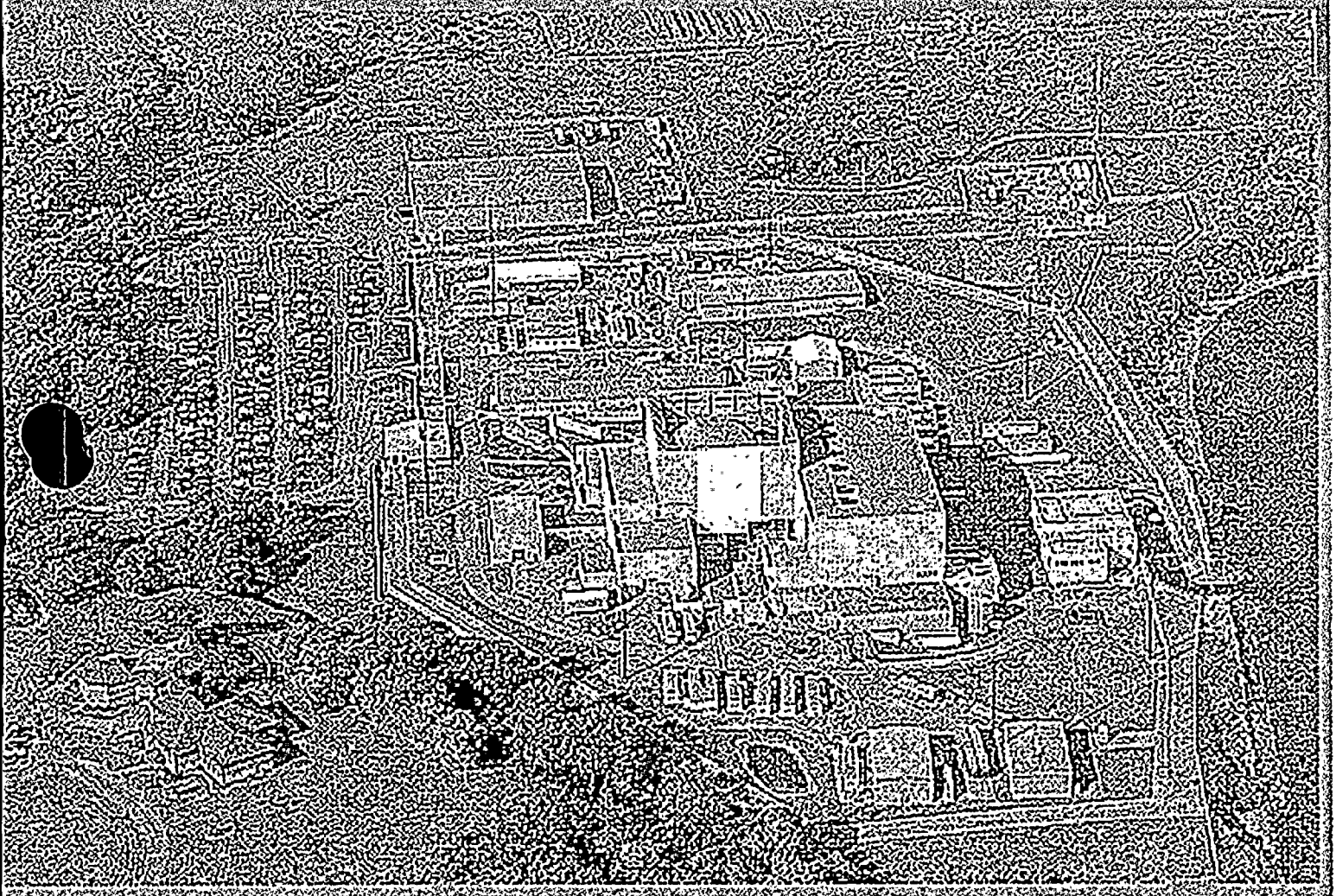
1997
Annual Radiological Environmental Operating Report



R.E. Ginna Nuclear Plant
Rochester Gas and Electric

Docket No. 50-244

1997

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

R.E. Ginna Nuclear Station

Rochester Gas & Electric Corporation

Docket No. 50-244

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RADIOLOGICAL ENVIRONMENTAL SURVEY

January 1 - December 31, 1997

1.0 SUMMARY

The Annual Radiological Environmental Operating Report is published in accordance with Section VI of the Offsite Dose Calculation Manual, (ODCM). This report describes the Radiological Environmental Monitoring Program, (REMP), and its implementation as required by the ODCM.

The REMP is implemented to measure radioactivity in the aquatic and terrestrial pathways. The aquatic pathways include Lake Ontario fish, Lake Ontario water, and Deer Creek water. Measurement results of the samples representing these pathways contained only natural background radionuclides or low concentrations of Cs-137 resulting from past atmospheric nuclear weapons testing. The 1997 results were consistent with data for the past five years and exhibited no adverse trends.

Terrestrial pathways were also monitored. These included airborne particulate and radioiodine, milk, food products, and direct radiation. Analysis of terrestrial pathways demonstrated no detectable increase in radiation levels as a result of plant operation. The 1997 results were consistent with data for the past five years and exhibited no adverse trends.

The analytical results from the 1997 Radiological Environmental Monitoring Program demonstrate that the operation of the Robert E. Ginna Nuclear Power Station had no measurable radiological impact on the environment. The results also demonstrate that operation of the plant did not result in a dose to the general population above natural background levels.

During 1997, 1454 samples were collected for analysis by gross beta counting and gamma spectroscopy. These included 928 air samples, 292 water samples, 16 fish samples, 7 vegetation samples, 58 milk samples, and 153 thermoluminescent dosimeter measurements. During 1997 there were 3 deviations from the sampling schedule for TLD's and 9 for tritium analysis. The minimum number of samples required in ODCM Table V-1 were collected for all pathways.

Samples were collected by Ginna Station chemistry personnel and analyzed by the J. A. Fitzpatrick Nuclear Power Plant Environmental Laboratory.

A summary of the data collected indicating the results of all data for indicator and control locations is given in Table 1-1.

Table 1-1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

PATHWAY SAMPLED UNIT OF MEASUREMENT	TYPE AND TOTAL NUMER OF ANALYSES	LLD	INDICATOR LOCATIONS MEAN (1) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (1) RANGE
				NAME, DISTANCE AND DIRECTION	MEAN (1) RANGE	
AIR: Particulate(pCi/M³)	Gross Beta 606	0.003	0.017 (456/456) 0.006-0.062	Onsite Location # 13 292 230M	0.019 (52/52) 0.007 - 0.062	0.016 (150/150) 0.005 - 0.037
(pCi/M³)	Gamma Scan 48	(2)	< LLD			< LLD
Iodine(pCi/M³)	Gamma Scan 304	0.02-0.06	< LLD			< LLD
DIRECT RADIATION: TLD (mrem/quarter)	Gamma 153	5.0	12.8 (117/117) 10.1 - 16.2	Onsite Location #7 257 220M	15.4 (4/4) 14.5 - 16.2	11.6 (36/36) 10.1 - 13.7
WATER: Drinking (pCi/Liter)	Gross Beta 12	1.2	2.69 (12/12) 1.64 - 4.69	OWD 70 1200M	2.69 1.64 - 4.69	
	Gamma Scan 12	(2)	Ra-226 94(10/12) 44 - 179	OWD 70 1200M	Ra-226 94 (10/12) 44 - 179	
	Iodine 29	0.45	< LLD			
Surface (pCi/Liter)	Gross Beta 48	1.2	2.44 (12/12) 1.55 - 3.72	Deer Creek 105 260M	4.35 (12/12) 2.78 - 7.51	2.45 (12/12) 1.78 - 3.52
	Gamma Scan 48	(2)	Ra-226 78 (11/12) 44 - 152	Circ-out 15 130M	Ra-226 78 (11/12) 44 - 152	Ra-226 (9/12) 44 - 119
	Iodine 48	0.45	< LLD			< LLD
MILK: (pCi/Liter)	Iodine 58	0.45	< LLD			< LLD
	Gamma Scan 58	(2)	< LLD			< LLD
FISH: (pCi/Kg)	Gamma Scan 16	(2)	Cs-137 11* (1/8)	Control Fish 270 25600M	Cs-137 20 (1/8) 70 2200	Cs-137 20 (1/8) 20*
VEGETATION: (pCi/Kg)	Gamma Scan 7	(2)	Ra-226 680 (4/4) 67-2730	Site Garden	Ra-226 680 (4/4) 67-2730	Ra-226 258 (2/2) 131-385

(1) Mean and range based on detectable measurements only. Fraction of detectable measurements at specified locations in parentheses.
(2) Table of LLD values attached for gamma scan measurements.
(3) Single sample
* No mean or range, single sample

2.0 PROGRAM DESCRIPTION

2.1 Program Objectives

The objectives of the Radiological Environmental Monitoring Program are:

- Measure and evaluate the effects of plant operation on the environment.
- Monitor background radiation levels in the environs of the Ginna site.
- Demonstrate compliance with the environmental conditions and requirements of applicable state and federal regulatory agencies, including the ODCM and 40 CFR 190.
- Provide information by which the general public can evaluate environmental aspects of the operation of Ginna Nuclear Power Station.

2.2 Program Requirements

In order to achieve the objectives listed in section 2.1, a sampling and analysis program is implemented each year according to table V-1 of the ODCM. Following are the requirements from the ODCM:

Monitoring Program

The radiological environmental monitoring program shall be conducted as specified in Table V-1 at the locations given in the ODCM.

If the radiological environmental monitoring program is not conducted as specified in Table V-1, prepare and submit to the Commission, in the Annual Radiological Environmental Operating Report, a description of the reasons for these deviations and the plans for preventing a recurrence. Deviations are permitted from the required sampling schedule if specimens are unobtainable due to hazardous conditions, seasonal availability, or to malfunction of automatic sampling equipment. If the latter, efforts shall be made to complete corrective action prior to the end of the next sampling period.

If milk or fresh leafy vegetable samples are unavailable for more than one sample period from one or more of the sampling locations indicated by the ODCM, a discussion shall be included in the Annual Radioactive Effluent Report which identifies the cause of the unavailability of samples and identifies locations for obtaining replacement samples. If a milk or leafy vegetable sample location becomes unavailable, the locations from which samples were unavailable may then be deleted from the ODCM, provided that comparable locations are added to the environmental monitoring program.

Land Use Census

A land use census shall be conducted and shall identify the location of the nearest milk producing animal and the nearest residence in each of the 16 meteorological sectors within a distance of five miles.

An onsite garden located in the meteorological sector having the highest historical D/Q may be used for broad leaf vegetation sampling in lieu of a garden census; otherwise the land use census shall also identify the location of the nearest garden of greater than 500 square feet in each of the 16 meteorological sectors within a distance of five miles. D/Q shall be determined in accordance with methods described in the ODCM.

Interlaboratory Comparison Program

Analyses shall be performed on applicable radioactive environmental samples supplied as part of an interlaboratory comparison program which has been approved by NRC, if such a program exists.

Specification

The radiological environmental monitoring samples shall be collected pursuant to Table V-1. Acceptable locations are shown in the ODCM. Samples shall be analyzed pursuant to the requirements of Tables V-1 and V-3.

A land use census shall be conducted annually (between June 1 and October 1).

A summary of the results obtained as part of the required Interlaboratory Comparison Program shall be included in the Annual Radiological Environmental Operating Report.

Deviations from the Sampling Schedule

Deviations from the sampling schedule are allowed when samples are unavailable due to hazardous conditions, seasonal variations or malfunction of automatic sampling equipment.

During the last quarter of 1996, the analysis of environmental samples was transferred to the James A. FitzPatrick Environmental Laboratory. The ability to do analyses still exists, but the Ginna lab is not currently used for routine environmental sample analyses.

Offsite Dose Calculation Manual Table V-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF SAMPLES & SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
1. AIRBORNE a. Radionuclide	5 indicator 1 control	Continuous operation of sampler with sample collection at least once per 10 days	Radionuclide canister. Analyze within 7 days of collection of I-131.
b. Particulate	9 indicator 3 control	Same as above	Particulate sampler. Analyze for gross beta radioactivity ≥ 24 hours following filter change. Perform gamma isotopic analysis on each sample for which gross beta activity is > 10 times the mean of offsite samples. Perform gamma isotopic analysis on composite (by location) sample at least once per 92 days.
2. DIRECT RADIATION	30 indicator 9 control 11 placed greater than 5 miles from plant site.	TLDs at least quarterly	Gamma dose quarterly.
3. WATERBORNE a. Surface	1 control (Russell Station) 1 indicator (Condenser Water Discharge)	Composite* sample collected over a period of ≤ 31 days.	Gross beta and gamma isotopic analysis of each composite sample. Tritium analysis of one composite sample at least once per 92 days.
b. Drinking	1 indicator (Ontario Water District Intake)	Same as above	Same as above

* Composite sample to be collected by collecting an aliquot at intervals not exceeding 2 hours.

Offsite Dose Calculation Manual Table V-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF SAMPLES & SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
4. INGESTION			
a. Milk	1 control 3 indicator June thru October each of 3 farms	At least once per 15 days	Gamma isotopic and I-131 analysis of each sample.
	1 control 1 indicator November thru May one of the farms	At least once per 31 days	Gamma isotopic and I-131 analysis of each sample.
b. Fish	4 control 4 indicator (Off shore at Ginna)	Twice during fishing season including at least four species.	Gamma isotopic analysis on edible portions of each sample.
c. Food Products	1 control 2 indicator (On site)	Annual at time of harvest. Sample from two of the following: 1. apples 2. cherries 3. grapes	Gamma isotopic analysis on edible portion of sample.
	1 control 1 indicator (On site garden or nearest offsite garden within 5 miles in the highest D/Q meterological sector)	At time of harvest. One sample of: 1. broad leaf vegetation 2. other vegetable	Gamma isotopic analysis on edible portion of sample.

The maximum LLD values as defined by ODCM Table V-3

Analysis	Water (pCi/Liter)	Airborne Particulate or Gas (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/Liter)	Food Particulate (pCi/kg, wet)
gross beta	4[a]	1×10^{-2}			
H-3	2000 (1000[a])				
MN-54	15		130		
Fe-59	30		260		
Co-58 Co-60	15		130		
Zn-65	30		260		
Zr-Nb-95	15[b]				
I-131	1	7×10^{-2}		1	60
Cs-134 Cs-137	15(10[a]), 18	1×10^{-2}	130	15	60
Ba-La-140	15[b]			15[b]	

a. LLD for drinking water

b. Total for parent and daughter

LLD TABLE NOTATION

The LLD is the smallest concentration of radioactive material in a sample that will yield a net count (above system background) that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

The LLD is defined as an apriori (before the fact) limit representing the capability of a measurement system and not as an aposteriori (after the fact) limit for a particular measurement, the minimum detectable activity (MDA).

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

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

where:

LLD is the lower limit of detection as defined above (as pCi per unit mass or volume)

4.66 establishes 95% confidence interval about LLD

Sb is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (in counts per minute)

E is the counting efficiency (as counts per disintegration)

V is the sample size (in units of mass or volume)

2.22 is the number of disintegrations per minute per picocurie

Y is the fractional radiochemical yield (when applicable)

λ is the decay constant for the particular radionuclide;

Δt is the elapsed time between sample collection, (or end of sample collection period), and time of counting.

