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161-03909-WFC/JRP
April 29, 1991

Docket Nos. STN 50-528/529/530

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Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Annual Radiological Environmental Operating Report
File: 91-005-419.05; 91-056-026

Attached is the Annual Radiological Environmental Operating Report for the Palo Verde Nuclear Generating Station. This report covers the operation of PVNGS Units 1, 2, and 3 during 1990, and is being submitted pursuant to Technical Specification 6.9.1.7.

If you should have any questions, please contact Michael E. Powell of my staff at (602) 340-4981.

Sincerely,



WFC/JRP/pmm

Attachments

cc: J. B. Martin
D. H. Coe
A. C. Gehr (w/o attachments)
A. H. Gutterman (w/o attachments)

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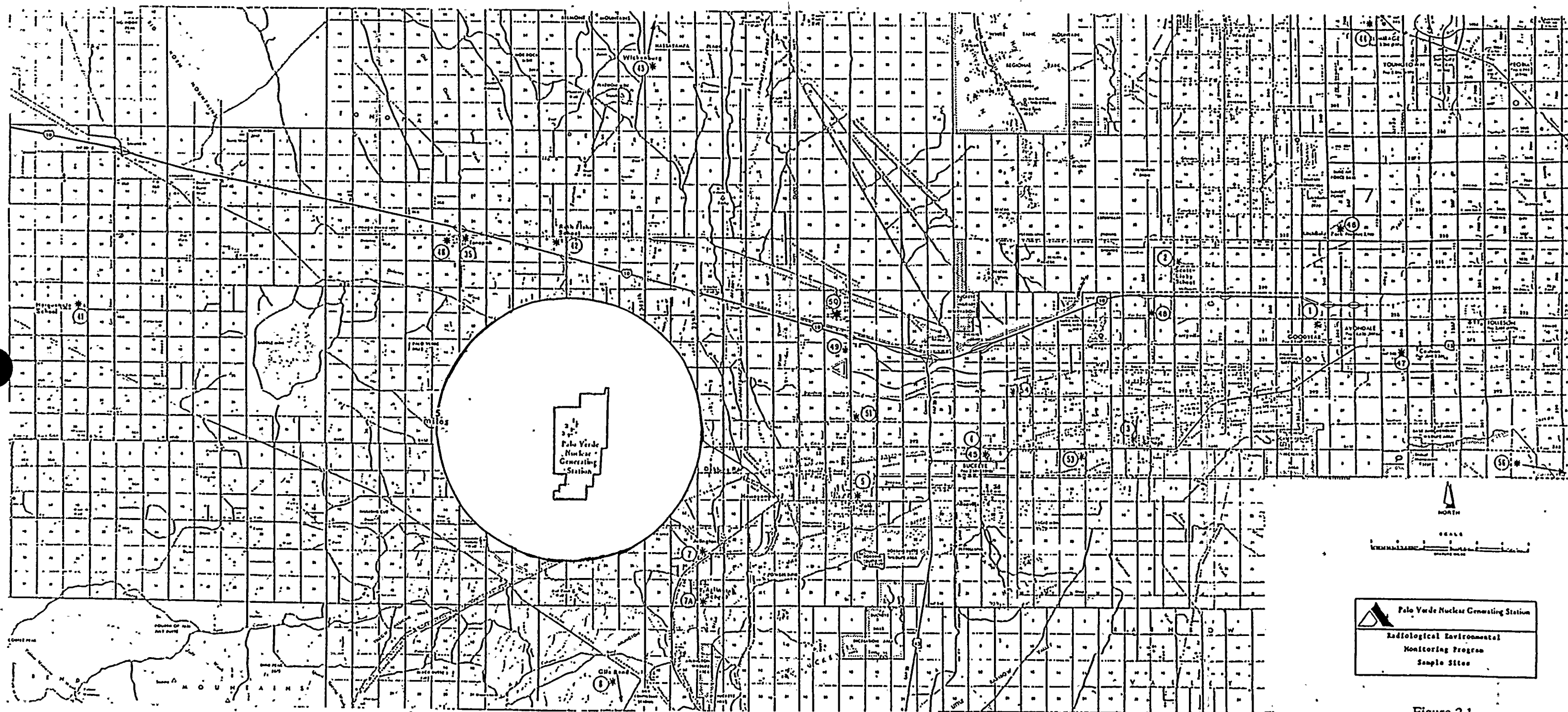


Figure 2.1

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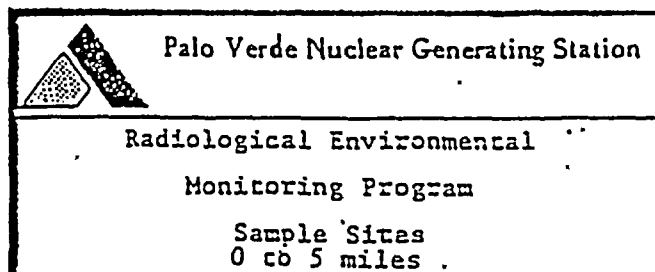
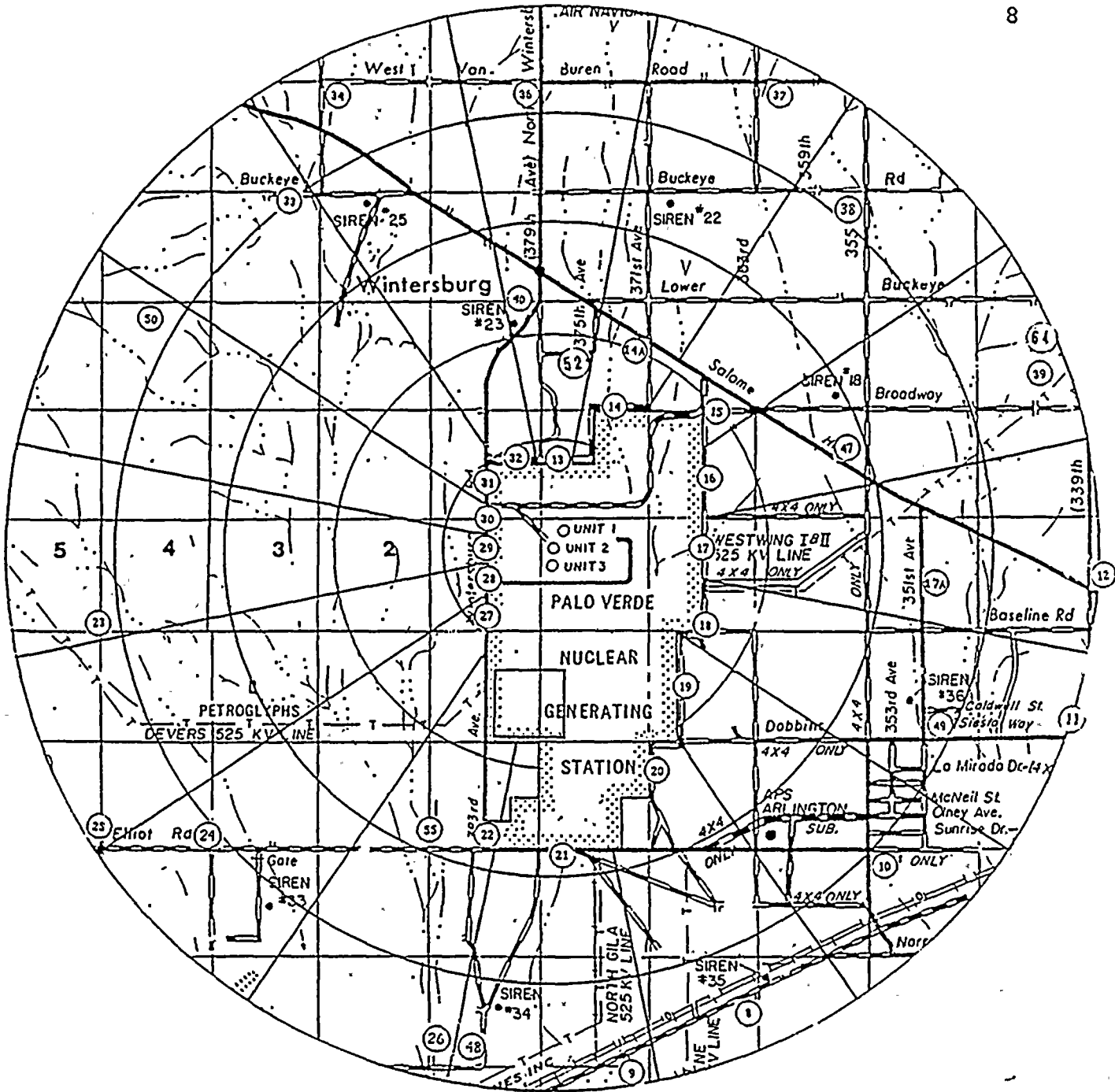


Figure 2.2



3.0 Sample Collection Program

3.1 Water

Water samples were collected by RMF and WRF personnel using PVNGS procedures.

3.1.1 Weekly samples were collected from the Reservoir, the Evaporation Pond #1, and Evaporation Pond #2. Weekly samples were collected in one-gallon cubitainers and 500-mL glass bottles at all three sites. Cubitainer samples were acidified with HCl in the laboratory prior to analysis.

3.1.2 Monthly composited samples were collected at four residence wells. Monthly composited samples were collected in 500 mL glass bottles and in one gallon cubitainers. For the bi-weekly analyses, samples were collected in one-gallon cubitainer and were acidified with HCl in the laboratory prior to analysis.

3.1.3 Quarterly grab samples were obtained from on-site wells 34abb and 27ddc. Samples were collected in 1-gallon cubitainers and 500-mL glass bottles. Cubitainer samples were acidified with HCl in the laboratory prior to analysis.

3.2 Vegetation

Vegetation samples were collected by RMF personnel using PVNGS procedures.

3.2.1 Vegetation samples were scheduled to be collected monthly, as available.

3.3 Air Filters and Canisters

Air samples were collected by RMF personnel using PVNGS procedures.

3.3.1 Air particulate filters and charcoal canisters were exchanged at 12 sites on a weekly basis until October 1990 when Site #44 was deleted.

3.4 Milk

Milk samples were collected by RMF personnel using PVNGS procedures.

3.4.1 Monthly milk samples were obtained from five dairies during the year. Samples were collected in 1-gallon cubitainers to which 100 mL of carrier/preservative was added. No samples were available from the goats located at Site #64.



3.5 Sludge

Sludge samples were collected by RMF personnel using PVNGS procedures.

3.5.1 Quarterly sludge samples were obtained from several on-site locations. Samples were collected using 1000-mL plastic bottles.

4.0 Analytical Procedures

A summary of RMF methods is presented here. Sample sizes are provided in Table 4.1. Typical times between sample collection and counting are presented in Table 4.2. Typical counting efficiencies and radiochemical yields are presented in Table 4.3. Table 4.4 presents typical sample counting times. The sample size and counting times used for LLD calculations are the same as used for actual measurements.

4.1 Gamma Spectrometry

All gamma spectra are obtained from Ge(Li) or HPGe detectors. Efficiency calibrations are done annually, and in triplicate, for each geometry used. The calculations are performed with a solution of mixed gamma ray emitters whose activities are explicitly traceable to the U.S. National Institute of Standards and Technology.

4.1.1 Water

Samples are counted in a one-liter Marinelli beaker. To reduce the counting time, up to two liters may be evaporated to one-liter and counted.

4.1.2 Milk

Milk is counted as received, in a one-liter Marinelli beaker.

4.1.3 Soil, Animal Feeds, Vegetation

300 g of material is mixed with 200 mL of water and homogenized in a blender. The sample is then transferred to a 500-mL Marinelli beaker and counted.

4.1.4 Air Particulate Filters

Filters are counted as received. Monthly composites consist of 4-5 filters stacked in a plastic dish on the detector and counted.

4.1.5 Charcoal Canisters

Charcoal canisters are counted on a twin NaI(Tl) detector system. Gamma spectroscopy is used only for verification if I-131 is detected by NaI(Tl). Counting efficiency is determined by spiking blank canisters with I-131 traceable



to the National Institute of Standards and Technology (NIST). A canister spiked with Ba-133 is used to verify system performance prior to counting each week's samples.

4.1.6 Sludge

Sludge was packed uniformly in a 500-mL Marinelli beaker and counted.

4.2 Gross Beta Activity

4.2.1 Water

Samples are converted to nitrates and then evaporated to dryness in stainless steel planchettes, which are then flamed and counted.

4.2.2 Air Particulate Filters

Efficiency calibration is obtained by depositing a known amount of NIST traceable Sr-90 on the surface of a glass fiber filter whose surface has been sealed to prevent penetration of the activity into the filter medium. Samples are counted as received after allowing 10 days for decay of radium and thorium daughters.

4.3 Tritium

4.3.1 Water

Water samples are distilled from an alkaline permanganate solution and counted in a liquid scintillation counter. Efficiency is determined on samples with identical quench and sample-to-scintillant ratios.

4.4 Iodine-131

4.4.1 Water

Radioiodine and added carrier are oxidized to I_2 and extracted into chloroform, reduced and back-extracted into aqueous bisulfite, precipitated as PdI_2 , and counted in a low-background gas-flow proportional counter. Counting efficiency is corrected for self-absorption by adding a known amount of NIST-traceable I-131 standard to a series of samples containing or varying amounts of iodide, precipitating as PdI_2 , and counting in a low-background gas-flow proportional counter.

4.4.2 Milk

Radioiodine and added carrier are adsorbed onto Dowex 1-X8 anion exchange resin, stripped with hypochlorite, oxidized to I_2 , extracted into chloroform and determination completed as for water samples.



4.5 Strontium-89 and Strontium-90

Radiostrontium and added carrier are precipitated from the samples as carbonates. Calcium and other elements are separated by differential solubility in acetone and repeated extractions with fuming nitric acid. The sample is counted immediately after separation from the Y-90 daughter of Sr-90. This gives the total activity due to Sr-89 and Sr-90. After a 14-day ingrowth the sample is counted again. The increase in count rate is due to Y-90, which at equilibrium is equal to Sr-90, whose activity is subtracted from the initial count to determine Sr-89. Counting efficiencies are corrected for self-absorption by adding a known amount of respective NIST traceable nuclide to a series of samples containing varying amounts of the respective carrier, precipitating as carbonate, and counting in a low-background counter.



