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LIMERICK GENERATING STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

Report No. 22

1 January Through 31 December 2006

Prepared By

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Table Of Contents

Appendices

Figures

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I. Summary and Conclusions

In 2006 the Limerick Generating Station released to the environment through the radioactive effluent liquid and gaseous pathways approximately 40 curies of noble gas, fission and activation products and approximately 64 curies of tritium. The dose from both liquid and gaseous effluents was conservatively calculated for the Maximum Exposed Member of the Public. The results of those calculations and their comparison to the allowable limits were as follows:

Gaseous and liquid radiation doses to members of the public at locations								
Effluent	Applicable Organ	Estimated Dose	Age Group	Location		% of Applicable Limit	Limit	Unit
				Distance (meters)	Direction (toward)			
Noble Gas	Gamma - Air Dose	2.19E-03	All	762	SE	0.011%	20	mRad
Noble Gas	Beta – Air Dose	1.38E-03	All	762	SE	0.004%	40	mRad
Noble Gas	Total Body (Gamma)	1.45E-03	All	762	SE	0.015%	10	mrem
Noble Gas	Skin (Beta)	2.71E-03	All	762	SE	0.009%	30	mrem
Iodine, Particulate & Tritium	Thyroid	4.71E-03	Infant	762	SE	0.016%	30	mrem
Liquid	Total Body	2.16E-03	Child	Phila. Sub. Water		0.036%	6	mrem
Liquid	Liver	2.32E-03	Teen	LGS Outfall		0.001%	20	mrem

The doses as a result of the radiological effluents released from Limerick were a very small percentage of the allowable limits.

This report on the Radiological Environmental Monitoring Program conducted for the Limerick Generating Station (LGS) by Exelon covers the period 1 January 2006 through 31 December 2006. During that time period, 1,128 analyses were performed on 918 samples.

Surface and drinking water samples were analyzed for concentrations of tritium and gamma emitting nuclides. Drinking water samples were also analyzed for concentrations of total gross beta. No fission or activation products were detected. Gross beta activities detected were consistent with those detected in previous years. Tritium was found at one downstream location at a concentration of 177 pCi/L, which was below the lower limit of detection of 200 pCi/L. The dose via the drinking water pathway was calculated at 0.018 mrem to a child (total body), which was 0.31% of the 10 CFR 50, Appendix I dose limit.

Fish (predator and bottom feeder) and sediment samples were analyzed for concentrations of gamma emitting nuclides. No fission or activation products were detected.

Sediment samples collected below the discharge had elevated Cesium-137 concentrations that were the result of LGS discharges. No other Plant produced fission or activation products were found in sediment. The calculated dose to a teenager's skin and whole body was 1.13E-3 mrem and 9.66E-4 mrem, respectively. This dose represents 0.006% and 0.016%, respectively of the 10 CFR Part 50, Appendix I dose limits.

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

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

Cow milk samples were analyzed for concentrations of I-131 and gamma emitting nuclides. All I-131 results were below the minimum detectable concentration. Concentrations of naturally occurring K-40 were consistent with those detected in previous years. No fission or activation products were found.

Broad Leaf Vegetation samples were analyzed for gamma emitting nuclides. Concentrations of naturally occurring Be-7 and K-40 were detected. No activation or fission products were detected.

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

Review of the gamma spectroscopy results from the surface water samples located at the Limerick intake (24S1) and downstream of the 10CFR20.2002 permitted storage area indicated no offsite radionuclide transport was evident.

A radiological groundwater protection program (RGPP) was established in 2006 as part of an Exelon Nuclear fleetwide assessment of potential groundwater intrusion from the operation of the Station. Well water samples were analyzed for tritium, Sr-90 and gamma emitters. Most tritium values were less than the lower limit of detection of 200 pCi/L. However, one well located near the Unit 1 Condensate Storage Tank dike had tritium as high as 4,360 pCi/L. It is likely that the tritium migrated from the Unit 1 Condensate Storage Tank and or the auxiliary heating steam pipe leak to the monitoring well. The dose via the drinking water pathway was calculated at 0.451 mrem to a child (total body), which was 7.52% of the 10 CFR 50, Appendix I dose limit. All results for Sr-90 and gamma emitting nuclides were less than MDC.

In assessing all the data gathered for this report and comparing these results with preoperational data, it was concluded that the operation of LGS had no adverse radiological impact on the environment.

II. Introduction

The Limerick Generating Station (LGS), consisting of two 3458 MWt boiling water reactors owned and operated by Exelon Corporation, 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 that 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 Teledyne Brown Engineering (TBE), Global Dosimetry, and Environmental Inc. (Midwest Labs) on samples collected during the period 1 January 2006 through 31 December 2006.

On 6 July 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 will decay to background while in storage. Final disposition will be determined at Station decommissioning.

A. Objective 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 radiological effects (if any) on man and the environment.

III. Program Description

A. Sample Collection

Samples for the LGS REMP were collected for Exelon Nuclear by Normandeau Associates, RMC Environmental Services Division (RMC). This section describes the general collection methods used by RMC to obtain environmental samples for the LGS REMP in 2006. Sample locations and descriptions can be found in Tables B–1 and B–2, and Figures B–1 through B–3, Appendix B. The collection procedures used by RMC are listed in Table B-3.

Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, drinking water, 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). Control locations were 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, 16C4 and 33A2 (control).

Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on 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 one cubic foot per minute. The filters were replaced weekly and sent to the laboratory for analysis.

Milk samples were collected biweekly at five locations (10F4, 18E1, 19B1, 23F1, and 25C1) from April through November, and monthly from December through March. Two additional locations (25E1 and 36E1) were sampled quarterly. Locations 36E1 and 23F1 were controls. All samples were collected in new unused two gallon plastic bottles from the bulk tank at each location, preserved with sodium bisulfite, and shipped promptly to the laboratory.

Broad Leaf Vegetation were collected monthly at three locations (11S3, 13S3 and 31G1). The control location was 31G1. Thirteen different kinds of vegetation samples were collected and placed in new unused plastic bags, and sent to the laboratory for analysis.

Ambient Gamma Radiation

Direct radiation measurements were made using Panasonic 814 calcium sulfate ($CaSO_4$) thermoluminescent dosimeters (TLD). The TLD locations were placed on and around the LGS site as follows:

A site boundary ring consisting of 16 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 16 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 sixteen–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 three $CaSO_4$ 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 Global for analysis.

10CFR20.2002 Permit Storage Area

The results of the surface water sampling program were used to determine if radioactive nuclide transport from the storage area into the Schuylkill River had occurred.

B. Sample Analysis

This section describes the general analytical methodologies used by TBE and Midwest Labs to analyze the environmental samples for radioactivity for the LGS REMP in 2006. The analytical procedures used by the laboratories are listed in Table B-3.

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

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

2. Concentrations of gamma emitters in surface and drinking water, air particulates, milk, fish, broad leaf vegetation 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 these operational data were compared. For the purpose of this report, LGS was considered

operational at initial criticality. In addition, data were compared to previous years' operational data for consistency and trending. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

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

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

2. Net Activity Calculation and Reporting of Results

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

   If no positive activity was detected, then gamma spectroscopy MDC results for each type of sample were grouped as follows:

   For surface and drinking water twelve nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Zr-95, Nb-95, I-131, Cs-134, Cs-137, Ba-140, and La-140 were reported.

   For fish nine nuclides, K-40, Mn-54, Co-58, Fe-59, Co-60, Zn-65, I-131, Cs-134, and Cs-137 were reported.

   For sediment and broad leaf vegetation seven nuclides, Be-7, K-40, Mn-54, Co-58, Co-60, Cs-134, and Cs-137 were reported.

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

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

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

D. Program Exceptions

For 2006 the LGS REMP had a sample recovery rate in excess of 99%. Exceptions are listed below:

1. Drinking Water composite sampler at location 16C2 was out of service during the following periods due to equipment malfunction:
   10/30/06, 12/11/06 and 12/18/06
   Grab samples were taken for the composite.

2. Drinking Water composite sampler at location 28F3 was out of service during the following weeks due to equipment malfunction or electrical failure:
   9/5/06, 9/25/06, 10/2/06, 10/9/06 and 10/16/06
   Grab samples were taken for the composites.

3. Drinking Water composite sampler at 15F4 was out of service on 10/23/06 - due to low volume. A partial grab sample was taken for the composite.

4. Drinking Water composite sampler at location 15F7 was out of service during the following weeks due to equipment malfunction:
   8/8/06, 9/5/06 and 9/12/06
   Grab samples were taken for the composites.

5. Surface Water composite sampler at location 13B1 was out of service during the following weeks:
   1/17/06 – Low sample volume due to low river level.
   2/13/06, 2/20/06 and 2/28/09 - due to a frozen intake line.
   7/3/06, 7/10/06, 8/8/06, 9/5/06 and 9/11/06, 11/20/06 – due to river flooding.
   9/25/06 – due to an electrical malfunction.
   10/16/06 and 12/18/06 – due to equipment malfunction.
   11/6/06 – due to a sample collection error.
   Grab samples were taken for the composites.

6. Surface Water composite sampler at location 24S1 was out of service during the following weeks:
2/6/06, 4/3/06, 4/10/06, 4/17/06 and 7/3/06– due to equipment malfunction.
3/6/06 and 3/27/06 – due to an electrical malfunction.
Grab samples were taken for the composites.

7. Air particulate and air iodine samples had low sample volume at location 22G1 for week 29 due to electrical problems.

8. Air particulate and air iodine samples had low sample volume at location 14S1 for week 40 due to electrical problems.

9. During the third quarter, TLD samples were not available at location 25S2, due to vandalism.

10. A third type of broad leaf vegetation sample was not taken at location 13S3 due to the lack of available vegetation.

11. Milk I-131 LLD of 1.0 pCi/L was missed due to the discontinuation and poor performance of two types of filter paper used in the I-131 analysis. Although sample aliquots were increased (up to 8 liters, when possible) and count times extended (up to 64 hours, in some cases), LLD requirements were missed due to low chemical yield and decay of the iodine during the investigation. TBE initiated NCR 06-13 to investigate and document this event. The following locations and dates were effected:

10F4	06/13/06	06/27/06	07/25/06
18E1	06/13/06	06/27/06	07/25/06
19B1	06/13/06	06/27/06	
23F1	06/13/06	06/27/06	07/25/06
25C1	06/13/06	06/27/06	07/25/06

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

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

E. Program Changes

Three broad leaf vegetation locations, 11S3, 13S3 and 31G1 were added to Limerick's sampling program in 2006.

Surface Water composite sampler at location 10F2 was removed from Limerick's sampling program since no water was drawn from the Delaware River for station cooling.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken from a continuous sampler at two locations (13B1 and 24S1) on a monthly schedule. Of these locations only 13B1 located downstream, could be affected by Limerick's effluent releases. 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). No tritium activity was detected. The highest MDC calculated was <174 pCi/L.

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides (Table C–I.2, Appendix C). All nuclides were less than the MDC.

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 Limerick's effluent releases. The following analyses were performed:

Gross Beta

Samples from all locations were analyzed for concentrations of total gross beta (Tables C–II.1, Appendix C). The values ranged from <2.3 to 8.3 pCi/L. Concentrations detected were consistent with those detected in previous years (Figure C–1, Appendix C).

Tritium

Monthly samples from all locations were composited quarterly and analyzed for tritium activity (Table C–II.2, Appendix C). Tritium activity was detected in one sample at a concentration of 177 pCi/L. The dose via the drinking water pathway was calculated at 0.018 mrem to a child (total body), which was 0.31% of the 10 CFR 50, Appendix I dose limit.

Gamma Spectrometry

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

Fish

Fish samples comprised of catfish/bullhead (bottom feeder) and sunfish (predator) were collected at two locations (16C5 and 29C1) in the spring and fall season. Location 16C5 could be affected by Limerick's effluent releases. 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). Naturally occurring K-40 was found at all stations and ranged from 2,750 to 3,320 pCi/kg wet and was consistent with levels detected in previous years. No other gamma emitting nuclides were found. Historical levels of Cs-137 are shown in Figure C–2, Appendix C.

4. Sediment

Aquatic sediment samples were collected at three locations (16B2, 16C4 and 33A2) semiannually. Of these locations two 16B2 and 16C4 located downstream, could be affected by Limerick's effluent releases. 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 naturally occurring Be-7, K-40 and the fission product Cs-137.

Beryllium-7 and K-40 were found at all stations and ranged from <968 to 5,380 and 13,800 to 18,900 pCi/kg dry, respectively. The fission product Cs-137 was found at locations 16B2 and 16C4 and ranged from <117 to 172 and 134 to 429 pCi/kg dry, respectively. The elevated Cs-137 activity was due to LGS radioactive effluent releases. The dose to a teenager's skin and whole body was conservatively calculated at 1.13E-3 mrem and 9.66E-4 mrem, respectively. These doses represent 0.006% and 0.016%, respectively of the Appendix I to 10 CFR Part 50 dose limits. The activity detected was consistent with those detected in the pre–operational years. (Figure C–4, Appendix C). No other Limerick fission or activation products were found.

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 <6 to 31 E–3 pCi/m^3 with a mean of 17 E–3 pCi/m^3. The results from the Intermediate Distance location (Group II) ranged from <7 to 27 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 <7 to 35 E–3 pCi/m^3 with a mean of 17 E–3 pCi/m^3. Comparison of the 2006 air particulate data with previous years data indicate no effects from the operation of LGS (Figure C–4, Appendix C). In addition a comparison of the weekly mean values for 2006 indicate no notable differences among the three groups (Figure C–5, 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 43 to 126 E–3 pCi/m^3. All other nuclides were less than the MDC.

b. Airborne Iodine

Continuous air samples were collected from five locations (10S3, 11S1, 14S1, 13C1, and 22G1) and analyzed weekly for I-131 (Table C–VI.1, Appendix C). All results were less than the MDC.

2. Terrestrial

a. Milk

Samples were collected from five locations (10F4, 18E1, 19B1, 23F1, and 25C1) biweekly April through November and monthly December through March. Samples from two additional locations (36E1 and 25E1) 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 MDC.

Gamma Spectrometry

Each milk sample was analyzed for concentrations of gamma emitting nuclides (Table C–VII.2, Appendix C).

Naturally occurring K-40 activity was found in all samples and ranged from 1,050 to 1,450 pCi/L. All other nuclides were less than the MDC.

b. Broad Leaf Vegetation

Three types of broad leaf vegetation samples were collected from three locations (11S3, 13S3 and 31G1) monthly from June through September. The following analysis was performed:

Gamma Spectrometry

Each broad leaf vegetation sample was analyzed for concentrations of gamma emitting nuclides (Table C-VIII.1, Appendix C).

Cosmogenic Be-7 was found in 27 of 35 samples and ranged from <23 to 2180 pCi/kg wet. Naturally occurring K-40 was found in 34 of 35 samples and ranged from <177 to 8,430 pCi/kg wet. All other nuclides were less than the MDC.

C. Ambient Gamma Radiation

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

Most TLD measurements were below 10 mR/standard month, with a range of 5.5 to 12.8 mR/standard month. A comparison of the Site Boundary and Intermediate Distance data to the Control Location data, indicate that the ambient gamma radiation levels from the Control Location 5H1 were consistently higher. The historical ambient gamma radiation data from Location 5H1 were plotted along with similar data from the Site, Intermediate Distance and Outer Ring Locations (Figure C–6, Appendix C). Location 5H1 has a historical high bias, but tracked with the data from all three groups. This bias is most likely due to radon emanating from the ground.

D. 10 CFR 20.2002 Permit Storage Area

The results of the surface water aquatic monitoring program from Location 24S1 were used to determine if radioactivity from the permit storage area had made it to the Schuylkill River. The data obtained from the gamma analysis program did not detect any migration of radioactivity from the permit storage area.

E. Land Use Survey

A Land Use Survey conducted in August 2006 around Limerick Generating Station (LGS) was performed by Normandeau Associates, RMC Environmental Services Division for Exelon Nuclear to comply with Bases 3.3.2 of the Limerick's Offsite Dose Calculation Manual. The purpose of the survey was to document the nearest resident, milk producing animal and garden of greater than 500 ft^2 in each of the sixteen 22 ½ degree sectors around the site. Four new gardens are included in the 2006 survey. The gardens are located in sectors ESE, SE, NNE and NNW. The distance and direction of all locations from the LGS reactor buildings were positioned using Global Positioning System (GPS) technology. There were no changes required to the LGS REMP, as a result of this survey. The results of this survey are summarized below.

Distance in Miles from the LGS Reactor Buildings			
Sector	Residence Miles	Garden Miles	Milk Farm Miles
1 N	0.6	1.8	4.7
2 NNE	0.5	1.8	-
3 NE	0.7	1.6	-
4 ENE	0.6	0.7	-
5 E	0.5	0.7	-
6 ESE	0.7	0.3	-
7 SE	1.0	0.2	-
8 SSE	1.0	1.1	-
9 S	0.8	1.2	4.2
10 SSW	1.0	1.0	2.0
11 SW	0.6	0.6	-
12 WSW	0.7	2.3	2.7
13 W	0.7	0.8	2.8
14 WNW	0.7	0.8	-
15 NW	0.7	1.6	-
16 NNW	1.0	1.3	-

F. Summary of Results – Inter-laboratory Comparison Program

The primary and secondary laboratories analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation and water matrices for 28 analytes (Appendix E). The PE samples, supplied by Analytics Inc., Environmental Resource Associates (ERA) and DOE's MAPEP, were evaluated against the following pre-set acceptance criteria:

1. Analytics Evaluation Criteria

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

2. ERA Evaluation Criteria

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

3. DOE Evaluation Criteria

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

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

For the primary laboratory, 24 out of 28 analytes met the specified acceptance criteria. Four samples did not meet the specified acceptance criteria for the following reasons:

1. Teledyne Brown Engineering's MAPEP Series 15 January 2006 soil Cs-134 was evaluated as a false positive, although TBE

considered the result a non-detect due to the peak not being identified by the gamma software. MAPEP suggests the Bi-214 is not being differentiated from the Cs-134 peak. When the ratio of activity to uncertainty exceeds 3, TBE will use a key line analysis rather than a weighted mean analysis when evaluating MAPEP non-detects.

2. Teledyne Brown Engineering's MAPEP Series 15 January 2006 Sr-90 in vegetation result of 2.22 Bq/kg exceeded the upper acceptance range of 2.029 Bq/kg. The samples were analyzed in triplicate and the results averaged. One high result of 2.43 Bq/kg biased the submitted results on the high side. TBE was unable to determine the cause for the higher result. The Sr-90 in vegetation results for MAPEP Series 14 and MAPEP Series 16 were acceptable. No client samples were analyzed during the MAPEP Series 14 time period.

3. Teledyne Brown Engineering's MAPEP Series 15 January 2006 Pu-238 and Pu-239/240 in vegetation result of 2.22 Bq/kg failed the required acceptance ranges. TBE was evaluating the current preparation method for vegetation samples, which proved insufficient for the analyses. TBE does not perform isotopic Pu on client's vegetation samples.

For the secondary laboratory, 20 out of 25 analytes met the specified acceptance criteria. Four samples did not meet the specified acceptance criteria for the following reasons:

1. Environmental Inc.'s ERA November 2006 water I-131 result of 28.4 pCi/L exceeded the upper control limit of 27.3 pCi/L. The reported result was an average of three analyses, results ranged from 25.36 pCi/L to 29.23 pCi/L. A fourth analysis was performed, with a result of 24.89 pCi/L.

2. Environmental Inc.'s MAPEP January 2006 vegetation Pu-238 result of 0.08 Bq/sample exceeded the lower control limit of 0.10 Bq/sample due to incomplete dissolution of the sample.

3. Environmental Inc.'s MAPEP January 2006 air particulate Pu-238 result of 0.03 Bq/sample exceeded the lower control limit of 0.05 Bq/sample due to incomplete dissolution of the sample.

4. Environmental Inc.'s MAPEP January 2006 soil Pu-238, Pu-239/240, U-233/234 and U-238 results of 14.6, 14.6, 13.5 and 15.4 Bq/kg, respectively, exceeded the lower control limits of

42.81, 32.09, 25.9 and 27.2 Bq/kg, respectively, due to incomplete dissolution of the sample.

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

V. References

1. 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. Pre-operational 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.

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LIMERICK GENERATING STATION, 2006

Name of Facility: LIMERICK GENERATING STATION **DOCKET NUMBER:** 50-352 & 50-353
Location of Facility: MONTGOMERY COUNTY, PA **REPORTING PERIOD:** 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	H-3	8	200	166 (0/4) (<156/<174)	166 (0/4) (<154/<173)	166 (0/4) (<156/<174)	13B1 INDICATOR VINCENT DAM 1.75 MILES SE OF SITE	0
	GAMMA	24						
	MN-54		15	4 (0/12) (<1/<8)	4 (0/12) (<2/<8)	4 (0/12) (<2/<8)	24S1 CONTROL LIMERICK INTAKE 0.20 MILES SW OF SITE	0
	CO-58		15	4 (0/12) (<1/<7)	4 (0/12) (<2/<9)	4 (0/12) (<2/<9)	24S1 CONTROL LIMERICK INTAKE 0.20 MILES SW OF SITE	0
	FE-59		30	9 (0/12) (<2/<17)	9 (0/12) (<4/<15)	9 (0/12) (<2/<17)	13B1 INDICATOR VINCENT DAM 1.75 MILES SE OF SITE	0
	CO-60		15	4 (0/12) (<1/<7)	4 (0/12) (<2/<9)	4 (0/12) (<2/<9)	24S1 CONTROL LIMERICK INTAKE 0.20 MILES SW OF SITE	0
	ZN-65		30	9 (0/12) (<1/<17)	9 (0/12) (<4/<22)	9 (0/12) (<4/<22)	24S1 CONTROL LIMERICK INTAKE 0.20 MILES SW OF SITE	0
	NB-95		15	4 (0/12) (<1/<8)	4 (0/12) (<2/<8)	4 (0/12) (<2/<8)	24S1 CONTROL LIMERICK INTAKE 0.20 MILES SW OF SITE	0

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

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SURFACE WATER (PCI/LITER)	ZR-95		30	7 (0/12) (<1/<14)	7 (0/12) (<3/<14)	7 (0/12) (<3/<14)	24S1 CONTROL LIMERICK INTAKE 0.20 MILES SW OF SITE	0
	I-131		15	11 (0/12) (<4/<19)	11 (0/12) (<5/<17)	11 (0/12) (<5/<17)	24S1 CONTROL LIMERICK INTAKE 0.20 MILES SW OF SITE	0
	CS-134		15	4 (0/12) (<1/<8)	4 (0/12) (<2/<10)	4 (0/12) (<2/<10)	24S1 CONTROL LIMERICK INTAKE 0.20 MILES SW OF SITE	0
	CS-137		18	4 (0/12) (<1/<8)	4 (0/12) (<2/<8)	4 (0/12) (<1/<8)	13B1 INDICATOR VINCENT DAM 1.75 MILES SE OF SITE	0
	BA-140		60	24 (0/12) (<7/<34)	25 (0/12) (<13/<43)	25 (0/12) (<13/<43)	24S1 CONTROL LIMERICK INTAKE 0.20 MILES SW OF SITE	0
	LA-140		15	8 (0/12) (<2/<12)	8 (0/12) (<5/<12)	8 (0/12) (<2/<12)	13B1 INDICATOR VINCENT DAM 1.75 MILES SE OF SITE	0
DRINKING WATER (PCI/LITER)	GR-B	48	4	4.2 (34/36) (< 2.3/ 8.3)	3.8 (11/12) (< 2.3/ 5.5)	4.6 (12/12) (2.9/ 7.7)	15F4 INDICATOR PHILADELPHIA SUBURBAN WATER COMPANY 8.62 MILES SE OF SITE	0
	H-3	16	200	166 (1/12) (<153/177)	165 (0/4) (<156/<172)	172 (1/4) (<163/177)	15F7 INDICATOR PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LIMERICK GENERATING STATION, 2006

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DRINKING WATER (PCI/LITER)	GAMMA	48						
	MN-54		15	4 (0/36) (<1/<11)	4 (0/12) (<1/<7)	4 (0/12) (<1/<10)	15F7 INDICATOR PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0
	CO-58		15	4 (0/36) (<1/<11)	4 (0/12) (<1/<7)	5 (0/12) (<1/<11)	15F4 INDICATOR PHILADELPHIA SUBURBAN WATER COMPANY 8.62 MILES SE OF SITE	0
	FE-59		30	9 (0/36) (<2/<21)	9 (0/12) (<3/<16)	9 (0/12) (<2/<21)	15F4 INDICATOR PHILADELPHIA SUBURBAN WATER COMPANY 8.62 MILES SE OF SITE	0
	CO-60		15	4 (0/36) (<1/<11)	4 (0/12) (<1/<6)	4 (0/12) (<1/<11)	15F4 INDICATOR PHILADELPHIA SUBURBAN WATER COMPANY 8.62 MILES SE OF SITE	0
	ZN-65		30	9 (0/36) (<1/<24)	8 (0/12) (<2/<15)	9 (0/12) (<1/<23)	15F7 INDICATOR PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0
	NB-95		15	5 (0/36) (<1/<12)	4 (0/12) (<1/<7)	5 (0/12) (<1/<12)	15F4 INDICATOR PHILADELPHIA SUBURBAN WATER COMPANY 8.62 MILES SE OF SITE	0
	ZR-95		30	8 (0/36) (<2/<18)	7 (0/12) (<2/<12)	8 (0/12) (<2/<16)	15F7 INDICATOR PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0
	I-131		15	12 (0/36) (<4/<30)	11 (0/12) (<5/<28)	12 (0/12) (<4/<25)	15F4 INDICATOR PHILADELPHIA SUBURBAN WATER COMPANY 8.62 MILES SE OF SITE	0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LIMERICK GENERATING STATION, 2006

Name of Facility: LIMERICK GENERATING STATION **DOCKET NUMBER:** 50-352 & 50-353
Location of Facility: MONTGOMERY COUNTY, PA **REPORTING PERIOD:** 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
DRINKING WATER (PCI/LITER)	CS-134		15	4 (0/36) (<1/<12)	4 (0/12) (<1/<8)	5 (0/12) (<1/<12)	15F4 INDICATOR PHILADELPHIA SUBURBAN WATER COMPANY 8.62 MILES SE OF SITE	0
	CS-137		18	4 (0/36) (<1/<11)	4 (0/12) (<1/<8)	4 (0/12) (<1/<11)	15F4 INDICATOR PHILADELPHIA SUBURBAN WATER COMPANY 8.62 MILES SE OF SITE	0
	BA-140		60	26 (0/36) (<7/<49)	25 (0/12) (<10/<49)	27 (0/12) (<9/<44)	15F4 INDICATOR PHILADELPHIA SUBURBAN WATER COMPANY 8.62 MILES SE OF SITE	0
	LA-140		15	8 (0/36) (<2/<15)	8 (0/12) (<3/<15)	9 (0/12) (<2/<14)	15F7 INDICATOR PHOENIXVILLE WATER WORKS 6.33 MILES SSE OF SITE	0
BOTTOM FEEDER (FISH) (PCI/KG WET)	GAMMA	4						
	K-40		N/A	3045 (2/2) (2820/3270)	2775 (2/2) (2750/2800)	3045 (2/2) (2820/3270)	16C5 INDICATOR VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	MN-54		130	47 (0/2) (<33/<61)	59 (0/2) (<40/<78)	59 (0/2) (<40/<78)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
	CO-58		130	64 (0/2) (<44/<85)	65 (0/2) (<47/<84)	65 (0/2) (<47/<84)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
	FE-59		260	155 (0/2) (<126/<184)	143 (0/2) (<89/<196)	155 (0/2) (<126/<184)	16C5 INDICATOR VINCENT POOL DOWNSTREAM OF DISCHARGE	0

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BOTTOM FEEDER (FISH) (PCI/KG WET)	CO-60		130	49 (0/2) (<39/<58)	66 (0/2) (<47/<85)	66 (0/2) (<47/<85)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
	ZN-65		260	131 (0/2) (<81/<180)	138 (0/2) (<108/<167)	138 (0/2) (<108/<167)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
	I-131		N/A	689 (0/2) (<401/<977)	236 (0/2) (<133/<339)	689 (0/2) (<401/<977)	16C5 INDICATOR VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	CS-134		100	56 (0/2) (<41/<71)	69 (0/2) (<40/<99)	69 (0/2) (<40/<99)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
	CS-137		100	57 (0/2) (<43/<70)	63 (0/2) (<34/<91)	63 (0/2) (<34/<91)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
PREDATOR (FISH) (PCI/KG WET)	GAMMA	4						
	K-40		N/A	3120 (2/2) (2920/3320)	3000 (2/2) (2860/3140)	3120 (2/2) (2920/3320)	16C5 INDICATOR VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	MN-54		130	49 (0/2) (<35/<62)	61 (0/2) (<41/<81)	61 (0/2) (<41/<81)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
	CO-58		130	66 (0/2) (<48/<84)	68 (0/2) (<52/<84)	68 (0/2) (<52/<84)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0