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Table 2-3

DIRECTION AND DISTANCE TO SAMPLE POINTS

All directions given in degrees and all distances given in meters

Air Sample Stations	Direction	Distance
#2 I	87	320
#3 I	110	420
#4 I	140	250
#5 I	185	160
#6 I	232	225
#7 I	257	220
#8 C	258	19200
#9 I	235	11400
#10 C	185	13100
#11 I	123	11500
#12 C	93	25100
#13 I	194	690

Water Sample Locations	Direction	Distance
Russell Station C	270	25600
Ontario Water District I	70	2200
Circ Water Intake S	0	420
Circ Water Discharge I	15	130
Deer Creek S	105	260
Tap S	Onsite	Sink

Milk Sample Locations	Direction	Distance
Farm A I	113	9500
Farm B I	242	5450
Farm C I	156	4950
Farm D C	132	21000

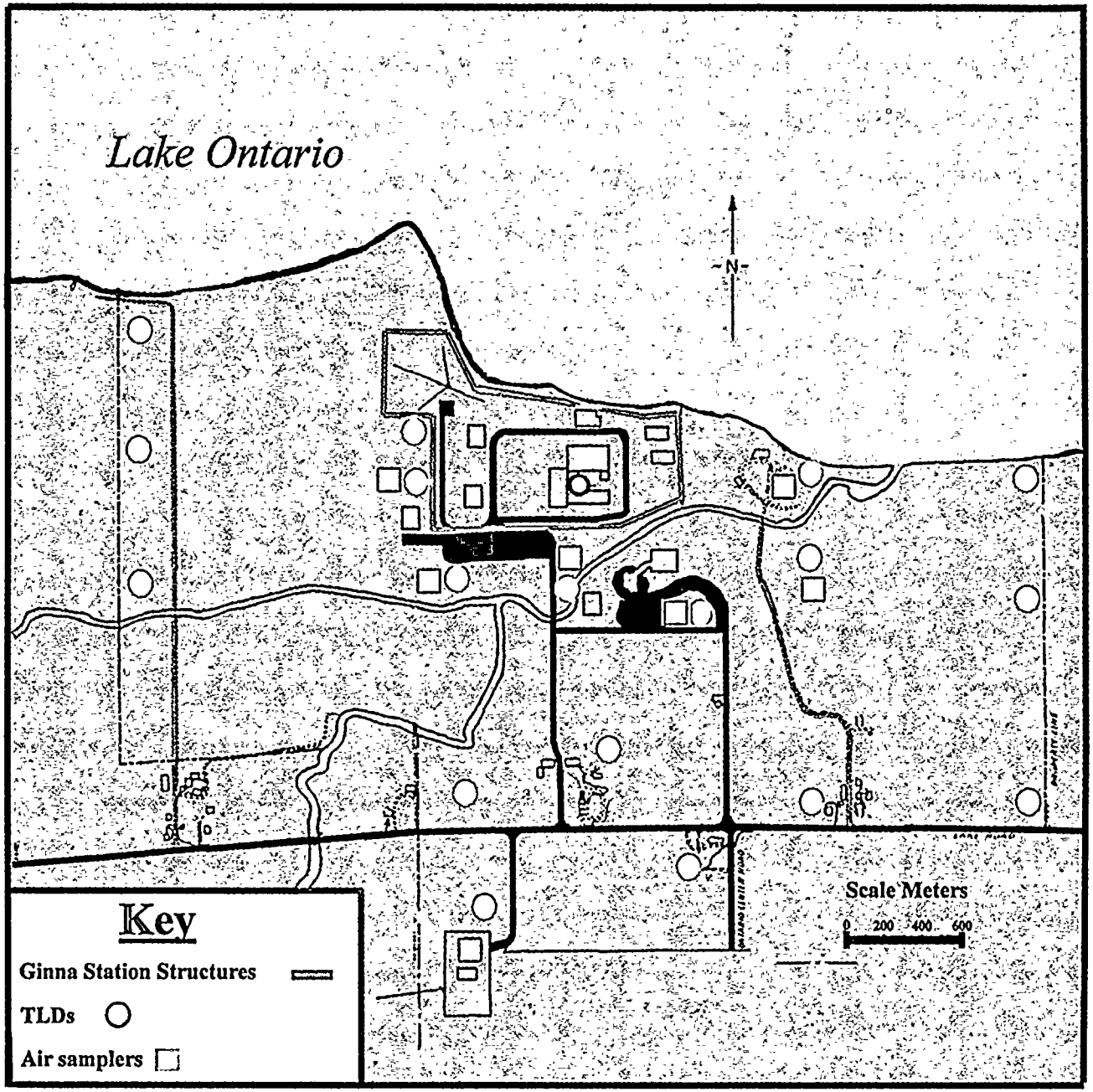
Fish Samples	
Indicator Samples	Lake Ontario Discharge Plume
Background Samples	Russell Station

Produce Samples	
Indicator Samples	Grown on property surrounding Plant
Background Samples	Purchased from farms > 10 miles

TLD Locations	Direction	Distance
#2	87	320
#3	110	420
#4	140	250
#5	185	160
#6	232	225
#7	257	220
#8	258	19200
#9	235	11400
#10	185	13100
#11	123	11500
#12	93	25100
#13	292	230
#14	292	770
#15	272	850
#16	242	900
#17	208	500
#18	193	650
#19	177	400
#20	165	680
#21	145	600
#22	128	810
#23	107	680
#24	90	630
#25	247	14350
#26	223	14800
#27	202	14700
#28	145	17700
#29	104	13800
#30	103	20500
#31	263	7280
#32	246	6850
#33	220	7950
#34	205	6850
#35	193	7600
#36	174	5650
#37	158	6000
#38	137	7070
#39	115	6630
#40	87	6630

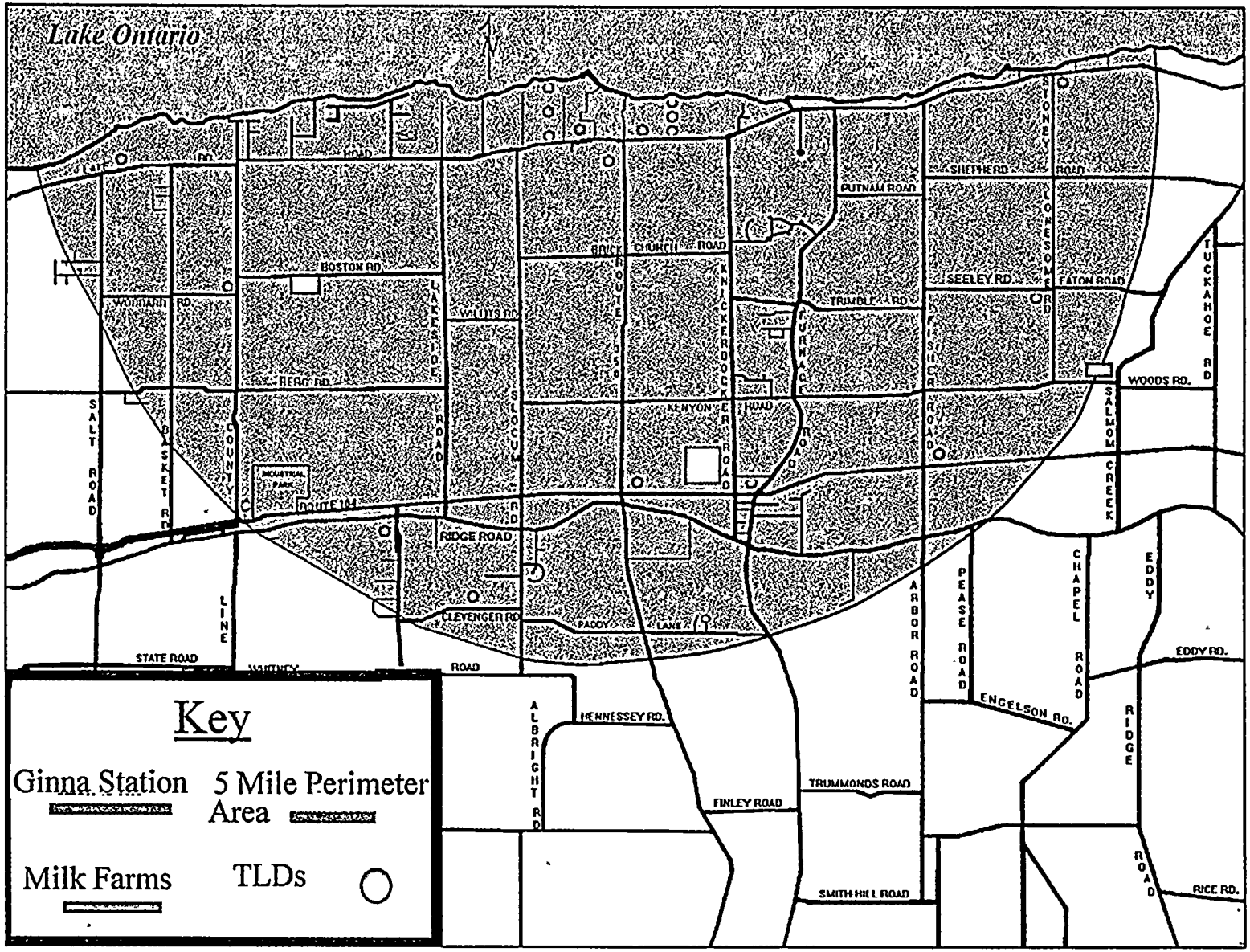
I = Indicator Samples
C = Control Samples
S = Supplemental Samples

Onsite Sample Locations



M
Offsite Sa Locations

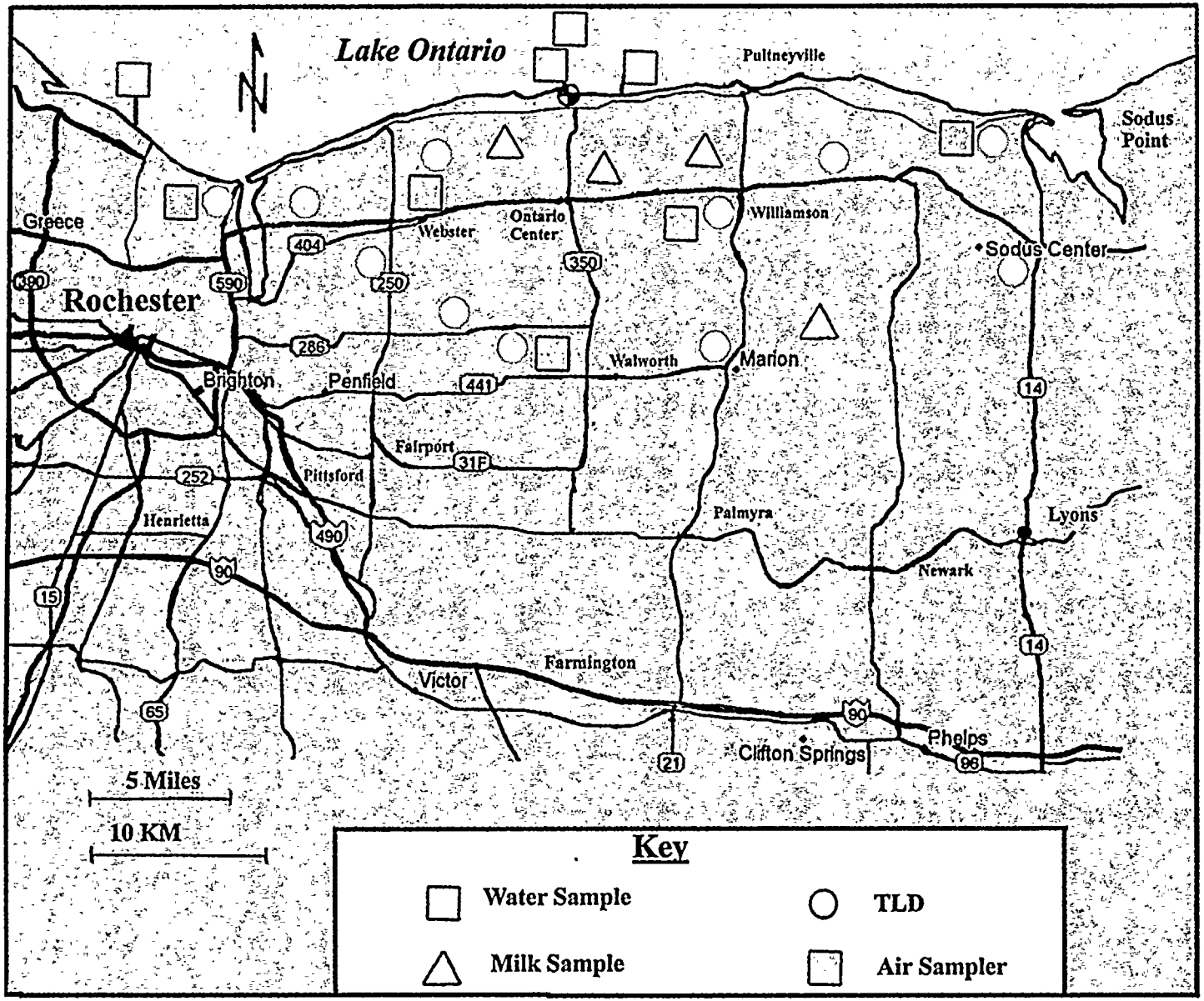
Location of TLDs and milk farms within 5 mile radius of Ginna Station *.



* Onsite samples detailed on map 2-1.

Water Sample & Milk Farm Locations

Location of water samples, milk farms and TLDs *.



* Onsite samples and samples in close proximity to Ginna Station are detailed on maps 2-1 and 2-2.

3.0 DATA SUMMARY

3.1 Analytical Results

The values listed on the following tables include the uncertainties stated as ± 1 standard deviation.

Key Definitions

Curie (Ci): The quantity of any radionuclide in which the number of disintegrations per second is 37 billion.

Picocurie (pCi): One millionth of a millionth of a curie or 0.037 disintegrations per second.

Cubic Meter (M^3): Approximately 35.3 cubic feet.

Liter (L): Approximately 1.06 quarts.

Kilogram (Kg): Approximately 2.205 pounds.

Lower Limit of Detection

The Nuclear Regulatory Commission has requested that reported values be compared to the Lower Limit of Detection (LLD) for each piece of equipment. The LLD for the equipment is established by the measurement of a blank sample. These values are before the correction for decay. Decay correction is applied from the end of the sampling period to the counting time, not from the midpoint of the sampling period. An explanation of the calculation of the LLD is included with Table 2-2, (page 8).

3.2 Air Samples

Radioactive particles in air are collected by drawing approximately one scfm through a two inch diameter particulate filter. The volume of air sampled is measured by a dry gas meter and corrected for the pressure drop across the filter. The filters are changed weekly and allowed to decay for three days prior to counting to eliminate most of the natural radioactivity such as the short half-life progeny products of radon and thoron. The decay period is used to give a more sensitive measurement of long-lived man-made radioactivity.

A ring of 6 sampling stations is located on the plant site from 150 to 300 meters from the reactor near the point of the maximum annual average ground level concentration and 1 additional at 690 meters. In addition, there is a ring of 5 sampling stations located approximately 7 to 17 miles from the site that serve as control stations.

Based on weekly comparisons, there was no statistical difference between the on-site and the off-site radioactive particulate concentrations. The average concentrations for the on-site and off-site samples were 0.017 and 0.016 pCi/m^3 respectively for the period of January to December, 1997. Maximum weekly concentrations for each station were less than 0.037 pCi/m^3, with the exception that Station 13 on the week of June 16, 1997 measured at 0.062 pCi/m^3. The composite gamma spectrum for Station 13 during this period showed no elevated level of radioactivity. The major airborne activities released from the plant are noble gases, tritium and radioiodines. Most of this activity is released in a gaseous form, however, some radioiodine is released as airborne particulate.

Tables 3-1A, 3-1B are a list of gross beta analyses values for the on-site samplers. Tables 3-2A, 3-2B are a list of gross beta analyses values for the off-site samplers.

The particulate filters from each sampling location were saved and a 13 week composite was made. A gamma isotopic analysis was done for each sampling location and corrected for decay. The results of these analyses are listed in Tables 3-4 A to D.

Iodine cartridges are placed at six locations. These cartridges are changed and counted each week. No positive analysis was found on any sample. A list of values for these cartridges is given in Table 3-5.

A trend plot of the 1997 Onsite vs. Offsite air filter data is included, Table 3-3. Additionally, a trend plot of the annual averages measured since 1968, Table 3-6, is included to show the variation of data during the years that the R.E. Ginna Nuclear Power Plant has been operational. The peak activities measured correspond to the years when atmospheric tests of nuclear weapons were being conducted.

Table 3-1 A
On-Site Air Particulate Samplers
Gross Beta Results in pCi/m3

Collection Date	Sta. #2 (I)	Sta. #3 (I)	Sta. #4 (I)	Sta. #5 (I)	Sta. #6 (I)	Sta. #7 (I)	Sta #13A (I)	Average
6-Jan	0.018 ± 0.003	0.019 ± 0.003	0.021 ± 0.004	0.021 ± 0.003	0.019 ± 0.003	0.020 ± 0.003	0.022 ± 0.003	0.020
13-Jan	0.016 ± 0.003	0.022 ± 0.003	0.019 ± 0.004	0.019 ± 0.003	0.020 ± 0.003	0.023 ± 0.003	0.017 ± 0.003	0.019
20-Jan	0.016 ± 0.003	0.023 ± 0.003	0.022 ± 0.004	0.022 ± 0.003	0.019 ± 0.003	0.020 ± 0.003	0.019 ± 0.003	0.020
27-Jan	0.016 ± 0.003	0.027 ± 0.004	0.030 ± 0.006	0.022 ± 0.003	0.018 ± 0.003	0.022 ± 0.003	0.022 ± 0.003	0.023
3-Feb	0.020 ± 0.003	0.024 ± 0.003	0.024 ± 0.004	0.024 ± 0.003	0.026 ± 0.003	0.023 ± 0.003	0.024 ± 0.003	0.024
10-Feb	0.018 ± 0.003	0.024 ± 0.003	0.020 ± 0.004	0.022 ± 0.003	0.020 ± 0.003	0.019 ± 0.003	0.019 ± 0.003	0.020
17-Feb	0.017 ± 0.003	0.023 ± 0.003	0.017 ± 0.003	0.021 ± 0.003	0.019 ± 0.003	0.019 ± 0.003	0.021 ± 0.003	0.020
24-Feb	0.013 ± 0.003	0.016 ± 0.003	0.016 ± 0.004	0.013 ± 0.003	0.015 ± 0.003	0.016 ± 0.004	0.017 ± 0.003	0.015
3-Mar	0.011 ± 0.002	0.012 ± 0.003	0.009 ± 0.003	0.012 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.015 ± 0.003	0.012
10-Mar	0.014 ± 0.003	0.022 ± 0.003	0.013 ± 0.004	0.019 ± 0.003	0.019 ± 0.003	0.019 ± 0.003	0.017 ± 0.003	0.018
17-Mar	0.016 ± 0.003	0.023 ± 0.003	0.019 ± 0.004	0.021 ± 0.003	0.020 ± 0.003	0.023 ± 0.004	0.020 ± 0.003	0.020
24-Mar	0.014 ± 0.003	0.022 ± 0.003	0.018 ± 0.004	0.017 ± 0.003	0.019 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.018
31-Mar	(a)	(a)	(a)	(a)	(a)	(a)	(a)	
7-Apr	0.016 ± 0.003	0.020 ± 0.003	0.016 ± 0.004	0.016 ± 0.003	0.017 ± 0.003	0.016 ± 0.003	0.017 ± 0.003	0.017
14-Apr	0.011 ± 0.003	0.022 ± 0.003	0.017 ± 0.004	0.019 ± 0.003	0.015 ± 0.003	0.019 ± 0.003	0.019 ± 0.003	0.017
21-Apr	0.014 ± 0.003	0.015 ± 0.003	0.016 ± 0.004	0.016 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.015 ± 0.003	0.015
28-Apr	0.011 ± 0.003	0.022 ± 0.004	0.017 ± 0.004	0.020 ± 0.003	0.016 ± 0.003	0.019 ± 0.003	0.019 ± 0.003	0.018
5-May	0.012 ± 0.002	0.017 ± 0.003	0.015 ± 0.003	0.017 ± 0.003	0.014 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.015
12-May	0.013 ± 0.003	0.016 ± 0.003	0.013 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.013 ± 0.003	0.014
19-May	0.007 ± 0.002	0.010 ± 0.003	0.008 ± 0.003	0.011 ± 0.003	0.009 ± 0.002	0.011 ± 0.003	0.009 ± 0.002	0.009
26-May	0.006 ± 0.002	0.009 ± 0.002	0.008 ± 0.003	0.010 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.007 ± 0.002	0.008
2-Jun	0.011 ± 0.003	0.014 ± 0.003	0.011 ± 0.003	0.012 ± 0.003	0.011 ± 0.003	0.011 ± 0.003	0.011 ± 0.003	0.012
9-Jun	0.013 ± 0.003	0.018 ± 0.003	0.015 ± 0.003	0.018 ± 0.003	0.012 ± 0.002	0.016 ± 0.003	0.016 ± 0.003	0.015
16-Jun	0.013 ± 0.003	0.023 ± 0.003	0.020 ± 0.003	0.017 ± 0.003	0.016 ± 0.003	0.017 ± 0.003	0.062 ± 0.010	0.024
23-Jun	0.012 ± 0.003	0.018 ± 0.003	0.017 ± 0.003	0.019 ± 0.003	0.015 ± 0.003	0.017 ± 0.003	0.016 ± 0.003	0.016
30-Jun	0.017 ± 0.003	0.024 ± 0.004	0.017 ± 0.003	0.022 ± 0.003	0.019 ± 0.003	0.023 ± 0.003	0.017 ± 0.003	0.020
Maximum	0.020 ± 0.003	0.027 ± 0.004	0.030 ± 0.006	0.024 ± 0.003	0.026 ± 0.003	0.023 ± 0.003	0.062 ± 0.010	
Average	0.014	0.019	0.017	0.018	0.016	0.017	0.019	
Minimum	0.006 ± 0.002	0.009 ± 0.002	0.008 ± 0.003	0.010 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.007 ± 0.002	

(a) Samples lost during shipment to analysis laboratory.

