Docket No: 50-352
50-353

LIMERICK GENERATING STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

Report #13

1 January Through 31 December 1996

Prepared By

PECO Nuclear
a Unit of PECO Energy
965 Chesterbrook Blvd.
Wayne, PA 19087-5691

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I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program conducted for the Limerick Generating Station by PECO Nuclear covers the period 1 January 1996 through 31 December 1996. During that time period, 1075 analyses were performed on 883 samples.

Surface water samples were analyzed for concentrations of tritium and gamma emitting nuclides. No fission or activation products were found. Tritium activities detected were consistent with those observed in other years.

Drinking water samples were analyzed for concentrations of gross beta (soluble and insoluble fractions), tritium, and gamma emitting nuclides. No fission or activation products were found. Gross beta and tritium activities detected were consistent with those observed in other years.

Fish (predator and bottom feeder) and sediment samples were analyzed for concentrations of gamma emitting nuclides. Sediment samples collected below the discharge had Cs-137 concentrations consistent with levels observed in the preoperational years. No other fission or activation products were found in either fish or sediment.

Air particulate samples were analyzed for concentrations of gross beta and gamma emitting nuclides. Cosmogenic Be-7 and naturally occurring K-40 were observed at levels consistent with those observed in other 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 and goat milk samples were analyzed for concentrations of I-131 and gamma emitting nuclides. All I-131 results detected were below the minimum detectable activity. Concentrations of K-40 were consistent with those observed in other years. No fission or activation products were found.

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

Review of the gamma spectroscopy results from the surface water sampler (25S1) located at the Limerick's intake and downstream of the 10CFR20.2002 permitted storage area indicate no offsite radioactive nuclide transport was evident.

In assessing all the data gathered for this report and comparing these results

with preoperational data, it was evident that, the operation of LGS had no adverse impact on the environment.

II. Introduction

The Limerick Generating Station (LGS), consisting of two 1163 MWe boiling water reactors owned and operated by PECO Nuclear (PECO), is located adjacent to the Schuylkill River in Montgomery County, Pennsylvania. Unit No. 1 went critical on 22 December 1984. Unit No. 2 went critical on 11 August 1989. The site is located in Piedmont countryside, transversed by numerous valleys containing small tributaries which feed into the Schuylkill River. On the eastern river bank elevation rises from approximately 110 to 300 feet mean sea level (MSL). On the western river bank elevation rises to approximately 50 feet MSL to the western site boundary.

A Radiological Environmental Monitoring Program (REMP) for LGS was initiated in 1971. Review of the 1971 through 1977 REMP data resulted in the modification of the program to comply with changes in the Environmental Report Operating License Stage (EROL) and the Branch Technical Position Paper (Rev. 1, 1979). The preoperational period for most media covers the periods 1 January 1982 through 21 December 1984 and was summarized in a separate report. This report covers those analyses performed by GPU Nuclear and Teledyne Brown Engineering (TBE) on samples collected during the period 1 January 1996 through 31 December 1996.

On July 6, 1996 a 10CFR20.2002 permit was issued to Limerick for storage of slightly contaminated soils, sediments and sludges obtained from the holding pond, cooling tower and spray pond systems. These materials while in storage will decay to background. Final disposition will be determined at decommissioning of the Station.

A. Objectives of the REMP

The objectives of the REMP are to:

1. Provide data on measurable levels of radiation and radioactive materials in the site environs.

2. Evaluate the relationship between quantities of radioactive material released from the plant and resultant radiation doses to individuals from principal pathways of exposure.

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 effects (if any) on man and the environment.

III. Program Description

A. Sample Collection

Samples for the LGS REMP were collected for PECO Nuclear by Normandeau Associates, RMC Environmental Services Division (RMC). This section describes the collection methods used by RMC to obtain environmental samples for the LGS REMP in 1996. Sample locations and descriptions can be found in Tables B-1 and B-2, and Figures B-1 through B-3, Appendix B.

Aquatic Environment

The aquatic environment was examined by analyzing samples of surface water, drinking water, fish, and sediment. Two gallon water samples were collected monthly from continuous samplers located at two surface water locations (13B1 and 24S1) and four drinking water locations (15F4, 15F7, 16C2, and 28F3). One additional surface water location (10F2) was sampled only during the months when water was taken from the Perkiomen Creek for cooling. Control locations were 10F2, 24S1, and 28F3. All samples were collected in new unused plastic bottles, which were rinsed at least twice with source water prior to collection. Fish samples comprising the flesh of two groups, catfish/bullhead (bottom feeder) and sunfish (predator), were collected semiannually at two locations: 16C5 and 29C1 (control). Sediment samples composed of recently deposited substrate were collected at three locations semiannually: 16B2 and 16C4 (indicator) and 33A2 (control).

Atmospheric Environment

The atmospheric environment was examined by analyzing samples of air particulate, airborne iodine, and milk. Airborne iodine and particulate samples were collected and analyzed weekly at five locations (10S3, 11S1, 13C1, 14S1, and 22G1). The control location was 22G1. 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 1 cubic foot per minute. The filters were replaced weekly and sent to the laboratory for analysis.

Milk samples were collected biweekly at five locations (9G!, 19B1, 18C1, and 21B1) during April through November, and monthly during December through March. Four additional locations (36E1, 22C1, 23F1 and 25C1) were sampled quarterly. Locations 9G1 and 23F1 were controls. All samples were collected in new unused two gallon plastic bottles from the bulk tank at each location, refrigerated, and shipped promptly to the

laboratory. No preservative was added.

Ambient Gamma Radiation

Direct radiation measurements were made using Panasonic 801 calcium sulfate ($CaSO_4$) thermoluminescent dosimeters (TLD). The TLD locations were placed on and around the LGS site as follows:

A site boundary ring consisting of sixteen locations (36S2, 3S1, 5S1, 7S1, 10S3, 11S1, 13S2, 14S1, 18S2, 21S2, 23S2, 25S2, 26S3, 29S1, 31S1 and 34S2) 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 LGS release.

An intermediate distance ring consisting of sixteen locations (36D1, 2E1, 4E1, 7E1, 10E1, 10F3, 13E1, 16F1, 19D1, 20F1, 24D1, 25D1, 28D2, 29E1, 31D2, and 34E1) extending to approximately 5 miles from the site designed to measure possible exposures to close-in population.

The balance of eight locations (5H1, 6C1, 9C1, 13C1, 15D1, 17B1, 20D1 and 31D1) representing control and special interests areas such as population centers, schools, etc.

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 16-22 1/2 degree sectors around the site, where estimated annual dose from LGS, 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.

Two TLDs - each comprised of two thermoluminescent phosphors enclosed in plastic - were placed at each location in a PVC conduit located approximately three feet above ground level. The TLDs were exchanged quarterly and sent to the laboratory for analysis.

10CFR20.2002 Permit Storage Area

1. The results of the surface water sampling program is used to determine any radioactive nuclide transport from the storage area

the Schuylkill River.

B. Sample Analysis

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

1. Concentrations of beta emitters in drinking water, and air particulates.

2. Concentrations of gamma emitters in surface and drinking water, air particulates, milk, fish, and sediment.

3. Concentrations of tritium in surface and drinking water.

4. Concentrations of I-131 in air and milk.

5. Ambient gamma radiation levels at various site environs.

C. Data Interpretation

The radiological and direct radiation data collected prior to LGS becoming operational was used as a baseline with which this operational data will be compared. For the purpose of this report, LGS was considered operational at initial criticality. In addition data will be compared to previous years' operational data for consistency and trending. Several factors are important in the interpretation of the data. These factors are discussed here to avoid undue repetition in the discussion of the results.

1. Lower Limit of Detection and Minimum Detectable Activity

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

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

2. Net Activity Calculation and Reporting of Results

Net activity for a sample was calculated by subtracting background activity from the sample activity. Since the REMP measures extremely small changes in radioactivity in the environment, background variations will result in sample activity being lower than the background activity effecting a negative number. For a more detailed description of the result calculations, see Appendix E.

Results for each type of sample were grouped according to the analyses performed. For gamma analyses, fifteen nuclides (Be-7, K-40, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Zr-95, Nm-95, Cs-134, Cs-137, Ba-140, La-140, Ra-226 and Th-232) were reported. Means and standard deviations of these results were calculated. These standard deviations represent the variability of measured results for different samples rather than single analysis uncertainty.

D. Program Exceptions

For 1996 the LGS REMP had a sample recovery rate of better than 99%. The exceptions to this program are listed below:

1. Surface water samples collected at location 24S1 (LGS Intake) were composites of weekly grabs during the weeks of 4/29/96, 11/11/96, 12/09/96, 12/16/96 and 12/30/96 due to equipment or weather related problems.

2. Surface water samples collected at location 13B1 (Vincent Dam) were composites of weekly grabs during the weeks of 1/29/96, 3/12/96, 3/25/96, 5/15/96, 7/01/96, 7/17/96, 7/23/96, 10/10/96, 12/09/96 and 12/30/96 due to equipment or weather related problems.

3. Surface water samples collected at location 10F2 (Perkiomen Creek) were composites of weekly grabs during the week of 6/19/96 due to equipment related problems.

4. Drinking water samples collected at location 16C2 (Citizen's Utilities) were composites of weekly grabs during the weeks of 4/12/96, 4/18/96, 12/16/96 and 12/30/96 due to equipment related problems.

5. Drinking water samples collected at location 15F7 (Phoenixville) were composites of weekly grabs during the weeks of 10/27/96 and 10/29/96 due to equipment related problems.

6. Milk samples from farm 10B1 were not available from January 1 to May 22 and October 8 through December 31, 1996, because the goats had stopped lactating.

7. TLD location 25S2 was vandalized during the second and fourth quarters of 1996. The TLDs were stolen or destroyed.

8. The air particulate filter week no 35 from QC sampling location was lost in transit to the laboratory.

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 numerous equipment problems noted for surface water location 13B1 were discussed with the sample collection contractor. The major cause of pump failure had been silt build due to the unusual high flows in the Schuylkill River. The high flows occasionally prevented the use of a backup battery operated ISCO sampler. The intake lines were inspected and minor repairs performed by SCUBA divers. Debris which may have caused some of the problems was removed from the line. Additional preventative maintenance is also being performed.

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

E. Program Changes

The following Program changes were made for 1996:

1. Farm 9G1 was moved from the quarterly sampling program to the bi-weekly sampling program replacing farm 22F1 which went out of business on April 23, 1996.

2. Farm 23F1 was added to the quarterly milk sampling program on July 2, 1996.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken from a continuous sampler at three locations (10F2, 13B1, and 24S1) on a monthly schedule. Of these locations, only 13B1 could be affected by Station discharges. The following analyses were performed.

Tritium

Monthly samples from all locations were composited quarterly and analyzed for tritium activity (Table C-I.1, Appendix C). Tritium activity ranged from -6.6 to 91 pCi/l.

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides (Table C-I.2, Appendix C). One positive K-40 result was found out of 31 samples. Potassium-40 results ranged from -15 to 48 pCi/l. All other nuclides searched for were less than the minimum detectable activity.

2. Drinking Water

Monthly samples were collected from continuous water samplers at four locations (15F4, 15F7, 16C2, and 28F3). Three locations (15F4, 15F7, and 16C2) could be affected by Station discharges. The following analyses were performed:

Gross Beta

Samples from all locations were analyzed for concentrations of gross beta in the insoluble and soluble fractions (Tables C-II.1 and C-II.2, Appendix C). The values ranged from -2.6 to 1.0 pCi/l for the insoluble fraction and from -1.9 to 5.8 pCi/l for the soluble fraction. Concentrations detected in both fractions were consistent with those observed in previous years (Figures C-1 and C-2, Appendix C).

Tritium

Monthly samples from all locations were composited quarterly and analyzed for tritium activity (Table C-II.3, Appendix C). Tritium activity ranged from 0.8 to 170 pCi/l. Similar activity levels were observed at all locations.

Gamma Spectrometry

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

3. Fish

Fish samples comprised of catfish/bullhead (bottom feeder) and redbreast/pumpkinseed (predator) were collected at two locations (16C5 and 29C1) semiannually. Location 16C5 could be affected by Station discharges. The following analysis was performed:

Gamma Spectrometry

The edible portion of fish samples from both locations was analyzed for gamma emitting nuclides (Table C-III.1, Appendix C). With the exception of naturally occurring K-40, no fission or activation products were found. The K-40 activity ranged from 2300 to 3700 pCi/kg (wet). Historical levels of Cs-137 are shown in Figure C-3, Appendix C.

4. Sediment

Aquatic sediment samples were collected at three locations (16B2, 16C4 and 33A2) semiannually. Of these locations, two (16B2 and 16C4) could be affected by Station discharge. The following analysis was performed:

Gamma Spectrometry

Sediment samples from all three locations were analyzed for gamma emitting nuclides (Table C-IV.1, Appendix C). Nuclides detected were cosmogenic Be-7; naturally occurring K-40, Ra-226 and Th-232 and the fission product Cs-137. The nuclides Th-232 and Ra-226 commonly occur in sediment from the daughter decay of natural uranium.

Concentrations of the fission product Cs-137 were found in

sediment samples from both indicator locations. Location 16C2 had the highest average concentration of 210 pCi/kg (dry). The activity detected was consistent with those observed in the preoperational years (Figure C-4, Appendix C).

B. Atmospheric Environment

1. Airborne

a. Air Particulates

Continuous air particulate samples were collected from five locations on a weekly basis. The five locations were separated into three groups: Group I represents locations within the LGS site boundary (10S3, 11S1, and 14S1), Group II represents the location at an intermediate distance from the LGS site (13C1), and Group III represents the control location at a remote distance from LGS (22G1). The following analyses were performed:

Gross Beta

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

Detectable gross beta activity was observed at all locations. Comparison of results among the three groups aid in determining the effects, if any, resulting from the operation of LGS. The results from the On-Site locations (Group I) ranged from 4 to 32 E-3 pCi/m^3 with a mean of 15 E-3 pCi/m^3. The results from the Intermediate Distance location (Group II) ranged from 4 to 31 E-3 pCi/m^3 with a mean of 16 E-3 pCi/m^3. The results from the Distant locations (Group III) ranged from 6 to 30 E-3 pCi/m^3 with a mean of 16 E-3 pCi/m^3. Comparison of the 1996 air particulate data with previous years data suggest no effects from the operation of LGS (Figure C-5, Appendix C). In addition a comparison of the weekly mean values for 1996 indicate no notable differences among the three groups (Figure C-6, Appendix C).

Gamma Spectrometry

Weekly samples were composited quarterly and analyzed for gamma emitting nuclides (Table C-V.3, Appendix C). Naturally occurring Be-7 due to cosmic ray activity was

detected in all samples. These values ranged from 44 to 91 E-3 pCi/m^3. All other nuclides searched for were less than the minimum detectable activity.

b. Airborne Iodine

Continuous air samples were collected from five (10S3, 11S1, 14S1, 13C1, and 22G1) locations and analyzed weekly for I-131 (Table C-VI.1, Appendix C). All results were less than the minimum detectable activity and ranged from -17 to 18 E-3 pCi/m^3.

2. Terrestrial

a. Milk

Samples were taken from five locations (10B1, 18C1, 19B1, 21B1 and 22F1/9G1) biweekly April through November and monthly December through March. Samples from four additional locations (9G1/23F1, 22C1, 25C1 and 36E1) were taken quarterly. The following analyses were performed:

Iodine-131

Milk samples from all locations were analyzed for concentrations of I-131 (Table C-VII.1, Appendix C). All results were less than the minimum detectable activity and ranged from -0.22 to 0.11 pCi/l.

Gamma Spectrometry

Each milk sample from locations 10B1, 18C1, 19B1, 21B1 and 22F1 were analyzed for concentrations of gamma emitting nuclides (Table C-VII.2, Appendix C).

Potassium-40 activity was found in all samples. The values ranged from 1300 to 1900 pCi/l. All other nuclides searched for were less than the minimum detectable activity.

C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured utilizing Panasonic 801 ($CaSO_4$) thermoluminescent dosimeters. Forty TLD locations were established around the site. Results of TLD measurements are listed in

Tables C-VIII.1 to C-VIII.4, Appendix C.

All TLD measurements were below 10 mrad/std. month, with a range of 4.1 to 9.3 mR/std. A comparison of the Site Boundary and Intermediate Distance data to the Control Location data, indicate that the ambient gamma radiation levels from the Control Location 5H1 was consistently higher. The historical ambient gamma radiation data from Location 5H1 was plotted along with similar data from the Site, Intermediate Distance and Outer Ring Locations (Figure C-7, Appendix C). The data indicate that Location 5H1 had a historical high bias, but tracked with the data from all three groups.

V. References

1. Environmental Report Operating License Stage, Limerick Generating Station, Units 1 and 2, Volumes 1-5 Philadelphia Electric Company.

2. Branch Technical Position Paper, Regulatory Guide 4.8, Revision 1, November 1979.

3. Preoperational Radiological Environmental Monitoring Program Report, Limerick Generating Station Units 1 and 2, 1 January 1982 through 21 December 1984, Teledyne Isotopes and Radiation Management Corporation.

4. Radiological Environmental Operating Report No. 2, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1985, Philadelphia Electric Company, analyses by Teledyne Isotopes.

5. Radiological Environmental Operating Report No. 3, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1986, Philadelphia Electric Company, analyses by Teledyne Isotopes.

6. Radiological Environmental Operating Report No. 4, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1987, Philadelphia Electric Company, analyses by Teledyne Isotopes.

7. Radiological Environmental Operating Report No. 5, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1988, Philadelphia Electric Company, analyses by Teledyne Isotopes.

8. Radiological Environmental Operating Report No. 6. Limerick Generating Station Units 1 and 2, 1 January through 31 December 1989, Philadelphia Electric Company, analyses by Teledyne Isotopes.

9. Radiological Environmental Operating Report No. 7, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1990, Philadelphia Electric Company, analyses by Teledyne Isotopes.

10. Radiological Environmental Operating Report No. 8, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1991, Philadelphia Electric Company, analyses by Teledyne Isotopes.

11. Radiological Environmental Operating Report No. 9, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1992, Philadelphia Electric Company, analyses by Teledyne Isotopes.

12. Radiological Environmental Operating Report No. 10, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1993, PECO Energy Company, analyses by Teledyne Isotopes.

13. Radiological Environmental Operating Report No. 11, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1994, PECO Energy Company.

14. Radiological Environmental Operating Report No. 12, Limerick Generating Station Units 1 and 2, 1 January through 31 December 1995, PECO Nuclear.

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION
LOCTION OF FACILITY: MONTGOMERY COUNTY, PA

DOCKET NUMBER: 50-352 & 50-353
REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	TRITIUM	10	2000	42 (4/4) (-7/81)	39 (6/6) (5.6/91)	51 (4/4) (6.6/91)	24S1 (CONTROL) LGS INTAKE 0.20 MILES SW OF SITE	0
	GAMMA	31						
	BE-7		N/A	3.9 (12/12) (-5/15)	0.8 (19/19) (-6.2/8.5)	3.9 (12/12) (-5/15)	13B1 (INDICATOR) VINCENT DAM 1.75 MILES SE OF SITE	0
	K-40		N/A	7.4 (12/12) (-13/48)	5.6 (19/19) (-15/39)	9.5 (7/7) (-12/39)	10F2 (CONTROL) PERKIOMEN PUMPING STATION 7.30 MILES E OF SITE	0
	MN-54		15	-0.1 (12/12) (-1.3/0.8)	0.1 (19/19) (-0.8/1.6)	0.3 (7/7) (-0.8/1.6)	10F2 (CONTROL) PERKIOMEN PUMPING STATION 7.30 MILES E OF SITE	0
	CO-58		15	-0.4 (12/12) (-1.3/0.5)	-0.4 (19/19) (-2.2/0.4)	-0.1 (12/12) (-0.9/0.4)	24S1 (CONTROL) LGS INTAKE 0.20 MILES SW OF SITE	0
	CO-60		15	0.2 (12/12) (-1/1.8)	0.1 (19/19) (-1.7/1.9)	0.2 (12/12) (-1/1.8)	13B1 (INDICATOR) VINCENT DAM 1.75 MILES SE OF SITE	0
	FE-59		30	0.4 (12/12) (-1.8/6.7)	1.1 (19/19) (-0.5/3.1)	1.4 (12/12) (-0.4/3.1)	24S1 (CONTROL) LGS INTAKE 0.20 MILES SW OF SITE	0
	ZN-65		30	-2.3 (12/12) (-6/0.1)	-1.1 (19/19) (-4/3.3)	-1.1 (12/12) (-4/3.3)	24S1 (CONTROL) LGS INTAKE 0.20 MILES SW OF SITE	0
	ZR-95		30	0.1 (12/12) (-1.7/1.4)	0.3 (19/19) (-2.3/1.7)	0.7 (7/7) (-0.1/1.7)	10F2 (CONTROL) PERKIOMEN PUMPING STATION 7.30 MILES E OF SITE	0
	NB-95		15	-0.1 (12/12) (-1.8/1.4)	0.4 (19/19) (-0.7/2.3)	0.6 (7/7) (0.1/1.1)	10F2 (CONTROL) PERKIOMEN PUMPING STATION 7.30 MILES E OF SITE	0
	CS-134		15	-4 (12/12) (-11/-1.1)	-3 (19/19) (-9/0.7)	-2.9 (7/7) (-8/0.3)	10F2 (CONTROL) PERKIOMEN PUMPING STATION 7.30 MILES E OF SITE	0

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

APPENDIX A

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NAME OF FACILITY: LIMERICK GENERATING STATION
LOCTION OF FACILITY: MONTGOMERY COUNTY, PA

DOCKET NUMBER: 50-352 & 50-353
REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	CS-137		18	0.0 (12/12) (-2.5/2.2)	0.0 (19/19) (-0.6/1.2)	0.0 (12/12) (-2.5/2.2)	13B1 (INDICATOR) VINCENT DAM 1.75 MILES SE OF SITE	0
	BA-140		60	-0.5 (12/12) (-5/3.2)	-0.4 (19/19) (-3.2/3.5)	0.5 (7/7) (-2.1/3.5)	10F2 (CONTROL) PERKIOMEN PUMPING STATION 7.30 MILES E OF SITE	0
	LA-140		15	0.1 (12/12) (-1.1/1.4)	0.6 (19/19) (-1.4/2.9)	0.6 (7/7) (-0.5/1.5)	10F2 (CONTROL) PERKIOMEN PUMPING STATION 7.30 MILES E OF SITE	0
	RA-226		N/A	12 (12/12) (-24/54)	-1.4 (19/19) (-36/21)	12 (12/12) (-24/54)	13B1 (INDICATOR) VINCENT DAM 1.75 MILES SE OF SITE	0
	TH-232		N/A	-1.3 (12/12) (-10/2.4)	1.5 (19/19) (-2.7/5.3)	1.9 (7/7) (-0.6/5.3)	10F2 (CONTROL) PERKIOMEN PUMPING STATION 7.30 MILES E OF SITE	0
DRINKING WATER (PCI/LITER)	GROSS BETA SOLUBLE	48	4	3.0 (36/36) (-1.0/5.8)	2.9 (12/12) (-1.9/5.3)	3.4 (12/12) (2/5.8)	15F4 (INDICATOR) PHILA. SUB. WATER CO. 8.62 MILES SE OF SITE	0
	GROSS BETA INSOLUBLE	48	4	-0.1 (36/36) (-2.5/1)	-0.3 (12/12) (-2.6/0.6)	0.0 (12/12) (-2.5/0.9)	16C2 (INDICATOR) CITIZENS HOME WATER CO. 2.66 MILES SSE OF SITE	0
	TRITIUM	16	2000	52 (12/12) (0.8/170)	39 (4/4) (16/50)	90 (4/4) (50/170)	15F7 (INDICATOR) PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0
	GAMMA BE-7	48	N/A	0.1 (36/36) (-6/15)	-1.7 (12/12) (-9/6.4)	1.2 (12/12) (-4/15)	16C2 (INDICATOR) CITIZENS HOME WATER CO. 2.66 MILES SSE OF SITE	0
	K-40		N/A	-2.0 (36/36) (-55/23)	3.6 (12/12) (-12/32)	3.6 (12/12) (-12/32)	28F3 (CONTROL) POTTSTOWN WATER AUTHORITY 5.84 MILES WNW OF SITE	0
	MN-54		15	-0.2 (36/36) (-1.4/0.5)	-0.1 (12/12) (-1.8/3.2)	0.0 (12/12) (-0.6/0.5)	15F4 (INDICATOR) PHILA. SUB. WATER CO. 8.62 MILES SE OF SITE	0

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION
LOCTION OF FACILITY: MONTGOMERY COUNTY, PA

DOCKET NUMBER: 50-352 & 50-353
REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	CO-58		15	-0.3 (36/36) (-1.8/2)	-0.2 (12/12) (-1.4/0.7)	-0.2 (12/12) (-1.0/2)	15F4 (INDICATOR) PHILA. SUB. WATER CO. 8.62 MILES SE OF SITE	0
	CO-60		15	0.0 (36/36) (-1.1/1.6)	0.1 (12/12) (-0.6/1)	0.1 (12/12) (-0.6/1.6)	15F7 (INDICATOR) PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0
	FE-59		30	0.8 (36/36) (-1.5/5.3)	1.0 (12/12) (-1.3/5.8)	1.1 (12/12) (-0.4/3.3)	15F4 (INDICATOR) PHILA. SUB. WATER CO. 8.62 MILES SE OF SITE	0
	ZN-65		30	-2.5 (36/36) (-8/2.3)	-3 (12/12) (-10/0.1)	-2.1 (12/12) (-6/0.8)	15F7 (INDICATOR) PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0
	ZR-95		30	0.1 (36/36) (-2.3/3.1)	0.0 (12/12) (-1.9/1.8)	0.2 (12/12) (-2.3/3.1)	15F7 (INDICATOR) PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0
	NB-95		15	0.2 (36/36) (-2/1.9)	0.0 (12/12) (-1.7/1.1)	0.3 (12/12) (-1.6/0.7)	15F4 (INDICATOR) PHILA. SUB. WATER CO. 8.62 MILES SE OF SITE	0
	CS-134		15	-3 (36/36) (-12/1.1)	-2.8 (12/12) (-11/-0.3)	-1.6 (12/12) (-8/1.1)	16C2 (INDICATOR) CITIZENS HOME WATER CO. 2.66 MILES SSE OF SITE	0
	CS-137		18	0.0 (36/36) (-2.3/1.0)	0.1 (12/12) (-0.9/1.6)	0.1 (12/12) (-0.9/1.6)	28F3 (CONTROL) POTTSTOWN WATER AUTHORITY 5.84 MILES WNW OF SITE	0
	BA-140		60	0.0 (36/36) (-6/8.9)	0.3 (12/12) (-3/4.7)	0.5 (12/12) (-6/6.2)	15F4 (INDICATOR) PHILA. SUB. WATER CO. 8.62 MILES SE OF SITE	0
	LA-140		15	0.0 (36/36) (-1.8/2.2)	-0.1 (12/12) (-2.3/1.7)	0.5 (12/12) (-1.2/2.2)	16C2 (INDICATOR) CITIZENS HOME WATER CO. 2.66 MILES SSE OF SITE	0
	RA-226		N/A	2.3 (36/36) (-24/62)	0.3 (12/12) (-44/27)	6.5 (12/12) (-11/38)	15F4 (INDICATOR) PHILA. SUB. WATER CO. 8.62 MILES SE OF SITE	0

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION — DOCKET NUMBER: 50-352 & 50-353

LOCTION OF FACILITY: MONTGOMERY COUNTY, PA — REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	TH-232		N/A	0.9 (36/36) (-7/7)	-1.7 (12/12) (-5/1.6)	1.5 (12/12) (-4/7)	15F7 (INDICATOR) PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0
BOTTOM FEEDER (FISH) (PCI/KG WET)	GAMMA	4						
	BE-7		N/A	-22 (2/2) (-27/-16)	-39 (2/2) (-50/-27)	-22 (2/2) (-27/-16)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	K-40		N/A	3550 (2/2) (3500/3600)	3300 (2/2) (2900/3700)	3550 (2/2) (3500/3600)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	MN-54		130	-1.0 (2/2) (-2.3/0.2)	-2.0 (2/2) (-4/0.4)	-1.0 (2/2) (-2.3/0.2)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	CO-58		130	0.7 (2/2) (0.2/1.2)	-1.9 (2/2) (-6/1.8)	0.7 (2/2) (0.2/1.2)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	CO-60		130	1.6 (2/2) (1.3/2)	-1.1 (2/2) (-1.8/-0.4	1.6 (2/2) (1.3/2)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	FE-59		260	-6 (2/2) (-10/-2)	3.1 (2/2) (2.3/4)	3.1 (2/2) (2.3/4)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	ZN-65		260	-1.8 (2/2) (-12/8.4)	1.5 (2/2) (-6/9.1)	1.5 (2/2) (-6/9.1)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	ZR-95		N/A	1.2 (2/2) (0.5/1.8)	0.3 (2/2) (-7/7.1)	1.2 (2/2) (0.5/1.8)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	NB-95		N/A	1.6 (2/2) (-0.5/3.7)	1.2 (2/2) (0.6/1.8)	1.6 (2/2) (-0.5/3.7)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION
LOCTION OF FACILITY: MONTGOMERY COUNTY, PA

DOCKET NUMBER: 50-352 & 50-353
REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	CS-134		130	1.5 (2/2) (-1.6/4.5)	-4 (2/2) (-6/-2.1)	1.5 (2/2) (-1.6/4.5)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	CS-137		150	3.2 (2/2) (1.7/4.7)	-2.8 (2/2) (-4/-1.7)	3.2 (2/2) (1.7/4.7)	1[illegible] (INDICATOR) V[illegible]OL D[illegible]M OF DISCHARGE	0
	BA-140		N/A	-12 (2/2) (-18/-7)	14 (2/2) (-1.0/28)	14 (2/2) (-1.0/28)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	LA-140		N/A	-0.1 (2/2) (-4/3.5)	4.3 (2/2) (1.7/7)	4.3 (2/2) (1.7/7)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	RA-226		N/A	-10 (2/2) (-32/12)	4.5 (2/2) (-38/47)	4.5 (2/2) (-38/47)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	TH-232		N/A	-0.5 (2/2) (-14/13)	-8 (2/2) (-22/6.2)	-0.5 (2/2) (-14/13)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
PREDATOR (FISH (PCI/KG WET)	GAMMA	4						
	BE-7		N/A	-9 (2/2) (-14/-3)	-13 (2/2) (-17/-8)	-9 (2/2) (-14/-3)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	K-40		N/A	3250 (2/2) (3100/3400)	2800 (2/2) (2300/3300)	3250 (2/2) (3100/3400)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	MN-54		130	-0.7 (2/2) (-1.6/0.2)	3.8 (2/2) (-3/11)	3.8 (2/2) (-3/11)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	CO-58		130	2.5 (2/2) (2.2/2.9)	-4 (2/2) (-5/-4)	2.5 (2/2) (2.2/2.9)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	CO-60		130	1.5 (2/2) (-0.8/3.9)	2.6 (2/2) (1.3/4)	2.6 (2/2) (1.3/4)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION DOCKET NUMBER: 50-352 & 50-353

LOCTION OF FACILITY: MONTGOMERY COUNTY, PA REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	FE-59		260	-5 (2/2) (-7/-4)	-1.8 (2/2) (-10/6.4)	-1.8 (2/2) (-10/6.4)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	ZN-65		260	-10 (2/2) (-16/-4)	-40 (2/2) (-59/-21)	-10 (2/2) (-16/-4)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	ZR-95		N/A	2.5 (2/2) (2.1/2.9)	7.2 (2/2) (0.3/14)	7.2 (2/2) (0.3/14)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	NB-95		N/A	-2.8 (2/2) (-5/-1.1)	5.4 (2/2) (5.3/5.5)	5.4 (2/2) (5.3/5.5)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	CS-134		130	-1.9 (2/2) (-3/-0.4)	1.7 (2/2) (0.4/3.1)	1.7 (2/2) (0.3/3.1)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	CS-137		150	4.1 (2/2) (-0.9/9.1)	-0.2 (2/2) (-1.3/1)	4.1 (2/2) (-0.9/9.1)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	BA-140		N/A	-11 (2/2) (-28/5.8)	19 (2/2) (8/30)	19 (2/2) (8/30)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	LA-140		N/A	-2 (2/2) (-2.4/-1.6)	-5 (2/2) (-8/-1.2)	-2 (2/2) (-2.4/-1.6)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	RA-226		N/A	0 (2/2) (-16/16)	10 (2/2) (-28/48)	10 (2/2) (-28/48)	29C1 (CONTROL) POTTSTOWN VICINITY UPSTREAM OF DISCHARGE	0
	TH-232		N/A	11 (2/2) (10/12)	2.5 (2/2) (1.3/3.7)	11 (2/2) (10/12)	16C5 (INDICATOR) VINCENT POOL DOWNSTREAM OF DISCHARGE	0
SILT (PCI/KG DRY	GAMMA BE-7	6	N/A	938 (4/4) (390/1500)	1 (2/2) (-60/62)	1350 (2/2) (1200/1500)	16B2 (INDICATOR) LINFIELD BRIDGE 1.35 MILES SSE OF SITE	0

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION DOCKET NUMBER: 50-352 & 50-353

LOCTION OF FACILITY: MONTGOMERY COUNTY, PA REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	K-40		N/A	15750 (4/4) (14000/18000)	13000 (2/2) (13000/13000)	16500 (2/2) (15000/18000)	16B2 (INDICATOR) LINFIELD BRIDGE 1.35 MILES SSE OF SITE	0
	MN-54		N/A	23 (4/4) (16/28)	7 (2/2) (4/10)	23 (2/2) (21/25)	16C4 (INDICATOR) VICENT DAM 2.18 MILES SSE OF SITE	0
	CO-58		N/A	-12 (4/4) (-23/-5)	-15 (2/2) (-15/-15)	-5 (2/2) (-6/-5)	16C4 (INDICATOR) VICENT DAM 2.18 MILES SSE OF SITE	0
	CO-60		N/A	17 (4/4) (9.4/26)	1.1 (2/2) (-6/8.1)	21 (2/2) (15/26)	16B2 (INDICATOR) LINFIELD BRIDGE 1.35 MILES SSE OF SITE	0
	FE-59		N/A	-15 (4/4) (-18/-13)	-13 (2/2) (-18/-8.4)	-13 (2/2) (-18/-8)	33A2 (CONTROL) UPSTREAM OF DISCHARGE 0.84 MILES NNW OF SITE	0
	ZN-65		N/A	19 (4/4) (-10/47)	-6 (2/2) (-10/-2.1)	41 (2/2) (35/47)	16B2 (INDICATOR) LINFIELD BRIDGE 1.35 MILES SSE OF SITE	0
	ZR-95		N/A	17 (4/4) (15/21)	19 (2/2) (11/26)	20 (2/2) (18/21)	16C4 (INDICATOR) VICENT DAM 2.18 MILES SSE OF SITE	0
	NB-95		N/A	32 (4/4) (24/36)	26 (2/2) (21/30)	33 (2/2) (31/35)	16C4 (INDICATOR) VICENT DAM 2.18 MILES SSE OF SITE	0
	CS-134		150	1.3 (4/4) (-7/9.2)	9.2 (2/2) (8.8/9.5)	9.2 (2/2) (8.8/9.5)	33A2 (CONTROL) UPSTREAM OF DISCHARGE 0.84 MILES NNW OF SITE	0
	CS-137		180	208 (4/4) (180/230)	8 (2/2) (-11/27)	210 (2/2) (200/220)	16C4 (INDICATOR) VICENT DAM 2.18 MILES SSE OF SITE	0
	BA-140		N/A	4 (4/4) (-23/25)	-19 (2/2) (-31/-6.9)	25 (2/2) (25/25)	16C4 (INDICATOR) VICENT DAM 2.18 MILES SSE OF SITE	0

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION
LOCTION OF FACILITY: MONTGOMERY COUNTY, PA
DOCKET NUMBER: 50-352 & 50-353
REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	LA-140		N/A	3.4 (4/4) (-21/13)	-9 (2/2) (-16/-1.2)	11 (2/2) (8.6/13)	16C4 (INDICATOR) VICENT DAM 2.18 MILES SSE OF SITE	0
	RA-226		N/A	2825 (4/4) (2500/3400)	2600 (2/2) (2600/2600)	3000 (2/2) (2600/3400)	16B2 (INDICATOR) LINFIELD BRIDGE 1.35 MILES SSE OF SITE	0
	TH-232		N/A	1425 (4/4) (1200/1800)	1250 (2/2) (1200/1300)	1550 (2/2) (1300/1800)	16B2 (INDICATOR) LINFIELD BRIDGE 1.35 MILES SSE OF SITE	0
AIR PARTICULATE (E-3 PCI/CU. METER)	GROSS BETA	260	10	15 (208/208) (4.1/32)	16 (52/52) (5.8/30)	16 (52/52) (4.3/31)	13C1 (INDICATOR) KING ROAD 2.84 MILES SE OF SITE	0
	GAMMA	20						
	BE-7		N/A	67 (16/16) (44/85)	76 (4/4) (69/91)	76 (4/4) (69/91)	22G1 (CONTROL) MANOR SUBSTATION 17.73 MILES SW OF SITE	0
	K-40		N/A	3.8 (16/16) (-7/18)	0.8 (4/4) (-6/9.2)	7.9 (4/4) (-6/18)	11S1 (INDICATOR) LGS INFORMATION CENTER 0.38 MILES ESE OF SITE	0
	MN-54		N/A	0.1 (16/16) (-0.6/1.1)	0.0 (4/4) (-0.5/0.4	0.4 (4/4) (-0.3/1.1)	11S1 (INDICATOR) LGS INFORMATION CENTER 0.38 MILES ESE OF SITE	0
	CO-58		N/A	-0.2 (16/16) (-1.0/0.4)	-0.3 (4/4) (-1.1/0.8)	0.1 (4/4) (-0.1/0.2)	10S3 (INDICATOR) KEEN ROAD 0.50 MILES E OF SITE	0
	CO-60		N/A	0.0 (16/16) (-0.3/0.7)	0.6 (4/4) (0.3/1.0)	0.6 (4/4) (0.3/1.0)	22G1 (CONTROL) MANOR SUBSTATION 17.73 MILES SW OF SITE	0
	FE-59		N/A	0.0 (16/16) (-1.9/3)	0.6 (4/4) (0.0/1.1	0.7 (4/4) (-0.5/3)	14S1 (INDICATOR) LONGVIEW ROAD 0.63 MILES SSE OF SITE	0
	ZN-65		N/A	-1.7 (16/16) (-7/1.3)	-0.2 (4/4) (-2.1/1.1)	-0.2 (4/4) (-2.1/1.1)	22G1 (CONTROL) MANOR SUBSTATION 17.73 MILES SW OF SITE	0

