FLORIDA POWER & LIGHT COMPANY

St. Lucie Plant Unit No. 1

License No. - DPR-67

Docket No. 50-335

# ANNUAL ENVIRONMENTAL RADIOLOGICAL

# MONITORING REPORT

for

The Period: 1-01-79 to 12-31-79

Prepared 3-21-80

Docket # 50-335 ENVIRO Control # 800 Hogozy 3-31-80 of Document:

# 1. Introduction

This report is submitted in accordance with St. Lucie Plant Technical Specifications' Section 5.6.1.b.

All environmental samples were collected and analyzed during this reporting period in accordance with requirements of St. Lucie Plant's Technical Specifications. The minimum of frequency of collection and analyses for specific radionuclide species as required by these specifications have been met or exceeded except where samples were biologically unavailable.

No harmful effects or evidence of irreversible damage to the environment or to the health and safety of individuals or population groups in the regions surrounding St. Lucie Plant have been detected by this monitoring program.

In addition to the Environmental Radiological Monitoring data, this report includes information about the semi-annual census for 500 ft<sup>2</sup> gardens and milk-producing animals.

Strontium analyses for this reporting period have been delayed due to the relocation of the State's Radiological Laboratory; these results will be shown in a separate report when analyses in progress are completed.

# 2. The Monitoring Program

# Analytical Responsibility

Environmental radiological monitoring at St. Lucie Plant is carried out by the Orlando Radiological Laboratory of the Department of Health and Rehabilitative Services of Florida (DHRS) personnel.

# Number of Samples Analyzed

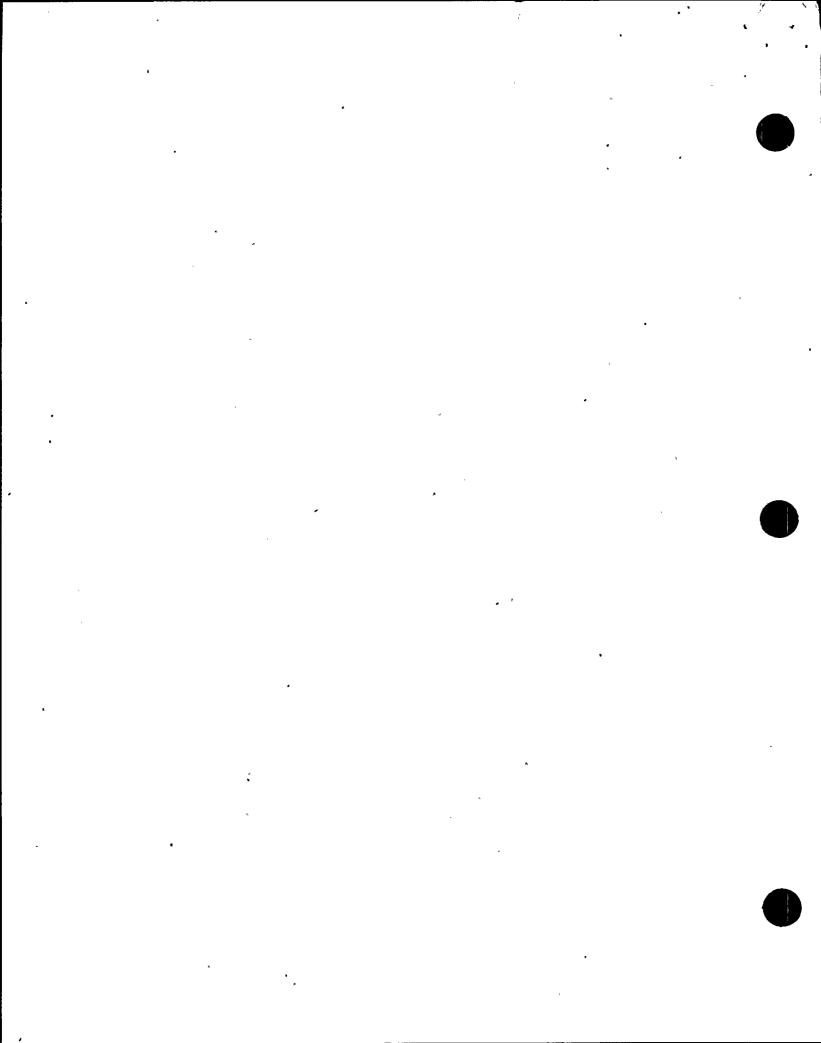
A total of 1425 analyses were performed on 1095 samples collected from 25 different sampling locations during the period of this report. TABLE 1 summarizes the mean and range values of these analyses. Since 40K, 226Ra, 232Th are naturally occurring radionuclides, no data for these species are recorded in this table. The gross beta data reported is representative of these and other naturally occurring radionuclides.