I=Indicator
C=Control

Table 3-1 B
On-Site Air Particulate Samplers
Gross Beta Results in pCi/m3

Collection Date	Sta. #2 (I)	Sta. #3 (I)	Sta. #4 (I)	Sta. #5 (I)	Sta. #6 (I)	Sta. #7 (I)	Sta. #13A (I)	Average
7-Jul	0.011 ± 0.002	0.016 ± 0.003	0.011 ± 0.002	0.013 ± 0.003	0.013 ± 0.003	0.015 ± 0.003	0.013 ± 0.003	0.013
14-Jul	0.012 ± 0.003	0.018 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.015
21-Jul	0.018 ± 0.003	0.024 ± 0.003	0.019 ± 0.003	0.023 ± 0.003	0.020 ± 0.003	0.020 ± 0.003	0.020 ± 0.003	0.021
28-Jul	0.010 ± 0.003	0.017 ± 0.003	0.015 ± 0.003	0.016 ± 0.003	0.013 ± 0.003	0.016 ± 0.003	0.014 ± 0.003	0.014
4-Aug	0.014 ± 0.003	0.020 ± 0.004	0.018 ± 0.003	0.018 ± 0.003	0.020 ± 0.003	0.018 ± 0.003	0.018 ± 0.003	0.018
11-Aug	0.018 ± 0.004	0.023 ± 0.004	0.020 ± 0.003	0.019 ± 0.003	0.020 ± 0.003	0.022 ± 0.003	0.017 ± 0.003	0.020
18-Aug	0.015 ± 0.003	0.012 ± 0.003	0.011 ± 0.002	0.013 ± 0.003	0.012 ± 0.002	0.013 ± 0.003	0.013 ± 0.002	0.013
25-Aug	0.008 ± 0.003	0.010 ± 0.003	0.008 ± 0.002	0.010 ± 0.002	0.007 ± 0.002	0.010 ± 0.003	0.008 ± 0.002	0.009
1-Sep	0.022 ± 0.004	0.028 ± 0.003	0.025 ± 0.003	0.025 ± 0.003	0.020 ± 0.003	0.022 ± 0.003	0.021 ± 0.003	0.023
8-Sep	0.013 ± 0.004	0.019 ± 0.004	0.016 ± 0.003	0.016 ± 0.003	0.017 ± 0.003	0.015 ± 0.003	0.016 ± 0.003	0.016
15-Sep	0.018 ± 0.004	0.021 ± 0.004	0.017 ± 0.003	0.015 ± 0.003	0.016 ± 0.003	0.018 ± 0.003	0.016 ± 0.003	0.017
22-Sep	0.015 ± 0.004	0.022 ± 0.004	0.019 ± 0.003	0.024 ± 0.003	0.018 ± 0.003	0.026 ± 0.005	0.020 ± 0.003	0.021
29-Sep	0.010 ± 0.003	0.017 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.015 ± 0.003	(a)	0.012 ± 0.002	0.014
6-Oct	0.020 ± 0.001	0.025 ± 0.001	0.020 ± 0.001	0.022 ± 0.001	(a)	(a)	0.020 ± 0.001	0.021
13-Oct	0.017 ± 0.004	0.029 ± 0.004	0.024 ± 0.003	0.028 ± 0.004	0.011 ± 0.005	0.014 ± 0.005	0.027 ± 0.004	0.021
20-Oct	0.021 ± 0.004	0.025 ± 0.004	0.021 ± 0.003	0.026 ± 0.003	0.020 ± 0.003	0.019 ± 0.003	0.018 ± 0.003	0.021
27-Oct	0.009 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.010 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.011
3-Nov	0.019 ± 0.004	0.027 ± 0.004	0.018 ± 0.003	0.021 ± 0.003	0.020 ± 0.003	0.018 ± 0.003	0.022 ± 0.003	0.021
10-Nov	0.014 ± 0.004	0.018 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.015
17-Nov	0.010 ± 0.004	0.012 ± 0.003	0.010 ± 0.002	0.012 ± 0.003	0.008 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.010
24-Nov	0.030 ± 0.005	0.030 ± 0.004	0.030 ± 0.004	0.029 ± 0.004	0.029 ± 0.003	0.027 ± 0.003	0.032 ± 0.004	0.029
1-Dec	0.020 ± 0.004	0.022 ± 0.003	0.026 ± 0.003	0.023 ± 0.003	0.024 ± 0.003	0.020 ± 0.003	0.022 ± 0.003	0.022
8-Dec	0.009 ± 0.004	0.007 ± 0.002	0.010 ± 0.003	0.012 ± 0.003	0.009 ± 0.002	0.008 ± 0.002	0.008 ± 0.003	0.009
15-Dec	0.009 ± 0.004	0.015 ± 0.005	0.010 ± 0.002	0.011 ± 0.003	0.009 ± 0.002	0.008 ± 0.002	0.008 ± 0.003	0.010
22-Dec	0.021 ± 0.004	0.021 ± 0.003	0.022 ± 0.003	0.023 ± 0.003	0.021 ± 0.003	0.021 ± 0.003	0.021 ± 0.003	0.021
29-Dec	0.014 ± 0.004	0.010 ± 0.003	0.014 ± 0.003	0.015 ± 0.003	0.011 ± 0.002	0.011 ± 0.002	0.015 ± 0.003	0.013
Maximum	0.030 ± 0.005	0.030 ± 0.004	0.030 ± 0.004	0.029 ± 0.004	0.029 ± 0.003	0.027 ± 0.003	0.032 ± 0.004	
Average	0.015	0.019	0.017	0.018	0.016	0.016	0.017	
Minimum	0.008 ± 0.003	0.007 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.007 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	

(a) Sample pump inoperable.

I=Indicator
C=Control

Table 3-2 A
Off-Site Air Particulate Samplers
Gross Beta Results in pCi/m3

Collection Date	Sta. #8 (C)	Sta.#9 (I)	Sta. #10 (C)	Sta. #11 (I)	Sta.#12 (C)	Average
6-Jan	0.028 ± 0.005	0.015 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.018 ± 0.004	0.019
13-Jan	0.018 ± 0.005	0.019 ± 0.003	0.016 ± 0.003	0.019 ± 0.003	0.019 ± 0.004	0.018
20-Jan	0.015 ± 0.004	0.019 ± 0.003	0.021 ± 0.003	0.018 ± 0.003	0.021 ± 0.004	0.019
27-Jan	0.019 ± 0.005	0.019 ± 0.003	0.020 ± 0.003	0.018 ± 0.003	0.021 ± 0.004	0.019
3-Feb	0.023 ± 0.005	0.021 ± 0.003	0.021 ± 0.003	0.021 ± 0.003	0.020 ± 0.004	0.021
10-Feb	0.019 ± 0.005	0.018 ± 0.003	0.017 ± 0.003	0.015 ± 0.003	0.022 ± 0.004	0.018
17-Feb	0.016 ± 0.004	0.018 ± 0.003	0.017 ± 0.003	0.020 ± 0.003	0.019 ± 0.003	0.018
24-Feb	0.013 ± 0.005	0.014 ± 0.003	0.014 ± 0.003	0.012 ± 0.003	0.015 ± 0.004	0.014
3-Mar	0.011 ± 0.004	0.011 ± 0.002	(a)	0.013 ± 0.002	0.010 ± 0.003	0.011
10-Mar	0.016 ± 0.005	0.016 ± 0.003	(a)	0.014 ± 0.003	0.018 ± 0.004	0.016
17-Mar	0.020 ± 0.005	0.021 ± 0.003	(a)	0.019 ± 0.003	0.020 ± 0.004	0.020
24-Mar	0.015 ± 0.004	0.016 ± 0.003	0.031 ± 0.004	0.016 ± 0.003	0.019 ± 0.004	0.019
31-Mar	(b)	(b)	(b)	(b)	(b)	
7-Apr	0.015 ± 0.005	0.017 ± 0.003	0.014 ± 0.003	0.016 ± 0.003	0.017 ± 0.004	0.016
14-Apr	0.019 ± 0.005	0.018 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.018 ± 0.004	0.018
21-Apr	0.016 ± 0.005	0.016 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.019 ± 0.004	0.017
28-Apr	0.019 ± 0.005	0.018 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.018 ± 0.004	0.018
5-May	0.014 ± 0.004	0.012 ± 0.002	0.014 ± 0.003	0.013 ± 0.002	0.014 ± 0.003	0.013
12-May	0.013 ± 0.004	0.013 ± 0.002	0.014 ± 0.003	0.012 ± 0.002	0.012 ± 0.003	0.013
19-May	0.006 ± 0.004	0.009 ± 0.002	0.010 ± 0.003	0.009 ± 0.002	0.008 ± 0.003	0.009
26-May	0.005 ± 0.003	0.007 ± 0.002	0.006 ± 0.002	0.007 ± 0.002	0.007 ± 0.003	0.006
2-Jun	0.012 ± 0.005	0.012 ± 0.003	0.011 ± 0.003	0.011 ± 0.002	0.011 ± 0.003	0.012
9-Jun	0.016 ± 0.004	0.015 ± 0.002	0.016 ± 0.003	0.014 ± 0.002	0.014 ± 0.003	0.015
16-Jun	0.016 ± 0.004	0.017 ± 0.003	0.016 ± 0.003	0.015 ± 0.002	0.037 ± 0.008	0.020
23-Jun	0.015 ± 0.004	0.017 ± 0.003	0.017 ± 0.003	0.015 ± 0.002	0.014 ± 0.003	0.015
30-Jun	0.016 ± 0.004	0.017 ± 0.003	0.018 ± 0.003	0.013 ± 0.002	0.019 ± 0.003	0.017
Maximum	0.028 ± 0.005	0.021 ± 0.003	0.031 ± 0.004	0.021 ± 0.003	0.037 ± 0.008	
Average	0.016	0.016	0.016	0.015	0.017	
Minimum	0.005 ± 0.003	0.007 ± 0.002	0.006 ± 0.002	0.007 ± 0.002	0.007 ± 0.003	

(a) Sample pump inoperable.
(b) Samples lost during shipment to analysis laboratory.

I=Indicator
C=Control

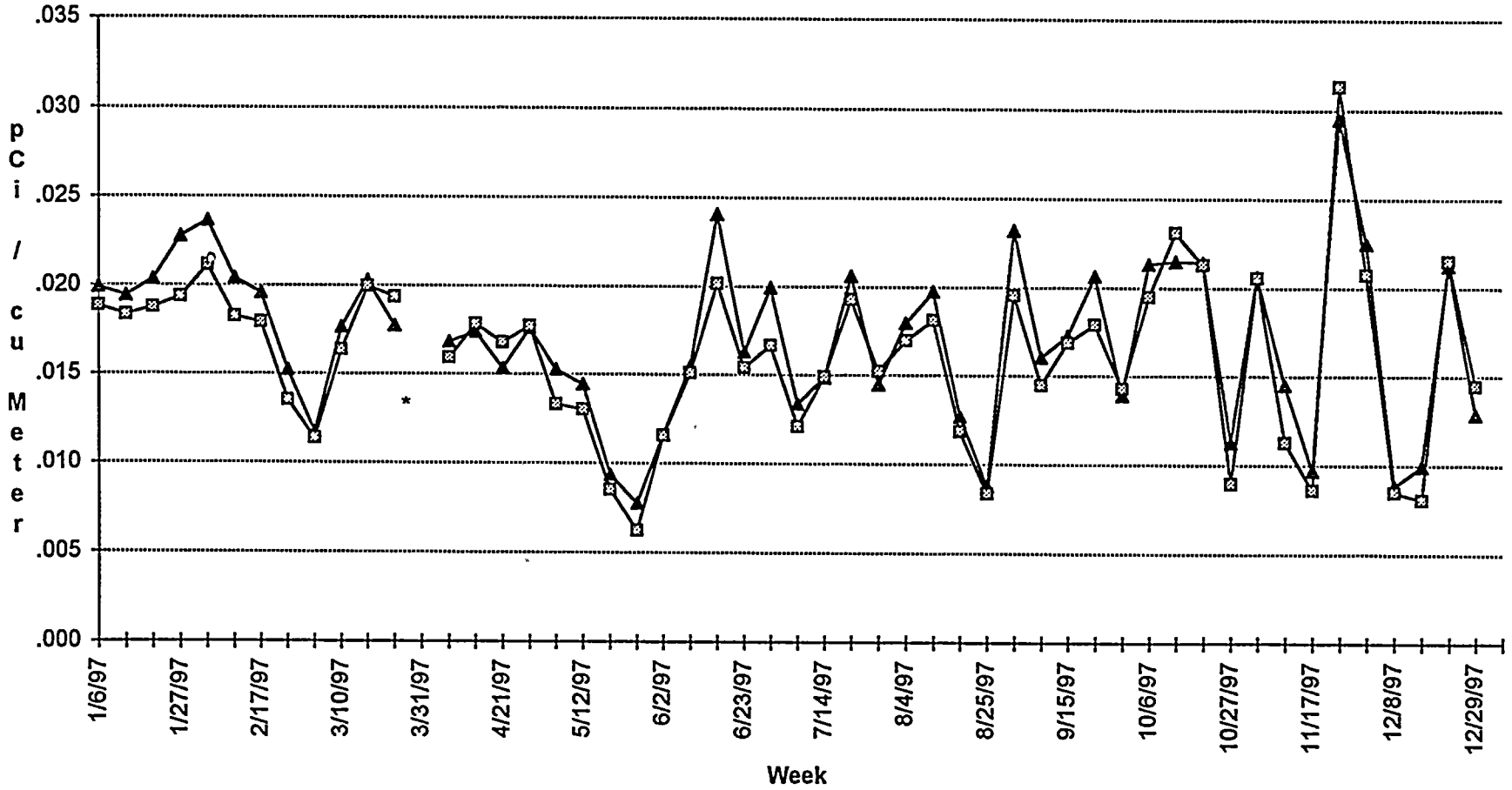
Table 3-2 B
Off-Site Air Particulate Samplers
Gross Beta Results in pCi/m3