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MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
PREDATOR (FISH) (PCI/KG WET)	FE-59		260	153 (0/2) (<128/<178)	147 (0/2) (<125/<168)	153 (0/2) (<128/<178)	16C5 INDICATOR VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	CO-60		130	58 (0/2) (<33/<82)	61 (0/2) (<40/<82)	61 (0/2) (<40/<82)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
	ZN-65		260	128 (0/2) (<82/<173)	142 (0/2) (<99/<185)	142 (0/2) (<99/<185)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
	I-131		N/A	614 (0/2) (<434/<794)	247 (0/2) (<142/<352)	614 (0/2) (<434/<794)	16C5 INDICATOR VINCENT POOL DOWNSTREAM OF DISCHARGE	0
	CS-134		100	50 (0/2) (<35/<65)	65 (0/2) (<40/<90)	65 (0/2) (<40/<90)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
	CS-137		100	55 (0/2) (<40/<69)	64 (0/2) (<50/<77)	64 (0/2) (<50/<77)	29C1 CONTROL POTTSTOWN VICINITY UPSTREAM OF INTAKE	0
SEDIMENT (PCI/KG DRY)	GAMMA	6						
	BE-7		N/A	3368 (4/4) (1560/5380)	1004 (1/2) (<968/1040)	4050 (2/2) (2720/5380)	16B2 INDICATOR LINFIELD BRIDGE 1.35 MILES SSE OF SITE	0

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SEDIMENT (PCI/KG DRY)	K-40		N/A	16650 (4/4) (13800/18900)	14400 (2/2) (14300/14500)	17300 (2/2) (15700/18900)	16B2 INDICATOR LINFIELD BRIDGE 1.35 MILES SSE OF SITE	0
	MN-54		N/A	95 (0/4) (<64/<128)	90 (0/2) (<74/<106)	110 (0/2) (<93/<128)	16C4 INDICATOR VINCENT DAM 2.18 MILES SSE OF SITE	0
	CO-58		N/A	99 (0/4) (<65/<125)	94 (0/2) (<78/<110)	111 (0/2) (<98/<125)	16C4 INDICATOR VINCENT DAM 2.18 MILES SSE OF SITE	0
	CO-60		N/A	103 (0/4) (<61/<141)	83 (0/2) (<72/<93)	105 (0/2) (<102/<107)	16C4 INDICATOR VINCENT DAM 2.18 MILES SSE OF SITE	0
	I-131		N/A	442 (0/4) (<369/<508)	389 (0/2) (<249/<529)	491 (0/2) (<474/<508)	16C4 INDICATOR VINCENT DAM 2.18 MILES SSE OF SITE	0
	CS-134		150	100 (0/4) (<65/<134)	93 (0/2) (<60/<127)	121 (0/2) (<107/<134)	16C4 INDICATOR VINCENT DAM 2.18 MILES SSE OF SITE	0
	CS-137		180	213 (3/4) (<117/429)	99 (0/2) (<90/<109)	282 (2/2) (134/429)	16C4 INDICATOR VINCENT DAM 2.18 MILES SSE OF SITE	0
AIR PARTICULATE (E-3 PCI/CU.METER)	GR-B	260	10	16 (199/208) (6/31)	17 (49/52) (<7/<35)	17 (49/52) (<7/<35)	22G1 CONTROL MANOR SUBSTATION 17.73 MILES SW OF SITE	0

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AIR PARTICULATE (E-3 PCI/CU.METER)	GAMMA	20						
	BE-7		N/A	75 (13/16) (57/<98)	91 (3/4) (43/126)	91 (3/4) (43/126)	22G1 CONTROL MANOR SUBSTATION 17.73 MILES SW OF SITE	0
	MN-54		N/A	3.3 (0/16) (< 1.4/< 6.3)	4.1 (0/4) (< 2.8/< 6.5)	4.1 (0/4) (< 2.8/< 6.5)	22G1 CONTROL MANOR SUBSTATION 17.73 MILES SW OF SITE	0
	CO-58		N/A	5.0 (0/16) (< 2.4/< 8.7)	5.3 (0/4) (< 3.3/< 8.6)	5.5 (0/4) (< 3.7/< 8.7)	11S1 INDICATOR LGS INFORMATION CENTER 0.38 MILES ESE OF SITE	0
	CO-60		N/A	3.1 (0/16) (< 1.5/< 5.2)	3.0 (0/4) (< 2.0/< 4.4)	3.6 (0/4) (< 2.3/< 5.2)	13C1 INDICATOR KING ROAD 2.84 MILES SE OF SITE	0
	CS-134		10	3.1 (0/16) (< 1.5/< 5.6)	3.5 (0/4) (< 2.1/< 5.3)	3.5 (0/4) (< 2.1/< 5.3)	22G1 CONTROL MANOR SUBSTATION 17.73 MILES SW OF SITE	0
	CS-137		10	3.0 (0/16) (< 1.5/< 4.8)	2.5 (0/4) (< 1.8/< 3.0)	3.4 (0/4) (< 2.2/< 4.8)	14S1 INDICATOR LONGVIEW ROAD 0.63 MILES SSE OF SITE	0
AIR IODINE (E-3 PCI/CU.METER)	GAMMA	260						
	I-131		70	41 (0/208) (<14/<142)	37 (0/52) (<12/<208)	43 (0/52) (<16/<142)	14S1 INDICATOR LONGVIEW ROAD 0.63 MILES SSE OF SITE	0

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MILK (PCI/LITER)	I-131 (LOW LVL)	118	1	0.7 (0/92) (< 0.2/< 7.4)	0.6 (0/26) (< 0.3/< 1.8)	0.9 (0/22) (< 0.3/< 7.4)	25C1 INDICATOR 2.69 MILES WSW OF SITE	0
	GAMMA K-40	118	N/A	1301 (92/92) (1050/1450)	1272 (26/26) (1150/1410)	1329 (22/22) (1200/1450)	19B1 INDICATOR 1.95 MILES SSW OF SITE	0
	CS-134		15	7 (0/92) (<2/<15)	7 (0/26) (<3/<12)	9 (0/4) (<5/<11)	25E1 INDICATOR 4.27 MILES WSW OF SITE	0
	CS-137		18	7 (0/92) (<2/<14)	7 (0/26) (<3/<11)	9 (0/4) (<5/<12)	25E1 INDICATOR 4.27 MILES WSW OF SITE	0
	BA-140		60	39 (0/92) (<15/<56)	39 (0/26) (<13/<55)	41 (0/4) (<36/<51)	25E1 INDICATOR 4.27 MILES WSW OF SITE	0
	LA-140		15	12 (0/92) (<4/<15)	12 (0/26) (<4/<15)	12 (0/22) (<9/<15)	10F4 INDICATOR 6.60 MILES ESE OF SITE	0
BROAD LEAF VEGETATION (PCI/KG WET)	GAMMA BE-7	35	N/A	198 (16/23) (<35/559)	723 (11/12) (<23/2180)	723 (11/12) (<23/2180)	31G1 CONTROL	0

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING BOTH THE MDAs AND THE POSITIVE VALUES FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LIMERICK GENERATING STATION, 2006

Name of Facility: LIMERICK GENERATING STATION
Location of Facility: MONTGOMERY COUNTY, PA
DOCKET NUMBER: 50-352 & 50-353
REPORTING PERIOD: 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
BROAD LEAF VEGETATION (PCI/KG WET)	K-40		N/A	4345 (23/23) (1630/8430)	4354 (11/12) (<177/6610)	4824 (12/12) (2150/8430)	11S3 INDICATOR LGS INFORMATION CENTER 0.35 MILES ESE OF SITE	0
	MN-54		N/A	7 (0/23) (<3/<18)	7 (0/12) (<2/<14)	8 (0/11) (<3/<18)	13S3 INDICATOR VINCENT DAM 0.24 MILES SE OF SITE	0
	CO-58		N/A	8 (0/23) (<3/<19)	8 (0/12) (<3/<15)	8 (0/11) (<4/<19)	13S3 INDICATOR VINCENT DAM 0.24 MILES SE OF SITE	0
	CO-60		N/A	7 (0/23) (<3/<18)	7 (0/12) (<2/<15)	8 (0/11) (<3/<18)	13S3 INDICATOR VINCENT DAM 0.24 MILES SE OF SITE	0
	I-131		60	33 (0/23) (<15/<57)	32 (0/12) (<14/<59)	36 (0/11) (<17/<57)	13S3 INDICATOR VINCENT DAM 0.24 MILES SE OF SITE	0
	CS-134		60	7 (0/23) (<3/<20)	7 (0/12) (<2/<15)	8 (0/11) (<3/<20)	13S3 INDICATOR VINCENT DAM 0.24 MILES SE OF SITE	0
	CS-137		80	7 (0/23) (<3/<19)	7 (0/12) (<2/<14)	8 (0/11) (<3/<19)	13S3 INDICATOR VINCENT DAM 0.24 MILES SE OF SITE	0
DIRECT RADIATION (MILLI-ROENTGEN/STD.MO.)	TLD-QUARTERLY	159	N/A	8 (155/155) (6/13)	9 (4/4) (9/10)	9 (4/4) (11/13)	13S2 INDICATOR 500 KV SUBSTATION 0.41 MILES SE OF SITE	0

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING BOTH THE MDAs AND THE POSITIVE VALUES
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

APPENDIX B

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

TABLE B-1: Location Designation and Identification System for the 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: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Limerick Generating Station, 2006

Location	Location Description	Distance & Direction From Site
A. Surface Water		
13B1	Vincent Dam (indicator)	1.75 miles SE
24S1	Limerick Intake (control)	0.20 miles SW
B. Drinking (Potable) Water		
15F4	Philadelphia Suburban Water Company (indicator)	8.62 miles SE
15F7	Phoenixville Water Works (indicator)	6.33 miles SSE
16C2	Citizens Home Water Company (indicator)	2.66 miles SSE
28F3	Pottstown Water Authority (control)	5.84 miles WNW
C. Milk - bi-weekly / monthly		
10F4		6.60 miles ESE
18E1		4.21 miles S
19B1		1.95 miles SSW
23F1	Control	5.02 miles SW
25C1		2.69 miles WSW
D. Milk - quarterly		
25E1		4.27 miles WSW
36E1	Control	4.70 miles N
E. Air Particulates / Air Iodine		
10S3	Keen Road	0.50 miles E
11S1	LGS Information Center	0.38 miles ESE
11S2	LGS Information Center	0.38 miles ESE
13C1	King Road	2.84 miles SE
14S1	Longview Road	0.63 miles SSE
22G1	Manor Substation (control)	17.73 miles SW
F. Fish		
16C5	Vincent Pool (indicator)	Downstream of Discharge
29C1	Pottstown Vicinity (control)	Upstream of Intake
G. Sediment		
16B2	Linfield Bridge (indicator)	1.35 miles SSE
16C4	Vincent Dam (indicator)	2.18 miles SSE
33A2	Upstream of Intake (control)	0.84 miles NNW
H. Broad Leaf Vegetation		
11S3	LGS Information Center	0.35 miles ESE
13S3	LGS 500 KV Yard	0.24 miles SE
31G1	Prout's Jollyview Farm	13.6 miles NW

TABLE B-2: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Limerick Generating Station, 2006

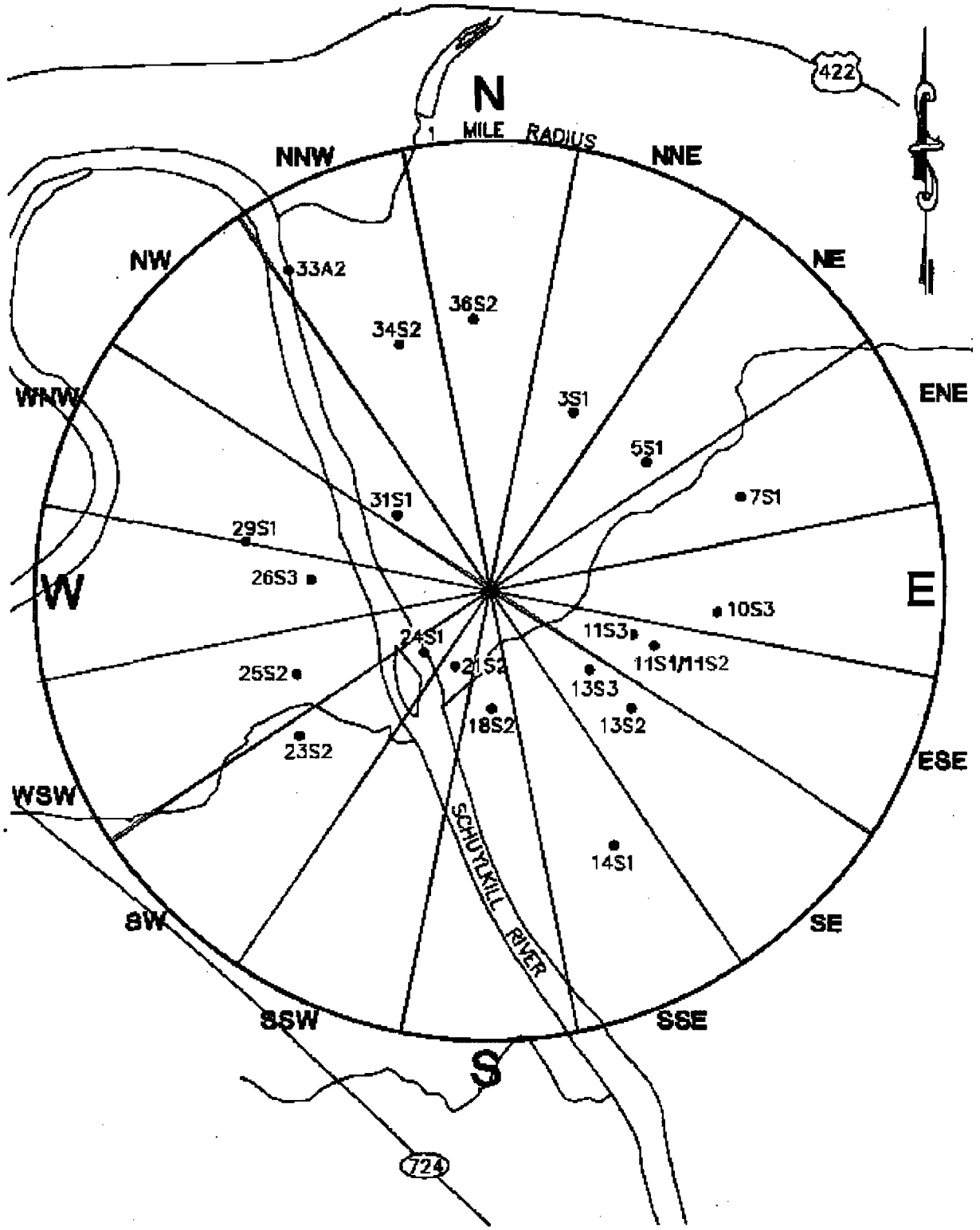
Location	Location Description	Distance & Direction From Site
H.	Environmental Dosimetry - TLD	
Site Boundary		
36S2	Evergreen & Sanatoga Road	0.60 miles N
3S1	Sanatoga Road	0.44 miles NNE
5S1	Possum Hollow Road	0.45 miles NE
7S1	LGS Training Center	0.59 miles ENE
10S3	Keen Road	0.50 miles E
11S1	LGS Information Center	0.38 miles ESE
13S2	500 KV Substation	0.41 miles SE
14S1	Longview Road	0.63 miles SSE
18S2	Rail Line along Longview Road	0.26 miles S
21S2	Near Intake Building	0.19 miles SSW
23S2	Transmission Tower	0.53 miles SW
25S2	Sector Site Boundary	0.46 miles WSW
26S3	Met. Tower #2	0.40 miles W
29S1	Sector Site Boundary	0.55 miles WNW
31S1	Sector Site Boundary	0.26 miles NW
34S2	Met. Tower #1	0.58 miles NNW
Intermediate Distance		
36D1	Siren Tower No. 147	3.51 miles N
2E1	Laughing Waters GSC	4.76 miles NNE
4E1	Neiffer Road	4.78 miles NE
7E1	Pheasant Road	4.26 miles ENE
10E1	Royersford Road	3.94 miles E
10F3	Trappe Substation	5.58 miles ESE
13E1	Vaughn Substation	4.31 miles SE
16F1	Pikeland Substation	5.04 miles SSE
19D1	Snowden Substation	3.49 miles S
20F1	Sheeder Substation	5.24 miles SSW
24D1	Porters Mill Substation	3.97 miles SW
25D1	Hoffecker & Keim Streets	3.99 miles WSW
28D2	W. Cedarville Road	3.83 miles W
29E1	Prince Street	4.95 miles WNW
31D2	Poplar Substation	3.87 miles NW
34E1	Varnell Road	4.59 miles NNW
Control and Special Interest		
5H1	Birch Substation (control)	24.76 miles NE
6C1	Pottstown Landing Field	2.14 miles NE
9C1	Reed Road	2.15 miles E
13C1	King Road	2.84 miles SE
15D1	Spring City Substation	3.20 miles SE
17B1	Linfield Substation	1.60 miles S
20D1	Ellis Woods Road	3.06 miles SSW
31D1	Lincoln Substation	3.00 miles WNW

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Limerick Generating Station, 2006

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Surface Water	Gamma Spectroscopy	Monthly composite from a continuous water compositor.	RMC-ER5 Collection of water samples for radiological analysis (Limerick Generating Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Surface Water	Tritium	Quarterly composite from a continuous water compositor.	RMC-ER5 Collection of water samples for radiological analysis (Limerick Generating Station)	500 ml	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Drinking Water	Gross Beta	Monthly composite from a continuous water compositor.	RMC-ER5 Collection of water samples for radiological analysis (Limerick Generating Station)	2 gallon	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices Env. Inc., W(DS)-01 Determination of gross alpha and/or gross beta in water (dissolved solids or total residue) Env. Inc., W(SS)-02 Determination of gross alpha and/or gross beta in water (suspended solids)
Drinking Water	Gamma Spectroscopy	Monthly composite from a continuous water compositor.	RMC-ER5 Collection of water samples for radiological analysis (Limerick Generating Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Drinking Water	Tritium	Quarterly composite from a continuous water compositor.	RMC-ER5 Collection of water samples for radiological analysis (Limerick Generating Station)	500 ml	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Fish	Gamma Spectroscopy	Semi-annual samples collected via electroshocking or other techniques	RMC-ER6 Collection of fish samples for radiological analysis (Limerick Generating Station)	1000 grams (wet)	TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Sediment	Gamma Spectroscopy	Semi-annual grab samples	RMC-ER7 Collection of sediment samples for radiological analysis (Limerick Generating Station)	500 grams (dry)	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Air Particulates	Gross Beta	One-week composite of continuous air sampling through glass fiber filter paper	RMC-ER8 Collection of air particulate and air iodine samples for radiological analysis (Limerick Generating Station)	1 filter (approximately 280 cubic meters weekly)	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices Env. Inc., AP-02 Determination of gross alpha and/or gross beta in air particulate filters

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Limerick Generating Station, 2006

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2023 Compositing of samples Env. Inc., AP-03 Procedure for compositing air particulate filters for gamma spectroscopic analysis	13 filters (approximately 3600 cubic meters)	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Air Iodine	Gamma Spectroscopy	One-week composite of continuous air sampling through charcoal filter	RMC-ER8 Collection of air particulate and air iodine samples for radiological analysis (Limerick Generating Station)	1 filter (approximately 280 cubic meters weekly)	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., I-131-02 Determination of I-131 in charcoal canisters by gamma spectroscopy (batch method)
Milk	I-131	Bi-weekly grab sample when cows are on pasture. Monthly all other times	RMC-ER10 Collection of milk samples for radiological analysis (Limerick Generating Station)	2 gallon	TBE, TBE-2012 Radioiodine in various matrices Env. Inc., I-131-01 Determination of I-131 in milk by anion exchange
Milk	Gamma Spectroscopy	Bi-weekly grab sample when cows are on pasture. Monthly all other times	RMC-ER10 Collection of milk samples for radiological analysis (Limerick Generating Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
TLD	Thermoluminescence Dosimetry	Quarterly TLDs comprised of two Panasonic 814 (containing 3 each $CaSO_4$ elements)	RMC-ER9 Collection of TLD samples for radiological analysis (Limerick Generating Station)	2 dosimeters	Global Dosimetry



Environmental Sampling Locations Within One Mile of the Limerick Generating Station, 2006

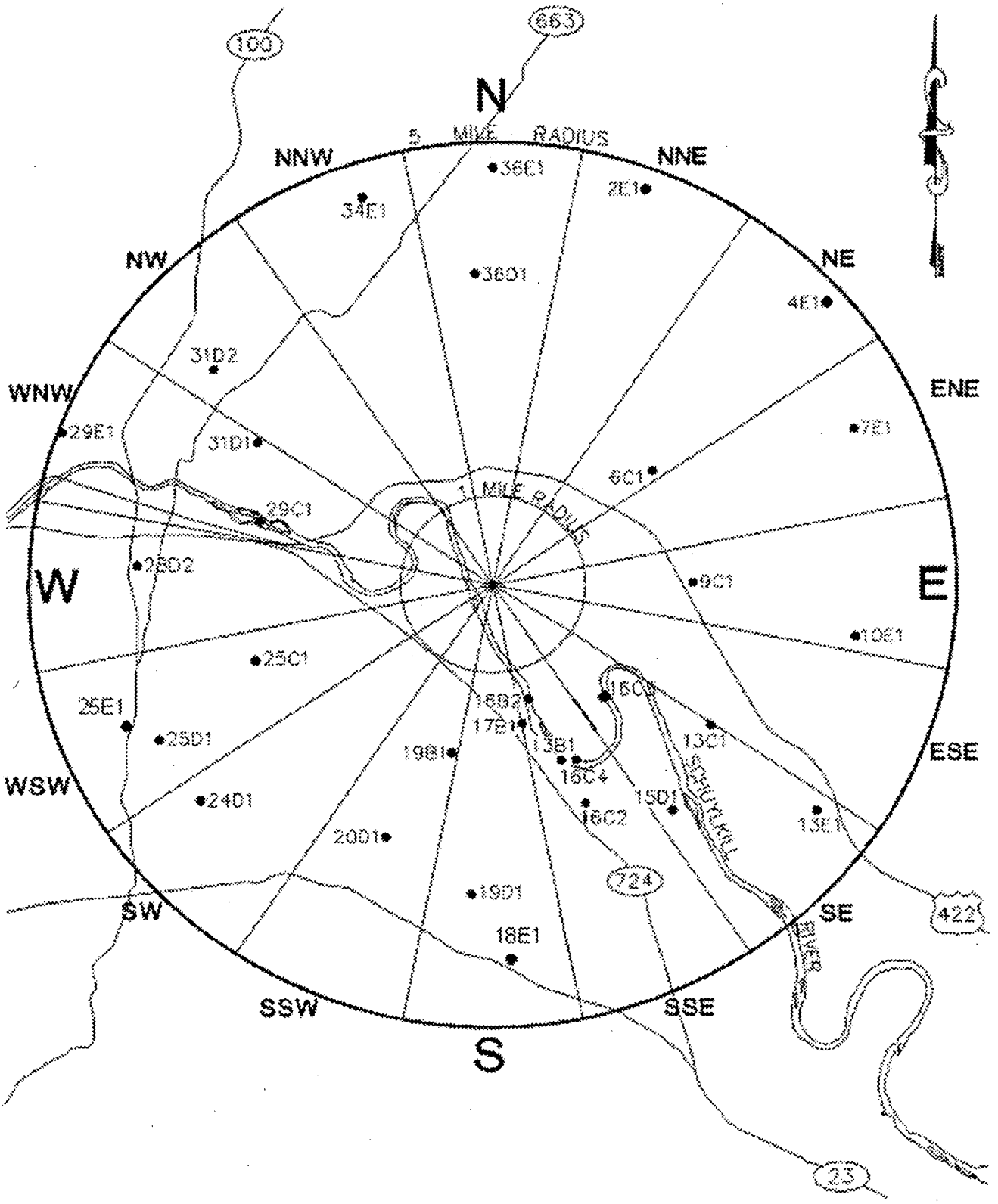


Figure B-2
Environmental Sampling Locations Between One and Five Miles from the Limerick Generating Station, 2006

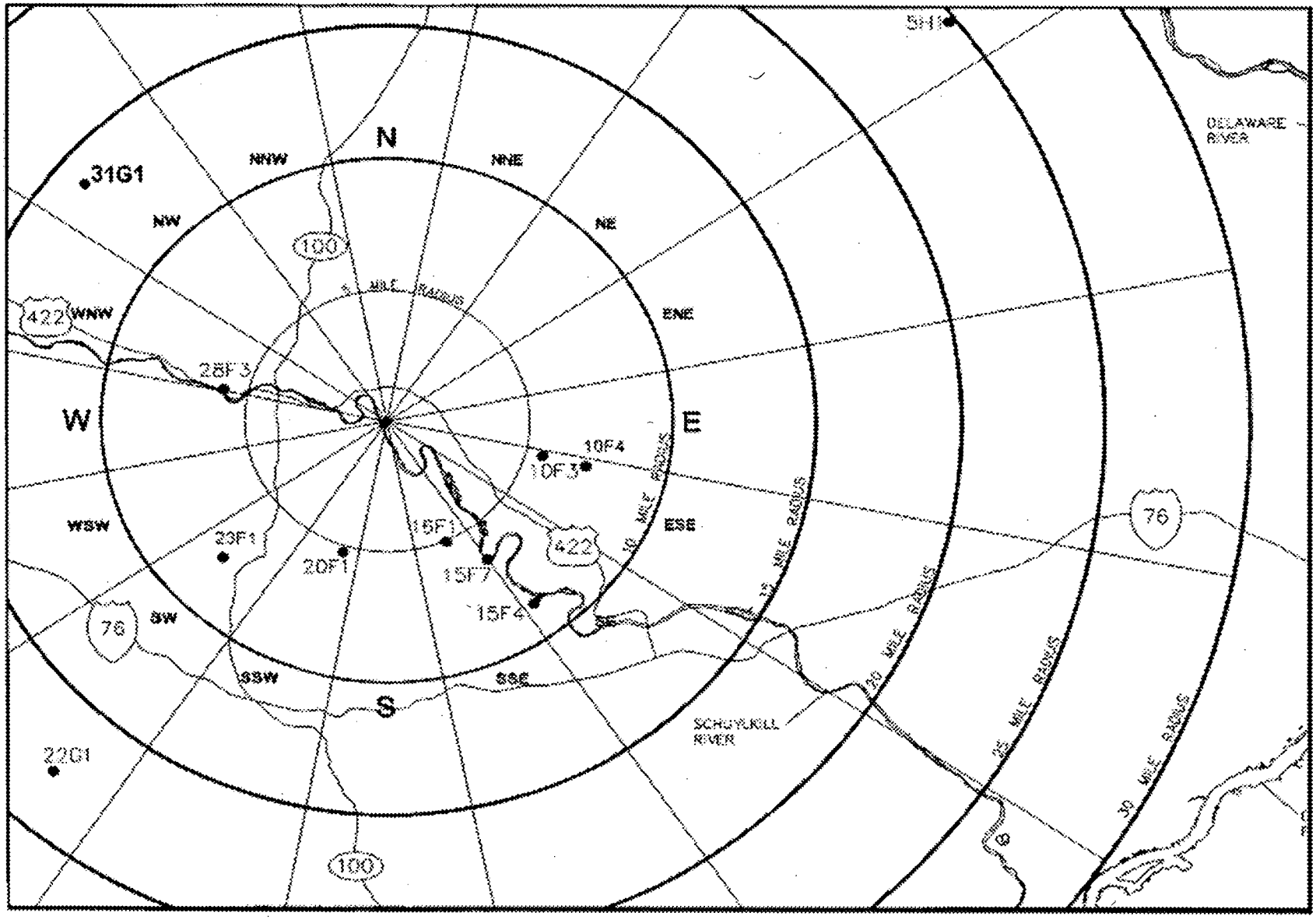


Figure B-3
Environmental Sampling Locations Greater than Five Miles from the Limerick Generating Station, 2006

APPENDIX C

DATA TABLES AND FIGURES
PRIMARY LABORATORY

TABLE C-I.1 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	13B1	24S1
JAN-MAR	< 174	< 173
APR-JUN	< 166	< 167
JUL-SEP	< 168	< 170
OCT-DEC	< 156	< 154
MEAN	166 ± 15	166 ± 17

