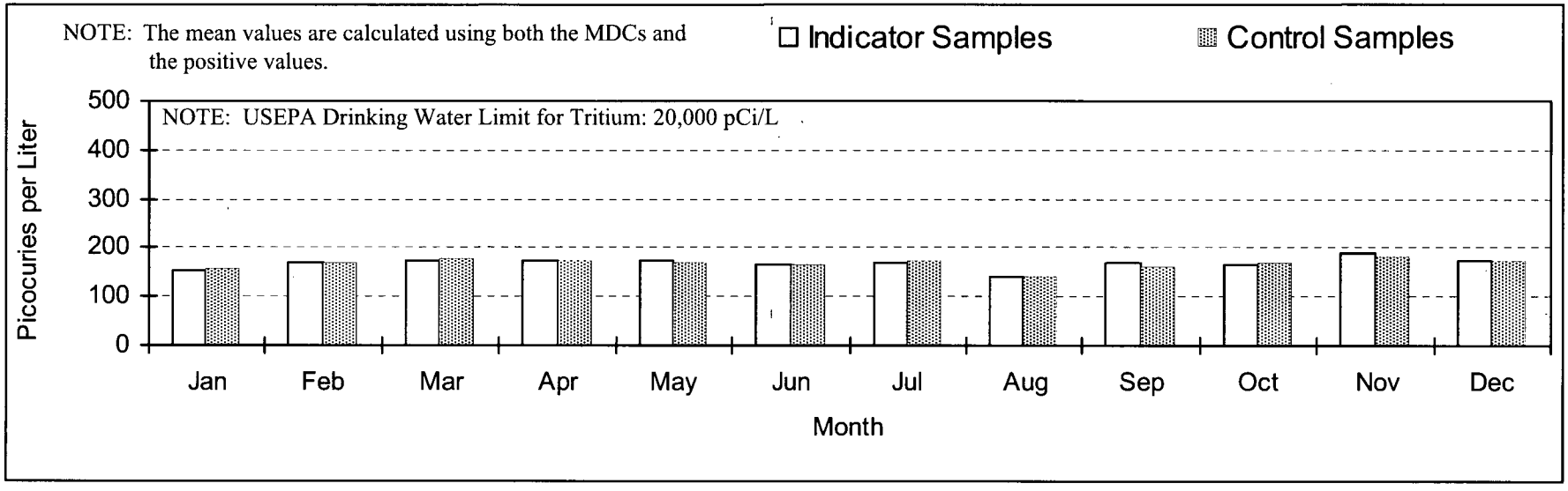


FIGURE C-4

Mean Monthly Tritium Concentrations in Drinking Water and Effluent Water

Three Mile Island Nuclear Station, 2008



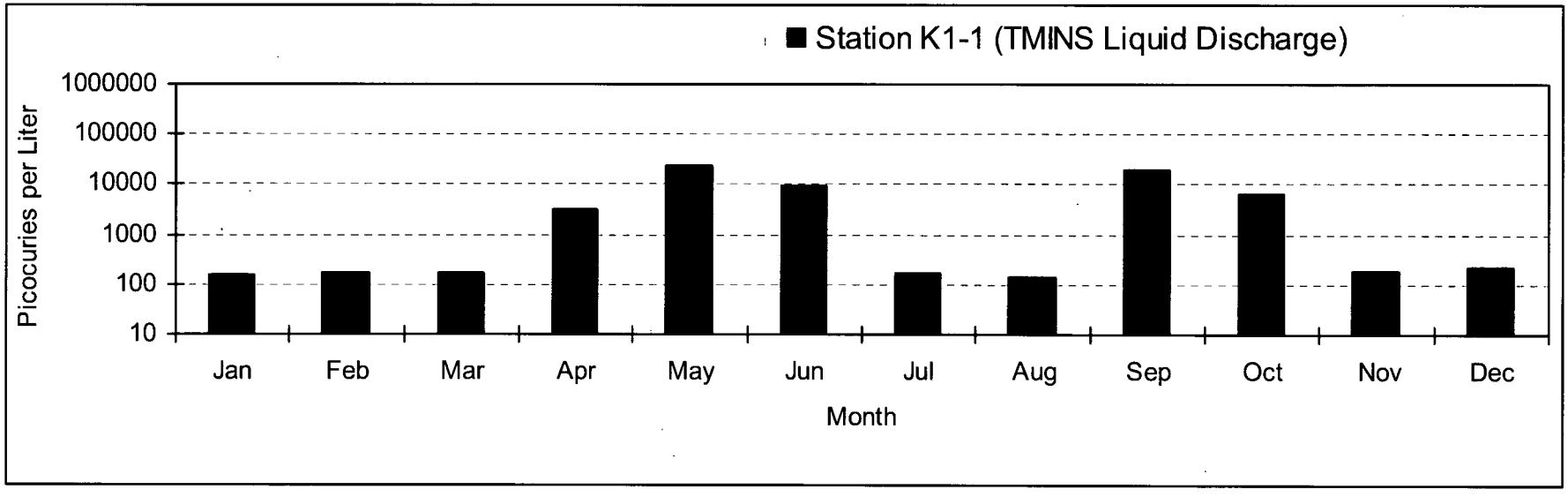


FIGURE C-5
Mean Cesium-137 Concentrations in Aquatic Sediments
Three Mile Island Nuclear Station, 1984 - 2008

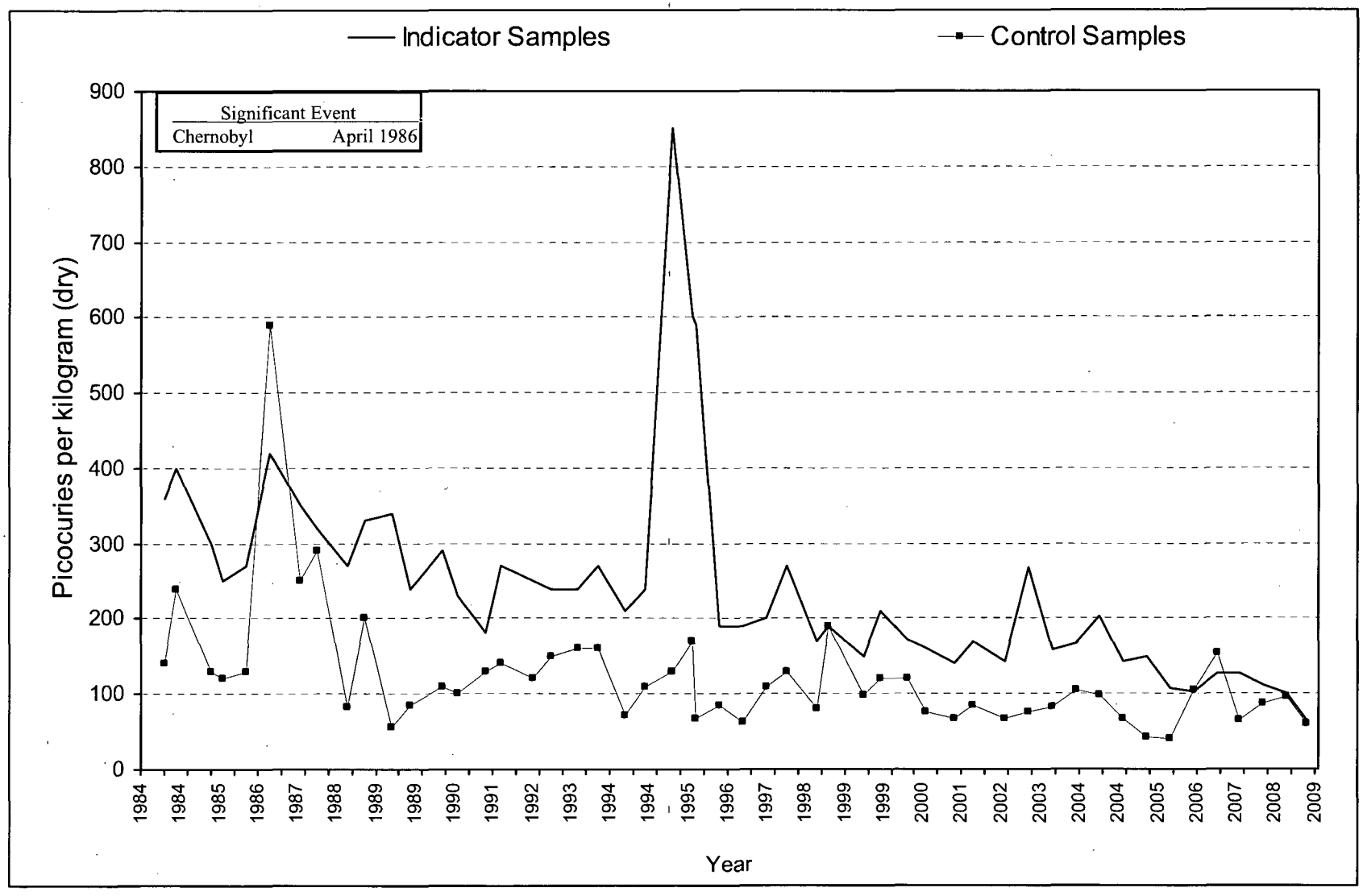


FIGURE C-6
Mean Quarterly Gross Beta Concentrations in Air Particulates
Three Mile Island Nuclear Station, 1972 - 2008

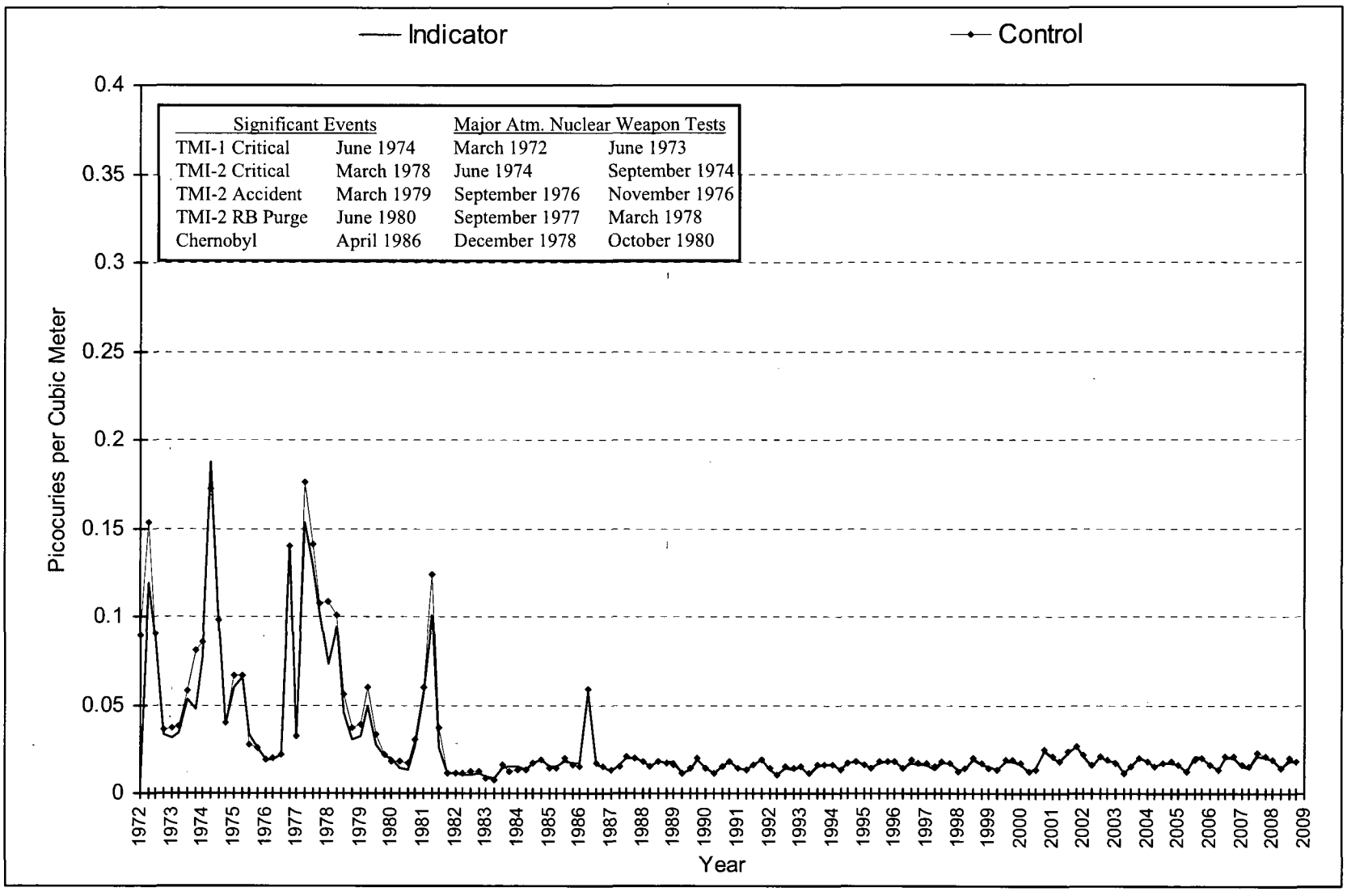


FIGURE C-7
Mean Weekly Gross Beta Concentrations in Air Particulates
Three Mile Island Nuclear Station, 2008