#### Split Sample Analyses

At least 20 of the samples collected have been analyzed in the DHRS/ERDA Split-Sample Program.

#### Evaluation of Data

Except as noted in TABLE 1, none of the sampling locations used in the environmental radiological monitoring program showed evidence of having significant concentrations of a particular radionuclide in a specific sample material much higher than the observed mean for that radionuclide at all sampling locations. Past weapons testing fallout accumulations (as  $^{90}$ Sr,  $^{95}$ Zr,  $^{131}$ I,  $^{137}$ Cs and  $^{54}$ Mn) observed at some locations were not indicative of any effluent release by Unit 1 during this operational period.



Trend plotting of our particulate and direct radiation data reveals no plant-related variations. Also, all data have been evaluated with respect to pre-operational data and have been found to be within the ± 200 limits observed for these pre-operational data. Comparative data obtained in the assay of control samples also appears in TABLE 1.

# 4. Dairy Herd, Goat, and Garden Census

A dairy herd census was conducted in February and in August during this report period. The nearest dairy is west of the plant site (260°; . 14 miles) Data obtained in the assays of samples collected at this location are reported in TABLE 1.

A goat herd census was conducted in February and in August during this report period. The results were; "no known goat herds in the County".

An aerial garden census in June, 1979 showed that there were several 500 ft<sup>2</sup> gardens within approximately 5 miles of St. Lucie Plant. Tomatoes were sampled at Robert Carman's, 7409 Indian River Drive: Results of these analyses appear in TABLE 1.

# 5. Conclusions

During this period, the environmental radiological monitoring program has found no evidence that the operations of Plant St. Lucie Unit No. 1 contribute harmful effects or irreversible damage to either the environment or to the health and safety of individuals and population groups in the regions surrounding St. Lucie Plant.



			in its property and the second	'Number of			All Indicator			an	Control(a) Location		Number of Nonroutine	
Hedium (S	or Pathway ampled	Unit	Analysis for	Sites	·Samples	Analyses	Mean ,	Range	Sample Location Distance & Direction	Mean	Range	Mean	Range	Reported Measurements
i.0	AIR		, ,	. ':.	***** ( )	• • •		•	5 · · · · · · · · · · · · · · · · · · ·	<u> </u>				
1.1	AIR PARTIC- ULATES (b)	pCi/m <sup>3</sup>	Gross β	· ģ̃	463	463		0.003 0.045	H:30: Residence, 7609 Indian River Drive	022	.007 .045	.019	0.006- 0.039	
1.1	Air Iodines	pCi/m <sup>3</sup>	131 I	9	466	466	, MD	ŅĀ					`\. '	,
1.1	Gamma Scan	pC1/m <sup>3</sup>	Ÿ	9:	: 108	108	ND	NA	•		]			
1.1	Sr 89, 90	pC1/m <sup>3</sup>	<sup>89</sup> sr 90 <sub>Sr</sub> ,	9 9	· 36 36	35 ^ . 35	ND ND	NA NA						
	Analysis of Filter Com- posites		_		:				, , , , , , , , , , , , , , , , , , , ,				,	
1.2 ,	Direct Radiation (d)	μRem/hr	Υ	. 9	. 36	36.	6.	3-23	H-12: (e) F.P.L. substation, Stuart, Florida; 5.12 miles	21	19-23	5	5-6	,
2.0	WATER											}		,
2.1.1	<u>Discharge</u> <u>Canal</u>	pCi/1	3 <sub>II</sub> 89 <sub>Sr</sub> . 90 <sub>Sr</sub>	j 1 · 1	12 12 12	12 8 8	<200 ND ND	na Na Na						` .
2.1.2	Ocean Water	pCi/l	. 3 <sub>II</sub> 89 <sub>Sr</sub> 90 <sub>Sr</sub> .	2 2	24 24	24 16	<200 ND	NV NV			-			٠
2.1.3	Estaurine Water	pCi/1	311/	1	4	4.	<200	NA			ľ			
2.2	Ground Water Well	pC1/1	3 <sub>II</sub> Gross β-DS Gross β-UDS	1 1 1	4 4 4	4 4 4	<200 ND ND	NA NA NA						
2.3	Potable Water	pCi/l	3 <sub>  </sub> Gross β-DS	. 3 . 3	12 12	12 12 .	<200 4	NA ND-7	H-11:St. Lucie County		ND-7	NA	NA.	;
,		÷	Gross β-UDS	. 3	. 12	12	ИД	МА	Health Dept.,Ft Plere					



