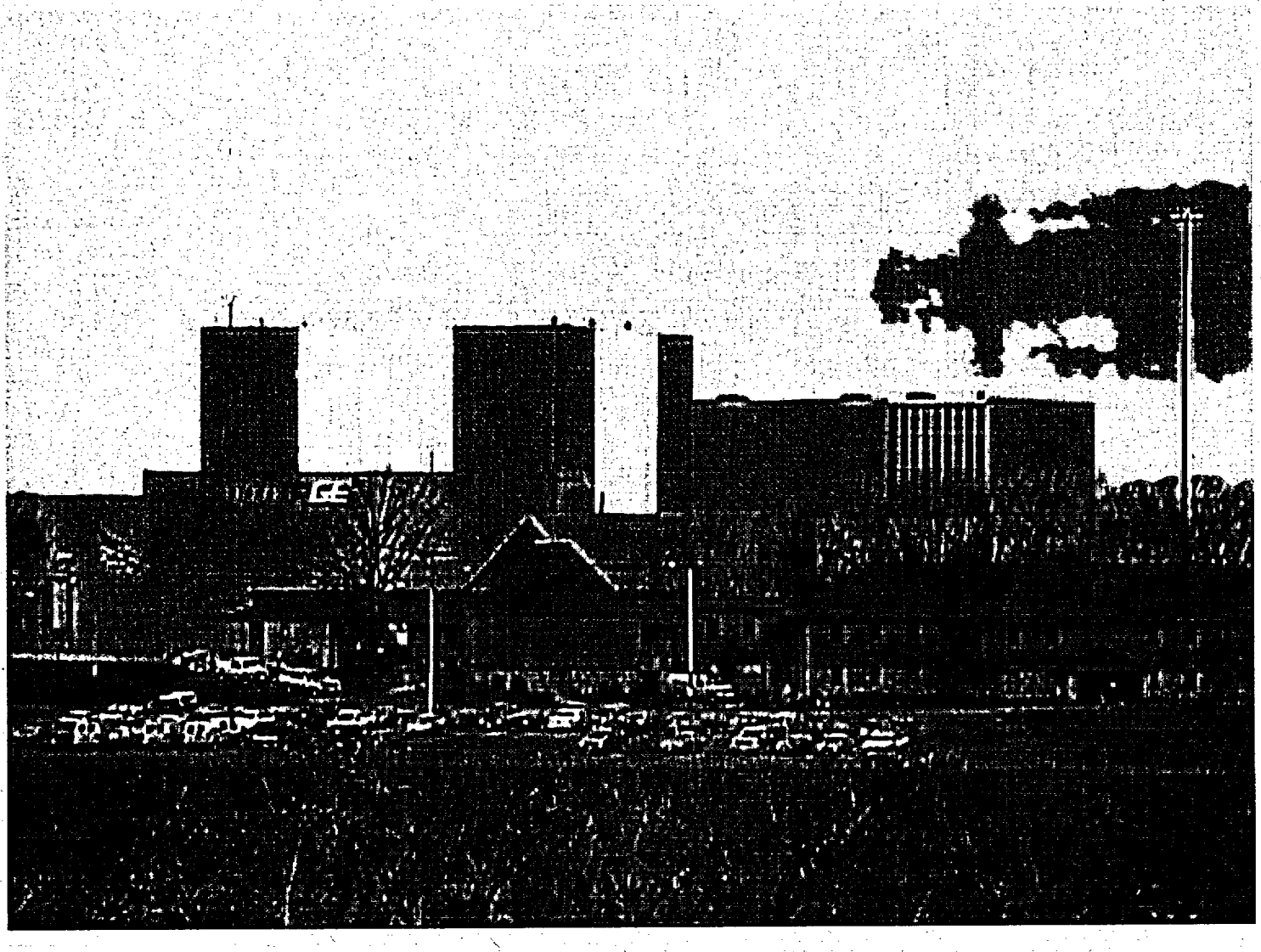
2002
Annual Effluent Operating Report



R.E. Ginna Nuclear Plant
Rochester Gas and Electric

Docket No. 50-244

2002

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

R. E. GINNA NUCLEAR PLANT

ROCHESTER GAS AND ELECTRIC

DOCKET NO. 50-244

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1.0 INTRODUCTION

This Annual Radioactive Effluent Release Report is for the Rochester Gas and Electric Corporation R. E. Ginna Nuclear Power Plant and is submitted in accordance with the requirements of Technical Specification Section 5.6.3. The report covers the period from January 1, 2002 through December 31, 2002.

This report includes a summary of the quantities of radioactive gaseous and liquid effluents and solid waste released from the plant presented in the format outlined in Appendix B of Regulatory Guide 1.21, Revision 1, June 1974.

All gaseous and liquid effluents discharged during this reporting period were in compliance with the limits of the R. E. Ginna Technical Specifications as defined in the Offsite Dose Calculation Manual (ODCM).

2.0 SUPPLEMENTAL INFORMATION

2.1 Regulatory Limits

The ODCM limits applicable to the release of radioactive material in liquid and gaseous effluents are:

2.1.1 Fission and Activation Gases

The instantaneous dose rate, as calculated in the ODCM, due to noble gases released in gaseous effluents from the site shall be limited to a release rate which would yield $\leq$ 500 mrem/yr to the total body and $\leq$ 3000 mrem/yr to the skin if allowed to continue for a full year.

The air dose, as calculated in the ODCM, due to noble gases released in gaseous effluents from the site shall be limited to the following:

(I) During any calendar quarter to $\leq$ 5 mrad for gamma radiation and to $\leq$ 10 mrad for beta radiation.

(ii) During any calendar year to $\leq$ 10 mrad for gamma radiation and to $\leq$ 20 mrad for beta radiation.

2.1.2 Radioiodine, Tritium and Particulates

The instantaneous dose rate, as calculated in the ODCM, due to radioactive materials released in gaseous effluents from the site as radioiodines, radioactive materials in particulate form, and radionuclides other than noble gases with half-lives greater than 8 days shall be limited to a release rate which would yield $\leq$ 1500 mrem/yr to any organ if allowed to continue for a full year.

The dose to an individual, as calculated in the ODCM, from radioiodine, radioactive materials in particulate form and radionuclides other than noble gases with half-lives greater than eight days released with gaseous effluents from the site shall be limited to the following:

(i) During any calendar quarter to $\leq$ 7.5 mrem to any organ.

(ii) During any calendar year to $\leq$ 15 mrem to any organ.

2.1.3 Liquid Effluents

The release of radioactive liquid effluents shall be such that the concentration in the circulating water discharge does not exceed the limits specified in accordance with Appendix B, Table II, Column 2 and notes thereto of 10CFR20. For dissolved or entrained noble gases the total activity due to dissolved or entrained noble gases shall not exceed 2 E-4 μCi/ml.

The dose or dose commitment to an individual as calculated in the ODCM from radioactive materials in liquid effluents released to unrestricted areas shall be limited:

(i) During any calendar quarter to $\leq$ 1.5 mrem to the total body and to $\leq$ 5 mrem to any organ, and

(ii) During any calendar year to $\leq$ 3 mrem to the total body and to $\leq$ 10 mrem to any organ.

2.2 Maximum Permissible Concentrations (MPC)

2.2.1 For gaseous effluents, maximum permissible concentrations are not directly used in release rate calculations since the applicable limits are stated in terms of dose rate at the unrestricted area boundary.

2.2.2 For liquid effluents, ten times the effluent concentration values specified in 10CFR20, Appendix B, Table II, column 2, are used to calculate release rates and permissible concentrations at the unrestricted area boundary as permitted by Technical Specification 5.5.4.b. A value of 2E-04 μCi/ml is used as the MPC for dissolved and entrained noble gases in liquid effluents.

2.3 Release Rate Limits Based on Average Nuclide Energy. The release rate limits for fission and activation gases from the R. E. Ginna Nuclear Station are not based on the average energy of the radionuclide mixture in gaseous effluents; therefore, this value is not applicable. However, the 2002 average beta/gamma energy of the radionuclide mixture in fission and activation gases released from Ginna Station is available for review upon request.

2.4 Measurements and Approximations of Total Radioactivity

Gamma spectroscopy was the primary analysis method used to determine the radionuclide composition and concentration of gaseous and liquid effluents. Composite samples were analyzed for Sr-89, Sr-90 and Fe-55 by a contract laboratory. Tritium and alpha analysis were performed using liquid scintillation and gas flow proportional counting respectively.

The total radioactivity in effluent releases was determined from the measured concentration of each radionuclide present and the total volume of effluents released.

2.5 Batch Releases

2.5.1 Liquid

1. Number of batch releases:	1.87 E+02
2. Total time period for batch releases:	4.45 E+04 min
3. Maximum time period for a batch release:	3.87 E+03 min
4. Average time period for batch releases:	2.38 E+02 min
5. Minimum time period for a batch release:	7.00 E+00 min
6. Average blowdown (LPM) during periods of effluent release into the discharge canal.	320*

*Continuous overboard blowdown from steam generators began 8/26/02.

2.5.2 Gaseous

1. Number of batch releases:	3.1 E+01
2. Total time period for batch releases:	4.14 E+04 min
3. Maximum time period for a batch release:	3.04 E+04 min
4. Average time period for batch releases:	1.34 E+03 min
5. Minimum time period for a batch release:	6.00 E+01 min

2.6 Abnormal Releases

The Containment equipment hatch was open between 3/19/02 and 4/11/02 for refueling outage activities. A non-routine batch release permit was generated in accordance with the requirements of section 2.5 of the ODCM, and the calculated conservative doses to the public were included in the applicable monthly release reports.

A small defect was detected in a section of the plant vent ductwork in September 2002. The defect was repaired in December 2002. Air samples were taken continuously during the period that the defect was open, and no radioactivity was detected. A conservative assessment of the potential air flow out of the defect represented an insignificant fraction of vent flow, and would have had a conservative effect on the calculated doses to the public from plant vent releases, so no adjustment to plant vent release calculations were made.

3.0 SUMMARY OF GASEOUS RADIOACTIVE EFFLUENTS

The quantities of radioactive material released in gaseous effluents are summarized in tables 1A and 1B. Plant vent and Containment Vent releases are modeled as mixed mode and Air Ejector is modeled as ground level release.

4.0 SUMMARY OF LIQUID RADIOACTIVE EFFLUENTS

The quantities of radioactive material released in liquid effluents are summarized in tables 2A and 2B.

5.0 SOLID WASTE

The quantities of radioactive material released in shipments of solid waste transported from the site during the reporting period are summarized in Table 3. Principal nuclides were determined by gamma spectroscopy and non-gamma emitters were calculated from scaling factors determined by an independent laboratory from representative samples of that waste type. The majority of Dry Active Waste is processed utilizing an off-site processor who reduces the volume and then sends the waste for burial.

6.0 LOWER LIMIT OF DETECTION

The a-posteriori Lower Limit of Detection (LLD), reported on gamma spectroscopy analysis as Minimum Detectable Activity (MDA), was not met on the following eight occasions of liquid batch releases in 2002. Actions have been taken to reduce depletion of the liquid waste processing resin. The a-priori LLD, as defined in the ODCM, was met for all liquid batch releases in 2002.

"A" Monitor Tank release #2002045, 3/15/02.
Depletion of the liquid waste treatment demineralizer resin led to higher activity in the counted sample. Cs-137, Fe-59, and Zn-65 did not meet LLD's.
"A" monitor Tank release #2002078, 4/5/02.
Depletion of the liquid waste treatment demineralizer resin led to higher activity in the counted sample. Cs-137, Fe-59, and Zn-65 did not meet LLD's.
"A" Monitor Tank release #2002079, 4/6/02.
Depletion of the liquid waste treatment demineralizer resin led to higher activity in the counted sample. Cs-137, Fe-59, and Zn-65 did not meet LLD's.
"A: Monitor Tank release #2002080, 4/7/02.
Depletion of the liquid waste treatment demineralizer resin led to higher activity in the counted sample. Cs-137, Fe-59, Cs-134, Ce-141, and Zn-65 did not meet LLD's.
"A" Monitor Tank release #2002084, 4/11/02.
Depletion of the liquid waste treatment demineralizer resin led to higher activity in the counted sample. Cs-137, Fe-59, Cs-134, Ce-141, and Zn-65 did not meet LLD's.
"A" Monitor Tank release #2002137, 7/18/02.
Depletion of the liquid waste treatment demineralizer resin led to higher activity in the counted sample. Cs-137, Fe-59, Cs-134, Ce-141, I-131, and Zn-65 did not meet LLD's.
"A" Monitor Tank release #2002143, 7/31/02.
Depletion of the liquid waste treatment demineralizer resin led to higher activity in the counted sample. Cs-137, Fe-59, Cs-134, Ce-141, I-131, and Zn-65 did not meet LLD's.
"A" Monitor Tank release #2002152, 8/14/02.
Interference from Ag-110m led to Cs-137 LLD not being met.

7.0 RADIOLOGICAL IMPACT

An assessment of doses to the maximally exposed individual from gaseous and liquid effluents was performed for locations representing the maximum calculated dose in occupied sectors. Meteorological sectors from WNW through ENE are entirely over Lake Ontario. In all cases, doses were well below Technical Specification limits as defined in the ODCM. Doses were assessed based upon actual meteorological conditions considering the noble gas exposure, inhalation, ground plane and ingestion pathways. The ingestion pathways considered were the fruit, vegetable, fish, drinking water, goat's milk, cow's milk and meat pathways. The results of this assessment are presented in Tables 4A and 4B.
Since the events of September 11, 2001, Ginna Station Security has been augmented by full-time presence of the New York State Police and the New York National Guard. These personnel have posts within the site boundary. For these personnel, the noble gas exposure and uptake pathways for 2002 are evaluated using maximum meteorological dispersion and deposition parameters on-site in order to assess dose to members of the public on-site.

7.1 Total Dose

40CFR190 limits the total dose to members of the public due to radiation and radioactivity from uranium fuel cycle sources to:

<25 mrem total body or any organ and;
<75 mrem thyroid for a calendar year.

Using the maximum gaseous effluent and liquid effluent exposure and uptake pathways at the site boundary, and the maximum direct radiation measurements at 600 meters SSE, the following are the dose summaries to the hypothetical maximally exposed individual member of the public.

7.9 mrem total body (7.9 mrem direct radiation plus 1.9E-2 mrem all other pathways).
1.24E-2 mrem thyroid (maximum organ dose).

These doses effectively bound the maximum doses to a real member of the public.

Using the maximum gaseous effluent and liquid effluent exposure and uptake pathways on-site in the vicinity of the National Guard outpost, and the maximum direct radiation measurements nearest the outpost, the following are the dose summaries to the hypothetical maximally exposed member of the public on-site.

3.6 mrem total body (3.6 mrem direct radiation plus 1.9E-2 mrem all other pathways)
1.24E-2 mrem thyroid (maximum organ dose).

8.0 METEOROLOGICAL DATA

The annual summary of hourly meteorological data collected during 2002 is not included with this report, but can be made available at the R. E. Ginna Nuclear Station.

9.0 LAND USE CENSUS CHANGES

There were no changes in critical receptor location for dose calculations during the reporting period. There were no large changes in land use within 5 miles of the plant. Additional new homes were built at a rate similar to past years.

10.0 CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

The ODCM was revised January 24, 2002 to correct transcriptional errors, clarify instructions, and include explanatory notes. No major changes were made to requirements or to methodology used in calculation of offsite dose. See attached ODCM, revision 17.

11.0 CHANGES TO THE PROCESS CONTROL PROGRAM

There were no changes to the Process Control Program during the reporting period.

12.0 MAJOR CHANGES TO RADWASTE TREATMENT SYSTEMS

There were no major changes to the Radwaste Treatment Systems during the reporting period.

13.0 INOPERABLE MONITORS

- RM-14A, Plant Vent Accident Range Radiation Monitor, was out of service from 3/17/02 through 4/16/02 for repair following a failure of source check channels 3 and 6.
- RM-14A, Plant Vent Accident Range Radiation Monitor, was out of service from 10/01/02 through 10/09/02 due to failure of channel 9.
- RM-12A, Containment Vent Accident Range Radiation Monitor was out of service from 3/22/02 through 4/19/02 due to noise spikes on channel 2.
- R10-B, Plant Vent Iodine Monitor, was out of service from 10/2/02 through 12/31/02 for modification of sample line.
- R-13, Plant Vent Particulate Monitor, was out of service from 10/2/02 through 12/31/02 for modification of sample line.

14.0 CHANGES TO PREVIOUS ANNUAL EFFLUENT OPERATING REPORTS

None.

ROCHESTER GAS ELECTRIC CORPORATION

Table 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
January - June : 2002

A. Fission & activation gases	Unit	Quarter 1st	Quarter 2nd	Est. Total Error, %
1. Total release	Ci	1.12E+01	7.95E+00	1.50E+01
2. Average release rate for period	uCi/sec	1.45E+00	1.01E+00	
3. Percent of technical specification limit	%	2.30E-04	1.60E-04	
B. Iodines				
1. Total iodine-131	Ci	2.33E-05	3.04E-05	1.50E+01
2. Average release rate for period	uCi/sec	2.99E-06	3.87E-06	
3. Percent of technical specification limit	%	6.57E-03	8.50E-03	
C. Particulates				
1. Particulates with half-lives > 8days	Ci	1.67E-06		2.00E+01
2. Average release rate for period	uCi/sec	2.15E-07		
3. Percent of technical specification limit	%	1.62E-05		
4. Gross alpha radioactivity	Ci			
D. Tritium				
1. Total release	Ci	1.11E+01	1.25E+01	9.20E+00
2. Average release rate for period	uCi/sec	1.41E+00	1.59E+00	
3. Percent of technical specification limit	%	1.66E-04	1.87E-04	

Note: Isotope for which no value is given were not identified in applicable releases.

ROCHESTER GAS ELECTRIC CORPORATION

Table 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
July - December 2002

A. Fission & activation gases	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
1. Total release	Ci	7.59E+00	5.14E+00	1.50E+01
2. Average release rate for period	uCi/sec	9.55E-01	6.47E-01	
3. Percent of technical specification limit	%	1.52E-04	1.03E-04	
B. Iodines				
1. Total iodine-131	Ci	1.30E-05	8.62E-06	1.50E+01
2. Average release rate for period	uCi/sec	1.64E-06	1.08E-06	
3. Percent of technical specification limit	%	3.59E-03	2.38E-03	
C. Particulates				
1. Particulates with half-lives > 8days	Ci			2.00E+01
2. Average release rate for period	uCi/sec			
3. Percent of technical specification limit	%			
4. Gross alpha radioactivity	Ci			
D. Tritium				
1. Total release	Ci	2.37E+01	6.47E+00	9.20E+00
2. Average release rate for period	uCi/sec	2.98E+00	8.14E-01	
3. Percent of technical specification limit	%	3.51E-04	9.58E-05	

Note: Isotope for which no value is given were not identified in applicable releases.

ROCHESTER GAS ELECTRIC CORPORATION

Table 1B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
GASEOUS EFFLUENTS - CONTINUOUS AND BATCH RELEASES

		Continuous Mode		Batch Mode	
Nuclides released	Unit	Quarter	Quarter	Quarter	Quarter
		1st	2nd	1st	2nd
1. Fission gases					
argon-41	Ci			1.83E-01	3.18E-02
krypton-85	Ci				
krypton-85m	Ci			2.20E-03	
krypton-87	Ci				
krypton-88	Ci				
xenon-131m	Ci			1.20E-02	
xenon-133	Ci	7.29E+00	5.72E+00	1.61E+00	1.76E-01
xenon-133m	Ci	1.12E-02		2.69E-02	
xenon-135	Ci	2.05E+00	2.01E+00	6.55E-02	3.53E-03
xenon-135m	Ci				
xenon-138	Ci				
others (specify)	Ci				
	Ci				
	Ci				
	Ci				
Total for period	Ci	9.35E+00	7.73E+00	1.90E+00	2.11E-01
2. Iodines					
iodine-131	Ci	2.31E-05	3.04E-05	1.96E-07	1.78E-08
iodine-132	Ci	1.86E-03		6.43E-07	2.75E-08
iodine-133	Ci	9.26E-06	1.26E-05	4.22E-08	
Total for period	Ci	1.89E-03	4.30E-05	8.81E-07	4.53E-08
3. Particulates					
strontium-89	Ci	1.68E-06			
strontium-90	Ci				
cesium-134	Ci				
cesium-137	Ci				
niobium-95	Ci				
cobalt-58	Ci				
cobalt-60	Ci				
Total for period	Ci	1.68E-06			
unidentified	Ci				

Note: Isotope for which no value is given were not identified in applicable releases.

ROCHESTER GAS ELECTRIC CORPORATION

Table 1B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
GASEOUS EFFLUENTS - CONTINUOUS AND BATCH RELEASES

		Continuous Mode		Batch Mode	
Nuclides released	Unit	Quarter	Quarter	Quarter	Quarter
		3rd	4th	3rd	4th
1. Fission gases					
argon-41	Ci			4.69E-02	2.99E-02
krypton-85	Ci				
krypton-85m	Ci				1.45E-04
krypton-87	Ci				
krypton-88	Ci				
xenon-131m	Ci			8.77E-04	
xenon-133	Ci	4.73E+00	3.14E+00	4.37E-01	3.97E-01
xenon-133m	Ci			1.37E-03	2.99E-03
xenon-135	Ci	2.36E+00	1.57E+00	7.70E-03	9.22E-03
xenon-135m	Ci				
xenon-138	Ci				
others (specify)	Ci				
	Ci				
	Ci				
	Ci				
Total for period	Ci	7.09E+00	4.71E+00	4.94E-01	4.39E-01
2. Iodines					
iodine-131	Ci	1.30E-05	8.62E-06		
iodine-133	Ci	1.48E-05	9.80E-06		
iodine-135	Ci				
Total for period	Ci	2.78E-05	1.84E-05		
3. Particulates					
strontium-89	Ci				
strontium-90	Ci				
cesium-134	Ci				
cesium-137	Ci				
niobium-95	Ci				
cobalt-58	Ci				
cobalt-60	Ci				
Total for period	Ci				
unidentified	Ci				

Note: Isotope for which no value is given were not identified in applicable releases.

