

**Florida
Power**

CORPORATION
Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72

May 15, 2000
3F0500-04

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: 1999 Annual Radiological Environmental Operating Report

Dear Sir:

Florida Power Corporation hereby submits the 1999 Annual Radiological Environmental Operating Report for Crystal River Unit 3 (CR-3) in accordance with the CR-3 Improved Technical Specifications, Section 5.7.1.1(b) and Section 6.6 of the Offsite Dose Calculation Manual (ODCM). The data provided in the attached report is consistent with the objectives outlined in the ODCM. All radiological environmental samples taken during the report period, January 1, 1999 through December 31, 1999, are summarized and tabulated in the format found in the Radiological Assessment Branch Technical Position, Revision 1, November 1979.

If you have any questions regarding this submittal, please contact Mr. Sid Powell, Manager, Nuclear Licensing at (352) 563-4883.

Sincerely,

D. L. Roderick
Director, Nuclear Plant Operations

DLR/ff

Attachment

xc: NRR Project Manager
Regional Administrator, Region II
Senior Resident Inspector

IE25

FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
1999

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Date 5/11/00

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INTRODUCTION

This report is submitted as required by Technical Specification 5.7.1.1(b) to the Crystal River Facility Operating License No. DPR-72, and Section 6.6 of the Offsite Dose Calculation Manual.

The following information is required to be included in this report:

- Data Summaries
- Interpretations
- Unachievable LLDs
- An analysis of trends
- An assessment of any observed impact of plant operation on the environment

NOTE: If harmful effects or evidence of irreversible damage are detected by the monitoring, the report shall provide an analysis of the problem and a planned course of action to correct it.

- Summarized and tabulated results of all radiological environmental samples taken during the report period, in the format of Radiological Assessment Branch Technical Position, Revision 1, November, 1979

NOTE: If some results are not available for inclusion, the report shall note and explain the reason for the missing results. The missing results shall be submitted as soon as possible in a supplementary report.

- A summary description of the Radiological Environmental Monitoring Program
- A map of all sampling locations keyed to a table giving distances and directions from the reactor
- Land-use census results
- Interlaboratory Comparison Program results

I. SUMMARY DESCRIPTION OF THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The analytical results of the Crystal River Unit 3 (CR-3) operational Radiological Environmental Monitoring Program (REMP) for 1999 are contained in this report. The operational program began on January 1, 1977 just prior to initial criticality, which was achieved on January 14, 1977.

Sampling of the facility environs is performed by the Florida Department of Health, Bureau of Radiation Control. The State also performs the required analyses, participates in the Interlaboratory Comparison Program, and performs the annual land-use census. Prior to 1990, the program was split between the Department of Health and the University of Florida. The transition to the State performing all of the programs sampling and analysis in 1990 is evident in several of the trend graphs, most notably oysters and carnivorous fish, and is due to the State using less sensitive measurement techniques for several of the pathways which were formerly evaluated by the University of Florida.

Sample station locations are given in Table I-1 and Figures I-2, -3, and -4. Sample frequency and analysis type may be determined from Table I-2. Figure I-1 illustrates the relevant exposure pathways.

Except for air sample gross beta results and direct radiation measurements, most of the analytical results are below the lower limit of detection (LLD) of the sample. Sample LLDs are generally much lower than the required "a priori" LLD. When measurable results are reported, the values are also usually less than the required "a priori" LLD.

The results of the 1999 REMF have been compared to previous years' results. This comparison, in part illustrated by the trend graphs of Section IV, shows no evidence of consistent long-term increasing trends in any of the sample media. However, radioactive material is routinely quantified in sediment samples which are taken in the discharge canal near the liquid release discharge point. In general, these results verify the effectiveness of in-plant measures for controlling radioactive releases.

Trend graphs illustrate the mean measured concentration of a particular radionuclide for the year. When measurable results are not obtained, the highest sample LLD is plotted. LLD and measured values are plotted on the same line to best illustrate any trend. As shown on each graph's key, shaded boxes indicate LLD values, while open boxes indicate measured values.

Statistical summary pages are provided for each medium or pathway. Measured values are reported in terms of a mean and range. In addition, the number of measured values versus samples obtained is reported. For example, the following entry

15 (249/256)
(4 - 35)

in the "All Indicator Locations" column would be interpreted as indicating a mean measured value of 15, with measured values ranging from 4 to 35. (249/256) means that out of 256 samples 249 were measured values.

TABLE I-1

FLORIDA POWER CORP. - CR3 - 1999

SAMPLE STATION LOCATIONS

SAMPLE MEDIA	STATION ID	DIRECTION	DISTANCE
TLD	C60	N	4400 Ft.
	C61	NNE	4400
	C62	NE	5300
	C63	ENE	4400
	C64	E	4400
	C65	ESE	1740
	C66	SE	1600
	C67	SSE	1480
	C68	S	1500
	C69	SSW	1780
	C41	SW	2100
	C70	WSW	4400
	C71	WNW	3600
	C72	NW	2400
	C73	NNW	2000
	C27	W	3400
	C18	N	5.2 Mi.
	C03	NNE	5.3
	C04	NE	6.3
	C74	ENE	5.5
	C75	E	4.2
	C76	ESE	5.4
	C08	SE	3.5
	C77	SSE	3.2
	C09	S	3.2
	C78	WSW	4.1
	C14G	W	2.8
	C01	NW	4.9
	C79	NNW	5.0
	C47-Control	ESE	80
	C07*	ESE	7.5 Mi.
	C40*	E	3.5 Mi.
	C46*	N	2000 Ft.

*TLDs not required by ODCM. Deployed at air sample locations.

TABLE I-1 (CONT'D)
FLORIDA POWER CORP. - CR3 - 1999
SAMPLE STATION LOCATIONS

SAMPLE MEDIA	STATION ID	DIRECTION	DISTANCE
AIR	C07	ESE	7.5 Mi.
	C18	N	5.2
	C40	E	3.5
	C41	SW	0.4
	C46	N	0.4
	C47-Control	ESE	80
SEAWATER	C14H	NW	0.1
	C14G	W	2.8
	C13-Control	WSW	3.4
GROUND WATER	C40-Control	E	3.5
DRINKING WATER	C07-Control	ESE	7.5
	C10-Control	ESE	5.9
	C18-Control	N	5.2
SHORELINE SEDIMENT	C09-Control	S	3.2
	C14H	NW	0.1
	C14M	W	1.2
	C14G	W	2.8
FISH & OYSTERS	C29	W	2.0
	C30-Control	WSW	3.6
BROAD LEAF VEGETATION	C48A	N	0.8
	C48B	NNE	0.8
	C47-Control	ESE	80
WATERMELON	C04	ENE	6.3
CITRUS	C19	ENE	8.5

TABLE I-2
FLORIDA POWER CORP. - CR3 - 1999
SAMPLING AND ANALYSIS PROGRAM

SAMPLE MEDIA	# OF STATIONS	FREQUENCY	ANALYSIS	LLD ¹	
TLD	33*	Quarterly	γ Dose	---	
Air Iodine	6	Weekly	I-131	0.07 pCi/m ³	
Air Particulate	6	Weekly	Gross β	0.01	
		Quarterly	γ Spec :	Cs-134	0.05
			Cs-137	0.06	
Seawater	3	Monthly	Tritium	3000 pCi/L	
		Monthly	γ Spec :	Mn-54	15
				Fe-59	30
				Co-58	15
				Co-60	15
				Zn-65	30
				Zr-Nb-95	15
				I-131	1
				Cs-134	15
				Cs-137	18
Ba-La-140	15				
Ground Water	1	Semiannual	Tritium	2000 pCi/L	
		Semiannual	γ Spec :	²	
Drinking Water	3	Quarterly	Tritium	2000 pCi/L	
		Quarterly	γ Spec :	²	
Shoreline Sediment	4	Semiannual	γ Spec :	Cs-134	150 pCi/kg
				Cs-137	180

*Includes 3 stations which are not required by the ODCM

¹The maximum "a priori" LLD

²Same as Seawater γ Spec

³When available

⁴During harvest

⁵Same as broad leaf vegetation

TABLE I-2 (Cont'd)
FLORIDA POWER CORP. - CR3 - 1999
SAMPLING AND ANALYSIS PROGRAM

SAMPLE MEDIA	# OF STATIONS	FREQUENCY	ANALYSIS	LLD ¹	
Carnivorous Fish and Oysters	2	Quarterly	γ Spec :	Mn-54	130 pCi/kg
				Fe-59	260
				Co-58	130
				Co-60	130
				Zn-65	260
				Cs-134	130
				Cs-137	150
Broad Leaf Vegetation	3	Monthly ³	γ Spec :	I-131	60 pCi/kg
				Cs-134	60
				Cs-137	80
Watermelon	1	Annual ⁴	γ Spec :	⁵	⁵
Citrus	1	Annual ⁴	γ Spec :	⁵	⁵