Collection Date	Sta. #8 (C)	Sta.#9 (I)	Sta. #10 (C)	Sta. #11 (I)	Sta.#12 (C)	Average
7-Jul	0.013 ± 0.004	0.012 ± 0.002	0.012 ± 0.003	0.011 ± 0.002	0.013 ± 0.003	0.012
14-Jul	0.016 ± 0.004	0.014 ± 0.002	0.016 ± 0.003	0.013 ± 0.002	0.017 ± 0.003	0.015
21-Jul	0.021 ± 0.005	0.019 ± 0.003	0.018 ± 0.003	0.018 ± 0.003	0.021 ± 0.003	0.019
28-Jul	0.016 ± 0.005	0.017 ± 0.003	0.015 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.015
4-Aug	0.015 ± 0.005	0.020 ± 0.003	0.016 ± 0.003	0.018 ± 0.003	0.017 ± 0.004	0.017
11-Aug	0.016 ± 0.004	0.018 ± 0.003	0.020 ± 0.003	0.017 ± 0.003	0.019 ± 0.003	0.018
18-Aug	0.012 ± 0.004	0.011 ± 0.002	0.011 ± 0.002	0.012 ± 0.002	0.013 ± 0.003	0.012
25-Aug	0.009 ± 0.004	0.008 ± 0.002	0.008 ± 0.002	0.009 ± 0.002	0.008 ± 0.003	0.008
1-Sep	0.016 ± 0.004	0.021 ± 0.003	0.020 ± 0.003	0.018 ± 0.002	0.023 ± 0.003	0.020
8-Sep	0.014 ± 0.005	0.014 ± 0.003	0.017 ± 0.003	0.013 ± 0.003	0.014 ± 0.004	0.014
15-Sep	0.016 ± 0.005	0.018 ± 0.003	0.017 ± 0.003	0.018 ± 0.003	0.016 ± 0.003	0.017
22-Sep	0.017 ± 0.005	0.018 ± 0.003	0.017 ± 0.003	0.019 ± 0.003	0.017 ± 0.004	0.018
29-Sep	0.014 ± 0.004	0.015 ± 0.002	0.015 ± 0.003	0.012 ± 0.002	0.015 ± 0.003	0.014
6-Oct	0.020 ± 0.001	0.020 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.019
13-Oct	0.024 ± 0.005	0.024 ± 0.003	0.022 ± 0.004	0.021 ± 0.003	0.024 ± 0.004	0.023
20-Oct	0.022 ± 0.005	0.020 ± 0.003	0.023 ± 0.003	0.019 ± 0.003	0.021 ± 0.003	0.021
27-Oct	0.009 ± 0.004	0.008 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.009 ± 0.003	0.009
3-Nov	0.018 ± 0.005	0.017 ± 0.003	0.023 ± 0.003	0.021 ± 0.003	0.024 ± 0.004	0.021
10-Nov	0.011 ± 0.004	0.011 ± 0.002	0.013 ± 0.003	0.013 ± 0.003	0.010 ± 0.003	0.011
17-Nov	0.005 ± 0.004	0.009 ± 0.002	0.011 ± 0.003	0.008 ± 0.002	0.009 ± 0.003	0.009
24-Nov	0.031 ± 0.006	0.029 ± 0.004	0.033 ± 0.004	0.028 ± 0.003	0.036 ± 0.005	0.031
1-Dec	0.016 ± 0.005	0.018 ± 0.003	0.022 ± 0.004	0.022 ± 0.003	0.026 ± 0.004	0.021
8-Dec	0.009 ± 0.003	0.008 ± 0.002	0.008 ± 0.003	0.008 ± 0.002	0.009 ± 0.003	0.008
15-Dec	0.007 ± 0.003	0.008 ± 0.002	0.009 ± 0.003	0.008 ± 0.002	0.009 ± 0.003	0.008
22-Dec	0.020 ± 0.004	0.020 ± 0.003	0.025 ± 0.004	0.018 ± 0.003	0.024 ± 0.004	0.022
29-Dec	0.013 ± 0.003	0.013 ± 0.003	0.014 ± 0.003	0.013 ± 0.003	0.018 ± 0.004	0.014
Maximum	0.031 ± 0.006	0.029 ± 0.004	0.033 ± 0.004	0.028 ± 0.003	0.036 ± 0.005	
Average	0.015	0.016	0.017	0.015	0.017	
Minimum	0.005 ± 0.004	0.008 ± 0.002	0.008 ± 0.002	0.008 ± 0.002	0.008 ± 0.003	

I=Indicator
C=Control

Onsite vs Offsite Air Monitors

Gross Beta Analysis 1997



* Samples lost during shipment to analysis laboratory.

Rochester Gas and Electric

Table 3-4 A
13 Week Composite Particulate Air Sample
Gamma Isotopic Analysis
Result in pCi/m3
First Quarter

Station		Be-7	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144
#2	I	.082±.010	.028±.006	<.001	<.007	<.001	<.001	<.003	<.002	<.003	<.002	<.010	<.001	<.001	<.017	<.002	<.003
#3	I	.119±.012	.016±.005	<.002	<.007	<.001	<.002	<.005	<.002	<.003	<.002	<.010	<.001	<.001	<.015	<.002	<.003
#4	I	.112±.013	.0330±.008	<.002	<.008	<.003	<.002	<.004	<.005	<.005	<.003	<.016	<.002	<.001	<.025	<.004	<.005
#5	I	.091±.010	<.017	<.001	<.006	<.002	<.001	<.003	<.003	<.002	<.002	<.011	<.001	<.001	<.020	<.002	<.003
#6	I	.101±.012	.0225±.008	<.001	<.007	<.002	<.002	<.003	<.005	<.005	<.003	<.013	<.001	<.001	<.031	<.003	<.005
#7	I	.102±.011	<.020	<.002	<.005	<.002	<.002	<.004	<.002	<.003	<.002	<.012	<.001	<.001	<.010	<.002	<.004
#8	C	.086±.015	<.020	<.002	<.006	<.003	<.002	<.003	<.005	<.006	<.004	<.025	<.002	<.001	<.043	<.004	<.007
#9	I	.112±.011	<.010	<.001	<.008	<.002	<.002	<.003	<.003	<.003	<.002	<.012	<.001	<.001	<.020	<.003	<.004
#10	C	.095±.013	<.015	<.002	<.006	<.002	<.001	<.005	<.005	<.002	<.003	<.016	<.002	<.001	<.031	<.004	<.005
#11	I	.117±.011	<.012	<.001	<.003	<.002	<.002	<.003	<.002	<.003	<.002	<.011	<.001	<.001	<.016	<.002	<.003
#12	C	.107±.016	<.025	<.002	<.007	<.004	<.002	<.004	<.006	<.005	<.006	<.018	<.002	<.002	<.052	<.005	<.007
#13	I	.088±.011	.014±.004	<.002	<.004	<.002	<.001	<.005	<.004	<.004	<.002	<.001	<.001	<.001	<.016	<.003	<.005

I=Indicator
C=Control

All values given as < are less than LLD corrected for decay.

Rochester Gas and Electric

Table 3-4 B

13 Week Composite Particulate Air Sample

Gamma Isotopic Analysis

Result in pCi/m3

Second Quarter

Station		Be-7	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144
#2	I	.112±.011	.018±.006	<.001	<.005	<.001	<.001	<.003	<.003	<.003	<.003	<.014	<.001	<.001	<.012	<.002	<.003
#3	I	.154±.014	.026±.007	<.002	<.005	<.001	<.001	<.003	<.004	<.004	<.002	<.013	<.001	<.001	<.012	<.002	<.005
#4	I	.140±.012	.129±.013	<.002	<.005	<.003	<.002	<.003	<.005	<.004	<.003	<.016	<.001	<.001	<.015	<.004	<.008
#5	I	.154±.012	.005±.004	<.001	<.003	<.001	<.001	<.002	<.002	<.002	<.002	<.009	<.001	<.001	<.016	<.002	<.003
#6	I	.140±.011	<.008	<.001	<.003	<.001	<.001	<.002	<.002	<.003	<.002	<.011	<.001	<.001	<.008	<.002	<.004
#7	I	.137±.013	.030±.007	<.001	<.003	<.002	<.001	<.004	<.003	<.003	<.002	<.013	<.001	<.001	<.020	<.002	<.004
#8	C	.101±.015	<.018	<.002	<.009	<.003	<.002	<.006	<.003	<.005	<.004	<.022	<.002	<.001	<.020	<.003	<.005
#9	I	.150±.011	.024±.006	<.001	<.004	<.001	<.002	<.002	<.003	<.003	<.001	<.007	<.001	<.001	<.014	<.002	<.002
#10	C	.142±.011	.101±.010	<.002	<.006	<.002	<.001	<.002	<.004	<.003	<.002	<.016	<.002	<.001	<.008	<.003	<.006
#11	I	.124±.009	<.014	<.001	<.004	<.002	<.001	<.003	<.002	<.002	<.002	<.009	<.001	<.001	<.007	<.002	<.004
#12	C	.147±.015	.046±.011	<.002	<.006	<.003	<.001	<.003	<.004	<.002	<.003	<.016	<.001	<.001	<.013	<.003	<.005
#13	I	.148±.012	<.011	<.001	<.003	<.002	<.001	<.003	<.003	<.002	<.002	<.011	<.001	<.001	<.013	<.002	<.003

I=Indicator
C=Control

All values given as < are less than LLD corrected for decay.

Rochester Gas and Electric

Table 3-4 C
13 Week Composite Particulate Air Sample
Gamma Isotopic Analysis
Result in pCi/m3
Third Quarter

Station		Be-7	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144
#2	I	.096±.011	.028±.008	<.001	<.006	<.002	<.002	<.005	<.004	<.003	<.002	<.009	<.001	<.001	<.010	<.003	<.005
#3	I	.147±.012	.117±.012	<.002	<.006	<.002	<.002	<.004	<.004	<.004	<.003	<.014	<.001	<.002	<.007	<.004	<.007
#4	I	.117±.010	.019±.006	<.001	<.005	<.002	<.001	<.002	<.002	<.002	<.002	<.012	<.001	<.001	<.008	<.002	<.004
#5	I	.126±.010	.085±.009	<.001	<.004	<.002	<.002	<.004	<.003	<.002	<.002	<.013	<.001	<.001	<.010	<.004	<.006
#6	I	.104±.009	<.008	<.001	<.004	<.001	<.001	<.004	<.003	<.002	<.002	<.009	<.001	<.001	<.008	<.002	<.004
#7	I	.116±.011	.030±.008	<.002	<.004	<.002	<.002	<.004	<.003	<.003	<.002	<.014	<.001	<.001	<.011	<.003	<.005
#8	C	.116±.015	.166±.020	<.002	<.008	<.003	<.003	<.007	<.007	<.005	<.004	<.025	<.001	<.002	<.021	<.006	<.013
#9	I	.126±.010	<.010	<.001	<.003	<.001	<.001	<.001	<.003	<.002	<.002	<.009	<.001	<.001	<.007	<.002	<.003
#10	C	.122±.010	.103±.010	<.002	<.006	<.002	<.002	<.004	<.004	<.003	<.002	<.014	<.001	<.001	<.006	<.004	<.007
#11	I	.117±.010	<.013	<.001	<.003	<.001	<.001	<.001	<.002	<.002	<.002	<.007	<.001	<.001	<.007	<.002	<.003
#12	C	.125±.012	.024±.008	<.001	<.004	<.002	<.001	<.004	<.004	<.003	<.002	<.014	<.001	<.001	<.017	<.003	<.004
#13	I	.113±.010	.091±.009	<.001	<.005	<.002	<.001	<.004	<.003	<.003	<.002	<.014	<.001	<.001	<.009	<.004	<.006

I=Indicator
C=Control

All values given as < are less than LLD corrected for decay.

Rochester Gas and Electric

Table 3-4 D

13 Week Composite Particulate Air Sample

Gamma Isotopic Analysis

Result in pCi/m3

Fourth Quarter

Station		Be-7	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144
#2	I	.082±.011	<.024	<.001	<.005	<.002	<.003	<.006	<.005	<.004	<.003	<.014	<.001	<.001	<.020	<.003	<.006
#3	I	.091±.013	<.023	<.001	<.005	<.002	<.002	<.005	<.003	<.003	<.002	<.020	<.002	<.001	<.022	<.004	<.007
#4	I	.084±.009	.011±.005	<.001	<.006	<.001	<.002	<.003	<.002	<.002	<.002	<.014	<.001	<.001	<.012	<.003	<.004
#5	I	.110±.009	.039±.006	<.001	<.003	<.002	<.001	<.002	<.003	<.002	<.002	<.010	<.001	<.001	<.013	<.003	<.006
#6	I	.096±.010	.008±.004	<.001	<.005	<.002	<.001	<.003	<.003	<.003	<.002	<.010	<.001	<.001	<.011	<.002	<.003
#7	I	.076±.010	.017±.007	<.001	<.006	<.002	<.002	<.004	<.002	<.002	<.003	<.008	<.001	<.001	<.013	<.003	<.005
#8	C	.127±.014	.068±.010	<.002	<.005	<.003	<.002	<.005	<.004	<.005	<.004	<.017	<.002	<.002	<.014	<.004	<.008
#9	I	.085±.008	.009±.003	<.001	<.003	<.001	<.001	<.002	<.002	<.002	<.002	<.011	<.001	<.001	<.008	<.002	<.003
#10	C	.089±.010	<.011	<.001	<.007	<.001	<.001	<.003	<.003	<.002	<.002	<.011	<.001	<.001	<.011	<.002	<.003
#11	I	.078±.010	<.018	<.001	<.006	<.002	<.002	<.003	<.003	<.003	<.002	<.014	<.001	<.001	<.019	<.003	<.004
#12	C	.104±.013	.030±.008	<.001	<.008	<.002	<.002	<.005	<.004	<.002	<.004	<.016	<.002	<.002	<.024	<.003	<.006
#13	I	.095±.009	.043±.006	<.001	<.004	<.002	<.001	<.003	<.003	<.003	<.002	<.009	<.001	<.001	<.015	<.003	<.004

I=Indicator
C=Control

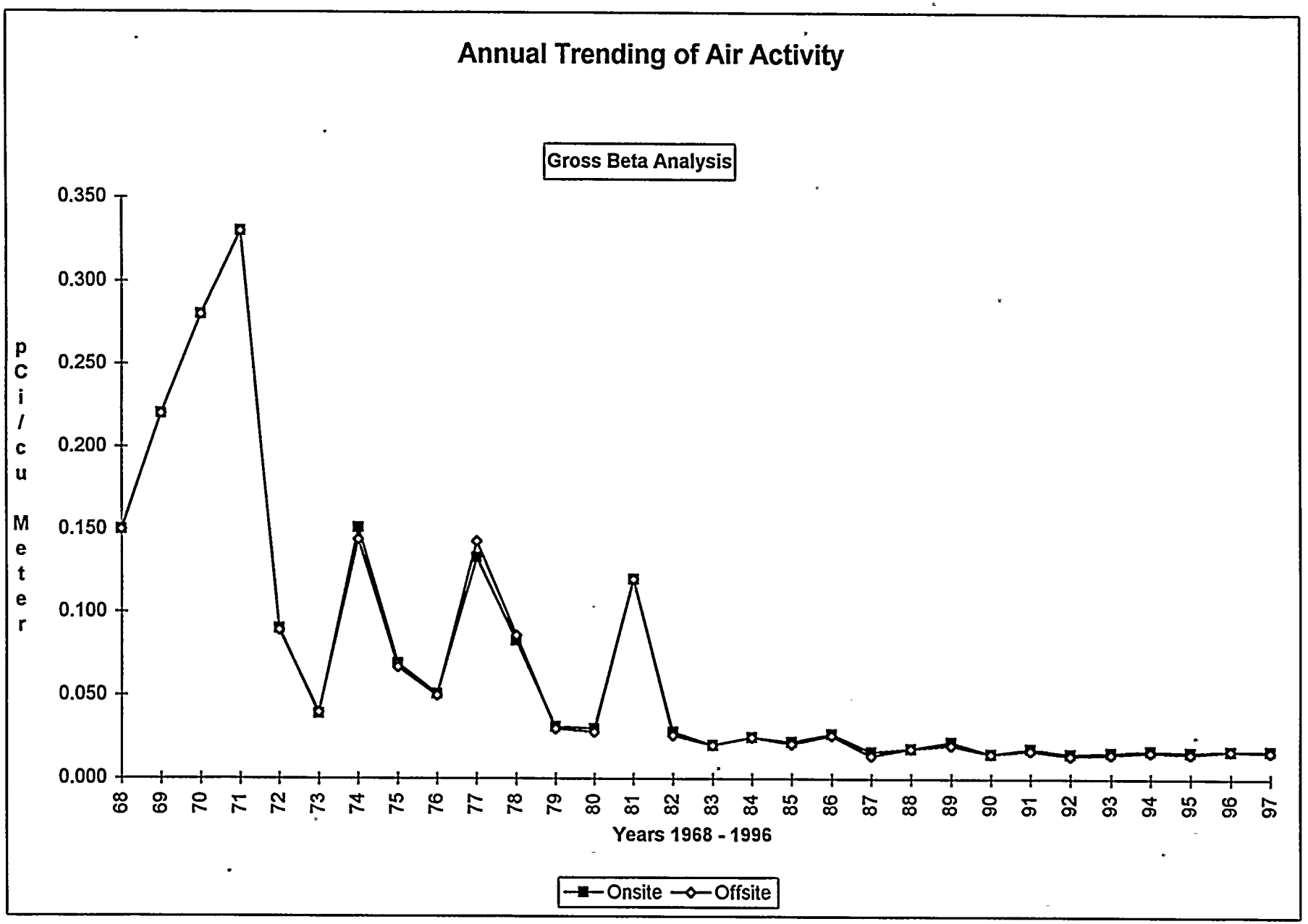
All values given as < are less than LLD corrected for decay.