TABLE 4.1

TYPICAL ALIQUOT SIZES

Sample Type	Gross Beta	Gamma Spec.	Iodine-131	Strontium-89	Strontium-90	Tritium
Air Particulates	430 m ³ *	1720 m ³ *				
Airborne Radioiodine		430 m ³ *				
Fresh Milk		1000 mL	2000 mL			
Broadleaf Vegetation		300 g				
Groundwater	250 mL	1000 mL	2000 mL			5 mL
Drinking Water	250 mL	1000 mL	2000 mL			5 mL
Surface	100 mL	1000 mL		1000 mL	1000 mL	5 mL

* Air sample volume determined using assumed constant flow of 1.5 CFM times conversions factors (cubic feet to cubic meters and hours to minutes) times the elapsed time. $1.5 \text{ ft}^3/\text{min} \times .02832 \text{ m}^3/\text{ft}^3 \times 60 \text{ min/hr} \times \text{Elapsed time in hours (ETH reading)} = \text{total flow in cubic meters.}$



TABLE 4.2

TYPICAL TIMES BETWEEN SAMPLE COLLECTION AND COUNTING

Sample Type	Time between collection and Counting
Air Particulates	10 d
Airborne Radioiodine	1 d < T < 2d
Fresh Milk	2 d < T < 4d *
Vegetation	2 d < T < 5d
Water	1 d < T < 7d
Sludge	1 d < T < 7d

* Priority is given to Iodine-131 radiochemical assay, then measurement of other nuclides with longer half lives.



TABLE 4.3

TYPICAL COUNTING EFFICIENCIES AND RADIOCHEMICAL YIELDS

GAMMA SPECTROSCOPY

Energy MeV	Isotope	Detector Efficiency
0.134	Ce-144	0.019
0.365	I-131	0.010
0.537	Ba-140	0.0064
0.605	Cs-134	0.0059
0.622	Ru, Rh-106	0.0057
0.662	Cs-137	0.0054
0.765	Zr, Nb-95	0.0047
0.811	Co-58	0.0045
0.835	Mn-54	0.0043
1.095	Fe-59	0.0034
1.115	Zn-65	0.0033
1.173	Co-60	0.0031
1.596	La-140	0.0024

OTHER THAN GAMMA SPECTROSCOPY

(Detector Efficiency // Chemical Recovery)

Sample Type	Gross Beta	I-131	Sr-89	Sr-90	H-3
Air Particulates	0.40//na				
Airborne Radioiodine		0.12//na			
Fresh Milk		0.30//0.70	0.45//0.85	0.30//0.85	
Groundwater	0.32//na	0.30//0.90	0.45//0.85	0.30//0.85	0.35//na
Drinking Water	0.32//na	0.30//0.90	0.45//0.85	0.30//0.85	0.35//na
Surface Water	0.20//na	0.30//0.90	0.45//0.85	0.30//0.85	0.35//na

na not applicable



TABLE 4.4
TYPICAL SAMPLE COUNTING TIMES

Sample Type	Gross Beta	Gamma Spec.	I-131	Sr-89	Sr-90	H-3
Air Particulates	100 m	45 m				
Airborne Radioiodine		60 m	60 m			
Fresh Milk		16 h	300 m			
Broadleaf Vegetation		8 h				
Groundwater	200 m	16 h*				100 m
Drinking Water	200 m	16 h*				100 m
Surface Water	200 m	16 h*	300 m	100 m	300 m	100 m
Sludge		8 h*				

* Counting times may be increased to meet LLD requirements.

5.0 Nuclear Instrumentation

5.1 Detectors and Equipment

Gamma spectra are analyzed by a Canberra Series 95 Multichannel Analyzer (MCA) using a MicroVax computer. Four Detectors are available:

- 1) PGT Ge(Li), 26% efficiency, 1.90 keV FWHM @ 1332.5 keV
- 2) Canberra Ge(Li), 14% efficiency, 2.08 keV FWHM @ 1332.5 keV
- 3) ORTEC HPGe, 13% efficiency, 1.98 keV FWHM @ 1332.5 keV
- 4) ORTEC HPGe, 43% efficiency, 1.80 keV FWHM @ 1332.5 keV

Two Tennelec LB-5100 low background proportional counters are used for alpha and beta counting. Each system has been interfaced to a personal computer and is completely automatic. Sample results and background counts are stored on disk. In addition, the computer is able to produce control charts and voltage plateaus.

Liquid scintillation counting is done in a Beckman LS-1801 Liquid Scintillation Spectrometer.

6.0 Isotopic Detection Limits and Reporting Criteria

6.1 Lower Limits of Detection

The lower limits of detection (LLD) and the method for calculation are specified in the PVNGS Technical Specifications [11] and are presented in Table 6.1. RMF a priori LLDs are presented in Table 6.2.

6.2 Data Reporting Criteria

All results which are less than the Technical Specifications defined LLD, but greater than the a posteriori LLD are reported at the amount of activity determined and its respective error. Errors are presented as percent one sigma.

Occasionally the PVNGS Technical Specifications a priori LLDs [11] may not be achieved as a result of;

- background fluctuations,
- unavoidably small sample sizes,
- the presence of interfering nuclides,
- self absorption corrections,
- decay corrections for short half-lived radionuclides, or
- other uncontrollable circumstances.

In these instances, the contributing factors will be noted in the table where the data is presented.



TABLE 6.1

PVNGS TECHNICAL SPECIFICATION LOWER LIMITS OF DETECTION (a priori) [11]

Analysis	Water (pCi/L)	Airborne Particulate or Gas (pCi/m ³)	Fresh Milk (pCi/L)	Food Products (pCi/kg, wet)
Gross beta	4	0.01		
H-3	2000*			
Mn-54	15			
Fe-59	30			
Co-58,-60	15			
Zn-65	30			
Zr-95	30			
Nb-95	15			
I-131	1**	0.07	1	60
Cs-134	15	0.05	15	60
Cs-137	18	0.06	18	80
Ba-140	60		60	
La-140	15		15	

Note: this list does not mean that only these nuclides are to be detected and reported. Other peaks that are measurable and identifiable, together with the above nuclides, shall also be identified and reported.

*If no drinking water pathway exists, a value of 3000 pCi/L may be used.

**If no drinking water pathway exists, a value of 15 pCi/L may be used.



TABLE 6.2

RMF a priori LOWER LIMITS OF DETECTION

GAMMA SPECTROSCOPY

Energy MeV	Isotope	Vegetation pCi/KGm	Water pCi/L	Fresh Milk pCi/L	Air Particulate pCi/m3
0.134	Ce-144	117	70	70	0.015
0.365	I-131	15	9	9	0.040
0.537	Ba-140	50	30	30	0.015
0.605	Cs-134	13	8	8	0.015
0.622	Ru, Rh-106	143	86	86	0.015
0.662	Cs-137	17	10	10	0.030
0.756	Zr-95	27	16	16	0.050
0.765	Nb-95	15	9	9	0.035
0.811	Co-58	15	9	9	0.020
0.835	Mn-54	15	9	9	0.020
1.095	Fe-59	30	18	18	0.060
1.115	Zn-65	33	20	20	0.075
1.173	Co-60	17	10	10	0.020
1.596	La-140	18	11	11	0.055

OTHER THAN GAMMA SPECTROSCOPY

Sample Type	Gross Beta	I-131	Sr-89	Sr-90	H-3
Air Particulates	0.0034 pCi/m3				
Airborne Radioiodine		0.06 pCi/m3			
Fresh Milk		0.5 pCi/L	1.0 pCi/L	0.5 pCi/L	
Groundwater	2.0 pCi/L			0.5 pCi/L	570 pCi/L
Drinking Water	2.0 pCi/L	0.5 pCi/L	1.0 pCi/L	0.5 pCi/L	570 pCi/L
Surface Water	2.0 pCi/L	0.5 pCi/L	1.0 pCi/L	0.5 pCi/L	570 pCi/L



7.0 Quality Control

7.1 Intercomparisons and Certification

The RHF routinely participates in intercomparisons sponsored by USEPA and BRMD.

7.2 Intercomparison Results

Results for the intercomparison program with the USEPA are presented in Table 7.1.



Table 7.1

U.S. EPA INTERCOMPARISON RESULTS

<u>Date</u>	<u>Sample Type</u>	<u>Units</u>	<u>Isotope</u>	<u>EPA Value</u>	<u>Reported Value</u>	<u>Control Limits</u>
01-12-90	Strontium in Water	pCi/L	Sr-89	25.0 ± 5.0	22.67 ± 1.53	16.3 - 33.7
01-12-90	Strontium in Water	pCi/L	Sr-90	20.0 ± 1.5	20.00 ± 1.00	17.4 - 22.6
01-26-90	Gross beta in Water	pCi/L	beta	12.0 ± 5.0	22.67 ± 3.79 (a)	3.3 - 20.7
02-9-90	Gamma in Water	pCi/L	Co-60	15.0 ± 5.0	16.67 ± 1.15	6.3 - 23.7
02-9-90	Gamma in Water	pCi/L	Zn-65	139.0 ± 14.0	147.67 ± 17.01	114.8 - 163.2
02-9-90	Gamma in Water	pCi/L	Ru-106	139.0 ± 14.0	137.00 ± 18.68	114.8 - 163.2
02-9-90	Gamma in Water	pCi/L	Cs-134	18.0 ± 5.0	17.67 ± 1.53	9.3 - 26.7
02-9-90	Gamma in Water	pCi/L	Cs-137	18.0 ± 5.0	20.67 ± 0.58	9.3 - 26.7
02-9-90	Gamma in Water	pCi/L	Ba-133	74.0 ± 7.0	76.00 ± 2.00	61.9 - 86.1
02-23-90	H-3 in Water	pCi/L	H-3	4976 ± 498	5243.33 ± 110.16	4113.4 - 5838.6
03-30-90	Air Filter	pCi/filter	beta	31.0 ± 5.0	30.67 ± 1.15	22.3 - 39.7
		pCi/filter	Sr-90	10.0 ± 1.5	10.0 ± 0.00	7.4 - 12.6
		pCi/filter	Cs-137	10.0 ± 5.0	9.33 ± 0.58	1.3 - 18.7
04-17-90	Blind Intercomparison	pCi/L	beta	52.0 ± 5.0	63.00 ± 2.00 (b)	43.3 - 60.7
		pCi/L	Sr-89	10.0 ± 5.0	9.33 ± 0.58	1.3 - 18.7
		pCi/L	Sr-90	10.0 ± 1.5	9.67 ± 0.58	7.4 - 12.6
		pCi/L	Cs-134	15.0 ± 5.0	13.67 ± 0.58	6.3 - 23.7
		pCi/L	Cs-137	15.0 ± 5.0	15.67 ± 2.08	6.3 - 23.7
04-27-90	Radionuclides in Milk	pCi/L	I-131	99.0 ± 10.0	100.67 ± 2.52	81.7 - 116.3
		pCi/L	Cs-137	24.0 ± 5.0	25.0 ± 1.0	15.3 - 32.7
05-04-90	Sr in Water	pCi/L	Sr-89	7.0 ± 5.0	7.67 ± 0.58	0.0 - 15.7
		pCi/L	Sr-90	7.0 ± 5.0	6.67 ± 0.58	0.0 - 15.7
05-11-90	Gross beta in Water	pCi/L	beta	15.0 ± 5.0	18.67 ± 1.53	6.3 - 23.7
06-08-90	Gamma in Water	pCi/L	Co-60	24.0 ± 5.0	24.67 ± 2.08	15.3 - 32.7
			Zn-65	148.0 ± 15.0	153.33 ± 8.14	122.0 - 174.0
			Ru-106	210.0 ± 21.0	209.33 ± 15.95	173.6 - 246.4
			Cs-134	24.0 ± 5.0	23.67 ± 2.52	15.3 - 32.7
			Cs-137	25.0 ± 5.0	28.00 ± 1.00	16.3 - 33.7
			Ba-133	99.0 ± 10.0	103.67 ± 5.51	81.7 - 116.3
06-22-90	H-3 in Water	pCi/L	H-3	2933.0 ± 358.0	3086.67 ± 219.39(c)	2311.9 - 3554.1
08-10-90	I-131 in Water	pCi/L	I-131	39.0 ± 6.0	39.0 ± 2.0	28.6 - 49.4

Table 7.1

U.S. EPA INTERCOMPARISON RESULTS

<u>Date</u>	<u>Sample Type</u>	<u>Units</u>	<u>Isotope</u>	<u>EPA Value</u>	<u>Reported Value</u>	<u>Control Limits</u>
08-31-90	Air filter	pCi/filter	beta	62.0 \pm 5.0	59.67 \pm 0.58	53.3 - 70.7
			Cs-137	20.0 \pm 5.0	20.33 \pm 0.58	11.3 - 28.7
			Sr-90	20.0 \pm 5.0	19.00 \pm 0.00	11.3 - 28.7
09-14-90	Strontium in Water	pCi/L	Sr-89	10.0 \pm 5.0	9.00 \pm 1.00	1.3 - 18.7
			Sr-90	9.0 \pm 5.0	9.33 \pm 0.58	0.3 - 17.7
09-28-90	Radionuclides in Milk	pCi/L	I-131	58.0 \pm 6.0	57.00 \pm 2.00	46.7 - 68.4
			Cs-137	20.0 \pm 5.0	20.66 \pm 1.53	11.3 - 28.7
09-21-90	Gross beta in Water	pCi/L	beta	10.0 \pm 5.0	9.67 \pm 1.15	1.3 - 18.7
10-05-90	Gamma in Water	pCi/L	Co-60	20.0 \pm 5.0	21.33 \pm 1.53	11.3 - 28.7
			Zn-65	115.0 \pm 12.0	119.00 \pm 10.80	94.2 - 135.8
			Ru-106	151.0 \pm 15.0	141.00 \pm 13.10	125.0 - 177.0
			Cs-134	12.0 \pm 5.0	11.67 \pm 0.58	3.3 - 20.7
			Cs-137	12.0 \pm 5.0	13.00 \pm 4.58	3.3 - 20.7
			Ba-133	111.0 \pm 11.0	109.00 \pm 3.61	90.9 - 129.1
10-19-90	Tritium in Water	pCi/L	H-3	7203.0 \pm 720.0	8030.00 \pm 112.69	5953.8 - 8452.2
10-30-90	Blind Intercomparison	pCi/L	Beta	53.0 \pm 5.0	61.00 \pm 2.77	44.3 - 61.7
			Sr-89	20.0 \pm 5.0	21.00 \pm 0.35	11.3 - 28.7
			Sr-90	15.0 \pm 5.0	15.00 \pm 0.00	6.3 - 23.7
			Cs-134	7.0 \pm 5.0	< 6	0.0 - 15.7
			Cs-137	5.0 \pm 5.0	< 6	0.0 - 10.8

- (a) All data has been checked and verified. The problem was not found. Sample was re-analyzed in triplicate and results were within control limits.
- (b) Outside control limits. Corrective action taken--A dual range calibration was implemented to cover low TDS samples (drinking water) and high TDS samples (surface water).
- (c) This value should be 2783 \pm 198. The 3086.67 number is the DPM value, not the pCi/l value that was reported to the EPA.



