Commonwealth Edison
LaSalle County Nuclear Station
Rural Route #1, Box 220
Marseilles, Illinois 61341
Telephone 815/357-6761

April 1, 1991

Mr. Bert Davis
Administrator
Nuclear Regulatory Commission Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Davis:

Enclosed is the 1990 Annual Radiological Environmental Operating Report for LaSalle County Nuclear Power Station, Docket Numbers 50-373 and 50-374. This report contains the results of the Radiological Environmental and Meteorological Monitoring Programs.

Two copies of the report are provided for your use. Two copies will be forwarded to the Document Control Desk and one copy to the Resident Inspector.

Sincerely,

G. J. Diederich
Station Manager
LaSalle County Station

GJD/KFK/djf

enclosure

cc: Station File

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LASALLE COUNTY STATION

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

1990

MARCH 1991

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INTRODUCTION

LaSalle Station, a two-unit BWR plant is located near Marseilles, Illinois, in LaSalle County, 3.5 miles south of the Illinois River. Each reactor is designed to have a capacity of 1078 MW net. Unit No. 1 loaded fuel in March 1982. Unit No. 2 loaded fuel in late December 1983. The plant has been designed to keep releases to the environment at levels below those specified in the regulations.

Liquid effluents from LaSalle County Station are released to the Illinois River in controlled batches after radioassay of each batch. Gaseous effluents are released to the atmosphere after delay to permit decay of short half-life gases. Releases to the atmosphere are calculated on the basis of analyses of routine grab samples of noble gases and continuously collected composite samples of iodine and particulate matter. The results of effluent analyses are summarized on a monthly basis and reported to the Nuclear Regulatory Commission as required per Technical Specifications. Airborne concentrations of noble gases, I-131 and particulate radioactivity in offsite areas are calculated using effluent and meteorological data.

Environmental monitoring is conducted by sampling at indicator and reference (control) locations in the vicinity of the LaSalle County Station to measure changes in radiation or radioactivity levels that may be attributable to plant operations. If significant changes attributable to LaSalle County Station are measured, these changes are correlated with effluent releases. External gamma radiation exposure from noble gases and I-131 in milk are the most critical pathways at this site; however, an environmental monitoring program is conducted which includes other pathways of less importance.

SUMMARY

Gaseous and liquid effluents for the period remained at a fraction of the Technical Specification limits. Calculations of environmental concentrations based on effluent, Illinois River flow, and meteorological data for the period indicate that consumption by the public of radionuclides attributable to the plant are well below the regulatory limits. Radiation exposure from radionuclides released to the atmosphere represented the critical pathway for the period with a maximum individual dose estimated to be 2.15E-04 mrem for the year, when a shielding and occupancy factor of 0.7 is assumed. The assessment of radiation doses is performed in accordance with the Offsite Dose Calculation Manual (ODCM). The results of analysis confirm that the station is operating in compliance with 10CFR50 and 40CFR190.

1.0 EFFLUENTS

1.1 Gaseous Effluents to the Atmosphere

Measured concentrations of noble gases, radioiodine, and particulate radioactivity released to the atmosphere during the year, are listed in Table 1.1-1. A total of 6.87E+02 curies of fission and activation gases was released with an average release rate of 7.55E+01 µCi/sec.

A total of 2.17E-03 curies of I-131 was released during the year, with an average release rate of 1.75E-04 µCi/sec for all iodines.

A total of 1.27E-03 curies of beta-gamma emitters were released as airborne particulate matter, with an average release rate of 2.11E-04 µCi/sec. Alpha emitting radionuclides were not measurable.

A total of 1.70E-01 curies of tritium was released, with an average release rate of 8.37E-03 µCi/sec.

1.2 Liquids Released to the Illinois River

A total of 4.07E+05 liters of radioactive liquid waste (prior to dilution) containing 2.46-02 curies (excluding tritium, gases, and alpha) were discharged after dilution with a total of 3.12E+08 liters of water. These wastes were released at a quarterly average concentration of 2.05E-06 µCi/ml, discharged on an unidentified nuclide basis. A total of 2.08E-01 curies of alpha radioactivity and 3.74E-01 curies of tritium were released. Quarterly release estimates in liquid effluents are given in Table 1.2-1.

2.0 SOLID RADIOACTIVE WASTE

Solid radioactive wastes were shipped by truck to Oak Ridge, Tennessee; Beatty, Nevada; Waltz Mill, Pennsylvania; Barnwell Nuclear Center, South Carolina; and Channahon, Illinois. The record of waste shipments is summarized in Table 2.0-1.

3.0 DOSE TO MAN

3.1 Gaseous Effluent Pathways

Gamma Dose Rates

Gamma air and whole body dose rates offsite were calculated based on measured release rates, isotopic composition of the noble gases, and meterological data for the period (Table 3.1-1). Isodose contours of whole body dose are shown in Figure 3.1-1 for the year.

Based on measured effluents and meteorological data, the maximum dose to an individual would be 2.15E-04 mrem for the year, with an occupancy or shielding factor of 0.7 included. The maximum gamma air dose was 4.08E-04 mrad.

Beta Air and Skin Rates

The range of beta particles in air is relatively small (on the order of a few meters or less); consequently, plumes of gaseous effluents may be considered "infinite" for purpose of calculating the dose from beta radiation incident on the skin. However, the actual dose to sensitive skin tissues is difficult to calculate because this depends on the beta particle energies, thickness of inert skin, and clothing covering sensitive tissues. For purposes of this report the skin is taken to have a thickness of 7 mg/cm^2 and an occupancy factor of 1.0 is used. The skin dose from beta and gamma radiation for the year was 1.25E-03 mrem. The maximum offsite beta air dose for the year was 1.41E-03 mrad.

The air concentrations of radioactive noble gases at the offsite receptor locations are given in Figure 3.1-2.

Radioactive Iodine

The human thyroid exhibits a significant capacity to concentrate ingested or inhaled iodine, and the radioiodine, I-131, released during routine operation of the plant, may be made available to man thus resulting in a dose to the thyroid. The principal pathway of interest for this radionuclide is ingestion of radioiodine in milk by an infant.

Iodine-131 Concentrations in Air

The calculated concentration contours for I-131 in air are shown in Figure 3.1-3. Included in these calculations is an iodine cloud depletion factor which accounts for the phenomenon of elemental iodine deposition on the ground. The maximum offsite concentration is estimated to be 3.43E-04 pCi/m^3 for the year.

Dose to Infant's Thyroid

The hypothetical thyroid dose to an infant living near the plant via ingestion of milk was calculated. The radionuclide considered was I-131 and the source of milk was taken to be the nearest dairy farm with the cows pastured from May to October. The maximum infant's thyroid dose was 3.64E-03 mrem during the year (Table 3.1-1).

Concentrations of Particulates in Air

Concentration contours of radioactive airborne particulates are shown in Figure 3.1-4. The maximum offsite level is estimated to be 1.44E-05 pCi/m^3.

Summary of Doses

Table 3.1-1 summarizes the doses resulting from releases of airborne radioactivity via the different exposure pathways.

3.2 Liquid Effluent Pathways

The three principal pathways through the aquatic environment for potential doses to man from liquid waste are ingestion of potable water, eating aquatic foods, and exposure while walking on the shoreline. Not all of these pathways are applicable at a given time or station but a reasonable approximation of the dose can be made by adjusting the dose formula for season of the year or type and degree of use of the aquatic environment. NRC* developed equations were used to calculate the doses to the whole body, lower GI tract, thyroid, bone and skin; specific parameters for use in the equations are given in the Commonwealth Edison Offsite Dose Calculation Manual. The maximum whole body dose for the year was 4.18E-05 mrem and no organ dose exceeded 3.24E-05 mrem.

3.3. Direct Radiation

In section 3/4.11 of the LaSalle Technical Specifications, 40CFR190 calculations of total dose due to the Uranium fuel Cycle are required only when calculated doses from liquid or gaseous releases of radioactivity exceed certain levels. These levels are twice the following limits:

- The RETS limits on dose or dose commitment to an individual due to radioactive materials in liquid effluents from each reactor unit (1.5 mrems to the whole body or 5 mrem to any organ during any calendar quarter; 3 mrem to the whole body or 10 mrem to any organ during any calendar year).

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* Nuclear Regulatory Commission, Regulatory Guide 1.109 (Rev. 1).

- The RETS limits on air dose in noble gases released in gaseous effluents to a member of the public from each reactor unit (5 mrad for gamma radiation or 10 mrads for beta radiation during any calendar quarter; 10 mrads for gamma radiation or 20 mrad for beta radiation during any calendar year).

- The RETS limits on dose to any individual due to iodine-131, iodine-133, tritium, and radionuclides in particulate form with half-lives greater than eight days in gaseous effluents released from each reactor unit (7.5 mrems to any organ during any calendar quarter; 15 mrems to any organ during any calendar year).

During the period January to December, 1990, LaSalle County Station did not exceed these criteria, and members of the public (occasional visitors to the site) did not exceed these criteria either when onsite.

4.0 SITE METEOROLOGY

A summary of the site meteorological measurements taken during each quarter of the year is given in Appendix II. The data are presented as cumulative joint frequency distributions of 375' and 33' levels. Data recovery for these measurements was about 98.9%.

5.0 ENVIRONMENTAL MONITORING

Table 5.0-1 provides an outline of the Radiological Environmental Monitoring Program as required in the Technical Specifications. Tables 5.0-3 to 5.0-6 summarize data for the year. Except for tables of special interest, tables listing all data are no longer included in the annual report. All data tables are available for inspection at the Station or in the Corporate offices.

Specific findings for various environmental media are discussed below.

5.1 Gamma Radiation

External radiation dose from onsite sources and noble gases released to the atmosphere was measured at ten indicator and four reference (background) locations using $CaSO_4$:Dy thermoluminescent dosimeters (TLDs). A comparison of the TLD results for reference stations with onsite and offsite indicator stations is included in Table 5.1-1. A total of forty-eight additional TLDs were installed on June 1, 1980 such that each sector was covered at both five miles and the site boundary. Six (6) TLD locations were added to the monitoring program on July 1, 1985.

Quarterly external radiation dose at fourteen air sampling locations averaged 17.8 mR) and was similar to levels measured in 1986 (17.1 mR), 1987 (17.8 mR), 1988 (16.5 mR), and 1989 (17.6 mR). The differences are not statistically significant.

5.2 Airborne I-131 and Particulate Radioactivity

Locations of the samplers are shown in Figure 5.0-1. Airborne I-131 remained below the LLD of 0.10 pCi/m^3 throughout the year.

Gross beta concentrations ranged from 0.010 to 0.079 pCi/m^3 and averaged 0.024 pCi/m^3 and was slightly lower than in 1985 (0.025 pCi/m^3), 1986 (0.027, except for the period from May 16 through June 6 when it was influenced by the nuclear reactor accident at Chernobyl), 1987 (0.027 pCi/m^3), 1988 (0.031 pCi/m^3), and 1989 (0.028 pCi/m^3.

Gamma-emitting isotopes were blow the LLD level of 0.01 pCi/m^3 in all quarterly composites.

No radioactivity attributable to plant operation was detected in any sample.

5.3 Terrestrial Radioactivity

Well water was collected quarterly from one onsite well and five offsite wells and analyzed for tritium and gamma-emitting isotopes. All results were below the limits of detection, indicating that there was no measurable amount of radioactivity due to the Station's releases.

5.4 Aquatic Radioactivity

Weekly surface water samples from the Illinois River at Seneca and LSCS Cooling Lake were composited monthly and analyzed for gamma-emitting isotopes. Weekly samples from the same locations were composited quarterly and analyzed for tritium. None of the composited samples indicated the presence of gamma-emitting isotopes above their respective LLD levels. Tritium was detected in five samples and ranged from 226 to 294 pCi/L. Similar results were obtained in 1988 and 1989.

Sediment samples were collected twice a year from one indicator location (downstream at Cooling Lake) and analyzed for gamma-emitters. Gamma-emitters were below their respective detection limits in all samples.

Levels of gamma radioactivity in fish were measured and found in all samples to be below the lower limits of detection for the program.

5.5 Milk

Milk samples were collected monthly from November through April and weekly from May through October and analyzed for iodine-131 and gamma-emitting isotopes.

I-131 remained below the detection limit of 0.5 pCi/L.

Cs-134 and Cs-137 were below the LLD level of 5 pCi/L. All other gamma-emitting isotopes, except naturally-occurring K-40, were below their respective LLDs. There was no indication of the effect on the environment due to station operation.

5.6 Sample Collections

All samples were collected as scheduled except those listed in the Listing of Missed Samples, Appendix III.

5.7 Program Modifications

Boldt Dairy (L-18) was replaced by Flatness Dairy. Gass Farm (L-20) was added to the program in November, 1990; the additional dairy was not required by the ODCM but was added to the program to ensure that the program included at least four dairies.

6.0 ANALYTICAL PROCEDURES

A summary of the procedures used for analyzing radioactivity in environmental samples is given in Appendix V of the report for the period January - December 1988. Procedures used during the period covered by this report remained essentially unchanged.

7.0 MILCH ANIMALS AND NEAREST CATTLE CENSUSES

A census of milch animals was conducted within five miles of the station. The survey was conducted by a "door-to-door" canvas and by information from Illinois Agricultural Agents. The census was conducted by A. Lewis on June 13 and 14, 1990. The nearest cattle census was conducted by A. Lewis on July 10, 11, and 12, 1990.

8.0 NEAREST RESIDENCES CENSUS

A census of the nearest residences within a five (5) mile radius was conducted by A. Lewis on June 27, 1990.

Results of milch animals, nearest cattle, and nearest residence censuses are presented in Appendix IV.

9.0 INTERLABORATORY COMPARISON PROGRAM RESULTS

Interlaboratory Comparison Program Results are presented in Appendix V.

APPENDIX I

DATA TABLES AND FIGURES

TABLE 1.1-1

LASALLE COUNTY NUCLEAR POWER STATION
UNITS ONE AND TWO
DOCKET NUMBERS 50-373 AND 50-374

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

		First Quarter	Second Quarter
A. Fission and Activation Gases			
1. Total release	Ci	4.36E+00	4.20E-02
2. Average release rate for period	uCi/sec	1.85E+00	8.23E-02
B. Iodines			
1. Total iodine-131	Ci	7.65E-04	5.64E-04
2. Average release rate for period	uCi/sec	3.12E-04	1.71E-04
C. Particulates			
1. Particulates with T1/2 >8 days	Ci	8.34E-04	1.80E-04
2. Average release rate for period	uCi/sec	3.13E-04	2.20E-04
3. Gross alpha radioactivity	Ci	<1.00E-11	<1.00E-11
D. Tritium			
1. Total release	Ci	0.00E+00	8.45E-03
2. Average release rate for period	uCi/sec	<1.00E-06	1.07E-03

"<" indicates activity of sample is less than LLD given in uci/ml

TABLE 1.1-1 (continued)

LASALLE COUNTY NUCLEAR POWER STATION
UNITS ONE AND TWO
DOCKET NUMBERS 50-373 AND 50-374

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

		Third Quarter	Fourth Quarter
A. Fission and Activation Gases			
1. Total release	Ci	6.74E+02	8.39E+00
2. Average release rate for period	uCi/sec	2.96E+02	4.23E+00
B. Iodines			
1. Total Iodine-131	Ci	3.21E-04	5.24E-04
2. Average release rate for period	uCi/sec	1.13E-04	1.02E-04
C. Particulates			
1. Particulates with T1/2 >8 days	Ci	2.38E-04	1.70E-05
2. Average release rate for period	uCi/sec	2.54E-04	5.70E-05
3. Gross alpha radioactivity	Ci	<1.00E-11	<1.00E-11
D. Tritium			
1. Total release	Ci	8.85E-02	7.32E-02
2. Average release rate for period	uCi/sec	1.80E-02	1.44E-02

'<' indicates activity of sample is less than LLD given in uci/ml

TABLE 1.2-1

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

UNIT ONE

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

		First Quarter	Second Quarter
A. Fission and Activation Products			
1. Total release (not including tritium, gases, alpha)	Ci	0.00E+00	0.00E+00
2. Average concentration released	uCi/ml	N/A	N/A
3. Maximum concentration released	uCi/ml	N/A	N/A
B. Tritium			
1. Total release	Ci	0.00E+00	0.00E+00
2. Average concentration released	uCi/ml	N/A	N/A
C. Dissolved Noble Gases			
1. Total release	Ci	0.00E+00	0.00E+00
2. Average concentration released	uCi/ml	N/A	N/A
D. Gross Alpha Radioactivity			
1. Total release	Ci	0.00E+00	0.00E+00
2. Average concentration released	uCi/ml	N/A	N/A
E. Volume of Waste Released	liters	0.00E+00	0.00E+00
F. Volume of Dilution Water	liters	0.00E+00	0.00E+00

"<" indicates activity of sample is less than LLD given in uCi/ml

TABLE 1.2-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

UNIT ONE

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

		Third Quarter	Fourth Quarter
A. Fission and Activation Products			
1. Total release (not including tritium, gases, alpha)	Ci	0.00E+00	5.97E-03
2. Average concentration released	uCi/ml	N/A	4.30E-06
3. Maximum concentration released	uCi/ml	N/A	2.10E-05
B. Tritium			
1. Total release	Ci	0.00E+00	1.83E-01
2. Average concentration released*	uCi/ml	N/A	9.20E-04
C. Dissolved Noble Gases			
1. Total release	Ci	0.00E+00	<1.00E-05
2. Average concentration released	uCi/ml	N/A	N/A
D. Gross Alpha Radioactivity			
1. Total release	Ci	0.00E+00	5.98E-07
2. Average concentration released	uCi/ml	N/A	3.00E-09
E. Volume of Waste Released	liters	0.00E+00	1.99E+05
F. Volume of Dilution Water	liters	0.00E+00	1.73E+08

*'<' indicates activity of sample is less than LLD given in uCi/ml

TABLE 1.2-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

UNIT TWO

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

		First Quarter	Second Quarter
A. Fission and Activation Products			
1. Total release (not including tritium, gases, alpha)	Ci	0.00E+00	0.00E+00
2. Average concentration released	uCi/ml	N/A	N/A
3. Maximum concentration released	uCi/ml	N/A	N/A
B. Tritium			
1. Total release	Ci	0.00E+00	0.00E+00
2. Average concentration released	uCi/ml	N/A	N/A
C. Dissolved Noble Gases			
1. Total release	Ci	0.00E+00	0.00E+00
2. Average concentration released	uCi/ml	N/A	N/A
D. Gross Alpha Radioactivity			
1. Total release	Ci	0.00E+00	0.00E+00
2. Average concentration released	uCi/ml	N/A	N/A
E. Volume of Waste Released	liters	0.00E+00	0.00E+00
F. Volume of Dilution Water	liters	0.00E+00	0.00E+00

"<" indicates activity of sample is less than LLD given in uCi/ml

TABLE 1.2-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

UNIT TWO

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

		Third Quarter	Fourth Quarter
A. Fission and Activation Products			
1. Total release (not including tritium, gases, alpha)	Ci	0.00E+00	1.86E-02
2. Average concentration released	uCi/ml	N/A	1.21E-05
3. Maximum concentration released	uCi/ml	N/A	5.48E-05
B. Tritium			
1. Total release	Ci	0.00E+00	1.91E-01
2. Average concentration released	uCi/ml	N/A	9.20E-04
C. Dissolved Noble Gases			
1. Total release	Ci	0.00E+00	<1.00E-05
2. Average concentration released	uCi/ml	N/A	N/A
D. Gross Alpha Radioactivity			
1. Total release	Ci	0.00E+00	2.08E-01
2. Average concentration released	uCi/ml	N/A	1.00E-09
E. Volume of Waste Released	liters	0.00E+00	2.08E+05
F. Volume of Dilution Water	liters	0.00E+00	1.39E+08

"<" indicates activity of sample is less than LLD given in uCi/ml

TABLE 2.0-1

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

		Jan.	Feb.	March	First Quarter
1. Spent resins, filter sludges, evaporator bottoms, etc.					
a. Quantity shipped	cu.m.	3.97E+01	1.86E+01	1.29E+01	7.12E+01
b. Total activity	Ci	4.51E+02	6.50E+02	1.12E+02	1.21E+03
c. Major nuclides (estimate)					
Co-60	%	22	25	36	
Fe-55	%	64	58	35	
Mn-54	%	05	13	21	
d. Container type		LSA	LSA	LSA	
e. Container volume	cu.m.	2.12E-01 3.85E+00 3.94E+00 5.07E+00	2.12E-01 3.85E+00 3.94E+00	3.94E+00 5.07E+00	
f. Solidification agent		Cement	Cement	Cement	
2. Dry compressible waste, contaminated equipment, etc.					
a. Quantity shipped	cu.m.	5.70E+01	5.43E+01	2.21E+01	1.33E+02
b. Total activity	Ci	2.18E+00	1.43E+00	7.04E-01	4.31E+00
c. Major nuclides (estimate)					
Co-60	%	36	36	36	
Mn-54	%	21	21	21	
Cr-51	%	32	32	32	
d. Container type		LSA	LSA	LSA	
e. Container volume	cu.m.	2.12E-01 2.72E+00	2.12E-01 2.72E+00 3.51E+01	2.12E-01 2.72E+00	

TABLE 2.0-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

		Jan.	Feb.	March	First Quarter
3. Solid Waste Disposition					
a. Number of Shipments		14	07	04	25
b. Mode of Transportation		Hittman	Hittman	Hittman	
	Number	14	07	04	
c. Destination		Barnwell, SC	Barnwell, SC	Barnwell, SC	
	Number	03	01	01	
		Beatty, NV	Beatty, NV	Beatty, NV	
	Number	08	04	02	
		Oak Ridge, TN	Oak Ridge, TN	Oak Ridge, TN	
	Number	03	01	01	
			Waltz Mill, PA		
	Number		01		

TABLE 2.0-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

		April	May	June	Second Quarter
1. Spent resins, filter sludges, evaporator bottoms, etc.					
a. Quantity shipped	cu.m.	1.56E+01	1.47E+01	3.10E+01	5.13E+01
b. Total activity	Ci	9.43E+01	5.48E+01	1.13E+02	2.62E+02
c. Major nuclides (estimate)					
Co-60	%	70	79	79	
Fe-55	%	03	01	01	
Mn-54	%	28	18	18	
d. Container type		LSA	LSA	LSA	
e. Container volume	cu.m.	2.12E-01 3.94E+00 5.07E+00	2.12E-01 3.94E+00	2.12E-01 3.94E+00 5.07E+00	
f. Solidification agent		Cement	Cement	Cement	
2. Dry compressible waste, contaminated equipment, etc.					
a. Quantity shipped	cu.m.	6.21E+01	2.10E+01	3.12E+01	9.61E+01
b. Total activity	Ci	6.65E+00	1.06E+00	2.44E+01	3.19E+01
c. Major nuclides (estimate)					
Fe-59	%	30	30	30	
Mn-54	%	28	28	28	
Cr-51	%	25	25	25	
d. Container type		LSA	LSA	LSA	
e. Container volume	cu.m.	2.12E-01 2.72E+00	2.12E-01 2.72E+00	2.12E-01 4.05E+00	

TABLE 2.0-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

		April	May	June	Second Quarter
3. Solid Waste Disposition					
a. Number of Shipments		07	05	08	20
b. Mode of Transportation		Hittman	Hittman	Hittman	
	Number	06	04	06	
		Kindrick	Kindrick	Kindrick	
	Number	01	01	02	
c. Destination		Barnwell, SC	Beatty, NV	Barnwell, SC	
	Number	01	04	02	
		Beatty, NV	Oak Ridge, TN	Beatty, NV	
	Number	04	01	04	
		Oak Ridge, TN		Oak Ridge, TN	
	Number	02		02	

TABLE 2.0-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

		July	August	September	Third Quarter
1. Spent resins, filter sludges, evaporator bottoms, etc.					
a. Quantity shipped	cu. m.	1.91E+01	1.35E+01	1.55E+01	4.81E+01
b. Total activity	Ci	4.04E+02	5.68E+02	3.35E+02	1.31E+03
c. Major nuclides (estimate)					
Mn-54	%	09	08	10	
Fe-55	%	62	69	65	
Co-60	%	22	20	23	
d. Container type		LSA	LSA	LSA	
e. Container volume	cu. m.	3.94E+00 5.07E+00	2.08E-01 3.94E+00	2.08E-01 3.14E-01 3.94E+00	
f. Solidification agent		Cement	Cement	Cement	
2. Dry compressible waste, contaminated equipment, etc.					
a. Quantity shipped	cu. m.	5.10E+01	5.68E+01	7.18E+01	1.80E+02
b. Total activity	Ci	7.53E-03	6.03E+00	3.35E+00	9.39E+00
c. Major nuclides (estimate)					
Cr-51	%	14	14	14	
Mn-54	%	13	13	13	
Fe-55	%	45	45	45	
Fe-59	%	16	16	16	
d. Container type		LSA	LSA	LSA	
e. Container volume	cu. m.	2.08E-01	2.08E-01 2.72E+00	2.08E-01	