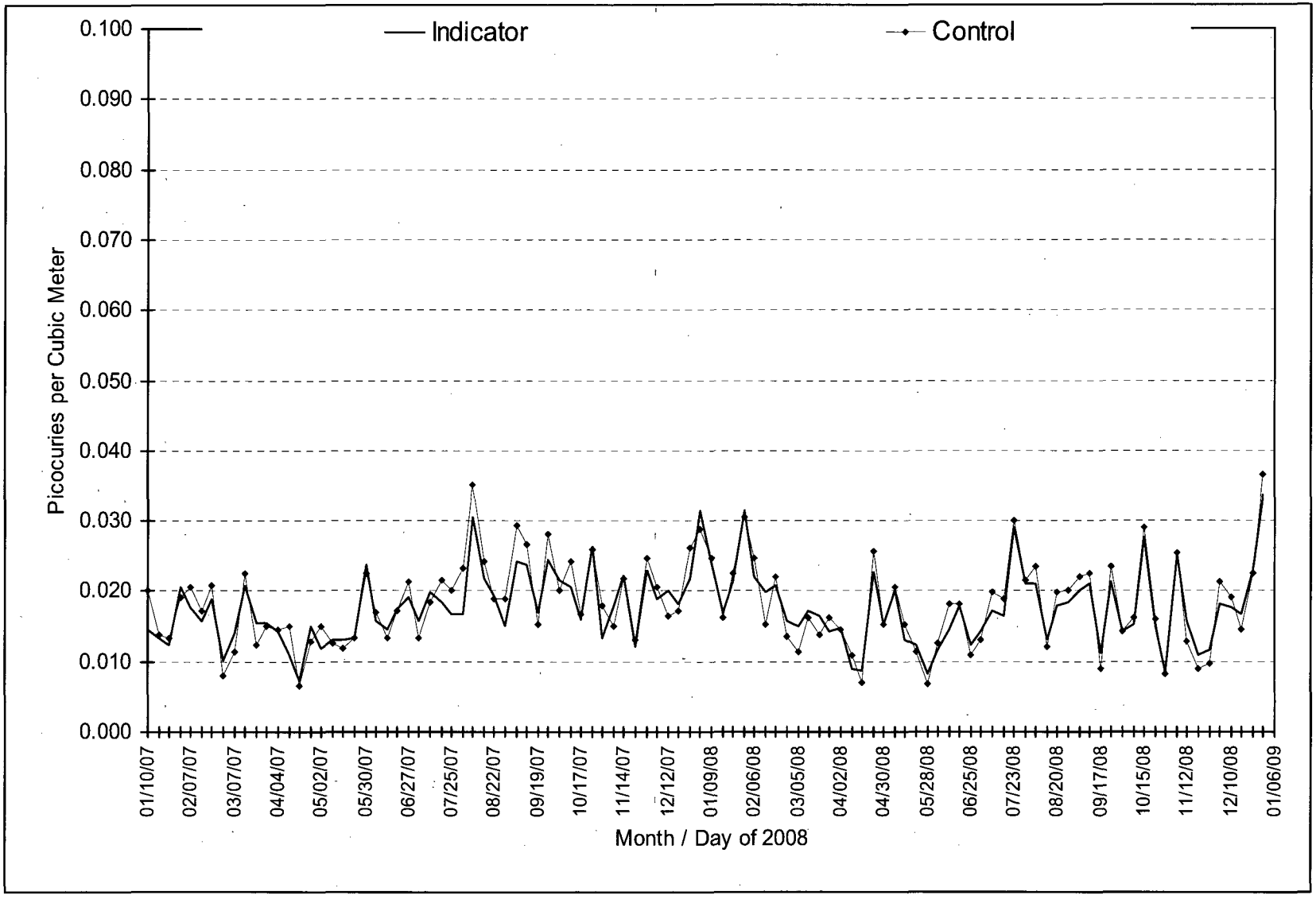


FIGURE C-8
Mean Quarterly Strontium-90 Concentrations in Cow Milk
Three Mile Island Nuclear Station, 1979 - 2008

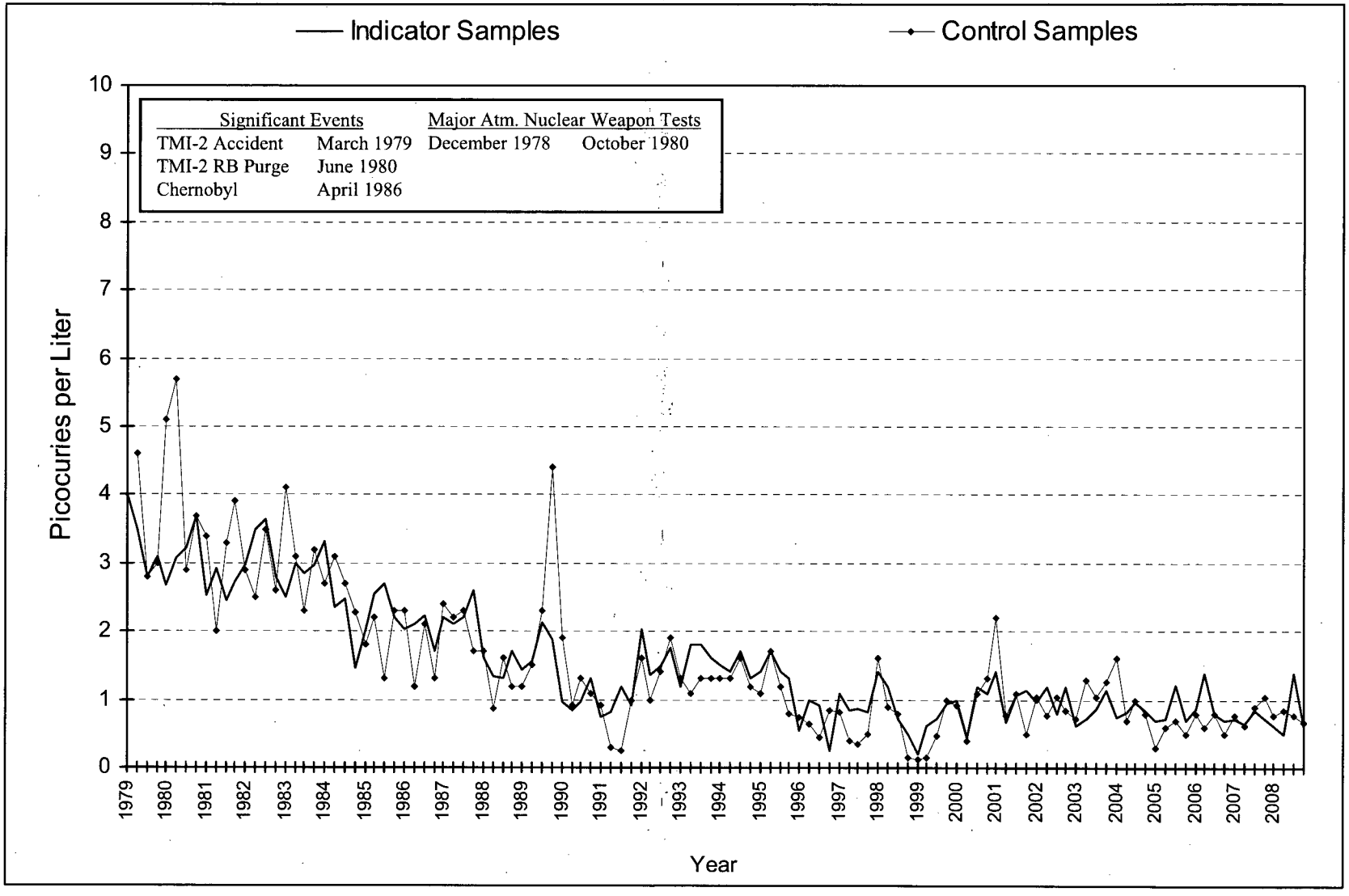
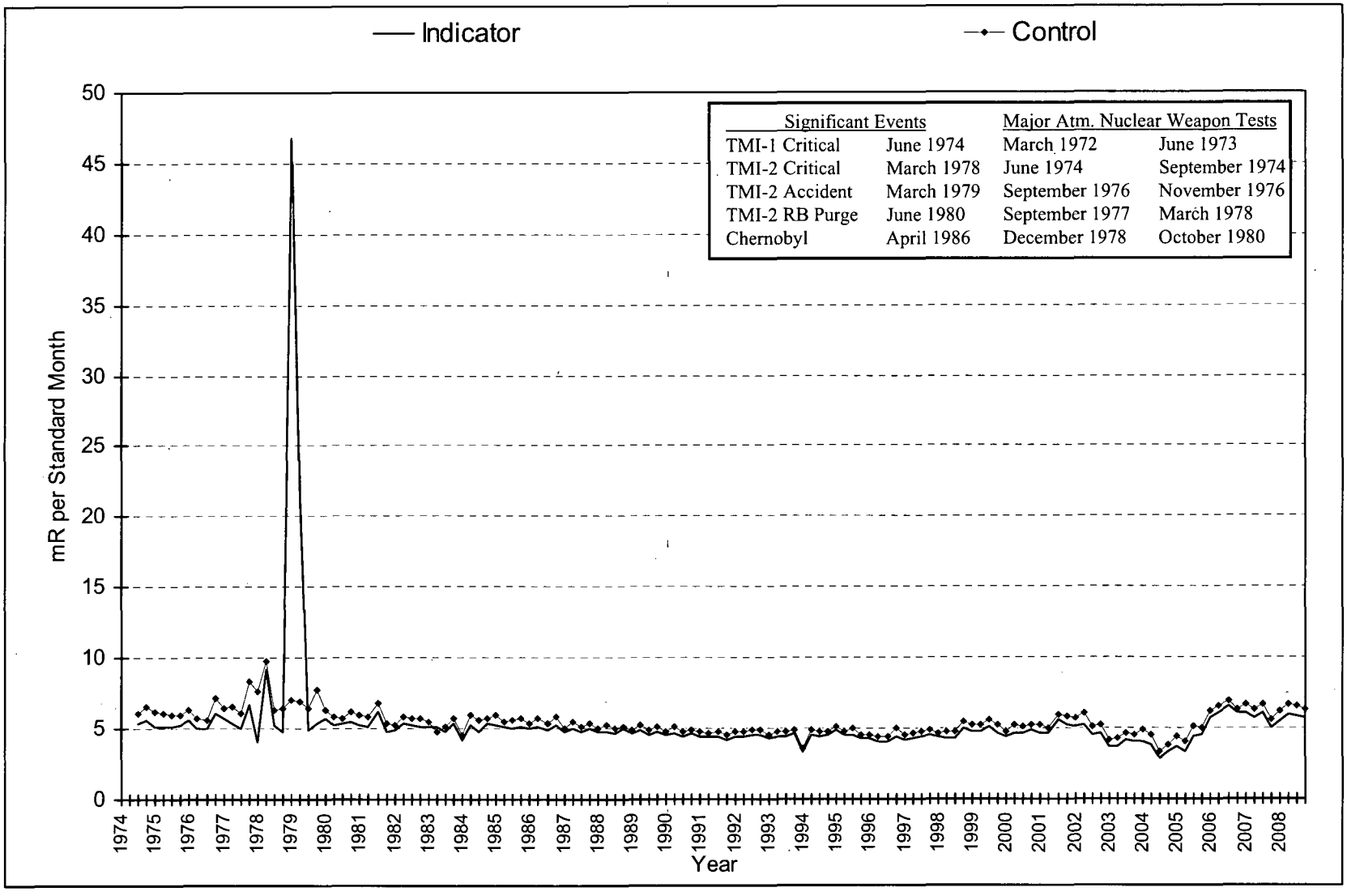


FIGURE C-9
Mean Quarterly Gamma Exposure Rates
Three Mile Island Nuclear Station, 1974 - 2008



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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, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q9-1Q
12/31/07 - 01/29/08	< 1.7
01/29/08 - 02/26/08	< 1.8
02/26/08 - 04/01/08	1.6 ± 0.6
04/01/08 - 04/29/08	0.8 ± 0.4
04/29/08 - 06/03/08	1.9 ± 1.0
06/03/08 - 07/01/08	0.9 ± 0.5
07/01/08 - 07/29/08	< 1.0
07/29/08 - 09/03/08	1.0 ± 0.6
09/03/08 - 09/30/08	3.0 ± 1.1
09/30/08 - 10/28/08	< 3.6
10/28/08 - 12/02/08	< 1.9
12/02/08 - 12/30/08	2.0 ± 0.9
MEAN	1.9 ± 2.1

TABLE D-I.2 **CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q9-1Q
12/31/07 - 01/29/08	< 155
01/29/08 - 02/26/08	< 177
02/26/08 - 04/01/08	< 180
04/01/08 - 04/29/08	< 158
04/29/08 - 06/03/08	< 167
06/03/08 - 07/01/08	< 171
07/01/08 - 07/29/08	< 142
07/29/08 - 09/03/08	< 152
09/03/08 - 09/30/08	< 161
09/30/08 - 10/28/08	< 160
10/28/08 - 12/02/08	< 152
12/02/08 - 12/30/08	< 132
MEAN	-

TABLE D-I.3 **CONCENTRATIONS OF IODINE-131 IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q9-1Q
12/31/07 - 01/29/08	< 0.1
01/29/08 - 02/26/08	< 0.1
02/26/08 - 04/01/08	< 0.2
04/01/08 - 04/29/08	< 0.2
04/29/08 - 06/03/08	< 0.4
06/03/08 - 07/01/08	< 0.4
07/01/08 - 07/29/08	< 0.3
07/29/08 - 09/03/08	< 0.4
09/03/08 - 09/30/08	< 0.4
09/30/08 - 10/28/08	< 0.4
10/28/08 - 12/02/08	< 0.3
12/02/08 - 12/30/08	< 0.4
MEAN	-

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE D-I.4 **CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 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	12/31/07 - 01/29/08	< 2.2	< 2.4	< 3.8	< 1.6	< 3.9	< 3.6	< 2.3	< 1.9	< 2.2	< 9.4	< 2.1
	01/29/08 - 02/26/08	< 2.7	< 1.5	< 5.9	< 2.8	< 2.3	< 4.0	< 1.8	< 2.7	< 3.1	< 13	< 1.6
	02/26/08 - 04/01/08	< 4.5	< 3.0	< 8.1	< 5.4	< 9.1	< 7.2	< 5.1	< 4.0	< 4.2	< 20	< 6.0
	04/01/08 - 04/29/08	< 3.1	< 2.3	< 3.5	< 3.3	< 4.9	< 5.9	< 4.5	< 4.6	< 3.8	< 22	< 2.7
	04/29/08 - 06/03/08	< 2.3	< 2.2	< 2.5	< 2.5	< 4.1	< 6.1	< 2.3	< 3.6	< 3.7	< 11	< 1.7
	06/03/08 - 07/01/08	< 2.4	< 1.7	< 7.1	< 2.1	< 6.4	< 3.8	< 1.6	< 3.5	< 2.9	< 20	< 3.8
	07/01/08 - 07/29/08	< 3.3	< 1.8	< 4.0	< 2.4	< 5.9	< 4.2	< 2.0	< 2.8	< 2.7	< 16	< 2.6
	07/29/08 - 09/03/08	< 1.7	< 3.1	< 6.7	< 2.2	< 5.5	< 3.5	< 3.3	< 3.7	< 2.7	< 30	< 6.2
	09/03/08 - 09/30/08	< 4.4	< 3.8	< 9.6	< 3.6	< 4.8	< 9.2	< 4.6	< 5.7	< 4.6	< 10	< 2.5
	09/30/08 - 10/28/08	< 2.6	< 3.7	< 8.9	< 2.9	< 4.2	< 6.2	< 2.4	< 5.3	< 3.2	< 14	< 5.1
	10/28/08 - 12/02/08	< 2.8	< 3.9	< 7.3	< 3.2	< 3.8	< 5.6	< 3.5	< 2.8	< 4.8	< 13	< 4.0
	12/02/08 - 12/30/08	< 3.0	< 1.7	< 7.9	< 3.1	< 4.7	< 5.0	< 2.1	< 2.5	< 2.4	< 15	< 3.7