¹The maximum "a priori" LLD

²Same as Seawater γ Spec

³When available

⁴During harvest

⁵Same as broad leaf vegetation

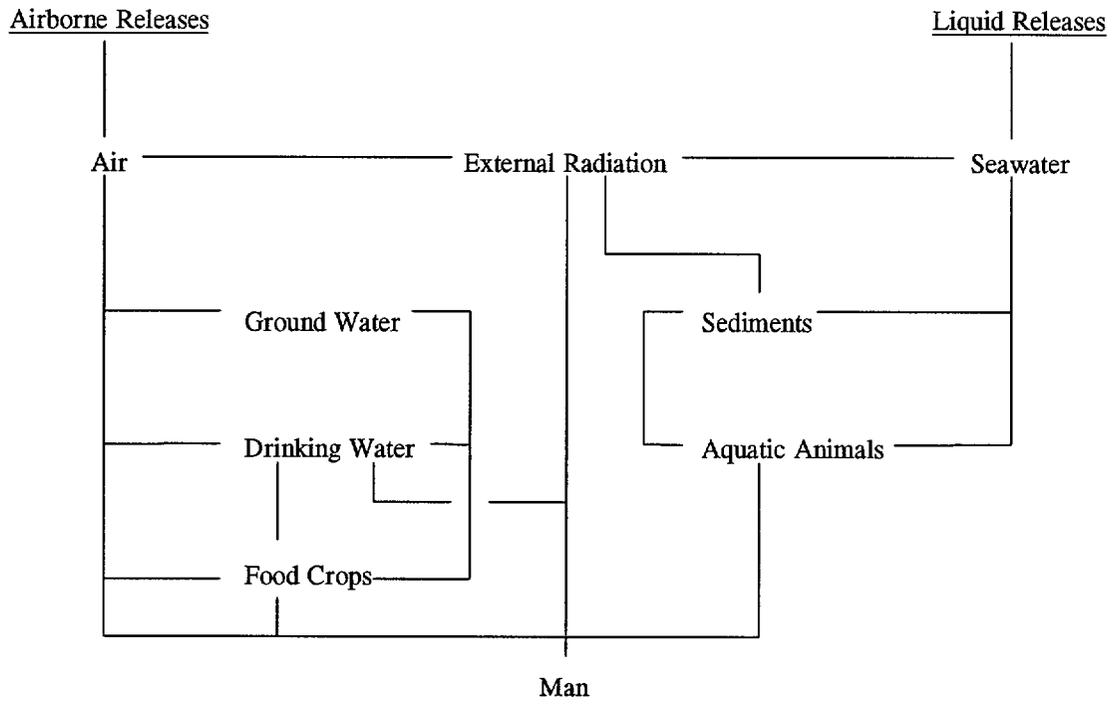


FIGURE I-1: Environmental Media and Exposure Pathways

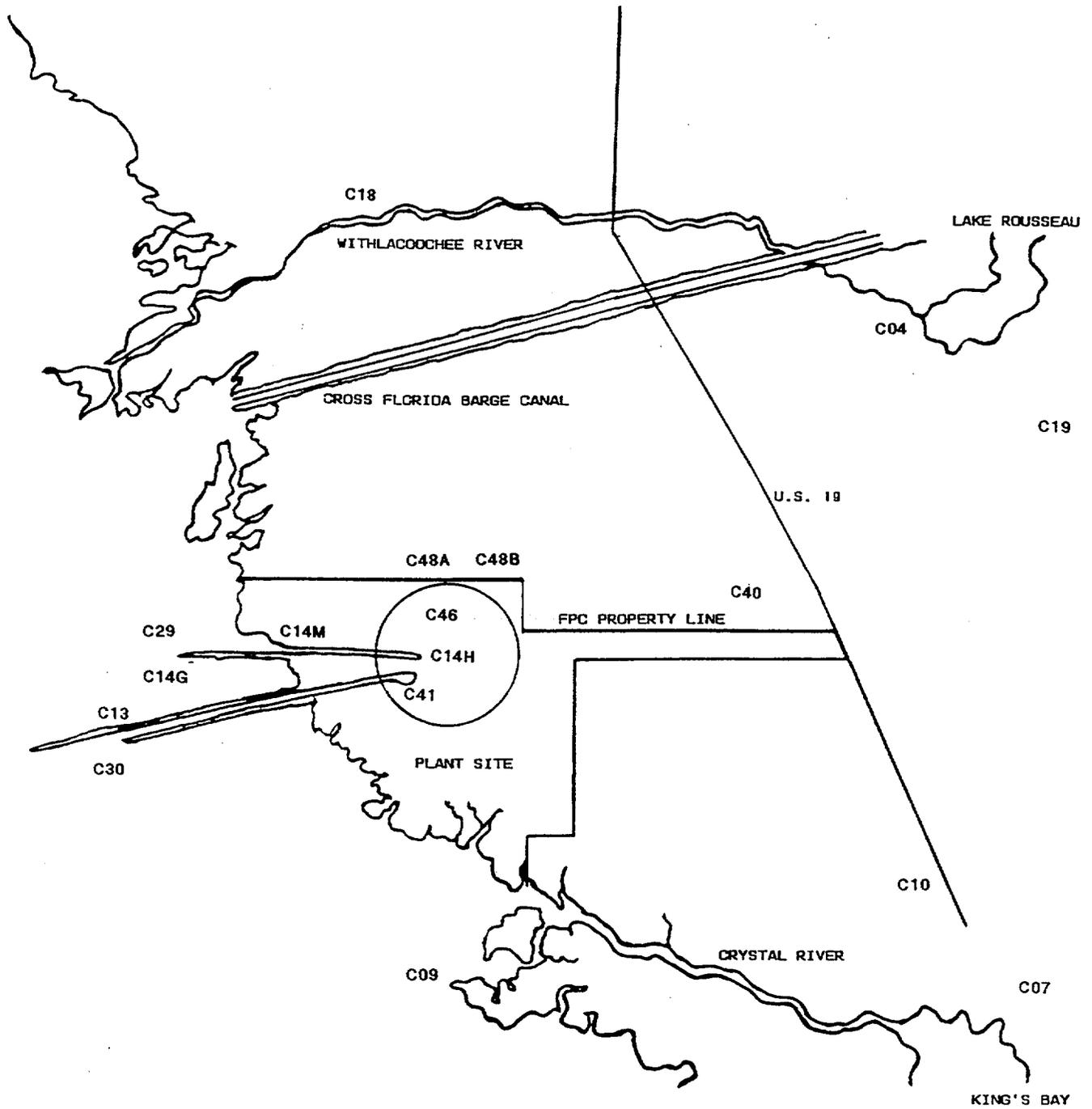


FIGURE I-2: Environmental Monitoring Sample Stations (non-TLDs)

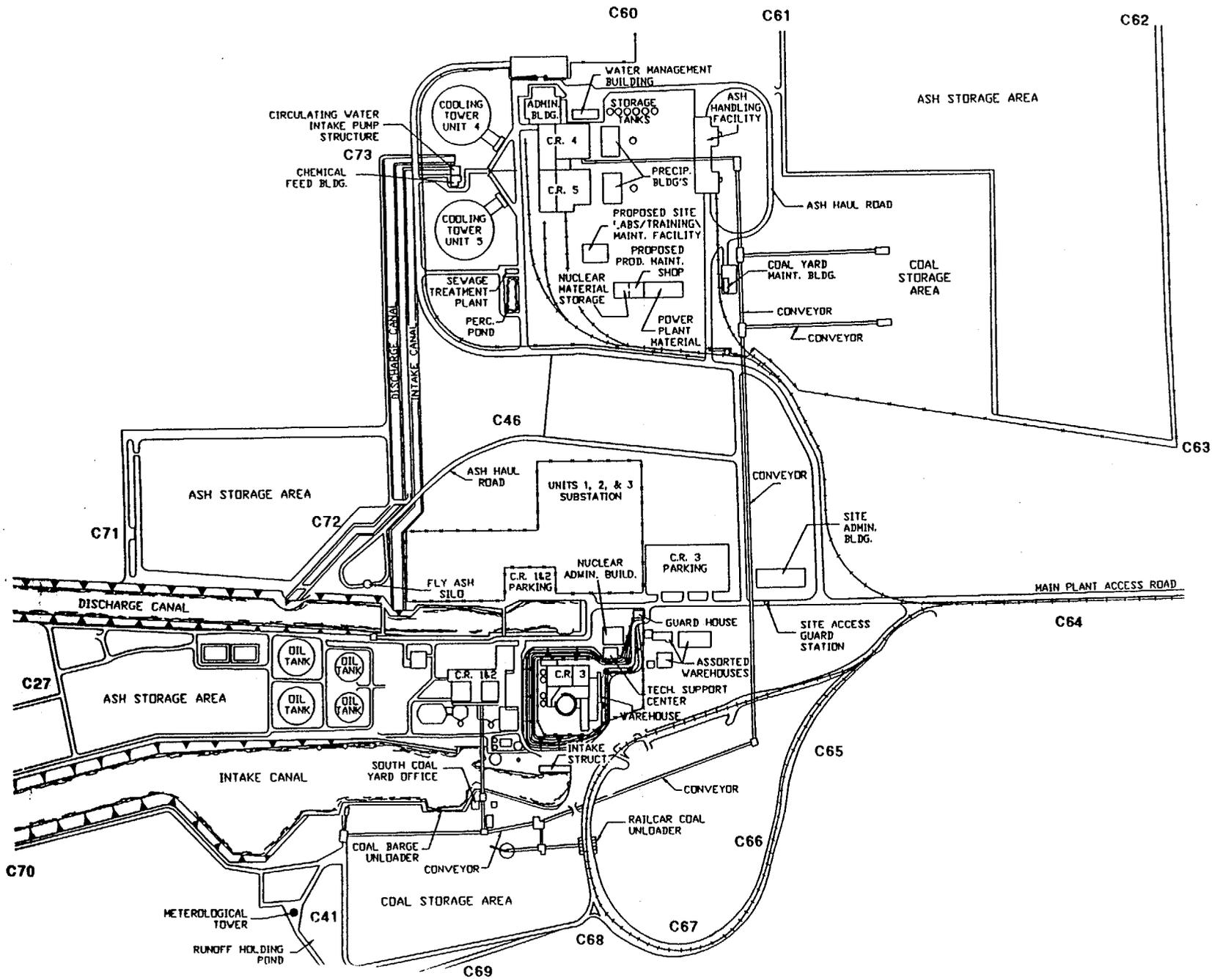


FIGURE I-3: Environmental Monitoring TLD Locations (on site)

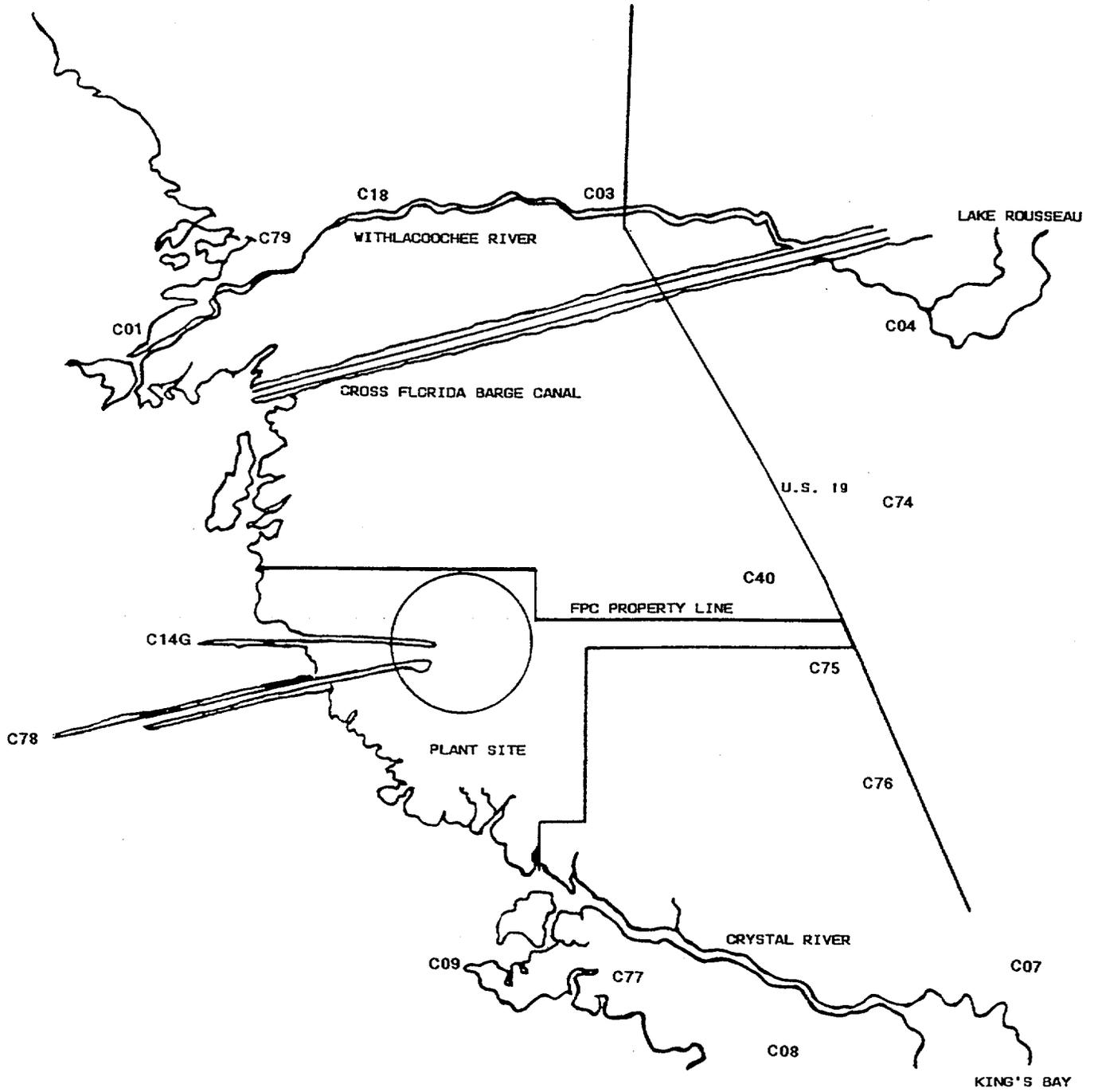


FIGURE I-4: Environmental Monitoring TLD Locations (off site)

II. LAND-USE CENSUS

A land-use census was conducted in June and July. The purpose of this census is to identify the nearest residences, vegetable gardens, and potential milk-producing animals within a five mile radius of the nuclear plant. The distance in miles and bearing in degrees for each receptor type in each of the sixteen sectors is summarized below.

SECTOR	NEAREST RESIDENCE	NEAREST GARDEN	NEAREST MILK ANIMAL
N	4.5 @ 5°	4.8 @ 8°	*
NNE	4.6 @ 18°	4.8 @ 19°	*
NE	3.8 @ 56°	4.1 @ 50°	*
ENE	3.4 @ 63°	4.2 @ 62°	*
E	2.4 @ 96°	4.3 @ 100°	*
ESE	4.3 @ 105°	4.3 @ 105°	*
SE	4.7 @ 136°	*	*
SSE	3.5 @ 152°	*	*
S	*	*	*
SSW	*	*	*
SW	*	*	*
WSW	*	*	*
W	*	*	*
WNW	*	*	*
NW	4.8 @ 323°	*	*
NNW	4.6 @ 341°	4.6 @ 341°	*

* No suitable sites were located within 5 miles.

FLORIDA DEPARTMENT OF HEALTH - INTERLABORATORY COMPARISON PROGRAM DATA

The EPA crosscheck program ceased operation at the end of 1998. To meet the requirements for a crosscheck program, the Florida Department of Health participates in the Department of Energy's Environmental Measurements Laboratory (EML) Quality Assessment Program.