		Analysis for		Number-of		All Indicator		Location with High	est:Hean		rol()	Number of Nonroutine
Medium or Pathway Sampled	Unit		Sites	Samples	Analyses	Mean	Range	Sample Location Distance & Direction	Mean R	ange Mean	Range	Reported Measurements
3.0 BOTTOM SEDIMENTS	-		:·.	617 <sub>6</sub> , ,		:						,
3.1 <u>Discharge</u> <u>Canal</u> .	pCi/kg	54Mn 952r 89Sr 90Sr 58 <sub>Co</sub>	1 1 1 1	1 1 2 . 2 . 2	1 1 1 2	120* 110* ND - ND 200	NA NA NA NA 110-290	H-36: **On site, Discharge Canal,				· /
•	`;	60 <sub>Co</sub>	1	2	2 .	1180	260-2100	West of AIA; ESE, 0.19 miles				,
3.2 <u>Ocean</u>	pC1/kg	<sup>89</sup> sr - <sup>90</sup> sr	3 3	8 8	4 4	ND ND	` NA NA					,
3.3 Beach Sand	pC1/kg	<sup>89</sup> Sr 90 <mark>Sr</mark>	3 .	6	4	ND ND	NA NA	· · · · · · · · · · · · · · · · · · ·	.		٠,	`
3.4 Estaurine (f)								. •				
4.0 AQUATIC BIOTIA												
4.1 <u>Crustacea</u> (g)	pC1/kg	89 <sub>Sr</sub> 90 <sub>Sr</sub>	2 2	4 .	1 . 1	ND ND	na Na	*				
4.2 · Fish Carnivore (h)	pC1/kg	89 90 <sub>Sr</sub> .	2 2	4	3 3	HD D	NA NA.					·
4.2.2 Fish   Herbivore (1)	pCi/kg	<sup>89</sup> Sr 90 <sub>Sr</sub>	2	3	2 2	ND ND	NA NA					
•				:				* one sample ** one location				



TABLE 1

	*				Number of				dicator tions	Location with High	est.ile	an	Control(j) Location		Number of Nonroutine
redium	n or Path Sampled	lway	Unit	Analysis for	Sites	Samples	Analyses	Mean	Range	: Sample Location Distance & Direction	Mean .	Range	Mean	Range	Reported Measurement
5.0	TERREST BIOTA	RIAL	•	•		•••.								• •	•
5.1	Milk	(k)	pCi/l`	137 <sub>C8</sub>	. 2 <sub>.</sub>	.37	37	26.1	ND-40	H-40: (Control)Davis Dairy; Boynton Bch., SSE, 55.8 miles	28.1	18-40.	26.1	ND-40	/
	*			89 <sub>Sr</sub>	2	37	32	2	2 - 5	<u>H-03</u> : Meadowbrook	2	2 <del>,</del> 5	2	2-3	
	,	-		90 <sub>Sr</sub>	2	37	32	, ND	NA.	Dairy; 14 miles, SSW.					_
				<sup>131</sup> 1 .	` 2	37	36 .	<.62	<.5~<2	H-03: Meadowbrook Dairy; 14 miles, SSW.	<.64	<.5-<2	<.58	<.5-<1	-
5.2.1	Food - Citrus	(1)	pCi/kg	89 <sub>Sr</sub> 90 <sub>Sr</sub>	7	7 7 .	7 7	ND 21	NA 7-45	<u>H-22</u> : Lentz Groves, U.S.1, SSW, 5.5 miles	45*	NA		•-	
5.2.2	Food - Leafy Vegetab	(m) les	pCi/kg	137 <sub>Cs</sub>	1	. 1 ,	.1	100*	NA ·	H-41: Robert Carman's 7409 Indian River Drive; WSW, 2 miles	100*	NA			•
			•	131 <sub>I</sub>	·, 1	. 1	i	ND	na .						
5.3	SOIL .	(n)	,	•	-			* 1 - *							· ·
			•							/·					
			•		•										
				-	•				٠	£					
								• •		1.				-	
					•	-	•	,		* one sample					•