TABLE D-II.1 **CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/KG WET ± 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	10/09/08	< 33	< 11	2960 ± 450	< 15	< 26	< 78	< 20	< 52	< 21	< 16

TABLE D-III.1 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137
J2-1Q	11/05/08	10778 ± 677	41 ± 18	38 ± 17

TABLE D-IV.1 CONCENTRATIONS OF GAMMA EMITTERS AND STRONTIUM IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

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	07/30/08	3470 ± 360	< 25	< 13	< 16	< 3	< 3
H1-2Q	08/22/08	4110 ± 380	< 34	< 15	< 12	< 5	< 3

TABLE D-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

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

COLLECTION PERIOD	E1-2Q
01/01/08 - 01/09/08	34 ± 4
01/09/08 - 01/16/08	19 ± 4
01/16/08 - 01/23/08	30 ± 5
01/23/08 - 01/30/08	39 ± 5
01/30/08 - 02/06/08	27 ± 5
02/06/08 - 02/13/08	27 ± 4
02/13/08 - 02/20/08	31 ± 5
02/20/08 - 02/27/08	22 ± 5
02/27/08 - 03/05/08	22 ± 5
03/05/08 - 03/12/08	22 ± 4
03/12/08 - 03/19/08	25 ± 5
03/19/08 - 03/26/08	19 ± 5
03/26/08 - 04/02/08	22 ± 4
04/02/08 - 04/09/08	17 ± 4
04/09/08 - 04/16/08	16 ± 4
04/16/08 - 04/23/08	31 ± 5
04/23/08 - 04/30/08	22 ± 4
04/30/08 - 05/07/08	33 ± 5
05/07/08 - 05/13/08	17 ± 5
05/13/08 - 05/21/08	16 ± 4
05/21/08 - 05/28/08	11 ± 4
05/28/08 - 06/04/08	20 ± 4
06/04/08 - 06/11/08	23 ± 4
06/11/08 - 06/18/08	22 ± 4
06/18/08 - 06/25/08	19 ± 4
06/25/08 - 07/02/08	19 ± 4
07/02/08 - 07/09/08	21 ± 5
07/09/08 - 07/16/08	25 ± 4
07/16/08 - 07/23/08	37 ± 5
07/23/08 - 07/30/08	28 ± 4
07/30/08 - 08/06/08	27 ± 4
08/06/08 - 08/13/08	18 ± 4
08/13/08 - 08/20/08	26 ± 4
08/20/08 - 08/27/08	20 ± 4
08/27/08 - 09/04/08	23 ± 4
09/04/08 - 09/10/08	27 ± 5
09/10/08 - 09/17/08	13 ± 4
09/17/08 - 09/24/08	26 ± 4
09/24/08 - 10/01/08	34 ± 4
10/01/08 - 10/08/08	19 ± 4
10/08/08 - 10/15/08	35 ± 5
10/15/08 - 10/22/08	21 ± 4
10/22/08 - 10/29/08	16 ± 4
10/29/08 - 11/05/08	29 ± 4
11/05/08 - 11/12/08	22 ± 4
11/12/08 - 11/19/08	11 ± 4
11/19/08 - 11/25/08	18 ± 4
11/25/08 - 12/03/08	24 ± 4
12/03/08 - 12/10/08	31 ± 5
12/10/08 - 12/17/08	21 ± 4
12/17/08 - 12/24/08	32 ± 4
12/24/08 - 12/31/08	47 ± 5
MEAN	24 ± 15

TABLE D-III.1 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137
J2-1Q	11/05/08	10778 ± 677	41 ± 18	38 ± 17

TABLE D-VI.1 CONCENTRATIONS OF I-131 BY CHEMICAL SEPARATION, GAMMA EMITTERS, AND STRONTIUM IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008

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	01/09/08	< 0.3	1240 ± 102	< 4.3	< 2.8	< 21	< 2.7		
	02/06/08	< 0.4	1163 ± 104	< 2.5	< 2.7	< 14	< 5.4		
	03/05/08	< 0.2	1269 ± 115	< 3.8	< 3.3	< 25	< 2.7		
	03/19/08	< 0.3	1436 ± 126	< 3.7	< 2.5	< 8.2	< 1.3	< 1.0	< 0.7
	04/02/08	< 0.3	1274 ± 115	< 3.3	< 3.4	< 23	< 2.8		
	04/16/08	< 0.2	1400 ± 114	< 4.4	< 3.2	< 14	< 1.8		
	04/30/08	< 0.2	1434 ± 125	< 3.0	< 2.9	< 21	< 3.2		
	05/14/08	< 0.4	1289 ± 121	< 3.4	< 3.4	< 13	< 1.7		
	05/28/08	< 0.4	1078 ± 121	< 4.3	< 2.4	< 18	< 3.4		
	06/11/08	< 0.3	1380 ± 114	< 2.8	< 3.2	< 9.0	< 2.4		
	06/25/08	< 0.3	1327 ± 111	< 5.7	< 4.9	< 21	< 4.6	< 0.7	0.7 ± 0.3
	07/09/08	< 0.3	1331 ± 123	< 3.6	< 5.7	< 17	< 2.9		
	07/23/08	< 0.3	1272 ± 101	< 3.6	< 3.9	< 20	< 4.9		
	08/06/08	< 0.2	636 ± 92	< 4.8	< 4.8	< 18	< 4.1		
	08/20/08	< 0.4	1050 ± 117	< 6.1	< 4.3	< 13	< 5.0		
	09/03/08	< 0.4	1358 ± 133	< 4.2	< 4.1	< 20	< 6.1		
	09/17/08	< 0.3	1466 ± 107	< 3.3	< 3.0	< 26	< 6.3	< 0.7	< 0.5
	10/01/08	< 0.2	1247 ± 108	< 3.9	< 3.0	< 25	< 2.8		
	10/15/08	< 0.4	1185 ± 86	< 2.9	< 2.8	< 19	< 6.9		
	10/29/08	< 0.2	1078 ± 107	< 3.2	< 2.4	< 20	< 4.2		
	11/12/08	0.4 ± 0.2	1244 ± 108	< 3.9	< 3.9	< 8.8	< 1.2		
	11/25/08	< 0.4	1285 ± 110	< 4.8	< 4.7	< 13	< 3.9		
	12/10/08	< 0.3	1383 ± 125	< 4.8	< 4.0	< 12	< 3.7	< 0.8	0.8 ± 0.4
	MEAN	0.4 ± 0.0	1253 ± 354	-	-	-	-	-	0.7 ± 0.1

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

FIGURE D-1
MONTHLY GROSS BETA CONCENTRATIONS IN
DRINKING WATER SAMPLES COLLECTED FROM TMINS LOCATION Q9-1Q, 2008

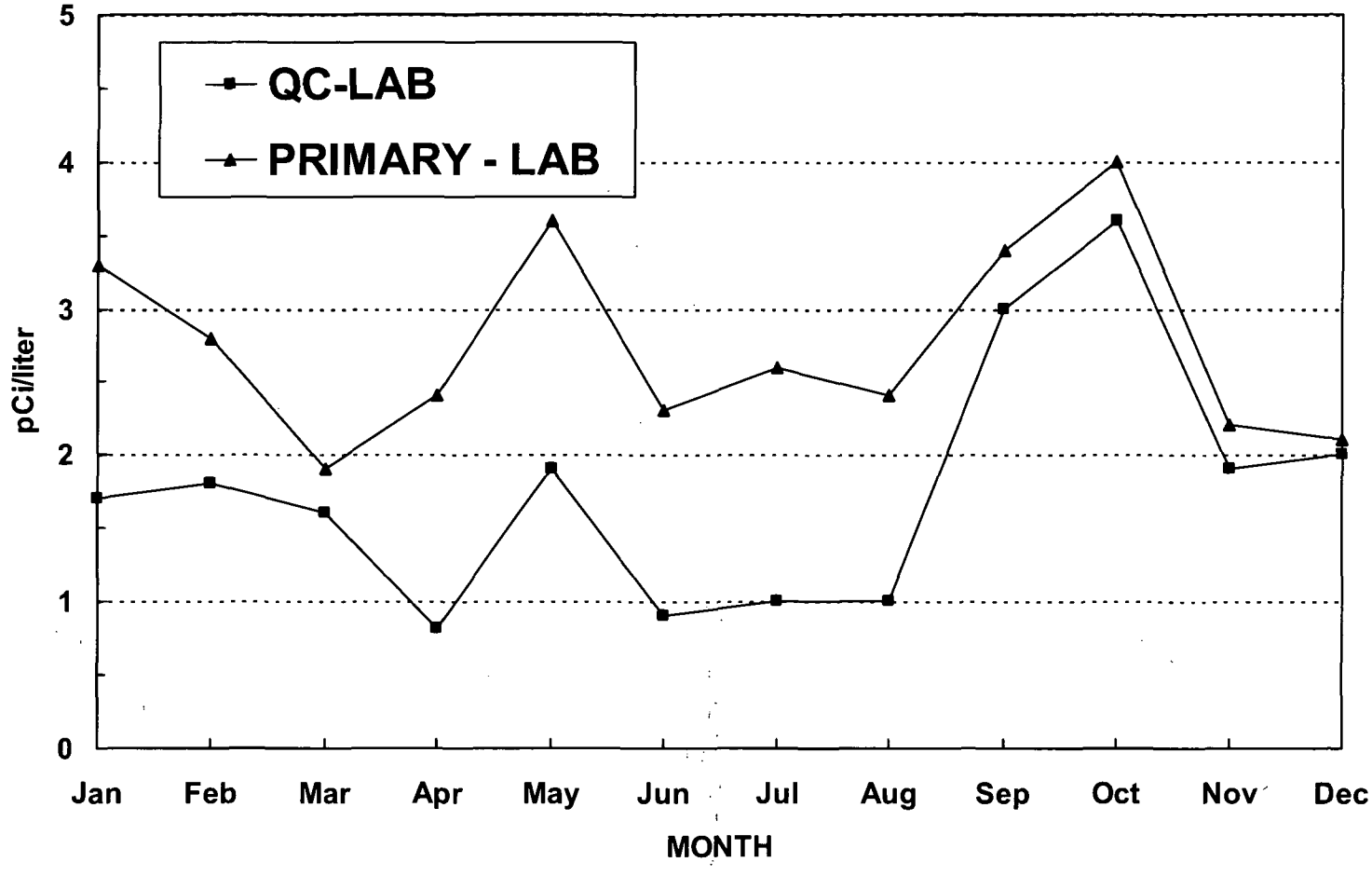
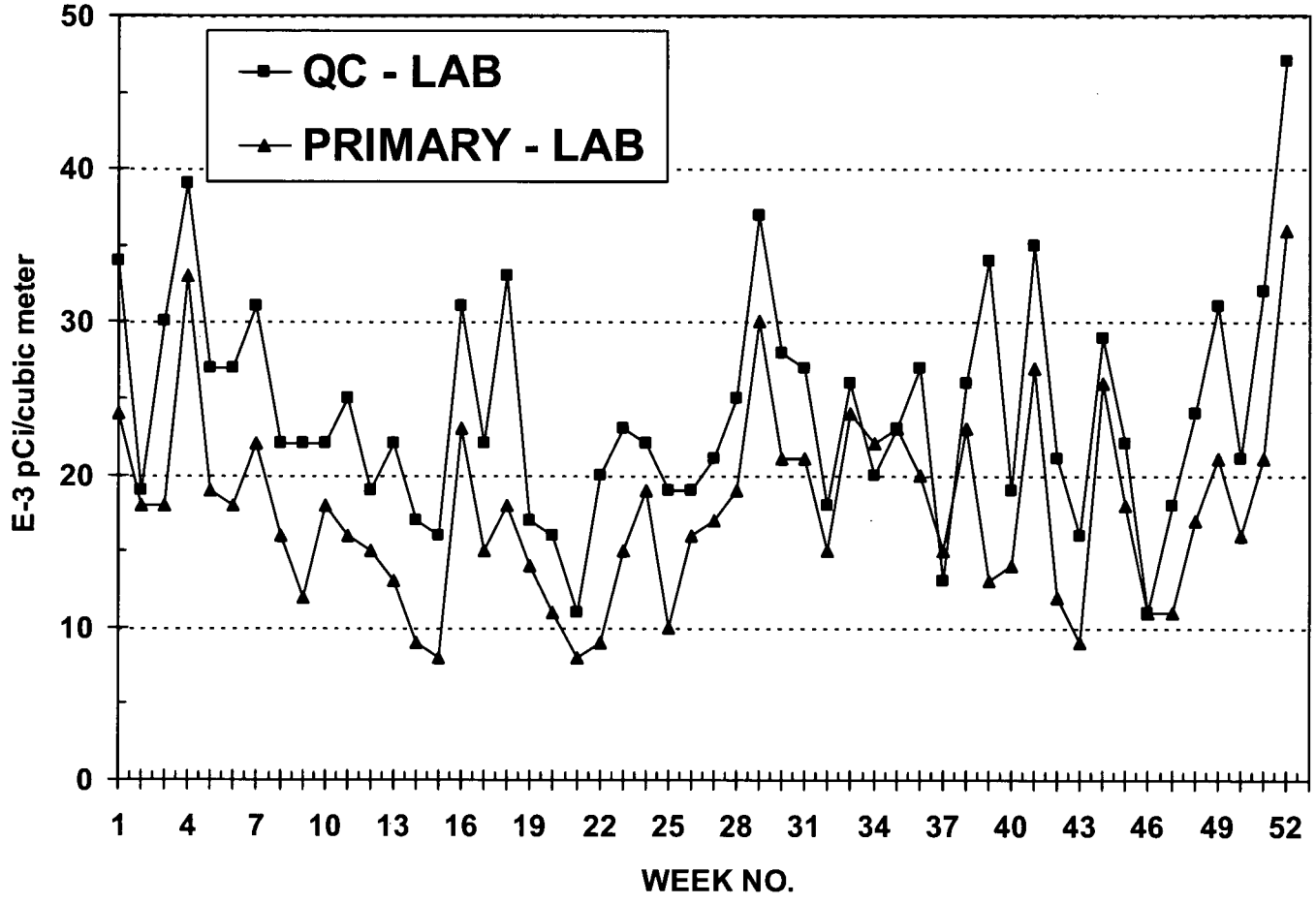


FIGURE D-2
WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED FROM TMINS LOCATION E1-2Q, 2008



APPENDIX E

ERRATA DATA

TABLE C-XII.2 MEAN QUARTERLY TLD RESULTS FOR THE SITE BOUNDARY, INDICATOR AND CONTROL LOCATIONS FOR THREE MILE ISLAND NUCLEAR STATION, 2007