The following units are used for each of the four media:

Air Filters: Bq/filter
 Soil: Bq/kg
 Vegetation: Bq/kg
 Water: Bq/L

1 pCi = 0.027 Bq

Analytical performance is based on historical analytical capabilities for individual analyte/matrix pairs. Acceptable performance is designated by an "A" and means that the value is between the 15th and 85th percentile for the cumulative normalized distribution. Warning is designated by a "W" and means that the value is between the 5th and 15th percentiles or between the 85th and 95th percentiles. Performance which is not acceptable is designated by an "N" and means that the value is less than the 5th percentile or greater than 95th percentile.

Results for March 1999:

Media	Nuclide	Reported Value	Reported Error	EML Value	EML Error	Reported/EML	Evaluation
Air	Am-241	0.14	0.02	0.1337	0.0012	1.047	A
Air	Co-57	3.03	0.03	3.01	0.14	1.007	A
Air	Co-60	5.4	0.07	4.96	0.28	1.089	A
Air	Cs-137	7.26	0.1	6.05	0.3	1.2	W
Air	Gross Alpha	1.35	0.06	1.61	0.16	0.839	A
Air	Gross Beta	1.65	0.06	1.56	0.16	1.058	A
Air	Sb-125	3.7	0.1	3.59	0.31	1.031	A
Soil	Am-241	4.3	0.6	4.8943	0.969	0.879	A
Soil	Cs-137	616.0	2.0	659.5	24.95	0.934	A
Soil	K-40	343.0	7.0	362.75	20.156	0.946	A
Soil	U-238	100.0	5.0	145.0	1.732	0.69	A
Vegetation	Am-241	4.0	0.7	3.522	0.5898	1.136	A
Vegetation	Co-60	21.6	0.5	21.45	1.0	1.007	A
Vegetation	Cs-137	472.0	2.0	467.0	20.0	1.011	A
Vegetation	K-40	657.0	10.0	656.5	20.0	1.001	A
Water	Am-241	1.6	0.4	1.146	0.0505	1.396	W
Water	Co-60	53.3	0.5	51.1	3.0	1.043	A
Water	Cs-137	42.3	0.6	39.375	2.4047	1.074	A
Water	Gross Alpha	1253.2	9.4	1090.0	20.0	1.15	A
Water	Gross Beta	1233.5	7.5	1100.0	40.0	1.121	A
Water	H-3	134.5	3.73	121.08	6.78	1.111	A
Water	Ni-63	91.72	1.04	114.0	10.0	0.805	A
Water	Sr-90	0.422	0.005	4.104	0.0453	0.103	N

Results for December 1999:

Media	Nuclide	Reported Value	Reported Error	EML Value	EML Error	Reported/ EML	Evaluation
Air	Am-241	0.160	0.020	0.127	0.010	1.260	A
Air	Co-57	8.740	0.040	7.730	0.033	1.131	W
Air	Co-60	7.330	0.060	6.350	0.410	1.154	W
Air	Cs-137	8.400	0.080	6.430	0.420	1.306	W
Air	Gross Alpha	2.570	0.090	2.770	0.260	0.928	A
Air	Gross Beta	3.200	0.080	2.660	0.260	1.203	A
Air	Mn-54	10.390	0.090	7.910	0.450	1.314	W
Air	Ru-106	5.400	0.400	5.500	1.760	0.982	A
Soil	Ac-228	118.000	2.000	124.000	4.800	0.952	A
Soil	Am-241	1.800	0.600	1.440	0.190	1.250	A
Soil	Bi-214	71.000	1.000	69.500	1.800	1.022	A
Soil	Cs-137	188.000	1.000	204.000	5.000	0.922	A
Soil	K-40	748.000	10.000	780.000	27.000	0.959	A
Soil	Pb-212	113.700	2.200	127.000	4.800	0.895	W
Soil	Pb-214	222.000	3.000	72.000	0.420	3.083	N
Soil	U-238	142.000	7.000	202.000	7.200	0.703	A
Vegetation	Am-241	6.000	0.800	2.880	0.220	2.083	W
Vegetation	Co-60	21.100	0.600	17.600	1.000	1.199	A
Vegetation	Cs-137	533.000	3.000	440.000	20.000	1.211	A
Vegetation	K-40	615.000	10.000	513.000	20.000	1.199	A
Water	Am-241	1.200	0.400	0.850	0.100	1.412	W
Water	Co-60	54.200	0.400	52.400	2.200	1.034	A
Water	Cs-137	78.400	0.600	76.000	3.400	1.032	A
Water	Gross Alpha	1655.400	8.300	1580.00	20.000	1.048	A
Water	Gross Beta	1008.400	4.500	740.000	40.000	1.363	W
Water	H-3	92.740	3.240	80.700	3.700	1.149	A
Water	Sr-90	1.340	0.020	1.720	0.100	0.779	W

IV-A. AIRBORNE PATHWAY

Air samples are taken at five locations in the vicinity of the plant. The control location is 80 miles ESE of the plant, at the State Bureau of Radiation Control in Orlando.

Table IV-A.1 provides a statistical summary of the analytical results for 311 gross beta samples and 311 iodine samples.

Tables IV-A.2 and IV-A.3 provide the results for each weekly air sample.

Of 311 particulate samples analyzed for gross beta activity, 310 had measurable activity. The average indicator concentration was 15 pCi/1000 m³ with a range of 3 to 31 pCi/1000 m³. The average indicator concentration for 1996 through 1998 was also 15 pCi/1000 m³. The control location concentration for 1999 averaged 15 pCi/1000 m³, with a range of 4 to 25 pCi/1000 m³.

Three hundred and eleven samples were analyzed for iodine activity, with none having measurable activity.

Quarterly composite data are summarized in Table IV-A.4. Measurable quantities of cesium were not identified. The highest cesium LLD was 1.2 pCi/1000 m³ for cesium 134, which is the same as 1998.

The gross beta LLD of 0.01 pCi/m³ and Iodine 131 LLD of 0.07 pCi/m³ were not attained for air sample station C40 during the period 11/23 through 12/06 due to a power outage.

TABLE IV-A.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS MEAN RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE & BEARING	MEAN RANGE	CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
AIRBORNE IODINE (pCi/m ³)	γ Spec 311 I-131	0.012	<LLD	-	-	<LLD	0
AIRBORNE PARTICULATES (pCi/1000m ³ for Gross β , pCi/1000m ³ for γ Spec)	Gross β 311 γ Spec 24 Cs-134 Cs-137	4.6	15 (254/256) (3 - 31)	C18 5.2 @ 3°	15 (52/52) (5 - 31)	15 (52/52) (4 - 25)	0
		0.8	<LLD	-	-	<LLD	0
		0.8	<LLD	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-A.2

FLORIDA POWER CORP. - CR3 - 1999

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
01-04	<.02	<.02	<.02	<.02	<.02	<.02
01-11	<.03	<.03	<.03	<.03	<.03	<.03
01-19	<.02	<.02	<.02	<.02	<.02	<.02
01-25	<.03	<.03	<.03	<.03	<.03	<.03
02-01	<.02	<.02	<.02	<.02	<.02	<.02
02-08	<.02	<.02	<.02	<.02	<.02	<.02
02-16	<.02	<.02	<.02	<.02	<.02	<.02
02-22	<.02	<.01	<.01	<.02	<.01	<.01
03-01	<.02	<.02	<.02	<.02	<.02	<.02
03-08	<.02	<.02	<.02	<.02	<.02	<.02
03-15	<.03	<.03	<.03	<.03	<.03	<.03
03-22	<.02	<.02	<.02	<.02	<.02	<.02
03-29	<.02	<.02	<.02	<.02	<.02	<.02
04-05	<.03	<.03	<.03	<.03	<.03	<.03
04-12	<.02	<.02	<.02	<.02	<.02	<.02
04-19	<.02	<.02	<.02	<.02	<.02	<.02
04-26	<.03	<.02	<.02	<.03	<.02	<.03

TABLE IV-A.2 (Cont'd)
FLORIDA POWER CORP. - CR3 - 1999

pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
05-03	<.01	<.01	<.01	<.01	<.01	<.01
05-11	<.01	<.01	<.01	<.01	<.01	<.01
05-17	<.02	<.02	<.03	<.03	<.03	<.02
05-24	<.02	<.02	<.01	<.02	<.02	<.02
06-01	<.01	<.01	<.01	<.01	<.01	<.01
06-07	<.02	<.02	<.02	<.02	<.02	<.02
06-14	<.02	<.02	<.02	<.02	<.02	<.02
06-21	<.02	<.02	<.02	<.02	<.02	<.02
06-28	<.01	<.01	<.01	<.01	<.01	<.01
07-06	<.01	<.01	<.01	<.01	<.01	<.01
07-13	<.01	<.01	<.01	<.01	<.01	<.01
07-19	<.03	<.03	<.03	<.03	<.03	<.03
07-26	<.02	<.02	<.02	<.02	<.02	<.02
08-02	<.02	<.02	<.02	<.02	<.02	<.02
08-09	<.02	<.02	<.02	<.02	<.02	<.02
08-16	<.02	<.02	<.02	<.02	<.02	<.02
08-23	<.02	<.02	<.02	<.02	<.02	<.02
08-30	<.01	<.01	<.01	<.02	<.01	<.01

TABLE IV-A.2 (Cont'd)
FLORIDA POWER CORP. - CR3 - 1999
pCi/m³ IODINE - 131 IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
09-07	<.02	<.02	<.02	<.02	<.02	<.02
09-13	<.02	<.02	<.02	<.02	<.02	<.02
09-21	<.02	<.02	<.02	<.02	<.02	<.02
09-27	<.02	<.02	<.02	<.02	<.02	<.02
10-04	<.03	<.03	<.03	<.03	<.03	<.03
10-11	<.02	<.02	<.02	<.02	<.02	<.02
10-19	<.01	<.01	<.01	<.01	<.01	<.01
10-25	<.02	<.02	<.02	<.02	<.02	<.02
11-01	<.02	<.02	<.02	<.02	<.02	<.02
11-08	<.03	<.03	<.03	<.03	<.03	<.03
11-15	<.02	<.02	<.02	<.02	<.02	<.02
11-23	<.02	<.02	<.02	<.02	<.02	<.02
11-29	<.03	<.03	<.05	<.03	<.03	<.03
12-06	<.03	<.03	-----	<.03	<.03	<.03
12-14	<.02	<.02	<.02	<.02	<.02	<.02
12-20	<.03	<.03	<.03	<.04	<.04	<.03
12-28	<.02	<.02	<.02	<.02	<.02	<.02

TABLE IV-A.3

FLORIDA POWER CORP. - CR3 - 1999

pCi/1000m³ GROSS β IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
01-04	15	15	12	12	17	17
01-11	17	13	13	19	17	18
01-19	9	16	10	13	8	17
01-25	18	14	14	21	18	19
02-01	10	18	10	16	17	16
02-08	17	12	17	16	10	21
02-16	13	12	17	13	15	14
02-22	15	13	5	12	11	18
03-01	8	18	15	24	12	20
03-08	19	16	17	12	16	18
03-15	11	13	7	20	18	21
03-22	17	15	16	15	18	18
03-29	23	18	14	22	16	24
04-05	22	18	11	21	20	18
04-12	17	18	12	11	14	15
04-19	10	17	13	19	13	16
04-26	19	20	15	20	22	15

TABLE IV-A.3 (Cont'd)

FLORIDA POWER CORP. - CR3 - 1999

pCi/1000m³ GROSS B IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
05-03	13	7	11	11	9	13
05-11	12	16	12	12	13	10
05-17	16	13	12	15	12	11
05-24	11	14	12	13	8	10
06-01	17	20	13	4	19	19
06-07	12	14	5	15	12	10
06-14	8	8	9	8	9	10
06-21	11	6	6	7	11	5
06-28	9	8	3	8	7	8
07-06	7	11	10	13	7	8
07-13	12	17	9	14	16	14
07-19	6	14	5	11	6	11
07-26	11	12	8	10	10	8
08-02	18	16	14	16	19	15
08-09	12	18	17	12	19	16
08-16	7	22	14	14	15	14
08-23	6	6	7	9	6	4
08-30	8	5	8	7	7	6