TABLE 2.0-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

		July	August	Sept.	Third Quarter
3. Solid Waste Disposition					
a. Number of Shipments		08	07	10	25
b. Mode of Transportation		Truck	Truck	Truck	
	Number	08	07	10	
c. Destination		Barnwell, SC	Barnwell, SC	Barnwell, SC	
	Number	03	00	00	
		Beatty, NV	Beatty, NV	Beatty, NV	
	Number	01	04	05	
		Oak Ridge, TN	Oak Ridge, TN	Oak Ridge, TN	
	Number	04	03	05	

TABLE 2.0-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

		October	November	December	Fourth Quarter
1. Spent resins, filter sludges, evaporator bottoms, etc.					
a. Quantity shipped	cu. m.	0.00E+00	1.17E+01	7.32E+00	1.90E+01
b. Total activity	Ci	0.00E+00	5.85E+01	4.98E+01	1.08E+02
c. Major nuclides (estimate)					
Mn-54	%	N/A	24	24	
Fe-55	%	N/A	02	02	
Co-60	%	N/A	70	71	
d. Container type		N/A	LSA	LSA	
e. Container volume	cu. m.	N/A	5.83E+00	2.08E-01 5.83E+00	
f. Solidification agent		N/A	Cement	Cement	
2. Dry compressible waste, contaminated equipment, etc.					
a. Quantity shipped	cu. m.	8.99E+01	1.30E+02	8.49E+01	3.05E+02
b. Total activity	Ci	2.15E+00	3.94E+00	4.87E+00	1.10E+01
c. Major nuclides (estimate)					
Cr-51	%	14	14	14	
Mn-54	%	15	15	15	
Fe-55	%	45	45	45	
Fe-59	%	16	16	16	
d. Container type		LSA	LSA	LSA	
e. Container volume	cu. m.	2.08E-01 2.72E+00	2.08E-01 2.72E+00	2.08E-01 2.72E+00	

TABLE 2.0-1 (continued)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1990)

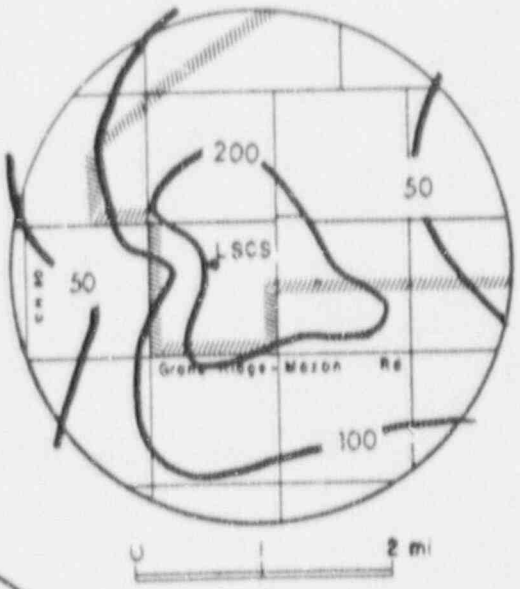
SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

		October	November	Dec.	Fourth Quarter
3. Solid Waste Disposition					
a. Number of Shipments		06	10	06	22
b. Mode of Transportation		Truck	Truck	Truck	
	Number	06	10	06	
c. Destination		Barnwell, SC	Barnwell, SC	Barnwell, SC	
	Number	00	02	01	
		Beatty, NV	Beatty, NV	Beatty, NV	
	Number	00	00	01	
		Channahon, IL	Channahon, IL	Channahon, IL	
	Number	00	01	00	
		Oak Ridge, TN	Oak Ridge, TN	Oak Ridge, TN	
	Number	06	08	04	
		Waltz Mill, PA	Waltz Mill, PA	Waltz Mill, PA	
	Number	00	01	00	

FIGURE 3.1-1

Estimated Cumulative Gamma Dose (in mrem) from the Lasalle Station for the period January-December 1990

Isopleth Labels
Small figure - multiply by 10^{-6}
Large figure - multiply by 10^{-6}



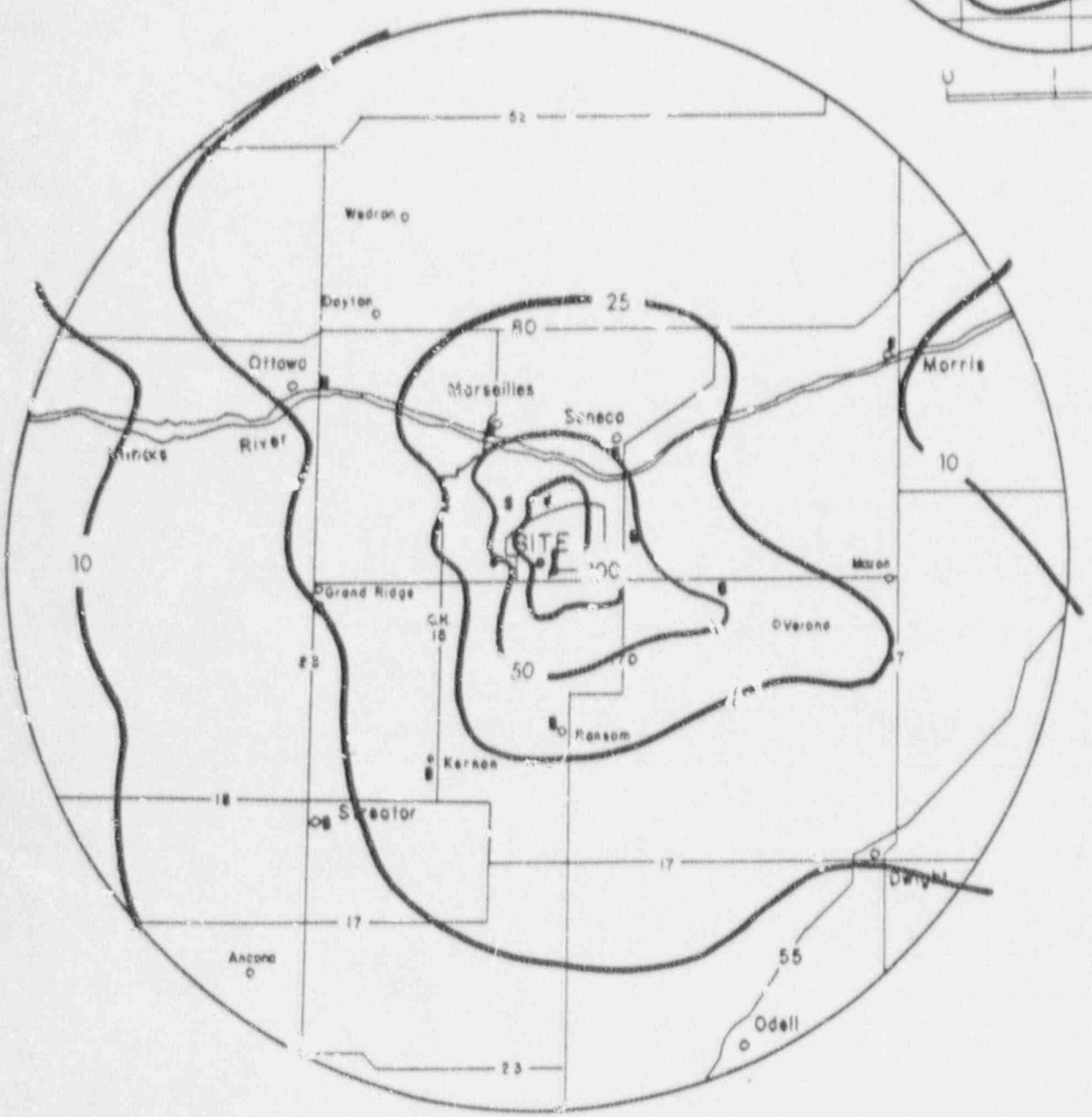


FIGURE 3.1-2

Estimated Total Concentrations (in pCi/m^3) of Noble Gases from the Lasalle Station for the period January-December 1990

Isopleth Labels
Small figure - multiply by 10^{-1}
Large figure - multiply by 10^{-1}

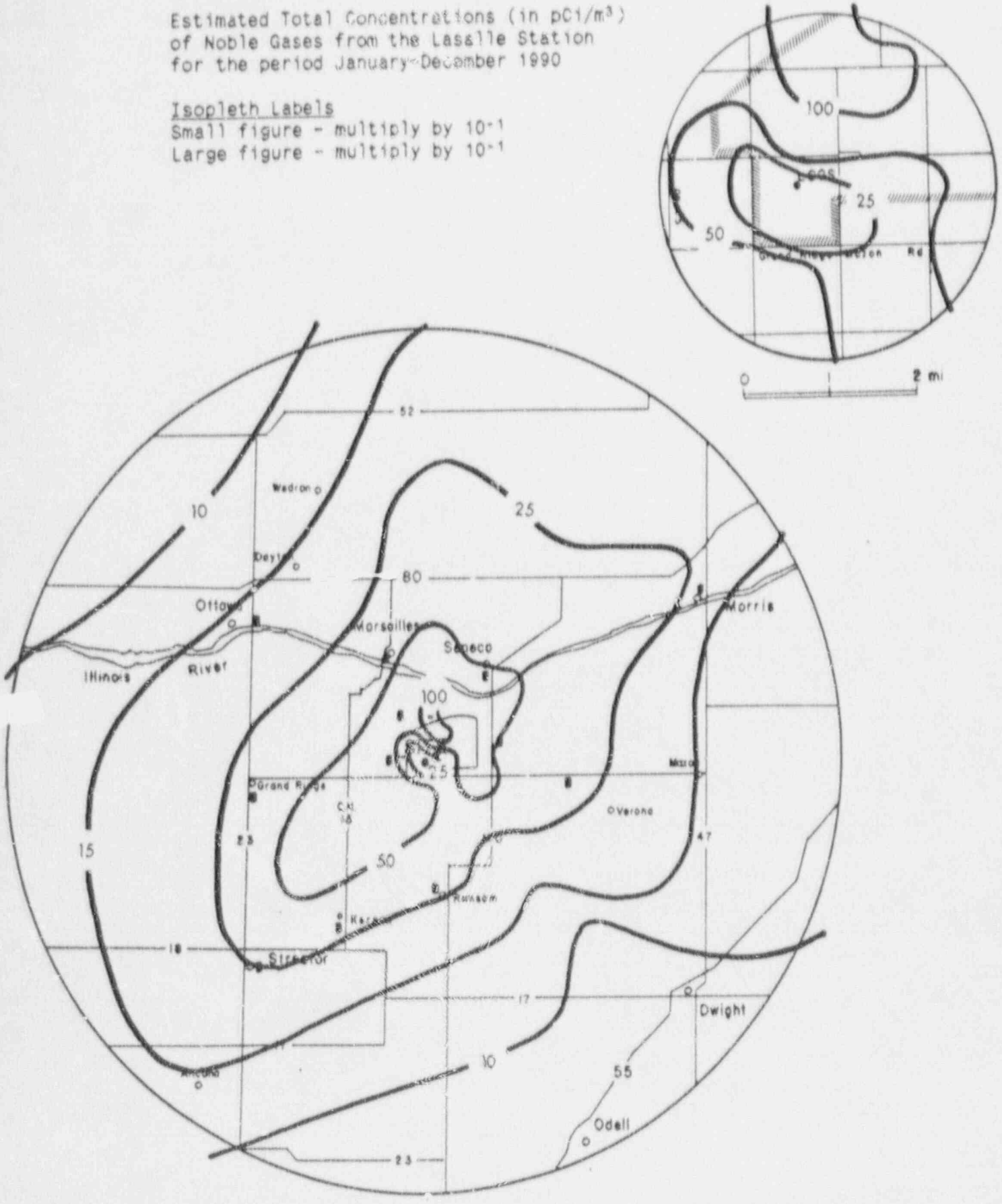
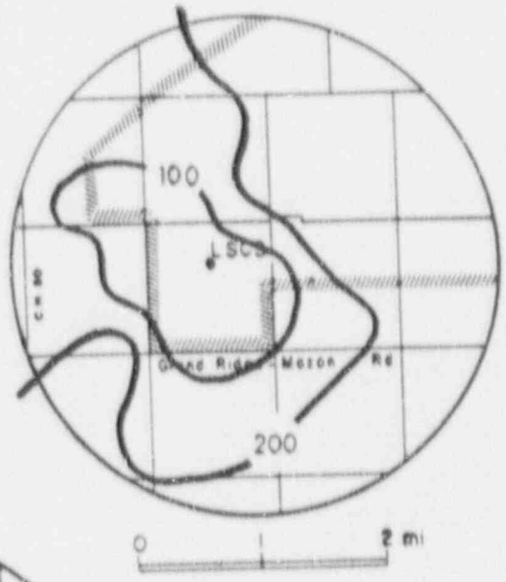


FIGURE 3.1-3

Estimated Total Concentrations (in pCi/m^3) of Iodine from the Lasalle Station for the period January-December 1990

Isopleth Labels
Small figure - multiply by 10^{-6}
Large figure - multiply by 10^{-6}



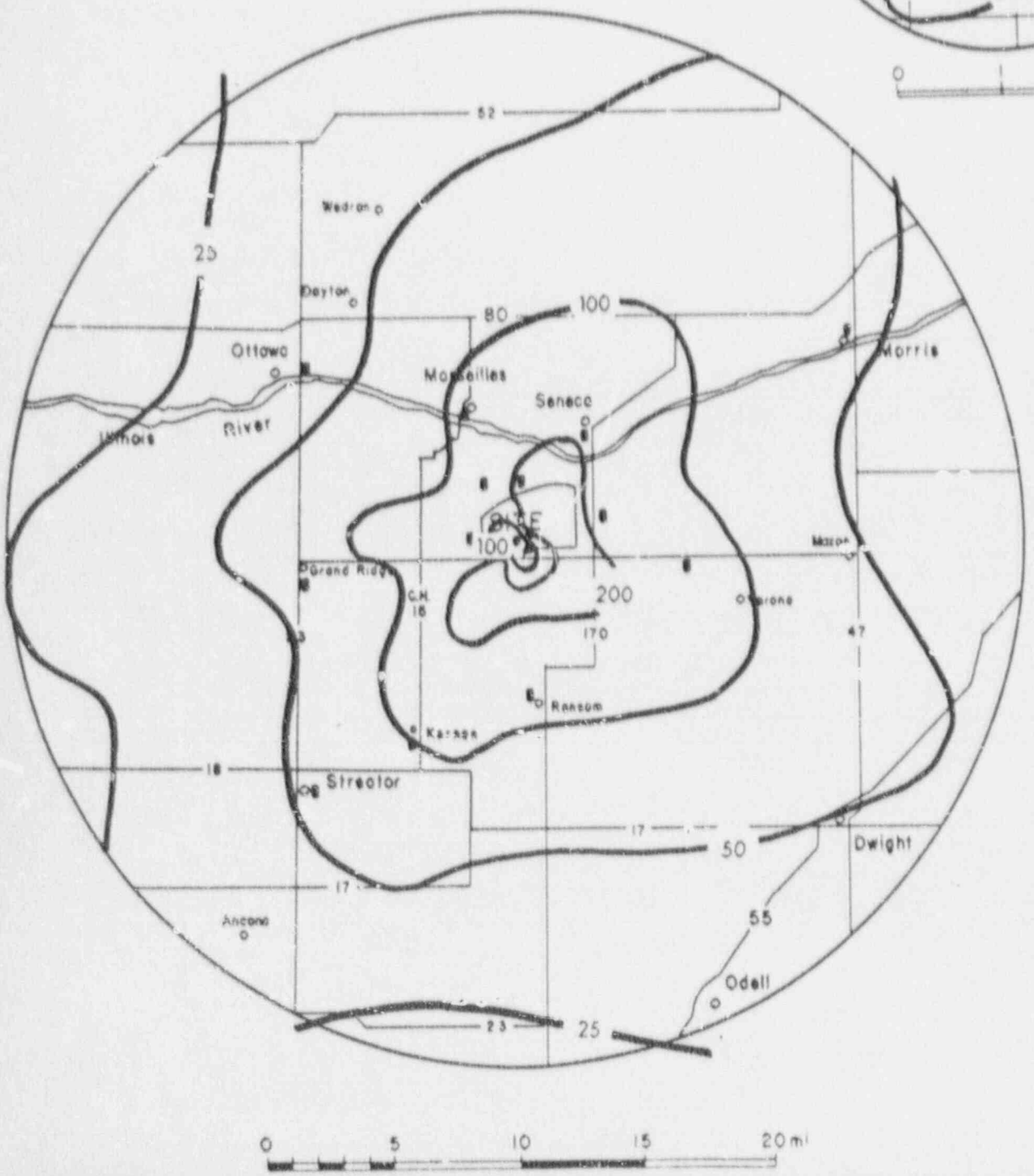
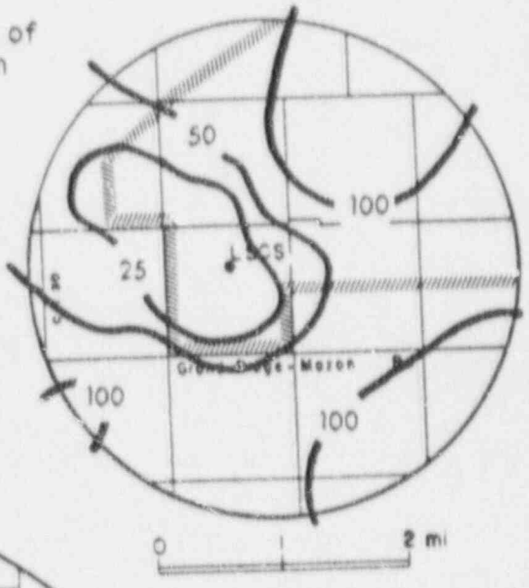


FIGURE 3.1-4

Estimated Total Concentrations (in pCi/m³) of Particulate Matter from the Lasalle Station for the period January-December 1990

Isopleth Labels
Small figure - multiply by 10^{-7}
Large figure - multiply by 10^{-7}



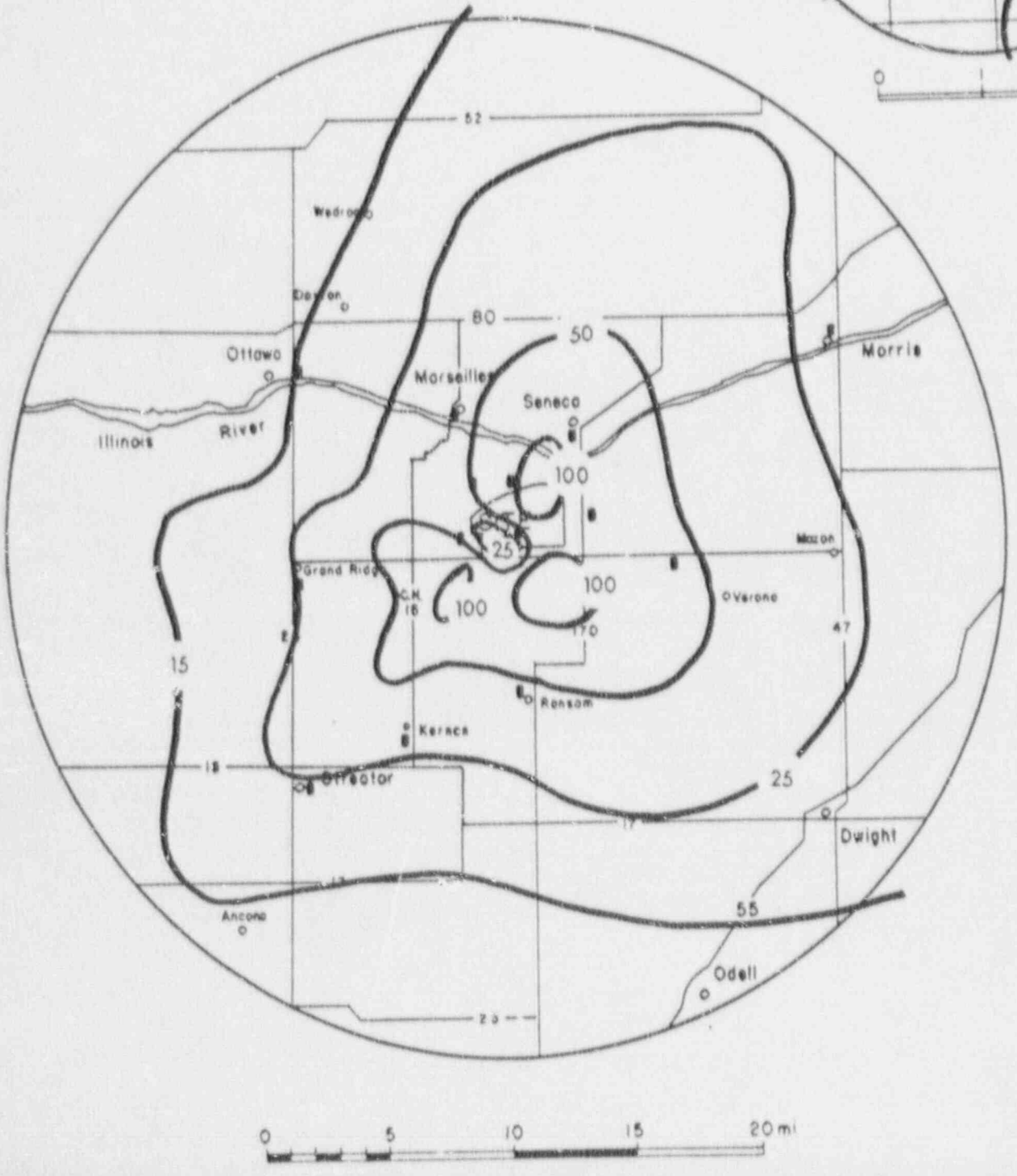


TABLE 3.1-1

LASALLE UNIT ONE

1990 ANNUAL REPORT
MAXIMUM DOSES RESULTING FROM AIRBORNE RELEASES
PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 03/06/91
INFANT RECEPTOR

TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
GAMMA AIR (MRAD)	2.54E-05 (ESE)	1.51E-09 (ESE)	5.89E-05 (ESE)	3.23E-04 (ESE)	4.08E-04 (ESE)
BETA AIR (MRAD)	8.88E-06 (E)	4.53E-10 (E)	1.38E-03 (E)	2.79E-05 (E)	1.41E-03 (E)
TOT. BODY (MREM)	1.05E-05 (ESE)	6.35E-10 (ESE)	2.73E-05 (ESE)	1.77E-04 (ESE)	2.15E-04 (ESE)
SKIN (MREM)	2.60E-05 (ESE)	1.50E-09 (ESE)	9.66E-04 (E)	2.73E-04 (ESE)	1.25E-03 (ESE)
ORGAN (MREM)	7.15E-04 (ESE)	1.16E-03 (ESE)	1.04E-03 (ESE)	7.34E-04 (E)	3.64E-03 (ESE)
	THYROID	THYROID	THYROID	THYROID	THYROID

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. I
INFANT RECEPTOR

	QTRLY OBJ	1ST QTR JAN-MAR	2ND QTR APR-JUN	3RD QTR JUL-SEP	4TH QTR OCT-NOV	YRLY OBJ	% OF APP.I
		---------- % OF APP I. ----------					
GAMMA AIR (MRAD)	5.0	0.00	0.00	0.00	0.01	10.0	0.00
BETA AIR (MRAD)	10.0	0.00	0.00	0.01	0.00	20.0	0.01
TOT. BODY (MREM)	2.5	0.00	0.00	0.00	0.01	5.0	0.00
SKIN (MREM)	7.5	0.00	0.00	0.01	0.00	15.0	0.01
ORGAN (MREM)	7.5	0.01	0.02	0.01	0.01	15.0	0.02
		THYROID	THYROID	THYROID	THYROID		THYROID

RESULTS BASED UPON
ODCM ANNEX
REVISION 0
MARCH 1989

TABLE 3.1-1 (continued)

LASALLE UNIT ONE

1990 ANNUAL REPORT
MAXIMUM DOSES RESULTING FROM AIRBORNE RELEASES
PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 03/06/91
ADULT RECEPTOR

TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
GAMMA AIR (MRAD)	2.54E-05 (ESE)	1.51E-09 (ESE)	5.89E-05 (ESE)	3.23E-04 (ESE)	4.08E-04 (ESE)
BETA AIR (MRAD)	8.88E-06 (E)	4.53E-10 (E)	1.38E-03 (E)	2.79E-05 (E)	1.41E-03 (E)
TOT. BODY (MREM)	1.05E-05 (ESE)	6.35E-10 (ESE)	2.73E-05 (ESE)	1.77E-04 (ESE)	2.15E-04 (ESE)
SKIN (MREM)	2.60E-05 (ESE)	1.50E-09 (ESE)	9.66E-04 (E)	2.73E-04 (ESE)	1.25E-03 (ESE)
ORGAN (MREM)	7.03E-04 (ESE)	8.24E-04 (ESE)	7.79E-04 (ESE)	4.92E-04 (ESE)	2.80E-03 (ESE)
	THYROID	THYROID	THYROID	THYROID	THYROID