RESULTS IN UNITS OF MILLI-ROENTGENS/MONTH ± 2 STANDARD DEVIATIONS OF THE STATION DATA

COLLECTION PERIOD	SITE BOUNDARY ± 2 S.D.	INDICATOR	CONTROL
JAN-MAR	5.5 ± 0.5	6.3 ± 1.3	6.7 ± 1.2
APR-JUN	5.1 ± 0.5	5.9 ± 1.4	6.3 ± 1.3
JUL-SEP	5.4 ± 0.5	6.3 ± 1.7	6.7 ± 1.6
OCT-DEC	4.7 ± 1.2	5.1 ± 1.3	5.6 ± 1.2

TABLE C-XI.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR THREE MILE ISLAND NUCLEAR STATION, 2007

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MONTH

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.	PRE-OP MEAN ± 2 S.D.
SITE BOUNDARY	76	4.1	6.9	5.2 ± 0.9	4.8 ± 1.5
INDICATOR	240	4.1	9.4	5.9 ± 1.7	5.2 ± 1.5
CONTROL	44	4.9	8.8	6.3 ± 1.6	5.8 ± 1.7

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

INDICATOR STATIONS - A3-1, A5-1, A9-3, B1-1, B10-1, B2-1, B5-1, C1-1, C2-1, C5-1, C8-1, D1-2, D2-2, D6-1, E1-2, E2-3, E5-1, E7-1, F1-1, F10-1, F2-1, F5-1, G1-2, G2-4, G5-1, H3-1, H5-1, H8-1, J1-1, 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

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APPENDIX F

INTER-LABORATORY COMPARISON PROGRAM

TABLE F-1 **ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING, 2008
(PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2008	E5847-396	Milk	Sr-89	pCi/L	83.5	95.8	0.87	A
			Sr-90	pCi/L	13.9	12.9	1.08	A
	E5848-396	Milk	I-131	pCi/L	57.3	60.0	0.96	A
			Ce-141	pCi/L	229	249	0.92	A
			Cr-51	pCi/L	336	359	0.94	A
			Cs-134	pCi/L	106	125	0.85	A
			Cs-137	pCi/L	141	146	0.97	A
			Co-58	pCi/L	71.8	70.8	1.01	A
			Mn-54	pCi/L	98.1	94.2	1.04	A
			Fe-59	pCi/L	102	102	1.00	A
			Zn-65	pCi/L	135	137	0.99	A
			Co-60	pCi/L	230	236	0.97	A
	E5850A-396	AP	Ce-141	pCi	163	157	1.04	A
			Cr-51	pCi	233	227	1.03	A
			Cs-134	pCi	72.6	79.0	0.92	A
			Cs-137	pCi	98.3	92.0	1.07	A
			Co-58	pCi	46.7	44.7	1.04	A
			Mn-54	pCi	69.8	59.4	1.18	A
			Fe-59	pCi	72.2	64.5	1.12	A
			Zn-65	pCi	106	86.4	1.23	W
			Co-60	pCi	156	149	1.05	A
	E5849-396	Charcoal	I-131	pCi	65.5	60.1	1.09	A
June 2008	E5971-396	Milk	Sr-89	pCi/L	83.9	85.0	0.99	A
			Sr-90	pCi/L	14.4	15.8	0.91	A
	E5972-396	Milk	I-131	pCi/L	70.9	71.4	0.99	A
			Ce-141	pCi/L	157	174	0.90	A
			Cr-51	pCi/L	159	138	1.15	A
			Cs-134	pCi/L	69.7	76.7	0.91	A
			Cs-137	pCi/L	115	116	0.99	A
			Co-58	pCi/L	59.1	61.9	0.95	A
			Mn-54	pCi/L	139	135	1.03	A
			Fe-59	pCi/L	98.4	91.7	1.07	A
			Zn-65	pCi/L	129	127	1.02	A
			Co-60	pCi/L	101	104	0.97	A
	E5974-396	AP	Ce-141	pCi	206	207	1.00	A
			Cr-51	pCi	173	164	1.05	A
			Cs-134	pCi	95.9	91.0	1.05	A
			Cs-137	pCi	142.0	138.0	1.03	A
			Co-58	pCi	72.0	73.4	0.98	A
			Mn-54	pCi	180	160.0	1.13	A
			Fe-59	pCi	108.0	109.0	0.99	A
			Zn-65	pCi	159	150	1.06	A
			Co-60	pCi	129	124	1.04	A

TABLE F-1 **ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING, 2008
(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
June 2008	E5973-396	Charcoal	I-131	pCi	73.8	84.1	0.88	A
September 2008	E6284-396	Milk	Sr-89	pCi/L	76.2	73.9	1.03	A
			Sr-90	pCi/L	12.3	11.0	1.12	A
	E6285-396	Milk	I-131	pCi/L	65.7	67.9	0.97	A
			Ce-141	pCi/L	145	161	0.90	A
			Cr-51	pCi/L	406	421	0.96	A
			Cs-134	pCi/L	196	232	0.84	A
			Cs-137	pCi/L	147	162	0.91	A
			Co-58	pCi/L	167	179	0.93	A
			Mn-54	pCi/L	165	166	0.99	A
			Fe-59	pCi/L	161	144	1.12	A
			Zn-65	pCi/L	305	319	0.96	A
			Co-60	pCi/L	218	234	0.93	A
	E6287-396	AP	Ce-141	pCi	79.5	76.3	1.04	A
			Cr-51	pCi	208	199	1.05	A
			Cs-134	pCi	106	110	0.96	A
			Cs-137	pCi	79.3	76.7	1.03	A
			Co-58	pCi	87.7	84.4	1.04	A
			Mn-54	pCi	90.3	78.6	1.15	A
			Fe-59	pCi	81.7	68.3	1.20	A
			Zn-65	pCi	144	151	0.95	A
			Co-60	pCi	111	111	1.00	A
	E6286-396	Charcoal	I-131	pCi	93.2	90.0	1.04	A
December 2008	E6415-396	Milk	Sr-89	pCi/L	98.4	91.9	1.07	A
			Sr-90	pCi/L	18.0	12.6	1.43	N (1)
	E6416-396	Milk	I-131	pCi/L	69.2	79.9	0.87	A
			Ce-141	pCi/L	177	191	0.93	A
			Cr-51	pCi/L	231	246	0.94	A
			Cs-134	pCi/L	117	134	0.87	A
			Cs-137	pCi/L	119	120	0.99	A
			Co-58	pCi/L	104	104	1.00	A
			Mn-54	pCi/L	153	152	1.01	A
			Fe-59	pCi/L	99.6	100	1.00	A
			Zn-65	pCi/L	177	183	0.97	A
			Co-60	pCi/L	133	133	1.00	A
	E6418-396	AP	Ce-141	pCi	148	146	1.01	A
			Cr-51	pCi	202	187	1.08	A
			Cs-134	pCi	103	102	1.01	A
			Cs-137	pCi	95.4	91.2	1.05	A
			Co-58	pCi	81.4	79.2	1.03	A
			Mn-54	pCi	113	116.0	0.97	A
			Fe-59	pCi	76.5	76.4	1.00	A
			Zn-65	pCi	122	139	0.88	A
			Co-60	pCi	108	101	1.07	A

TABLE F-1 **ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING, 2008
(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2008	E6417-396	Charcoal	I-131	pCi	65.8	74.1	0.89	A

(1) NCR 09-02 initiated to investigate the failure.

(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 F-2 **ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING, 2008
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Control Limits	Evaluation (c)
January 2008	Quik[tm] Response	Water	Sr-89	pCi/L	37.33	19.0	11.8 - 25.2	N (1)
			Sr-90	pCi/L	40.40	42.7	31.5 - 49.0	A
			Ba-133	pCi/L	87.8	90.5	76.2 - 99.6	A
			Cs-134	pCi/L	80.67	88.9	72.9 - 97.8	A
			Cs-137	pCi/L	222.33	231	208 - 256	A
			Co-60	pCi/L	98.9	101.0	90.9 - 113	A
			Zn-65	pCi/L	352	350	315 - 408	A
			Gr-A	pCi/L	13.0	12.7	6.02 - 18.7	A
			Gr-B	pCi/L	32.7	36.2	23.8 - 43.8	A
			H-3	pCi/L	11100	11300	9840 - 12400	A
January 2008	RAD 72	Water	Sr-89	pCi/L	69.0	65.3	53.0 - 73.4	A
			Sr-90	pCi/L	35.6	41.4	30.5 - 47.6	A
			Ba-133	pCi/L	25.9	25.7	20.0 - 29.5	A
			Cs-134	pCi/L	86.5	92.6	76.0 - 102	A
			Cs-137	pCi/L	155	158	142 - 176	A
			Co-60	pCi/L	16.0	14.4	11.4 - 18.7	A
			Zn-65	pCi/L	214	204	184 - 240	A
			Gr-A	pCi/L	13.3	14.8	7.15 - 21.2	A
			Gr-B	pCi/L	21.2	22.5	13.7 - 30.6	A
			I-131	pCi/L	22.8	23.6	19.6 - 28.0	A
			H-3	pCi/L	3390	3540	3000 - 3910	A
April 2008	Rad 73	Water	Sr-89	pCi/L	65.47	60.4	48.6 - 68.2	A
			Sr-90	pCi/L	39.80	39.2	28.8 - 45.1	A
			Ba-133	pCi/L	59.63	58.3	48.3 - 64.3	A
			Cs-134	pCi/L	45.00	46.6	37.4 - 51.3	A
			Cs-137	pCi/L	97.97	102	91.8 - 115	A
			Co-60	pCi/L	75.47	76.6	68.9 - 86.7	A
			Zn-65	pCi/L	109	106	95.4 - 126	A
			Gr-A	pCi/L	41.03	50.8	26.5 - 63.7	A
			Gr-B	pCi/L	50.20	51.4	35.0 - 58.4	A
			I-131	pCi/L	26.67	28.7	23.9 - 33.6	A
			H-3	pCi/L	11633	12000	10400 - 13200	A

(1) Could find no cause for Sr-89 failure. Sample sent to outside lab for verification, but the outside laboratory was unable to confirm our numbers or ERA numbers. Studies bracketing these results, RAD 71 and RAD 72, had acceptable Sr-89 results. NCR 08-03

(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 F-3 **DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)**
TELEDYNE BROWN ENGINEERING, 2008
(PAGE 1 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
January 2008	07-MaW18	Water	Cs-134	Bq/L	-0.26		(1)	A
			Cs-137	Bq/L	0.029		(1)	A
			Co-57	Bq/L	21	22.8	16.0 - 29.6	A
			Co-60	Bq/L	8.2	8.40	5.88 - 10.92	A
			H-3	Bq/L	473	472	330 - 614	A
			Mn-54	Bq/L	12	12.1	8.5 - 15.7	A
			Sr-90	Bq/L	10.70	11.4	7.98- 14.82	A
			Zn-65	Bq/L	15.6	16.3	11.4 - 21.2	A
	07-GrW18	Water	Gr-A	Bq/L	1.4	1.399	>0.0 - 2.798	A
			Gr-B	Bq/L	3.06	2.43	1.22 - 3.65	A
	07-MaS18	Soil	Cs-134	Bq/kg	790	854.0	598 - 1110	A
			Cs-137	Bq/kg	568	545	382 - 709	A
			Co-57	Bq/kg	424	421	295 - 547	A
			Co-60	Bq/kg	2.307	2.9	(2)	A
			Mn-54	Bq/kg	611	570	399 - 741	A
			K-40	Bq/kg	6.09	571	400 - 742	A
			Sr-90	Bq/kg	454	493.0	345 - 641	A
			Zn-65	Bq/kg	0.162		(1)	A
	07-RdF18	AP	Cs-134	Bq/sample	2.73	2.5200	1.76 - 3.28	A
			Cs-137	Bq/sample	2.88	2.7	1.89 - 3.51	A
			Co-57	Bq/sample	3.493	3.55	2.49 - 4.62	A
			Co-60	Bq/sample	1.357	1.31	0.92 - 1.70	A
			Mn-54	Bq/sample	0.006		(1)	A
			Sr-90	Bq/sample	1.61	1.548	1.084 - 2.012	A
			Zn-65	Bq/sample	2.59	2.04	1.43 - 2.65	A
	07-GrF18	AP	Gr-A	Bq/sample	0.131	0.348	>0.0 - 0.696	A
			Gr-B	Bq/sample	0.261	0.286	0.143 - 0.429	A
January 2008	07-RdV18	Vegetation	Cs-134	Bq/sample	5.25	6.28	4.40 - 8.16	A
			Cs-137	Bq/sample	3.13	3.41	2.39 - 4.43	A
			Co-57	Bq/sample	6.837	6.89	4.82 - 8.96	A
			Co-60	Bq/sample	2.44	2.77	1.94 - 3.60	A
			Mn-54	Bq/sample	4.45	4.74	3.32 - 6.16	A
			K-40	Bq/sample	61.3		(1)	
			Sr-90	Bq/sample	1.33	1.273	0.891 - 1.655	A
			Zn-65	Bq/sample	0.085		(1)	A
August 2008	08-MaW19	Water	Cs-134	Bq/L	17.1	19.5	13.7 - 25.4	A
			Cs-137	Bq/L	21.4	23.6	16.5 - 30.7	A
			Co-57	Bq/L	-0.044		(1)	A
			Co-60	Bq/L	10.8	11.6	8.1 - 15.1	A
			H-3	Bq/L	334	341	239 - 443	A
			Mn-54	Bq/L	13.0	13.7	9.6 - 17.8	A
			Sr-90	Bq/L	6.55	6.45	4.52- 8.39	A
			Zn-65	Bq/L	16.5	17.1	12.0 - 22.2	A

TABLE F-3 **DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)**
TELEDYNE BROWN ENGINEERING, 2008
(PAGE 2 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
August 2008	08-GrW19	Water	Gr-A	Bq/L	0.0612	<0.56	(3)	A
			Gr-B	Bq/L	0.222	<1.85	(3)	A
	08-MaS19	Soil	Cs-134	Bq/kg	546	581	407 - 755	A
			Cs-137	Bq/kg	2.52	2.8	(2)	A
			Co-57	Bq/kg	340	333	233 - 433	A
			Co-60	Bq/kg	157	145.0	102 - 189	A
			Mn-54	Bq/kg	460	415	291 - 540	A
			K-40	Bq/kg	650	571	399 - 741	A
			Sr-90	Bq/kg	1.40		(1)	A
			Zn-65	Bq/kg	-1.53		(1)	A
	08-RdF19	AP	Cs-134	Bq/sample	2.46	2.6300	1.84 - 3.42	A
			Cs-137	Bq/sample	0.0063		(1)	A
			Co-57	Bq/sample	1.36	1.50	1.05 - 1.95	A
			Co-60	Bq/sample	0.0143		(1)	A
			Mn-54	Bq/sample	2.70	2.64	1.85 - 3.43	A
			Sr-90	Bq/sample	1.42	1.12	0.78 - 1.46	W
			Zn-65	Bq/sample	0.975	0.94	0.66 - 1.22	A
	08-GrF19	AP	Gr-A	Bq/sample	-0.0037		(4)	A
			Gr-B	Bq/sample	0.540	0.525	0.263 - 0.788	A
	08-RdV19	Vegetation	Cs-134	Bq/sample	4.36	5.5	3.9 - 7.2	W
			Cs-137	Bq/sample	-0.03		(1)	A
			Co-57	Bq/sample	6.72	7.1	5.0 - 9.2	A
			Co-60	Bq/sample	4.04	4.70	3.3 - 6.1	A
			Mn-54	Bq/sample	5.22	5.8	4.1 - 7.5	A
			K-40	Bq/sample	64.4		(1)	
			Sr-90	Bq/sample	1.62	1.9	1.3 - 2.5	A
			Zn-65	Bq/sample	6.160	6.9	4.8 - 9.0	A

