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 50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251
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*See Annual Rad.
 Environ Operating Rept*

SUBJECT: "1998 Annual Radiological Environ Operating Rept for Turkey Point Plant Units 3 & 4." With 990507 ltr.

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10 CFR 50.36b

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
1998 Annual Radiological
Environmental Operating Report

Attached is the 1998 Annual Radiological Environmental Operating Report for Turkey Point Units 3 and 4, as required by Technical Specification 6.9.1.3.

Should there be any questions or comments regarding this information, please contact us.

Very truly yours,

R. J. Hovey
Vice President
Turkey Point Plant

SM

Attachment

cc: Regional Administrator, Region II, USNRC
Sr. Resident Inspector, USNRC, Turkey Point Plant

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ANNUAL
RADIOLOGICAL ENVIRONMENTAL
OPERATING REPORT

TURKEY POINT PLANT

UNITS 3 & 4

LICENSE NOS. DPR-31, DPR-41

DOCKET NOS. 50-250, 50-251

Data Submitted by: Florida DOH

Prepared by: Peter G. Bailey

Reviewed by: J. H. Smith

9905170101



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TURKEY POINT PLANT – UNITS 3 & 4

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TURKEY POINT PLANT – UNITS 3 & 4

EXECUTIVE SUMMARY

The data obtained through the Turkey Point Radiological Environmental Monitoring Program verifies that the levels of radiation and concentrations of radioactive materials in environmental samples are not increasing. These measurements verify that the dose or dose commitment to members of the public, due to operation of Turkey Point Units 3 & 4, during the surveillance year, is well within the limits established by 10 CFR 50, Appendix I. The sampling period was from January 1, 1998 to December 31, 1998.

Additionally, supplemental samples collected by the State of Florida, DOH, do not indicate adverse trends in the radiological environment.

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TURKEY POINT PLANT – UNITS 3 & 4

I. INTRODUCTION

This report is submitted pursuant to Specification 6.9 of Turkey Point Units 3 & 4 Technical Specifications. The Annual Radiological Environmental Operating Report provides information, summaries and analytical results pertaining to the Radiological Environmental Monitoring Program for the calendar year indicated. This report covers surveillance activities described in the Offsite Dose Calculation Manual (ODCM) meeting the requirements of Unit 3 and Unit 4 Technical Specifications.

II. RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

A. Purpose

The purpose of the Radiological Environmental Monitoring Program is to provide representative measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures of members of the public resulting from station operation. The radiological Environmental Monitoring Program also supplements the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways.

B. Program Description

The Radiological Environmental Monitoring Program (REMP) for the Turkey Point Plant is conducted pursuant to Control 5.1 of Turkey Point Unit 3 & 4 ODCM.

1. Sample Locations, Types and Frequencies:

- a. Direct radiation gamma exposure rate is monitored continuously at 21 locations by thermoluminescent dosimeters (TLDs). TLDs are collected and analyzed quarterly.
- b. Airborne radioiodine and particulate samplers are operated continuously at five locations. Samples are collected and analyzed weekly. Analyses include Iodine-131, gross beta, and gamma isotopic measurements.
- c. Surface water samples are collected from three locations. Samples are collected and analyzed monthly. Analyses include gamma isotopic and tritium measurements.

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- d. Shoreline sediment samples are collected from three locations coinciding with the locations for surface water samples. Samples are collected and analyzed semi-annually. Sediment samples are analyzed by gamma isotopic measurements.
- e. Fish and invertebrate samples are collected from two locations coinciding with two of the locations for surface water samples. Samples are collected and analyzed semi-annually. Fish and invertebrate samples are analyzed by gamma isotopic measurements.
- f. Broad leaf vegetation samples are collected from three locations. Samples are collected and analyzed monthly. Broad leaf vegetation samples are analyzed by gamma isotopic measurements.

Attachment A provides specific information pertaining to sample locations, types and frequencies.

2. Analytical Responsibility:

Radiological environmental monitoring for the Turkey Point Plant is conducted by the State of Florida, Department of Health (DOH). Samples are collected and analyzed by DOH personnel.

Samples are analyzed at the DOH Environmental Radiation Control Laboratory in Orlando, Florida.

C. Analytical Results

Table 1, Environmental Radiological Monitoring Program Annual Summary provides a summary for all specified samples collected during the referenced surveillance period. Deviations from the sample schedule, missing data and/or samples not meeting the specified "A PRIORI" LLD, if any, are noted and explained in Tables 1A and 1B respectively. Analysis data for all specified samples analyzed during the surveillance period is provided in Attachment B.

D. Land Use Census

A land use census out to a distance of 5 miles radius from the Turkey Point Plant is conducted annually to determine the location of the nearest milk animal, residence, and garden producing broad leaf vegetation, in each of the sixteen meteorological sectors. A summary of the land use census for the surveillance year is provided in Table 2, Land Use Census Summary.



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No locations yielding a calculated dose or dose commitment greater than the values currently being calculated were identified by the land use census.

No locations yielding a calculated dose or dose commitment (via the same exposure pathway) 20% greater than locations currently being sampled in the radiological environmental monitoring program were identified by the land use census.

E. Interlaboratory Comparison Program

The intercomparison program, for 1998, consisted of samples provided through the EPA Safe Drinking Water Program and Department of Energy QAP Program.

The EPA program consisted of one round of Water samples. The results are listed in ATTACHMENT C, RESULTS FROM THE INTERLABORATORY COMPARISON PROGRAM.

The DOE-QAP consisted of two rounds of Air Filter, Water, Soil, and Vegetation matrices. The samples were analyzed using the methods applicable to the REMP (gamma spectroscopy, Gross Beta, and Tritium for water). The results for nuclides associated with the REMP are listed as the last two pages of ATTACHMENT C, RESULTS FROM THE INTERLABORATORY COMPARISON PROGRAM. Please note that although our laboratory participated in the analysis for alpha in water, the results of this analysis are not used to support Turkey Point's Radiological Environmental Monitoring Program.



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III. DISCUSSION AND INTERPRETATION OF RESULTS

A. Reporting of Results

The Annual Radiological Environmental Operating Report contains the summaries, interpretations and information required by Control 1.4 of ODCM. Table 1 provides a summary of the measurements made for the nuclides required by ODCM Table 5.1-2, for all samples specified by Table 5.1-1. In addition, summaries are provided for other nuclides identified in the specified samples, including those not related to station operation. These include nuclides such as K-40, Th-232, Ra-226, and Be-7 which are common in the Florida environment.

B. Interpretation of Results

1. Direct Radiation:

The results of direct radiation monitoring are consistent with past measurements for the specified locations. The exposure rate data shows no indication of any trends attributed to effluents from the plant. The measured exposure rates are consistent with exposure rates that were observed during the preoperational surveillance program. Direct radiation monitoring results are summarized in Table 1.

2. Air Particulates/Radioiodine:

Results of gross beta measurement are consistent with past measurements. No radioiodine was detected. The only identified isotopes are cosmic-ray produced Be-7 and naturally occurring Pb-210 at levels consistent with past measurements.

3. Waterborne, Surface Water:

The results of radioactivity measurements in surface water samples are consistent with past measurements. Tritium was reported as present in 4 of the 36 surface water samples collected. These results are consistent with the known subsurface interchange that occurs between the closed cooling canal and its surrounding waters, and the pressure gradients caused by the flow of aquifer subsurface waters in South Florida. The highest reported tritium is less than 2% of the reporting value specified by ODCM Table 5.1-2.

4. Waterborne, Sediment:

The results are consistent with past measurements. In addition to cosmic-ray produced Be-7 and naturally occurring isotopes, Cesium-137 was identified in 1 of the 6 samples collected. The result is less than 13% of the required LLD specified in ODCM Table 5.1-3



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5. Waterborne, Food Products:

The results are consistent with past measurements; only naturally occurring radionuclides were detected.

6. Broad Leaf Vegetation

The results of radioactivity measurements are consistent with past measurements. Cs-137 was detected, as in the past, in samples collected from the indicator and control locations. The maximum concentration reported was less than 15% of the reporting level specified by ODCM Table 5.1-2. No other fission products were detected.

C. Conclusions

The data obtained through the Turkey Point Plant Radiological Environmental Monitoring Program verifies that the levels of radiation and concentrations of radioactive materials in environmental samples, representing the highest potential exposure pathways to members of the public, are not being increased.

Additionally, supplemental to the ODCM program, sampling of the direct exposure, inhalation, and ingestion pathways, performed by DOH, does not show adverse trends in levels of radiation and radioactive materials in unrestricted areas. The measurements verify that the dose or dose commitment to members of the public, due to operation of Turkey Point Units 3 & 4, during the surveillance year, are well within "as low as reasonably achievable (ALARA)" criteria established by 10 CFR 50, Appendix I.



ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1998
(County, State)

PATHWAY: DIRECT RADIATION

SAMPLES COLLECTED: TLD

UNITS: micro-R/hr

Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c Distance & Direction	Mean (f) ^b Range	
Exposure Rate, 88 ^d	---	5.1 (84/84) 3.9 - 7.6	NW-10 10 mi., NW	7.3 (4/4) 7.0 - 7.6	5.5 (4/4) 5.3 - 5.9

Number of Nonroutine Reported Measurements = 0



ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY
 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251
 Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1998
 (County, State)

PATHWAY: AIRBORNE

SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES

UNITS: pCi/m³

Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c Distance & Direction	Mean (f) ^b Range	
¹³¹ I, 260	0.024	<MDA	---	---	<MDA
Gross Beta, 260	0.0025	0.013 (205/208) 0.004 - 0.024	T-72 <1 mi., WSW	0.013 (51/52) 0.006 - 0.024	0.014 (52/52) 0.005 - 0.026
Composite Gamma Isotopic, 20					
⁷ Be	0.0052	0.1266 (16/16) 0.0811 - 0.1498	T-72 <1 mi., WSW	0.1332 (4/4) 0.1032 - 0.1498	0.1292 (4/4) 0.1068 - 0.1473
¹³⁴ Cs	0.00069	<MDA	---	---	<MDA
¹³⁷ Cs	0.00066	<MDA	---	---	<MDA
²¹⁰ Pb	---	0.0146 (16/16) 0.0084 - 0.0191	T-51 2 mi., NNW	0.0161 (4/4) 0.0145 - 0.0176	0.0140 (4/4) 0.0114 - 0.0160

Number of Nonroutine Reported Measurements = 0



ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1998
(County, State)

PATHWAY: WATERBORNE

SAMPLES COLLECTED: SURFACE WATER

UNITS: pCi/L

Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c Distance & Direction	Mean (f) ^b Range	
Tritium, 36	230	271 (4/24) 162 - 407	T-81 6 mi., S	271 (4/24) 162 - 407	<MDA
Gamma Isotopic, 36					
⁴⁰ K	60	274 (24/24) 153 - 324	T-81 6 mi., S	289 (12/12) 232 - 350	149 (12/12) 65 - 287
⁵⁴ Mn	4	<MDA	---	---	<MDA
⁵⁹ Fe	8	<MDA	---	---	<MDA
⁵⁸ Co	4	<MDA	---	---	<MDA
⁶⁰ Co	4	<MDA	---	---	<MDA
⁶⁵ Zn	8	<MDA	---	---	<MDA
⁹⁵ Zr-Nb	7	<MDA	---	---	<MDA
¹³¹ I	5	<MDA	---	---	<MDA
¹³⁴ Cs	5	<MDA	---	---	<MDA
¹³⁷ Cs	5	<MDA	---	---	<MDA
¹⁴⁰ Ba-La	11	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0

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PATHWAY: WATERBORNE

SAMPLES COLLECTED: SHORELINE SEDIMENT

UNITS: pCi/kg, DRY

Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c	Mean (f) ^b	
			Distance & Direction	Range	
Gamma Isotopic, 6					
¹³⁷ Cs	12	22 (1/4)	T-42 <1 mi., ENE	22 (1/4)	<MDA
⁷ Be	100	304 (4/4) 166 - 532	T-81 6 mi., S	349 (2/2) 166 - 582	<MDA
⁴⁰ K	140	396 (3/4) 232 - 506	T-81 6 mi., S	451 (1/2)	255 (2/2) 249 - 261
²¹⁰ Pb	---	830 (4/4) 473 - 1130	T-42 <1 mi., ENE	1124 (2/2) 1119 - 1130	<MDA
²²⁶ Ra	49	702 (4/4) 605 - 892	T-81 6 mi., S	758 (2/2) 625 - 892	145 (1/2)
²³⁸ U	---	610 (4/4) 409 - 1117	T-42 <1 mi., ENE	763 (2/2) 409 - 1117	<MDA
⁵⁸ Co	9	<MDA	---	---	<MDA
⁶⁰ Co	12	<MDA	---	---	<MDA
¹³⁴ Cs	14	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0



ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Units 3 & 4, Docket No(s) 50-250 & 50-251Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1998
(County, State)

PATHWAY: INGESTION

SAMPLES COLLECTED: CRUSTACEA

UNITS: pCi/kg, WET

Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c	Mean (f) ^b	
			Distance & Direction	Range	
Gamma Isotopic, 4					
⁴⁰ K	130	1296 (2/2) 979 - 1612	T-81 6 mi., S	1296 (2/2) 979 - 1612	1016 (2/2) 948 - 1084
²²⁶ Ra	20	856 (1/2)	T-81 6 mi., S	856 (1/2)	<MDA
²²⁸ Ra	---	1105 (1-2)	T-81 6 mi., S	1105 (1-2)	<MDA
⁵⁴ Mn	9	<MDA	---	---	<MDA
⁵⁹ Fe	16	<MDA	---	---	<MDA
⁵⁸ Co	9	<MDA	---	---	<MDA
⁶⁰ Co	19	<MDA	---	---	<MDA
⁶⁵ Zn	17	<MDA	---	---	<MDA
¹³⁴ Cs	9	<MDA	---	---	<MDA
¹³⁷ Cs	9	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0



ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Units 3 & 4, Docket No(s) 50-250 & 50-251Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1998
(County, State)

PATHWAY: INGESTION

SAMPLES COLLECTED: FISH

UNITS: pCi/kg, WET

Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c	Mean (f) ^b	
			Distance & Direction	Range	
Gamma Isotopic, 4					
⁷ Be	---	<MDA	---	---	140 (1/2)
⁴⁰ K	130	1835 (2/2) 1798 - 1872	T-81 6 mi., S	1835 (2/2) 1798 - 1872	1825 (2/2) 1379 - 2271
²¹⁰ Pb	---	<MDA	---	---	255 (1/2)
²²⁶ Ra	---	377 (1/2)	T-81 6 mi., S	377 (1/2)	<MDA
⁵⁴ Mn	9	<MDA	---	---	<MDA
⁵⁹ Fe	16	<MDA	---	---	<MDA
⁵⁸ Co	9	<MDA	---	---	<MDA
⁶⁰ Co	10	<MDA	---	---	<MDA
⁶⁵ Zn	17	<MDA	---	---	<MDA
¹³⁴ Cs	9	<MDA	---	---	<MDA
¹³⁷ Cs	9	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0



ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY
 Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251
 Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1998
 (County, State)

PATHWAY: INGESTION

SAMPLES COLLECTED: BROAD LEAF VEGETATION

UNITS: pCi/kg, WET

Type and Total Number of Analyses Performed	Lower Limit of Detection ^a (LLD)	All Indicator Locations Mean (f)Range	Location with Highest Annual Mean		Control Locations Mean (f) ^b Range
			Name ^c	Mean (f) ^b	
			Distance & Direction	Range	
Gamma Isotopic, 36					
⁷ Be	71	1515 (24/24) 692 - 2370	T-40 3 mi., W	1648 (12/12) 1067 - 2370	1305 (12/12) 912 - 1806
⁴⁰ K	100	3360 (24/24) 1701 - 5605	T-41 2 mi., W/NW	3770 (12/12) 2260 - 5608	3445 (12/12) 2058 - 5143
¹³⁷ Cs	8	108 (24/24) 32 - 294	T-41 2 mi., W/NW	136 (12/12) 32 - 294	25 (7/12) 15 - 46
⁵⁸ Co	9	<MDA	---	---	<MDA
²¹⁰ Pb	---	789 (3/24) 570 - 1001	T-40 3 mi., W	795 (1/12)	817 (3/12) 608 - 950
¹³¹ I	9	<MDA	---	---	<MDA
¹³⁴ Cs	8	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility Turkey Point Units 3 & 4, Docket No(s). 50-250 & 50-251Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1998
(County, State)NOTES

- a. The LLD is an "a priori" lower limit of detection which establishes the smallest concentration of radioactive material in a sample that will yield a net count above system background that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a real signal.

LLDs in this column are at time of measurement. The MDAs reported in Attachment B for the individual samples have been corrected to the time of sample collection.

- b. Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (f).
- c. Specific identifying information for each sample location is provided in Attachment A.
- d. Results were based upon the average net response of two TLDs. (Thermoluminescent dosimeters).

MDA refers to minimum detectable activity.



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TABLE 1A

DEVIATIONS / MISSING DATA

There were no deviations from the sampling schedule. All samples were analyzed and the results included in Table 1.



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TABLE 1B

ANALYSIS WITH LLDs ABOVE TABLE 4.12-1 DETECTION CAPABILITIES
1/1/98 – 12/31/98

The values specified in ODCM Table 5.1-3, Detection Capabilities, were achieved for all samples.