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. I
ADULT RECEPTOR

	QTRLY OBJ	1ST QTR JAN-MAR (% OF APP I.)	2ND QTR APR-JUN (% OF APP I.)	3RD QTR JUL-SEP (% OF APP I.)	4TH QTR OCT-NOV (% OF APP I.)	YRLY OBJ	% OF APP.I
GAMMA AIR (MRAD)	5.0	0.00	0.00	0.00	0.01	10.0	0.00
BETA AIR (MRAD)	10.0	0.00	0.00	0.01	0.00	20.0	0.01
TOT. BODY (MREM)	2.5	0.00	0.00	0.00	0.01	5.0	0.00
SKIN (MREM)	7.5	0.00	0.00	0.01	0.00	15.0	0.01
ORGAN (MREM)	7.5	0.01	0.01	0.01	0.01	15.0	0.02
		THYROID	THYROID	THYROID	THYROID		THYROID

RESULTS BASED UPON
ODCM ANNEX
REVISION 0
MARCH 1989

TABLE 3.2-1

LASALLE UNIT ONE
ADULT RECEPTOR

1990 ANNUAL REPORT
MAXIMUM DOSES (MREM) RESULTING FROM LIQUID EFFLUENTS
PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 03/06/91

DOSE TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
TOTAL BODY	0.00E+00	0.00E+00	0.00E+00	1.81E-05	1.81E-05
INTERNAL ORGAN	0.00E+00	0.00E+00	0.00E+00	2.42E-05	2.42E-05
				LIVER	LIVER

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. I

	QTRLY OBJ	% OF APP I. 1ST QTR JAN-MAR	2ND QTR APR-JUN	3RD QTR JUL-SEP	4TH QTR OCT-NOV	YRLY OBJ	% OF APP.I
TOTAL BODY (MREM)	1.5	0.00	0.00	0.00	0.00	3.0	0.00
CRIT. ORGAN(MREM)	5.0	0.00	0.00	0.00	0.00	10.0	0.00
					LIVER		LIVER

RESULTS BASED UPON
ODCM ANNEX
REVISION 0
MARCH 1989

TABLE 3.2-1 (continued)

LASALLE UNIT TWO
ADULT RECEPTOR

1990 ANNUAL REPORT
MAXIMUM DOSES (MREM) RESULTING FROM LIQUID EFFLUENTS
PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 03/06/91

DOSE TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
TOTAL BODY	0.00E+00	0.00E+00	0.00E+00	2.37E-05	2.37E-05
INTERNAL ORGAN	0.00E+00	0.00E+00	0.00E+00	3.24E-05	3.24E-05
				LIVER	LIVER

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. I

	QTRLY OBJ	% OF APP I. 1ST QTR JAN-MAR	2ND QTR APR-JUN	3RD QTR JUL-SEP	4TH QTR OCT-NOV	YRLY OBJ	% OF APP.I
TOTAL BODY (MREM)	1.5	0.00	0.00	0.00	0.00	3.0	0.00
CRIT. ORGAN(MREM)	5.0	0.00	0.00	0.00	0.00	10.0	0.00
					LIVER		LIVER

RESULTS BASED UPON
ODCM ANNEX
REVISION 0
MARCH 1989

FIGURE 5.0-1

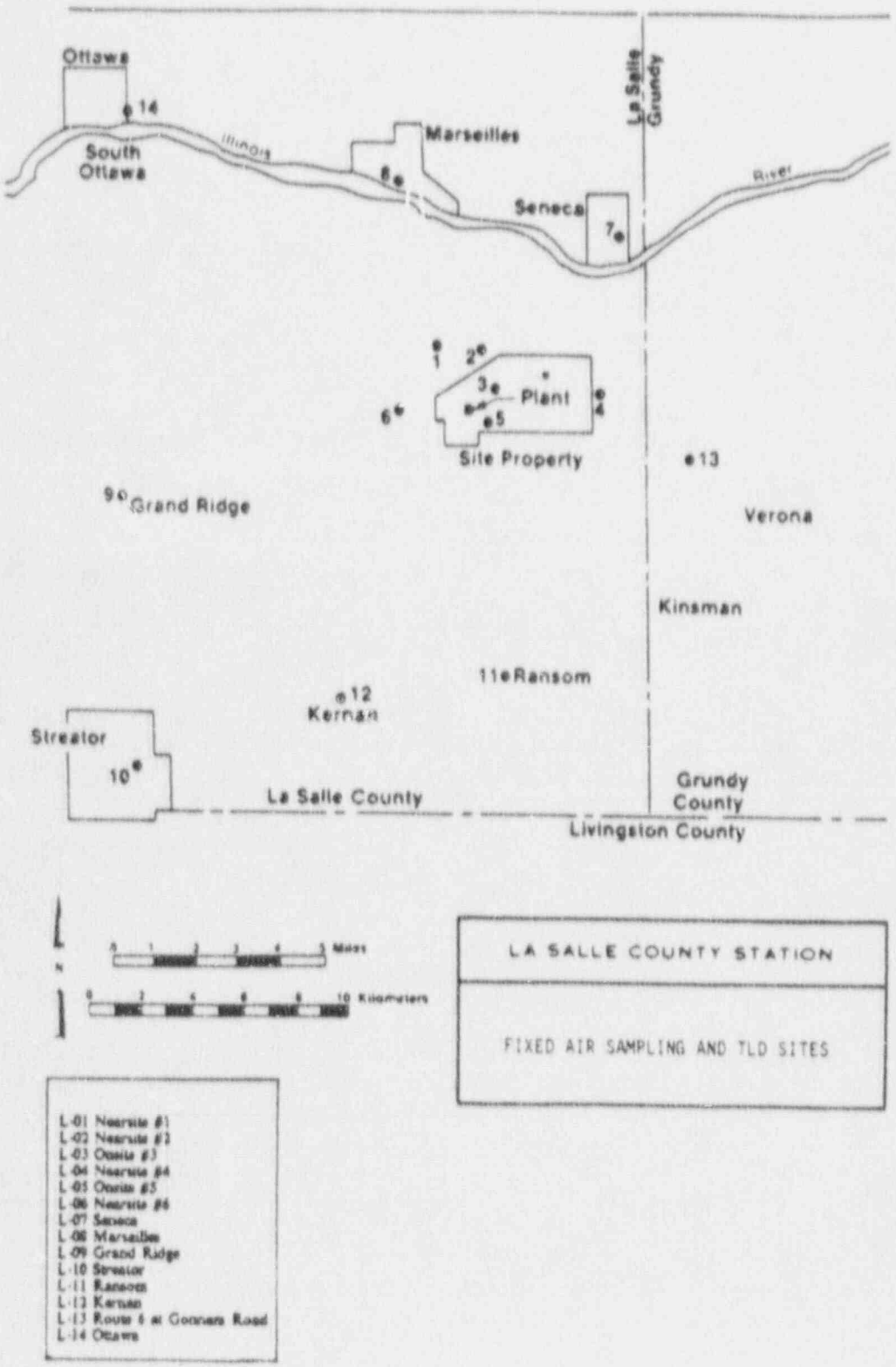
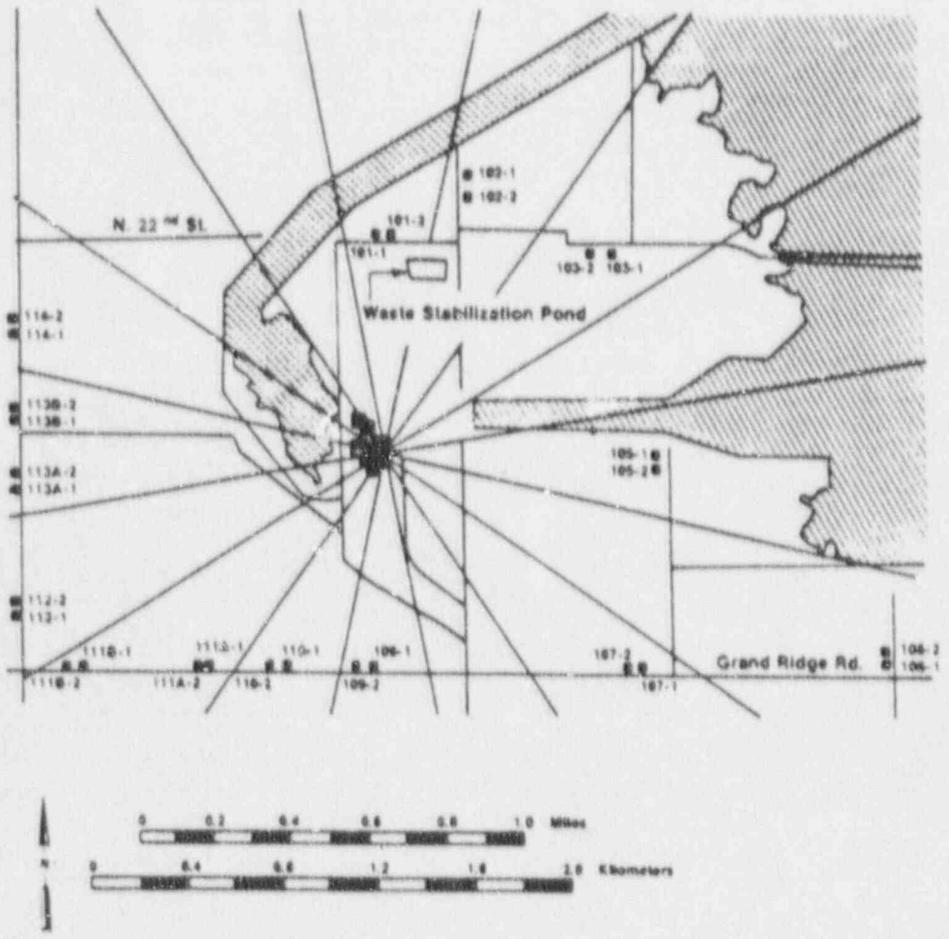

Ottawa
14
South Ottawa
Illinois
Marseilles
8
La Salle
Grundy
River
Seneca
7
1
2
3
Plant
4
6
5
Site Property
13
9
Grand Ridge
Verona
Kinsman
11
Ransom
12
Kernan
Streator
10
La Salle County
Grundy County
Livingston County
N
Miles
Kilometers
LA SALLE COUNTY STATION
FIXED AIR SAMPLING AND TLD SITES
L-01 Nearsite #1
L-02 Nearsite #2
L-03 Onsite #3
L-04 Nearsite #4
L-05 Onsite #5
L-06 Nearsite #6
L-07 Seneca
L-08 Marseilles
L-09 Grand Ridge
L-10 Streator
L-11 Ransom
L-12 Kernan
L-13 Route 6 at Goodnes Road
L-14 Ottawa

FIGURE 5.0-2



LA SALLE COUNTY STATION

INNER RING TLD LOCATIONS

FIGURE 5.0-3

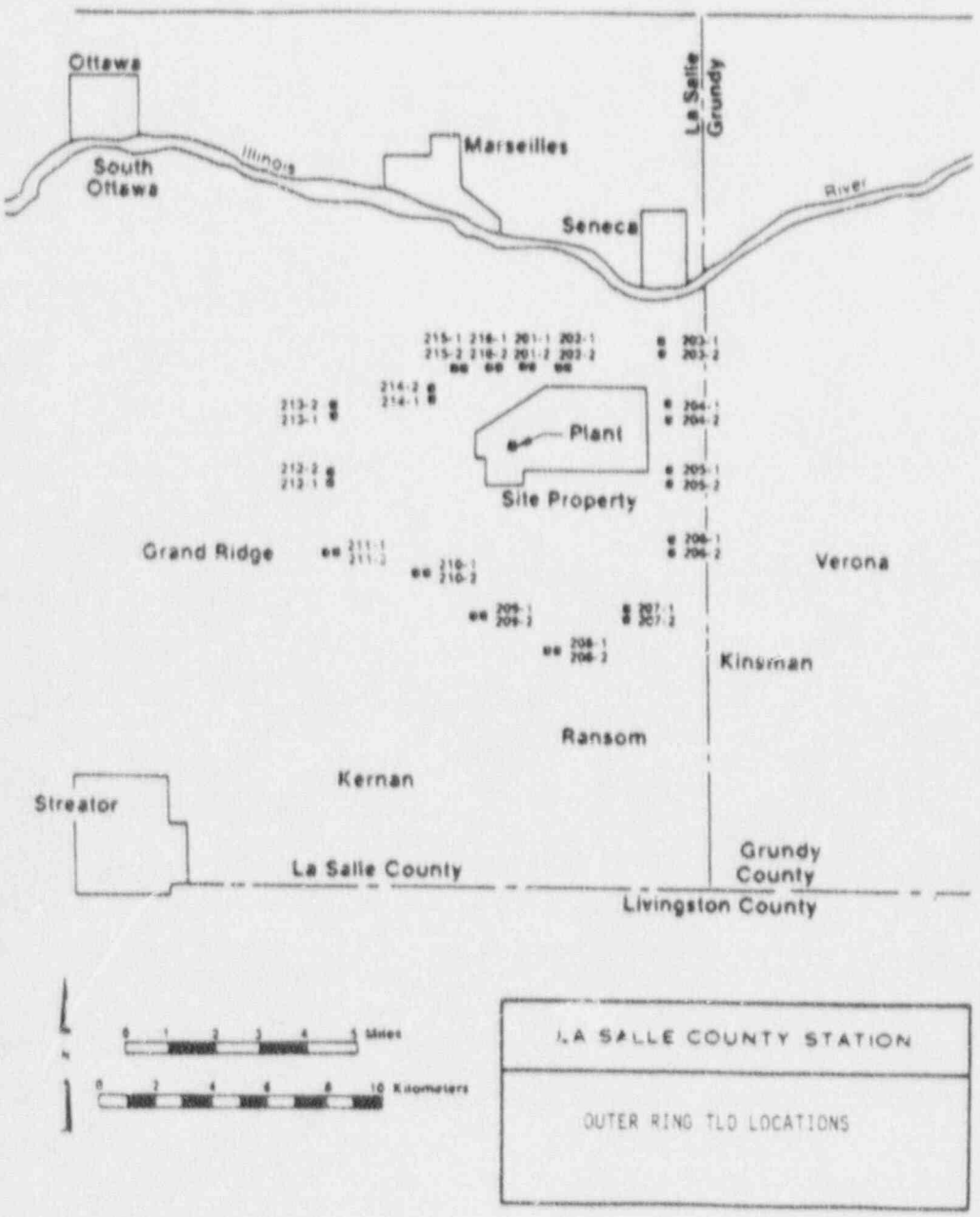
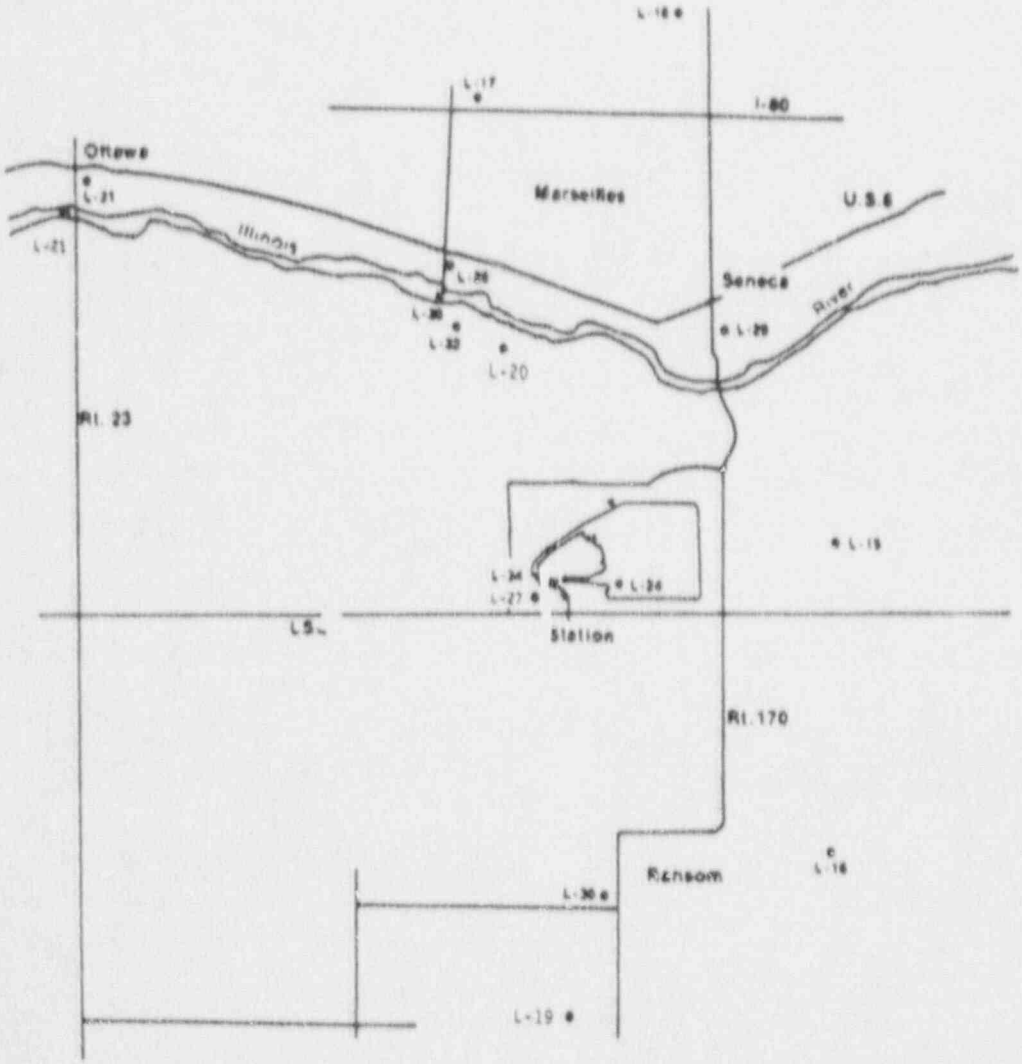
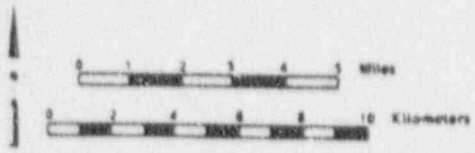

Ottawa
South Ottawa
Illinois
Marseilles
La Salle
Grundy
Seneca
River
Plant
Site Property
Grand Ridge
Verona
Kinsman
Ransom
Kernan
Streator
La Salle County
Grundy County
Livingston County
0 1 2 3 4 5 Miles
0 2 4 6 8 10 Kilometers
LA SALLE COUNTY STATION
OUTER RING TLD LOCATIONS

FIGURE 5.0-4





LA SALLE COUNTY STATION

INGESTION AND WATERBORNE EXPOSURE PATHWAY SAMPLE LOCATIONS

L-16 Lowery Dairy
L-17 Hayer-Patterson Dairy
L-18 Flatness Dairy
L-19 Bettenhausen Dairy
L-20 Gass Farm
L-21 Illinois River at Seneca
L-24 LSCS Cooling Lake near Recreation Area
L-27 LSCS Onsite Well
L-28 Marseilles Well Water
L-29 Seneca Well Water
L-30 Ransom Well Water
L-32 Illinois State Park Well
L-34 Cooling Lake Discharge Structure-Downstream
L-35 Marseilles Pool of Illinois River

TABLE 5.0-1

LaSalle Station
Radiological Environmental Monitoring Locations

	Air Sampling TLD	Cooling Water	Fish	Lake Water	Milk	Public Water	Rabbits	Sediments	Surface Water	Vegetables	Ground/Well Water
L-01 Nearsite #1	O	O									
L-02 Nearsite #2	O	O									
L-03 Onsite #3	O	O									
L-04 Nearsite #4	O	O									
L-05 Onsite #5	O	O									
L-06 Nearsite #6	O	O									
L-07 Seneca	O	O									
L-08 Marseilles	O	O									
L-09 Grand Ridge	O	O									
L-10 Streator	O	O									
L-11 Ransom	O	O									
L-12 Kernan	O	O									
L-13 Route 6 at Gonnam Road	O	O									
L-14 Ottawa	O	O									
L-16 Lowery Farm					O						
L-17 Hayer-Patterson Dairy					O						
L-18 Boldt Dairy					O						
L-19 Bellenhausen Dairy					O						
L-20 Gass Farm					O						
L-21 Illinois River at Seneca											
L-24 LSCS Cooling Lake near Recreation Area									O		
L-27 LSCS Onsite Well			O						O		
L-28 Marseilles Well Water											O
L-29 Seneca Well Water											O
L-30 Ransom Well Water											O
L-31 Ottawa Well Water											O
L-32 Illinois State Park Well											O
L-34 Cooling Lake Discharge Structure - Downstream								O			O
L-35 Marseilles Pool of Illinois River			O								

CENSUS

Dairy
Residence

Table 5.0-2

LA SALLE COUNTY STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLING LOCATIONS

1. AIR SAMPLERS

Site Code[a]	Location	Distance (miles)	Direction (°)
L-01	Near-site No. 1	0.5	326
L-02	On-site Station No. 2	0.6	11
L-03	On-site Station No. 3	0.2	56
L-04	Near-site No. 4	1.5	90
L-05	On-site Station No. 5	0.3	145
L-06	Near-site No. 6	0.4	270
L-07	Seneca	5.2	18
L-08	Marseilles	7.0	326
L-09 (C)	Grand Ridge	10.4	260
L-10 (C)	Streator	13.5	220
L-11	Ransom	6.0	191
L-12 (C)	Kernan	5.0	214
L-13	Route 6 at Gonnam Road	7.0	100
L-14 (C)	Ottawa	12.0	315

2. TLDs

a. Same as No. 1.

b. Special TLD Samplers

Site Code	Distance (miles)	Direction (°)
Inner Ring		
L-101-1,2	0.5	359
L-102-1,2	0.6	17
L-103-1,2	0.7	46
L-105-1,2	0.7	91
L-106-1,2	1.4	110
L-107-1,2	0.8	128
L-109-1,2	0.6	178
L-110-1,2	0.6	205
L-111a-1,2	0.7	217
L-111b-1,2	0.8	230
L-112-1,2	0.9	244
L-113a-1,2	0.8	262
L-113b-1,2	0.8	273
L-114-1,2	0.9	288

[a] Control (reference) locations are denoted by a "C" after site code. All other locations are indicators.

TABLE 5.0-2 (continued)

LA SALLE COUNTY STATION

ENVIRONMENTAL RADIOLOGIAL MONITORING PROGRAM, SAMPLING LOCATIONS

2. TLDs

b. Special TLD Samplers (continued)

Site Code	Distance (miles)	Direction (°)
Outer Ring		
L-201-1,2	2.0	15
L-202-1,2	2.3	33
L-203-1,2	4.0	56
L-204-1,2	3.5	78
L-205-1,2	3.5	102
L-206-1,2	4.3	123
L-207-1,2	4.5	146
L-208-1,2	4.5	170
L-209-1,2	4.0	192
L-210-1,2	3.3	216
L-211-1,2	4.5	240
L-212-1,2	4.0	261
L-213-1,2	3.8	283
L-214-1,2	2.0	303
L-215-1,2	2.0	330
L-216-1,2	1.5	350

3. MILK

Site Code[a]	Location	Distance (miles)	Direction (°)
L-16	Lowery Dairy Farm	8.2	120
L-17 (C)	Hayer-Patterson Dairy Farm	12.3	18
L-18 (C)	Flatness Dairy Farm	12.5	10
L-19	Bettenhousen Dairy Farm	8.5	180
L-20	Gass Farm[b]	4.6	348

[a] Control (reference) locations are denoted by a "C" after site code. All other locations are indicators.

[b] Additional farm was not required by the ODCM but was included to ensure that the program has at least four milking stations. This is not a commercial dairy but a farm having milking cows for personal use.

Table 5.0-2 (continued)

LA SALLE COUNTY STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLING LOCATIONS

4. GROUND/WELL WATER

Site Code[a]	Location	Distance (miles)	Direction (°)
L-27	Onsite Well		
L-28	Marseilles Well	7.0	326
L-29 (C)	Seneca Well	5.1	18
L-30	Ranson Well	6.0	191
L-31	Ottawa Well	12.8	304
L-32	Illinois State Park	6.5	326

5. SURFACE WATER

Site Code[a]	Location	Distance (miles)	Direction (°)
L-21 (C)	Illinois River at Seneca	4.0	22
L-24	LSCS Cooling Lake	0.3	112

6. FISH

Site Code[a]	Location	Distance (miles)	Direction (°)
L-24	LSCS Cooling Lake near Recreation Area	0.3	112
L-35	Marseilles Pool of Illinois River	6.5	326

7. SHORELINE SEDIMENTS

Site Code[a]	Location	Distance (miles)	Direction (°)
L-34	Downstream of cooling lake discharge structure	At Station	

[a] Control (reference) locations are denoted by a "C" after site code. All other locations are indicators.