ROCHESTER GAS ELECTRIC CORPORATION

Table 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
January - June 2002

A. Fission and activation products	Unit	Quarter 1st	Quarter 2nd	Est.Total Error, %
1. Total release (not including tritium, gases, alpha)	Ci	7.02E-04	2.40E-04	9.90E+00
2. Average diluted concentration during period	uCi/ml	5.74E-12	1.45E-12	
3. Percent of applicable limit	%	3.30E-05	9.72E-05	
B. Tritium				
1. Total release	Ci	1.43E+02	3.10E+01	9.20E+00
2. Average diluted concentration during period	uCi/ml	1.17E-06	2.24E-07	
3. Percent of applicable limit	%	5.85E+00	1.12E+00	
C. Dissolved and entrained gases				
1. Total release	Ci	2.89E-03	1.82E-04	9.90E+00
2. Average diluted concentration during period	uCi/ml	2.37E-11	1.32E-12	
3. Percent of applicable limit	%	1.19E-05	6.60E-07	
D. Gross alpha radioactivity				
1. Total release	Ci			
E. Vol. of waste released (prior to dilution)	Liters	3.20E+07	2.87E+07	
F. Vol. of dilution water used during period	Liters	1.22E+11	1.38E+11	

Note: Isotope for which no value is given were not identified in applicable releases.

ROCHESTER GAS ELECTRIC CORPORATION

Table 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES
July - December 2002

A. Fission and activation products	Unit	Quarter 3rd	Quarter 4th	Est.Total Error, %
1. Total release (not including tritium, gases, alpha)	Ci	1.17E-02	7.34E-06	9.90E+00
2. Average diluted concentration during period	uCi/ml	6.84E-11	4.64E-14	
3. Percent of applicable limit	%	7.28E-05	2.32E-08	
B. Tritium				
1. Total release	Ci	2.11E+01	4.63E+01	9.20E+00
2. Average diluted concentration during period	uCi/ml	1.24E-07	2.92E-07	
3. Percent of applicable limit	%	6.20E-01	1.46E+00	
C. Dissolved and entrained gases				
1. Total release	Ci			
2. Average diluted concentration during period	uCi/ml			
3. Percent of applicable limit	%			
D. Gross alpha radioactivity				
1. Total release	Ci	1.35E-05		2.00E+01
E. Vol. of waste released (prior to dilution)	Liters	5.52E+07	6.80E+07	
F. Vol. of dilution water used during period	Liters	1.71E+11	1.58E+11	

Note: Isotope for which no value is given were not identified in applicable releases.

ROCHESTER GAS ELECTRIC CORPORATION

Table 2B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
LIQUID EFFLUENTS

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter	Quarter	Quarter	Quarter
		1st	2nd	1st	2nd
chromium-51	Ci				3.63E-04
manganese-54	Ci				
iron-55	Ci			3.61E-04	2.30E-04
iron-59	Ci				
cobalt-58	Ci			1.01E-04	5.16E-03
cobalt-60	Ci			8.97E-05	5.21E-04
zinc-65	Ci				
strontium-89	Ci				
strontium-90	Ci				
zirconium/niobium-95	Ci			6.07E-07	1.66E-05
molybdenum-99	Ci				
silver-110m	Ci			2.51E-05	8.08E-05
antimony-122	Ci				
antimony-124	Ci				
antimony-125	Ci			1.25E-04	
iodine-131	Ci				
iodine-133	Ci				
iodine-135	Ci				
cesium-134	Ci				
cesium-136	Ci				
cesium-137	Ci				3.22E-06
barium/lanthanum-140	Ci				
cerium-141	Ci				
Te-123m	Ci				
Sn-113	Ci				
Co-57	Ci				1.39E-05
Total for period (above)	Ci			7.02E-04	6.38E-03
unidentified	Ci				

xenon-133	Ci			2.67E-03	1.82E-04
xenon-135	Ci			2.18E-04	

Note: Isotope for which no value is given were not identified in applicable releases.

ROCHESTER GAS ELECTRIC CORPORATION

Table 2B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
LIQUID EFFLUENTS

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter	Quarter	Quarter	Quarter
		3rd	4th	3rd	4th
chromium-51	Ci			4.81E-04	
manganese-54	Ci			1.00E-04	
iron-55	Ci			1.50E-03	
iron-59	Ci				
cobalt-58	Ci			5.15E-03	7.34E-06
cobalt-60	Ci			2.09E-03	
zinc-65	Ci				
strontium-89	Ci				
strontium-90	Ci				
niobium-95	Ci			3.89E-04	
molybdenum-99	Ci				
silver-110m	Ci			1.38E-03	
antimony-122	Ci				
antimony-124	Ci				
antimony-125	Ci			1.93E-04	
iodine-131	Ci				
iodine-133	Ci				
iodine-135	Ci				
cesium-134	Ci				
cesium-136	Ci				
cesium-137	Ci				
barium/lanthanum-140	Ci				
cerium-141	Ci				
Sn-113	Ci				
Zr-95	Ci			2.16E-04	
Co-57				6.36E-05	
Total for period (above)	Ci			1.16E-02	7.34E-06
unidentified	Ci				

xenon-133	Ci				
xenon-135	Ci				

Note: Isotope for which no value is given were not identified in applicable releases.

Table 3
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
January 1, 2002 - December 31, 2002

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL - (Not irradiated fuel)

1. Type of waste	Unit	12 month period	Est. total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3 Ci	7.38 312	7.0 E+00 1.4 E+01
b. Dry compressible waste, contaminated equip, etc.	m^3 Ci	11.81 3.43	7.0 E+00 1.4 E+01
c. Irradiated components, control rods, etc.	m^3 Ci	N/A N/A	N/A N/A
d. Other:	m^3 Ci	N/A N/A	N/A N/A

2.Estimate of major nuclide composition (by type of waste)

a.			b.			d.		
Co-58	%	22.35	Co-58	%	18.7		%	
Ni-63	%	39	Fe-55	%	37.3		%	
Cs-134	%	2.44	Cr-51	%	4.5		%	
Cs-137	%	7.24	Co-60	%	16.9		%	
Co-60	%	13.2	Ni-63	%	14.23		%	
Fe-55	%	12.25	Mn-54	%	0.88		%	
Mn-54	%	1.3	Zr-95	%	0.79		%	
Ce-144	%	0.72	Ce-144	%	0.49		%	
	%		Nb-95	%	0.95		%	
	%		Cs-137	%	0.38		%	
	%		H-3	%	1.71		%	
Total		98.5	Total		96.8	Total		

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
2	Sole Use Truck	Oak Ridge, TN
2	Sole Use Truck	Barnwell, SC
1	Sole Use Truck	Irwin, TN

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
None		

Table 4A

Radiation Dose to Maximum Individual Receptor From Gaseous Releases

First Quarter 2002

(Units In rem)

	All	All	Adult	Teen	Child	Infant
	T. Body	Skin	THYRD	THYRD	THYRD	THYRD
N	1.01E-06	1.38E-06				
NNE	8.79E-07	1.11E-06				
NE	8.00E-07	1.08E-06				
ENE	9.58E-07	1.45E-06				
E	1.07E-06	1.72E-07	1.51E-06	1.53E-06	1.37E-06	8.19E-07
ESE	7.68E-07	9.89E-07	5.05E-07	5.13E-07	4.59E-07	2.73E-07
SE	1.08E-06	1.25E-06	3.80E-07	3.94E-07	3.52E-07	2.09E-07
SSE	1.30E-06	1.67E-06	7.51E-07	7.63E-07	6.83E-07	4.06E-07
S	1.43E-06	1.81E-06	8.79E-07	8.93E-07	7.99E-07	4.76E-07
SSW	1.21E-06	1.39E-06	4.17E-07	4.23E-07	3.78E-07	2.24E-07
SW	1.21E-06	1.41E-06	4.63E-07	4.71E-07	4.20E-07	2.50E-07
WSW	5.92E-07	8.12E-07	5.01E-07	5.10E-07	4.56E-07	2.71E-07
W	6.23E-07	9.13E-07	6.68E-07	6.80E-07	6.08E-07	3.63E-07
WNW	8.83E-07	1.19E-06	6.94E-07	7.06E-07	6.31E-07	3.76E-07
NW	7.22E-07	1.08E-06				
NNW	8.22E-07	1.15E-06				
MAX.	1.43E-06	1.81E-06	1.51E-06	1.53E-06	1.37E-06	8.19E-07

Note: Meteorological sectors without thyroid dose entries are entirely over Lake Ontario

Table 4A

Radiation Dose to Maximum Individual Receptor From Gaseous Releases

Second Quarter 2002

(Units In rem)

	All	All	Adult	Teen	Child	Infant
	T. Body	Skin	THYRD	THYRD	THYRD	THYRD
N	2.80E-07	4.19E-07				
NNE	2.79E-07	4.29E-07				
NE	4.38E-07	6.87E-07				
ENE	4.12E-07	6.38E-07				
E	3.60E-07	5.53E-07	6.92E-07	7.02E-07	6.24E-07	3.24E-07
ESE	3.38E-07	5.10E-07	6.25E-07	6.34E-07	5.63E-07	3.32E-07
SE	2.97E-07	3.60E-07	3.49E-07	3.54E-07	3.15E-07	1.85E-07
SSE	2.83E-07	3.77E-07	4.00E-07	4.05E-07	3.60E-07	2.13E-07
S	2.75E-07	3.27E-07	2.92E-07	2.96E-07	2.63E-07	1.55E-07
SSW	2.52E-07	2.63E-07	1.79E-07	1.81E-07	1.61E-07	9.48E-08
SW	3.07E-07	3.01E-07	1.71E-07	1.73E-07	1.54E-07	9.04E-08
WSW	2.28E-07	3.56E-07	4.58E-07	4.64E-07	4.12E-07	2.43E-07
W	2.86E-07	4.89E-07	6.76E-07	6.85E-07	6.09E-07	3.59E-07
WNW	4.43E-07	7.59E-07	1.05E-06	1.06E-06	9.44E-07	5.57E-07
NW	4.28E-07	7.48E-07				
NNW	4.33E-07	7.41E-07				
MAX.	4.43E-07	7.59E-07	1.05E-06	1.06E-06	9.44E-07	5.57E-07

Note: Meteorological sectors without thyroid dose are entirely over Lake Ontario

Table 4A

Radiation Dose to Maximum Individual Receptor From Gaseous Releases

Third Quarter 2002

(Units In rem)

	All	All	Adult	Teen	Child	Infant
	T. Body	Skin	THYRD	THYRD	THYRD	THYRD
N	5.57E-07	9.03E-07				
NNE	3.68E-07	5.24E-07				
NE	4.62E-07	6.25E-07				
ENE	4.57E-07	6.93E-07				
E	3.73E-07	5.08E-07	9.12E-07	9.21E-07	8.14E-07	4.72E-07
ESE	3.53E-07	4.77E-07	8.40E-07	8.48E-07	7.99E-07	4.35E-07
SE	4.08E-07	5.84E-07	1.17E-06	1.18E-06	1.05E-06	6.08E-07
SSE	4.06E-07	5.80E-07	1.17E-06	1.18E-60	1.04E-06	6.04E-07
S	3.18E-07	4.46E-07	8.57E-07	8.65E-07	7.64E-07	4.44E-07
SSW	2.47E-07	3.05E-07	4.06E-07	4.10E-07	3.62E-07	2.10E-07
SW	4.00E-07	5.30E-07	8.86E-07	8.95E-07	7.90E-07	4.59E-07
WSW	4.40E-07	7.24E-07	1.86E-06	1.88E-06	1.66E-06	9.64E-07
W	4.30E-07	7.05E-07	1.81E-06	1.82E-06	1.61E-06	9.36E-07
WNW	5.22E-07	8.59E-07	2.18E-06	2.20E-06	1.94E-06	1.13E-06
NW	7.25E-07	1.23E-06				
NNW	5.26E-07	8.72E-07				
MAX.	7.25E-07	1.23E-06	2.18E-06	2.20E-06	1.94E-06	1.13E-06

Note: Meteorological sectors without thyroid dose are entirely over Lake Ontario

Table 4A

Radiation Dose to Maximum Individual Receptor From Gaseous Releases

Fourth Quarter 2002

(Units In rem)

	All	All	Adult	Teen	Child	Infant
	T. Body	Skin	THYRD	THYRD	THYRD	THYRD
N	2.59E-07	3.87E-07				
NNE	2.32E-07	3.36E-07				
NE	3.29E-07	5.06E-07				
ENE	2.36E-07	3.48E-07				
E	2.28E-07	3.36E-07	2.46E-07	2.48E-07	2.20E-07	1.29E-07
ESE	2.95E-07	4.26E-07	2.86E-07	2.89E-07	2.56E-07	1.50E-07
SE	2.76E-07	3.78E-07	1.98E-07	2.00E-07	1.77E-07	1.03E-07
SSE	2.92E-07	3.96E-07	1.96E-07	1.98E-07	1.75E-07	1.02E-07
S	2.84E-07	3.75E-07	1.53E-07	1.54E-07	1.37E-07	7.96E-08
SSW	3.13E-07	4.17E-07	1.84E-07	1.86E-07	1.65E-07	8.67E-08
SW	2.95E-07	3.90E-07	1.67E-07	1.68E-07	1.49E-07	8.67E-08
WSW	3.12E-07	5.08E-07	5.02E-07	5.08E-07	4.51E-07	2.64E-07
W	2.88E-07	4.69E-07	4.62E-07	4.67E-07	4.14E-07	2.42E-07
WNW	2.74E-07	4.07E-07	3.07E-07	3.10E-07	2.75E-07	1.61E-07
NW	2.63E-07	4.20E-07				
NNW	2.41E-07	3.84E-07				
MAX.	3.29E-07	5.08E-07	5.02E-07	5.08E-07	4.51E-07	2.64E-07

Note: Meteorological sectors without thyroid dose entries are entirely over Lake Ontario

Radiation Dose To Maximum Individual Receptor

From Liquid Release

2002

(Units in rem)

	Adult	Teen	Child	Infant
First Quarter				
T. Body	1.24E-06	8.80E-07	1.66E-06	1.61E-06
Bone	3.11E-10	3.19E-10	5.50E-10	1.84E-10
Thyroid	1.24E-06	8.80E-07	1.66E-06	1.61E-06
Second Quarter				
T. Body	2.27E-07	1.61E-07	3.02E-07	2.92E-07
Bone	1.19E-09	1.26E-09	1.69E-09	1.51E-10
Thyroid	2.27E-07	1.61E-07	3.02E-07	2.92E-07
Third Quarter				
T. Body	1.26E-07	8.95E-08	1.68E-07	1.62E-07
Bone	1.02E-09	1.04E-09	1.74E-09	5.60E-10
Thyroid	1.26E-07	8.95E-08	1.68E-07	1.62E-07
Fourth Quarter				
T. Body	2.69E-07	1.90E-07	3.58E-07	3.48E-07
Bone	<1.0E-10	<1.0E-10	<1.0E-10	<1.0E-10
Thyroid	2.69E-07	1.90E-07	3.58E-07	3.48E-07

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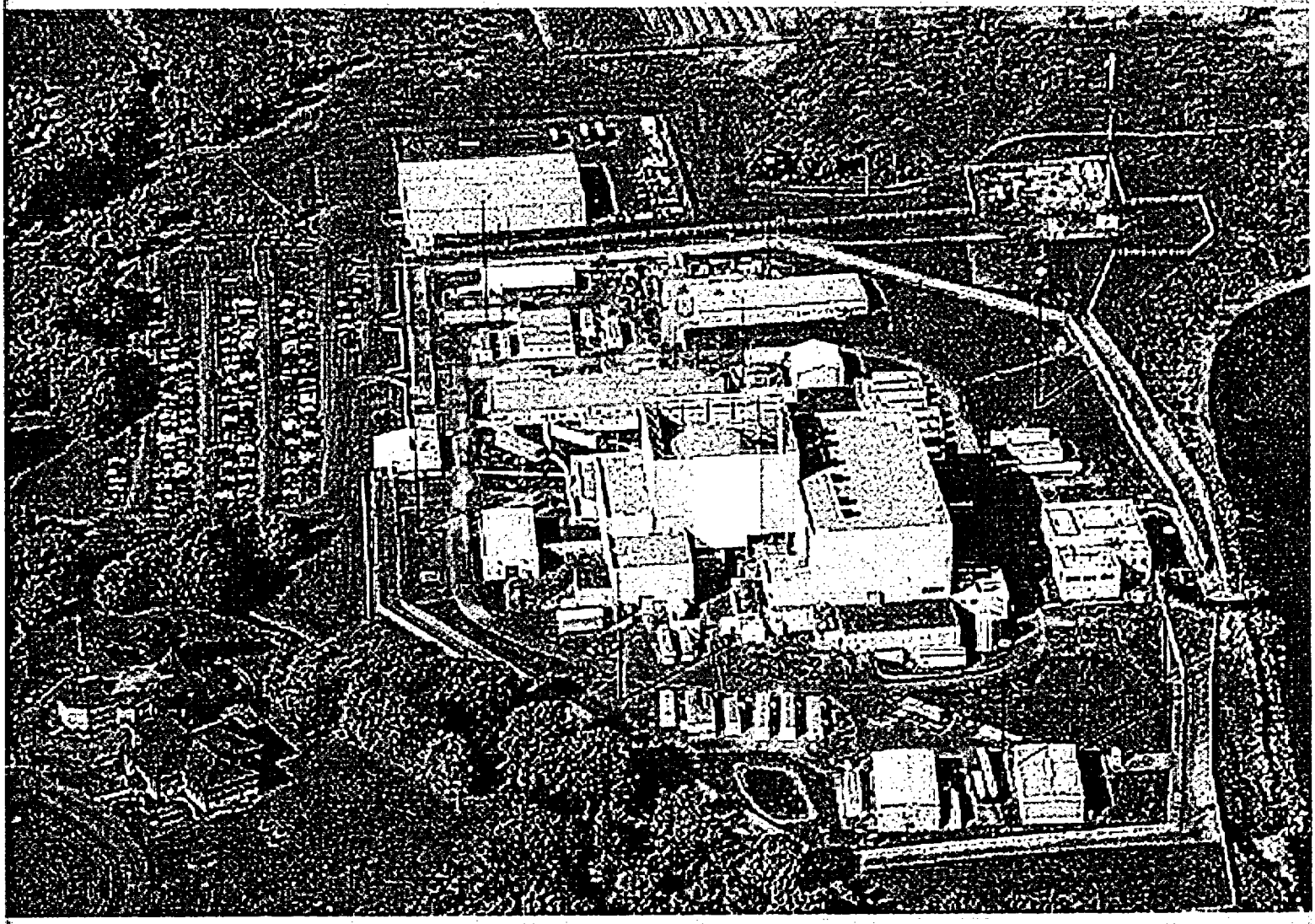

R.E. Ginna Nuclear Plant
Rochester Gas and Electric

Docket No. 50-244

2002

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

R.E. Ginna Nuclear Plant

Rochester Gas & Electric Corporation

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1.0 SUMMARY

The Annual Radiological Environmental Operating Report is published in accordance with Section 5.0 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 radiation or low concentrations of Cs-137 resulting from past atmospheric nuclear weapons testing. Terrestrial pathways monitored 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 2002 results were consistent with data for the past five years and exhibited no adverse trends.

The analytical results from the 2002 Radiological Environmental Monitoring Program demonstrate that the operation of the R. E. Ginna Nuclear Power Plant had no measurable radiological impact on the environment. The results also demonstrate that operation of the plant did not result in a measurable radiation dose to the general population above natural background levels.

During 2002, 1185 samples were collected for analysis by gross beta counting and/or gamma spectroscopy. These included 932 air samples, 60 water samples, 18 fish samples, 5 sediment samples, 9 vegetation samples, 47 milk samples, and 156 thermoluminescent dosimeter measurements. During 2002 there were two deviations from the sampling schedule for air samples. The minimum number of samples required in ODCM Table 5-1 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

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

PATHWAY SAMPLED UNIT OF MEASUREMENT	TYPE AND TOTAL NUMBER OF ANALYSES	LLD	INDICATOR LOCATIONS MEAN (1) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATION MEAN (1) RANGE
				NAME, DISTANCE AND DIRECTION	MEAN (1) RANGE	
AIR: Particulate (pCi/M^3)	Gross Beta 624	0.003	0.017 (468/468) 0.006-0.032	Onsite Location #13 194 690M	0.019 (52/52) 0.011 - 0.030	0.016 (156/156) 0.007 - 0.034
(pCi/M^3)	Gamma Scan 48	(2)	< LLD	N/A	N/A	< LLD
Iodine (pCi/M^3)	Gamma Scan 260	0.006 - 0.057	< LLD	N/A	N/A	< LLD
DIRECT RADIATION: TLD (mrem/quarter)	Gamma 156	5.0	12.5 (120/120) 10.1 – 18.0	Onsite Location #7 257 220M	17.7 (4/4) 17.4 – 18.0	11.2 (36/36) 10.0 – 13.4
WATER: Drinking (pCi/Liter)	Gross Beta 12	0.2	2.35 (12/12) 1.13 – 3.81	OWD 70 1200M	2.35 1.13 – 3.81	N/A
	Gamma Scan 12	(2)	Ra-226 89 (11/12) 34 – 130	OWD 70 1200M	Ra-226 89 (11/12) 34 – 130	N/A
	Tritium 12	(2)	<LLD	N/A	N/A	N/A
	Iodine 12	0.58*	< LLD	N/A	N/A	N/A
WATER: Surface (pCi/Liter)	Gross Beta 48	0.2	2.06 (12/12) 0.82 - 2.94	Deer Creek 105 260M	3.62 (12/12) 1.51 – 5.75	2.14 (12/12) 0.76 – 3.09
	Gamma Scan 48	(2)	Ra-226 100 (10/12) 60 – 120	Circ-out 15 130M	Ra-226 100 (10/12) 60 - 120	Ra-226 95 (12/12) 41 – 165
	Tritium 48	(2)	<LLD	N/A	N/A	N/A
	Iodine 48	0.56*	< LLD	N/A	N/A	< LLD
MILK: (pCi/Liter)	Iodine 58	0.46*	< LLD	N/A	N/A	< LLD
	Gamma Scan 58	(2)	< LLD	N/A	N/A	< LLD
FISH: (pCi/Kg)	Gamma Scan 17	(2)	Ra-226 487 (8/9) 262 - 776	Indicator Fish 015 130M	Ra-226 487 (8/9) 262 - 776	Ra-226 198 (4/4) 122 – 391
VEGETATION: (pCi/Kg)	Gamma Scan 9	(2)	Ra-226 355 (5/5) 99.7 - 691	Indicator Vegetation	Ra-226 355 (5/5) 99.7 - 691	Ra-226 135 (3/4) 65 - 204
SEDIMENT: (pCi/Kg)	Gamma Scan 5	(2)	Ra-226 703 (2/3) 682 - 724	Indicator Sediment	Ra-226 703 (2/3) 682 - 724	Ra-226 975 (2/2) 950 - 1000

(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 and tritium measurements.