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TABLE 2

LAND USE CENSUS

Distance to Nearest (a, b)

Sector	6/98 Milk (c) Animal	6/98 Residence	6/98 Garden (d)
N	L (e)	L (g)	L
NNE	O (f)	O	O
NE	O	O	O
ENE	O	O	O
E	O	O	O
ESE	O	O	O
SE	O	O	O
SSE	O	O	O
S	L	L	L
SSW	L	L	L
SW	L	L	L
WSW	L	L	L
W	L	L	L
WNW	L	4.8/285	L
NW	L	3.7/316 (g)	4.4/306
NNW	L	4.4/337 (g)	4.5/332



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TABLE 2

LAND USE CENSUS

NOTES

a. All categories surveyed out to 5 miles radius from the Turkey Point Plant.

b. The following format is used to denote the location:

distance (miles)/bearing (degrees)

For example, a residence located in the north sector at a distance of 2.1 miles bearing 350 degrees is recorded as 2.1/350.

c. Potential milk animal locations.

d. Gardens with an estimated growing area of 500 square feet or more.

e. L denotes that the sector area is predominantly a land area unoccupied by the category type.

f. O denotes that the sector area is predominantly an ocean area.

g. Non-residential occupied buildings in these sectors include the following:

<u>Sector</u>	<u>Distance</u>	<u>Description</u>
N	1.8/349	24-hour Security Staff Building
NW	3.5/304	24-hour Security Staffing
NNW	1.8/345	Security booth at park entrance



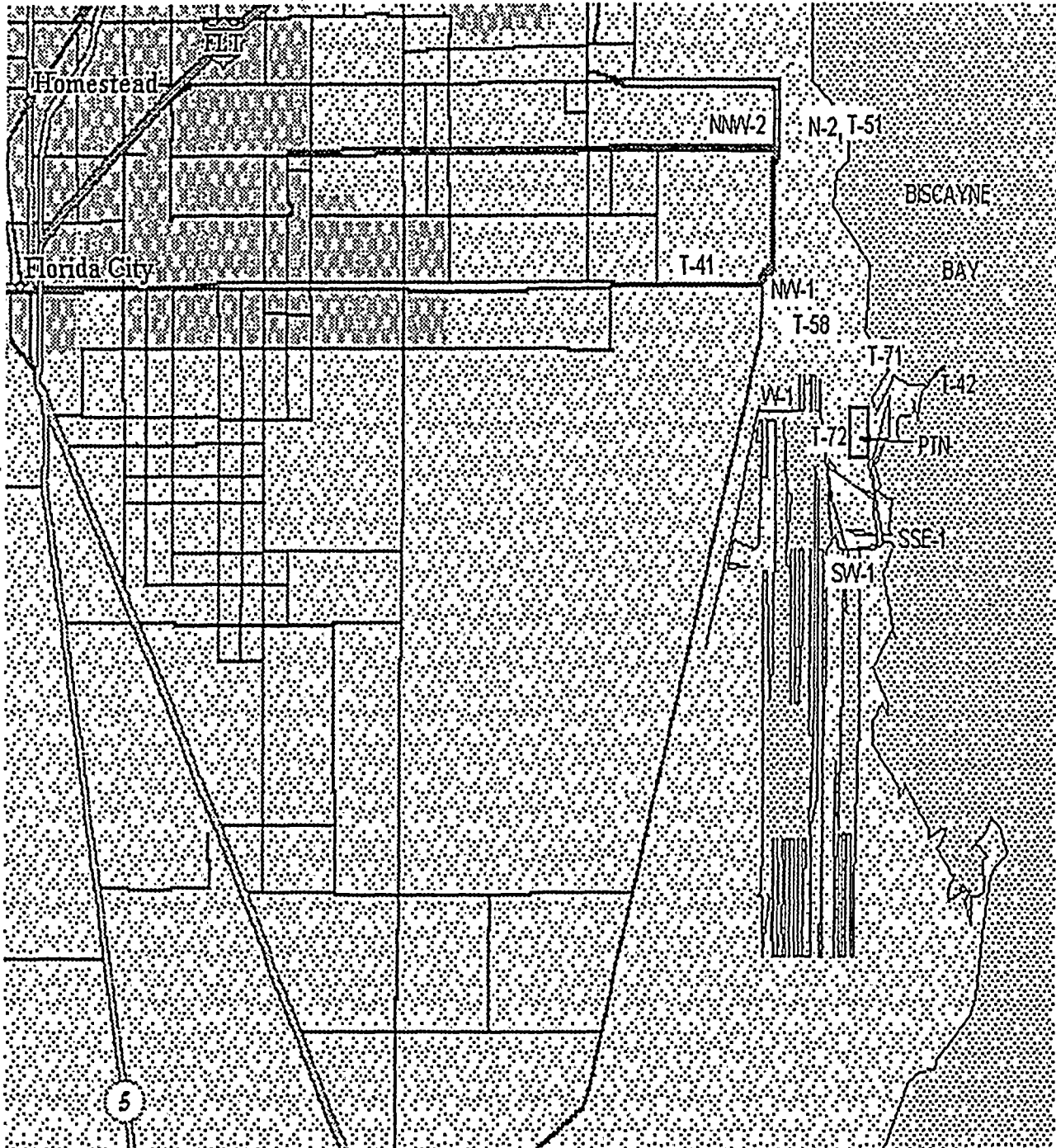
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ATTACHMENT A

KEY TO SAMPLE LOCATIONS

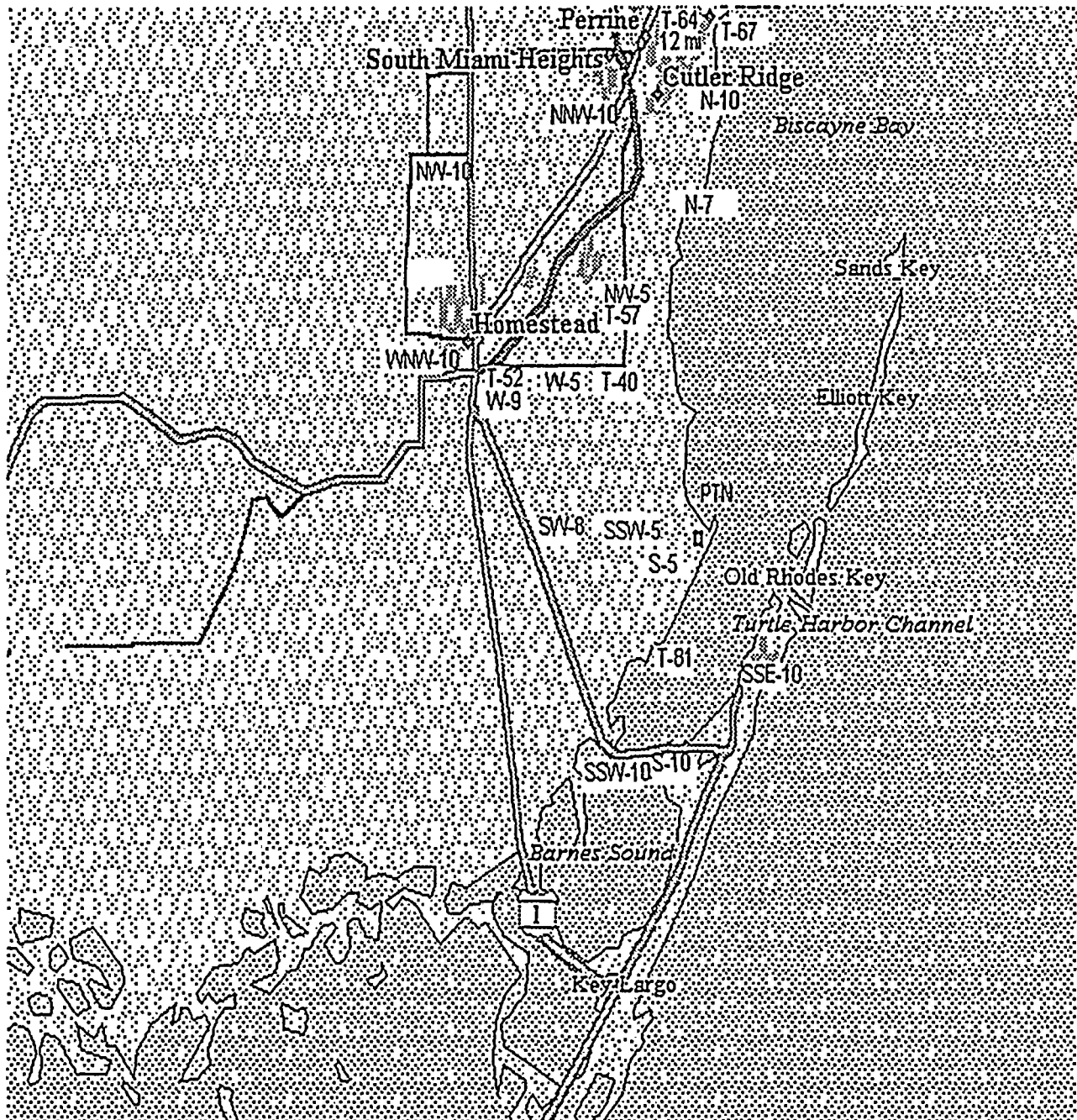
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NEAR SITE SAMPLING LOCATIONS



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DISTANT REMP SAMPLING LOCATIONS



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ATTACHMENT A

PAGE 1 OF 4

PATHWAY: DIRECT RADIATION
SAMPLES COLLECTED: TLD
SAMPLE COLLECTION FREQUENCY: QUARTERLY

Location ^(a)

<u>Name</u>	<u>Description</u>
N-2	Convey Point, Parking Area
N-7	Black Point Marina Parking Lot
N-10	Old Cutler Rd. approx. 196th Street
NNW-2	East End North Canal Road
NNW-10	Bailes Road & U.S. #1
NW-1	Turkey Point Entrance Road
NW-5	Mowry Drive & 117th Avenue
NW-10	Newton Road, North of Coconut Palm Drive
WNW-10	Homestead Middle School
W-1	On-Site, North Side of Discharge Canal
W-5	Palm Drive & Tallahassee Road
W-9	Card Sound Road, 0.6 mile from U.S. #1
WSW-8	Card Sound Road, 3.4 miles from U.S. #1
SW-1	On-Site near Land Utilization Offices
SW-8	Card Sound Road, 5 miles from U.S. #1
SSW-5	On-Site, Southwest Corner of Cooling Canals
SSW-10	Card Sound Road, west side of Toll Plaza
S-5	On-Site, South East Corner of Cooling Canals
S-10	Card Sound Road at Steamboat Creek
SSE-1	Turtle Point
SSE-10	Ocean Reef
<u>Control</u>	
NNE-22	Natoma Substation

^aThe location name is the direction sector - approximate distance (miles)



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PATHWAY: AIRBORNE

SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES

SAMPLE COLLECTION FREQUENCY: WEEKLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-51	NNW	2	Entrance Area to Biscayne National Park
T-57	NW	4	SW 107th Avenue at Mowry Canal
T-58	NW	1	Turkey Point Entrance Road
T-72	WSW	<1	Just before entrance to Land Utilization's access gate.