TABLE 5.0-2 (continued)

LA SALLE COUNTY STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLE COLLECTION AND ANALYSES

Sample Media	Location Code[a]	Location Site	Collection Frequency	Type of Analysis	Frequency of Analysis	Remarks
1. Airborne Particulates	a. Onsite and Near Field		Continuous operation for a week	Gross beta	Weekly	On all samples.
				Gamma Isot	Quarterly	On quarterly composites from each location.
	L-1	Nearsite No. 1		Gamma Isot	Weekly	If gross beta in a sample exceeds 10X the yearly mean of the control samples.
	L-2	Nearsite No. 2				
	L-3	Onsite No. 3		Filter Exchange	Weekly	
	L-4	Nearsite No. 4				
	L-5	Onsite No. 5				
	L-6	Nearsite No. 6				
	b. Far Field					
	L-7	Seneca				
	L-8	Marseille				
	L-9 (C)	Grand Ridge				
	L-10 (C)	Streator				
	L-11	Ransom				
	L-12 (C)	Kernan				
	L-13	Route 6 at Gonnam Rd.				
	L-14 (C)	Ottawa				
2. Airborne Iodine	Same as 1.		Weekly	I-131	Weekly	On all samples.
3. Air Sampling Train	Same as 1.		--	Test and Maintenance	Weekly	On all samplers.
4. TLD	Same as 1.		Quarterly	Gamma	Quarterly	Two sets at all AP locations. One set read quarterly. Second set read if required by Commonwealth Edison. At other locations, all sets read quarterly. Minimum of two TLDs per set.
	L-101-1,2	Inner Ring				
	102-1,2					
	103-1,2					
	105-1,2					
	106-1,2					
	107-1,2					
	108-1,2					
	109-1,2					
	110-1,2,					
	111a-1,2,					
	111b-1,2					
	112-1,2[b]					
	113a-1,2,					
	113b-1,2					
	114-1,2[b]					

[a] Control (reference) locations are denoted by a "C" in this column. All other locations are indicators.
[b] New special TLD site for this Spec.

TABLE 5.0-2 (continued)

LA SALLE COUNTY STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLE COLLECTION AND ANALYSES

Sample Media	Location Code[a]	Location Site	Collection Frequency	Type of Analysis	Frequency of Analysis	Remarks
4. TLD (continued)	L-201-1,2 202-1,2 203-1,2 204-1,2 205-1,2 206-1,2 207-1,2 208-1,2 209-1,2 210-1,2 211-1,2 212-1,2 213-1,2 214-1,2 215-1,2 216-1,2	Outer Ring				
5. Milk	L-16 L-17(C) L-18 (C) L-19 L-20	Lowery Dairy Hauer-Patterson Dairy Flatness Dairy Bettenhousen Dairy Gass Farm[b]	Bi-weekly: May through October Monthly: November through April	I-131 Gamma Isot. I-131 Gamma Isot	Bi-Weekly Bi-Weekly Monthly Monthly	On all samples. LLD: 0.5 pCi/L. On all samples. On all samples. LLD: 0.5 pCi/L. On all samples.
6. Ground/Well Water	L-27 L-28 L-29 (C) L-30 L-31 L-32	Onsite Well Marseilles Well Seneca Well Ransom Well Ottawa Well Illinois State Park Well	Quarterly	Gamma Isot Tritium	Quarterly Quarterly	On all samples. On all samples.
7. Surface Water	L-21 (C) L-24	Illinois River at Ottawa LSCS Cooling Lake	Weekly	Gamma Isot Tritium	Monthly Quarterly	On monthly composites from each location. On quarterly composites from each location.
8. Fish	L-24 L-35	LSCS Cooling Lake Marseilles Pool	Semi-annual	Gamma Isot	Semi-annual	On edible portions only. Two species.

[a] Control (reference) locations are denoted by a "C" after site code. All other locations are indicators.
[b] An additional dairy was not required by the ODCM but was included to ensure that the program has at least four dairies.

TABLE 5.0-2 (continued)

LA SALLE COUNTY STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLE COLLECTION AND ANALYSES

Sample Media	Location Code[a]	Location Site	Collection Frequency	Type of Analysis	Frequency of Analysis	Remarks
9. Shoreline Sediments	L-34	Downstream of cooling lake	Semi-annual	Gamma Isot	Semi-annual	
10. Dairy Census	a. Site boundary to 2 miles		--	a. Enumeration by a door-to-door or equivalent counting technique.	Annually	During grazing season.
	b. 2 miles to 5 miles		--	b. Enumeration by using referenced information from county agricultural agents or other reliable sources.	Annually	During grazing season.
	c. At dairies listed in Item 4.		--	c. Inquire as to feeding practices: 1. Pasture only. 2. Feed and chop only. 3. Pasture and feed; if both, ask farmer to estimate fraction of food from pasture: <25%, 25-50%, 50-75%, or >75%.	Annually	During grazing season.
11. Nearest Residence Census	In all 16 sectors up to 5 miles				Annually	

TABLE 5.0-3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility LaSalle Nuclear Power Station Docket No. 50-373, 50-374
Location of Facility Marseilles, Illinois (County, State) Reporting Period 1st Quarter 1990

Sample Type (Units)	Type and Number of Analyses		LLD	Indicator Locations Mean[a] Range	Location with Highest Quarterly Mean: Location	Location with Highest Quarterly Mean: Mean Range	Control Locations Mean[a] Range	Number of Non-routine Results
Air Particulates (pCi/m^3)	Gross Beta	78	0.01	0.022 (78/78) (0.011-0.034)	L-04, Near-site No. 4 1.5 mi @90°	0.024 (13/13) (0.016-0.031)	None	0
	Gamma Spec.	6	0.01	<LLD	-	-	None	0
Airborne Iodine (pCi/m^3)	I-131	78	0.10	<LLD	-	-	<LLD	0
Gamma Background (TLDs) (mR/Qtr.)	Gamma Dose	14	3.0	17.7 (10/10) (15.1-19.2)	L-05, On-Site No. 5, 0.3 mi @ 185°	19.2 (1/1) -	15.7 (4/4) (15.3-16.9)	0
Milk (pCi/l)	I-131	12	0.5	<LLD	-	-	<LLD	0
	Gamma Spec.	12						
	Cs-134		5	<LLD	-	-	<LLD	0
	Cs-137		5	<LLD	-	-	<LLD	0
	Other Gammas		10	<LLD	-	-	<LLD	0
Surface Water (pCi/l)	Gamma Spec.	6						
	Cs-134		10	<LLD	-	-	<LLD	0
	Cs-137		10	<LLD	-	-	<LLD	0
	Other Gammas		20	<LLD	-	-	<LLD	0
	Tritium	2	200	<LLD	-	-	<LLD	0
Well Water (pCi/l)	Gamma Spec.	6						
	Cs-134		10	<LLD	-	-	<LLD	0
	Cs-137		10	<LLD	-	-	<LLD	0
	Other Gammas		20	<LLD	-	-	<LLD	0
	Tritium	6	200	<LLD	-	-	<LLD	0

[a] Mean and range based on detectable measurements only. Fraction indicated in parenthesis.

TABLE 5.0-4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility LaSalle Nuclear Power Station Docket No. 50-373, 50-374

Location of Facility Marseilles, Illinois (County, State) Reporting Period 2nd Quarter 1990

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean[a] Range	Location with Highest Quarterly Mean: Location	Location with Highest Quarterly Mean: Mean Range	Control Locations Mean[a] Range	Number of Non-routine Results
Air Particulates (pCi/m^3)	Gross Beta 78	0.01	0.018 (78/78) (0.010-0.031)	L-01[b] Near-site Station No. 1 0.5 mi @ 326°	0.018 (13/13) (0.011-0.030)	None	0
	Gamma Spec. 6	0.01	<LLD	-	-	None	0
Airborne Iodine (pCi/m^3)	I-131 78	0.10	<LLD	-	-	None	0
Gamma Background (TLDs) (mR/Qtr.)	Gamma Dose 14	3.0	15.9 (10/10) (14.4-19.2)	L-06, Near-site No. 6 0.4 mi @ 270°	19.2 (1/1) -	15.8 (4/4) (14.9-16.4)	0
Milk (pCi/L)	I-131 20	0.5	<LLD	-	-	<LLD	0
	Gamma Spec. 20						
	Cs-134	5	<LLD	-	-	<LLD	0
	Cs-137	5	<LLD	-	-	<LLD	0
	Other Gammas	10	<LLD	-	-	<LLD	0
Surface Water (pCi/L)	Gamma Spec. 6						
	Cs-134	10	<LLD	-	-	<LLD	0
	Cs-137	10	<LLD	-	-	<LLD	0
	Other Gammas	20	<LLD	-	-	<LLD	0
	Tritium 2	200	240 (1/1)	L-21 Illinois River at Seneca 4.0 mi @ 22°	272 (1/1)	272 (1/1)	0

[a] Mean and range based on detectable measurements only. Fractions indicated in parentheses.

[b] Locations L-01, L-02, L-03, L-04, and L-06 all had identical means of 0.018 pCi/m^3.

TABLE 5.0-4 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility LaSalle Nuclear Power Station Docket No. 50-373, 50-374
Location of Facility Marseilles, Illinois (County, State) Reporting Period 2nd Quarter 1990

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean[a] Range	Location with Highest Quarterly Mean Location	Location with Highest Quarterly Mean Range	Control Locations Mean[a] Range	Number of Non-routine Results
Well Water (pCi/L)	Gamma Spec. 6						
	Cs-134	10	<LLD	-	-	<LLD	0
	Cs-137	10	<LLD	-	-	<LLD	0
	Other Gammas	20	<LLD	-	-	<LLD	0
	Tritium 6	200	<LLD	-	-	<LLD	0
Bottom Sediments (pCi/m^3)	Gamma Spec. 1						
	Cs-134	0.1	<LLD	-	-	<LLD	0
	Cs-137	0.1	<LLD	-	-	<LLD	0
	Other Gammas	0.2	<LLD	-	-	<LLD	0
Fish (pCi/g wet)	Gamma Spec. 9						
	Cs-134	0.1	<LLD	-	-	<LLD	0
	Cs-137	0.1	<LLD	-	-	<LLD	0
	Other Gammas	0.2	<LLD	-	-	<LLD	0

[a] Mean and range based on detectable measurements only. Fractions indicated in parentheses.

TABLE 5.0-5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility LaSalle Nuclear Power Station Docket No. 50-373, 50-374
Location of Facility Marseilles, Illinois (County, State) Reporting Period 3rd Quarter 1990

Sample Type (Units)	Type and Number of Analyses		LLD	Indicator Locations Mean[a] Range	Location with Highest Quarterly Mean: Location	Location with Highest Quarterly Mean: Mean Range	Control Locations Mean[a] Range	Number of Non-routine Results
Air Particulates (pCi/m^3)	Gross Beta	78	0.01	0.025 (78/78) (0.011-0.079)	L-06, Near-Site #6 0.4 mi @ 270°	0.027 (13/13) (0.015-0.079)	None	0
	Gamma Spec.	6	0.01	<LLD	-	-	None	0
Airborne Iodine (pCi/m^3)	I-131	78	0.10	<LLD	-	-	<LLD	0
Gamma Background	Gamma Dose	14	3.0	18.5 (10/10) (15.2-20.4)	L-05, Onsite Station No. 5, 0.3 mi @ 145°	20.4 (1/1) -	16.8 (4/4) (15.3-17.2)	0
Milk (pCi/L)	I-131	24	0.5	<LLD	-	-	<LLD	0
	Gamma Spec.	24						
	Cs-134		5	<LLD	-	-	<LLD	0
	Cs-137		5	<LLD	-	-	<LLD	0
	Other Gammas		10	<LLD	-	-	<LLD	0
Surface Water (pCi/L)	Gamma Spec.	6			-	-		
	Cs-134		10	<LLD	-	-	<LLD	0
	Cs-137		10	<LLD	-	-	<LLD	0
	Other Gammas		20	<LLD	-	-	<LLD	0
	Tritium	3	200	226 (1/1)	L-24, Recreational Area Cooling Lake, 0.3 mi @ 112°	226 (1/1)	<LLD	0
Well Water (pCi/L)	Gamma Spec.	6						
	Cs-134		10	<LLD	-	-	<LLD	0
	Cs-137		10	<LLD	-	-	<LLD	0
	Other Gammas		20	<LLD	-	-	<LLD	0
	Tritium	6	200	<LLD	-	-	<LLD	0

[a] Mean and range based on detectable measurements only. Fractions indicated in parentheses.

TABLE 5.0-6

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility LaSalle Nuclear Power Station Docket No. 50-373, 50-374
Location of Facility Marseilles, Illinois (County, State) Reporting Period 4th Quarter 1990

Sample Type (Units)	Type and Number of Analyses		LLD	Indicator Locations Mean[a] Range	Location with Highest Quarterly Mean: Location	Location with Highest Quarterly Mean: Mean Range	Control Locations Mean[a] Range	Number of Non-routine Results
Air Particulates (pCi/m^3)	Gross Beta	78	0.01	0.029 (78/78) (0.016-0.042)	L-02, Near Site No. 2 0.6 mi @ 11°	0.030 (13/13) (0.019-0.042)	None	0
	Gamma Spec.	6	0.01	<LLD	-	-	None	0
Airborne Iodine (pCi/m^3)	I-131	78	0.10[b]	<LLD	-	-	None	0
Gamma Background	Gamma Dose	14	3.0	20.2 (10/10) (16.0-22.8)	L-05, On Site No. 5 0.3 mi @ 145°	22.8 (1/1)	17.9 (4/4) (17.1-18.4)	0
Milk (pCi/L)	I-131	18	0.5	<LLD	-	-	<LLD	0
	Gamma Spec.	18						
	Cs-134		5	<LLD	-	-	<LLD	0
	Cs-137		5	<LLD	-	-	<LLD	0
	Other Gammas		10	<LLD	-	-	<LLD	0
Surface Water (pCi/L)	Gamma Spec.	6			-	-		
	Cs-134		10	<LLD	-	-	<LLD	0
	Cs-137		10	<LLD	-	-	<LLD	0
	Other Gammas		20	<LLD	-	-	<LLD	0
	Tritium	2	200	294 (1/1)	L-24, Recreational Area Cooling Lake, 0.3 mi @ 112°	294 (1/1)	238 (1/1)	0

TABLE 5.0-6 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility LaSalle Nuclear Power Station Docket No. 50-373, 50-374
Location of Facility Marseilles, Illinois (County, State) Reporting Period 4th Quarter 1990

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean[a] Range	Location with Highest Quarterly Mean		Control Locations Mean[a] Range	Number of Non-routine Results
				Location	Mean Range		
Well Water (pCi/L)	Gamma Spec. 6						
	Cs-134	15	<LLD	-	-	<LLD	0
	Cs-137	10	<LLD	-	-	<LLD	0
	Other Gammas	20	<LLD	-	-	<LLD	0
	Tritium 6	200	<LLD	-	-	<LLD	0
Fish (pCi/g wet)	Gamma Spec. 10						
	Cs-134	0.1	<LLD	-	-	None	0
	Cs-137	0.1	<LLD	-	-	None	0
	Other Gammas	0.2	<LLD	-	-	None	0
Bottom Sediments (pCi/g dry)	Gamma Spec. 1						
	Cs-134	0.1	<LLD	-	-	None	0
	Cs-137	0.1	<LLD	-	-	None	0
	Other Gammas	0.2	<LLD	-	-	None	0

[a] Mean and range based on detectable measurements only. Fractions indicated in parentheses.
[b] One result for I-131 exceeded LLD (<0.14) because of very low volume (68 m^3).

LASALLE

Table 5.1-1

GAMMA RADIATION, AS MEASURED BY THERMOLUMINESCENT DOSIMETERS (TLDs)

STANDARD RADIOLOGICAL MONITORING PROGRAM

		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date Placed:		12-29-89	03-30-90	06-29-90	09-29-90
Date Removed:		03-30-90	06-29-90	09-29-90	12-28-90
Days in the Field:		91	91	92	90
Location		Average mR/Quarter			
On-Site and Near-Site Indicator Locations					
L-01	Near Site No. 1	18.6±1.3	15.7±1.0	18.0±1.4	21.5±0.9
L-02	On-Site No. 2	18.5±1.2	16.5±0.9	18.7±1.3	20.1±1.3
L-03	On-Site No. 3	17.8±1.0	16.3±0.6	17.8±1.2	19.9±1.2
L-04	Near-Site No. 4	18.1±1.7	17.9±1.1	19.7±1.6	21.5±1.8
L-05	On-Site No. 5	19.2±1.3	17.9±1.1	20.4±1.7	22.8±1.4
L-06	Near-Site No. 6	17.8±1.6	19.2±0.7	20.3±1.6	22.1±1.4
	Mean ± s.d.	18.3±0.5	17.2±1.3	19.2±1.1	21.3±1.1
Off-Site Indicator Locations					
L-07	Seneca	18.6±0.9	17.8±1.2	19.4±1.2	20.5±1.5
L-08	Marseilles	18.0±1.3	16.7±0.6	18.9±1.2	19.9±1.7
L-11	Ransom	15.1±1.1	14.4±0.8	15.2±1.2	16.0±0.8
L-13	Rt. 6/Gonnam Road	15.2±1.1	16.2±0.8	15.9±1.2	17.5±1.1
	Mean ± s.d.	16.7±1.8	16.3±1.4	17.4±2.1	18.5±2.1
Background Locations					
L-09	Grand Ridge	16.9±1.5	15.7±0.8	17.2±1.7	18.1±1.0
L-10	Streator	15.3±1.5	14.9±0.8	15.3±1.4	17.1±0.7
L-12	Kernan	15.3±1.4	16.0±0.7	16.3±1.3	17.9±0.8
L-14	Ottawa	15.3±1.5	16.4±0.7	16.6±1.3	18.4±1.1
	Mean ± s.d.	15.7±0.8	15.8±0.6	16.4±0.8	17.9±0.6

Table 5.1-1 (continued)

GAMMA RADIATION, AS MEASURED BY THERMOLUMINESCENT DOSIMETERS (TLDs)

SPECIAL PROGRAM

Inner Ring, Near Site Boundary, Indicator Locations

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date Placed:	12-29-89	03-30-90	06-29-90	09-29-90
Date Removed:	03-30-90	06-29-90	09-29-90	12-28-90
Days in the Field:	91	91	92	90
Location Code	Average mR/Quarter			
L-101-1	16.5±1.5	15.6±0.6	17.4±1.2	18.6±1.0
L-101-2	16.1±0.7	16.6±1.0	17.4±0.8	18.8±1.3
L-102-1	19.3±1.5	19.7±0.8	20.4±1.8	22.1±1.3
L-102-2	18.1±1.0	19.6±0.9	19.5±0.9	20.7±1.0
L-103-1	17.8±1.5	17.1±1.2	19.3±1.3	19.7±1.6
L-103-2	17.9±1.2	20.0±0.8	18.8±1.1	21.5±1.0
L-105-1	17.5±1.0	18.2±1.0	19.2±1.1	21.6±1.1
L-105-2	18.0±1.4	17.7±1.0	19.1±1.4	19.0±1.5
L-106-1	16.6±1.4	17.3±0.7	18.3±1.1	19.4±0.8
L-106-2	15.6±1.0	15.5±0.9	17.2±1.6	16.0±1.5
L-107-1	17.1±1.1	19.1±1.4	19.8±1.4	21.4±1.6
L-107-2	16.5±0.8	17.0±0.7	17.7±1.2	17.7±1.0
L-108-1	16.9±1.1	19.1±1.0	18.7±1.2	20.9±1.0
L-108-2	14.7±1.1	15.1±0.7	15.4±1.1	16.3±1.3
L-109-1	17.4±1.0	18.2±0.8	20.0±1.2	20.3±1.1
L-109-2	16.8±1.3	17.9±0.9	18.5±1.5	18.7±1.2
L-110-1	17.2±1.1	17.2±0.7	19.3±0.8	19.1±0.8
L-110-2	16.8±1.1	17.4±0.8	18.2±1.5	18.8±1.0
L-111a-1	16.4±0.7	18.1±0.7	18.7±1.2	20.0±1.0
L-111a-2	16.5±1.1	19.3±1.3	18.0±1.1	21.0±1.7
L-111b-1	16.7±1.2	18.1±0.7	19.8±2.0	20.7±0.7
L-111b-2	17.6±1.4	17.4±1.3	18.7±1.2	19.6±0.9
L-112-1	15.6±1.6	17.1±0.9	15.6±1.0	18.9±1.4
L-112-2	16.7±1.2	18.4±1.1	18.6±1.3	19.4±1.2
L-113a-1	15.5±0.9	19.2±1.2	16.3±1.6	20.2±1.4
L-113a-2	17.1±1.0	20.3±1.4	18.7±1.1	21.4±1.4
L-113b-1	14.8±1.1	18.8±0.9	16.0±1.5	20.0±1.0
L-113b-2	17.2±1.1	18.6±1.1	19.4±1.3	20.0±1.0
L-114-1	14.7±1.3	17.8±0.7	16.9±1.4	19.3±1.3
L-114-2	17.3±1.3	18.3±0.9	19.3±1.1	19.5±1.2
Mean ± s.d.	16.8±1.0	18.0±1.2	18.3±1.3	19.7±1.4

Table 5.1-1 (continued)

GAMMA RADIATION, AS MEASURED BY THERMOLUMINESCENT DOSIMETERS (TLDs)

SPECIAL PROGRAM

Outer Ring, Near 5 Miles Radius, Indicator Locations

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date Placed:	12-29-89	03-30-90	06-29-90	09-29-90
Date Removed:	03-30-90	06-29-90	09-29-90	12-28-90
Days in the Field:	91	91	92	90
Location		Average mR/Qtr.		
L-201-1	15.3±1.1	17.4±1.0	16.6±1.2	18.9±1.2
L-201-2	17.4±1.2	17.9±0.8	19.1±1.5	18.6±0.8
L-202-1	15.5±1.5	17.2±0.9	16.6±1.1	17.9±1.0
L-202-2	17.2±0.9	17.8±1.0	18.1±1.0	19.6±1.8
L-203-1	14.6±1.1	15.6±1.0	15.1±1.2	15.9±1.5
L-203-2	17.4±1.2	19.0±1.3	18.4±1.5	20.2±1.9
L-204-1	15.1±1.5	17.4±0.6	16.9±1.2	18.7±1.0
L-204-2	15.6±1.0	17.0±0.7	16.8±1.6	17.8±0.9
L-205-1	15.9±1.3	19.4±1.0	16.9±1.2	21.3±1.8
L-205-2	15.2±0.8	17.1±0.9	16.9±1.0	18.3±1.3
L-206-1	15.4±1.4	17.4±1.0	16.7±1.1	19.6±1.4
L-206-2	16.3±1.3	16.6±0.9	17.6±1.6	17.2±0.9
L-207-1	16.7±0.8	19.1±0.7	17.5±0.9	20.7±0.8
L-207-2	15.5±0.9	15.2±0.8	16.8±0.9	16.4±1.3
L-208-1	18.1±1.5	19.4±0.6	20.5±1.6	21.0±0.8
L-208-2	16.1±1.0	17.8±0.7	17.0±1.3	19.1±1.4
L-209-1	19.0±0.5	18.8±1.2	20.4±1.0	21.2±1.1
L-209-2	15.8±1.0	18.0±0.8	16.7±1.4	18.1±1.2
L-210-1	16.9±0.9	19.8±0.7	19.2±0.9	21.4±0.9
L-210-2	17.7±1.0	18.3±0.7	19.6±1.2	17.7±0.8
L-211-1	19.4±1.3	19.9±0.8	21.1±1.6	21.2±1.1
L-211-2	17.4±1.2	17.9±0.8	19.5±1.5	19.0±0.8
L-212-1	15.8±1.1	17.8±0.7	17.3±1.1	19.0±1.0
L-212-2	17.3±1.4	17.9±0.9	20.6±1.7	19.6±1.0
L-213-1	17.3±1.2	15.5±1.1	18.6±1.0	18.3±1.3
L-213-2	16.3±1.4	19.4±0.8	19.2±1.9	22.6±1.1
L-214-1	18.6±1.0	19.6±0.8	20.3±1.2	20.5±1.6
L-214-2	18.4±1.1	19.8±0.8	21.1±1.8	23.1±1.1
L-215-1	17.3±0.9	19.2±0.6	19.4±1.1	20.4±1.5
L-215-2	18.0±0.9	20.5±0.7	20.5±1.2	23.5±1.2
L-216-1	16.5±1.0	18.3±0.9	17.7±1.2	19.5±1.2
L-216-2	16.7±1.1	18.4±0.6	18.7±1.8	20.6±0.9
Mean ± s.d.	16.7±1.2	18.2±1.4	18.4±1.6	19.6±1.8

LASALLE

Table 5.1-1 (continued)

GAMMA RADIATION, AS MEASURED BY THERMOLUMINESCENT DOSIMETERS (TLDs)

RESTRICTED AREA MONITORING PROGRAM

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date Placed:	12-29-89	03-30-90	06-29-90	09-29-90
Date Removed:	03-30-90	06-29-90	09-29-90	12-28-90
Days in the Field:	91	91	92	90
Location[a]	Average mR/Qtr.			
Initial Program:				
L-304-1	18.7±1.5	20.0±1.3	21.0±1.7	22.6±1.4
L-305-1	17.9±1.4	18.3±0.8	19.7±0.9	20.5±1.2
L-308-1	13.3±1.0	15.2±0.8	14.8±1.1	17.0±0.8
L-310-1	26.2±1.4	29.6±0.9	40.4±3.7[b]	25.1±1.1
L-316-1	18.9±1.7	19.8±1.0	21.8±1.7	22.8±1.1

[a] Description of locations:

L-304-1	Leased Farmland
L-305-1	Boat Ramp
L-308-1	Proposed Site of Relocated Meteorological Tower
L-310-1	NGET Building
L-316-1	Leased Farmland

[b] Spare No. 1 placed at Location L-310-1 on 09-02-90. Results are prorated to 91 days.