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

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RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION — DOCKET NUMBER: 50-352 & 50-353

LOCTION OF FACILITY: MONTGOMERY COUNTY, PA — REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	ZR-95		N/A	0.0 (16/16) (-1.3/1.3)	-0.5 (4/4) (-1.1/-0.0)	0.2 (4/4) (-0.8/1.2)	14S1 (INDICATOR) LONGVIEW ROAD 0.63 MILES SSE OF SITE	0
	NB-95		N/A	0.1 (16/16) (-0.8/0.9)	0.2 (4/4) (-0.4/0.7)	0.4 (4/4) (-0.5/0.9)	13C1 (INDICATOR) KING ROAD 2.84 MILES SE OF SITE	0
	CS-134		50	-0.2 (16/16) (-2.9/0.5)	-0.4 (4/4) (-1.5/0.0)	0.3 (4/4) (-0.2/0.5)	14S1 (INDICATOR) LONGVIEW ROAD 0.63 MILES SSE OF SITE	0
	CS-137		60	-0.1 (16/16) (-0.8/1.1)	0.0 (4/4) (-0.4/0.8)	0.3 (4/4) (-0.3/1.1)	11S1 (INDICATOR) LGS INFORMATION CENTER 0.38 MILES ESE OF SITE	0
	BA-140		N/A	0.3 (16/16) (-5/8.1)	0.9 (4/4) (-0.7/2.6)	3.4 (4/4) (1/8.1)	11S1 (INDICATOR) LGS INFORMATION CENTER 0.38 MILES ESE OF SITE	0
	LA-140		N/A	0.6 (16/16) (-1.3/3)	0.0 (4/4) (-0.9/0.9)	1.3 (4/4) (0.4/3)	11S1 (INDICATOR) LGS INFORMATION CENTER 0.38 MILES ESE OF SITE	0
	RA-226		N/A	0.9 (16/16) (-9/12)	-5 (4/4) (-10/-0.4)	2.6 (4/4) (-4/6.3)	14S1 (INDICATOR) LONGVIEW ROAD 0.63 MILES SSE OF SITE	0
	TH-232		N/A	-0.5 (16/16) (-4/3.2)	0.4 (4/4) (-1.1/1.7)	0.4 (4/4) (-1.1/1.7)	22G1 (CONTROL) MANOR SUBSTATION 17.73 MILES SW OF SITE	0
AIR IODINE (E-3 PCI/CU. METER)	I-131	260	70	0.4 (208/208) (-17/18)	0.2 (52/52) (-11/16)	1.4 (52/52) (-9/17)	13C1 (INDICATOR) KING ROAD 2.84 MILES SE OF SITE	0
GOAT MILK (PCI/LITER)	I-131	10	1	0.0 (10/10) (-0.2/0.1)		0.0 (10/10) (-0.2/0.1)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	GAMMA	10						
	BE-7		N/A	-1.9 (10/10) (-14/6.5)		-1.9 (10/10) (-14/6.5)	10F1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION
LOCTION OF FACILITY: MONTGOMERY COUNTY, PA

DOCKET NUMBER: 50-352 & 50-353
REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	K-40		N/A	1690 (10/10) (1500/1900)		1690 (10/10) (1500/1900)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	MN-54		N/A	-0.8 (10/10) (-3/0.6)		-0.8 (10/10) (-3/0.6)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	CO-58		N/A	-0.5 (10/10) (-1.7/0.6)		-0.5 (10/10) (-1.7/0.6)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	CO-60		N/A	-0.5 (10/10) (-2.9/0.7)		-0.5 (10/10) (-2.9/0.7)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	FE-59		N/A	0.1 (10/10) (-3/2.9)		0.1 (10/10) (-3/2.9)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	ZN-65		N/A	-2.2 (10/10) (-9/3.5)		-2.2 (10/10) (-9/3.5)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	ZR-95		N/A	-0.4 (10/10) (-4/4.7)		-0.4 (10/10) (-4/4.7)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	NB-95		N/A	0.9 (10/10) (-0.2/2.7)		0.9 (10/10) (-0.2/2.7)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	CS-134		15	-3.0 (10/10) (-10/2.1)		-3.0 (10/10) (-10/2.1)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	CS-137		18	1.1 (10/10) (-0.4/4)		1.1 (10/10) (-0.4/4)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	BA-140		60	0.2 (10/10) (-4/5.1)		0.2 (10/10) (-4/5.1)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION DOCKET NUMBER: 50-352 & 50-353

LOCTION OF FACILITY: MONTGOMERY COUNTY, PA REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	LA-140		15	-0.1 (10/10) (-2.4/2)		-0.1 (10/10) (-2.4/2)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	RA-226		N/A	-9 (10/10) (-66/36)		-9 (10/10) (-66/36)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
	TH-232		N/A	1.5 (10/10) (-5/6.1)		1.5 (10/10) (-5/6.1)	10B1 (INDICATOR) REGIONAL FARM 1.08 MILES E OF SITE	0
MILK (PCI/LITER)	I-131	98	1	0.0 (71/71) (-0.2/0.2)	0.0 (27/27) (-0.2/0.1)	0.1 (4/4) (0.0/0.1)	36E1 (CONTROL) REGIONAL FARM 4.70 MILES N OF SITE	0
	GAMMA	84						
	BE-7		N/A	0.1 (63/63) (-17/12)	3.6 (21/21) (-6/13)	6.3 (5/5) (-1.9/13)	22F1 (CONTROL) REGIONAL FARM 9.58 MILES SW OF SITE	0
	K-40		N/A	1432 (63/63) (1300/1600)	1395 (21/21) (1300/1600)	1452 (21/21) (1300/1600)	18C1 (INDICATOR) REGIONAL FARM 2.26 MILES S OF SITE	0
	MN-54		N/A	-0.2 (63/63) (-1.7/1.6)	-0.2 (21/21) (-2.2/1)	-0.1 (21/21) (-1/1.3)	18C1 (INDICATOR) REGIONAL FARM 2.26 MILES S OF SITE	0
	CO-58		N/A	-0.3 (63/63) (-2.4/2.7)	0.0 (21/21) (-1.3/2.2)	0.1 (16/16) (-1.1/2.2)	9G1 (CONTROL) REGIONAL FARM 11.64 MILES E OF SITE	0
	CO-60		N/A	0.2 (63/63) (-2.7/2.4)	0.1 (21/21) (-3.1/2.1)	0.4 (5/5) (-0.6/2.1)	22F1 (CONTROL) REGIONAL FARM 9.58 MILES SW OF SITE	0
	FE-59		N/A	0.4 (63/63) (-5/3.6)	0.4 (21/21) (-2.8/4.1)	0.5 (16/16) (-2.8/4.1)	9G1 (CONTROL) REGIONAL FARM 11.64 MILES E OF SITE	0
	ZN-65		N/A	-3 (63/63) (-17/3.3)	-2.9 (21/21) (-11/2.8)	-2.4 (16/16) (-6/0.2)	9G1 (CONTROL) REGIONAL FARM 11.64 MILES E OF SITE	0

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: LIMERICK GENERATING STATION DOCKET NUMBER: 50-352 & 50-353

LOCTION OF FACILITY: MONTGOMERY COUNTY, PA REPORTING PERIOD: 1996

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENTS	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	ZR-95		N/A	-0.2 (63/63) (-3/2)	0.1 (21/21) (-1.2/2.1)	0.7 (5/5) (-0.7/2.1)	22F1 (CONTROL) REGIONAL FARM 9.58 MILES SW OF SITE	0
	NB-95		N/A	0.2 (63/63) (-2.2/2.6)	0.4 (21/21) (-1/2.2)	0.6 (5/5) (-1/2.1)	22F1 (CONTROL) REGIONAL FARM 9.58 MILES SW OF SITE	0
	CS-134		15	-2.7 (63/63) (-16/1.7)	-2.5 (21/21) (-8/1.6)	-1.6 (5/5) (-8/1.6)	22F1 (CONTROL) REGIONAL FARM 9.58 MILES SW OF SITE	0
	CS-137		18	0.2 (63/63) (-1.8/3.8)	0.4 (21/21) (-1.2/1.7)	0.6 (5/5) (0.0/1.7)	22F1 (CONTROL) REGIONAL FARM 9.58 MILES SW OF SITE	0
	BA-140		60	0.1 (63/63) (-4/5.4)	0.9 (21/21) (-2.7/4.7)	1.0 (16/16) (-2.4/3.8)	9G1 (CONTROL) REGIONAL FARM 11.64 MILES E OF SITE	0
	LA-140		15	-0.1 (63/63) (-2.7/1.9)	0.1 (21/21) (-1.3/2.3)	0.3 (5/5) (-1/2.3)	22F1 (CONTROL) REGIONAL FARM 9.58 MILES SW OF SITE	0
	RA-226		N/A	0.9 (63/63) (-37/94)	5.9 (21/21) (-20/62)	12 (5/5) (-14/62)	22F1 (CONTROL) REGIONAL FARM 9.58 MILES SW OF SITE	0
	TH-232		N/A	1.4 (63/63) (-6/11)	-0.2 (21/21) (-11/3.8)	2.6 (21/21) (-4/11)	18C1 (INDICATOR) REGIONAL FARM 2.26 MILES S OF SITE	0
DIRECT RADIATION (MILLI-ROENTGEN/STD.	TLD-QUARTERLY	160	N/A	5.9 (156/156) (0/11)	7.5 (4/4) (6.8/7.9)	10.0 (4/4) (9.3/11)	13S2 (INDICATOR) 500 KV SUBSTATION 0.41 MILES SE OF SITE	0

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

APPENDIX B

SAMPLE DESIGNATION AND LOCATIONS

APPENDIX B: SAMPLE DESIGNATION AND LOCATIONS

LIST OF TABLES AND FIGURES

TABLES

FIGURES

TABLE B-1: Location Designation and Identification System for the Limerick Generating Station

XXYZ - General code for identification of locations, where:

XX - Angular Sector of Sampling Location. The compass is divided into 36 sectors of 10 degrees each with center at Limerick's Units 1 and 2 off-gas vents. Sector 36 is centered due North, and others are numbered in a clockwise direction.

Y - Radial Zone of Sampling Location (in this report, the radial distance from the Limerick vent for all regional stations).

S : on-site location
A : 0-1 mile off-site
B : 1-2 miles off-site
C : 2-3 miles off-site
D : 3-4 miles off-site
E : 4-5 miles off-site
F : 5-10 miles off-site
G : 10-20 miles off-site
H : 20-100 miles off-site

Z - Station's Numerical Designation within sector and zone, using 1, 2, 3... in each sector and zone.

TABLE B-2 Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Limerick Generating Station, 1996

Location	Location Description	Distance & Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
A. Surface Water				
13B1	Vincent Dam (indicator)	1.75 miles SE	Two gallon sample collected from a continuous water sampler, monthly	Gamma Spec - monthly - GPU Tritium - quarterly comp. - GPU
24S1	Limerick Intake (control)	0.20 miles SW	Same as 13B1	Same as 13B1
10F2	Perkiomen Pumping Station (control)	7.25 miles E	Same as 13B1 except water collected monthly only when water is withdrawn from the Perkiomen Creek for cooling	Same as 13B1
B. Drinking (Potable) Water				
15F4	Philadelphia Suburban Water Company (indicator)	8.62 miles SE	Two gallon composite sample collected from a continuous water sampler, monthly	G. Beta (S&I) - monthly - GPU Gamma Spec - monthly - GPU Tritium - quarterly comp. - GPU
15F7	Phoenixville Water Works indicator)	6.33 miles SSE	Same as 15F4	Same as 15F4
16C2	Citizens Home Water Company (indicator)	2.66 miles SSE	Same as 15F4	Same as 15F4 G. Beta (S&I) - monthly - TBE* Gamma Spec - monthly - TBE*
28F3	Pottstown Water Authority (control)	5.84 miles WNW	Same as 15F4	Same as 15F4
C. Milk - Bi-weekly / monthly				
9G1	Control	11.64 miles E	Two gallon grab sample collected from farm bulk tank bi-weekly during grazing season (April through November), monthly other times	I-131 - biweekly - GPU Gamma Spec - biweekly - GPU I-131 - quarterly - TBE* Gamma Spec - quarterly - TBE*

TABLE B-2 Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Limerick Generating Station, 1996

Location	Location Description	Distance & Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
10B1	Goat Farm	1.08 miles E	Two gallon grab sample purchased at goat farm, biweekly during grazing season (April through November); monthly otherwise	I-131 - biweekly - GPU Gamma Spec - biweekly - GPU
18C1		2.26 miles S	Same as 9G1	Same as 10B1
19B1		1.95 miles SSW	Same as 9G1	Same as 9G1
21B1		1.75 miles SSW	Same as 9G1	Same as 9G1
22F1	Control	9.58 miles SW	Same as 9G1	Same as 9G1
D. Milk - Quarterly				
36E1		4.70 miles N	Two gallons processed milk purchased at farm dairy store, quarterly	I-131 - quarterly - GPU
22C1		2.92 miles SW	Two gallon grab sample collected from farm bulk tank, quarterly	Same as 36E1
23F1	Control	5.02 miles SW	Same as 22C1	Same as 36E1
25C1		2.69 miles WSW	Same as 22C1	Same as 36E1
E. Air Particulates / Air Iodine				
10S3	Keen Road	0.50 miles E	Approximately 1 cfm continuous flow through glass fiber and charcoal filters (approx. 2" diameter) which are installed for one week and replaced.	G. Beta - weekly - GPU Gamma Spec - quarterly comp. - GPU I-131 - weekly - GPU
11S1	LGS Information Center	0.38 miles ESE	Same as 10S3	Same as 10S3
11S2	LGS Information Center	0.38 miles ESE	Same as 10S3	G. Beta - weekly - TBE* Gamma Spec - quarterly comp. - TBE*

TABLE B-2 Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Limerick Generating Station, 1996

Location	Location Description	Distance & Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
13C1	King Road	2.84 miles SE	Same as 10S3	Same as 10S3
14S1	Longview Road	0.63 miles SSE	Same as 10S3	Same as 10S3
22G1	Manor Substation (control)	17.73 miles SW	Same as 10S3	Same as 10S3
F. Fish				
16C5	Vincent Pool (indicator)	Downstream of Discharge	Fish flesh from two groups representing predator and bottom feeder species collected by electrofishing or other appropriate fishery gear, semiannually	Gamma Spec - semiannually - GPU
29C1	Pottstown Vicinity (control)	Upstream of Intake	Same as 16C5	Same as 16C5
G. Sediment				
16B2	Linfield Bridge (indicator)	1.35 miles SSE	Recently deposited sediment collected below the waterline, semi-annually	Gamma Spec - semiannually - GPU
16C4	Vicent Dam (indicator)	2.18 miles SSE	Same as 16B2	Same as 16B2
33A2	Control	0.84 miles NNW	Same as 16B2	Same as 16B2
H. Environmental Dosimetry - TLD				
Site Boundary				
36S2	Evergreen & Sanatoga Road	0.60 miles N	Collection method and frequency is described in placement procedure Section III, A.	TLD - quarterly - GPU
3S1	Sanatoga Road	0.44 miles NNE	Same as 36S2	Same as 36S2

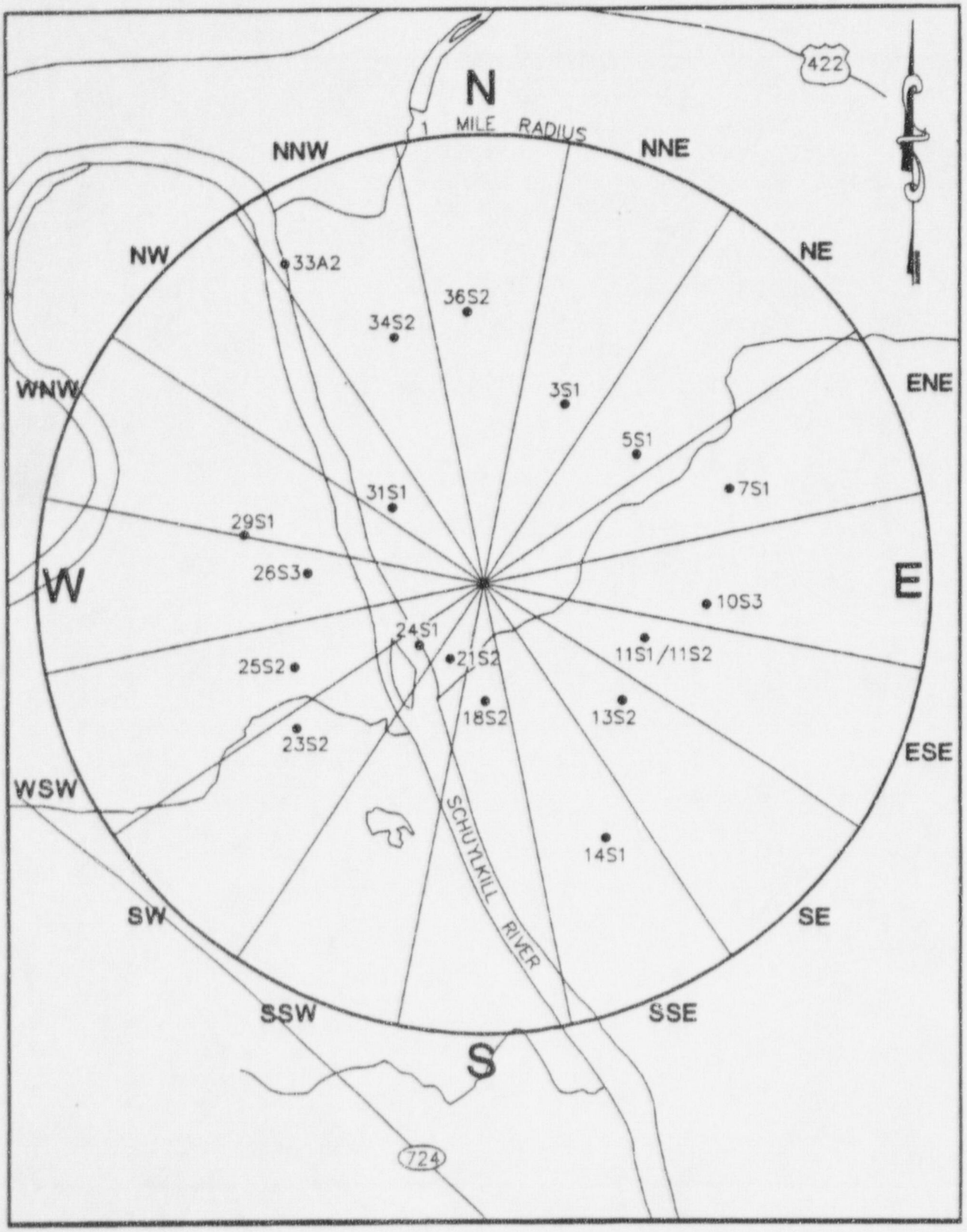
TABLE B-2 Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Limerick Generating Station, 1996

Location	Location Description	Distance & Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
5S1	Possum Hollow Road	0.45 miles NE	Same as 36S2	Same as 36S2
7S1	LGS Training Center	0.59 miles ENE	Same as 36S2	Same as 36S2
10S3	Keen Road	0.50 miles E	Same as 36S2	Same as 36S2
11S1	LGS Information Center	0.38 miles ESE	Same as 36S2	Same as 36S2
13S2	500 KV Substation	0.41 miles SE	Same as 36S2	Same as 36S2
14S1	Longview Road	0.63 miles SSE	Same as 36S2	Same as 36S2
18S2	Rail Line along Longview Road	0.26 miles S	Same as 36S2	Same as 36S2
21S2	Near Intake Building	0.19 miles SSW	Same as 36S2	Same as 36S2
23S2	Transmission Tower	0.53 miles SW	Same as 36S2	Same as 36S2
25S2	Sector Site Boundary	0.46 miles WSW	Same as 36S2	Same as 36S2
26S3	Met. Tower #2	0.40 m. W	Same as 36S2	Same as 36S2
29S1	Sector Site Boundary	0.55 miles WNW	Same as 36S2	Same as 36S2
31S1	Sector Site Boundary	0.26 miles NW	Same as 36S2	Same as 36S2
34S2	Met. Tower #1	0.58 miles NNW	Same as 36S2	Same as 36S2
Intermediate Distance				
36D1	Siren Tower No. 147	3.51 miles N	Same as 36S2	Same as 36S2
2E1	Laughing Waters GSC	4.76 miles NNE	Same as 36S2	Same as 36S2
4E1	Neiffer Road	4.78 miles NE	Same as 36S2	Same as 36S2
7E1	Pheasant Road	4.26 miles ENE	Same as 36S2	Same as 36S2
10E1	Royersford Road	3.94 miles E	Same as 36S2	Same as 36S2
10F3	Trappe Substation	5.58 miles ESE	Same as 36S2	Same as 36S2
13E1	Vaughn Substation	4.31 miles SE	Same as 36S2	Same as 36S2
16F1	Pikeland Substation	5.04 miles SSE	Same as 36S2	Same as 36S2
19D1	Snowden Substation	3.49 miles S	Same as 36S2	Same as 36S2
20F1	Sheeder Substation	5.24 miles SSW	Same as 36S2	Same as 36S2
24D1	Porters Mill Substation	3.97 miles SW	Same as 36S2	Same as 36S2
25D1	Hoffecker & Keim Streets	3.99 miles WSW	Same as 36S2	Same as 36S2
28D2	W. Cedarville Road	3.83 miles W	Same as 36S2	Same as 36S2
29E1	Prince Street	4.95 miles WNW	Same as 36S2	Same as 36S2
31D2	Poplar Substation	3.87 miles NW	Same as 36S2	Same as 36S2
34E1	Varnell Road	4.59 miles NNW	Same as 36S2	Same as 36S2

TABLE B-2: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Limerick Generating Station, 1996

Location	Location Description	Distance & Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
Distant and Special Interest				
5H1	Birch Substation (Control)	24.76 miles NE	Same as 36S2	Same as 36S2
6C1	Pottstown Landing Field	2.14 miles NE	Same as 36S2	Same as 36S2
9C1	Reed Road	2.15 miles E	Same as 36S2	Same as 36S2
13C1	King Road	2.84 miles SE	Same as 36S2	Same as 36S2
15D1	Spring City Substation	3.20 miles SE	Same as 36S2	Same as 36S2
17B1	Linfield Substation	1.60 miles S	Same as 36S2	Same as 36S2
20D1	Ellis Woods Road	3.06 miles SSW	Same as 36S2	Same as 36S2
31D1	Lincoln Substation	3.00 miles WNW	Same as 36S2	Same as 36S2

* QC Laboratory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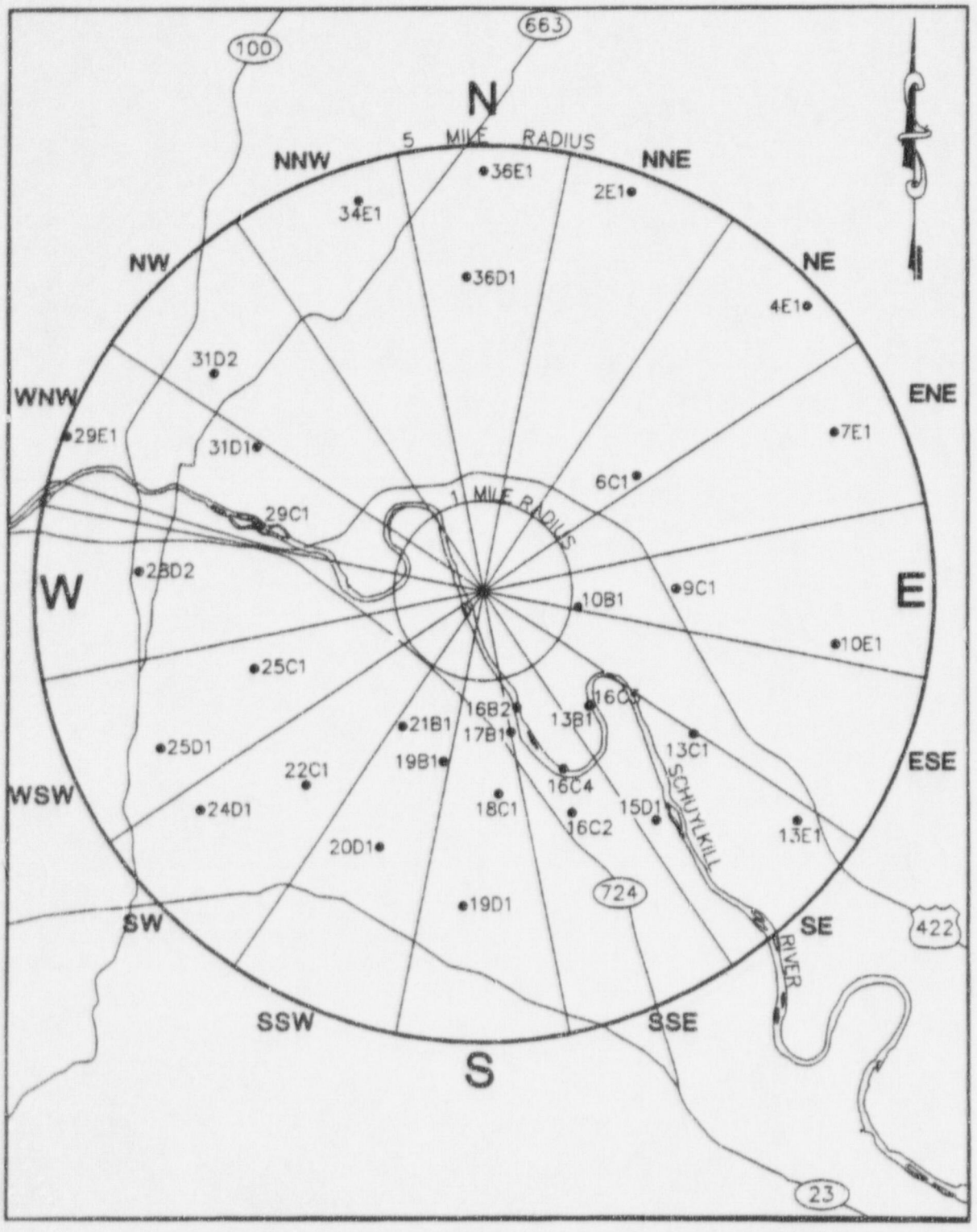
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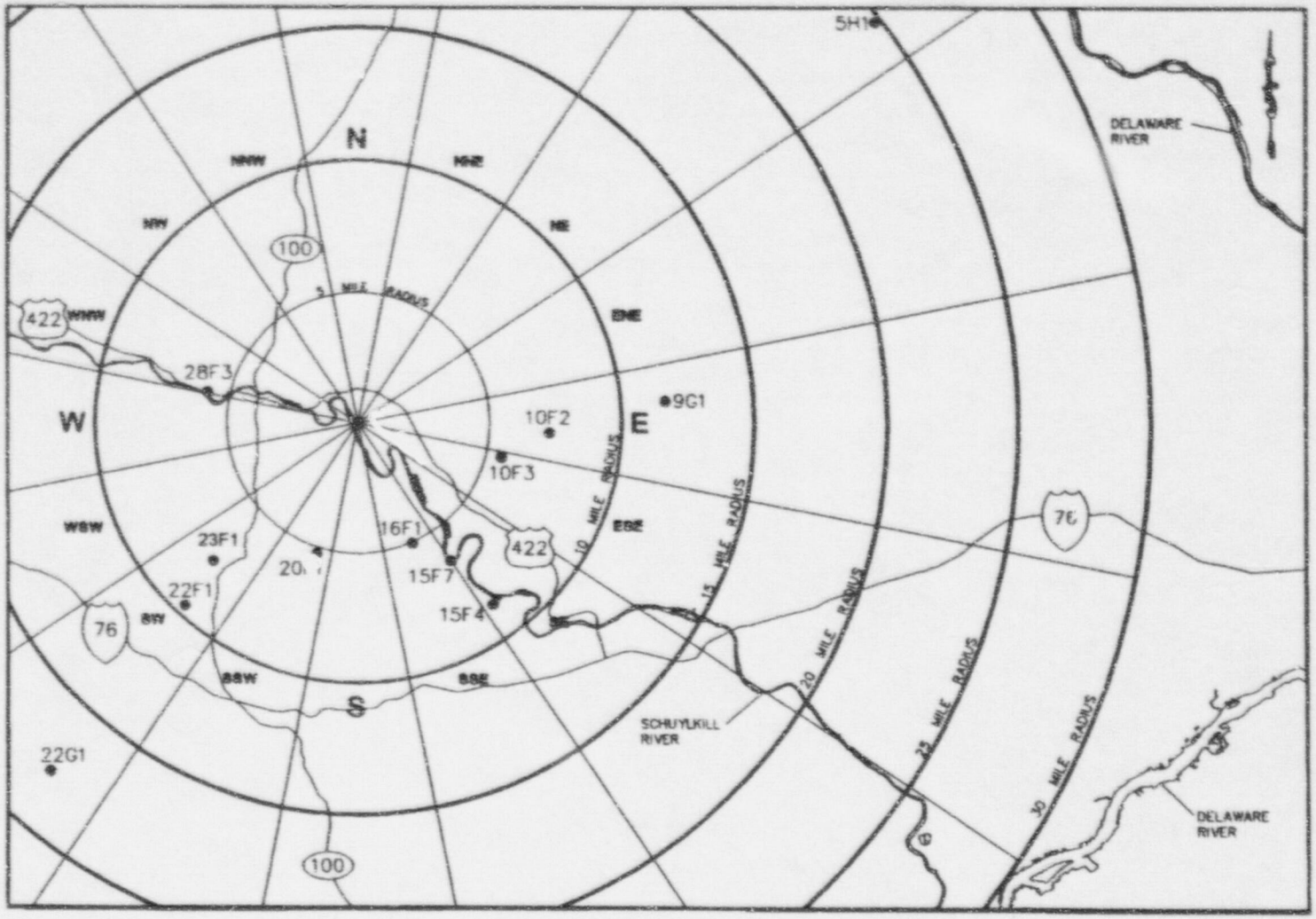


Figure B-3
Environmental Sampling Locations Greater than Five Miles of the Limerick Generating Station, 1996

APPENDIX C

DATA TABLES AND FIGURES
PRIMARY LABORATORY

APPENDIX C: DATA TABLES AND FIGURES - PRIMARY LABORATORY

TABLES

FIGURES

TABLE C-I.1 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	10F2	13B1	24S1
JAN-MAR	(1)	72 ± 60	91 ± 61
APR-JUN	(1)	81 ± 59	83 ± 59
JUL-SEP	5.6 ± 61	-6.6 ± 61	6.6 ± 61
OCT-DEC	24 ± 65	20 ± 64	23 ± 65
MEAN	15 ± 26	42 ± 84	51 ± 85

(1) SAMPLER NOT IN SERVICE BECAUSE NO WATER DRAWN FROM THAT LOCATION FOR COOLING

TABLE C-I.2 CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	COLLECTION PERIOD	BE-7	K-40	MN-54	CO-58	CO-60	FE-59	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-232
10F2																
	JUN	-2.4 ± 7.2	-5 ± 14	-0.8 ± 0.9	-0.2 ± 0.9	2 ± 2	-0.1 ± 1.0	-1 ± 2	1 ± 2	0.7 ± 1.1	-2.5 ± 1.0	0.3 ± 0.9	1 ± 5	1.1 ± 1.7	-17 ± 25	0.8 ± 3.1
	JUL	8.5 ± 10.	13 ± 21	0.9 ± 1.3	-0.8 ± 1.3	1 ± 3	-0.2 ± 1.6	1 ± 3	1 ± 3	0.3 ± 1.4	-0.6 ± 1.3	-0.1 ± 1.5	1 ± 5	-0.5 ± 2.3	2 ± 33	2.2 ± 5.3
	AUG	4.9 ± 6.9	27 ± 15	0.6 ± 0.8	-0.9 ± 0.8	1 ± 2	0.3 ± 0.9	-4 ± 2	0 ± 1	0.4 ± 0.9	0.3 ± 0.9	0.5 ± 0.9	4 ± 3	-0.4 ± 1.0	8 ± 23	3.9 ± 3.0
	SEP	-4.8 ± 12.	-7 ± 20	-0.4 ± 1.4	-0.5 ± 1.4	1 ± 3	-0.4 ± 1.7	-3 ± 4	1 ± 3	0.2 ± 1.5	-6.3 ± 1.7	0.2 ± 1.6	-2 ± 6	1.3 ± 2.3	-29 ± 34	0.7 ± 5.6
	OCT	2.1 ± 14.	39 ± 23	1.6 ± 1.8	-2.2 ± 1.8	0 ± 4	1.0 ± 2.2	-2 ± 4	2 ± 3	1.1 ± 1.7	-3.0 ± 1.8	-0.1 ± 1.9	0 ± 6	1.4 ± 2.4	10 ± 44	1.0 ± 9.0
	NOV	-2.1 ± 12.	12 ± 21	0.6 ± 1.6	-1.2 ± 1.7	0 ± 4	-0.4 ± 2.0	0 ± 4	1 ± 3	1.1 ± 1.7	-8.3 ± 2.1	-0.3 ± 1.6	-1 ± 6	1.5 ± 2.3	2 ± 33	5.3 ± 5.4
	DEC	2.7 ± 6.1	-12 ± 12	-0.5 ± 0.7	-0.6 ± 0.7	-1 ± 1	0.2 ± 0.8	1 ± 2	0 ± 1	0.1 ± 0.7	0.3 ± 0.8	-0.6 ± 0.7	1 ± 3	-0.1 ± 0.9	6 ± 25	-0.6 ± 3.1
	MEAN	1.3 ± 9.3	10 ± 38	0.3 ± 1.8	-0.9 ± 1.3	1 ± 2	0.0 ± 1.0	-1 ± 4	1 ± 1	0.6 ± 0.8	-2.9 ± 6.7	0.0 ± 0.7	0 ± 3	0.6 ± 1.8	-3 ± 29	1.9 ± 4.1
13B1																
	JAN	3.1 ± 11.	-13 ± 22	0.8 ± 1.4	-1.3 ± 1.3	1 ± 3	1.3 ± 1.5	-3 ± 3	-1 ± 2	0.1 ± 1.5	-3.8 ± 1.5	-0.4 ± 1.5	-1 ± 5	0.2 ± 2.1	20 ± 34	-2.8 ± 6.3
	FEB	4.6 ± 11.	-3 ± 20	-0.2 ± 1.4	-0.9 ± 1.4	-1 ± 3	1.1 ± 1.6	-3 ± 3	1 ± 2	-0.8 ± 1.3	-1.9 ± 1.3	-0.1 ± 1.4	-1 ± 5	-0.6 ± 2.0	25 ± 32	2.4 ± 6.5
	MAR	0.0 ± 7.0	6 ± 12	-0.8 ± 0.8	-1.0 ± 0.8	-1 ± 2	-0.5 ± 0.9	-6 ± 2	1 ± 2	-0.2 ± 1.2	-11. ± 1.4	-0.3 ± 1.0	-1 ± 3	0.4 ± 1.1	-5 ± 28	0.2 ± 3.9
	APR	4.2 ± 11.	-7 ± 19	-0.1 ± 1.3	-0.1 ± 1.2	-2 ± 3	0.2 ± 1.4	0 ± 3	1 ± 2	1.4 ± 1.3	-1.1 ± 1.4	-0.4 ± 1.3	3 ± 5	-0.8 ± 1.6	-6 ± 37	-2.7 ± 5.5
	MAY	-4.6 ± 6.0	-1 ± 10	0.5 ± 0.7	0.1 ± 0.7	0 ± 1	0.0 ± 0.8	0 ± 2	0 ± 1	0.3 ± 0.7	-1.2 ± 0.8	-0.1 ± 0.8	1 ± 3	0.3 ± 0.9	11 ± 19	-0.6 ± 2.5
	JUN	1.4 ± 5.3	-9 ± 10	0.3 ± 0.6	-0.2 ± 0.6	-1 ± 1	-0.3 ± 0.7	0 ± 1	0 ± 1	0.5 ± 0.7	-2.1 ± 0.7	0.2 ± 0.7	-1 ± 3	-0.1 ± 0.8	6 ± 16	0.1 ± 2.2
	JUL	6.3 ± 14.	1 ± 30	0.7 ± 1.9	-0.9 ± 1.7	-1 ± 4	-1.0 ± 2.2	-1 ± 4	0 ± 3	-0.7 ± 1.9	-3.6 ± 1.8	-2.5 ± 2.1	-1 ± 6	-1.1 ± 3.0	54 ± 56	-2.3 ± 8.9
	AUG	1.6 ± 14.	18 ± 24	-1.3 ± 1.8	0.5 ± 1.8	2 ± 4	-0.7 ± 2.1	-4 ± 5	0 ± 3	0.2 ± 1.8	-3.1 ± 1.9	2.2 ± 1.9	1 ± 6	-0.1 ± 3.0	-24 ± 46	-1.7 ± 7.8
	SEP	6.5 ± 9.5	9 ± 15	0.3 ± 1.0	0.0 ± 1.0	-2 ± 2	0.1 ± 1.2	-1 ± 3	1 ± 2	-0.3 ± 1.0	-2.4 ± 1.2	-0.2 ± 1.1	-2 ± 4	0.9 ± 1.4	3 ± 29	0.6 ± 3.5
	OCT	8.4 ± 12.	48 ± 22	0.0 ± 1.6	-0.6 ± 1.6	7 ± 3	1.8 ± 2.0	-2 ± 4	1 ± 3	0.5 ± 1.7	-4.9 ± 1.9	0.7 ± 1.6	1 ± 6	-0.6 ± 2.2	8 ± 37	2.0 ± 6.1
	NOV	0.2 ± 7.5	6 ± 14	-0.6 ± 0.9	-0.3 ± 0.9	0 ± 2	0.0 ± 0.9	-4 ± 2	0 ± 2	-1.8 ± 1.3	-4.7 ± 1.1	0.8 ± 1.0	-5 ± 3	1.0 ± 1.2	10 ± 28	-1.2 ± 3.7
	DEC	15.0 ± 14.	32 ± 25	-0.2 ± 1.9	-0.2 ± 1.6	0 ± 4	0.9 ± 2.2	-2 ± 4	-2 ± 3	-1.1 ± 1.8	-5.9 ± 2.0	0.5 ± 1.9	-2 ± 6	1.4 ± 2.6	45 ± 44	-10. ± 8.0
	MEAN	3.9 ± 9.9	7 ± 35	-0.1 ± 1.3	-0.4 ± 1.1	0 ± 5	0.2 ± 1.7	-2 ± 4	0 ± 2	-0.1 ± 1.7	-3.8 ± 5.4	0.0 ± 2.2	-1 ± 4	0.1 ± 1.5	12 ± 43	-1.3 ± 6.4
24S1																
	JAN	1.8 ± 7.0	-15 ± 12	-0.4 ± 0.8	-0.4 ± 0.8	1 ± 2	-0.4 ± 0.8	-2 ± 2	1 ± 1	0.7 ± 0.8	-4.8 ± 0.9	-0.6 ± 0.8	0 ± 3	-0.3 ± 1.0	21 ± 27	3.6 ± 2.8
	FEB	-3.5 ± 7.8	9 ± 13	0.1 ± 0.9	-0.9 ± 0.8	1 ± 2	0.4 ± 0.9	3 ± 2	0 ± 1	0.6 ± 0.9	0.7 ± 1.1	-0.1 ± 0.9	-2 ± 3	0.2 ± 1.1	-1 ± 28	3.0 ± 3.2
	MAR	-3.3 ± 5.5	-2 ± 10	-0.5 ± 0.6	0.2 ± 0.6	0 ± 1	0.1 ± 0.7	-3 ± 2	0 ± 1	0.0 ± 0.6	-3.4 ± 0.8	-0.4 ± 0.7	2 ± 3	-0.5 ± 0.9	10 ± 18	-1.4 ± 2.3
	APR	2.6 ± 9.6	13 ± 17	-0.2 ± 1.1	-0.3 ± 1.2	2 ± 3	1.9 ± 1.4	-3 ± 3	-1 ± 2	0.4 ± 1.3	-1.6 ± 1.5	-0.6 ± 1.3	-1 ± 5	-0.3 ± 1.9	-36 ± 27	0.3 ± 4.7
	MAY	6.8 ± 6.7	-5 ± 13	-0.4 ± 0.8	-0.5 ± 0.8	0 ± 2	-0.1 ± 0.9	0 ± 2	1 ± 1	0.6 ± 0.8	-2.7 ± 0.9	-0.1 ± 0.8	-1 ± 3	0.8 ± 1.1	2 ± 25	1.9 ± 3.1
	JUN	4.6 ± 5.6	-4 ± 10	-0.2 ± 0.6	-0.5 ± 0.6	0 ± 1	-0.3 ± 0.7	0 ± 2	1 ± 1	-0.4 ± 0.6	-1.6 ± 0.7	0.1 ± 0.7	-2 ± 3	0.5 ± 0.8	20 ± 18	1.5 ± 2.1
	JUL	0.3 ± 11.	11 ± 20	1.0 ± 1.6	-0.2 ± 1.6	2 ± 3	0.3 ± 1.8	3 ± 4	0 ± 3	-0.3 ± 1.6	-1.4 ± 1.5	1.2 ± 1.6	0 ± 6	2.9 ± 2.6	-13 ± 34	0.9 ± 6.1
	AUG	-6.2 ± 12.	24 ± 21	0.1 ± 1.6	0.4 ± 1.6	3 ± 3	-1.7 ± 2.1	-4 ± 4	1 ± 3	-0.5 ± 1.7	-6.3 ± 2.3	0.1 ± 1.7	-3 ± 6	1.8 ± 2.4	13 ± 36	-2.7 ± 6.3
	SEP	1.1 ± 12.	-1 ± 16	0.3 ± 1.3	0.4 ± 1.3	2 ± 3	-0.1 ± 1.3	2 ± 3	-1 ± 2	1.3 ± 1.7	0.4 ± 1.5	-0.2 ± 1.3	0 ± 6	0.9 ± 1.9	0 ± 40	3.4 ± 4.6
	OCT	-0.3 ± 7.3	4 ± 13	0.0 ± 0.9	-0.2 ± 0.9	2 ± 2	0.8 ± 1.0	-2 ± 2	-3 ± 2	-0.8 ± 1.0	-4.5 ± 1.1	0.5 ± 1.0	2 ± 3	0.9 ± 1.3	-12 ± 28	-1.3 ± 4.1
	NOV	-0.2 ± 7.3	3 ± 14	-0.2 ± 0.9	0.1 ± 1.0	0 ± 2	0.3 ± 0.9	-2 ± 2	2 ± 2	0.8 ± 0.9	-4.1 ± 1.1	-0.4 ± 1.0	-2 ± 4	1.1 ± 1.3	-10 ± 24	3.1 ± 3.5
	DEC	3.2 ± 12.	4 ± 20	-0.6 ± 1.6	0.2 ± 1.6	2 ± 3	0.0 ± 1.8	-4 ± 4	1 ± 3	2.3 ± 1.7	-9.3 ± 2.1	0.0 ± 1.7	-3 ± 6	-1.4 ± 2.4	-2 ± 36	2.7 ± 6.3
	MEAN	0.6 ± 7.3	3 ± 20	-0.1 ± 0.8	-0.1 ± 0.8	1 ± 2	0.1 ± 1.7	-1 ± 5	0 ± 2	0.4 ± 1.7	-3.2 ± 5.7	0.0 ± 1.0	-1 ± 3	0.5 ± 2.3	-1 ± 32	1.2 ± 4.2