TABLE IV-A.3 (Cont'd)
FLORIDA POWER CORP. - CR3 - 1999

pCi/1000m³ GROSS β IN AIR

COLLECTION DATE	C07	C18	C40	C41	C46	C47
09-07	15	17	18	17	17	15
09-13	15	18	10	17	18	15
09-21	13	13	14	12	16	12
09-27	12	12	15	13	9	15
10-04	6	9	10	12	9	9
10-11	15	18	12	17	13	14
10-19	16	17	18	17	14	11
10-25	11	14	18	17	16	20
11-01	24	23	23	23	20	23
11-08	13	20	15	21	20	19
11-15	24	31	24	21	23	25
11-23	10	20	17	19	24	9
11-29	<7	14	9	8	12	17
12-06	19	24	---	21	15	18
12-14	16	20	17	18	10	16
12-20	9	16	13	15	13	14
12-28	18	22	24	21	23	22

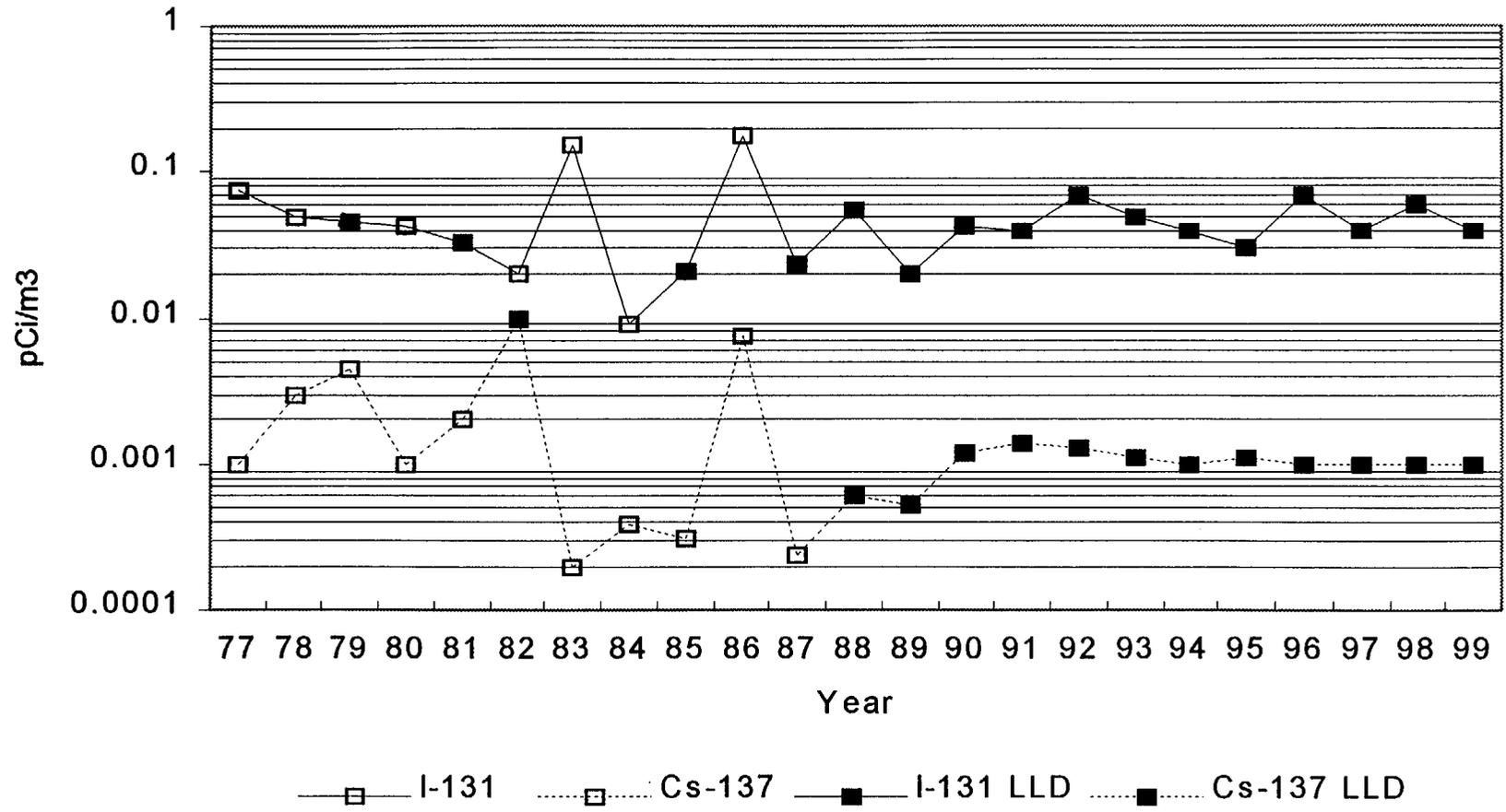
TABLE IV-A.4

FLORIDA POWER CORP. - CR3 - 1999

pCi/1000m³ γ EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATES

STATION	NUCLIDE	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
C07	Be-7	124	116	73	111
	K-40	<17	<19	<20	<17
	Cs-134	<0.8	<0.8	<0.8	<0.9
	Cs-137	<0.6	<0.6	<0.7	<0.6
C18	Be-7	119	136	84	130
	K-40	<17	<17	<18	<15
	Cs-134	<0.8	<0.8	<0.9	<0.9
	Cs-137	<0.9	<1.0	<0.9	<1.0
C40	Be-7	98	91	79	129
	K-40	<18	<23	<18	<19
	Cs-134	<0.8	<1.2	<0.9	<1.1
	Cs-137	<0.7	<0.9	<0.9	<0.9
C41	Be-7	127	110	111	128
	K-40	<19	<21	<17	<17
	Cs-134	<0.6	<0.8	<0.7	<0.5
	CS-137	<0.8	<0.7	<0.8	<0.9
C46	Be-7	113	114	85	99
	K-40	<16	<18	<18	<19
	Cs-134	<1.0	<1.0	<0.8	<0.8
	Cs-137	<0.5	<0.5	<0.7	<0.8
C47	Be-7	172	135	84	131
	K-40	<16	<18	<16	<18
	Cs-134	<0.9	<0.5	<0.7	<0.7
	Cs-137	<0.9	<0.8	<0.7	<0.8

Airborne



IV-B. DIRECT RADIATION

Direct radiation measurements (using TLDs) were taken at seventeen locations (stations C60 through C73 and station C27) within one mile of the plant, at fifteen locations ranging from 2.8 to 6.3 miles from the plant, and at one control location 78 miles from the site. The highest on-site dose was 122 mrem/yr at station C71 (WNW at 3600 feet). Station C71 was relocated in 1992 due to construction of the helper cooling towers on the former site. The new location has a higher background radiation level due to being closer to the storage pond for Units 4 & 5 fly ash, which produces a higher external radiation component than normal levels of natural background.

The highest off-site dose was 63 mrem/yr at station C40 (east at 3.5 miles). The control station (C47) dose was 48 mrem/yr. The average for all stations was 57 mrem/yr for 1999 and 51 mrem/yr for 1998. Direct radiation results are similar to previous years and show no change of significance.

TABLE IV-B

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)	<u>ALL INDICATOR LOCATIONS MEAN RANGE</u>	<u>LOCATION WITH HIGHEST MEAN</u>		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
				NAME DISTANCE & BEARING	MEAN RANGE		
DIRECT RADIATION (mrem/yr)	γ DOSE 132	15	57 (128/128) (40 - 128)	C71 0.5 @ 280°	122 (4/4) (117 - 128)	48 (4/4) (46 - 49)	0

TABLE IV-B.1

FLORIDA POWER CORP. - CR-3 - 1999

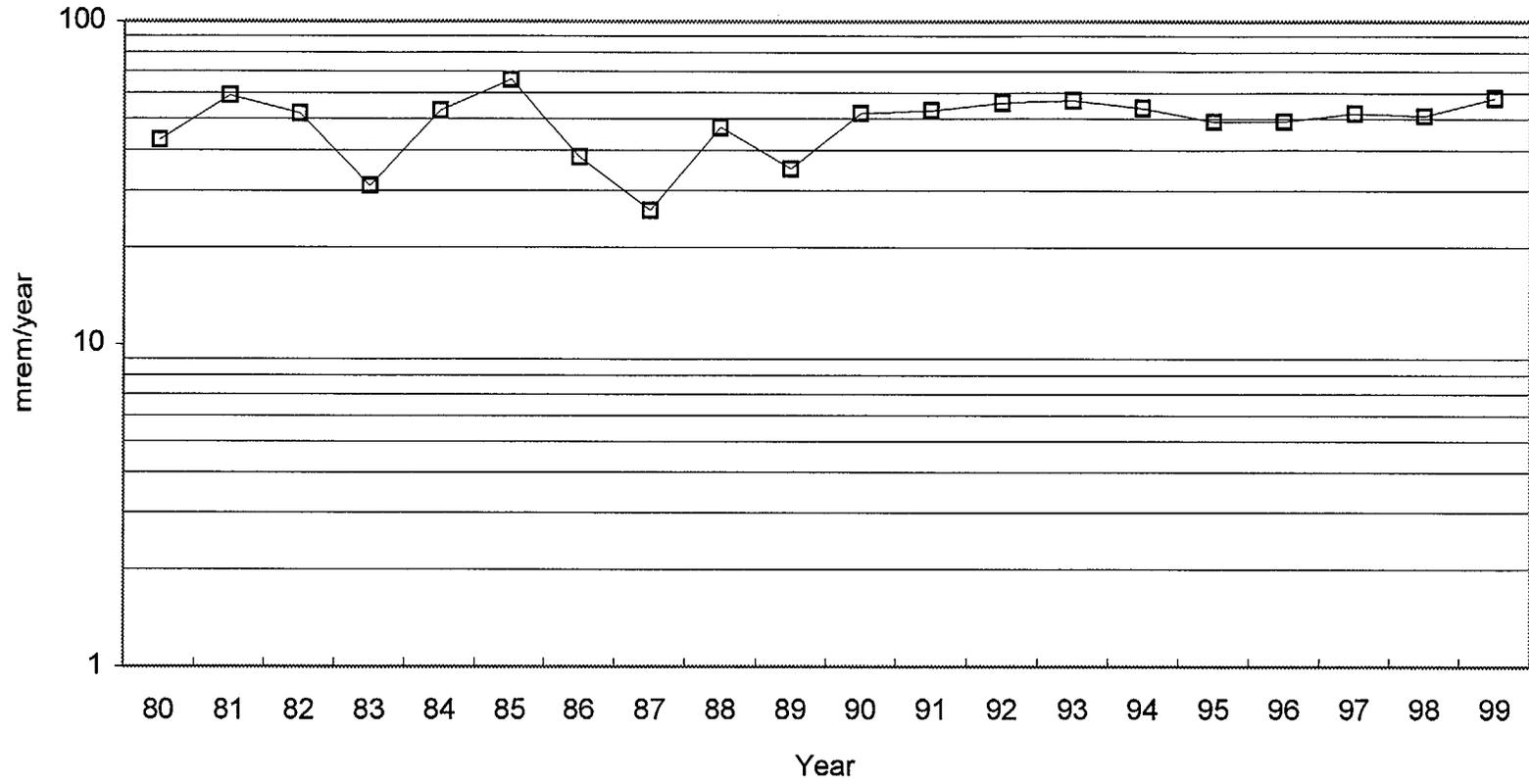
mrem/yr γ Dose

TLD STATION	Quarter	1	2	3	4
CO1		48	46	46	46
CO3		47	46	44	46
CO4		46	47	43	47
CO7*		43	45	40	43
CO8		44	46	42	40
C09		44	45	43	41
C14G		54	53	54	53
C18		48	50	51	47
C27		69	69	67	61
C40*		62	65	62	61
C41		61	64	56	53
C46*		55	58	56	57
C47 (CONTROL)		47	49	47	46
C60		58	59	56	53
C61		59	63	60	59
C62		67	67	64	64
C63		60	62	60	61
C64		58	60	59	57
C65		71	74	70	74
C66		60	60	57	61
C67		68	67	66	60
C68		60	60	60	57
C69		62	64	60	60
C70		64	65	66	63
C71		120	128	117	122
C72		63	65	62	63
C73		54	58	55	53
C74		43	46	41	42
C75		56	58	53	53
C76		49	51	48	48
C77		41	43	41	42
C78		46	45	43	41
C79		50	51	48	46

*TLDs not required by the ODCM.

Quarterly values are multiplied by 4 to obtain an equivalent yearly dose.

Direct Radiation



IV-C. WATERBORNE PATHWAY

To evaluate the waterborne pathway, samples are taken of seawater, ground water, drinking water, and shoreline sediment.