(1) Not evaluated by MAPEP.
(2) Reported a statistically zero result.
(3) Designed to test the Safe Drinking Water screening levels. Labs reporting values less than ref values were found to be acceptable.
(4) False positive test.
(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 F-4 **ERA (a) STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM ENVIRONMENTAL, INC., 2008**

Lab Code [b]	Date	Analysis	Concentration (pCi/L) Laboratory Result [c]	ERA Result [d]	Control Limits	Acceptance
STAP-1143	03/24/08	Co-60	650.72 ± 3.00	730.0	565.0 - 912.0	Pass
STAP-1143	03/24/08	Cs-134	467.50 ± 5.53	523.0	341.0 - 647.0	Pass
STAP-1143	03/24/08	Cs-137	1375.90 ± 25.41	1450.0	1090.0 - 1900.0	Pass
STAP-1143 [e]	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10.0	Pass
STAP-1143	03/24/08	Sr-90	157.60 ± 7.70	152.0	66.9 - 236.0	Pass
STAP-1143	03/24/08	Zn-65	889.90 ± 15.90	872.0	604.0 - 1210.0	Pass
STAP-1144	03/24/08	Gr. Beta	99.90 ± 3.09	92.2	56.80 - 135.0	Pass
STSO-1145	03/24/08	Ac-228	1269.02 ± 36.81	1180.0	757.0 - 1660.0	Pass
STSO-1145	03/24/08	Bi-212	1407.10 ± 56.64	1360.0	357.0 - 2030.0	Pass
STSO-1145	03/24/08	Co-60	5219.70 ± 90.30	5130.0	3730.0 - 6890.0	Pass
STSO-1145	03/24/08	Cs-134	5427.30 ± 102.94	5640.0	3630.0 - 6790.0	Pass
STSO-1145	03/24/08	Cs-137	6346.60 ± 201.80	6010.0	4600.0 - 7810.0	Pass
STSO-1145	03/24/08	K-40	11052.70 ± 181.80	11000.0	7980.0 - 14900.0	Pass
STSO-1145 [e]	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10.0	Pass
STSO-1145	03/24/08	Pb-212	1198.20 ± 96.58	1080.0	697.0 - 1520.0	Pass
STSO-1145	03/24/08	Pb-214	2253.30 ± 291.60	2020.0	1210.0 - 3010.0	Pass
STSO-1145	03/24/08	Sr-90	6407.00 ± 277.00	5360.0	1940.0 - 8750.0	Pass
STSO-1145	03/24/08	Th-234	2421.80 ± 321.00	2030.0	644.0 - 3870.0	Pass
STSO-1145	03/24/08	Zn-65	2936.20 ± 73.50	2660.0	2110.0 - 3570.0	Pass
STVE-1146	03/24/08	Co-60	912.41 ± 13.59	888.0	600.0 - 1280.0	Pass
STVE-1146	03/24/08	Cs-134	1547.70 ± 38.81	1540.0	882.0 - 2130.0	Pass
STVE-1146	03/24/08	Cs-137	1163.80 ± 20.62	1100.0	807.0 - 1530.0	Pass
STVE-1146	03/24/08	K-40	22186.00 ± 339.40	24600.0	17700.0 - 34800.0	Pass
STVE-1146 [e]	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10.0	Pass
STVE-1146	03/24/08	Sr-90	3825.90 ± 140.66	4130.0	2310.0 - 5480.0	Pass
STVE-1146	03/24/08	Zn-65	1676.80 ± 43.00	1430.0	1030.0 - 1960.0	Pass
STW-1147	03/24/08	Co-60	1430.00 ± 33.33	1420.0	1240.0 - 1680.0	Pass
STW-1147	03/24/08	Cs-134	730.18 ± 33.39	751.0	555.0 - 862.0	Pass
STW-1147	03/24/08	Cs-137	1947.80 ± 13.80	1990.0	1690.0 - 2380.0	Pass
STW-1147 [e]	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10.0	Pass
STW-1147	03/24/08	Sr-90	512.03 ± 43.37	512.0	325.0 - 684.0	Pass
STW-1147	03/24/08	Zn-65	708.90 ± 29.00	694.0	588.0 - 865.0	Pass
STW-1120	03/19/07	Zn-65	2009.00 ± 36.40	1910.0	1600.0 - 2410.0	Pass

[a] Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the Environmental Measurements Laboratory Quality Assessment Program (EML).

[b] Laboratory codes as follows: STW (water), STAP (air filter), STSO (soil), STVE (vegetation).

[c] Unless otherwise indicated, the laboratory result is given as the mean ± standard deviation for three determinations.

[d] Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination) and control limits as provided by ERA.

[e] Included in the testing series as a "false positive". No activity expected.

TABLE F-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)[a]
ENVIRONMENTAL, INC., 2008
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		Concentration [b]				
Lab Code[c]	Date	Analysis	Laboratory result	Known Activity	Control Limits [d]	Acceptance
STW-1137	01/01/08	Co-57	23.80 ± 0.60	22.80	16.00 - 29.60	Pass
STW-1137	01/01/08	Co-60	8.60 ± 0.50	8.40	5.88 - 10.92	Pass
STW-1137	01/01/08	Cs-134	-0.021 ± 0.10	0.00	-1.00 - 1.00	Pass
STW-1137	01/01/08	Cs-137	0.00 ± 0.10	0.00	-1.00 - 1.00	Pass
STW-1137	01/01/08	H-3	515.10 ± 12.70	472.00	330.00 - 614.00	Pass
STW-1137	01/01/08	Mn-54	12.90 ± 0.80	12.10	8.50 - 15.70	Pass
STW-1137	01/01/08	Sr-90	12.00 ± 1.50	11.40	7.98 - 14.82	Pass
STW-1137	01/01/08	Zn-65	16.90 ± 1.40	16.30	11.40 - 21.20	Pass
STW-1138	01/01/08	Gr. Beta	2.30 ± 0.15	2.43	1.22 - 3.65	Pass
STAP-1139	01/01/08	Co-57	3.90 ± 0.07	3.55	2.49 - 4.62	Pass
STAP-1139	01/01/08	Co-60	1.43 ± 0.07	1.31	0.92 - 1.70	Pass
STAP-1139	01/01/08	Cs-134	2.59 ± 0.16	2.52	1.76 - 3.28	Pass
STAP-1139	01/01/08	Cs-137	3.05 ± 0.12	2.70	1.89 - 3.51	Pass
STAP-1139	01/01/08	Mn-54	0.43 ± 0.58	0.00	0.00 - 1.00	Pass
STAP-1139	01/01/08	Sr-90	1.30 ± 0.27	1.55	1.08 - 2.01	Pass
STAP-1139	01/01/08	Zn-65	2.36 ± 0.18	2.04	1.43 - 2.65	Pass
STAP-1140	01/01/08	Gr. Beta	0.34 ± 0.04	0.29	0.14 - 0.43	Pass
STVE-1141	01/01/08	Co-57	8.30 ± 0.18	6.89	4.82 - 8.96	Pass
STVE-1141	01/01/08	Co-60	3.03 ± 0.13	2.77	1.94 - 3.60	Pass
STVE-1141	01/01/08	Cs-134	6.53 ± 0.29	6.28	4.40 - 8.16	Pass
STVE-1141	01/01/08	Cs-137	3.90 ± 0.19	3.41	2.39 - 4.43	Pass
STVE-1141	01/01/08	Mn-54	5.43 ± 0.21	4.74	3.32 - 6.16	Pass
STVE-1141	01/01/08	Zn-65	0.033 ± 0.10	0.00	0.00 - 1.00	Pass
STSO-1142	01/01/08	Co-57	483.00 ± 3.00	421.00	295.00 - 547.00	Pass
STSO-1142	01/01/08	Co-60	3.00 ± 0.80	2.90	0.00 - 5.00	Pass
STSO-1142	01/01/08	Cs-134	896.50 ± 7.40	854.00	598.00 - 1110.00	Pass
STSO-1142	01/01/08	Cs-137	624.40 ± 4.10	545.00	382.00 - 709.00	Pass
STSO-1142	01/01/08	Mn-54	667.20 ± 3.80	570.00	399.00 - 741.00	Pass
STSO-1142	01/01/08	Zn-65	0.093 ± 0.91	0.00	0.00 - 1.00	Pass
STSO-1158	08/01/08	Co-57	353.02 ± 2.01	333.00	233.00 - 433.00	Pass
STSO-1158	08/01/08	Co-60	151.99 ± 1.58	145.00	102.00 - 189.00	Pass
STSO-1158	08/01/08	Cs-134	499.72 ± 2.65	581.00	407.00 - 755.00	Pass
STSO-1158	08/01/08	Cs-137	2.54 ± 0.25	2.80	0.00 - 5.00	Pass
STSO-1158	08/01/08	K-40	643.94 ± 15.50	570.00	399.00 - 741.00	Pass
STSO-1158	08/01/08	Mn-54	452.14 ± 2.96	415.00	291.00 - 540.00	Pass
STSO-1158	08/01/08	Sr-90	1.95 ± 2.04	0.00	0.00 - 5.00	Pass
STSO-1158	08/01/08	Zn-65	0.10 ± 2.04	0.00	0.00 - 5.00	Pass

TABLE F-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)[a] ENVIRONMENTAL, INC., 2008

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		Concentration [b]				
Lab Code[c]	Date	Analysis	Laboratory result	Known Activity	Control Limits [d]	Acceptance
STVE-1159	08/01/08	Co-57	8.52 ± 0.23	7.10	5.00 - 9.20	Pass
STVE-1159	08/01/08	Co-60	5.08 ± 0.19	4.70	3.30 - 6.10	Pass
STVE-1159	08/01/08	Cs-134	5.26 ± 0.18	5.50	3.90 - 7.20	Pass
STVE-1159	08/01/08	Cs-137	0.01 ± 0.14	0.00	0.00 - 1.00	Pass
STVE-1159	08/01/08	Mn-54	6.39 ± 0.28	5.80	4.10 - 7.50	Pass
STVE-1159	08/01/08	Zn-65	7.73 ± 0.45	6.90	4.80 - 9.00	Pass
STW-1162	08/01/08	Co-57	0.03 ± 0.16	0.00	0.00 - 5.00	Pass
STW-1162	08/01/08	Co-60	11.27 ± 0.23	11.60	8.10 - 15.10	Pass
STW-1162	08/01/08	Cs-134	17.93 ± 0.52	19.50	13.70 - 25.40	Pass
STW-1162	08/01/08	Cs-137	23.72 ± 0.43	23.60	16.50 - 30.70	Pass
STW-1162	08/01/08	H-3	385.15 ± 8.93	341.00	239.00 - 443.00	Pass
STW-1162	08/01/08	Mn-54	13.87 ± 0.37	13.70	9.60 - 17.80	Pass
STW-1162	08/01/08	Sr-90	6.49 ± 1.12	6.45	4.52 - 8.39	Pass
STW-1162	08/01/08	Zn-65	17.64 ± 0.61	17.10	12.00 - 22.20	Pass
STW-1163	08/01/08	Gr. Beta	0.12 ± 0.05	0.00	0.00 - 1.85	Pass

[a] 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

[b] Results are reported in units of Bq/kg (soil), Bq/L (water) or Bq/total sample (filters, vegetation).

[c] Laboratory codes as follows: STW (water), STAP (air filter), STSO (soil), STVE (vegetation).

[d] MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP.

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APPENDIX G

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

Docket No: 50-289
50-320

THREE MILE ISLAND NUCLEAR STATION
UNITS 1 and 2

Annual Radiological
Groundwater Protection Program Report (ARGPPR)

1 January Through 31 December 2008

Prepared By

Teledyne Brown Engineering
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Nuclear

Three Mile Island Nuclear Station
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April 2009

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Appendices (cont.)

Appendix C Tables	Data Tables (cont.)
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I. Summary and Conclusions

In 2006, Exelon instituted a comprehensive program to evaluate the impact of station operations on groundwater and surface water in the vicinity of Three Mile Island Nuclear Station. At Three Mile Island Nuclear, 31 new permanent groundwater monitoring wells were installed in 2006. The results of the special investigations for all TMI wells are included in this report. This report covers groundwater and surface water samples, collected from the environment, both on and off station property in 2008. During that time period, 426 analyses were performed on 244 samples from 74 locations.

In assessing all the data gathered for this report, it was concluded that the operation of Three Mile Island Nuclear Station had no adverse radiological impact on the environment, and there were no known active releases at the end of 2008 into the groundwater at Three Mile Island Nuclear Station.

Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective Lower Limits of Detection (LLDs) as specified in the Offsite Dose Calculation Manual (ODCM) in any of the groundwater or surface water samples. In the case of tritium, Exelon specified that its laboratories achieve a lower limit of detection 10 times lower than that required by federal regulation.

Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 picoCuries per liter (pCi/L) in the groundwater samples tested.

Tritium was not detected in any groundwater, surface water or precipitation samples at concentrations greater than the United States Environmental Protection Agency (USEPA) drinking water standard (and the Nuclear Regulatory Commission Reporting Limit) of 20,000 pCi/L. Low levels of tritium were detected at concentrations greater than the LLD of 200 pCi/L in 45 of 65 groundwater monitoring locations and in five of six precipitation locations. The groundwater tritium concentrations ranged from 201 ± 112 pCi/L to 7,210 ± 785 pCi/L, and the precipitation tritium concentrations ranged from 226 ± 117 pCi/L to 706 ± 149 pCi/L. Tritium that was detected in groundwater at the Station is believed to be the result of historical releases, the recapture of gaseous tritium releases via rainwater and/or background from external sources greater than 200 pCi/L.

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II. Introduction

The Three Mile Island Nuclear Station (TMINS) established a revised and more comprehensive groundwater monitoring program in 2006 as part of an Exelon Nuclear fleetwide assessment.