8.0 Results and Data Interpretation

Results and interpretation of the data for all of the samples analyzed during 1990 are presented in the following sections. Assessment of pre-operational and operational data revealed no significant changes to environmental radiation levels. There was no observed impact on the environment due to PVNGS operations in 1990.

8.1 Air Particulates

Weekly gross beta results in quarterly format, are presented in Tables 8.1 through 8.4. Table 8.5 contains the average gross beta activities by station. Average quarterly activities are calculated using all weekly activities except those marked invalid. The findings are consistent with pre-operational baseline and previous operational results. Table 8.6 displays the results of gamma spec on the monthly composite. No Cs-134 or -137 was observed.

8.2 Airborne Radioiodine

Tables 8.7 through 8.10 present the quarterly radioiodine results. No radioiodine was detected in any of the samples.

8.3 Vegetation

Table 8.11 presents I-131, Cs-134 and Cs-137 data for the vegetation samples. No activity was observed in any of the samples.

8.4 Drinking Water

All samples were analyzed for I-131 (radiochemical), Gross Beta, H-3, and for gamma-emitting nuclides. Results of these analysis are summarized in Tables 8.12 and 8.13. Gross Beta activity ranged from less than three pCi/L to a high of eighteen pCi/L (Shepard Residence 1/30/90). Tritium results were less than LLD for all drinking water samples. No gamma-emitting nuclides of man-made origin were detected. All I-131 results were less than LLD.



8.5 Groundwater

All groundwater samples were analyzed for H-3, I-131, and for gamma-emitting nuclides. Results obtained from the analysis of the samples are presented in Table 8.14.

No radioactivity was observed above the LLD values for I-131, H-3, or gamma-emitting nuclides.

8.6 Surface Water

Surface water samples from the Reservoir and Evaporation ponds were analyzed for Gross Beta, Sr-89, Sr-90, H-3 and gamma-emitting nuclides. Results are presented in Tables 8.15 through 8.17. I-131 was observed in all surface waters. The highest concentrations were 28 pCi/L (12-4-90) in the Reservoir, 13 pCi/L in Evaporation Pond #1 (10-16, 23, 30-90) and 14 pCi/L Evaporation Pond #2 (12-18-90).

Influent samples collected by the Water Reclamation Facility (WRF) and were analyzed for gamma-emitting nuclides and H-3. The results, presented in Table 8.19, demonstrate that I-131 was observed routinely. The highest concentration was 86 pCi/L (4-17-90). The results are consistent with assays from the previous years.

Gamma spectrometry analysis was performed on samples obtained from each of the three cooling towers and results are presented in Tables 8.20 through 8.22. Iodine-131 was routinely observed in the cooling towers of operating units. The highest concentrations were 184 pCi/L (12-4-90), 177 pCi/L (12-4-90) and 185 pCi/L (10-9-90) for Units #1, #2, and #3, respectively.

Elevated I-131 levels in the cooling towers are not the result of plant effluents, but instead reflect the increased concentration observed in the WRF influent. The WRF influent I-131 is a result of radiopharmaceutical discharges into the Phoenix sewage system. Refer to Section 11 of the 1988 AREOR for a detailed explanation.

Water samples from the Retention Basins were analyzed for Tritium and for gamma-emitting nuclides. The results, presented in Tables 8.23 and 8.24, show that Cs-134, Cs-137, and I-131 concentrations were above LLD in a few of the samples collected during the year. Co-60 and Mn-54 were observed in the oil portion of the sample obtained from Retention Basin #2 on 11-13-90. Tritium was detected in both Retention Basins routinely.



Table 8.25 presents gamma spectrometry and tritium measurements of samples collected from Sedimentation Basin #2 (J-Hook Pond). No man-made gamma-emitting radionuclides or tritium were observed.

8.7 Milk

Fresh Milk samples were analyzed by gamma spectrometry for Cs-134, Cs-137, Ba-140, and La-140. Samples were analyzed radiochemically for I-131. As shown in Table 8.18 all of the results were < LLD.

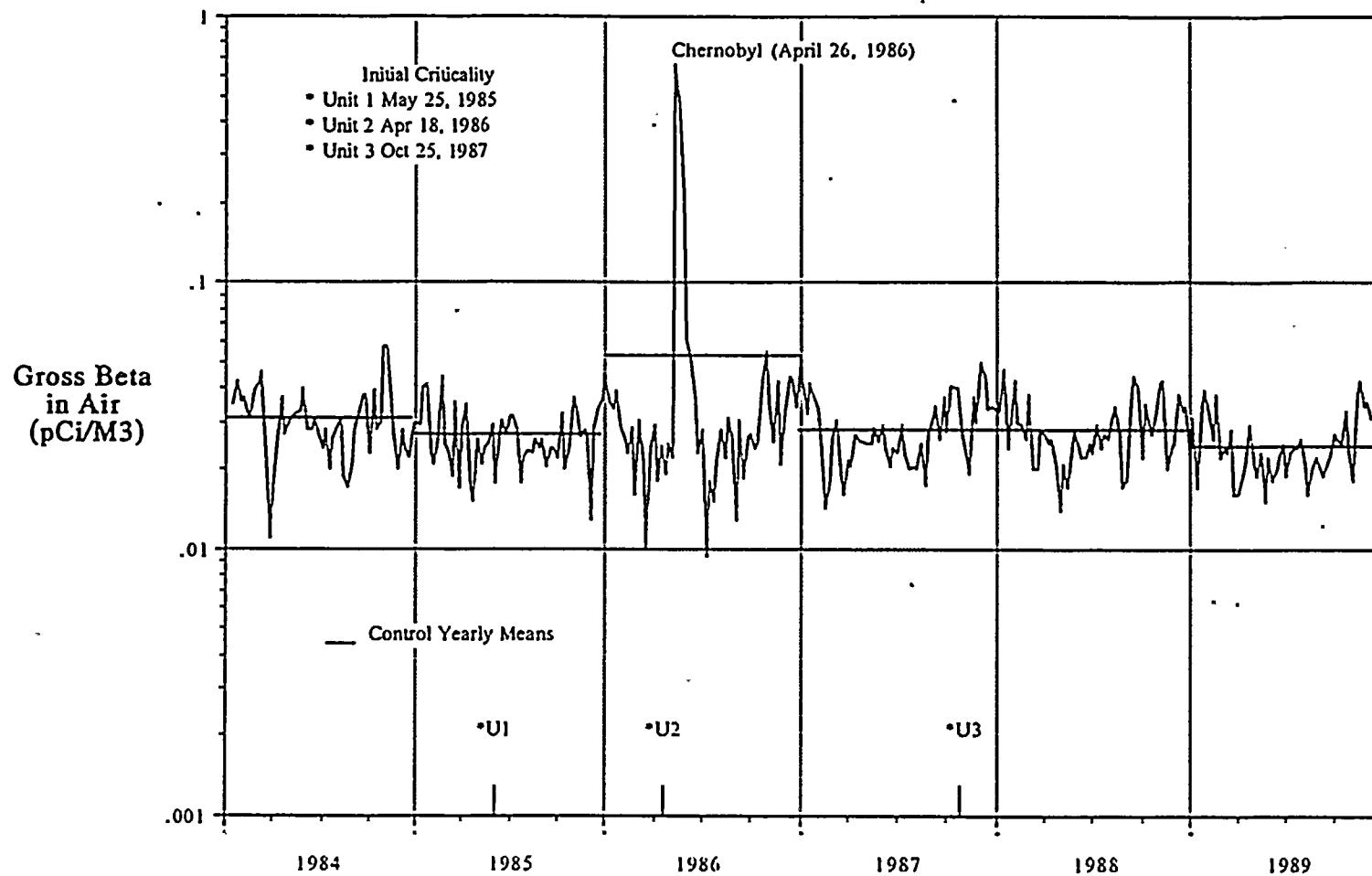
8.8 Sludge

Sludge samples were obtained from several on-site locations and analyzed by gamma spectrometry. Results can be found in Table 8.26. No man-made radionuclides were detected in either Sedimentation Basin #2 or STP Digester C. Beginning in June 1990, the STP Digester was collected weekly from the truck. Co-58 was detected once (7-13-90), Co-60 was detected three times (7-5, 13, 20-90) and I-131 was detected infrequently. The sludge from the Retention Basins contains Co-60, Cs-134, Cs-137 and Mn-54. Co-58 was also found twice in Retention Basin #2.



Figure 8.1

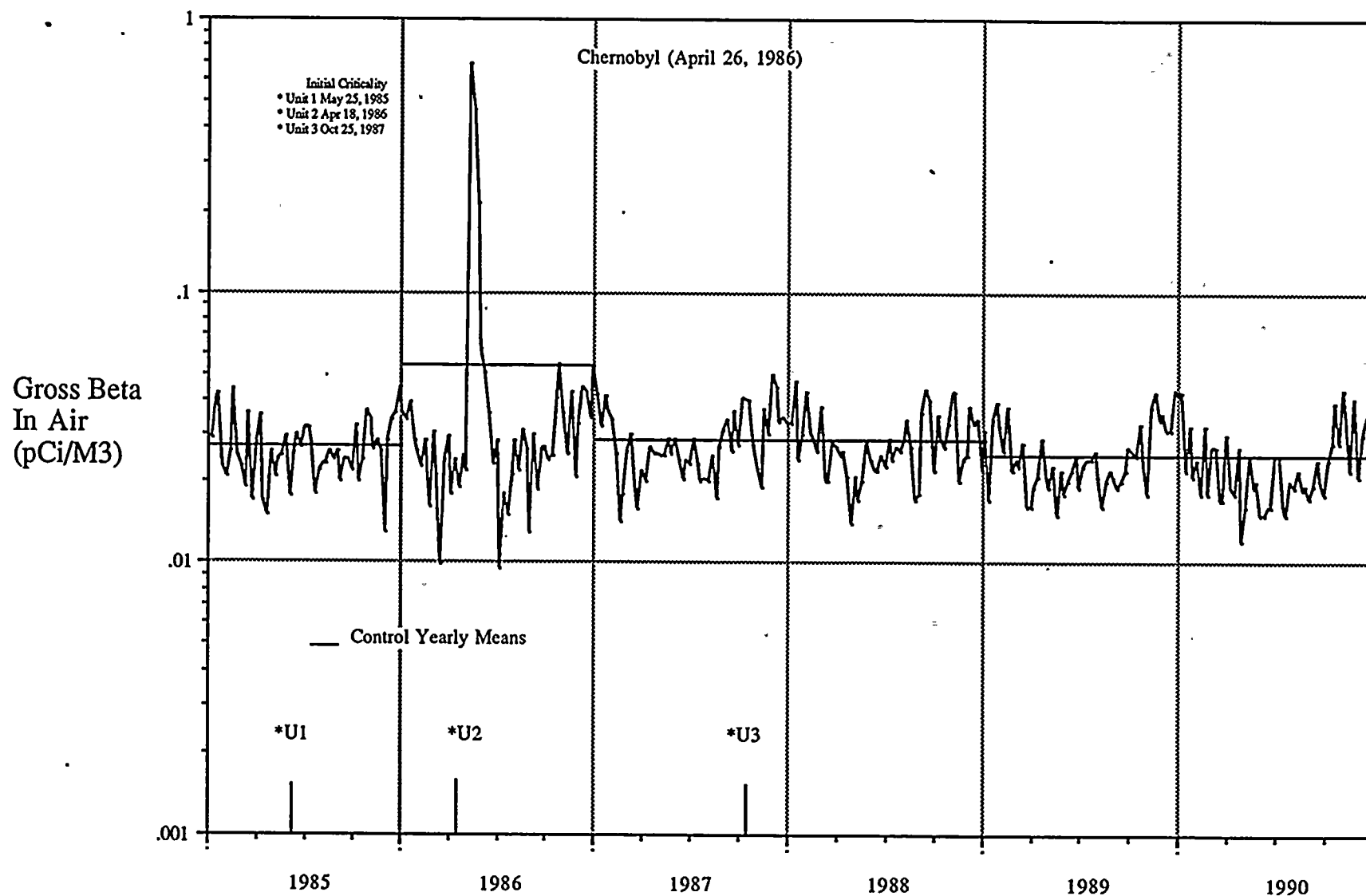
Gross Beta in Air from 1984 to 1989



1984-1989 Weekly Air Sample Results



Figure 8.2
Gross Beta in Air from 1985 to 1990



1985-1990 Weekly Air Sample Results



TABLE 8.1

GROSS BETA IN AIR PARTICULATE DATA (pCi/m³)