* Average LLD

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 regulations, 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 5-1 of the ODCM. Following are the requirements from the ODCM:

Monitoring Program

The radiological environmental monitoring program shall be conducted as specified in Table 5-1 at the locations given in the ODCM.

If the radiological environmental monitoring program is not conducted as specified in Table 5-1, 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 Radiological Environmental Operating 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 (if available) 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 either the meteorological sector having the highest historical D/Q, or in a location with a higher D/Q than the location of the maximally exposed individual, 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 5-1. Acceptable locations are shown in the ODCM. Samples shall be analyzed pursuant to the requirements of Tables 5-1 and 5-3.

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.

Table 2-1 Page 1 of 2
Offsite Dose Calculation Manual Table 5-1

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. Radioiodine	5 indicator 1 control	Continuous operation of sampler with sample collection at least once per 10 days	Radioiodine canister. Analyze within 7 days of collection for Iodine-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.
c. Shoreline Sediment	1 Control (Russell Station) 1 Indicator (Ontario Water District)	Semi-annnually	Gamma isotopic analysis of each sample

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

Offsite Dose Calculation Manual Table 5-1
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)	At least once per 15 days	Gamma isotopic and I-131 analysis of each sample.
	1 control 1 indicator (November thru May)	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. Other crops grown on site by contract farmer	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 *leaves from 3 different plant species composited	Gamma isotopic analysis on edible portion of sample.

* See Land Use Census, page 50

Table 2-2 Page 1 of 2

The maximum LLD values as defined by ODCM Table 5-3

Analysis	Water (pCi/Liter)	Airborne Particulate or Gas (pCi/m^3)	Fish (pCi/kg,wet)	Milk (pCi/Liter)	Food Products (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

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

Sediment Samples	Direction	Distance
OWD Shoreline I	70	2200
Russell Shoreline C	270	25600
Lake Ontario Benthic S	70	2200

Milk Sample Locations	Direction	Distance
Farm A I	113	8270
Farm B I	242	4680
Farm C I	156	5230
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

I = Indicator Samples

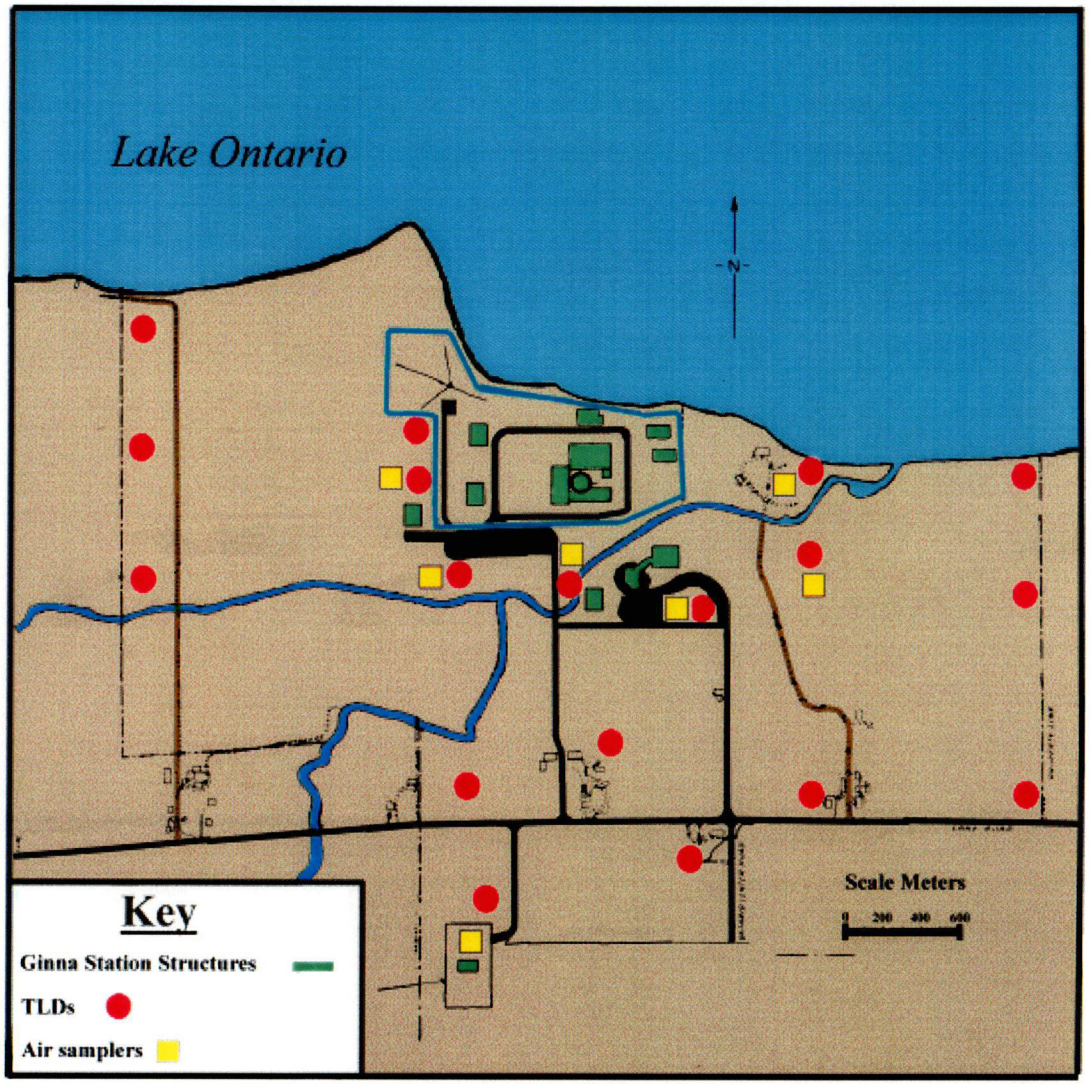
C = Control Samples

S = Supplemental Samples

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

Map 2-1

Onsite Sample Locations



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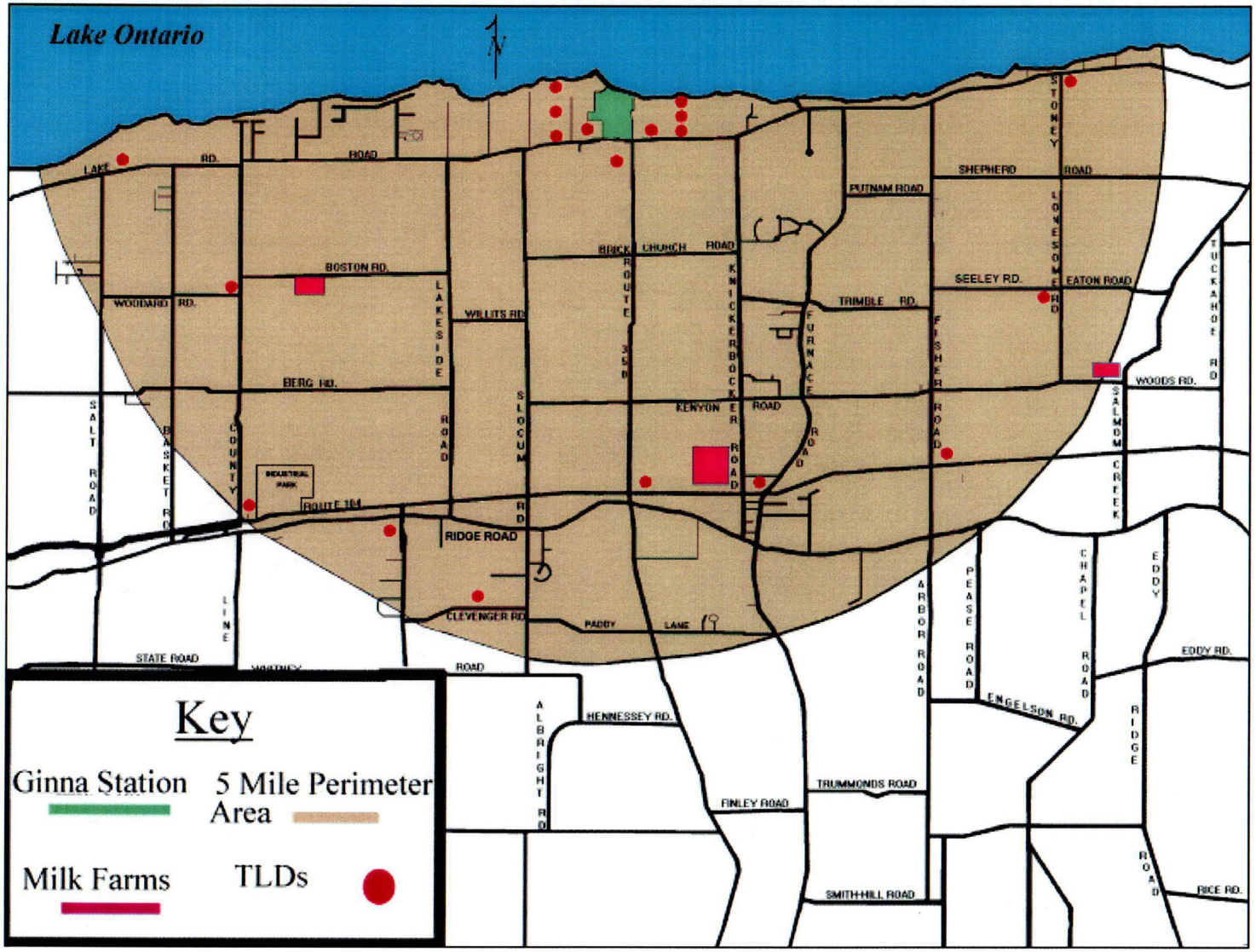
Map 2-2
Offsite Sample Locations
Location of TLDs and milk farms within 5 mile radius of Ginna Station *.



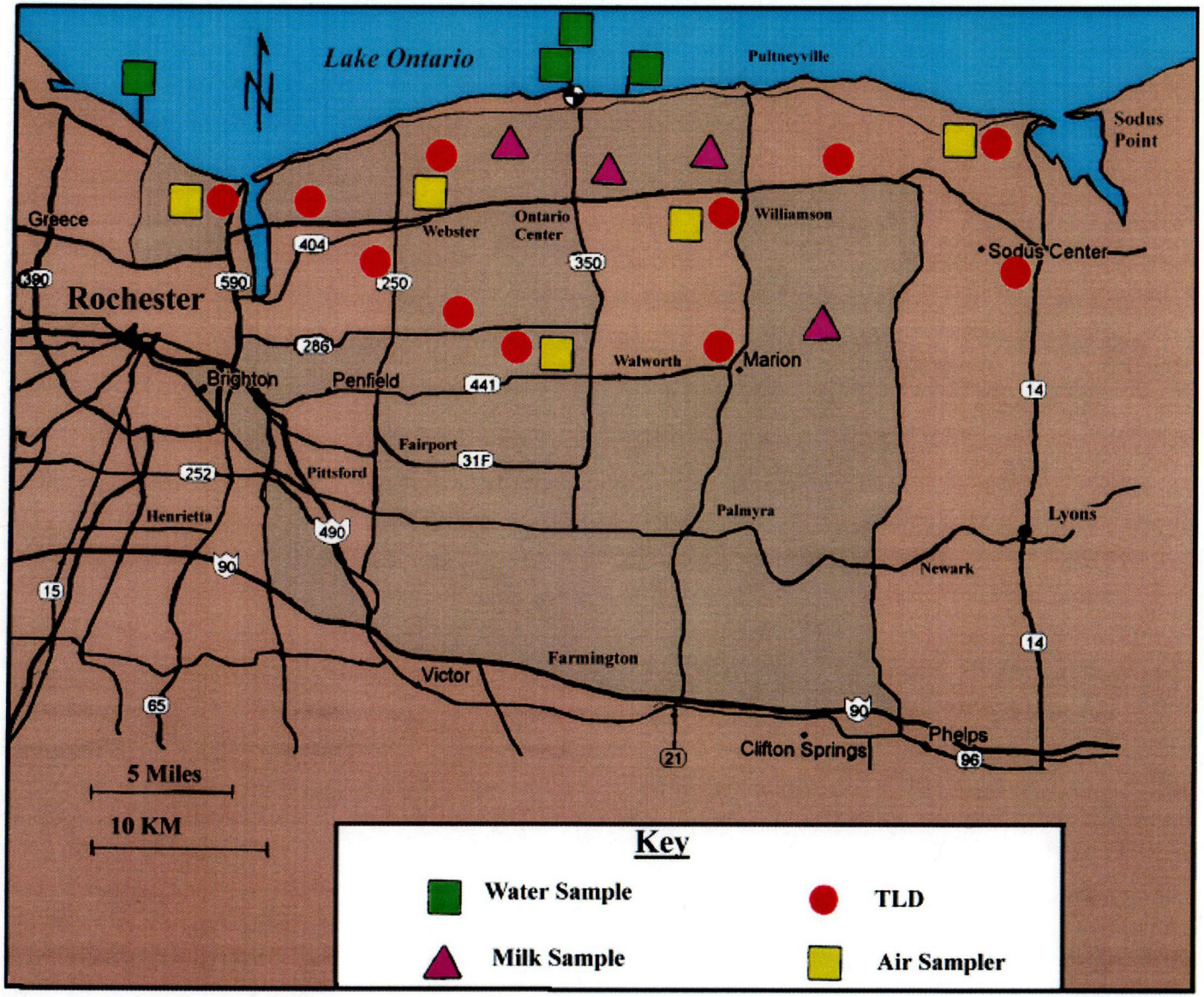
* Onsite samples detailed on map 2-1.

C02

Map 2-3

Water Sample and 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.

C03

3.0 DATA SUMMARY

3.1 Analytical Results

The values listed on the following tables include the uncertainties stated as +/- 1 standard deviation.

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 U.S. 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 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 decay 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 420 meters from the reactor centerline near the point of the maximum annual average ground level concentration, 1 more is located on-site at 690 meters, and 2 others offsite at approximately 7 miles. In addition, there are 3 sampling stations located approximately 7 to 16 miles from the site that serve as control stations.

Based on weekly comparisons, there was no statistical difference between the Control and Indicator radioactive particulate concentrations. The averages for the control samples were 0.016 pCi/m^3, and the averages for the indicators were 0.018 pCi/m^3 for the period of January to December, 2002. Maximum weekly concentrations for each station were less than 0.038 pCi/m^3. These values include a worst-case evaluation of the two environmental air sample gas meters which failed as-found testing on 5/23/02 and 8/14/02. The failed as-found flows were 108% and 127%, respectively, at Stations 3 and 13. See section 7.0.
The major airborne species 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 and some of the particulate activity is due to short lived noble gas decay products.

Tables 3-1A, 3-1B are a list of gross beta analysis values for the on-site sample stations. Tables 3-2A, 3-2B are a list of gross beta analysis values for the off-site sampler stations.

The particulate filters from each sampling location were saved and a 13 week composite was made. A gamma isotopic analysis was performed for each sampling location and corrected for decay. The results of these analyses are listed in Tables 3-4 A to D, and indicate only the naturally occurring radioisotopes, Be-7 and K-40.

Radioiodine cartridges are placed at six locations. These cartridges are changed and analyzed each week. No positive analytical results were found on any sample. A list of values for these cartridges is given in Table 3-5.

A trend plot of the 2002 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.

Rochester Gas and Electric

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

Collection Date	Station #2 (I)	Station #3 (I)	Station #4 (I)	Station #5 (I)	Station #6 (I)	Station #7 (I)	Station #13 A (I)	Average
7-Jan	0.021 ± 0.004	0.019 ± 0.004	0.022 ± 0.004	0.019 ± 0.005	0.022 ± 0.005	0.026 ± 0.005	0.023 ± 0.006	0.022
14-Jan	0.017 ± 0.003	0.020 ± 0.003	0.017 ± 0.003	0.016 ± 0.004	0.018 ± 0.003	0.019 ± 0.003	0.021 ± 0.005	0.018
21-Jan	0.016 ± 0.003	0.018 ± 0.003	0.017 ± 0.003	0.017 ± 0.004	0.017 ± 0.003	0.017 ± 0.003	0.022 ± 0.004	0.018
28-Jan	0.023 ± 0.003	0.019 ± 0.003	0.022 ± 0.003	0.020 ± 0.004	0.022 ± 0.004	0.020 ± 0.004	0.026 ± 0.005	0.022
4-Feb	0.014 ± 0.003	0.018 ± 0.003	0.020 ± 0.003	0.021 ± 0.004	0.020 ± 0.004	0.017 ± 0.003	0.023 ± 0.005	0.019
11-Feb	0.021 ± 0.003	0.030 ± 0.004	0.023 ± 0.003	0.021 ± 0.004	0.025 ± 0.004	0.026 ± 0.004	0.030 ± 0.005	0.025
18-Feb	0.013 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.016 ± 0.004	0.014 ± 0.003	0.016 ± 0.003	0.018 ± 0.005	0.015
25-Feb	0.018 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.015 ± 0.004	0.012 ± 0.003	0.014 ± 0.003	0.027 ± 0.005	0.017
4-Mar	0.017 ± 0.003	0.015 ± 0.003	0.032 ± 0.006	0.017 ± 0.004	0.017 ± 0.003	0.017 ± 0.003	0.019 ± 0.003	0.019
11-Mar	0.024 ± 0.003	0.027 ± 0.004	0.022 ± 0.003	0.026 ± 0.004	0.019 ± 0.003	0.025 ± 0.004	0.027 ± 0.004	0.024
18-Mar	0.022 ± 0.003	0.028 ± 0.004	0.021 ± 0.003	0.020 ± 0.004	0.021 ± 0.004	0.024 ± 0.004	0.023 ± 0.003	0.023
25-Mar	0.013 ± 0.003	0.021 ± 0.004	0.016 ± 0.003	0.016 ± 0.004	0.012 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.016
1-Apr	0.014 ± 0.003	0.021 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.018 ± 0.003	0.018 ± 0.003	0.022 ± 0.003	0.018
8-Apr	0.015 ± 0.003	0.018 ± 0.004	0.014 ± 0.003	0.014 ± 0.004	0.011 ± 0.003	0.015 ± 0.004	0.016 ± 0.003	0.015
15-Apr	0.014 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.017 ± 0.004	0.013 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.015
22-Apr	0.019 ± 0.003	0.024 ± 0.004	0.020 ± 0.003	0.019 ± 0.004	0.017 ± 0.003	0.019 ± 0.004	0.020 ± 0.003	0.020
29-Apr	0.014 ± 0.003	0.020 ± 0.004	0.015 ± 0.003	0.013 ± 0.004	0.017 ± 0.003	0.015 ± 0.003	0.018 ± 0.003	0.016
6-May	0.011 ± 0.002	0.017 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.013 ± 0.003	0.014 ± 0.003	0.017 ± 0.003	0.014
13-May	0.014 ± 0.003	0.016 ± 0.003	0.014 ± 0.003	0.015 ± 0.004	0.017 ± 0.003	0.015 ± 0.003	0.019 ± 0.003	0.016
21-May	0.008 ± 0.002	0.011 ± 0.003	0.009 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.008 ± 0.003	0.011 ± 0.003	0.009
28-May	0.009 ± 0.002	0.012 ± 0.003	0.010 ± 0.002	0.012 ± 0.003	0.010 ± 0.003	0.010 ± 0.003	0.013 ± 0.003	0.011
3-Jun	0.014 ± 0.003	0.012 ± 0.003	0.015 ± 0.003	0.013 ± 0.004	0.010 ± 0.003	0.016 ± 0.004	0.017 ± 0.004	0.014
10-Jun	0.011 ± 0.003	0.015 ± 0.003	0.013 ± 0.003	0.010 ± 0.003	0.012 ± 0.003	0.014 ± 0.003	0.013 ± 0.003	0.013
17-Jun	0.007 ± 0.002	0.011 ± 0.003	0.010 ± 0.003	0.011 ± 0.003	0.007 ± 0.003	0.010 ± 0.003	0.013 ± 0.004	0.010
24-Jun	0.025 ± 0.003	0.023 ± 0.004	0.021 ± 0.004	0.023 ± 0.004	0.019 ± 0.003	0.020 ± 0.004	0.018 ± 0.003	0.021
1-Jul	0.019 ± 0.003	0.021 ± 0.004	0.019 ± 0.003	0.018 ± 0.004	0.015 ± 0.003	0.019 ± 0.004	0.017 ± 0.003	0.018
Maximum	0.026 ± 0.004	0.038 ± 0.004	0.032 ± 0.006	0.026 ± 0.005	0.025 ± 0.005	0.026 ± 0.005	0.030 ± 0.006	
Average	0.017	0.024	0.017	0.016	0.016	0.017	0.019	
Minimum	0.007 ± 0.002	0.014 ± 0.003	0.009 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.008 ± 0.003	0.011 ± 0.003	