Rochester Gas and Electric
Table 3-5
Charcoal Cartridges Gamma Analysis for Iodine
Results in pCi/m3

Collection Date	Sta. #2 (I)	Sta. #4 (I)	Sta. #7 (I)	Sta. #8 (C)	Sta. #9 (I)	Sta. #11
6-Jan	<.019	<.021	<.013	<.050	<.017	<.021
13-Jan	<.017	<.014	<.019	<.060	<.025	<.024
20-Jan	<.018	<.021	<.015	<.044	<.023	<.019
27-Jan	<.018	<.036	<.017	<.044	<.023	<.022
3-Feb	<.016	<.027	<.020	<.034	<.021	<.012
10-Feb	<.018	<.033	<.017	<.035	<.014	<.016
17-Feb	<.012	<.022	<.015	<.032	<.012	<.017
24-Feb	<.024	<.020	<.033	<.029	<.021	<.016
3-Mar	<.013	<.027	<.017	<.046	<.021	<.023
10-Mar	<.020	<.033	<.020	<.019	<.008	<.019
17-Mar	<.021	<.022	<.025	<.044	<.013	<.010
24-Mar	<.014	<.030	<.013	<.031	<.020	<.015
31-Mar	(a)	(a)	(a)	(a)	(a)	(a)
7-Apr	<.015	<.026	<.034	<.038	<.020	<.014
14-Apr	<.015	<.018	<.029	<.029	<.021	<.008
21-Apr	<.019	<.030	<.017	<.032	<.008	<.019
28-Apr	<.016	<.022	<.025	<.029	<.015	<.011
5-May	<.024	<.034	<.032	<.036	<.008	<.018
12-May	<.024	<.020	<.028	<.030	<.018	<.016
19-May	<.016	<.024	<.015	<.030	<.011	<.021
26-May	<.014	<.023	<.011	<.033	<.009	<.019
2-Jun	<.018	<.025	<.016	<.069	<.015	<.022
9-Jun	<.013	<.023	<.009	<.046	<.013	<.022
16-Jun	<.024	<.013	<.018	<.043	<.016	<.016
23-Jun	<.022	<.013	<.009	<.024	<.019	<.020
30-Jun	<.014	<.007	<.026	<.024	<.009	<.010
7-Jul	<.020	<.015	<.025	<.024	<.011	<.012
14-Jul	<.013	<.013	<.015	<.030	<.013	<.015
21-Jul	<.011	<.011	<.015	<.044	<.014	<.015
28-Jul	<.021	<.011	<.020	<.024	<.011	<.013
4-Aug	<.012	<.014	<.024	<.037	<.011	<.014
11-Aug	<.029	<.013	<.014	<.018	<.017	<.013
18-Aug	<.015	<.015	<.019	<.030	<.017	<.021
25-Aug	<.026	<.015	<.033	<.037	<.029	<.016
1-Sep	<.014	<.012	<.021	<.033	<.010	<.010
8-Sep	<.023	<.016	<.030	<.045	<.009	<.019
15-Sep	<.025	<.021	<.019	<.028	<.014	<.014
22-Sep	<.020	<.019	<.041	<.027	<.024	<.014
29-Sep	<.020	<.014	(b)	<.025	<.018	<.009
6-Oct	<.040	<.013	(b)	<.031	<.011	<.024
13-Oct	<.042	<.012	<.027	<.025	<.012	<.022
20-Oct	<.023	<.017	<.012	<.039	<.017	<.014
27-Oct	<.030	<.016	<.016	<.036	<.026	<.016
3-Nov	<.020	<.013	<.013	<.056	<.012	<.018
10-Nov	<.016	<.016	<.011	<.032	<.007	<.013
17-Nov	<.024	<.025	<.008	<.031	<.024	<.012
24-Nov	<.025	<.016	<.011	<.058	<.013	<.012
1-Dec	<.050	<.016	<.025	<.036	<.014	<.019
8-Dec	<.021	<.011	<.010	<.028	<.013	<.018
15-Dec	<.028	<.018	<.012	<.020	<.013	<.020
22-Dec	<.023	<.018	<.008	<.023	<.018	<.022
29-Dec	<.026	<.025	<.018	<.038	<.023	<.026

I=Indicator
C=Control

All values given as < are less than LLD.
(a) Samples lost during shipment to analysis laboratory.
(b) Sample pump inoperable.



Peaks are indicative of atmospheric nuclear weapon detonations

3.3 Water Samples

Water samples are collected on a regular schedule from locations surrounding the plant to assess if there is any measurable influence or contamination of drinking or irrigation water from liquid effluent releases or deposition from gaseous effluent releases.

Composite samples are collected weekly from Lake Ontario, upstream (Russell Station) and downstream (Ontario Water District Plant - OWD), and analyzed for gross beta activity. There was no significant difference between the upstream and downstream sample concentrations. The 1997 averages were 2.45 and 2.69 pCi/liter for the upstream and downstream samples respectively.

A graphical comparison of upstream vs downstream gross beta analysis results is given in Table 3-7A. Peaks up to 5 pCi/liter occur when the lake is stirred up by wind and the sample includes large quantities of suspended silt. A trend plot, Table 3-7 B, showing the annual average activity measured during the years since 1968 is included to show the data during the years the R.E. Ginna Nuclear Power Plant has been in operation. The peaks correspond to the years when atmospheric testing of nuclear weapons occurred.

Weekly composite samples are taken from the plant circulating water intake (Circ In) and discharge canal (Circ Out). The yearly averages were 2.69 and 2.44 pCi/liter for the intake and discharge canal respectively. These are essentially the same as the upstream and downstream values as they fall within the $\pm$ 2 sigma error band and range of the measurement. A gamma isotopic analysis of monthly composites of the OWD and the discharge canal was performed.

For all batch releases, the average concentration in the discharge canal from the identified activity during 1997 was 3.8×10^{-5} pCi/liter. The normal ± 1 sigma variation for the activity calculation of composite samples is 0.48 pCi/liter or 10^4 times the average concentration added by releases from the plant.

Samples of tap water and the creek which crosses the site are collected and analyzed monthly. The results show no indication of plant influence. The higher average gross beta values for Deer Creek are attributed to higher levels of Radon progeny in the soils from which the creek recharges and over which the creek flows. Results for all water beta analyses are listed in Tables 3-8 .

Gamma isotopic analysis is done on each monthly sample and each monthly composite of weekly samples. These are listed in Tables 3-9 to 3-14 and are separated by source of sample. Since these are decay corrected from the end of the sample period, short half-life elements such as Ba-La may not meet the required LLD.

Tritium Analysis

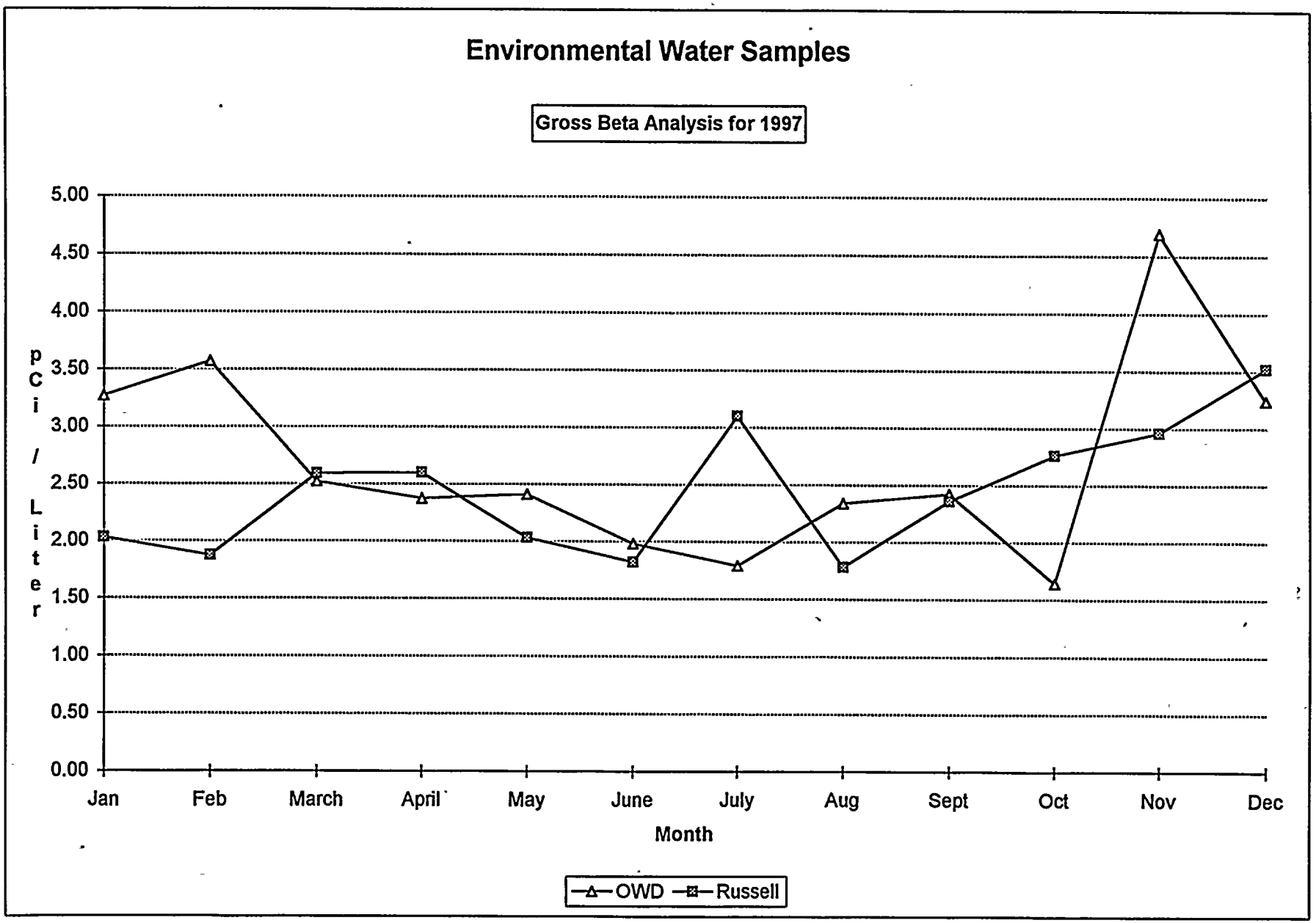
Tritium analysis was performed on all water samples on a monthly basis. Composites are made from the weekly composites and a portion distilled for analysis to remove interferences. Tritium data is given in Table 3-15.

The supplemental tritium samples, (Deer Creek and tap water), were temporarily deleted from the sample schedule from January through May. Subsequently, tap water was permanently deleted as redundant with Ontario Water District.

Iodine Analysis

All monthly composite water samples except the fallout samples are analyzed for Iodine-131. The analysis allows the determination of Iodine-131 activity of < 1 pCi/liter. Iodine data is given in Table 3-16. Any positive counts and the 2 sigma error are reported. All negative counts after background correction are reported as <LLD for that analysis. There were no positive Iodine-131 results.

Rochester Gas and Electric
Figure 3-7A



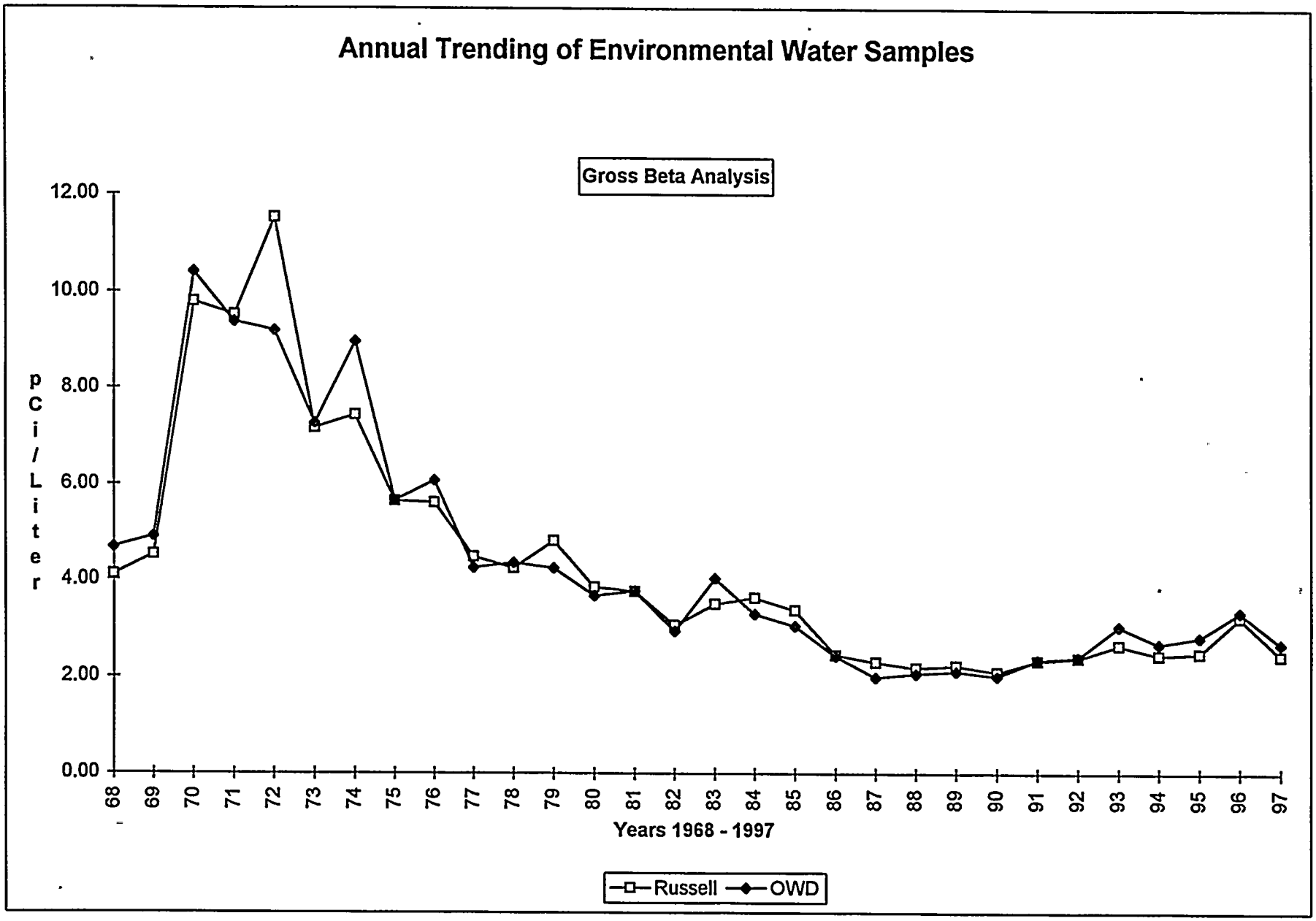

Annual Trending of Environmental Water Samples
Gross Beta Analysis
pCi/Liter
12.00
10.00
8.00
6.00
4.00
2.00
0.00
68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97
Years 1968 - 1997
Russell
OWD

Table 3-8
Environmental Water Samples Gross Beta Analysis
Results in pCi/Liter

Month	Russell (C)	O.W.D. (I)	Circ In (S)	Circ Out (I)	Deer Creek (S)	Tap (S)
January	2.03 ± 0.41	3.27 ± 0.47	3.77 ± 0.47	2.89 ± 0.43	2.78 ± 0.47	2.23 ± 0.43
February	1.87 ± 0.41	3.57 ± 0.47	2.33 ± 0.43	2.89 ± 0.44	3.28 ± 0.51	2.63 ± 0.47
March	2.59 ± 0.46	2.52 ± 0.46	1.87 ± 0.44	2.31 ± 0.44	3.02 ± 0.52	1.32 ± 0.43
April	2.60 ± 0.42	2.37 ± 0.42	2.61 ± 0.43	2.91 ± 0.43	2.91 ± 0.52	1.65 ± 0.44
May	2.03 ± 0.41	2.41 ± 0.43	2.75 ± 0.44	1.90 ± 0.40	4.37 ± 0.50	3.11 ± 0.43
June	1.82 ± 0.43	1.98 ± 0.42	2.27 ± 0.44	2.10 ± 0.44	3.85 ± 0.56	2.95 ± 0.48
July	3.10 ± 0.47	1.79 ± 0.42	1.79 ± 0.43	1.61 ± 0.42	4.72 ± 0.56	2.99 ± 0.47
August	1.78 ± 0.52	2.34 ± 0.52	3.23 ± 0.52	2.03 ± 0.48	6.22 ± 0.60	2.38 ± 0.42
September	2.36 ± 0.48	2.42 ± 0.51	1.93 ± 0.46	1.55 ± 0.45	3.87 ± 0.55	2.10 ± 0.45
October	2.76 ± 0.47	1.64 ± 0.44	2.89 ± 0.49	2.19 ± 0.46	7.51 ± 0.72	2.79 [redacted]
November	2.96 ± 0.86 (a)	4.69 ± 0.95 (a)	3.61 ± 0.87 (a)	3.17 ± 0.87 (a)	4.47 ± 0.56	2.54 ± 0.48
December	3.52 ± 0.51	3.24 ± 0.51	3.19 ± 0.51	3.72 ± 0.53	5.17 ± 0.57	2.64 ± 0.47
Maximum	3.52 ± 0.51	4.69 ± 0.55	3.77 ± 0.47	3.72 ± 0.53	7.51 ± 0.72	3.11 ± 0.43
Average	2.45	2.69	2.69	2.44	4.35	2.44
Minimum	1.78 ± 0.52	1.64 ± 0.44	1.79 ± 0.43	1.55 ± 0.45	2.78 ± 0.47	1.32 ± 0.43

I=Indicator
C=Control
S=Supplemental Sample

All values given as < are less than the LLD corrected for decay.

(a) Technician questioned first count on OWD, performed two subsequent counts on four samples, data represents average of three counts.