TABLE C-I.2 CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
13B1	JAN	< 5	< 5	< 11	< 6	< 12	< 6	< 10	< 11	< 6	< 6	< 26	< 10
	FEB	< 6	< 5	< 11	< 6	< 14	< 6	< 9	< 8	< 6	< 6	< 24	< 10
	MAR	< 6	< 6	< 14	< 5	< 14	< 6	< 10	< 12	< 6	< 6	< 31	< 12
	APR	< 6	< 6	< 12	< 6	< 13	< 6	< 10	< 11	< 6	< 6	< 31	< 10
	MAY	< 3	< 3	< 7	< 3	< 7	< 4	< 6	< 19	< 3	< 3	< 32	< 11
	JUN	< 8	< 7	< 17	< 7	< 17	< 8	< 14	< 9	< 8	< 8	< 28	< 10
	JUL	< 2	< 3	< 6	< 2	< 5	< 3	< 5	< 14	< 2	< 2	< 24	< 8
	AUG	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 14	< 1	< 1	< 19	< 6
	SEP	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 4	< 1	< 1	< 7	< 2
	OCT	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 6	< 2	< 2	< 14	< 5
	NOV	< 4	< 4	< 8	< 3	< 7	< 5	< 7	< 15	< 4	< 4	< 34	< 9
	DEC	< 3	< 3	< 7	< 4	< 8	< 4	< 6	< 8	< 4	< 4	< 19	< 6
	MEAN	4 ± 4	4 ± 4	9 ± 9	4 ± 4	9 ± 10	4 ± 4	7 ± 7	11 ± 8	4 ± 5	4 ± 5	24 ± 16	8 ± 6

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
24S1	JAN	< 8	< 9	< 15	< 8	< 22	< 7	< 14	< 15	< 10	< 8	< 43	< 12
	FEB	< 5	< 5	< 9	< 5	< 15	< 5	< 10	< 8	< 6	< 6	< 25	< 7
	MAR	< 2	< 2	< 5	< 2	< 5	< 2	< 4	< 5	< 3	< 2	< 13	< 5
	APR	< 5	< 4	< 10	< 5	< 10	< 4	< 7	< 9	< 4	< 5	< 23	< 9
	MAY	< 3	< 3	< 7	< 3	< 6	< 3	< 6	< 17	< 3	< 3	< 30	< 11
	JUN	< 8	< 8	< 14	< 9	< 17	< 8	< 14	< 10	< 8	< 8	< 30	< 10
	JUL	< 2	< 2	< 5	< 3	< 4	< 3	< 4	< 13	< 2	< 2	< 24	< 7
	AUG	< 2	< 2	< 6	< 2	< 4	< 3	< 4	< 15	< 2	< 2	< 25	< 8
	SEP	< 3	< 4	< 7	< 3	< 6	< 4	< 7	< 13	< 3	< 4	< 26	< 11
	OCT	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 7	< 2	< 2	< 14	< 5
	NOV	< 3	< 4	< 9	< 5	< 8	< 5	< 8	< 14	< 4	< 4	< 31	< 9
	DEC	< 4	< 4	< 11	< 4	< 7	< 4	< 8	< 7	< 4	< 4	< 21	< 7
	MEAN	4 ± 4	4 ± 5	9 ± 7	4 ± 5	9 ± 11	4 ± 4	7 ± 7	11 ± 8	4 ± 5	4 ± 4	25 ± 16	8 ± 5

TABLE C-II.1 CONCENTRATIONS OF TOTAL GROSS BETA IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	15F4	15F7	16C2	28F3
JAN	3.8 ± 1.7	< 2.3	< 2.4	< 2.3
FEB	2.9 ± 1.4	2.9 ± 1.4	8.3 ± 1.8	3.7 ± 1.5
MAR	3.5 ± 1.7	3.5 ± 1.8	3.0 ± 1.7	3.0 ± 1.8
APR	4.6 ± 1.7	3.2 ± 1.6	3.8 ± 1.7	3.1 ± 1.6
MAY	4.2 ± 1.6	5.7 ± 1.7	4.9 ± 1.6	4.3 ± 1.6
JUN	4.7 ± 1.7	4.4 ± 1.7	4.7 ± 1.7	4.9 ± 1.8
JUL	4.9 ± 1.8	4.7 ± 1.8	3.5 ± 1.7	2.7 ± 1.7
AUG	7.7 ± 1.9	5.1 ± 1.8	4.2 ± 1.7	4.4 ± 1.7
SEP	4.5 ± 1.6	3.7 ± 1.6	3.4 ± 1.6	5.5 ± 1.8
OCT	4.8 ± 1.6	2.8 ± 1.4	2.8 ± 1.4	3.7 ± 1.5
NOV	3.9 ± 1.4	3.1 ± 1.3	5.4 ± 1.6	3.7 ± 1.4
DEC	5.6 ± 2.5	5.6 ± 2.5	3.9 ± 2.4	4.9 ± 2.4
MEAN	4.6 ± 2.4	3.9 ± 2.3	4.2 ± 3.1	3.8 ± 1.9

TABLE C-II.2 CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	15F4	15F7	16C2	28F3
JAN-MAR	< 172	< 172	< 172	< 172
APR-JUN	< 172	< 174	< 174	< 163
JUL-SEP	< 155	< 163	< 157	< 170
OCT-DEC	< 153	177 ± 108	< 156	< 156
MEAN	163 ± 21	172 ± 12	165 ± 19	165 ± 15

TABLE C-II.3 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
15F4	JAN	< 5	< 5	< 11	< 5	< 11	< 5	< 9	< 10	< 5	< 5	< 25	< 9
	FEB	< 8	< 7	< 15	< 7	< 15	< 7	< 12	< 12	< 8	< 7	< 35	< 9
	MAR	< 5	< 6	< 11	< 8	< 13	< 6	< 10	< 11	< 6	< 6	< 31	< 9
	APR	< 6	< 7	< 12	< 7	< 14	< 7	< 12	< 13	< 7	< 7	< 34	< 12
	MAY	< 4	< 4	< 10	< 4	< 8	< 5	< 7	< 4	< 4	< 4	< 44	< 15
	JUN	< 11	< 11	< 21	< 11	< 24	< 12	< 18	< 15	< 12	< 11	< 43	< 14
	JUL	< 2	< 2	< 5	< 2	< 5	< 3	< 4	< 14	< 2	< 2	< 22	< 8
	AUG	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 13	< 1	< 1	< 17	< 6
	SEP	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 4	< 1	< 1	< 9	< 3
	OCT	< 1	< 1	< 3	< 1	< 3	< 1	< 2	< 5	< 1	< 1	< 10	< 3
	NOV	< 3	< 4	< 10	< 5	< 9	< 4	< 7	< 15	< 4	< 4	< 32	< 10
	DEC	< 4	< 4	< 6	< 2	< 7	< 4	< 7	< 9	< 4	< 4	< 22	< 7
	MEAN	4 ± 6	5 ± 6	9 ± 11	4 ± 6	9 ± 13	5 ± 6	8 ± #	10 ± 8	5 ± 7	4 ± 6	27 ± 23	9 ± 8
15F7	JAN	< 6	< 6	< 12	< 7	< 14	< 6	< 11	< 12	< 7	< 5	< 31	< 10
	FEB	< 8	< 8	< 16	< 7	< 18	< 8	< 14	< 12	< 9	< 8	< 38	< 14
	MAR	< 6	< 6	< 12	< 5	< 12	< 5	< 9	< 10	< 5	< 5	< 29	< 11
	APR	< 5	< 5	< 12	< 6	< 12	< 5	< 10	< 12	< 6	< 5	< 30	< 9
	MAY	< 3	< 3	< 8	< 3	< 6	< 4	< 6	< 6	< 3	< 3	< 35	< 11
	JUN	< 10	< 10	< 20	< 9	< 23	< 11	< 16	< 13	< 11	< 10	< 44	< 12
	JUL	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 24	< 8
	AUG	< 1	< 2	< 3	< 1	< 3	< 2	< 3	< 13	< 1	< 1	< 18	< 6
	SEP	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 4	< 1	< 1	< 7	< 2
	OCT	< 1	< 2	< 3	< 1	< 3	< 2	< 3	< 6	< 1	< 2	< 12	< 4
	NOV	< 4	< 4	< 8	< 3	< 8	< 4	< 9	< 14	< 4	< 4	< 28	< 10
	DEC	< 4	< 4	< 8	< 4	< 10	< 5	< 8	< 9	< 4	< 4	< 25	< 9
	MEAN	4 ± 6	5 ± 6	9 ± 11	4 ± 5	9 ± 13	5 ± 6	8 ± 9	10 ± 7	4 ± 6	4 ± 5	27 ± 21	9 ± 7

TABLE C-II.3 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
16C2	JAN	< 6	< 6	< 11	< 7	< 13	< 6	< 10	< 10	< 6	< 6	< 28	< 9
	FEB	< 6	< 7	< 12	< 7	< 16	< 7	< 11	< 10	< 8	< 7	< 30	< 12
	MAR	< 3	< 3	< 5	< 3	< 6	< 3	< 5	< 6	< 3	< 3	< 15	< 5
	APR	< 5	< 5	< 10	< 5	< 11	< 5	< 9	< 10	< 5	< 5	< 24	< 9
	MAY	< 4	< 5	< 11	< 4	< 10	< 5	< 9	< 5	< 5	< 5	< 49	< 15
	JUN	< 9	< 7	< 18	< 7	< 19	< 8	< 14	< 9	< 9	< 8	< 31	< 10
	JUL	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 10	< 2	< 2	< 17	< 5
	AUG	< 1	< 1	< 4	< 1	< 3	< 1	< 3	< 12	< 1	< 1	< 19	< 7
	SEP	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 5	< 1	< 1	< 10	< 3
	OCT	< 2	< 2	< 5	< 3	< 4	< 2	< 4	< 8	< 2	< 2	< 15	< 4
	NOV	< 4	< 4	< 9	< 4	< 8	< 5	< 8	< 15	< 4	< 4	< 30	< 9
	DEC	< 5	< 4	< 9	< 4	< 10	< 5	< 8	< 7	< 4	< 4	< 20	< 7
	MEAN	4 ± 5	4 ± 4	8 ± 9	4 ± 4	9 ± 11	4 ± 5	7 ± 7	9 ± 6	4 ± 5	4 ± 5	24 ± 21	8 ± 7
28F3	JAN	< 5	< 6	< 13	< 6	< 13	< 7	< 11	< 11	< 6	< 7	< 31	< 10
	FEB	< 7	< 7	< 16	< 6	< 15	< 7	< 12	< 11	< 8	< 8	< 33	< 10
	MAR	< 2	< 3	< 5	< 2	< 5	< 3	< 5	< 6	< 3	< 3	< 14	< 5
	APR	< 5	< 5	< 11	< 6	< 12	< 6	< 10	< 11	< 6	< 5	< 29	< 11
	MAY	< 4	< 5	< 11	< 5	< 9	< 5	< 8	< 4	< 4	< 4	< 49	< 15
	JUN	< 6	< 6	< 12	< 6	< 15	< 7	< 11	< 8	< 6	< 8	< 23	< 8
	JUL	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 21	< 6
	AUG	< 1	< 2	< 4	< 5	< 3	< 2	< 3	< 14	< 1	< 2	< 21	< 6
	SEP	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 5	< 1	< 1	< 10	< 3
	OCT	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 7	< 2	< 2	< 14	< 4
	NOV	< 4	< 4	< 9	< 4	< 6	< 4	< 6	< 15	< 4	< 4	< 29	< 8
	DEC	< 4	< 5	< 11	< 5	< 7	< 4	< 7	< 8	< 4	< 4	< 21	< 6
	MEAN	4 ± 4	4 ± 4	9 ± 8	4 ± 4	8 ± 10	4 ± 4	7 ± 7	9 ± 7	4 ± 5	4 ± 5	25 ± 21	8 ± 7

TABLE C-III.1 **CONCENTRATIONS OF GAMMA EMITTERS IN PREDATOR AND BOTTOM FEEDER (FISH) SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	I-131	Cs-134	Cs-137
16C5	PREDATOR									
	05/17/06	2920 ± 783	< 62	< 84	< 178	< 82	< 173	< 794	< 65	< 69
	11/14/06	3320 ± 698	< 35	< 48	< 128	< 33	< 82	< 434	< 35	< 40
	MEAN	3120 ± 566	49 ± 38	66 ± 51	153 ± 71	58 ± 69	128 ± 128	614 ± 509	50 ± 42	55 ± 40
	BOTTOM FEEDER									
	05/17/06	2820 ± 723	< 61	< 85	< 184	< 58	< 180	< 977	< 71	< 70
	11/14/06	3270 ± 705	< 33	< 44	< 126	< 39	< 81	< 401	< 41	< 43
	MEAN	3045 ± 636	47 ± 39	64 ± 58	155 ± 82	49 ± 27	131 ± 140	689 ± 815	56 ± 43	57 ± 38
29C1	PREDATOR									
	05/10/06	2860 ± 1050	< 81	< 84	< 168	< 82	< 185	< 142	< 90	< 77
	11/16/06	3140 ± 754	< 41	< 52	< 125	< 40	< 99	< 352	< 40	< 50
	MEAN	3000 ± 396	61 ± 57	68 ± 46	147 ± 61	61 ± 59	142 ± 122	247 ± 297	65 ± 71	64 ± 39
	BOTTOM FEEDER									
	05/10/06	2750 ± 912	< 78	< 84	< 196	< 85	< 167	< 133	< 99	< 91
	11/16/06	2800 ± 719	< 40	< 47	< 89	< 47	< 108	< 339	< 40	< 34
	MEAN	2775 ± 71	59 ± 54	65 ± 53	143 ± 151	66 ± 54	138 ± 83	236 ± 291	69 ± 83	63 ± 80

TABLE C-IV.1 **CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006**

RESULTS IN UNITS OF PCI/KG DRY ± 2 SIGMA

STC	COLLECTION PERIOD	Be-7	K-40	Mn-54	Co-58	Co-60	I-131	Cs-134	Cs-137
16B2									
	06/09/06	5380 ± 563	18900 ± 933	< 64	< 65	< 61	< 369	< 65	172 ± 42
	10/31/06	2720 ± 1050	15700 ± 1850	< 97	< 108	< 141	< 415	< 93	< 117
	MEAN	4050 ± 3762	17300 ± 4525	80 ± 48	87 ± 61	101 ± 114	392 ± 65	79 ± 40	145 ± 78
16C4									
	06/09/06	1560 ± 785	13800 ± 1390	< 93	< 98	< 102	< 474	< 134	429 ± 104
	10/31/06	3810 ± 1050	18200 ± 2510	< 128	< 125	< 107	< 508	< 107	134 ± 114
	MEAN	2685 ± 3182	16000 ± 6223	110 ± 50	111 ± 39	105 ± 7	491 ± 48	121 ± 38	282 ± 417
33A2									
	06/09/06	< 968	14500 ± 1530	< 106	< 110	< 93	< 529	< 127	< 109
	10/31/06	1040 ± 550	14300 ± 1450	< 74	< 78	< 72	< 249	< 60	< 90
	MEAN	1004 ± 102	14400 ± 283	90 ± 45	94 ± 45	83 ± 29	389 ± 396	93 ± 95	99 ± 27

TABLE C-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

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

	GROUP I			GROUP II	GROUP III	
WEEK	10S3	11S1	14S1	13C1	22G1	
1	13 ± 6	9 ± 5	12 ± 5	9 ± 5	15 ± 5	
2	16 ± 5	17 ± 5	16 ± 5	14 ± 5	16 ± 5	
3	12 ± 5	9 ± 5	16 ± 5	13 ± 5	10 ± 5	
4	11 ± 6	12 ± 6	19 ± 6	18 ± 6	16 ± 6	
5	18 ± 5	19 ± 5	23 ± 5	22 ± 5	24 ± 9	
6	14 ± 5	16 ± 5	14 ± 5	11 ± 5	16 ± 5	
7	19 ± 5	22 ± 5	20 ± 5	18 ± 5	19 ± 5	
8	25 ± 6	20 ± 6	19 ± 6	23 ± 6	22 ± 6	
9	12 ± 5	16 ± 5	13 ± 5	15 ± 5	18 ± 5	
10	16 ± 5	13 ± 5	16 ± 5	16 ± 5	13 ± 5	
11	18 ± 5	12 ± 5	16 ± 5	16 ± 5	14 ± 5	
12	11 ± 4	11 ± 4	6 ± 4	9 ± 4	9 ± 4	
13	20 ± 6	20 ± 5	23 ± 5	18 ± 5	17 ± 5	
14	9 ± 5	14 ± 5	13 ± 5	11 ± 5	10 ± 5	
15	22 ± 6	19 ± 5	16 ± 5	14 ± 5	15 ± 5	
16	7 ± 5	< 7	< 7	7 ± 4	< 7	
17	< 8	11 ± 5	< 7	8 ± 5	9 ± 5	
18	16 ± 4	9 ± 4	13 ± 4	12 ± 4	13 ± 4	
19	11 ± 5	9 ± 5	< 7	< 7	< 7	
20	< 7	< 6	7 ± 4	7 ± 4	9 ± 4	
21	18 ± 5	17 ± 5	18 ± 5	12 ± 4	15 ± 4	
22	15 ± 5	18 ± 5	17 ± 5	12 ± 5	31 ± 13	
23	8 ± 5	9 ± 5	7 ± 4	8 ± 4	8 ± 5	
24	16 ± 5	13 ± 5	15 ± 5	10 ± 4	12 ± 5	
25	19 ± 5	21 ± 5	14 ± 5	9 ± 5	15 ± 5	
26	18 ± 5	16 ± 5	18 ± 5	14 ± 5	16 ± 5	
27	17 ± 5	19 ± 5	22 ± 5	19 ± 5	21 ± 5	
28	22 ± 5	24 ± 6	19 ± 5	16 ± 5	22 ± 5	
29	16 ± 5	24 ± 6	19 ± 6	22 ± 6	< 35	(1)
30	20 ± 5	24 ± 5	27 ± 6	23 ± 5	26 ± 6	
31	26 ± 5	31 ± 5	27 ± 5	23 ± 5	27 ± 5	
32	15 ± 5	16 ± 6	19 ± 6	17 ± 6	13 ± 6	
33	21 ± 5	25 ± 5	19 ± 5	19 ± 5	20 ± 5	
34	25 ± 5	19 ± 5	23 ± 5	24 ± 5	23 ± 5	
35	8 ± 4	9 ± 4	6 ± 4	7 ± 4	8 ± 4	
36	20 ± 5	22 ± 5	21 ± 5	21 ± 5	22 ± 5	
37	12 ± 5	10 ± 5	13 ± 6	15 ± 6	16 ± 6	
38	15 ± 5	16 ± 5	19 ± 6	18 ± 6	17 ± 5	
39	17 ± 5	17 ± 5	17 ± 5	16 ± 5	15 ± 5	
40	12 ± 4	15 ± 5	29 ± 11 (1)	18 ± 5	18 ± 5	
41	20 ± 5	20 ± 5	19 ± 5	19 ± 5	18 ± 5	
42	16 ± 5	18 ± 5	14 ± 5	14 ± 5	16 ± 5	
43	11 ± 4	9 ± 4	12 ± 5	11 ± 5	17 ± 5	
44	25 ± 5	25 ± 6	23 ± 6	27 ± 6	23 ± 6	
45	16 ± 5	22 ± 5	16 ± 5	18 ± 5	24 ± 5	
46	8 ± 5	< 7	11 ± 5	9 ± 5	11 ± 5	
47	25 ± 5	22 ± 5	22 ± 5	23 ± 5	21 ± 5	
48	21 ± 5	26 ± 6	26 ± 6	24 ± 6	25 ± 6	
49	26 ± 5	24 ± 6	21 ± 5	24 ± 6	22 ± 5	
50	25 ± 5	28 ± 6	25 ± 6	25 ± 6	22 ± 6	
51	15 ± 4	15 ± 5	14 ± 4	13 ± 4	16 ± 5	
52	16 ± 5	19 ± 5	13 ± 5	13 ± 5	16 ± 5	
MEAN	16 ± 11	17 ± 12	17 ± 11	16 ± 11	17 ± 12	

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

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, 2006**

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
1/3/2006 - 1/30/2006	9	19	13 ± 7	1/3/2006 - 1/30/2006	9	18	13 ± 7	1/3/2006 - 1/30/2006	10	16	14 ± 5
1/30/2006 - 2/27/2006	14	25	19 ± 7	1/30/2006 - 2/27/2006	11	23	18 ± 11	1/30/2006 - 2/27/2006	16	24	20 ± 7
2/27/2006 - 4/3/2006	6	23	15 ± 8	2/27/2006 - 4/3/2006	9	18	15 ± 7	2/27/2006 - 4/3/2006	9	18	14 ± 7
4/3/2006 - 5/1/2006	< 7	22	12 ± 10	4/3/2006 - 5/1/2006	7	14	10 ± 7	4/3/2006 - 5/1/2006	< 7	15	10 ± 7
5/1/2006 - 5/30/2006	< 6	18	11 ± 9	5/1/2006 - 5/30/2006	< 7	12	10 ± 5	5/1/2006 - 5/30/2006	< 7	15	11 ± 7
5/30/2006 - 7/3/2006	7	21	15 ± 8	5/30/2006 - 7/3/2006	8	14	10 ± 5	5/30/2006 - 7/3/2006	8	31	16 ± 17
7/3/2006 - 7/31/2006	16	27	21 ± 6	7/3/2006 - 7/31/2006	16	23	20 ± 6	7/3/2006 - 7/31/2006	< 21	35	26 ± 13
7/31/2006 - 8/28/2006	15	31	22 ± 10	7/31/2006 - 8/28/2006	17	24	21 ± 7	7/31/2006 - 8/28/2006	13	27	21 ± 12
8/28/2006 - 10/2/2006	6	22	15 ± 10	8/28/2006 - 10/2/2006	7	21	15 ± 10	8/28/2006 - 10/2/2006	8	22	16 ± 10
10/2/2006 - 10/30/2006	9	29	16 ± 11	10/2/2006 - 10/30/2006	11	19	16 ± 7	10/2/2006 - 10/30/2006	16	18	17 ± 2
10/30/2006 - 11/27/2006	< 7	25	18 ± 13	10/30/2006 - 11/27/2006	9	27	19 ± 15	10/30/2006 - 11/27/2006	11	24	20 ± 12
11/27/2006 - 1/2/2007	13	28	21 ± 10	11/27/2006 - 1/2/2007	13	25	20 ± 13	11/27/2006 - 1/2/2007	16	25	20 ± 8
1/3/2006 - 1/2/2007	< 6	31	17 ± 7	12/28/2004 - 1/3/2006	< 7	27	16 ± 8	12/28/2004 - 1/3/2006	< 7	35	17 ± 9

TABLE C-V.3 CONCENTRATION OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

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

STC	COLLECTION PERIOD	Be-7	Mn-54	Co-58	Co-60	Cs-134	Cs-137
10S3	01/03 - 04/03/06	< 83	< 4.9	< 8.0	< 4.4	< 2.7	< 4.1
	04/03 - 07/03/06	61 ± 27	< 3.7	< 4.4	< 5.0	< 3.1	< 3.3
	07/03 - 10/02/06	77 ± 28	< 1.8	< 3.1	< 1.6	< 1.5	< 1.5
	10/02 - 01/02/07	64 ± 16	< 2.1	< 2.4	< 2.1	< 2.2	< 2.2
	MEAN	72 ± 21	3.1 ± 2.8	4.5 ± 5.0	3.3 ± 3.4	2.4 ± 1.4	2.8 ± 2.3
11S1	01/03 - 04/03/06	< 98	< 6.3	< 8.7	< 2.8	< 5.0	< 3.5
	04/03 - 07/03/06	65 ± 30	< 2.5	< 4.7	< 3.2	< 2.7	< 2.9
	07/03 - 10/02/06	64 ± 39	< 2.6	< 4.8	< 1.7	< 2.3	< 2.5
	10/02 - 01/02/07	71 ± 22	< 3.4	< 3.7	< 3.5	< 2.8	< 3.2
	MEAN	74 ± 32	3.7 ± 3.5	5.5 ± 4.5	2.8 ± 1.5	3.2 ± 2.4	3.1 ± 0.9
13C1	01/03 - 04/03/06	64 ± 46	< 2.9	< 6.0	< 3.6	< 4.3	< 2.9
	04/03 - 07/03/06	89 ± 42	< 4.0	< 5.1	< 5.2	< 4.4	< 3.4
	07/03 - 10/02/06	84 ± 37	< 1.4	< 4.6	< 3.3	< 2.0	< 1.7
	10/02 - 01/02/07	81 ± 24	< 3.0	< 3.4	< 2.3	< 3.0	< 3.3
	MEAN	80 ± 22	2.8 ± 2.1	4.8 ± 2.2	3.6 ± 2.4	3.4 ± 2.2	2.8 ± 1.5
14S1	01/03 - 04/03/06	< 76	< 5.5	< 5.7	< 4.2	< 5.6	< 4.8
	04/03 - 07/03/06	81 ± 41	< 4.3	< 7.3	< 3.5	< 3.5	< 3.4
	07/03 - 10/02/06	57 ± 47	< 2.2	< 3.8	< 2.4	< 2.2	< 2.2
	10/02 - 01/02/07	82 ± 30	< 2.5	< 3.8	< 1.5	< 2.8	< 3.0
	MEAN	74 ± 24	3.6 ± 3.2	5.1 ± 3.4	2.9 ± 2.3	3.5 ± 3.0	3.4 ± 2.2
22G1	01/03 - 04/03/06	< 102	< 6.5	< 8.6	< 4.4	< 5.3	< 3.0
	04/03 - 07/03/06	93 ± 34	< 3.4	< 5.9	< 2.6	< 3.7	< 2.7
	07/03 - 10/02/06	126 ± 39	< 2.8	< 3.5	< 2.0	< 2.1	< 1.8
	10/02 - 01/02/07	43 ± 26	< 3.6	< 3.3	< 3.1	< 3.0	< 2.6
	MEAN	91 ± 70	4.1 ± 3.4	5.3 ± 4.9	3.0 ± 2.0	3.5 ± 2.7	2.5 ± 1.0

TABLE C-VI.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

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

		GROUP I		GROUP II	GROUP III
WEEK	10S3	11S1	14S1	13C1	22G1
1	< 39	< 37	< 37	< 37	< 24
2	< 28	< 27	< 27	< 27	< 15
3	< 32	< 31	< 31	< 30	< 15
4	< 44	< 42	< 42	< 42	< 28
5	< 27	< 26	< 25	< 25	< 30
6	< 37	< 35	< 35	< 35	< 19
7	< 34	< 32	< 32	< 32	< 18
8	< 43	< 42	< 41	< 41	< 27
9	< 37	< 35	< 35	< 35	< 19
10	< 29	< 28	< 28	< 28	< 15
11	< 26	< 25	< 25	< 25	< 16
12	< 34	< 32	< 32	< 32	< 21
13	< 41	< 39	< 39	< 39	< 26
14	< 27	< 26	< 26	< 25	< 17
15	< 41	< 39	< 39	< 38	< 21
16	< 31	< 30	< 30	< 22	< 30
17	< 41	< 39	< 38	< 39	< 25
18	< 56	< 54	< 53	< 53	< 30
19	< 62	< 38	< 68	< 68	< 68
20	< 52	< 50	< 49	< 49	< 25
21	< 69	< 66	< 66	< 65	< 43
22	< 33	< 32	< 32	< 32	< 48
23	< 62	< 59	< 44	< 58	< 69
24	< 40	< 51	< 51	< 50	< 51
25	< 39	< 37	< 37	< 37	< 30
26	< 28	< 30	< 30	< 32	< 17
27	< 35	< 57	< 58	< 58	< 58
28	< 53	< 57	< 58	< 59	< 32
29	< 63	< 60	< 63	< 62	< 208 (1)
30	< 25	< 28	< 28	< 28	< 23
31	< 30	< 33	< 33	< 34	< 27
32	< 35	< 38	< 30	< 39	< 39
33	< 33	< 29	< 37	< 37	< 36
34	< 53	< 58	< 58	< 59	< 33
35	< 52	< 57	< 45	< 58	< 57
36	< 50	< 55	< 55	< 56	< 56
37	< 40	< 55	< 56	< 56	< 56
38	< 63	< 69	< 69	< 56	< 70
39	< 34	< 37	< 37	< 38	< 19
40	< 57	< 61	< 142 (1)	< 63	< 34
41	< 31	< 42	< 44	< 43	< 43
42	< 24	< 20	< 26	< 26	< 25
43	< 32	< 44	< 44	< 45	< 46
44	< 14	< 16	< 16	< 16	< 12
45	< 18	< 33	< 34	< 34	< 34
46	< 62	< 66	< 67	< 68	< 45
47	< 27	< 37	< 37	< 38	< 37
48	< 40	< 64	< 64	< 66	< 66
49	< 39	< 54	< 55	< 55	< 54
50	< 35	< 38	< 39	< 39	< 26
51	< 36	< 39	< 39	< 40	< 21
52	< 19	< 21	< 21	< 21	< 14
MEAN	39 ± 26	41 ± 27	43 ± 39	42 ± 28	37 ± 58

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-VII.1 CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