(a) Sample collected for <84 hours in sample period

I = Indicator
C = Control

Rochester Gas and Electric

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

Collection Date	Station #2 (I)	Station #3 (I)	Station #4 (I)	Station #5 (I)	Station #6 (I)	Station #7 (I)	Station #13 A (I)	Average
8-Jul	0.019 ± 0.003	0.024 ± 0.004	0.024 ± 0.004	0.023 ± 0.004	0.021 ± 0.004	0.020 ± 0.003	0.024 ± 0.003	0.022
15-Jul	0.018 ± 0.003	0.020 ± 0.004	0.016 ± 0.003	0.017 ± 0.004	0.017 ± 0.003	0.018 ± 0.004	0.018 ± 0.003	0.018
22-Jul	0.021 ± 0.003	0.024 ± 0.004	0.024 ± 0.004	0.020 ± 0.004	0.020 ± 0.003	0.029 ± 0.005	0.020 ± 0.003	0.023
30-Jul	0.017 ± 0.003	0.018 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.015 ± 0.003	0.015 ± 0.003	0.016 ± 0.003	0.016
5-Aug	0.022 ± 0.004	0.025 ± 0.004	0.019 ± 0.004	0.019 ± 0.005	0.020 ± 0.003	0.019 ± 0.003	0.021 ± 0.003	0.021
12-Aug	0.017 ± 0.003	0.019 ± 0.003	0.014 ± 0.003	0.013 ± 0.004	0.013 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.015
19-Aug	0.026 ± 0.004	0.020 ± 0.004	0.030 ± 0.004	0.030 ± 0.005	0.023 ± 0.003	0.024 ± 0.003	0.027 ± 0.004	0.026
26-Aug	0.013 ± 0.003	0.012 ± 0.003	0.015 ± 0.003	0.012 ± 0.004	0.016 ± 0.003	0.013 ± 0.003	0.016 ± 0.003	0.014
3-Sep	0.012 ± 0.003	0.012 ± 0.003	0.017 ± 0.003	0.015 ± 0.004	0.017 ± 0.003	0.013 ± 0.002	0.014 ± 0.003	0.014
9-Sep	0.021 ± 0.004	0.020 ± 0.004	0.021 ± 0.004	0.016 ± 0.005	0.019 ± 0.003	0.020 ± 0.003	0.022 ± 0.004	0.020
16-Sep	0.025 ± 0.004	0.023 ± 0.004	0.022 ± 0.004	0.015 ± 0.004	0.026 ± 0.004	0.020 ± 0.003	0.023 ± 0.003	0.022
23-Sep	0.023 ± 0.004	0.024 ± 0.004	0.026 ± 0.004	0.007 ± 0.003	0.025 ± 0.004	0.025 ± 0.003	0.024 ± 0.004	0.022
30-Sep	0.018 ± 0.003	0.018 ± 0.004	0.020 ± 0.004	0.000 ± 0.003(a)	0.022 ± 0.003	0.017 ± 0.003	0.019 ± 0.003	0.019
7-Oct	0.022 ± 0.004	0.022 ± 0.004	0.026 ± 0.004	0.017 ± 0.005	0.024 ± 0.004	0.019 ± 0.003	0.021 ± 0.003	0.022
14-Oct	0.011 ± 0.003	0.010 ± 0.003	0.013 ± 0.003	0.013 ± 0.004	0.016 ± 0.003	0.009 ± 0.002	0.012 ± 0.003	0.012
21-Oct	0.010 ± 0.003	0.012 ± 0.003	0.011 ± 0.003	0.011 ± 0.004	0.012 ± 0.003	0.009 ± 0.002	0.013 ± 0.003	0.011
28-Oct	0.013 ± 0.003	0.011 ± 0.003	0.012 ± 0.003	0.014 ± 0.004	0.013 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.013
4-Nov	0.012 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.009 ± 0.008	0.015 ± 0.003	0.013 ± 0.003	0.014 ± 0.003	0.013
12-Nov	0.028 ± 0.004	0.030 ± 0.004	0.029 ± 0.004	0.028 ± 0.005	0.030 ± 0.004	0.022 ± 0.003	0.030 ± 0.004	0.028
18-Nov	0.016 ± 0.003	0.014 ± 0.004	0.015 ± 0.004	0.016 ± 0.005	0.016 ± 0.003	0.014 ± 0.003	0.016 ± 0.003	0.015
25-Nov	0.019 ± 0.003	0.014 ± 0.003	0.017 ± 0.003	0.022 ± 0.005	0.022 ± 0.004	0.015 ± 0.003	0.022 ± 0.004	0.019
2-Dec	0.016 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.018 ± 0.005	0.014 ± 0.003	0.011 ± 0.003	0.016 ± 0.003	0.014
9-Dec	0.020 ± 0.003	0.020 ± 0.004	0.018 ± 0.003	0.022 ± 0.005	0.025 ± 0.004	0.018 ± 0.003	0.021 ± 0.004	0.021
16-Dec	0.019 ± 0.004	0.019 ± 0.004	0.019 ± 0.004	0.022 ± 0.005	0.017 ± 0.003	0.017 ± 0.003	0.017 ± 0.004	0.019
23-Dec	0.014 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.019 ± 0.005	0.015 ± 0.003	0.013 ± 0.003	0.019 ± 0.003	0.015
30-Dec	0.019 ± 0.003	0.016 ± 0.003	0.020 ± 0.004	0.019 ± 0.005	0.020 ± 0.003	0.016 ± 0.003	0.018 ± 0.003	0.018
Maximum	0.028 ± 0.004	0.030 ± 0.004	0.030 ± 0.004	0.030 ± 0.008	0.030 ± 0.004	0.029 ± 0.005	0.030 ± 0.004	
Average	0.018	0.018	0.018	0.016	0.019	0.017	0.019	
Minimum	0.010 ± 0.003	0.010 ± 0.003	0.011 ± 0.003	0.000 ± 0.003	0.012 ± 0.003	0.009 ± 0.002	0.012 ± 0.003	

(a) Sample collected for <84 hours in sample period

I = Indicator
C = Control

Rochester Gas and Electric

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

Collection Date	Station #8 (C)	Station #9 (I)	Station #10 (C)	Station #11 (I)	Station #12 (C)	Average
7-Jan	0.023 ± 0.004	0.021 ± 0.005	0.016 ± 0.006	0.018 ± 0.004	0.019 ± 0.004	0.019
14-Jan	0.015 ± 0.003	0.018 ± 0.004	0.019 ± 0.005	0.020 ± 0.003	0.015 ± 0.003	0.017
21-Jan	0.015 ± 0.003	0.017 ± 0.004	0.017 ± 0.005	0.020 ± 0.003	0.015 ± 0.003	0.017
28-Jan	0.023 ± 0.003	0.021 ± 0.004	0.018 ± 0.005	0.025 ± 0.003	0.020 ± 0.003	0.021
4-Feb	0.018 ± 0.003	0.019 ± 0.004	0.015 ± 0.005	0.017 ± 0.003	0.016 ± 0.003	0.017
11-Feb	0.023 ± 0.003	0.024 ± 0.004	0.027 ± 0.005	0.024 ± 0.003	0.024 ± 0.003	0.024
18-Feb	0.014 ± 0.003	0.018 ± 0.004	0.014 ± 0.005	0.015 ± 0.003	0.013 ± 0.003	0.015
25-Feb	0.015 ± 0.003	0.015 ± 0.004	0.012 ± 0.004	0.016 ± 0.003	0.014 ± 0.003	0.014
4-Mar	0.013 ± 0.003	0.015 ± 0.004	0.015 ± 0.005	0.016 ± 0.003	0.014 ± 0.003	0.015
11-Mar	0.025 ± 0.006(a)	0.023 ± 0.004	0.021 ± 0.005	0.026 ± 0.004	0.020 ± 0.003	0.023
18-Mar	0.016 ± 0.005	0.023 ± 0.004	0.025 ± 0.005	0.025 ± 0.004	0.021 ± 0.003	0.022
25-Mar	0.015 ± 0.003	0.017 ± 0.004	0.011 ± 0.005	0.016 ± 0.003	0.015 ± 0.003	0.015
1-Apr	0.015 ± 0.003	0.015 ± 0.004	0.015 ± 0.004	0.016 ± 0.003	0.013 ± 0.003	0.015
8-Apr	0.015 ± 0.003	0.017 ± 0.004	0.014 ± 0.005	0.017 ± 0.003	0.016 ± 0.003	0.016
15-Apr	0.015 ± 0.003	0.015 ± 0.004	0.012 ± 0.004	0.014 ± 0.003	0.013 ± 0.003	0.014
22-Apr	0.018 ± 0.003	0.023 ± 0.004	0.018 ± 0.005	0.021 ± 0.003	0.017 ± 0.003	0.019
29-Apr	0.016 ± 0.003	0.015 ± 0.004	0.016 ± 0.005	0.017 ± 0.003	0.012 ± 0.003	0.015
6-May	0.013 ± 0.003	0.014 ± 0.003	0.010 ± 0.004	0.011 ± 0.003	0.011 ± 0.002	0.012
13-May	0.014 ± 0.003	0.013 ± 0.003	0.013 ± 0.008	0.014 ± 0.003	0.015 ± 0.003	0.014
21-May	0.007 ± 0.002	0.009 ± 0.002	0.009 ± 0.004	0.008 ± 0.003	0.008 ± 0.002	0.008
28-May	0.009 ± 0.002	0.010 ± 0.002	0.009 ± 0.004	0.012 ± 0.003	0.009 ± 0.002	0.010
3-Jun	0.013 ± 0.003	0.015 ± 0.005	0.011 ± 0.005	0.013 ± 0.004	0.012 ± 0.003	0.013
10-Jun	0.011 ± 0.003	0.006 ± 0.007	0.016 ± 0.005	0.011 ± 0.003	0.012 ± 0.002	0.011
17-Jun	0.008 ± 0.002	0.008 ± 0.002	0.011 ± 0.004	0.009 ± 0.003	0.009 ± 0.003	0.009
24-Jun	0.016 ± 0.003	0.016 ± 0.003	0.018 ± 0.005	0.017 ± 0.003	0.018 ± 0.004	0.017
1-Jul	0.016 ± 0.003	0.017 ± 0.003	0.013 ± 0.004	0.016 ± 0.003	0.016 ± 0.004	0.016
Maximum	0.025 ± 0.005	0.024 ± 0.007	0.027 ± 0.008	0.026 ± 0.004	0.024 ± 0.004	
Average	0.015	0.016	0.015	0.017	0.015	
Minimum	0.007 ± 0.002	0.006 ± 0.002	0.009 ± 0.004	0.008 ± 0.003	0.008 ± 0.002	

(a) Sample collected for <84 hours in sample period

I = Indicator
C = Control

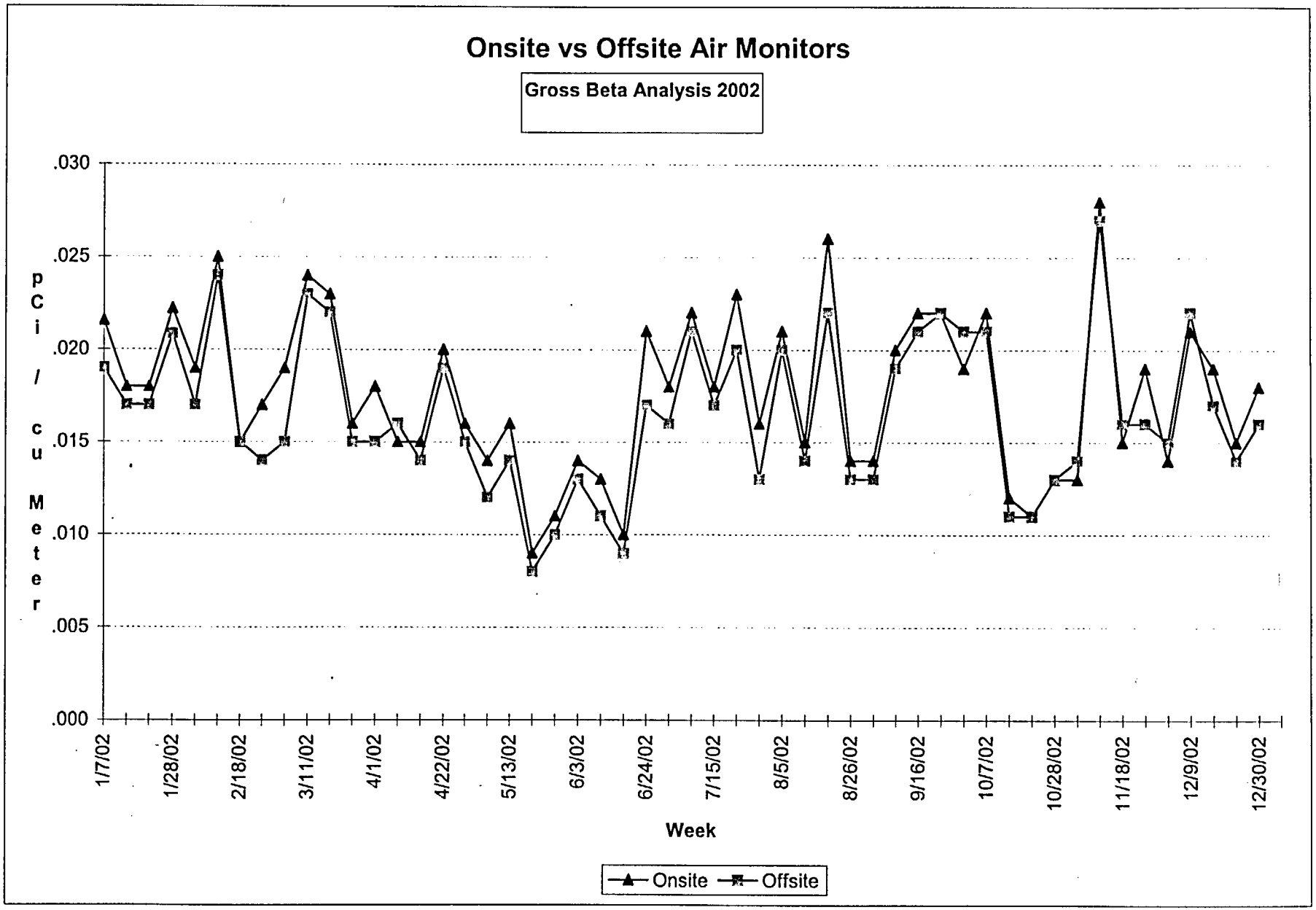
Rochester Gas and Electric

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

Collection Date	Station #8 (C)	Station #9 (I)	Station #10 (C)	Station #11 (I)	Station #12 (C)	Average
8-Jul	0.023 ± 0.003	0.021 ± 0.003	0.023 ± 0.005	0.019 ± 0.004	0.020 ± 0.004	0.021
15-Jul	0.017 ± 0.003	0.017 ± 0.003	0.018 ± 0.005	0.016 ± 0.003	0.016 ± 0.003	0.017
22-Jul	0.018 ± 0.003	0.022 ± 0.003	0.021 ± 0.005	0.019 ± 0.004	0.019 ± 0.004	0.020
30-Jul	0.014 ± 0.003	0.013 ± 0.003	0.013 ± 0.005	0.015 ± 0.003	0.012 ± 0.003	0.013
5-Aug	0.022 ± 0.003	0.020 ± 0.003	0.022 ± 0.005	0.016 ± 0.004	0.020 ± 0.004	0.020
12-Aug	0.014 ± 0.003	0.013 ± 0.003	0.017 ± 0.005	0.012 ± 0.003	0.016 ± 0.003	0.014
19-Aug	0.025 ± 0.004	0.021 ± 0.003	0.021 ± 0.003	0.022 ± 0.004	0.023 ± 0.004	0.022
26-Aug	0.014 ± 0.003	0.014 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.010 ± 0.003	0.013
3-Sep	0.013 ± 0.003	0.012 ± 0.002	0.013 ± 0.002	0.013 ± 0.003	0.014 ± 0.003	0.013
9-Sep	0.022 ± 0.004	0.019 ± 0.003	0.017 ± 0.003	0.018 ± 0.004	0.019 ± 0.004	0.019
16-Sep	0.021 ± 0.003	0.021 ± 0.003	0.021 ± 0.003	0.021 ± 0.004	0.022 ± 0.004	0.021
23-Sep	0.024 ± 0.004	0.023 ± 0.003	0.021 ± 0.003	0.022 ± 0.004	0.022 ± 0.004	0.022
30-Sep	0.021 ± 0.003	0.023 ± 0.003	0.019 ± 0.003	0.020 ± 0.004	0.022 ± 0.004	0.021
7-Oct	0.019 ± 0.003	0.021 ± 0.003	0.022 ± 0.003	0.018 ± 0.004	0.024 ± 0.004	0.021
14-Oct	0.013 ± 0.003	0.010 ± 0.003	0.012 ± 0.003	0.009 ± 0.003	0.011 ± 0.004	0.011
21-Oct	0.012 ± 0.003	0.010 ± 0.002	0.012 ± 0.002	0.010 ± 0.003	0.010 ± 0.003	0.011
28-Oct	0.012 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.011 ± 0.003	0.015 ± 0.004	0.013
4-Nov	0.014 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.016 ± 0.004	0.014
12-Nov	0.026 ± 0.003	0.025 ± 0.003	0.023 ± 0.003	0.026 ± 0.004	0.034 ± 0.005	0.027
18-Nov	0.013 ± 0.003	0.016 ± 0.003	0.014 ± 0.003	0.015 ± 0.004	0.021 ± 0.005	0.016
25-Nov	0.015 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.018 ± 0.004	0.018 ± 0.004	0.016
2-Dec	0.014 ± 0.003	0.012 ± 0.002	0.013 ± 0.002	0.014 ± 0.003	0.022 ± 0.004	0.015
9-Dec	0.022 ± 0.004	0.019 ± 0.003	0.019 ± 0.003	0.020 ± 0.004	0.032 ± 0.006	0.022
16-Dec	0.013 ± 0.003	0.015 ± 0.003	0.016 ± 0.003	0.018 ± 0.004	0.022 ± 0.005	0.017
23-Dec	0.012 ± 0.003	0.013 ± 0.003	0.016 ± 0.003	0.013 ± 0.003	0.016 ± 0.005	0.014
30-Dec	0.015 ± 0.003	0.014 ± 0.003	0.013 ± 0.003	0.013 ± 0.003	0.023 ± 0.005	0.016
Maximum	0.026 ± 0.004	0.025 ± 0.003	0.023 ± 0.005	0.026 ± 0.004	0.034 ± 0.006	
Average	0.017	0.017	0.017	0.016	0.019	
Minimum	0.012 ± 0.003	0.010 ± 0.002	0.012 ± 0.002	0.009 ± 0.003	0.010 ± 0.003	

(a) Sample collected for <84 hours in sample period

I = Indicator
C = Control


Onsite vs Offsite Air Monitors
Gross Beta Analysis 2002
.030
.025
.020
.015
.010
.005
.000
pCi/cu Meter
1/7/02
1/28/02
2/18/02
3/11/02
4/1/02
4/22/02
5/13/02
6/3/02
6/24/02
7/15/02
8/5/02
8/26/02
9/16/02
10/7/02
10/28/02
11/18/02
12/9/02
12/30/02
Week
Onsite
Offsite

Rochester Gas and Electric

Table 3-4A
13 Week Composite
Gamma Isotopic Analysis
Results in pCi/m3
First Quarter

Station	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13
Be-7	0.108±0.011	0.079±0.012	0.104±0.0116	0.089±0.0131	0.098±0.012	0.113±0.015	0.081±0.012	0.101±0.017	0.098±0.018	0.121±0.014	0.103±0.011	0.014±0.018
Cs-134	<0.002	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.001	<0.001	<0.002
Cs-137	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.001	<0.001	<0.002
Zr-95	<0.003	<0.004	<0.004	<0.004	<0.004	<0.005	<0.004	<0.004	<0.008	<0.004	<0.003	<0.005
Nb-95	<0.003	<0.004	<0.003	<0.005	<0.004	<0.004	<0.004	<0.004	<0.005	<0.001	<0.003	<0.003
Co-58	<0.022	<0.002	<0.003	<0.003	<0.024	<0.002	<0.002	<0.003	<0.003	<0.002	<0.002	<0.001
Mn-54	<0.013	<0.000	<0.001	<0.002	<0.014	<0.002	<0.001	<0.002	<0.003	<0.001	<0.001	<0.002
Ru-103	<0.003	<0.002	<0.003	<0.004	<0.003	<0.003	<0.003	<0.004	<0.003	<0.003	<0.002	<0.004
Ru-106	<0.012	<0.017	<0.014	<0.014	<0.016	<0.015	<0.017	<0.018	<0.002	<0.013	<0.009	<0.019
Ce-141	<0.004	<0.003	<0.003	<0.003	<0.004	<0.043	<0.003	<0.004	<0.006	<0.003	<0.002	<0.005
Ce-144	<0.006	<0.004	<0.006	<0.006	<0.004	<0.007	<0.006	<0.007	<0.008	<0.006	<0.005	<0.008
Fe-59	<0.006	<0.011	<0.008	<0.032	<0.026	<0.010	<0.005	<0.012	<0.016	<0.007	<0.006	<0.015
Zn-65	<0.004	<0.001	<0.003	<0.006	<0.028	<0.007	<0.004	<0.007	<0.007	<0.003	<0.002	<0.007
Co-60	<0.000	<0.002	<0.002	<0.003	<0.001	<0.002	<0.001	<0.027	<0.004	<0.001	<0.002	<0.003
K-40	0.035±0.007	<0.007	0.023±0.006	<0.007	<0.016	<0.006	0.035±0.009	<0.010	<0.010	<0.005	<0.012	<0.037
Ba/La-140	<0.011	<0.019	<0.020	<0.020	<0.016	<0.025	<0.016	<0.027	<0.029	<0.006	<0.016	<0.034

Rochester Gas and Electric

Table 3-4B
13 Week Composite
Gamma Isotopic Analysis
Results in pCi/m3
Second Quarter

Station	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13
Be-7	0.124±0.013	0.125±0.015	0.112±0.013	0.13±0.018	0.098±0.014	0.099±0.013	0.11±0.012	0.099±0.014	0.11±0.019	0.13±0.016	0.099±0.012	0.11±0.013
Cs-134	<0.001	<0.002	<0.001	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.002	<0.001	<0.002
Cs-137	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Zr-95	<0.004	<0.004	<0.003	<0.005	<0.004	<0.005	<0.004	<0.003	<0.005	<0.005	<0.002	<0.004
Nb-95	<0.003	<0.004	<0.003	<0.006	<0.004	<0.004	<0.001	<0.004	<0.006	<0.003	<0.003	<0.004
Co-58	<0.002	<0.002	<0.001	<0.003	<0.002	<0.002	<0.001	<0.002	<0.004	<0.003	<0.002	<0.002
Mn-54	<0.000	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.000	<0.003	<0.001	<0.001	<0.001
Ru-103	<0.003	<0.002	<0.003	<0.004	<0.003	<0.002	<0.002	<0.002	<0.006	<0.004	<0.002	<0.002
Ru-106	<0.012	<0.016	<0.014	<0.018	<0.021	<0.010	<0.011	<0.010	<0.027	<0.011	<0.013	<0.012
Ce-141	<0.002	<0.003	<0.003	<0.006	<0.004	<0.003	<0.002	<0.004	<0.005	<0.004	<0.003	<0.003
Ce-144	<0.003	<0.005	<0.005	<0.008	<0.007	<0.005	<0.005	<0.007	<0.008	<0.006	<0.005	<0.004
Fe-59	<0.009	<0.003	<0.010	<0.013	<0.010	<0.008	<0.008	<0.003	<0.018	<0.003	<0.005	<0.007
Zn-65	<0.001	<0.003	<0.001	<0.005	<0.004	<0.004	<0.001	<0.006	<0.006	<0.003	<0.003	<0.003
Co-60	<0.000	<0.002	<0.000	<0.003	<0.001	<0.002	<0.002	<0.001	<0.003	<0.001	<0.001	<0.001
K-40	<0.005	<0.015	<0.005	0.046±0.013	0.044±0.008	<0.020	<0.005	<0.016	<0.009	0.042±0.011	0.039±0.007	<0.015
Ba/La-140	<0.006	<0.008	<0.006	<0.037	<0.021	<0.008	<0.018	<0.032	<0.013	<0.008	<0.018	<0.008