Control:

T-64	NNE	22	Natoma Substation
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PATHWAY: WATERBORNE
SAMPLES COLLECTED: SURFACE WATER (OCEAN)
SAMPLE COLLECTION FREQUENCY: MONTHLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-42	ENE	<1	Biscayne Bay at Turkey Point
T-81	S	6	Card Sound, near Mouth of Old Discharge Canal

Control:

T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Plant, North to Matheson Hammock Park
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SAMPLES COLLECTED: SHORELINE SEDIMENT
SAMPLE COLLECTION FREQUENCY: SEMI-ANNUALLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-42	ENE	<1	Biscayne Bay at Turkey Point
T-81	S	6	Card Sound, near Mouth of Old Discharge Canal

Control:

T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Plant, North to Matheson Hammock Park
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PATHWAY: INGESTION

SAMPLES COLLECTED: CRUSTACEA AND FISH

SAMPLE COLLECTION FREQUENCY: SEMI-ANNUALLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-81	S	6	Card Sound Vicinity of Turkey Point Facility
<u>Control:</u>			
T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Plant, North to Matheson Hammock Park

SAMPLES COLLECTED: BROAD LEAF VEGETATION

SAMPLE COLLECTION FREQUENCY: MONTHLY

<u>Location Name</u>	<u>Direction Sector</u>	<u>Approximate Distance (miles)</u>	<u>Description</u>
T-40	W	3	South of Palm Dr. on S.W. 117th Street Extension
T-41	WNW	2	Palm Dr., West of Old Missile Site near Plant Site Boundary
<u>Control:</u>			
T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Plant, North to Matheson Hammock Park

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ATTACHMENT B

RADIOLOGICAL SURVEILLANCE OF
FLORIDA POWER AND LIGHT COMPANY'S

TURKEY POINT SITE

1998

First Quarter, 1998

Second Quarter, 1998

Third Quarter, 1998

Fourth Quarter, 1998





RADIOLOGICAL SURVEILLANCE
OF
FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT SITE

FIRST QUARTER 1998

BUREAU OF RADIATION CONTROL



TURKEY POINT SITE

Technical Specifications Sampling

First Quarter, 1998

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	22	22
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Monthly	3	9
3.b. Shoreline Sediment	Semiannually	3	3
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	0	0
4.a.2. Fish	Semiannually	1	1
4.b. Food Products			
Broad Leaf Vegetation	Monthly	3	9
			<hr/> Total: 174

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as "non-detectable" (ND) or as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.



1. DIRECT RADIATION - TLDs - (μ R/hour)

<u>Sample Site</u>	<u>Deployment 16-Dec-97 Collection 17-Mar-98</u>	<u>Sample Site</u>	<u>Deployment 16-Dec-97 Collection 17-Mar-98</u>
N-2	5.9 ± 0.4	WSW-8	5.5 ± 0.4 (A)
N-7	5.0 ± 0.4		
N-10	4.7 ± 0.4	SW-1	4.6 ± 0.4
		SW-8	4.7 ± 0.4 (A)
NNW-2	4.5 ± 0.3		
NNW-10	5.6 ± 0.4	SSW-5	4.7 ± 0.4
		SSW-10	4.9 ± 0.4
NW-1	6.3 ± 0.5		
NW-5	4.6 ± 0.3	S-5	4.9 ± 0.4 (A)
NW-10	7.6 ± 0.5	S-10	5.7 ± 0.4
WNW-10	6.5 ± 0.5	SSE-1	4.5 ± 0.3
		SSE-10	5.4 ± 0.4 (B)
W-1	6.5 ± 0.5		
W-5	5.1 ± 0.3	NNE-22	5.5 ± 0.4
W-9	5.0 ± 0.4		

(A) - The dosimeter for sites WSW-8, SW-8 and S-5 were found on the ground when collection was attempted. We suspect wind blew the tld cages off the utility pole. The TLD cages were remounted on utility poles and new dosimeters were deployed.

(B) - The dosimeter for site SSE-10 was found in the bushes upon collection. We suspect wind blew the TLD cage off the utility pole. The cage was remounted and a new dosimeter was deployed.



2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m³)

<u>Collection Date</u>	<u>T51</u>	<u>T57</u>	<u>T58</u>	<u>T64</u>	<u>T72</u>
05-Jan-98	<0.02	<0.02	<0.02	<0.02	<0.02
12-Jan-98	<0.02	<0.02	<0.03	<0.02	<0.02
20-Jan-98	<0.02	<0.02	<0.02	<0.02	<0.02
26-Jan-98	<0.02	<0.02	<0.02	<0.02	<0.02
03-Feb-98	<0.02	<0.02	<0.01	<0.01	<0.02
09-Feb-98	<0.02	<0.02	<0.03	<0.03	<0.03
16-Feb-98	<0.02	<0.02	<0.02	<0.03	<0.02
23-Feb-98	<0.01	<0.01	<0.01	<0.01	<0.01
02-Mar-98	<0.03	<0.03	<0.02	<0.03	<0.03
10-Mar-98	<0.02	<0.02	<0.02	<0.02	<0.02
17-Mar-98	<0.03	<0.03	<0.03	<0.04	<0.03
23-Mar-98	<0.03	<0.03	<0.03	<0.02	<0.03
30-Mar-98	<0.02	<0.02	<0.02	<0.02	<0.02

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
05-Jan-98	0.006 ± 0.002	0.006 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.008 ± 0.002
12-Jan-98	0.007 ± 0.002	0.010 ± 0.002	0.013 ± 0.002	0.010 ± 0.002	0.007 ± 0.002
20-Jan-98	0.019 ± 0.002	0.013 ± 0.002	0.009 ± 0.002	0.020 ± 0.002	0.016 ± 0.002
26-Jan-98	0.015 ± 0.002	0.014 ± 0.002	0.007 ± 0.002	0.013 ± 0.002	0.013 ± 0.002
03-Feb-98	0.011 ± 0.002	0.016 ± 0.002	0.019 ± 0.002	0.014 ± 0.002	0.016 ± 0.002
09-Feb-98	0.011 ± 0.002	0.014 ± 0.002	0.009 ± 0.002	0.016 ± 0.002	0.009 ± 0.002
16-Feb-98	0.013 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.015 ± 0.002	0.012 ± 0.002
23-Feb-98	0.009 ± 0.002	0.011 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.014 ± 0.002
02-Mar-98	0.017 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.016 ± 0.002	0.015 ± 0.002
10-Mar-98	0.016 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.020 ± 0.002	0.019 ± 0.002
17-Mar-98	0.019 ± 0.002	0.015 ± 0.002	0.015 ± 0.002	0.015 ± 0.003	0.019 ± 0.002
23-Mar-98	0.010 ± 0.002	0.011 ± 0.002	0.008 ± 0.002	0.012 ± 0.002	0.009 ± 0.002
30-Mar-98	0.010 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.015 ± 0.002	0.012 ± 0.002
Mean:	0.013 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.013 ± 0.001

2.b.2. AIR PARTICULATES GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m³)

Sample Site	First Quarter, 1998				
	Be-7	K-40	Cs-134	Cs-137	Pb-210
T51	0.1395 ± 0.0107	<0.0116	<0.0008	<0.0008	0.0145 ± 0.0033
T57	0.1465 ± 0.0107	<0.0131	<0.0007	<0.0008	0.0191 ± 0.0029
T58	0.1401 ± 0.0104	<0.0157	<0.0008	<0.0006	0.0124 ± 0.0031
T64	0.1473 ± 0.0097	<0.0143	<0.0013	<0.0007	0.0133 ± 0.0032
T72	0.1498 ± 0.0102	<0.0175	<0.0008	<0.0010	0.0123 ± 0.0030

3.a. SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	23-Jan-98	<145	201 ± 30	<3	<3	<7	<4	<7	<7	<6	<4	<5	<5
	13-Feb-98	<163	172 ± 26	<4	<4	<9	<4	<9	<7	<12	<4	<4	<4
	06-Mar-98	<153	273 ± 29	<4	<4	<9	<4	<9	<6	<13	<4	<4	<7
T67	22-Jan-98	<145	109 ± 26	<3	<4	<10	<3	<8	<7	<7	<4	<3	<5
	18-Feb-98	<163	73 ± 25	<4	<3	<7	<3	<8	<6	<9	<4	<3	<6
	04-Mar-98	<154	122 ± 26	<4	<4	<7	<4	<7	<7	<15	<4	<3	<5
T81	23-Jan-98	<145	331 ± 32	<3	<4	<7	<4	<8	<7	<7	<4	<4	<6
	13-Feb-98	<163	232 ± 28	<4	<4	<8	<4	<9	<7	<12	<5	<4	<6
	03-Mar-98	162 ± 50	243 ± 30	<4	<4	<10	<5	<9	<7	<14	<4	<5	<8

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLDs.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.