NA = Non Applicable

ND = None Detectable



- a) Control Location, H-32: Department of Health and Rehabilitative Services, Entomology Laboratory, East of U.S. 1, Vero Beach, NNW, 19 miles
- b) 1.1 Air Particulate, H-09, H-10, & H-14: were each found on one occasion to be without a particulate filter during sample collection for this reporting period

  H-14: on Oct. 10, 1979, low sample volume due to equipment failure

  H-30: On one occasion sample was not collected due to operator error
- c) Analyses of Filter Composites, Sr<sup>89</sup> & Sr <sup>90</sup>, H-09: one analysis was lost due to insufficient chemical yield in laboratory processing. All other results were Non-Detectable.
- d) 1.2 Direct Radiation: data reflects net dosimeter response average of two (2) dosimeters for each sampling location
  H-10: On Oct. 10, 1979, results from one (1) T.L.D. were lost due to operator error
- e) H-12: this monitor is located on/near natural radioactivity contained in fill material. All other monitors had a mean of 5 µRem/hr and a range of 3 to 6 µRem/hr
- f) 3.4 Estaurine:  $^{40}$ K,  $^{226}$ Ra, &  $^{232}$ Th were the only radionuclides found in these samples
- g) 4.1 Crustacea: blue crab, shrimp
- h) 4.2.1 Fish-Carnivore: mixed, large mouth bass
- i) 4.2.2 Fish-Herbivore: mullet
- j) Control Location H-40: Davis Dairy, Boynton Beach, SSE, 55.8 miles
- k) 5.1 Milk H-03, H-40: on 8-8-79 and 12-27-79 respectively, <sup>89</sup>Sr & <sup>90</sup>Sr results were lost due to spoilage of samples
  H-03: routine split-sample for Il<sup>31</sup> analysis, to Eberline Corp. on
  2-2-79, was destroyed in shipment by the U.S. Postal Service. Results of the make-up sample collected on 2-16-79, are included in all data for 5.1 Milk
- 1) <u>5.2.1 Food-Citrus</u>: grapefruit, citrus, oranges
- m) <u>5.2.2 Food-Leafy Vegetables, H-41</u>: tomatoes; Robert Carman's, 7409 Indian River Drive
- n) 5.3 Soil: samples once per three (3) year period the last sampling period was in 1977

