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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
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Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
1990 Annual Radiological
Environmental Operating Report

This letter transmits the subject report in accordance with Technical Specification 6.9.1.3 for Turkey Point Units 3 and 4.

Should there be any questions on this information, please contact us.

Very truly yours,

T. F. Plunkett
Vice President
Turkey Point Nuclear

TFP/RJT/rjt

Enclosure

cc: Stewart D. Ebneter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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1990

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 DHRS

1990
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT - UNITS 3 & 4

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1990
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT - UNITS 3 & 4

EXECUTIVE SUMMARY

The data obtained through the Turkey Point Radiological Environmental Monitoring Program verifies the levels of radiation and concentrations of radioactive materials in environmental samples, is 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.

1990
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
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 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 for the Turkey Point Plant is conducted pursuant to Technical Specifications 3/4.12 of Turkey Point Unit 3 & 4 Technical Specifications.

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.

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 the 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 and Rehabilitative Services (HRS). Samples are collected and analyzed by HRS personnel. Samples are analyzed at the HRS 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.

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 State of Florida HRS Environmental Radiation Control Laboratory participates in the Environmental Radioactivity Laboratory Intercomparison Studies Program conducted by the Environmental Protection Agency. Results from the Interlaboratory Comparison Program are provided in Attachment C.

III. DISCUSSION AND INTERPRETATION OF RESULTS

A. Reporting of Results

The Annual Radiological Environmental Operating Report contains the summaries, interpretations and information required by the Turkey Point Units 3 & 4 Technical Specifications. Table 1 provides a summary of the measurements made for the nuclides required by Technical Specifications, Table 3.12-2, for all samples specified by Table 3.12-1. 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 for 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 isotope is cosmic-ray produced Be-7 and naturally occurring K-40 at levels consistent with past measurements.

3. **Waterborne; Surface Water:**

The results for radioactivity measurements in surface water samples are consistent with past measurements. Tritium was reported as present in the surface water samples collected from Site T-81. 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 about 3% of the reporting value specified by Technical Specifications, Table 3.12-2.

4. **Waterborne; Sediment, and Food Products:**

4.1 Sediment: The results are consistent with past measurements; Cs-137 was detected in one sample collected at the control location. The result is about 18% of the table 4.12-1 LLD. No other fission products were detected.

4.2 Food Products: The results are consistent with past measurements. Mn-54 was detected in one sample collected at an indicator location; the result is about 15% of the table 4.12-1 LLD and is less than 0.1% of the table 3.12-2 reporting level. Cs-137 was detected in two samples collected at an indicator location; the maximum value is about 28% of the table 4.12-1 LLD and is 2% of the table 3.12-2 reporting level. Again, the occasional extremely low level appearance of these nuclides is consistent with past measurements. No other fission products were detected.

5. Broad Leaf Vegetation:

The results for radioactivity measurements are consistent with past measurements. Cs-137 was detected, as in the past, in samples collected from all locations. The maximum value, occurring at the control location, is about 19% of the table 3.12-2 reporting level. 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. 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 & 50-251
Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1990
(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 Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Exposure Rate, 84[d]	---	5.6 (84/84) 4.5 - 7.8	NW-10 10 mi., NW	7.6 (4/4) 7.3 - 7.8	---

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, 1990
(County, State)

PATHWAY: AIRBORNE
SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES
UNITS: PICO - Ci/M^3

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
^{131}I, 260	0.024	<MDA	---	---	<MDA
Gross Beta, 260	0.0025	0.010 (258/260) 0.003 - 0.018	T-57 4 mi., NW	0.010 (51/52) 0.003 - 0.018	0.010 (52/52) 0.004 - 0.018
Composite Gamma Isotopic, 20					
^{7}Be	0.0052	0.092 (20/20) 0.074 - 0.122	T-57 4 mi., NW	0.100 (4/4) 0.074 - 0.122	0.096 (4/4) 0.079 - 0.114
^{40}K	0.012	0.011 (2/20) 0.011 - 0.011	T-57 4 mi., NW	0.011 (2/4) 0.011 - 0.011	<MDA
^{134}Cs	0.00069	<MDA	---	---	<MDA
^{137}Cs	0.00066	<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, 1990
(County, State)