TABLE C-II.1 CONCENTRATIONS OF GROSS BETA INSOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	15F4	15F7	16C2	28F3
JAN	0.2 ± 0.9	0.4 ± 0.9	0.8 ± 0.9	0.3 ± 0.9
FEB	0.5 ± 0.9	0.0 ± 0.8	0.3 ± 0.8	0.1 ± 0.8
MAR	-2.2 ± 1.0	-2.4 ± 1.0	-2.5 ± 1.0	-2.6 ± 1.0
APR	-1.2 ± 1.1	-2.0 ± 1.1	-0.4 ± 1.2	-0.3 ± 1.2
MAY	0.6 ± 0.8	0.8 ± 0.8	0.9 ± 0.8	0.3 ± 0.8
JUN	1.0 ± 0.8	0.4 ± 0.8	0.5 ± 0.8	0.2 ± 0.8
JUL	-0.1 ± 0.8	0.3 ± 0.8	0.3 ± 0.8	0.6 ± 0.8
AUG	0.6 ± 0.9	0.3 ± 0.8	-0.2 ± 0.8	0.6 ± 0.9
SEP	-1.4 ± 0.8	-0.9 ± 0.9	-0.2 ± 0.9	-1.2 ± 0.9
OCT	0.4 ± 0.8	0.6 ± 0.8	0.3 ± 0.8	0.6 ± 0.8
NOV	-0.3 ± 0.9	0.4 ± 0.9	-0.2 ± 0.9	-0.8 ± 0.8
DEC	0.3 ± 0.9	-0.5 ± 0.9	0.0 ± 0.9	-0.8 ± 0.9
MEAN	-0.1 ± 1.9	-0.2 ± 2.1	0.0 ± 1.8	-0.3 ± 1.9

TABLE C-II.2 CONCENTRATIONS OF GROSS BETA SOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	15F4	15F7	16C2	28F3
JAN	3.9 ± 1.3	3.6± 1.3	2.1 ± 1.2	2.6 ± 1.3
FEB	2.0 ± 1.1	3.1 ± 1.2	2.4 ± 1.2	2.2 ± 1.2
MAR	4.2 ± 1.2	3.3 ± 1.2	1.8 ± 1.1	3.6 ± 1.2
APR	3.8 ± 1.4	0.8 ± 1.3	-1.0 ± 1.4	-1.9 ± 1.2
MAY	2.6 ± 1.1	3.5 ± 1.1	2.1 ± 1.1	3.8 ± 1.2
JUN	3.1 ± 1.2	2.4 ± 1.2	3.3 ± 1.2	2.4 ± 1.2
JUL	5.8 ± 1.3	4.0 ± 1.2	3.8 ± 1.2	3.0 ± 1.2
AUG	3.0 ± 1.2	3.6 ± 1.2	2.9 ± 1.3	2.9 ± 1.3
SEP	3.8 ± 1.3	3.8 ± 1.3	3.0 ± 1.3	5.0 ± 1.4
OCT	3.6 ± 1.2	3.7 ± 1.2	4.0 ± 1.3	5.3 ± 1.3
NOV	2.7 ± 1.2	5.3 ± 1.3	2.3 ± 1.2	2.3 ± 1.2
DEC	2.4 ± 1.1	3.3 ± 1.2	1.6 ± 1.1	3.2 ± 1.1
MEAN	3.4 ± 2.0	3.4 ± 2.1	2.4 ± 2.6	2.9 ± 3.6

TABLE C-II.3 CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	15F4	15F7	16C2	28F3
JAN-MAR	67 ± 60	50 ± 59	52 ± 59	44 ± 59
APR-JUN	33 ± 58	170 ± 60	0.8 ± 60	45 ± 60
JUL-SEP	50 ± 62	75 ± 63	14 ± 61	16 ± 61
OCT-DEC	22 ± 64	64 ± 66	22 ± 64	50 ± 65
MEAN	43 ± 39	90 ± 10	22 ± 43	39 ± 31

TABLE C-II.4 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	COLLECTION PERIOD	BE-7	K-40	MN-54	CO-58	CO-60	FE-59	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-232
15F4																
	JAN	-1.7 ± 7.2	23 ± 11	0.5 ± 0.9	-0.1 ± 0.9	0 ± 2	0.0 ± 0.9	-2.3 ± 2.1	-0.8 ± 1.6	-0.2 ± 1.0	-5.9 ± 1.1	0.8 ± 0.9	-2 ± 3	-0.3 ± 1.1	-11 ± 42	5 ± 3
	FEB	-1.6 ± 7.3	-14 ± 15	0.0 ± 0.9	0.0 ± 0.9	0 ± 2	0.5 ± 1.0	-2.8 ± 2.2	-0.1 ± 1.6	0.5 ± 1.0	-4.0 ± 1.0	0.3 ± 0.9	-1 ± 3	0.4 ± 1.3	-10 ± 24	2 ± 3
	MAR	4.6 ± 12.	22 ± 21	0.2 ± 1.5	-1.0 ± 1.5	3 ± 4	1.2 ± 1.8	-5.1 ± 3.9	0.2 ± 2.5	0.7 ± 1.6	-10. ± 2.1	-2.3 ± 1.6	0 ± 6	-1.0 ± 2.3	26 ± 34	6 ± 6
	APR	-2.0 ± 7.1	-3 ± 13	-0.6 ± 0.9	-0.3 ± 0.8	0 ± 2	-0.8 ± 0.9	-0.3 ± 2.0	-0.2 ± 1.5	0.6 ± 0.9	-2.4 ± 0.9	0.5 ± 0.9	2 ± 4	0.5 ± 1.2	-4 ± 26	-1 ± 4
	MAY	-3.3 ± 11.	-29 ± 22	-0.1 ± 1.4	-0.7 ± 1.4	1 ± 3	0.9 ± 1.6	-0.3 ± 3.2	0.1 ± 2.5	0.7 ± 1.4	-1.2 ± 1.5	-0.1 ± 1.5	5 ± 5	-1.2 ± 2.3	-6 ± 32	-2 ± 6
	JUN	1.9 ± 7.5	0 ± 14	0.3 ± 0.9	-0.2 ± 0.9	1 ± 2	0.6 ± 1.0	-1.8 ± 1.9	0.8 ± 1.6	0.6 ± 1.0	-3.5 ± 1.3	-0.5 ± 0.9	0 ± 4	-0.4 ± 1.6	11 ± 27	-2 ± 4
	JUL	-3.3 ± 13.	-37 ± 28	0.2 ± 1.8	2.0 ± 1.7	2 ± 4	-0.8 ± 2.0	0.8 ± 4.1	1.0 ± 3.1	0.1 ± 1.9	-0.9 ± 1.7	0.9 ± 2.0	6 ± 7	0.2 ± 2.3	38 ± 38	0 ± 8
	AUG	2.2 ± 7.0	4 ± 11	-0.5 ± 0.8	-0.3 ± 0.8	2 ± 2	0.7 ± 0.8	-3.5 ± 1.9	0.6 ± 1.4	0.3 ± 0.8	0.0 ± 0.9	0.1 ± 0.9	2 ± 3	-0.5 ± 1.1	1 ± 28	-1 ± 3
	SEP	-5.3 ± 12.	10 ± 19	0.4 ± 1.4	-0.8 ± 1.5	1 ± 3	-0.4 ± 1.4	-4.6 ± 2.9	-0.5 ± 2.4	-1.6 ± 1.7	-4.9 ± 1.7	-0.3 ± 1.5	0 ± 6	0.4 ± 1.8	21 ± 39	2 ± 6
	OCT	-1.1 ± 5.9	-3 ± 11	-0.4 ± 0.7	-0.3 ± 0.7	0 ± 2	-0.7 ± 0.8	-3.1 ± 1.8	-0.1 ± 1.1	0.5 ± 0.7	-4.2 ± 0.8	0.1 ± 0.7	0 ± 3	0.6 ± 0.9	-2 ± 23	0 ± 3
	NOV	2.6 ± 14.	15 ± 25	0.4 ± 1.7	-0.3 ± 1.8	0 ± 4	0.8 ± 2.0	-4.6 ± 4.3	-2.0 ± 2.8	0.5 ± 2.0	-3.1 ± 1.9	0.8 ± 1.8	-6 ± 7	-1.6 ± 2.5	4 ± 43	-7 ± 8
	DEC	-1.7 ± 10.	-55 ± 30	-0.4 ± 1.3	-0.6 ± 1.3	2 ± 3	-0.6 ± 1.4	-3.8 ± 3.5	-0.3 ± 2.3	0.4 ± 1.3	-3.5 ± 1.3	-0.2 ± 1.5	-1 ± 5	-0.4 ± 1.6	10 ± 42	-2 ± 8
	MEAN	-0.7 ± 5.8	-6 ± 48	0.0 ± 0.8	-0.2 ± 1.5	1 ± 2	0.1 ± 1.5	-2.6 ± 3.8	-0.1 ± 1.6	0.3 ± 1.3	-3.6 ± 5.2	0.0 ± 1.7	1 ± 6	-0.3 ± 1.5	6 ± 31	0 ± 7
15F7																
	JAN	-0.9 ± 5.8	0 ± 11	-0.1 ± 0.7	-0.4 ± 0.7	0 ± 1	0.1 ± 0.7	-5.7 ± 1.8	0.1 ± 1.2	0.4 ± 0.7	-5.2 ± 0.9	-0.1 ± 0.7	-2 ± 3	0.6 ± 0.9	-16 ± 23	-2 ± 4
	FEB	1.3 ± 7.4	-6 ± 14	-1.3 ± 0.9	-0.2 ± 0.9	1 ± 2	0.0 ± 1.1	-3.4 ± 2.1	0.9 ± 1.5	-2.0 ± 1.1	-5.5 ± 1.1	-0.4 ± 1.0	1 ± 4	0.2 ± 1.2	-23 ± 28	-2 ± 4
	MAR	-3.1 ± 14.	-10 ± 29	0.2 ± 1.9	0.1 ± 1.8	0 ± 4	-0.5 ± 1.9	-2.2 ± 4.1	3.1 ± 3.2	1.1 ± 1.8	-6.1 ± 1.9	-1.5 ± 1.9	3 ± 8	0.6 ± 2.8	-8 ± 46	3 ± 7
	APR	9.7 ± 13.	-18 ± 23	0.3 ± 1.9	-0.5 ± 1.8	1 ± 4	1.3 ± 2.1	-1.1 ± 4.1	-0.7 ± 3.1	-0.6 ± 1.9	-2.1 ± 1.8	0.2 ± 1.8	-3 ± 6	-1.8 ± 2.6	9 ± 45	4 ± 8
	MAY	-0.7 ± 12.	19 ± 21	0.2 ± 1.6	-0.8 ± 1.6	3 ± 3	-0.4 ± 1.9	-0.2 ± 3.8	1.2 ± 2.8	-0.2 ± 1.5	0.7 ± 1.4	0.0 ± 1.6	-4 ± 6	-0.1 ± 2.6	-8 ± 38	5 ± 6
	JUN	5.2 ± 13.	23 ± 19	-0.5 ± 1.6	-1.3 ± 1.6	2 ± 4	1.6 ± 1.8	-2.5 ± 3.5	-1.4 ± 2.8	1.9 ± 1.8	-6.6 ± 1.8	0.7 ± 1.6	-3 ± 7	-1.3 ± 3.2	-8 ± 33	7 ± 6
	JUL	-6.2 ± 9.5	1 ± 17	0.0 ± 1.1	0.0 ± 1.1	1 ± 2	0.0 ± 1.1	-1.2 ± 2.7	-0.8 ± 1.8	0.2 ± 1.2	-3.0 ± 1.3	0.3 ± 1.3	-3 ± 5	-0.6 ± 1.7	62 ± 55	0 ± 5
	AUG	-1.3 ± 11.	-4 ± 22	0.5 ± 1.5	0.0 ± 1.4	3 ± 3	-0.6 ± 1.7	0.8 ± 3.3	1.6 ± 2.5	0.0 ± 1.3	0.0 ± 1.5	-1.4 ± 1.5	-3 ± 5	-0.8 ± 2.2	4 ± 35	3 ± 6
	SEP	-4.5 ± 11.	-1 ± 17	0.1 ± 1.3	1.0 ± 1.2	0 ± 3	-0.4 ± 1.1	-1.6 ± 3.1	0.4 ± 2.1	-0.4 ± 1.4	-0.4 ± 1.5	0.3 ± 1.3	0 ± 5	-0.2 ± 2.0	-7 ± 36	4 ± 5
	OCT	0.6 ± 10.	5 ± 20	0.2 ± 1.4	-1.5 ± 1.3	1 ± 3	-0.5 ± 1.4	0.2 ± 3.0	-2.3 ± 2.3	0.3 ± 1.5	-6.2 ± 2.0	0.9 ± 1.4	0 ± 5	0.6 ± 2.0	0 ± 32	-4 ± 5
	NOV	-2.7 ± 5.9	-8 ± 10	0.1 ± 0.7	0.4 ± 0.7	-1 ± 1	0.8 ± 0.8	-2.5 ± 1.7	-0.5 ± 1.2	0.3 ± 0.7	-2.5 ± 0.8	0.0 ± 0.7	1 ± 3	0.4 ± 0.9	1 ± 23	0 ± 3
	DEC	2.7 ± 8.2	3 ± 14	0.1 ± 0.9	-0.9 ± 0.9	0 ± 2	-0.1 ± 1.0	-5.7 ± 2.4	0.4 ± 1.7	0.4 ± 1.1	-12. ± 1.5	-0.7 ± 1.1	1 ± 4	0.2 ± 1.3	10 ± 30	-1 ± 4
	MEAN	0.0 ± 8.7	0 ± 23	0.0 ± 1.0	-0.3 ± 1.4	1 ± 2	0.1 ± 1.5	-2.1 ± 4.1	0.2 ± 2.9	0.1 ± 1.9	-4.1 ± 7.2	-0.1 ± 1.5	-1 ± 4	-0.2 ± 1.6	2 ± 43	1 ± 7

TABLE C-II.4 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	COLLECTION PERIOD	BE-7	K-40	MN-54	CO-58	CO-60	FE-59	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-232
16C2																
	JAN	-3.8 ± 6.3	-5 ± 12	-0.4 ± 0.7	-0.2 ± 0.7	0 ± 1	-1.1 ± 0.8	-8.1 ± 1.9	0.2 ± 1.2	0.2 ± 0.8	-0.2 ± 0.8	-0.3 ± 0.8	-1 ± 3	0.4 ± 1.0	12 ± 20	-2 ± 3
	FEB	15.0 ± 12.	-8 ± 20	-0.1 ± 1.6	0.3 ± 1.6	5 ± 4	-0.4 ± 1.9	-2.9 ± 3.7	-1.3 ± 2.7	-0.6 ± 1.6	-4.6 ± 1.8	0.9 ± 1.7	-2 ± 5	0.5 ± 2.5	-15 ± 35	4 ± 7
	MAR	2.2 ± 7.4	-13 ± 14	-0.4 ± 0.9	-1.0 ± 0.9	1 ± 2	-0.6 ± 1.0	0.6 ± 2.3	-1.5 ± 1.7	0.5 ± 1.0	-6.6 ± 1.2	-0.3 ± 1.0	1 ± 4	-0.1 ± 1.4	2 ± 23	1 ± 3
	APR	-0.8 ± 13.	15 ± 21	-0.9 ± 1.7	0.3 ± 1.7	0 ± 3	-0.4 ± 1.9	-6.4 ± 4.2	1.1 ± 2.9	-0.9 ± 1.7	-0.1 ± 1.7	0.5 ± 1.7	-1 ± 6	1.2 ± 2.4	1 ± 35	6 ± 6
	MAY	5.3 ± 7.8	0 ± 15	-0.8 ± 0.9	-0.7 ± 0.9	0 ± 2	0.9 ± 1.0	-6.5 ± 2.5	-1.3 ± 1.7	-0.2 ± 1.3	0.2 ± 1.0	0.1 ± 1.0	0 ± 4	0.5 ± 1.4	-11 ± 27	-2 ± 4
	JUN	-3.3 ± 14.	17 ± 27	-0.5 ± 1.9	-0.4 ± 1.7	3 ± 4	-0.5 ± 2.1	-3.0 ± 4.1	1.7 ± 3.0	0.0 ± 2.0	0.5 ± 1.8	-0.7 ± 1.8	9 ± 8	-1.2 ± 3.4	-24 ± 42	-5 ± 9
	JUL	-0.1 ± 13.	0 ± 21	-0.4 ± 1.4	-0.2 ± 1.5	-1 ± 3	0.4 ± 1.6	0.3 ± 3.6	-0.5 ± 2.5	-0.2 ± 1.5	0.1 ± 1.6	-0.2 ± 1.6	-2 ± 6	-0.3 ± 2.0	2 ± 39	6 ± 5
	AUG	1.4 ± 6.5	-6 ± 11	-0.4 ± 0.8	-0.1 ± 0.7	1 ± 1	-0.5 ± 0.7	-4.7 ± 1.9	0.3 ± 1.2	-0.1 ± 0.8	-0.5 ± 0.8	0.2 ± 0.8	0 ± 3	0.7 ± 1.0	-7 ± 19	-2 ± 3
	SEP	-3.7 ± 11.	-17 ± 15	0.2 ± 1.2	-0.5 ± 1.1	1 ± 2	-0.4 ± 1.2	0.1 ± 2.9	0.9 ± 2.0	0.2 ± 1.4	-0.3 ± 1.2	0.5 ± 1.3	1 ± 5	0.7 ± 1.6	9 ± 36	-2 ± 5
	OCT	0.7 ± 11.	11 ± 18	-0.3 ± 1.3	0.5 ± 1.4	-2 ± 3	-1.0 ± 1.5	-0.8 ± 3.0	0.3 ± 2.2	1.1 ± 1.5	-8.4 ± 1.8	-0.5 ± 1.4	0 ± 5	2.2 ± 2.0	14 ± 39	2 ± 6
	NOV	-0.8 ± 7.3	-8 ± 13	-0.4 ± 0.9	-0.7 ± 0.9	-2 ± 2	-0.3 ± 1.0	-5.5 ± 2.1	0.2 ± 1.5	0.2 ± 0.9	-0.1 ± 1.0	0.2 ± 1.0	0 ± 3	-0.1 ± 1.1	5 ± 25	3 ± 3
	DEC	1.8 ± 13.	3 ± 21	-1.4 ± 1.8	-1.8 ± 1.7	0 ± 4	-0.5 ± 2.0	2.3 ± 4.0	0.9 ± 2.8	1.2 ± 1.8	1.1 ± 1.9	1.0 ± 1.8	0 ± 7	1.3 ± 2.8	-2 ± 37	6 ± 7
	MEAN	1.2 ± 10.	-1 ± 21	-0.5 ± 0.8	-0.4 ± 1.3	1 ± 4	-0.4 ± 1.1	-2.9 ± 6.8	0.1 ± 2.1	0.1 ± 1.2	-1.6 ± 6.3	0.1 ± 1.1	0 ± 6	0.5 ± 1.7	-1 ± 23	1 ± 8
28F3																
	JAN	1.7 ± 6.0	-11 ± 16	0.0 ± 0.7	-0.1 ± 0.7	0 ± 1	-0.3 ± 0.7	-4.6 ± 1.7	-1.0 ± 1.1	0.3 ± 0.7	-4.7 ± 0.8	-0.6 ± 0.7	2 ± 3	0.4 ± 0.9	3 ± 18	-2 ± 2
	FEB	-5.7 ± 15.	-2 ± 26	-1.8 ± 1.9	0.6 ± 1.8	1 ± 4	0.2 ± 2.0	-4.0 ± 4.6	-0.2 ± 3.1	1.1 ± 2.0	-4.6 ± 1.9	-0.9 ± 1.8	0 ± 7	0.4 ± 2.7	-11 ± 45	-2 ± 8
	MAR	-3.6 ± 13.	14 ± 19	-0.7 ± 1.8	-1.2 ± 1.8	6 ± 3	1.0 ± 1.8	-9.8 ± 4.5	0.3 ± 3.0	-1.7 ± 1.9	-11. ± 2.2	0.5 ± 1.7	-3 ± 7	-0.4 ± 2.7	-44 ± 35	0 ± 6
	APR	-6.6 ± 11.	21 ± 22	-0.7 ± 1.4	-0.5 ± 1.3	-1 ± 3	0.6 ± 1.6	-1.0 ± 3.1	1.7 ± 2.3	-0.2 ± 1.5	-1.4 ± 1.3	-0.6 ± 1.5	2 ± 5	-1.1 ± 2.1	15 ± 32	0 ± 7
	MAY	4.8 ± 7.6	-12 ± 13	-0.7 ± 0.9	-0.2 ± 0.9	0 ± 2	-0.1 ± 1.0	-0.2 ± 1.9	0.5 ± 1.6	0.1 ± 0.9	-2.3 ± 1.0	0.5 ± 1.0	0 ± 4	0.3 ± 1.3	5 ± 29	2 ± 4
	JUN	-8.6 ± 11.	1 ± 22	0.4 ± 1.2	-0.7 ± 1.4	0 ± 3	0.2 ± 1.6	-2.5 ± 3.3	-1.3 ± 2.5	-0.1 ± 1.4	-1.7 ± 1.3	0.5 ± 1.4	1 ± 7	-2.3 ± 2.5	21 ± 33	-4 ± 7
	JUL	1.6 ± 12.	-4 ± 17	0.4 ± 1.4	-1.4 ± 1.4	0 ± 3	0.5 ± 1.4	-1.6 ± 2.8	-1.1 ± 2.4	0.0 ± 1.5	-2.1 ± 1.7	0.3 ± 1.3	-1 ± 6	1.2 ± 1.8	-12 ± 41	1 ± 5
	AUG	-4.0 ± 6.0	13 ± 13	-0.6 ± 0.7	0.0 ± 0.7	1 ± 1	-0.1 ± 0.7	-0.2 ± 1.7	-0.1 ± 1.1	0.3 ± 0.7	-0.3 ± 0.8	0.1 ± 0.7	-1 ± 3	0.2 ± 0.9	-15 ± 19	-3 ± 2
	SEP	-6.4 ± 12.	9 ± 22	-0.5 ± 1.3	0.4 ± 1.3	1 ± 3	0.7 ± 1.9	-2.4 ± 3.2	1.8 ± 2.4	-0.4 ± 1.4	-1.4 ± 1.4	1.6 ± 1.4	5 ± 6	1.7 ± 2.4	27 ± 33	-4 ± 6
	OCT	6.4 ± 8.1	-12 ± 15	-0.5 ± 0.9	-0.3 ± 1.0	1 ± 2	-0.6 ± 1.1	-5.5 ± 2.3	0.8 ± 1.7	0.2 ± 1.0	-2.9 ± 1.1	0.5 ± 1.0	-1 ± 4	0.2 ± 1.4	4 ± 31	-1 ± 4
	NOV	-0.8 ± 6.2	-6 ± 11	0.3 ± 0.7	-0.1 ± 0.8	0 ± 2	-0.3 ± 0.8	0.1 ± 1.7	-1.9 ± 1.3	0.0 ± 0.8	-0.3 ± 0.9	-0.7 ± 0.8	2 ± 3	-0.2 ± 1.0	-5 ± 19	-2 ± 3
	DEC	0.9 ± 15.	32 ± 25	3.2 ± 2.0	0.7 v2.1	2 ± 4	-0.4 ± 2.1	-10. ± 5.2	1.0 ± 3.1	0.6 ± 2.1	-0.8 ± 2.1	0.2 ± 1.9	-1 ± 7	-1.8 ± 3.3	16 ± 47	-5 ± 8
	MEAN	-1.7 ± 9.7	4 ± 28	-0.1 ± 2.4	-0.2 ± 1.3	1 ± 4	0.1 ± 1.0	-3.5 ± 7.0	0.0 ± 2.4	0.0 ± 1.3	-2.8 ± 5.9	0.1 ± 1.4	0 ± 4	-0.1 ± 2.3	0 ± 39	-2 ± 4

TABLE C-III.1 CONCENTRATIONS OF GAMMA EMITTERS IN PREDATOR AND BOTTOM FEEDER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/KG WET +/- 2 SIGMA

STC	COLLECTION PERIOD	BE-7	K-40	MN-54	CO-58	CO-60	FE-59	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-232
16C5																
	PREDATOR (FISH)															
	5/23/96	-14 ± 40	3400 ± 300	0 ± 6	3 ± 5	-7 ± 10	4 ± 7	-4 ± 20	3 ± 10	-5 ± 6	-3 ± 6	9 ± 6	-28 ± 20	-2 ± 8	16 ± 90	10 ± 20
	11/15/96	-3 ± 31	3100 ± 300	-2 ± 4	2 ± 4	-4 ± 9	-1 ± 4	-16 ± 10	2 ± 6	-1 ± 4	0 ± 4	-1 ± 4	6 ± 20	-2 ± 5	-16 ± 90	12 ± 20
	MEAN	-9 ± 15	3250 ± 424	-1 ± 3	3 ± 1	-5 ± 4	2 ± 7	-10 ± 17	3 ± 1	-3 ± 5	-2 ± 4	4 ± 14	-11 ± 48	-2 ± 1	0 ± 45	11 ± 3
	BOTTOM FEEDER (FISH)															
	5/23/96	-27 ± 30	3500 ± 400	0 ± 4	0 ± 4	-10 ± 10	1 ± 4	8 ± 10	1 ± 7	4 ± 4	5 ± 4	2 ± 4	-7 ± 20	4 ± 5	-32 ± 90	-14 ± 20
	11/21/96	-16 ± 37	3600 ± 400	-2 ± 6	1 ± 5	-2 ± 10	2 ± 6	-12 ± 20	2 ± 10	0 ± 6	-2 ± 6	5 ± 6	-18 ± 20	-4 ± 7	12 ± 100	13 ± 20
	MEAN	-22 ± 16	3550 ± 141	-1 ± 4	1 ± 1	-6 ± 11	2 ± 1	-2 ± 29	1 ± 2	2 ± 6	1 ± 9	3 ± 4	-12 ± 16	0 ± 10	-10 ± 62	-1 ± 38
29C1																
	PREDATOR (FISH)															
	5/24/96	-8 ± 40	3300 ± 300	-3 ± 5	-4 ± 5	6 ± 10	1 ± 5	-21 ± 10	0 ± 8	6 ± 6	0 ± 5	1 ± 5	8 ± 20	-1 ± 6	-28 ± 100	1 ± 20
	11/7/96	-17 ± 90	2300 ± 400	11 ± 10	-5 ± 10	-10 ± 20	4 ± 10	-59 ± 30	14 ± 20	5 ± 10	3 ± 10	-1 ± 10	30 ± 50	-8 ± 20	48 ± 200	4 ± 50
	MEAN	-13 ± 13	2800 ± 141	4 ± 20	-4 ± 1	-2 ± 23	3 ± 4	-40 ± 54	7 ± 19	5 ± 0	2 ± 4	0 ± 3	19 ± 31	-5 ± 10	10 ± 107	3 ± 3
	BOTTOM FEEDER (FISH)															
	5/24/96	-27 ± 30	3700 ± 400	0 ± 4	2 ± 4	2 ± 10	0 ± 5	-6 ± 10	7 ± 7	2 ± 4	-2 ± 4	-2 ± 5	-1 ± 20	2 ± 5	-38 ± 80	6 ± 20
	11/20/96	-50 ± 50	2900 ± 300	-4 ± 6	-6 ± 6	4 ± 10	-2 ± 8	9 ± 20	-7 ± 10	1 ± 8	-6 ± 7	-4 ± 7	28 ± 30	7 ± 9	47 ± 100	-22 ± 20
	MEAN	-39 ± 33	3300 ± 113	-2 ± 7	-2 ± 10	3 ± 2	-1 ± 2	2 ± 21	0 ± 19	1 ± 2	-4 ± 5	-3 ± 3	14 ± 41	4 ± 7	5 ± 120	-8 ± 40

TABLE C-IV.1 CONCENTRATIONS OF GAMMA EMITTERS IN SILT SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/KG DRY +/- 2 SIGMA

STC	COLLECTION PERIOD	BE-7	K-40	MN-54	CO-58	CO-60	FE-59	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-232
16B2																
	5/28/96	1200 ± 200	18000 ± 2000	16 ± 20	-23 ± 20	26 ± 20	-18 ± 40	35 ± 50	15 ± 31	36 ± 22	-7 ± 18	230 ± 40	-11 ± 60	-21 ± 20	3400 ± 600	1800 ± 200
	11/25/96	1500 ± 100	15000 ± 1000	28 ± 14	-16 ± 10	15 ± 11	-13 ± 22	47 ± 32	15 ± 19	24 ± 13	0 ± 11	180 ± 20	-23 ± 50	13 ± 10	2600 ± 400	1300 ± 100
	MEAN	1350 ± 424	16500 ± 4243	22 ± 17	-20 ± 10	21 ± 16	-16 ± 7	41 ± 17	15 ± 0	30 ± 17	-3 ± 10	205 ± 71	-17 ± 17	-4 ± 48	3000 ± 113	1550 ± 707
16C4																
	5/28/96	660 ± 190	16000 ± 2000	25 ± 10	-5 ± 10	19 ± 20	-17 ± 30	-10 ± 40	18 ± 25	31 ± 17	2 ± 14	200 ± 30	25 ± 50	9 ± 10	2800 ± 500	1400 ± 100
	11/25/96	390 ± 140	14000 ± 1000	21 ± 11	-6 ± 10	9 ± 10	-13 ± 21	5 ± 27	21 ± 18	35 ± 14	9 ± 10	220 ± 20	25 ± 50	13 ± 10	2500 ± 400	1200 ± 100
	MEAN	525 ± 382	15000 ± 2828	23 ± 6	-5 ± 1	14 ± 14	-15 ± 6	-2 ± 21	20 ± 4	33 ± 6	6 ± 10	210 ± 28	25 ± 0	11 ± 6	2650 ± 424	1300 ± 283
33A2																
	5/28/96	62 ± 90	13000 ± 1000	10 ± 10	-15 ± 10	8 ± 10	-18 ± 20	-10 ± 30	26 ± 19	30 ± 13	9 ± 10	27 ± 16	-7 ± 40	-16 ± 14	2600 ± 400	1300 ± 100
	11/25/96	-60 ± 80	13000 ± 1000	4 ± 10	-15 ± 9	-6 ± 9	-8 ± 20	-2 ± 30	11 ± 20	21 ± 10	10 ± 10	-11 ± 10	-31 ± 50	-1 ± 10	2600 ± 400	1200 ± 100
	MEAN	1 ± 173	13000 ± 0	7 ± 8	-15 ± 0	1 ± 20	-13 ± 14	-6 ± 11	19 ± 21	26 ± 13	9 ± 1	8 ± 54	-19 ± 34	-9 ± 21	2600 ± 0	1250 ± 141