	CONTROL FARMS		INDICATOR FARMS				
COLLECTION PERIOD	23F1	36E1	10F4	18E1	19B1	25C1	25E1
01/11/06	< 0.5	< 0.4	< 0.4	< 0.5	< 0.4	< 0.5	< 0.4
02/14/06	< 0.7		< 0.2	< 0.5	< 0.7	< 0.6	
03/14/06	< 0.5		< 0.4	< 0.5	< 0.3	< 0.4	
04/04/06	< 0.4	< 0.4	< 0.4	< 0.3	< 0.8	< 0.4	< 0.3
04/17/06	< 0.5		< 0.4	< 0.5	< 0.6	< 0.6	
05/02/06	< 0.6		< 0.4	< 0.6	< 0.4	< 0.3	
05/16/06	< 0.6		< 0.9	< 0.6	< 0.6	< 0.4	
05/30/06	< 0.6		< 0.5	< 0.5	< 0.7	< 0.6	
06/13/06	< 1.3 (1)		< 1.3 (1)	< 1.8 (1)	< 1.8 (1)	< 1.1 (1)	
06/27/06	< 1.1 (1)		< 1.2 (1)	< 1.9 (1)	< 1.3 (1)	< 7.4 (1)	
07/12/06	< 0.4	< 0.6	< 0.7	< 0.5	< 0.6	< 0.9	< 0.9
07/25/06	< 1.8 (1)		< 1.1 (1)	< 1.1 (1)	< 0.6	< 2.8 (1)	
08/08/06	< 0.4		< 0.4	< 0.4	< 0.7	< 0.7	
08/22/06	< 0.5		< 0.5	< 0.5	< 0.4	< 0.5	
09/05/06	< 0.4		< 0.4	< 0.4	< 0.4	< 0.5	
09/19/06	< 0.3		< 0.3	< 0.3	< 0.2	< 0.3	
10/03/06	< 0.5	< 0.5	< 0.4	< 0.4	< 0.4	< 0.5	< 0.4
10/17/06	< 0.3		< 0.6	< 0.3	< 0.3	< 0.4	
10/31/06	< 0.5		< 0.5	< 0.4	< 0.4	< 0.4	
11/14/06	< 0.5		< 0.5	< 0.5	< 0.5	< 0.4	
11/28/06	< 0.6		< 0.5	< 0.5	< 0.5	< 0.5	
12/12/06	< 0.6		< 0.6	< 0.6	< 0.6	< 0.7	
MEAN	0.6 ± 0.7	0.5 ± 0.2	0.6 ± 0.6	0.6 ± 0.9	0.6 ± 0.7	0.9 ± 3.1	0.5 ± 0.5

(1) See Exceptions Section for Explanation

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
10F4	01/10/06	1220 ± 160	< 10	< 10	< 30	< 12
	02/14/06	1270 ± 119	< 9	< 7	< 39	< 11
	03/14/06	1360 ± 147	< 7	< 8	< 31	< 10
	04/04/06	1420 ± 143	< 8	< 8	< 38	< 11
	04/17/06	1300 ± 126	< 7	< 8	< 30	< 9
	05/02/06	1290 ± 155	< 9	< 9	< 41	< 12
	05/16/06	1330 ± 180	< 15	< 14	< 54	< 13
	05/30/06	1240 ± 115	< 7	< 7	< 47	< 14
	06/13/06	1320 ± 139	< 9	< 8	< 47	< 15
	06/27/06	1380 ± 133	< 11	< 10	< 46	< 13
	07/11/06	1120 ± 172	< 10	< 9	< 44	< 12
	07/25/06	1300 ± 161	< 8	< 9	< 34	< 11
	08/08/06	1340 ± 146	< 6	< 7	< 35	< 13
	08/22/06	1230 ± 129	< 5	< 6	< 38	< 12
	09/05/06	1350 ± 138	< 5	< 6	< 41	< 14
	09/19/06	1280 ± 186	< 8	< 9	< 43	< 14
	10/03/06	1390 ± 130	< 5	< 5	< 42	< 14
	10/17/06	1320 ± 122	< 5	< 5	< 46	< 13
	10/31/06	1250 ± 106	< 4	< 4	< 40	< 12
	11/14/06	1290 ± 113	< 2	< 2	< 24	< 10
	11/28/06	1160 ± 115	< 5	< 6	< 38	< 11
	12/12/06	1300 ± 175	< 7	< 9	< 47	< 15
	MEAN	1294 ± 144	7 ± 6	8 ± 5	40 ± 14	12 ± 3
18E1	01/10/06	1400 ± 128	< 9	< 8	< 28	< 10
	02/14/06	1320 ± 123	< 9	< 7	< 39	< 10
	03/14/06	1300 ± 127	< 8	< 7	< 25	< 9
	04/04/06	1370 ± 121	< 8	< 8	< 31	< 9
	04/17/06	1310 ± 153	< 10	< 9	< 36	< 14
	05/02/06	1200 ± 160	< 10	< 10	< 42	< 13
	05/16/06	1380 ± 167	< 8	< 9	< 44	< 11
	05/30/06	1310 ± 119	< 7	< 7	< 56	< 14
	06/13/06	1220 ± 111	< 7	< 7	< 44	< 15
	06/27/06	1280 ± 210	< 13	< 11	< 48	< 15
	07/11/06	1370 ± 159	< 14	< 10	< 46	< 15
	07/25/06	1270 ± 80.5	< 5	< 5	< 21	< 7
	08/08/06	1340 ± 146	< 5	< 7	< 34	< 12
	08/22/06	1050 ± 166	< 8	< 9	< 55	< 13
	09/05/06	1200 ± 130	< 6	< 6	< 48	< 13
	09/19/06	1340 ± 180	< 6	< 9	< 46	< 15
	10/03/06	1400 ± 138	< 6	< 6	< 37	< 9
	10/17/06	1320 ± 112	< 3	< 5	< 37	< 14
	10/31/06	1390 ± 114	< 4	< 5	< 41	< 14
	11/14/06	1210 ± 130	< 2	< 4	< 40	< 10
	11/28/06	1420 ± 134	< 6	< 7	< 47	< 13
	12/12/06	1130 ± 152	< 11	< 10	< 45	< 15
	MEAN	1297 ± 190	8 ± 6	8 ± 4	40 ± 18	12 ± 5

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC		K-40	Cs-134	Cs-137	Ba-140	La-140
19B1	01/10/06	1450 ± 161	< 10	< 10	< 35	< 9
	02/14/06	1320 ± 115	< 8	< 7	< 34	< 10
	03/14/06	1280 ± 161	< 9	< 9	< 33	< 9
	04/04/06	1420 ± 133	< 9	< 9	< 40	< 12
	04/17/06	1320 ± 155	< 9	< 9	< 44	< 11
	05/02/06	1320 ± 163	< 7	< 9	< 31	< 12
	05/16/06	1270 ± 144	< 9	< 8	< 39	< 11
	05/30/06	1350 ± 114	< 8	< 7	< 51	< 14
	06/13/06	1270 ± 114	< 6	< 7	< 44	< 13
	06/27/06	1380 ± 188	< 11	< 11	< 45	< 14
	07/11/06	1200 ± 125	< 9	< 9	< 37	< 13
	07/25/06	1350 ± 72	< 3	< 3	< 15	< 4
	08/08/06	1340 ± 153	< 6	< 6	< 40	< 11
	08/22/06	1380 ± 184	< 7	< 8	< 52	< 14
	09/05/06	1420 ± 145	< 5	< 5	< 41	< 14
	09/19/06	1430 ± 195	< 7	< 9	< 45	< 12
	10/03/06	1300 ± 139	< 6	< 6	< 46	< 12
	10/17/06	1200 ± 123	< 4	< 5	< 46	< 13
	10/31/06	1250 ± 101	< 3	< 4	< 35	< 14
	11/14/06	1360 ± 121	< 4	< 4	< 51	< 13
	11/28/06	1250 ± 133	< 5	< 5	< 36	< 10
	12/12/06	1380 ± 129	< 5	< 5	< 26	< 8
	MEAN	1329 ± 143	7 ± 5	7 ± 4	39 ± 17	11 ± 5
23F1	01/10/06	1280 ± 177	< 7	< 8	< 23	< 6
	02/14/06	1180 ± 123	< 8	< 8	< 40	< 12
	03/14/06	1300 ± 144	< 9	< 8	< 32	< 10
	04/04/06	1320 ± 149	< 9	< 10	< 39	< 14
	04/17/06	1300 ± 132	< 7	< 8	< 34	< 12
	05/02/06	1300 ± 171	< 10	< 11	< 42	< 14
	05/16/06	1320 ± 149	< 7	< 8	< 33	< 12
	05/30/06	1410 ± 91.7	< 6	< 6	< 43	< 14
	06/13/06	1210 ± 111	< 6	< 6	< 40	< 15
	06/27/06	1150 ± 156	< 11	< 10	< 44	< 13
	07/12/06	1210 ± 149	< 12	< 8	< 39	< 12
	07/25/06	1300 ± 60.3	< 3	< 3	< 13	< 4
	08/08/06	1220 ± 152	< 7	< 7	< 45	< 13
	08/22/06	1270 ± 156	< 6	< 7	< 47	< 13
	09/05/06	1240 ± 147	< 5	< 6	< 41	< 13
	09/19/06	1320 ± 157	< 7	< 8	< 33	< 12
	10/03/06	1260 ± 146	< 5	< 6	< 43	< 11
	10/17/06	1290 ± 128	< 5	< 6	< 55	< 12
	10/31/06	1370 ± 145	< 5	< 6	< 54	< 15
	11/14/06	1290 ± 135	< 3	< 4	< 38	< 9
	11/28/06	1350 ± 135	< 4	< 6	< 41	< 12
	12/12/06	1240 ± 146	< 7	< 8	< 36	< 7
	MEAN	1279 ± 124	7 ± 5	7 ± 4	39 ± 18	12 ± 6

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC		K-40	Cs-134	Cs-137	Ba-140	La-140
25C1	01/10/06	1130 ± 240	< 7	< 8	< 23	< 6
	02/14/06	1300 ± 99	< 6	< 6	< 27	< 7
	03/14/06	1260 ± 128	< 8	< 9	< 27	< 9
	04/04/06	1240 ± 121	< 7	< 7	< 33	< 9
	04/17/06	1330 ± 146	< 10	< 10	< 43	< 11
	05/02/06	1170 ± 169	< 12	< 10	< 46	< 13
	05/16/06	1210 ± 150	< 8	< 9	< 40	< 13
	05/30/06	1300 ± 97	< 6	< 6	< 45	< 14
	06/13/06	1380 ± 133	< 8	< 8	< 50	< 14
	06/27/06	1410 ± 136	< 9	< 8	< 35	< 10
	07/11/06	1330 ± 164	< 11	< 11	< 47	< 11
	07/25/06	1240 ± 69.6	< 4	< 4	< 17	< 5
	08/08/06	1300 ± 163	< 5	< 6	< 40	< 12
	08/22/06	1210 ± 147	< 5	< 5	< 32	< 15
	09/05/06	1340 ± 157	< 6	< 6	< 47	< 15
	09/19/06	1340 ± 175	< 6	< 7	< 34	< 12
	10/03/06	1360 ± 130	< 4	< 5	< 40	< 14
	10/17/06	1380 ± 95.7	< 4	< 4	< 36	< 13
	10/31/06	1180 ± 126	< 5	< 5	< 46	< 15
	11/14/06	1210 ± 115	< 2	< 3	< 42	< 14
	11/28/06	1330 ± 140	< 6	< 6	< 42	< 13
	12/12/06	1260 ± 140	< 6	< 6	< 29	< 12
	MEAN	1282 ± 153	7 ± 5	7 ± 4	37 ± 18	12 ± 6
25E1	01/11/06	1250 ± 129	< 11	< 8	< 36	< 11
	04/04/06	1200 ± 159	< 10	< 9	< 39	< 12
	07/11/06	1410 ± 187	< 11	< 12	< 51	< 8
	10/03/06	1390 ± 120	< 5	< 5	< 39	< 15
	MEAN	1313 ± 207	9 ± 6	9 ± 5	41 ± 13	11 ± 6
36E1	01/10/06	1190 ± 157	< 12	< 10	< 46	< 13
	04/04/06	1210 ± 120	< 7	< 6	< 28	< 11
	07/11/06	1190 ± 149	< 11	< 10	< 39	< 10
	10/03/06	1360 ± 148	< 6	< 7	< 47	< 15
	MEAN	1238 ± 164	9 ± 6	8 ± 4	40 ± 17	12 ± 4

TABLE C-VIII.1 CONCENTRATIONS OF GAMMA EMITTERS IN BROAD LEAFY VEGETATION SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	TYPE	BE-7	K-40	MN-54	CO-58	CO-60	I-131	CS-134	CS-137
11S3	06/22/06	Cabbage	< 155	5920 ± 330	< 14	< 14	< 13	< 55	< 14	< 15
		Collards	< 138	5610 ± 276	< 15	< 15	< 15	< 47	< 15	< 14
		Lettuce	< 82	2150 ± 173	< 10	< 11	< 11	< 29	< 10	< 10
	07/20/06	Cabbage	191 ± 32	4190 ± 95	< 5	< 5	< 5	< 20	< 5	< 5
		Collards	110 ± 23	4340 ± 77	< 4	< 4	< 4	< 15	< 4	< 4
		Parsley	390 ± 38	8430 ± 120	< 5	< 6	< 6	< 19	< 5	< 5
	08/24/06	Cabbage	117 ± 32	4850 ± 100	< 4	< 5	< 4	< 50	< 4	< 4
		Collards	103 ± 39	3870 ± 101	< 4	< 5	< 4	< 43	< 3	< 4
		Parsley	304 ± 32	6710 ± 92	< 3	< 3	< 3	< 30	< 3	< 3
	09/18/06	Cabbage	260 ± 45	3510 ± 109	< 4	< 5	< 4	< 24	< 4	< 4
		Collards	559 ± 53	3500 ± 118	< 5	< 5	< 5	< 16	< 4	< 5
		Brussel Sprout Leaves	320 ± 53	4810 ± 145	< 5	< 6	< 7	< 17	< 5	< 6
		Mean	227 ± 289	4824 ± 3333	< 7	< 7	< 7	< 30	< 6	< 7
13S3	06/22/06	Cabbage	102 ± 97	3540 ± 186	< 11	< 11	< 10	< 33	< 12	< 11
		Collards	< 95	4720 ± 182	< 10	< 11	< 11	< 32	< 11	< 10
		Lettuce	< 168	4240 ± 248	< 18	< 19	< 18	< 57	< 20	< 19
	07/20/06	Cabbage	297 ± 68	2870 ± 136	< 7	< 8	< 7	< 34	< 7	< 8
		Collards	188 ± 42	5140 ± 105	< 4	< 5	< 4	< 17	< 4	< 4
		Cauliflower Leaves	351 ± 119	4460 ± 264	< 13	< 14	< 14	< 45	< 13	< 14
	08/24/06	Cabbage	< 35	2370 ± 96	< 3	< 4	< 3	< 38	< 3	< 3
		Collards	102 ± 36	5060 ± 93	< 3	< 4	< 3	< 41	< 3	< 3
		Cauliflower Leaves	119 ± 38	4130 ± 112	< 4	< 5	< 4	< 46	< 4	< 4
	09/18/06	Cabbage	< 53	1630 ± 107	< 6	< 6	< 5	< 18	< 5	< 5
		Collards (1)	319 ± 53	3880 ± 130	< 5	< 6	< 5	< 30	< 5	< 5
		Mean	166 ± 220	3822 ± 2250	< 8	< 8	< 8	< 36	< 8	< 8

TABLE C-VIII.1 CONCENTRATIONS OF GAMMA EMITTERS IN BROAD LEAFY VEGETATION SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC	COLLECTION PERIOD	TYPE	BE-7	K-40	MN-54	CO-58	CO-60	I-131	CS-134	CS-137
31G1	06/22/06	Cabbage	229 ± 100	6580 ± 240	< 14	< 15	< 15	< 46	< 15	< 14
		Lettuce	184 ± 64	3250 ± 180	< 10	< 10	< 11	< 28	< 10	< 10
		Zucchini Leaves	159 ± 71	5480 ± 227	< 11	< 12	< 11	< 38	< 11	< 12
	7/20/2006	String Bean Leaves	817 ± 47	5630 ± 113	< 5	< 5	< 5	< 19	< 4	< 5
		Yellow Squash Leaves	844 ± 51	6180 ± 122	< 6	< 6	< 6	< 22	< 6	< 6
		Zuchini Leaves	754 ± 40	5760 ± 104	< 3	< 4	< 4	< 14	< 3	< 3
	08/24/06	Cabbage	< 23	2190 ± 57	< 2	< 3	< 2	< 24	< 2	< 2
		Cucumber Leaves	680 ± 57	6610 ± 128	< 5	< 6	< 5	< 59	< 4	< 5
		Yellow Squash Leaves	328 ± 57	< 177	< 4	< 4	< 3	< 39	< 3	< 3
	9/18/2006	Catalpa Leaves	938 ± 94	3120 ± 181	< 9	< 10	< 8	< 28	< 8	< 9
		Sumac Leaves	1540 ± 83	4610 ± 166	< 6	< 7	< 6	< 32	< 6	< 7
		Sycamore Leaves	2180 ± 130	2660 ± 198	< 10	< 10	< 9	< 29	< 9	< 10
		Mean	723 ± 1259	4354 ± 4093	< 7	< 8	< 7	< 32	< 7	< 7

(1) SEE PROGRAM EXCEPTION SECTION FOR EXPLANATION

TABLE C-IX.1 QUARTERLY TLD RESULTS FOR LIMERICK GENERATION STATION, 2006

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MONTH ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S. D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
36S2	8.1 ± 1.4	8.1 ± 0.5	7.3 ± 0.4	9.0 ± 0.7	7.9 ± 0.6
36D1	7.0 ± 1.0	7.5 ± 0.4	6.5 ± 0.6	7.3 ± 0.7	6.7 ± 0.4
2E1	8.0 ± 0.8	7.9 ± 0.6	7.7 ± 1.3	8.6 ± 0.4	7.8 ± 0.8
3S1	7.7 ± 0.6	7.6 ± 0.4	7.4 ± 0.3	8.1 ± 0.6	7.6 ± 0.7
4E1	6.1 ± 1.1	6.0 ± 0.3	5.8 ± 0.3	6.9 ± 0.6	5.6 ± 0.3
5S1	8.8 ± 0.6	8.8 ± 0.6	8.4 ± 0.4	9.0 ± 1.5	9.0 ± 1.4
5H1	9.0 ± 1.2	8.9 ± 0.5	8.5 ± 1.1	9.8 ± 0.6	8.6 ± 1
6C1	7.3 ± 1.3	7.8 ± 1.9	6.8 ± 0.5	8.0 ± 0.7	6.7 ± 0.4
7S1	8.1 ± 0.6	7.9 ± 1.4	7.8 ± 0.7	8.5 ± 0.6	8.0 ± 0.4
7E1	7.9 ± 1.2	7.9 ± 0.6	7.9 ± 0.4	8.6 ± 0.6	7.1 ± 0.7
9C1	7.3 ± 1.2	7.2 ± 0.1	6.8 ± 0.3	8.1 ± 0.7	6.9 ± 0.4
10S3	8.0 ± 0.6	8.0 ± 0.3	7.7 ± 0.1	8.4 ± 0.9	7.9 ± 0.6
10E1	7.7 ± 0.9	7.7 ± 0.5	7.4 ± 0.6	8.4 ± 0.7	7.4 ± 0.5
10F3	7.5 ± 1.4	7.5 ± 0.5	7.3 ± 0.8	8.4 ± 0.4	6.7 ± 0.3
11S1	9.1 ± 1.4	8.9 ± 0.8	8.2 ± 0.3	9.7 ± 2.5	9.6 ± 1.4
13S2	11.6 ± 1.6	11 ± 0.6	11 ± 0.7	12 ± 0.6	12 ± 0.7
13C1	6.0 ± 1.4	6.3 ± 0.4	5.5 ± 0.4	6.8 ± 0.4	5.3 ± 0.6
13E1	7.6 ± 1.9	7.1 ± 0.4	7.5 ± 0.9	8.9 ± 0.7	6.8 ± 0.4
14S1	7.1 ± 1.0	7.0 ± 0.4	6.5 ± 0.5	7.6 ± 0.5	7.4 ± 0.5
15D1	7.7 ± 1.3	7.8 ± 0.4	7.2 ± 0.4	8.6 ± 0.5	7.3 ± 0.7
16F1	7.9 ± 0.8	7.7 ± 0.5	7.5 ± 1.0	8.4 ± 0.5	7.8 ± 0.6
17B1	7.2 ± 1.2	7.4 ± 0.7	6.6 ± 0.5	8.0 ± 0.3	6.9 ± 0.6
18S2	8.2 ± 1.8	7.0 ± 0.4	8.4 ± 0.7	9.2 ± 0.4	8.3 ± 0.6
19D1	7.1 ± 1.3	7.4 ± 0.4	6.7 ± 1.2	7.9 ± 0.7	6.5 ± 0.4
20D1	7.1 ± 1.2	7.2 ± 0.4	6.5 ± 0.2	7.8 ± 0.8	6.7 ± 0.5
20F1	7.3 ± 1.2	7.1 ± 0.4	6.9 ± 0.9	8.2 ± 0.2	6.9 ± 0.5
21S2	7.2 ± 0.6	7.1 ± 0.3	6.8 ± 0.5	7.4 ± 0.4	7.4 ± 0.6
23S2	7.3 ± 1.1	6.9 ± 0.6	6.7 ± 0.7	7.8 ± 0.5	7.6 ± 0.7
24D1	6.5 ± 1.4	7.0 ± 0.6	5.8 ± 0.8	7.2 ± 0.2	6.1 ± 0.5
25S2	6.7 ± 0.5	6.8 ± 0.8	6.4 ± 0.6	(1)	6.8 ± 0.4
25D1	6.4 ± 1.3	6.9 ± 0.3	5.8 ± 0.3	7.1 ± 0.8	5.9 ± 0.5
26S3	7.0 ± 0.8	7.0 ± 0.9	6.5 ± 0.7	7.5 ± 0.8	7.1 ± 0.5
28D2	6.9 ± 1.0	7.3 ± 0.3	6.4 ± 0.5	7.4 ± 0.6	6.6 ± 0.6
29S1	7.2 ± 0.9	7.3 ± 0.3	6.5 ± 0.6	7.4 ± 0.2	7.4 ± 1.0
29E1	7.4 ± 2.0	8.6 ± 0.7	6.3 ± 0.1	7.8 ± 0.7	6.9 ± 0.4
31S1	7.9 ± 0.7	7.6 ± 0.4	7.6 ± 0.6	8.3 ± 0.9	8.0 ± 0.3
31D1	8.9 ± 1.1	9.0 ± 0.8	8.5 ± 0.3	9.6 ± 0.5	8.4 ± 0.5
31D2	7.7 ± 1.2	7.9 ± 0.6	7.4 ± 0.3	8.5 ± 0.5	7.1 ± 0.3
34S2	7.9 ± 1.1	8.1 ± 0.5	7.4 ± 0.9	8.6 ± 1.6	7.6 ± 0.3
34E1	7.3 ± 1.2	7.7 ± 0.6	6.7 ± 0.5	8.0 ± 0.4	6.9 ± 0.2

(1) SEE PROGRAM EXCEPTIONS FOR EXPLANATION

TABLE C-IX.2 **MEAN QUARTERLY TLD RESULTS FOR THE SITE BOUNDARY, MIDDLE AND CONTROL LOCATIONS FOR LIMERICK GENERATING STATION, 2006**

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

COLLECTION PERIOD	SITE BOUNDARY ± 2 S. D.	MIDDLE	CONTROL
JAN-MAR	7.8 ± 1.1	7.5 ± 0.6	8.9 ± 0.0
APR-JUN	7.5 ± 1.1	6.8 ± 0.7	8.5 ± 0.0
JUL-SEP	8.6 ± 1.2	8.0 ± 0.7	9.8 ± 0.0
OCT-DEC	8.1 ± 1.3	6.8 ± 0.7	8.6 ± 0.0

TABLE C-IX.3 **SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR LIMERICK GENERATING STATION, 2006**

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MONTH

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S. D.	PRE-OP MEAN ± 2 S. D.
SITE BOUNDARY	63	6.4	12.4	8.0 ± 1.2	7.6 ± 2.4
MIDDLE DISTANCE	92	5.3	9.6	7.3 ± 0.8	7.8 ± 2.2
CONTROL	4	8.5	9.8	9.0 ± 0.6	7.8 ± 3.0

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

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

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

CONTROL STATIONS - 5H1

TABLE C-X.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

SURFACE WATER (TRITIUM LIQUID SCINTILLATION)

COLLECTION PERIOD	13B1	24S1
JAN-MAR	01/03/06 - 04/03/06	01/03/06 - 04/03/06
APR-JUN	04/03/06 - 06/26/06	04/03/06 - 06/26/06
JUL-SEP	06/26/06 - 10/02/06	06/26/06 - 10/02/06
OCT-DEC	10/02/06 - 01/02/07	10/02/06 - 01/02/07

SURFACE WATER (GAMMA SPECTROSCOPY)

COLLECTION PERIOD	13B1	24S1
JAN	01/03/06 - 01/31/06	01/03/06 - 01/31/06
FEB	01/31/06 - 02/28/06	01/31/06 - 02/28/06
MAR	02/28/06 - 04/03/06	02/28/06 - 04/03/06
APR	04/03/06 - 05/01/06	04/03/06 - 05/01/06
MAY	05/01/06 - 05/30/06	05/01/06 - 05/30/06
JUN	05/30/06 - 06/26/06	05/30/06 - 06/26/06
JUL	06/26/06 - 07/31/06	06/26/06 - 07/31/06
AUG	07/31/06 - 08/28/06	07/31/06 - 08/28/06
SEP	08/28/06 - 10/02/06	08/28/06 - 10/02/06
OCT	10/02/06 - 10/30/06	10/02/06 - 10/30/06
NOV	10/30/06 - 11/27/06	10/30/06 - 11/27/06
DEC	11/27/06 - 01/02/07	11/27/06 - 01/02/07

DRINKING WATER (TRITIUM)

COLLECTION PERIOD	15F4	15F7	16C2	28F3
JAN-MAR	01/03/06 - 04/03/06	01/03/06 - 04/03/06	01/03/06 - 04/03/06	01/03/06 - 04/03/06
APR-JUN	04/03/06 - 06/26/06	04/03/06 - 06/26/06	04/03/06 - 06/26/06	04/03/06 - 06/26/06
JUL-SEP	06/26/06 - 10/02/06	06/26/06 - 10/02/06	06/26/06 - 10/02/06	06/26/06 - 10/02/06
OCT-DEC	10/02/06 - 01/02/07	10/02/06 - 01/02/07	10/02/06 - 01/02/07	10/02/06 - 01/02/07

DRINKING WATER (GROSS BETA & GAMMA SPECTROSCOPY)

COLLECTION PERIOD	15F4	15F7	16C2	28F3
JAN	01/03/06 - 01/31/06	01/03/06 - 01/31/06	01/03/06 - 01/31/06	01/03/06 - 01/31/06
FEB	01/31/06 - 02/28/06	01/31/06 - 02/28/06	01/31/06 - 02/28/06	01/31/06 - 02/28/06
MAR	02/28/06 - 04/03/06	02/28/06 - 04/03/06	02/28/06 - 04/03/06	02/28/06 - 04/03/06
APR	04/03/06 - 05/01/06	04/03/06 - 05/01/06	04/03/06 - 05/01/06	04/03/06 - 05/01/06
MAY	05/01/06 - 05/30/06	05/01/06 - 05/30/06	05/01/06 - 05/30/06	05/01/06 - 05/30/06
JUN	05/30/06 - 06/26/06	05/30/06 - 06/26/06	05/30/06 - 06/26/06	05/30/06 - 06/26/06
JUL	06/26/06 - 07/31/06	06/26/06 - 07/31/06	06/26/06 - 07/31/06	06/26/06 - 07/31/06
AUG	07/31/06 - 08/28/06	07/31/06 - 08/28/06	07/31/06 - 08/28/06	07/31/06 - 08/28/06
SEP	08/28/06 - 10/02/06	08/28/06 - 10/02/06	08/28/06 - 10/02/06	08/28/06 - 10/02/06
OCT	10/02/06 - 10/30/06	10/02/06 - 10/30/06	10/02/06 - 10/30/06	10/02/06 - 10/30/06
NOV	10/30/06 - 11/27/06	10/30/06 - 11/27/06	10/30/06 - 11/27/06	10/30/06 - 11/27/06
DEC	11/27/06 - 01/02/07	11/27/06 - 01/02/07	11/27/06 - 01/02/07	11/27/06 - 01/02/07

TABLE C-X.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

AIR PARTICULATE (GAMMA SPECTROSCOPY)