Rochester Gas and Electric

Table 3-4C
13 Week Composite
Gamma Isotopic Analysis
Results in pCi/m3
Third Quarter

Station	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13
Be-7	0.102±0.011	0.120±0.010	0.119±0.010	0.088±0.011	0.12±0.010	0.11±0.009	0.112±0.013	0.114±0.011	0.118±0.011	0.107±0.010	0.114±0.010	0.108±0.009
Cs-134	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Cs-137	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zr-95	<0.003	<0.003	<0.002	<0.003	<0.002	<0.002	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003
Nb-95	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.003	<0.003	<0.002	<0.002	<0.003	<0.002
Co-58	<0.002	<0.001	<0.001	<0.002	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.002	<0.001
Mn-54	<0.000	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ru-103	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.003	<0.002	<0.002	<0.001
Ru-106	<0.014	<0.013	<0.009	<0.014	<0.010	<0.007	<0.018	<0.010	<0.008	<0.016	<0.010	<0.009
Ce-141	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.002	<0.002	<0.005	<0.002	<0.002
Ce-144	<0.004	<0.004	<0.005	<0.005	<0.005	<0.004	<0.006	<0.004	<0.004	<0.002	<0.004	<0.004
Fe-59	<0.007	<0.007	<0.006	<0.007	<0.004	<0.006	<0.007	<0.009	<0.007	<0.008	<0.006	<0.006
Zn-65	<0.003	<0.002	<0.003	<0.003	<0.003	<0.002	<0.003	<0.002	<0.003	<0.003	<0.003	<0.002
Co-60	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.000	<0.002	<0.001	<0.002	<0.000	<0.001
K-40	<0.004	<0.014	0.019±0.006	0.022±0.007	0.030±0.006	0.031±0.006	0.033±0.007	<0.004	<0.003	<0.015	<0.017	0.032±0.006
Ba/La-140	<0.012	<0.015	<0.009	<0.004	<0.009	<0.009	<0.004	<0.004	<0.003	<0.010	<0.010	<0.019

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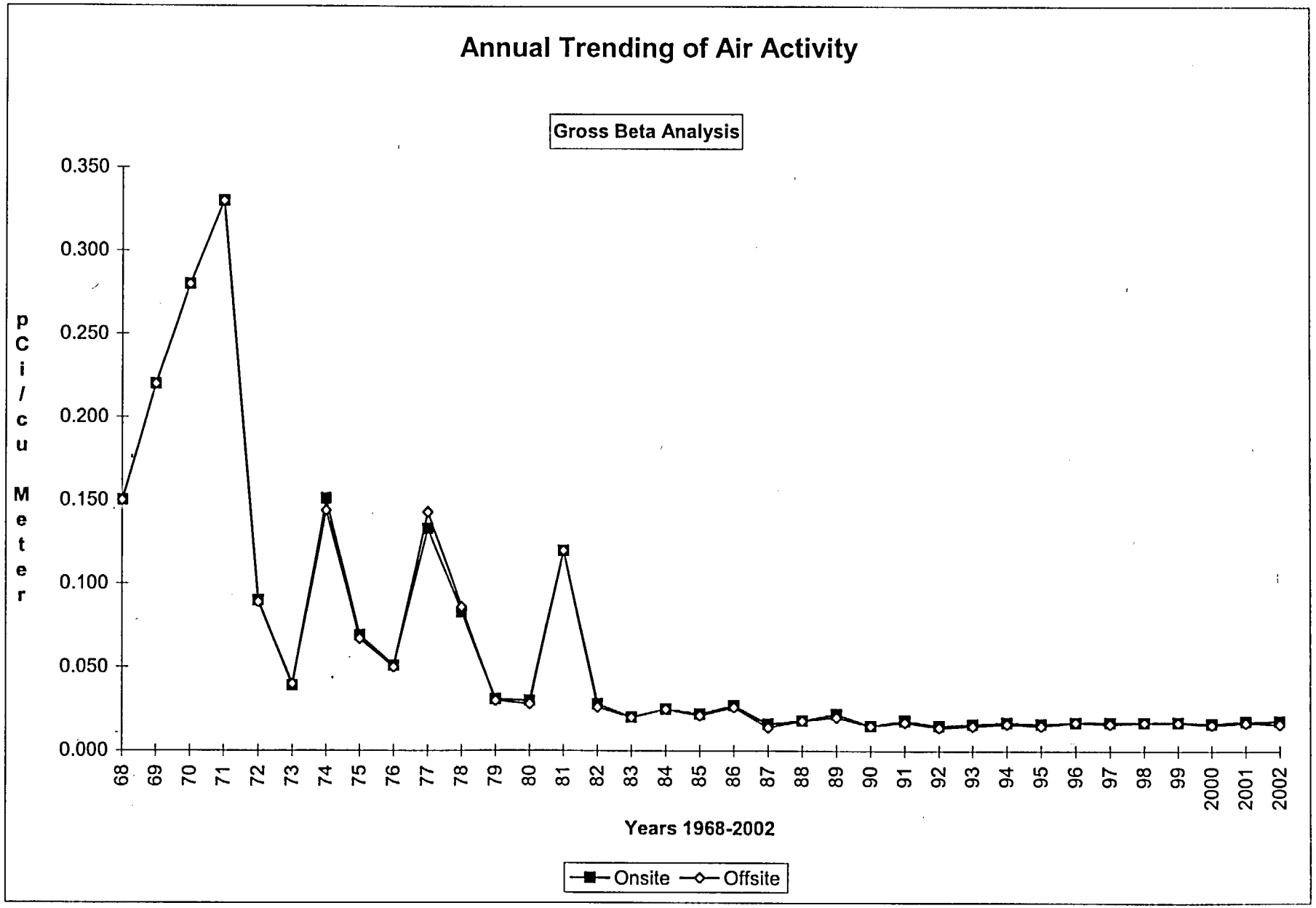
Table 3-4D
13 Week Composite
Gamma Isotopic Analysis
Results in pCi/m3
Fourth Quarter

Station	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13
Be-7	0.075±0.008	0.077±0.009	0.090±0.009	0.080±0.015	0.089±0.009	0.076±0.008	0.094±0.89	0.077±0.088	0.084±0.0078	0.078±0.010	0.10±0.012	0.083±0.010
Cs-134	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001
Cs-137	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zr-95	<0.003	<0.003	<0.004	<0.007	<0.002	<0.002	<0.002	<0.001	<0.001	<0.003	<0.005	<0.003
Nb-95	<0.003	<0.003	<0.002	<0.004	<0.002	<0.002	<0.002	<0.003	<0.002	<0.003	<0.004	<0.002
Co-58	<0.001	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.002
Mn-54	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ru-103	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.002	<0.002	<0.003	<0.002	<0.002
Ru-106	<0.008	<0.009	<0.009	<0.016	<0.009	<0.008	<0.009	<0.010	<0.008	<0.009	<0.015	<0.007
Ce-141	<0.002	<0.003	<0.002	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.003	<0.003
Ce-144	<0.004	<0.004	<0.003	<0.007	<0.004	<0.004	<0.003	<0.004	<0.003	<0.004	<0.004	<0.004
Fe-59	<0.002	<0.007	<0.004	<0.011	<0.009	<0.005	<0.007	<0.007	<0.005	<0.005	<0.008	<0.008
Zn-65	<0.003	<0.003	<0.002	<0.005	<0.003	<0.003	<0.003	<0.001	<0.002	<0.003	<0.004	<0.004
Co-60	<0.001	<0.001	<0.001	<0.001	<0.000	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
K-40	<0.003	<0.009	0.016±0.005	<0.008	<0.003	<0.009	<0.012	<0.016	<0.008	<0.014	<0.015	<0.016
Ba/La-140	<0.020	<0.020	<0.021	<0.032	<0.004	<0.012	<0.013	<0.019	<0.012	<0.016	<0.023	<0.022

Table 3-5
Charcoal Cartridges Gamma Analysis for Iodine
Results in pCi/M3

Collection Date	Station #2	Station #4	Station #7	Station #8	Station #9	Station #11
7-Jan	<0.031	<0.017	<0.042	<0.030	<0.042	<0.031
14-Jan	<0.013	<0.026	<0.027	<0.023	<0.040	<0.015
21-Jan	<0.017	<0.028	<0.032	<0.024	<0.044	<0.023
28-Jan	<0.020	<0.029	<0.030	<0.018	<0.051	<0.027
5-Feb	<0.017	<0.019	<0.035	<0.013	<0.031	<0.022
11-Feb	<0.027	<0.022	<0.039	<0.030	<0.025	<0.016
18-Feb	<0.025	<0.030	<0.024	<0.023	<0.026	<0.025
25-Feb	<0.030	<0.022	<0.021	<0.024	<0.044	<0.026
4-Mar	<0.018	<0.013	<0.032	<0.026	<0.035	<0.027
11-Mar	<0.020	<0.035	<0.038	<0.057	<0.037	<0.022
18-Mar	<0.023	<0.025	<0.025	<0.043	<0.024	<0.022
25-Mar	<0.025	<0.021	<0.025	<0.038	<0.036	<0.026
1-Apr	<0.023	<0.016	<0.023	<0.022	<0.020	<0.019
8-Apr	<0.022	<0.028	<0.032	<0.025	<0.022	<0.027
15-Apr	<0.023	<0.024	<0.020	<0.021	<0.029	<0.019
22-Apr	<0.024	<0.024	<0.006	<0.018	<0.032	<0.032
29-Apr	<0.034	<0.024	<0.032	<0.020	<0.039	<0.020
6-May	<0.029	<0.018	<0.023	<0.020	<0.027	<0.036
13-May	<0.018	<0.021	<0.029	<0.021	<0.038	<0.023
20-May	<0.024	<0.029	<0.023	<0.022	<0.022	<0.026
28-May	<0.024	<0.017	<0.021	<0.017	<0.022	<0.025
3-Jun	<0.017	<0.027	<0.028	<0.028	<0.054	<0.033
10-Jun	<0.026	<0.022	<0.032	<0.024	<0.057	<0.043
17-Jun	<0.017	<0.026	<0.039	<0.036	<0.018	<0.027
24-Jun	<0.018	<0.025	<0.035	<0.023	<0.029	<0.033
1-Jul	<0.022	<0.029	<0.034	<0.018	<0.022	<0.025
8-Jul	<0.024	<0.024	<0.033	<0.033	<0.014	<0.032
15-Jul	<0.018	<0.006	<0.029	<0.023	<0.026	<0.034
22-Jul	<0.037	<0.019	<0.026	<0.029	<0.029	<0.041
30-Jul	<0.017	<0.023	<0.020	<0.027	<0.024	<0.030
5-Aug	<0.035	<0.028	<0.020	<0.014	<0.017	<0.027
12-Aug	<0.034	<0.015	<0.016	<0.025	<0.023	<0.039
19-Aug	<0.035	<0.031	<0.021	<0.027	<0.025	<0.021
26-Aug	<0.029	<0.025	<0.013	<0.027	<0.027	<0.034
3-Sep	<0.023	<0.027	<0.031	<0.025	<0.013	<0.025
9-Sep	<0.028	<0.049	<0.040	<0.031	<0.021	<0.057
16-Sep	<0.016	<0.028	<0.023	<0.020	<0.026	<0.028
23-Sep	<0.022	<0.023	<0.013	<0.024	<0.019	<0.031
30-Sep	<0.018	<0.014	<0.014	<0.015	<0.015	<0.018
7-Oct	<0.021	<0.032	<0.020	<0.031	<0.016	<0.035
14-Oct	<0.026	<0.017	<0.012	<0.019	<0.017	<0.025
21-Oct	<0.021	<0.017	<0.016	<0.021	<0.015	<0.023
28-Oct	<0.012	<0.021	<0.015	<0.016	<0.018	<0.023
4-Nov	<0.014	<0.023	<0.012	<0.023	<0.023	<0.032
12-Nov	<0.013	<0.018	<0.022	<0.021	<0.014	<0.025
18-Nov	<0.022	<0.030	<0.016	<0.014	<0.016	<0.035
25-Nov	<0.025	<0.022	<0.012	<0.016	<0.013	<0.027
2-Dec	<0.019	<0.023	<0.014	<0.017	<0.015	<0.020
9-Dec	<0.023	<0.020	<0.021	<0.020	<0.024	<0.026
16-Dec	<0.019	<0.020	<0.015	<0.019	<0.025	<0.013
23-Dec	<0.031	<0.018	<0.016	<0.015	<0.014	<0.036
30-Dec	<0.025	<0.028	<0.017	<0.021	<0.019	<0.025

Rochester Gas and Electric
Figure 3-6



Peaks are indicative of years in which atmospheric testing of nuclear weapons occurred. (25)

3.3 Water Samples

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

Samples are collected weekly from Lake Ontario, upstream (Russell Station) and downstream (Ontario Water District Plant - OWD), composited monthly, and analyzed for gross beta activity, Table 3-8. There was no statistically significant difference between the upstream and downstream sample concentrations. The 2002 averages were 2.14 pCi/liter and 2.35 pCi/liter for the upstream and downstream samples respectively. Gamma isotopic analysis of the monthly composite samples showed no significant difference in activity between the upstream and downstream samples.

A graphical comparison of upstream vs downstream gross beta analysis results is given in Table 3-7A. Peaks up to 10 pCi/liter can occur when the lake is stirred up by wind and the weekly 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 samples are taken from the plant circulating water intake (Circ In) and discharge canal (Circ Out), and composited monthly. The 2002 averages were 2.16 pCi/liter and 2.06 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 $\pm$ 1 sigma error band and range of the measurement.

Results for all water beta analyses are listed in Table 3-8 .

Samples of the creek which crosses the site are collected and analyzed monthly. Deer Creek gross beta values are typically higher than other surface water samples due to Radon progeny in the soils from which the creek recharges and over which the creek flows.

Isotopic Analysis

Gamma isotopic analysis is performed on each monthly composite sample. These are listed in Tables 3-9 to 3-14 and are separated by source of sample. No anomalous results were noted.

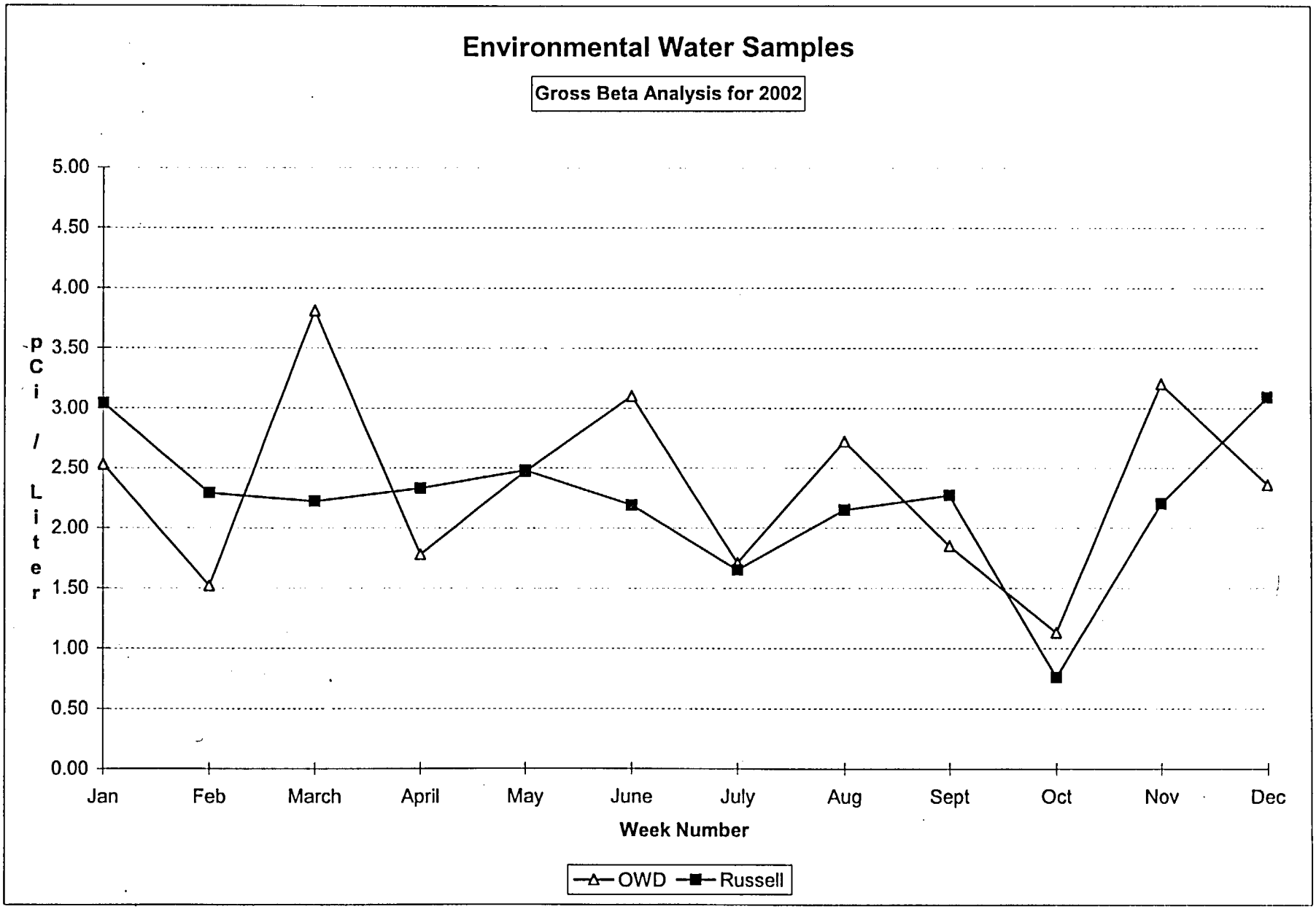
Tritium Analysis

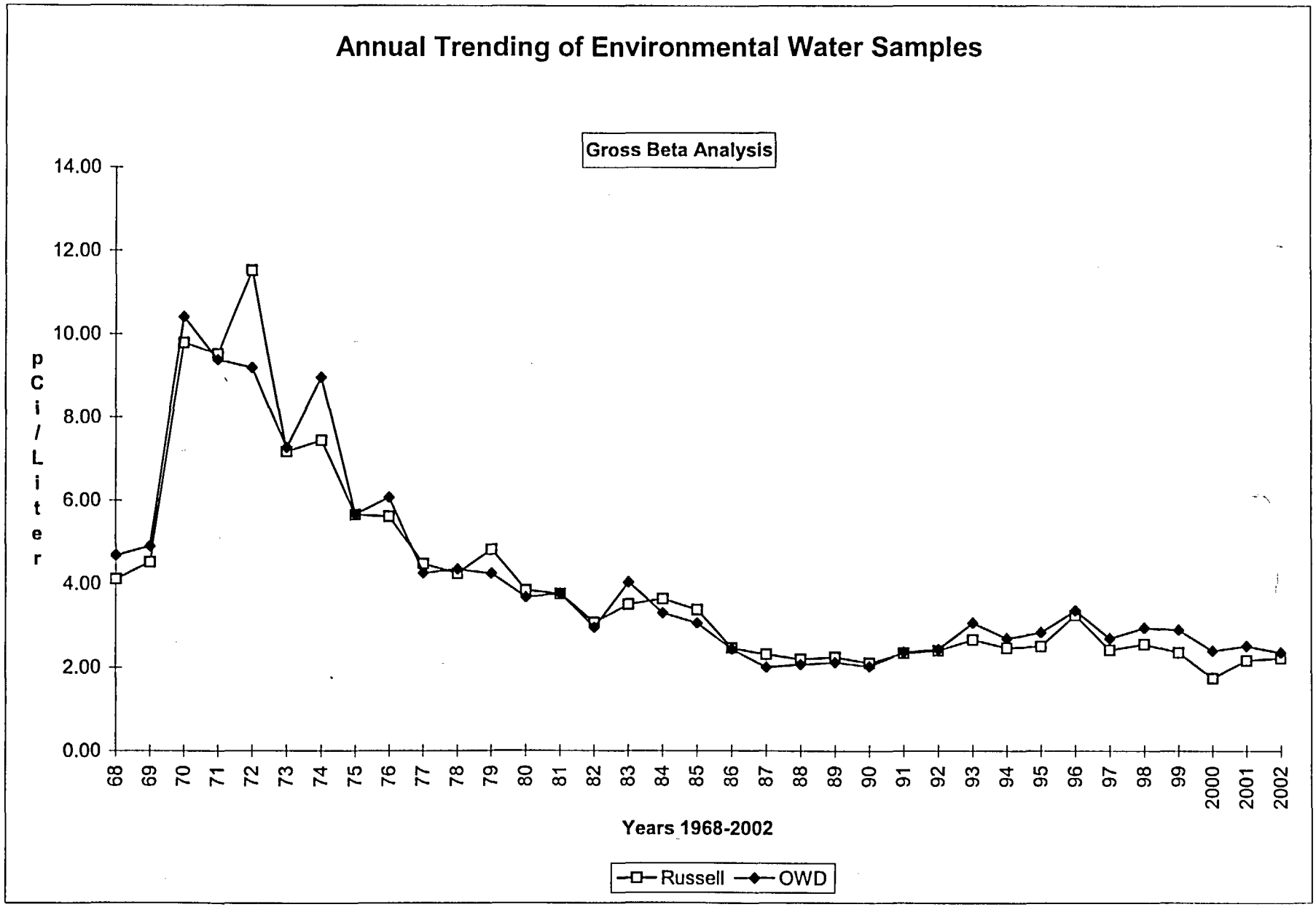
Tritium analysis was performed on all water samples on a monthly basis. Composites are made from the weekly samples and a portion filtered to remove interferences for analysis by beta scintillation. Tritium data is given in Table 3-15.

Radioiodine analysis

All monthly composite water samples are analyzed for Iodine-131. The analysis allows the determination of Iodine-131 activity of <1pCi/liter. Radioiodine data is given in Table 3-16. Any positive counts and the 1 sigma error are reported. During 2002, no sample results indicated I-131 activity in excess of the LLD for the analysis.