TABLE C-V.1 TABLE CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

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

	GROUP I			GROUP II	GROUP III
WEEK NO	10S3	11S1	14S1	13C1	22G1
01	26 ± 4	23 ± 4	22 ± 4	24 ± 4	21 ± 4
02	24 ± 5	24 ± 5	32 ± 5	31 ± 5	30 ± 5
03	14 ± 4	19 ± 4	16 ± 4	13 ± 4	13 ± 4
04	16 ± 4	14 ± 3	18 ± 4	14 ± 4	15 ± 4
05	15 ± 4	15 ± 4	17 ± 4	20 ± 4	20 ± 4
06	20 ± 4	20 ± 4	19 ± 4	22 ± 4	17 ± 4
07	13 ± 3	15 ± 4	7 ± 3	14 ± 4	15 ± 4
08	7 ± 4	7 ± 4	10 ± 4	7 ± 4	11 ± 3
09	17 ± 4	13 ± 3	18 ± 4	18 ± 4	16 ± 4
10	15 ± 4	17 ± 4	14 ± 3	20 ± 4	17 ± 4
11	19 ± 4	22 ± 4	17 ± 4	23 ± 4	22 ± 4
12	9 ± 4	13 ± 4	12 ± 4	11 ± 4	12 ± 4
13	17 ± 4	19 ± 4	19 ± 4	18 ± 4	19 ± 4
14	13 ± 4	11 ± 4	14 ± 4	16 ± 4	12 ± 4
15	11 ± 3	7 ± 3	14 ± 4	16 ± 4	14 ± 4
16	13 ± 4	14 ± 4	13 ± 4	12 ± 4	15 ± 4
17	13 ± 4	13 ± 4	13 ± 3	15 ± 4	15 ± 4
18	14 ± 3	14 ± 3	13 ± 3	17 ± 4	10 ± 3
19	4 ± 3	5 ± 3	5 ± 3	4 ± 3	6 ± 4
20	13 ± 4	8 ± 4	14 ± 6	10 ± 4	14 ± 4
21	13 ± 3	12 ± 3	10 ± 4	14 ± 3	14 ± 3
22	13 ± 4	11 ± 3	10 ± 3	16 ± 4	11 ± 4
23	13 ± 4	11 ± 3	10 ± 3	10 ± 3	11 ± 3
24	12 ± 3	13 ± 3	14 ± 3	18 ± 4	16 ± 4
25	16 ± 4	14 ± 3	12 ± 3	12 ± 3	13 ± 3
26	9 ± 3	9 ± 3	11 ± 3	11 ± 3	11 ± 3
27	21 ± 4	24 ± 4	21 ± 4	16 ± 4	19 ± 4
28	14 ± 3	14 ± 3	14 ± 3	12 ± 3	14 ± 3
29	16 ± 4	14 ± 3	18 ± 4	19 ± 4	18 ± 4
30	16 ± 4	14 ± 4	10 ± 3	10 ± 3	12 ± 3
31	14 ± 3	13 ± 3	13 ± 3	16 ± 4	15 ± 3
32	11 ± 3	15 ± 4	14 ± 4	14 ± 4	15 ± 4
33	16 ± 4	13 ± 4	15 ± 4	12 ± 3	18 ± 4
34	18 ± 4	14 ± 4	14 ± 4	16 ± 4	15 ± 4
35	16 ± 4	17 ± 4	20 ± 4	20 ± 4	19 ± 4
36	22 ± 4	19 ± 4	18 ± 4	22 ± 4	20 ± 4
37	17 ± 4	15 ± 4	17 ± 4	16 ± 4	19 ± 4
38	16 ± 4	19 ± 4	17 ± 4	22 ± 4	20 ± 4
39	15 ± 3	12 ± 3	12 ± 3	15 ± 3	15 ± 4
40	14 ± 4	13 ± 4	14 ± 4	15 ± 4	16 ± 4
41	10 ± 3	10 ± 3	11 ± 3	11 ± 3	12 ± 3
42	18 ± 4	18 ± 4	19 ± 4	21 ± 4	16 ± 4
43	20 ± 4	24 ± 5	17 ± 4	22 ± 4	20 ± 4
44	17 ± 4	17 ± 4	18 ± 4	21 ± 4	20 ± 4
45	11 ± 3	16 ± 4	17 ± 4	16 ± 4	16 ± 4
46	16 ± 4	12 ± 3	15 ± 4	14 ± 4	18 ± 4
47	15 ± 4	19 ± 4	18 ± 4	22 ± 4	21 ± 4
48	14 ± 3	15 ± 3	15 ± 3	16 ± 3	15 ± 3
49	14 ± 4	17 ± 4	15 ± 4	18 ± 4	16 ± 4
50	11 ± 3	12 ± 3	12 ± 4	8 ± 3	10 ± 3
51	15 ± 4	13 ± 3	16 ± 4	18 ± 4	15 ± 4
52	21 ± 4	23 ± 4	21 ± 4	23 ± 4	19 ± 4
MEAN	15 ± 8	15 ± 9	15 ± 9	16 ± 10	16 ± 8

TABLE C-V.2 MONTHLY AND YEARLY MEAN VALUES OF GROSS BETA CONCENTRATIONS (E-3 PCI/CU. METER) IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

GROUP I - ON-SITE LOCATIONS					GROUP II - INTERMEDIATE DISTANCE LOCATIONS					GROUP III - CONTROL LOCATIONS				
COLLECTION PERIOD			MIN.	MAX.	MEAN +/- 2 SD	COLLECTION PERIOD			MIN.	MAX.	MEAN +/- 2 SD	COLLECTION PERIOD			MIN.	MAX.	MEAN +/- 2 SD
1/2/96	-	1/29/96	14	32	21 ± 11	1/2/96 -	1/29/96		13	31	21 ± 17	1/2/96	-	1/26/96	13	30	20 ± 15
1/29/96	-	3/4/96	7	20	14 ± 9	1/29/96 -	3/4/96		7	22	15 ± 12	1/29/96	-	3/4/96	11	20	16 ± 7
3/4/96	-	4/1/96	9	22	16 ± 7	3/4/96 -	4/1/96		11	23	18 ± 10	3/4/96	-	4/1/96	12	22	18 ± 8
4/1/96	-	4/29/96	7	14	12 ± 4	4/1/96 -	4/29/96		12	16	15 ± 4	4/1/96	-	4/29/96	12	15	14 ± 3
4/29/96	-	6/3/96	4	14	11 ± 7	4/29/96 -	6/3/96		4	17	12 ± 10	4/26/96	-	6/3/96	6	14	11 ± 7
6/3/96	-	7/1/96	9	16	12 ± 4	6/3/96 -	7/1/96		10	18	13 ± 7	6/3/96	-	7/1/96	11	16	13 ± 5
7/1/96	-	7/29/96	10	24	16 ± 8	7/1/96 -	7/29/96		10	19	14 ± 8	7/1/96	-	7/29/96	12	19	16 ± 7
7/29/96	-	9/3/96	11	20	15 ± 5	7/29/96 -	9/3/96		12	20	16 ± 6	7/29/96	-	9/3/96	15	19	16 ± 4
9/3/96	-	10/1/96	12	22	17 ± 6	9/3/96 -	10/1/96		15	22	19 ± 8	9/3/96	-	10/1/96	15	20	19 ± 5
10/1/96	-	11/4/96	10	24	16 ± 8	10/1/96 -	11/4/96		11	22	18 ± 10	10/1/96	-	11/4/96	12	20	17 ± 7
11/4/96	-	12/3/96	11	19	15 ± 5	11/4/96 -	12/3/96		14	22	17 ± 7	11/4/96	-	12/3/96	15	21	18 ± 5
12/3/96	-	12/30/96	11	23	16 ± 8	12/3/96 -	12/30/96		8	23	17 ± 13	12/3/96	-	12/30/96	10	19	15 ± 7
1/2/96	-	12/30/96	4	32	15 ± 9	1/2/96 -	12/30/96		4	31	16 ± 10	1/2/96	-	12/30/96	6	30	16 ± 8

NOTE: GROUP I CONSISTS OF LOCATIONS 10S3, 11S1 AND 14S1
GROUP II CONSISTS OF LOCATION 13C1
GROUP III CONSISTS OF LOCATION 22G1

TABLE C-V.3 CONCENTRATION OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VINCINITY OF LIMERICK GENERATING STATION, 1996

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

STC	COLLECTION PERIOD	BE-7	K-40	MN-54	CO-58	CO-60	FE-59	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-232
19S3																
	1/2/96 - 4/1/96	84 ± 19	5 ± 17	-0.4 ± 1	0.2 ± 1	0 ± 1	-1 ± 1	-2 ± 3	0 ± 2	0 ± 1	0.1 ± 1	0.0 ± 1	4 ± 5	1 ± 2	-8 ± 18	1 ± 4
	4/1/96 - 7/1/96	74 ± 23	6 ± 14	0.1 ± 1	0.2 ± 1	0 ± 1	0 ± 2	-7 ± 4	-1 ± 2	0 ± 1	-0.3 ± 1	-0.8 ± 1	-2 ± 5	-1 ± 3	10 ± 18	1 ± 5
	7/1/96 - 10/1/96	74 ± 13	5 ± 10	0.4 ± 1	0.1 ± 1	0 ± 1	1 ± 2	0 ± 2	0 ± 2	0 ± 1	-1.2 ± 1	-0.6 ± 1	-5 ± 3	0 ± 2	1 ± 11	-2 ± 3
	10/1/96 - 12/30/9	45 ± 14	-7 ± 11	-0.3 ± 1	-0.1 ± 1	1 ± 1	-1 ± 2	0 ± 2	1 ± 1	0 ± 1	-0.3 ± 1	-0.5 ± 1	-1 ± 4	1 ± 2	1 ± 13	0 ± 3
	MEAN	69 ± 34	2 ± 12	-0.1 ± 1	0.1 ± 0	0 ± 1	0 ± 1	-2 ± 6	0 ± 2	0 ± 1	-0.4 ± 1	-0.5 ± 1	-1 ± 7	0 ± 1	1 ± 15	0 ± 3
11S1																
	1/2/96 - 4/1/96	73 ± 15	16 ± 14	-0.3 ± 1	0.3 ± 1	0 ± 1	-1 ± 2	-3 ± 3	-1 ± 1	1 ± 1	0.0 ± 1	0.6 ± 1	3 ± 5	0 ± 2	1 ± 14	-3 ± 3
	4/1/96 - 7/1/96	84 ± 20	18 ± 15	0.6 ± 1	0.4 ± 1	0 ± 1	-2 ± 2	-1 ± 2	0 ± 1	-1 ± 1	0.3 ± 1	-0.2 ± 1	1 ± 6	1 ± 2	1 ± 14	-2 ± 3
	7/1/96 - 10/1/96	58 ± 19	4 ± 12	0.2 ± 1	-0.1 ± 1	0 ± 1	2 ± 2	1 ± 3	1 ± 2	1 ± 1	-2.9 ± 2	1.1 ± 1	1 ± 5	1 ± 2	1 ± 16	-3 ± 5
	10/1/96 - 12/30/9	48 ± 20	-6 ± 16	1.1 ± 1	-1.0 ± 1	0 ± 2	1 ± 3	-6 ± 5	1 ± 2	1 ± 2	0.5 ± 2	-0.3 ± 1	8 ± 6	3 ± 3	-5 ± 19	2 ± 5
	MEAN	66 ± 32	8 ± 23	0.4 ± 1	-0.1 ± 1	0 ± 0	0 ± 3	-2 ± 7	0 ± 2	0 ± 1	-0.5 ± 3	0.3 ± 1	3 ± 7	1 ± 2	-1 ± 6	-1 ± 5
13C1																
	1/2/96 - 4/1/96	85 ± 19	2 ± 12	0.2 ± 1	-0.7 ± 1	0 ± 1	0 ± 2	-1 ± 2	0 ± 2	1 ± 1	0.1 ± 1	0.0 ± 1	1 ± 5	2 ± 2	-6 ± 14	-2 ± 3
	4/1/96 - 7/1/96	83 ± 16	-3 ± 12	-0.1 ± 1	-0.2 ± 1	0 ± 1	-1 ± 2	0 ± 3	0 ± 2	1 ± 1	-1.0 ± 1	0.0 ± 1	-3 ± 5	0 ± 2	-9 ± 15	3 ± 3
	7/1/96 - 10/1/96	47 ± 16	-4 ± 10	-0.5 ± 1	0.0 ± 1	0 ± 1	0 ± 2	-3 ± 3	-1 ± 2	-1 ± 1	0.3 ± 1	0.0 ± 1	2 ± 5	0 ± 2	12 ± 16	-4 ± 3
	10/1/96 - 12/30/9	46 ± 12	6 ± 8	0.2 ± 1	-0.5 ± 1	0 ± 1	0 ± 2	1 ± 2	0 ± 1	1 ± 1	0.0 ± 1	-0.5 ± 1	0 ± 3	0 ± 2	5 ± 13	-1 ± 3
	MEAN	65 ± 43	0 ± 9	0.0 ± 1	-0.4 ± 1	0 ± 0	0 ± 1	-1 ± 3	0 ± 1	0 ± 1	-0.2 ± 1	-0.1 ± 1	0 ± 4	1 ± 2	1 ± 20	-1 ± 6
14S1																
	1/2/96 - 4/1/96	83 ± 20	-1 ± 15	0.1 ± 1	-0.8 ± 1	0 ± 1	0 ± 2	-3 ± 3	0 ± 2	-1 ± 2	-0.2 ± 1	0.1 ± 1	1 ± 5	2 ± 3	6 ± 14	-1 ± 3
	4/1/96 - 7/1/96	82 ± 20	15 ± 18	-0.6 ± 1	-0.3 ± 2	0 ± 1	1 ± 2	1 ± 1	1 ± 3	-1 ± 1	0.5 ± 1	0.2 ± 1	1 ± 5	0 ± 3	3 ± 19	1 ± 4
	7/1/96 - 10/1/96	68 ± 20	-3 ± 15	0.5 ± 1	-0.4 ± 1	0 ± 1	3 ± 3	-1 ± 2	-1 ± 1	0 ± 1	0.3 ± 1	0.0 ± 1	-4 ± 5	0 ± 2	-4 ± 13	-2 ± 4
	10/1/96 - 12/30/9	44 ± 20	9 ± 16	-0.1 ± 1	-0.2 ± 1	0 ± 1	0 ± 2	-4 ± 3	1 ± 2	0 ± 1	0.5 ± 1	-0.2 ± 1	-2 ± 4	-1 ± 2	5 ± 17	3 ± 5
	MEAN	69 ± 36	5 ± 17	-0.1 ± 1	-0.4 ± 1	0 ± 1	1 ± 3	-2 ± 4	0 ± 2	0 ± 1	0.3 ± 1	0.0 ± 0	-1 ± 5	0 ± 3	3 ± 9	0 ± 5
22G1																
	1/2/96 - 4/1/96	69 ± 15	-6 ± 10	-0.5 ± 1	-0.6 ± 1	1 ± 1	1 ± 2	1 ± 2	-1 ± 2	0 ± 1	0.0 ± 1	-0.2 ± 1	1 ± 6	1 ± 2	0 ± 14	1 ± 3
	4/1/96 - 7/1/96	91 ± 15	-5 ± 8	0.4 ± 1	-0.2 ± 1	0 ± 1	1 ± 1	-2 ± 2	0 ± 1	0 ± 1	0.0 ± 1	-0.3 ± 1	1 ± 3	0 ± 2	-4 ± 11	-1 ± 3
	7/1/96 - 10/1/96	74 ± 17	5 ± 12	-0.1 ± 1	-1.1 ± 1	1 ± 1	0 ± 2	-1 ± 2	0 ± 2	0 ± 1	-1.5 ± 1	0.8 ± 1	3 ± 4	-1 ± 3	-5 ± 14	2 ± 4
	10/1/96 - 12/30/9	69 ± 17	9 ± 11	0.0 ± 1	0.8 ± 1	0 ± 1	0 ± 2	1 ± 2	-1 ± 1	1 ± 1	-0.1 ± 1	-0.4 ± 1	-1 ± 5	0 ± 2	-10 ± 15	0 ± 3
	MEAN	76 ± 21	1 ± 15	0.0 ± 1	-0.3 ± 2	1 ± 1	1 ± 1	0 ± 3	-1 ± 1	0 ± 1	-0.4 ± 1	0.0 ± 1	1 ± 3	0 ± 2	-5 ± 8	0 ± 2

TABLE C-VI.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

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

	GROUP I			GROUP II	GROUP III
WEEK NO	10S3	11S1	14S1	13C1	22G1
01	0 ± 9	2 ± 11	-1 ± 12	17 ± 14	2 ± 8
02	4 ± 15	-11 ± 22	18 ± 18	-2 ± 23	3 ± 16
03	-1 ± 8	-4 ± 13	-9 ± 8	7 ± 9	7 ± 10
04	0 ± 13	6 ± 12	-5 ± 11	3 ± 7	-8 ± 14
05	2 ± 12	-1 ± 13	-3 ± 13	4 ± 8	-5 ± 13
06	-3 ± 9	-1 ± 10	4 ± 11	5 ± 12	3 ± 8
07	-4 ± 8	-9 ± 15	-1 ± 10	1 ± 13	1 ± 11
08	3 ± 12	2 ± 11	-5 ± 10	-3 ± 12	3 ± 11
09	2 ± 10	3 ± 12	-6 ± 9	-5 ± 14	5 ± 16
10	-2 ± 9	9 ± 10	-7 ± 10	2 ± 12	4 ± 7
11	10 ± 9	-1 ± 11	-1 ± 9	3 ± 13	-5 ± 12
12	1 ± 10	0 ± 13	7 ± 14	6 ± 17	6 ± 10
13	-7 ± 12	-3 ± 14	-8 ± 11	9 ± 12	4 ± 10
14	10 ± 9	0 ± 12	10 ± 10	0 ± 14	3 ± 12
15	8 ± 10	-3 ± 7	2 ± 6	1 ± 9	0 ± 12
16	-8 ± 11	7 ± 10	5 ± 11	-3 ± 11	7 ± 11
17	1 ± 12	-6 ± 9	2 ± 10	-6 ± 11	3 ± 12
18	-3 ± 8	-8 ± 9	-1 ± 7	4 ± 11	7 ± 10
19	-1 ± 9	-2 ± 10	1 ± 9	3 ± 8	-5 ± 13
20	-5 ± 8	-1 ± 14	-10 ± 22	3 ± 11	-10 ± 9
21	-5 ± 7	1 ± 9	-9 ± 10	3 ± 10	-2 ± 7
22	-4 ± 11	3 ± 15	0 ± 8	-9 ± 14	1 ± 15
23	3 ± 8	0 ± 10	4 ± 9	4 ± 12	-7 ± 11
24	2 ± 10	7 ± 12	-9 ± 9	8 ± 8	16 ± 21
25	6 ± 9	-5 ± 13	4 ± 12	8 ± 8	7 ± 10
26	2 ± 10	0 ± 8	-4 ± 12	1 ± 12	-1 ± 9
27	-6 ± 9	0 ± 9	-6 ± 14	-4 ± 13	-5 ± 10
28	14 ± 13	-1 ± 10	12 ± 15	-3 ± 12	-1 ± 9
29	-6 ± 12	0 ± 11	6 ± 8	-4 ± 11	2 ± 9
30	9 ± 9	-5 ± 11	0 ± 12	-5 ± 13	2 ± 12
31	2 ± 12	9 ± 10	1 ± 11	-5 ± 8	3 ± 12
32	0 ± 8	-1 ± 10	7 ± 12	-9 ± 13	-6 ± 8
33	-1 ± 8	3 ± 13	-3 ± 8	4 ± 12	2 ± 8
34	-6 ± 10	-12 ± 13	1 ± 12	-1 ± 7	-3 ± 12
35	0 ± 9	-1 ± 9	-8 ± 10	11 ± 20	4 ± 7
36	2 ± 11	9 ± 11	2 ± 15	9 ± 16	5 ± 10
37	3 ± 10	-5 ± 13	2 ± 13	7 ± 11	5 ± 13
38	4 ± 12	-8 ± 11	0 ± 11	13 ± 16	-5 ± 10
39	-2 ± 9	-2 ± 9	-6 ± 12	2 ± 10	-2 ± 8
40	-2 ± 16	18 ± 14	-17 ± 15	1 ± 10	-11 ± 15
41	3 ± 7	-3 ± 12	1 ± 11	1 ± 12	-3 ± 11
42	-4 ± 10	3 ± 13	13 ± 16	11 ± 16	3 ± 10
43	8 ± 15	13 ± 14	6 ± 13	-8 ± 12	-8 ± 13
44	4 ± 8	-10 ± 11	-10 ± 12	0 ± 11	-3 ± 7
45	-1 ± 8	-2 ± 10	-8 ± 11	6 ± 14	0 ± 7
46	2 ± 9	-4 ± 10	10 ± 13	-3 ± 12	4 ± 10
47	3 ± 9	-3 ± 10	3 ± 12	-9 ± 12	-4 ± 7
48	-3 ± 9	4 ± 10	-1 ± 11	0 ± 13	-5 ± 11
49	2 ± 9	-2 ± 10	1 ± 14	-2 ± 8	-2 ± 13
50	5 ± 14	-4 ± 13	1 ± 13	3 ± 13	1 ± 14
51	0 ± 9	0 ± 10	-7 ± 15	-1 ± 13	-5 ± 10
52	4 ± 12	-3 ± 11	-1 ± 11	0 ± 7	0 ± 12
MEAN	1 ± 9	0 ± 12	0 ± 13	1 ± 11	0 ± 10

TABLE C-VII.1 CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

	CONTROL FARMS				INDICATOR FARMS					
COLLECTION PERIOD	36E1	9G1	22F1	23F1	10B1	18C1	19B1	21B1	22C1	25C1
1/16/96	0.0 ± 0.3	-0.1 ± 0.2	-0.1 ± 0.3			0.1 ± 0.2	0.2 ± 0.3	0.1 ± 0.2	-0.1 ± 0.2	0.0 ± 0.2
2/6/96			-0.1 ± 0.2			-0.1 ± 0.2	0.0 ± 0.2	0.1 ± 0.2		
3/5/96			0.0 ± 0.2			0.1 ± 0.2	0.0 ± 0.2	0.1 ± 0.2		
4/9/96	0.1 ± 0.2	0.1 ± 0.2	0.0 ± 0.2			-0.1 ± 0.2	-0.1 ± 0.2	-0.1 ± 0.2	0.0 ± 0.2	0.1 ± 0.2
4/23/96			-0.1 ± 0.2			0.0 ± 0.2	0.1 ± 0.2	0.1 ± 0.2		
5/7/96		0.0 ± 0.2				0.1 ± 0.2	0.0 ± 0.2	0.0 ± 0.2		
5/22/96		0.0 ± 0.2			0.0 ± 0.2	0.0 ± 0.2	0.1 ± 0.2	0.1 ± 0.2		
6/4/96		0.0 ± 0.2			-0.1 ± 0.3	-0.1 ± 0.2	0.1 ± 0.2	0.0 ± 0.2		
6/18/96		-0.1 ± 0.2			-0.2 ± 0.2	0.0 ± 0.2	0.1 ± 0.2	0.0 ± 0.2		
7/2/96	0.1 ± 0.2	-0.2 ± 0.3		-0.1 ± 0.2	0.1 ± 0.2	-0.1 ± 0.2	-0.2 ± 0.2	-0.2 ± 0.2	0.0 ± 0.2	-0.1 ± 0.2
7/16/96		0.0 ± 0.2			-0.1 ± 0.2	0.0 ± 0.2	0.1 ± 0.2	0.1 ± 0.2		
7/30/96		-0.1 ± 0.2			0.1 ± 0.3	0.0 ± 0.2	0.0 ± 0.2	-0.1 ± 0.2		
8/13/96		0.0 ± 0.2			0.0 ± 0.2	0.0 ± 0.2	-0.1 ± 0.2	0.0 ± 0.2		
8/27/96		-0.1 ± 0.2			0.1 ± 0.2	-0.1 ± 0.2	0.0 ± 0.2	0.0 ± 0.2		
9/10/96		-0.1 ± 0.2			-0.1 ± 0.3	0.1 ± 0.2	-0.2 ± 0.2	0.0 ± 0.2		
9/24/96		0.1 ± 0.2			0.0 ± 0.2	-0.1 ± 0.2	-0.1 ± 0.2	0.0 ± 0.2		
10/8/96	0.1 ± 0.2	0.0 ± 0.2		0.0 ± 0.2		0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	0.1 ± 0.3	-0.1 ± 0.2
10/22/96		0.0 ± 0.2				-0.1 ± 0.2	0.0 ± 0.2	0.1 ± 0.2		
11/5/96		0.0 ± 0.2				0.0 ± 0.2	0.1 ± 0.2	0.0 ± 0.2		
11/19/96		0.1 ± 0.2				-0.2 ± 0.2	0.0 ± 0.2	-0.1 ± 0.2		
12/10/96						0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.2		
12/11/96		0.0 ± 0.2								
MEAN	0.1 ± 0.1	0.0 ± 0.2	-0.1 ± 0.1	-0.1 ± 0.1	0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.1	0.0 ± 0.2

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

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	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-232
10B1																
	5/22/96	2 ± 12	1700 ± 200	-2.1 ± 2.0	-0.2 ± 2.0	0 ± 2	1.1 ± 3	-2 ± 4	0.8 ± 2	0.5 ± 1.0	-4.5 ± 2	0.8 ± 2.0	-2 ± 5	1.1 ± 2.0	36 ± 30.	-1.2 ± 6.0
	6/4/96	-1 ± 13	1900 ± 200	-0.6 ± 2.0	0.6 ± 2.0	1 ± 2	0.1 ± 4	0 ± 5	2.5 ± 3	1.4 ± 2.0	-5.1 ± 2	0.5 ± 2.0	-2 ± 5	-1.2 ± 2.0	3 ± 40.	5.0 ± 6.0
	6/18/96	7 ± 14	1700 ± 200	0.6 ± 2.0	-0.5 ± 2.0	-1 ± 2	-1.0 ± 5	-3 ± 6	-1.7 ± 4	-0.2 ± 2.0	-9.7 ± 2	0.8 ± 2.0	0 ± 6	-0.3 ± 2.0	31 ± 40.	-4.6 ± 9.0
	7/2/96	4 ± 15	1800 ± 200	-0.1 ± 2.0	-1.6 ± 2.0	0 ± 2	2.9 ± 5	-2 ± 5	-0.2 ± 3	0.6 ± 2.0	-6.4 ± 2	0.6 ± 2.0	-4 ± 8	1.7 ± 3.0	-24 ± 40.	6.1 ± 7.0
	7/16/96	-14 ± 19	1600 ± 200	-3.2 ± 3.0	0.4 ± 3.0	-3 ± 3	2.1 ± 7	1 ± 8	-2.9 ± 5	1.5 ± 3.0	-0.1 ± 3	4.0 ± 3.0	1 ± 10	-1.8 ± 3.0	-10 ± 60.	-2.5 ± 10.
	7/30/96	-7 ± 15	1800 ± 200	0.4 ± 2.0	0.0 ± 2.0	-1 ± 2	-1.3 ± 4	-9 ± 5	-1.5 ± 3	-0.1 ± 2.0	0.0 ± 2	1.0 ± 2.0	1 ± 7	1.8 ± 2.0	10 ± 40.	5.9 ± 7.0
	8/13/96	-9 ± 23	1500 ± 200	0.0 ± 3.0	-1.7 ± 3.0	-3 ± 4	-3.3 ± 7	-5 ± 9	0.0 ± 5	1.9 ± 3.0	2.1 ± 3	0.5 ± 3.0	4 ± 9	-1.6 ± 4.0	-66 ± 60.	1.3 ± 10.
	8/27/96	1 ± 17	1600 ± 200	-0.8 ± 2.0	0.0 ± 2.0	0 ± 3	-1.3 ± 6	-7 ± 6	-2.5 ± 4	0.3 ± 2.0	-5.2 ± 2	2.3 ± 2.0	-3 ± 7	-2.4 ± 3.0	-16 ± 50.	-2.6 ± 10.
	9/10/96	1 ± 17	1700 ± 200	-0.5 ± 2.0	-1.1 ± 2.0	1 ± 2	-1.0 ± 5	4 ± 6	4.7 ± 4	2.7 ± 2.0	0.3 ± 3	-0.4 ± 2.0	5 ± 8	2.0 ± 2.0	-41 ± 60.	2.7 ± 9.0
	9/24/96	-2 ± 14	1600 ± 200	-1.4 ± 2.0	-0.7 ± 2.0	0 ± 2	2.3 ± 4	3 ± 5	-3.7 ± 3	0.3 ± 2.0	-0.9 ± 2	1.0 ± 2.0	1 ± 6	0.2 ± 2.0	-11 ± 50.	4.8 ± 7.0
	MEAN	-2 ± 13	1690 ± 239	-0.8 ± 2.4	-0.5 ± 1.6	-1 ± 3	0.1 ± 4.0	-2 ± 8	-0.4 ± 5.2	0.9 ± 1.9	-3.0 ± 7.5	1.1 ± 2.4	0 ± 5.9	-0.1 ± 3.3	-9 ± 62.	1.5 ± 8.0
18C1																
	1/16/96	3 ± 7	1500 ± 100	-0.2 ± 0.9	-0.1 ± 0.9	0 ± 1	1.7 ± 2	-4 ± 2	0.1 ± 1	-0.7 ± 0.9	-6.2 ± 1	0.4 ± 0.9	0 ± 3	0.7 ± 0.8	-6 ± 20.	0.2 ± 3.0
	2/6/96	6 ± 17	1300 ± 100	-0.3 ± 2.0	-2.4 ± 2.0	-1 ± 3	3.6 ± 5	-15 ± 7	0.6 ± 4	1.3 ± 2.0	-1.4 ± 2	-0.3 ± 2.0	1 ± 7	0.2 ± 3.0	-27 ± 60.	9.8 ± 9.0
	3/5/96	-2 ± 8	1400 ± 100	-0.5 ± 1.0	-1.4 ± 1.0	-1 ± 1	-0.5 ± 2	1 ± 3	-1.6 ± 2	0.8 ± 1.0	0.8 ± 1	0.0 ± 1.0	4 ± 3	0.2 ± 1.0	3 ± 30.	-1.8 ± 4.0
	4/9/96	-5 ± 10	1500 ± 100	1.3 ± 1.0	-0.5 ± 1.0	1 ± 1	-0.8 ± 3	-5 ± 3	-0.5 ± 2	-0.4 ± 1.0	-6.6 ± 2	0.7 ± 1.0	1 ± 5	-0.5 ± 1.0	-20 ± 40.	0.0 ± 5.0
	4/23/96	-2 ± 8	1400 ± 100	-0.7 ± 1.0	-1.0 ± 1.0	0 ± 1	1.5 ± 3	1 ± 3	1.3 ± 2	-0.6 ± 1.0	-3.6 ± 1	-0.1 ± 1.0	0 ± 4	-0.7 ± 1.0	19 ± 30.	4.4 ± 5.0
	5/7/96	8 ± 8	1300 ± 100	0.7 ± 1.0	0.7 ± 1.0	1 ± 1	0.9 ± 3	-5 ± 3	-0.2 ± 2	1.0 ± 1.0	-0.1 ± 1	-0.7 ± 1.0	2 ± 4	-1.3 ± 1.0	-2 ± 40.	-2.2 ± 5.0
	5/22/96	1 ± 7	1500 ± 200	0.3 ± 0.9	-1.0 ± 0.9	0 ± 1	0.9 ± 2	-2 ± 2	0.1 ± 1	0.0 ± 0.8	-3.2 ± 0.9	-0.1 ± 0.9	0 ± 3	0.0 ± 0.8	0 ± 20.	1.6 ± 4.0
	6/4/96	3 ± 10	1400 ± 100	1.2 ± 2.0	-0.9 ± 2.0	1 ± 2	2.4 ± 4	0 ± 5	-1.5 ± 3	-0.7 ± 2.0	-1.6 ± 2	-1.8 ± 2.0	0 ± 6	0.5 ± 2.0	0 ± 40.	7.7 ± 8.0
	6/18/96	0 ± 8	1400 ± 100	-1.0 ± 1.0	0.0 ± 1.0	0 ± 1	0.8 ± 3	-3 ± 3	0.3 ± 2	0.2 ± 1.0	-3.9 ± 1	0.2 ± 1.0	1 ± 4	-0.8 ± 1.0	5 ± 30.	2.1 ± 5.0
	7/2/96	5 ± 10	1600 ± 200	-0.7 ± 1.0	-0.5 ± 1.0	0 ± 1	2.1 ± 3	0 ± 3	-1.3 ± 2	1.0 ± 1.0	-1.3 ± 1	0.7 ± 1.0	0 ± 6	-1.0 ± 2.0	-1 ± 30.	4.2 ± 5.0
	7/16/96	6 ± 10	1400 ± 100	0.1 ± 2.0	1.1 ± 2.0	-1 ± 3	1.6 ± 5	3 ± 6	-2.2 ± 3	0.6 ± 2.0	-1.5 ± 2	-0.1 ± 2.0	0 ± 6	-0.6 ± 2.0	8 ± 40.	8.4 ± 9.0
	7/30/96	7 ± 9	1500 ± 100	-0.9 ± 1.0	-0.1 ± 1.0	1 ± 1	0.3 ± 3	-2 ± 3	1.1 ± 2	0.8 ± 1.0	-3.3 ± 1	1.4 ± 1.0	2 ± 4	-0.3 ± 2.0	-3 ± 30.	5.0 ± 5.0
	8/13/96	-17 ± 30	1500 ± 100	0.3 ± 4.0	2.7 ± 4.0	-1 ± 4	-5.1 ± 9	-17 ± 10	2.0 ± 7	-0.3 ± 4.0	-2.4 ± 4	3.8 ± 4.0	-2 ± 10	-2.5 ± 5.0	21 ± 70.	11.0 ± 20.
	8/27/96	2 ± 8	1500 ± 100	-0.1 ± 1.0	-0.3 ± 1.0	0 ± 1	0.3 ± 2	-2 ± 3	0.2 ± 2	0.2 ± 1.0	-0.6 ± 1	1.2 ± 1.0	3 ± 4	-0.1 ± 1.0	-15 ± 30.	-1.3 ± 4.0
	9/10/96	-2 ± 7	1500 ± 200	-0.1 ± 0.9	-0.4 ± 0.9	0 ± 1	0.8 ± 2	-2 ± 2	-0.9 ± 1	0.8 ± 0.9	-2.8 ± 0.9	-0.6 ± 0.8	0 ± 3	-0.6 ± 0.9	-25 ± 20.	1.3 ± 4.0
	9/24/96	1 ± 10	1300 ± 100	1.1 ± 2.0	0.3 ± 2.0	1 ± 2	-1.0 ± 4	-3 ± 5	-3.1 ± 3	-0.8 ± 2.0	0.1 ± 2	1.9 ± 2.0	3 ± 6	0.4 ± 2.0	94 ± 80.	-3.8 ± 7.7
	10/8/96	-3 ± 7	1600 ± 200	-0.6 ± 1.0	-0.1 ± 1.0	0 ± 1	0.5 ± 2	-4 ± 2	0.2 ± 2	-0.4 ± 1.0	-3.6 ± 1	0.7 ± 1.0	-1 ± 4	-0.2 ± 1.0	-10 ± 20.	3.2 ± 4.0
	10/22/96	2 ± 9	1400 ± 100	-0.5 ± 1.0	-0.3 ± 1.0	0 ± 1	2.4 ± 3	-4 ± 3	0.1 ± 2	-2.2 ± 1.0	-6.9 ± 1	-0.2 ± 1.0	-1 ± 4	0.2 ± 1.0	-10 ± 30.	2.3 ± 5.0
	11/5/96	-9 ± 9	1500 ± 100	-0.9 ± 1.0	-1.4 ± 1.0	1 ± 1	-1.1 ± 3	-7 ± 3	0.5 ± 2	1.0 ± 1.0	0.4 ± 1	0.5 ± 1.0	0 ± 4	-0.1 ± 1.0	-7 ± 30.	3.6 ± 5.0
	11/19/96	-4 ± 7	1500 ± 200	0.3 ± 0.9	-0.2 ± 0.9	0 ± 1	0.0 ± 2	-5 ± 2	0.1 ± 2	0.6 ± 0.9	-5.5 ± 1	-0.2 ± 0.9	1 ± 3	0.0 ± 0.9	-8 ± 30.	0.6 ± 4.0
	12/10/96	-3 ± 8	1500 ± 200	-0.4 ± 0.9	-0.8 ± 0.9	0 ± 1	-0.8 ± 2	-7 ± 2	-0.3 ± 2	1.2 ± 1.0	-0.3 ± 1	-0.6 ± 1.0	5 ± 3	0.0 ± 1.0	17 ± 30.	-0.8 ± 4.0
	MEAN	0 ± 12	1452 ± 175	-0.1 ± 1.4	-0.3 ± 2.1	0 ± 1	0.5 ± 3.6	-4 ± 10	-0.2 ± 2.4	0.2 ± 1.8	-2.5 ± 4.7	0.3 ± 2.3	1 ± 3.6	-0.3 ± 1.4	2 ± 49.	2.6 ± 8.1