1. Monthly seawater grab samples are taken at two locations in the discharge canal (C14G and C14H) and at one control location (C13) near the mouth of the intake canal. Of twenty-four indicator samples, four had measurable tritium at an average concentration of 1173 pCi/L. The sample with the highest concentration of tritium, 3687 pCi/L, was obtained in September during a period when a series of liquid releases were made in preparation for refueling outage 11. The seawater tritium activity is consistent with concentration of tritium in the liquid waste stream. Two control station samples contained tritium at an average concentration of 230 pCi/L.

Gamma spectral analysis was performed on thirty-six samples, none of which showed measurable amounts of the gamma emitters of interest.

2. Semiannual ground water samples are taken at one location, station C40. Gamma spectral and tritium analyses are performed on both samples. All results were less than the detection limits. Since plant startup, all results, except for the results of one 1985 tritium analysis, have been less than LLD. The required sensitivity for measuring tritium in ground water is 2000 pCi/L. Analysis of ground water in the vicinity of CR-3 is done at a sensitivity of approximately 160 pCi/L for tritium and 10 pCi/L for select gamma emitters.
3. Quarterly drinking water samples are drawn from three locations: the Crystal River City Hall (C07), the Days Inn Motel (C10), and the Yankeetown City Well (C18). All samples were collected and analyzed for gamma emitters and tritium. None of the samples yielded measurable activities of tritium or the required gamma emitters. The measurement sensitivity for drinking water samples are the same as those for ground water samples.
4. Semiannual shoreline sediment samples are taken at three indicator locations in the discharge canal (C14H, C14M, C14G) and one control location (C09) at Fort Island Gulf Beach. Of the six indicator samples, all had measurable amounts of cobalt-60 and two had measurable amounts of cesium-137. The average cobalt-60 concentration at the indicator locations was 118 pCi/L for 1999 as compared to 384 pCi/L for 1998 and 371 pCi/L for 1997. The average cesium-137 concentration at the indicator locations was 65 pCi/L for 1999 as compared to 50 pCi/L for 1998 and 64 pCi/L for 1997. None of the samples taken at Fort Island Gulf Beach indicated measurable amounts of cobalt or cesium. These results are similar to previous years' results, although the amount of cobalt-60 and silver-110m is somewhat less. The decline in cobalt-60 and silver-110m is likely due to improved liquid radwaste processing methods which were implemented in September 1999, prior to refueling outage 11.

TABLE IV-C.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS MEAN RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE & BEARING	MEAN RANGE	CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SEAWATER (pCi/L)	Tritium 36 γ Spec 36	155	1173 (4/24) (178-3687)	C14G 2.8 @ 270°	1173 (4/12) (178-3687)	230 (2/12) (159-300)	0
	Mn-54	3	<LLD	-	-	<LLD	0
	Fe-59	6	<LLD	-	-	<LLD	0
	Co-58	3	<LLD	-	-	<LLD	0
	Co-60	4	<LLD	-	-	<LLD	0
	Zn-65	7	<LLD	-	-	<LLD	0
	Zr-Nb-95	6	<LLD	-	-	<LLD	0
	I-131	4	<LLD	-	-	<LLD	0
	Cs-134	4	<LLD	-	-	<LLD	0
	Cs-137	4	<LLD	-	-	<LLD	0
	Ba-La-140	9	<LLD	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-C.1.a

FLORIDA POWER CORP. - CR3 - 1999

pCi/L γ EMITTERS AND TRITIUM IN SEAWATER

STATION	MONTH	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-Nb-95	I-131	Cs-134	Cs-137	Ba-La-140	
C13	JAN	300 \pm 41	202 \pm 33	<4	<3	<6	<4	<7	<7	<6	<4	<4	<6	
	FEB	<144	275 \pm 16	<2	<2	<3	<2	<4	<3	<2	<2	<2	<2	
	MAR	<149	196 \pm 32	<3	<4	<7	<5	<8	<6	<4	<4	<4	<6	
	APR	<148	212 \pm 27	<4	<4	<9	<4	<6	<6	<6	<4	<4	<6	
	MAY	<146	226 \pm 15	<2	<2	<3	<2	<3	<3	<2	<2	<2	<2	
	JUN	<147	139 \pm 30	<3	<3	<7	<5	<8	<6	<4	<4	<4	<9	
	JUL	<146	286 \pm 28	<4	<3	<9	<4	<9	<8	<6	<4	<4	<5	<6
	AUG	<148	344 \pm 33	<3	<4	<7	<4	<8	<6	<5	<4	<4	<4	<9
	SEP	<146	302 \pm 29	<2	<3	<6	<4	<5	<6	<3	<3	<3	<3	<9
	OCT	<142	324 \pm 33	<4	<4	<8	<5	<5	<6	<6	<4	<4	<4	<7
	NOV	159 \pm 26	220 \pm 29	<3	<4	<7	<5	<8	<6	<4	<4	<4	<4	<7
	DEC	<142	256 \pm 27	<4	<3	<5	<4	<7	<6	<4	<4	<4	<4	<7
C14G	JAN	281 \pm 41	196 \pm 30	<4	<4	<9	<4	<7	<6	<7	<3	<4	<5	
	FEB	178 \pm 48	254 \pm 32	<4	<4	<7	<4	<7	<5	<5	<3	<4	<4	
	MAR	<149	243 \pm 15	<2	<2	<3	<2	<3	<3	<2	<2	<2	<3	
	APR	<148	228 \pm 27	<3	<3	<8	<4	<8	<7	<4	<5	<3	<10	
	MAY	<146	252 \pm 29	<3	<4	<7	<4	<8	<6	<6	<3	<4	<6	
	JUN	545 \pm 28	195 \pm 32	<4	<3	<8	<4	<8	<6	<4	<3	<4	<4	<8
	JUL	<144	222 \pm 33	<3	<3	<6	<5	<9	<8	<4	<4	<4	<4	<8
	AUG	<148	254 \pm 34	<4	<3	<7	<4	<8	<5	<5	<3	<4	<4	<6
	SEP	3687 \pm 56	271 \pm 29	<4	<4	<7	<4	<8	<6	<5	<4	<4	<4	<8
	OCT	<142	282 \pm 33	<3	<3	<7	<3	<8	<6	<5	<3	<4	<4	<6
	NOV	<142	327 \pm 30	<3	<3	<7	<5	<8	<7	<3	<4	<4	<4	<11
	DEC	<139	336 \pm 15	<2	<2	<4	<2	<4	<3	<2	<2	<2	<2	<3

TABLE IV-C.1a (CONT'D)

FLORIDA POWER CORP. - CR3 - 1999

pCi/L γ EMITTERS AND TRITIUM IN SEAWATER

STATION	MONTH	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-Nb-95	I-131	Cs-134	Cs-137	Ba-La-140
C14H	JAN	<145	269 \pm 33	<4	<4	<9	<3	<9	<7	<7	<5	<4	<4
	FEB	<144	255 \pm 31	<4	<3	<6	<4	<8	<6	<5	<4	<4	<5
	MAR	<149	204 \pm 30	<4	<3	<7	<4	<6	<7	<4	<5	<5	<7
	APR	<148	203 \pm 13	<1	<2	<3	<2	<3	<3	<3	<2	<2	<2
	MAY	<148	187 \pm 32	<4	<4	<8	<4	<8	<6	<5	<3	<5	<6
	JUN	<147	238 \pm 15	<2	<1	<3	<2	<3	<3	<2	<2	<2	<3
	JUL	<146	254 \pm 33	<4	<4	<8	<4	<9	<7	<5	<5	<5	<7
	AUG	<148	378 \pm 32	<4	<3	<8	<3	<7	<6	<4	<3	<3	<10
	SEP	<146	381 \pm 32	<4	<3	<8	<5	<8	<6	<4	<4	<4	<6
	OCT	<142	300 \pm 32	<3	<4	<9	<4	<9	<5	<6	<3	<4	<4
	NOV	<142	358 \pm 11	<1	<1	<2	<1	<2	<2	<1	<1	<1	<2
	DEC	<139	289 \pm 31	<3	<4	<7	<3	<8	<6	<5	<4	<4	<5

Seawater

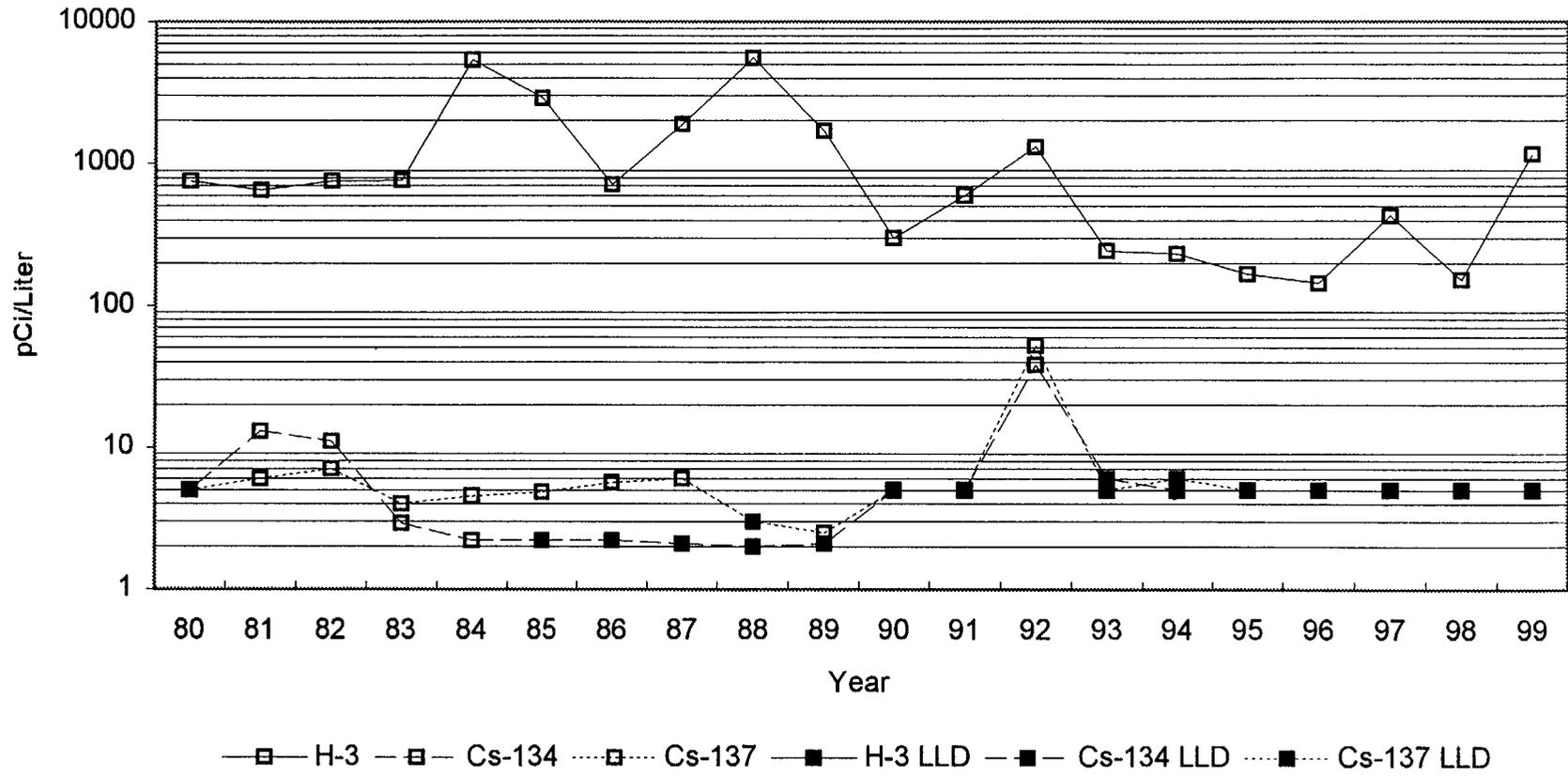


TABLE IV-C.2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME	MEAN RANGE		
GROUND	Tritium 2	155	None	-	-	<LLD	0
WATER							
(pCi/L)	γ Spec 2						
	Mn-54	3	None	-	-	<LLD	0
	Fe-59	6	None	-	-	<LLD	0
	Co-58	3	None	-	-	<LLD	0
	Co-60	4	None	-	-	<LLD	0
	Zn-65	7	None	-	-	<LLD	0
	Zr-Nb-95	6	None	-	-	<LLD	0
	I-131	4	None	-	-	<LLD	0
	Cs-134	4	None	-	-	<LLD	0
	Cs-137	4	None	-	-	<LLD	0
	Ba-La-140	9	None	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-C.2.a