Collection Period	FIRST QUARTER												WEEKLY MEAN ALL SITES	%SD
	Site 1	Site 4	Site 6	Site 7A	Site 14A	Site 15	Site 17A	Site 21	Site 29	Site 35	Site 40	Site 44		
12/27/89 - 01/02/90	0.043 ± 0.003	0.036 ± 0.002	0.041 ± 0.003	0.044 ± 0.003	0.043 ± 0.003	0.043 ± 0.003	0.048 ± 0.003	0.046 ± 0.003	0.044 ± 0.003	0.045 ± 0.003	0.041 ± 0.003	0.038 ± 0.003	0.043	7.8
01/02/90 - 01/09/90	0.022 ± 0.002	0.022 ± 0.002	0.026 ± 0.002	0.023 ± 0.002	0.022 ± 0.002	0.022 ± 0.002	0.021 ± 0.002	0.024 ± 0.002	0.022 ± 0.002	0.020 ± 0.002	0.022 ± 0.002	0.021 ± 0.002	0.022 :	6.3
01/09/90 - 01/16/90	0.036 ± 0.002	0.031 ± 0.002	0.033 ± 0.002	0.039 ± 0.002	0.033 ± 0.002	0.032 ± 0.002	0.031 ± 0.002	0.036 ± 0.002	0.033 ± 0.002	0.027 ± 0.002	0.034 ± 0.002	0.024 ± 0.002	0.032	12.2
01/16/90 - 01/23/90	0.019 ± 0.002	0.020 ± 0.002	0.022 ± 0.002	0.024 ± 0.002	0.021 ± 0.002	0.021 ± 0.002	0.021 ± 0.002	0.025 ± 0.002	0.023 ± 0.002	0.021 ± 0.002	0.022 ± 0.002	0.019 ± 0.002	0.021	8.5
01/23/90 - 01/30/90	0.024 ± 0.002	0.023 ± 0.002	0.025 ± 0.002	0.025 ± 0.002	0.023 ± 0.002	0.024 ± 0.002	0.023 ± 0.002	0.026 ± 0.002	0.023 ± 0.002	0.022 ± 0.002	0.023 ± 0.002	0.022 ± 0.002	0.024	4.9
01/30/90 - 02/06/90	0.019 ± 0.002	0.018 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.017 ± 0.001	0.018 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.017 ± 0.001	0.017 ± 0.001	0.018	5.2
02/06/90 - 02/13/90	0.034 ± 0.002	0.032 ± 0.002	0.032 ± 0.002	0.035 ± 0.002	0.030 ± 0.002	0.032 ± 0.002	0.031 ± 0.002	0.034 ± 0.002	0.034 ± 0.002	0.027 ± 0.002	0.032 ± 0.002	0.028 ± 0.002	0.032	8.0
02/13/90 - 02/20/90	0.019 ± 0.002	0.018 ± 0.001	0.018 ± 0.002	0.022 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.016 ± 0.001	0.019 ± 0.002	0.017 ± 0.001	0.018	7.7
02/20/90 - 02/27/90	0.027 ± 0.002	0.028 ± 0.002	0.028 ± 0.002	0.029 ± 0.002	0.028 ± 0.002	0.028 ± 0.002	0.027 ± 0.002	0.028 ± 0.002	0.026 ± 0.002	0.026 ± 0.002	0.026 ± 0.002	0.025 ± 0.002	0.027	4.2
02/27/90 - 03/06/90	0.029 ± 0.002	0.028 ± 0.002	0.026 ± 0.002	0.026 ± 0.002	0.029 ± 0.002	0.030 ± 0.002	0.029 ± 0.002	0.029 ± 0.002	0.026 ± 0.002	0.027 ± 0.002	0.026 ± 0.002	0.026 ± 0.002	0.027	5.3
03/06/90 - 03/13/90	0.018 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.020 ± 0.002	0.016 ± 0.001	0.018 ± 0.002	0.017 ± 0.001	0.017 ± 0.001	0.019 ± 0.002	0.015 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.017	8.4
03/13/90 - 03/20/90	0.016 ± 0.001	0.016 ± 0.001	0.018 ± 0.002	0.017 ± 0.002	0.016 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.019 ± 0.002	0.016 ± 0.001	0.017 ± 0.002	0.016 ± 0.001	0.015 ± 0.001	0.017	6.2
03/20/90 - 03/27/90	0.029 ± 0.002	0.029 ± 0.002	0.028 ± 0.002	0.032 ± 0.002	0.028 ± 0.002	0.031 ± 0.002	0.028 ± 0.002	0.034 ± 0.002	0.032 ± 0.002	0.031 ± 0.002	0.027 ± 0.002	0.030 ± 0.002	0.030	7.3



TABLE 8.2

GROSS BETA IN AIR PARTICULATE DATA (pCi/m³)

Collection Period	SECOND QUARTER												WEEKLY MEAN ALL SITES	%SD
	Site 1	Site 4	Site 6	Site 7A	Site 14A	Site 15	Site 17A	Site 21	Site 29	Site 35	Site 40	Site 44		
03/27/90 - 04/03/90	0.016 ± 0.001	0.018 ± 0.002	0.021 ± 0.002	0.020 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.021 ± 0.002	0.023 ± 0.002	0.020 ± 0.002	0.018 ± 0.002	0.019	8.4
04/03/90 - 04/10/90	0.018 ± 0.002	0.017 ± 0.002	0.017 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.017 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.019 ± 0.002	0.018	5.8
04/10/90 - 04/17/90	0.026 ± 0.002	0.027 ± 0.002	0.023 ± 0.002	0.029 ± 0.002	0.027 ± 0.002	0.028 ± 0.002	0.028 ± 0.002	0.029 ± 0.002	0.026 ± 0.002	0.028 ± 0.002	0.028 ± 0.002	0.027 ± 0.002	0.027	6.2
04/17/90 - 04/24/90	0.012 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.013 ± 0.001	0.012	6.8
04/24/90 - 05/01/90	0.014 ± 0.001	0.018 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.016	7.3
05/01/90 - 05/08/90	0.024 ± 0.002	0.024 ± 0.002	0.025 ± 0.002	0.024 ± 0.002	0.025 ± 0.002	0.026 ± 0.002	0.027 ± 0.002	0.026 ± 0.002	0.023 ± 0.002	0.027 ± 0.002	0.024 ± 0.002	0.023 ± 0.002	0.025	5.3
05/08/90 - 05/15/90	0.020 ± 0.002	0.018 ± 0.002	0.021 ± 0.002	0.020 ± 0.002	0.021 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.021 ± 0.002	0.019 ± 0.002	0.020 ± 0.002	0.019	5.2
05/15/90 - 05/22/90	0.018 ± 0.002	0.021 ± 0.002	0.018 ± 0.002	0.021 ± 0.002	0.020 ± 0.002	0.021 ± 0.002	0.021 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.021 ± 0.002	0.022 ± 0.002	0.019 ± 0.002	0.020	6.2
05/22/90 - 05/29/90	0.017 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.017 ± 0.002	0.014 ± 0.001	0.015 ± 0.002	0.013 ± 0.001	0.015 ± 0.002	0.015	7.3
05/29/90 - 06/05/90	0.015 ± 0.002	0.013 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.015	5.1
06/05/90 - 06/12/90	0.020 ± 0.002	0.017 ± 0.002	0.017 ± 0.002	0.018 ± 0.002	0.015 ± 0.002	0.018 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.013 ± 0.001	0.015 ± 0.002	0.016	11.3
06/12/90 - 06/19/90	0.015 ± 0.002	0.018 ± 0.002	0.016 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.018 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.016	8.0
06/19/90 - 06/26/90	0.025 ± 0.002	0.023 ± 0.002	0.024 ± 0.002	0.028 ± 0.002	0.025 ± 0.002	0.025 ± 0.002	0.025 ± 0.002	0.027 ± 0.002	0.024 ± 0.002	0.024 ± 0.002	0.025 ± 0.002	0.026 ± 0.002	0.025	6.3



TABLE 8.3

GROSS BETA IN AIR PARTICULATE DATA (pCi/m³)

THIRD QUARTER

Collection Period	Site 1	Site 4	Site 6	Site 7A	Site 14A	Site 15	Site 17A	Site 21	Site 29	Site 35	Site 40	Site 44	WEEKLY MEAN ALL SITES	%SD
06/26/90 - 07/03/90	0.025 ± 0.002	0.024 ± 0.002	0.026 ± 0.002	0.026 ± 0.002	0.027 ± 0.002	0.023 ± 0.002	0.023 ± 0.002	0.025 ± 0.002	0.024 ± 0.002	(a)	0.024 ± 0.002	0.025 ± 0.002	0.025	6.0
07/03/90 - 07/10/90	0.016 ± 0.002	0.015 ± 0.002	0.017 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.016	6.5
07/10/90 - 07/17/90	0.016 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.012 ± 0.001	0.017 ± 0.002	(a)	0.016 ± 0.002	0.015 ± 0.002	0.016 ± 0.002	0.016 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.015	8.9
07/17/90 - 07/24/90	0.022 ± 0.002	0.020 ± 0.002	(a)	0.019 ± 0.002	0.020 ± 0.002	(a)	0.021 ± 0.002	0.027 ± 0.003	0.021 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.020 ± 0.002	0.021	11.1
07/24/90 - 07/31/90	0.020 ± 0.002	0.018 ± 0.002	(a)	0.018 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.020 ± 0.002	0.021 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.019	4.9
07/31/90 - 08/07/90	0.024 ± 0.002	0.021 ± 0.002	(a)	0.022 ± 0.002	0.022 ± 0.002	0.022 ± 0.002	0.021 ± 0.002	0.021 ± 0.002	0.023 ± 0.002	0.022 ± 0.002	0.023 ± 0.002	0.022 ± 0.002	0.021	3.8
08/07/90 - 08/14/90	0.020 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.019 ± 0.002	0.020 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.022 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.017 ± 0.002	0.019	7.5
08/14/90 - 08/21/90	0.020 ± 0.002	0.019 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.021 ± 0.002	0.017 ± 0.002	0.020 ± 0.002	0.020 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.020 ± 0.002	0.019	5.3
08/21/90 - 08/28/90	0.017 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.018 ± 0.002	0.016 ± 0.002	0.017 ± 0.002	0.018 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.015 ± 0.002	0.017	6.0
08/28/90 - 09/04/90	0.020 ± 0.002	0.020 ± 0.002	0.020 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.020 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.019 ± 0.002	0.019 ± 0.002	0.019	3.1
09/04/90 - 09/11/90	0.025 ± 0.001	0.023 ± 0.001	0.024 ± 0.001	0.025 ± 0.001	0.023 ± 0.001	0.023 ± 0.001	0.024 ± 0.001	(a)	0.025 ± 0.001	0.023 ± 0.001	0.025 ± 0.001	0.023 ± 0.001	0.024	3.7
09/11/90 - 09/18/90	0.020 ± 0.001	0.021 ± 0.001	0.022 ± 0.001	0.019 ± 0.001	0.022 ± 0.001	0.021 ± 0.001	0.021 ± 0.001	(a)	0.018 ± 0.001	0.020 ± 0.001	0.020 ± 0.001	0.021 ± 0.001	0.020	5.6
09/18/90 - 09/25/90	0.014 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.021 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	(a)	0.021 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.018	9.9

(a) Invalid sample



TABLE 8.4

GROSS BETA IN AIR PARTICULATE DATA (pCi/m³)
FOURTH QUARTER

Collection Period	Site 1	Site 4	Site 6	Site 7A	Site 14A	Site 15	Site 17A	Site 21	Site 29	Site 35	Site 40	Site 44	WEEKLY MEAN ALL SITES	%SD
09/25/90 - 10/02/90	0.022 ± 0.001	0.023 ± 0.001	0.020 ± 0.001	0.026 ± 0.001	0.024 ± 0.001	0.025 ± 0.001	0.020 ± 0.001	(a)	0.026 ± 0.001	0.026 ± 0.001	0.024 ± 0.001	(b)	0.024	9.9
10/02/90 - 10/09/90	0.025 ± 0.001	0.025 ± 0.001	0.026 ± 0.001	0.029 ± 0.001	0.027 ± 0.001	0.029 ± 0.001	0.028 ± 0.001	0.030 ± 0.001	0.029 ± 0.001	0.027 ± 0.001	0.029 ± 0.001	(b)	0.028	6.0
10/09/90 - 10/16/90	0.038 ± 0.002	0.039 ± 0.002	0.035 ± 0.001	0.044 ± 0.002	0.037 ± 0.002	0.038 ± 0.002	0.039 ± 0.002	0.039 ± 0.002	0.042 ± 0.002	0.036 ± 0.002	0.037 ± 0.001	(b)	0.039	6.8
10/16/90 - 10/23/90	0.028 ± 0.001	0.027 ± 0.001	0.030 ± 0.001	0.030 ± 0.001	0.028 ± 0.001	0.026 ± 0.001	0.028 ± 0.001	0.027 ± 0.001	0.029 ± 0.001	0.028 ± 0.001	0.027 ± 0.001	(b)	0.028	4.1
10/23/90 - 10/30/90	(a)	0.038 ± 0.001	0.044 ± 0.002	0.046 ± 0.002	0.042 ± 0.002	0.045 ± 0.002	0.042 ± 0.002	0.047 ± 0.002	0.046 ± 0.002	0.044 ± 0.002	0.044 ± 0.002	(b)	0.044	6.1
10/30/90 - 11/06/90	(a)	0.026 ± 0.001	0.029 ± 0.001	0.029 ± 0.001	0.026 ± 0.001	0.028 ± 0.001	0.028 ± 0.001	0.031 ± 0.001	0.029 ± 0.001	0.028 ± 0.001	0.026 ± 0.001	(b)	0.028	5.4
11/06/90 - 11/13/90	0.024 ± 0.001	0.023 ± 0.001	0.028 ± 0.001	0.023 ± 0.001	0.021 ± 0.001	0.022 ± 0.001	0.022 ± 0.001	(a)	0.022 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	(b)	0.022	11.0
11/13/90 - 11/20/90	0.045 ± 0.002	0.042 ± 0.002	0.041 ± 0.001	0.043 ± 0.002	0.041 ± 0.001	0.041 ± 0.002	0.039 ± 0.001	0.043 ± 0.002	0.041 ± 0.002	0.037 ± 0.002	0.039 ± 0.001	(b)	0.041	5.3
11/20/90 - 11/27/90	0.022 ± 0.001	0.021 ± 0.001	0.023 ± 0.001	0.024 ± 0.001	0.021 ± 0.001	0.021 ± 0.001	0.020 ± 0.001	0.021 ± 0.001	0.021 ± 0.001	0.022 ± 0.001	0.021 ± 0.001	(b)	0.021	6.0
11/27/90 - 12/04/90	0.029 ± 0.001	0.032 ± 0.001	0.033 ± 0.001	0.031 ± 0.001	0.026 ± 0.001	0.029 ± 0.001	0.030 ± 0.001	0.031 ± 0.001	0.029 ± 0.001	0.030 ± 0.001	(a)	(b)	0.030	6.0
12/04/90 - 12/11/90	0.033 ± 0.001	(a)	0.030 ± 0.001	0.033 ± 0.001	0.034 ± 0.001	0.035 ± 0.001	0.030 ± 0.001	0.034 ± 0.001	0.034 ± 0.001	0.031 ± 0.001	0.032 ± 0.001	(b)	0.033	5.4
12/11/90 - 12/18/90	0.035 ± 0.001	0.037 ± 0.001	0.036 ± 0.001	0.036 ± 0.002	0.032 ± 0.001	0.037 ± 0.001	0.039 ± 0.002	0.037 ± 0.001	0.041 ± 0.002	0.037 ± 0.001	0.040 ± 0.002	(b)	0.037	7.0
12/18/90 - 12/26/90	0.026 ± 0.001	0.028 ± 0.001	0.027 ± 0.001	0.034 ± 0.001	0.032 ± 0.001	0.029 ± 0.001	0.033 ± 0.001	0.031 ± 0.001	0.032 ± 0.001	0.032 ± 0.001	0.031 ± 0.001	(b)	0.030	7.9

(a) Invalid sample

(b) Sample collection for Site 44 was discontinued due to inaccessibility of sample equipment.