Conestoga Rovers & Associates (CRA) performed the initial assessment. CRA prepared a Hydrogeologic Investigation Report (HIR) for Exelon to determine whether groundwater at and near TMINS has been adversely impacted by any releases of radionuclides. The CRA report documents the results of the May 2006 Hydrogeologic Investigation Work Plan. CRA assessed groundwater quality at the Station in locations designated as Areas for Further Evaluation. The results and conclusions of this Phase 1 study were made available to state and federal regulators as well as the public on an Exelon web site in station specific reports. The summary report for the Three Mile Island Nuclear Station may be found at the following web page:

http://www.exeloncorp.com/ourcompanies/powergen/nuclear/Tritium.htm

As a result of the Phase 1 study, the Radiological Groundwater Protection Program (RGPP) was revised to a long term monitoring program. This report covers those analyses performed by Teledyne Brown Engineering (TBE) on well water and surface water samples collected in 2008. All wells that were established were located in the owner controlled areas of the site. No offsite wells were established because the groundwater movement is to the Susquehanna River.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Environmental Inc. (Midwest Labs) on samples collected in 2008.

A. Objective of the RGPP

The long-term objectives of the RGPP are as follows:

1. Identify suitable locations to monitor and evaluate potential impacts from station operations before significant radiological impact to the environment and potential drinking water sources.

2. Understand the local hydrogeologic regime in the vicinity of the station and maintain up-to-date knowledge of flow patterns on the surface and shallow subsurface.

3. Perform routine water sampling and radiological analysis of water from selected locations.

4. Notify stakeholders in a timely manner for new leaks, spills, or other detections with potential radiological significance.

5. Regularly assess analytical results to identify adverse trends.

6. Take necessary corrective actions to protect groundwater resources.

B. Implementation of the Objectives

The objectives identified have been implemented at Three Mile Island Nuclear Station as discussed below:

1. Three Mile Island Nuclear Station continues to sample and monitor the groundwater at the station in accordance with station procedures. Sample frequencies and locations are adjusted based on monitoring results and investigations.

2. The Three Mile Island Nuclear Station reports describe the local hydrogeologic regime. Periodically, the flow patterns on the surface and shallow subsurface are updated based on ongoing measurements.

3. Three Mile Island Nuclear Station will continue to perform routine sampling and radiological analysis of water from selected locations.

4. Three Mile Island Nuclear Station has implemented new procedures to identify and report new leaks, spills, or other detections with potential radiological significance in a timely manner.

5. Three Mile Island Nuclear Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends.

C. Program Description

1. Sample Collection

Sample locations can be found in Table A-1 and Figures A-1 and A-2, Appendix A.

<u>Groundwater and Surface Water</u>

Samples of water are collected, managed, transported and analyzed in accordance with approved procedures. Both groundwater and surface water are collected. Sample locations, sample collection frequencies and analytical frequencies are

controlled in accordance with approved station procedures. Contractor and/or station personnel are trained in the collection, preservation management, and shipment of samples, as well as in documentation of sampling events. Analytical laboratories are subject to internal quality assurance programs, industry cross-check programs, as well as nuclear industry audits. Station personnel review and evaluate all analytical data deliverables as data are received.

Analytical data results are reviewed by both station personnel and an independent hydrogeologist for adverse trends or changes to hydrogeologic conditions.

D. Characteristics of Tritium (H-3)

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common form of tritium is tritium oxide, which is also called "tritiated water." Tritiated water behaves chemically and physically like non-tritiated water in the subsurface, and therefore tritiated water will travel at the same velocity as the average groundwater velocity.

Tritium is created in the environment from naturally occurring processes both cosmic and subterranean, as well as from anthropogenic (i.e., man-made) sources. Tritium is produced naturally in the upper atmosphere when cosmic rays strike air molecules. This “cosmogenic” tritium combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, “lithogenic” tritium is produced by the bombardment of natural lithium present in crystalline rocks by neutrons produced by the radioactive decay of naturally abundant uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

A major anthropogenic source of tritium and strontium-90 comes from the former atmospheric testing of thermonuclear weapons. Levels of tritium in precipitation increased significantly during the 1950s and early 1960s, and later with additional testing, resulting in the release of significant amounts of tritium to the atmosphere. The Canadian heavy water nuclear power reactors, other commercial power reactors, nuclear research and weapons production continue to influence tritium concentrations in the environment.

The chemical properties of tritium are essentially those of ordinary hydrogen. Tritium can be taken into the body by drinking water, breathing air, eating food, or absorption through skin. Once tritium enters the body, it disperses quickly and is uniformly distributed throughout the body. Tritium

is excreted primarily through urine with a clearance rate characterized by an effective biological half-life of about 14 days. Within one month or so after ingestion, all tritium is essentially cleared. Organically bound tritium (tritium that is incorporated in organic compounds) can remain in the body for a longer period.

Tritium has a half-life of approximately 12.3 years. It decays spontaneously to helium-3 (He-3). This radioactive decay releases a beta particle (low-energy electron). The radioactive decay of tritium is the source of the health risk from exposure to tritium. Tritium is one of the least dangerous radionuclides, because it emits very weak radiation and leaves the body relatively quickly. Since tritium is almost always found as water, it goes directly into soft tissues and organs. The associated dose to these tissues is generally uniform and is dependent on the water content of the specific tissue.

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by TBE and EIML to analyze the environmental samples for radioactivity for the Three Mile Island Nuclear Station RGPP in 2008.

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

1. Concentrations of gamma emitters in groundwater and surface water.

2. Concentrations of strontium in groundwater and surface water.

3. Concentrations of tritium in groundwater and surface water.

B. Data Interpretation

1. <u>Lower Limit of Detection and Minimum Detectable Concentration</u>

The lower limit of detection (LLD) is specified by federal regulation as a minimum sensitivity value that must be achieved routinely by the analytical parameter.

2. Laboratory Measurements Uncertainty

The estimated uncertainty in measurement of tritium in environmental samples is frequently on the order of 50% of the measurement value.

Statistically, the exact value of a measurement is expressed as a range with a stated level of confidence. The convention is to report results with a 95% level of confidence. The uncertainty comes from calibration standards, sample volume or weight measurements, sampling uncertainty and other factors. Exelon reports the uncertainty of a measurement created by statistical process (counting error)

Analytical uncertainties are reported at the 95% confidence level in this report for reporting consistency with the AREOR.

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

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

The radio-analytical laboratory is counting tritium results to an LLD of 200 pCi/L. Typically, the lowest positive measurement will be reported within a range of 40 – 240 pCi/L or 140 ± 100 pCi/L. Clearly, these sample results cannot be distinguished as different from background at this concentration.

IV. Results and Discussion

A. Groundwater Results

Samples were collected from on and off-site wells throughout the year in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below.

Tritium

Samples from 65 locations were analyzed for tritium activity (Table B–I.1, Appendix B). Tritium values ranged from the detection limit to 7,210 pCi/l. Two of the locations were offsite drinking water

wells with no detectable concentration of tritium.

Strontium

Strontium-90 was not detected above the required detection limit of 2.0 pCi/liter. (Table B–I.1, Appendix B).

Gamma Emitters

Potassium-40 was detected in nine of 65 samples. The concentrations ranged from 37 pCi/liter to 130 pCi/liter. No other gamma emitting nuclides were detected. (Table B–I.2, Appendix B).

B. Surface Water Results

Samples were collected from surface water locations throughout the year in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below.

Tritium

Tritium was not detected above the required detection limit of 200 pCi/liter. (Table B-II.1, Appendix B).

Strontium

Strontium-90 was not detected above the required detection limit of 2.0 pCi/liter. (Table B–II.1, Appendix B).

Gamma Emitters

No gamma emitting nuclides were detected. (Table B–II.2, Appendix B).

C. Precipitation Results

Samples were collected from temporary precipitation collection devises from January through June. Analytical results and anomalies are discussed below.

Tritium

Samples from six locations were analyzed for tritium activity (Table B–III.1 Appendix B). Tritium values ranged from the detection limit to 706 pCi/l.

Strontium

Strontium-90 was not analyzed in 2008.

Gamma Emitters

Gamma emitters were not analyzed in 2008.

D. Leaks, Spills, and Releases

No new active leaks were identified at the TMI in 2008. TMI continues to monitor tritium plumes from previous years and reports the dose to the public in the ARERR. No spills were determined to be reportable under voluntary reporting requirements for the NEI Groundwater Protection Initiative (GPI) as implemented in Exelon's Reportability procedure LS-AA-1120, RAD 1.34.

E. Actions Taken

1. Compensatory Actions

TMI continues to monitor groundwater radioactivity as part of natural monitored attenuation of historical leaks.

APPENDIX A

LOCATION DESIGNATION & DISTANCE

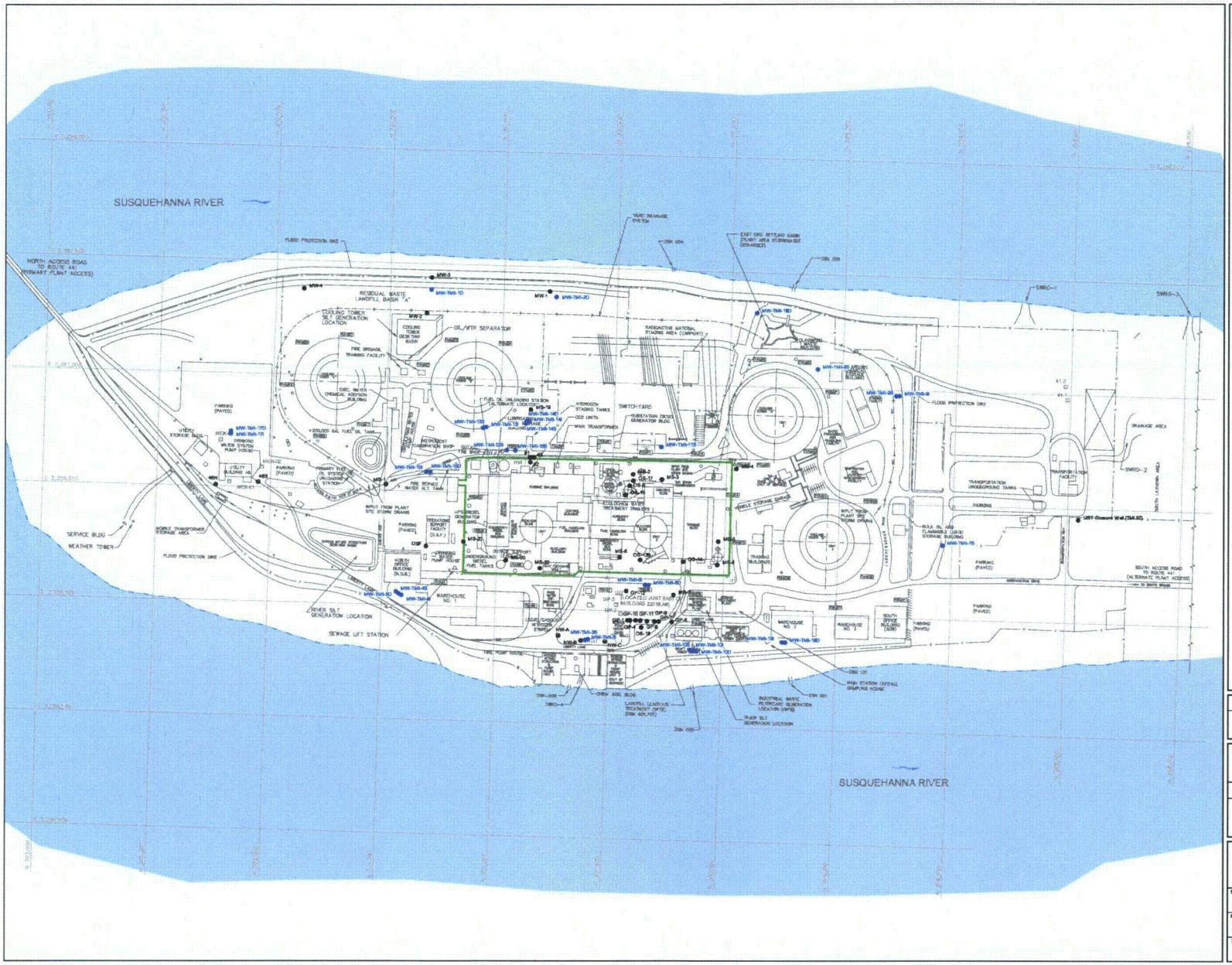
TABLE A-1: **Radiological Groundwater Protection Program - Sampling Locations and Distance, Three Mile Island Nuclear Station, 2008**

Site	Site Type
#3	Monitoring Well
48N	Monitoring Well
48S	Production Potable Well
E1-2	Monitoring Well, Offsite
GP-12	Monitoring Well
GP-6	Monitoring Well
GP-8	Monitoring Well
GP-9	Monitoring Well
J1-3	Precipitation
MS-1	Monitoring Well, Precipitation
MS-19	Monitoring Well, Precipitation
MS-2	Monitoring Well, Precipitation
MS-20	Monitoring Well, Precipitation
MS-21	Monitoring Well
MS-22	Monitoring Well
MS-3	Monitoring Well
MS-4	Monitoring Well
MS-5	Monitoring Well
MS-6	Monitoring Well
MS-7	Monitoring Well
MS-8	Monitoring Well
MW-1	Monitoring Well
MW-2	Monitoring Well
MW-3	Monitoring Well
MW-4	Monitoring Well
N2-1	Monitoring Well, Offsite
NW-A	Production Well
NW-B	Production Well, Precipitation
NW-C	Production Well
NW-CW	Clearwell
OS-13B	Monitoring Well
OS-14	Monitoring Well
OS-16	Monitoring Well
OS-17	Monitoring Well
OS-18	Monitoring Well
OSF	Production Potable Well
RW-1	Monitoring Well
RW-2	Monitoring Well
SW-E-1	Surface Water
SW-E-2	Surface Water
SW-E-3	Surface Water
MW-TMI-9S*	Monitoring Well
MW-TMI-10D	Monitoring Well
MW-TMI-10I	Monitoring Well
MW-TMI-10S	Monitoring Well
MW-TMI-11S*	Monitoring Well
MW-TMI-12S	Monitoring Well
MW-TMI-13I	Monitoring Well
MW-TMI-13S	Monitoring Well
MW-TMI-14D	Monitoring Well
MW-TMI-14I	Monitoring Well
MW-TMI-14S	Monitoring Well
MW-TMI-16D	Monitoring Well
MW-TMI-16I	Monitoring Well

* NO WATER PRESENT TO SAMPLE

TABLE A-1: **Radiological Groundwater Protection Program - Sampling Locations and Distance, Three Mile Island Nuclear Station, 2008**

Site	Site Type
MW-TMI-17D	Monitoring Well
MW-TMI-17I	Monitoring Well
MW-TMI-18D	Monitoring Well
MW-TMI-19D	Monitoring Well
MW-TMI-19I	Monitoring Well
MW-TMI-1D	Monitoring Well
MW-TMI-2D	Monitoring Well
MW-TMI-3I	Monitoring Well
MW-TMI-4I	Monitoring Well
MW-TMI-4S	Monitoring Well
MW-TMI-5D	Monitoring Well
MW-TMI-6D	Monitoring Well
MW-TMI-6I	Monitoring Well
MW-TMI-7S	Monitoring Well
MW-TMI-8S	Monitoring Well
MW-TMI-9I	Monitoring Well
TRAINING CENTER	Monitoring Well



LEGEND

- EDGE OF WATER
- FENCE LINE
- SITE GRID
- RAILROAD
- SURFACE WATER FLOW DIRECTION
- SUPPLY WELL LOCATION
- RECOVERY WELL LOCATION
- ABANDONED MONITORING WELL LOCATION
- ABANDONED TEST WELL LOCATION
- EXISTING MONITORING WELL LOCATION
- CRA MONITORING WELL LOCATION
- PROTECTED AREA

NOTES:

1). CLOSED TMI CONSTRUCTION LANDFILL - SOUTH TMI AREA PVC PIE "DITCH WELLS".