Rochester Gas and Electric
Figure 3-7A




Annual Trending of Environmental Water Samples
Gross Beta Analysis
pCi/Liter
14.00
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 98 99 2000 2001 2002
Years 1968-2002
Russell
OWD

Rochester Gas and Electric
Table 3-8
Environmental Water Samples Gross Beta Analysis
Results in pCi/Liter

Month	Russell	O.W.D.	Circ In	Circ Out	Deer Creek
January	3.04 ± 0.50	2.53 ± 0.49	2.70 ± 0.49	2.53 ± 0.49	4.66 ± 1.17
February	2.29 ± 0.62	1.52 ± 0.58	2.52 ± 0.62	1.69 ± 0.60	2.76 ± 0.63
March	2.22 ± 0.50	3.81 ± 0.58	1.96 ± 0.46	2.94 ± 0.51	2.90 ± 0.62
April	2.33 ± 0.52	1.78 ± 0.50	1.96 ± 0.50	2.85 ± 0.53	4.20 ± 0.60
May	2.48 ± 0.54	2.47 ± 0.56	1.78 ± 0.51	2.23 ± 0.55	3.60 ± 0.58
June	2.19 ± 0.50	3.10 ± 0.55	1.57 ± 0.52	0.82 ± 0.51	1.78 ± 0.54
July	1.65 ± 0.48	1.71 ± 0.47	1.74 ± 0.47	1.68 ± 0.45	2.95 ± 0.62
August	2.15 ± 0.47	2.72 ± 0.48	2.41 ± 0.47	2.77 ± 0.49	4.15 ± 1.05
September	2.27 ± 0.47	1.85 ± 0.50	2.52 ± 0.51	1.77 ± 0.49	1.51 ± 0.58
October	0.76 ± 0.51	1.13 ± 0.54	1.76 ± 0.55	<1.61	5.75 ± 0.71
November	2.20 ± 0.64	3.20 ± 0.66	2.86 ± 0.64	1.31 ± 0.62	5.56 ± 0.71
December	3.09 ± 0.56	2.36 ± 0.54	4.32 ± 0.59	1.69 ± 0.51	5.37 ± 0.66
Maximum	3.09 ± 0.64	3.81 ± 0.66	4.32 ± 0.64	2.94 ± 0.62	5.75 ± 1.17
Average	2.14	2.35	2.16	2.06	3.62
Minimum	0.76 ± 0.47	1.13 ± 0.47	1.57 ± 0.46	0.82 ± 0.45	1.51 ± 0.54

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

Month	7Be	51Cr	134Cs	137Cs	95Zr	95Nb	58Co	54Mn	103Ru	106Ru	141Ce	144Ce	59Fe	65Zn	60Co	140Ba	226Ra
January	< 24	< 29	< 2	< 2	< 5	< 3	< 2	< 2	< 3	< 24	< 6	< 17	< 7	< 5	< 2	< 8	74±21
February	< 27	< 36	< 2	< 3	< 5	< 4	< 3	< 3	< 4	< 33	< 7	< 20	< 9	< 6	< 3	< 10	99±28
March	< 33	< 43	< 2	< 3	< 6	< 4	< 3	< 3	< 4	< 31	< 8	< 22	< 10	< 7	< 3	< 14	73±25
April	< 27	< 37	< 3	< 3	< 6	< 4	< 3	< 2	< 4	< 28	< 4	< 19	< 8	< 6	< 3	< 9	41±21
May	< 34	< 44	< 3	< 3	< 7	< 5	< 4	< 3	< 5	< 32	< 9	< 25	< 12	< 7	< 4	< 14	141±30
June	< 25	< 32	< 1	< 2	< 4	< 3	< 2	< 2	< 3	< 24	< 6	< 18	< 6	< 3	< 2	< 6	105±19
July	< 31	< 38	< 3	< 3	< 6	< 4	< 3	< 3	< 4	< 30	< 5	< 22	< 11	< 8	< 3	< 10	122±24
August	< 25	< 35	< 1	< 2	< 4	< 3	< 3	< 2	< 3	< 22	< 6	< 18	< 7	< 3	< 2	< 8	101±18
September	< 31	< 36	< 3	< 3	< 5	< 4	< 3	< 3	< 2	< 30	< 7	< 22	< 9	< 5	< 3	< 8	63±24
October	< 25	< 39	< 3	< 3	< 6	< 4	< 3	< 3	< 4	< 30	< 6	< 18	< 10	< 7	< 3	< 10	115±26
November	< 19	< 24	< 2	< 2	< 4	< 3	< 2	< 2	< 3	< 18	< 3	< 13	< 6	< 4	< 2	< 6	165±17
December	< 25	< 31	< 2	< 2	< 5	< 3	< 3	< 2	< 4	< 25	< 6	< 18	< 7	< 6	< 2	< 8	44±20

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

Month	7Be	51Cr	134Cs	137Cs	95Zr	95Nb	58Co	54Mn	103Ru	106Ru	141Ce	144Ce	59Fe	65Zn	60Co	140Ba	226Ra
January	< 28	< 33	< 2	< 3	< 5	< 3	< 3	< 3	< 4	< 28	< 6	< 21	< 10	< 7	< 3	< 6	34±20
February	< 27	< 34	< 3	< 3	< 6	< 3	< 3	< 3	< 4	< 30	< 6	< 21	< 9	< 7	< 3	< 7	68±22
March	< 35	< 38	< 3	< 3	< 6	< 4	< 4	< 3	< 5	< 32	< 8	< 24	< 10	< 8	< 3	< 10	126±30
April	< 43	< 48	< 4	< 4	< 9	< 6	< 5	< 4	< 5	< 44	< 8	< 28	< 12	< 11	< 6	< 13	63±35
May	< 25	< 30	< 1	< 2	< 4	< 3	< 3	< 2	< 3	< 24	< 6	< 17	< 7	< 5	< 2	< 5	87±21
June	< 23	< 33	< 3	< 3	< 5	< 4	< 3	< 3	< 4	< 29	< 3	< 18	< 7	< 6	< 3	< 8	99±22
July	< 23	< 30	< 3	< 3	< 5	< 3	< 3	< 3	< 3	< 28	< 6	< 18	< 10	< 6	< 2	< 8	110±21
August	< 29	< 34	< 3	< 3	< 6	< 4	< 3	< 3	< 4	< 29	< 6	< 19	< 9	< 7	< 3	< 8	83±25
September	< 37	< 44	< 4	< 4	< 5	< 5	< 4	< 4	< 6	< 43	< 7	< 25	< 14	< 7	< 4	< 9	130±33
October	< 25	< 35	< 2	< 2	< 6	< 3	< 3	< 3	< 4	< 24	< 4	< 18	< 10	< 6	< 3	< 8	89±24
November	< 26	< 34	< 2	< 3	< 5	< 3	< 3	< 3	< 4	< 31	< 7	< 22	< 9	< 6	< 3	< 6	< 67
December	< 27	< 35	< 2	< 3	< 5	< 4	< 3	< 3	< 4	< 30	< 7	< 22	< 10	< 6	< 3	< 9	94±26

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

Month	7Be	51Cr	134Cs	137Cs	95Zr	95Nb	58Co	54Mn	103Ru	106Ru	141Ce	144Ce	59Fe	65Zn	60Co	140Ba	226Ra
January	< 33	< 36	< 2	< 3	< 6	< 4	< 3	< 3	< 5	< 29	< 7	< 23	< 10	< 5	< 4	< 9	143±31
February	< 36	< 37	< 4	< 4	< 7	< 5	< 5	< 4	< 5	< 36	< 7	< 21	< 12	< 9	< 5	< 11	56±27
March	< 23	< 30	< 1	< 2	< 4	< 3	< 2	< 2	< 3	< 24	< 6	< 18	< 6	< 3	< 2	< 7	66±23
April	< 34	< 41	< 4	< 4	< 7	< 5	< 4	< 4	< 5	< 45	< 8	< 26	< 9	< 9	< 4	< 10	< 78
May	< 35	< 43	< 3	< 3	< 7	< 4	< 3	< 3	< 5	< 30	< 6	< 25	< 12	< 5	< 4	< 11	130±30
June	< 30	< 37	< 3	< 3	< 6	< 4	< 3	< 3	< 4	< 33	< 5	< 24	< 10	< 8	< 4	< 9	77±26
July	< 21	< 27	< 1	< 2	< 4	< 3	< 2	< 2	< 3	< 23	< 5	< 18	< 6	< 3	< 2	< 5	88±18
August	< 26	< 36	< 3	< 3	< 5	< 4	< 3	< 3	< 4	< 23	< 4	< 17	< 9	< 5	< 3	< 8	107±22
September	< 36	< 42	< 3	< 4	< 8	< 4	< 5	< 4	< 6	< 41	< 9	< 28	< 13	< 9	< 4	< 11	55±30
October	< 26	< 36	< 3	< 3	< 6	< 4	< 3	< 3	< 4	< 29	< 6	< 20	< 8	< 7	< 3	< 7	46±22
November	< 23	< 28	< 1	< 2	< 4	< 3	< 2	< 2	< 3	< 23	< 5	< 18	< 7	< 3	< 2	< 6	98±19
December	< 28	< 34	< 3	< 2	< 5	< 4	< 4	< 3	< 4	< 27	< 6	< 18	< 8	< 3	< 3	< 9	125±25

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

Month	7Be	51Cr	134Cs	137Cs	95Zr	95Nb	58Co	54Mn	103Ru	106Ru	141Ce	144Ce	59Fe	65Zn	60Co	140Ba	226Ra
January	< 24	< 30	< 2	< 3	< 5	< 3	< 3	< 2	< 4	< 26	< 3	< 19	< 7	< 3	< 3	< 7	116±21
February	< 26	< 34	< 2	< 3	< 5	< 4	< 3	< 3	< 3	< 31	< 7	< 23	< 8	< 6	< 3	< 9	91±24
March	< 25	< 33	< 3	< 3	< 5	< 4	< 3	< 3	< 4	< 25	< 6	< 17	< 10	< 6	< 3	< 9	108±23
April	< 39	< 45	< 4	< 4	< 7	< 4	< 4	< 4	< 5	< 47	< 9	< 28	< 14	< 7	< 4	< 11	80±36
May	< 24	< 30	< 2	< 2	< 5	< 3	< 3	< 2	< 3	< 24	< 5	< 18	< 7	< 3	< 2	< 7	120±20
June	< 22	< 28	< 1	< 2	< 4	< 3	< 2	< 2	< 3	< 23	< 3	< 17	< 6	< 3	< 2	< 5	100±20
July	< 30	< 36	< 2	< 3	< 6	< 4	< 4	< 3	< 4	< 33	< 7	< 24	< 10	< 8	< 3	< 9	115±27
August	< 27	< 35	< 3	< 3	< 5	< 4	< 3	< 3	< 4	< 31	< 7	< 21	< 9	< 6	< 3	< 9	60±22
September	< 37	< 47	< 4	< 4	< 7	< 4	< 5	< 4	< 6	< 35	< 8	< 29	< 12	< 8	< 4	< 12	< 89
October	< 27	< 37	< 2	< 3	< 5	< 4	< 3	< 3	< 4	< 31	< 7	< 22	< 8	< 6	< 3	< 9	< 63
November	< 33	< 39	< 3	< 4	< 8	< 5	< 4	< 4	< 5	< 37	< 7	< 23	< 12	< 8	< 4	< 9	100±27
December	< 31	< 41	< 3	< 3	< 7	< 4	< 4	< 3	< 4	< 36	< 7	< 21	< 12	< 8	< 3	< 11	107±28

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

Month	7Be	51Cr	134Cs	137Cs	95Zr	95Nb	58Co	54Mn	103Ru	106Ru	141Ce	144Ce	59Fe	65Zn	60Co	140Ba	226Ra
January	< 38	< 37	< 3	< 5	< 8	< 5	< 5	< 5	< 5	< 51	< 10	< 40	< 13	< 6	< 6	< 5	< 132
February	< 31	< 41	< 5	< 5	< 9	< 5	< 5	< 4	< 4	< 42	< 7	< 30	< 12	< 11	< 5	< 8	140±40
March	< 44	< 47	< 4	< 5	< 9	< 5	< 6	< 6	< 6	< 54	< 9	< 43	< 16	< 15	< 6	< 8	< 130
April	< 35	< 44	< 4	< 5	< 8	< 6	< 4	< 5	< 5	< 47	< 8	< 32	< 11	< 15	< 5	< 8	< 110
May	< 46	< 45	< 6	< 6	< 10	< 5	< 5	< 5	< 6	< 45	< 9	< 43	< 17	< 13	< 7	< 9	98±46
June	< 44	< 52	< 5	< 6	< 10	< 6	< 6	< 6	< 7	< 67	< 10	< 41	< 15	< 13	< 7	< 8	< 135
July	< 45	< 47	< 7	< 6	< 11	< 6	< 7	< 7	< 6	< 50	< 9	< 35	< 11	< 14	< 6	< 11	< 114
August	< 55	< 49	< 6	< 5	< 10	< 6	< 7	< 6	< 8	< 55	< 10	< 50	< 14	< 19	< 6	< 10	< 153
September	< 46	< 42	< 7	< 5	< 11	< 7	< 6	< 8	< 6	< 65	< 9	< 33	< 17	< 12	< 8	< 9	125±50
October	< 44	< 48	< 5	< 5	< 9	< 5	< 6	< 5	< 6	< 54	< 10	< 41	< 15	< 14	< 6	< 6	144±48
November	< 31	< 35	< 3	< 4	< 7	< 4	< 3	< 3	< 4	< 39	< 7	< 31	< 8	< 5	< 4	< 4	< 94
December	< 41	< 42	< 5	< 4	< 8	< 5	< 5	< 5	< 5	< 48	< 8	< 36	< 13	< 11	< 5	< 9	60±38

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Table 3-14
2002 Environmental Water Samples Tritium Analysis
Results in pCi/Liter

Month	Russell	O.W.D.	Circ In	Circ Out	Deer Creek
January	<260	<262	<263	<260	<264
February	<265	<263	<262	<260	<272
March	<264	<262	<260	<263	<270
April	<265	<261	<263	<263	<271
May	<258	<251	<255	<253	<264
June	<234	<233	<234	<235	<260
July	<248	<252	<254	<253	<263
August	<248	<247	<248	<248	<256
September	<251	<253	<250	<254	<262
October	<237	<236	<236	<236	<243
November	<235	<235	<237	<235	<241
December	<256	<259	<258	<258	<258

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Table 3-15
Radioiodine in Water
Results in pCi/Liter

Month	Russell	O.W.D.	Circ In	Circ Out	Deer Creek
January	<0.7	<0.6	<0.5	<0.5	<0.4
February	<0.7	<0.6	<0.5	<0.5	<0.4
March	<0.8	<0.5	<0.4	<0.4	<0.5
April	<0.7	<0.5	<0.4	<0.5	<0.4
May	<0.8	<0.5	<0.4	<0.4	<0.5
June	<0.8	<0.5	<0.6	<0.6	<0.5
July	<0.6	<0.6	<0.5	<0.4	<0.4
August	<1.0	<0.5	<0.4	<0.5	<1.0
September	<0.9	<1.2	<0.5	<0.7	<0.4
October	<0.9	<0.5	<0.5	<0.6	<0.6
November	<0.7	<0.5	<0.5	<0.4	<0.4
December	<0.7	<0.5	<0.6	<0.5	<0.4

3.4 Milk Samples

There were three indicator dairy herds located three to five miles from the plant on 1/1/02. The owner of indicator farm C retired early In 2002, and a change to the ODCM will be submitted to reflect this. Milk samples are collected monthly during November through May from one of the indicator farms 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 analyzed by gamma spectroscopy for major fission products.

All positive counts and the ±1 sigma error are reported. During 2002, no samples indicated I-131 activity that exceeded the LLD for the analysis.
Table 3-17 is a listing of all samples collected during 2001 with analytical results.

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Table 3-16
Milk
Results in pCi/Liter

Farm	Date	K-40	Cs-134	Cs-137	Ba-140	I-131
FARM C	01/08/02	1270±62.8	<4	<8	<5	<0.45
FARM D	01/08/02	1520±93.4	<6	<9	<10	<0.45
FARM B	02/12/02	1510±65.6	<6	<5	<5	<0.39
FARM D	02/12/02	1540±65.3	<5	<5	<7	<0.40
FARM A	03/11/02	1700±89.1	<7	<8	<9	<0.57
FARM D	03/12/02	1450±63.7	<5	<6	<7	<0.59
FARM B	04/09/02	1270±79.9	<7	<6	<10	<0.49
FARM D	04/09/02	1460±64.3	<4	<5	<7	<0.45
FARM A	05/14/02	1400±62	<4	<5	<6	<0.44
FARM D	05/14/02	1420±62	<3	<4	<6	<0.46
FARM A	06/11/02	1400±75	<6	<5	<8	<0.51
FARM B	06/11/02	1610±85	<8	<7	<12	<0.44
FARM D	06/11/02	1610±51	<3	<5	<5	<0.45
FARM A	06/25/02	1600±67	<7	<5	<6	<0.42
FARM B	06/25/02	1520±64	<4	<4	<6	<0.51
FARM D	06/25/02	1660±70	<6	<5	<7	<0.52
FARM A	07/09/02	1830±74	<6	<5	<8	<0.47
FARM B	07/09/02	1680±50	<3	<4	<5	<0.46
FARM D	07/09/02	1500±66	<5	<6	<7	<0.55
FARM A	07/23/02	1490±65.0	<5	<5	<6	<0.43
FARM B	07/23/02	1640±69.3	<5	<5	<7	<0.43
FARM D	07/23/02	1750±50.6	<2	<4	<4	<0.42
FARM A	08/06/02	1420±95	<7	<9	<11	<0.51
FARM B	08/06/02	1670±84	<7	<7	<10	<0.44
FARM D	08/06/02	1720±60	<3	<5	<5	<0.43
FARM A	08/20/02	1570±96	<7	<7	<8	<0.54
FARM B	08/20/02	1410±75	<5	<6	<7	<0.44
FARM D	08/20/02	1560±78	<6	<7	<6	<0.47
FARM A	09/04/02	1710±52	<3	<4	<4	<0.46
FARM B	09/04/02	1620±85	<6	<7	<10	<0.38
FARM D	09/04/02	1510±67	<5	<5	<6	<0.39
FARM A	09/17/02	1780±74	<6	<6	<10	<0.44
FARM B	09/17/02	1660±51	<3	<4	<4	<0.39
FARM D	09/17/02	1640±69	<5	<4	<6	<0.40
FARM A	09/30/02	1590±83	<6	<6	<10	<0.66
FARM B	09/30/02	1450±64	<5	<6	<7	<0.52
FARM D	09/30/02	1510±64	<6	<6	<6	<0.57
FARM A	10/15/02	1540±84	<8	<5	<9	<0.48
FARM B	10/15/02	1350±63	<5	<5	<3	<0.48
FARM D	10/15/02	1530±67	<6	<5	<5	<0.42
FARM A	10/29/02	1390±79.8	<6	<7	<5	<0.44
FARM B	10/29/02	1560±68.2	<5	<6	<6	<0.39
FARM D	10/29/02	1580±67	<4	<6	<6	<0.42
FARM B	11/13/02	1770±73	<6	<6	<6	<0.38
FARM D	11/13/02	1630±50	<5	<4	<3	<0.47
FARM A	12/10/02	1670±88	<6	<7	<5	<0.39
FARM D	12/10/02	1370±63	<5	<5	<8	<0.42

3.5 Fish Samples

Indicator fish are caught in the vicinity of the Discharge Canal and analyzed 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 control samples 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 between the indicator and control locations.

Fish are caught by R. G. & E. biologists and analyzed by gamma spectroscopy after being held for periods of less than one week to keep the LLD value for the shorter half-life isotopes realistic. Detection limits could also be affected by small mass samples, (< 2000 grams), in some species.
Gamma isotopic concentrations (pCi/kilogram wet) are listed in Tables 3-17A, and 3-17B.

3.6 Sediment Samples

Samples of shoreline sediment are taken upstream (Russell Station) and downstream (OWD) of Ginna Station.
Results of the gamma isotopic analysis for sediment are included in Table 3-18, along with benthic sediment from Lake Ontario.