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

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	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-232
19B1																
	1/16/96	-4 ± 7	1300 ± 100	-0.3 ± 0.9	-1.6 ± 0.8	0 ± 0.9	-0.5 ± 2	-5 ± 2	0.2 ± 1	-0.1 ± 0.9	-8.2 ± 1	-0.3 ± 0.9	0 ± 3	-0.1 ± 0.8	-8 ± 20.	0.3 ± 3.0
	2/6/96	-4 ± 9	1300 ± 100	-0.5 ± 1.0	0.2 ± 1.0	0 ± 1	-1.0 ± 3	-6 ± 3	0.4 ± 2	0.9 ± 1.0	-10. ± 1	-0.1 ± 1.0	-2 ± 4	0.2 ± 1.0	-11 ± 30.	4.8 ± 4.0
	3/5/96	1 ± 7	1300 ± 100	-0.2 ± 0.9	0.2 ± 0.9	0 ± 1	-0.3 ± 2	1 ± 2	-1.1 ± 1	-0.3 ± 0.8	-0.3 ± 0.9	-0.3 ± 0.9	-1 ± 3	-0.1 ± 0.8	18 ± 20.	0.3 ± 3.0
	4/9/96	8 ± 10	1300 ± 100	-0.6 ± 1.0	-1.1 ± 1.0	1 ± 2	1.1 ± 3	2 ± 4	0.2 ± 2	1.4 ± 2.0	-0.1 ± 2	0.6 ± 1.0	-2 ± 5	1.2 ± 2.0	17 ± 40.	-2.9 ± 5.0
	4/23/96	-6 ± 7	1400 ± 100	-0.5 ± 0.9	-0.1 ± 0.9	0 ± 1	0.1 ± 2	-1 ± 2	-0.3 ± 2	0.4 ± 0.9	-3.4 ± 0.9	-0.1 ± 1.0	1 ± 3	-0.4 ± 1.0	9 ± 30.	1.1 ± 3.0
	5/7/96	3 ± 7	1400 ± 100	-0.4 ± 0.9	-0.2 ± 0.9	0 ± 1	-1.3 ± 2	-2 ± 2	1.1 ± 2	0.4 ± 0.9	-4.0 ± 0.9	-0.4 ± 0.9	2 ± 3	0.1 ± 0.9	-16 ± 3[illegible]	-0.9 ± 3.0
	5/22/96	-11 ± 10	1400 ± 100	-1.7 ± 2.0	-0.5 ± 2.0	0 ± 2	-0.8 ± 4	-5 ± 5	-1.5 ± 3	0.6 ± 2.0	-1.2 ± 2	0.4 ± 2.0	3 ± 6	0.5 ± 2.0	-16 ± 40.	6.2 ± 8.0
	6/4/96	2 ± 9	1400 ± 100	-0.2 ± 1.0	-0.5 ± 1.0	0 ± 1	-0.3 ± 3	-2 ± 3	-1.7 ± 2	0.3 ± 1.0	-3.1 ± 1	1.3 ± 1.0	2 ± 4	0.6 ± 1.0	-6 ± [illegible]	-0.9 ± 5.0
	6/18/96	1 ± 7	1500 ± 100	-0.4 ± 0.8	-0.6 ± 0.8	0 ± 0.9	1.1 ± 2	-2 ± 2	-1.2 ± 1	0.0 ± 0.8	-2.0 ± 0.8	0.2 ± 0.9	-2 ± 3	-0.2 ± 0.8	10 ± 20.	-1.1 ± 4.0
	7/2/96	-8 ± 10	1500 ± 200	-0.7 ± 1.0	0.1 ± 1.0	1 ± 2	1.2 ± 3	-2 ± 4	-0.7 ± 3	1.2 ± 1.0	-1.8 ± 1	0.0 ± 1.0	1 ± 6	-1.9 ± 2.0	-33 ± 30.	0.1 ± 5.0
	7/16/96	3 ± 10	1400 ± 100	0.4 ± 2.0	0.8 ± 2.0	1 ± 2	0.3 ± 5	1 ± 5	0.5 ± 3	-1.8 ± 2.0	-2.2 ± 2	0.3 ± 2.0	-4 ± 6	0.7 ± 3.0	10 ± 40.	-2.5 ± 9.0
	7/30/96	-1 ± 20	1400 ± 100	-1.0 ± 2.0	-0.3 ± 2.0	2 ± 3	1.8 ± 6	-5 ± 6	0.2 ± 4	0.7 ± 2.0	-0.8 ± 2	2.4 ± 2.0	2 ± 8	0.6 ± 3.0	-37 ± 50.	5.7 ± 10.
	8/13/96	2 ± 20	1300 ± 100	1.1 ± 2.0	2.3 ± 2.0	1 ± 2	-1.2 ± 5	-5 ± 6	1.6 ± 4	-1.1 ± 2.0	1.7 ± 2	1.7 ± 2.0	0 ± 7	0.6 ± 2.0	24 ± 40.	5.5 ± 8.0
	8/27/96	9 ± 20	1400 ± 100	0.1 ± 2.0	-0.7 ± 2.0	1 ± 2	2.1 ± 5	-7 ± 6	0.6 ± 4	0.4 ± 2.0	0.3 ± 2	-0.1 ± 2.0	1 ± 7	1.9 ± 2.0	23 ± 40.	3.5 ± 8.0
	9/10/96	-1 ± 7	1500 ± 200	0.0 ± 0.9	0.5 ± 0.9	0 ± 1	-1.0 ± 2	-3 ± 2	-0.9 ± 1	-0.5 ± 0.9	0.1 ± 0.9	0.3 ± 0.9	-1 ± 3	0.9 ± 0.8	4 ± 20.	0.3 ± 3.0
	9/24/96	-7 ± 8	1600 ± 200	0.0 ± 1.0	0.0 ± 1.0	0 ± 1	1.7 ± 2	-1 ± 3	-0.3 ± 2	-0.3 ± 1.0	-0.2 ± 1	0.0 ± 1.0	-2 ± 4	0.7 ± 1.0	-21 ± 30.	2.4 ± 4.0
	10/8/96	-4 ± 7	1400 ± 100	-0.3 ± 0.8	0.5 ± 0.9	0 ± 0.9	-0.1 ± 2	-5 ± 2	0.3 ± 2	-0.7 ± 0.9	-2.5 ± 0.9	0.3 ± 0.9	0 ± 4	0.4 ± 1.0	14 ± 20.	1.5 ± 3.0
	10/22/96	8 ± 8	1500 ± 200	-0.8 ± 1.0	-0.7 ± 1.0	1 ± 1	-0.9 ± 2	-5 ± 3	0.7 ± 2	0.9 ± 1.0	-8.3 ± 1	0.3 ± 1.0	-2 ± 3	-0.1 ± 1.0	-14 ± 30.	5.2 ± 4.0
	11/5/96	-3 ± 20	1500 ± 100	0.0 ± 2.0	-0.9 ± 2.0	-1 ± 3	2.3 ± 5	-7 ± 6	1.2 ± 4	2.6 ± 2.0	-0.3 ± 2	-0.6 ± 2.0	0 ± 7	-1.7 ± 2.0	7 ± 50.	5.4 ± 10.
	11/19/96	7 ± 9	1500 ± 100	-0.1 ± 1.0	-0.3 ± 1.0	0 ± 1	1.1 ± 2	-6 ± 3	-0.9 ± 2	0.5 ± 1.0	-0.3 ± 1	0.0 ± 1.0	1 ± 4	0.6 ± 1.0	5 ± 30.	2.6 ± 4.0
	12/10/96	0 ± 6	1500 ± 100	-0.4 ± 0.8	0.5 ± 0.8	1 ± 0.9	0.0 ± 2	-4 ± 2	-0.7 ± 1	-0.8 ± 0.8	-1.8 ± 0.9	0.6 ± 0.9	0 ± 3	0.4 ± 0.8	11 ± 20.	1.2 ± 3.0
	MEAN	0 ± 11	1419 ± 175	-0.3 ± 1.1	-0.1 ± 1.6	0 ± 1	0.3 ± 2.3	-3 ± 5	-0.1 ± 1.8	0.2 ± 1.9	-2.3 ± 6.1	0.3 ± 1.4	0 ± 3.6	0.2 ± 1.7	-1 ± 35.	1.8 ± 5.7
21B1																
	1/16/96	0 ± 8	1400 ± 100	-0.2 ± 1.0	-0.7 ± 1.0	0 ± 1	1.4 ± 2	-9 ± 3	-1.4 ± 1.7	2.5 ± 1.1	-16. ± 1.4	-0.5 ± 1.0	-1 ± 4	1.1 ± 1.0	34 ± 32.	4.4 ± 3.9
	2/6/96	-2 ± 6	1400 ± 100	0.1 ± 0.8	-1.0 ± 0.8	0 ± 0.9	-1.4 ± 2	-9 ± 3	0.2 ± 1	0.3 ± 0.8	-10. ± 1	-0.3 ± 0.9	3 ± 3	-0.4 ± 0.9	-21 ± 30.	-0.5 ± 4.0
	3/5/96	1 ± 7	1400 ± 100	-0.4 ± 1.0	-0.8 ± 1.0	0 ± 1	1.0 ± 2	1 ± 3	0.4 ± 2	1.3 ± 1.0	-0.1 ± 1	-0.1 ± 1.0	1 ± 3	-0.8 ± 0.9	9 ± 30.	4.7 ± 4.0
	4/9/96	-2 ± 10	1400 ± 100	-0.8 ± 1.0	0.3 ± 1.0	0 ± 2	-0.3 ± 3	0 ± 4	-0.6 ± 2	-0.8 ± 1.0	-0.8 ± 2	0.0 ± 1.0	1 ± 5	0.0 ± 1.0	39 ± 30.	-0.5 ± 5.0
	4/23/96	-1 ± 8	1400 ± 100	-0.1 ± 1.0	0.3 ± 1.0	0 ± 1	-1.2 ± 2	-4 ± 3	-0.1 ± 2	0.0 ± 1.0	-5.2 ± 1	0.0 ± 1.0	2 ± 4	0.0 ± 1.0	7 ± 30.	0.9 ± 5.0
	5/7/96	2 ± 7	1400 ± 100	-0.4 ± 0.8	-0.8 ± 0.8	0 ± 0.9	0.5 ± 2	-5 ± 2	1.0 ± 1	0.6 ± 0.8	-0.7 ± 0.9	1.0 ± 0.8	0 ± 3	-0.2 ± 0.8	-8 ± 20.	0.6 ± 4.0
	5/22/96	7 ± 8	1500 ± 200	-0.3 ± 1.0	0.3 ± 1.0	-1 ± 1	-0.4 ± 2	-4 ± 3	-0.1 ± 2	0.5 ± 1.0	-0.5 ± 1	0.5 ± 1.0	-2 ± 3	0.0 ± 1.0	-9 ± 30.	-1.2 ± 5.0
	6/4/96	7 ± 20	1400 ± 100	1.6 ± 2.0	0.6 ± 2.0	2 ± 3	1.8 ± 5	-9 ± 6	-0.9 ± 4	-0.7 ± 2.0	-3.4 ± 2	-0.1 ± 2.0	-4 ± 8	-2.7 ± 2.0	17 ± 50.	-5.6 ± 10.
	6/18/96	-7 ± 10	1400 ± 100	-1.5 ± 2.0	-2.0 ± 2.0	-3 ± 2	0.7 ± 5	-3 ± 6	1.4 ± 3	1.2 ± 2.0	-4.3 ± 2	0.8 ± 2.0	0 ± 6	0.4 ± 2.0	-17 ± 40.	-4.0 ± 8.0
	7/2/96	8 ± 10	1400 ± 100	-1.5 ± 2.0	0.9 ± 2.0	1 ± 2	0.7 ± 3	0 ± 4	-1.0 ± 3	-0.1 ± 2.0	-2.1 ± 2	0.6 ± 2.0	-4 ± 7	0.1 ± 2.0	25 ± 40.	-0.7 ± 5.0
	7/16/96	12 ± 20	1400 ± 100	-1.3 ± 2.0	-1.8 ± 2.0	-1 ± 2	1.5 ± 5	-4 ± 6	-0.8 ± 4	1.5 ± 2.0	-7.0 ± 2	-0.6 ± 2.0	1 ± 7	-2.3 ± 3.0	9 ± 50.	-2.1 ± 10.
	7/30/96	8 ± 9	1400 ± 100	0.2 ± 1.0	-0.3 ± 1.0	0 ± 1	-0.6 ± 3	-2 ± 3	-0.2 ± 2	0.4 ± 1.0	-0.6 ± 1	-0.6 ± 1.0	0 ± 4	0.4 ± 1.0	-8 ± 30.	-0.3 ± 5.0
	8/13/96	-2 ± 10	1400 ± 100	0.5 ± 2.0	-0.8 ± 2.0	1 ± 2	-1.2 ± 4	-7 ± 5	0.1 ± 3	-0.1 ± 2.0	-1.1 ± 2	-0.4 ± 2.0	2 ± 6	-0.6 ± 2.0	0 ± 40.	-0.3 ± 7.0
	8/27/96	-5 ± 10	1400 ± 100	-1.2 ± 2.0	-0.8 ± 2.0	-1 ± 2	0.1 ± 4	-5 ± 5	1.6 ± 3	-0.1 ± 2.0	-0.4 ± 2	0.5 ± 2.0	2 ± 6	-1.5 ± 2.0	26 ± 40.	7.0 ± 7.0
	9/10/96	-4 ± 8	1500 ± 200	0.7 ± 1.0	1.0 ± 1.0	1 ± 1	1.3 ± 2	-2 ± 3	-1.7 ± 2	-0.4 ± 1.0	-0.2 ± 1	0.5 ± 1.0	-1 ± 4	0.5 ± 1.0	7 ± 30.	-0.5 ± 4.0
	9/24/96	3 ± 7	1400 ± 100	-0.1 ± 0.9	0.2 ± 0.8	1 ± 1	0.8 ± 2	0 ± 2	-0.8 ± 1	-0.3 ± 0.9	0.0 ± 0.9	-0.6 ± 0.9	-4 ± 3	-0.4 ± 0.8	-3 ± 20.	-0.6 ± 3.0
	10/8/96	-4 ± 7	1600 ± 200	-0.7 ± 0.9	0.0 ± 0.8	1 ± 0.9	0.0 ± 2	0 ± 2	-0.1 ± 2	0.3 ± 0.9	-1.8 ± 0.8	0.0 ± 0.8	0 ± 4	-0.2 ± 1.0	2 ± 20.	-1.0 ± 3.0
	10/22/96	-5 ± 8	1400 ± 100	-0.9 ± 1.0	-0.6 ± 1.0	1 ± 1	1.1 ± 3	-4 ± 3	-1.2 ± 2	0.9 ± 1.0	-8.5 ± 1	-0.3 ± 1.0	-2 ± 4	-0.3 ± 1.0	-23 ± 30.	-3.3 ± 5.0
	11/5/96	5 ± 9	1500 ± 100	-0.1 ± 1.0	-0.2 ± 1.0	0 ± 1	-0.1 ± 3	1 ± 3	0.1 ± 2	0.1 ± 1.0	-0.7 ± 1	-0.5 ± 1.0	-3 ± 4	-0.6 ± 1.0	-17 ± 30.	-0.5 ± 5.0
	11/19/96	-5 ± 8	1400 ± 100	-0.3 ± 1.0	-1.4 ± 1.0	0 ± 1	-1.4 ± 2	2 ± 3	0.7 ± 2	-0.3 ± 1.0	-0.4 ± 1	-1.1 ± 1.0	2 ± 4	0.4 ± 1.0	-5 ± 30.	3.0 ± 4.0
	12/10/96	-5 ± 10	1400 ± 100	0.2 ± 2.0	-1.3 ± 2.0	-1 ± 2	2.1 ± 4	-1 ± 5	-2.2 ± 3	-0.2 ± 2.0	-3.0 ± 2	0.8 ± 2.0	-2 ± 6	0.2 ± 2.0	-22 ± 40.	-4.2 ± 7.0
	MEAN	1 ± 11	1424 ± 108	-0.3 ± 1.5	-0.4 ± 1.7	0 ± 2	0.3 ± 2.2	-3 ± 7	-0.3 ± 2.0	0.3 ± 1.6	-3.2 ± 8.3	0.0 ± 1.1	-1 ± 4.3	-0.3 ± 1.8	2 ± 36.	-0.2 ± 6.1

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

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	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-232
22F1																
	1/16/96	9 ± 12	1300 ± 100	0.0 ± 2.0	-0.3 ± 2.0	1 ± 2	-1.4 ± 4	-7 ± 5	2.1 ± 3	-1.0 ± 2.0	-1.8 ± 2	0.9 ± 2.0	2 ± 5	2.3 ± 2.0	10 ± 40.	-0.2 ± 8.0
	2/6/96	0 ± 8	1300 ± 100	0.3 ± 1.0	-0.9 ± 1.0	0 ± 1	-1.4 ± 2	3 ± 3	-0.7 ± 2	-0.1 ± 1.0	0.3 ± 1	1.7 ± 1.0	-3 ± 3	0.0 ± 1.0	2 ± 30.	0.7 ± 4.0
	3/5/96	13 ± 10	1300 ± 100	-1.2 ± 2.0	1.4 ± 2.0	2 ± 2	2.4 ± 4	-11 ± 5	0.4 ± 3	1.2 ± 2.0	1.6 ± 2	0.2 ± 2.0	5 ± 5	0.2 ± 2.0	0 ± 40.	0.6 ± 7.0
	4/9/96	-2 ± 10	1400 ± 100	-0.1 ± 1.0	-0.4 ± 2.0	-1 ± 2	-0.2 ± 3	-2 ± 4	0.6 ± 2	2.1 ± 2.0	0.4 ± 2	0.0 ± 2.0	-1 ± 5	0.1 ± 2.0	62 ± 60.	1.9 ± 5.0
	4/23/96	12 ± 10	1400 ± 100	0.3 ± 1.0	-1.3 ± 1.0	0 ± 2	0.5 ± 3	-6 ± 4	0.9 ± 2	0.7 ± 2.0	-8.3 ± 2	0.3 ± 1.0	1 ± 5	-1.0 ± 2.0	-14 ± 40.	-1.3 ± 6.0
	MEAN	6 ± 14	1340 ± 110	-0.2 ± 1.2	-0.3 ± 2.1	0 ± 2	0.0 ± 3.2	-5 ± 11	0.7 ± 2.0	0.6 ± 2.4	-1.6 ± 7.9	0.6 ± 1.4	1 ± 5.8	0.3 ± 2.4	12 ± 58.	0.4 ± 2.4
9G1																
	5/7/96	-6 ± 7	1400 ± 100	-0.4 ± 1.0	-0.1 ± 1.0	1 ± 1	1.2 ± 2	0 ± 3	-0.9 ± 2	-0.9 ± 1.0	-4.5 ± 1	-0.8 ± 1.0	1 ± 3	-0.1 ± 0.9	12 ± 30.	-4.5 ± 4.0
	5/22/96	0 ± 8	1500 ± 200	0.5 ± 0.9	-0.6 ± 0.9	0 ± 1	1.1 ± 2	-1 ± 2	0.6 ± 2	0.6 ± 1.0	-2.9 ± 1	1.3 ± 1.0	2 ± 3	0.8 ± 0.9	-5 ± 30.	3.8 ± 4.0
	6/4/96	10 ± 9	1400 ± 100	0.1 ± 1.0	0.3 ± 1.0	0 ± 1	0.9 ± 3	-4 ± 3	0.6 ± 2	1.2 ± 1.0	-3.4 ± 1	0.3 ± 1.0	-2 ± 4	-1.1 ± 1.0	-4 ± 30.	-4.3 ± 5.0
	6/18/96	4 ± 20	1300 ± 100	-1.6 ± 2.0	-0.2 ± 2.0	2 ± 3	2.8 ± 5	0 ± 6	0.1 ± 4	1.1 ± 2.0	-5.4 ± 2	0.9 ± 2.0	4 ± 7	-1.2 ± 2.0	19 ± 50.	0.8 ± 10.
	7/2/96	0 ± 10	1500 ± 200	-0.4 ± 1.0	0.9 ± 2.0	0 ± 2	3.0 ± 4	-2 ± 4	-0.3 ± 3	1.1 ± 2.0	-0.8 ± 2	-1.2 ± 1.0	1 ± 6	0.5 ± 2.0	-1 ± 30.	0.4 ± 5.0
	7/16/96	5 ± 20	1300 ± 100	-2.2 ± 2.0	2.2 ± 2.0	1 ± 3	-1.7 ± 6	-3 ± 6	-1.2 ± 4	0.6 ± 2.0	-3.9 ± 2	1.5 ± 2.0	3 ± 7	-1.3 ± 3.0	-11 ± 50.	-11. ± 10.
	7/30/96	-3 ± 10	1400 ± 100	0.4 ± 2.0	0.7 ± 2.0	0 ± 2	-2.8 ± 5	0 ± 6	0.6 ± 3	2.2 ± 2.0	-2.7 ± 2	0.8 ± 2.0	3 ± 7	0.5 ± 3.0	-13 ± 40.	-2.8 ± 8.0
	8/13/96	-3 ± 7	1400 ± 100	0.3 ± 0.8	-0.1 ± 0.8	0 ± 0.9	0.6 ± 2	-2 ± 2	1.1 ± 1	-0.4 ± 0.8	-2.3 ± 0.9	1.2 ± 0.9	-1 ± 3	0.2 ± 0.8	3 ± 20.	2.4 ± 3.0
	8/27/96	2 ± 7	1400 ± 100	0.1 ± 0.9	0.4 ± 0.8	0 ± 0.9	0.6 ± 2	-2 ± 2	-1.2 ± 1	-0.2 ± 0.8	-0.2 ± 1	0.6 ± 0.9	2 ± 3	0.1 ± 0.9	13 ± 20.	-0.3 ± 3.0
	9/10/96	11 ± 10	1300 ± 100	0.2 ± 2.0	0.3 ± 2.0	1 ± 2	4.1 ± 5	-2 ± 5	0.0 ± 3	0.1 ± 2.0	-1.5 ± 2	0.3 ± 2.0	1 ± 6	-0.7 ± 2.0	8 ± 40.	1.7 ± 7.0
	9/24/96	2 ± 7	1400 ± 100	0.1 ± 0.9	0.8 ± 1.0	0 ± 1	-1.2 ± 2	-3 ± 2	-0.7 ± 2	-0.7 ± 0.9	-4.3 ± 1	0.3 ± 0.9	-1 ± 3	0.4 ± 0.9	4 ± 20.	-1.0 ± 3.0
	10/8/96	7 ± 9	1500 ± 100	1.0 ± 1.0	-1.1 ± 1.0	1 ± 1	0.0 ± 3	-2 ± 3	0.5 ± 2	0.5 ± 1.0	-3.2 ± 1	-0.5 ± 1.0	0 ± 5	0.4 ± 1.0	15 ± 30.	1.7 ± 4.0
	10/22/96	-1 ± 7	1400 ± 100	0.2 ± 0.9	0.5 ± 0.8	0 ± 1	-1.4 ± 2	-5 ± 3	0.5 ± 1	-0.8 ± 0.9	-3.4 ± 1	-0.5 ± 0.9	1 ± 3	0.1 ± 0.9	22 ± 20.	3.2 ± 4.0
	11/5/96	7 ± 10	1400 ± 100	-1.2 ± 2.0	-0.7 ± 2.0	-3 ± 3	1.2 ± 5	0 ± 6	0.1 ± 3	0.2 ± 2.0	-0.2 ± 2	-0.9 ± 2.0	2 ± 6	2.2 ± 2.0	-20 ± 40.	2.0 ± 8.0
	11/19/96	5 ± 7	1400 ± 100	-0.6 ± 0.9	-0.7 ± 0.9	0 ± 1	1.0 ± 2	-6 ± 3	0.1 ± 2	-0.6 ± 0.9	-6.0 ± 1	1.0 ± 1.0	3 ± 3	0.2 ± 0.9	10 ± 20.	-0.3 ± 4.0
	12/11/96	4 ± 8	1600 ± 200	-0.3 ± 1.0	-0.4 ± 1.0	0 ± 1	-0.9 ± 2	-5 ± 3	-0.2 ± 2	0.7 ± 1.0	0.8 ± 1	0.3 ± 1.0	-2 ± 3	-0.2 ± 1.0	13 ± 30.	3.0 ± 4.0
	MEAN	3 ± 9	1413 ± 161	-0.2 ± 1.7	0.1 ± 1.6	0 ± 2	0.5 ± 3.7	-2 ± 4	0.0 ± 1.4	0.3 ± 1.7	-2.7 ± 3.9	0.3 ± 1.7	1 ± 3.7	0.0 ± 1.7	4 ± 24.	-0.3 ± 7.6

TABLE C-VIII.1 QUARTERLY TLD RESULTS FOR LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. +/- 2 SIGMA

STATION CODE	MEAN +/- 2 S.D (1)	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC
36S2	6.7 ± 0.6	6.2 ± 0.3	6.9 ± 0.4	6.7 ± 0.6	6.8 ± 0.4
36D1	5.1 ± 0.5	5.2 ± 0.3	5.4 ± 0.3	4.8 ± 0.2	5.1 ± 0.7
2E1	6.2 ± 0.9	5.5 ± 0.4	6.5 ± 0.3	6.3 ± 0.6	6.4 ± 0.5
3S1	6.0 ± 0.5	5.7 ± 0.3	6.3 ± 0.5	6.1 ± 0.4	6.1 ± 0.2
4E1	4.5 ± 0.5	4.2 ± 0.2	4.8 ± 0.2	4.4 ± 0.2	4.7 ± 0.3
5S1	7.0 ± 0.9	6.4 ± 0.8	7.3 ± 0.3	7.0 ± 0.5	7.3 ± 0.8
5H1	7.5 ± 1	6.8 ± 0.3	7.7 ± 0.6	7.7 ± 0.3	7.9 ± 0.3
6C1	6.1 ± 0.5	5.8 ± 0.2	6.2 ± 0.1	6.2 ± 0.2	6.3 ± 0.5
7S1	6.4 ± 0.7	5.9 ± 0.2	6.6 ± 0.5	6.6 ± 0.6	6.5 ± 0.5
7E1	6.3 ± 0.8	5.7 ± 0.5	6.6 ± 0.3	6.3 ± 0.3	6.5 ± 0.4
9C1	6.0 ± 0.3	5.8 ± 0.3	6.0 ± 0.4	6.0 ± 0.8	6.1 ± 0.5
10S3	6.1 ± 1	5.9 ± 0.4	6.6 ± 0.6	5.6 ± 0.5	6.5 ± 0.7
10E1	6.3 ± 0.7	5.8 ± 0.5	6.6 ± 0.2	6.2 ± 0.6	6.5 ± 0.5
10F3	6.2 ± 0.9	5.6 ± 0.4	6.6 ± 0.2	6.0 ± 0.2	6.4 ± 0.7
11S1	6.9 ± 1	6.4 ± 0.6	7.1 ± 0.5	6.5 ± 0.1	7.4 ± 0.3
13S2	10.0 ± 1.3	9.5 ± 0.8	10.5 ± 0.6	9.3 ± 0.5	10.6 ± 1.0
13C1	4.5 ± 0.4	4.4 ± 0.1	4.6 ± 0.3	4.3 ± 0.3	4.7 ± 0.3
13E1	6.2 ± 0.8	5.8 ± 0.5	6.6 ± 0.6	6.0 ± 0.5	6.5 ± 0.4
14S1	5.5 ± 0.5	5.3 ± 0.3	5.8 ± 0.4	5.2 ± 0.3	5.6 ± 0.3
15D1	6.2 ± 1.2	5.5 ± 0.4	6.6 ± 0.5	6.0 ± 0.4	6.7 ± 0.7
16F1	6.4 ± 0.9	5.7 ± 0.2	6.7 ± 0.4	6.4 ± 0.7	6.7 ± 0.5
17B1	5.8 ± 0.9	5.3 ± 0.3	6.3 ± 0.2	5.6 ± 0.3	6.1 ± 0.2
18S2	6.7 ± 1	6.3 ± 0.8	7.4 ± 0.3	6.3 ± 0.5	6.8 ± 0.3
19D1	5.9 ± 0.8	5.5 ± 0.4	6.3 ± 0.3	5.6 ± 0.4	6.1 ± 0.3
20D1	5.5 ± 0.7	5.2 ± 0.4	5.9 ± 0.6	5.3 ± 0.3	5.7 ± 0.3
20F1	5.9 ± 0.9	5.3 ± 0.2	6.3 ± 0.7	5.8 ± 0.5	6.1 ± 0.9
21S2	5.4 ± 0.8	5.0 ± 0.1	5.9 ± 0.6	5.1 ± 0.5	5.5 ± 0.3
23S2	5.6 ± 0.5	5.3 ± 0.2	5.8 ± 0.5	5.4 ± 0.3	5.8 ± 0.3
24D1	5.1 ± 0.9	4.8 ± 0.4	5.6 ± 0.4	4.7 ± 0.2	5.3 ± 0.3
25S2	5.0 ± 0.3	4.9 ± 0.6	(2)	5.1 ± 0.2	(2)
25D1	4.9 ± 0.7	4.7 ± 0.2	5.3 ± 0.3	4.5 ± 0.3	5.1 ± 0.5
26S3	5.1 ± 0.8	4.8 ± 0.3	5.6 ± 0.3	4.8 ± 0.2	5.3 ± 0.3
28D2	5.5 ± 0.7	5.3 ± 0.3	6.0 ± 0.5	5.2 ± 0.3	5.6 ± 0.6
29S1	5.3 ± 0.9	5.0 ± 0.2	5.9 ± 0.4	4.9 ± 0.5	5.3 ± 0.4
29E1	5.8 ± 0.7	5.5 ± 0.3	6.2 ± 0.5	5.5 ± 0.2	6.0 ± 0.3
31S1	6.2 ± 0.9	6.2 ± 0.3	6.6 ± 0.7	5.6 ± 0.5	6.3 ± 0.4
31D1	7.4 ± 1.2	7.2 ± 0.2	8.0 ± 0.6	6.7 ± 0.4	7.8 ± 0.7
31D2	6.3 ± 0.7	6.1 ± 0.3	6.8 ± 0.4	6.0 ± 0.4	6.4 ± 0.5
34S2	6.6 ± 1	6.5 ± 0.4	7.0 ± 0.3	5.9 ± 0.2	7.0 ± 0.6
34E1	5.9 ± 1	5.4 ± 0.6	6.6 ± 0.4	5.8 ± 0.4	5.6 ± 0.3

(1) MEAN AND TWO TIMES THE STANDARD DEVIATION OF THE QUARTERLY RESULTS
(2) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-VIII.2 1996 MEAN TLD RESULTS FROM LIMERICK GENERATING STATIONFOR THE SITE BOUNDARY, MIDDLE, AND OUTER RINGS 1996

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MO. +/- 2 STANDARD DEVIATIONS OF THE STATION DATA

EXPOSURE PERIOD	SITE	MIDDLE RING	OUTER RING
JAN-MAR	6.0 ± 2.2	5.4 ± 1.2	6.8 ± 0.0
APR-JUN	6.3 ± 4.1	6.2 ± 1.4	7.7 ± 0.0
JUL-SEP	6.0 ± 2.3	5.6 ± 1.4	7.7 ± 0.0
OCT-DEC	o.2 ± 4.1	6.0 ± 1.4	7.9 ± 0.0

TABLE C-VIII.3 SUMMARY OF THE 1996 AMBIENT DOSIMETRY PROGRAM FOR LIMERICK GENERATING STATION

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MO.

LOCATION	NO. OF SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN +/- 2 S.D.	PRE-OP MEAN +/- 2 S.D. (1)
SITE	64	0.0	10.6	6.1 ± 3.2	7.6 ± 2.4
MIDDLE RING	92	4.2	8.0	5.8 ± 1.5	7.8 ± 2.2
OUTER RING	4	6.8	7.9	7.5 ± 1.0	7.8 ± 3.0

THE PRE-OPERATIONAL MEAN WAS CALCULATED FROM MONTHLY TLD READINGS 01/15/82 TO 12/02/84.

SITE BOUNDARY RING STATIONS - 36S2, 3S1, 5S1, 7S1, 10S3, 11S1, 13S2, 14S1, 18S2, 21S2, 23S2, 25S2, 26S3, 29S1, 31S1, 34S2

MIDDLE RING STATIONS - 36D1, 2E1, 4E1, 6C1, 7E1, 9C1, 10E1, 10F3, 13C1, 13E1, 15D1, 16F1, 17B1, 19D1, 20D1, 20F1, 24D1, 25D1, 28D2, 29E1, 31D1, 31D2, 34E1

OUTER RING STATIONS - 5H1

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

SURFACE WATER (TRITIUM)

SAMPLING	10F2	13B1	24S1
JAN-MAR	-	1/2/96 - 3/25/96	1/2/96 - 3/25/96
APR-JUN	-	3/25/96 - 7/1/96	3/25/96 - 7/1/96
JUL-SEP	7/1/96 - 9/30/96	7/1/96 - 9/30/96	7/1/96 - 9/30/96
OCT-DEC	9/30/96 - 12/30/96	9/30/96 - 12/30/96	9/30/96 - 12/30/96

SURFACE WATER (GAMMA SPECTROSCOPY)

SAMPLING	10F2	13B1	24S1
JAN	-	1/2/96 - 1/29/96	1/2/96 - 1/29/96
FEB	-	1/29/96 - 2/26/96	1/29/96 - 2/26/96
MAR	-	2/26/96 - 3/25/96	2/26/96 - 3/25/96
APR	-	3/25/96 - 4/29/96	3/25/96 - 4/29/96
MAY	-	4/29/96 - 6/3/96	4/29/96 - 6/3/96
JUN	6/3/96 - 7/1/96	6/3/96 - 7/1/96	6/3/96 - 7/1/96
JUL	7/1/96 - 7/29/96	7/1/96 - 7/29/96	7/1/96 - 7/29/96
AUG	7/29/96 - 9/2/96	7/29/96 - 9/2/96	7/29/96 - 9/2/96
SEP	9/2/96 - 9/30/96	9/2/96 - 9/30/96	9/2/96 - 9/30/96
OCT	9/30/96 - 10/28/96	9/30/96 - 10/28/96	9/30/96 - 10/28/96
NOV	10/28/96 - 12/2/96	10/28/96 - 12/2/96	10/28/96 - 12/2/96
DEC	12/2/96 - 12/30/96	12/2/96 - 12/30/96	12/2/96 - 12/30/96

DRINKING WATER (GROSS BETA & GAMMA SPECTROSCOPY)

SAMPLING	15F4	15F7	16C2	28F3
JAN	1/2/96 - 1/29/96	1/2/96 - 1/29/96	1/2/96 - 1/29/96	1/2/96 - 1/29/96
FEB	1/29/96 - 2/26/96	1/29/96 - 2/26/96	1/29/96 - 2/26/96	1/29/96 - 2/26/96
MAR	2/26/96 - 3/25/96	2/26/96 - 3/25/96	2/26/96 - 3/25/96	2/26/96 - 3/25/96
APR	3/25/96 - 4/29/96	3/25/96 - 4/29/96	3/25/96 - 4/29/96	3/25/96 - 4/29/96
MAY	4/29/96 - 6/3/96	4/29/96 - 6/3/96	4/29/96 - 6/3/96	4/29/96 - 6/3/96
JUN	6/3/96 - 7/1/96	6/3/96 - 7/1/96	6/3/96 - 7/1/96	6/3/96 - 7/1/96
JUL	7/1/96 - 7/29/96	7/1/96 - 7/29/96	7/1/96 - 7/29/96	7/1/96 - 7/29/96
AUG	7/29/96 - 9/2/96	7/29/96 - 9/2/96	7/29/96 - 9/2/96	7/29/96 - 9/3/96
SEP	9/2/96 - 9/30/96	9/2/96 - 9/30/96	9/2/96 - 9/30/96	9/3/96 - 9/30/96
OCT	9/30/96 - 10/28/96	9/30/96 - 10/28/96	9/30/96 - 10/28/96	9/30/96 - 10/28/96
NOV	10/28/96 - 12/2/96	10/28/96 - 12/2/96	10/28/96 - 12/2/96	10/28/96 - 12/2/96
DEC	12/2/96 - 12/30/96	12/2/96 - 12/30/96	12/2/96 - 12/30/96	12/2/96 - 12/30/96

DRINKING WATER (TRITIUM)

SAMPLING	15F4	15F7	16C2	28F3
JAN-MAR	1/2/96 - 3/25/96	1/2/96 - 3/25/96	1/2/96 - 3/25/96	1/2/96 - 3/25/96
APR-JUN	3/25/96 - 7/1/96	3/25/96 - 7/1/96	3/25/96 - 7/1/96	3/25/96 - 7/1/96
JUL-SEP	7/1/96 - 9/30/96	7/1/96 - 9/30/96	7/1/96 - 9/30/96	7/1/96 - 9/30/96
OCT-DEC	9/30/96 - 12/30/96	9/30/96 - 12/30/96	9/30/96 - 12/30/96	9/30/96 - 12/30/96