APPENDIX II

METEOROLOGICAL DATA

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY-MARCH 1990
STABILITY CLASS - EXTREMELY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 13

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY-MARCH 1990
STABILITY CLASS - MODERATELY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	1	0	0	0	0	1
SSW	0	2	0	0	0	0	2
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	3	0	0	0	0	3

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 13

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY-MARCH 1990
STABILITY CLASS - SLIGHTLY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	1	0	1	4	2	8
SW	0	0	0	0	0	0	0
WSW	0	0	0	1	3	0	4
W	0	0	0	0	0	3	3
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	1	1
NNW	0	0	0	2	1	0	3
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	1	0	5	8	6	20

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 13

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY-MARCH 1990
STABILITY CLASS - NEUTRAL (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	6	15	19	10	5	56
NNE	1	6	11	19	9	9	55
NE	2	5	29	30	17	2	85
ENE	0	2	4	20	11	16	53
E	2	3	3	10	17	15	50
ESE	0	0	2	6	3	0	11
SE	1	3	2	7	4	1	18
SSE	0	4	4	6	13	0	27
S	0	3	7	19	14	16	59
SSW	1	4	17	11	9	38	80
SW	1	7	20	9	12	21	70
WSW	2	2	18	7	11	9	49
W	2	5	5	13	18	30	73
WNW	1	12	5	8	24	66	116
NW	1	4	13	15	39	44	116
NNW	1	5	20	43	10	13	92
VARIABLE	0	0	0	0	0	0	0
TOTAL	16	71	175	242	221	285	1010

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 75
Hours of missing stability measurements in all stability classes: 13

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY-MARCH 1990
STABILITY CLASS - SLIGHTLY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	1	0	4	6	0	11
NNE	2	0	2	7	2	0	13
NE	1	2	6	1	2	0	12
ENE	2	1	3	0	1	1	8
E	0	6	7	2	5	5	25
ESE	0	6	4	4	6	6	26
SE	0	3	3	6	4	13	29
SSE	1	0	2	5	5	24	37
S	0	0	10	5	10	100	125
SSW	1	3	3	6	19	105	137
SW	0	2	4	10	10	34	60
WSW	0	5	4	9	9	14	41
W	1	1	5	13	12	26	58
WNW	0	2	8	17	14	19	60
NW	0	3	4	12	12	12	43
NNW	0	1	2	9	6	2	20
VARIABLE	0	0	0	0	0	0	0
TOTAL	8	36	67	110	123	361	705

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 51
Hours of missing stability measurements in all stability classes: 13

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY-MARCH 1990
STABILITY CLASS - MODERATELY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	0	0	0	1	1	2
ESE	0	0	0	3	1	0	4
SE	0	0	2	3	2	1	8
SSE	0	0	0	6	3	5	14
S	0	2	2	10	7	22	43
SSW	1	3	1	8	7	17	37
SW	0	1	3	6	9	29	48
WSW	0	2	1	5	2	21	31
W	0	0	3	7	6	6	22
WNW	0	1	1	6	4	1	13
NW	0	2	6	1	2	1	12
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	1	12	19	55	44	104	235

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 3
Hours of missing stability measurements in all stability classes: 13

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JANUARY-MARCH 1990
STABILITY CLASS - EXTREMELY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	1	0	1
SE	0	0	0	1	1	0	2
SSE	0	0	1	1	3	2	7
S	0	0	0	3	3	8	14
SSW	0	0	0	0	2	7	9
SW	0	0	0	0	0	1	1
WSW	0	0	0	0	1	5	6
W	0	0	0	1	2	0	3
WNW	0	0	1	0	0	1	2
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	2	6	13	24	45

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 13

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL-JUNE 1990
STABILITY CLASS - EXTREMELY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 35

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL-JUNE 1990
STABILITY CLASS - MODERATELY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	6	0	0	0	6
NE	0	0	0	1	0	0	1
ENE	0	0	0	1	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	1	2
SSW	0	0	5	1	8	11	25
SW	0	1	0	4	3	0	8
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	2	2
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	1	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	1	12	7	11	15	46

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 35

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL-JUNE 1990
STABILITY CLASS - SLIGHTLY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	5	0	0	0	5
NNE	0	0	7	3	0	0	10
NE	0	0	2	5	0	0	7
ENE	0	0	1	0	0	0	1
E	0	0	1	1	0	0	2
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	2	0	2
S	0	0	5	0	3	6	14
SSW	0	0	8	2	6	8	24
SW	0	2	3	3	2	0	10
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	3	3
WNW	0	0	0	0	1	5	6
NW	0	0	0	0	0	2	2
NNW	0	0	0	0	6	1	7
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	2	32	14	20	25	93

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 1
Hours of missing stability measurements in all stability classes: 35

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL-JUNE 1990
STABILITY CLASS - NEUTRAL (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	8	13	16	14	2	53
NNE	0	8	9	16	15	2	50
NE	0	16	33	32	3	0	84
ENE	0	7	12	19	7	1	46
E	0	0	15	9	4	17	45
ESE	1	3	6	6	5	7	28
SE	0	4	2	8	9	0	23
SSE	0	5	16	15	12	6	55
S	1	6	14	15	25	22	83
SSW	0	5	5	14	23	31	78
SW	0	4	9	14	20	20	67
WSW	1	7	8	8	13	7	44
W	0	4	12	28	11	11	66
WNW	1	4	14	34	18	39	110
NW	0	3	19	31	50	26	129
NNW	0	7	11	12	34	8	72
VARIABLE	0	0	0	0	0	0	0
TOTAL	4	91	198	278	263	199	1033

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 35

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL-JUNE 1990
STABILITY CLASS - SLIGHTLY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4-7	8-12	13-18	19-24	GT 24	TOTAL
N	1	1	8	6	6	0	22
NNE	1	4	3	8	5	0	21
NE	0	2	14	16	3	0	35
ENE	1	2	4	8	3	0	18
E	1	3	16	9	5	0	34
ESE	0	2	5	7	9	2	25
SE	0	1	2	3	14	4	24
SSE	2	1	3	11	13	9	39
S	0	2	5	6	18	24	55
SSW	0	2	13	8	13	62	98
SW	0	2	11	12	11	9	45
WSW	0	6	11	8	2	9	36
W	0	3	11	13	6	5	38
WNW	0	0	11	16	10	17	54
NW	0	3	5	11	12	3	34
NNW	0	4	5	8	2	0	19
VARIABLE	0	0	0	0	0	0	0
TOTAL	6	38	127	150	132	144	597

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 35

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL-JUNE 1990
STABILITY CLASS - MODERATELY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	3	0	0	3
NNE	0	1	2	2	0	0	5
NE	0	0	1	2	0	0	3
ENE	0	0	0	1	2	0	3
E	1	0	4	6	2	0	13
ESE	0	1	1	4	2	0	8
SE	0	3	2	1	6	0	12
SSE	0	0	3	4	6	10	23
S	0	1	3	6	5	18	33
SSW	0	2	2	7	5	41	57
SW	0	2	4	5	6	9	26
WSW	0	2	8	9	7	0	26
W	0	0	7	7	12	3	29
WNW	0	0	5	9	24	9	47
NW	0	0	2	10	7	2	21
NNW	0	3	3	2	2	0	10
VARIABLE	0	0	0	0	0	0	0
TOTAL	1	15	47	78	86	92	319

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 35

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - APRIL-JUNE 1990
STABILITY CLASS - EXTREMELY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	2	1	0	3
SE	1	0	0	3	1	1	6
SSE	0	0	2	2	5	8	17
S	0	0	3	4	5	2	14
SSW	0	0	1	0	0	0	1
SW	0	0	2	4	2	4	12
WSW	0	0	0	2	0	2	4
W	0	0	0	0	1	0	1
WNW	0	0	0	0	1	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	2	0	8	17	16	17	60

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 35

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JULY-SEPTEMBER 1990
STABILITY CLASS - EXTREMELY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	1	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	1	0	0	1

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 11

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JULY-SEPTEMBER 1990
STABILITY CLASS - MODERATELY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	3	0	5	0	8
NNE	0	0	4	0	0	0	4
NE	0	0	4	2	0	0	6
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	1	1	0	0	0	2
SSW	0	3	7	5	0	0	15
SW	0	0	3	7	2	3	15
WSW	0	0	0	1	0	0	1
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	1	0	0	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	4	22	16	7	3	52

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 11

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JULY-SEPTEMBER 1990
STABILITY CLASS - SLIGHTLY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	5	4	0	0	9
NNE	0	0	4	2	0	0	6
NE	0	0	5	3	0	0	8
ENE	0	0	3	0	0	0	3
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	5	1	7	0	0	13
S	0	3	10	1	3	0	17
SSW	0	2	7	4	3	2	18
SW	0	5	12	8	1	0	26
WSW	0	5	2	11	3	0	21
W	0	0	0	0	1	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	1	4	1	0	6
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	20	50	44	12	2	128

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 11

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JULY-SEPTEMBER 1990
STABILITY CLASS - NEUTRAL (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	2	8	15	23	4	0	52
NNE	1	15	24	58	8	0	106
NE	1	20	53	63	5	0	142
ENE	2	8	25	29	3	0	67
E	3	9	19	19	1	0	51
ESE	1	7	17	3	1	0	29
SE	2	6	13	2	1	0	24
SSE	0	5	22	19	6	0	52
S	1	8	21	22	5	0	57
SSW	3	8	8	15	16	3	53
SW	2	10	10	22	13	5	62
WSW	0	8	10	17	18	0	53
W	2	13	15	2	2	2	36
WNW	3	24	7	13	5	4	56
NW	0	12	22	10	13	14	71
NNW	2	7	16	16	14	1	56
VARIABLE	0	0	0	0	0	0	0
TOTAL	25	168	297	333	115	29	967

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 4
Hours of missing stability measurements in all stability classes: 11

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JULY-SEPTEMBER 1990
STABILITY CLASS - SLIGHTLY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	2	3	6	4	4	0	19
NNE	0	5	7	20	10	0	42
NE	0	11	29	12	1	0	53
ENE	1	12	13	7	0	0	33
E	5	4	13	17	3	2	44
ESE	1	3	8	6	2	0	20
SE	0	7	7	8	6	0	28
SSE	1	3	5	4	3	1	17
S	0	3	3	12	7	6	31
SSW	0	1	10	20	20	15	66
SW	1	6	6	7	18	23	61
WSW	2	5	13	5	7	4	36
W	0	7	8	1	2	1	19
WNW	2	5	2	4	1	0	14
NW	0	0	5	6	3	2	16
NNW	1	2	2	5	5	1	16
VARIABLE	0	0	0	0	0	0	0
TOTAL	16	77	137	138	92	55	515

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 1
Hours of missing stability measurements in all stability classes: 11

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JULY-SEPTEMBER 1990
STABILITY CLASS - MODERATELY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	1	1	3	2	0	7
NNE	1	0	1	0	0	0	2
NE	1	1	0	0	0	0	2
ENE	0	0	2	0	0	0	2
E	1	1	4	2	2	0	10
ESE	0	0	2	7	1	3	13
SE	0	0	7	9	7	4	27
SSE	0	1	3	14	4	8	30
S	0	2	3	15	13	16	49
SSW	0	6	6	15	11	16	54
SW	2	4	16	12	21	42	97
WSW	0	7	7	11	11	17	53
W	1	6	9	3	5	0	24
WNW	1	1	4	5	1	0	12
NW	1	2	4	8	3	0	18
NNW	0	0	4	5	2	0	11
VARIABLE	0	0	0	0	0	0	0
TOTAL	8	32	73	109	83	106	411

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 11

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - JULY-SEPTEMBER 1990
STABILITY CLASS - EXTREMELY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	2	0	2
NNE	0	0	0	1	1	0	2
NE	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	2	3	1	6
SSE	0	0	1	5	5	3	14
S	0	0	3	10	5	3	21
SSW	0	0	4	2	6	3	15
SW	0	2	0	1	6	14	23
WSW	0	0	0	3	1	2	6
W	0	0	0	3	3	3	9
WNW	0	0	0	6	5	2	13
NW	1	0	0	2	2	0	5
NNW	0	0	0	1	0	0	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	2	2	8	36	39	31	118

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 11

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER-DECEMBER 1990
STABILITY CLASS - EXTREMELY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER-DECEMBER 1990
STABILITY CLASS - MODERATELY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 12
Hours of missing stability measurements in all stability classes: 3

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER-DECEMBER 1990
STABILITY CLASS - SLIGHTLY UNSTABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	1	1	0	1	3
SW	0	0	1	0	0	2	3
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	1	1	2
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	2	1	1	4	8

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 14
Hours of missing stability measurements in all stability classes: 3

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER-DECEMBER 1990
STABILITY CLASS - NEUTRAL (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	1	1	3	16	19	4	44
NNE	0	1	2	9	28	4	44
NE	0	3	6	19	11	1	39
ENE	0	0	3	5	4	6	18
E	0	5	4	1	5	5	20
ESE	0	4	7	12	8	4	35
SE	2	1	12	16	5	0	36
SSE	1	3	12	29	11	2	58
S	2	6	3	15	12	17	55
SSW	3	3	19	19	11	34	89
SW	2	2	12	29	18	34	97
WSW	1	5	5	7	9	10	37
W	3	6	6	22	9	37	83
WNW	0	9	14	29	34	35	121
NW	0	5	12	26	18	54	115
NNW	0	9	12	23	14	4	62
VARIABLE	0	0	0	0	0	0	0
TOTAL	15	63	131	277	216	251	953

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 69
Hours of missing stability measurements in all stability classes: 3

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER-DECEMBER 1990
STABILITY CLASS - SLIGHTLY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	3	10	8	4	1	26
NNE	0	4	4	11	8	0	27
NE	0	1	3	6	1	0	11
ENE	0	0	2	3	4	0	9
E	0	4	1	2	8	2	17
ESE	0	2	2	2	8	0	14
SE	0	0	5	3	7	8	23
SSE	2	3	2	9	13	11	40
S	0	1	7	11	8	47	74
SSW	0	0	7	7	11	114	139
SW	0	2	5	2	16	55	80
WSW	0	2	3	3	2	3	13
W	0	1	7	7	12	10	37
WNW	3	3	3	7	14	16	46
NW	0	3	9	11	5	7	35
NNW	1	3	5	8	14	4	35
VARIABLE	0	0	0	0	0	0	0
TOTAL	6	32	75	100	135	278	626

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 17
Hours of missing stability measurements in all stability classes: 3

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER-DECEMBER 1990
STABILITY CLASS - MODERATELY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	1	3	8	9	0	21
NNE	0	0	2	5	0	0	7
NE	0	1	2	2	0	0	5
ENE	0	4	0	0	0	0	4
E	0	1	2	0	0	0	3
ESE	0	2	2	1	0	1	6
SE	3	9	6	2	9	4	33
SSE	1	5	9	0	2	10	27
S	2	0	4	8	1	11	26
SSW	1	1	1	8	7	42	60
SW	1	0	5	3	4	50	63
WSW	0	2	2	3	3	14	24
W	0	2	1	5	8	10	26
WNW	0	1	4	7	15	8	35
NW	1	1	1	5	9	8	25
NNW	0	1	2	14	6	0	23
VARIABLE	0	0	0	0	0	0	0
TOTAL	9	31	46	71	73	158	388

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

LASALLE NUCLEAR POWER STATION
PERIOD OF RECORD - OCTOBER-DECEMBER 1990
STABILITY CLASS - EXTREMELY STABLE (DIFF TEMP 375-33 FT)
WINDS MEASURED AT 375 FEET

WIND DIRECTION	WIND SPEED (IN MPH) .7-3	4- 7	8-12	13-18	19-24	GT 24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	1	0	0	0	0	1
ESE	0	0	0	1	0	0	1
SE	0	1	2	3	5	4	15
SSE	0	0	2	4	3	6	15
S	0	0	0	2	8	8	18
SSW	0	0	0	0	0	9	9
SW	0	0	0	0	1	17	18
WSW	0	1	1	2	7	15	26
W	0	0	1	3	0	3	7
WNW	0	0	0	2	0	1	3
NW	0	0	0	0	3	0	3
NNW	0	0	0	1	0	0	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	4	6	18	27	63	118

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

APPENDIX III

LISTING OF MISSED SAMPLES

LISTING OF MISSED SAMPLES

Sample Type	Location	Expected Collection Dates	Reason

There were no missed samples in 1990.

APPENDIX IV

MILCH ANIMALS, NEAREST CATTLE, AND NEAREST RESIDENCES CENSUSES

MILCH ANIMALS CENSUS, 1990[a]

There are no commercial dairy farms within a five mile radius of LaSalle County Station.

Sampling Locations

L-19 Robert Bettenhausen Farm
8.5 miles @ 180°

Number of cows - 76
Number of fresh cows - 60

Diet consists of the following:

Ground feed*	10 lbs. per day
Ground corn mix**	10 lbs. per day

* Ground feed consists of:

Hay	10 lbs.
Silage	70 lbs.

** Ground corn mix consists of:

Corn	2000 lbs.
Oats	400 lbs.
Soybeans	400 lbs.
Minerals	50 lbs.
Salt	50 lbs.

L-16 Lowery Dairy Farms
8.2 miles @ 120°

Number of cows - 102
Number of fresh cows - 76

Diet consists of the following:

Ground feed*	20 lbs. per day
Corn and oats silage	Free choice
Alfalfa hay	Free choice

* Ground feed mix consists of:

Ground corn	2000 lbs.
Soybean meal	600 lbs.
Pre-mix	300 lbs.
Salt	50 lbs.

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[a] Supplemental search; one private residence, Loretta Gass, L-20; two milk cows, 4.6 miles at 348°.

MILCH ANIMALS CENSUS, 1990 (continued)

L-17 Earl Hayer - Andrew Patterson
12.3 miles @ 18°

Number of cows - 37
Number of fresh cows - 28

Diet consists of the following:

Ground corn mix*	15 lbs. per day
Silage	20 lbs. per day
Hay	Free choice

* Ground corn mix consists of:

Corn	2000 lbs.
Oats	1000 lbs.
Protein	700 lbs.
Minerals	50 lbs.
Salt	50 lbs.

L-18 Flatness Dairy Farm
12.5 miles @ 10°

Number of cows - 50
Number of fresh cows - 39

Diet consists of the following:

Ground feed mix*	20 lbs. per day
Silage	20 lbs. per day
Hay	Free choice

* Ground feed mix consists of:

Corn	1,500 lbs.
Soybean meal	750 lbs.
Oats	750 lbs.
Linseed meal	100 lbs.
Minerals	50 lbs.

Census conducted by A. Lewis on June 13 and 14, 1990.

NEAREST RESIDENCE CENSUS, 1990

Nearest resident of the LaSalle Station within a five (5) mile radius.

Direction	Distance
N	2.2 miles
NNE	1.4 miles
NE	1.8 miles
ENE	3.4 miles
E	3.1 miles
ESE	1.6 miles
SE	1.5 miles
SSE	1.1 miles
S	2.2 miles
SSW	2.0 miles
SW	0.7 miles
WSW	1.3 miles
W	0.9 miles
WNW	1.0 miles
NW	2.6 miles
NNW	1.2 miles (new house)

Census conducted by A. Lewis on June 7, 1990.

LASALLE

NEAREST CATTLE CENSUS, 1990

Nearest cattle of the LaSalle Station within a five (5) mile radius.

Direction	Distance
N	4.2 miles
NNE	3.0 miles
NE	No cattle
ENE	3.2 miles
E	No cattle
ESE	No cattLE
SE	4.8 miles
SSE	4.5 miles
S	No cattle
SSW	No cattle
SW	No cattle
WSW	No cattle
W	3.4 miles
WNW	1.0 miles
NW	No cattle
NNW	5.0 miles

Census conducted by A. Lewis on July 10, 11 and 12, 1990.

APPENDIX V

INTERLABORATORY COMPARISON PROGRAM RESULTS

Appendix V

Interlaboratory Comparison Program Results

Teledyne Isotopes Midwest Laboratory (formerly Hazleton Environmental Sciences) has participated in interlaboratory comparison (crosscheck) programs since the formulation of its quality control program in December 1971. These programs are operated by agencies which supply environmental-type samples (e.g., milk or water) containing concentrations of radionuclides known to the issuing agency but not to participant laboratories. The purpose of such a program is to provide an independent check on the laboratory's analytical procedures and to alert it to any possible problems.

Participant laboratories measure the concentrations of specified radionuclides and report them to the issuing agency. Several months later, the agency reports the known values to the participant laboratories and specifies control limits. Results consistently higher or lower than the known values or outside the control limits indicate a need to check the instruments or procedures used.

The results in Table A-1 were obtained through participation in the environmental sample crosscheck program for milk, water, air filters, and food samples during the period January 1986 through December, 1990. This program has been conducted by the U.S. Environmental Protection Agency Intercomparison and Calibration Section, Quality Assurance Branch, Environmental Monitoring and Support Laboratory, Las Vegas, Nevada.

The results in Table A-2 were obtained for thermoluminescent dosimeters (TLDs) during the period 1976, 1977, 1979, 1980, 1984, and 1985-1986 through participation in the Second, Third, Fourth, Fifth, Seventh, and Eighth International Intercomparison of Environmental Dosimeters under the sponsorships listed in Table A-2. Also Teledyne testing results are listed.

Table A-3 lists results of the analyses on in-house spiked samples.

Table A-4 lists results of the analyses on in-house "blank" samples.

Attachment B lists acceptance criteria for "spiked" samples.

Addendum to Appendix A provides explanation for out-of-limit results.