COLLECTION PERIOD	10S3	11S1	14S1	13CS	22G1
JAN-MAR	01/03/06 - 04/03/06	01/03/06 - 04/03/06	01/03/06 - 04/03/06	01/03/06 - 04/03/06	01/03/06 - 04/03/06
APR-JUN	04/03/06 - 07/03/06	04/03/06 - 07/03/06	04/03/06 - 07/03/06	04/03/06 - 07/03/06	04/03/06 - 07/03/06
JUL-SEP	07/03/06 - 10/02/06	07/03/06 - 10/02/06	07/03/06 - 10/02/06	07/03/06 - 10/02/06	07/03/06 - 10/02/06
OCT-DEC	10/02/06 - 01/02/07	10/02/06 - 01/02/07	10/02/06 - 01/02/07	10/02/06 - 01/02/07	10/02/06 - 01/02/07

AIR PARTICULATE (GROSS BETA & I-131)

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

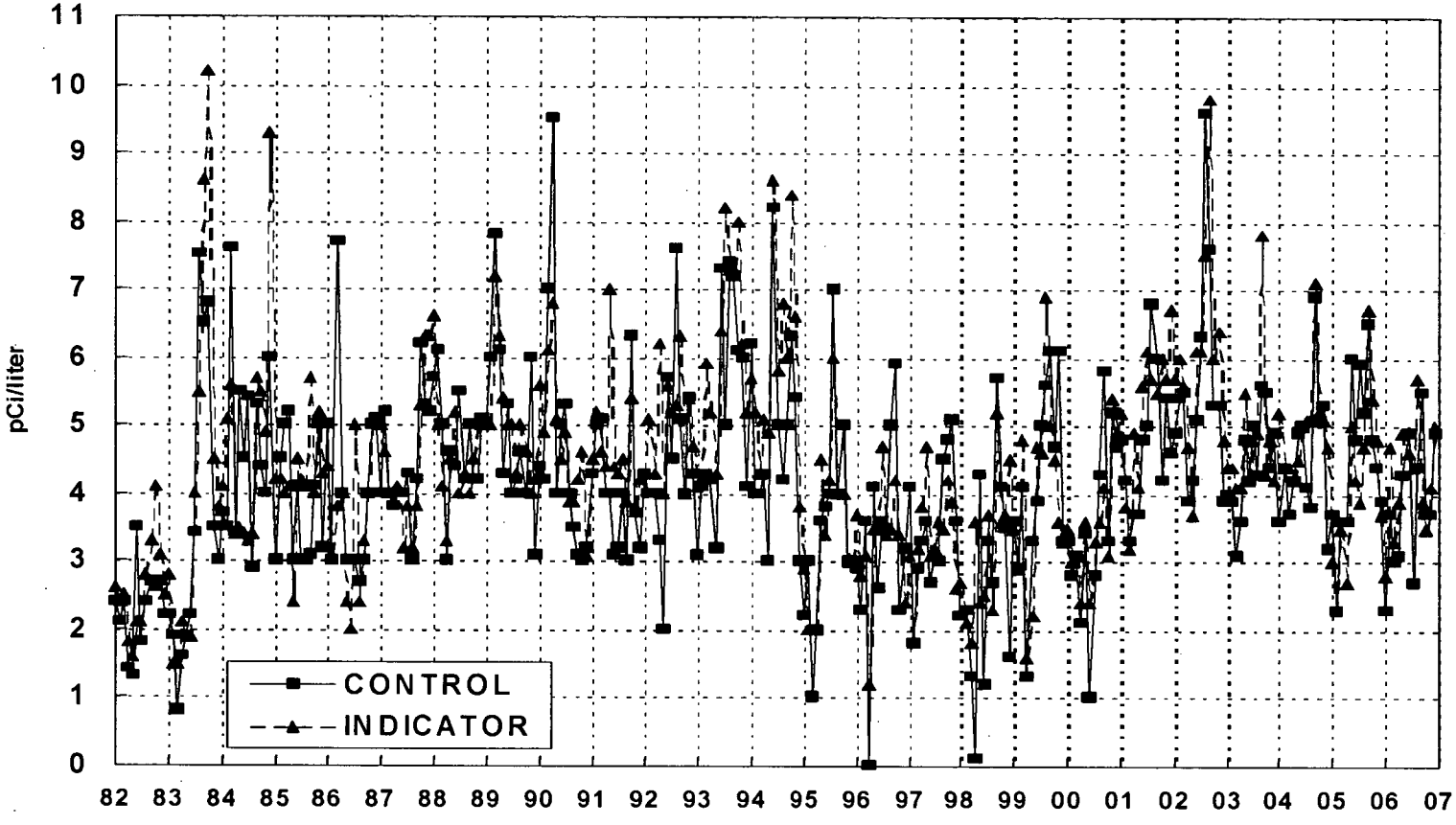
TABLE C-X.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

TLD

STATION CODE	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
36S2	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
36D1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
2E1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
3S1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
4E1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
5S1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
5H1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
6C1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
7S1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
7E1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
9C1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
10S3	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
10E1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
10F3	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
11S1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
13S2	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
13C1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
13E1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
14S1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
15D1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
16F1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
17B1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
18S2	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
19D1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
20D1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
20F1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
21S2	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
23S2	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
24D1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
25S2	01/05/06 - 04/12/06	04/12/06 - 07/12/06	(1)	10/03/06 - 01/04/07
25D1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
26S3	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
28D2	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
29S1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
29E1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
31S1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
31D1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
31D2	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
34S2	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07
34E1	01/05/06 - 04/12/06	04/12/06 - 07/12/06	07/12/06 - 10/03/06	10/03/06 - 01/04/07

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

FIGURE C-1
MEAN MONTHLY TOTAL GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LGS, 1982 - 2006

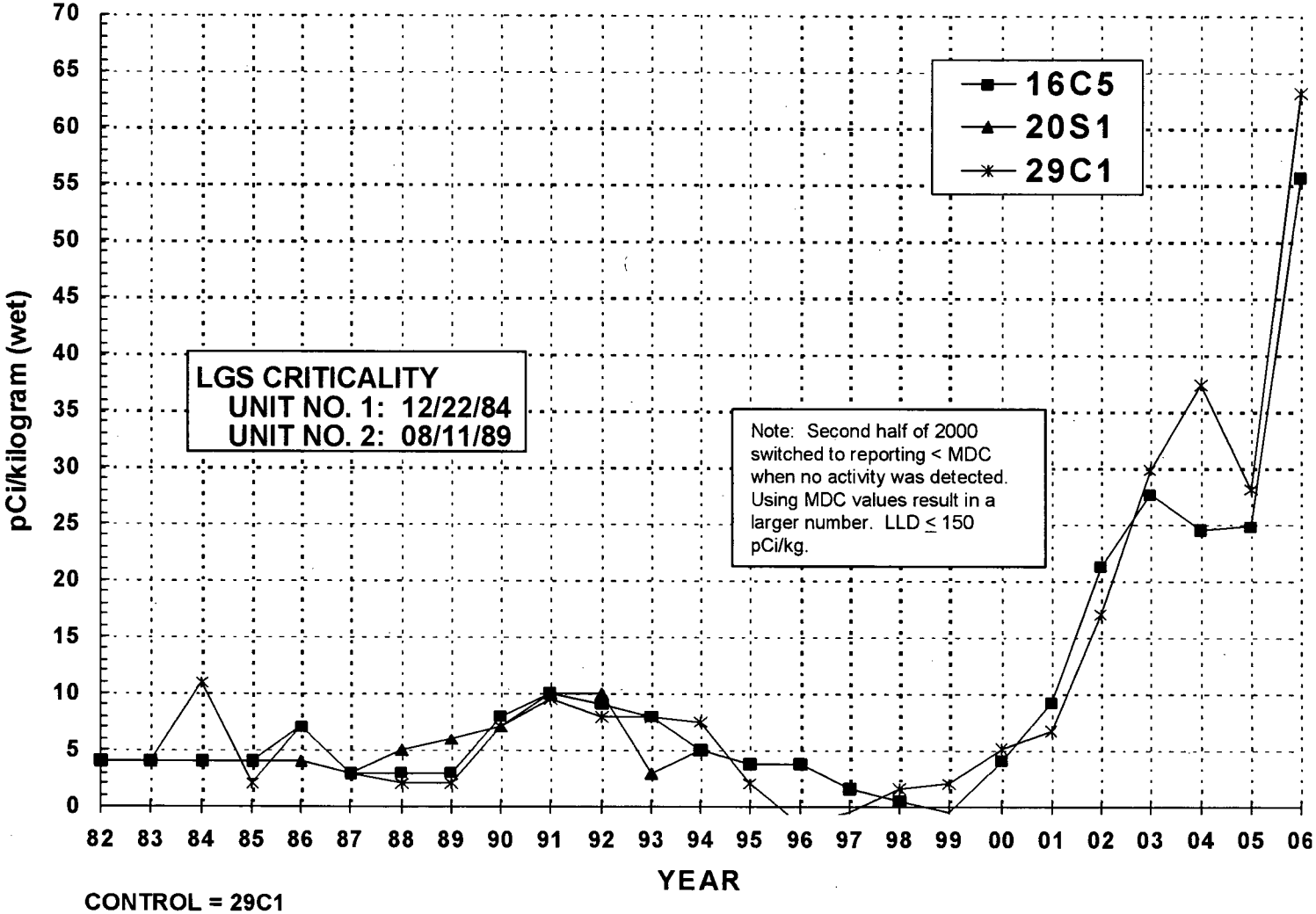


Note: 2005 analysis changed from Insoluble & Soluble to Total Gross Beta

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

LGS CHANGED TO TOTAL GROSS BETA AT THE BEGINNING OF 2005. PREVIOUS DATA INCLUDED SUMMATION OF LESS THAN VALUES.

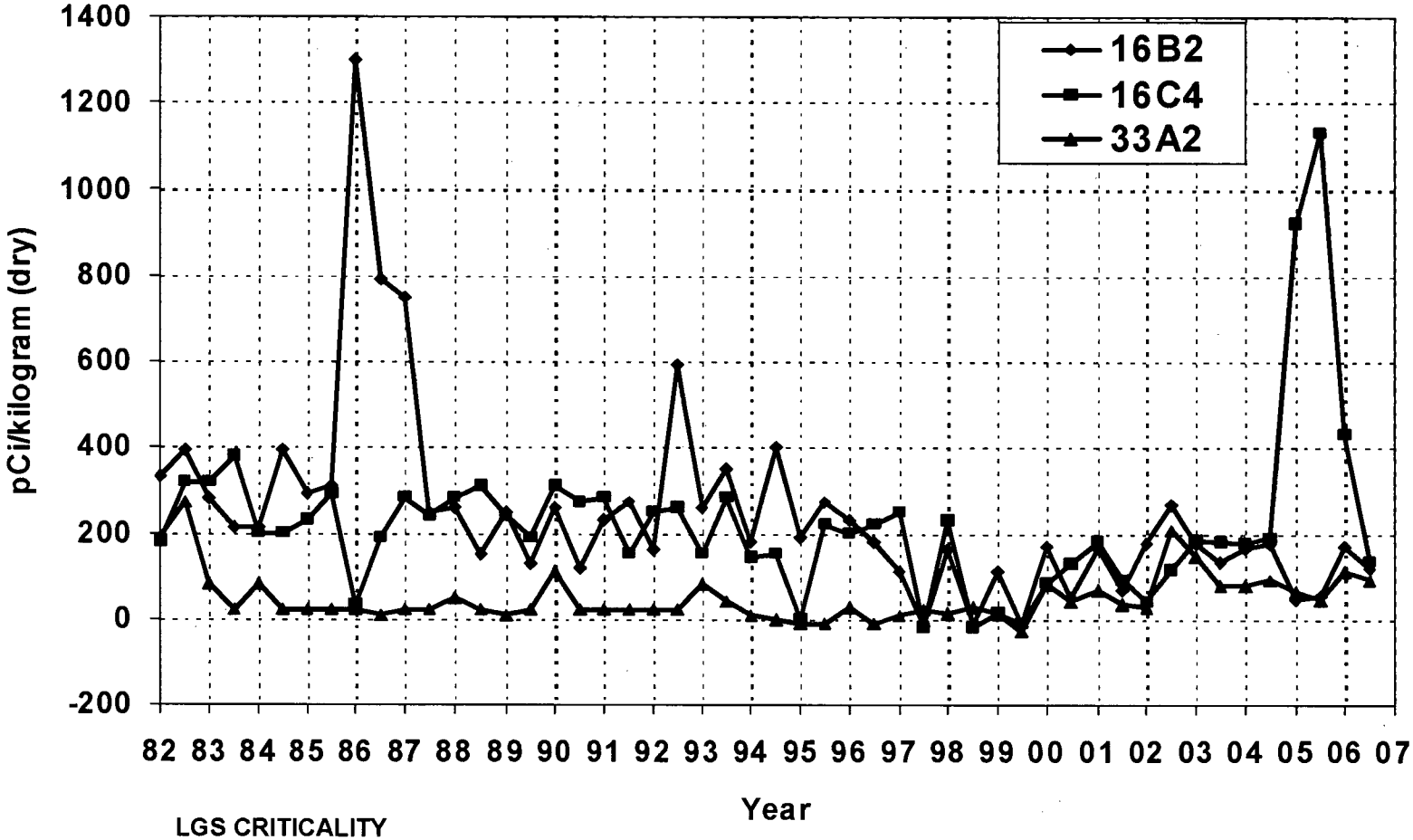
FIGURE C-2
MEAN ANNUAL CS-137 CONCENTRATIONS IN FISH SAMPLES COLLECTED IN THE VICINITY OF LGS, 1982 - 2006



CONTROL = 29C1

Station 20S1 discontinued in 1995

FIGURE C-3
CONCENTRATIONS OF CS-137 IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF LGS, 1982 - 2006



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

CONTROL = 33A2

FIGURE C-4
MEAN MONTHLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LGS, 1982 – 2006

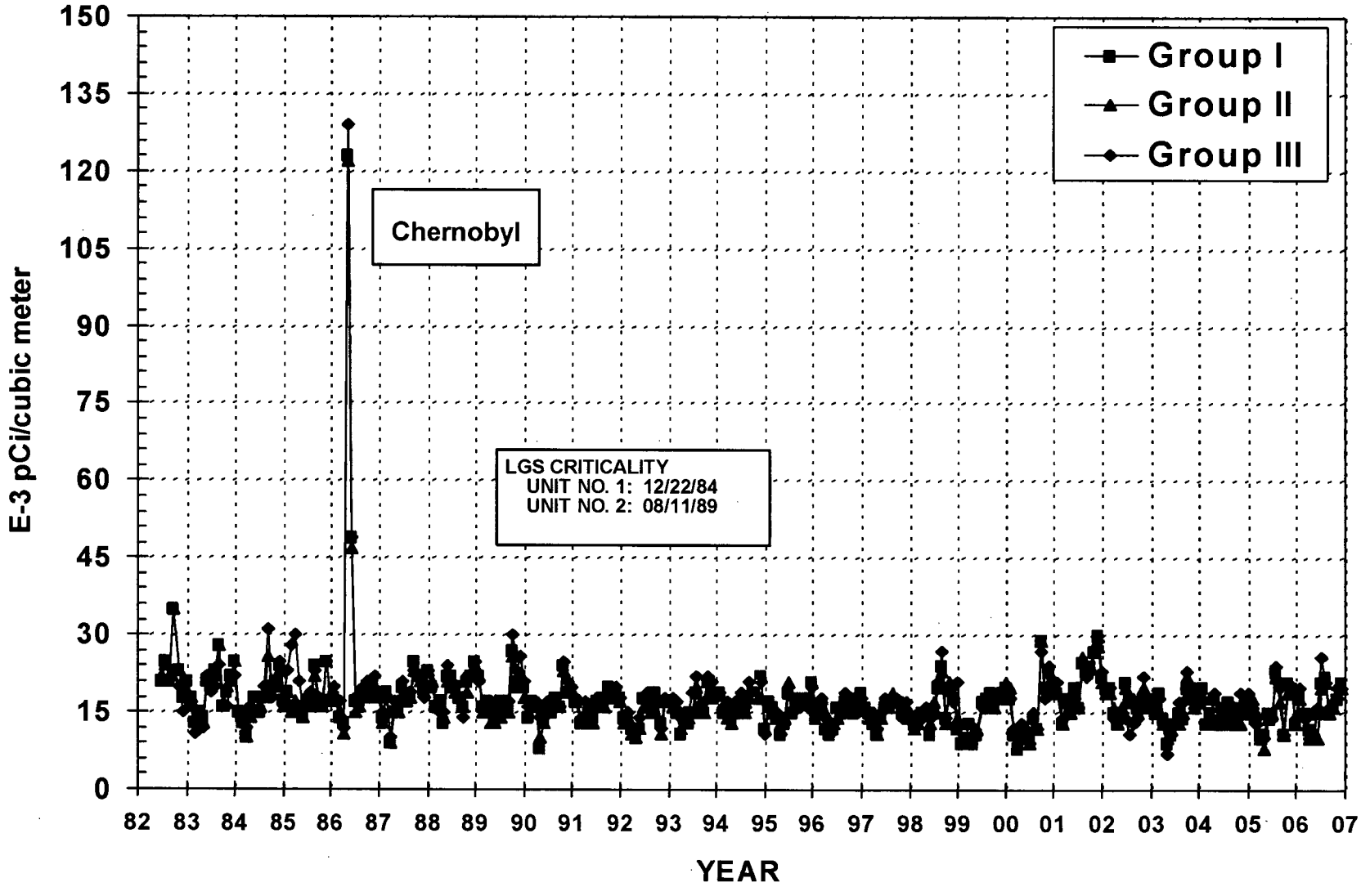


FIGURE C-5
MEAN WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LGS, 2006

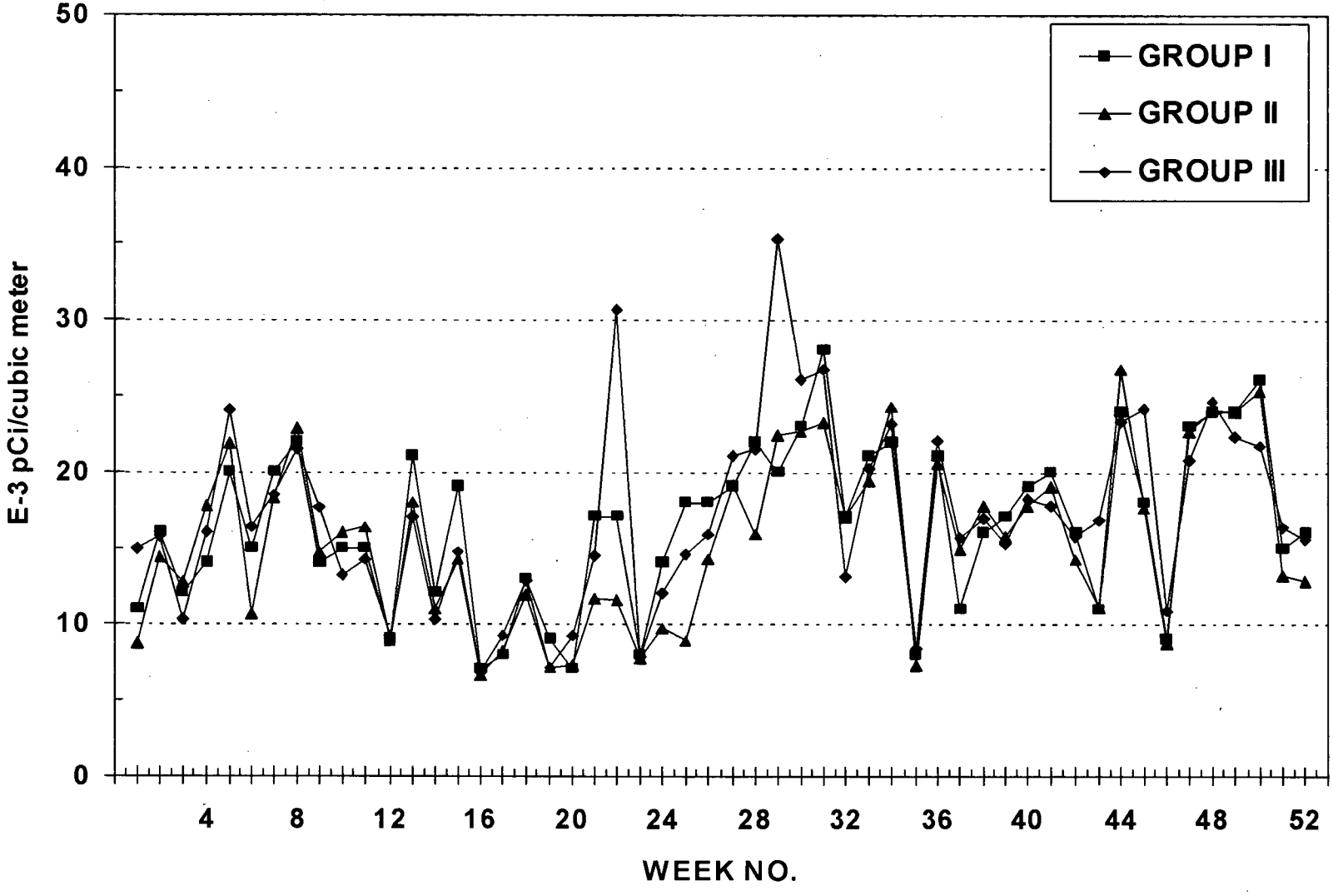
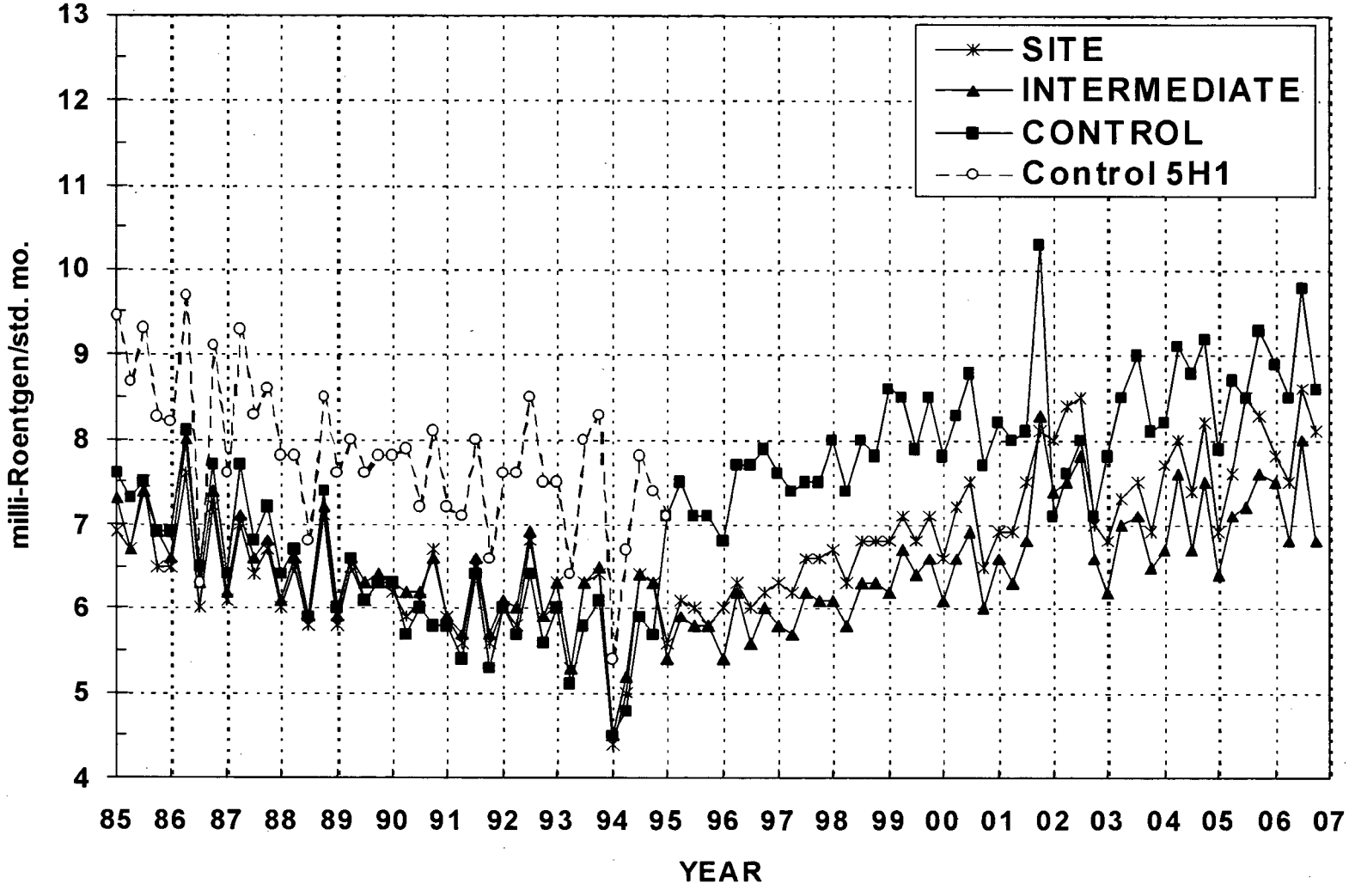


FIGURE C-6
MEAN QUARTERLY AMBIENT GAMMA RADIATION LEVELS (TLD) IN THE VICINITY OF LGS, 1985 – 2006



NOTE: Control Station 5H1 became the only distant location beginning in 1995

APPENDIX D

DATA TABLES AND FIGURES
COMPARISON LABORATORY

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

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TABLE D-I.1 CONCENTRATIONS OF TOTAL GROSS BETA IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	16C2
JAN	1.5 ± 0.6
FEB	1.2 ± 0.5
MAR	1.8 ± 1.0
APR	5.2 ± 1.2
MAY	2.4 ± 1.0
JUN	1.7 ± 0.6
JUL	1.8 ± 0.6
AUG	2.1 ± 1.5
SEP	1.9 ± 0.6
OCT	2.4 ± 1.0
NOV	2.9 ± 1.1
DEC	2.4 ± 0.8
MEAN	0.9 ± 0.6

TABLE D-I.2 CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	16C2
JAN - MAR	< 167
APR - JUN	< 131
JUL - SEP	< 183
SEP - DEC	< 146
MEAN	< 157

TABLE D-I.3 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	I-131	Cs-134	Cs-137	Ba-140	La-140
16C2	JAN	< 4	< 3	< 6	< 4	< 5	< 4	< 4	< 5	< 4	< 4	< 8	< 2
	FEB	< 3	< 2	< 5	< 2	< 3	< 5	< 2	< 4	< 3	< 3	< 9	< 1
	MAR	< 3	< 3	< 5	< 3	< 2	< 5	< 2	< 3	< 4	< 3	< 11	< 2
	APR	< 3	< 4	< 8	< 1	< 4	< 4	< 2	< 3	< 2	< 3	< 11	< 2
	MAY	< 3	< 4	< 8	< 2	< 4	< 5	< 5	< 4	< 3	< 4	< 18	< 5
	JUN	< 6	< 5	< 9	< 3	< 8	< 10	< 4	< 4	< 6	< 4	< 22	< 3
	JUL	< 3	< 3	< 5	< 3	< 6	< 5	< 4	< 5	< 2	< 4	< 11	< 2
	AUG	< 2	< 3	< 13	< 4	< 6	< 8	< 4	< 3	< 4	< 5	< 12	< 5
	SEP	< 2	< 3	< 5	< 3	< 3	< 5	< 3	< 4	< 3	< 2	< 18	< 3
	OCT	< 4	< 2	< 6	< 3	< 5	< 6	< 5	< 7	< 2	< 3	< 21	< 5
	NOV	< 3	< 1	< 3	< 1	< 5	< 4	< 3	< 2	< 3	< 3	< 10	< 3
	DEC	< 3	< 4	< 6	< 3	< 4	< 6	< 3	< 4	< 5	< 4	< 16	< 3
	MEAN	3.1 ± 1.9	3.0 ± 2.1	6 ± 5.3	2.6 ± 1.8	4.5 ± 3.2	5.5 ± 3.5	3.2 ± 2.0	4.1 ± 2.7	3.3 ± 2.3	3.4 ± 1.7	14 ± 9	3.1 ± 2.4

TABLE D-II.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

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

COLLECTION PERIOD	11S2
1	12 ± 5
2	19 ± 4
3	15 ± 4
4	20 ± 5
5	20 ± 4
6	19 ± 4
7	33 ± 4
8	28 ± 5
9	20 ± 4
10	18 ± 4
11	24 ± 5
12	8 ± 4
13	31 ± 5
14	19 ± 4
15	21 ± 5
16	9 ± 4
17	15 ± 4
18	22 ± 4
19	15 ± 5
20	7 ± 4
21	24 ± 4
22	20 ± 5
23	8 ± 4
24	18 ± 4
25	23 ± 4
26	23 ± 5
27	24 ± 5
28	24 ± 5
29	30 ± 5
30	27 ± 5
31	37 ± 5
32	18 ± 5
33	26 ± 5
34	31 ± 5
35	9 ± 4
36	26 ± 5
37	11 ± 5
38	31 ± 5
39	21 ± 4
40	25 ± 5
41	26 ± 5
42	22 ± 4
43	11 ± 4
44	29 ± 5
45	23 ± 5
46	19 ± 4
47	24 ± 5
48	30 ± 5
49	33 ± 5
50	31 ± 5
51	22 ± 4
52	21 ± 4
MEAN	22 ± 14