3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>	<u>U-238</u>
T42	14-Jan-98	212 ± 46	232 ± 39	<10	<10	<10	<11	1119 ± 459	687 ± 15	1117 ± 189
T67	13-Jan-98	<77	249 ± 32	<7	<6	<8	<7	<531	143 ± 8	<299
T81	08-Jan-98	532 ± 85	<237	<15	<15	<17	<13	473 ± 179	892 ± 20	428 ± 180

4.a.1. CRUSTACEA - Blue Crab, Spider Crab - (pCi/kg, wet weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>
T67	This sample has not yet been collected.										
T81	This sample has not yet been collected.										

4.a.2. FISH - Mangrove Snapper - (pCi/kg, wet weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>	<u>Other</u>
T67	16-Jan-98	1379 ± 173	<19	<20	<38	<24	<46	<23	<17	<336	<69	Be-7: 140 ± 44 Pb-210: 259 ± 11
T81	This sample has not yet been collected.											



4.b. BROAD LEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>
T40	23-Jan-98	2264 ± 97	1701 ± 108	<19	<12	34 ± 8	<801	<281
	17-Feb-98	2370 ± 97	2379 ± 124	<24	<11	60 ± 8	<800	<258
	04-Mar-98	2313 ± 46	2918 ± 58	<17	<5	58 ± 3	795 ± 150	<156
T41	23-Jan-98	1521 ± 82	5608 ± 182	<17	<12	55 ± 7	1001 ± 318	<252
	17-Feb-98	2288 ± 106	3899 ± 155	<24	<12	200 ± 11	<814	<274
	04-Mar-98	1925 ± 90	3959 ± 139	<32	<9	61 ± 6	<695	<231
T67	22-Jan-98	1099 ± 79	4516 ± 163	<20	<12	31 ± 6	892 ± 266	<243
	17-Feb-98	1806 ± 100	3754 ± 154	<23	<13	15 ± 6	<767	<274
	04-Mar-98	1742 ± 85	3889 ± 148	<31	<9	<10	<699	<724





RADIOLOGICAL SURVEILLANCE
OF
FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT SITE

SECOND QUARTER 1998

BUREAU OF RADIATION CONTROL



TURKEY POINT SITE

Technical Specifications Sampling

Second Quarter, 1998

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	22	22
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Monthly	3	9
3.b. Shoreline Sediment	Semiannually	0	0
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	2	2
4.a.2. Fish	Semiannually	1	1
4.b. Food Products			
Broadleaf Vegetation	Monthly	3	9
			<hr/>
			Total: 173

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as "non-detectable" (ND) or as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.



1. DIRECT RADIATION - TLDs - (μ R/hour)

Sample Site	Deployment 17-Mar-98 Collection 23-Jun-98	Sample Site	Deployment 17-Mar-98 Collection 23-Jun-98
N-2	5.7 ± 0.4	W-9	4.5 ± 0.3
N-7	4.5 ± 0.3	WSW-8	4.7 ± 0.3
N-10	4.9 ± 0.4	SW-1	5.0 ± 0.4
NNW-2	4.5 ± 0.3	SW-8	4.5 ± 0.3
NNW-10	5.1 ± 0.4	SSW-5	4.8 ± 0.4
NW-1	6.8 ± 0.5	SSW-10	4.7 ± 0.3
NW-5	4.5 ± 0.3	S-5	4.5 ± 0.3
NW-10	7.6 ± 0.6	S-10	5.4 ± 0.4
WNW-10	6.0 ± 0.4	SSE-1	4.6 ± 0.3
W-1	6.5 ± 0.5	SSE-10 (B)	5.4 ± 0.4
W-5	4.9 ± 0.4	NNE-22	5.4 ± 0.4

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m^3)

Collection Date	T51	T57	T58	T64	T72
07-Apr-98	<0.02	<0.02	<0.02	<0.02	<0.02
13-Apr-98	<0.02	<0.02	<0.01	<0.02	<0.01
20-Apr-98	<0.02	<0.02	<0.02	<0.02	<0.02
27-Apr-98	<0.03	<0.03	<0.03	<0.03	<0.03
04-May-98	<0.02	<0.02	<0.02	<0.02	<0.03
11-May-98	<0.02	<0.02	<0.02	<0.02	<0.02
18-May-98	<0.02	<0.02	<0.02	<0.02	<0.02
26-May-98	<0.01	<0.01	<0.01	<0.01	<0.01
01-Jun-98	<0.03	<0.03	<0.03	<0.03	<0.03
08-Jun-98	<0.02	<0.02	<0.02	<0.02	<0.02
15-Jun-98	<0.02	<0.02	<0.02	<0.02	<0.02
23-Jun-98	<0.01	<0.01	<0.01	<0.01	<0.01
30-Jun-98	<0.02	<0.02	<0.02	<0.02	<0.02

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

<u>Collection Date</u>	<u>Sample Site</u>				
	<u>T51</u>	<u>T57</u>	<u>T58</u>	<u>T64</u>	<u>T72</u>
07-Apr-98	0.009 ± 0.002	0.013 ± 0.002	0.011 ± 0.002	0.012 ± 0.002	0.006 ± 0.002
13-Apr-98	0.019 ± 0.003	0.014 ± 0.002	0.015 ± 0.002	0.021 ± 0.003	0.019 ± 0.002
20-Apr-98	0.016 ± 0.002	0.014 ± 0.002	0.020 ± 0.002	0.014 ± 0.002	0.016 ± 0.002
27-Apr-98	0.014 ± 0.002	0.015 ± 0.002	0.017 ± 0.002	0.019 ± 0.002	0.017 ± 0.002
04-May-98	0.014 ± 0.002	0.007 ± 0.002	0.007 ± 0.002	0.012 ± 0.002	0.015 ± 0.002
11-May-98	0.015 ± 0.002	0.015 ± 0.002	0.017 ± 0.002	0.026 ± 0.003	0.016 ± 0.002
18-May-98	0.012 ± 0.002	0.015 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.013 ± 0.002
26-May-98	0.023 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.021 ± 0.002	0.021 ± 0.002
01-Jun-98	0.006 ± 0.002	0.009 ± 0.002	<0.006	0.009 ± 0.002	<0.006
08-Jun-98	0.009 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.009 ± 0.002	0.009 ± 0.002
15-Jun-98	0.019 ± 0.002	0.012 ± 0.002	0.018 ± 0.002	0.014 ± 0.002	0.015 ± 0.002
23-Jun-98	0.009 ± 0.002	0.013 ± 0.002	0.015 ± 0.002	0.012 ± 0.002	0.013 ± 0.002
30-Jun-98	0.018 ± 0.002	0.016 ± 0.002	0.020 ± 0.002	0.018 ± 0.002	0.024 ± 0.003
Mean:	0.014 ± 0.001	0.013 ± 0.001	<0.014	0.015 ± 0.001	<0.015

2.b.2. AIR PARTICULATES GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m³)Second Quarter, 1998

<u>Sample Site</u>	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
T51	0.1441 ± 0.0113	<0.0135	<0.0007	<0.0009	0.0152 ± 0.0032
T57	0.1249 ± 0.0105	<0.0161	<0.0008	<0.0008	0.0166 ± 0.0028
T58	0.1412 ± 0.0097	<0.0158	<0.0009	<0.0007	0.0158 ± 0.0040
T64	0.1460 ± 0.0104	<0.0152	<0.0010	<0.0007	0.0153 ± 0.0032
T72	0.1416 ± 0.0130	<0.0176	<0.0009	<0.0008	0.0171 ± 0.0038

3.a. SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	14-Apr-98	<150	271 ± 32	<4	<4	<6	<4	<8	<7	<7	<4	<3	<4
	14-May-98	<146	344 ± 31	<4	<4	<7	<4	<7	<6	<6	<4	<4	<5
	10-Jun-98	<151	374 ± 37	<5	<3	<10	<5	<7	<5	<10	<4	<4	<7
T67	15-Apr-98	<150	65 ± 9	<1	<1	<2	<1	<2	<2	<3	<1	<1	<2
	15-May-98	<146	184 ± 29	<4	<5	<8	<4	<7	<6	<7	<3	<4	<6
	11-Jun-98	<151	247 ± 35	<3	<4	<8	<4	<8	<8	<10	<4	<4	<6
T81	14-Apr-98	<150	306 ± 13	<1	<1	<3	<1	<3	<2	<3	<1	<1	<2
	14-May-98	<146	314 ± 38	<3	<3	<8	<4	<8	<6	<7	<5	<4	<4
	10-Jun-98	<151	260 ± 33	<4	<4	<8	<4	<6	<6	<11	<4	<4	<7

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLDs.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	<u>Be-7</u>	<u>K-40</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>	<u>U-238</u>
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These samples were previously collected.