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Table 3-17A
Fish Samples Gamma Isotopic Analysis
Results in pCi/kgm Wet

Description	226Ra	51Cr	131 I	134Cs	137Cs	103Ru	106Ru	141Ce	144Ce
Indicator Fish									
First Half 2002									
Carp	<448	< 265	< 49	< 30	< 29	< 28	< 350	< 42	< 147
Walley	350±186	< 229	< 54	< 26	< 28	< 27	< 276	< 40	< 127
Brown Trout	536±164	< 247	< 55	< 25	< 27	< 30	< 284	< 36	< 132
Small Mouth Bass	459±198	< 334	< 61	< 34	< 35	< 36	< 329	< 50	< 174
Second Half 2002									
Chinook Salmon	262±158	< 184	< 36	< 22	< 24	< 24	< 221	< 28	< 107
Smallmouth Bass	435±137	< 160	< 31	< 21	< 20	< 19	< 184	< 27	< 98
Brown Trout	776±133	< 153	< 35	< 20	< 20	< 21	< 200	< 28	< 95
Rainbow Trout	512±157	< 195	< 38	< 20	< 20	< 27	< 224	< 32	< 126
Coho Salmon	567±155	< 194	< 41	< 14	< 20	< 21	< 220	< 33	< 123
Background (Control) Fish									
First Half 2002									
Freshwater Drum	226±121	< 249	< 126	< 21	< 20	< 28	< 228	< 40	< 100
Small Mouth Bass	743±112	< 162	< 30	< 17	< 17	< 21	< 165	< 25	< 92
White Sucker	684±226	< 322	< 112	< 18	< 31	< 34	< 294	< 52	< 168
Rainbow Trout	411±229	< 350	< 117	< 19	< 31	< 35	< 334	< 54	< 178
Second Half 2002									
Small Mouth Bass	533±141	< 254	< 136	< 22	< 20	< 28	< 207	< 36	< 118
Small Mouth Bass	281±124	< 172	< 40	< 20	< 19	< 20	< 208	< 26	< 103
Brown Trout	752±154	< 199	< 39	< 21	< 16	< 22	< 209	< 27	< 98
Freshwater Drum	395±159	< 214	< 49	< 23	12.8±6.71	< 27	< 235	< 35	< 126
White Sucker	821±151	< 183	< 34	< 13	< 21	< 22	< 216	< 31	< 119

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Table 3-17B
Fish Samples Gamma Isotopic Analysis
Results in pCi/kgm Wet

Description	95Zr	95Nb	58Co	54Mn	59Fe	65Zn	60Co	40K	140Ba
Indicator Fish									
First Half 2002									
Carp	< 53	< 34	< 38	< 33	< 103	< 75	< 30	4590±295	< 62
Walley	< 48	< 32	< 26	< 26	< 78	< 53	< 37	4450±275	< 50
Brown Trout	< 53	< 32	< 26	< 27	< 81	< 68	< 34	4430±275	< 50
Small Mouth Bass	< 55	< 36	< 32	< 31	< 92	< 88	< 38	6060±340	< 74
Second Half 2002									
Chinook Salmon	< 44	< 29	< 24	< 22	< 72	< 57	< 28	4810±253	< 38
Smallmouth Bass	< 34	< 19	< 18	< 19	< 63	< 45	< 17	4630±199	< 31
Brown Trout	< 38	< 23	< 20	< 22	< 54	< 51	< 19	4770±205	< 26
Rainbow Trout	< 39	< 27	< 23	< 21	< 71	< 57	< 26	5590±230	< 42
Coho Salmon	< 36	< 23	< 20	< 21	< 53	< 51	< 21	5980±199	< 33
Background (Control) Fish									
First Half 2002									
Freshwater Drum	< 41	< 29	< 21	< 22	< 77	< 54	< 21	3440±183	< 66
Small Mouth Bass	< 35	< 23	< 18	< 20	< 60	< 49	< 19	4020±183	< 35
White Sucker	< 59	< 36	< 29	< 32	< 83	< 68	< 27	5450±262	< 75
Rainbow Trout	< 57	< 36	< 34	< 29	< 86	< 70	< 28	5450±270	< 70
Second Half 2002									
Small Mouth Bass	< 49	< 40	< 26	< 22	< 85	< 66	< 30	4370±239	< 72
Small Mouth Bass	< 33	< 20	< 20	< 19	< 52	< 50	< 20	4333±193	< 38
Brown Trout	< 36	< 21	< 22	< 21	< 58	< 53	< 17	5180±214	< 29
Freshwater Drum	< 46	< 25	< 25	< 23	< 62	< 62	< 23	5370±231	< 51
White Sucker	< 35	< 21	< 20	< 21	< 47	< 47	< 21	5410±186	< 25

Rochester Gas and Electric

Table 3-18
Sediment Samples Gamma Isotopic Analysis
Results in pCi/kg (wet)

Description	Collection Date	226Ra	51Cr	131 I	134Cs	137Cs	103 Ru	Ru 106	141Ce	144Ce
Shoreline Sediment (I)	04/25/02	724±250	<288	<49	<33	<30	<33	<333	<50	<203
Shoreline Sediment (C)	04/25/02	950±239	<266	<57	<40	<30	<37	<292	<52	<192
Shoreline Sediment (I)	08/05/02	<661	<234	<41	<34	<35	<32	<309	<47	<188
Shoreline Sediment (C)	07/31/02	1000±224	<283	<51	<38	<32	<37	<321	<46	<176
Benthic Sediment (I)	09/18/02	682±243	<334	<85	<33	<33	<33	<319	<61	<227

		95Zr	95Nb	58Co	54Mn	59Fe	65Zn	60Co	40K	140Ba
Shoreline Sediment (I)	04/25/02	<57	<40	<28	<32	<64	<44	<26	8250±316	<50
Shoreline Sediment (C)	04/25/02	<52	<44	<33	<30	<78	<97	<35	8580±39	<59
Shoreline Sediment (I)	08/05/02	<46	<31	<34	<32	<77	<102	<38	9280±407	<47
Shoreline Sediment (C)	07/31/02	<63	<39	<34	<30	<86	<90	<41	14000±481	<51
Benthic Sediment (I)	09/18/02	<60	<41	<34	<30	<70	<47	<30	10100±352	<68

(I) = Indicator
(C) = Control

3.6 Vegetation Samples

Crops are grown on the plant property in a location with a higher D/Q than the location of the maximally exposed individual, and samples of the produce are collected at harvest time for analysis. Control samples are purchased from farms greater than ten miles from the plant. (Gro-Moore Farm Market in Henrietta, New York). There was no indication in the samples of any measurable activity other than naturally occurring K-40 and Ra-226.

Gamma isotopic data is given in Table 3-19.

Rochester Gas and Electric

Table 3-19
Vegetation Samples Gamma Isotopic Analysis
Results in pCi/kg (wet)

Description	Collection Date									
Indicator Vegetation		**226Ra**	**51Cr**	**131 I**	**134Cs**	**137Cs**	**103 Ru**	**Ru 106**	**141Ce**	**144Ce**
Red Raspberries	07/11/02	99.7±51.3	<78	<19	<7	<8	<9	<80	<12	<41
Lettuce	07/30/02	691±152	<164	<26.5	<25	<22	<22	<257	<29	<110
Lettuce	08/20/02	641±115	<100	<14	<9	<12	<12	<134	<18	<78
Tomatoes	09/23/02	106±41	<39	<6	<5	<5	<5	<50	<7	<27
Apples	09/23/02	237±66.8	<71	<12	<11	<9	<10	<100	<9	<46
Background (Control) Vegetation										
Raspberries	08/05/02	146±37.9	<41	<6	<6	<5	<5	<50	<7	<32
Lettuce	09/13/02	391±115	<126	<28	<12	<18	<17	<191	<23	<86
Tomatoes	10/17/02	122±24.8	<32	<6	<2	<4	<3	<35	<6	<24
Apples	10/17/02	134±53.1	<60	<11	<7	<7	<7	<73	<10	<40

Indicator Vegetation		**95Zr**	**95Nb**	**58Co**	**54Mn**	**59Fe**	**65Zn**	**60Co**	**40K**	**140Ba**
Red Raspberries	07/11/02	<15	<9	<8	<8	<22	<20	<7	2360±79.3	<20
Lettuce	07/30/02	<44	<30	<26	<28	<77	<64	<28	8330±297	<33
Lettuce	08/20/02	<21	<12	<12	<12	<32	<28	<12	5180±128	<14
Tomatoes	09/23/02	<9	<5	<5	<4	<15	<14	<6	2030±58.0	<6
Apples	09/23/02	<19	<11	<10	<10	<28	<22	<11	1370±78.7	<14
Background (Control) Vegetation										
Raspberries	08/05/02	<9	<5	<5	<5	<16	<13	<6	1750±56.5	<7
Lettuce	09/13/02	<33	<22	<18	<19	<54	<47	<24	3980±183	<31
Tomatoes	10/17/02	<6	<3	<3	<3	<10	<5	<4	2330±42.3	<5
Apples	10/17/02	<13	<8	<7	<7	<20	<18	<7	1450±65.5	<12

3.7 External Penetrating Radiation

Thermoluminescent dosimeters, (TLD's), with a minimum sensitivity of 5 millirem per 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 radioactive equipment storage areas and will normally read slightly higher than other locations. For the year of 2002, on-site exposure ranged between 10.1 – 18.0 mrem/quarter, with an average exposure of 13.5 mrem/quarter and off-site ranged between 10.0 – 13.4 mrem/quarter with an average exposure of 11.9 mrem/quarter.

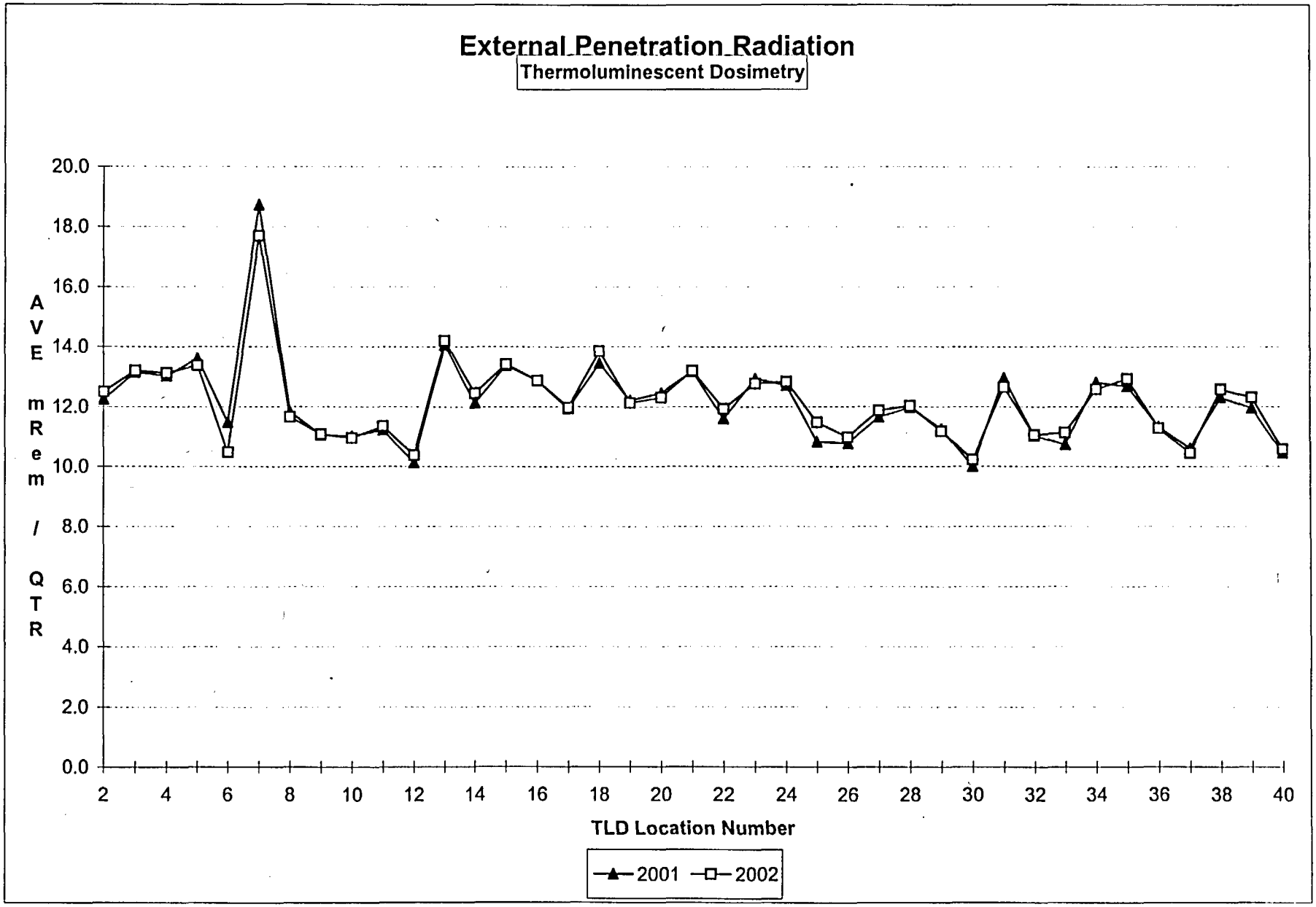
40 CFR 190 requires that the annual dose equivalent not exceed 25 millirems to the whole body of any member of the public. Using the annual average of control TLD stations as background and the highest site boundary TLD, leads to 7.9 millirem direct radiation dose to the hypothetical maximally exposed member of the public. Table 3-21 gives TLD readings for each quarter.

A trend chart with a comparison of data for each location for the years of 2001 and 2002 is included, Table 3-21. The data plotted is the average quarterly dose measured. TLD location #7 is elevated due to its proximity to radioactive equipment storage areas

Table 3-20
External Penetrating Radiation
Thermoluminescent Dosimetry 2002
Units mrem/91 Day Quarter

	Location	Type	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
#2 - #7 plus #13 are	2	I	12.6 ± 3.2	12.6 ± 3.2	12.4 ± 3.1	12.4 ± 3.1
on-site near the line	3	I	13.1 ± 3.3	12.9 ± 3.2	13.7 ± 3.4	13.1 ± 3.3
of the highest annual	4	I	13.1 ± 3.3	13.0 ± 3.3	13.4 ± 3.4	13.0 ± 3.3
average ground level	5	I	12.7 ± 3.2	13.4 ± 3.4	13.7 ± 3.5	13.7 ± 3.5
concentration.	6	I	10.1 ± 2.5	10.4 ± 2.6	10.9 ± 2.7	10.5 ± 2.6
	7	I	18.0 ± 4.5	17.9 ± 4.5	17.4 ± 4.4	17.5 ± 4.4
#8 - #12 are offsite at	8	C	11.6 ± 2.9	11.9 ± 3.0	11.7 ± 3.0	11.4 ± 3.0
a distance of 8 to 15 miles.	9	I	11.4 ± 2.9	11.2 ± 2.8	10.9 ± 2.8	10.8 ± 2.7
	10	C	10.9 ± 2.8	10.9 ± 2.8	10.9 ± 2.7	11.1 ± 2.8
	11	I	11.7 ± 2.9	10.9 ± 2.8	11.5 ± 2.9	11.3 ± 2.9
	12	C	10.6 ± 2.7	10.3 ± 2.6	10.3 ± 2.6	10.3 ± 2.6
	13	I	13.9 ± 3.5	14.1 ± 3.6	14.7 ± 3.9	14.1 ± 3.5
#14 - #16 are located	14	I	12.4 ± 3.1	11.5 ± 2.9	13.0 ± 3.3	12.9 ± 3.2
along a line 3000 ft. west	15	I	13.2 ± 3.3	13.5 ± 3.4	14.0 ± 3.5	13.0 ± 3.3
of the plant.	16	I	12.6 ± 3.2	12.8 ± 3.2	13.2 ± 3.3	12.9 ± 3.3
#17 - #21 are located	17	I	12.2 ± 3.1	11.6 ± 2.9	12.3 ± 3.1	11.8 ± 3.0
along Lake Road.	18	I	13.5 ± 3.4	14.0 ± 3.5	14.0 ± 3.5	13.9 ± 3.5
	19	I	11.8 ± 3.0	11.7 ± 3.0	12.7 ± 3.2	12.3 ± 3.1
	20	I	12.1 ± 3.0	11.9 ± 3.0	12.7 ± 3.2	12.5 ± 3.1
	21	I	13.0 ± 3.3	12.8 ± 3.2	13.6 ± 3.4	13.4 ± 3.4
#22 - #24 are located	22	I	11.5 ± 2.9	12.6 ± 3.2	12.0 ± 3.0	11.6 ± 2.9
along the east site	23	I	12.4 ± 3.1	12.3 ± 3.1	13.3 ± 3.3	13.1 ± 3.3
boundary line.	24	I	12.5 ± 3.2	12.4 ± 3.1	13.3 ± 3.4	13.1 ± 3.3
#25 - #30 are offsite	25	C	10.8 ± 2.7	13.4 ± 3.4	10.9 ± 2.8	10.8 ± 2.7
at a distance of 8	26	C	11.1 ± 2.8	10.7 ± 2.7	11.0 ± 2.8	11.1 ± 2.8
to 15 miles.	27	C	11.7 ± 2.9	11.6 ± 2.9	12.4 ± 3.1	11.8 ± 3.0
	28	C	11.7 ± 3.0	12.2 ± 3.1	12.0 ± 3.0	12.2 ± 3.1
	29	C	11.4 ± 2.9	10.7 ± 2.7	11.4 ± 2.9	11.2 ± 2.8
	30	C	10.3 ± 2.6	10.0 ± 2.5	10.3 ± 2.6	10.3 ± 2.6
#31 - #40 are located	31	I	12.6 ± 3.2	11.7 ± 2.9	13.4 ± 3.4	12.9 ± 3.3
in an arc at a distance	32	I	11.7 ± 2.9	11.0 ± 2.8	11.2 ± 2.8	10.3 ± 2.6
of 4 - 5 miles.	33	I	10.9 ± 2.7	11.1 ± 2.8	11.1 ± 2.8	11.4 ± 2.9
	34	I	12.1 ± 3.1	12.5 ± 3.1	13.1 ± 3.3	12.6 ± 3.2
	35	I	12.6 ± 3.2	12.8 ± 3.2	13.8 ± 3.5	12.5 ± 3.2
	36	I	11.3 ± 2.8	10.8 ± 2.7	11.6 ± 2.9	11.4 ± 2.9
	37	I	11.0 ± 2.8	10.1 ± 2.5	10.4 ± 2.6	10.3 ± 2.6
	38	I	12.3 ± 3.1	12.5 ± 3.2	12.7 ± 3.2	12.8 ± 3.2
	39	I	12.0 ± 3.0	11.8 ± 3.0	12.7 ± 3.2	12.1 ± 3.1
	40	I	10.2 ± 2.6	10.8 ± 2.7	10.9 ± 2.8	10.4 ± 2.6

Rochester Gas and Electric
Figure 3-21



4.0 LAND USE CENSUS

A land use census is performed 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 2002. The land use remains mainly agricultural in nature. There were several new private home developments. The three dairy operations nearest to the plant began the year in operation with 40 to 70 milk cows. Molino Farm ceased commercial operation early in 2002. There are no goats raised for human consumption of milk or meat within the five mile radius. Beef cattle are still raised on 3 farms within 5 miles of the plant as in past years.

An on-site garden is used for broad leaf vegetation and on-site crops are collected for indicator samples when available.

A copy of the Land Use Census that was completed in September 2002 is attached. Detailed land use census data is available on file at Ginna Station.

5.0 EXTERNAL INFLUENCES

During 2002, there were no external influences such as atmospheric weapons testing or accidents at other nuclear facilities which had an impact on the data.

Attachment I

Land Use Census

Sector	Distance to Nearest Residence	Distance to Nearest Garden	Distance to Milk Producing Animals
E	1260 m	N/A	N/A
ESE	1050 m	N/A	N/A
SE	610 m	N/A	8270 m
SSE	660 m	N/A	5230 m
S	1560 m	N/A	N/A
SSW	760 m	N/A	N/A
SW	660 m	N/A	4680 m
WSW	1350 m	N/A	N/A
W	1160 m	N/A	N/A

Changes from previous year:

None

Milk animal locations:

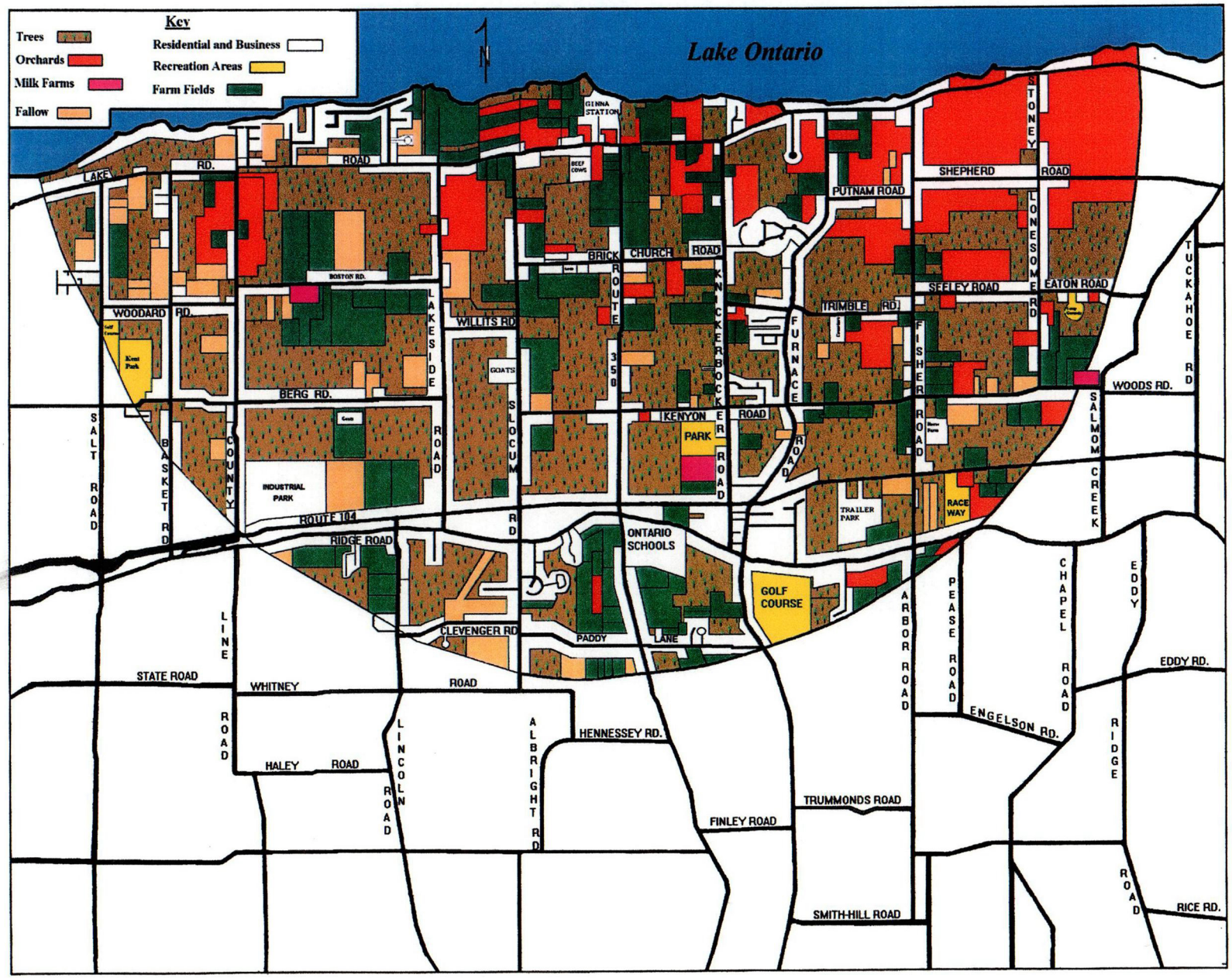
No new milk producing animals identified in 2002 Census.
Milk farm formerly at 5230 m SSE is no longer in business as of 3/1/02.

UFSAR change request: Y_____ N__X__

Land Use Census Completed by: M. Jones Date: 9/23/02

Reviewed by: [signature] Date: 10/8/02

Map 2-4


Key
Trees
Orchards
Milk Farms
Fallow
Residential and Business
Recreation Areas
Farm Fields
N
Lake Ontario
GINNA STATION
BEEF COWS
LAKE RD.
ROAD
BOSTON RD.
WOODARD RD.
Kent Park
BERG RD.
WILLITS RD
GOATS
BRICK CHURCH ROAD
ROUTE 350
KNICKERBOCKER ROAD
PUTNAM ROAD
SHEPHERD ROAD
STONEY
LONESOME RD
SEELEY ROAD
EATON ROAD
TRIMBLE RD
FURNACE ROAD
FISHER ROAD
TUCKAHOE RD
WOODS RD.
SALMON CREEK
LAKESIDE ROAD
SLOCUM RD
KENYON ROAD
PARK
INDUSTRIAL PARK
SALT ROAD
BASKET RD
COUNTY
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.
ARBOR ROAD
PEASE ROAD
CHAPEL ROAD
EDDY
EDDY RD.
ENGELSON RD.
RIDGE ROAD
FINLEY ROAD
TRUMMONDS ROAD
SMITH-HILL ROAD
RICE RD.