PATHWAY: WATERBORNE
SAMPLES COLLECTED: SURFACE WATER
UNITS: PICO - Ci/LITER

Type and Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Tritium, 36	230	297 (6/36) 121 - 910	T-81 6 mi., S	297 (6/12) 121 - 910	<MDA
Gamma Isotopic, 36					
^{40}K	60	319 (36/36) 200 - 450	T-81 6 mi., S	360 (12/12) 250 - 450	277 (12/12) 210 - 330
^{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

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, 1990
(County, State)

PATHWAY: WATERBORNE
SAMPLES COLLECTED: SHORELINE SEDIMENT
UNITS: PICO - Ci/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 Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma-Isotopic, 6					
^{7}Be	100	365 (4/6) 270 - 610	T-67 13-18 mi., N/NNE	610 (1/2)	610 (1/2)
^{40}K	140	657 (6/6) 220 - 1650	T-67 13-18 mi., N/NNE	1225 (2/2) 800 - 1650	1225 (2/2) 800 - 1650
^{137}Cs	12	33 (2/6) 29 - 36	T-67 13-18 mi., N/NNE	33 (2/2) 29 - 36	33 (2/2) 29 - 36
^{232}Th	52	104 (5/6) 76 - 135	T-67 13-18 mi., N/NNE	112 (2/2) 100 - 124	112 (2/2) 100 - 124
^{226}Ra	49	532 (6/6) 298 - 721	T-42 <1 mi., ENE	688 (2/2) 655-721	363 (2/2) 298 - 427
^{238}U	---	1010 (1/6)	T-67 13-18 mi, N/NNE	1010 (1/6)	1010 (1/6)
^{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 & 50-251
Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1990
(County, State)

PATHWAY: INGESTION
SAMPLES COLLECTED: CRUSTACEA
UNITS: PICO - Ci/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 Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 4					
^{40}K	130	1875 (4/4) 1840 - 2060	T-81 6 mi., S	1960 (2/2) 1860 - 2060	1790 (2/2) 1740 - 1840
^{226}Ra	20	500 (4/4) 156 - 1174	T-81 6 mi., S	837 (2/2) 500 - 1174	163 (2/2) 156 - 169
^{54}Mn	9	19 (1/4)	T-81 6 mi., S	19 (1/2)	<MDA
^{228}Ra	---	90 (2/4) 61 - 117	T-81 6 mi., S	117 (1/2)	62 (1/2)
^{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 & 50-251
Location of Facility Dade, Florida, Reporting Period January 1 - December 31, 1990
(County, State)

PATHWAY: INGESTION
SAMPLES COLLECTED: FISH
UNITS: PICO - Ci/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 Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 4					
^{40}K	130	2366 (4/4) 1870 - 3090	T-81 6 mi., S	2480 (2/2) 1870 - 3090	2251 (2/2) 2150 - 2352
^{137}Cs	9	30 (2/4) 18 - 42	T-81 6 mi., S	30 (2/2) 18 - 42	<MDA
^{226}Ra	18	70 (2/4)	T-81 6 mi. S	116 (1/2)	24 (1/2)
^{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

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, 1990
(County, State)

PATHWAY: INGESTION
SAMPLES COLLECTED: BROAD LEAF VEGETATION
UNITS: PICO - Ci/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 Name[c] Distance & Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic, 36					
^{7}Be	71	1000 (36/36) 240 - 2130	T-41 2 mi., W/NW	1024 (12/12) 550 - 1740	995 (12/12) 620 - 1580
^{40}K	100	3376 (36/36) 1381 - 5260	T-40 3 mi., W	4413 (12/12) 2490 - 5190	2819 (12/12) 1381 - 5260
^{137}Cs	8	139 (31/36) 24 - 372	T-67 6 mi., S	233 (8/12) 24 - 372	233 (8/12) 24 - 372
^{131}I	9	<MDA	---	---	<MDA
^{134}Cs	8	<MDA	---	---	<MDA

Number of Nonroutine Reported Measurements = 0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY
Name of Facility Turkey Point Units 1 & 2
Docket No.(s) 50-250 and 50-251
Location of Facility Dade, Florida
(County, State)
Reporting Period January 1 - December 31, 1990

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 are based upon the average net response of two TLDs. (Thermoluminescent dosimeters).

