

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

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## 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 90Sr, 95Zr, 131I, 137Cs and 54Mn) 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  $\pm 2\sigma$  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 (2600; .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.

TABLE 1

Medium or Pathway Sampled	Unit	Analysis for	Number of			All Indicator Locations		Location with Highest Mean			Control (a) Location		Number of Nonroutine Reported Measurements
			Sites	Samples	Analyses	Mean	Range	Sample Location Distance & Direction	Mean	Range	Mean	Range	
1.0 AIR													
1.1 AIR PARTICULATES (b)	pCi/m <sup>3</sup>	Gross $\beta$	9	463	463	0.021	0.003-0.045	H-30: Residence, 7609 Indian River Drive	0.022	0.007-0.045	0.019	0.006-0.039	
1.1 Air Iodines	pCi/m <sup>3</sup>	<sup>131</sup> I	9	466	466	ND	NA						
1.1 Gamma Scan	pCi/m <sup>3</sup>	$\gamma$	9	108	108	ND	NA						
1.1 Sr <sup>89</sup> , <sup>90</sup> (c)	pCi/m <sup>3</sup>	<sup>89</sup> Sr	9	36	35	ND	NA						
Analysis of Filter Composites		<sup>90</sup> Sr	9	36	35	ND	NA						
1.2 Direct Radiation (d)	$\mu$ Rem/hr	$\gamma$	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 Discharge Canal	pCi/l	<sup>3</sup> H	1	12	12	<200	NA						
		<sup>89</sup> Sr	1	12	8	ND	NA						
		<sup>90</sup> Sr	1	12	8	ND	NA						
2.1.2 Ocean Water	pCi/l	<sup>3</sup> H	2	24	24	<200	NA						
		<sup>89</sup> Sr	2	24	16	ND	NA						
		<sup>90</sup> Sr											
2.1.3 Estuarine Water	pCi/l	<sup>3</sup> H	1	4	4	<200	NA						
2.2 Ground Water Well	pCi/l	<sup>3</sup> H	1	4	4	<200	NA						
		Gross $\beta$ -DS	1	4	4	ND	NA						
		Gross $\beta$ -UDS	1	4	4	ND	NA						
2.3 Potable Water	pCi/l	<sup>3</sup> H	3	12	12	<200	NA						
		Gross $\beta$ -DS	3	12	12	4	ND-7	H-11: St. Lucie County Health Dept., Ft. Pierce	5	ND-7	NA	NA	
		Gross $\beta$ -UDS	3	12	12	ND	NA						

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\* one sample  
\*\* one location

TABLE 1

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TABLE 1 NOTES

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  $\mu$ Rem/hr and a range of 3 to 6  $\mu$ Rem/hr
- f) 3.4 Estaurine: <sup>40</sup>K, <sup>226</sup>Ra, & <sup>232</sup>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 <sup>113</sup>Sn 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
- l) 5.2.1 Food-Citrus: grapefruit, citrus, oranges
- m) 5.2.2 Food-Leafy Vegetables, H-41: 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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1.1 <u>Sr 89, 90</u> (c) <u>Analysis of Filter Composites</u>	pCi/m <sup>3</sup>	<sup>89</sup> Sr <sup>90</sup> Sr	9 9	36 36	35 35	ND ND	NA NA						
1.2 <u>Direct Radiation</u> (d)	$\mu$ Rcm/hr	$\gamma$	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>													
2.1.1 <u>Discharge Canal</u>	pCi/l	<sup>3</sup> H <sup>89</sup> Sr <sup>90</sup> Sr	1 1 1	12 12 12	12 8 8	<200 ND ND	NA NA NA						
2.1.2 <u>Ocean Water</u>	pCi/l	<sup>3</sup> H <sup>89</sup> Sr <sup>90</sup> Sr	2 2	24 24	24 16	<200 ND	NA NA						
2.1.3 <u>Estuarine Water</u>	pCi/l	<sup>3</sup> H	1	4	4	<200	NA						
2.2 <u>Ground Water Well</u>	pCi/l	<sup>3</sup> H Gross $\beta$ -DS Gross $\beta$ -UDS	1 1 1	4 4 4	4 4 4	<200 ND ND	NA NA NA						
2.3 <u>Potable Water</u>	pCi/l	<sup>3</sup> H Gross $\beta$ -DS Gross $\beta$ -UDS	3 3 3	12 12 12	12 12 12	<200 4 ND	NA ND-7 NA	H-11: St. Lucie County Health Dept., Ft. Pierce	5	ND-7	NA	NA	



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