C04

6.0 QUALITY ASSURANCE

6.1 INTERLABORATORY BLIND SAMPLE COMPARISON

A Laboratory's participation in an interlaboratory comparison program provides a means for verifying the measurement accuracy of radioactive material in environmental sample media with another laboratory. 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 Analytics, Inc., Atlanta, Georgia for quality control blind spiked environmental sample media for interlaboratory comparison. Ginna Station submits blind spiked to our contract laboratory, James A. Fitzpatrick Environmental Laboratory (JAFEL), for analysis with field samples. JAFEL engages the services of Analytics and Environmental Measurements Laboratory (EML) for environmental sample media as blind sample spikes that are in addition to those submitted by Ginna Station. Framatome, ANP, performed tritium analyses during 2002 for JAFEL. JAFEL reports their comparison results to Ginna Station.

An assessment of the blind spiked sample media for accuracy was performed; 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 Laboratory's accuracy is evaluation by comparison to a reference as follows:

$$\text{Error Resolution} = \frac{\text{Reference Value}}{\text{Reference Uncertainty}}$$

$$\text{Comparison Ratio} = \frac{\text{Laboratory Analysis}}{\text{Reference Value}}$$

The reference value and uncertainty are Analytics values. Using Table 6.1A, the interval for the RATIO OF AGREEMENT is determined by the appropriate row under the ERROR RESOLUTION column. The RATIO OF AGREEMENT provides criteria for evaluating the comparison ratio as to being in agreement or disagreement. When the comparison ratio is found to be in agreement with the reference value a Laboratory's analysis does not have a statistically significant analysis error, either systematic or programmatic. If the comparison ratio is found to be in disagreement with the reference value the Laboratory's analysis has a statistically significant analysis error, which may be either systematic or programmatic.

Table 6.1A

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

A 5% reference uncertainty was applied to the reference value. According to ANSI N42.23-1996, 5% is the maximum acceptable bias for a reference laboratory that prepares blind spiked samples. The ERROR RESOLUTION for all the Analytics' spiked samples was determined to fall between 15.6 and 50.5 which correlates to RATIO OF AGREEMENT OF 0.75 to 1.33. Comparison ratios are displayed in Figures 6.1A, 6.1B, 6.1C and 6.1D along with a lower control limit (LCL) of 0.75 and an upper control limit (UCL) of 1.33.

6.2 ANALYTICS SAMPLE NON-CONFORMITIES

For 2002, there were two analysis that were found outside of the LCL and UCL, beta analysis and Cr-51 (Figures 6.1A, QC-3, 6.1C and 6.1C, QC-6). JAFEL was unable to identify systematic error or programmatic deficiency for either analysis.

Beta Non-conformity

A beta water sample was received from Analytics, Inc. and was analyzed in accordance with standard laboratory procedures. The result for beta was determined to be outside the QA Acceptance Criteria.
An evaluation of the beta result was performed. Results were examined with no abnormalities identified. Upon request from Ginna Station, the sample was re-analyzed by JAFEL. The sample result was 283 pCi/L with a known value of 280 pCi/L. With an error resolution of 20, the comparison ratio is 1.01. This is acceptable within the ratio of agreement limits of 0.75 to 1.33. However, the cause of the initial poor analytical results for this sample was not determined. It is suspected that there may have been a loss of sample in the transfer from lab ware to counting planchet.
Confidence in the accurate analysis of beta can be easily demonstrated by other beta analytical results both in the sample results for the 2002 QA program and historical QA results. No corrective actions were implemented as a result of this non-conformity.

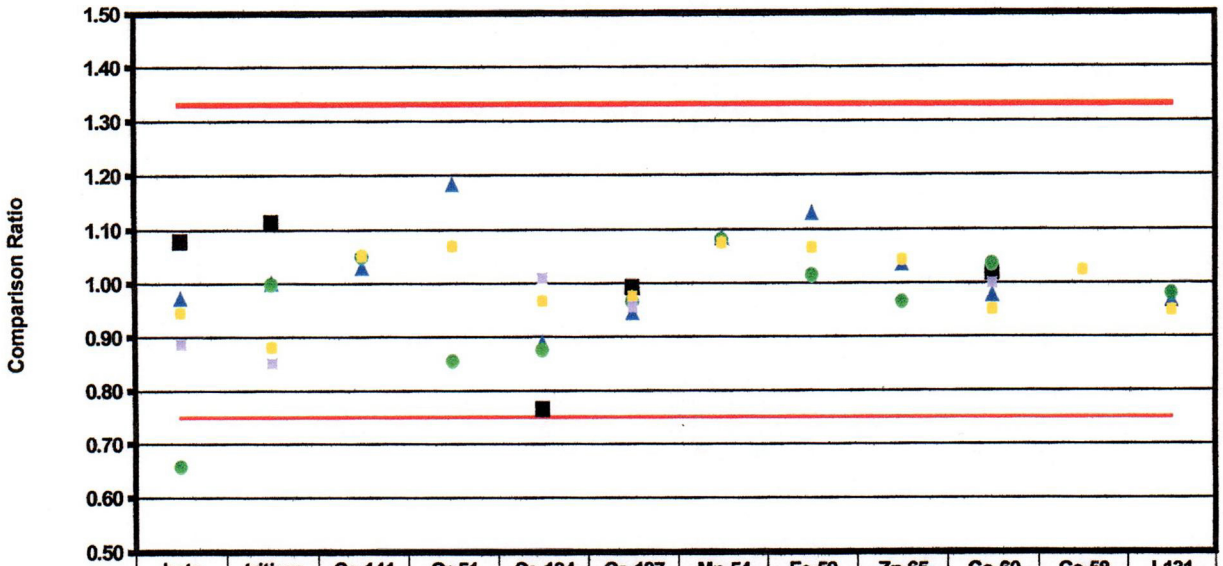
Cr-51 Non-conformity

A spiked mixed gamma in an air filter sample was received from Analytics, Inc. and was analyzed in accordance with standard laboratory procedures. The sample contained a total of nine radionuclides for analysis. Nine of the nine radionuclides present were quantified. Eight of the nine radionuclides were quantified within the acceptable range. The result for Cr-51 was determined to be outside the QA Acceptance Criteria.
An evaluation of the Cr-51 result was performed. The spectrum and peak search results were examined with no abnormalities identified. Cr-51 decays by electron capture with a 27.7day half-life and a gamma ray energy of 320 Kev with a yield of 9.8%. No secondary gamma energies are produced in the Cr-51 decay scheme. This low gamma energy yield and short half-life will result in very low net counts for samples containing environmental levels of Cr-51.
The combination of the following; low sample activity and resulting very small net count rate, short half-life, low gamma energy, small gamma yield and high sample density, resulted in an inaccurate sample result. The wide range of the associated counting errors demonstrates the low confidence level in the reported results. The poor analytical results for this sample is not routine and does not indicate a programmatic deficiency in the analysis of Cr-51 in air filter samples or other environmental media.

Confidence in the accurate analysis of Cr-51 can be easily demonstrated by other Cr-51 analytical results both in the sample results for the 2002 QA program and historical results.

A review of historical QA data for 2001 was also performed to determine if this is a recurring systematic error or bias. In 2001, numerous QA samples were analyzed which contained Cr-51. The mean ratio for these samples relative to the Known (reference) Value is 0.99. There were two Cr-51 non-conformities in the 2001 Crosscheck Program and were determined not to be systematic or programmatic errors. The historic Cr-51 non-conformities were a low percentage of the overall gamma spectroscopy QA program and have determined to be the result of the low sample activity and low gamma yields for Cr-51 in the spiked samples. Analytical methods and system calibrations are not the cause for this non-conformity, based on the accurate results achieved for the analysis of the other eight radionuclides present in the sample. No corrective actions were implemented as a result of this non-conformity.

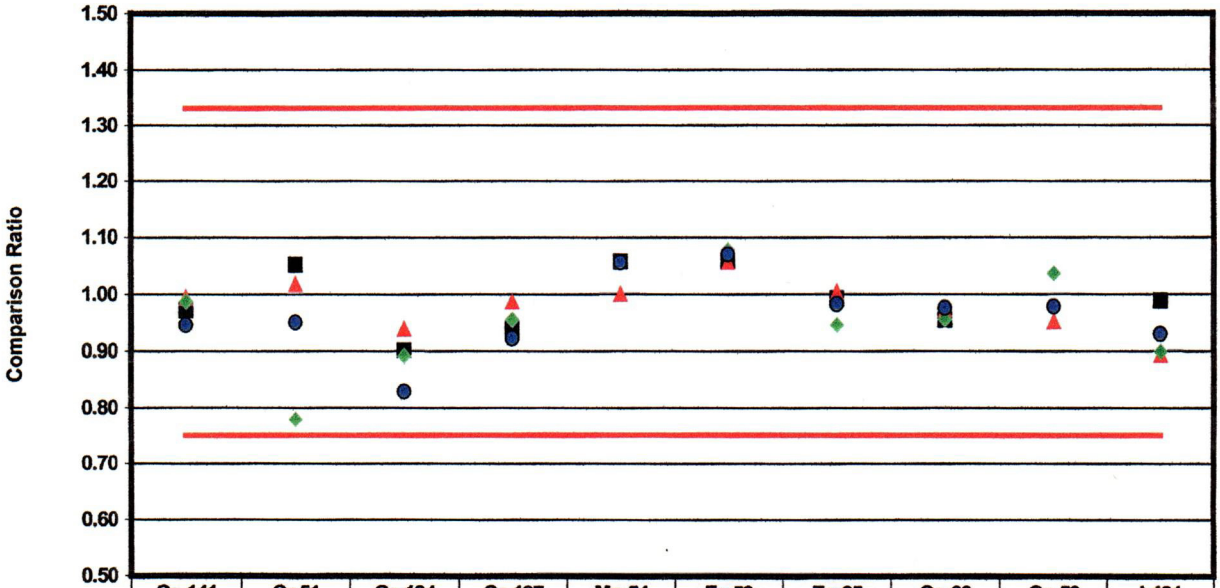
Figure 6.1A Trend of Blind Spiked Water Samples



	beta	tritium	Ce-141	Cr-51	Cs-134	Cs-137	Mn-54	Fe-59	Zn-65	Co-60	Co-58	I-131
UCL	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
QC-1	1.08	1.11			0.76	0.99				1.02		
QC-2	0.97	1.00	1.03	1.18	0.89	0.94	1.08	1.13	1.03	0.98		0.97
QC-3	0.66	1.00	1.05	0.85	0.87	0.96	1.08	1.01	0.96	1.03		0.98
QC-4	0.89	0.85			1.01	0.95				1.00		
QC-5	0.94	0.88	1.05	1.07	0.97	0.98	1.07	1.06	1.04	0.95	1.02	0.95
LCL	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

C05

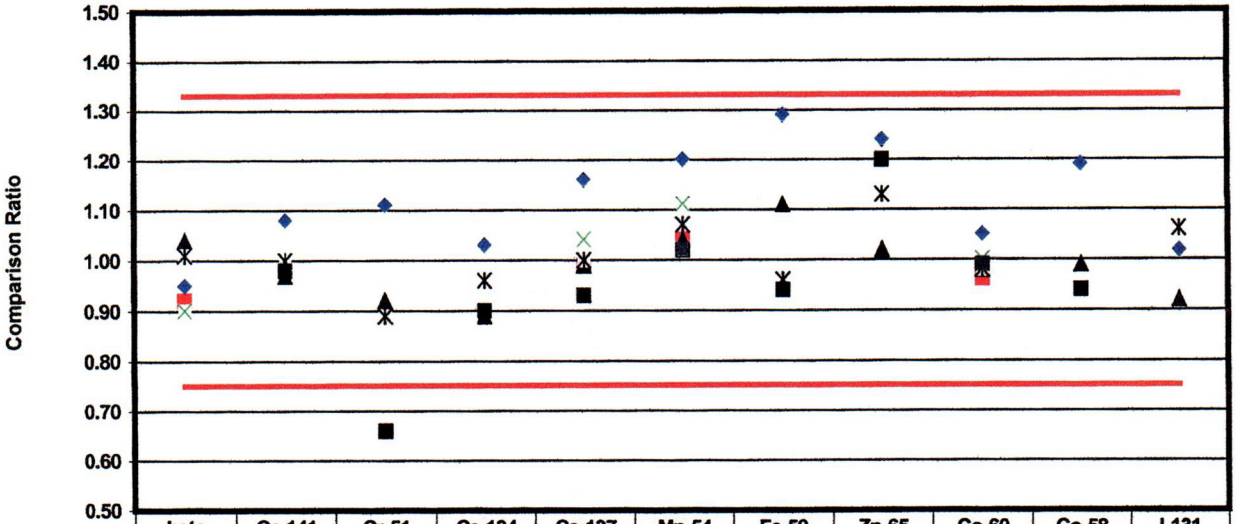
Figure 6.1B Trend of Blind Spiked Milk Samples



	Ce-141	Cr-51	Cs-134	Cs-137	Mn-54	Fe-59	Zn-65	Co-60	Co-58	I-131
UCL	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
QC-1	0.97	1.05	0.90	0.94	1.06	1.06	0.99	0.96		0.99
QC-2	0.99	1.02	0.94	0.99	1.00	1.06	1.00	0.97	0.95	0.89
QC-3	0.99	0.78	0.89	0.96	1.06	1.08	0.95	0.96	1.04	0.90
QC-4	0.95	0.95	0.83	0.92	1.06	1.07	0.98	0.98	0.98	0.93
LCL	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

C06

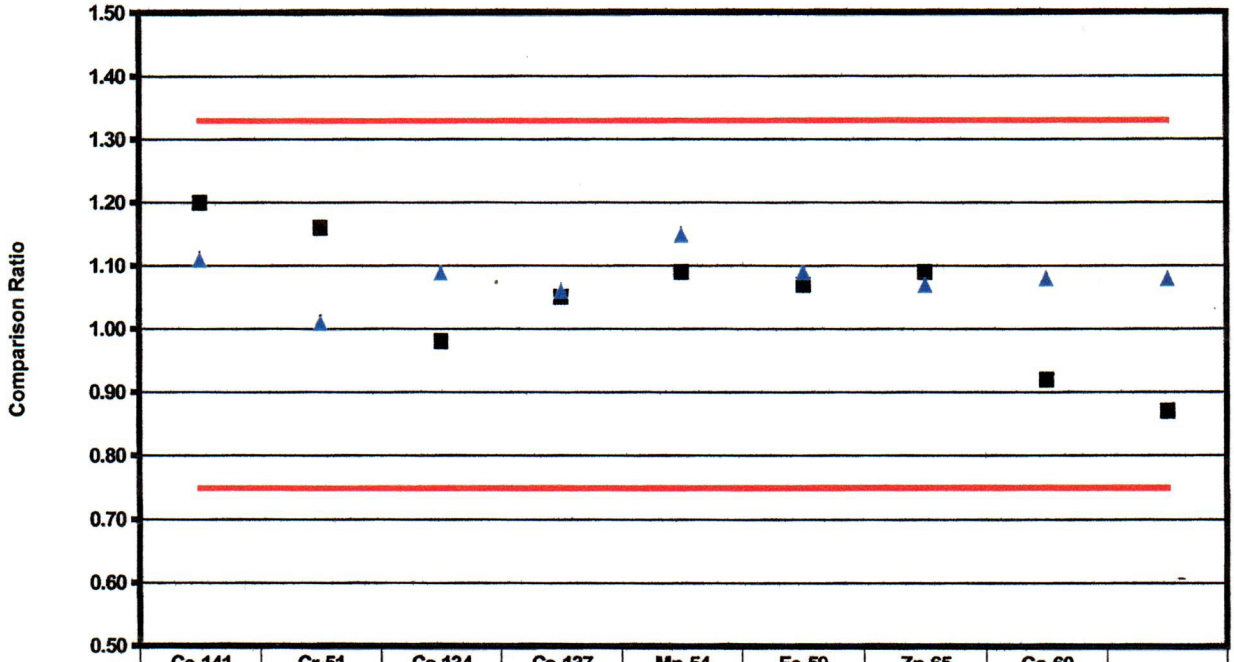
Figure 6.1C Trend of Blind Spiked Filter Samples



	beta	Ce-141	Cr-51	Cs-134	Cs-137	Mn-54	Fe-59	Zn-65	Co-60	Co-58	I-131
UCL	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
QC-1	0.92				0.99	1.04			0.96		
QC-2	1.04	0.97	0.92	0.89	0.99	1.04	1.11	1.02	0.98	0.99	0.92
QC-3	1.01	1.00	0.89	0.96	1.00	1.07	0.96	1.13	0.98		1.06
QC-4	0.95	1.08	1.11	1.03	1.16	1.20	1.29	1.24	1.05	1.19	1.02
QC-5	0.90				1.04	1.11			1.00		
QC-6		0.98	0.66	0.90	0.93	1.02	0.94	1.20	0.99	0.94	
LCL	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

C07

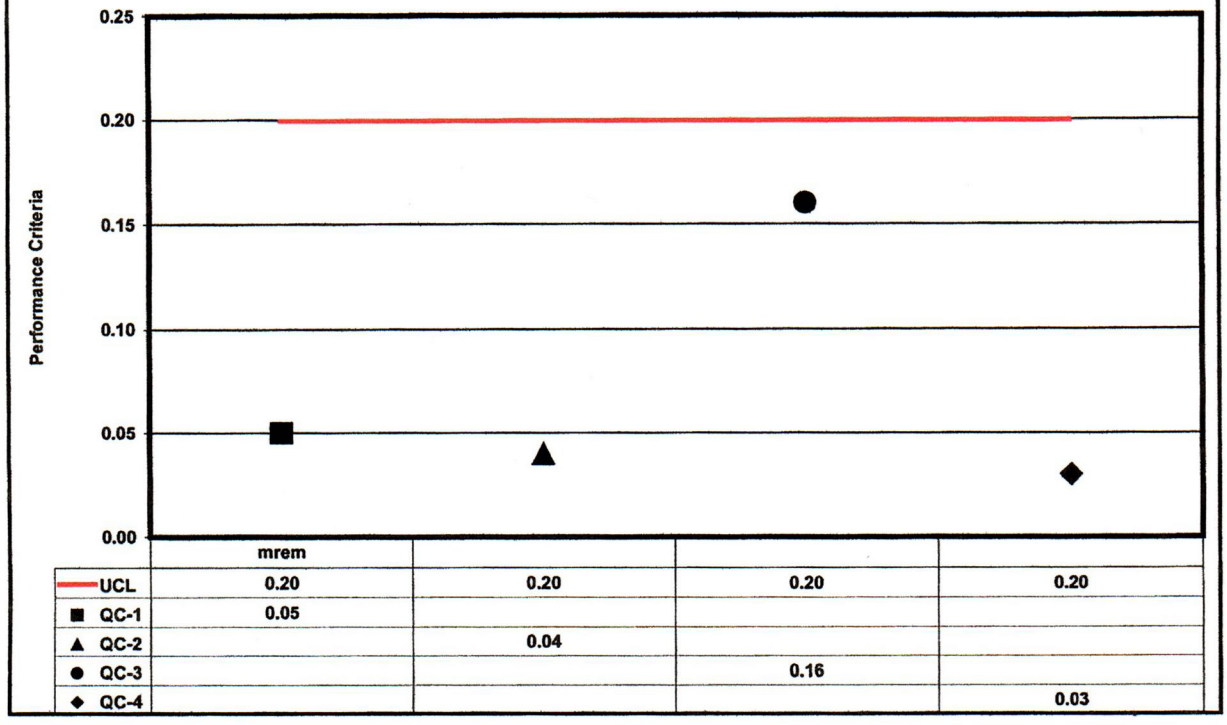
Figure 6.1D Trend of Blind Spiked Soil/Vegetation Samples



	Ce-141	Cr-51	Cs-134	Cs-137	Mn-54	Fe-59	Zn-65	Co-60	
UCL	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
QC-1	1.20	1.16	0.98	1.05	1.09	1.07	1.09	0.92	0.87
QC-2	1.11	1.01	1.09	1.06	1.15	1.09	1.07	1.08	1.08
LCL	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

C08

Figure 6.2A Trend of QC Blind Spiked TLDs



	mrem			
UCL	0.20	0.20	0.20	0.20
QC-1	0.05			
QC-2		0.04		
QC-3			0.16	
QC-4				0.03

6.2 INTRALABORATORY BLIND SAMPLE COMPARISON

A Laboratory's use of in-house quality control spiked samples provides a means for verifying measurement accuracy for analyzing environmental sample media. In 2002, Ginna Station implemented field spiked environmental TLDs by irradiating TLDs with a Cs-137 source to a known dose. The spiked TLDs were placed in the field and processed with each quarter's environmental TLDs. The reported dose was background corrected, using the average of the field control TLDs. The reported dose and delivered dose are used to calculate a performance quotient ((reported - delivered)/delivered) for each TLD within the set of spiked TLDs. The performance bias is the average of the performance quotients. The standard deviation of bias is the standard deviation of the performance quotients. For the set of spiked TLDs a performance criteria is calculated by adding the performance bias and standard deviation of the bias. The performance criteria limit was established to be 0.20. Spike performance criteria of less than 0.20 validate the TLD processing at Ginna Station. All blind TLD performance criteria for year 2001 were less than 0.20. Figure 6.2A displays the spike TLD performance criteria.

C09

6.3 AUDIT OF CONTRACT LABORATORY

Ginna Station Quality Assurance personnel conducted an audit of the ODCM and REMP during the period of January 28, 2002 to March 28, 2002, Audit report AINT-2002-0001-JMT. A strength was identified with the format and function of the Offsite Dose Calculation Manual. Two concerns were identified in the audit with three deficiencies. None of the areas for improvement identified in the report were related to the JAFEL. There were no surveillances performed at the JAFEL in 2002. Surveillance is required every three years and was performed in 2001 in the following six areas: Control of MT&E, Control of Records/Documents, Control/Adequacy of Sampling and Analysis, Qualification/Training of Personnel, Shipping and Storage of Samples, and Quality Program Controls. The surveillance report indicated that the JAFEL functioned in an acceptable manner and was rated satisfactory with respect to all six areas.

7.0 DEVIATIONS FROM SCHEDULE

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

1. Environmental Air Sample Station (ES) # 8 found off 3/11/02. Trouble card issued for repair. Sample period was 73.2 hours.
2. ES #5 found on 10/01/02 with hose barb broken. No sample results for week of 9/23/02 - 9/30/02. Returned to service 10/01/02.

In addition to these deviations, two environmental air sampler flow meters failed as found criteria at annual preventive maintenance. Although the failures appeared to have occurred during the test procedures, average air radioactivity and conclusions derived from air radioactivity applied the as found flow rate to the entire sample periods. See section 3.2