2). OB-15 LOCATED IN THE SOUTH END OF THE ISLAND, OFF-MAP. WELLS OB-11 AND OB-12 WERE NEVER COMPLETED, SUBSEQUENTLY THEY ARE NOT SHOWN ON THIS FIGURE.

DRAFT

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FLEETWIDE ASSESSMENT

GROUNDWATER MONITORING WELL LOCATIONS
THREE MILE ISLAND GENERATING STATION
MIDDLETOWN, PENNSYLVANIA

Exelon. CONESTOGA-ROVERS & ASSOCIATES

Source Reference:			
Project Manager: S. QUIGLEY	Reviewed By: M. KELLY	Date: AUGUST 2006	
Scale: AS SHOWN	Project N°: 45136-29	Report N°: 021	Drawing N°: figure 4.2

45136-29(021)GN-WA028 ALG 11/2006

APPENDIX B

DATA TABLES

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM AND STRONTIUM IN WELL WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM - THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	SR-90
#3	05/15/08	< 164	
#3	10/22/08	175 ± 116	< 1.0
48N	05/14/08	414 ± 125	
48N	10/23/08	< 188	< 1.9
48S	03/03/08	< 165	
48S	05/16/08	201 ± 112	
48S	08/11/08	< 163	
48S	10/28/08	< 188	< 1.1
E1-2	05/13/08	< 163	
E1-2	10/28/08	< 170	< 1.3
GP-12	03/03/08	249 ± 112	
GP-6	03/03/08	167 ± 106	
GP-6	05/15/08	204 ± 115	
GP-8	03/03/08	292 ± 114	
GP-8	05/15/08	341 ± 119	
GP-9	03/03/08	259 ± 110	
GP-9	05/13/08	378 ± 123	
MS-1	05/16/08	< 167	
MS-1	10/24/08	205 ± 112	< 1.3
MS-19	05/14/08	537 ± 131	
MS-19	10/21/08	< 168	< 1.5
MS-19	10/21/08	< 184	< 1.5
MS-2	05/14/08	221 ± 113	
MS-2	10/22/08	< 165	< 0.9
MS-20	01/14/08	568 ± 125	
MS-20	01/29/08	486 ± 133	
MS-20	03/05/08	358 ± 116	
MS-20	04/09/08	246 ± 115	
MS-20	05/13/08	453 ± 128	
MS-20	07/02/08	330 ± 125	
MS-20	08/13/08	337 ± 119	
MS-20	09/16/08	289 ± 104	
MS-20	10/21/08	257 ± 112	< 1.5
MS-20	12/08/08	309 ± 107	
MS-21	01/14/08	361 ± 101	
MS-21	01/29/08	259 ± 109	
MS-21	03/05/08	263 ± 112	
MS-21	03/05/08	209 ± 112	
MS-21	04/09/08	< 180	
MS-21	10/21/08	234 ± 118	< 1.5
MS-22	03/05/08	945 ± 165	
MS-22	05/13/08	187 ± 112	
MS-22	05/15/08	1130 ± 185	
MS-22	08/13/08	1160 ± 181	
MS-22	10/23/08	985 ± 162	< 1.5
MS-3	05/13/08	226 ± 113	
MS-3	10/22/08	215 ± 114	< 0.8
MS-4	05/14/08	297 ± 122	
MS-4	10/23/08	321 ± 127	< 1.4

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM AND STRONTIUM IN WELL WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM - THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	SR-90
MS-5	05/13/08	< 166	
MS-5	10/21/08	< 158	< 0.9
MS-6	05/13/08	196 ± 112	
MS-6	10/21/08	< 161	< 0.8
MS-7	05/13/08	< 175	
MS-7	10/22/08	< 182	< 1.3
MS-8	05/13/08	307 ± 130	
MS-8	05/13/08	365 ± 118	
MS-8	10/21/08	247 ± 115	< 0.8
MW-1	05/15/08	< 173	
MW-1	10/23/08	< 171	< 1.3
MW-1	10/23/08	< 187	< 1.9
MW-2	05/15/08	< 197	
MW-2	05/15/08	185 ± 108	
MW-2	10/23/08	< 186	< 1.1
MW-3	05/15/08	< 142	
MW-3	10/23/08	< 163	< 1.2
MW-4	05/15/08	< 143	
MW-4	10/23/08	< 164	< 1.3
MW-TMI-10D	05/15/08	386 ± 137	
MW-TMI-10D	10/24/08	303 ± 120	< 1.4
MW-TMI-10I	03/04/08	3570 ± 417	
MW-TMI-10I	05/14/08	3640 ± 425	
MW-TMI-10I	08/13/08	2540 ± 310	
MW-TMI-10I	10/22/08	2240 ± 292	< 1.9
MW-TMI-10I	10/22/08	1840 ± 252	< 1.4
MW-TMI-10S	03/04/08	4600 ± 516	
MW-TMI-10S	03/04/08	4720 ± 532	
MW-TMI-10S	05/14/08	3890 ± 451	
MW-TMI-10S	08/13/08	4790 ± 531	
MW-TMI-10S	10/24/08	3970 ± 459	< 1.8
MW-TMI-12S	01/14/08	224 ± 101	
MW-TMI-12S	03/05/08	< 160	
MW-TMI-12S	05/14/08	194 ± 113	
MW-TMI-12S	08/12/08	< 163	
MW-TMI-12S	10/23/08	628 ± 134	< 1.3
MW-TMI-13I	01/14/08	7030 ± 761	
MW-TMI-13I	01/29/08	7060 ± 767	
MW-TMI-13I	01/29/08	7210 ± 785	
MW-TMI-13I	03/06/08	6670 ± 740	
MW-TMI-13I	04/08/08	4710 ± 529	
MW-TMI-13I	04/08/08	5280 ± 592	
MW-TMI-13I	05/16/08	4740 ± 533	
MW-TMI-13I	05/16/08	4530 ± 521	
MW-TMI-13I	07/02/08	3920 ± 451	
MW-TMI-13I	08/12/08	3290 ± 385	
MW-TMI-13I	09/16/08	3000 ± 345	
MW-TMI-13I	10/24/08	2210 ± 290	< 1.7
MW-TMI-13I	12/08/08	2120 ± 263	

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM AND STRONTIUM IN WELL WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM - THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	SR-90
MW-TMI-13S	01/14/08	452 ± 118	
MW-TMI-13S	01/14/08	422 ± 114	
MW-TMI-13S	01/29/08	490 ± 133	
MW-TMI-13S	03/04/08	< 164	
MW-TMI-13S	04/08/08	220 ± 117	
MW-TMI-13S	05/15/08	435 ± 140	
MW-TMI-13S	07/02/08	732 ± 145	
MW-TMI-13S	08/12/08	215 ± 110	
MW-TMI-13S	09/16/08	425 ± 111	
MW-TMI-13S	10/24/08	385 ± 126	< 1.6
MW-TMI-13S	12/08/08	450 ± 116	
MW-TMI-14D	01/14/08	1370 ± 196	
MW-TMI-14D	01/29/08	1140 ± 192	
MW-TMI-14D	03/04/08	1120 ± 183	
MW-TMI-14D	04/08/08	1340 ± 201	
MW-TMI-14D	05/14/08	1510 ± 217	
MW-TMI-14D	07/02/08	1130 ± 180	
MW-TMI-14D	08/12/08	1190 ± 179	
MW-TMI-14D	08/12/08	1040 ± 170	
MW-TMI-14D	09/16/08	1030 ± 156	
MW-TMI-14D	10/22/08	1190 ± 188	< 1.6
MW-TMI-14D	12/08/08	1270 ± 183	
MW-TMI-14I	04/08/08	745 ± 146	
MW-TMI-14I	05/14/08	849 ± 158	
MW-TMI-14I	07/02/08	609 ± 140	
MW-TMI-14I	08/12/08	438 ± 124	
MW-TMI-14I	09/16/08	331 ± 106	
MW-TMI-14I	10/21/08	237 ± 128	< 1.0
MW-TMI-14I	12/08/08	< 191	
MW-TMI-14I	12/08/08	374 ± 116	
MW-TMI-14S	01/14/08	686 ± 136	
MW-TMI-14S	01/29/08	806 ± 155	
MW-TMI-14S	03/04/08	< 164	
MW-TMI-14S	04/08/08	605 ± 136	
MW-TMI-14S	05/14/08	197 ± 114	
MW-TMI-14S	07/02/08	399 ± 129	
MW-TMI-14S	08/12/08	273 ± 114	
MW-TMI-14S	09/16/08	177 ± 96	
MW-TMI-14S	10/22/08	< 171	< 1.3
MW-TMI-14S	12/08/08	< 148	
MW-TMI-16D	01/14/08	2660 ± 323	
MW-TMI-16D	01/29/08	2530 ± 323	
MW-TMI-16D	03/04/08	2670 ± 327	
MW-TMI-16D	03/04/08	3110 ± 374	
MW-TMI-16D	04/09/08	2800 ± 338	
MW-TMI-16D	05/14/08	2520 ± 327	
MW-TMI-16D	05/14/08	2750 ± 339	
MW-TMI-16D	07/02/08	1970 ± 280	
MW-TMI-16D	07/02/08	2250 ± 286	

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM AND STRONTIUM IN WELL WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM - THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	SR-90
MW-TMI-16D	08/12/08	2040 ± 263	
MW-TMI-16D	09/16/08	2000 ± 248	
MW-TMI-16D	10/22/08	1540 ± 219	< 1.6
MW-TMI-16D	12/08/08	1360 ± 190	
MW-TMI-16I	01/14/08	1090 ± 171	
MW-TMI-16I	01/29/08	795 ± 160	
MW-TMI-16I	03/04/08	987 ± 169	
MW-TMI-16I	04/09/08	1110 ± 181	
MW-TMI-16I	05/14/08	1130 ± 186	
MW-TMI-16I	07/02/08	1020 ± 170	
MW-TMI-16I	08/12/08	671 ± 135	
MW-TMI-16I	09/16/08	448 ± 110	
MW-TMI-16I	09/16/08	374 ± 108	
MW-TMI-16I	10/22/08	757 ± 154	< 1.8
MW-TMI-16I	12/08/08	1450 ± 198	
MW-TMI-17D	05/14/08	< 195	
MW-TMI-17D	10/23/08	< 167	< 1.8
MW-TMI-17D	10/23/08	< 171	< 1.0
MW-TMI-17I	05/16/08	238 ± 129	
MW-TMI-17I	10/23/08	< 165	< 1.5
MW-TMI-18D	05/14/08	< 190	
MW-TMI-18D	10/22/08	< 171	< 1.5
MW-TMI-19D	05/13/08	< 187	
MW-TMI-19D	10/23/08	< 170	< 1.5
MW-TMI-19I	05/19/08	< 196	
MW-TMI-19I	05/19/08	< 187	
MW-TMI-19I	10/23/08	< 161	< 1.5
MW-TMI-1D	05/15/08	380 ± 119	
MW-TMI-1D	10/23/08	459 ± 127	< 1.3
MW-TMI-2D	03/04/08	533 ± 130	
MW-TMI-2D	05/15/08	349 ± 118	
MW-TMI-2D	08/13/08	591 ± 130	
MW-TMI-2D	10/23/08	581 ± 137	< 1.7
MW-TMI-3I	05/16/08	278 ± 129	
MW-TMI-3I	10/23/08	< 171	< 1.5
MW-TMI-4I	05/14/08	< 195	
MW-TMI-4I	10/21/08	< 173	< 1.7
MW-TMI-4S	05/14/08	< 191	
MW-TMI-4S	10/21/08	< 165	< 1.5
MW-TMI-5D	05/14/08	< 195	
MW-TMI-5D	10/21/08	< 170	< 1.7
MW-TMI-6D	05/13/08	287 ± 116	
MW-TMI-6D	10/21/08	246 ± 123	< 1.3
MW-TMI-6I	05/13/08	408 ± 123	
MW-TMI-6I	05/13/08	270 ± 115	
MW-TMI-6I	10/21/08	217 ± 126	< 1.5
MW-TMI-7S	05/13/08	< 195	
MW-TMI-7S	10/22/08	< 168	< 1.6
MW-TMI-8S	05/13/08	253 ± 129	