TABLE D-II.2 CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

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

STC	COLLECTION PERIOD	Be-7	Mn-54	Co-58	Co-60	Cs-134	Cs-137
11S2	01/02 - 04/03/2006	96 ± 0	< 0.8	< 0.7	< 1.2	< 0.4	< 0.3
	04/03 - 07/03/2006	82 ± 17	< 1.0	< 1.1	< 1.1	< 0.7	< 0.7
	07/03 - 10/02/2006	75 ± 14	< 0.8	< 0.6	< 1.1	< 0.8	< 0.5
	10/02 - 01/02/2007	67 ± 17	< 0.5	< 1.0	< 0.6	< 0.9	< 0.6
	MEAN	80 ± 25	0.8 ± 0.4	0.9 ± 0.5	1.0 ± 0.5	0.7 ± 0.4	0.5 ± 0.3

TABLE D-III.1 CONCENTRATIONS OF I-131 BY CHEMICAL SEPARATION AND GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	I-131	K-40	Cs-134	Cs-137	Ba-140	La-140
19B1	01/10/2006	< 0.2	1228 ± 98	< 3.3	< 3	< 9.8	< 1.4
	04/04/2006	< 0.2	1321 ± 129	< 4.5	< 1.7	< 16	< 3.7
	07/11/2006	< 0.3	1380 ± 104	< 4.1	< 3.6	< 15	< 3.5
	10/03/2006	< 0.5	1413 ± 113	< 4.5	< 2.4	< 11	< 2.4
	MEAN	0.30 ± 0.28	1335 ± 162	4 ± 1	3 ± 2	13 ± 5	3 ± 2
10F4	01/10/2006	< 0.2	1200 ± 138.6	< 2.9	< 6	< 22	< 2.8
	04/04/2006	< 0.4	1322 ± 120	< 4.7	< 4.2	< 21	< 5.3
	07/11/2006	< 0.4	1399 ± 112	< 3	< 2.7	< 10	< 3
	10/03/2006	< 0.5	1284 ± 157	< 5.2	< 6.4	< 19	< 3.2
	MEAN	0.38 ± 0.25	1301 ± 165	4 ± 2	5 ± 3	18 ± 11	4 ± 2
25C1	01/10/2006	< 0.2	1338 ± 168	< 7.8	< 6.4	< 18	< 3.1
	04/04/2006	< 0.2	1253 ± 168	< 4.1	< 3.9	< 26	< 7.7
	07/11/2006	< 0.4	1278 ± 109	< 2.3	< 3.2	< 18	< 2.5
	10/03/2006	< 0.4	1341 ± 121	< 3.8	< 2.2	< 9.0	< 2.5
	MEAN	0.30 ± 0.23	1303 ± 88	5 ± 5	4 ± 4	17 ± 13	4 ± 5

TABLE D-IV.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF LIMERICK GENERATING STATION, 2006

DRINKING WATER (GROSS BETA & GAMMA SPECTROSCOPY)

COLLECTION PERIOD	16C2
JAN	01/03/06 - 01/30/06
FEB	01/31/06 - 02/28/05
MAR	02/28/06 - 04/03/06
APR	04/03/06 - 05/01/06
MAY	05/01/06 - 05/30/06
JUN	05/30/06 - 06/26/06
JUL	06/26/06 - 07/31/06
AUG	07/31/06 - 08/28/06
SEP	08/28/06 - 10/02/06
OCT	10/02/06 - 10/30/06
NOV	10/30/06 - 11/27/06
DEC	11/27/06 - 01/02/07

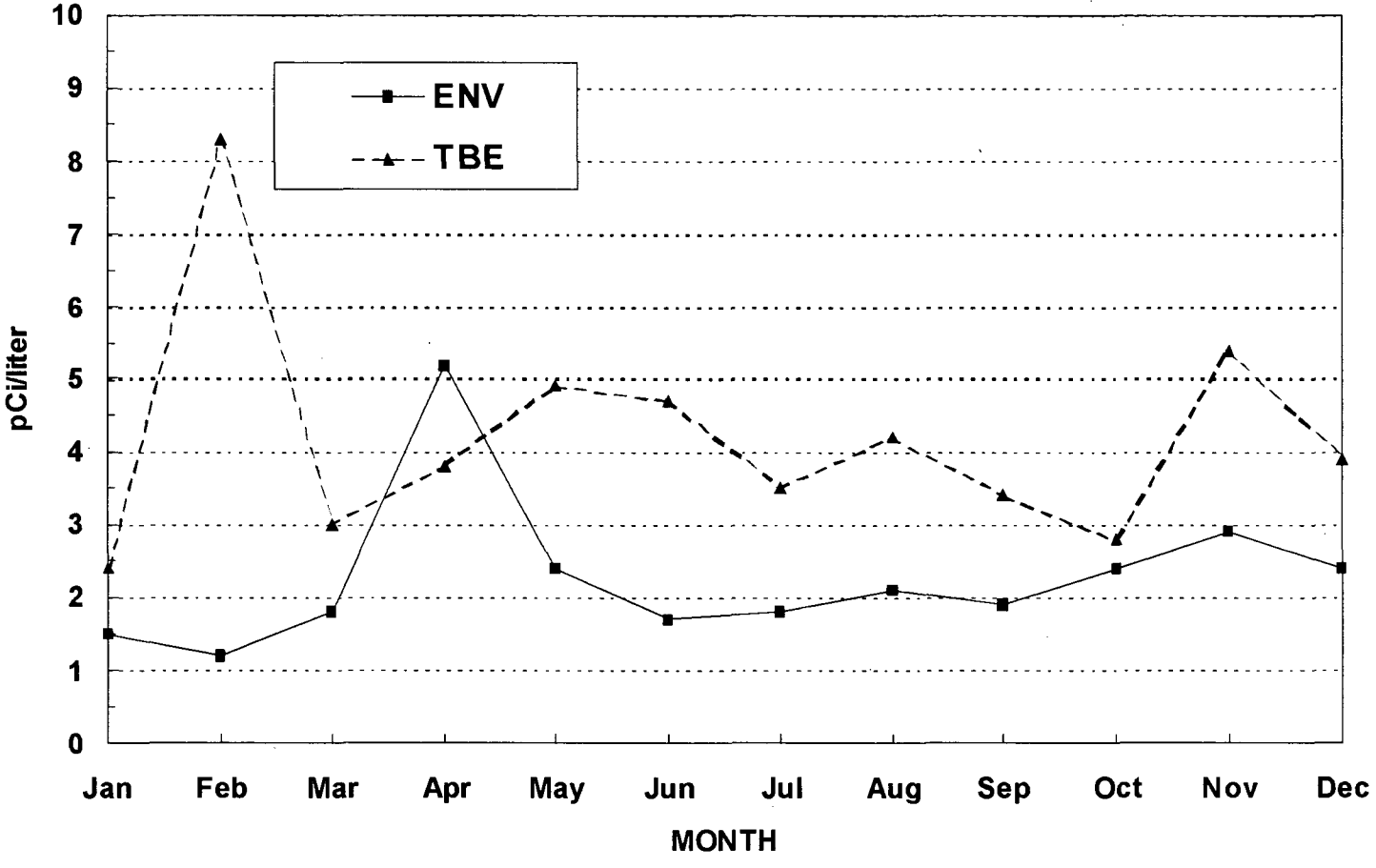
AIR PARTICULATE (GAMMA SPECTROSCOPY)

COLLECTION PERIOD	11S2
JAN-MAR	01/02/06 - 04/03/06
APR-JUN	04/03/06 - 07/03/06
JUL-SEP	07/03/06 - 10/02/06
OCT-DEC	10/02/06 - 01/02/07

AIR PARTICULATE (GROSS BETA)

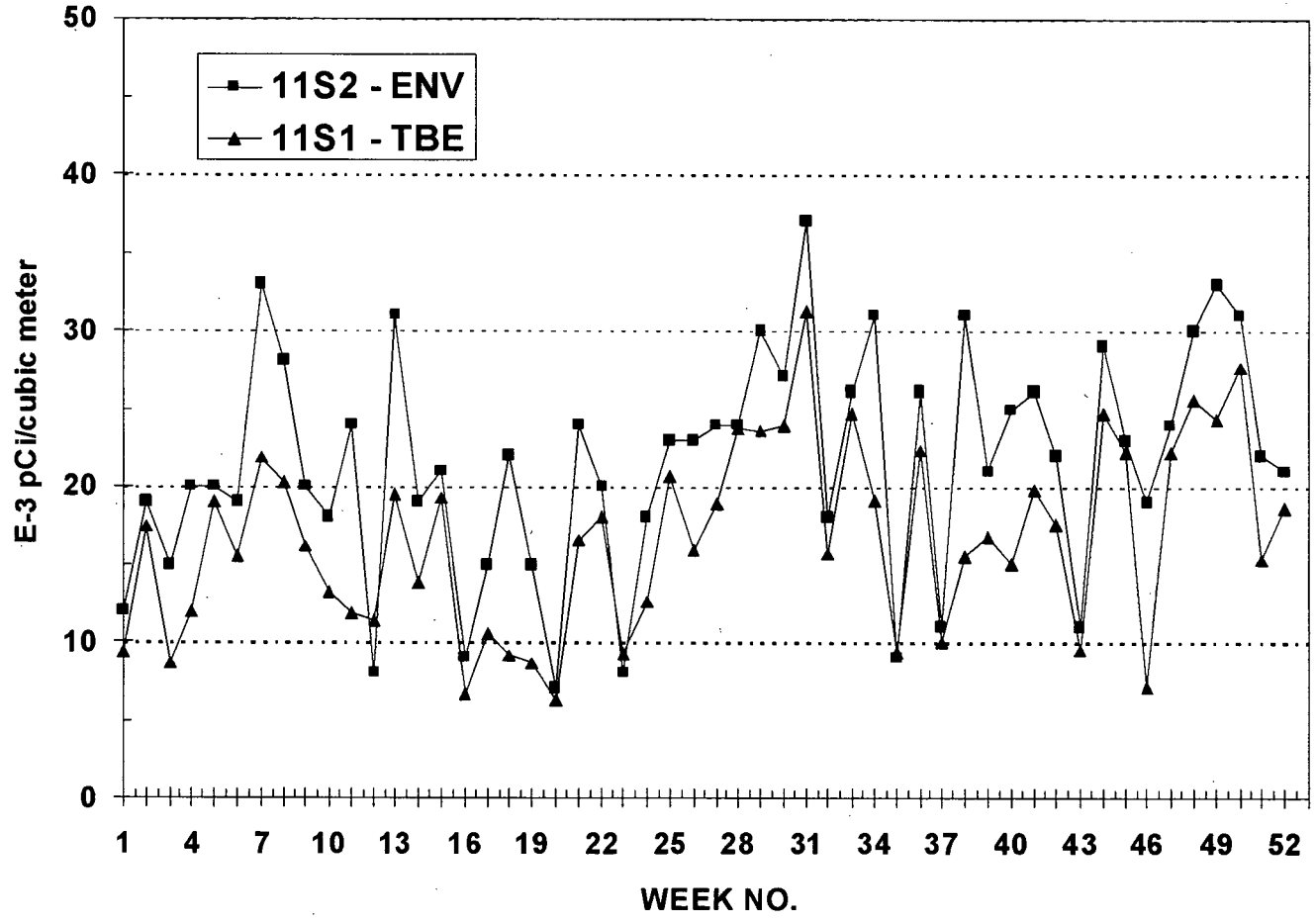
COLLECTION PERIOD	11S2	COLLECTION PERIOD	11S2
1	01/02/06 - 01/09/06	01/27/00	07/03/06 - 07/10/06
2	01/09/06 - 01/17/06	01/28/00	07/10/06 - 07/17/06
3	01/17/06 - 01/24/06	01/29/00	07/17/06 - 07/24/06
4	01/24/06 - 01/30/06	01/30/00	07/24/06 - 07/31/06
5	01/30/06 - 02/06/06	01/31/00	07/31/06 - 08/08/06
6	02/06/06 - 02/13/06	02/01/00	08/08/06 - 08/14/06
7	02/13/06 - 02/21/06	02/02/00	08/14/06 - 08/21/06
8	02/21/06 - 02/27/06	02/03/00	08/21/06 - 08/28/06
9	02/27/06 - 03/06/06	02/04/00	08/28/06 - 09/05/06
10	03/06/06 - 03/13/06	02/05/00	09/05/06 - 09/12/06
11	03/13/06 - 03/20/06	02/06/00	09/12/06 - 09/18/06
12	03/20/06 - 03/27/06	02/07/00	09/18/06 - 09/25/06
13	03/27/06 - 04/03/06	02/08/00	09/25/06 - 10/02/06
14	04/03/06 - 04/10/06	02/09/00	10/02/06 - 10/09/06
15	04/10/06 - 04/17/06	02/10/00	10/09/06 - 10/16/06
16	04/17/06 - 04/24/06	02/11/00	10/16/06 - 10/23/06
17	04/24/06 - 05/01/06	02/12/00	10/23/06 - 10/30/06
18	05/01/06 - 05/09/06	02/13/00	10/30/06 - 11/06/06
19	05/09/06 - 05/15/06	02/14/00	11/06/06 - 11/13/06
20	05/15/06 - 05/22/06	02/15/00	11/13/06 - 11/20/06
21	05/22/06 - 05/30/06	02/16/00	11/20/06 - 11/27/06
22	05/30/06 - 06/05/06	02/17/00	11/27/06 - 12/04/06
23	06/05/06 - 06/12/06	02/18/00	12/04/06 - 12/11/06
24	06/12/06 - 06/19/06	02/19/00	12/11/06 - 12/18/06
25	06/19/06 - 06/26/06	02/20/00	12/18/06 - 12/26/06
26	06/26/06 - 07/03/06	02/21/00	12/26/06 - 01/02/07

FIGURE D-1
COMPARISON OF MONTHLY TOTAL GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES SPLIT BETWEEN ENV AND TBE, 2006



ENVIRONMENTAL INC. SOLUBLE AND INSOLUBLE FRACTIONS WERE COMBINED FOR TOTAL GROSS BETA COMPARISON.

FIGURE D-2
COMPARISON OF WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED FROM LGS COLLOCATED LOCATIONS 11S1 AND 11S2, 2006



APPENDIX E

INTER-LABORATORY COMPARISON PROGRAM

TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2006
(PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2006	E4964-396	Milk	Sr-89	pCi/L	91.5	99.2	0.92	A
			Sr-90	pCi/L	12.2	10.8	1.13	A
	E4965-396	Milk	I-131	pCi/L	74.4	78.0	0.95	A
			Ce-141	pCi/L	95.1	104	0.91	A
			Cr-51	pCi/L	278	280	0.99	A
			Cs-134	pCi/L	103	121	0.85	A
			Cs-137	pCi/L	87.6	88.8	0.99	A
			Co-58	pCi/L	93.9	105	0.89	A
			Mn-54	pCi/L	90.0	93.3	0.96	A
			Fe-59	pCi/L	83.0	86.6	0.96	A
			Zn-65	pCi/L	178	176	1.01	A
			Co-60	pCi/L	118	128	0.92	A
	E4967-396	AP	Ce-141	pCi	89.9	74	1.21	W
			Cr-51	pCi	253	200	1.27	W
			Cs-134	pCi	71.5	86.1	0.83	A
			Cs-137	pCi	67.5	63.3	1.07	A
			Co-58	pCi	79.7	74.6	1.07	A
			Mn-54	pCi	74.9	67	1.12	A
			Fe-59	pCi	75.5	61.8	1.22	W
			Zn-65	pCi	146	126	1.16	A
			Co-60	pCi	91.2	91	1.00	A
	E4966-396	Charcoal	I-131	pCi	87.4	86.2	1.01	A
June 2006	E5018-396	Milk	Sr-89	pCi/L	118	129	0.91	A
			Sr-90	pCi/L	9.29	9.74	0.95	A
	E5019-396	Milk	I-131	pCi/L	49.9	63.2	0.79	W
			Ce-141	pCi/L	174	184	0.95	A
			Cr-51	pCi/L	266	259	1.03	A
			Cs-134	pCi/L	111	127	0.88	A
			Cs-137	pCi/L	116	117	0.99	A
			Co-58	pCi/L	101	100	1.01	A
			Mn-54	pCi/L	144	146	0.98	A
			Fe-59	pCi/L	96.7	93.6	1.03	A
			Zn-65	pCi/L	182	185	0.98	A
			Co-60	pCi/L	126	129	0.98	A
	E5021-396	AP	Ce-141	pCi	113	124	0.91	A
			Cr-51	pCi	176	174	1.01	A
			Cs-134	pCi	63.7	85.1	0.75	W
			Cs-137	pCi	76.8	79.0	0.97	A
			Co-58	pCi	63.1	67.4	0.94	A
			Mn-54	pCi	102	99	1.04	A
			Fe-59	pCi	64.6	62.9	1.03	A
			Zn-65	pCi	131	125	1.05	A
			Co-60	pCi	81.6	86.5	0.94	A
	E5020-396	Charcoal	I-131	pCi	65.4	65.9	0.99	A

TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2006
(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
September 2006	E5120-396	Milk	Sr-89	pCi/L	90.3	89.2	1.01	A
			Sr-90	pCi/L	11.6	12.4	0.94	A
	E5121-396	Milk	I-131	pCi/L	67.8	73.8	0.92	A
			Ce-141	pCi/L	85.0	86.0	0.99	A
			Cr-51	pCi/L	263	282	0.93	A
			Cs-134	pCi/L	74.7	85.0	0.88	A
			Cs-137	pCi/L	172	175	0.98	A
			Co-58	pCi/L	107	109	0.98	A
			Mn-54	pCi/L	110	113	0.98	A
			Fe-59	pCi/L	46.6	43.7	1.07	A
			Zn-65	pCi/L	144	145	0.99	A
			Co-60	pCi/L	127	134	0.95	A
	E5123-396	AP	Ce-141	pCi	67.1	66.4	1.01	A
			Cr-51	pCi	223	217	1.03	A
			Cs-134	pCi	51.7	65.6	0.79	W
			Cs-137	pCi	134	135.0	0.99	A
			Co-58	pCi	84.8	84.3	1.01	A
			Mn-54	pCi	95.2	87	1.10	A
			Fe-59	pCi	41.6	33.7	1.23	W
			Zn-65	pCi	123	112	1.10	A
			Co-60	pCi	98.9	103	0.96	A
			Co-57	pCi	0.922	(1)	NA	NA
	E5122-396	Charcoal	I-131	pCi	77.7	90.7	0.86	A
December 2006	E5172-396	Milk	Sr-89	pCi/L	72.4	72.0	1.01	A
			Sr-90	pCi/L	7.05	5.90	1.19	A
	E5173-396	Milk	I-131	pCi/L	71.9	70.8	1.02	A
			Ce-141	pCi/L	268	294	0.91	A
			Cr-51	pCi/L	420	433	0.97	A
			Cs-134	pCi/L	128	147	0.87	A
			Cs-137	pCi/L	231	237	0.97	A
			Co-58	pCi/L	82.0	83.8	0.98	A
			Mn-54	pCi/L	113	111	1.02	A
			Fe-59	pCi/L	79.8	79.7	1.00	A
			Zn-65	pCi/L	170	164	1.04	A
			Co-60	pCi/L	265	281	0.94	A
	E5175-396	AP	Ce-141	pCi	220	210	1.05	A
			Cr-51	pCi	343	309	1.11	A
			Cs-134	pCi	90.8	105	0.86	A
			Cs-137	pCi	185	169.0	1.09	A
			Co-58	pCi	65.0	59.7	1.09	A
			Mn-54	pCi	90.6	79	1.15	A
			Fe-59	pCi	70.7	56.7	1.25	W
			Zn-65	pCi	136	117	1.16	A
			Co-60	pCi	208	200	1.04	A

TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2006
(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2006	E5174-396	Charcoal	I-131	pCi	77.4	85.4	0.91	A

(1) Impurity detected but not measured by Analytics.
(a) Teledyne Brown Engineering reported result.
(b) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.
(c) Ratio of Teledyne Brown Engineering to Analytics results.
(d) Analytics evaluation based on TBE internal QC limits: A= Acceptable. Reported result falls within ratio limits of 0.80-1.20. W-Acceptable with warning. Reported result falls within 0.70-0.80 or 1.20-1.30. N = Not Acceptable. Reported result falls outside the ratio limits of < 0.70 and > 1.30.

TABLE E-2 ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2006
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Control Limits	Evaluation (c)
May 2006	Rad 65	Water	Sr-89	pCi/L	30.2	32.4	23.6 - 41.1	A
			Sr-90	pCi/L	8.74	9.00	0.340 - 17.7	A
			Ba-133	pCi/L	10.9	10.0	1.34 - 18.7	A
			Cs-134	pCi/L	39.7	43.4	34.7 - 52.1	A
			Cs-137	pCi/L	199	214	195 - 233	A
			Co-60	pCi/L	111	113.0	103 - 123	A
			Zn-65	pCi/L	146	152	126 - 178	A
			Gr-A	pCi/L	22.9	21.3	12.1 - 30.5	A
			Gr-B	pCi/L	23.7	23.0	14.3 - 31.7	A
			Ra-226	pCi/L	2.64	3.02	2.23 - 3.81	A
			U-Nat	pCi/L	74.9	69.1	57.1 - 81.1	A
			H-3	pCi/L	7950	8130	6720 - 9540	A
	Rad 65	Water	I-131	pCi/L	18.2	19.1	13.9 - 24.3	A
November 2006	Rad 67	Water	Sr-89	pCi/L	40.0	39.9	31.2 - 48.6	A
			Sr-90	pCi/L	16.2	16.0	7.34 - 24.7	A
			Ba-133	pCi/L	65.0	70.2	58.1 - 82.3	A
			Cs-134	pCi/L	27.4	29.9	21.2 - 38.6	A
			Cs-137	pCi/L	74.4	78.2	69.5 - 86.9	A
			Co-60	pCi/L	61.6	62.3	53.6 - 71.0	A
			Zn-65	pCi/L	277	277	229 - 325	A
			Gr-A	pCi/L	23.3	28.7	16.3 - 41.1	A
			Gr-B	pCi/L	22.0	20.9	12.2 - 29.6	A
			U-Nat	pCi/L	3.18	3.20	0.00 - 8.40	A
			H-3	pCi/L	2930	3050	2430 - 3670	A
		Water	I-131	pCi/L	19.8	22.1	16.9 - 27.3	A

(a) Teledyne Brown Engineering reported result.

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

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

TABLE E-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2006
(PAGE 1 OF 3)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
January 2006	06-MaW15	Water	Am-241	Bq/L	1.29	1.30	0.91 - 1.69	A
			Cs-134	Bq/L	79.2	95.1	66.57 - 123.63	A
			Cs-137	Bq/L	-0.188			A
			Co-57	Bq/L	151	166.12	116.28 - 215.96	A
			Co-60	Bq/L	141	153.50	107.45 - 199.55	A
			H-3	Bq/L	988	952.01	666.41 - 1237.61	A
			Fe-55	Bq/L	106.0	129.60	90.72 - 168.48	A
			Mn-54	Bq/L	297	315.00	220.50 - 409.50	A
			Ni-63	Bq/L	61.5	60.34	44.24 - 78.44	A
			Pu-238	Bq/L	0.961	0.91	0.64 - 1.18	A
			Pu-239/240	Bq/L	0.00965	0.00710	(1)	A
			Sr-90	Bq/L	12.6	13.16	9.21- 17.11	A
			Tc-99	Bq/L	22.5	23.38	16.37 - 30.39	A
			U-234/233	Bq/L	2.20	2.09	1.46 - 2.72	A
			U-238	Bq/L	2.23	2.17	1.52 - 2.82	A
			Zn-65	Bq/L	219	228.16	159.71 - 296.61	A
	06-GrW15	Water	Gr-A	Bq/L	0.575	0.581	>0.0 - 1.162	A
			Gr-B	Bq/L	1.52	1.13	0.56 - 1.70	A
	06-MaS15	Soil	Am-241	Bq/kg	48.8	57.08	39.96 - 74.20	A
			Cs-134	Bq/kg	15.9			N (1)
			Cs-137	Bq/kg	370	339.69	237.78 - 441.60	A
			Co-57	Bq/kg	667	656.29	459.40 - 853.18	A
			Co-60	Bq/kg	478	447.10	312.97 - 581.23	A
			Mn-54	Bq/kg	384	346.77	242.74 - 450.80	A
			Ni-63	Bq/kg	394	323.51	226.46 - 420.56	W
			K-40	Bq/kg	667	604	423 - 785	A
			Sr-90	Bq/kg	253	314.35	220.04 - 408.66	A
			Tc-99	Bq/kg	146	154.76	108.33 - 201.19	A
			Zn-65	Bq/kg	740	657.36	460.15 - 854.57	A
	06-RdF15	AP	Am-241	Bq/sample	0.0850	0.093	0.065 - 0.121	A
			Cs-134	Bq/sample	2.34	2.934	2.054 - 3.814	A
			Cs-137	Bq/sample	2.45	2.531	1.772 - 3.290	A
			Co-57	Bq/sample	3.87	4.096	2.867 - 5.325	A
			Co-60	Bq/sample	2.12	2.186	1.530 - 2.842	A
			Mn-54	Bq/sample	0.0206			A
			Pu-238	Bq/sample	0.0766	0.067	0.047 - 0.087	A
			Pu-239/240	Bq/sample	0.00520	0.00041	(1)	A
			Sr-90	Bq/sample	0.761	0.792	0.554 - 1.030	A
			U-234/233	Bq/sample	0.0217	0.020	0.014 - 0.026	A
			U-238	Bq/sample	0.0220	0.021	0.015 - 0.027	A
			Zn-65	Bq/sample	3.86	3.423	2.396 - 4.450	A
	06-GrF15	AP	Gr-A	Bq/sample	0.257	0.361	>0.0 - 0.722	A
			Gr-B	Bq/sample	0.398	0.481	0.241 - 0.722	A

TABLE E-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2006
(PAGE 2 OF 3)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
January 2006	06-RdV15	Vegetation	Am-241	Bq/sample	0.156	0.156	0.109 - 0.203	A
			Cs-134	Bq/sample	0.369			A
			Cs-137	Bq/sample	3.15	3.074	2.152 - 3.996	A
			Co-57	Bq/sample	10.1	8.578	6.005 - 11.151	A
			Co-60	Bq/sample	4.69	4.520	3.164 - 5.876	A
			Mn-54	Bq/sample	6.53	6.247	4.373 - 8.121	A
			Pu-238	Bq/sample	0.183	0.137	0.096 - 0.178	N (2)
			Pu-239/240	Bq/sample	0.111	0.164	0.115 - 0.213	N (2)
			Sr-90	Bq/sample	2.22	1.561	1.093 - 2.029	N (2)
			U-234/233	Bq/sample	0.208	0.208	0.146 - 0.270	A
			U-238	Bq/sample	0.176	0.216	0.151 - 0.281	A
			Zn-65	Bq/sample	10.5	9.798	6.859 - 12.737	A
July 2006	06-MaW16	Water	Am-241	Bq/L	2.09	2.31	1.62 - 3.00	A
			Cs-134	Bq/L	99.8	112.82	78.98 - 146.66	A
			Cs-137	Bq/L	191	196.14	137.30 - 254.98	A
			Co-57	Bq/L	203	213.08	149.16 - 277.00	A
			Co-60	Bq/L	46.2	47.5	33.2 - 61.8	A
			H-3	Bq/L	471	428.85	300.20 - 557.50	A
			Fe-55	Bq/L	173	165.4	115.8 - 215.0	A
			Ni-63	Bq/L	109	118.62	83.03 - 154.21	A
			Pu-238	Bq/L	1.50	1.39	0.97 - 1.81	A
			Pu-239/240	Bq/L	2.01	1.94	1.36 - 2.52	A
			Sr-90	Bq/L	13.7	15.69	10.98- 20.40	A
			Tc-99	Bq/L	29.0	27.15	19.00 - 35.29	A
			U-234/233	Bq/L	2.19	2.15	1.50 - 2.80	A
			U-238	Bq/L	2.25	2.22	1.55 - 2.89	A
			Zn-65	Bq/L	178	176.37	123.46 - 229.28	A
	06-GrW16	Water	Gr-A	Bq/L	1.52	1.033	>0.0 - 2.066	A
			Gr-B	Bq/L	1.18	1.03	0.52 - 1.54	A
	06-MaS16	Soil	Am-241	Bq/kg	83.6	105.47	73.83 - 137.11	W
			Cs-134	Bq/kg	393	452.13	316.49 - 587.77	A
			Cs-137	Bq/kg	522	525.73	368.01 - 683.45	A
			Co-57	Bq/kg	636	676.33	473.43 - 879.23	A
			Co-60	Bq/kg	3.78	1.98		A (3)
			Mn-54	Bq/kg	598	594.25	415.98 - 772.52	A
			Ni-63	Bq/kg	571	627.3	470.6 - 874.0	A
			Pu-238	Bq/kg	71.2	82	57 - 107	A
			Pu-239240	Bq/kg	0.487	0.93		A (3)
			K-40	Bq/kg	615	604	423 - 785	A
			Sr-90	Bq/kg	178	223.3	156.3 - 290.3	W
			Tc-99	Bq/kg	175	218.01	152.61 - 283.41	A
			U-234/233	Bq/kg	119	152.44	106.71 - 198.17	W
			U-238	Bq/kg	115	158.73	111.11 -206.35	W
			Zn-65	Bq/kg	937	903.61	632.53 - 1174.69	A

TABLE E-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2006
(PAGE 3 OF 3)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
July 2006	06-RdF16	AP	Am-241	Bq/sample	0.124	0.142	0.099 - 0.185	A
			Cs-134	Bq/sample	2.62	3.147	2.203 - 4.091	A
			Cs-137	Bq/sample	1.98	1.805	1.263 - 2.346	A
			Co-57	Bq/sample	2.65	2.582	1.807 - 3.357	A
			Co-60	Bq/sample	1.63	1.577	1.104 - 2.050	A
			Mn-54	Bq/sample	2.10	1.92	1.34 - 2.50	A
			Pu-238	Bq/sample	0.118	0.118	0.083 - 0.153	A
			Pu-239/240	Bq/sample	0.00822	NA		A
			Sr-90	Bq/sample	0.549	0.62	0.43 - 0.81	A
			U-234/233	Bq/sample	0.140	0.134	0.094 - 0.174	A
			U-238	Bq/sample	0.136	0.139	0.097 - 0.181	A
			Zn-65	Bq/sample	-0.163	NA		A
	06-GrF16	AP	Gr-A	Bq/sample	0.134	0.290	>0.0 - 0.580	A
			Gr-B	Bq/sample	0.358	0.359	0.180 - 0.538	A

(1) False positive test

(2) Evaluated as a false positive by MAPEP although we considered the result a non-detect due to the peak not being identified by the gamma software. For Cs-134, MAPEP suggests the Bi-214 is not being differentiated from the Cs-134 peak. See email attached with MAPEP results in Appendix A. NCR 06-07.