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

AIR PARTICULATE & AIR IODINE

SAMPLING	10S3	11S1	14S1	13C1	22G1
01	1/2/96 - 1/9/96	1/2/96 - 1/9/96	1/2/96 - 1/9/96	1/2/96 - 1/9/96	1/2/96 - 1/9/96
02	1/8/96 - 1/15/96	1/8/96 - 1/15/96	1/8/96 - 1/15/96	1/8/96 - 1/15/96	1/8/96 - 1/15/96
03	1/15/96 - 1/22/96	1/15/96 - 1/22/96	1/15/96 - 1/22/96	1/15/96 - 1/22/96	1/15/96 - 1/22/96
04	1/22/96 - 1/29/96	1/22/96 - 1/29/96	1/22/96 - 1/29/96	1/22/96 - 1/29/96	1/22/96 - 1/26/96
05	1/29/96 - 2/5/96	1/29/96 - 2/5/96	1/29/96 - 2/5/96	1/29/96 - 2/5/96	1/29/96 - 2/5/96
06	2/5/96 - 2/12/96	2/5/96 - 2/12/96	2/5/96 - 2/12/96	2/5/96 - 2/12/96	2/5/96 - 2/12/96
07	2/12/96 - 2/19/96	2/12/96 - 2/19/96	2/12/96 - 2/19/96	2/12/96 - 2/19/96	2/12/96 - 2/19/96
08	2/19/96 - 2/26/96	2/19/96 - 2/26/96	2/19/96 - 2/26/96	2/19/96 - 2/26/96	2/19/96 - 2/26/96
09	2/26/96 - 3/4/96	2/26/96 - 3/4/96	2/26/96 - 3/4/96	2/26/96 - 3/4/96	2/26/96 - 3/4/96
10	3/4/96 - 3/11/96	3/4/96 - 3/11/96	3/4/96 - 3/11/96	3/4/96 - 3/11/96	3/4/96 - 3/11/96
11	3/11/96 - 3/18/96	3/11/96 - 3/18/96	3/11/96 - 3/18/96	3/11/96 - 3/18/96	3/11/96 - 3/18/96
12	3/18/96 - 3/25/96	3/18/96 - 3/25/96	3/18/96 - 3/25/96	3/18/96 - 3/25/96	3/18/96 - 3/25/96
13	3/25/96 - 4/1/96	3/25/96 - 4/1/96	3/25/96 - 4/1/96	3/25/96 - 4/1/96	3/25/96 - 4/1/96
14	4/1/96 - 4/8/96	4/1/96 - 4/8/96	4/1/96 - 4/8/96	4/1/96 - 4/8/96	4/1/96 - 4/8/96
15	4/8/96 - 4/15/96	4/8/96 - 4/15/96	4/8/96 - 4/15/96	4/8/96 - 4/15/96	4/8/96 - 4/15/96
16	4/15/96 - 4/22/96	4/15/96 - 4/22/96	4/15/96 - 4/22/96	4/15/96 - 4/22/96	4/15/96 - 4/22/96
17	4/22/96 - 4/29/96	4/22/96 - 4/29/96	4/22/96 - 4/29/96	4/22/96 - 4/29/96	4/22/96 - 4/29/96
18	4/29/96 - 5/6/96	4/29/96 - 5/6/96	4/29/96 - 5/6/96	4/29/96 - 5/6/96	4/26/96 - 5/6/96
19	5/6/96 - 5/13/96	5/6/96 - 5/13/96	5/6/96 - 5/13/96	5/6/96 - 5/13/96	5/6/96 - 5/13/96
20	5/13/96 - 5/20/96	5/13/96 - 5/20/96	5/13/96 - 5/20/96	5/13/96 - 5/20/96	5/13/96 - 5/20/96
21	5/20/96 - 5/28/96	5/20/96 - 5/28/96	5/20/96 - 5/28/96	5/20/96 - 5/28/96	5/20/96 - 5/28/96
22	5/28/96 - 6/3/96	5/28/96 - 6/3/96	5/28/96 - 6/3/96	5/28/96 - 6/3/96	5/28/96 - 6/3/96
23	6/3/96 - 6/10/96	6/3/96 - 6/10/96	6/3/96 - 6/10/96	6/3/96 - 6/10/96	6/3/96 - 6/10/96
24	6/10/96 - 6/17/96	6/10/96 - 6/17/96	6/10/96 - 6/17/96	6/10/96 - 6/17/96	6/10/96 - 6/17/96
25	6/17/96 - 6/24/96	6/17/96 - 6/24/96	6/17/96 - 6/24/96	6/17/96 - 6/24/96	6/17/96 - 6/24/96
26	6/24/96 - 7/1/96	6/24/96 - 7/1/96	6/24/96 - 7/1/96	6/24/96 - 7/1/96	6/24/96 - 7/1/96
27	7/1/96 - 7/8/96	7/1/96 - 7/8/96	7/1/96 - 7/8/96	7/1/96 - 7/8/96	7/1/96 - 7/8/96
28	7/8/96 - 7/15/96	7/8/96 - 7/15/96	7/8/96 - 7/15/96	7/8/96 - 7/15/96	7/8/96 - 7/15/96
29	7/15/96 - 7/22/96	7/15/96 - 7/22/96	7/15/96 - 7/22/96	7/15/96 - 7/22/96	7/15/96 - 7/22/96
30	7/22/96 - 7/29/96	7/22/96 - 7/29/96	7/22/96 - 7/29/96	7/22/96 - 7/29/96	7/22/96 - 7/29/96
31	7/29/96 - 8/5/96	7/29/96 - 8/5/96	7/29/96 - 8/5/96	7/29/96 - 8/5/96	7/29/96 - 8/5/96
32	8/5/96 - 8/12/96	8/5/96 - 8/12/96	8/5/96 - 8/12/96	8/5/96 - 8/12/96	8/5/96 - 8/12/96
33	8/12/96 - 8/19/96	8/12/96 - 8/19/96	8/12/96 - 8/19/96	8/12/96 - 8/19/96	8/12/96 - 8/19/96
34	8/19/96 - 8/26/96	8/19/96 - 8/26/96	8/19/96 - 8/26/96	8/19/96 - 8/26/96	8/19/96 - 8/26/96
35	8/26/96 - 9/3/96	8/26/96 - 9/3/96	8/26/96 - 9/3/96	8/26/96 - 9/3/96	8/26/96 - 9/3/96
36	9/3/96 - 9/9/96	9/3/96 - 9/9/96	9/3/96 - 9/9/96	9/3/96 - 9/9/96	9/3/96 - 9/9/96
37	9/9/96 - 9/16/96	9/9/96 - 9/16/96	9/9/96 - 9/16/96	9/9/96 - 9/16/96	9/9/96 - 9/16/96
38	9/16/96 - 9/23/96	9/16/96 - 9/23/96	9/16/96 - 9/23/96	9/16/96 - 9/23/96	9/16/96 - 9/23/96
39	9/23/96 - 10/1/96	9/23/96 - 10/1/96	9/23/96 - 10/1/96	9/23/96 - 10/1/96	9/23/96 - 10/1/96
40	10/1/96 - 10/7/96	10/1/96 - 10/7/96	10/1/96 - 10/7/96	10/1/96 - 10/7/96	10/1/96 - 10/7/96
41	10/7/96 - 10/15/96	10/7/96 - 10/15/96	10/7/96 - 10/15/96	10/7/96 - 10/15/96	10/7/96 - 10/15/96
42	10/15/96 - 10/21/96	10/15/96 - 10/21/96	10/15/96 - 10/21/96	10/15/96 - 10/21/96	10/15/96 - 10/21/96
43	10/21/96 - 10/28/96	10/21/96 - 10/28/96	10/21/96 - 10/28/96	10/21/96 - 10/28/96	10/21/96 - 10/28/96
44	10/28/96 - 11/4/96	10/28/96 - 11/4/96	10/28/96 - 11/4/96	10/28/96 - 11/4/96	10/28/96 - 11/4/96
45	11/4/96 - 11/11/96	11/4/96 - 11/11/96	11/4/96 - 11/11/96	11/4/96 - 11/11/96	11/4/96 - 11/11/96
46	11/11/96 - 11/18/96	11/11/96 - 11/18/96	11/11/96 - 11/18/96	11/11/96 - 11/18/96	11/11/96 - 11/18/96
47	11/18/96 - 11/25/96	11/18/96 - 11/25/96	11/18/96 - 11/25/96	11/18/96 - 11/25/96	11/18/96 - 11/25/96
48	11/25/96 - 12/3/96	11/25/96 - 12/3/96	11/25/96 - 12/3/96	11/25/96 - 12/3/96	11/25/96 - 12/3/96
49	12/3/96 - 12/9/96	12/3/96 - 12/9/96	12/3/96 - 12/9/96	12/3/96 - 12/9/96	12/3/96 - 12/9/96
50	12/9/96 - 12/16/96	12/9/96 - 12/16/96	12/9/96 - 12/16/96	12/9/96 - 12/16/96	12/9/96 - 12/16/96
51	12/16/96 - 12/23/96	12/16/96 - 12/23/96	12/16/96 - 12/23/96	12/16/96 - 12/23/96	12/16/96 - 12/23/96
52	12/23/96 - 12/30/96	12/23/96 - 12/30/96	12/23/96 - 12/30/96	12/23/96 - 12/30/96	12/23/96 - 12/30/96

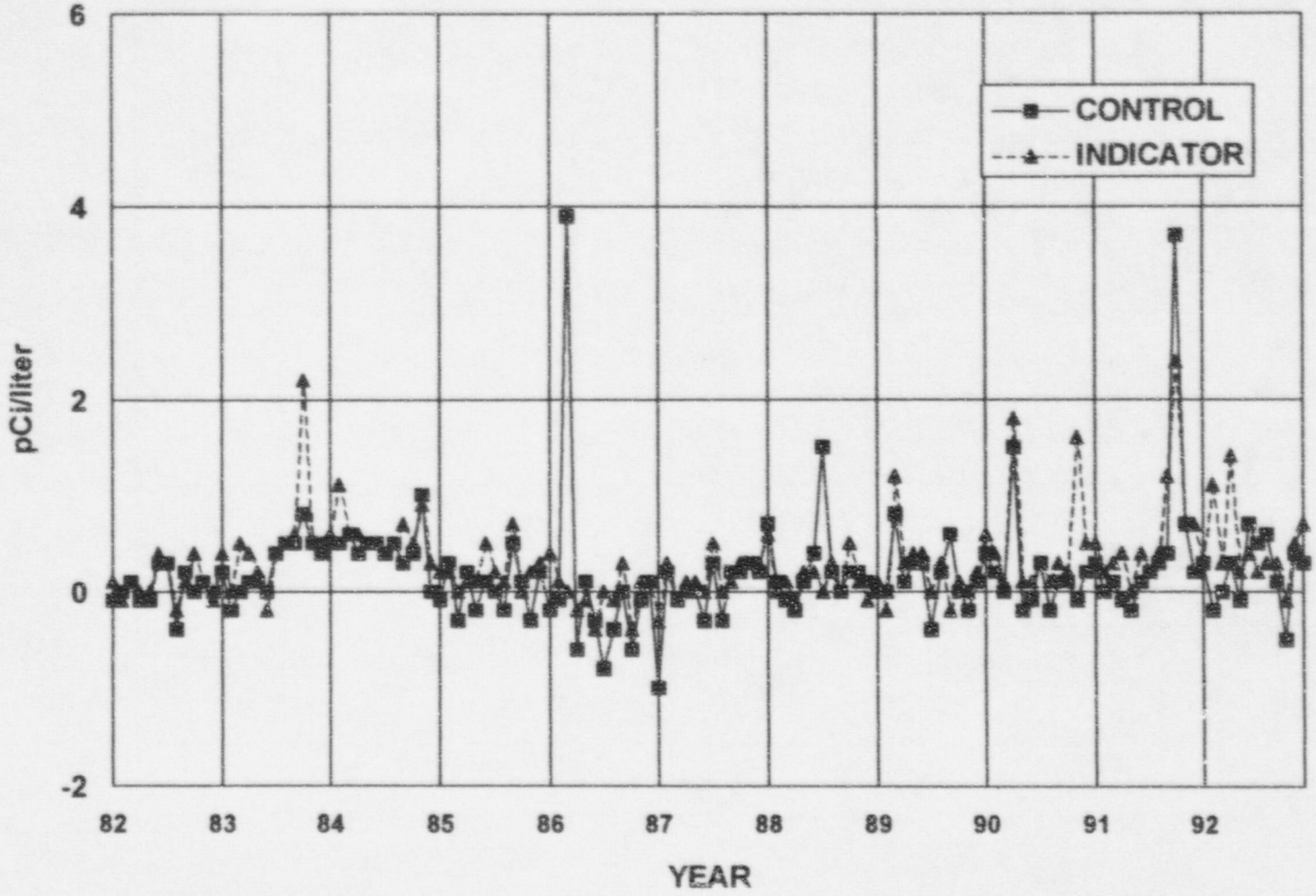
AIR PARTICULATE (GAMMA SPECTROSCOPY)

SAMPLING	10S3	11S1	14S1	13C1	22G1
JAN-MAR	1/2/96 - 4/1/96	1/2/96 - 4/1/96	1/2/96 - 4/1/96	1/2/96 - 4/1/96	1/2/96 - 4/1/96
APR-JUN	4/1/96 - 7/1/96	4/1/96 - 7/1/96	4/1/96 - 7/1/96	4/1/96 - 7/1/96	4/1/96 - 7/1/96
JUL-SEP	7/1/96 - 10/1/96	7/1/96 - 10/1/96	7/1/96 - 10/1/96	7/1/96 - 10/1/96	7/1/96 - 10/1/96
OCT-DEC	10/1/96 - 12/30/96	10/1/96 - 12/30/96	10/1/96 - 12/30/96	10/1/96 - 12/30/96	10/1/96 - 12/30/96

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

STATION CODE	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC
36S2	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
36D1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
2E1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
3S1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
4E1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
5S1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
5H1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
6C1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
7S1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
7E1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
9C1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
10S3	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
10E1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
10F3	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
11S1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
13S2	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
13C1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
13E1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
14S1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
15D1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
16F1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
17B1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
18S2	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
19D1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
20D1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
20F1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
21S2	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
23S2	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
24D1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
25S2	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
25D1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
26S3	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
28D2	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
29S1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
29E1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
31S1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
31D1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
31D2	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
34S2	1/2/96 - 4/3/96	4/3/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97
34E1	1/2/96 - 4/2/96	4/2/96 - 7/1/96	7/1/96 - 10/1/96	10/1/96 - 1/7/97

FIGURE C-1
MEAN MONTHLY INSOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LGS, 1982 - 1996



LGS CRITICALITY
UNIT NO. 1: 12/22/84
UNIT NO. 2: 08/11/89

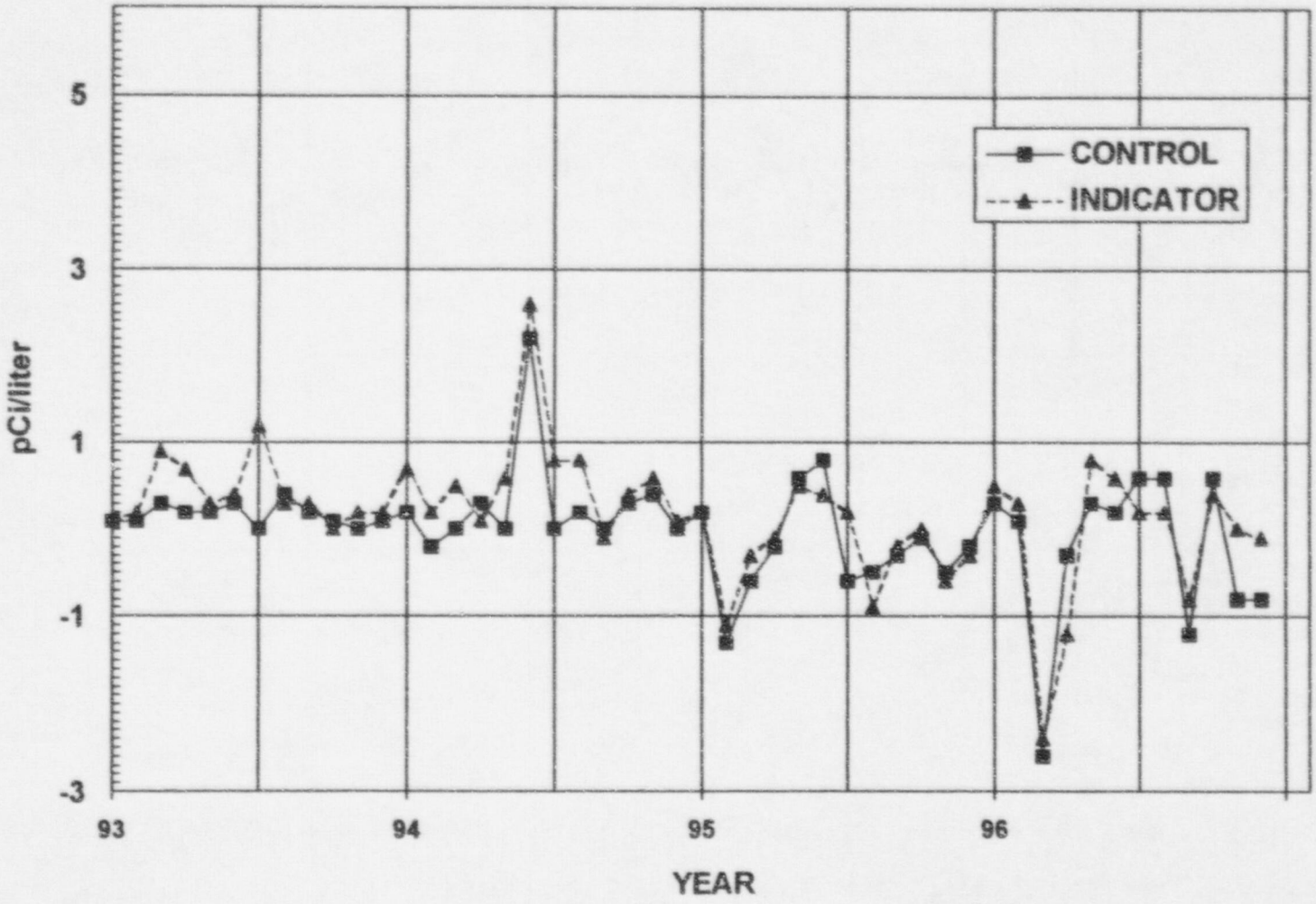
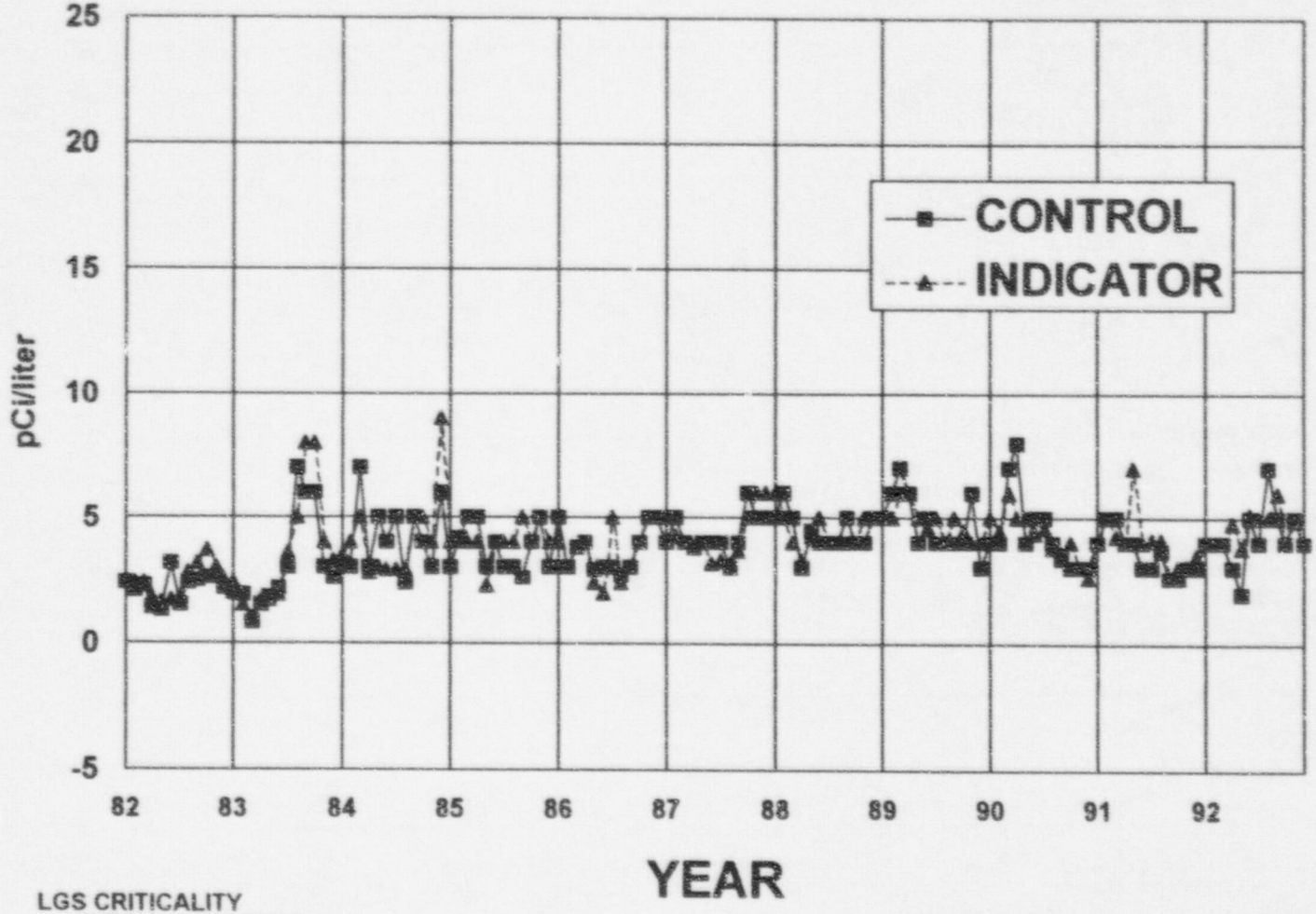

5
3
1
-1
-3
pCi/liter
93
94
95
96
YEAR
CONTROL
INDICATOR

FIGURE C-2
MEAN MONTHLY SOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LGS, 1982 - 1996



LGS CRITICALITY
UNIT NO. 1: 12/22/84
UNIT NO. 2: 08/11/89

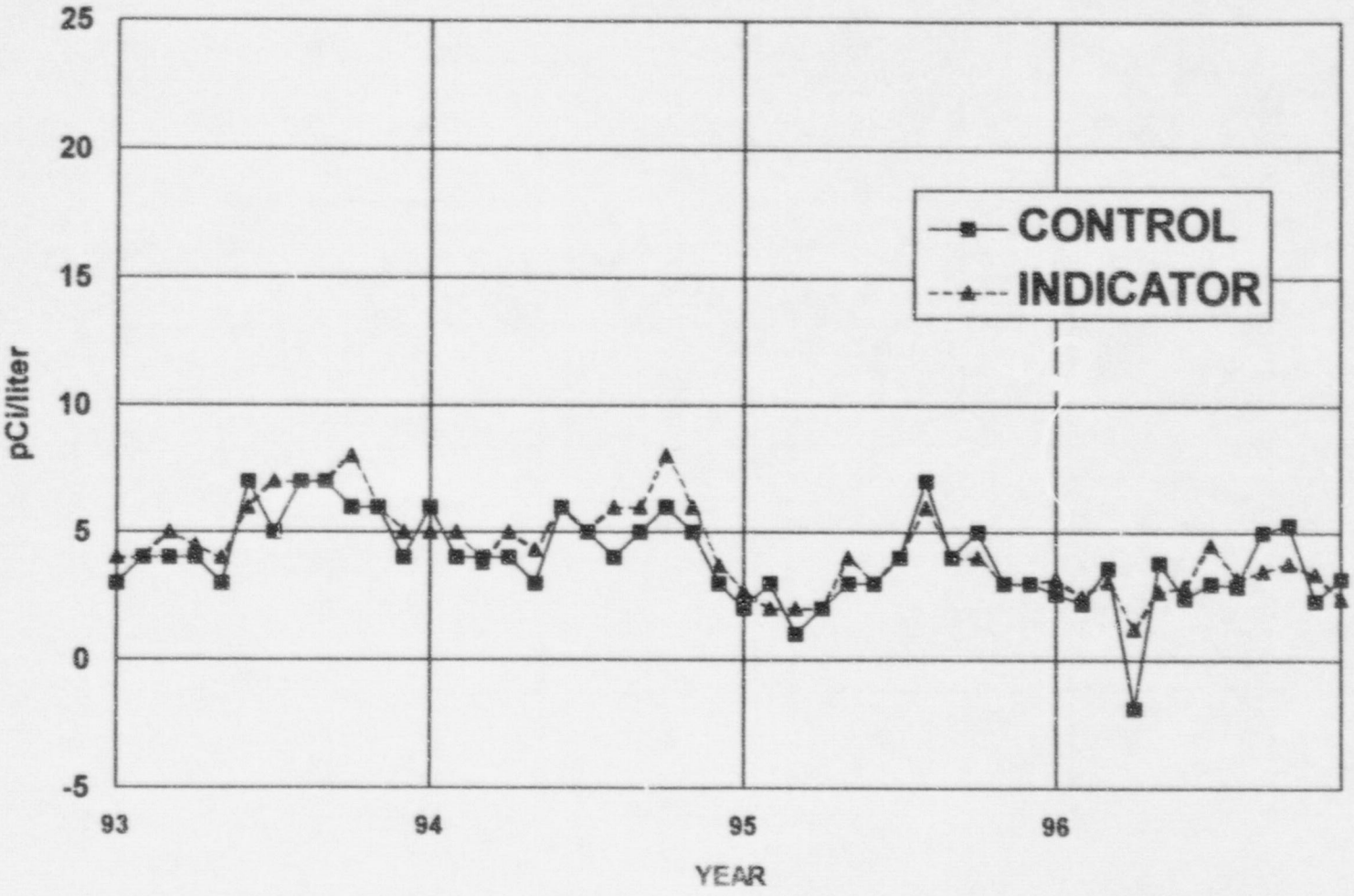
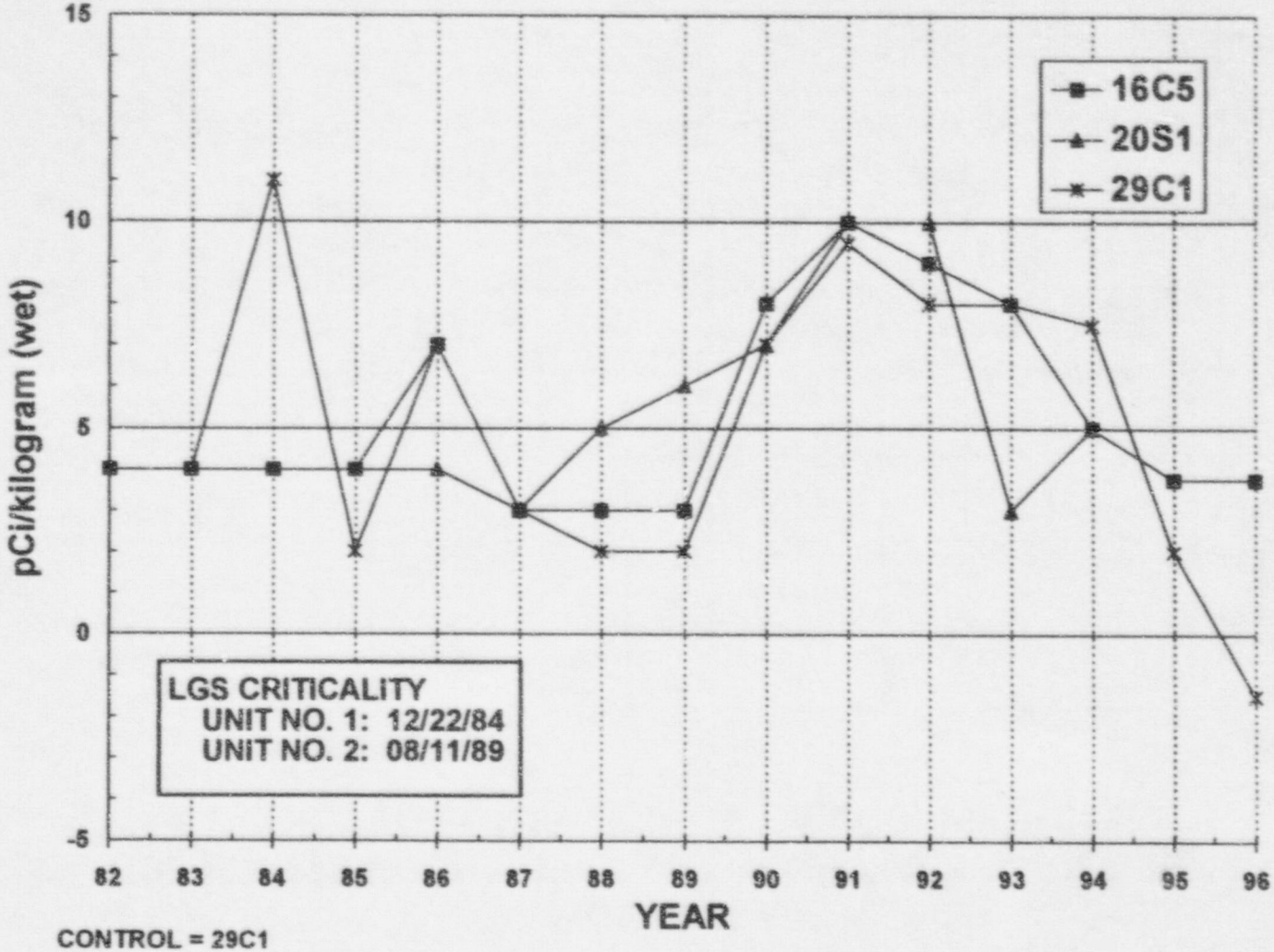

25
20
15
10
5
0
-5
pCi/liter
93
94
95
96
YEAR
CONTROL
INDICATOR

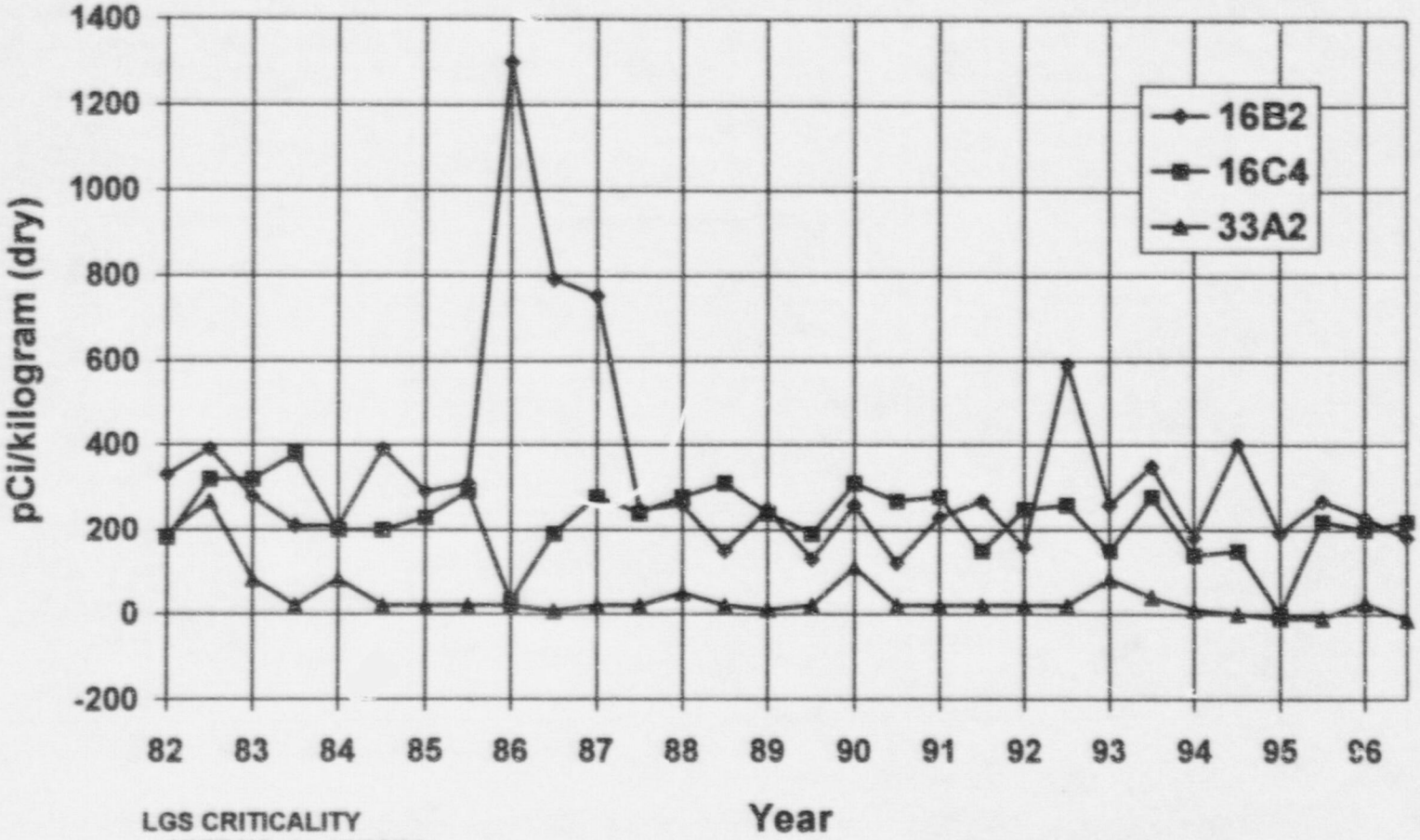
FIGURE C-3
MEAN ANNUAL CS-137 CONCENTRATIONS IN FISH SAMPLES COLLECTED IN THE VICINITY OF LGS, 1982 - 1996



CONTROL = 29C1

Station 20S1 discontinued in 1995

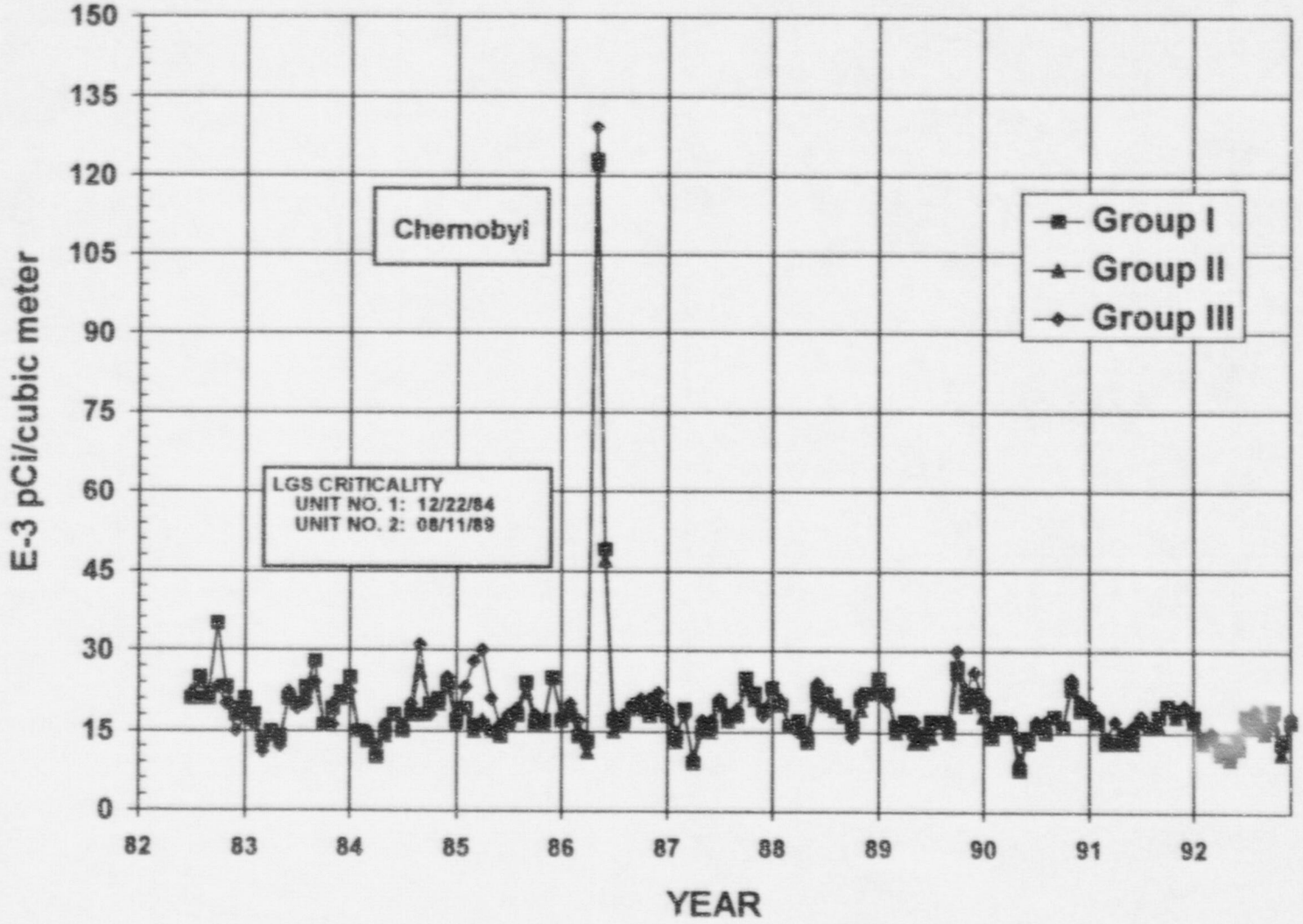
FIGURE C-4
CONCENTRATIONS OF CS-137 IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF LGS, 1982 - 1996



LGS CRITICALITY
UNIT NO. 1: 12/22/84
UNIT NO. 2: 08/11/89

CONTROL = 33A2

FIGURE C-5
MEAN MONTHLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LGS, 1982 - 1996