Table 3-9
Russell Station
Surface Water Control
Gamma Isotopic Analyses
Results in pCi/Liter

Month	Be-7	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226
Jan	<44	<65	<6	<13	<6	<7	<14	<10	<6	<7	<58	<5	<5	<14	<12	<42	119±42
Feb	<40	<43	<5	<11	<5	<5	<10	<7	<5	<7	<38	<3	<3	<14	<9	<28	<91
March	<26	<32	<3	<8	<3	<3	<7	<6	<5	<4	<28	<2	<3	<11	<6	<16	<56
April	<36	<44	<5	<15	<5	<5	<12	<8	<6	<6	<50	<5	<4	<13	<9	<30	88±35
May	<38	<46	<4	<13	<5	<4	<9	<8	<6	<6	<47	<4	<4	<12	<9	<26	83±36
June	<31	<33	<3	<8	<3	<3	<7	<5	<4	<4	<32	<2	<3	<11	<6	<17	71±22
July	<29	<28	<3	<8	<3	<3	<7	<6	<4	<4	<27	<3	<3	<8	<6	<19	<70
Aug	<40	<49	<4	<11	<4	<4	<9	<9	<6	<6	<39	<3	<4	<12	<8	<26	76±34
Sept	<38	<46	<4	<9	<4	<4	<10	<8	<6	<5	<39	<3	<3	<13	<8	<26	114±35
Oct	<26	<30	<3	<6	<3	<3	<6	<5	<4	<4	<30	<3	<2	<8	<6	<17	44±20
Nov	<27	<32	<3	<7	<3	<3	<7	<6	<3	<4	<28	<2	<3	<9	<6	<17	112±24
Dec	<27	<35	<3	<5	<4	<3	<7	<5	<4	<5	<30	<2	<3	<9	<7	<18	64±22

All values given as < are less than LLD corrected for decay.

Rochester Gas and Electric

Table 3-10
Ontario Water District
Drinking Water Indicator
Gamma Isotopic Analyses
Results in pCi/Liter

Month	Be-7	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226
Jan	<35	<42	<4	<12	<5	<5	<9	<6	<6	<6	<43	<5	<4	<9	<9	<30	142±40
Feb	<46	<52	<5	<11	<4	<5	<10	<8	<6	<6	<49	<5	<4	<13	<11	<34	<103
March	<48	<66	<5	<12	<6	<5	<8	<8	<6	<6	<51	<3	<5	<9	<13	<41	<118
April	<44	<45	<4	<9	<5	<5	<9	<7	<6	<5	<53	<5	<5	<12	<8	<27	83±37
May	<32	<47	<3	<8	<4	<3	<5	<6	<4	<4	<34	<2	<3	<8	<9	<27	134±29
June	<34	<46	<4	<9	<4	<4	<11	<7	<5	<5	<39	<3	<4	<10	<8	<25	64±31
July	<28	<40	<3	<7	<4	<3	<5	<6	<4	<4	<32	<2	<3	<6	<8	<27	96±33
Aug	<32	<45	<4	<8	<4	<3	<5	<6	<4	<4	<35	<3	<3	<8	<9	<27	179±33
Sept	<28	<28	<3	<8	<3	<3	<5	<5	<4	<4	<29	<3	<3	<8	<5	<17	60±18
Oct	<29	<31	<3	<7	<3	<3	<7	<6	<4	<4	<31	<3	<3	<9	<6	<19	44±25
Nov	<27	<31	<3	<9	<3	<3	<6	<5	<3	<4	<29	<2	<3	<8	<6	<17	75±22
Dec	<30	<34	<3	<9	<3	<3	<7	<6	<4	<4	<33	<3	<3	<9	<7	<20	65±23

All values given as < are less than LLD corrected for decay.

Table 3-11
Circ-In Water
Supplemental Sample Site
Gamma Isotopic Analyses
Results in pCi/Liter

Month	Be-7	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226
Jan	<46	<57	<5	<16	<5	<4	<13	<10	<5	<6	<57	<5	<5	<11	<11	<36	<116
Feb	<43	<50	<4	<13	<5	<4	<10	<10	<6	<6	<48	<4	<4	<14	<8	<25	93±38
March	<42	<50	<4	<12	<5	<5	<10	<9	<6	<6	<44	<5	<5	<11	<9	<30	<93
April	<39	<39	<4	<12	<5	<6	<11	<8	<5	<6	<48	<6	<5	<13	<8	<25	<76
May	<29	<35	<3	<8	<3	<3	<4	<5	<4	<4	<29	<2	<3	<11	<7	<17	113±26
June	<27	<28	<3	<8	<3	<3	<7	<5	<4	<4	<28	<2	<3	<9	<6	<18	89±23
July	<36	<40	<4	<10	<4	<3	<8	<8	<4	<5	<40	<2	<3	<5	<7	<25	101±33
Aug	<27	<33	<3	<7	<4	<4	<6	<6	<4	<4	<31	<3	<3	<8	<6	<19	<68
Sept	<29	<32	<3	<8	<3	<4	<6	<5	<3	<4	<30	<3	<3	<9	<6	<18	71±23
Oct	<35	<45	<3	<9	<4	<5	<9	<8	<5	<5	<37	<3	<4	<14	<8	<26	95±35
Nov	<28	<30	<3	<8	<4	<3	<6	<6	<4	<4	<32	<3	<3	<8	<6	<20	43±23
Dec	<37	<50	<4	<10	<4	<5	<9	<7	<5	<5	<39	<4	<3	<13	<8	<25	46±27

All values given as < are less than LLD corrected for decay.

Rochester Gas and Electric

Table 3-12
Circ. Outlet
Surface Water Indicator
Gamma Isotopic Analyses
Results in pCi/Liter

Month	Be-7	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226
Jan	<43	<46	<5	<14	<6	<6	<11	<9	<7	<6	<51	<5	<5	<15	<8	<32	88±38
Feb	<46	<71	<5	<11	<6	<5	<7	<11	<7	<6	<57	<4	<5	<11	<14	<47	152±51
March	<41	<47	<4	<12	<6	<6	<9	<8	<5	<6	<36	<4	<4	<9	<10	<26	62±31
April	<65	<80	<8	<12	<9	<7	<12	<7	<12	<11	<87	<8	<8	<22 (a)	<15	<46	108±55
May	<28	<31	<3	<8	<4	<3	<7	<6	<4	<4	<28	<2	<3	<10	<7	<21	63±28
June	<29	<35	<3	<8	<3	<3	<6	<6	<4	<2	<30	<3	<2	<10	<6	<20	46±23
July	<28	<29	<3	<9	<3	<3	<6	<5	<3	<3	<27	<2	<3	<9	<5	<17	52±20
Aug	<27	<32	<3	<7	<3	<3	<7	<6	<4	<4	<29	<3	<2	<9	<6	<16	74±20
Sept	<32	<45	<4	<8	<4	<3	<5	<7	<4	<4	<35	<4	<3	<7	<9	<29	<80
Oct	<35	<42	<3	<8	<4	<3	<5	<7	<5	<5	<33	<2	<3	<8	<9	<28	112±31
Nov	<27	<26	<3	<9	<3	<3	<8	<5	<3	<4	<29	<3	<3	<10	<5	<16	64±25
Dec	<28	<32	<3	<8	<3	<3	<8	<5	<4	<4	<29	<3	<3	<12	<5	<16	44±22

All values given as < are less than LLD corrected for decay.

(a) LLD not achieved due to technician interpretation error, short half-life precluded recount.

Table 3-13
Deer Creek Water
Supplemental Sample Site
Gamma Isotopic Analyses
Results in pCi/Liter

Month	Be-7	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226
Jan	<50	<65	<8	<13	<7	<6	<17	<12	<6	<7	<84	<4	<8	<9	<12	<57	115±62
Feb	<39	<33	<4	<9	<5	<5	<12	<7	<5	<5	<43	<3	<4	<5	<6	<27	108 ±44
March	<41	<42	<5	<9	<5	<5	<12	<7	<4	<5	<51	<5	<4	<6	<9	<36	<120
April	<37	<35	<5	<7	<5	<6	<11	<8	<5	<5	<59	<3	<4	<8	<7	<29	<114
May	<36	<32	<5	<10	<4	<6	<13	<8	<4	<5	<60	<5	<5	<7	<6	<28	<99
June	<37	<35	<6	<11	<4	<6	<12	<7	<4	<5	<48	<4	<5	<6	<7	<31	96±41
July	<38	<35	<5	<9	<4	<6	<12	<8	<5	<6	<53	<3	<5	<7	<7	<28	<109
Aug	<36	<32	<5	<10	<5	<6	<11	<8	<5	<5	<46	<5	<5	<6	<7	<32	62±38
Sept	<53	<56	<6	<14	<6	<8	<14	<12	<7	<5	<51	<6	<4	<7	<10	<40	<129
Oct	<41	<35	<4	<9	<5	<5	<12	<7	<5	<5	<41	<3	<4	<7	<7	<26	<100
Nov	<46	<36	<5	<12	<6	<6	<11	<8	<5	<6	<59	<5	<5	<9	<8	<32	<121
Dec	<38	<37	<5	<12	<5	<6	<10	<10	<5	<5	<53	<5	<4	<7	<7	<31	<126

All values given as < are less than LLD corrected for decay.

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Table 3-14
Tap Water
Supplemental Sample Site
Gamma Isotopic Analyses
Results in pCi/Liter

Month	Be-7	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Ru-103	Ru-106	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226
Jan	<33	<36	<4	<12	<5	<6	<9	<8	<6	<5	<50	<5	<5	<6	<7	<27	57±33
Feb	<40	<39	<4	<12	<5	<6	<15	<9	<5	<5	<47	<5	<5	<7	<8	<38	<128
March	<38	<28	<5	<8	<4	<6	<9	<7	<4	<5	<49	<5	<4	<6	<7	<29	94±33
April	<35	<33	<5	<10	<5	<6	<11	<7	<4	<5	<42	<6	<5	<7	<6	<29	88±32
May	<55	<50	<7	<12	<6	<7	<13	<11	<7	<6	<67	<7	<7	<10	<9	<42	<141
June	<53	<55	<8	<15	<6	<10	<20	<14	<8	<8	<86	<9	<8	<13	<10	<40	113±46
July	<40	<33	<5	<11	<5	<6	<11	<9	<5	<5	<51	<6	<5	<7	<7	<32	<116
Aug	<35	<35	<5	<9	<5	<4	<10	<8	<4	<5	<45	<4	<4	<6	<7	<30	72±39
Sept	<66	<58	<8	<17	<9	<11	<23	<14	<9	<8	<80	<7	<9	<11	<11	<47	<164
Oct	<37	<32	<4	<12	<6	<6	<11	<9	<5	<5	<56	<4	<5	<6	<7	<30	79±38
Nov	<38	<32	<5	<13	<5	<6	<16	<5	<4	<5	<46	<5	<5	<7	<7	13±8	<99
Dec	<39	<29	<4	<11	<4	<7	<14	<7	<4	<5	<43	<5	<5	<6	<6	<28	77±37

All values given as < are less than LLD corrected for decay.

Table 3-15
Environmental Water Samples Tritium Analysis
Results in pCi/Liter

Month of	Russell (I)	O.W.D. (I)	Circ In (S)	Circ Out (I)	Deer Creek (S)	Tap (S)
January	<421	<417	508 ± 133	<421	<420	<421
February	<493	<491	<492	<492	a	a
March	<463	<461	<429	<466	a	a
April	<466	<464	<468	<472	a	a
May	<755	<460	<462	<461	a	a
June	<440	<443	<444	<443	<485	a
July	<420	<418	<423	<422	<487	<492
August	<452	<455	<443	<458	<491	<487
September	<424	<425	<427	<425	<427	<426
October	<487	<487	<487	<485	<487	<483
November	<495	<493	<491	<488	<491	<489
December	<509	<507	<511	<505	<509	<509

I=Indicator
C=Control
S=Supplemental Sample

All values given as < are less than the LLD corrected for decay.

(a) Unavailable data detailed on page 52.

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Table 3-16
Iodine in Water
Results in pCi/Liter

Month of	Russell (C)	O.W.D. (I)	Circ. In (S)	Circ. Out (I)	Deer Creek (S)	Tap (S)
January	<.79	<.41	<.49	<.35	<.51	<.36
February	<.39	<.63	<.66	<.58	<.61	<.63
March	<.79	<.99	<.85	<.81	<.46	<.36
April	<.39	<.67	<.73	<.45	<.40	<.43
May	<.72	<.41	<.46	<.34	<.44	<.71
June	<.54	<.43	<.74	<.68	<.43	<.33
July	<.45	<.53	<.74	<.53	<.43	<.61
August	<.51	<.72	<.42	<.78	<.45	<.53
September	<.58	<.46	<.48	<.87	<.66	<.44
October	<.46	<.52	<.64	<.50	<.65	<.36
November	<.79	<.51	<.52	<.41	<.82	<.3
December	<.74	<.83	<.67	<.97	<.41	<.43

I=Indicator
C=Control
S=Supplemental Sample

All values given as < are less than the LLD corrected for decay

3.4 Milk Samples

There are three dairy herds located three to five miles from the plant. Milk samples are collected monthly during November through May from one of the three and biweekly during June through October from each. A control farm sample is taken for each monthly sample and once during each biweekly period. The milk is analyzed for Iodine-131 and also gamma scanned for major fission products.

All positive counts and the ±1 sigma error are reported. All negative counts after background correction are reported as <LLD for that analysis. During 1997, no samples indicated positive I-131 activity that exceeded the LLD for the analysis. Table 3-17 is a listing of all samples collected during 1997.

The annual dose to the thyroid of an infant which could result from the measured plant release rate was calculated by the method described in the ODCM. The calculation was done for releases during the growing season when cows may be grazing. For Ginna Station, this includes only releases during the months of May through October. The maximum resultant annual thyroid dose for 1997 would be 0.25 mrem using the cow-milk-infant pathway for a hypthetical farm at the site boundary. Using the farm with the highest D/Q which is 5 miles from the plant, the maximum calculated dose to the infant would be 1.35×10^{-3} mrem from plant releases during the growing season.

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Table 3-17
Milk
Results in pCi/Liter

Farm		Date	I-131	Cs-134	Cs-137	Ba-140	K-40
FARM B	I	1/21/97	<.40	<5	<5	<7	1310±60
FARM D	C	1/21/97	<.32	<6	<5	<6	1610±68
FARM C	I	2/11/97	<.36	<5	<5	<7	1460±71
FARM D	C	2/11/97	<.29	<9	<6	<8	1470±81
FARM A	I	3/18/97	<.40	<5	<6	<7	1420±69
FARM D	C	3/18/97	<.45	<3	<5	<5	2300±65
FARM B	I	4/22/97	<.43	<4	<5	<5	1430±62
FARM D	C	4/15/97	<.37	<6	<5	<6	1530±65
FARM C	I	5/13/97	<.39	<5	<5	<7	1360±62
FARM D	C	5/13/97	<.30	<5	<5	<6	1460±65
FARM A	I	6/10/97	<.41	<4	<5	<6	1410±62
FARM B	I	6/10/97	<.47	<6	<5	<6	1590±68
FARM C	I	6/10/97	<.36	<6	<6	<8	1440±72
FARM D	C	6/10/97	<.46	<6	<6	<9	1580±85
FARM A	I	6/24/97	<.64	<4	<5	<5	2080±60
FARM B	I	6/24/97	<.40	<5	<5	<7	1440±64
FARM C	I	6/24/97	<.36	<6	<5	<6	1570±68
FARM D	C	6/24/97	<.46	<6	<7	<8	1480±81
FARM A	I	7/8/97	<.79	<5	<6	<5	1310±62
FARM B	I	7/9/97	<.34	<6	<6	<7	1710±71
FARM C	I	7/9/97	<.48	<5	<5	<7	1590±68
FARM D	C	7/8/97	<.72	<4	<6	<8	1470±64
FARM A	I	7/22/97	<.43	<3	<5	<6	1390±62
FARM B	I	7/22/97	<.32	<4	<5	<5	2170±60
FARM C	I	7/22/97	<.41	<5	<5	<7	1520±64
FARM D	C	7/22/97	<.65	<6	<6	<6	1600±68
FARM A	I	8/5/97	<.40	<5	<6	<4	2120±60
FARM B	I	8/5/97	<.46	<6	<7	<9	1630±85
FARM C	I	8/5/97	<.36	<6	<6	<5	2200±62
FARM D	C	8/5/97	<.64	<6	<6	<7	1430±72
FARM A	I	8/19/97	<.45	<4	<6	<5	2110±60
FARM B	I	8/19/97	<.66	<6	<5	<7	1600±68
FARM C	I	8/19/97	<.41	<5	<4	<6	1390±62
FARM D	C	8/19/97	<.47	<6	<7	<7	1670±85
FARM A	I	9/2/97	<.39	<3	<6	<5	2080±60
FARM B	I	9/2/97	<.44	<5	<5	<6	1440±62
FARM C	I	9/2/97	<.40	<6	<5	<6	1600±68
FARM D	C	9/2/97	<.45	<5	<5	<7	1480±71
FARM A	I	9/17/97	<.41	<5	<7	<9	1550±85
FARM B	I	9/16/97	<.66	<4	<6	<5	2280±62
FARM C	I	9/16/97	<.39	<5	<5	<6	1640±68
FARM D	C	9/17/97	<.64	<3	<5	<6	1560±67
FARM A	I	9/30/97	<.45	<5	<6	<8	1420±62
FARM B	I	9/30/97	<.38	<6	<5	<8	1490±65
FARM C	I	9/30/97	<.76	<8	<7	<11	1690±91
FARM D	C	9/30/97	<.46	<5	<7	<12	1470±81
FARM A	I	10/14/97	<.44	<3	<5	<8	1440±62
FARM B	I	10/14/97	<.34	<9	<8	<10	1470±93
FARM C	I	10/14/97	<.71	<4	<5	<6	1350±71
FARM D	C	10/14/97	<.47	<6	<5	<7	1570±68
FARM A	I	10/27/97	<.41	<4	<6	<6	1190±59
FARM B	I	10/27/97	<.46	<4	<5	<7	1680±70
FARM C	I	10/27/97	<.37	<5	<6	<8	1530±75
FARM D	C	10/27/97	<.76	<7	<8	<10	1550±87
FARM A	I	11/10/97	<.44	<5	<5	<8	1430±64
FARM D	C	11/11/97	<.44	<6	<6	<8	1480±68
FARM C	I	12/17/97	<.73	<5	<6	<8	1470±64
FARM D	C	12/17/97	<.48	<5	<5	<7	1600±68

I=Indicator
C=Control

All values given as < are less than the LLD corrected for decay.