MDA refers to minimum detectable activity.

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TURKEY POINT PLANT, UNITS 3 & 4

TABLE 1A

DEVIATIONS/MISSING DATA

A) **Pathway:** Airborne

Locations: T-51 (2 miles NNW) and T-57 (4 miles NW)

Date: 10/2/90 to 10/15/90

Deviation: Failure to continuously provide air sampling at these locations.

Description of Problem: Due to massive storms, there were power outages to the areas in which these sample stations are located. The power was out for approximately the last four hours of the sampling period 10/2/90 to 10/9/90 and the first eight hours of the sampling period 10/9/90 to 10/15/90.

Corrective Action: Verified equipment as operable upon notification that power was restored.

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TURKEY POINT PLANT, UNITS 3 & 4

TABLE 1B

ANALYSES WITH LLDs ABOVE TABLE 4.12-1 DETECTION CAPABILITIES
1/1/90 - 12/31/90

The values specified in Table 4.12-1, Detection Capabilities, were achieved for all samples.

TABLE 2

LAND USE CENSUS

Distance to Nearest (a, b)

Sector	5/90 Milk (c) Animal	5/90 Residence	5/90 Garden (d)
N	L (e)	2.1/350 (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 (g)	O
SSW	L	L	L
SW	L	L	L
WSW	L	L	L
W	L	L	L
WNW	L	L	4.0/229
NW	L	3.7/319	3.8/305
NNW	L	L (g)	4.0/328

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:

Sector	Distance	Description
N	1.8/349	24-hour Security Staffing Building
S	4.9/171	Small building/boat dock - not considered a residence
NNW	4.5/327	2 mobile homes used for field offices
NNW	1.8/345	Security booth at park entrance

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TURKEY POINT PLANT, UNITS 3 & 4

ATTACHMENT A

KEY TO SAMPLE LOCATIONS

ATTACHMENT A

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

Location Name	Direction Sector	Approximate Distance (miles)	Description
N-1	N	1	Convoy Point
N-5	N	6	North of Moody Drive
N-10	N	12	Old Cutler Rd. at S.W. 87 Avenue
NNW-1	NNW	<1	Turkey Point Entrance Rd.
NNW-10	NNW	9	Burr Rd. at Hainlin Mill Dr.
NW/WNW-1	WNW	1	Turkey Point Entrance Rd.
NW-5	NNW	4	Dolan's Farm on Kings Hwy.
NW-10	NW	10	Intersec Farm Lite & Coconut Palm
W/WNW-5	W	5	Palm Dr. at Tallahassee Rd.
WNW-10	WNW	9	Homestead near Vehicle Inspect. Station
W-1	W	1	On-Site near Cooling Tower
W-10	W	10	Florida City near Fire Tower
WSW-10	WSW	12	Old Hawk Missile Site, South of Florida City
SW/SSW-1	SSW	1	On-Site near Land Utilization Offices
SW-10	SW	10	U.S. 1 South of Florida City
SSW/SW-5	SSW	5	On-Site, Southeast Corner of Cooling Canals
SSW-10	SSW	10	At Card Sound Bridge
S-5	S	5	On-Site, South End of Cooling Canals
S-10	S	10	Card Sound Road at Steamboat Creek
SSE/S-1	SSE	1	Turtle Point
SSE-10	SSE	8	Ocean Reef

ATTACHMENT A

PATHWAY: AIRBORNE
SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES
SAMPLE COLLECTION FREQUENCY: WEEKLY

Location Name	Direction Sector	Approximate Distance (miles)	Description
T-51	NNW	2	Homestead Bayfront Park
T-57	NW	4	Tree Nursery on 316th Street
T-58	NW	1	Turkey Point Entrance Road
T-72	WSW	<1	Turkey Point Boy Scout Camp
Control:			
T-64	NNE	22	Natoma Substation

ATTACHMENT A

PATHWAY: WATERBORNE
SAMPLES COLLECTED: SURFACE WATER (OCEAN)
SAMPLE COLLECTION FREQUENCY: MONTHLY

Location Name	Direction Sector	Approximate Distance (miles)	Description
T-42	ENE	<1	Biscayne Bay at Turkey Point
LT-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