Table A-1. U.S. Environmental Protection Agency's crosscheck program, comparison of EPA and Teledyne Isotopes Midwest Laboratory results for milk, water, air filters, and food samples, 1986 through 1990.[a]

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STF-447	Food	Jan 1986	Sr-89	24.3±2.5	25.0±5.0	16.3-33.7
			Sr-90	17.3±0.6	10.0±1.5	7.4-12.6
			I-131	22.7±2.3	20.0±0.6	9.6-30.4
			Cs-137	16.3±0.6	15.0±5.0	6.3-23.7
			K	927±46	950±144	701-1199
STW-448	Water	Feb 1986	Cr-51	45.0±3.6	38.0±5.0	29.3-46.7
			Co-60	19.7±1.5	18.0±5.0	9.3-26.7
			Zn-65	44.0±3.5	40.0±5.0	31.3-48.7
			Ru-106	<9.0	0.0±5.0	0.0-8.7
			Cs-134	28.3±2.3	30.0±5.0	21.3-38.7
			Cs-137	23.7±0.6	22.0±5.0	13.3-30.7
STW-449	Water	Feb 1986	H-3	5176±48	5227±525	4317-6137
STW-450	Water	Feb 1986	U total	8.0±0.0	9.0±6.0	0.0-19.4
STM-451	Milk	Feb 1986	I-131	7.0±0.0	9.0±6.0	0.0-19.4
STW-452	Water	Mar 1986	Ra-226	3.8±0.1	4.1±0.6	3.0-5.2
			Ra-228	11.0±0.5	12.4±1.8	9.2-15.5
STW-453	Water	Mar 1986	Gr. alpha	6.7±0.6	15.0±5.0	6.3-23.7
			Gr. beta	7.3±0.6	8.0±5.0	0.0-16.7
STW-454	Water	Apr 1986	I-131	7.0±0.0	9.0±6.0	0.0-19.4
STW-455 456	Water (Blind)	Apr 1986				
	Sample A		Gr. alpha	15.0±1.0	17.0±5.0	8.3-25.7
			Ra-226	3.1±0.1	2.9±0.4	2.1-3.7
			Ra-228	1.5±0.2	2.0±0.3	1.5-2.5
			Uranium	4.7±0.6	5.0±6.0	0.0-15.4
	Sample B		Gr. beta	28.7±1.2	35.0±5.0	26.3-43.7
			Sr-89	5.7±0.6	7.0±5.0	0.0-15.7
			Sr-90	7.0±0.0	7.0±1.5	4.4-9.6
			Co-60	10.7±1.5	10.0±5.0	1.3-18.7
			Cs-134	4.0±1.7	5.0±5.0	0.0-13.7
			Cs-137	5.3±0.6	5.0±5.0	0.0-13.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STAF-457	Air Filter	Apr 1986	Gr. alpha	13.7±0.6	15.0±5.0	6.3-23.7
			Gr. beta	46.3±0.6	47.0±5.0	38.3-55.7
			Sr-90	14.7±0.6	18.0±1.5	15.4-20.6
			Cs-137	10.7±0.6	10.0±5.0	1.3-18.7
STU-458	Urine	Apr 1986	Tritium	4313±70	4423±189	4096-4750
STW-459	Water	May 1986	Sr-89	4.3±0.6	5.0±5.0	0.0-13.7
			Sr-90	5.0±0.0	5.0±1.5	2.4-7.6
STW-460	Water	May 1986	Gr. alpha	5.3±0.6	8.0±5.0	0.0-16.7
			Gr. beta	11.3±1.2	15.0±5.0	6.3-23.7
STW-461	Water	Jun 1986	Cr-51	<9.0	0.0±5.0	0.0-8.7
			Co-60	66.0±1.0	66.0±5.0	57.3-74.7
			Zn-65	87.3±1.5	86.0±5.0	77.3-94.7
			Ru-106	39.7±2.5	50.0±5.0	41.3-58.7
			Cs-134	49.3±2.5	49.0±5.0	40.3-57.7
			Cs-137	10.3±1.5	10.0±5.0	1.3-18.7
STW-462	Water	Jun 1986	Tritium	3427±25	3125±361	2499-3751
STM-464	Milk	Jun 1986	Sr-89	<1.0	0.0±5.0	0.0-8.7
			Sr-90	15.3±0.6	16.0±1.5	13.4-18.6
			I-131	48.3±2.3	41.0±6.0	30.6-51.4
			Cs-137	43.7±1.5	31.0±5.0	22.3-39.7
			K	1567±114	1600±80	1461-1739
STW-465	Water	Jul 1986	Gr. alpha	4.7±0.6	6.0±5.0	0.0-14.7
			Gr. beta	18.7±1.2	18.0±5.0	9.3-26.7
STW-467	Water	Aug 1986	I-131	30.3±0.6	45.0±6.0	34.4-55.4
STW-468	Water	Aug 1986	Pu-239	11.3±0.6	10.1±1.0	8.3-11.9
STW-469	Water	Aug 1986	Uranium	4.0±0.0	4.0±6.0	0.0-14.4
STAF-470 471 472	Air Filter	Sep 1986	Gr. alpha	19.3±1.5	22.0±5.0	13.3-30.7
			Gr. beta	64.0±2.6	66.0±5.0	57.3-74.7
			Sr-90	22.0±1.0	22.0±5.0	19.4-24.6
			Cs-137	25.7±1.5	22.0±5.0	13.3-30.7
STW-473	Water	Sep 1986	Ra-226	6.0±0.1	6.1±0.9	4.5-7.7
			Ra-228	8.7±1.1	9.1±1.4	6.7-11.5

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-474	Water	Sep 1986	Gr. alpha	16.3±3.2	15.0±5.0	6.3-23.7
			Gr. beta	9.0±1.0	8.0±5.0	0.0-16.7
STW-475	Water	Oct 1986	Cr-51	63.3±5.5	59.0±5.0	50.3-67.7
			Co-60	31.0±2.0	31.0±5.0	22.3-39.7
			Zn-65	87.3±5.9	85.0±5.0	76.3-93.7
			Ru-106	74.7±7.4	74.0±5.0	65.3-82.7
			Cs-134	25.7±0.6	28.0±5.0	19.3-36.7
			Cs-137	46.3±1.5	44.0±5.0	35.3-52.7
STW-476	Water	Oct 1986	H-3	5918±60	5973±597	4938-7008
SPW-477	Water (Blind)	Oct 1986				
	Sample A		Gr. alpha	34.0±6.0	40.0±5.0	31.3-48.7
			Ra-226	5.8±0.2	6.0±0.9	4.4-7.6
			Ra-228	2.7±1.0	5.0±0.8	3.7-6.3
			Uranium	11.0±0.0	10.0±6.0	0.0-20.4
	Sample B		Gr. beta	38.7±1.2	51.0±5.0	42.3-59.7
			Sr-89	5.0±0.0	10.0±5.0	1.3-18.7
			Sr-90	3.0±0.0	4.0±1.5	1.4-6.6
			Co-60	24.7±1.2	24.0±5.0	15.3-32.7
			Cs-134	11.0±2.0	12.0±5.0	3.3-20.7
			Cs-137	9.3±1.2	8.0±5.0	0.0-20.4
STM-479	Milk	Nov 1986	Sr-89	7.7±1.2	9.0±5.0	0.3-17.7
			Sr-90	1.0±0.0	0.0±1.5	0.0-2.6
			I-131	52.3±3.1	49.0±6.0	38.6-59.4
			Cs-137	45.7±3.1	39.0±5.0	30.3-47.7
			K	1489±104	1565±78	1430-1700
STU-480	Urine	Nov 1986	H-3	5540±26	5257±912	4345-6169
STW-481	Water	Nov 1986	Gr. alpha	12.0±4.0	20.0±5.0	11.3-28.7
			Gr. beta	20.0±3.5	20.0±5.0	11.3-28.7
STW-482	Water	Dec 1986	Ra-226	6.7±0.2	6.8±1.0	5.0-8.6
			Ra-228	5.2±0.2	11.1±1.7	8.2-14.0
STW-483	Water	Jan 1987	Sr-89	19.7±5.0	25.0±5.0	16.3-33.7
			Sr-90	21.0±2.0	25.0±1.5	22.4-27.6

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-484	Water	Jan 1987	Pu-239	17.0±2.3	16.7±1.7	13.8-19.6
STF-486	Food	Jan 1987	Sr-90	36.0±4.0	49.0±10.0	31.7-66.3
			I-131	78.0±3.4	78.0±8.0	64.1-91.9
			Cs-137	89.7±3.0	84.0±5.0	75.3-92.7
			K	942±56	980±49	895-1065
STF-487	Food (Blank)	Jan 1987	Sr-90	2.0±0.0	---	
			I-131	<3	---	
			Cs-137	<2	---	
			K	993±102	---	
STW-488	Water	Feb 1987	Co-60	49.0±0.0	50.0±5.0	41.3-58.7
			Zn-65	96.0±7.2	91.0±5.0	82.3-99.7
			Ru-106	92.0±20.2	100.0±5.0	91.3-108.7
			Cs-134	53.0±3.4	59.0±5.0	50.3-67.7
			Cs-137	89.3±4.6	87.0±5.0	78.3-95.7
STW-489	Water	Feb 1987	H-3	4130±140	4209±420	3479-4939
STW-490	Water	Feb 1987	Uranium	8.3±1.2	8.0±6.0	0.0-18.4
STM-491	Milk	Feb 1987	I-131	10.0±0.0	9.0±0.9	7.4-10.6
STW-492	Water	Mar 1937	Gr. alpha	3.7±1.2	3.0±5.0	0.0-11.7
			Gr. beta	11.3±1.2	13.0±5.0	4.3-21.7
STW-493	Water	Mar 1987	Ra-226	7.0±0.1	7.3±1.1	5.4-9.2
			Ra-228	7.1±2.3	7.5±1.1	5.5-9.5
STW-494	Water	Apr 1987	I-131	8.0±0.0	7.0±0.7	5.8-8.2
STAF-495	Air Filter	Apr 1987	Gr. alpha	15.0±0.0	14.0±5.0	5.3-22.7
			Gr. beta	41.0±2.0	43.0±5.0	34.3-51.7
			Sr-90	16.3±1.2	17.0±1.5	14.4-19.6
			Cs-137	7.0±0.0	8.0±5.0	0.0-16.7
STW-496 497	Water (Blind)	Apr 1987				
	Sample A		Gr. alpha	30.7±1.2	30.0±8.0	16.1-43.9
			Ra-226	3.9±0.2	3.9±0.6	2.9-4.9
			Ra-228	4.9±0.9	4.0±0.6	3.0-5.0
			Uranium	5.0±0.0	5.0±6.0	0.0-15.4

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-496 497	Water (Blind)	Apr 1987				
	Sample B		Gr. beta	69.3±9.4	66.0±5.0	57.3-74.7
			Sr-89	16.3±3.0	19.0±5.0	10.3-27.7
			Sr-90	10.0±0.0	10.0±1.5	7.4-12.6
			Co-60	8.3±3.0	8.0±5.0	0.0-16.7
			Cs-134	19.0±2.0	20.0±5.0	11.3-28.7
			Cs-137	14.7±1.2	15.0±5.0	6.3-23.7
STU-498	Urine	Apr 1987	H-3	6017±494	5620±795	4647-6593
STW-499	Water	May 1987	Sr-89	38.0±6.0	41.0±5.0	32.3-49.7
			Sr-90	21.0±2.0	20.0±1.5	17.4-22.6
STW-500	Water	May 1987	Gr. alpha	9.0±3.4	11.0±5.0	2.3-19.7
			Gr. beta	10.3±1.2	7.0±5.0	0.0-15.7
STW-501	Water	Jun 1987	Cr-51	40.0±8.0	41.0±5.0	32.3-49.7
			Co-60	60.3±3.0	64.0±5.0	55.3-72.7
			Zn-65	11.3±5.0	10.0±5.0	1.3-18.7
			Ru-106	78.3±6.4	75.0±5.0	66.3-83.7
			Cs-134	36.7±3.0	40.0±5.0	31.3-48.7
			Cs-137	80.3±4.2	80.0±5.0	71.3-88.7
STW-502	Water	Jun 1987	H-3	2906±86	2895±357	2277-3513
STW-503	Water	Jun 1987	Ra-226	6.9±0.1	7.3±1.1	5.4-9.2
			Ra-228	13.3±1.0	15.2±2.3	11.2-19.2
STM-504	Milk	Jun 1987	Sr-89	57.0±4.3	69.0±5.0	60.3-77.7
			Sr-90	32.0±1.0	35.0±5.0	32.4-37.6
			I-131	64.0±2.0	59.0±6.0	48.6-69.4
			Cs-137	77.7±0.6	74.0±5.0	65.3-82.7
			K	1383±17	1525±76	1393-1657
STW-505	Water	Jul 1987	Gr. alpha	2.3±0.7	5.0±5.0	0.0-13.7
			Gr. beta	4.0±1.0	5.0±5.0	0.0-13.7
STF-506	Food	Jul 1987	I-131	82.7±4.6	80.0±8.0	66.1-93.9
			Cs-137	53.7±3.0	50.0±5.0	41.3-58.7
			K	1548±57	1680±84	1534-1825
STW-507	Water	Aug 1987	I-131	45.7±4.2	48.0±6.0	37.6-58.4

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-508	Water	Aug 1987	Pu-239	5.8±0.2	5.3±0.5	4.4-6.2
STW-509	Water	Aug 1987	Uranium	13.3±0.3	13.0±6.0	2.6-23.4
STAF-510	Air Filter	Aug 1987	Gr. alpha	9.7±0.4	10.0±5.0	1.3-18.7
			Gr. beta	28.3±0.6	30.0±5.0	21.3-38.7
			Sr-90	10.0±0.9	10.0±1.5	7.4-12.6
			Cs-137	10.0±1.0	10.0±5.0	1.3-18.7
STW-511	Water	Sep 1987	Ra-226	9.9±0.1	9.7±1.5	7.2-12.2
			Ra-228	8.1±1.4	6.3±1.0	4.6-8.0
STW-512	Water	Sep 1987	Gr. alpha	2.0±0.6	4.0±5.0	0.0-12.7
			Gr. beta	11.3±1.3	12.0±5.0	3.3-20.7
STW-513	Water	Sep 1987	H-3	4473±100	4492±449	3714-5270
STW-514	Water (Blind)	Oct 1987				
	Sample A		Gr. alpha	29.3±2.6	28.0±7.0	15.9-40.1
			Ra-226	4.9±0.1	4.8±0.7	3.6-6.1
			Ra-228	4.2±1.0	3.6±0.5	2.7-4.5
			Uranium	3.0±0.1	3.0±6.0	0.0-13.4
	Sample B		Sr-89	14.3±1.3	16.0±5.0	7.3-24.7
			Sr-90	9.7±0.4	10.0±1.5	7.4-12.6
			Co-60	16.7±3.0	16.0±5.0	7.3-24.7
			Cs-134	16.7±2.3	16.0±5.0	7.3-24.7
			Cs-137	24.3±3.3	24.0±5.0	15.3-32.7
STW-516	Water	Oct 1987	Cr-51	80.3±17.5	70.0±5.0	61.3-78.7
			Co-60	16.0±2.3	15.0±5.0	6.3-23.7
	Sample A		Zn-65	46.3±5.6	46.0±5.0	37.3-54.7
			Ru-106	57.3±15.4	61.0±5.0	52.3-69.7
			Cs-134	23.7±2.5	25.0±5.0	16.3-33.7
			Cs-137	51.7±3.2	51.0±5.0	42.3-59.7
STU-517	Urine	Nov 1987	H-3	7267±100	7432±743	6145-8719
STW-518	Water	Nov 1987	Gr. alpha	3.0±2.0	7.0±5.0	0.0-15.7
			Gr. beta	15.7±2.3	19.0±5.0	10.3-27.7
STW-519	Water	Dec 1987	I-131	26.0±3.0	25.0±6.0	15.6-36.4

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-520	Water	Dec 1987	Ra-226	5.1±0.8	4.8±0.7	3.6-6.0
			Ra-228	3.4±0.1	5.3±0.8	3.9-6.7
STW-521	Water	Jan 1988	Sr-89	27.3±5.0	30.0±5.0	21.3-38.7
			Sr-90	15.3±1.2	15.0±1.5	12.4-17.6
STW-523	Water	Jan 1988	Gr. alpha	2.3±1.2	4.0±5.0	0.0-12.7
			Gr. beta	7.7±1.2	8.0±5.0	0.0-16.7
STF-524	Food	Jan 1988	Sr-89	44.0±4.0	46.0±5.0	37.3-54.7
			Sr-90	53.0±2.0	55.0±2.8	50.2-59.8
			I-131	102.3±4.2	102.0±10.2	84.3-119.7
			Cs-137	95.7±6.4	91.0±5.0	82.3-99.7
			K	1011±158	1230±62	1124-1336
STW-525	Water	Feb 1988	Co-60	69.3±2.3	69.0±5.0	60.3-77.7
			Zn-65	99.0±3.4	94.0±9.4	77.7-110.3
			Ru-106	92.7±14.4	105.0±10.5	86.8-123.2
			Cs-134	61.7±8.0	64.0±5.0	55.3-72.7
			Cs-137	99.7±3.0	94.0±5.0	85.3-102.7
STW-526	Water	Feb 1988	H-3	3453±103	3327±362	2700-3954
STW-527	Water	Feb 1988	Uranium	3.0±0.0	3.0±6.0	0.0-13.4
STM-528	Milk	Feb 1988	I-131	4.7±1.2	4.0±0.4	3.3-4.7
STW-529	Water	Mar 1988	Ra-226	7.1±0.6	7.6±1.1	5.6-9.6
			Ra-228	NA[e]	7.7±1.2	5.7-9.7
STW-530	Water	Mar 1988	Gr. alpha	4.3±1.2	6.0±5.0	0.0-14.7
			Gr. beta	13.3±1.3	13.0±5.0	4.3-21.7
STAF-531	Air Filter	Mar 1988	Gr. alpha	21.0±2.0	20.0±5.0	11.3-28.7
			Gr. beta	48.0±0.0	50.0±5.0	41.3-58.7
			Sr-90	16.7±1.2	17.0±1.5	14.4-19.6
			Cs-137	18.7±1.3	16.0±5.0	7.3-24.7
STW-532	Water	Apr 1988	I-131	9.0±2.0	7.5±0.8	6.2-8.8

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-533 534	Water (Blind)	Apr 1988				
	Sample A		Gr. alpha	ND[f]	46.0±11.0	27.0-65.0
			Ra-226	ND	6.4±1.0	4.7-8.1
			Ra-228	ND	5.6±0.8	4.2-7.0
			Uranium	6.0±0.0	6.0±6.0	0.0-16.4
	Sample B		Gr. beta	ND	57.0±5.0	48.3-65.7
			Sr-89	3.3±1.2	5.0±5.0	0.0-13.7
			Sr-90	5.3±1.2	5.0±1.5	2.4-7.6
			Co-60	63.3±1.3	50.0±5.0	41.3-58.7
			Cs-134	7.7±1.2	7.0±5.0	0.0-15.7
			Cs-137	8.3±1.2	7.0±5.0	0.0-15.7
STU-535	Urine	Apr 1988	H-3	6483±155	6202±620	5128-7276
STW-536	Water	Apr 1988	Sr-89	14.7±1.3	20.0±5.0	11.3-28.7
			Sr-90	20.0±2.0	20.0±1.5	17.4-22.6
STW-538	Water	Jun 1988	Cr-51	331.7±13.0	302.0±30.0	250.0-354.0
			Co-60	16.0±2.0	15.0±5.0	6.3-23.7
			Zn-65	107.7±11.4	101.0±10.0	83.7-118.3
			Ru-106	191.3±11.0	195.0±20.0	160.4-229.6
			Cs-134	18.3±4.6	20.0±5.0	11.3-28.7
			Cs-137	26.3±1.2	25.0±5.0	16.3-33.7
STW-539	Water	Jun 1988	H-3	5586±92	5565±557	4600-6530
STM-541	Milk	Jun 1988	Sr-89	33.7±11.4	40.0±5.0	31.3-48.7
			Sr-90	55.3±5.8	60.0±3.0	54.8-65.2
			I-131	103.7±3.1	94.0±9.0	78.4-109.6
			Cs-137	52.7±3.1	51.0±5.0	42.3-59.7
			K	1587±23	1600±80	1461-1739
STW-542	Water	Jul 1988	Gr. alpha	8.7±4.2	15.0±5.0	6.3-23.7
			Gr. beta	5.3±1.2	4.0±5.0	0.0-12.7
STF-543	Food	Jul 1988	Sr-89	ND[f]	33.0±5.0	24.3-41.7
			Sr-90	ND	34.0±2.0	30.5-37.5
			I-131	115.0±5.3	107.0±11.0	88.0-126.0
			Cs-137	52.7±6.4	49.0±5.0	40.3-57.7
			K	1190±66	1240±62	1133-1347