3.5 Fish Samples

Indicator fish are caught in the vicinity of the Discharge Canal and tested for radioactivity from liquid effluent releases from the plant. The fish are filleted to represent that portion which would normally be eaten. Additional fish are caught more than 15 miles away to be used as background indicators and are prepared in the same manner.

Four different species of fish are analyzed during each half year from the indicator and background locations if they are available. There was no statistically significant difference in the activity of the fish caught between the indicator and background locations.

Fish are caught by R. G. & E. biologists and counted by gamma spectroscopy after being held for periods of less than one week. The LLD value for the shorter half life isotopes became greater. The data could also be affected by small mass samples, (< 2000 grams), in some species.
Isotopic gamma concentrations (pCi/kilogram wet) are listed in Tables 3-18A, 3-18B.

Samples of algae (cladophora) and sand, (benthic sediment), were obtained from the lake bottom in the discharge plume area. Lake bottom samples continue to show small amounts of Cs-137 activity. Results of the gamma scans are included in Table 3-19.

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Table 3-18 A
Fish Samples Gamma Isotopic Analysis
Results in pCi/kg Wet

Description	K-40	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95
Indicator Fish									
First Half 1997									
White Suckers	4800±270	<421	<22	<92	<32	<31	<58	<67	<55
Walleye	10200±265	<495	<31	<87	<38	<25	<48	<64	<49
Freshwater Drum	3150±193	<313	<23	<79	<30	<28	<61	<53	<32
Brown Trout	4520±240	<414	<25	<78	<24	<29	<65	<55	<45
Second Half 1997									
Brown Trout	4860±.254	<203	<23	<60	<26	<27	<68	<49	<27
Chinook Salmon	4300±226	<177	<21	<50	<23	<25	<60	<37	<24
Rainbow Trout	4560±292	<259	<30	<89	<33	<33	<86	<64	<38
Lake Trout	4360±229	<214	<22	<55	<24	<28	<64	<43	<28
Control Fish									
First Half 1997									
Chinook Salmon	4740±260	<606	<25	<125	<35	<28	<63	<80	<57
White Suckers	3530±182	<300	<23	<70	<30	<24	<55	<40	<35
Freshwater Drum	4610±220	<333	<24	<92	<30	<28	<63	<56	<45
Brown Trout	9610±262	<508	<29	<96	<37	<31	<46	<61	<49
Second Half 1997									
Smallmouth Bass	5290±363	<473	<49	<130	<42	<44	<135	<89	<63
Rock Bass	10500±294	<375	<35	<72	<40	<36	<52	<62	<45
Rainbow Trout	4400±279	<255	<33	<63	<32	<34	<86	<66	<37
Chinook Salmon	5460±263	<226	<25	<57	<24	<25	<43	<49	<28

All values given as < are less than the LLD corrected for decay

Table 3-18 B
Fish Samples Gamma Isotopic Analysis
Results in pCi/kg Wet

Description	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226
Indicator Fish									
First Half 1997									
White Suckers	<49	<249	<403	<25	<25	<200	<58	<141	401±170
Walleye	<42	<263	<468	<19	<27	<109	<69	<175	690±192
Freshwater Drum	<32	<224	<277	<25	11±7	<155	<41	<86	613±153
Brown Trout	<41	<269	<366	<24	<25	<189	<52	<126	595±157
Second Half 1997									
Brown Trout	<24	<248	<36	<22	<22	<48	<33	<120	372±166
Chinook Salmon	<22	<195	<32	<21	<25	<29	<24	<86	372±140
Rainbow Trout	<32	<334	<61	<33	<32	<72	<47	<149	<527
Lake Trout	<25	<200	<37	<21	<21	<39	<31	<123	606±165
Control Fish									
First Half 1997									
Chinook Salmon	<51	<288	<1160	<24	<23	<397	<73	<141	480±160
White Suckers	<35	<211	<282	<19	<19	<169	<49	<93	505±129
Freshwater Drum	<35	<257	<366	<25	20±9	<151	<50	<120	<431
Brown Trout	<43	<270	<502	<20	<26	<162	<71	<171	431±181
Second Half 1997									
Smallmouth Bass	<54	<459	<242	<43	<49	<176	<72	<215	<794
Rock Bass	<38	<332	<189	<22	<31	<93	<63	<195	<591
Rainbow Trout	<31	<336	<51	<32	<28	<43	<43	<140	<543
Chinook Salmon	<27	<233	<62	<22	<24	<47	<36	<109	<371

All values given as < are less than the LLD corrected for decay

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Table 3-19
Lake Samples Discharge Plume Area
Gamma Isotopic Analysis
Results in pCi/kg Wet

Description	K-40	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95
Cladophora	4160±89	<54	<6	<15	<6	<8	<16	<12	<8
Benthic Sediment	13200±384	<319	<33	<83	<33	<33	<93	<56	<39

Description	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226
Cladophora	<6	<56	<9	<6	13±3	<8	<9	<31	250±49
Benthic Sediment	<33	<329	<69	<31	<32	<46	<55	<224	782±258

All values given as < are less than the LLD corrected for decay

3.6 Vegetation Samples

Crops are grown on the plant property and samples of the fruits and grains are collected at harvest time for testing. Background samples are purchased from farms greater than 10 miles from the plant. There was no indication in the samples of any measurable activity other than naturally occuring K-40 and Ra-226. Gamma isotopic data is given in Table 3-20.

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Table 3-20

Vegetation Samples Gamma Isotopic Analysis

Results in pCi/kg Wet

Description	K-40	Cr-51	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95
Indicator Vegetation									
Squash	4400±94	<75	<9	<19	<9	<9	<14	<14	<9
Lettuce	8710±335	<347	<41	<89	<39	<52	<103	<77	<46
Cherries	1590±64	<50	<7	<17	<7	<8	<20	<11	<7
Apples	1210±44	<31	<4	<11	<4	<5	<10	<8	<4
Feed Corn	2130±80	<49	<7	<17	<6	<9	<18	<13	<7
Control Vegetation									
Apples	857±35	<30	<4	<9	<4	<4	<10	<7	<4
Lettuce	4280±97	<78	<9	<20	<9	<9	<17	<17	<10

	Ru-103	Ru-106	I-131	Cs-134	Cs-137	Ba-140	Ce-141	Ce-144	Ra-226
Indicator Vegetation									
Squash	<9	<92	<10	<6	<9	<9	<13	<57	246±68
Lettuce	<41	<416	<46	<41	<42	<63	<53	<227	2730±369
Cherries	<7	<72	<8	<4	<6	<11	<8	<29	150±45
Apples	<4	<49	<7	<4	<4	<7	<5	<21	67±27
Feed Corn	<7	<69	<6	<7	<6	<9	<8	<33	208±52
Control Vegetation									
Apples	<4	<40	<7	<3	<4	<7	<5	<17	131±26
Lettuce	<11	<87	<20	<8	<8	<16	<15	<54	385±70

All va[illegible] given as < are less than the LLD corrected for decay

3.7 External Penetrating Radiation

Thermoluminescent dosimeters, (TLD's), with a sensitivity of 5 millirem/quarter are placed as part of the environmental monitoring program. Thirty-nine TLD badges are currently placed in four rings around the plant. These rings range from less than 1000 feet to 15 miles and have been dispersed to give indications in each of the nine land based sectors around the plant should an excessive release occur from the plant. Badges are changed and read after approximately 3 months exposure.

TLD locations #7 and #13 are influenced by close proximity to the Contaminated Equipment Storage Areas and will normally read slightly higher than other locations. For the year of 1997, on-site exposure ranged between 10.5-16.2 mrem/quarter, with an average exposure of 13.2 mrem/quarter and off-site 10.1-14.1 mrem/quarter with an average exposure of 11.9 mrem/quarter.

40 CFR 190 requires that the annual dose equivalent not exceed 25 millirems to the whole body of any member of the public. Using 54 millirems average ambient radiation,(*Environmental Radioactivity,* Eisenbud, 1987), and the highest annual total TLD value, (Station 7), of 61.5 millirems yields an annual maximum dose of 7.5 millirems. Table 3-21 gives TLD readings for each quarter. 3 TLD's were missing at the times of collection.

A trend chart with a comparison of data for each location for the years of 1996 and 1997 is included, Table 3-22. The data plotted is the average quarterly dose measured. TLD location #13 for 1996 was influenced by its proximity to the Contaminated Equipment Storage Area.

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Table 3-21

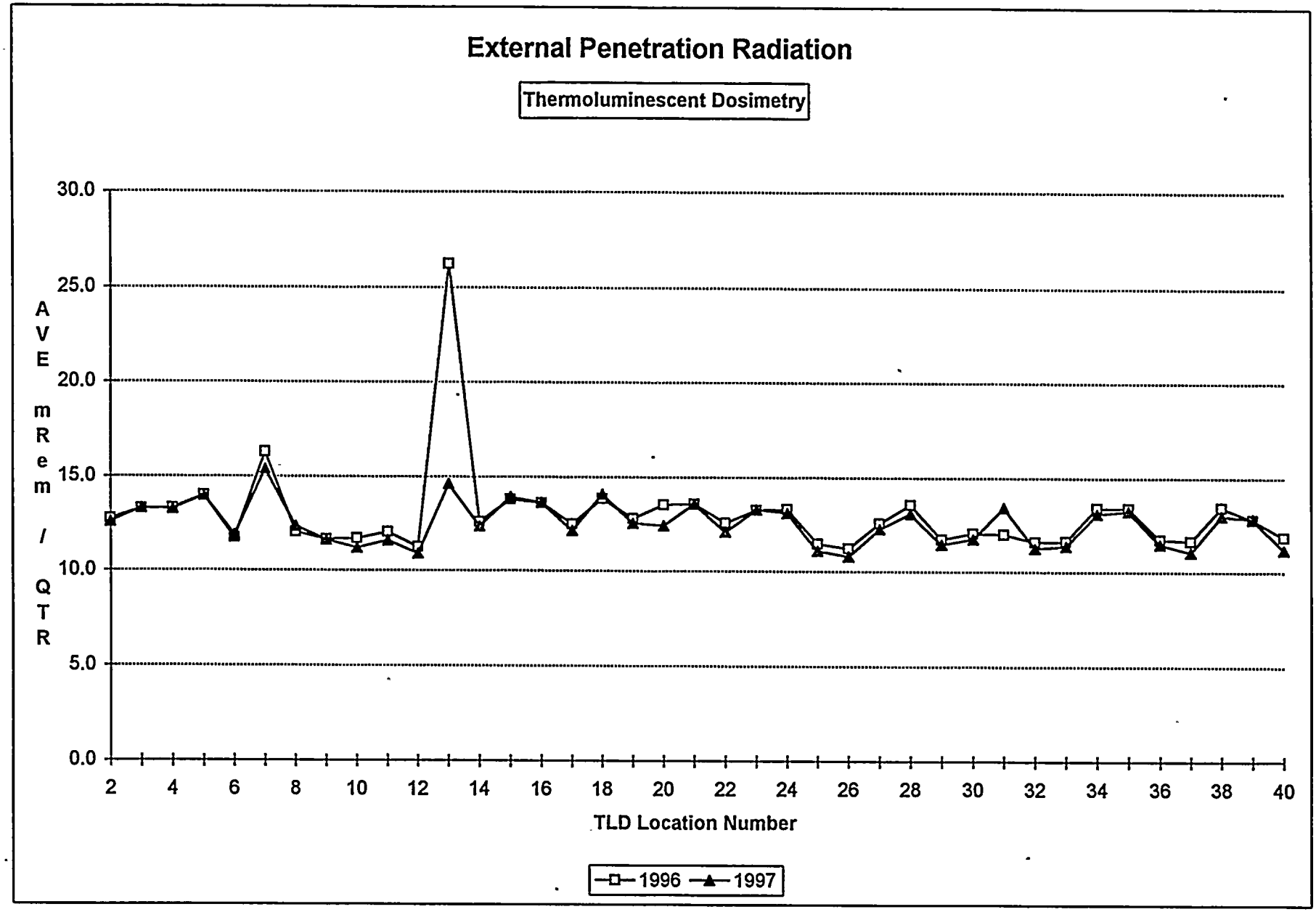
External Penetrating Radiation

Thermoluminescent Dosimetry 1997

Units mRem/91 Day Quarter

	Location	Type	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
#2 - #7 plus #13 are	2	I	11.3 ± 2.9	13.2 ± 3.3	13.1 ± 3.3	12.7 ± 3.2
on-site near the line	3	I	11.8 ± 3.0	13.5 ± 3.4	14.7 ± 3.7	13.2 ± 3.3
of the highest annual	4	I	12.3 ± 3.1	13.8 ± 3.5	13.8 ± 3.5	13.1 ± 3.3
average ground level	5	I	12.9 ± 3.3	14.1 ± 3.6	14.9 ± 3.8	14.0 ± 3.5
concentration.	6	I	10.5 ± 2.6	12.0 ± 3.0	12.6 ± 3.2	12.4 ± 3.1
	7	I	14.5 ± 3.7	14.7 ± 3.7	16.2 ± 4.1	16.1 ± 4.1
#8 - #12 are offsite at	8	C	11.6 ± 2.9	12.5 ± 3.1	12.5 ± 3.2	12.7 ± 3.2
a distance of 8 to 16 miles.	9	I	10.5 ± 2.6	11.7 ± 2.9	12.5 ± 3.1	11.8 ± 3.0
	10	C	10.3 ± 2.6	11.5 ± 2.9	11.7 ± 3.0	11.3 ± 2.9
	11	I	10.9 ± 2.7	11.8 ± 3.0	11.9 ± 3.0	11.8 ± 3.0
	12	C	10.1 ± 2.5	10.9 ± 2.8	11.5 ± 2.9	11.1 ± 2.8
	13	I	13.3 ± 3.4	14.8 ± 3.7	15.1 ± 3.8	15.2 ± 3.8
#14 - #16 are located	14	I	11.1 ± 2.8	12.4 ± 3.1	13.6 ± 3.4	a
along a line 3000 ft. west	15	I	12.5 ± 3.1	14.3 ± 3.6	14.6 ± 3.7	14.3 ± 3.6
of the plant.	16	I	12.7 ± 3.2	13.5 ± 3.4	14.5 ± 3.7	13.8 ± 3.5
#17 - #21 are located	17	I	11.3 ± 2.8	12.3 ± 3.1	12.8 ± 3.2	12.1 ± 3.1
along Lake Road.	18	I	13.0 ± 3.3	14.0 ± 3.5	15.0 ± 3.8	14.3 ± 3.6
	19	I	11.4 ± 2.9	12.6 ± 3.2	13.4 ± 3.4	12.7 ± 3.2
	20	I	12.1 ± 3.0	12.4 ± 3.1	13.0 ± 3.3	12.1 ± 3.0
	21	I	12.5 ± 3.1	13.5 ± 3.4	14.6 ± 3.7	13.7 ± 3.5
#22 - #24 are located	22	I	11.5 ± 2.9	11.9 ± 3.0	12.5 ± 3.1	12.4 ± 3.1
along the east site	23	I	12.3 ± 3.1	12.9 ± 3.3	14.5 ± 3.6	13.4 ± 3.4
boundary line.	24	I	12.3 ± 3.1	13.1 ± 3.3	14.0 ± 3.5	13.0 ± 3.3
#25 - #30 are offsite	25	C	10.4 ± 2.6	10.9 ± 2.7	11.7 ± 3.0	11.4 ± 2.9
at a distance of 8	26	C	10.1 ± 2.6	10.5 ± 2.6	11.6 ± 2.9	11.0 ± 2.8
to 13 miles.	27	C	11.2 ± 2.8	11.9 ± 3.0	13.3 ± 3.4	12.6 ± 3.2
	28	C	11.8 ± 3.0	13.1 ± 3.3	13.7 ± 3.5	13.7 ± 3.5
	29	C	10.6 ± 2.7	11.2 ± 2.8	12.4 ± 3.1	11.6 ± 2.9
	30	C	10.9 ± 2.7	11.8 ± 3.0	12.5 ± 3.1	11.7 ± 2.9
#31 - #40 are located	31	I	a	12.6 ± 3.2	14.0 ± 3.5	13.6 ± 3.4
in an arc at a distance	32	I	10.5 ± 2.6	11.1 ± 2.8	12.2 ± 3.1	11.2 ± 2.8
of 3 - 5 miles.	33	I	10.6 ± 2.7	a	12.2 ± 3.1	11.3 ± 2.8
	34	I	12.1 ± 3.0	13.3 ± 3.3	14.0 ± 3.5	12.9 ± 3.3
	35	I	11.8 ± 3.0	13.7 ± 3.4	14.1 ± 3.5	13.3 ± 3.3
	36	I	10.5 ± 2.7	11.4 ± 2.9	12.2 ± 3.1	11.8 ± 3.0
	37	I	10.3 ± 2.6	11.0 ± 2.8	11.8 ± 3.0	11.1 ± 2.8
	38	I	12.0 ± 3.0	12.6 ± 3.2	14.1 ± 3.6	13.2 ± 3.3
I=Indicator	39	I	11.7 ± 2.9	12.8 ± 3.2	13.6 ± 3.4	13.2 ± 3.3
C=Control	40	I	10.1 ± 2.6	11.0 ± 2.8	12.4 ± 3.1	11.3 ± 2.9

(a) TLD Missing at time of collection.