(3) Sr samples analyzed in triplicate and one high result of 2.43 pCi/kg biased the submitted results on the high side. We were unable to determine the cause for the higher result. Since we do not analyze vegetation for isotpic Pu, no NCR was initiated for the Pu failure. MAPEP suggest pyrosulfate fusion preparation prior to analysis for isotopic Pu in vegetation samples.

(4) Not detected, reported a statistically zero result. (False positive test)

(a) Teledyne Brown Engineering reported result.

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

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

TABLE E-4 ERA(a) STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM
ENVIRONMENTAL, INC., 2006
(Page 1 of 2)

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory Result (b)	ERA Result (c)	Control Limits	Acceptance
STW-1078	01/16/06	Sr-89	49.9 ± 3.5	50.2	41.5 - 58.9	Pass
STW-1078	01/16/06	Sr-90	31.5 ± 1.5	30.7	22.0 - 39.4	Pass
STW-1079	01/16/06	Ba-133	86.5 ± 4.1	95.0	78.6 - 111.0	Pass
STW-1079	01/16/06	Co-60	96.3 ± 4.1	95.3	86.6 - 104.0	Pass
STW-1079	01/16/06	Cs-134	22.6 ± 3.0	23.1	14.4 - 31.8	Pass
STW-1079	01/16/06	Cs-137	109.0 ± 5.9	111.0	101.0 - 121.0	Pass
STW-1079	01/16/06	Zn-65	198.0 ± 11.2	192.0	159.0 - 225.0	Pass
STW-1080	01/16/06	Gr. Alpha	10.8 ± 1.4	9.6	1.0 - 18.3	Pass
STW-1080	01/16/06	Gr. Beta	56.9 ± 1.9	61.9	44.6 - 79.2	Pass
STW-1081	01/16/06	Ra-226	4.3 ± 0.4	4.6	3.4 - 5.8	Pass
STW-1081	01/16/06	Ra-228	7.1 ± 1.8	6.6	3.7 - 9.5	Pass
STW-1081	01/16/06	Uranium	20.7 ± 0.5	22.1	16.9 - 27.3	Pass
STW-1088	04/10/06	Sr-89	29.0 ± 1.8	32.4	23.7 - 41.1	Pass
STW-1088	04/10/06	Sr-90	8.7 ± 1.0	9.0	0.3 - 17.7	Pass
STW-1089	04/10/06	Ba-133	10.3 ± 0.4	10.0	1.3 - 18.7	Pass
STW-1089	04/10/06	Co-60	114.0 ± 2.8	113.0	103.0 - 123.0	Pass
STW-1089	04/10/06	Cs-134	41.9 ± 1.4	43.4	34.7 - 52.1	Pass
STW-1089	04/10/06	Cs-137	208.0 ± 1.1	214.0	195.0 - 233.0	Pass
STW-1089	04/10/06	Zn-65	154.0 ± 0.8	152.0	126.0 - 178.0	Pass
STW-1090	04/10/06	Gr. Alpha	13.4 ± 1.1	21.3	12.1 - 30.5	Pass
STW-1090	04/10/06	Gr. Beta	27.7 ± 2.1	23.0	14.3 - 31.7	Pass
STW-1091	04/10/06	I-131	22.0 ± 0.3	19.1	13.9 - 24.3	Pass
STW-1092	04/10/06	H-3	7960.0 ± 57.0	8130.0	6720.0 - 9540.0	Pass
STW-1092	04/10/06	Ra-226	2.9 ± 0.4	3.0	2.2 - 3.8	Pass
STW-1092	04/10/06	Ra-228	20.9 ± 1.2	19.1	10.8 - 27.4	Pass
STW-1092	04/10/06	Uranium	68.6 ± 3.4	69.1	57.1 - 81.1	Pass
STW-1094	07/10/06	Sr-89	15.9 ± 0.7	19.7	11.0 - 28.4	Pass
STW-1094	07/10/06	Sr-90	24.3 ± 0.4	25.9	17.2 - 34.6	Pass
STW-1095	07/10/06	Ba-133	94.9 ± 8.9	88.1	72.9 - 103.0	Pass
STW-1095	07/10/06	Co-60	104.0 ± 1.8	99.7	91.0 - 108.0	Pass
STW-1095	07/10/06	Cs-134	48.7 ± 1.3	54.1	45.4 - 62.8	Pass
STW-1095	07/10/06	Cs-137	236.0 ± 3.0	238.0	217.0 - 259.0	Pass
STW-1095	07/10/06	Zn-65	126.0 ± 8.0	121.0	100.0 - 142.0	Pass
STW-1096	07/10/06	Gr. Alpha	10.9 ± 1.0	10.0	1.3 - 18.6	Pass
STW-1096	07/10/06	Gr. Beta	9.7 ± 0.4	8.9	0.2 - 17.5	Pass
STW-1097	07/10/06	Ra-226	11.0 ± 0.5	10.7	7.9 - 13.5	Pass
STW-1097	07/10/06	Ra-228	12.2 ± 0.8	10.7	6.1 - 15.3	Pass
STW-1097	07/10/06	Uranium	43.4 ± 0.1	40.3	33.3 - 47.3	Pass

TABLE E-4 ERA(a) STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM
ENVIRONMENTAL, INC., 2006
(Page 2 of 2)

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory Result (b)	ERA Result (c)	Control Limits	Acceptance
STW-1104	10/06/06	Sr-89	38.4 ± 1.3	39.9	31.2 - 45.7	Pass
STW-1104	10/06/06	Sr-90	15.5 ± 0.5	16.0	7.3 - 24.7	Pass
STW-1105	10/06/06	Ba-133	64.9 ± 2.8	70.2	58.1 - 82.3	Pass
STW-1105	10/06/06	Co-60	61.6 ± 1.0	62.3	53.6 - 71.0	Pass
STW-1105	10/06/06	Cs-134	29.0 ± 0.9	29.9	21.2 - 38.6	Pass
STW-1105	10/06/06	Cs-137	77.8 ± 2.4	78.2	69.5 - 86.9	Pass
STW-1105	10/06/06	Zn-65	293.0 ± 2.4	277.0	229.0 - 325.0	Pass
STW-1106	10/06/06	Gr. Alpha	23.9 ± 2.5	28.7	16.3 - 41.1	Pass
STW-1106	10/06/06	Gr. Beta	23.7 ± 1.4	20.9	12.2 - 29.6	Pass
STW-1107 (d)	10/06/06	I-131	28.4 ± 1.2	22.1	16.9 - 27.3	Fail
STW-1108	10/06/06	Ra-226	14.5 ± 0.5	14.4	10.7 - 18.1	Pass
STW-1108	10/06/06	Ra-228	6.6 ± 0.4	5.9	3.3 - 8.4	Pass
STW-1108	10/06/06	Uranium	2.9 ± 0.1	3.2	0.0 - 8.4	Pass
STW-1109	10/06/06	H-3	3000.0 ± 142.0	3050.0	2430.0 - 3670.0	Pass

a Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing in drinking water conducted by Environmental Resources Associates (ERA).
b Unless otherwise indicated, the laboratory result is given as the mean ± standard deviation for three determinations.
c Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination) and control limits as provided by ERA.
d The reported result was an average of three analyses, results ranged from 25.36 to 29.23 pCi/L. A fourth analysis was performed, result of analysis, 24.89 pCi/L.

TABLE E-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) (a)
ENVIRONMENTAL, INC., 2006

		Concentration (b)				
Lab Code (c)	Date	Analysis	Laboratory result	Known Activity	Control Limits (d)	Acceptance
STVE-1082	01/01/06	Am-241	0.16 ± 0.06	0.16	0.11 - 0.20	Pass
STVE-1082	01/01/06	Co-57	10.40 ± 0.20	8.58	6.00 - 11.15	Pass
STVE-1082	01/01/06	Co-60	5.00 ± 0.20	4.52	3.16 - 5.88	Pass
STVE-1082 (e)	01/01/06	Cs-134	< 0.20	0.00		Pass
STVE-1082	01/01/06	Cs-137	3.40 ± 0.20	3.07	2.15 - 4.00	Pass
STVE-1082	01/01/06	Mn-54	6.90 ± 0.20	6.25	4.37 - 8.12	Pass
STVE-1082 (f)	01/01/06	Pu-238	0.08 ± 0.03	0.14	0.10 - 0.18	Fail
STVE-1082	01/01/06	Pu-239/40	0.17 ± 0.03	0.16	0.11 - 0.21	Pass
STVE-1082	01/01/06	Sr-90	1.40 ± 0.20	1.56	1.09 - 2.03	Pass
STVE-1082	01/01/06	U-233/4	0.24 ± 0.05	0.21	0.15 - 0.27	Pass
STVE-1082	01/01/06	U-238	0.19 ± 0.04	0.22	0.15 - 0.28	Pass
STVE-1082	01/01/06	Zn-65	11.10 ± 0.50	9.80	6.86 - 12.74	Pass
STSO-1083	01/01/06	Am-241	54.60 ± 5.50	57.08	39.96 - 74.20	Pass
STSO-1083	01/01/06	Co-57	762.90 ± 12.70	656.29	459.40 - 853.18	Pass
STSO-1083	01/01/06	Co-60	504.90 ± 3.10	447.10	312.97 - 581.23	Pass
STSO-1083 (e)	01/01/06	Cs-134	< 1.70	0.00		Pass
STSO-1083	01/01/06	Cs-137	406.50 ± 3.70	339.69	237.78 - 441.60	Pass
STSO-1083	01/01/06	K-40	719.20 ± 18.40	604.00	422.80 - 785.20	Pass
STSO-1083	01/01/06	Mn-54	415.60 ± 4.80	346.77	242.74 - 450.80	Pass
STSO-1083	01/01/06	Ni-63	261.40 ± 14.70	323.51	226.46 - 420.56	Pass
STSO-1083	01/01/06	Pu-238	14.60 ± 2.90	61.15	42.81 - 79.50	Fail
STSO-1083	01/01/06	Pu-239/40	14.60 ± 2.40	45.85	32.09 - 59.61	Fail
STSO-1083	01/01/06	U-233/4	13.50 ± 1.70	37.00	25.90 - 48.10	Fail
STSO-1083	01/01/06	U-238	15.40 ± 1.80	38.85	27.20 - 50.50	Fail
STSO-1083	01/01/06	Zn-65	783.40 ± 7.00	657.36	460.15 - 854.57	Pass
STAP-1084	01/01/06	Gr. Alpha	0.26 ± 0.02	0.36	0.00 - 0.72	Pass
STAP-1084	01/01/06	Gr. Beta	0.51 ± 0.03	0.48	0.24 - 0.72	Pass
STAP-1085	01/01/06	Am-241	0.12 ± 0.02	0.09	0.07 - 0.12	Pass
STAP-1085	01/01/06	Co-57	4.32 ± 0.10	4.10	2.87 - 5.32	Pass
STAP-1085	01/01/06	Co-60	2.24 ± 0.16	2.19	1.53 - 2.84	Pass
STAP-1085	01/01/06	Cs-134	2.96 ± 0.19	2.93	2.05 - 3.81	Pass
STAP-1085	01/01/06	Cs-137	2.64 ± 0.20	2.53	1.77 - 3.29	Pass
STAP-1085 (f)	01/01/06	Pu-238	0.03 ± 0.01	0.07	0.05 - 0.09	Fail
STAP-1085 (e)	01/01/06	Pu-239/40	< 0.01	0.00		Pass
STAP-1085	01/01/06	Sr-90	0.77 ± 0.21	0.79	0.55 - 1.03	Pass
STAP-1085	01/01/06	U-233/4	0.03 ± 0.01	0.02	0.01 - 0.03	Pass
STAP-1085	01/01/06	U-238	0.02 ± 0.01	0.02	0.01 - 0.03	Pass
STAP-1085	01/01/06	Zn-65	3.94 ± 0.44	3.42	2.40 - 4.45	Pass

TABLE E-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) (a) ENVIRONMENTAL, INC., 2006

		Concentration (b)				
Lab Code (c)	Date	Analysis	Laboratory result	Known Activity	Control Limits (d)	Acceptance
STW-1086	01/01/06	Am-241	1.29 ± 0.05	1.30	0.91 - 1.69	Pass
STW-1086	01/01/06	Co-57	177.10 ± 1.00	166.12	116.28 - 215.96	Pass
STW-1086	01/01/06	Co-60	158.30 ± 1.00	153.50	107.45 - 199.55	Pass
STW-1086	01/01/06	Cs-134	96.40 ± 1.50	95.10	66.57 - 123.63	Pass
STW-1086 (e)	01/01/06	Cs-137	< 0.80	0.00		Pass
STW-1086	01/01/06	Fe-55	102.50 ± 18.10	129.60	90.72 - 168.48	Pass
STW-1086	01/01/06	H-3	956.60 ± 16.50	952.01	666.41 - 1238.00	Pass
STW-1086	01/01/06	Mn-54	335.30 ± 2.20	315.00	220.50 - 409.50	Pass
STW-1086	01/01/06	Ni-63	62.90 ± 3.60	60.34	42.24 - 78.44	Pass
STW-1086	01/01/06	Pu-238	0.96 ± 0.07	0.91	0.70 - 1.30	Pass
STW-1086 (e)	01/01/06	Pu-239/40	< 0.20	0.00		Pass
STW-1086	01/01/06	Sr-90	12.80 ± 1.60	13.16	9.21 - 17.11	Pass
STW-1086	01/01/06	Tc-99	22.30 ± 1.20	23.38	16.37 - 30.39	Pass
STW-1086	01/01/06	U-233/4	2.02 ± 0.12	2.09	1.46 - 2.72	Pass
STW-1086	01/01/06	U-238	2.03 ± 0.12	2.17	1.52 - 2.82	Pass
STW-1086	01/01/06	Zn-65	249.50 ± 3.40	228.16	159.71 - 296.61	Pass
STW-1087	01/01/06	Gr. Alpha	0.59 ± 0.10	0.58	0.00 - 1.16	Pass
STW-1087	01/01/06	Gr. Beta	1.69 ± 0.07	1.13	0.56 - 1.70	Pass
STVE-1098 (e)	07/01/06	Co-57	< 0.14	0.00		Pass
STVE-1098 (g)	07/01/06	Co-60	6.89 ± 0.17	5.81	4.06 - 7.55	Pass
STVE-1098	07/01/06	Cs-134	8.46 ± 0.16	7.49	5.24 - 9.73	Pass
STVE-1098	07/01/06	Cs-137	6.87 ± 0.29	5.50	3.85 - 7.14	Pass
STVE-1098	07/01/06	Mn-54	10.36 ± 0.29	8.35	5.85 - 10.86	Pass
STVE-1098	07/01/06	Zn-65	7.46 ± 0.50	5.98	4.19 - 7.78	Pass
STSO-1099	07/01/06	Am-241	130.00 ± 11.60	105.47	73.83 - 137.11	Pass
STSO-1099	07/01/06	Co-57	784.90 ± 3.80	676.33	473.43 - 879.23	Pass
STSO-1099	07/01/06	Co-60	2.10 ± 0.90	1.98	0.00 - 5.00	Pass
STSO-1099	07/01/06	Cs-134	500.70 ± 7.40	452.13	316.49 - 587.77	Pass
STSO-1099	07/01/06	Cs-137	624.20 ± 4.90	525.73	368.01 - 683.45	Pass
STSO-1099	07/01/06	K-40	701.30 ± 3.40	604.00	423.00 - 785.00	Pass
STSO-1099	07/01/06	Mn-54	699.20 ± 5.20	594.25	415.98 - 772.52	Pass
STSO-1099	07/01/06	Ni-63	614.40 ± 17.10	672.30	470.60 - 874.00	Pass
STSO-1099	07/01/06	Pu-238	79.90 ± 5.80	82.00	57.00 - 107.00	Pass
STSO-1099 (e)	07/01/06	Pu-239/40	< 0.70	0.00		Pass
STSO-1099	07/01/06	U-233/4	150.50 ± 5.90	152.44	106.71 - 198.17	Pass
STSO-1099	07/01/06	U-238	151.60 ± 6.00	158.73	111.11 - 206.35	Pass
STSO-1099	07/01/06	Zn-65	1021.90 ± 9.20	903.61	632.53 - 1175.00	Pass

TABLE E-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) (a) ENVIRONMENTAL, INC., 2006

			Concentration [b]			
Lab Code (c)	Date	Analysis	Laboratory result	Known Activity	Control Limits (d)	Acceptance
STAP-1100	07/01/06	Am-241	0.16 ± 0.03	0.14	0.10 - 0.19	Pass
STAP-1100	07/01/06	Co-57	2.17 ± 0.06	2.58	1.81 - 3.36	Pass
STAP-1100	07/01/06	Co-60	1.38 ± 0.07	1.58	1.10 - 2.05	Pass
STAP-1100	07/01/06	Cs-134	2.52 ± 0.13	3.15	2.20 - 4.09	Pass
STAP-1100	07/01/06	Cs-137	1.64 ± 0.08	1.81	1.26 - 2.35	Pass
STAP-1100	07/01/06	Mn-54	1.76 ± 0.18	1.92	1.34 - 2.50	Pass
STAP-1100	07/01/06	Pu-238	0.09 ± 0.02	0.12	0.08 - 0.15	Pass
STAP-1100	07/01/06	Sr-90	0.66 ± 0.21	0.62	0.43 - 0.81	Pass
STAP-1100	07/01/06	U-233/4	0.15 ± 0.02	0.13	0.09 - 0.17	Pass
STAP-1100	07/01/06	U-238	0.13 ± 0.02	0.14	0.10 - 0.18	Pass
STAP-1100 (e)	07/01/06	Zn-65	< 0.07	0.00		Pass
STAP-1101	07/01/06	Gr. Alpha	0.08 ± 0.03	0.29	0.00 - 0.58	Pass
STAP-1101	07/01/06	Gr. Beta	0.41 ± 0.05	0.36	0.18 - 0.54	Pass
STW-1102	07/01/06	Gr. Alpha	0.76 ± 0.07	1.03	0.00 - 2.07	Pass
STW-1102	07/01/06	Gr. Beta	1.23 ± 0.06	1.03	0.52 - 1.54	Pass
STW-1103	07/01/06	Am-241	1.86 ± 0.09	2.31	1.62 - 3.00	Pass
STW-1103	07/01/06	Co-57	224.10 ± 1.20	213.08	149.16 - 277.00	Pass
STW-1103	07/01/06	Co-60	49.40 ± 0.50	47.50	33.20 - 61.80	Pass
STW-1103	07/01/06	Cs-134	112.70 ± 0.90	112.82	78.97 - 146.66	Pass
STW-1103	07/01/06	Cs-137	206.60 ± 1.40	196.14	137.30 - 254.98	Pass
STW-1103	07/01/06	Fe-55	138.40 ± 5.40	165.40	115.80 - 215.00	Pass
STW-1103	07/01/06	H-3	446.50 ± 11.80	428.85	300.20 - 557.50	Pass
STW-1103 (e)	07/01/06	Mn-54	< 0.30	0.00		Pass
STW-1103	07/01/06	Ni-63	116.70 ± 3.60	118.62	83.03 - 154.21	Pass
STW-1103	07/01/06	Pu-238	1.27 ± 0.07	1.39	0.97 - 1.81	Pass
STW-1103	07/01/06	Pu-239/40	1.67 ± 0.08	1.94	1.36 - 2.52	Pass
STW-1103	07/01/06	Sr-90	16.40 ± 1.90	15.69	10.98 - 20.40	Pass
STW-1103	07/01/06	Tc-99	29.40 ± 1.10	27.15	19.00 - 35.29	Pass
STW-1103	07/01/06	U-233/4	1.97 ± 0.08	2.15	1.50 - 2.80	Pass
STW-1103	07/01/06	U-238	1.97 ± 0.08	2.22	1.55 - 2.89	Pass
STW-1103	07/01/06	Zn-65	192.50 ± 2.40	176.37	123.46 - 229.28	Pass

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

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

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

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

e Included in the MAPEP as a false positive.

f Difficulties with the analyses for transuranics isotopes in solid samples (Filters, Soil and vegetation), were attributed to incomplete dissolution of the samples. Soil samples were repeated, results of reanalyses: Pu-238, 53.1 ± 5.3 bq/kg. Pu-239/240, 42.4 ± 4.7 bq/kg. U-233/4, 33.3 ± 3.5 bq/kg. U-238, 35.5 ± 3.6 bq/kg.

g The July vegetation sample was provided in two separate geometries, (100 ml. and 500 ml.). Results reported here used the 500 ml. standard size geometry. Results for the 100 ml. geometry showed approximately a 15% higher bias.

APPENDIX F

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

Docket No: 50-352
50-353

LIMERICK GENERATING STATION
UNITS 1 and 2

Annual Radiological
Groundwater Protection Program Report

1 January Through 31 December 2006

Prepared By

Teledyne Brown Engineering
Environmental Services

Exelon Nuclear

Limerick Generating Station
Sanatoga, PA 19464

April 2007

Table Of Contents

Appendices

I. Summary and Conclusions

This report on the Radiological Groundwater Protection Program (RGPP) conducted for the Limerick Generating Station (LGS) by Exelon Nuclear covers the period 01 January 2006 through 31 December 2006.

In 2006, Exelon instituted a comprehensive program to evaluate the impact of station operations on groundwater and surface water in the vicinity of Limerick Generating Station. This evaluation involved numerous station personnel and contractor support personnel.

This is the first in a series of annual reports on the status of the RGPP conducted at LGS. This report covers groundwater and surface water samples, collected from the environment, both on and off station property in 2006. During that time period, 179 analyses were performed on 64 samples from 29 locations. The monitoring was conducted in two phases. Phase 1 of the monitoring was part of a comprehensive study initiated by Exelon to determine whether groundwater or surface water at and in the vicinity of Limerick Generating Station had been adversely impacted by any releases of radionuclides.

Phase 1 was conducted by Conestoga Rovers and Associates (CRA) and the conclusions were made available to state and federal regulators as well as the public on an Exelon web site

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

Phase 2 of the RGPP was conducted by Exelon corporate and station personnel to initiate follow up of Phase 1 and to begin long-term monitoring at groundwater and surface water locations selected during Phase 1. All analytical results from both the Phase 1 and Phase 2 monitoring are reported herein.

In assessing all the data gathered for this report, it was concluded that the operation of Limerick Generating Station had no adverse radiological impact on the environment offsite of LGS. There are no know active releases into the groundwater at Limerick Generating Station.

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

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

Tritium was not detected in any of the groundwater or surface water samples at concentrations greater than the United States Environmental Protection Agency (USEPA) drinking water standard (and the Nuclear Regulatory Commission Reporting Limit) of 20,000 pCi/L. Low levels of tritium were detected at concentrations greater than the LLD of 200 pCi/L in 10 of 29 groundwater monitoring locations. The tritium concentrations ranged from 158 ± 103 pCi/L to 4,360 ± 494 pCi/L. Most of the tritium that was detected in groundwater at the Station is on the west side of the Turbine building. It is likely that the tritium has migrated from the Unit 1 Condensate Storage Tank and or the auxiliary heating steam pipe leak to the monitoring well. The dose via the drinking water pathway was calculated at 0.451 mrem to a child (total body), which was 7.52% of the 10 CFR 50, Appendix I dose limit. All results for Sr-90 and gamma emitting nuclides were less than MDC.

II. Introduction

The Limerick Generating Station (LGS), consisting of two 3458 MWt boiling water reactors owned and operated by Exelon Corporation, 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 that 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.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) on samples collected in 2006.

A. Objective of the RGPP

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

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

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

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

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

5. Regularly assess analytical results to identify adverse trends.

6. Take necessary corrective actions to protect groundwater resources.

B. Implementation of the Objectives

The objectives identified have been implemented at Limerick Generating Station as discussed below:

1. Exelon and its consultant identified locations as described in the Phase 1 study. Phase 1 studies were conducted by Connestoga Rovers and Associates (CRA) and the results and conclusions

were made available to state and federal regulators as well as the public on an Exelon web site in station specific reports. www.exeloncorp.com/ourcompanies/powergen/nuclear/Tritium.htm

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

3. Limerick Generating Station will continue to perform routine sampling and radiological analysis of water from selected locations.

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

5. Limerick Generating Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends.

C. Program Description

Samples for the LGS RGPP Phase 1 were collected for Exelon Nuclear by Conestoga Rovers and Associates (CRA) and samples for Phase 2 were collected by on-site personnel and Normandeau Associates, RMC Environmental Services Division (RMC). This section describes the general collection methods used to obtain environmental samples for the LGS RGPP in 2006. Sample locations can be found in Table A–1, Appendix A.

1. Sample Collection

Groundwater and Surface Water

Samples of water were collected, managed, transported and analyzed in accordance with approved procedures following EPA methods. Both groundwater and surface water were collected. Sample locations, sample collection frequencies and analytical frequencies were controlled in accordance with approved station procedures. Contractor and/or station personnel were trained in the collection, preservation management, and shipment of samples, as well as in documentation of sampling events. Analytical laboratories were subject to internal quality assurance programs, industry

cross-check programs, as well as nuclear industry audits. Station personnel reviewed and evaluated all analytical data deliverables as data were received.

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

D. Characteristics of Tritium (H-3)

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common form of tritium is tritium oxide, which is also called "tritiated water." The chemical properties of tritium are essentially those of ordinary hydrogen.

Tritiated water behaves the same as ordinary water in both the environment and the body. Tritium can be taken into the body by drinking water, breathing air, eating food, or absorption through skin. Once tritium enters the body, it disperses quickly and is uniformly distributed throughout the body. Tritium is excreted primarily through urine with a clearance rate characterized by an effective biological half-life of about 14 days. Within one month or so after ingestion, essentially all tritium is cleared. Organically bound tritium (tritium that is incorporated in organic compounds) can remain in the body for a longer period.

Tritium is produced naturally in the upper atmosphere when cosmic rays strike air molecules. Tritium is also produced during nuclear weapons explosions, as a by-product in reactors producing electricity, and in special production reactors, where the isotopes lithium-7 and/or boron-10 are activated to produce tritium. Like normal water, tritiated water is colorless and odorless. Tritiated water behaves chemically and physically like non-tritiated water in the subsurface, and therefore tritiated water will travel at the same velocity as the average groundwater velocity.