TABLE 8.5

AVERAGE GROSS BETA IN AIR PARTICULATE (pCi/M³), STATION SUMMARY

Station	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Annual Average
1	0.026	0.018	0.020	0.030	0.024
4	0.024	0.019	0.019	0.030	0.024
6	0.026	0.018	0.020	0.031	0.024
7A	0.027	0.019	0.020	0.033	0.026
14A	0.025	0.019	0.020	0.030	0.024
15	0.026	0.019	0.019	0.031	0.025
17A	0.025	0.019	0.029	0.031	0.024
21	0.027	0.019	0.021	0.034	0.028
29	0.026	0.018	0.020	0.032	0.025
35	0.024	0.019	0.019	0.031	0.024
40	0.025	0.018	0.019	0.031	0.024
44	0.023	0.018	0.019	(a)	0.022
Average All Sites	0.025	0.019	0.021	0.033	0.022

(a) site not in service 4th quarter.



TABLE 8.6

GAMMA RADIATION AIR FILTER COMPOSITES (pCi/m³)

Collection Period		Site 1	Site 4	Site 6	Site 7A	Site 14A	Site 15	Site 17A	Site 21	Site 29	Site 35	Site 40	Site 44
January	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
February	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
March	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
April	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
May	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
June	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
July	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
August	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
September	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(a)	< LLD	< LLD	< LLD	< LLD
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(a)	< LLD	< LLD	< LLD	< LLD
October	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
November	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
December	Cs-134	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
	Cs-137	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	

(a) Invalid samples.

(b) Sample collection for site 44 was discontinued.



TABLE 8.7

AIRBORNE RADIOIODINE DATA (pCi/m³)

FIRST QUARTER

Collection Period	Site 1	Site 4	Site 6	Site 7A	Site 14A	Site 15	Site 17A	Site 21	Site 29	Site 35	Site 40	Site 44
12/27/89 - 01/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/02/90 - 01/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/09/90 - 01/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/16/90 - 01/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/23/90 - 01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/30/90 - 02/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/06/90 - 02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/13/90 - 02/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/20/90 - 02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/27/90 - 03/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/06/90 - 03/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/13/90 - 03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/20/90 - 03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD



TABLE 8.8
AIRBORNE RADIOIODINE DATA (pCi/m³)

Collection Period	SECOND QUARTER											
	Site 1	Site 4	Site 6	Site 7A	Site 14A	Site 15	Site 17A	Site 21	Site 29	Site 35	Site 40	Site 44
03/27/90 - 04/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/03/90 - 04/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/10/90 - 04/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/17/90 - 04/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/24/90 - 05/01/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/01/90 - 05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/08/90 - 05/15/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/15/90 - 05/22/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/22/90 - 05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/29/90 - 06/05/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/05/90 - 06/12/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/12/90 - 06/19/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/19/90 - 06/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD

TABLE 8.9

AIRBORNE RADIOIODINE DATA (pCi/m³)

THIRD QUARTER

<u>Collection Period</u>	<u>Site 1</u>	<u>Site 4</u>	<u>Site 6</u>	<u>Site 7A</u>	<u>Site 14A</u>	<u>Site 15</u>	<u>Site 17A</u>	<u>Site 21</u>	<u>Site 29</u>	<u>Site 35</u>	<u>Site 40</u>	<u>Site 44</u>
06/26/90 - 07/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(a)	< LLD	< LLD
07/03/90 - 07/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90 - 07/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	(a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/17/90 - 07/24/90	< LLD	< LLD	(a)	< LLD	< LLD	(a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/24/90 - 07/31/90	< LLD	< LLD	(a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/31/90 - 08/07/90	< LLD	< LLD	(a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/07/90 - 08/14/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/14/90 - 08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/21/90 - 08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/28/90 - 09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/04/90 - 09/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(a)	< LLD	< LLD	< LLD	< LLD
09/11/90 - 09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(a)	< LLD	< LLD	< LLD	< LLD
09/18/90 - 09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(a)	< LLD	< LLD	< LLD	< LLD

(a) Invalid sample



TABLE 8.10
AIRBORNE RADIOIODINE DATA (pCi/m³)

FOURTH QUARTER

Collection Period	Site <u>1</u>	Site <u>4</u>	Site <u>6</u>	Site <u>7A</u>	Site <u>14A</u>	Site <u>15</u>	Site <u>17A</u>	Site <u>21</u>	Site <u>29</u>	Site <u>35</u>	Site <u>40</u>	Site <u>44</u>
09/25/90 - 10/02/90	(a)											
10/02/90 - 10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
10/09/90 - 10/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
10/16/90 - 10/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
10/23/90 - 10/30/90	(c)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
10/30/90 - 11/06/90	(c)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
11/06/90 - 11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(c)	< LLD	< LLD	< LLD	(b)
11/13/90 - 11/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
11/20/90 - 11/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
11/27/90 - 12/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(c)	(b)
12/04/90 - 12/11/90	< LLD	(c)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
12/11/90 - 12/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)
12/18/90 - 12/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(b)

(a) Sample results were overwritten. Corrective action taken--software was modified to save files with unique names versus overwriting previous data.

(b) Site 44 samples became unavailable due to inaccessibility of sample equipment.

(c) Invalid Sample



TABLE 8.11

BROADLEAF VEGETATION (pCi/kg) [Wet]

<u>Collection Location</u>	<u>Sample Description</u>	<u>Date Collected</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>
J.A. Woods - Commercial Operation (Site #62) (a)	Lettuce	02/13/90	< LLD	< LLD	< LLD
DeShazo Residence (Site #52)	Cabbage	02/13/90	< LLD	< LLD	< LLD
	Cabbage	03/20/90	< LLD	< LLD	< LLD
Adams Residence (Site # 47)	Spinach	06/12/90	< LLD	< LLD	< LLD

(a) Control site.



TABLE 8.12
 DRINKING WATER BI-WEEKLY
 I-131 (pCi/L)
 (RADIOCHEMICAL SEPARATION)

<u>Date Collected</u>	<u>McArthur Residence (Site # 46)</u>	<u>Scott Residence (Site # 49)</u>	<u>Shepard Residence (Site # 48)</u>	<u>GaVette Residence (Site # 55)</u>
01/02/90				
01/09/90	< LLD	< LLD	< LLD	< LLD
01/16/90				
01/23/90	< LLD	< LLD	< LLD	< LLD
01/30/90				
02/06/90	< LLD	< LLD	< LLD	< LLD
02/13/90				
02/20/90	< LLD	< LLD	< LLD	< LLD
02/27/90				
03/06/90	< LLD	< LLD	< LLD	< LLD
03/13/90				
03/20/90	< LLD	< LLD	< LLD	< LLD
03/27/90				
04/03/90	< LLD	< LLD	< LLD	< LLD
04/10/90				
04/17/90	< LLD	< LLD	< LLD	< LLD
04/24/90				
05/01/90	< LLD	< LLD	< LLD	< LLD
05/08/90				
05/15/90	< LLD	< LLD	< LLD	< LLD
05/22/90				
05/29/90	< LLD	< LLD	< LLD	< LLD
06/05/90				
06/12/90	< LLD	< LLD	< LLD	< LLD
06/19/90				
06/26/90	< LLD	< LLD	< LLD	< LLD
07/03/90				
07/10/90	< LLD	< LLD	< LLD	< LLD

TABLE 8.12
 DRINKING WATER BI-WEEKLY
 I-131 (pCi/L)
 (RADIOCHEMICAL SEPARATION)

<u>Date Collected</u>	<u>McArthur Residence (Site # 46)</u>	<u>Scott Residence (Site # 49)</u>	<u>Shepard Residence (Site # 48)</u>	<u>GaVette Residence (Site # 55)</u>
07/17/90				
07/24/90	< LLD	< LLD	< LLD	< LLD
07/31/90				
08/07/90	< LLD	< LLD	< LLD	< LLD
08/14/90				
08/21/90	< LLD	< LLD	< LLD	< LLD
08/28/90				
09/04/90	< LLD	< LLD	< LLD	< LLD
09/11/90				
09/18/90	< LLD	< LLD	< LLD	< LLD
09/25/90				
10/02/90	< LLD	< LLD	< LLD	< LLD
10/09/90				
10/16/90	< LLD	< LLD	< LLD	< LLD
10/23/90				
10/30/90	< LLD	< LLD	< LLD	< LLD
11/06/90				
11/13/90	< LLD	< LLD	< LLD	< LLD
11/20/90				
11/27/90	< LLD	< LLD	< LLD	< LLD
12/04/90				
12/11/90	< LLD	< LLD	< LLD	< LLD
12/18/90				
12/26/90	< LLD	< LLD	< LLD	< LLD



DRINKING WATER (pCi/L)

[illegible]

TABLE 8.13

<u>Collection Location</u>	<u>Date Collected</u>	<u>DRINKING WATER (pCi/L)</u>												<u>Gross Beta</u>
		<u>Ba-140</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Fe-59</u>	<u>La-140</u>	<u>Mn-54</u>	<u>Nb-95</u>	<u>Zn-65</u>	<u>Zr-95</u>	<u>H-3</u>	
Scott Residence (Site #49)	01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	6 ± 1
	02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	8 ± 1
	03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	4 ± 1
	04/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3 ± 1
	05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3 ± 1
	06/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	8 ± 1
	07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	4 ± 1
	08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	5 ± 1
	09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3 ± 1
	10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	5 ± 1
	11/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	5 ± 1
	12/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3 ± 1

(a) High Solids



TABLE 8.14

GROUNDWATER QUARTERLY (pCi/L)

<u>Collection Location</u>	<u>Date Collected</u>	<u>Ba-140</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Fe-59</u>	<u>I-131</u>	<u>La-140</u>	<u>Mn-54</u>	<u>Nb-95</u>	<u>Zn-65</u>	<u>Zr-95</u>	<u>H-3</u>	<u>I-131 (Radiochemical)</u>
Well 27ddc (Site #57)	02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(a)
	05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
Well 34abb (Site #58)	02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	(a)
	05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD

(a) Resumed radiochemical I-131 per PVNGS letter (222-00961) dated February 28, 1990.



TABLE 8.15

SURFACE WATER (pCi/L)
RESERVOIR (SITE #60)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
01/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< 17 (a)	< LLD	< LLD	< LLD	< LLD	< LLD
01/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	4 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	18 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/01/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	6 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/15/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/22/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	10 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/05/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/12/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/19/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD

TABLE 8.15

SURFACE WATER (pCi/L)
RESERVOIR (SITE #60)

<u>Date</u> <u>Collected</u>	<u>Ba-140</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Fe-59</u>	<u>I-131</u>	<u>La-140</u>	<u>Mn-54</u>	<u>Nb-95</u>	<u>Zn-65</u>	<u>Zr-95</u>	<u>H-3</u>
07/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	10 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/07/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	17 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/14/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	22 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	14 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	10 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	17 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	28 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	17 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	18 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	8 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD

(a) Count time was shortened to accommodate sample load. One detector was out of commission.



TABLE 8.16

SURFACE WATER (pCi/L)
EVAPORATION POND #1 (SITE #59)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
01/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	770 ± 190
02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	6 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	890 ± 100
03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	600 ± 190
04/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	730 ± 190
04/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	620 ± 190
05/01/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/15/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	700 ± 190
05/22/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	680 ± 180
05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/05/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/12/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	730 ± 190
06/19/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	850 ± 190



TABLE 8.16

SURFACE WATER (pCi/L)
EVAPORATION POND #1 (SITE #59)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
07/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	610 ± 190
07/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/07/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/14/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	790 ± 190
08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	650 ± 190
09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	8 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	8 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	720 ± 200
11/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	840 ± 200
11/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD



TABLE 8.17

SURFACE WATER (pCi/L)
EVAPORATION POND #2 (SITE #63)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
01/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	700 ± 190
01/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	680 ± 180
03/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	900 ± 190
03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	4 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/01/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/15/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	890 ± 190
05/22/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	690 ± 180
05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/05/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/12/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/19/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	8 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	840 ± 190

TABLE 8.17

SURFACE WATER (pCi/L)
EVAPORATION POND #2 (SITE #59)

<u>Date</u> <u>Collected</u>	<u>Ba-140</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Fe-59</u>	<u>I-131</u>	<u>La-140</u>	<u>Mn-54</u>	<u>Nb-95</u>	<u>Zn-65</u>	<u>Zr-95</u>	<u>H-3</u>
07/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/07/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/14/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	870 ± 210
11/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	860 ± 200
11/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	10 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	690 ± 200
12/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	710 ± 200
12/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	14 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	820 ± 200
12/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	8 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	1110 ± 280

TABLE 8.18

MILK (pCi/L)

<u>Collection Location</u>	<u>Date Collected</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ba-140</u>	<u>La-140</u>
Crosswinds Dairy (Site #50)	01/14/90	< LLD	< LLD	< LLD	< LLD	< LLD
	02/11/90	< LLD	< LLD	< LLD	< LLD	< LLD
	03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD
	04/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	05/13/90	< LLD	< LLD	< LLD	< LLD	< LLD
	06/10/90	< LLD	< LLD	< LLD	< LLD	< LLD
	07/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	08/12/90	< LLD	< LLD	< LLD	< LLD	< LLD
	09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD
	10/07/90	< LLD	< LLD	< LLD	< LLD	< LLD
	11/04/90	< LLD	< LLD	< LLD	< LLD	< LLD
	12/02/90	< LLD	< LLD	< LLD	< LLD	< LLD
Dickman Dairy (Site #54)	01/14/90	< LLD	< LLD	< LLD	< LLD	< LLD
	02/11/90	< LLD	< LLD	< LLD	< LLD	< LLD
	03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD
	04/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	05/13/90	< LLD	< LLD	< LLD	< LLD	< LLD
	06/10/90	< LLD	< LLD	< LLD	< LLD	< LLD
	07/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	08/12/90	< LLD	< LLD	< LLD	< LLD	< LLD
	09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD
	10/07/90	< LLD	< LLD	< LLD	< LLD	< LLD
	11/04/90	< LLD	< LLD	< LLD	< LLD	< LLD
	12/02/90	< LLD	< LLD	< LLD	< LLD	< LLD
John Kerr Dairy (Site #53)	01/14/90	< LLD	< LLD	< LLD	< LLD	< LLD
	02/11/90	< LLD	< LLD	< LLD	< LLD	< LLD
	03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD
	04/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	05/13/90	< LLD	< LLD	< LLD	< LLD	< LLD
	06/10/90	< LLD	< LLD	< LLD	< LLD	< LLD
	07/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	08/12/90	< LLD	< LLD	< LLD	< LLD	< LLD
	09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD
	10/07/90	< LLD	< LLD	< LLD	< LLD	< LLD
	11/04/90	(a)				
	12/02/90	(a)				