External Penetration Radiation
Thermoluminescent Dosimetry
AVE mRem / QTR
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
TLD Location Number
1996
1997

4.0 LAND USE CENSUS

A land use census is done each year to determine any major changes in the use of the land within 5 miles of the plant. There were no major changes in 1997. The land use remains mainly agricultural in nature. There were several private homes constructed, but no new housing developments. A new Tops Supermarket was under construction at the southeast corner of Furnace Road and Highway 104, scheduled to open for business in March, 1998. The three dairy operations nearest the plant continued in operation with an average of 40 to 70 milking cows. There are no goats used for milk on a regular basis within the 5 mile radius. Beef cattle are still raised on 3 farms within 2 miles of the plant as in the past.

An onsite garden is used for the broad leaf vegetation and onsite crops are collected for indicator samples when available.

A copy of the Land Use Census that was completed during August and September, 1997 is attached.

5.0 EXTERNAL INFLUENCES

During 1997, there were no external influences such as atmospheric weapons testing or accidents at other nuclear facilities which caused an influence on the data reported. The annual trending graphs for air and water indicate a level effect in the measured activity.

Rochester Gas and Electric Corporation, in cooperation with the University of Rochester, is currently pursuing a research project to identify and quantify sub-trace levels of long lived radionuclides in the environs of western New York, and to identify their sources and migration pathways.

FIGURE 4-1

Land Use Census

Sector	Distance to Nearest Residence	Distance to Nearest Garden	Distance to Milk Producing Animals
E	2100 m	2100 m	
ESE	950 m	1770 m	
SE	650 m	2580 m	8200 m
SSE	735 m	2380 m	5450 m
S	1130 m	1643 m	
SSW	600 m	1124 m	
SW	750 m	1950 m	4950 m
WSW	1000 m	2980 m	
W	1500 m	3545 m	

Changes from previous year:

No major changes from previous years. Construction of new homes continues at approximately the same rate as previous years with no new housing developments. A new TOPS supermarket was under construction at the southeast corner of Furnace Road and Highway 104.

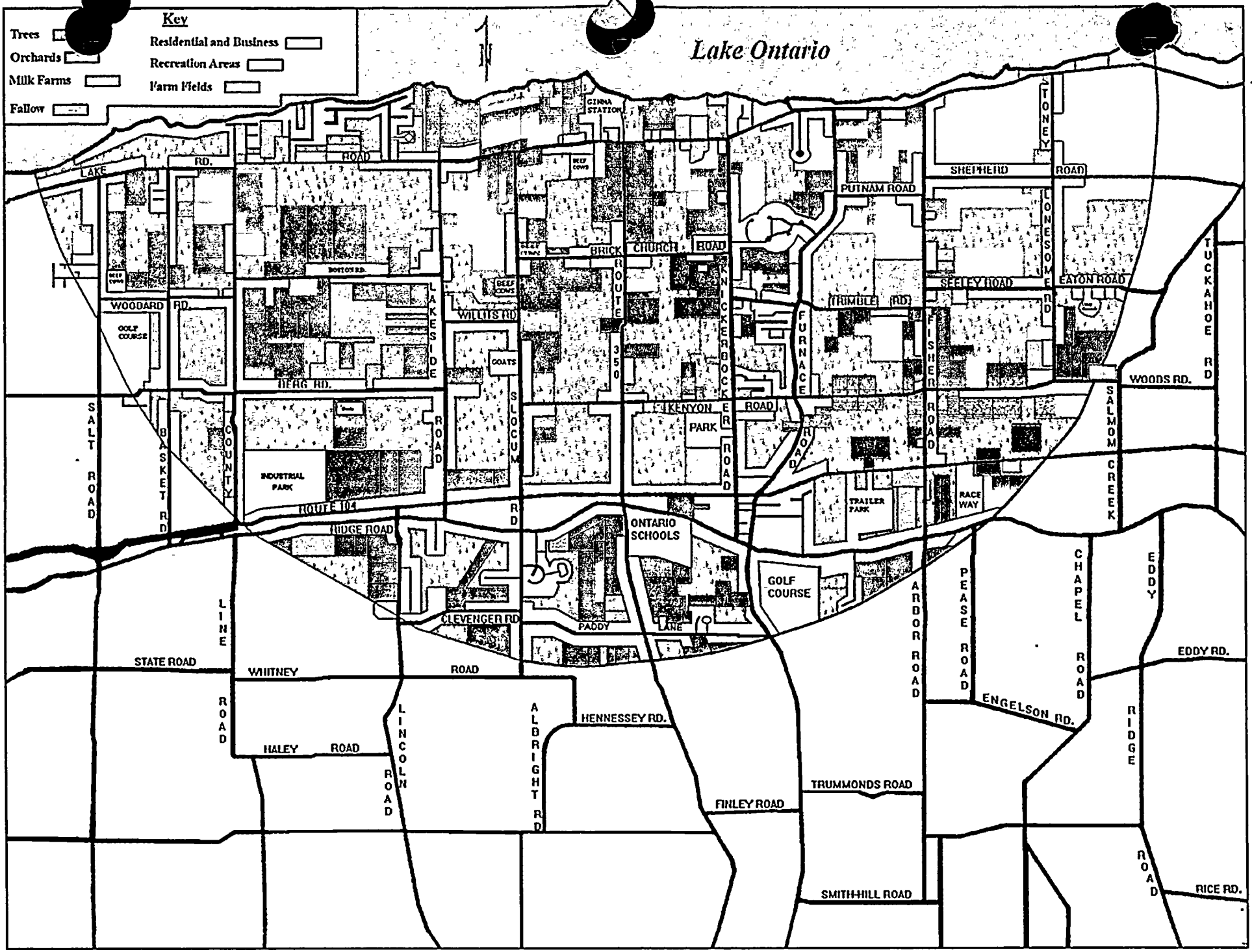
Milk animal locations:

No new milk animal locations. Local meat market has goats for non-dairy purposes.

UFSAR request for unreviewed safety concern Y_____ N__X__

Land Use Census Completed by: _____ Date: 11/1/97

Reviewed by: _____ Date: 3/25/98


Key
Trees
Orchards
Milk Farms
Fallow
Residential and Business
Recreation Areas
Farm Fields
Lake Ontario
LAKE RD.
WOODARD RD.
GOLF COURSE
BOSTON RD.
DEAG RD.
LAKESIDE ROAD
WILLIS RD
BRICK CHURCH ROAD
ROUTE 350
KNICKERBOCKER ROAD
FURNACE ROAD
PUTNAM ROAD
SHEPHERD ROAD
LONESOME RD
SEELEY ROAD
EATON ROAD
TRIMBLE RD
FISHER ROAD
TUCKAHOE RD
WOODS RD.
SALMON CREEK
SALT ROAD
BASKET RD
COUNTY RD
SLOCUM ROAD
INDUSTRIAL PARK
KENYON PARK
ROUTE 104
RIDGE ROAD
ONTARIO SCHOOLS
TRAILER PARK
RACE WAY
GOLF COURSE
CLEVENGER RD
PADDY LANE
LINE ROAD
STATE ROAD
WHITNEY ROAD
HALEY ROAD
LINCOLN ROAD
ALBRIGHT RD
HENNESSEY RD.
FINLEY ROAD
TRUMMONDS ROAD
SMITH HILL ROAD
ARBOR ROAD
PEASE ROAD
ENGELSON RD.
CHAPEL ROAD
EDDY RIDGE ROAD
EDDY RD.
RICE RD.

6.0 INTERLABORATORY COMPARISON STUDY

Participation in an interlaboratory comparison program ensures that independent checks for bias and accuracy of the measurement of radioactive material in environmental samples are performed as part of a quality assurance program for environmental monitoring. The ODCM requires participation in an interlaboratory comparison program that is approved by the NRC, if such a program exists. Until 1996 the United States Environmental Protection Agency (EPA), Office of Research and Development, National Exposure Research Laboratory, Las Vegas, Nevada, was the NRC approved program. Since the NRC has not approved a replacement for the EPA's program, Ginna Station has engaged the services of an independent laboratory, Analytics, Inc., Atlanta, Georgia.

The Analytics Environmental Cross-Check Program supplies sample media that is similar to routinely collected environmental water, milk, and air samples, as blind spikes at levels of radioactivity appropriate for environmental monitoring. The blind spikes are received by Ginna Station and shipped to JAF Environmental Laboratory (JAFEL) for analysis with routine samples. Ginna Station assesses JAFEL's analysis after receiving Analytics Report that compares the JAFEL to Analytics results.

An assessment of JAFEL for analysis bias of the Analytics blind spikes is not possible at this time, since during the first year of the program the baseline history for evaluating a bias is established.

An assessment of JAFEL for analysis accuracy of the Analytics blind spikes was preformed, using the acceptance test generally referred to as the ANRC@ method. This method is contained in NRC Procedure DVP-04.01 and was taken from the Criteria of Comparing Analytical Results (USNRC) and Bevington, P.R., Data Reduction and Error Analysis for the Physical Sciences, McGraw-Hill, New York, (1969). The accuracy evaluation is as follows:

$$\text{Error Resolution} = \frac{\text{Analytics Value}}{\text{Analytics Uncertainty}} \qquad \text{Comparison Ratio} = \frac{\text{JAFEL Value}}{\text{Analytics Value}}$$

Using the appropriate row under the ERROR RESOLUTION column in Table 6.1, a corresponding RATIO OF AGREEMENT interval is used as the acceptance criteria for the comparison ratio.

TABLE 6.1

ERROR RESOLUTION	RATIO OF AGREEMENT
<3	0.4-2.5
3.1 to 7.5	0.5-2.0
7.6 to 15.5	0.6-1.66
15.6 to 50.5	0.75-1.33
50.6 to 200	0.8-1.25
>200	0.85-1.18

If the comparison ratio falls within the RATIO OF AGREEMENT interval, the analysis is assessed as agree, and if not the assessment is disagree. Table 6.2 summarizes the Analytics Environmental Cross-Check Program. A beta and an Fe-59 analysis were assessed as disagree. No recurrences of disagree assessments were made for beta or Fe-59 analyses by Ginna Station=s Analytics Program or JAFEL's in-house Interlaboratory Comparison Program. No corrective actions were implemented by JAFEL as a result of the disagree assessments.

TABLE 6.2

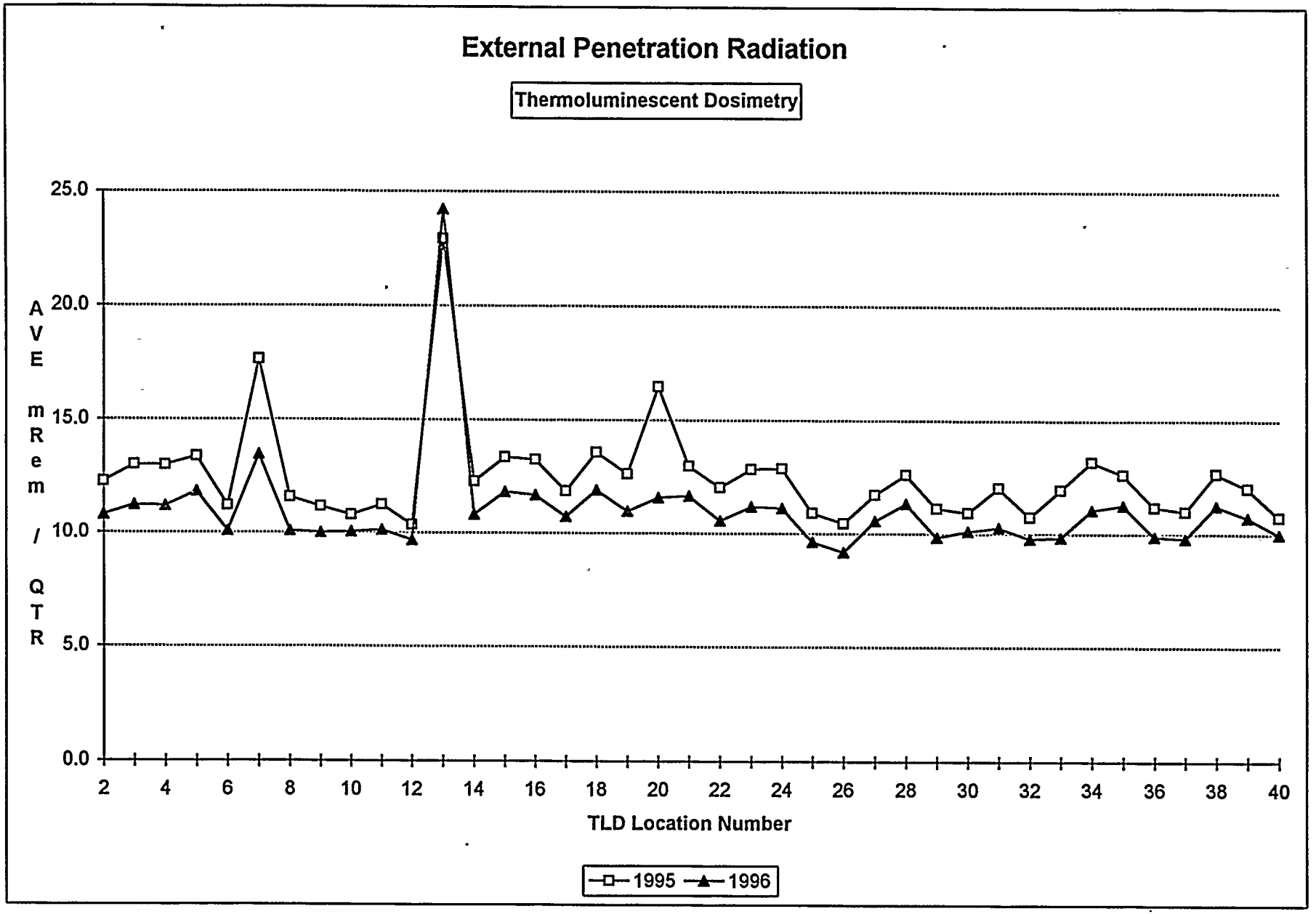
QC Sample Ginna Log # (Analytics ID #) Media (units)	JAFEL Value	Analytics Value	Analytics Uncertainty (3 sigma)	Error Resolution	Comparison Ratio	Assessment
97-626 (E1069-80) water (pCi/L)						
beta	188	139	7	60	1.35	disagree
97-355 (E1070-80) water (pCi/L)						
tritium	1210	1313	66	60	0.92	agree
97-337 (E1068-80) water (pCi/L)						
Ce-141	177	192	10	58	0.92	agree
Cr-51	250	288	14	62	0.87	agree
Cs-134	102	118	6	59	0.86	agree
Cs-137	161	176	9	59	0.91	agree
Co-58	120	112	6	56	1.07	agree
Mn-54	129	123	6	62	1.05	agree
Fe-59	125	110	6	55	1.14	agree
Zn-65	230	214	11	58	1.07	agree
Co-60	151	151	8	57	1.00	agree
97-338 (E1067-80) milk (pCi/L)						
Ce-141	196	213	11	58	0.92	agree
Cr-51	287	319	16	60	0.90	agree
Cs-134	110	131	7	56	0.84	agree
Cs-137	181	185	9	62	0.98	agree
Co-58	108	124	6	62	0.87	agree
Mn-54	139	137	7	59	1.01	agree
Fe-59	126	122	6	61	1.03	agree
Zn-65	226	225	11	61	1.00	agree
Co-60	164	168	8	63	0.98	agree
I-131	58	61	3	61	0.95	agree
97-614 (E1165-80) particulate filter (pCi)						
Ce-141	62	62	3	62	1.00	agree
Cr-51	229	245	12	61	0.93	agree
Cs-134	73	82	4	62	0.89	agree
Cs-137	97	86	4	65	1.13	agree
Co-58	56	49	2	74	1.14	agree
Mn-54	87	71	4	53	1.23	agree
Fe-59	127	96	5	58	1.32	disagree
Zn-65	179	158	8	59	1.13	agree
Co-60	160	159	8	60	1.01	agree
97-642 (E1162-80) water (pCi/L)	312	291	15	58	1.07	agree
beta	312	291	15	58	1.07	agree
97-658 (E1163-80) water (pCi/L)						
tritium	2960	3498	175	60	0.85	agree
97-613 (E1164-80) charcoal cartridge (pCi)						
I-131	50	60	3	60	0.83	agree

7.0 ERRATA

Table 3-18 of the 1996 Environmental Radiological Operating Report had a discrepancy in average mrem/quarter for 1996. This error, which occurred on the graph, but not in the data table, was due to an averaging error in preparation of the graph. A corrected graph is included with the erroneous graph for comparison, Figures 7-1 A & B.

Three items reportable in the Annual Environmental Radiological Operating Report under CHA-RETS-VARIATION were reported as follows:

1.) April, 1997, Circ-out water Ba-La LLD was exceeded due to laboratory error.
2.) September, 1997, Environmental air sampler #7 out of service, Trouble Card issued to repair or replace sampler.
3.) September, 1997, Environmental air sampler #6 out of service, Trouble Card issued to repair or replace sampler.


External Penetration Radiation
Thermoluminescent Dosimetry
AVE mRem / QTR
25.0
20.0
15.0
10.0
5.0
0.0
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36
38
40
TLD Location Number
1995
1996

Rochester Gas and Electric