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

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by TBE to analyze the environmental samples for radioactivity for the Limerick Generating Station RGPP in 2006.

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

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

2. Concentrations of strontium in groundwater and surface water.

3. Concentrations of tritium in groundwater and surface water.

B. Data Interpretation

The radiological data collected prior to Limerick Generating Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, Limerick Generating Station was considered operational at initial criticality. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

   The lower limit of detection (LLD) is 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 is intended as a before the fact estimate of a system (including instrumentation, procedure and sample type) and not as an after the fact criterion for the presence of activity. All analyses were designed to achieve the required OCGS detection capabilities for environmental sample analysis.

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

2. Laboratory Measurements Uncertainty

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

Statistically, the exact value of a measurement is expressed as a range with a stated level of confidence. The convention is to report results with a 95% level of confidence. The uncertainty comes from calibration standards, sample volume or weight measurements, sampling uncertainty and other factors. Exelon reports the uncertainty of a measurement created by statistical process (counting error) as well as all sources of error (Total Propagated Uncertainty or TPU). Each result has two values calculated. Exelon reports the TPU by following the result with plus or minus ± the estimated sample standard deviation, as TPU, that is obtained by propagating all sources of analytical uncertainty in measurements.

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

C. Background Analysis

A pre-operational radiological environmental monitoring program (pre-operational REMP) was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were atmospheric radiation, fall-out, domestic water, surface water, aquatic life, and foodstuffs. The results of the monitoring were detailed in the report entitled, Pre-operational 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.

The pre-operational REMP contained analytical results from samples collected from both surface water and groundwater.

Monthly surface water sampling began in 1982, and the samples were analyzed for tritium as well as other radioactive analytes. During the preoperational program tritium was detected at a maximum concentration of 420 pCi/L, indicating that these preoperational results were from nuclear weapons testing and are radioactively decaying as predicted. Gamma isotopic results from the

preoperational program were all less than or at the minimum detectable concentration (MDC) level.

1. Background Concentrations of Tritium

The purpose of the following discussion is to summarize background measurements of tritium in various media performed by others. Additional detail may be found by consulting references.

a. Tritium Production

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

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

b. Precipitation Data

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provide tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation

concentration data for samples collected world wide from 1960 to 2006. RadNet provides tritium precipitation concentration data for samples collected at stations through out the U.S. from 1960 up to and including 2006. Based on GNIP data for sample stations located in the U.S. Midwest, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of thermonuclear weapons. Tritium concentrations in surface water showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations in have typically been below 100 pCi/L since around 1980. Tritium concentrations in wells may still be above the 200 pCi/L detection limit from the external causes described above. Water from previous years was naturally captured in groundwater. As a result, some well water sources today are affected by the surface water from the 1960s that contained elevated tritium activity.

c. Surface Water Data

Tritium concentrations are routinely measured in the Schuylkill and Delaware Rivers. Pennsylvania surface water data are typically less than 100 pCi/L.

The USEPA RadNet surface water data typically has a reported 'Combined Standard Uncertainty' of 35 to 50 pCi/L. According to USEPA, this corresponds to a ±70 to 100 pCi/L 95% confidence bound on each given measurement. Therefore, the typical background data provided may be subject to measurement uncertainty of approximately ± 70 to 100 pCi/L.

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

IV. Results and Discussion

Gamma spectroscopy results for groundwater and surface water sample were reported for twelve nuclides (Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, I-131, Cs-134, Cs-137, Ba-140 and La-140).

A. Groundwater Results

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

Tritium

Samples from 16 locations were analyzed for tritium activity (Table B–I.1, Appendix B). Tritium values ranged from <165 to 4,360 pCi/L. Well P-12 had the highest value of 4,360 pCi/L. After the results from well P-12 were confirmed well MW-LR-9 was dug directly over P-12 to the aquifer depth. Results from well MW-LR-9 ranged from <171 to 1,500 pCi/L. It was likely that tritium had migrated from the Unit 1 Condensate Storage Tank and or the auxiliary heating steam pipe leak to monitoring wells P-12 and MW-LR-9. The tritium migration pathway could be directly from the Unit 1 Condensate Storage Tank dike through bedrock fractures to P-12 and MW-LR-9. However, a more likely pathway is from the Unit 1 Condensate Storage Tank dike and or the auxiliary heating steam pipe leak through bedrock fractures to the drain system around the power block and into the Power Block Foundation Sump. From the drain system, the tritiated water could then migrate through bedrock fractures to P-12 and MW-LR-9. No other wells showed any elevated tritium results indicated that this contamination was localized to wells P-12 and MW-LR-9. The dose via the drinking water pathway was calculated at 0.451 mrem to a child (total body), which was 7.52% of the 10 CFR 50, Appendix I dose limit.

Strontium

No Sr-90 activity was detected in any of the ground water samples analyzed (Table B–I.1, Appendix B).

Gamma Emitters

Potassium-40 was detected in four of 38 samples. The concentrations ranged from 58 pCi/Liter to 119 pCi/Liter. No other gamma emitting nuclides were detected (Table B–I.2, Appendix B).

B. Surface Water Results

In accordance with the Station's radiological groundwater protection program surface water samples were collected from streams that transverses the site, as well as, from other water bodies that could influence the tritium concentration at Limerick. Analytical results and anomalies are discussed below.

Tritium

Samples from 13 locations were analyzed for tritium activity (Table B–1.3, Appendix B). Tritium values ranged from <141 to 2,020 pCi/L The Foundation Power Block Sump (FPBS) had the highest value of 2,020 pCi/L. The FPBS is located in the general area of wells P-12 and MW-LR-9.

Strontium

No Sr-90 activity was detected in any of surface water samples analyzed (Table B–I.3, Appendix B).

Gamma Emitters

No gamma emitting nuclides were detected in any of the surface water samples analyzed (Table B–I.4, Appendix B).

C. Drinking Water Well Survey

A drinking water well survey was conducted during the summer 2006 by CRA (CRA 2006) around the Limerick Generating Station. CRA reviewed the Pennsylvania Groundwater Information System database to identify wells within a 1-mile radius from the center of the Station. Forty-six domestic withdrawal wells, two industrial wells, two commercial wells, and one institutional well were identified within the specified radius. The well depths range from 78 to 345 feet bgs, and they yield between 8 and 100 gallons per minute (gpm). All wells are completed in the Brunswick Formation.

The Station has one potable supply well and one fire water well. The potable supply well is constructed as an open-rock borehole. Groundwater was measured at a depth 102 feet bgs during a well pump replacement in 2004 (personal communication with Station, 2006). The pump was placed at a depth of approximately 294 feet bgs. The total well depth and the depth of the steel casing are unknown. The well is located approximately 175 feet east of the Reactor Building. The Station

estimates that the well is pumped at approximately 2 gpm. The fire water well is constructed as an open-rock borehole. Groundwater was encountered at 121 feet bgs during a well pump replacement in 2004. The well pump was placed at a depth of approximately 399 feet bgs. The total well depth and the depth of the steel casing are unknown. The well is located approximately 500 feet east of the cooling towers. The well is used only in an emergency fire situation; therefore, water use is estimated to be zero.

D. Summary of Results – Inter-Laboratory Comparison Program

Inter-Laboratory Comparison Program results for TBE are presented in the Annual Radiological Environmental Operating Report.

E. Leaks, Spills, and Releases

The Station records inadvertent release of radioactive liquids in accordance with 10 CFR 50.75)g). As part of the fleet wide assessment, a third party environmental engineering firm was contracted to evaluate historic releases, and determine if a potential pathway to the environment existed. Those releases that were determined to have potentially impacted groundwater were subsequently investigated as part of the fleet wide assessment. The hydrogeologic investigation determined that there is currently one radiological impacts to groundwater that is limited to the LGS site protected area boundary.

F. Trends

No trends have been identified.

G. Investigations

Conclusions from the Phase 1 report have been made available to state and federal regulators and to the public. Currently no investigations are on going.

H. Actions Taken

1. Compensatory Actions

   There have been no station events requiring compensatory actions at the Limerick Generating Station.

2. Installation of Monitoring Wells

   After phase 1 was completed two additional wells were added to the program. Wells MW-LR-8 and MW-LR-9 were drilled near the Unit 1 condensate storage tank dike to monitor groundwater tritium levels in that area. No new wells were required to be installed as a result of the phase 2 study.

3. Actions to Recover/Reverse Plumes

   No actions were required to recover or reverse groundwater plumes.

V. References

1. Conestoga Rovers and Associates, Fleetwide Assessment, Oyster Creek Generating Station, Forked River, New Jersey, Ref. No. 045136(18), September 2006

2. Pre-operational 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.

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APPENDIX A

LOCATION DESIGNATION

TABLE A-1: Radiological Groundwater Protection Program – Sampling locations for the Limerick Generating Station, 2006

Location	Type	Distance	Study Phase
MW-LR-1	Monitoring Well	Onsite	1, 2
MW-LR-2	Monitoring Well	Onsite	1, 2
MW-LR-3	Monitoring Well	Onsite	1, 2
MW-LR-4	Monitoring Well	Onsite	1, 2
MW-LR-5	Monitoring Well	Onsite	1, 2
MW-LR-6	Monitoring Well	Onsite	1, 2
MW-LR-7	Monitoring Well	Onsite	1, 2
MW-LR-8	Monitoring Well	Onsite	1, 2
MW-LR-9	Monitoring Well	Onsite	2
P11	Monitoring Well	Onsite	2
P12	Monitoring Well	Onsite	1
P14	Monitoring Well	Onsite	1, 2
P16	Monitoring Well	Onsite	1, 2
P17	Monitoring Well	Onsite	1, 2
P3	Monitoring Well	Onsite	1, 2
SP22	Monitoring Well	Onsite	1, 2
SW-LR-1	Surface Water	Offsite	1, 2
SW-LR-2	Surface Water	Offsite	1
SW-LR-3	Surface Water	Offsite	1
SW-LR-4	Surface Water	Offsite	1
SW-LR-5	Surface Water	Offsite	1
SW-LR-6	Surface Water	Offsite	1
SW-LR-7	Surface Water	Onsite	1
SW-LR-8	Surface Water	Onsite	1, 2
SW-LR-9	Surface Water	Onsite	1, 2
POWER BLOCK SUMP	Surface Water	Onsite	1
STILL CREEK	Surface Water	Offsite	1
BRADSHAW RESERVE	Surface Water	Offsite	1
WADESVILLE MINE	Surface Water	Offsite	1

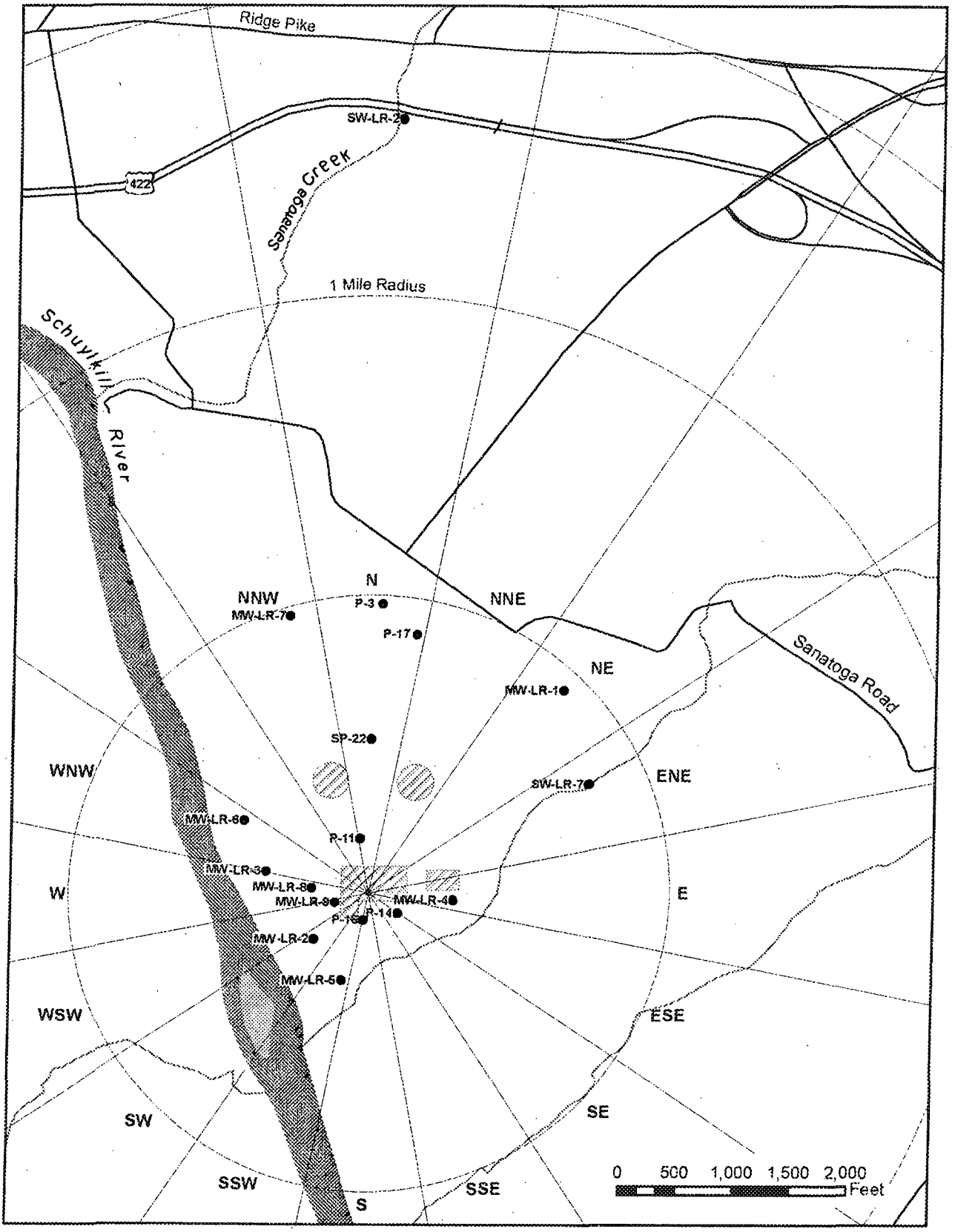

Figure 1 Phase 2 Well Water and Surface Water Sample Locations for the Radiological Groundwater Protection Program, Limerick Generating Station, 2006

APPENDIX B

DATA TABLES

TABLE B-I.1 CONCENTRATIONS OF TRITIUM AND STRONIUM-90 IN WELL WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, LIMERICK GENERATING STATION 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

	COLLECTION	H-3		SR-90
STC	DATE			
MW-LR-1	05/17/06	< 183		< 0.72
MW-LR-1	10/17/06	< 181	*	< 0.91
MW-LR-2	05/18/06	< 184		< 0.9
MW-LR-2 DUP	05/18/06	< 169		< 1.41
MW-LR-2	10/16/06	< 181	*	< 1.35
MW-LR-2	10/17/06	< 185	*	< 0.92
MW-LR-3	05/18/06	< 170		< 1.18
MW-LR-3	10/18/06	< 180	*	< 1.33
MW-LR-4	05/19/06	222 ± 118		< 0.8
MW-LR-4	10/17/06	< 185	*	< 1.4
MW-LR-5	05/19/06	305 ± 121		< 0.79
MW-LR-5	10/18/06	< 183	*	< 1.11
MW-LR-5	10/18/06	236 ± 118*		< 1.49
MW-LR-5	10/18/06	275 ± 137*		< 1.42
MW-LR-5	10/18/06	247 ± 118*		
MW-LR-5	10/18/06	209 ± 129*		
MW-LR-6	05/17/06	< 182		< 1.35
MW-LR-6	10/16/06	< 180	*	< 1.35
MW-LR-6	10/17/06	< 175	*	< 1.34
MW-LR-7	05/18/06	< 166		< 1.16
MW-LR-7	10/16/06	< 181	*	< 1.49
MW-LR-7	10/18/06	< 167	*	< 1.47
MW-LR-8	06/28/06	184 ± 116		
MW-LR-8	07/07/06	244 ± 116*		
MW-LR-8	08/16/06	246 ± 124*		< 1.56
MW-LR-8	10/18/06	< 180	*	< 1.37

* INDICATES DISTILLED ANALYSIS

TABLE B-I.1 CONCENTRATIONS OF TRITIUM AND STRONIUM-90 IN WELL WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, LIMERICK GENERATING STATION 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

LOCATION	COLLECTION DATE	H-3		SR-90	
MW-LR-9	08/16/06		1500 ± 210*	<	1.24
MW-LR-9	10/19/06	<	171 *	<	1.33
MW-LR-9	10/19/06		238 ± 120*	<	1.36
MW-LR-9	10/19/06	<	172 *		
MW-LR-9	10/19/06	<	180 *		
P11	05/18/06	<	184	<	1.35
P11	10/17/06		204 ± 118*	<	1.48
P11	10/17/06	<	187 *	<	0.81
P11 DUP	05/18/06	<	185		
P12	05/18/06		4360 ± 494	<	1.3
P12	05/18/06		4350 ± 199		
P14	05/18/06	<	185	<	0.89
P14	10/17/06	<	180 *	<	1.36
P16	05/18/06	<	182	<	0.94
P17	05/17/06	<	183	<	1.37
P17	10/18/06	<	174 *	<	1.48
P3	05/18/06	<	170	<	1.12
P3	10/19/06	<	178 *	<	1.46
SP22	05/19/06	<	165	<	0.55
SP22	10/17/06	<	185 *	<	1.4

* INDICATES DISTILLED ANALYSIS

TABLE B-I.2 CONCENTRATIONS OF GAMMA EMITTERS IN WELL WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, LIMERICK GENERATING STATION 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION DATE	BE-7	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	I-131	CS-134	CS-137	BA-140	LA-140
MW-LR-1	05/17/06	< 25	< 29	< 3	< 3	< 6	< 3	< 10	< 4	< 5	< 4	< 6	< 3	< 12	< 4
MW-LR-1	10/17/06	< 37	< 33	< 4	< 5	< 9	< 6	< 10	< 5	< 9	< 12	< 4	< 4	< 26	< 7
MW-LR-2	05/18/06	< 41	< 43	< 5	< 5	< 9	< 5	< 16	< 6	< 9	< 8	< 8	< 5	< 22	< 7
MW-LR-2	10/16/06	< 43	58 ± 46	< 5	< 5	< 10	< 6	< 9	< 6	< 9	< 14	< 4	< 5	< 30	< 12
MW-LR-2	10/17/06	< 33	< 61	< 3	< 3	< 7	< 3	< 6	< 4	< 6	< 9	< 3	< 4	< 23	< 8
MW-LR-2 DUP	05/18/06	< 29	< 31	< 3	< 3	< 6	< 3	< 12	< 4	< 6	< 5	< 7	< 4	< 14	< 5
MW-LR-3	05/18/06	< 45	< 56	< 5	< 6	< 11	< 6	< 16	< 6	< 9	< 8	< 8	< 6	< 22	< 8
MW-LR-3	10/18/06	< 51	< 52	< 5	< 5	< 11	< 4	< 11	< 6	< 9	< 14	< 4	< 5	< 36	< 11
MW-LR-4	05/19/06	< 45	< 56	< 6	< 5	< 12	< 5	< 14	< 6	< 9	< 8	< 6	< 5	< 24	< 9
MW-LR-4	10/17/06	< 39	< 85	< 4	< 4	< 8	< 4	< 8	< 4	< 7	< 12	< 4	< 4	< 28	< 11
MW-LR-5	05/19/06	< 50	< 72	< 6	< 6	< 11	< 6	< 22	< 7	< 9	< 9	< 10	< 6	< 24	< 8
MW-LR-5	10/18/06	< 48	< 74	< 4	< 4	< 8	< 5	< 10	< 5	< 8	< 14	< 4	< 5	< 30	< 12
MW-LR-5	10/18/06	< 40	< 99	< 4	< 4	< 7	< 4	< 8	< 5	< 8	< 15	< 4	< 4	< 33	< 10
MW-LR-5	10/18/06	< 38	< 42	< 5	< 5	< 11	< 7	< 8	< 5	< 9	< 15	< 4	< 4	< 32	< 11
MW-LR-6	05/17/06	< 27	< 50	< 3	< 3	< 6	< 4	< 9	< 4	< 6	< 4	< 5	< 4	< 13	< 5
MW-LR-6	10/16/06	< 49	< 50	< 4	< 5	< 14	< 5	< 11	< 6	< 9	< 16	< 4	< 5	< 35	< 9
MW-LR-6	10/17/06	< 43	119 ± 61	< 5	< 6	< 11	< 7	< 10	< 5	< 10	< 16	< 6	< 6	< 35	< 12
MW-LR-7	05/18/06	< 29	< 49	< 3	< 3	< 7	< 3	< 12	< 4	< 6	< 5	< 6	< 4	< 15	< 5
MW-LR-7	10/16/06	< 20	< 18	< 2	< 2	< 5	< 3	< 4	< 2	< 4	< 7	< 2	< 2	< 15	< 5
MW-LR-7	10/18/06	< 45	< 93	< 5	< 5	< 12	< 7	< 10	< 6	< 9	< 14	< 5	< 6	< 31	< 8

TABLE B-I.2 CONCENTRATIONS OF GAMMA EMITTERS IN WELL WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, LIMERICK GENERATING STATION 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	DATE	BE-7	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	I-131	CS-134	CS-137	BA-140	LA-140
MW-LR-8	08/16/06	< 45	< 62	< 6	< 6	< 13	< 7	< 10	< 7	< 10	< 7	< 5	< 6	< 25	< 7
MW-LR-8	10/18/06	< 32	< 29	< 3	< 3	< 8	< 3	< 6	< 4	< 6	< 12	< 3	< 3	< 26	< 6
MW-LR-9	08/16/06	< 39	61 ± 55	< 5	< 5	< 10	< 4	< 8	< 6	< 7	< 5	< 4	< 5	< 17	< 6
MW-LR-9	10/19/06	< 38	< 87	< 4	< 4	< 12	< 5	< 7	< 5	< 9	< 14	< 4	< 5	< 31	< 9
MW-LR-9	10/19/06	< 35	< 79	< 3	< 4	< 9	< 4	< 5	< 4	< 7	< 12	< 4	< 4	< 27	< 7
P11	05/18/06	< 48	< 48	< 5	< 5	< 11	< 6	< 15	< 7	< 9	< 8	< 7	< 6	< 23	< 7
P11	10/17/06	< 43	79 ± 49	< 5	< 4	< 11	< 4	< 10	< 5	< 8	< 16	< 4	< 4	< 29	< 14
P11 DUP	05/18/06	< 43	< 52	< 5	< 5	< 10	< 5	< 16	< 5	< 9	< 8	< 8	< 6	< 22	< 8
P12	05/18/06	< 39	< 76	< 5	< 5	< 8	< 4	< 14	< 5	< 8	< 7	< 7	< 5	< 21	< 6
P14	05/18/06	< 46	< 56	< 5	< 5	< 10	< 6	< 13	< 6	< 9	< 8	< 6	< 6	< 25	< 8
P14	10/17/06	< 43	< 116	< 4	< 5	< 10	< 3	< 10	< 5	< 10	< 16	< 4	< 5	< 33	< 12
P16	05/18/06	< 47	< 50	< 5	< 6	< 13	< 6	< 16	< 6	< 9	< 9	< 7	< 6	< 22	< 9
P17	05/17/06	< 33	< 62	< 4	< 4	< 8	< 4	< 9	< 4	< 7	< 5	< 5	< 4	< 16	< 5
P17	10/18/06	< 52	< 97	< 5	< 5	< 10	< 5	< 8	< 6	< 10	< 13	< 5	< 5	< 34	< 12
P3	05/18/06	< 38	< 46	< 5	< 5	< 9	< 4	< 13	< 5	< 8	< 6	< 6	< 5	< 20	< 7
P3	10/19/06	< 42	< 40	< 4	< 5	< 10	< 5	< 10	< 5	< 7	< 12	< 4	< 4	< 29	< 10
SP22	05/19/06	< 53	< 52	< 5	< 6	< 12	< 6	< 14	< 6	< 10	< 9	< 7	< 6	< 27	< 9
SP22	10/17/06	< 42	< 74	< 4	< 5	< 11	< 5	< 9	< 6	< 8	< 16	< 4	< 4	< 34	< 13

TABLE B-II.1 CONCENTRATIONS OF TRITIUM AND STRONIUM-90 IN SURFACE WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, LIMERICK GENERATING STATION 2006

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

LOCATION	COLLECTION DATE	H-3		SR-90
SW-LR-1	05/22/06	< 150		< 1.5
SW-LR-1	10/16/06	< 187	*	< 1.59
SW-LR-2	05/22/06	< 152		< 1.46
SW-LR-3	05/22/06	< 154		< 1.59
SW-LR-4	05/22/06	158	± 103	< 1.49
SW-LR-5	05/22/06	< 141		< 1.23
SW-LR-5 DUP	05/22/06	< 152		< 1.89
SW-LR-6	05/22/06	184	± 108	< 1.35
SW-LR-7	05/22/06	< 150		< 1.84
SW-LR-8	05/19/06	523	± 137	< 0.7
SW-LR-8	10/16/06	< 176	*	< 1.26
SW-LR-9	05/19/06	< 166		< 1.15
SW-LR-9	10/16/06	< 183	*	< 1.5
SW-LR-9 DUP	05/19/06	< 172		< 0.89
BRADSHAW RESERVOIR	05/31/06	< 166		< 1.73
POWER BLOCK SUMP	05/31/06	2020	± 154	< 1.83
STILL CREEK	05/31/06	< 165		< 1.63
WADESVILLE MINE	05/31/06	< 165		< 1.28

* INDICATES DISTILLED ANALYSIS

TABLE B-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, LIMERICK GENERATING STATION 2006**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

LOCATION	COLLECTION DATE	BE-7	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	I-131	CS-134	CS-137	BA-140	LA-140
SW-LR-1	05/22/06	< 16	< 19	< 2	< 2	< 4	< 2	< 5	< 2	< 3	< 3	< 2	< 2	< 9	< 3
SW-LR-1	10/16/06	< 37	< 76	< 4	< 4	< 8	< 4	< 8	< 4	< 7	< 12	< 4	< 4	< 27	< 6
SW-LR-2	05/22/06	< 48	< 47	< 5	< 5	< 9	< 5	< 11	< 5	< 10	< 9	< 6	< 5	< 23	< 8
SW-LR-3	05/22/06	< 30	< 33	< 3	< 3	< 7	< 4	< 7	< 3	< 6	< 6	< 4	< 3	< 17	< 5
SW-LR-4	05/22/06	< 30	< 33	< 3	< 4	< 7	< 3	< 8	< 4	< 6	< 6	< 4	< 4	< 16	< 5
SW-LR-5	05/22/06	< 43	< 46	< 5	< 5	< 9	< 5	< 10	< 5	< 9	< 9	< 5	< 5	< 23	< 8
SW-LR-5 DUP	05/22/06	< 34	< 65	< 4	< 4	< 8	< 4	< 9	< 4	< 7	< 7	< 5	< 4	< 20	< 6
SW-LR-6	05/22/06	< 43	< 45	< 6	< 5	< 11	< 5	< 14	< 6	< 9	< 10	< 6	< 5	< 26	< 8
SW-LR-7	05/22/06	< 48	< 87	< 5	< 5	< 10	< 5	< 12	< 5	< 9	< 10	< 5	< 5	< 25	< 9
SW-LR-8	05/19/06	< 45	< 49	< 4	< 5	< 9	< 5	< 11	< 5	< 8	< 8	< 5	< 5	< 22	< 7
SW-LR-8	10/16/06	< 40	< 117	< 4	< 4	< 9	< 3	< 8	< 4	< 10	< 16	< 4	< 4	< 35	< 11
SW-LR-9	05/19/06	< 51	< 50	< 6	< 6	< 13	< 6	< 12	< 6	< 10	< 9	< 5	< 7	< 27	< 8
SW-LR-9	10/16/06	< 61	< 57	< 6	< 7	< 15	< 6	< 14	< 7	< 8	< 22	< 6	< 7	< 53	< 11
SW-LR-9 DUP	05/19/06	< 39	< 42	< 5	< 5	< 10	< 5	< 10	< 5	< 8	< 7	< 5	< 5	< 21	< 7
BRADSHAW RESERVOIR	05/31/06	< 56	< 53	< 5	< 6	< 12	< 5	< 11	< 6	< 10	< 20	< 6	< 6	< 40	< 12
POWER BLOCK SUMP	05/31/06	< 49	< 47	< 5	< 5	< 12	< 5	< 12	< 5	< 10	< 16	< 6	< 5	< 37	< 12
STILL CREEK	05/31/06	< 49	< 46	< 5	< 5	< 12	< 5	< 11	< 6	< 9	< 17	< 6	< 5	< 38	< 12
WADESVILLE MINE	05/31/06	< 47	< 40	< 5	< 5	< 11	< 4	< 10	< 5	< 9	< 16	< 5	< 5	< 35	< 11