FLORIDA POWER CORP. - CR3 - 1999

pCi/L γ EMITTERS AND TRITIUM IN GROUND WATER

STATION	NUCLIDE	FIRST HALF	SECOND HALF
C40	H-3	<144	<148
	Mn-54	<3	<3
	Fe-59	<7	<8
	Co-58	<3	<4
	Co-60	<4	<4
	Zn-65	<5	<6
	Zr-Nb-95	<7	<6
	I-131	<4	<4
	Cs-134	<4	<3
	Cs-137	<4	<4
	Ba-La-140	<7	<7
	K-40	<52	<54

Ground Water

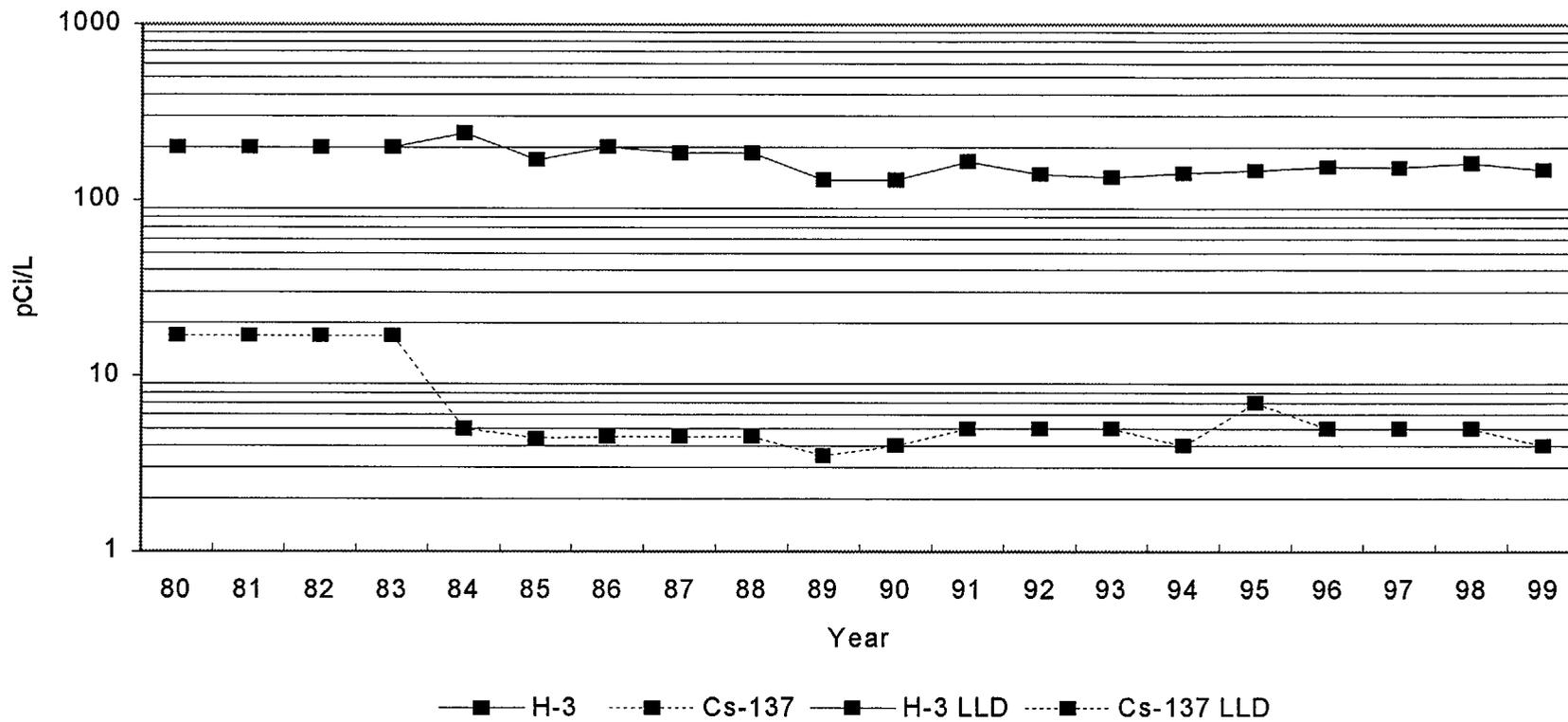


TABLE IV-C.3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS		LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE		NAME DISTANCE & BEARING	MEAN RANGE		
DRINKING WATER (pCi/L)	Tritium 12	155	None		-	-	<LLD	0
	γ Spec 12							
	Mn-54	3	None		-	-	<LLD	0
	Fe-59	6	None		-	-	<LLD	0
	Co-58	3	None		-	-	<LLD	0
	Co-60	4	None		-	-	<LLD	0
	Zn-65	7	None		-	-	<LLD	0
	Zr-Nb-95	6	None		-	-	<LLD	0
	I-131	4	None		-	-	<LLD	0
	Cs-134	4	None		-	-	<LLD	0
	Cs-137	4	None		-	-	<LLD	0
Ba-La-140	9	None		-	-	<LLD	0	

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-C.3.a

FLORIDA POWER CORP. - CR3 - 1999

pCi/L γ EMITTERS AND TRITIUM IN DRINKING WATER

STATION	DATE	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zn-Nb-95	I-131	Cs-134	Cs-137	Ba-La-140
C07	01-11	<144	<48	<3	<4	<6	<4	<7	<5	<4	<4	<4	<8
	04-26	<147	<33	<2	<2	<3	<2	<3	<3	<2	<2	<2	<4
	07-19	<146	<51	<4	<4	<5	<4	<10	<6	<4	<4	<4	<10
	10-04	<142	<58	<3	<4	<7	<4	<7	<6	<5	<4	<4	<7
C10	01-19	<145	<59	<3	<4	<7	<3	<7	<6	<4	<4	<4	<9
	04-26	<147	<61	<4	<3	<7	<4	<8	<6	<5	<4	<4	<5
	07-13	<146	<53	<3	<3	<6	<4	<4	<6	<4	<4	<3	<10
	10-04	<142	<57	<4	<3	<8	<4	<8	<6	<6	<5	<4	<5
C18	01-11	<144	<48	<3	<3	<6	<4	<7	<6	<4	<3	<4	<9
	04-26	<147	<55	<4	<3	<6	<4	<8	<6	<5	<4	<5	<7
	07-13	<146	<64	<4	<4	<7	<4	<9	<7	<5	<4	<5	<11
	10-04	<142	<27	<2	<1	<3	<2	<3	<3	<2	<2	<2	<3

Drinking Water

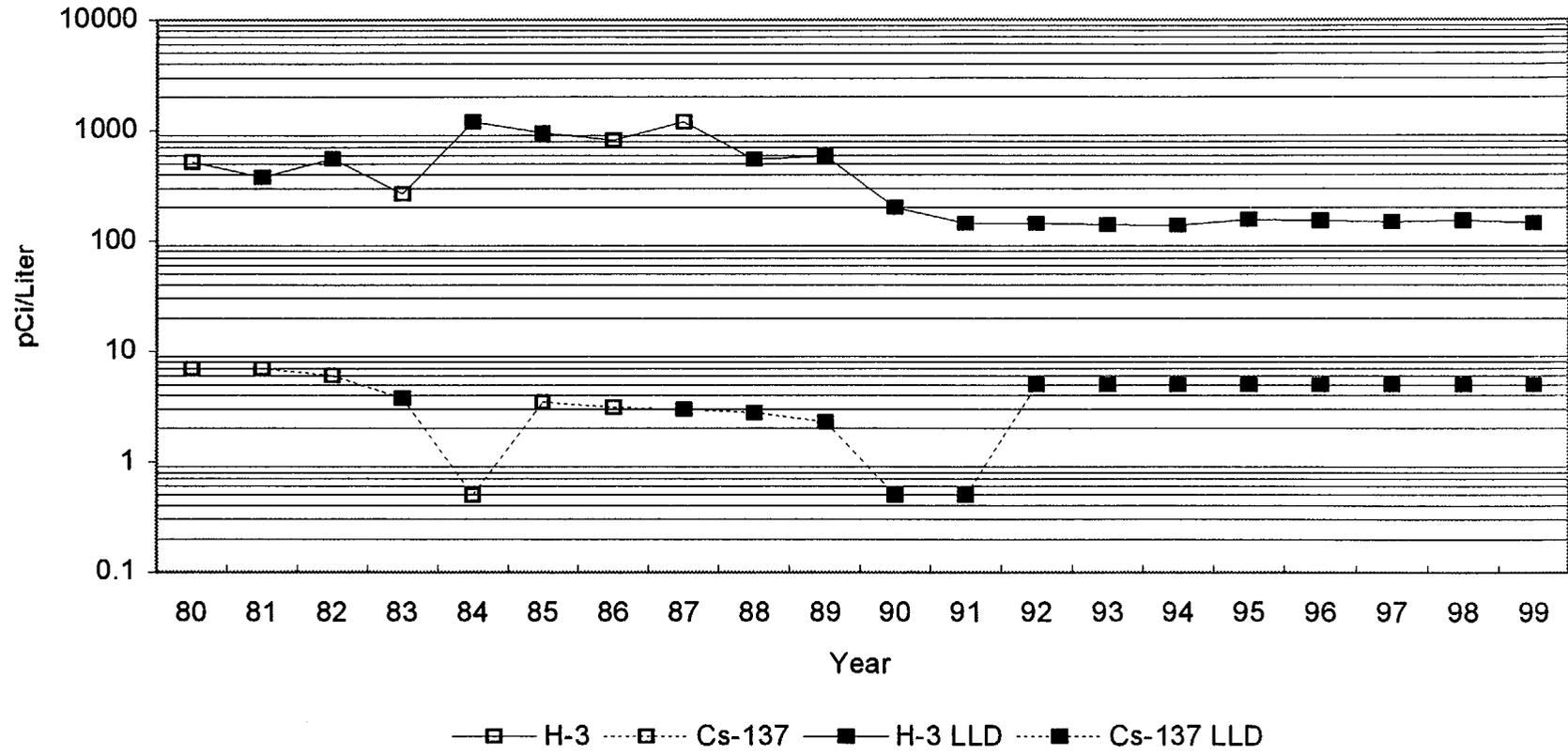


TABLE IV-C.4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS MEAN RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE & BEARING	MEAN RANGE	CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SHORELINE SEDIMENT (pCi/kg)	γ Spec 8 Cs-134 Cs-137	7 7	<LLD 65 (2/6) (55 - 75)	— C14H 0.1 @ 315°	— 65 (2/2) (55 - 75)	<LLD <LLD	0 0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-C.4.a