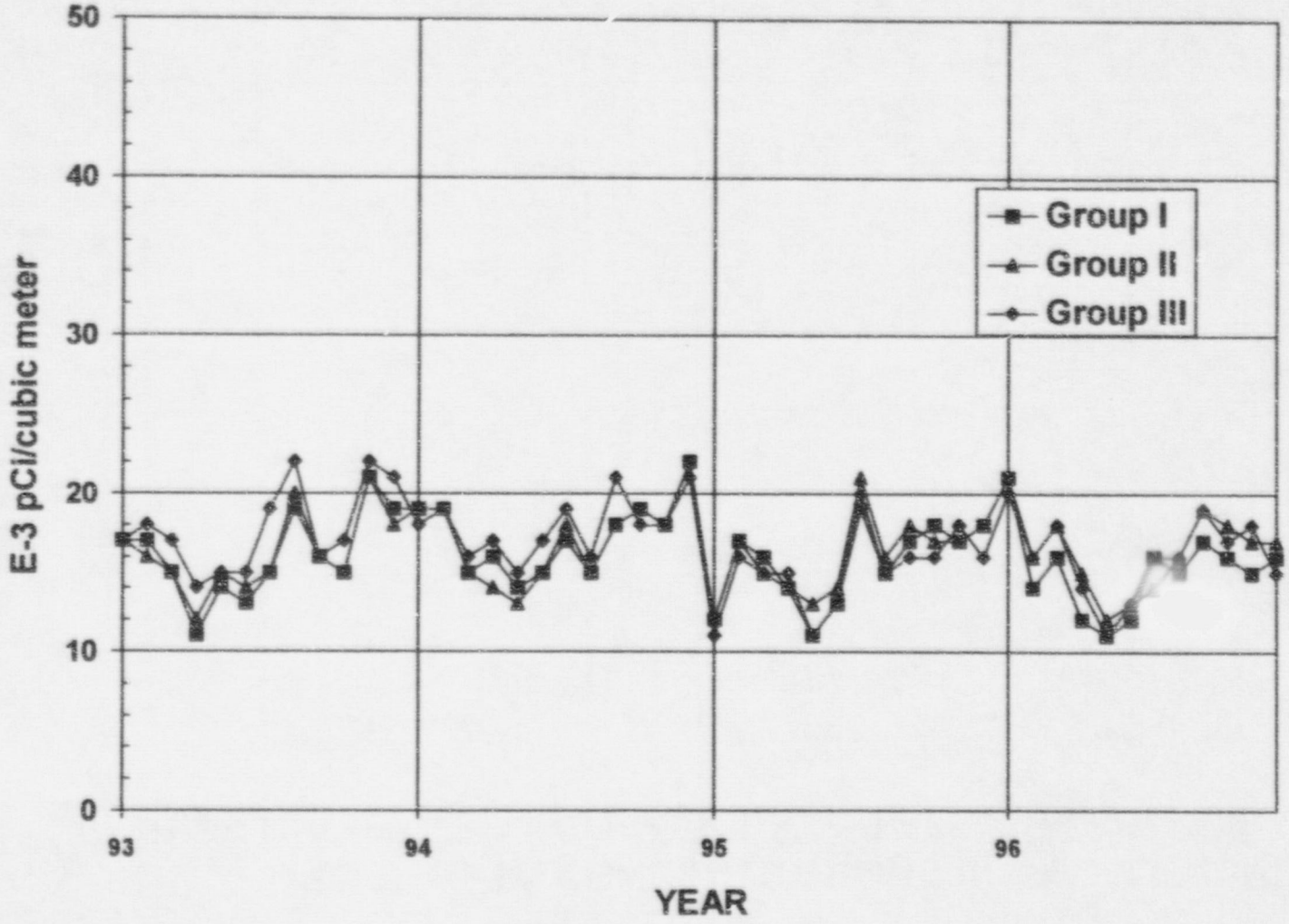

50
40
30
20
10
0
E-3 pCi/cubic meter
93
94
95
96
YEAR
Group I
Group II
Group III

FIGURE C-6
MEAN WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LGS, 1996

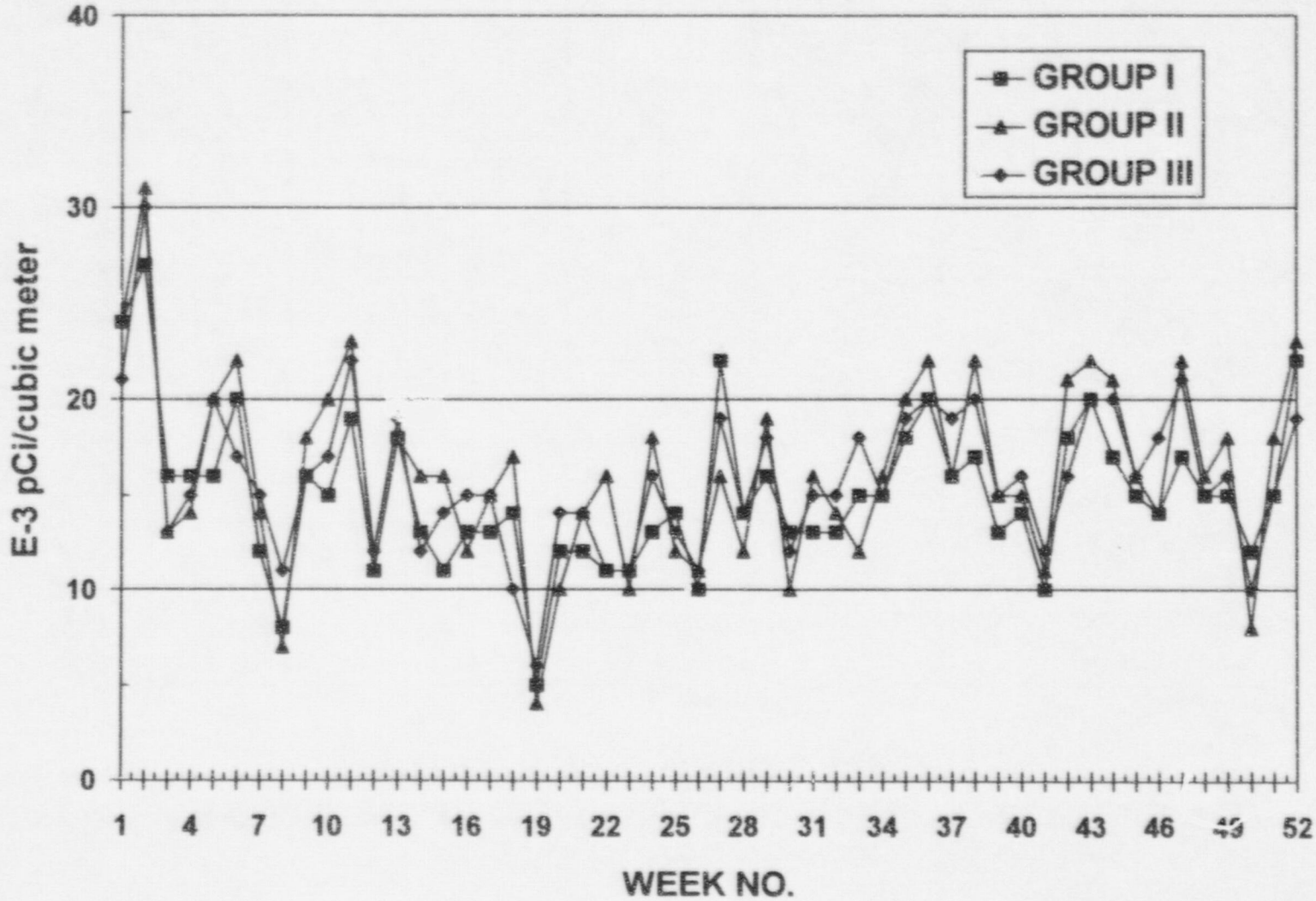
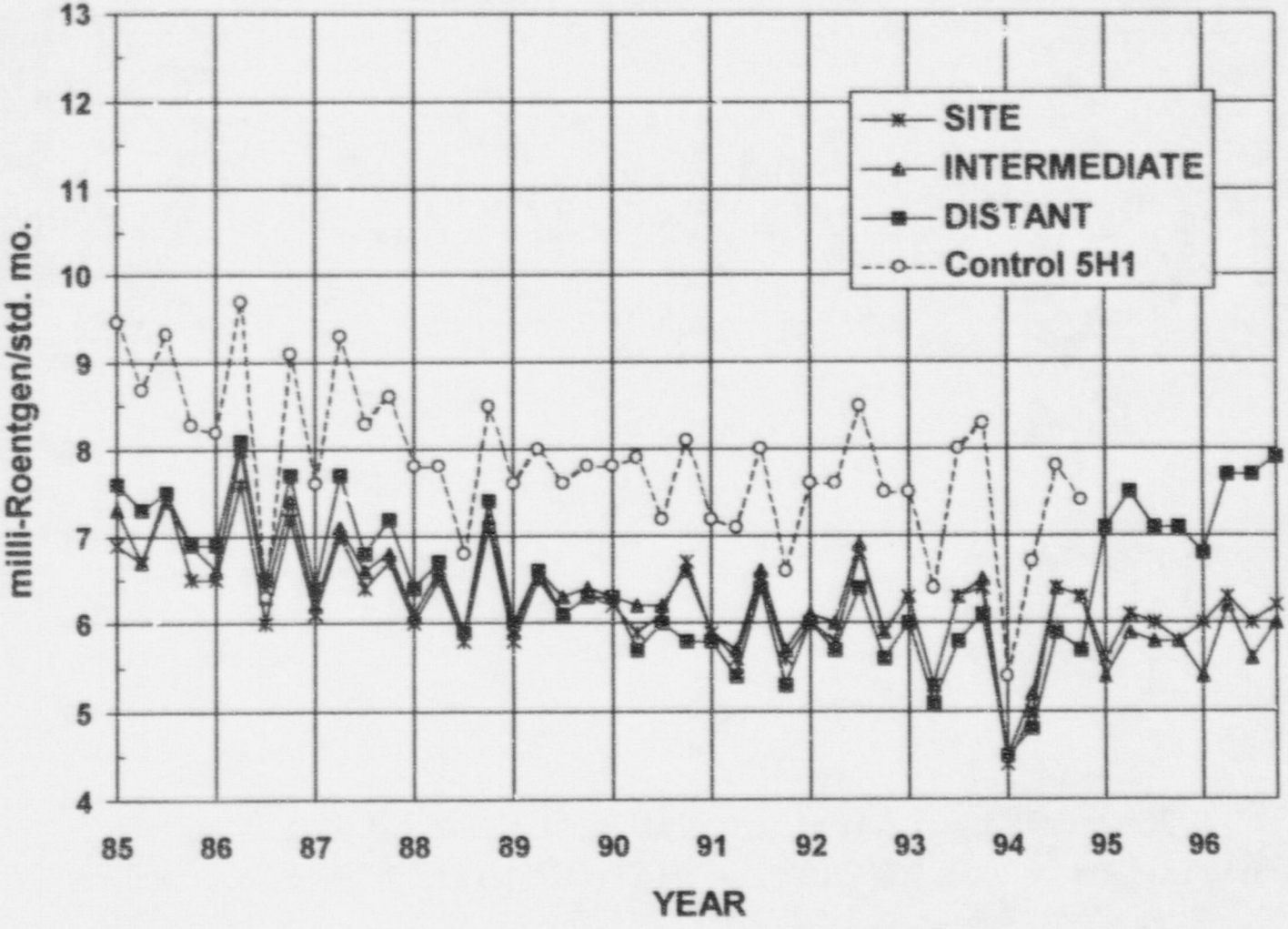


FIGURE C-7
MEAN QUARTERLY AMBIENT GAMMA RADIATION LEVELS (TLD)
IN THE VICINITY OF LGS, 1985 - 1995



APPENDIX D

DATA TABLES AND FIGURES
QC LABORATORY

APPENDIX D: DATA TABLES AND FIGURES - COMPARISON LABORATORY

TABLES

FIGURES

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

The gross beta results for the drinking water insoluble and soluble fractions for both GPU and TBE were similar (Figures D-1 and D-2, Appendix D). Any differences noted were probably due to variations in the respective laboratory's analytical procedures. TBE counts the samples for 50 minutes, GPU counts for 100 minutes.

The gross beta results for air particulate samples collected at the collocated stations 11S1 and 11S2 compared very well (Figure D-3, Appendix D). No significant differences were noted. Both laboratories use Cs-137 as a calibration source.

TABLE D-I.1 CONCENTRATIONS OF GROSS BETA INSOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	16C2
JAN	0.6 ± 0.5
FEB	0.1 ± 0.4
MAR	-0.1 ± 0.5
APR	1.0 ± 0.5
MAY	0.3 ± 0.5
JUN	0.2 ± 0.5
JUL	0.5 ± 0.5
AUG	0.2 ± 0.4
SEP	-0.1 ± 0.5
OCT	0.3 ± 1.3
NOV	-0.1 ± 0.5
DEC	1.2 ± 0.6
MEAN	0.3 ± 0.8

TABLE D-I.2 CONCENTRATIONS OF GROSS BETA SOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- SIGMA

COLLECTION PERIOD	16C2
JAN	3.3 ± 1.0
FEB	2.0 ± 0.9
MAR	3.4 ± 1.1
APR	2.9 ± 1.0
MAY	2.9 ± 1.1
JUN	3.3 ± 1.0
JUL	3.7 ± 1.1
AUG	4.2 ± 1.1
SEP	3.4 ± 1.4
OCT	3.2 ± 1.1
NOV	3.2 ± 1.1
DEC	2.5 ± 1.0
MEAN	3.4 ± 2.2

TABLE D-I.3 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	SAMPLING PERIOD	BE-7	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-228
16C2																
	JAN	2.0 ± 5.0	-13 ± 7	0.2 ± 0.5	0.0 0.5	0 ± 1	-0.2 ± 0.5	0.7 ± 1.1	-0.1 ± 1.0	0.2 ± 0.5	0.3 ± 0.6	0.3 ± 0.5	1 ± 2	0.1 ± 0.7	-10 ± 10	0 ± 1
	FEB	-1.0 ± 5.0	-11 ± 8	0.1 ± 0.5	-0.3 0.5	-1 ± 1	-0.1 ± 0.6	0.5 ± 1.1	-0.6 ± 1.0	-0.2 ± 0.5	-0.4 ± 0.5	0.4 ± 0.5	1 ± 2	-0.2 ± 0.6	-1 ± 12	1 ± 1
	MAR	2.0 ± 5.0	-7 ± 7	0.1 ± 0.5	0.0 0.5	1 ± 1	0.1 ± 0.5	0.5 ± 0.9	-0.1 ± 1.0	0.2 ± 0.5	0.2 ± 0.5	0.3 ± 0.6	1 ± 2	1.0 ± 0.7	-10 ± 10	1 ± 1
	APR	0.5 ± 4.4	-8 ± 6	0.0 ± 0.4	0.1 0.5	0 ± 1	0.3 ± 0.4	0.4 ± 0.9	0.3 ± 0.9	0.5 ± 0.5	-0.1 ± 0.4	0.5 ± 0.5	-1 ± 2	0.4 ± 1.0	-12 ± 10	-1 ± 1
	MAY	0.8 ± 4.7	-12 ± 8	0.5 ± 0.5	0.1 0.5	0 ± 1	-0.1 ± 0.5	-0.4 ± 1.0	-0.2 ± 1.0	0.3 ± 0.5	0.2 ± 0.5	-0.5 ± 0.5	0 ± 2	0.2 ± 0.7	-10 ± 10	1 ± 1
	JUN	0.8 ± 5.0	-4 ± 8	-0.1 ± 0.5	-0.3 0.5	0 ± 1	0.1 ± 0.5	0.0 ± 1.0	0.0 ± 1.0	0.3 ± 0.5	0.4 ± 0.5	-0.3 ± 0.6	0 ± 2	0.3 ± 0.9	-10 ± 10	0 ± 1
	JUL	0.2 ± 5.2	-14 ± 8	0.3 ± 0.5	0.4 0.5	0 ± 1	0.0 ± 0.5	0.5 ± 1.1	0.9 ± 1.1	0.4 ± 0.6	0.2 ± 0.5	0.3 ± 0.5	1 ± 2	0.2 ± 1.0	-20 ± 10	0 ± 1
	AUG	-2.0 ± 4.0	2 ± 6	0.2 ± 0.4	-0.4 0.4	0 ± 1	0.6 ± 0.4	0.6 ± 0.9	0.6 ± 0.9	0.1 ± 0.4	0.0 ± 0.4	0.2 ± 0.4	-1 ± 2	-0.6 ± 1.0	5 ± 9	2 ± 1
	SEP	3.0 ± 5.0	-26 ± 9	0.0 ± 0.5	-0.1 0.5	1 ± 1	-0.1 ± 0.5	0.1 ± 1.0	0.6 ± 1.1	0.5 ± 0.5	-0.4 ± 0.6	0.6 ± 0.5	3 ± 2	-0.5 ± 0.8	-7 ± 9	0 ± 1
	OCT	-20.0 ± 50.0	40 ± 80	1.0 ± 5.0	-2.0 5.0	0 ± 11	2.0 ± 5.0	-3.0 ± 10.0	-5.0 ± 10.0	5.0 ± 5.0	3.0 ± 5.0	-0.7 ± 5.2	9 ± 19	5.0 ± 8.0	-200 ± 100	10 ± 9
	NOV	1.0 ± 4.0	-19 ± 7	0.0 ± 0.4	0.0 0.4	0 ± 1	0.1 ± 0.4	0.0 ± 0.8	0.3 ± 0.8	0.2 ± 0.4	0.2 ± 0.4	0.0 ± 0.4	0 ± 1	0.2 ± 0.5	-10 ± 7	-2 ± 1
	DEC	-3.0 ± 5.0	12 ± 6	-0.2 ± 0.5	-0.3 0.5	0 ± 1	0.0 ± 0.5	-0.7 ± 1.2	1.0 ± [illegible]	0.4 ± 0.5	0.2 ± 0.5	0.3 ± 0.5	0 ± 2	0.4 ± 0.9	-10 ± 10	-2 ± 1
	MEAN	-1.3 ± 12.3	-5 ± 34	0.2 ± 0.6	-0.2 ± 1.2	0 ± 1	0.2 ± 1.2	-0.1 ± 2.0	-0.2 ± [illegible]	0.7 ± 2.8	0.3 ± 1.8	0.1 ± 0.8	1 ± 5	0.5 ± 2.9	-25 ± 111	1 ± 6

TABLE D-II.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

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

WEEK NO.	1152
01	19 ± 3
02	27 ± 4
03	17 ± 3
04	17 ± 3
05	23 ± 3
06	24 ± 4
07	15 ± 3
08	13 ± 3
09	22 ± 4
10	21 ± 3
11	19 ± 3
12	15 ± 3
13	21 ± 3
14	20 ± 3
15	18 ± 3
16	18 ± 3
17	17 ± 3
18	14 ± 3
19	6 ± 2
20	16 ± 3
21	13 ± 3
22	13 ± 3
23	12 ± 3
24	18 ± 3
25	10 ± 3
26	11 ± 3
27	15 ± 3
28	10 ± 3
29	18 ± 3
30	28 ± 4
31	13 ± 3
32	17 ± 4
33	17 ± 3
34	23 ± 4
35	(1)
36	24 ± 5
37	16 ± 3
38	23 ± 4
39	11 ± 3
40	13 ± 4
41	15 ± 3
42	13 ± 4
43	24 ± 4
44	20 ± 4
45	14 ± 3
46	12 ± 3
47	20 ± 3
48	12 ± 3
49	12 ± 4
50	9 ± 3
51	24 ± 4
52	24 ± 4
MEAN	17 ± 10

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE D-II.2 CONCENTRATION OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VINCINITY OF LIMERICK GENERATING STATION, 1996

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

STC COLLECTION PERIOD	BE-7	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226	TH-228
11S2															
1/2/96 - 4/1/96	95 ± 10	-1 ± 4	0.1 ± 0	0.1 ± 0	0 ± 0	0 ± 1	0 ± 1	0 ± 1	0 ± 0	0.0 ± 0	-0.1 ± 0	0 ± 1	0 ± 1	-3 ± 6	0 ± 1
4/1/96 - 7/1/96	72 ± 7	5 ± 7	0.0 ± 0	0.0 ± 0	0 ± 0	0 ± 1	0 ± 1	0 ± 1	0 ± 0	0.0 ± 0	0.0 ± 0	1 ± 2	0 ± 1	-5 ± 4	0 ± 0
7/1/96 - 10/1/96	70 ± 7	0 ± 4	0.1 ± 0	0.0 ± 0	0 ± 0	-1 ± 1	1 ± 1	0 ± 1	0 ± 0	-0.2 ± 0	0.1 ± 0	1 ± 2	-1 ± 1	-5 ± 4	-1 ± 0
10/1/96 - 12/30/96	43 ± 5	3 ± 7	-0.1 ± 0	0.1 ± 0	0 ± 0	-1 ± 1	0 ± 1	0 ± 1	0 ± 0	-0.3 ± 0	0.2 ± 0	0 ± 2	-1 ± 1	-1 ± 4	0 ± 0
MEAN	70 ± 43	2 ± 5	0.0 ± 0	0.0 ± 0	0 ± 0	-1 ± 1	0 ± 1	0 ± 1	0 ± 0	-0.1 ± 0	0.1 ± 0	0 ± 1	0 ± 1	-3 ± 4	0 ± 1

TABLE D-III.1 CONCENTRATION OF I-131 BY CHEMICAL SEPARATION AND GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VINCINITY OF LIMERICK GENERATING STATION, 1996

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	SAMPLING PERIOD	I-131	BE-7	K-40	MN-54	CO-58	FE-59	ZN-65	ZR-95	NB-95	CS-134	CS-137	RA-140	LA-140	RA-226	TH-228
19B1																
	1/16/96	-0.02 ± 0.08	1 ± 1	1500 ± 200	0.4 ± 1.9	-2.0 ± 2.0	2 ± 4	5 ± 4	2 ± 2	0.6 ± 0.6	0.8 ± 2.1	4.0 ± 2.0	1 ± 0.8	0.4 ± 2.1	-10 ± 30	4 ± 3
	4/9/96	0.09 ± 0.08	2 ± 2	1300 ± 200	1.0 ± 1.9	-0.6 ± 2.0	3 ± 4	0 ± 4	0 ± 0	1.0 ± 1.0	0.0 ± 2.1	1.0 ± 2.0	0 ± 0.0	0.1 ± 2.1	-10 ± 30	6 ± 3
	7/2/96	-0.01 ± 0.08	7 ± 7	1400 ± 200	0.3 ± 1.9	-0.4 ± 2.0	0 ± 4	-1 ± 4	3 ± 3	2.0 ± 2.0	-1.0 ± 2.1	0.1 ± 2.0	-3 ± -3.	-0.9 ± 2.1	-10 ± 30	-5 ± 3
	10/8/96	-0.11 ± 0.08	-5 ± -5	1500 ± 200	-0.7 ± 1.9	-2.0 ± 2.0	1 ± 4	6 ± 4	5 ± 5	2.0 ± 2.0	0.1 ± 2.1	3.0 ± 2.0	2 ± 2.0	0.1 ± 2.1	-40 ± 30	4 ± 3
	MEAN	-0.01 ± 0.15	1 ± 8.8	1425 ± 171	0.2 ± 1.3	-1.3 ± 1.6	1 ± 2	3 ± 6	3 ± 4	1.4 ± 1.3	0.0 ± 1.3	2.0 ± 3.2	0 ± 3.8	-0.1 ± 1.0	-18 ± 26.8	2 ± 9
21B1																
	1/16/96	0.04 ± 0.08	-8 ± -8	1500 ± 200	-1.0 ± 2.0	1.0 ± 2.0	2 ± 5	1 ± 6	4 ± 4	0.3 ± 0.3	2.0 ± 3.0	0.2 ± 2.7	-5 ± -5.	-0.7 ± 2.7	-30 ± 40	0 ± 4
	4/9/96	0.06 ± 0.08	9 ± 9	1400 ± 200	0.3 ± 2.0	0.0 ± 2.0	3 ± 5	-2 ± 6	2 ± 2	1.0 ± 1.0	-0.7 ± 3.0	1.0 ± 2.7	3 ± 3.0	0.7 ± 2.7	10 ± 40	0 ± 4
	7/2/96	0.12 ± 0.08	2 ± 2	1300 ± 200	1.0 ± 2.0	2.0 ± 2.0	0 ± 5	2 ± 6	-7 ± -7	1.0 ± 1.0	0.3 ± 3.0	-0.3 ± 2.7	3 ± 3.0	-3.0 ± 2.7	-30 ± 40	-19 ± 4
	10/8/96	0.00 ± 0.08	-4 ± -4	1400 ± 200	0.8 ± 2.0	0.2 ± 2.0	0 ± 5	7 ± 6	2 ± 2	0.3 ± 0.3	-0.4 ± 3.0	0.6 ± 2.7	3 ± 3.0	-0.2 ± 2.7	20 ± 40	2 ± 4
	MEAN	0.06 ± 0.09	0 ± 13.	1400 ± 146	0.3 ± 1.6	0.8 ± 1.6	1 ± 3	2 ± 7	0 ± 9	0.7 ± 0.7	0.3 ± 2.2	0.4 ± 1.0	1 ± 7.2	-0.8 ± 2.8	-8 ± 47.0	-4 ± 18
22F1																
	1/16/96	0.01 ± 0.10	-5 ± -5	1400 ± 100	0.5 ± 1.7	0.1 ± 1.7	0 ± 4	-1 ± 4	1 ± 1	2.0 ± 2.0	0.2 ± 1.9	2.0 ± 2.0	3 ± 3.0	-0.7 ± 1.8	-5 ± 40	3 ± 3
	4/9/96	0.03 ± 0.10	-4 ± -4	1400 ± 100	1.0 ± 1.7	-0.7 ± 1.7	3 ± 4	7 ± 4	3 ± 3	2.0 ± 2.0	-2.0 ± 1.9	2.0 ± 2.0	-1 ± -0.	0.6 ± 1.8	± 40	1 ± 3
	MEAN	0.02 ± 0.02	-5 ± 1.2	1400 ± 0	0.8 ± 0.6	-0.3 ± 0.9	2 ± 3	3 ± 9	2 ± 2	2.0 ± 0.0	-0.9 ± 2.5	2.0 ± 0.0	1 ± 4.2	0.0 ± 1.5	-18 ± 28.9	2 ± 3
9G1																
	7/2/96	0.07 ± 0.13	-2 ± -2	1400 ± 100	0.3 ± 1.7	-0.7 ± 1.7	-1 ± 4	3 ± 4	1 ± 1	0.8 ± 0.8	-0.4 ± 1.8	0.3 ± 1.9	4 ± 4.0	0.1 ± 2.6	-30 ± 30	3 ± 3
	10/8/96	0.09 ± 0.13	-2 ± -2	1400 ± 100	0.6 ± 1.7	-2.0 ± 1.7	0 ± 4	6 ± 4	2 ± 2	1.0 ± 1.0	-0.3 ± 1.8	1.0 ± 1.9	2 ± 2.0	0.7 ± 2.6	-60 ± 30	-11 ± 3
	MEAN	0.08 ± 0.01	-2 ± 0.0	1400 ± 0	0.5 ± 0.3	-1.4 ± 1.5	0 ± 2	5 ± 3	1 ± 1	0.9 ± 0.2	-0.3 ± 0.1	0.6 ± 0.8	3 ± 2.3	0.4 ± 0.7	-45 ± 34.6	-4 ± 16

TABLE D-IV.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 1996

DRINKING WATER (GROSS BETA & GAMMA SPECTROSCOPY)

SAMPLING PERIOD	16C2		
JAN	1/2/96	-	1/29/96
FEB	1/29/96	-	2/26/96
MAR	2/26/96	-	3/25/96
APR	3/25/96	-	4/29/96
MAY	4/29/96	-	6/3/96
JUN	6/3/96	-	7/1/96
JUL	7/1/96	-	7/29/96
AUG	7/29/96	-	9/2/96
SEP	9/2/96	-	9/30/96
OCT	9/30/96	-	10/28/96
NOV	10/28/96	-	12/2/96
DEC	12/2/96	-	12/30/96

AIR PARTICULATE (GAMMA SPECTROSCOPY)

SAMPLING PERIOD	11S1		
JAN-MAR	1/2/96	-	4/1/96
APR-JUN	4/1/96	-	7/1/96
JUL-SEP	7/1/96	-	10/1/96
OCT-DEC	10/1/96	-	12/30/96

AIR PARTICULATE (GROSS BETA)

SAMPLING PERIOD	11S1					
1	1/2/96	-	1/9/96	27	7/1/96	- 7/8/96
2	1/8/96	-	1/15/96	28	7/8/96	- 7/15/96
3	1/15/96	-	1/22/96	29	7/15/96	- 7/22/96
4	1/22/96	-	1/29/96	30	7/22/96	- 7/29/96
5	1/29/96	-	2/5/96	31	7/29/96	- 8/5/96
6	2/5/96	-	2/12/96	32	8/5/96	- 8/12/96
7	2/12/96	-	2/19/96	33	8/12/96	- 8/19/96
8	2/19/96	-	2/26/96	34	8/19/96	- 8/26/96
9	2/26/96	-	3/4/96	35		
10	3/4/96	-	3/11/96	36	9/4/96	- 9/9/96
11	3/11/96	-	3/18/96	37	9/9/96	- 9/16/96
12	3/18/96	-	3/25/96	38	9/16/96	- 9/23/96
13	3/25/96	-	4/1/96	39	9/23/96	- 10/1/96
14	4/1/96	-	4/8/96	40	10/1/96	- 10/7/96
15	4/8/96	-	4/15/96	41	10/7/96	- 10/15/96
16	4/15/96	-	4/22/96	42	10/15/96	- 10/21/96
17	4/22/96	-	4/29/96	43	10/21/96	- 10/28/96
18	4/29/96	-	5/6/96	44	10/28/96	- 11/4/96
19	5/6/96	-	5/13/96	45	11/4/96	- 11/11/96
20	5/13/96	-	5/20/96	46	11/11/96	- 11/18/96
21	5/20/96	-	5/28/96	47	11/18/96	- 11/25/96
22	5/28/96	-	6/3/96	48	11/25/96	- 12/3/96
23	6/3/96	-	6/10/96	49	12/3/96	- 12/9/96
24	6/10/96	-	6/17/96	50	12/9/96	- 12/16/96
25	6/17/96	-	6/24/96	51	12/16/96	- 12/23/96
26	6/24/96	-	7/1/96	52	12/23/96	- 12/30/96

FIGURE D-1
COMPARISON OF MONTHLY INSOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES SPLIT BETWEEN GPU AND TBE, 1996

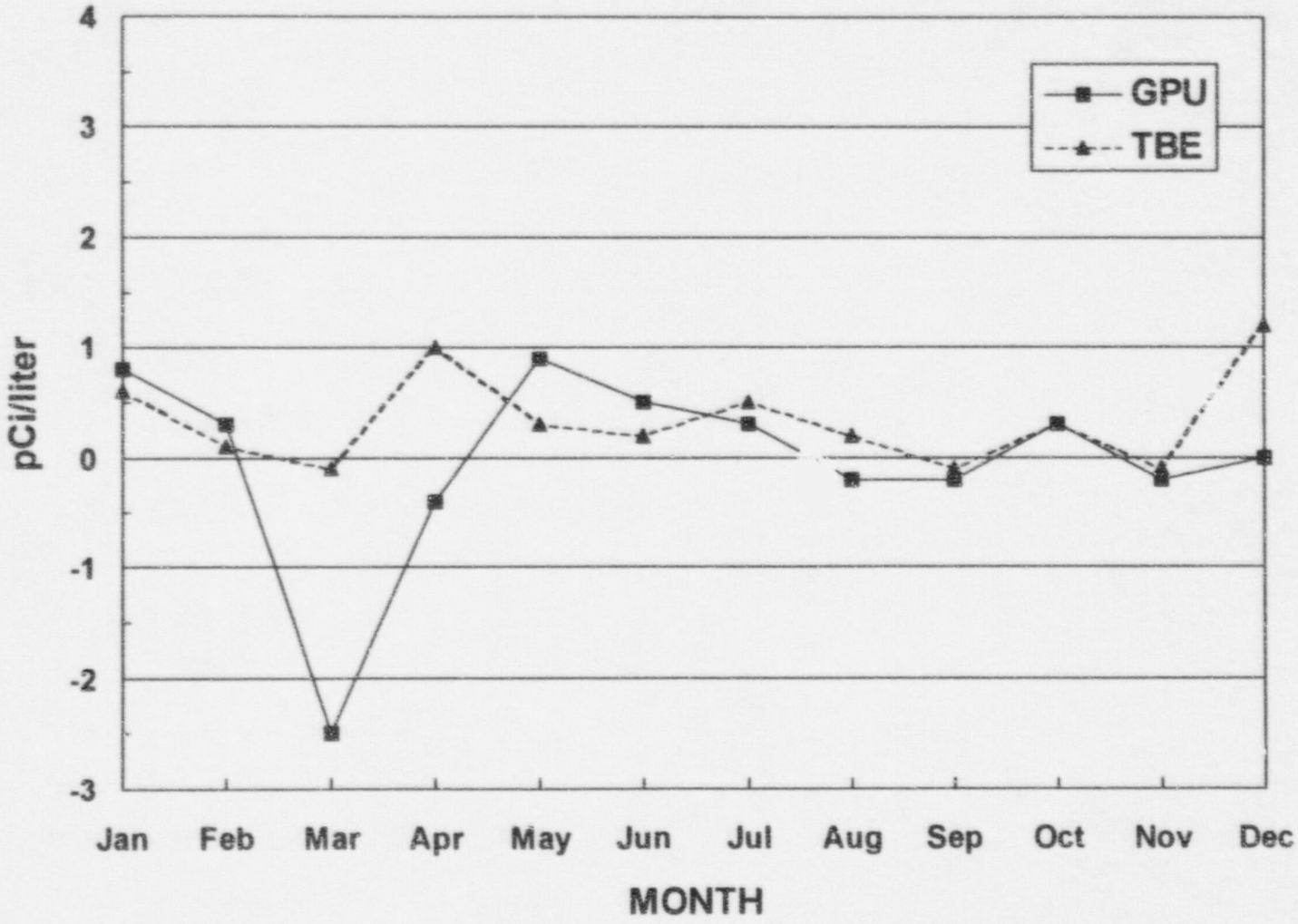


FIGURE D-2
COMPARISON OF MONTHLY SOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES SPLIT BETWEEN GPU AND TBE, 1996

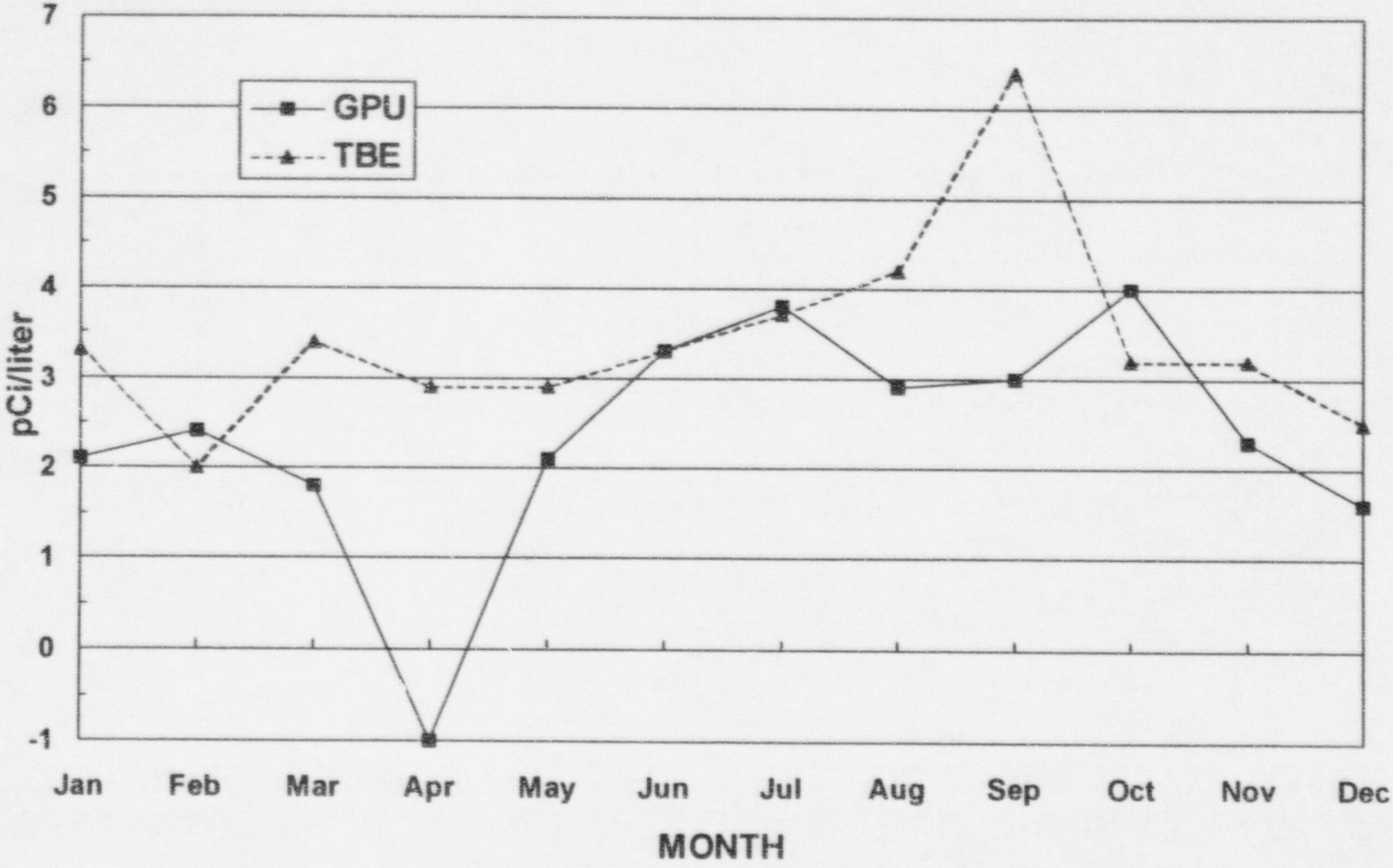
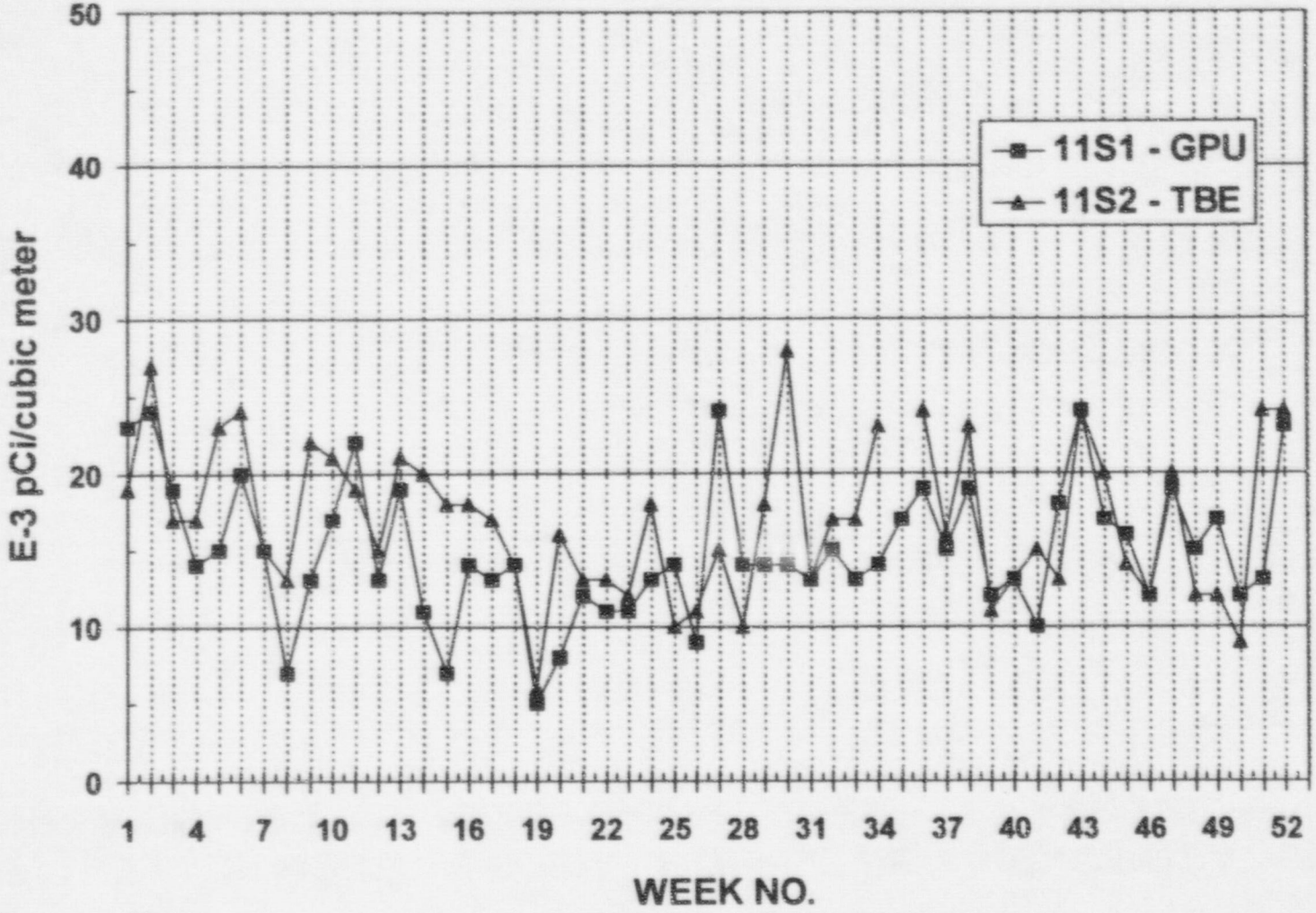


FIGURE D-3
COMPARISON OF WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED FROM LGS CO-LOCATED LOCATIONS 11S1 AND 11S2, 1996



APPENDIX E

SYNOPSIS OF ANALYTICAL PROCEDURES

APPENDIX E: SYNOPSIS OF ANALYTICAL PROCEDURES

The following section contains a description of the analytical laboratory procedures along with an explanation of the analytical calculation methods used by GPU Nuclear and Teledyne Brown Engineering to obtain the sample activities.