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-544	Water	Aug 1988	I-131	80.0±0.0	76.0±8.0	62.1-89.9
STW-545	Water	Aug 1988	Pu-239	11.0±0.2	10.2±1.0	8.5-11.9
STW-546	Water	Aug 1988	Uranium	6.0±0.0	6.0±6.0	0.0-16.4
STAF-547	Air Filter	Aug 1988	Gr. alpha	8.0±0.0	8.0±5.0	0.0-16.7
			Gr. beta	26.3±1.2	29.0±5.0	20.3-37.7
			Sr-90	8.0±2.0	8.0±1.5	5.4-10.6
			Cs-137	13.0±2.0	12.0±5.0	3.3-20.7
STW-548	Water	Sep 1988	Ra-226	9.3±0.5	8.4±2.6	6.2-10.6
			Ra-228	5.8±0.4	5.4±1.6	4.0-6.8
STW-549	Water	Sep 1988	Gr. alpha	7.0±2.0	8.0±5.0	0.0-16.7
			Gr. beta	11.3±1.2	10.0±5.0	1.3-18.7
STW-550	Water	Oct 1988	Cr-51	252.0±14.0	251.0±25.0	207.7-294.3
			Co-60	26.0±2.0	25.0±5.0	16.3-33.7
			Zn-65	158.3±10.2	151.0±15.0	125.0-177.0
			Ru-106	153.0±9.2	152.0±15.0	126.0-178.0
			Cs-134	28.7±5.0	25.0±5.0	16.3-33.7
			Cs-137	16.3±1.2	15.0±5.0	6.3-23.7
STW-551	Water	Oct 1988	H-3	2333±127	2316±350	1710-2927
STW-552 553	Water (Blind)	Oct 1988				
	Sample A		Gr. alpha	38.3±8.0	41.0±10.0	23.7-58.3
			Ra-226	4.5±0.5	5.0±0.8	3.6-6.4
			Ra-228	4.4±0.6	5.2±0.8	3.6-6.4
			Uranium	4.7±1.2	5.0±6.0	0.0-15.4
	Sample B		Gr. beta	51.3±3.0	54.0±5.0	45.3-62.7
			Sr-89	3.7±1.2	11.0±5.0	2.3-19.7
			Sr-90	10.7±1.2	10.0±1.5	7.4-12.6
			Cs-134	15.3±2.3	15.0±5.0	6.3-23.7
			Cs-137	16.7±1.2	15.0±5.0	6.3-23.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STM-554	Milk	Oct 1988	Sr-89	40.3±7.0	40.0±5.0	31.3-48.7
			Sr-90	51.0±2.0	60.0±3.0	54.8-65.2
			I-131	94.0±3.4	91.0±9.0	75.4-106.6
			Cs-137	45.0±4.0	50.0±5.0	41.3-58.7
			K	1500±45	1600±80	1461-1739
STU-555	Urine	Nov 1988	H-3	3030±209	3025±359	2403-3647
STW-556	Water	Nov 1988	Gr. alpha	9.0±3.5	9.0±5.0	0.3-17.7
			Gr. beta	9.7±1.2	9.0±5.0	0.3-17.7
STW-557	Water	Dec 1988	I-131	108.7±3.0	115.0±12.0	94.2-135.8
STW-559	Water	Jan 1989	Sr-89	40.0±8.7	40.0±5.0	31.3-48.7
			Sr-90	24.3±3.1	25.0±1.5	24.4-27.6
STW-560	Water	Jan 1989	Pu-239	5.8±1.1	4.2±0.4	3.5-4.9
STW-561	Water	Jan 1989	Gr. alpha	7.3±1.2	8.0±5.0	0.0-16.7
			Gr. beta	5.3±1.2	4.0±5.0	0.0-12.7
STW-562	Water	Feb 1989	Cr-51	245±46	235±24	193.4-276.6
			Co-60	10.0±2.0	10.0±5.0	1.3-18.7
			Zn-65	170±10	159±16	139.2-186.7
			Ru-106	181±7.6	178±18	146.8-209.2
			Cs-134	9.7±3.0	10.0±5.0	1.3-18.7
			Cs-137	11.7±1.2	10.0±5.0	1.3-18.7
STW-563	Water	Feb 1989	I-131	109.0±4.0	106.0±11.0	86.9-125.1
STW-564	Water	Feb 1989	H-3	2820±20	2754±356	2137-3371
STW-565	Water	Mar 1989	Ra-226	4.2±0.3	4.9±0.7	3.7-6.1
			Ra-228	1.9±1.0	1.7±0.3	1.2-2.2
STW-566	Water	Mar 1989	U	5.0±0.0	5.0±6.0	0.0-15.4
STW-567	Air Filter	Mar 1989	Gr. alpha	21.7±1.2	21.0±5.0	12.3-29.7
			Gr. beta	68.3±4.2	62.0±5.0	53.3-70.7
			Sr-90	20.0±2.0	20.0±1.5	17.4-22.6
			Cs-137	21.3±1.2	20.0±5.0	11.3-28.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-568 569	Water (Blind)	Apr 1989				
	Sample A		Gr. alpha	22.7±2.3	29.0±7.0	16.9-41.2
			Ra-226	3.6±0.6	3.5±0.5	2.6-4.4
			Ra-228	2.6±1.0	3.6±0.5	2.7-4.5
			U	3.0±0.0	3.0±6.0	0.0-13.4
	Sample B		Gr. beta	52.3±6.1	57.0±5.0	43.3-65.7
			Sr-89	9.3±5.4	8.0±5.0	0.0-16.7
			Sr-90	7.0±0.0	8.0±1.5	5.4-10.6
			Cs-134	21.0±5.2	20.0±5.0	11.3-28.7
			Cs-137	23.0±2.0	20.0±5.0	11.3-28.7
STW-570	Milk	Apr 1989	Sr-89	26.0±10.0	39.0±5.0	30.3-47.7
			Sr-90	45.7±4.2	55.0±3.0	49.8-60.2
			Cs-137	54.0±6.9	50.0±5.0	41.3-58.7
			K-40	1521±208	1600±80	1461-1739
STW-5719	Water	May 1989	Sr-89	<0.7	6.0±5.0	0.0-14.7
			Sr-90	5.0±1.0	6.0±1.5	3.4-8.6
STW-572	Water	May 1989	Gr. alpha	24.0±2.0	30.0±8.0	16.1-43.9
			Gr. beta	49.3±15.6	50.0±5.0	41.3-58.7
STW-573	Water	Jun 1989	Ba-133	50.7±1.2	49.0±5.0.	40.3-57.7
			Co-60	31.3±2.3	31.0±5.0	22.3-39.7
			Zn-65	167±10	165±17	135.6-194.4
			Ru-106	123±9.2	128±13	105.5-150.5
			Cs-134	40.3±1.2	39±5	30.3-47.7
			Cs-137	22.3±1.2	20±5	11.3-28.7
STW-574	Water	Jun 1989	H-3	4513±136	4503±450	3724-5282
STW-575	Water	Jul 1989	Ra-226	16.8±3.1	17.7±2.7	13.0-22.4
			Ra-228	13.8±3.7	18.3±2.7	13.6-23.0
STW-576	Water	Jul 1989	U	40.3±1.2	41.0±6.0	30.6-51.4
STW-577	Water	Aug 1989	I-131	84.7±5.8	83.0±8.0	69.1-96.9
STAF-579	Air Filter	Aug 1989	Gr. alpha	6.0±0.0	6.0±5.0	0.0-14.7
			Cs-137	10.3±2.3	10.0±5.0	1.3-18.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-580	Water	Sep 1989	Sr-89	14.7±1.2	14.0±5.0	5.3-22.7
			Sr-90	9.7±1.2	10.0±1.5	7.4-12.6
STW-581	Water	Sep 1989	Gr. alpha	5.0±0.0	4.0±5.0	0.0-12.7
			Gr. Beta	8.7±2.3	6.0±5.0	0.0-14.7
STW-583	Water	Oct 1989	Ba-133	60.3±10.0	59.0±6.0	48.6-69.4
			Co-60	29.0±4.0	30.0±5.0	21.1-38.7
			Zn-65	132.3±6.0	129.0±13.0	106.5-151.5
			Ru-106	155.3±6.1	161.0±16.0	133.3-188.7
			Cs-134	30.7±6.1	29.0±5.0	20.3-37.7
			Cs-137	66.3±4.6	59.0±5.0	50.3-67.7
STW-584	Water	Oct 1989	H-3	3407±150	3496±364	2866-4126
STW-585 586	Water (Blind)	Oct 1989				
	Sample A		Gr. Alpha	41.7±9.4	49.0±12.0	28.2-69.8
			Ra-226	7.9±0.4	8.4±1.3	6.2-10.6
			Ra-228	4.4±0.8	4.1±0.6	3.1-5.1
			U	12.0±0.0	12.0±6.0	1.6-22.4
	Sample B		Gr. Beta	31.7±2.3	32.0±5.0	23.3-40.7
			Sr-89	13.3±4.2	15.0±5.0	6.3-23.7
			Sr-90	7.0±2.0	7.0±3.0	4.4-9.6
			Cs-134	5.0±0.0	5.0±5.0	0.0-13.7
			Cs-137	7.0±0.0	5.0±5.0	0.0-13.7
STW-587	Water	Nov 1989	Ra-226	7.9±0.4	8.7±1.3	6.4-11.0
			Ra-228	8.9±1.2	9.3±1.2	6.9-11.7
STW-588	Water	Nov 1989	U	15.0±0.09	15.0±6.0	4.6-25.4
STW-589	Water	Jan 1990	Sr-89	22.7±5.0	25.0±5.0	16.3-33.7
			Sr-90	17.3±1.2	20.0±1.5	17.4-22.6
STW-591	Water	Jan 1990	Gr. Alpha	10.3±3.0	12.0±5.0	3.3-20.7
			Gr. Beta	12.3±1.2	12.0±5.0	3.3-20.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-592	Water	Jan 1990	Co-60	14.7±2.3	15±5.0	6.3-23.7
			Zn-65	135.0±6.9	139.0±14.0	114.8-163.2
			Ru-106	133.3±13.4	139.0±14.0	114.8-163.2
			Cs-134	17.3±1.2	18.0±5.0	9.3-26.7
			Cs-137	19.3±1.2	18.0±5.0	9.3-26.7
			Ba-133	78.0±0.0	74.0±7.0	61.9-86.1
STW-593	Water	Feb 1990	H-3	4827±83	4976±498	4113-5839
STW-594	Water	Mar 1990	Ra-226	5.0±0.2	4.9±0.7	4.1-5.7
			Ra-228	13.5±0.7	12.7±1.9	9.4-16.0
STW-595	Water	Mar 1990	U	4.0±0.0	4.0±6.0	0.0-14.4
STW-596	Air Filter	Mar 1990	Gr. Alpha	7.3±1.2	5.0±5.0	0.0-13.7
			Gr. Beta	34.0±0.0	31.0±5.0	22.3-39.7
			Sr-90	10.0±0.0	10.0±1.5	7.4-12.6
			Cs-137	9.3±1.2	10.0±5.0	1.3-18.7
STW-597 598	Water (Blind)	Apr 1990				
	Sample A		Gr. Alpha	81.0±3.5	90.0±23.0	50.1-129.9
			Ra-226	4.9±0.4	5.0±0.8	3.6-6.4
			Ra-228	10.6±0.3	10.2±1.5	7.6-12.8
			U	18.7±3.0	20.0±6.0	9.6-30.4
	Sample B		Gr. Beta	51.0±10.1	52.0±5.0	43.3-60.7
			Sr-89	9.3±1.2	10.0±5.0	1.3-18.7
			Sr-90	10.3±3.1	10.0±1.5	8.3-11.7
			Cs-134	16.0±0.0	15.0±5.0	6.3-23.7
			Cs-137	19.0±2.0	15.0±5.0	6.3-23.7
STM-599	Milk	Apr 1990	Sr-89	21.7±3.1	23.0±5.0	14.3-31.7
			Sr-90	21.0±7.0	23.0±5.0	14.3-31.7
			I-131	98.7±1.2	99.0±10.0	81.7-116.3
			Cs-137	26.0±6.0	24.0±5.0	15.3-32.7
			K	1300.0±69.2	1550.0±78.0	1414.7-1685.3
STW-600	Water	May 1990	Sr-89	6.0±2.0	7.0±5.0	0.0-15.7
			Sr-90	6.7±1.2	7.0±5.0	0.0-15.7
STW-601	Water	May 1990	Gr. Alpha	11.0±2.0	22.0±6.0	11.6-32.4
			Gr. Beta	12.3±1.2	15.0±5.0	6.3-23.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-602	Water	Jun 1990	Co-60	25.3±2.3	24.0±5.0	15.3-32.7
			Zn-65	155.0±10.6	148.0±15.0	130.6-165.4
			Ru-106	202.7±17.2	210.0±21.0	173.6-246.4
			Cs-134	23.7±1.2	24.0±5.0	18.2-29.8
			Cs-137	27.7±3.1	25.0±5.0	16.3-33.7
			Ba-133	100.7±8.1	99.0±10.0	81.7-116.3
STW-603	Water	Jun 1990	H-3	2927±306	2933±358	2312-3554
STW-604	Water	Jul 1990	Ra-226	11.8±0.9	12.1±1.8	9.0-15.2
			Ra-228	4.1±1.4	5.1±1.3	2.8-7.4
STW-605	Water	Jul 1990	U	20.3±1.7	20.8±3.0	15.6-26.0
STW-606	Water	Aug 1990	I-131	43.0±1.2	39.0±6.0	28.6-49.4
STW-607	Water	Aug 1990	Pu-239	10.0±1.7	9.1±0.9	7.5-10.7
STW-608	Air Filter	Aug 1990	Gr. alpha	14.0±0.0	10.0±5.0	1.3-18.7
			Gr. beta	65.3±1.2	62.0±5.0	53.3-70.7
			Sr-90	19.0±6.9	20.0±5.0	11.3-28.7
			Cs-137	19.0±2.0	20.0±5.0	11.3-28.7
STW-609	Water	Sep 1990	Sr-89	9.0±2.0	10.0±5.0	1.3-18.7
			Sr-90	9.0±2.0	9.0±5.0	0.3-17.7
STM-610	Water	Sep 1990	Gr. alpha	8.3±1.2	10.0±5.0	1.3-18.7
			Gr. beta	10.3±1.2	10.0±5.0	1.3-18.7
STM-611	Milk	Sep 1990	Sr-89	11.7±3.1	16.0±5.0	7.3-24.7
			Sr-90	15.0±0.0	20.0±5.0	11.3-28.7
			I-131	63.0±6.0	58.0±6.0	47.6-68.4
			Cs-137	20.0±2.0	20.0±5.0	11.3-28.7
			K	1673.3±70.2	1700.0±85.0	1552.5-1847.5
STW-612	Water	Oct 1990	Co-60	20.3±3.1	20.0±5.0	11.3-28.7
			Zn-65	115.3±12.2	115.0±12.0	94.2-135.8
			Ru-106	152.0±8.0	151.0±15.0	125.0-177.0
			Cs-134	11.0±0.0	12.0±5.0	3.3-20.7
			Cs-137	14.0±2.0	12.0±5.0	3.3-20.7
			Ba-133	116.7±9.9	110.0±11.0	90.9-129.1
STW-613	Water	Oct 1990	H-3	7167±330	7203±720	5954-8452

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] TIML Result ±2σ[c]	EPA Result[d] 1s, N=1	EPA Result[d] Control Limits
STW-614 615	Water	Oct 1990				
	Sample A		Gr. alpha	68.7±7.2	62.0±16.0	34.2-89.8
			Ra-226	12.9±0.3	13.6±2.0	10.1-17.1
			Ra-228	4.2±0.6	5.0±1.3	2.7-7.3
			U	10.4±0.6	10.2±3.0	5.0-15.4
	Sample B		Gr. beta	55.0±8.7	53.0±5.0	44.3-61.7
			Sr-89	15.7±2.9	20.0±5.0	11.3-28.7
			Sr-90	12.0±2.0	15.0±5.0	6.3-23.7
			Cs-134	9.0±1.7	7.0±5.0	0.0-15.7
			Cs-137	7.7±1.2	5.0±5.0	0.0-13.7
STW-616	Water	Nov 1990	Ra-226	6.8±1.0	7.4±1.1	5.5-9.3
			Ra-228	5.3±1.7	7.7±1.9	4.4-11.0
STW-6179	Water	Nov 1990	U	35.0±0.4	35.5±3.6	29.3-41.7

[a] Results obtained by Teledyne Isotopes Midwest Laboratory as a participant in the environmental sample crosscheck program operated by the Intercomparison and Calibration Section, Quality Assurance Branch, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency (EPA), Las Vegas, Nevada.

[b] All results are in the pCi/l, except for elemental potassium (K) data in milk, which are in mg/l; air filter samples, which are in pCi/filter; and food, which is in mg/kg.

[c] Unless otherwise indicated, the TIML results are given as the mean ± 2 standard deviations for three determinations.

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

[e] NA = Not analyzed.

[f] ND = No data; not analyzed due to relocation of the lab.

[g] Sample was analyzed but the results not submitted to EPA because deadline was missed (all data on file).

Table A-2. Crosscheck program results, thermoluminescent dosimeters (TLDs).

Lab Code	TLD Type	Measurement	mR: Teledyne Result ±2σ[a]	mR: Known Value[c]	mR: Average ±2σ[d] (All Participants)
2nd International Intercomparison[b]					
115-2	CaF_2:Mn Bulb	Field	17.0±1.9	17.1	16.4±7.7
		Lab	20.8±4.1	21.3	18.8±7.6
3rd International Intercomparison[e]					
115-3	CaF_2:Mn Bulb	Field	30.7±3.2	34.9±4.8	31.5±3.0
		Lab	89.6±6.4	91.7±14.6	86.2±21.6
4th International Intercomparison[f]					
115-4	CaF_2:Mn Bulb	Field	14.1±1.1	14.1±1.4	16.0±9.0
		Lab (Low)	9.3±1.3	12.2±2.4	12.0±7.4
		Lab (High)	40.4±1.4	45.8±9.2	43.9±13.2
5th International Intercomparison[g]					
115-5A	CaF_2:Mn Bulb	Field	31.4±1.8	30.0±6.0	30.2±14.6
		Lab at beginning	77.4±5.8	75.2±7.6	75.8±40.4
		Lab at the end	96.6±5.8	88.4±8.8	90.7±31.2
115-5B	LiF-100 Chips	Field	30.3±4.8	30.0±6.0	30.2±14.6
		Lab at beginning	81.1±7.4	75.2±7.6	75.8±40.4
		Lab at the end	85.4±11.7	88.4±8.8	90.7±31.2
7th International Intercomparison[h]					
115-7A	LiF-100 Chips	Field	75.4±2.5	75.8±6.0	75.1±29.8
		Lab (Co-60)	80.0±3.5	79.9±4.0	77.9±27.6
		Lab (Cs-137)	66.6±2.5	75.0±3.8	73.0±22.2

Table A-2. (continued)

Lab Code	TLD Type	Measurement	mR: Teledyne Result ±2σ[a]	mR: Known Value[c]	mR: Average ±2σ[d] (All Participants)
115-7B	CaF_2:Mn Bulbs	Field	71.5±2.6	75.8±6.0	75.1±29.8
		Lab (Co-60)	84.8±6.4	79.9±4.0	77.9±27.6
		Lab (Cs-137)	78.8±1.6	75.0±3.8	73.0±22.2
115-7C	$CaSO_4$:Dy Cards	Field	76.8±2.7	75.8±6.0	75.1±29.8
		Lab (Co-60)	82.5±3.7	79.9±4.0	77.9±27.6
		Lab (Cs-137)	79.0±3.2	75.0±3.8	73.0±22.2
8th International Intercomparison[i]					
115-8A	LiF-100 Chips	Field Site 1	29.5±1.4	29.7±1.5	28.9±12.4
		Field Site 2	11.3±0.8	10.4±0.5	10.1±9.06
		Lab (Cs-137)	13.7±0.9	17.2±0.9	16.2±6.8
115-8B	CaF_2:Mn Bulbs	Field Site 1	32.3±1.2	29.7±1.5	28.9±12.4
		Field Site 2	9.0±1.0	10.4±0.5	10.1±9.0
		Lab (Cs-137)	15.8±0.9	17.2±0.9	16.2±6.8
115-8C	$CaSO_4$:Dy Cards	Field Site 1	32.3±0.7	29.7±1.5	28.9±12.4
		Field Site 2	10.6±0.6	10.4±0.5	10.1±9.0
		Lab (Cs-137)	18.1±0.8	17.2±0.9	16.2±6.8
Teledyne Testing[j]					
89-1	LiF-100 Chips	Lab	21.0±0.4	22.4	--
89-2	Teledyne $CaSO_4$:Dy Cards	Lab	20.9±1.0	20.3	--

Table A-2. (continued)

Lab Code	TLD Type	Measurement	mR: Teledyne Result ±2σ[a]	mR: Known Value[c]	mR: Average ±2σ[d] (All Participants)
Teledyne Testing[j]					
90-1[k]	Teledyne $CaSO_4$:Dy Cards	Lab	20.6±1.4	19.6	--
90-1[l]	Teledyne $CaSO_4$:Dy Cards	Lab	100.8±4.3	100.0	--

[a] Lab result given is the mean ±2 standard deviations of three determinations.
[b] Second International Intercomparison of Environmental Dosimeters conducted in April of 1976 by the Health and Safety Laboratory (GASL), New York, New York, and the School of Public Health of the University of Texas, Houston, Texas.
[c] Value determined by sponsor of the intercomparison using continuously operated pressurized ion chamber.
[d] Mean ±2 standard deviations of results obtained by all laboratories participating in the program.
[e] Third International Intercomparison of Environmental Dosimeters conducted in summer of 1977 by Oak Ridge National Laboratory and the School of Public Health of the University of Texas, Houston, Texas.
[f] Fourth International Intercomparison of Environmental Dosimeters conducted in summer of 1979 by the School of Public Health of the University of Texas, Houston, Texas.
[g] Fifth International Intercomparison of Environmental Dosimeter conducted in fall of 1980 at Idaho Falls, Idaho and sponsored by the School of Public Health of the University of Texas, Houston, Texas and Environmental Measurements Laboratory, New York, New York, U.S. Department of Energy.
[h] Seventh International Intercomparison of Environmental Dosimeters conducted in the spring and summer of 1984 at Las Vegas, Nevada, and sponsored by the U.S. Department of Energy, the U.S. Nuclear Regulatory Commission, and the U.S. Environmental Protection Agency.
[i] Eighth International Intercomparison of Environmental Dosimeters conducted in the fall and winter of 1985-1986 at New York, New York, and sponsored by the U.S. Department of Energy.
[j] Chips were submitted in September 1989 and cards were submitted in November 1989 to Teledyne Isotopes, Inc., Westwood, NJ for irradiation.
[k] Cards were irradiated by Teledyne Isotopes, Inc., Westwood, NJ on June 19, 1990.
[l] Cards were irradiated by Dosimetry Associates, Inc., Northville, MI on October 30, 1990.

Table A-3. In-house spiked samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) TIML Result n=3	Known Activity	Expected Precision 1s, n=3[a]
QC-MI-6	Milk	Feb 1986	Sr-89	6.0±1.9	6.4±3.0	8.7
			Sr-90	14.2±1.7	12.9±2.0	5.2
			I-131	34.2±3.8	35.2±3.5	10.4
			Cs-134	32.0±1.8	27.3±5.0	8.7
			Cs-137	35.8±2.1	35.0±5.0	8.7
QC-W-14	Water	Mar 1986	Sr-89	1.6±0.4	1.6±1.0	7.1
			Sr-90	2.4±0.2	2.4±2.0	4.2
QC-W-15	Water	Apr 1986	I-131	44.9±2.4	41.5±7.0	10.6
			Co-60	10.6±1.7	12.1±5.0	7.1[b]
			Cs-134	30.2±2.4	25.8±8.0	7.1[b]
			Cs-137	21.9±1.9	19.9±5.0	7.1[b]
QC-MI-7	Milk	Apr 1986	I-131	39.7±3.3	41.5±7.0	10.4
			Cs-134	28.7±2.8	25.8±8.0	8.7
			Cs-137	21.2±2.8	19.9±5.0	8.7
SPW-1	Water	May 1986	Gr. alpha	15.8±1.8	18.0±5.0	5[c]
QC-W-16	Water	Jun 1986	Gr. alpha	16.2±0.7	16.9±2.5	8.7
			Gr. beta	38.4±3.5	30.2±5.0	8.7
QC-MI-9	Milk	Jun 1986	Sr-89	<1.0	0.0	7.1[b]
			Sr-90	12.6±1.8	13.3±3.0	4.2[b]
			I-131	38.9±7.0	34.8±7.0	10.4
			Cs-134	33.0±3.4	36.1±5.0	8.7
			Cs-137	38.5±2.8	39.0±5.0	8.7
SPW-2	Water	Jun 1986	Gr. alpha	16.8±1.8	18.0±5.0	5[c]
SPW-3	Water	Jun 1986	Gr. alpha	17.7±0.8	18.0±5.0	5[c]
QC-W-18	Water	Sep 1986	Cs-134	34.7±5.6	31.3±5.0	8.7
			Cs-137	51.1±7.0	43.3±8.0	8.7
QC-W-19	Water	Sep 1986	Sr-89	13.6±4.1	15.6±3.5	7.1[b]
			Sr-90	6.4±1.6	6.2±2.0	4.2[b]

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) TIML Result n=3	Known Activity	Expected Precision 1s, n=3[a]
QC-W-21	Water	Oct 1986	Co-60	19.2±2.2	18.5±3.0	8.7
			Cs-134	31.7±5.2	25.6±8.0	8.7
			Cs-137	23.8±1.0	21.6±5.0	8.7
QC-MI-11	Milk	Oct 1986	Sr-89	12.3±1.8	14.3±3.0	8.7
QC-W-20	Water	Nov 1986	H-3	3855±180	3960±350	520[b]
QC-W-22	Water	Dec 1986	Gr. alpha	9.8±1.4	11.2±4.0	8.7
			Gr. beta	21.7±2.0	23.8±5.0	8.7
QC-W-23	Water	Jan 1987	I-131	29.8±2.5	27.9±3.0	10.4
QC-MI-12	Milk	Jan 1987	I-131	36.5±1.3	32.6±5.0	10.4
			Cs-137	32.6±4.2	27.4±8.0	8.7
QC-MI-13	Milk	Jan 1987	Sr-89	10.4±2.1	12.2±4.0	8.7
			Sr-90	14.6±1.6	12.6±3.0	5.2
			I-131	49.5±1.2	54.9±8.0	10.4
			Cs-134	<1.6	0.0	8.7
			Cs-137	33.3±0.6	27.4±8.0	8.7
QC-W-24	Water	Mar 1987	Sr-89	24.7±3.6	25.9±5.0	8.7
			Sr-90	23.9±3.8	22.8±8.0	5.2
QC-W-25	Water	Apr 1987	I-131	28.0±1.9	29.3±5.0	10.6
QC-MI-14	Milk	Apr 1987	I-131	25.0±2.2	23.9±5.0	10.4
			Cs-134	<2.1	0.0	8.7
			Cs-137	34.2±2.0	27.2±7.0	8.7
QC-W-26	Water	Jun 1987	H-3	3422±100	3362±300	520
			Co-60	24.8±1.4	26.5±7.0	8.7
			Cs-134	<2.0	0.0	8.7
			Cs-137	21.2±0.5	21.6±7.0	8.7
QC-W-27	Water	Jun 1987	Gr. alpha	8.5±1.9	10.1±4.0	8.7
			Gr. beta	12.6±1.9	21.2±5.0	8.7
QC-W-28	Water	Jun 1987	Gr. alpha	8.7±1.3	10.1±4.0	8.7
			Gr beta	12.2±5.2	9.4±3.0	8.7

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) TIML Result n=3	Known Activity	Expected Precision 1s, n=3[a]
QC-W-29	Water	Jun 1987	Gr. alpha	16.4±1.3	18.9±5.0	8.7
			Gr. beta	15.9±4.0	11.8±4.0	8.7
QC-MI-15	Milk	Jul 1987	Sr-90	19.4±1.6	18.8±3.5	5.2
			I-131	43.5±0.7	45.3±7.0	10.4
			Cs-134	17.9±2.2	16.0±5.3	8.7
			Cs-137	25.4±1.8	22.7±5.0	8.7
QC-W-30	Water	Sep 1987	Sr-89	17.5±3.0	14.3±5.0	8.7
			Sr-90	18.4±2.2	17.5±2.2	5.2
QC-W-31	Water	Oct 1987	H-3	2053±939	2059±306	520
QC-W-32	Water	Dec 1987	Gr. alpha	8.6±1.0	10.1±5.0	8.7
			Gr. beta	15.2±0.1	13.1±3.0	8.7
QC-W-33	Water	Dec 1987	Gr. alpha	7.7±1.4	10.1±5.0	8.7
			Gr. beta	10.9±1.0	7.9±3.0	8.7
QC-W-34	Water	Dec 1987	Gr. alpha	4.0±0.9	5.1±3.0	8.7
			Gr. beta	9.4±0.9	7.9±3.0	8.7
QC-MI-16	Milk	Feb 1988	Sr-89	31.8±4.7	31.7±6.0	8.7
			Sr-90	25.5±2.7	27.8±3.5	5.2
			I-131	26.4±0.5	23.2±5.0	10.4
			Cs-134	23.8±2.3	24.2±6.0	8.7
			Cs-137	26.5±0.8	25.1±6.0	8.7
QC-MI-17	Milk	Feb 1988	I-131	10.6±1.2	14.3±1.6	10.4
QC-W-35	Water	Feb 1988	I-131	9.7±1.1	11.6±1.1	10.4
QC-W-36	Water	Feb 1988	I-131	10.5±1.3	11.6±1.0	10.4
QC-W-37	Water	Mar 1988	Sr-89	17.1±2.0	19.8±8.0	8.7
			Sr-90	18.7±0.9	17.3±5.0	5.2
QC-MI-18	Milk	Mar 1988	I-131	33.2±2.3	26.7±5.0	10.4
			Cs-134	31.3±2.1	30.2±5.0	8.7
			Cs-137	29.9±1.4	26.2±5.0	8.7