4.a.1. CRUSTACEA - Blue Crab - (pCi/kg, wet weight)

Sample Site	Collection Date	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>
T67	08-Apr-98	948 ± 233	<24	<25	<30	<27	<47	<30	<22	<408	<81
T81	08-Apr-98	1612 ± 197	<21	<22	<53	<26	<47	<23	<24	856 ± 205	<105

4.a.2. FISH - Lookdown, Jack - (pCi/kg, wet weight)

Sample Site	Collection Date	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>
T81	29-Apr-98	1872 ± 135	<13	<16	<34	<16	<33	<15	<13	377 ± 97	<62



4.b. BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>
T40	16-Apr-98	1612 ± 74	4073 ± 157	<15	<10	35 ± 7	<742	<261
	14-May-98	1190 ± 75	3685 ± 146	<20	<12	84 ± 8	<782	<257
	11-Jun-98	1067 ± 67	2277 ± 123	<18	<11	95 ± 10	<713	<260
T41	16-Apr-98	1083 ± 71	5255 ± 167	<16	<13	55 ± 8	<766	<265
	14-May-98	692 ± 68	2875 ± 136	<17	<12	147 ± 12	<689	<238
	11-Jun-98	752 ± 82	3837 ± 147	<23	<12	234 ± 12	<776	<258
T67	15-Apr-98	1566 ± 85	2269 ± 119	<20	<11	46 ± 6	950 ± 273	<277
	15-May-98	912 ± 64	5143 ± 172	<16	<14	<12	<714	<245
	11-Jun-98	1077 ± 89	2396 ± 133	<24	<12	22 ± 8	608 ± 255	<294





RADIOLOGICAL SURVEILLANCE
OF
FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT SITE

THIRD QUARTER 1998

BUREAU OF RADIATION CONTROL



TURKEY POINT SITE

Technical Specifications Sampling

Third Quarter, 1998

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	22	22
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Monthly	3	9
3.b. Shoreline Sediment	Semiannually	3	3
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	2	2
4.a.2. Fish	Semiannually	2	2
4.b. Food Products			
Broadleaf Vegetation	Monthly	3	9
			<hr/> Total: 177

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as "non-detectable" (ND) or as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.



1. DIRECT RADIATION - TLDs - ($\mu\text{R}/\text{hour}$)

Sample Site	Deployment 23-Jun-98 Collection 23-Sep-98	Sample Site	Deployment 23-Jun-98 Collection 23-Sep-98
N-2	5.0 ± 0.4	WSW-8	4.6 ± 0.3
N-7	4.3 ± 0.3		
N-10	4.6 ± 0.3	SW-1	4.2 ± 0.3
		SW-8	4.1 ± 0.3
NNW-2	4.0 ± 0.3		
NNW-10	4.9 ± 0.4	SSW-5	4.4 ± 0.3
		SSW-10	4.3 ± 0.3
NW-1	6.0 ± 0.4		
NW-5	3.9 ± 0.3	S-5	4.3 ± 0.3
NW-10	7.0 ± 0.5	S-10	5.2 ± 0.4
WNW-10	5.9 ± 0.4	SSE-1	4.3 ± 0.3
		SSE-10	5.3 ± 0.4
W-1	5.9 ± 0.4		
W-5	4.8 ± 0.4	NNE-22	5.3 ± 0.4
W-9	4.2 ± 0.3		

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m^3)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
06-Jul-98	<0.03	<0.03	<0.03	<0.03	<0.03
13-Jul-98	<0.01	<0.01	<0.01	<0.01	<0.01
20-Jul-98	<0.01	<0.01	<0.02	<0.01	<0.01
27-Jul-98	<0.02	<0.02	<0.02	<0.02	<0.02
03-Aug-98	<0.02	<0.02	<0.02	<0.02	<0.02
10-Aug-98	<0.02	<0.02	<0.01	<0.01	<0.02
17-Aug-98	<0.02	<0.02	<0.02	<0.02	<0.02
24-Aug-98	<0.01	<0.01	<0.01	<0.01	<0.01
31-Aug-98	<0.01	<0.01	<0.01	<0.01	<0.01
08-Sep-98	<0.02	<0.02	<0.02	<0.02	<0.02
14-Sep-98	<0.02	<0.02	<0.02	<0.02	<0.02
21-Sep-98	<0.02	<0.02	<0.02	<0.02	<0.02
28-Sep-98	<0.02	<0.06	<0.02	<0.02	<0.02



2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

<u>Collection Date</u>	<u>Sample Site</u>				
	<u>T51</u>	<u>T57</u>	<u>T58</u>	<u>T64</u>	<u>T72</u>
06-Jul-98	0.012 ± 0.002	0.018 ± 0.003	0.018 ± 0.003	0.020 ± 0.003	0.017 ± 0.003
13-Jul-98	0.012 ± 0.002	0.014 ± 0.002	0.011 ± 0.002	0.015 ± 0.002	0.013 ± 0.002
20-Jul-98	0.008 ± 0.002	0.006 ± 0.002	0.012 ± 0.003	0.010 ± 0.002	0.009 ± 0.002
27-Jul-98	0.019 ± 0.002	0.019 ± 0.002	0.017 ± 0.002	0.020 ± 0.002	0.019 ± 0.002
03-Aug-98	0.017 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.019 ± 0.003	0.016 ± 0.002
10-Aug-98	0.009 ± 0.002	0.005 ± 0.002	0.008 ± 0.002	0.008 ± 0.002	0.011 ± 0.002
17-Aug-98	0.005 ± 0.002	0.008 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.009 ± 0.002
24-Aug-98	0.012 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.012 ± 0.002
31-Aug-98	0.018 ± 0.002	0.014 ± 0.002	0.022 ± 0.002	0.020 ± 0.002	0.018 ± 0.002
08-Sep-98	0.012 ± 0.002	0.012 ± 0.002	0.017 ± 0.002	0.013 ± 0.002	0.014 ± 0.002
14-Sep-98	0.014 ± 0.002	0.015 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.012 ± 0.002
21-Sep-98	0.007 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.007 ± 0.002
28-Sep-98	0.009 ± 0.002	<0.014 (A)	0.012 ± 0.002	0.013 ± 0.002	0.015 ± 0.002
Mean:	0.012 ± 0.001	<0.012	0.014 ± 0.001	0.014 ± 0.001	0.013 ± 0.001

(A) - The air pump failed during the sampling period. The pump is estimated to have run 49 out of 175 hours during the sampling interval.

2.b.2. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m³)Third Quarter, 1998

<u>Sample Site</u>	<u>Be-7</u>	<u>K-40</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>
T51	0.0811 ± 0.0094	<0.0201	<0.0009	<0.0005	0.0176 ± 0.0028
T57	0.0916 ± 0.0104	<0.0198	<0.0009	<0.0006	0.0120 ± 0.0034
T58	0.1042 ± 0.0109	<0.0132	<0.0006	<0.0008	0.0160 ± 0.0033
T64	0.1068 ± 0.0081	<0.0195	<0.0008	<0.0006	0.0160 ± 0.0034
T72	0.1032 ± 0.0094	<0.0162	<0.0012	<0.0007	0.0127 ± 0.0028



3.a. SURFACE WATER - (pCi/L)

<u>Sample Site</u>	<u>Collection Date</u>	<u>H-3</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Zr-95 Nb-95 (A)</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ba-140 La-140 (B)</u>
T42	15-Jul-98	<152	327 ± 32	<4	<4	<8	<5	<8	<7	<7	<4	<5	<5
	17-Aug-98	<144	316 ± 34	<3	<4	<10	<4	<8	<7	<6	<4	<3	<6
	09-Sep-98	<144	287 ± 33	<4	<4	<8	<4	<9	<8	<13	<4	<3	<7
T67	16-Jul-98	<152	162 ± 31	<4	<4	<8	<5	<9	<7	<5	<4	<3	<4
	18-Aug-98	<144	287 ± 32	<3	<4	<6	<4	<8	<8	<6	<5	<4	<4
	10-Sep-98	<144	216 ± 32	<3	<4	<8	<4	<7	<7	<12	<4	<3	<6
T81	15-Jul-98	407 ± 54	349 ± 33	<3	<4	<9	<5	<8	<6	<7	<4	<4	<4
	17-Aug-98	348 ± 51	350 ± 33	<4	<4	<7	<5	<9	<6	<8	<5	<4	<6
	09-Sep-98	165 ± 47	299 ± 33	<4	<4	<9	<4	<9	<8	<14	<4	<4	<8

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLDs.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.