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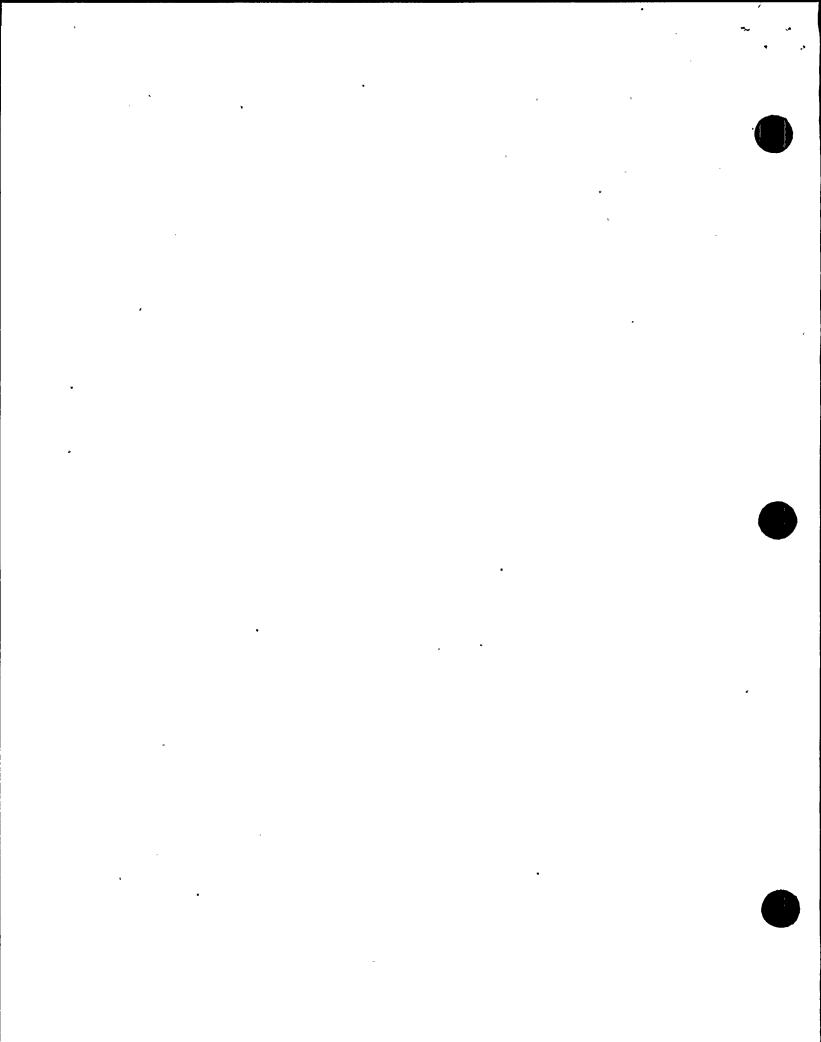


TABLE 1

		ne stand employed by the			Number of		R	ndicator ations	Location with High	ięs ţ.://le	an.	Con	trol(a)	Number of Nonroutine
	or Pathway Sampled	Unit	Análysis for	Sites	Samples	Analyses	Mean	Range	. Sample Location Distance & Direction	Mean	Range	Mean	Range	Reported Measurement
i.0	<u>air</u>			· · ·	****			. ,		,			<i>ਚ</i> ਾ	
1.1	AIR PARTIC- ULATES (b)	pCi/m <sup>3</sup>	Gross β	· ō'	463	463	0.021	0.003 0.045	H:30: Residence, 7609 Indian River Driva	022	.007 .045	.019	0.006- 0.039	•/
1.1	Air Iodines	pCi/m <sup>3</sup>	131 <sub>I</sub>	9	466	466	, ND	NA.					`.\.	- -
1.1	Camma Scan	pC1/m <sup>3</sup>	Ÿ	. 9:	: 108	108	. אס	NA	•					•
1.1	Sr 89, 90 (c) Analysis of Filter Com-	pC1/m <sup>3</sup>	89 <sub>Sr</sub> . 90 <sub>Sr</sub> .	9	36 36	35. . 35	, ND	NA NA			,		,	· .
1.2 .	Direct Radiation (d)	μRcm/hr̀	γ.	. 9	. 36	36*	6	3-23	H-12: (e) F.P.L. substation, Stuart, Florida; '5.12"miles	 21	19-23	5	5-6	
2.0	<u>WATER</u> <u>Discharge</u> <u>Canal</u>	pCi/l	3 <sub>11</sub> 89Sr 90Sr	. 1 1	. 12 12 12		<200 ND ND	- NA NA NA			,	*		•
2.1.2	Ocean Water	pCi/l	. 3 <sub>ll</sub> 89Sr 90Sr .	2 · 2	24 24	24 16	<200 ND	NA NA :			,			
2.1.3	Estaurine Water	pC1/1	- <sup>3</sup> 11	1	4	4.	<200	NA.	.*					
2.2	Ground Water Well	pCi/1	3 <sub>H</sub> Gross β-DS Gross β-UDS	1 1 1	4 · 4 4	4 4 4	<200 ND ND	. ПЛ НА НА			-			-
2.3	<u>Potable</u> <u>Water</u>	pC1/1	3 <sub>II</sub> Gross β-DS	3	12 12	12 12	<200 4	NA ND-7	H-11:St. Lucic County	5	ND-7	NA.	- NA	
			Gross β-VDS	.∙3	. 12 .	· 12	. ND	γл .	Health Dept.,Ft.Plere					•