FLORIDA POWER CORP. - CR3 - 1999

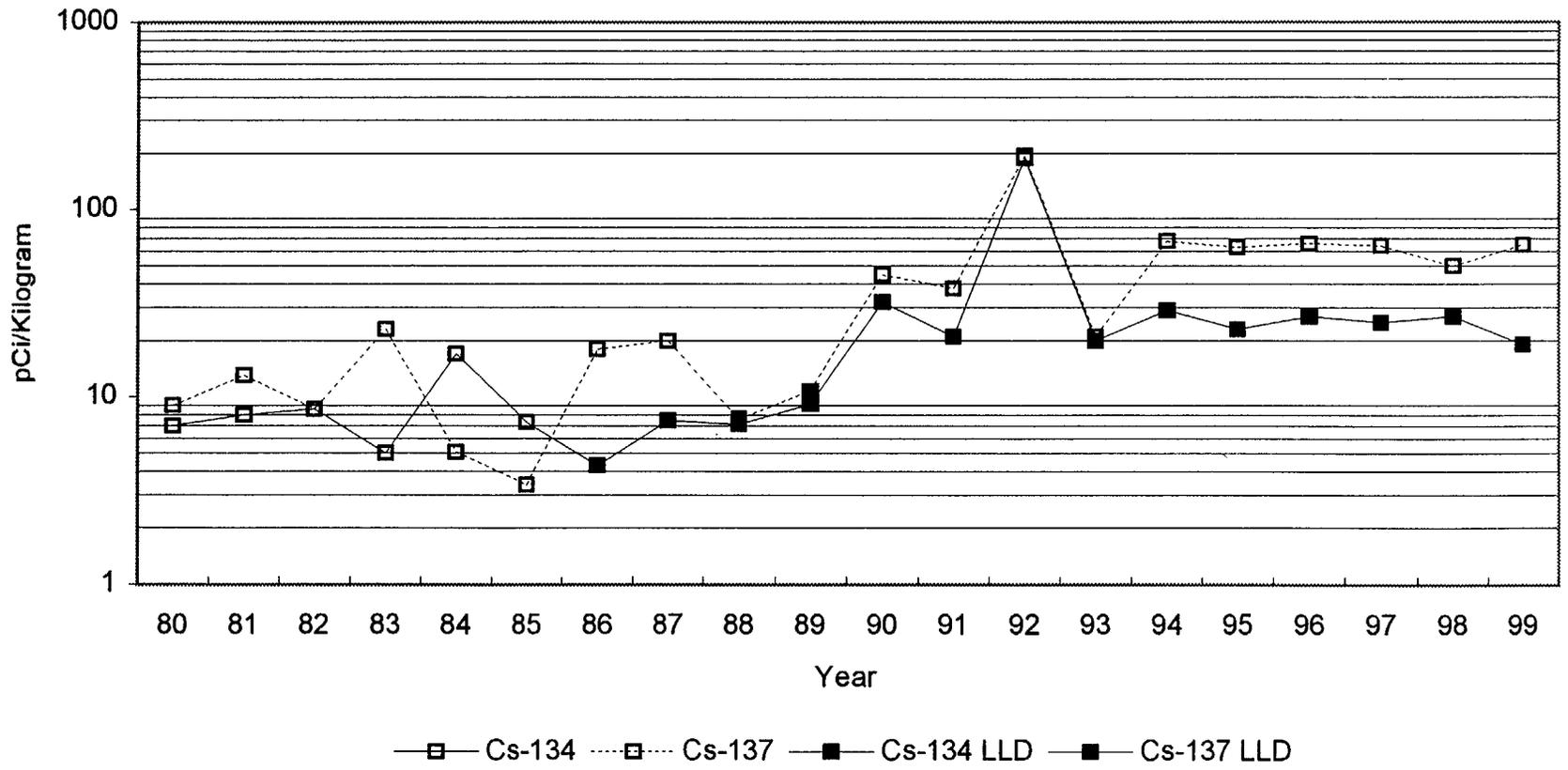
pCi/kg γ EMITTERS IN SHORELINE SEDIMENT

STATION	PERIOD	Cs-134	Cs-137	Co-58	Co-60	K-40	Ra-226
C09	First Half	<17	<14	<12	<12	625 \pm 66	748 \pm 17
	Second Half	<17	<14	<11	<12	713 \pm 76	887 \pm 20
C14H	First Half	<19	75 \pm 10	<15	162 \pm 9	1785 \pm 105	968 \pm 22
	Second Half	<7	55 \pm 3	11 \pm 2	179 \pm 3	2086 \pm 44	975 \pm 8
C14M	First Half	<14	<15	<11	128 \pm 6	349 \pm 51	606 \pm 16
	Second Half	<12	<12	28 \pm 5	74 \pm 5	364 \pm 51	700 \pm 17
C14G	First Half	<16	<17	<13	122 \pm 7	452 \pm 66	1199 \pm 21
	Second Half	<12	<11	<12	43 \pm 4	295 \pm 52	682 \pm 15

C09 is the control station at Ft. Island Beach. C14H, C14M, & C14G are discharge canal stations.

For the samples taken on February 2nd, Ag-110m was identified at a concentration of 34 pCi/kg at station C14M.

Shoreline Sediment



IV-D. INGESTION PATHWAY

To evaluate the ingestion pathway, samples are taken of fish, oysters, broad leaf vegetation, citrus, and watermelon.

1. Quarterly carnivorous fish samples were taken at two locations: C29 at the end of the discharge canal, and C30, the control location near the mouth of the intake canal. None of the required radionuclides were found in measurable quantities. The highest cesium-137 LLD for station C29 was 30 pCi/kg. Naturally occurring potassium-40 was quantified at levels ranging from 1879 pCi/kg to 2789 pCi/kg in the eight samples.
2. Quarterly oyster samples were taken at the same locations as fish samples, C29 and C30. Station C29 is the indicator location and station C30 is the control location. Of the isotopes required to be evaluated, none indicated measurable amounts of radioactivity. However, silver-110m was quantified in three of the four indicator samples, with activity ranging from 199 pCi/kg to 905 pCi/kg. Silver-110m was quantified in two control station samples at concentrations of 165 pCi/kg and 1882 pCi/kg. While the concentration of silver-110m in indicator samples decreased since 1999 (from a high of 5785 pCi/kg), the concentration of silver-110m in control samples went up. The location of the control station is under evaluation.
3. Monthly broad leaf vegetation samples were taken at two indicator locations, C48a and C48b, and one control location, C47. Five twenty-four indicator samples had measurable amounts of cesium-137 with an average concentration of 61 pCi/kg and a range of 12 to 190 pCi/kg. Four of the twelve control station samples had measurable amounts of cesium-137 with an average of 42 pCi/kg and a range of 15 to 61 pCi/kg.
4. Citrus samples are taken at station C19 and watermelon samples were obtained at station C04. Cesium-137 was quantified at 5 pCi/kg in citrus and 8 pCi/kg in watermelon.

TABLE IV-D.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	<u>ALL INDICATOR LOCATIONS</u>	<u>LOCATION WITH HIGHEST MEAN</u>		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
CARNIVOROUS FISH (pCi/kg)	γ Spec 8						
	Mn-54	16	<LLD	-	-	<LLD	0
	Fe-59	28	<LLD	-	-	<LLD	0
	Co-58	15	<LLD	-	-	<LLD	0
	Co-60	16	<LLD	-	-	<LLD	0
	Zn-65	32	<LLD	-	-	<LLD	0
	Cs-134	16	<LLD	-	-	<LLD	0
	Cs-137	18	<LLD	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-D.1.a

FLORIDA POWER CORP. - CR3 - 1999

pCi/kg γ EMITTERS IN CARNIVOROUS FISH

STATION	QUARTER	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	K-40
C29	1	<19	<19	<43	<22	<45	<21	<16	2428 \pm 202
	2	<20	<19	<31	<26	<51	<28	<22	1879 \pm 214
	3	<17	<17	<39	<23	<46	<24	<18	2229 \pm 187
	4	<20	<22	<46	<32	<57	<27	<30	2314 \pm 219
C30	1	<22	<17	<50	<28	<51	<25	<23	2704 \pm 228
	2	<17	<18	<35	<20	<44	<18	<20	2554 \pm 218
	3	<8	<8	<15	<10	<19	<9	<9	2482 \pm 94
	4	<14	<16	<41	<21	<47	<14	<23	2789 \pm 198

TABLE IV-D.1.a

FLORIDA POWER CORP. - CR3 - 1999

pCi/kg γ EMITTERS IN CARNIVOROUS FISH

STATION	QUARTER	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	K-40
C29	1	<19	<19	<43	<22	<45	<21	<16	2428 \pm 202
	2	<20	<19	<31	<26	<51	<28	<22	1879 \pm 214
	3	<17	<17	<39	<23	<46	<24	<18	2229 \pm 187
	4	<20	<22	<46	<32	<57	<27	<30	2314 \pm 219
C30	1	<22	<17	<50	<28	<51	<25	<23	2704 \pm 228
	2	<17	<18	<35	<20	<44	<18	<20	2554 \pm 218
	3	<8	<8	<15	<10	<19	<9	<9	2482 \pm 94
	4	<14	<16	<41	<21	<47	<14	<23	2789 \pm 198

Carnivorous Fish

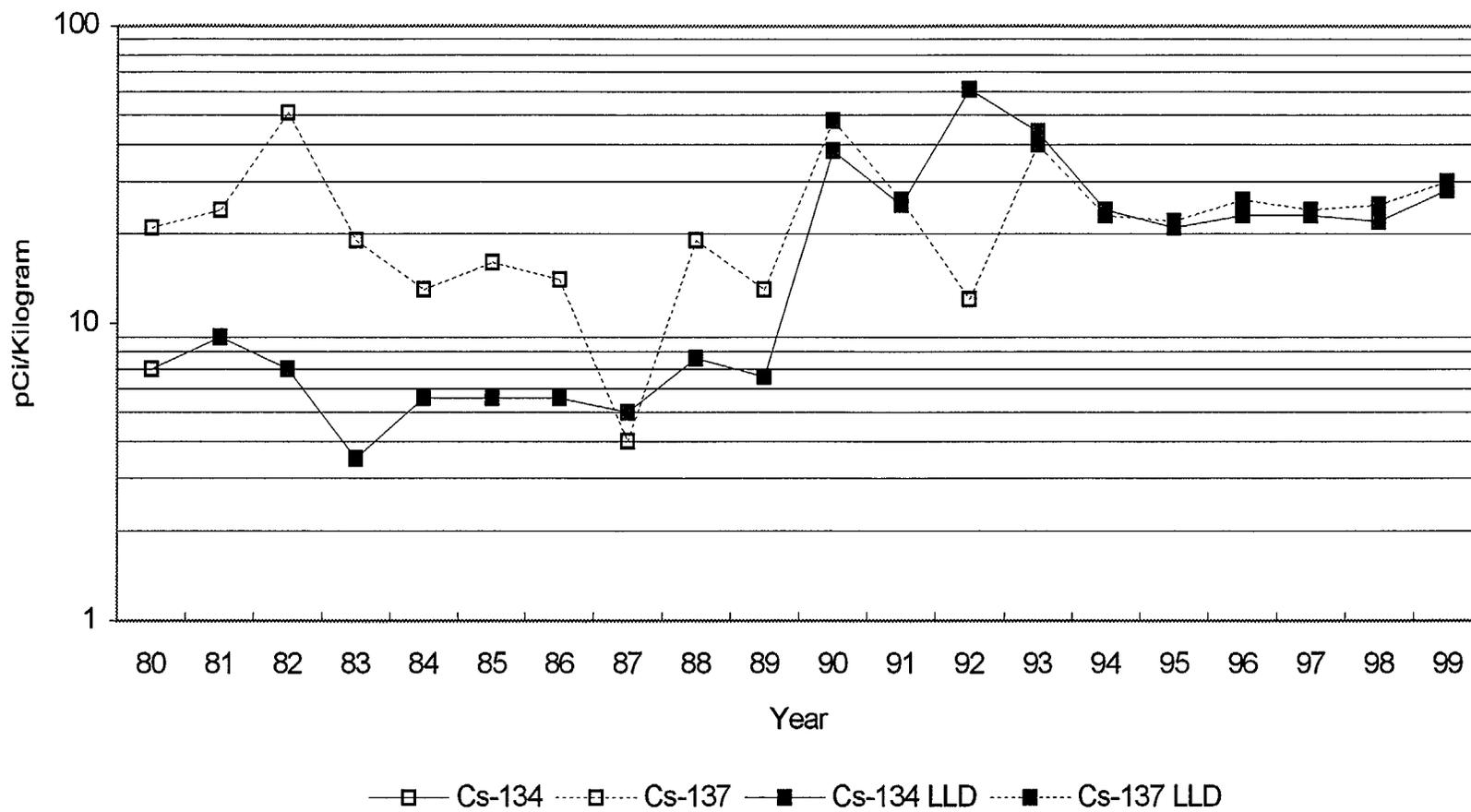


TABLE IV-D.2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
OYSTERS (pCi/kg)	γ Spec 8						
	Mn-54	16	<LLD	-	-	<LLD	0
	Fe-59	28	<LLD	-	-	<LLD	0
	Co-58	15	<LLD	-	-	<LLD	0
	Co-60	16	<LLD	-	-	<LLD	0
	Zn-65	32	<LLD	-	-	<LLD	0
	Cs-134	16	<LLD	-	-	<LLD	0
	Cs-137	18	<LLD	-	-	<LLD	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-D.2.a
FLORIDA POWER CORP. - CR3 - 1999
pCi/kg γ EMITTERS IN OYSTERS

STATION	QUARTER	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	K-40
C29	1	<36	<26	<70	<39	<76	<35	<33	748 \pm 236
	2	<23	<23	<44	<32	<46	<22	<26	869 \pm 161
	3	<31	<39	<71	<39	<77	<32	<45	1091 \pm 171
	4	<30	<27	<63	<45	<72	<34	<33	1401 \pm 234
C30	1	<42	<40	<93	<41	<81	<45	<56	824 \pm 198
	2	<24	<24	<49	<36	<73	<24	<30	1327 \pm 248
	3	<21	<23	<40	<26	<51	<26	<21	1217 \pm 163
	4	<21	<24	<56	<28	<47	<27	<25	1570 \pm 212

Ag-110m was quantified in three samples taken at station C29. The concentrations were 199 pCi/kg, 905 pCi/kg, and 363 pCi/kg, for the second, third, and fourth quarters respectively.