3.b. SEDIMENT - (pCi/kg, dry weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>	<u>U-238</u>
T42	09-Jul-98	304 ± 71	506 ± 69	<12	<12	<14	22 ± 5	1130 ± 252	605 ± 18	409 ± 139
T67	14-Jul-98	<77	261 ± 41	<7	<7	<7	<8	<623	<32	<313
T81	09-Jul-98	166 ± 44	451 ± 72	<12	<10	<12	<11	599 ± 221	625 ± 17	484 ± 149

4.a.1. CRUSTACEA - Blue Crab - (pCi/kg, wet weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>
T67	31-Aug-98	1084 ± 134	<17	<22	<50	<16	<46	<20	<20	<363	<75
T81	27-Aug-98	979 ± 147	<22	<28	<62	<24	<52	<23	<22	1105 ± 239	<102

4.a.2. FISH - Mangrove Snapper, Bass, Perch - (pCi/kg, wet weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>
T67	27-Aug-98	2271 ± 210	<18	<26	<59	<20	<47	<20	<22	<337	<85
T81	26-Aug-98	1798 ± 208	<23	<21	<51	<24	<50	<19	<23	<471	<101



4.b. BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>
T40	16-Jul-98	1160 ± 94	2431 ± 140	<24	<13	111 ± 11	<858	<331
	19-Aug-98	1572 ± 88	2238 ± 124	<11	<12	85 ± 9	<706	<289
	10-Sep-98	1378 ± 92	2148 ± 138	<22	<10	80 ± 12	<856	<305
T41	16-Jul-98	812 ± 28	2989 ± 52	<7	<4	294 ± 5	<265	<95
	19-Aug-98	1527 ± 83	3969 ± 147	<13	<12	211 ± 12	<719	<259
	10-Sep-98	1392 ± 71	3684 ± 146	<18	<11	76 ± 9	<641	<228
T67	16-Jul-98	935 ± 71	3397 ± 160	<18	<13	<11	<766	<244
	18-Aug-98	1048 ± 69	2058 ± 113	<11	<8	25 ± 5	<630	<230
	10-Sep-98	978 ± 69	2358 ± 124	<16	<10	21 ± 6	<698	<245





RADIOLOGICAL SURVEILLANCE
OF
FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT SITE

FOURTH QUARTER 1998

BUREAU OF RADIATION CONTROL

TURKEY POINT SITE

Technical Specifications Sampling

Fourth Quarter, 1998

<u>Sample Type</u>	<u>Collection Frequency</u>	<u>Locations Sampled</u>	<u>Number of Samples</u>
1. Direct Radiation	Quarterly	22	22
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Monthly	3	9
3.b. Shoreline Sediment	Semiannually	0	0
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	0	0
4.a.2. Fish	Semiannually	0	0
4.b. Food Products			
Broadleaf Vegetation	Monthly	3	9
			<hr/> Total: 170

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as "non-detectable" (ND) or as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.



1. DIRECT RADIATION - TLDs - (μ R/hour)

<u>Sample Site</u>	<u>Deployment 23-Sep-98 Collection 16-Dec-98</u>	<u>Sample Site</u>	<u>Deployment 23-Sep-98 Collection 16-Dec-98</u>
N-2	5.3 ± 0.4	WSW-8	5.0 ± 0.4
N-7	4.8 ± 0.4		
N-10	4.6 ± 0.3	SW-1	4.4 ± 0.3
		SW-8	4.2 ± 0.3
NNW-2	4.1 ± 0.3		
NNW-10	5.1 ± 0.6	SSW-5	4.4 ± 0.3
		SSW-10	4.5 ± 0.3
NW-1	5.8 ± 0.4		
NW-5	4.3 ± 0.3	S-5	4.3 ± 0.3
NW-10	7.0 ± 0.5	S-10	5.3 ± 0.4
WNW-10	5.8 ± 0.4	SSE-1	4.2 ± 0.3
		SSE-10	5.1 ± 0.4
W-1	5.9 ± 0.4		
W-5	4.4 ± 0.3	NNE-22	5.9 ± 0.4
W-9	4.5 ± 0.3		



2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m³)

<u>Collection Date</u>	<u>Sample Site</u>				
	<u>T51</u>	<u>T57</u>	<u>T58</u>	<u>T64</u>	<u>T72</u>
05-Oct-98	<0.02	<0.03	<0.02	<0.02	<0.02
13-Oct-98	<0.03	<0.03	<0.03	<0.03	<0.03
20-Oct-98	<0.02	<0.02	<0.02	<0.01	<0.02
26-Oct-98	<0.01	<0.01	<0.01	<0.01	<0.01
02-Nov-98	<0.02	<0.02	<0.02	<0.02	<0.02
09-Nov-98	<0.02	<0.02	<0.02	<0.02	<0.02
16-Nov-98	<0.02	<0.02	<0.02	<0.02	<0.02
23-Nov-98	<0.04	<0.03	<0.03	<0.03	<0.03
30-Nov-98	<0.03	<0.03	<0.03	<0.02	<0.03
07-Dec-98	<0.02	<0.02	<0.02	<0.02	<0.02
14-Dec-98	<0.02	<0.02	<0.02	<0.03	<0.02
21-Dec-98	<0.02	<0.02	<0.02	<0.02	<0.02
28-Dec-98	<0.02	<0.02	<0.02	<0.02	<0.02



2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
05-Oct-98	0.010 ± 0.002	0.010 ± 0.003	0.011 ± 0.002	0.009 ± 0.002	0.010 ± 0.002
13-Oct-98	0.005 ± 0.002	0.008 ± 0.002	0.007 ± 0.002	0.007 ± 0.002	0.008 ± 0.002
20-Oct-98	0.010 ± 0.002	0.008 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.010 ± 0.002
26-Oct-98	0.010 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.008 ± 0.002	0.010 ± 0.002
02-Nov-98	0.019 ± 0.002	0.017 ± 0.002	0.019 ± 0.002	0.017 ± 0.002	0.019 ± 0.002
09-Nov-98	0.017 ± 0.002	0.016 ± 0.002	0.020 ± 0.003	0.017 ± 0.002	0.016 ± 0.002
16-Nov-98	0.011 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.016 ± 0.002
23-Nov-98	0.006 ± 0.002	0.006 ± 0.002	0.007 ± 0.002	0.005 ± 0.002	0.008 ± 0.002
30-Nov-98	0.010 ± 0.002	0.012 ± 0.002	0.013 ± 0.002	0.017 ± 0.002	0.012 ± 0.002
07-Dec-98	0.011 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.012 ± 0.002
14-Dec-98	0.009 ± 0.002	0.007 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.010 ± 0.002
21-Dec-98	0.016 ± 0.002	0.016 ± 0.002	0.018 ± 0.002	0.021 ± 0.002	0.021 ± 0.002
28-Dec-98	0.006 ± 0.002	0.004 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.009 ± 0.002
Mean:	0.011 ± 0.001	0.010 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.012 ± 0.001

2.b.2. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES (pCi/m³)

Sample Site	Fourth Quarter, 1998				
	Be-7	K-40	Cs-134	Cs-137	Pb-210
T51	0.1264 ± 0.0091	<0.0152	<0.0009	<0.0008	0.0170 ± 0.0024
T57	0.1223 ± 0.0100	<0.0190	<0.0010	<0.0006	0.0137 ± 0.0023
T58	0.1317 ± 0.0107	<0.0125	<0.0011	<0.0007	0.0084 ± 0.0029
T64	0.1165 ± 0.0103	<0.0168	<0.0008	<0.0008	0.0114 ± 0.0029
T72	0.1380 ± 0.0106	<0.0219	<0.0009	<0.0009	0.0133 ± 0.0030



3.a. SURFACE WATER - (pCi/L)

<u>Sample Site</u>	<u>Collection Date</u>	<u>H-3</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Zr-95 Nb-95 (A)</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ba-140 La-140 (B)</u>
T42	15-Oct-98	<145	156 ± 30	<4	<4	<7	<4	<6	<6	<6	<4	<4	<6
	10-Nov-98	<148	213 ± 29	<6	<6	<11	<6	<11	<10	<12	<6	<7	<11
	03-Dec-98	<145	174 ± 29	<5	<4	<8	<4	<10	<7	<20	<5	<4	<10
T67	15-Oct-98	<145	139 ± 32	<3	<4	<6	<4	<9	<7	<7	<4	<3	<5
	12-Nov-98	<147	92 ± 28	<3	<4	<9	<3	<6	<7	<7	<3	<5	<6
	09-Dec-98	<145	89 ± 24	<3	<3	<9	<2	<8	<7	<12	<3	<4	<6
T81	14-Oct-98	<145	301 ± 35	<3	<4	<7	<4	<6	<7	<6	<4	<3	<6
	10-Nov-98	<148	239 ± 31	<3	<4	<7	<3	<8	<8	<9	<4	<4	<4
	03-Dec-98	<146	246 ± 31	<2	<5	<9	<4	<6	<6	<19	<4	<4	<8

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLDs.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.



3.b. SEDIMENT - (pCi/kg, dry weight)

Sample	Collection										
<u>Site</u>	<u>Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>Co-58</u>	<u>Co-60</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>	<u>U-238</u>	

These samples were previously collected.

4.a.1. CRUSTACEA - (pCi/kg, wet weight)

Sample	Collection										
<u>Site</u>	<u>Date</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>

These samples were previously collected.

4.a.2. FISH - (pCi/kg, wet weight)

Sample	Collection										
<u>Site</u>	<u>Date</u>	<u>K-40</u>	<u>Mn-54</u>	<u>Co-58</u>	<u>Fe-59</u>	<u>Co-60</u>	<u>Zn-65</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Ra-226</u>	<u>Ra-228</u>

These samples were previously collected.