DETERMINATION OF GROSS BETA ACTIVITY IN WATER SAMPLES
(TOTAL SUSPENDED AND DISSOLVED FRACTIONS)

GPUN Environmental Radioactivity Laboratory

This describes the process used to measure the radioactivity of water samples without identifying the radioactive species present. No chemical separation techniques are involved.

For surface and drinking water samples, 400 ml of the sample is filtered under vacuum through a 0.45 micron filter. This filter represents the insoluble portion of the sample. The filter is dried and mounted on a planchet. The filtrate which represents the soluble portion of the sample is evaporated on a hot plate, and the residue is transferred and dried on another planchet.

The planchets are counted for 100 minutes in a low-background gas flow proportional counter. Calculation of activity includes a self-absorption correction for counter efficiency based on the weight of residue on each planchet.

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$R = \frac{C - B}{2.22x\,E_0\,xTFxVxT}$$

$$2s = \frac{2x\sqrt{C + B}}{2.22x\,E_0\,xTFxVxT}$$

$$LLD = \frac{4.66x\sqrt{B}}{2.22x\,E_0\,xTFxVxT}$$

Where:

R	=	Activity of sample in picocuries per unit volume or weight. Volume or weight units are those used for V.
2s	=	2 Sigma Counting Uncertainty
LLD	=	Lower Limit of Detection
C	=	Sample Counts
B	=	Blank Counts
E_0	=	Efficiency of the counter
TF	=	Transmission Factor
T	=	Acquisition time in minutes
V	=	Volume or weight of aliquot analyzed.

DETERMINATION OF GROSS BETA ACTIVITY IN WATER SAMPLES
(TOTAL SUSPENDED AND DISSOLVED FRACTIONS)

Teledyne Brown Engineering

This describes the process used to measure the radioactivity of water samples without identifying the radioactive species present. No chemical separation techniques are involved.

For surface and drinking water samples, one liter of the sample is filtered under vacuum through a 0.45 micron Millipore filter. This filter represents the insoluble portion of the sample. The filter is dried and mounted on a planchet. The filter which represents the soluble portion of the sample is evaporated on a hot plate, and the residue is transferred and dried on another planchet.

The planchets are counted for 50 minutes in a low-background gas flow proportional counter. Calculation of activity includes a self-absorption correction for counter efficiency based on the weight of residue on each planchet.

Calculation of Sample Activity and 2 Sigma Error:

$$\frac{Result}{(pCi/l)} = \frac{\frac{N}{t_s} - \beta}{(2.22)(v)(E)} \pm \frac{2\sqrt{\frac{N}{t_s^2} + \frac{\beta}{t_b}}}{(2.22)(v)(E)}$$

Net Activity Counting Error

where:

N	=	total counts from sample (counts)
t_s	=	counting time for sample (min)
ß	=	background rate of counter (cpm)
t_b	=	counting time for background (min)
2.22	=	dpm/pCi
v	=	volume in liters
E	=	efficiency of the counter
2	=	multiple of counting error

The MDA is defined as that value equal to the two sigma counting error of the result.

DETERMINATION OF TRITIUM IN WATER BY
LIQUID SCINTILLATION COUNTING

GPUN Environmental Radioactivity Laboratory

Seven (7) milliliters of sample is filtered through a 0.45 micron filter into a vial and mixed with 15 ml of liquid scintillation material and counted for a minimum of 480 minutes to determine its activity. The tritium activity is determined by measuring the count rate in the beta activity energy spectrum in Region A. 20.0 to 2000 represents Region C. If the sample Region C cpm is within ± 25% of the average background Region C cpm and the sample Quench Indicating Parameter (QIP) is within 20 of the H-3 source QIP the sample has no contamination and the tritium activity may be calculated directly. If not the sample must be purified before recounting.

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$R = \frac{C - B}{2.22x\ E_0 x V x DF}$$

$$2s = \frac{2x\sqrt{\frac{C}{T_a} + \frac{\beta}{T_b}}}{2.22x\ E_0 x V x DF}$$

$$LLD = \frac{3.29x\sqrt{\frac{\beta}{T_a} + \frac{\beta}{T_b}}}{2.22x\ E_0 x V x DF}$$

Where:

T_a	=	Total count time of sample in minutes
T_b	=	Total count time of background in minutes
R	=	Tritium activity in picoCuries per unit volume (Volume units are those used in V)
2s	=	2 sigma Uncertainty in the same units as above
LLD	=	Lower limit of detection in same units as above
C	=	Average count rate of sample
ß	=	Average count rate of background
E_0	=	Tritium detection efficiency of counter, calculated as shown below
V	=	Volume of aliquot
DF	=	Decay factor, calculated as shown below

$$DF = e^{\frac{-\ln 2xDT}{12.43}}$$

DT = time difference in years from collection stop date to counting date of sample

The efficiency is calculated as follows:

$$E_0 = \frac{S - B}{AsxVsxDFs}$$

Where:

S = Average count rate for the "efficiency determination" standard
B = Average count rate of background
As = Activity of standard in dpm per unit volume
Vs = Volume of standard used
DFs = Decay factor of standard, calculated as follows:

$$DFs = e^{\frac{-\ln 2 x DTs}{12.43}}$$

DTs = time difference (in years) between calibration date and counting date

DETERMINATION OF GROSS BETA ACTIVITY IN AIR PARTICULATE SAMPLES

GPUN Environmental Radioactivity Laboratory

After allowing at least a three-day (extending from the sample stop date to the sample count time) period for the short-lived radionuclides to decay out, each air particulate filter paper is placed in a 2-inch diameter stainless steel planchet and counted using a gas flow proportional counter.

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$R = \frac{C - B}{2.22x\,E_0\,xTFxVxT}$$

$$2s = \frac{2x\sqrt{C + B}}{2.22x\,E_0\,xTFxVxT}$$

$$LLD = \frac{4.66x\sqrt{B}}{2.22x\,E_0\,xTFxVxT}$$

Where

R	=	Activity of sample in picoCuries per unit volume or weight. Volume or weight units are those used for V.
2s	=	2 Sigma Counting Uncertainty
LLD	=	Lower Limit of Detection
C	=	Sample Counts
B	=	Blank Counts
E_0	=	Efficiency of the counter
TF	=	Transmission Factor of filter (i.e. 1.00 for gross beta, 0.80 for gross alpha)
T	=	Acquisition time in minutes
V	=	Volume analyzed.

DETERMINATION OF GROSS BETA ACTIVITY IN AIR PARTICULATE SAMPLES

Teledyne Brown Engineering

This describes the process used to measure the overall beta activity of air particulate filters without identifying the radioactive species present. No chemical separation techniques are involved. Each air particulate filter is placed directly on a 2-inch stainless steel planchet. The planchets are then counted for beta activity in a low-background gas flow proportional counter. Calculation of activity includes an empirical self-absorption correction curve which allows for the change in effective counting efficiency caused by the residue mass. Self-absorption is not considered in the case of air particulate filters because of the impracticality of accurately weighing the deposit and because the penetration depth of the deposit into the filter is unknown.

Calculation of Sample Activity and 2 Sigma Error:

$$\frac{Result}{(pCi/m^3)} = \frac{\frac{N}{t_s} - \beta}{2.22(v)(E)(.02832)} \pm \frac{2\sqrt{\frac{N}{t_s^2} + \frac{\beta}{t_b}}}{2.22(v)(E)(.02832)}$$

Net Activity Counting Error

where:

N	=	total counts from sample (counts)
t_s	=	counting time for sample (min)
ß	=	background rate of counter (cpm)
t_b	=	counting time for background (min)
2.22	=	dpm/pCi
v	=	volume of sample analyzed in cubic feet calculated from the elapsed time meter
E	=	efficiency of the counter
2	=	multiple of counting error
.02832	=	conversion to cubic meters

The MDA is defined as that value equal to the two sigma counting error of the result.

DETERMINATION OF I-131 IN MILK SAMPLES

GPUN Environmental Radioactivity Laboratory

Stable iodine carrier is equilibrated in a 3.5-liter volume of raw milk before pumping through 25cc of anion exchange resin to extract iodine. The system is washed with de-ionized water until clear and the washed resin is transferred to a gamma counting container and analyzed by gamma spectroscopy.

Calculation of Sample Activity and 2 Sigma Uncertainty:

The same calculations are used as in DETERMINATION OF GAMMA EMITTING RADIOISOTOPES below.

DETERMINATION OF I-131 IN MILK SAMPLES

Teledyne Brown Engineering

Two liters of sample are first equilibrated with stable iodide carrier. A batch treatment with anion exchange resin is used to remove iodide from the sample. The iodine is then stripped from the resin with sodium hypochlorite, reduced with hydroxylamine hydrochloride, and extracted into carbon tetrachloride as free iodine. It is then back-extracted as iodide into sodium bisulfite solution and is precipitated as palladium iodide. The precipitate is weighed for chemical yield and is mounted on a nylon planchet for low level beta counting. The chemical yield is corrected by measuring the stable iodide content of the milk or water with a specific ion electrode.

Calculation of the Sample Activity and 2 Sigma Error:

$$\frac{Result}{(pCi/l)} = \frac{\frac{N}{t_s} - \beta}{(2.22)(v)(E)(y)(\exp^{-\lambda\Delta t})} \pm \frac{2\sqrt{\frac{N}{t_s^2} + \frac{\beta}{t_b}}}{(2.22)(v)(E)(y)(\exp^{-\lambda\Delta t})}$$

Net Activity Counting Error

where:

N	=	total counts from sample (counts)
t_s	=	counting time for sample (min)
ß	=	background rate of counter (cpm)
t_b	=	counting time for background (min)
2.22	=	dpm/pCi
v	=	volume of sample analyzed (liters)
y	=	chemical yield of the amount of sample counted
λ	=	is the radioactive decay constant for I-131 (0.693/8.05)
Δt	=	is the elapsed time between sample collection (or end of the sample collection) to the midcount time
2	=	multiple of the counting error
E	=	efficiency of the counter for I-131, corrected for self absorption effects by the formula:

$$E = E_s \frac{(\exp^{-0.006lM})}{(\exp^{-0.006lM_s})}$$

where:

E_s	=	efficiency of the counter determined from an I-131 standard mount
M	=	mass of PdI_2 on the sample mount (mg)
M_s	=	mass of PdI_2 on the standard mount (mg)

The MDA is defined as that value equal to the two sigma counting error of the result.

DETERMINATION OF GAMMA EMITTING RADIOISOTOPES

GPUN Environmental Radioactivity Laboratory

The procedure for detection of gamma emitting radioisotopes generates high resolution gamma spectra which are used for quantitative determination and identification. Standard geometries have been established to maximize efficiency for sample types: air particulate filters, water, milk, soil/sediment and food products.

A description of the analytical methods, beginning with air particulates used for each sample type is presented, followed by the general formula used for calculation of the sample activities.

Air particulate: At the end of each calendar quarter, 13 (or 14) weekly air filters from the given location are stacked in a two inch diameter Petri dish in chronological order, with the oldest filter at the bottom, nearest the detector, and the newest one on top. The Petri dish is closed and the sample counted.

Water and Milk: A well-mixed 3.5-liter sample is poured into a Marinelli beaker. The samples are brought to ambient temperature and counted.

Soil and Sediment: The sample is dried, sieved and put into a counting container and counted.

Food products: The sample is chopped up and put into a counting container and counted.

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$A = \frac{P}{2.22xqx\varepsilon xbx\,E_L} x\, e^{\lambda T_s} x \frac{\lambda E_R}{(1-e^{-\lambda E_R})}$$

where:

A	=	the computed specific activity
P	=	peak area
2.22	=	dpm/picoCuries
q	=	sample quantity
ε	=	detection efficiency
b	=	gamma-ray abundance
E_L	=	elapsed live time
λ	=	decay constant
T_S	=	acquisition start time
E_R	=	elapsed real time

$$\Delta A = A\sqrt{\left(\frac{\Delta P}{P}\right)^2 + \left(\frac{\Delta b}{b}\right)^2\left(\frac{\Delta \varepsilon}{\varepsilon}\right)^2\left(\frac{sys}{100}\right)^2 (\Delta Decay)^2}$$

where: ΔA = uncertainty in the activity

$$\Delta Decay = \frac{\Delta T_{1/2}}{T_{1/2}} x\left(\frac{\lambda E_R}{1 - e^{-\lambda E_R}} - \lambda(T_S + E_R) - 1\right)$$

ΔP = uncertainty in the peak area P
Δb = uncertainty in the **S**-ray abundance
$\Delta \varepsilon$ = uncertainty in the efficiency
sys = systematic Uncertainty estimate (in %)
ΔT ½ = uncertainty in the half-life

DETERMINATION OF GAMMA EMITTING RADIOISOTOPES

Teledyne Brown Engineering

Gamma emitting radioisotopes are determined with the use of a lithium drifted germanium (GeLi) and high purity germanium detectors with high resolution spectrometry in specific media; such as, air particulate filters, charcoal filters, milk and water. Each sample to be assayed is prepared and counted in standard geometries such as one liter wrap-around Marinelli containers, 300 ml or 150 ml bottles, or 2-inch filter paper source geometries.

Samples are counted on large (>55 cc volume) GeLi detectors connected to Nuclear Data 6620 data acquisition and computation systems. All resultant spectra are stored on magnetic tape.

The analysis of each sample consists of calculating the specific activities of all detected radionuclides or the detection limits from a standard list of nuclides. The GeLi systems are calibrated for each standard geometry using certified radionuclides standards traceable to the National Bureau of Standards.

Gamma Spectroscopy Statistically Significant Activity and 2 Sigma Error Calculation for the ND6620 and ND6700 Systems:

$$\frac{Activity}{\left(\frac{pCi}{unit\ mass}\right)} = \frac{AREA * DECAY}{LIVETIME(\text{sec.}) * ABN * EFF * 0.037 * (unit\ mass)}$$

Statistically Significant Activity

$$\pm\ 200 * \frac{\sqrt{2 * BKGND + AREA}}{AREA} * Activity$$

2 Sigma Counting Error

Where:

AREA	=	Net Peak Area (from Nuclide Line Activity Report)
BKGND	=	Compton Background (from Nuclide Line Activity Report
DECAY	=	Decay Correction Factor (from Minimum Detectable Activity Report) (Nuclide Half Life - Collection time to Mid Count time)
LIVE TIME	=	Elapsed Live Time (from Header Information)
ABN	=	Nuclide Abundance (from Nuclide Line Activity Report)
EFF	=	Detector Efficiency (from Nuclide Line Activity Report)
0.037	=	Conversion Factor (dps to picoCuries)
unit mass	=	Sample weight or volume (from Header Information)

Gamma Spectroscopy Statistically Non Significant Activity and 2 Sigma Error Calculation for the ND6620 and ND6700 Systems:

$$\frac{Activity}{\left(\frac{pCi}{unit\ mass}\right)} = \frac{AREA * DECAY}{LIVETIME(sec.) * ABN * EFF * 0.037 * (unit\ mass)}$$

Statistically Non Significant Activity

$$\pm\ 200 * \frac{\sqrt{2 * BKGND + NET}}{NET} * Net\ Activity$$

2 Sigma Counting Error

where:

NET	=	Net Peak Area (from Minimum Detectable Activity Report)
BKGND	=	Compton Background (from Nuclide Line Activity Report)
DECAY	=	Decay Correction Factor (from Minimum Detectable Activity Report) (Nuclide Half Life - Collection time to Mid Count time)
LIVE TIME	=	Elapsed Live Time (from Header Information)
(EFF*B.I)	=	Efficiency * Abundance (from Minimum Detectable Activity Report)
0.037	=	Conversion Factor (dps to picoCuries)
unit mass	=	Sample weight or volume (from Header Information)

Gamma Spectroscopy Minimum Detectable Activity Calculation for the ND6620 and ND6700 Systems:

$$\frac{MDA}{\left(\frac{pCi}{unit\ mass}\right)} = \frac{2.83\sqrt{BKGN} * DECAY}{LIVETIME(\text{sec.}) * (EFF * B.I.) * 0.037 * (unit\ mass)}$$

where:

BKGN	=	Total Peak Background Area (from Minimum Detectable Activity Report)
DECAY	=	Decay Correction Factor (from Minimum Detectable Activity Report) (Nuclide Half Life - Collection time to Mid Count time)
LIVE TIME	=	Elapsed Live Time (from Header Information)
(EFF*B.I)	=	Efficiency * Abundance (from Minimum Detectable Activity Report)
0.037	=	Conversion Factor (dps to picoCuries)
unit mass	=	Sample weight or volume (from Header Information)

GPUN Environmental Radioactivity Laboratory

GPU Nuclear thermoluminescent dosimeters (TLDS) are Panasonic Type 801 AS badges, two of which are deployed at each station. Each badge contains two calcium sulfate and two lithium borate elements. Since each element responds to radiation independently, this provides eight independent detectors at each station. The calcium sulfate elements are shielded with a thin layer of lead, which makes the response to different energies of gama radiation more linear. The lead also shields the calcium sulfate elements from beta radiation, so that they respond to gamma radiation only. The two lithium borate elements are shielded differently to permit the detection of beta radiation. Only the calcium sulfate elements normally are used for environmental monitoring; however, the lithium borate elements can be used to evaluate beta exposures or as a backup to the calcium sulfate elements should more data be required.

TLDs are annealed and read using a Panasonic UD701 A TLD Reader equipped with glow curve capture capability. A reader alignment is performed monthly using TLDs irradiated to a known exposure. Run Correction Factors (RCF) are inserted in each read batch to correct for small drifts in reader calibration. An Element Correction Factor (ECF) is generated for each element before a new TLD badge is placed into service to standardize each element to a known exposure. The ECF for each element is updated every two years. Each calcium sulfate element is annealed to a total residual exposure of less than 0.5 mR prior to being issued each time that a badge is used.

Control (transit) badges are issued with every batch of field TLDs and accompany the badges into the field to quantify transit exposure. After the field badges are deployed, the control badges are kept in a lead shield with minimum 2" thick lead during the period of field exposure. Additional control badges are kept in a lead shield for the entire quarter, and receive essentially no transit exposure. All control and field badges are read together at the end of each quarter, and the average field control badge exposure is subtracted from the average shield control badge exposure to generate the transit exposure. The transit exposure (generally less than 1 mR total) is subtracted from the gross exposures on the field badges to yield the net exposures. Net exposures are then converted to mR per standard month. This method of calculating transit exposure conforms to guidance contained in ANSI N545.

Each station comprises two TLD badges, each of which has two calcium sulfate elements. Outliers are identified using predefined algorithms. If all four elements are available, a given exposure value is judged an outlier if the standard deviation exceeds 5% of the mean exposure based on all four elements, and the exposure for one element is outside three standard deviations of the mean exposure based on the other three elements. If only two elements are available, the relative standard deviation based on the two exposure values must be 12% or less, or else both exposure values are considered outliers and no valid data are reported for that station for that Quarter.

APPENDIX F

QUALITY CONTROL
EPA INTER-LABORATORY COMPARISON PROGRAM

APPENDIX F: QUALITY CONTROL PROGRAM

GPU Nuclear (GPU) and Teledyne Brown Engineering (TBE) participate in the EPA Radiological Comparison (cross check) Program. This participation was limited to analyses of water samples due to budget reductions within EPA. To supplement this program both laboratories contracted with an independent vendor Analytics to provide additional media for analysis. The results of these two Inter-laboratory programs represent the various media as found in the Limerick Generating Station REMP. As a result of this participation, an objective measurement of analytical precision and accuracy as well as, a bias estimation of the results are obtained.

Examination of the data shows that the vast majority were within the EPA or Analytics control limits. Each case of exceeding the control limits was investigated. There was no evidence to suggest systematic errors.

The results of GPU's and TBE's participation in the EPA and Analytics cross check program can be found in Tables F-1, F-2 and F-3.

TABLE F-1

1996 USEPA Cross-Check Program Results - 1996

GPU NUCLEAR AND TELEDYNE BROWN ENGINEERING

Collection Date	Media	Nuclide	EPA Results (A)	GPUN-ERL Results (B)	Teledyne Brown Eng. Results (B)
01/23/96	Water	Sr-89	73.0 ± 8.7	75.33 ± 1.53	73.67 ± 3.21
		Sr-90	5.0 ± 8.7	8.33 ± 0.58	5.00 ± 0.00
01/26/96	Water	Alpha	12.1 ± 8.7	14.00 ± 1.00	19.00 ± 1.00
		Beta	7.0 ± 8.7	8.47 ± 1.15	7.13 ± 0.21
02/02/96	Water	I-131	67.0 ± 12.1	70.00 ± 1.00	71.67 ± 3.06
03/08/96	Water	H-3	22002.0 ± 3816.9	22000.00 ± 0.00	22000.00 ± 0.00
04/16/96	Water	Alpha	74.8 ± 32.4	69.33 ± 2.52	63.67 ± 2.89
		Beta	166.9 ± 43.4	156.67 ± 5.77	160.00 ± 0.00
		Co-60	31.0 ± 8.7	31.33 ± 2.08	31.67 ± 1.15
		Sr-89	43.0 ± 8.7	45.00 ± 1.00	41.33 ± 2.31
		Sr-90	16.0 ± 8.7	16.67 ± 1.15	15.33 ± 0.58
		Cs-134	46.0 ± 8.7	42.00 ± 1.73	42.33 ± 1.53
		Cs-137	50.0 ± 8.7	51.67 ± 1.53	52.33 ± 1.53
06/07/96	Water	Co-60	99.0 ± 8.7	98.67 ± 1.53	99.00 ± 1.73
		Zn-65	300.0 ± 52.0	326.67 ± 5.77	309.33 ± 2.08
		Ba-133	745.0 ± 130.1	770.00 ± 0.00	711.00 ± 71.42
		Cs-134	79.0 ± 8.7	75.33 ± 0.58	69.67 ± 1.53 (C)
		Cs-137	197.0 ± 17.3	206.67 ± 5.77	202.00 ± 2.65
07/12/96	Water	Sr-89	25.0 ± 8.7	30.33 ± 1.53	22.67 ± 1.53
		Sr-90	12.0 ± 8.7	10.33 ± 0.58	12.33 ± 1.15
07/19/96	Water	Alpha	24.4 ± 10.6	23.67 ± 0.58	22.67 ± 0.58
		Beta	44.8 ± 8.7	48.00 ± 3.00	45.33 ± 2.08
08/09/96	Water	H-3	10879.0 ± 1887.6	11000.00 ± 0.00	9800.00 ± 346.41
10/04/96	Water	I-131	27.0 ± 10.4	32.00 ± 3.00	26.33 ± 2.31

TABLE F-1

1996 USEPA Cross-Check Program Results - 1996

GPU NUCLEAR AND TELEDYNE BROWN ENGINEERING

Collection Date	Media	Nuclide	EPA Results (A)	GPUN-ERL Results (B)	Teledyne Brown Eng. Results (B)
10/15/96	Water	Alpha	59.1 ± 25.7	59.33 ± 4.16	55.67 ± 5.03
		Beta	111.8 ± 29.1	106.67 ± 5.77	110.00 ± 0.00
		Co-60	15.0 ± 8.7	15.33 ± 0.58	14.67 ± 1.53
		Sr-89	10.0 ± 8.7	18.00 ± 3.61	9.00 ± 0.00
		Sr-90	25.0 ± 8.7	16.00 ± 1.00 (D)	26.00 ± 1.00
		Cs-134	20.0 ± 8.7	19.33 ± 0.58	19.67 ± 1.15
		Cs-137	30.0 ± 8.7	31.33 ± 0.58	29.33 ± 1.15
10/25/96	Water	Alpha	10.3 ± 8.7	8.43 ± 2.23	9.03 ± 0.72
		Beta	34.6 ± 8.7	35.33 ± 1.53	39.67 ± 0.58
11/8/96	Water	Co-60	44.0 ± 8.7	45.67 ± 0.58	44.67 ± 0.58
		Zn-65	35.0 ± 8.7	37.67 ± 2.08	38.67 ± 0.58
		Ba-133	64.0 ± 10.4	9467 ± 0.00	66.00 ± 0.00
		Cs-134	11.0 ± 8.7	11.67 ± 0.58	12.00 ± 0.00
		Cs-137	19.0 ± 8.7	21.00 ± 1.00	20.67 ± 1.15

A. EPA Results - Expected Laboratory precision (control limit, ± 3 sigma, n = 3). Units are pCi/L.

B. Results - Average ± one standard deviation. Units are pCi/L.

C. The TBE Cs-134 result is below the control limit. To verify the cause for the deviation, a Cs-134 standard has been purchased. If the Cs-134 efficiency is lower than the efficiency at 604 Kev and 795 Kev, then rather than change those efficiencies (which may be needed for other isotopes of comparable energies), the Cs-134 branching intensity shall be adjusted.

D. The ERL Sr-90 result is below the control limit. Upon investigation it was found that the background count rate was 2.47 cpm. This was outside of the instrument background control limit and should not have been used. The sample holders are now being kept clean to prevent reoccurrence.

Criteria is listed in EPA 600/4-81-004

TABLE F-2
1996 ANALYTICS Cross-Check Program Results
GPU NUCLEAR

Collection Date	Media	Nuclide	ANALYTICS Value (A)	Uncertainty (3 Sigma)	Uncertainty (1 Sigma)	Resolution	GPU Value (B)	Ratio	Min Ratio	Max Ratio	Agreement	
3/12/96	Filter	Alpha	12	1	0.3	36.0	10	0.83	0.75	1.33	Yes	
		Beta	85	4	1.3	63.8	74	0.87	0.8	1.25	Yes	
3/12/96	Filter	Ce-141	194	10	3.3	58.2	210	1.08	0.8	1.25	Yes	
		Cr-51	719	36	12.0	59.9	760	1.06	0.8	1.25	Yes	
		Cs-134	128	6	2.0	64.0	120	0.94	0.8	1.25	Yes	
		Cs-137	141	7	2.3	60.4	150	1.06	0.8	1.25	Yes	
		Co-58	106	5	1.7	63.6	110	1.04	0.8	1.25	Yes	
		Mn-54	70	3	1.0	70.0	75	1.07	0.8	1.25	Yes	
		Fe-59	186	9	3.0	62.0	210	1.13	0.8	1.25	Yes	
		Zn-65	215	11	3.7	58.6	230	1.07	0.8	1.25	Yes	
		Co-60	169	8	2.7	63.4	180	1.07	0.8	1.25	Yes	
3/12/96	Cartridge	I-131	92	5	1.7	55.2	91	0.99	0.8	1.25	Yes	
3/12/96	Filter	Sr-90	36	2	0.7	54.0	26	0.72	0.8	1.25	No	Yes "B" Agreement (1 result see Note D)
3/12/96	Milk	Ce-141	234	12	4.0	58.5	170	0.73	0.8	1.25	No	Out of Range
		Ce-141*	234	12	4.0	58.5	240	1.03	0.8	1.25	Yes	* Corrected Results (see Note C)
		Cr-51	858	43	14.3	59.9	790	0.92	0.8	1.25	Yes	
		Cs-134	154	8	2.7	57.8	140	0.91	0.8	1.25	Yes	
		Cs-137	170	9	3.0	56.7	170	1.00	0.8	1.25	Yes	
		Co-58	128	6	2.0	64.0	130	1.02	0.8	1.25	Yes	
		Mn-54	84	4	1.3	63.0	84	1.00	0.8	1.25	Yes	
		Fe-59	223	11	3.7	60.8	240	1.08	0.8	1.25	Yes	
		Zn-65	260	13	4.3	60.0	290	1.12	0.8	1.25	Yes	
		Co-60	204	10	3.3	61.2	200	0.98	0.8	1.25	Yes	
3/12/96	Milk	I-131	13	1	0.3	39.0	15	1.15	0.75	1.33	Yes	(1 result see Note D)
3/12/96	Milk	Sr-89	31	2	0.7	46.5	20	0.65	0.75	1.33	No	Yes "B" Agreement
		Sr-90	16	1	0.3	48.0	22	1.38	0.75	1.33	No	Yes "B" Agreement
3/12/96	Soil	Ce-141	0.323	0.02	0.007	48.5	0.3	0.93	0.75	1.33	Yes	
		Cr-51	1.182	0.06	0.020	59.1	1.175	0.99	0.8	1.25	Yes	
		Cs-134	0.212	0.01	0.003	63.6	0.175	0.83	0.8	1.25	Yes	
		Cs-137	0.332	0.02	0.007	49.8	0.325	0.98	0.75	1.33	Yes	
		Co-58	0.176	0.01	0.003	52.8	0.163	0.93	0.8	1.25	Yes	
		Mn-54	0.116	0.01	0.003	34.8	0.119	1.03	0.75	1.33	Yes	
		Fe-59	0.307	0.02	0.007	46.1	0.313	1.02	0.75	1.33	Yes	
		Zn-65	0.358	0.02	0.007	53.7	0.363	1.01	0.8	1.25	Yes	
		Co-60	0.281	0.01	0.003	84.3	0.288	1.02	0.8	1.25	Yes	

Notes:

A. Units are pCi/L for Milk, pCi/g (dry) for Soil and total pCi for Filter and Cartridge.
B. GPU Value is an average of three or more determinations. Units are pCi/L for Milk, pCi/g (dry) for Soil and total pCi for Filter and Cartridge.
C. The value reported to Analytics was in error (Mean of 233.4+242.0+24.5 instead of 233.4+242.0+245)
D. Due to insufficient sample only 1 analysis was performed.

To determine agreement or possible agreement:

1. Divide each Analytics value by its associated one sigma uncertainty to obtain the resolution.
2. Divide each GPU value by the corresponding Analytics value to obtain the ratio.
3. The GPU measurement is in agreement if the value of the ratio falls within the limits shown in the following table for the corresponding resolution.

Resolution	Agreement	Agreement "A" Criteria	Agreement "B" Criteria
< 3	no comp	no comp	no comp
≥ 3 - < 4	0.4 - 2.5	0.3 - 3.0	no comp
≥ 4 - < 8	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
≥ 8 - < 16	0.6 - 1.67	0.5 - 2.0	0.4 - 2.5
≥ 16 - < 51	0.75 - 1.33	0.6 - 1.67	0.5 - 2.0
≥ 51 - < 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.67
≥ 200	0.85 - 1.18	0.80 - 1.25	0.75 - 1.33

"A" criteria are applied to the following analyses:
Gamma Spectrometry where the principal gamma energy used for identification is greater than 250 kev,
Tritium analyses of liquid samples and
Low-level I-131.

"B" criteria are applied to the following analyses:
Gamma Spectrometry where the principal gamma energy used for identification is less than 250 kev,
Sr-89 and Sr-90 determinations and
Gross Alpha and Beta.

Criteria are similar to those listed in USNRC Inspection Procedure 84750 with minor adjustments to account for activity concentrations with large uncertainties.

TABLE F-3

1996 ANALYTICS Cross-Check Program Results

Collection Date	Media	Nuclide	ANALYTICS Value	Teledyne Brown Engineering Value (A)	Ratio (B)
3/12/96	Water	I-131	36 ± 2	39 ± 5	1.08
		Ce-141	88 ± 4	89 ± 9	1.01
		Cr-51	322 ± 16	330 ± 30	1.02
		Cs-134	58 ± 3	53 ± 5	0.91
		Cs-137	64 ± 3	65 ± 7	1.02
		Co-58	48 ± 2	49 ± 5	1.02
		Mn-54	31 ± 2	37 ± 4	1.19
		Fe-59	83 ± 4	93 ± 9	1.12
		Zn-65	97 ± 5	100 ± 10	1.03
		Co-60	76 ± 4	81 ± 8	1.07
3/12/96	Milk	I-131	13 ± 1	16 ± 6	1.23
		Ce-141	234 ± 12	240 ± 20	1.03
		Cr-51	858 ± 43	880 ± 90	1.03
		Cs-134	154 ± 8	150 ± 20	0.97
		Cs-137	170 ± 9	180 ± 20	1.06
		Co-58	128 ± 6	140 ± 10	1.09
		Mn-54	84 ± 4	93 ± 9	1.11
		Fe-59	223 ± 11	250 ± 30	1.12
		Zn-65	260 ± 13	260 ± 30	1.00
		Co-60	204 ± 10	220 ± 20	1.08
3/12/96	Water	Sr-89	24 ± 1	30 ± 4	1.25
		Sr-90	21 ± 1	23 ± 2	1.10
3/12/96	Milk	Sr-89	31 ± 2	30 ± 4	0.97
		Sr-90	16 ± 1	17 ± 1	1.06
3/12/96	Water	H-3	2982 ± 149	2800 ± 200	0.94
6/19/96	Filter	Alpha	35 ± 2	37 ± 3	1.06
		Beta	144 ± 7	150 ± 10	1.04
6/19/96	Filter	Ce-141	400 ± 20	500 ± 50	1.25
		Cr-51	1048 ± 52	1200 ± 100	1.15
		Cs-134	310 ± 16	310 ± 30	1.00
		Cs-137	764 ± 38	910 ± 90	1.19
		Co-58	173 ± 9	210 ± 20	1.21
		Mn-54	559 ± 28	690 ± 70	1.23
		Fe-59	144 ± 7	190 ± 20	1.32
		Zn-65	108 ± 5	140 ± 10	1.30
		Co-60	156 ± 8	180 ± 20	1.15
6/19/96	Filter	Sr-90	74 ± 4	71 ± 3	0.96
6/19/96	Filter	Sr-90	49 ± 2	64 ± 3	1.31
6/19/96	Filter	Sr-90	63 ± 3	66 ± 4	1.05

Notes:

A. Teledyne Results -Results are one determination, counting error is two standard deviations. Units are pCi/liter for water and milk. For gamma results, if two standard deviations are less than 10%, than a 10% error is reported. Units are total pCi for air particulate filters.

B. Ratio of Teledyne Brown Engineering to Analytics results.

To determine agreement or possible agreement:

1. Divide each Analytics value by its associated one sigma uncertainty to obtain the resolution.
2. Divide each value by the corresponding Analytics value to obtain the ratio.
3. The measurement is in agreement if the value of the ratio falls within the limits shown in the following table for the corresponding resolution.

Resolution	Agreement	Agreement "A" Criteria	Agreement "B" Criteria
< 3	no comp	no comp	no comp
≥ 3 - < 4	0.4 - 2.5	0.3 - 3.0	no comp
≥ 4 - < 8	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
≥ 8 - < 16	0.6 - 1.67	0.5 - 2.0	0.4 - 2.5
≥ 16 - < 51	0.75 - 1.33	0.6 - 1.67	0.5 - 2.0
≥ 51 - < 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.67
≥ 200	0.85 - 1.18	0.80 - 1.25	0.75 - 1.33

"A" criteria are applied to the following analyses:
Gamma Spectrometry where the principal gamma energy used for identification is greater than 250 kev,
Tritium analyses of liquid samples and
Low-level I-131.

"B" criteria are applied to the following analyses:
Gamma Spectrometry where the principal gamma energy used for identification is less than 250 kev,
Sr-89 and Sr-90 determinations and
Gross Alpha and Beta.

Criteria are similar to those listed in USNRC Inspection Procedure 84750 with minor adjustments to account for activity concentrations with large uncertainties.

APPENDIX G

LGS SURVEY

APPENDIX G: LGS SURVEYS

A Land Use Census around the Limerick Generating Station (LGS) was conducted by Normandeau Associates, RMC Environmental Services Division for PECO Energy to comply with Sections 2.5.1 and 3.4.2 of the Plant's Offsite Dose Calculation Manual. The survey was conducted during the May to September 1996 growing season. The distance and direction of all locations were positioned from the barn to the LGS vents using Global Positioning System (GPS) technology. The results of this survey are summarized in Table G-1 .

There were no changes required to the LGS REMP as a result of this survey.

Table G-1 Location of Nearest Residence, Garden and Milk Farm within a Five Mile Radius of Limerick Generating Station, 1996

(Distance in Miles)

Sector	Residence	Garden[1]	Milk Farm
N	0.6	1.6	4.7
NNE	0.5	0.5	-
NE	0.8	1.5	-
ENE	0.6	2.5	-
E	0.6	1.1	-
ESE	0.5	1.2	1.1[2]
SE	1.0	1.1	-
SSE	1.0	1.2	4.7
S	0.8	1.2	2.3
SSW	1.0	1.4	1.8
SW	0.6	0.6	3.0
WSW	0.8	0.8	2.8
W	0.6	2.2	-
WNW	0.7	0.8	-
NW	1.3	1.6	-
NNW	0.9	1.2	-

(1) Garden greater than 500 square feet
(2) Goat Milk