TABLE 8.18

MILK (pCi/L)

<u>Collection Location</u>	<u>Date Collected</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ba-140</u>	<u>La-140</u>
Butler Dairy (Site #51)	01/14/90	< LLD	< LLD	< LLD	< LLD	< LLD
	02/11/90	< LLD	< LLD	< LLD	< LLD	< LLD
	03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD
	04/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	05/13/90	< LLD	< LLD	< LLD	< LLD	< LLD
	06/10/90	< LLD	< LLD	< LLD	< LLD	< LLD
	07/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	08/12/90	< LLD	< LLD	< LLD	< LLD	< LLD
	09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD
	10/07/90	< LLD	< LLD	< LLD	< LLD	< LLD
	11/04/90	< LLD	< LLD	< LLD	< LLD	< LLD
	12/02/90	< LLD	< LLD	< LLD	< LLD	< LLD
Pew Dairy (Site #56)	01/14/90	< LLD	< LLD	< LLD	< LLD	< LLD
	02/11/90	< LLD	< LLD	< LLD	< LLD	< LLD
	03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD
	04/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	05/13/90	< LLD	< LLD	< LLD	< LLD	< LLD
	06/10/90	< LLD	< LLD	< LLD	< LLD	< LLD
	07/15/90	< LLD	< LLD	< LLD	< LLD	< LLD
	08/12/90	< LLD	< LLD	< LLD	< LLD	< LLD
	09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD
	10/07/90	< LLD	< LLD	< LLD	< LLD	< LLD
	11/04/90	< LLD	< LLD	< LLD	< LLD	< LLD
	12/02/90	< LLD	< LLD	< LLD	< LLD	< LLD

(a) No sample available due to construction.

TABLE 8.19

WRF INFLUENT WATER (pCi/L)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
01/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	25 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	32 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	37 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	26 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/13/90 (a)													
03/20/90 (a)													
03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	27 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	86 ± 3(b)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	20 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/01/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/15/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/22/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	24 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/05/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	30 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/12/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	26 ± 4	< 16	< LLD	< LLD	< LLD	< LLD	< LLD
06/19/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD



TABLE 8.19

WRF INFLUENT WATER (pCi/L)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
07/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	34 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	14 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	14 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/07/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	34 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/14/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	40 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	24 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	21 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	15 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	15 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	41 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	42 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	23 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/20/90	< LLD	< LLD	< LLD	< LLD	3 ± 1	< LLD	12 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
11/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	39 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	51 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	22 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	31 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
12/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD

(a) No sample available.

(b) Fresh sample was counted on May 1, 1990, yielded an I-131 analysis result of 82 ± 6.



TABLE 8.20

COOLING TOWERS (pCi/L)

UNIT #1

[illegible]



TABLE 8.20

COOLING TOWERS (pCi/L)
UNIT #1

<u>Date</u> <u>Collected</u>	<u>Ba-140</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Fe-59</u>	<u>I-131</u>	<u>La-140</u>	<u>Mn-54</u>	<u>Nb-95</u>	<u>Zn-65</u>	<u>Zr-95</u>
07/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	18 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	53 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
07/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	28 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD
07/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	52 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	60 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
08/07/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	95 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
08/14/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	124 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	84 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	82 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	84 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
09/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	100 ± 6	< LLD	< LLD	< LLD	< LLD	< LLD
09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	51 ± 5	< LLD	< LLD	< LLD	< LLD	< LLD
09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	29 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
10/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	102 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	177 ± 9	< LLD	< LLD	< LLD	< LLD	< LLD
10/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	124 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
10/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	129 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD
10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	130 ± 9	< LLD	< LLD	< LLD	< LLD	< LLD
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	93 ± 6	< LLD	< LLD	< LLD	< LLD	< LLD
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	72 ± 6	< LLD	< LLD	< LLD	< LLD	< LLD
11/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	73 ± 5	< LLD	< LLD	< LLD	< LLD	< LLD
11/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	121 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD
12/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	184 ± 11	< LLD	< LLD	< LLD	< LLD	< LLD
12/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	163 ± 10	< LLD	< LLD	< LLD	< LLD	< LLD
12/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	136 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD
12/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	111 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD

TABLE 8.21

COOLING TOWERS (pCi/L)
UNIT #2

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95
01/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	25 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
01/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	18 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
01/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD
01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	20 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
02/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	70 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	55 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
02/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	74 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	53 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
03/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	30 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD
03/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	20 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD
03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	11 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD
03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/01/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/15/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/22/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/05/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/12/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/19/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD

TABLE 8.21

COOLING TOWERS (pCi/L)
UNIT #2

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95
07/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	5 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD
07/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	28 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	52 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
08/07/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	94 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
08/14/90	(a)											
08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	136 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	81 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	109 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
09/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	100 ± 6	< LLD	< LLD	< LLD	< LLD	< LLD
09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	91 ± 6	< LLD	< LLD	< LLD	< LLD	< LLD
09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	78 ± 5	< LLD	< LLD	< LLD	< LLD	< LLD
10/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	111 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	160 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD
10/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	115 ± 10	< LLD	< LLD	< LLD	< LLD	< LLD
10/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	118 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	128 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	88 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	67 ± 5	< LLD	< LLD	< LLD	< LLD	< LLD
11/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	66 ± 6	< LLD	< LLD	< LLD	< LLD	< LLD
11/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	114 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
12/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	177 ± 10	< LLD	< LLD	< LLD	< LLD	< LLD
12/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	165 ± 9	< LLD	< LLD	< LLD	< LLD	< LLD
12/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	133 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD
12/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	109 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD

(a) Inclement weather made sample location inaccessible.



TABLE 8.22

COOLING TOWERS (pCi/L)
UNIT #3

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95
01/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< 17	< LLD	< LLD	< LLD	< LLD
01/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	15 ± 3	< 17	< LLD	< LLD	< LLD	< LLD
02/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	58 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	55 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
02/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	69 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	79 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
03/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	69 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
03/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	41 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	27 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD
03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	21 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
04/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	57 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
04/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	73 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
04/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	54 ± 4	< 16	< LLD	< LLD	< LLD	< LLD
04/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	81 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
05/01/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	72 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	72 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
05/15/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	41 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD
05/22/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	28 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	55 ± 5	< 16	< LLD	< LLD	< LLD	< LLD
06/05/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	86 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
06/12/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	74 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
06/19/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	64 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
06/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	42 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD



TABLE 8.22
COOLING TOWERS (pCi/L)
UNIT #3

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95
07/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	67 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	79 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
07/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	47 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
07/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	52 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	73 ± 5	< LLD	< LLD	< LLD	< LLD	< LLD
08/07/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	56 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
08/14/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	143 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD
08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	151 ± 5	< LLD	< LLD	< LLD	< LLD	< LLD
08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	76 ± 3	< LLD	< LLD	< LLD	< LLD	< LLD
09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	121 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
09/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	116 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	106 ± 6	< LLD	< LLD	< LLD	< LLD	< LLD
09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	86 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
10/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	121 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD
10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	185 ± 11	< LLD	< LLD	< LLD	< LLD	< LLD
10/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	109 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD
10/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	84 ± 6	< LLD	< LLD	< LLD	< LLD	< LLD
10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	127 ± 9	< LLD	< LLD	< LLD	< LLD	< LLD
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	76 ± 5	< LLD	< LLD	< LLD	< LLD	< LLD
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	69 ± 6	< LLD	< LLD	< LLD	< LLD	< LLD
11/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	59 ± 5	< LLD	< LLD	< LLD	< LLD	< LLD
11/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	109 ± 8	< LLD	< LLD	< LLD	< LLD	< LLD
12/04/90	(a)											
12/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	165 ± 9	< LLD	< LLD	< LLD	< LLD	< LLD
12/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	126 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD
12/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	97 ± 7	< LLD	< LLD	< LLD	< LLD	< LLD

(a) Site inaccessible due to construction.

TABLE 8.23

RETENTION BASIN #1 (pci/L)

<u>Date</u> <u>Collected</u>	<u>Ba-140</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Fe-59</u>	<u>I-131</u>	<u>La-140</u>	<u>Mn-54</u>	<u>Nb-95</u>	<u>Zn-65</u>	<u>Zr-95</u>	<u>H-3</u>
01/02/90 (a)													
01/09/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/16/90 (a)													
01/23/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/30/90 (a)													
02/06/90 < LLD	< LLD	< LLD	< LLD	9 ± 1	19 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/13/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/20/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	4040 ± 240
02/27/90 < LLD	< LLD	< LLD	< LLD	17 ± 2	32 ± 4	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1220 ± 190
03/06/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/13/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/20/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/27/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/03/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	670 ± 190
04/10/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/17/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/24/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/01/90 (a)													
05/08/90 (a)													
05/15/90 (a)													
05/22/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	720 ± 180
05/29/90 (a)													
06/05/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/12/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	880 ± 190
06/19/90 < LLD	< LLD	< LLD	< LLD	< LLD	7 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	750 ± 200
06/26/90 < LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1010 ± 190



TABLE 8.23

RETENTION BASIN #1 (pci/L)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
07/03/90	< LLD	< LLD	< LLD	< LLD	8 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90 (a)													
07/17/90 (a)													
07/24/90	< LLD	< LLD	< LLD	< LLD	13 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	20 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	1000 ± 200
08/07/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	7030 ± 290
08/14/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	4900 ± 250
08/21/90 (a)													
08/28/90 (a)													
09/04/90 (a)													
09/11/90 (a)													
09/18/90	< LLD	< LLD	< LLD	6 ± 1	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1380 ± 210
09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1110 ± 210
10/02/90	< LLD	< LLD	< LLD	< LLD	8 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1330 ± 210
10/09/90 (a)													
10/16/90	< LLD	< LLD	< LLD	< LLD	10 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2480 ± 240
10/23/90 (a)													
10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1960 ± 230
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1840 ± 230
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2650 ± 250
11/20/90 (a)													
11/27/90	< LLD	< LLD	< LLD	< LLD	8 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3060 ± 260
12/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3170 ± 260
12/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3820 ± 250
12/18/90 (a)													
12/26/90 (a)													

(a) No sample available.

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TABLE 8.24

RETENTION BASIN #2 (pCi/L)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
01/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2160 ± 210
01/09/90 (a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/23/90 (a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/06/90 (a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	650 ± 190
02/20/90 (a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	610 ± 180
02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/06/90	< LLD	< LLD	< LLD	< LLD	6 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/20/90 (a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
04/24/90	< LLD	< LLD	< LLD	< LLD	10 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	780 ± 190
05/01/90	< LLD	< LLD	< LLD	12 ± 1	17 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/15/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1320 ± 200
05/22/90 (a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/05/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/12/90	< LLD	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	780 ± 190
06/19/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
06/26/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD

TABLE 8.24
RETENTION BASIN #2 (pCi/L)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
07/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
07/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	890 ± 190
07/17/90	< LLD	< LLD	< LLD	7 ± 1	9 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	720 ± 190
07/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1030 ± 200
07/31/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	35 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	1060 ± 200
08/07/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	4620 ± 260
08/14/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1710 ± 500
08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1640 ± 200
08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3500 ± 270
09/04/90	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2670 ± 250
09/11/90	< LLD	< LLD	< LLD	7 ± 1	10 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2900 ± 260
09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1790 ± 220
09/25/90	< LLD	< LLD	< LLD	< LLD	8 ± 2	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	880 ± 200
10/02/90 (a)	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2700 ± 240
10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2450 ± 240
10/16/90 (a)	< LLD	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1840 ± 220
10/23/90	< LLD	< LLD	< LLD	< LLD	9 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	1860 ± 230
10/30/90	< LLD	< LLD	< LLD	< LLD	10 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2520 ± 250
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2690 ± 240
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3000 ± 250
11/13/90(b)	< LLD	< LLD	15 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	12 ± 2	< LLD	< LLD	< LLD	2780 ± 250
11/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3050 ± 250
11/27/90	< LLD	< LLD	< LLD	< LLD	8 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	2430 ± 240
12/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	3710 ± 260
12/11/90	< LLD	< LLD	< LLD	< LLD	3 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
12/18/90	< LLD	< LLD	< LLD	4 ± 1	8 ± 1	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
12/26/90	< LLD	< LLD	< LLD	6 ± 1	12 ± 2	< LLD	19 ± 2	< LLD	< LLD	< LLD	< LLD	< LLD	

(a) No sample available.

(b) (Oil) Due to the amount of oil, the sample was separated with the water and oil being counted separately.



TABLE 8.25
SEDIMENTATION BASIN #2 (pCi/L)

<u>Date</u> <u>Collected</u>	<u>Ba-140</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Fe-59</u>	<u>I-131</u>	<u>La-140</u>	<u>Mn-54</u>	<u>Nb-95</u>	<u>Zn-65</u>	<u>Zr-95</u>	<u>H-3</u>
01/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
01/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
01/16/90 (a)													
01/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
01/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
02/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
02/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
02/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
02/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
03/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
03/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
03/20/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
03/27/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
04/03/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
04/10/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
04/17/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
04/24/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
05/01/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
05/08/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
05/15/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
05/22/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
05/29/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
06/05/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
06/12/90 (a)													
06/19/90 (a)													
06/26/90 (a)													



TABLE 8.25

SEDIMENTATION BASIN #2 (pCi/L)

Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95	H-3
07/03/90	(a)												
07/10/90	(a)												
07/17/90	(a)												
07/24/90	(a)												
07/31/90	(a)												
08/07/90	(a)												
08/14/90	(a)												
08/21/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
08/28/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
09/04/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
09/11/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
09/18/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
09/25/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
10/02/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
10/09/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
10/16/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
10/23/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
10/30/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
11/06/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
11/13/90	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	
11/20/90	(a)												
11/27/90	(a)												
12/04/90	(a)												
12/11/90	(a)												
12/18/90	(a)												
12/26/90	(a)												

(a) No sample available.