4.b. BROAD-LEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

<u>Sample Site</u>	<u>Collection Date</u>	<u>Be-7</u>	<u>K-40</u>	<u>I-131</u>	<u>Cs-134</u>	<u>Cs-137</u>	<u>Pb-210</u>	<u>Ra-226</u>
T40	15-Oct-98	1713 ± 97	4741 ± 180	<20	<14	188 ± 12	<857	<287
	12-Nov-98	1394 ± 79	3294 ± 138	<26	<14	41 ± 8	<899	<324
	09-Dec-98	1741 ± 84	3524 ± 137	<20	<10	84 ± 9	<697	<243
T41	15-Oct-98	2004 ± 91	3408 ± 151	<16	<11	108 ± 9	<787	<258
	12-Nov-98	837 ± 64	2260 ± 122	<27	<14	170 ± 9	<879	<351
	09-Dec-98	1761 ± 40	3493 ± 69	<9	<5	32 ± 3	570 ± 142	<116
T67	15-Oct-98	1669 ± 100	4040 ± 180	<18	<15	<13	<909	<294
	12-Nov-98	1370 ± 74	2811 ± 129	<23	<15	16 ± 5	<1014	<357
	09-Dec-98	1454 ± 82	4704 ± 196	<24	<13	<15	<829	<294



1998
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT – UNITS 3 & 4

ATTACHMENT C

RESULTS FROM THE INTERLABORATORY
COMPARISON PROGRAM 1998



FLORIDA DEPT. OF HEALTH - EPA INTERLABORATORY CROSS-CHECK PROGRAM DATA

January through June, 1998

Media	Nuclide	Collection Mon Day Yr	EPA Known	Units	Normal. Range	Mean of Analyses	N.D.K.	Action Level
WATER	Alpha	01 30 98	30.5	pCi/L	0.241	9.77	-4.73	1
WATER	Beta	01 30 98	3.9	pCi/L	0.071	7.30	1.18	
WATER	H-3	03 13 98	2155	pCi/L	0.144	2066.33	-0.44	
WATER	I-131	02 06 98	104.9	pCi/L	0.146	103.97	-0.15	
WATER	Sr-89	01 16 98	8	pCi/L	0.000	6.00	-0.69	
WATER	Sr-90	01 16 98	32	pCi/L	0.118	27.33	-1.62	
WATER	Co-60	06 05 98	12	pCi/L	0.118	12.33	0.12	
WATER	Zn-65	06 05 98	104	pCi/L	0.295	112.00	1.39	
WATER	Cs-134	06 05 98	31	pCi/L	0.000	29.00	-0.69	
WATER	Cs-137	06 05 98	35	pCi/L	0.118	37.67	0.92	
WATER	Ba-133	06 05 98	40	pCi/L	0.354	37.00	-1.04	

NOTES:

Normal.: Normalized range. As defined in "Environmental Radioactivity Laboratory Intercomparison Studies Program Fiscal Year 1981 - 1982", Environmental Monitoring Systems Laboratory, U. S. Environmental Protection Agency, P. O. Box 93478, Las Vegas, Nevada, 89193-3478. EPA-600/4-81-004, February, 1981.

N.D.K.: Normalized deviation of the mean from the known value, as defined in EPA-600/4-81-004.

NDP: No data provided. No data was provided to EPA for inclusion in their report.

NA: Not available. Report containing this data has not yet been received from EPA, Las Vegas.

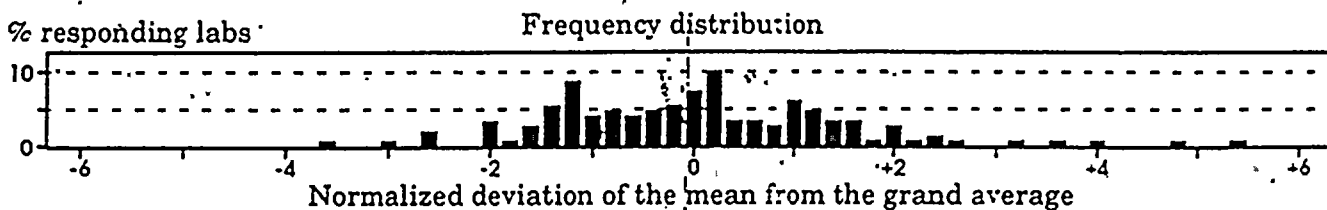
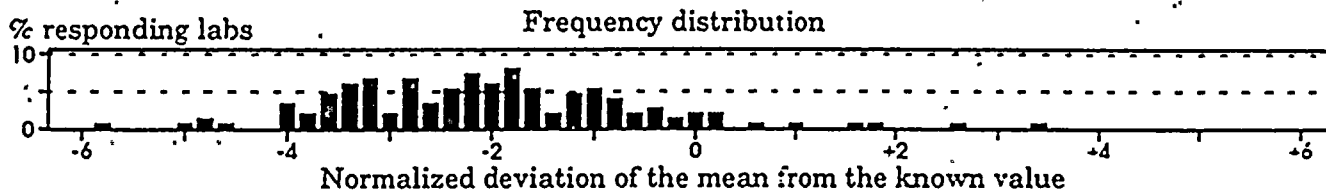
ACTION LEVEL:

(1) Cause: No cause for the low result can be found. However, the graph of % responding labs vs. normalized deviation of the mean from the known value given on page 9 of EPA's report for this cross-check (copy attached) shows most laboratories reported a value lower than the known value. Furthermore, the second graph on page 9, % responding labs vs. normalized deviation of the mean from the grand average, shows that the laboratories agree fairly well with each other.
Action: None at this time.

Gross Alpha

Data sorted by Laboratory Average

Average	Tag	Lab	Average	Tag	Lab	Average	Tag	Lab
23.23		JM	26.00		DO	28.60		QP
23.37		JS	26.10		O	28.67		K
23.63		RZ	26.10		GQ	28.77		RB
23.73		WR	26.23		DB	29.67		KT
23.77		AZ	26.27		OB	29.77		EB
23.83		BH	26.33		BC	30.33		D*
24.37		SD	26.50		RD	30.47		BL
24.73		XM	26.77		UP	30.53		S
24.77		T	27.03		U	31.17		CA
24.87		BA	27.03		QZ	31.57		J
25.07		AW	27.27		C	31.60		XQ
25.37		JY	27.33		RR	33.00		CJ
25.37		D	27.40		WP	35.23		AU
25.53		SL	27.53		XL	37.17		XF
25.60		BM	27.90		QW	38.73		XN
25.67		BS	28.20		VH	42.30		WN
25.80		QU	28.57		AL	45.00	x	SG



• ≡ No data submitted

⊙ ≡ Insufficient data

TAG SYMBOLS

x ≡ Determined to be an outlier

↑ ≡ Above control limit

↓ ≡ Below control limit

DOE-QAP 48 RESULTS

No. Test	Radionuclide	Reported Value	Reported Error	EML Value	EML Error	Reported EML	Evaluation
Matrix: AI Air Filter Bq/filter							
1	GROSS BETA	2.300	0.040	1.960	0.300	1.173	A
1	MN54	5.950	0.080	5.44	0.485	1.094	A
1	CO57	10.180	0.040	11.110	0.846	0.916	A
1	CO60	8.960	0.070	9.090	0.732	0.986	A
1	SB125	11.100	0.300	12.160	1.151	0.913	A
1	CS134	17.100	0.100	19.740	1.380	0.866	A
1	CS137	12.700	0.100	11.860	0.957	1.071	A
1	CE144	7.700	0.100	8.210	0.796	0.938	A
Matrix: WA Water Bq/l							
	H3	240.100	4.800	218.300	6.505	1.100	A
1	MN54	63.500	0.600	57.000	1.900	1.114	A
1	CO60	15.000	0.300	13.600	1.200	1.103	A
1	CS137	51.500	0.600	46.000	1.700	1.120	A
Matrix: VE Vegetation Bq/kg							
1	K40	757.000	10.000	707.500	24.987	1.070	A
1	CO60	11.100	0.500	10.575	0.206	1.050	A
1	CS137	186.000	1.000	181.500	7.141	1.025	A
Matrix: SO Soil Bq/kg							
1	K40	313.000	6.000	313.500	10.150	0.998	A
1	CS137	325.000	1.000	329.500	9.260	0.986	A

Evaluation : A = Acceptable, W = Acceptable with Warning, N = Not Acceptable

10-11-12

10-11-12

10-11-12

10-11-12

DOE-QAP 49 RESULTS

No. Test	Radionuclide	Reported Value	Reported Error	EML Value	EML Error	<u>Reported</u> EML	Evaluation
Matrix: AI Air Filter Bq/filter							
1	GROSS BETA	2.080	0.070	2.160	0.070	0.963	A
1	MN54	5.250	0.050	4.920	0.400	1.067	A
1	CO60	8.630	0.050	9.160	0.580	0.942	A
1	SB125	7.300	0.200	8.890	0.550	0.821	W
1	CS137	23.830	0.100	22.470	1.030	1.061	A
Matrix: WA Water Bq/l							
	H3	84.080	3.100	76.200	2.900	1.103	A
1	MN54	36.400	0.500	32.400	1.400	1.123	A
1	CO60	51.300	0.400	49.400	1.200	1.038	A
1	NI63	95.230	0.670	95.700	0.900	0.995	A
1	CS137	52.700	0.600	50.000	1.700	1.054	A
Matrix: VE Vegetation Bq/kg							
1	K40	499.000	9.000	460.000	20.000	1.085	A
1	CO60	20.200	0.500	20.000	1.000	1.010	A
1	CS137	402.000	2.000	390.000	20.000	1.031	A
Matrix: SO Soil Bq/kg							
1	K40	332.00	6.000	314.000	13.000	1.057	A
1	CS137	945.000	2.000	954.000	38.000	0.991	A

Evaluation : A = Acceptable, W = Acceptable with Warning, N = Not Acceptable