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM AND STRONTIUM IN WELL WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM - THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE		COLLECTION DATE	H-3	SR-90
MW-TMI-8S		10/22/08	< 170	< 1.6
MW-TMI-8S		10/22/08	< 170	< 1.6
MW-TMI-9I		05/13/08	< 198	
MW-TMI-9I		10/22/08	< 170	< 1.7
N2-1		05/12/08	< 164	
N2-1		10/22/08	< 169	< 1.2
NW-A		05/15/08	704 ± 144	
NW-A		10/28/08	1120 ± 185	< 1.2
NW-B		05/15/08	881 ± 158	
NW-B		10/28/08	483 ± 128	< 1.6
NW-C	ORIGINAL	05/15/08	4460 ± 505	
NW-C	RERUN	05/15/08	5020 ± 540	
NW-C		10/28/08	2750 ± 342	< 1.3
NW-CW		05/15/08	932 ± 165	
NW-CW		10/28/08	958 ± 172	< 1.6
OS-13B		05/13/08	279 ± 114	
OS-14		05/13/08	317 ± 119	
OS-14		10/21/08	< 167	< 1.0
OS-16		05/13/08	374 ± 121	
OS-17		05/14/08	439 ± 127	
OS-17		10/23/08	< 163	
OS-18		03/04/08	369 ± 116	
OS-18		05/15/08	< 190	
OS-18		08/12/08	592 ± 131	
OS-18		10/21/08	220 ± 117	< 1.7
OS-18		10/21/08	279 ± 116	< 1.8
OSF		03/03/08	720 ± 143	
OSF		05/16/08	547 ± 129	
OSF		08/11/08	517 ± 127	
OSF		08/11/08	414 ± 122	
OSF		10/28/08	599 ± 139	< 1.6
RW-1		05/14/08	< 171	
RW-1		10/22/08	< 176	< 1.1
RW-2		01/14/08	449 ± 113	
RW-2		01/29/08	297 ± 118	
RW-2		03/05/08	365 ± 117	
RW-2		04/09/08	259 ± 118	
RW-2		05/14/08	245 ± 117	
RW-2		07/02/08	288 ± 124	
RW-2		08/13/08	249 ± 112	
RW-2		08/13/08	232 ± 113	
RW-2		09/16/08	308 ± 103	
RW-2		10/23/08	929 ± 168	< 1.3
RW-2		10/23/08	979 ± 160	< 0.9
RW-2	ORIGINAL	12/08/08	2250 ± 298	
RW-2	RERUN	12/08/08	2070 ± 265	
TRAINING CENTER		05/12/08	< 169	
TRAINING CENTER		10/28/08	< 168	< 1.2

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN WELL WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
#3	10/22/08	< 9	< 14	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 1	< 1	< 41	< 13
48N	10/23/08	< 9	< 4	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 0	< 0	< 41	< 11
48S	10/28/08	< 10	< 6	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 1	< 1	< 35	< 11
E1-2	10/28/08	< 15	< 7	< 1	< 2	< 4	< 1	< 2	< 2	< 3	< 1	< 1	< 51	< 14
MS-1	10/24/08	< 16	< 24	< 1	< 1	< 4	< 1	< 2	< 1	< 2	< 1	< 1	< 56	< 15
MS-19	10/21/08	< 14	< 7	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 58	< 14
MS-19	10/21/08	< 8	< 4	< 0	< 1	< 2	< 0	< 1	< 1	< 1	< 0	< 0	< 39	< 11
MS-2	10/22/08	< 12	< 5	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 49	< 14
MS-20	10/21/08	< 9	< 17	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 1	< 1	< 44	< 14
MS-21	10/21/08	< 11	< 17	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 1	< 1	< 43	< 14
MS-22	10/23/08	< 10	< 14	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 1	< 1	< 43	< 15
MS-3	10/22/08	< 12	< 5	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 49	< 15
MS-4	10/23/08	< 10	< 14	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 59	< 13
MS-5	10/21/08	< 11	61 ± 26	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 52	< 15
MS-6	10/21/08	< 10	< 13	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 50	< 13
MS-7	10/22/08	< 10	130 ± 17	< 1	< 1	< 2	< 0	< 1	< 1	< 2	< 1	< 1	< 41	< 14
MS-8	10/21/08	< 11	123 ± 24	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 1	< 1	< 47	< 15
MW-1	10/23/08	< 13	51 ± 23	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 54	< 15
MW-1	10/23/08	< 11	< 6	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 50	< 15
MW-2	10/23/08	< 10	< 5	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 46	< 15
MW-3	10/23/08	< 11	< 4	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 58	< 11
MW-4	10/23/08	< 13	37 ± 23	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 58	< 14
MW-TMI-10D	10/24/08	< 13	< 23	< 1	< 1	< 4	< 1	< 2	< 1	< 2	< 1	< 1	< 44	< 14
MW-TMI-10I	10/22/08	< 15	< 9	< 1	< 1	< 4	< 1	< 2	< 2	< 3	< 1	< 1	< 57	< 14
MW-TMI-10I	10/22/08	< 12	62 ± 24	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 47	< 15
MW-TMI-10S	10/24/08	< 12	< 7	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 47	< 12
MW-TMI-12S	10/23/08	< 11	< 6	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 46	< 15
MW-TMI-13I	10/24/08	< 11	< 5	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 41	< 13
MW-TMI-13S	10/24/08	< 12	< 8	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 39	< 14
MW-TMI-14D	10/22/08	< 7	< 4	< 0	< 1	< 2	< 1	< 1	< 1	< 1	< 0	< 1	< 37	< 14
MW-TMI-14I	10/21/08	< 9	< 14	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 48	< 15
MW-TMI-14S	10/22/08	< 7	59 ± 17	< 0	< 1	< 2	< 0	< 1	< 1	< 1	< 0	< 0	< 32	< 11
MW-TMI-16D	10/22/08	< 9	< 15	< 1	< 1	< 2	< 0	< 1	< 1	< 2	< 0	< 1	< 43	< 14
MW-TMI-16I	10/22/08	< 8	< 16	< 1	< 1	< 2	< 0	< 1	< 1	< 1	< 0	< 1	< 41	< 13
MW-TMI-17D	10/23/08	< 11	< 26	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 44	< 13
MW-TMI-17D	10/23/08	< 13	119 ± 22	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 52	< 14

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN WELL WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
MW-TMI-17I	10/23/08	< 14	< 8	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 50	< 15
MW-TMI-18D	10/22/08	< 14	< 26	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 53	< 14
MW-TMI-19D	10/23/08	< 16	< 8	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 50	< 15
MW-TMI-19I	10/23/08	< 13	< 7	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 44	< 15
MW-TMI-1D	10/23/08	< 11	62 ± 25	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 42	< 14
MW-TMI-2D	10/23/08	< 13	< 29	< 1	< 1	< 4	< 1	< 2	< 1	< 2	< 1	< 1	< 46	< 15
MW-TMI-3I	10/23/08	< 12	< 6	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 43	< 12
MW-TMI-4I	10/21/08	< 13	< 20	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 46	< 15
MW-TMI-4S	10/21/08	< 14	< 7	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 52	< 15
MW-TMI-5D	10/21/08	< 11	< 21	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 39	< 15
MW-TMI-6D	10/21/08	< 13	< 19	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 56	< 15
MW-TMI-6I	10/21/08	< 11	< 5	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 51	< 15
MW-TMI-7S	10/22/08	< 11	< 23	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 45	< 14
MW-TMI-8S	10/22/08	< 14	< 8	< 1	< 1	< 4	< 1	< 2	< 2	< 2	< 1	< 1	< 54	< 14
MW-TMI-8S	10/22/08	< 10	< 6	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 40	< 14
MW-TMI-9I	10/22/08	< 13	< 6	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 47	< 12
N2-1	10/22/08	< 11	< 22	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 44	< 15
NW-A	10/28/08	< 16	< 8	< 1	< 2	< 4	< 1	< 2	< 2	< 2	< 1	< 1	< 56	< 13
NW-B	10/28/08	< 15	< 9	< 1	< 2	< 4	< 1	< 2	< 2	< 3	< 1	< 1	< 42	< 14
NW-C	10/28/08	< 19	< 9	< 1	< 2	< 4	< 1	< 2	< 2	< 4	< 1	< 1	< 57	< 13
NW-CW	10/28/08	< 14	< 8	< 1	< 1	< 3	< 1	< 2	< 2	< 2	< 1	< 1	< 45	< 13
OS-14	10/21/08	< 8	< 5	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 0	< 0	< 35	< 12
OS-18	10/21/08	< 12	< 6	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 46	< 14
OS-18	10/21/08	< 13	< 20	< 1	< 1	< 3	< 1	< 1	< 1	< 2	< 1	< 1	< 51	< 14
OSF	10/28/08	< 14	< 24	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 40	< 13
RW-1	10/22/08	< 9	< 16	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 0	< 1	< 40	< 13
RW-2	10/23/08	< 12	< 7	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 44	< 12
RW-2	10/23/08	< 8	< 5	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 0	< 1	< 37	< 12
TRAINING CENTER	10/28/08	< 13	< 8	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 39	< 15

TABLE B-II.1 CONCENTRATIONS OF TRITIUM AND STRONTIUM IN SURFACE WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM - THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	SR-90
SW-E-1	03/03/08	< 165	
SW-E-1	05/12/08	< 191	
SW-E-1	05/12/08	< 197	
SW-E-1	08/11/08	< 165	
SW-E-1	10/28/08	< 171	< 1.0
SW-E-2	03/03/08	< 166	
SW-E-2	05/12/08	< 192	
SW-E-2	08/11/08	< 162	
SW-E-2	10/28/08	< 167	< 1.6
SW-E-3	03/03/08	< 166	
SW-E-3	05/15/08	< 191	
SW-E-3	08/11/08	< 161	
SW-E-3	10/28/08	< 158	< 1.8

TABLE B-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
TM-SW-E-1	10/28/08	< 16	< 10	< 1	< 2	< 4	< 1	< 2	< 2	< 3	< 1	< 1	< 47	< 12
TM-SW-E-2	10/28/08	< 16	< 32	< 1	< 2	< 3	< 1	< 2	< 2	< 3	< 1	< 1	< 45	< 13
TM-SW-E-3	10/28/08	< 14	< 25	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 41	< 14

TABLE B-III.1 **CONCENTRATIONS OF TRITIUM IN PRECIPITATION WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM - THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE		COLLECTION DATE	H-3
PR-J1-3		01/28/08 - 02/26/08	< 171
PR-J1-3		02/26/08 - 03/31/08	< 178
PR-J1-3		03/31/08 - 04/29/08	< 173
PR-J1-3		04/29/08 - 06/03/08	< 172
PR-J1-3		06/03/08 - 07/01/08	< 166
PR-MS-1		01/28/08 - 02/26/08	< 167
PR-MS-1		02/26/08 - 03/31/08	< 169
PR-MS-1		03/31/08 - 04/29/08	< 167
PR-MS-1		04/29/08 - 06/03/08	< 172
PR-MS-1		06/03/08 - 07/01/08	< 167
PR-MS-19		01/28/08 - 02/26/08	< 172
PR-MS-19		02/26/08 - 03/31/08	< 177
PR-MS-19		03/31/08 - 04/29/08	175 ± 114
PR-MS-19		04/29/08 - 06/03/08	< 168
PR-MS-19		06/03/08 - 07/01/08	172 ± 111
PR-MS-2		01/28/08 - 02/26/08	463 ± 132
PR-MS-2		02/26/08 - 03/31/08	181 ± 115
PR-MS-2		03/31/08 - 04/29/08	< 174
PR-MS-2		04/29/08 - 06/03/08	< 162
PR-MS-2		06/03/08 - 07/01/08	< 168
PR-MS-20		01/28/08 - 03/31/08	475 ± 131
PR-MS-20		02/26/08 - 04/29/08	425 ± 130
PR-MS-20	ORIGINAL	03/31/08 - 04/29/08	706 ± 149
PR-MS-20	RERUN	03/31/08 - 04/29/08	512 ± 131
PR-MS-20		04/29/08 - 06/03/08	< 169
PR-MS-20		06/03/08 - 07/01/08	196 ± 112
PR-NW-B		01/28/08 - 02/26/08	290 ± 117
PR-NW-B		02/26/08 - 03/31/08	265 ± 116
PR-NW-B		03/31/08 - 04/29/08	191 ± 113
PR-NW-B		04/29/08 - 06/03/08	226 ± 117
PR-NW-B		06/03/08 - 07/01/08	< 168

APPENDIX C

DATA TABLES

TABLE C-I.1 **CONCENTRATIONS OF TRITIUM IN WELL WATER SPLIT SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE		COLLECTION DATE	H-3	SR-90
MW-TMI-13S		01/14/08	446 ± 111	
MW-TMI-13I	ORIGINAL	01/29/08	8159 ± 268	
MW-TMI-13I	DUPLICATE	01/29/08	7913 ± 264	
MW-TMI-16D		03/04/08	3095 ± 180	
MW-TMI-10S		03/04/08	4811 ± 214	
MS-21		03/05/08	258 ± 102	
MW-TMI-13I		04/08/08	6123 ± 242	
MW-TMI-6I		05/13/08	411 ± 91	
MW-TMI-16D		05/14/08	2817 ± 163	
MW-2		05/15/08	< 147	
MS-8		05/13/08	403 ± 91	
MW-TMI-13I		05/16/08	5385 ± 214	
MW-TMI-19I		05/19/08	179 ± 81	
MW-TMI-16D		07/02/08	2246 ± 159	
RW-2		08/13/08	205 ± 97	
MW-TMI-14D		08/12/08	1317 ± 133	
OSF		08/11/08	591 ± 111	
MW-TMI-16I		09/16/08	570 ± 97	
OS-18		10/21/08	< 154	< 0.5
MW-TMI-8S		10/22/08	249 ± 89	< 0.5
MW-TMI-17D		10/23/08	182 ± 86	< 0.5
RW-2		10/23/08	877 ± 115	< 0.7
MS-19		10/21/08	173 ± 85	< 0.5
MW-TMI-10I		10/22/08	2058 ± 152	< 0.5
MW-1		10/23/08	< 154	< 0.6
MW-TMI-14I		12/08/08	< 160	

TABLE C-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN WELL WATER SPLIT SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2008**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
MS-1	10/24/08	< 48	< 81	< 3	< 3	< 10	< 3	< 5	< 3	< 6	< 5	< 2	< 31	< 6
MS-19	10/21/08	< 39	< 85	< 3	< 3	< 6	< 2	< 6	< 4	< 8	< 3	< 4	< 16	< 4
MW-TMI-10I	10/22/08	< 28	< 83	< 4	< 4	< 7	< 2	< 6	< 4	< 8	< 3	< 4	< 16	< 4
MW-TMI-17D	10/23/08	< 36	< 78	< 3	< 4	< 6	< 2	< 10	< 2	< 6	< 3	< 4	< 16	< 4
MW-TMI-8S	10/22/08	< 45	< 85	< 3	< 3	< 9	< 2	< 4	< 3	< 6	< 4	< 4	< 31	< 3
OS-18	10/21/08	< 31	< 65	< 3	< 2	< 6	< 2	< 7	< 3	< 6	< 4	< 3	< 17	< 4
RW-2	10/23/08	< 34	< 81	< 2	< 2	< 5	< 3	< 4	< 3	< 7	< 3	< 2	< 23	< 3

TABLE C-II.1 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SPLIT SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
SW-E-3	05/12/08	< 147

TABLE C-III.1 CONCENTRATIONS OF TRITIUM IN PRECIPITATION WATER SPLIT SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM - THREE MILE ISLAND NUCLEAR STATION, 2008

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
PR-MS-1Q	01/28/08 - 02/26/08	< 177
PR-MS-1Q	02/26/08 - 03/31/08	< 180
PR-MS-1Q	03/31/08 - 04/29/08	< 155
PR-MS-1Q	04/29/08 - 06/03/08	< 167
PR-MS-1Q	06/03/08 - 07/01/08	251 ± 95