Ag-110m was quantified in two samples taken at station C30. The concentrations were 1882 pCi/kg and 165 pCi/kg for the first and second quarters respectively.

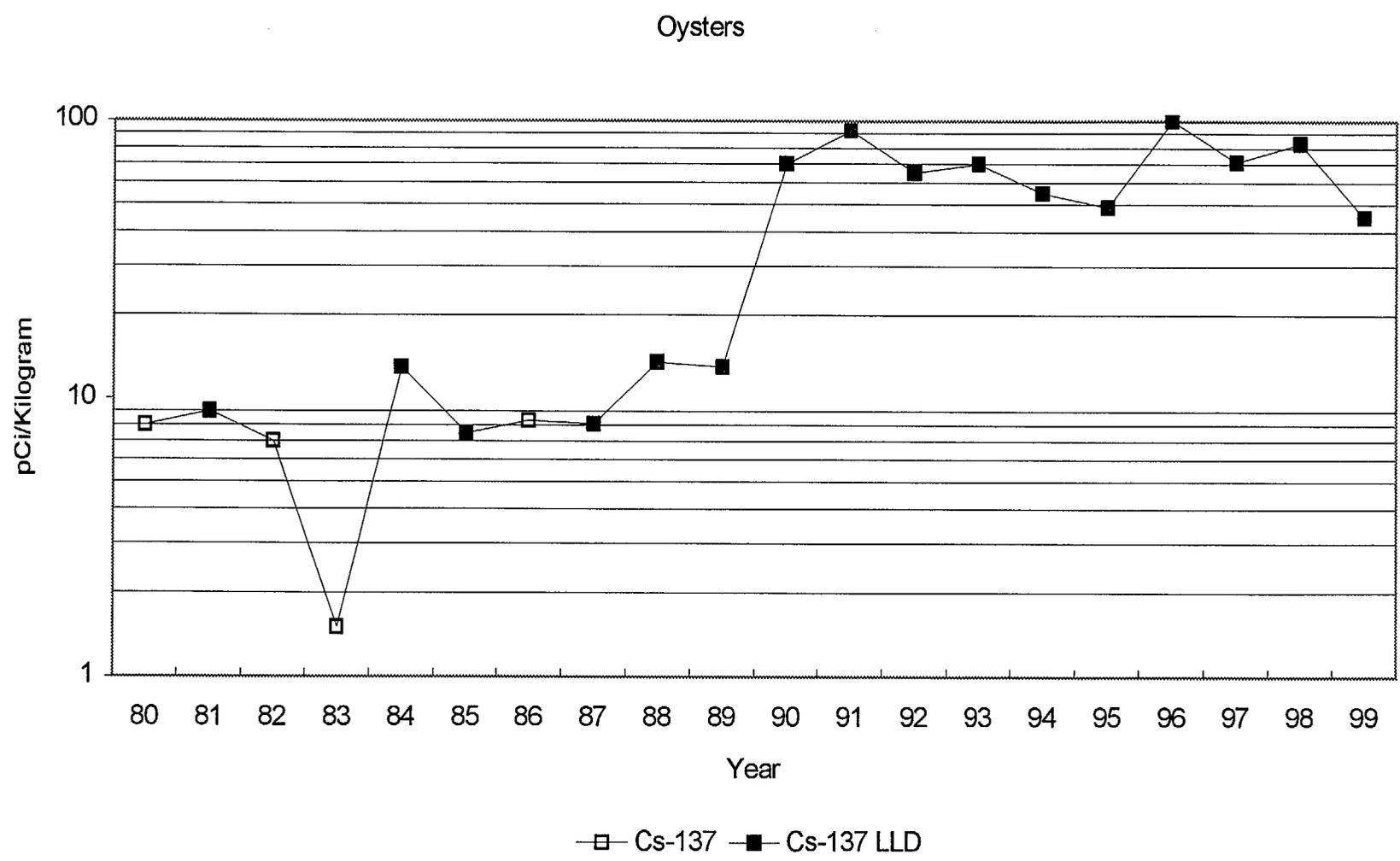


TABLE IV-D.3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	ALL INDICATOR LOCATIONS MEAN RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE & BEARING	MEAN RANGE	CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
BROAD LEAF VEGETATION (pCi/kg)	γ Spec 36						
	I-131	8	<LLD	-	-	<LLD	0
	Cs-134	8	<LLD	-	-	<LLD	0
	Cs-137	8	61 (5/24) (12-190)	C48A 0.8 @ 30°	73 (4/12) (24-190)	43 (4/12) (15 - 61)	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-D.3.a

FLORIDA POWER CORP. - CR3 - 1999

pCi/kg OF γ EMITTERS IN BROAD LEAF VEGETATION

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C47	JAN	<14	<19	<17	2418 \pm 151
	FEB	<10	<11	<17	4830 \pm 168
	MAR	<12	<17	60 \pm 8	3334 \pm 160
	APR	<16	<12	<14	3639 \pm 161
	MAY	<13	<12	<14	5118 \pm 187
	JUN	<17	<16	<24	4204 \pm 192
	JUL	<20	<16	61 \pm 11	4854 \pm 196
	AUG	<15	<16	<21	4850 \pm 224
	SEP	<14	<15	33 \pm 8	3317 \pm 168
	OCT	<16	<10	<11	2257 \pm 112
	NOV	<8	<6	15 \pm 3	4618 \pm 81
	DEC	<13	<11	<13	5357 \pm 182
C48A	JAN	<18	<16	51 \pm 11	4802 \pm 209
	FEB	<14	<14	190 \pm 12	4794 \pm 189
	MAR	<12	<14	24 \pm 6	4333 \pm 172
	APR	<16	<13	<16	3923 \pm 173
	MAY	<5	<6	<6	3719 \pm 65
	JUN	<15	<13	<14	3962 \pm 168
	JUL	<7	<5	<5	3827 \pm 70
	AUG	<5	<5	<5	4532 \pm 74
	SEP	<13	<11	<12	4322 \pm 149
	OCT	<17	<13	26 \pm 7	2076 \pm 121
	NOV	<16	<13	<14	2622 \pm 134
	DEC	<12	<13	<14	1524 \pm 104

TABLE IV-D.3.a (CONT'D)

FLORIDA POWER CORP. - CR3 - 1999

pCi/kg OF γ EMITTERS IN BROAD LEAF VEGETATION

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C48B	JAN	<7	<6	12 \pm 3	5058 \pm 86
	FEB	<13	<11	<12	3845 \pm 161
	MAR	<12	<13	<14	3187 \pm 155
	APR	<20	<15	<25	6517 \pm 210
	MAY	<12	<13	<15	4105 \pm 161
	JUN	<14	<15	<13	3791 \pm 175
	JUL	<17	<17	<14	5384 \pm 190
	AUG	<16	<14	<15	5626 \pm 196
	SEP	<5	<6	<6	4647 \pm 77
	OCT	<18	<14	<15	4095 \pm 179
	NOV	<18	<11	<14	4966 \pm 190
	DEC	<14	<14	<13	5779 \pm 198

Broad Leaf Vegetation

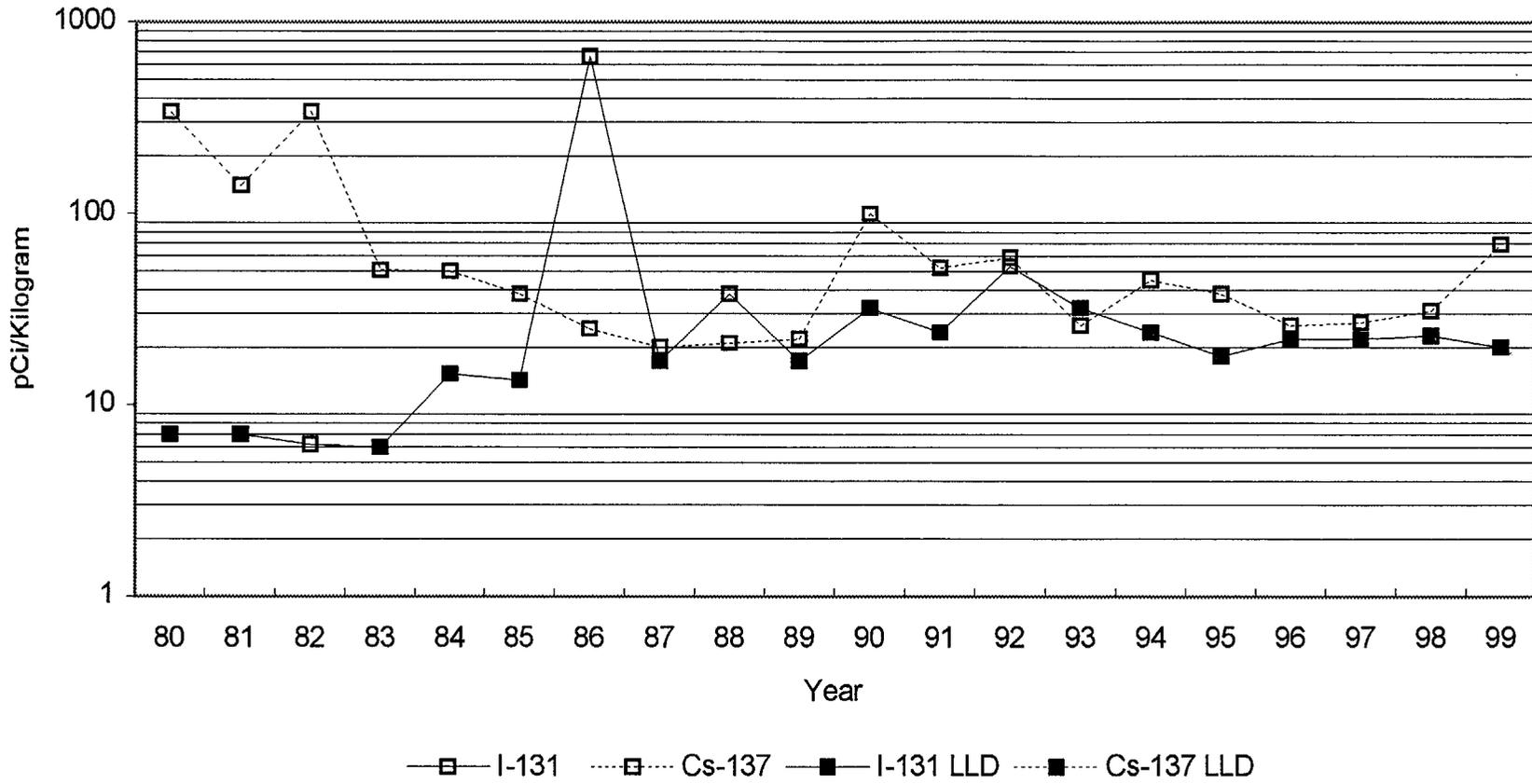


TABLE IV-D.4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

CITRUS COUNTY, FLORIDA

JANUARY 1 TO DECEMBER 31, 1999

MEDIUM OR PATHWAY SAMPLED (UNITS)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) ¹	<u>ALL INDICATOR LOCATIONS</u>	<u>LOCATION WITH HIGHEST MEAN</u>		CONTROL LOCATION MEAN RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
			MEAN RANGE	NAME DISTANCE & BEARING	MEAN RANGE		
WATERMELON (pCi/kg)	γ Spec 1						
	I-131	8	<LLD	-	-	None	0
	Cs-134	8	<LLD	-	-	None	0
	Cs-137	8	8 ± 3	-	-	None	0
CITRUS (pCi/kg)	γ Spec 1						
	I-131	8	<LLD	-	-	None	0
	Cs-134	8	<LLD	-	-	None	0
	Cs-137	8	5 ± 1	-	-	None	0

¹The "a priori" LLD which meets or exceeds the requirements of Table 2-9 of the CR-3 ODCM.

TABLE IV-D.4.a

FLORIDA POWER CORP. - CR3 - 1999

pCi/kg OF γ EMITTERS IN WATERMELON AND CITRUS

STATION	MONTH	I-131	Cs-134	Cs-137	K-40
C04 - Watermelon	June	<6	<5	8 ± 3	1891 ± 74
C19 - Citrus	January	<2	<3	5 ± 1	1996 ± 33