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) TIML Result n=3	Known Activity	Expected Precision 1s, n=3[a]
QC-W-38	Water	Apr 1988	I-131	17.1±1.1	14.2±5.0	10.4
QC-W-39	Water	Apr 1988	H-3	4439±31	4176±500	724
QC-W-40	Water	Apr 1988	Co-60	23.7±0.5	26.1±4.0	8.7
			Cs-134	25.4±2.6	29.2±4.5	8.7
			Cs-137	26.6±2.3	26.2±4.0	8.7
QC-W-41	Water	Jun 1988	Gr. alpha	12.3±0.4	13.1±5.0	8.7
			Gr. beta	22.6±1.0	20.1±5.0	8.7
QC-MI-19	Milk	Jul 1988	Sr-89	15.1±1.6	16.4±5.0	8.7
			Sr-90	18.0±0.6	18.3±5.0	5.2
			I-131	88.4±4.9	86.6±8.0	10.4
			Cs-137	22.7±0.8	20.8±6.0	8.7
QC-W-42	Water	Sep 1988	Sr-89	48.5±3.3	50.8±8.0	8.7
			Sr-90	10.9±1.0	11.4±3.5	5.2
QC-W-43	Water	Oct 1988	Co-60	20.9±3.2	21.4±3.5	8.7
			Cs-134	38.7±1.6	38.0±6.0	8.7
			Cs-137	19.0±2.4	21.0±3.5	8.7
QC-W-44	Water	Oct 1988	I-131	22.2±0.6	23.3±3.5	10.4
QC-W-45	Water	Oct 1988	H-3	4109±43	4153±500	724
QC-MI-20	Milk	Oct 1988	I-131	59.8±0.9	60.6±9.0	10.4
			Cs-134	49.6±1.8	48.6±7.5	8.7
			Cs-137	25.8±4.6	24.7±4.0	8.7
QC-W-46	Water	Dec 1988	Gr. alpha	11.5±2.3	15.2±5.0	8.7
			Gr. beta	26.5±2.0	25.7±5.0	8.7
QC-MI-21	Milk	Jan 1989	Sr-89	25.5±10.3	34.0±10.0	8.7
			Sr-90	28.3±3.2	27.1±3.0	5.2
			I-131	540±13	550±20	10.4
			Cs-134	24.5±2.6	22.6±5.5	8.7
			Cs-137	24.0±0.6	20.5±5.0	8.7

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) TIML Result n=3	Known Activity	Expected Precision 1s, n=3[a]
QC-W-47	Water	Mar 1989	Sr-89	15.2±3.8	16.1±5.0	8.7
			Sr-90	16.4±1.7	16.9±3.0	5.2
QC-MI-22	Milk	Apr 1989	I-131	36.3±1.1	37.2±5.0	10.4
			Cs-134	20.8±2.8	20.7±8.0	8.7
			Cs-137	22.2±2.4	20.4±8.0	8.7
QC-W-48	Water	Apr 1989	Co-60	23.5±2.0	25.1±8.0	8.7
			Cs-134	24.2±1.1	25.9±8.0	8.7
			Cs-137	23.6±1.2	23.0±8.0	8.7
QC-W-49	Water	Apr 1989	I-131	37.2±3.7	37.2±5.0	10.4
QC-W-50	Water	Apr 1989	H-3	3011±59	3089±500	724
QC-W-51	Water	Jun 1989	Gr. alpha	13.0±1.8	15.0±5.0	8.7
			Gr. beta	26.0±1.2	25.5±8.0	8.7
QC-MI-23	Milk	Jul 1989	Sr-89	19.4±6.5	22.0±10.0	8.7
			Sr-90	27.6±3.5	28.6±3.0	5.2
			I-131	46.8±3.2	43.4±5.0	10.4
			Cs-134	27.4±1.8	28.3±6.0	8.7
			Cs-137	24.1±1.8	20.8±6.0	8.7
QC-MI-24	Milk	Aug 1989	Sr-89	25.4±2.7	27.2±10.0	8.7
			Sr-90	46.0±1.1	47.8±9.6	8.3
QC-W-52	Water	Sep 1989	I-131	9.6±0.3	9.7±1.9	10.4
QC-W-53	Water	Sep 1989	I-131	19.0±0.2	20.9±4.2	10.4
QC-W-54	Water	Sep 1989	Sr-89	25.8±4.6	24.7±4.0	8.7
			Sr-90	26.5±5.3	29.7±5.0	5.2
QC-MI-25	Milk	Oct 1989	I-131	70.0±3.3	73.5±20.0	10.4
			Cs-134	22.1±2.6	22.6±8.0	8.7
			Cs-137	29.4±1.5	27.5±8.0	8.7
QC-W-55	Water	Oct 1989	I-131	33.3±1.3	35.3±10.0	10.4

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) TIML Result n=3	Known Activity	Expected Precision 1s, n=3[a]
QC-W-56	Water	Oct 1989	Co-60	15.2±0.9	17.4±5.0	8.7
			Cs-134	22.1±4.4	18.9±8.0	8.7
			Cs-137	27.2±1.2	22.9±8.0	8.7
QC-W-57	Water	Oct 1989	H-3	3334±22	3379±500	724
QC-W-58	Water	Nov 1989	Sr-89	10.9±1.4[d]	11.1±1.0[d]	8.7
			Sr-90	10.4±1.0[d]	10.3±1.0[d]	5.2
QC-W-59	Water	Nov 1989	Sr-89	101.0±6.0[d]	104.1±10.5[d]	17.5
			Sr-90	98.0±3.0[d]	95.0±10.0[d]	17.0
QC-W-60	Water	Dec 1989	Gr. alpha	10.8±1.1	10.6±4.0	8.7
			Gr. beta	11.6±0.5	11.4±4.0	8.7
QC-MI-26	Milk	Jan 1990	Cs-134	19.3±1.0	20.8±8.0	8.7
			Cs-137	25.2±1.2	22.8±8.0	8.7
QC-MI-27	Milk	Feb 1990	Sr-90	18.0±1.6	18.8±5.0	5.2
QC-MI-28	Milk	Mar 1990	I-131	63.8±2.2	62.6±6.0	6.3
QC-MI-61	Water	Apr 1990	Sr-89	17.9±5.5	23.1±8.7	8.7
			Sr-90	19.4±2.5	23.5±5.2	5.2
QC-MI-29	Milk	Apr 1990	I-131	90.7±9.2	82.5±8.5	10.4
			Cs-134	18.3±1.0	19.7±5.0	8.7
			Cs-137	20.3±1.0	18.2±5.0	8.7
QC-W-62	Water	Apr 1990	Co-60	8.7±0.4	9.4±5.0	8.7
			Cs-134	20.0±0.2	19.7±5.0	8.7
			Cs-137	28.7±1.4	22.7±5.0	8.7
QC-W-63	Water	Apr 1990	I-131	63.5±8.0	66.0±6.7	6.6
QC-W-64	Water	Apr 1990	H-3	1941±130	1826.0±350.0	724
QC-W-65	Water	Jun 1990	Ra-226	6.4±0.2	6.9±1.0	1.0
QC-W-66	Water	Jun 1990	U	6.2±0.2	6.0±6.0	6.0

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) TIML Result n=3	Known Activity	Expected Precision 1s, n=3[a]
QC-MI-30	Milk	Jul 1990	Sr-89	12.8±0.4	18.4±10.0	8.7
			Sr-90	18.2±1.4	18.7±6.0	5.2
			Cs-134	46.0±1.3	49.0±5.0	8.7
			Cs-137	27.6±1.3	25.3±5.0	8.7
QC-W-68	Water	Jun 1990	Gr. alpha	9.8±0.3	10.6±6.0	8.7
			Gr. beta	11.4±0.6	11.3±7.0	8.7
QC-MI-31	Milk	Aug 1990	I-131	68.8±1.6	61.4±12.3	10.4
QC-W-69	Water	Sep 1990	Sr-89	17.7±1.6	19.2±10.0	8.7
			Sr-90	13.9±1.6	17.4±10.0	5.2
QC-MI-32	Milk	Oct 1990	I-131	34.8±0.2	32.4±6.5	8.7
			Cs-134	25.8±1.2	27.3±10.0	8.7
			Cs-137	25.3±2.0	22.4±10.0	8.7
QC-W-70	Water	Oct 1990	H-3	2355±59	2276±455	605
QC-W-71	Water	Oct 1990	I-131	55.9±0.9	51.8±10.4	10.4
QC-W-73	Water	Oct 1990	Co-60	18.3±2.7	16.8±5.0	8.7
			Cs-134	28.3±2.3	27.0±5.0	8.7
			Cs-137	22.7±1.3	22.4±5.0	8.7
QC-W-74	Water	Dec 1990	Gr. alpha	21.4±1.0	26.1±6.5	11.3
			Gr. beta	25.9±1.0	22.3±5.6	9.7

[a] n = 3 unless noted otherwise.
[b] n = 2 unless noted otherwise.
[c] n = 1 unless noted otherwise.
[d] Concentration in pCi/ml.

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) Results (4.66 σ)	Concentration (pCi/L) Acceptance Criteria (4.66 σ)
BL-1	D.I. Water	Nov 1985	Gross alpha	<0.1	<1
			Gross beta	<0.4	<4
BL-2	D.I. Water	Nov 1985	Cs-137 (gamma)	<1.9	<10
BL-3	D.I. Water	Nov 1985	Sr-89	<0.5	<5
			Sr-90	<0.6	<1
BL-5	D.I. Water	Nov 1985	Ra-226	<0.4	<1
			Ra-228	<0.4	<1
SPW-2265	D.I. Water	Apr 1985	Gross alpha	<0.6	<1
			Gross beta	<2.2	<4
			Sr-89	<0.2	<5
			Sr-90	<0.4	<1
			I-131	<0.2	<1
			Cs-137 (gamma)	<7.4	<10
BL-6	D.I. Water	Apr 1986	Gross alpha	<0.4	<1
BL-7	D.I. Water	Apr 1986	Gross alpha	<0.4	<1
BL-8	D.I. Water	Jun 1986	Gross alpha	<0.4	<1
BL-9	D.I. Water	Jun 1986	Gross alpha	<0.3	<1
SPW-3185	D.I. Water	Jan 1987	Ra-226	<0.1	<1
			Ra-228	<0.9	<1
SPS-3292	Milk	Jan 1987	I-131	<0.1	<1
			Cs-134	<6.2	<10
			Cs-137	<6.4	<10
SPW-3554	D.I. Water	Feb 1987	H-3	<180	<300
			Gross beta	<2.6	<4
SPS-3555	Milk	Feb 1987	Sr-89	<0.6	<5
			Sr-90	1.9±0.4[a]	<1
SPS-3731	Milk	Mar 1987	Cs-134	<2.2	<10
			Cs-137	<2.5	<10

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) Results (4.66 σ)	Concentration (pCi/L) Acceptance Criteria (4.66 σ)
SPS-3732	D.I. Water	Mar 1987	Sr-89	<0.9	<5
			Sr-90	<0.8	<1
			I-131	<0.3	<1
			Co-60	<2.3	<10
			Cs-134	<2.2	<10
			Cs-137	<2.4	<10
			Ra-226	<0.1	<1
			Ra-228	<1.0	<1
			Np-237	<0.04	<1
			Th-230	<0.05	<0.1
			Th-232	<0.02	<0.1
			U-234	<0.05	<0.1
			U-235	<0.03	<0.1
			U-238	<0.03	<0.1
SPS-4023	Milk	May 1987	I-131	<0.1	<1
SPS-4203	D.I. Water	May 1987	Gross alpha	<0.7	<1
			Gross beta	<1.7	<4
SPS-4204	Milk	May 1987	Sr-89	<0.5	<5
			Sr-90	2.4±0.6[a]	<1
SPS-4390	Milk	Jun 1987	Cs-134	<4.7	<10
			Cs-137	<5.2	<10
SPS-4391	D.I. Water	Jun 1987	Sr-89	<0.4	<5
			Sr-90	<0.4	<1
			I-121	<0.1	<1
			Co-60	<3.8	<10
			Cs-137	<5.7	<10
			Ra-226	<0.1	<1
			Ra-228	<0.9	<1
SPW-4627	D.I. Water	Aug 1987	Gross alpha	<0.6	<1
			Gross beta	<1.4	<4
			Tritium	<150	<300
SPS-4628	Milk	Aug 1987	Sr-89	<0.6	<5
			Sr-90	2.4±0.6[a]	<1

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) Results (4.66 σ)	Acceptance Criteria (4.66 σ)
SPS-4847	Milk	Sep 1987	Cs-134	<4.4	<10
			Cs-137	<5.3	<10
SPS-4848	D.I. Water	Sep 1987	I-131	<0.2	<1
SPW-4849	D.I. Water	Sep 1987	Co-60	<4.1	<10
			Cs-134	<4.8	<10
			Cs-137	<4.0	<10
			Sr-89	<0.7	<5
			Sr-90	<0.7	<1
SPW-4850	D.I. Water	Sep 1987	Th-228	<0.04	<1
			Th-232	<0.8	<1
			U-234	<0.03	<1
			U-235	<0.03	<1
			U-238	<0.02	<1
			Am-241	<0.06	<1
			Cm-242	<0.04	<1
			Ra-226	<0.1	<1
			Ra-228	<1.0	<2
SPW-4859	D.I. Water	Oct 1987	Fe-55	<0.5	<1
SPS-5348	Milk	Dec 1987	Cs-134	<2.3	<10
			Cs-137	<2.5	<10
SPW-5384	D.I. Water	Dec 1987	Co-60	<2.8	<10
			Cs-134	<2.6	<10
			Cs-137	<2.8	<10
			I-131	<0.2	<1
			Ra-226	<0.1	<1
			Ra-228	<1.2	<2
			Sr-89	<0.5	<1
			Sr-90	<0.4	<1
SPW-5385	D.I. Water	Nov 1987	Gross alpha	<0.4	<1
			Gross beta	<2.2	<4
			Fe-55	<0.3	<1
SPS-5386	Milk	Jan 1988	I-131	<0.1	<1
SPW-5448	"Dead" Water	Jan 1988	H-3	<177	<300

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) Results (4.66 σ)	Concentration (pCi/L) Acceptance Criteria (4.66 σ)
SPS-5615	Milk	Mar 1988	Cs-134	<2.4	<10
			Cs-137	<2.5	<10
			I-131	<0.3	<1
			Sr-89	<0.4	<5
			Sr-90	2.4±0.5[a]	<1
SPS-5650	D.I. Water	Mar 1988	Th-228	<0.3	<1
			Th-230	<0.04	<1
			Th-232	<0.05	<1
			U-234	<0.03	<1
			U-235	<0.03	<1
			U-238	<0.03	<1
			Am-241	<0.06	<1
			Cm-242	<0.01	<1
			Pu-238	<0.08	<1
			Pu-240	<0.02	<1
SPS-6090	Milk	Jul 1988	Sr-89	<0.5	<1
			Sr-90	1.8±0.5	<1
			I-131	<0.4	<1
			Cs-137	<0.4	<10
SPW-6209	Water	Jul 1988	Fe-55	<0.8	<1
SPW-6292	Water	Sep 1988	Sr-89	<0.7	<1
			Sr-90	<0.7	<1
SPS-6477	Milk	Oct 1988	I-131	<0.2	<1
			Cs-134	<6.1	<10
			Cs-137	<5.9	<10
SPW-6478	Water	Oct 1988	I-131	<0.2	<1
SPW-6479	Water	Oct 1988	Co-60	<5.7	<10
			Cs-134	<3.7	<10
			Cs-137	<4.3	<10
SPW-6480	Water	Oct 1988	H-3	<170	<300
SPW-6625	Water	Dec 1988	Gross alpha	<0.7	<1
			Gross beta	<1.9	<4

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) Results (4.66 σ)	Concentration (pCi/L) Acceptance Criteria (4.66 σ)
SPS-6723	Milk	Jan 1989	Sr-89	<0.6	<5
			Sr-90	1.9±0.5[a]	<1
			I-131	<0.2	<1
			Cs-134	<4.3	<10
			Cs-137	<4.4	<10
SPW-6877	Water	Mar 1989	Sr-89	<0.4	<5
			Sr-90	<0.6	<1
SPS-6963	Milk	Apr 1989	I-131	<0.3	<1
			Cs-134	<5.9	<10
			Cs-137	<6.2	<10
SPW-7561	Water	Apr 1989	H-3	<150	<300
SPW-7207	Water	Jun 1989	Ra-226	<0.2	<1
			Ra-228	<0.6	<1
SPS-7208	Milk	Jun 1989	Sr-89	<0.6	<5
			Sr-90	2.1±0.5[a]	<1
			I-131	<0.3	<1
			Cs-134	<6.4	<10
			Cs-137	<7.2	<10
SPW-7558	Water	Jun 1989	Gross alpha	<0.2	<1
			Gross beta	<1.0	<4
SPS-7322	Milk	Aug 1989	Sr-89	<1.4	<5
			Sr-90	4.8±1.0[a]	<1
			I-131	<0.2	<1
			Cs-134	<6.9	<10
			Cs-137	<8.2	<10
SPW-7559	Water	Sep 1989	Sr-89	<2.0	<5
			Sr-90	<0.7	<1
SPW-7560	Water	Oct 1989	I-131	<0.1	<1
SPW-7562	Water	Oct 1989	H-3	<140	<300

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) Results (4.66 σ)	Concentration (pCi/L) Acceptance Criteria (4.66 σ)
SPS-7605	Milk	Nov 1989	I-131	<0.2	<1
			Cs-134	<8.6	<10
			Cs-137	<10	<10
SPW-7971	Water	Dec 1989	Gross alpha	<0.4	<1
			Gross beta	<0.8	<4
SPW-8039	Water	Jan 1990	Ra-226	<0.2	<1
SPS-8040	Milk	Jan 1990	Sr-89	<0.8	<5
			Sr-90	<1.0	<1
SPS-8208	Milk	Jan 1990	Sr-89	<0.8	<5
			Sr-90	1.6±0.5[a]	<1
			Cs-134	<3.6	<10
			Cs-137	<4.7	<10
SPS-8312	Milk	Feb 1990	Sr-89	<0.3	<5
			Sr-90	1.2±0.3[a]	<1
SPW-8312A	Water	Feb 1990	Sr-89	<0.6	<5
			Sr-90	<0.7	<1
SPS-8314	Milk	Mar 1990	I-131	<0.3	<1
SPS-8510	Milk	May 1990	I-131	<0.2	<1
			Cs-134	<4.6	<10
			Cs-137	<4.8	<10
SPW-8511A	Water	May 1990	H-3	<200	<300
SPS-8600	Milk	Jul 1990	Sr-89	<0.8	<5
			Sr-90	1.7±0.6[a]	<1
			I-131	<0.3	<1
			Cs-134	<5.0	<10
			Cs-137	<7.0	<10
SPM-8877	Milk	Aug 1990	I-131	<0.2	<1
SPW-8925	Water	Aug 1990	H-3	<200	<300

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L) Results (4.66 σ)	Concentration (pCi/L) Acceptance Criteria (4.66 σ)
SPW-8926	Water	Aug 1990	Gross alpha	<0.3	<1
			Gross beta	<0.7	<4
SPW-8927	Water	Aug 1990	U-234	<0.01	<1
			U-235	<0.02	<1
			U-238	<0.01	<1
SPW-8928	Water	Aug 1990	Mn-54	<4.0	<5
			Co-58	<4.1	<5
			Co-60	<2.4	<5
			Cs-134	<3.3	<5
			Cs-137	<3.7	<5
SPW-8929	Water	Aug 1990	Sr-89	<1.4	<5
			Sr-89	<0.6	<1
SPW-69	Water	Sep 1990	Sr-89	<1.8	<5
			Sr-90	<0.8	<1
SPW-106	Water	Oct 1990	H-3	<180	<300
SPM-107	Milk	Oct 1990	I-131	<0.4	<1
			Cs-134	<3.3	<5
			Cs-137	<4.3	<5
SPW-370	Water	Oct 1990	Mn-54	<1.7	<5
			Co-58	<2.6	<5
			Co-60	<1.6	<5
			Cs-134	<1.7	<5
			Cs-137	<1.8	<5
SPW-372	Water	Dec 1990	Gross alpha	<0.3	<1
			Gross beta	<0.8	<4

[a] Low level of Sr-90 concentration in milk (1 - 5 pCi/L) is not unusual.

ATTACHMENT B

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES

LABORATORY PRECISION: ONE STANDARD DEVIATION VALUES FOR VARIOUS ANALYSES[a]

Analysis	Level	One Standard Deviation for Single Determination
Gamma Emitters	5 to 100 pCi/liter or kg	5 pCi/liter
	>100 pCi/liter or kg	5% of known value
Strontium-89[b]	5 to 50 pCi/liter or kg	5 pCi/liter
	>50 pCi/liter or kg	10% of known value
Strontium-90[b]	2 to 30 pCi/liter or kg	3.0 pCi/liter
	>30 pCi/liter of kg	10% of known value
Potassium	>0.1 g/liter or kg	5% of known value
Gross Alpha	<20 pCi/liter	5 pCi/liter
	>20 pCi/liter	25% of known value
Gross Beta	<100 pCi/liter	5 pCi/liter
	>100 pCi/liter	5% of known value
Tritium	<4,000 pCi/liter	1s = (pCi/liter) = 169.85 x (known).0933
	>4,000 pCi/liter	10% of known value
Radium-226, Radium-228	<0.1 pCi/liter	15% of known value
Plutonium	0.1 pCi/liter, gram, or sample	10% of known value
Iodine-131, Iodine-129[b]	<55 pCi/liter	6 pCi/liter
	>55 pCi/liter	10% of known value
Uranium-238, Nickel-63[b], Technetium-99[b]	<35 pCi/liter	6 pCi/liter
	>35 pCi/liter	15% of known value
Iron-55[b]	50 to 100 pCi/liter	10 pCi/liter
	>100 pCi/liter	10% of known value

[a] From EPA publication, "Environmental Radioactivity Laboratory Intercomparison Studies Program, Fiscal Year 1981-1982, EPA-600/4-81-004.

[b] TIML limit.

ADDENDUM TO APPENDIX V

The following is an explanation of the reasons why certain samples were outside the control limit specified by the Environmental Protection Agency for the Interlaboratory Comparison Program starting January 1987.

Lab Code	Analysis	TIML Result (pCi/L)[a]	EPA Control Limit (pCi/L)[a]	Explanation
STM-504	Sr-89 Sr-90	57.0±4.3 32.0±1.0	60.3-77.7 32.4-37.6	Milk had high fat content which made analyses difficult. Addition of errors to TIML result would put values within EPA control limits. EPA also had the same problem in analyzing its own sample.
STW-511	Ra-228	8.1±1.4	.6-8.0	TIML results are usually within EPA control limits. Analysis of the next sample was within EPA control limits. No further action is planned.
STW-516	Cr-51	80.3±17.5	61.3-78.7	Results in the past have been within EPA control limits and TIML will monitor the situation in the future.
STF-524	K	1010.7±158.5[b]	1123.5-1336.5[b]	Error in transference of data. Correct data was 1105±33 mg/kg. Results in the past have been within the limits and TIML will monitor the situation in the future.
STW-532	I-131	9.0±2.0	6.2-8.8	Sample recounted after 12 days. The average result was 8.8±1.7 pCi/L (within EPA control limits). The sample was recounted in order to check the decay. Results in the past have been within the limits and TIML will continue to monitor the situation in the future.

[a] Reported in pCi/L unless otherwise noted.
[b] Concentrations are reported in mg/kg.

Lab Code	Analysis	TIML Result (pCi/L)[a]	EPA Control Limit (pCi/L)[a]	Explanation
STW-534	Co-60	63.3±1.3	41.3-58.7	High level of Co-60 was due to contamination of beaker. Beaker was discarded upon discovery of contamination and sample was recounted. Recount results 53.2±3.6 and 50.9±2.4 pCi/L.
STM-554	Sr-90	51.0±2.0	54.8-65.2	The cause of low result was due to very high fat content in the milk. It should be noted that 63% of all participants failed this test. Also, the average for all participants was 54.0 pCi/L before the Grubb and 55.8 pCi/L after the Grubb.
STW-560	Pu-239	5.8±1.1	3.5-4.9	The cause of high results is not known it is suspected that the standard was not properly calibrated by supplier and is under investigation. New Pu-236 standard was obtained and will be used for the next test.
STW-568	Ra-228	2.6±1.0	2.7-4.5	The cause of low results is not known. Next EPA crosscheck results were within the control limits. No further action is planned.
STM-570	Sr-89 Sr-90	26.0±10.0 45.7±4.2	30.3-47.7 49.8-60.2	The cause of low results was falsely high recovery due to suspected incomplete calcium removal. Since EPA sample was used up, internal spike was prepared and analyzed. The results were within control limits (See table A-3, sample QC-MI-24). No further action is planned.

[a] Reported in pCi/L unless otherwise noted.

ADDENDUM TO APPENDIX A (continued)

Lab Code	Analysis	TIML Result (pCi/L)[a]	EPA Control Limit (pCi/L)[a]	Explanation
STW-589	Sr-90	17.3±1.2	17.4-22.6	Sample was reanalyzed in triplicate; results of reanalyses 18.8±1.5 pCi/L. No further action is planned.
STM-599	K	1300.0±69.2[c]	1414.7-1685.3[c]	Sample was reanalyzed in triplicate. Results of reanalyses, 1421.7±95.3 mg/L. The cause of low results is unknown.
STW-601	Gross Alpha	11.0±2.0	11.6-32.4	Sample was reanalyzed in triplicate. Results of reanalyses, 13.4±1.0 pCi/L.

[a] Reported in pCi/L unless otherwise noted.
[c] Concentrations are reported in mg/L.