Table 8.26

SLUDGE (pCi/kg)

Collection Location	Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95
STP Digester Truck	06/05/90	< 39	< 11	< 14	< 9.9	< 13	< 26	< 11	< 14	< 11	< 11	< 30	< 19
	06/08/90	< 47	< 12	< 14	< 10	< 11	< 22	< 14	< 19	< 11	< 11	< 24	< 21
	06/14/90	< 35	< 7.5	< 6.4	< 5.9	< 6.8	< 12	< 13	< 13	< 6.9	< 7.4	< 14	< 13
	06/20/90	< 52	< 7.8	< 8.8	< 6.2	< 8.6	< 16	< 26 (a)	< 15	< 7.4	< 9.4	< 16	< 14
	06/21/90	< 29	< 6.4	< 7.5	< 5.5	< 6.4	< 13	< 12	< 9.8	< 5.9	< 6.7	< 12	< 11
	07/02/90	< 32	< 9.0	< 8.6	< 8.5	< 10	< 19	< 12	< 12	< 9.2	< 9.6	< 19	< 17
	07/03/90	< 42	< 11	< 12	< 8.6	< 12	< 21	< 13	< 17	< 11	< 9.9	< 21	< 17
	07/05/90	< 26	< 6.0	8 ± 1	< 5.7	< 6.8	< 12	< 10	< 8.6	< 5.4	< 5.6	< 12	< 9.7
	07/13/90	< 31	7 ± 1	12 ± 1	< 7.4	< 7.9	< 15	< 10	< 9.8	< 6.6	< 7.6	< 15	< 12
	07/14/90	< 41	< 9.8	< 11	< 9.7	< 12	< 20	8 ± 2	< 12	< 9.9	< 10	< 19	< 17
	07/20/90	< 28	< 5.9	9 ± 1	< 5.4	< 6.6	< 11	< 9.8	< 7.8	< 5.5	< 6.1	< 11	< 11
	07/30/90	< 41	< 9.6	< 12	< 9.8	< 13	< 22	< 12	< 9.5	< 11	< 12	< 24	< 18
	08/02/90	< 49	< 9.4	< 12	< 9.3	< 11	< 22	< 19	< 12	< 9.8	< 12	< 20	< 17
	08/07/90	< 32	< 5.5	< 6.6	< 5.0	< 6.5	< 11	< 13	< 9.5	< 5.5	< 6.4	< 12	< 10
	08/12/90	< 31	< 8.3	< 8.8	< 7.7	< 8.4	< 16	< 13	< 11	< 7.4	< 7.9	< 15	< 14
	08/16/90	< 35	< 6.5	< 6.7	< 6.5	< 7.0	< 13	< 13	< 12	< 6.6	< 7.3	< 15	< 12
	08/19/90	< 35	< 8.7	< 10	< 6.7	< 9.2	< 16	< 13	< 14	< 7.3	< 8.8	< 22	< 13
	08/30/90 (b)	< 31	< 8.8	< 12	< 8.2	< 11	< 17	< 8.9	< 8.7	< 8.6	< 8.8	< 20	< 15
	09/06/90 (c)	< 22	< 6.2	< 8.7	< 6.8	< 8.1	< 14	< 7.1	< 6.1	< 7.0	< 6.4	< 14	< 11
	09/24/90 (c)	< 31	< 9.9	< 13	< 9.5	< 12	< 20	< 9.7	< 11	< 9.9	< 10	< 19	< 17
	10/02/90 (c)	< 33	< 11	< 11	< 10	< 11	< 20	< 9.7	< 10	< 10	< 9.6	< 24	< 15
	10/10/90 (c,d)	< 19	< 6.2	< 7.9	< 6.3	< 7.1	< 15	131 ± 7	< 7.4	< 6.6	< 6.1	< 14	< 11
	10/23/90 (c)	< 32	< 9.0	< 11	< 9.5	< 11	< 18	37 ± 4	< 10	< 9.3	< 9.9	< 22	< 17
	11/14/90 (c)	< 34	< 9.7	< 15	< 11	< 13	< 18	45 ± 5	< 11	< 12	< 12	< 24	< 20
	11/20/90 (c)	< 32	< 9.1	< 10	< 9.9	< 11	< 18	11 ± 3	< 8.7	< 9.4	< 10	< 24	< 15
	12/12/90 (c)	< 110	< 8.5	< 6.5	< 6.5	< 7.2	< 18	< 97	< 35	< 6.7	< 12	< 15	< 16
STP Digester C	01/02/90	< 29	< 6.0	< 5.6	< 5.4	< 6.5	< 11	< 10	< 8.2	< 5.7	< 6.4	< 14	< 10
	02/06/90	< 38	< 10	< 10	< 10	< 11	< 21	< 11	< 11	< 10	< 10	< 22	< 17
	03/06/90	< 44	< 10	< 9.2	< 8.9	< 9.9	< 19	< 18	< 13	< 9.7	< 11	< 20	< 17
	04/04/90	< 29	< 5.6	< 7.0	< 6.0	< 7.0	< 13	< 9.7	< 8.3	< 6.3	< 6.9	< 13	< 12
	05/14/90	< 33	< 6.6	< 6.4	< 5.6	< 6.0	< 13	< 13	< 9.4	< 5.9	< 6.6	< 13	< 11
	06/04/90	< 33	< 7.8	< 9.7	< 8.3	< 9.5	< 16	< 12	< 12	< 8.9	< 8.9	< 17	< 16

Table 8.26

SLUDGE (pCi/kg)

Collection Location	Date Collected	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	La-140	Mn-54	Nb-95	Zn-65	Zr-95
Sedimentation Basin #2	03/06/90	< 135	< 26	< 26	< 23	< 25	< 69	< 60	< 52	< 23	< 27	< 64	< 49
	06/05/90	< 100	< 29	< 36	< 21	< 33	< 61	< 29	< 33	< 26	< 28	< 66	< 49
	09/04/90 (e)	< 61	< 17	< 21	< 16	17 ± 4	< 38	< 18	< 16	< 17	< 18	< 47	< 31
Retention Basin #1	03/06/90	< 150	< 37	1910 ± 70	510 ± 20	1050 ± 40	< 73	< 46	< 28	250 ± 10	< 38	< 82	< 60
	06/05/90	< 180	< 43	2610 ± 80	1020 ± 30	2080 ± 60	< 76	< 56	< 29	280 ± 10	< 42	< 90	< 68
	09/04/90(e,f)	< 85	< 27	1720 ± 70	386 ± 18	856 ± 41	< 54	< 28	< 22	194 ± 14	< 21	< 61	< 41
	12/04/90	< 150	< 34	2060 ± 80	572 ± 27	1340 ± 60	< 69	< 51	< 28	200 ± 17	< 34	< 80	< 62
Retention Basin #2	03/06/90	< 240	46 ± 7	2260 ± 70	670 ± 20	1340 ± 40	< 89	< 100	< 47	300 ± 10	< 45	< 91	< 67
	06/05/90	< 100	< 26	1360 ± 40	460 ± 10	1140 ± 30	< 56	< 35	< 21	130 ± 10	< 25	< 62	< 42
	09/04/90(e,g)	< 99	21 ± 6	1880 ± 80	442 ± 21	100 ± 5	< 54	< 31	< 19	244 ± 17	< 26	< 72	< 44
	12/04/90	< 220	< 50	1240 ± 60	712 ± 35	1510 ± 80	< 86	< 74	< 48	208 ± 19	< 48	< 110	< 84
Waste Centrifuge	02/06/90	< 31	< 9.0	< 8.1	< 9.7	< 10	< 16	594 ± 15	< 13	< 9.2	< 12	< 19	< 15
	03/06/90 (h)												
	06/04/90	< 40	< 11	< 11	< 9.7	< 11	< 18	2740 ± 80	< 13	< 9.2	< 9.9	< 19	< 16
	09/11/90	< 33	< 6.5	< 7.0	< 6.4	< 7.9	< 15	1810 ± 70	< 9.0	< 6.5	< 8.0	< 14	< 12
	12/04/90	< 84	< 17	< 12	< 14	< 17	< 40	1700 ± 90	< 37	< 14	< 21	< 53	< 33
	12/10/90	< 61	< 13	< 15	< 13	< 13	< 28	1370 ± 60	< 16	< 12	< 15	< 26	< 23
	12/16/90	< 24	< 5.6	< 5.2	< 5.6	< 6.4	< 10	935 ± 39	< 5.6	< 5.4	< 5.8	< 11	< 10
	12/25/90	< 56	< 6.9	< 5.3	< 6.0	< 6.5	< 14	792 ± 44	< 18	< 6.4	< 9.2	< 12	< 13
	12/28/90	< 77	< 10	< 8.4	< 8.1	< 8.8	< 20	738 ± 46	< 30	< 9.3	< 14	< 18	< 21
	12/31/90	< 69	< 11	< 9.9	< 8.9	< 11	< 23	528 ± 36	< 28	< 9.7	< 12	< 19	< 19

- (a) Decay interval between sample collection by WRF and receipt by RMF (07/03/90) was two weeks.
 (b) No decay correction made per APS supervision.
 (c) Time of count data. No decay correction.
 (d) I-131 was verified by APS to have been from an employee uptake of radiopharmaceutical I-131.
 (e) Sample density outside calibration range.
 (f) Sb-125: < 74 pCi/kg.
 (g) Sb-125: 131 ± 15 pCi/kg.
 (h) Insufficient sample for analysis.



TABLE 8.27

SURFACE WATER QUARTERLY COMPOSITE ANALYSIS

<u>Collection Location</u>	<u>Date Collected</u>	<u>Gross Beta</u>	<u>Sr-89</u>	<u>Sr-90</u>
Evaporation Pond #1 Site #59	03/27/90	530 ± 60	0.63 ± 0.1	0.75 ± 0.2
	06/26/90	640 ± 70	< 0.66	1.2 ± 0.3
	09/25/90	842 ± 75	< 0.81	1.2 ± 0.3
	12/26/90	838 ± 91	< 0.80	0.90 ± 0.2
Evaporation Pond #2 Site #63	03/27/90	560 ± 60	0.86 ± 0.1	0.72 ± 0.1
	06/26/90	650 ± 70	< 0.60	1.0 ± 0.2
	09/25/90	759 ± 65	< 0.83	1.2 ± 0.3
	12/26/90	639 ± 77	< 0.81	1.2 ± 0.3
Reservoir Site #60	03/27/90	15 ± 2	< 0.58	< 0.29
	06/26/90	16 ± 2	< 0.59	< 0.31
	09/25/90	19 ± 2	< 0.86	< 0.45
	12/26/90	16 ± 2	< 0.75	< 0.46

9.0 Thermoluminescent Dosimetry Results and Data Interpretation

Thermoluminescent Dosimeters were placed in fifty locations ranging from one to forty-five miles from the Palo Verde Nuclear Generating Station. Beginning in 1984, the Panasonic Model 812 Dosimeter replaced all other TLD's in use. The 812 is a multi-element dosimeter combining two elements of Lithium Borate and two elements of Calcium Sulfate.

TLD locations are shown in Figures 2.1 and 2.2. TLD locations are described in Table 9.1. TLD results for 1990 are presented in Table 9.2. TLD results for 1984 through 1990 are presented in Figure 9.1 (excluding transit control TLD #45).

TLD results for 1990 are consistent with preoperational data.



THERMOLUMINESCENT DOSIMETRY SITE LOCATIONS

<u>TLD NUMBER</u>	<u>TLD LOCATION</u>	<u>LOCATION DESCRIPTION</u>
1	E30	APS Western Division Office, Goodyear
2	ENE24	Scott-Libby School, Perryville Rd. and Thomas Rd.
3	E21	Liberty School, 19800 W. Hwy. 85
4	E16	APS Buckeye Office, 615 N. 4th St., Buckeye
5	ESE11	Palo Verde School, Palo Verde Rd. (291st Ave) and Old Hwy. 80
6	SSE31	APS Gila Bend Substation, service road west of town off I-8
7	SE7	Old U.S. 80 and Arlington School Rd.
8	SSE5	Southern Pacific Pipeline Rd., 1.4 miles SW of 355th Ave.
9	SS	Southern Pacific Pipeline Rd., 2.5 miles SW of 355th Ave.
10	SE5	SE corner of 355th Ave and Elliot Rd.
11	ESE5	NW corner of 339th Ave. and Dobbins Rd.
12	E5	NE corner of 339th Ave. and Buckeye-Salome Rd.
13	N1	N site boundary
14	NNE2	NNE site boundary
15	NE2	NE site boundary, on WRF Access Rd.
16	ENE2	ENE site boundary
17	E2	E site boundary
18	ESE2	ESE site boundary
19	SE2	SE site boundary
20	SSE2	SSE site boundary
21	S3	S site boundary
22	SSW3	SSW site boundary
23	W5	2 miles north of Elliot Rd., 3 miles west of Wintersburg Rd.
24	SW4	Elliot Rd., 2 miles west of Wintersburg Rd. at Desert Farms
25	WSW5	Elliot Rd., 3 miles west of Wintersburg Rd. at cattle guard
26	SSW5	Shepard farm, 13202 S. 383rd Ave., 0.5 miles west of house



THERMOLUMINESCENT DOSIMETRY SITE LOCATIONS

<u>TLD NUMBER</u>	<u>TLD LOCATION</u>	<u>LOCATION DESCRIPTION</u>
27	SW1	SW site boundary
28	WSW1	WSW site boundary
29	W1	W site boundary
30	WNW1	WNW site boundary
31	NW1	NW site boundary
32	NNW1	NNW site boundary
33	NW4	Buckeye Rd., 0.5 miles west of 395th Ave.
34	NNW5	SE corner of 395th Ave. and Van Buren St.
35	NNW9	Palo Verde Inn Fire Station, 40901 W. Osborn Rd., Tonopah
36	N5	SW corner of Wintersburg Rd. and Van Buren St.
37	NNE5	SE corner of 363rd Ave. and Van Buren St.
38	NE5	SW corner of 355th Ave. and Buckeye Rd.
39	ENE5	343rd Ave., 0.5 miles south of Lower Buckeye Rd.
40	N3	Wintersburg, Transmission Rd. at telephone pole
41	WNW20	Marquahala Valley School, Van Buren St., 1 mile west of Steve Hartori Dr.
42	N8	Ruth Fisher School, Indian School Rd. and Wintersburg Rd.
43	N45	Vulture Peak School, 1 mile south of U.S. 60, Wickenburg
44	ENE35	APS El Mirage Office, 12313 W. Grand Ave.
45	E16	APS Buckeye Office, 615 N. 4th St., REMP trailer (lead pig)
46	ENE30	Litchfield Park School, 13825 W. Indian School Rd.
47	E35	Littleton School, 115th Ave. and Hwy. 85, Cashion
48	E24	Jackrabbit Trail south of I-10, north of Filmore St.
49	ENE11	Palo Verde Rd., 0.25 miles south of I-10
50	WNW5	Olinski Rd., 2 miles south of Buckeye-Salome Rd.