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# TABLE 1

36154				Number-of			ndicator tions	Location with High	esț:Hea	in	Cont Loca	rol()	Number of Nonroutine
ledium or Pathway Sampled	Unit	Analysis for	Sites	·Samples	Analyses	Hean	Range	Sample Location Distance & Direction	Kean	Range	Mean	Range	Reported Measurement
3.0 BOTTOM SEDIMENTS	•		:.	••• <sub>•</sub> •••••				; ;;		•			
3.1 <u>Discharge</u> <u>Canal</u>	pCi/kg	54Mn 952 <del>:</del> 89Sr 90Sr 58Co	1 1 1 1	1 1 2 · 2 2	1 '1 '1 '1 '1 '1 '2 '	120* 110* ND ND 200	NÁ NA NA NA 110–290	N-36: **On site,		• •	-		./
	;			. <b>-</b>				Discharge Canal, West of AIA; ESE, 0.19 miles				`\.	-
3.2 <u>Ocean</u>	pCi/kg	60 <sub>Co</sub> 89 <sub>Sr</sub>	1 3 3	2 8 8	2 .	1180 ND ND	260-2100 NA NA		-		e		
3.3 Beach Sand	pC1/kg	89sr 90sr	3	; ,6	4	ND ND	NA NA			•		•	
3.4 Estauring (f)					,	٠.٠				<b>k</b>			•
4.0 AQUATIC BIOTIA		-						• •					•
4.1 <u>Crustacea</u> (g)	pC1/kg	89 <sub>Sr</sub> 90 <sub>Sr</sub>	2 2	4 4 .	. 1	D D D	NA NA		,				
4.2 · Fish Carnivore (h)	pCi/kg	89 90 <sub>Sr</sub> .	2 2	. 4	3	DND DND	NA.						
4.2.2 Fish Herbivore (1)	pC1/kg ·	<sup>89</sup> Sr <sup>90</sup> Sr	2 2	,3 ,3	2 2	ND	NA NA				•		•
			•										
•		•	•				• -	* one sample ** one location					

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Acceptable to the second secon	,	ACTION THE PROPERTY OF THE PARTY OF THE PART		Nimbër of			dicator tions	Location with High	es tl·le	an	Control(j)		Number of Nonroutine
Medium or Pathway Sampled	Unit	Analysis for	Sites	:Samples	Analyses	Mean	Range	. Sample Location Distance & Direction	Mean	Range	Mean	Range	Reported Measurement
5.0 TERRESTRIAL BIOTA		• ,	ļ., :.	•**, * - , .		i				٠	,		
5.1 <u>Milk</u> (k)	pCi/1	137 <sub>C8</sub>	. 2	.37	37	26.1	ND-40	H-40: (Control)Davis Dairy; Boynton Bch., SSE, 55.8 miles	28.1	18-40	26.1	ND-40	
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5.2.1 <u>Food</u> - (1) <u>Citrus</u>	pC1/kg	89Sr 90Sr	- 7	, 7 7	7 7	ND 21	NA . 7-45	H-22: Lentz Groves, U.S.1, SSW, 5.5 miles	45*	МА		4	
5.2.2 Food - (m) Leafy Vegetables	pCi/kg	137 <sub>Cs</sub>	1	1	1	100*	NA -	H-41: Robert Carman's 7409 Indian River Drive; WSW, 2 miles	100*	NA			. •
		131 <sub>I</sub>	1	. 1	1	MD	·NA		•				
5.3 <u>SOIL</u> (n)													:
						,		/ · · · ·					
•	•	, •		~									
		,	,			٠.		, .		    -			
						,		* one sample					

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