10

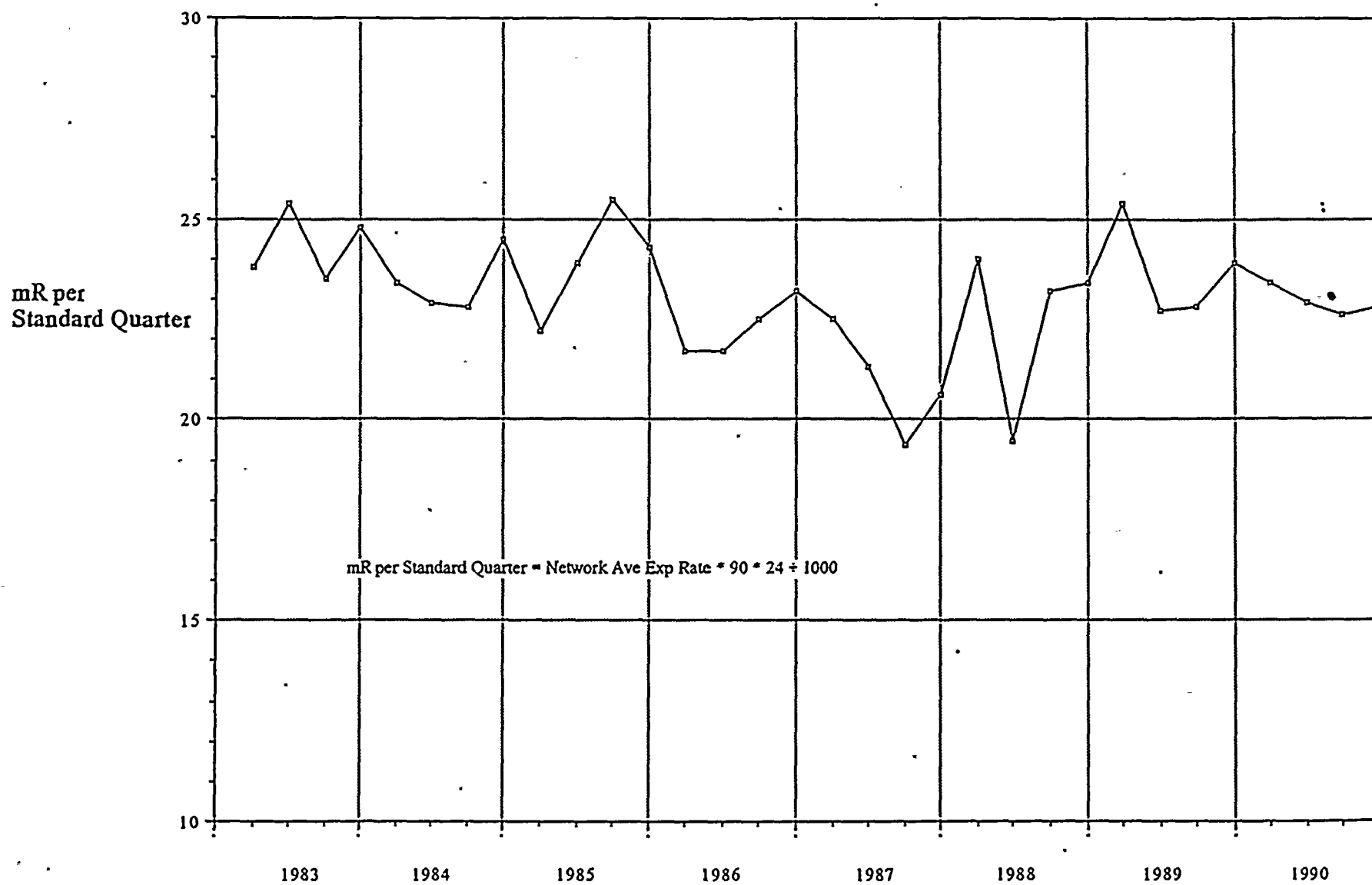


Table 9.2
1990 Environmental TLD Results

<u>Station</u>	<u>Otr</u> <u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>Average</u> <u>mR/Std Otr</u>
1	19.4	19.2	19.4	20.5	19.6
2	20.5	20.3	21.0	21.0	20.7
3	22.0	22.2	21.6	21.0	21.7
4	22.0	21.4	22.0	22.0	21.9
5	17.9	16.8	17.1	16.6	17.1
6	25.5	24.6	25.5	25.5	25.3
7	24.0	23.3	23.5	23.5	23.6
8	22.5	21.4	21.0	21.6	21.6
9	28.5	27.2	27.0	27.4	27.5
10	22.0	21.8	22.0	21.6	21.9
11	24.0	23.8	22.5	23.5	23.5
12	22.9	21.8	*	21.6	22.1
13	23.5	23.3	24.0	23.5	23.6
14	24.4	22.7	23.5	24.0	23.7
15	21.6	21.8	21.0	22.0	21.6
16	21.0	20.3	20.1	20.5	20.5
17	24.0	22.2	22.9	23.5	23.2
18	22.5	21.8	21.6	22.5	22.1
19	24.0	23.3	24.4	23.5	23.8
20	22.5	21.8	22.5	22.9	22.4
21	25.5	24.6	23.5	24.4	24.5
22	20.1	25.7	24.4	25.5	23.9
23	22.0	21.4	21.0	21.0	21.1
24	21.6	19.9	19.4	20.1	20.3
25	21.6	19.9	22.9	21.6	21.5
26	27.0	28.1	25.1	25.5	26.4
27	25.9	27.2	25.5	24.0	25.7
28	20.1	24.6	22.9	25.5	23.3
29	24.4	22.7	23.5	23.5	23.5
30	24.4	24.2	25.1	24.4	24.5
31	22.5	20.3	21.6	22.9	21.8
32	24.4	25.3	24.4	24.4	24.6
33	25.9	23.3	24.4	24.4	24.5
34	26.6	25.7	25.9	24.4	25.7
35	28.5	29.2	27.9	27.9	28.4
36	23.5	24.6	22.9	22.9	23.5
37	22.9	20.7	22.9	21.0	21.9
38	25.9	25.3	25.1	25.1	25.4
39	22.9	20.7	21.0	22.0	21.7
40	22.5	20.7	22.5	22.5	22.1
41	27.0	24.2	26.4	25.1	25.7
42	24.4	22.7	22.9	22.9	23.2
43	22.9	22.2	18.1	22.9	21.5
44	19.4	16.8	22.5	19.0	19.4
45	5.4	4.8	5.6	5.6	5.4
46	20.5	19.2	19.4	19.4	19.6
47	20.1	23.3	24.0	26.4	23.5
48	22.0	21.4	19.4	22.0	21.2
49	20.5	19.9	20.1	21.0	20.4
50	17.9	16.8	16.6	18.1	17.4



Figure 9.1
PVNGS Network TLD Exposure Rate



1983-1990 Quarterly TLD Results



10.0 Land Use Census

10.1 Introduction

In accordance with PVNGS Technical Specification 3.12.2, the annual Land Use Census was performed within a five mile radius of the midline of Unit 2 containment between November and December, 1990.

Observations were made in each of the 16 meteorological sectors to determine the nearest milking animals, residences, and gardens of greater than 500 square feet. This census was completed by driving the roads and speaking with residents within a five mile radius of PVNGS.

The results of the Land Use Census are presented in Table 10.1 and discussed below. The directions and distances listed are in sectors and miles from the Unit 2 containment. The mileage was estimated from map positions of each location. Unless otherwise stated, the actual location is the same as stated in the 1989 AREOR.

10.2 Census Results

10.2.1 Nearest Resident

There were two changes in the nearest resident status noted in the 1990 census. These changes were in the SSE and the WSW sectors.

10.2.2 Milking Animals

The milk goats that were located in the ENE sector in the 1989 census are no longer located in this location.

10.2.3 Vegetable Gardens

There was one change in the garden locations. The garden located in the N sector in the 1989 census is no longer in use.

10.3 Conclusion

Two changes were made to the REMP as a result of the 1990 Land Use Census. The milking animals (goats) located 5 miles ENE of PVNGS were deleted from the REMP as there were no replacement milk animals located within the 5 miles. The garden located 2 miles N of PVNGS was deleted from the REMP as there was no replacement garden located within the 5 miles.



TABLE 10.1

LAND USE CENSUS
(distances in miles)

SECTOR	NEAREST RESIDENT	NEAREST GARDEN	NEAREST MILK COW	ANIMAL GOAT	CHANGED LOCATION
N	1.77	NONE	NONE	NONE	GARDEN
NNE	1.66	NONE	NONE	NONE	
NE	2.10	NONE	NONE	NONE	
ENE	2.80	2.85	NONE	NONE	
E	2.89	NONE	NONE	NONE	
ESE	3.70	NONE	NONE	NONE	GOAT
SE	4.31	NONE	NONE	NONE	
SSE	4.42	NONE	NONE	NONE	
S	4.28	NONE	NONE	NONE	
SSW	NONE	NONE	NONE	NONE	
SW	2.65	NONE	NONE	NONE	RESIDENT
WSW	1.84	NONE	NONE	NONE	
W	NONE	NONE	NONE	NONE	
WNW	NONE	NONE	NONE	NONE	
NW	4.08	NONE	NONE	NONE	
NNW	2.51	NONE	NONE	NONE	



11.0 Summary and Conclusions

The conclusions are based on a review of the radioassay results and background gamma radiation measurements for the 1990 calendar year. The radioassay conclusions are based on observations of fission product radionuclides and do not include observations of naturally occurring radionuclides such as the uranium or thorium series, C-14, or K-40.

A summary of all sample results for 1990 is presented in Table 11.1. With the exception of on-site surface water and associated sludge, all sample assays presented in the annual report reveal no detectable man-made radioactivity which can be attributed to PVNGS. As reported in 1988 [10], I-131 concentrations in the Reservoir, Cooling Towers and Evaporation Ponds are the result of off-site sources and appear in the effluent sewage from Phoenix.

Natural background radiation is consistent with measurements reported in previous pre-operational and operational radiological environmental monitoring program annual reports. [1-10]

TABLE 11.1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Palo Verde Nuclear Generating Station
Maricopa County, Arizona

Docket Nos. 50-528, 50-529, 50-530
Calendar Year 1990

Medium or Pathway Sampled (unit of measurement)	Type and (Total Number of Analyses Performed)	All Indicator Locations Mean (a) Range	Location With Highest Annual Mean		Control Locations Mean (a) Range	Number of Non-routine Reported Measurements
			Name Distance & Direction	Mean (a) Range		
Air Particulates (pCi/m ³)	Gross Beta (596)	0.024 (596/596) 0.010 - 0.048	Site #21 3 miles 180°	0.025 (48/48) 0.011 - 0.047	0.024 (49/49) 0.011 - 0.044	0
	Gamma Spec Composites (141)	<LLD	NA	<LLD	<LLD	0
Air Radioiodine (pCi/m ³)	Radioiodine (585)	<LLD	NA	<LLD	<LLD	0
Broadleaf Vegetation (pCi/Kg-wet)	Gamma Spec (4)	<LLD	NA	<LLD	<LLD	0
Drinking Water (pCi/L)	Gross Beta (48)	6.5 (46/48) 3 - 18	Site #48 5 miles 190°	11.3 (11/12) 5 - 18	NA	0
	Gamma Spec (48)	<LLD	NA	<LLD	NA	0
	Iodine-131 (104)	<LLD	NA	<LLD	NA	0
	Tritium (48)	<LLD	NA	<LLD	NA	0
Groundwater (pCi/L)	Gamma Spec (8)	<LLD	NA	<LLD	NA	0
	Tritium (8)	<LLD	NA	<LLD	NA	0
	Iodine-131 (6)	<LLD	NA	<LLD	NA	0
Milk (pCi/L)	Gamma Spec (58)	<LLD	NA	<LLD	<LLD	0

TABLE 11.1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY (continued)

Medium or Pathway Sampled (unit of measurement)	Type and (Total Number of Analyses Performed)	All Indicator Locations Mean (a) Range	Location With Highest Annual Mean		Control Locations Mean (a) Range	Number of Non-routine Reported Measurements
			Name Distance & Direction	Mean (a) Range		
Surface Water (pCi/L)	Tritium (156)	770 (26/156) 600 - 1110	Site #63 Onsite 160°	810 (12/52) 680 - 1110	NA	0
	Gamma Spec I-131 (156)	11 (53/156) 4 - 28	Site #60 Onsite 70°	12 (35/52) 4 - 28	NA	0.

(a) Mean and range are based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses.



12.0 References

1. 1981 Annual Report, Palo Verde Nuclear Generating Station's Pre-Operational Radiological Monitoring Program.
2. 1982 Annual Report, Palo Verde Nuclear Generating Station's Pre-Operational Radiological Monitoring Program.
3. 1983 Annual Report, Palo Verde Nuclear Generating Station's Pre-Operational Radiological Monitoring Program.
4. 1984 Annual Report, Palo Verde Nuclear Generating Station's Pre-Operational Radiological Monitoring Program.
5. Palo Verde Nuclear Generating Station's Pre-Operational Radiological Monitoring Program, Summary Report 1979-1985.
6. 1985 Annual Report, Arizona Nuclear Power Project Operational Radiological Environmental Monitoring Program.
7. 1986 Annual Report, Arizona Nuclear Power Project Operational Radiological Environmental Monitoring Program.
8. 1987 Annual Report, Arizona Nuclear Power Project Operational Radiological Environmental Monitoring Program.
9. Operational Radiological Environmental Monitoring Program Report for 1987; Arizona State University, Radiation Measurements Facility.
10. Annual Radiological Environmental Operating Report for 1988; Arizona State University, Radiation Measurements Facility.
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12. Annual Radiological Environmental Operating Report for 1989; Arizona State University, Radiation Measurements Facility.