SAMPLES COLLECTED: SHORELINE SEDIMENT
SAMPLE COLLECTION FREQUENCY: SEMI-ANNUALLY

Location Name	Direction Sector	Approximate Distance (miles)	Description
T-42	ENE	<1	Biscayne Bay at Turkey Point A1A
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

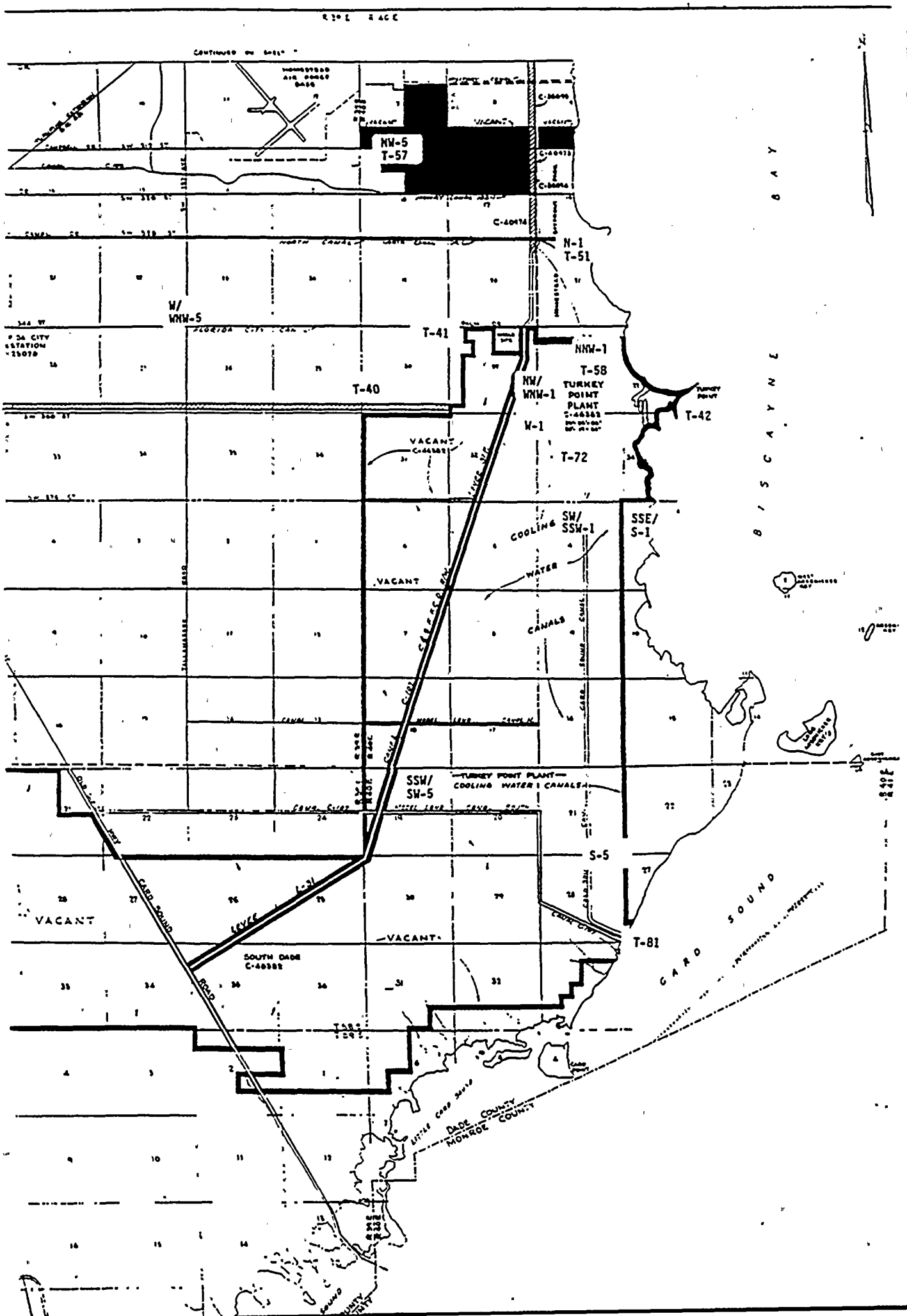
ATTACHMENT A

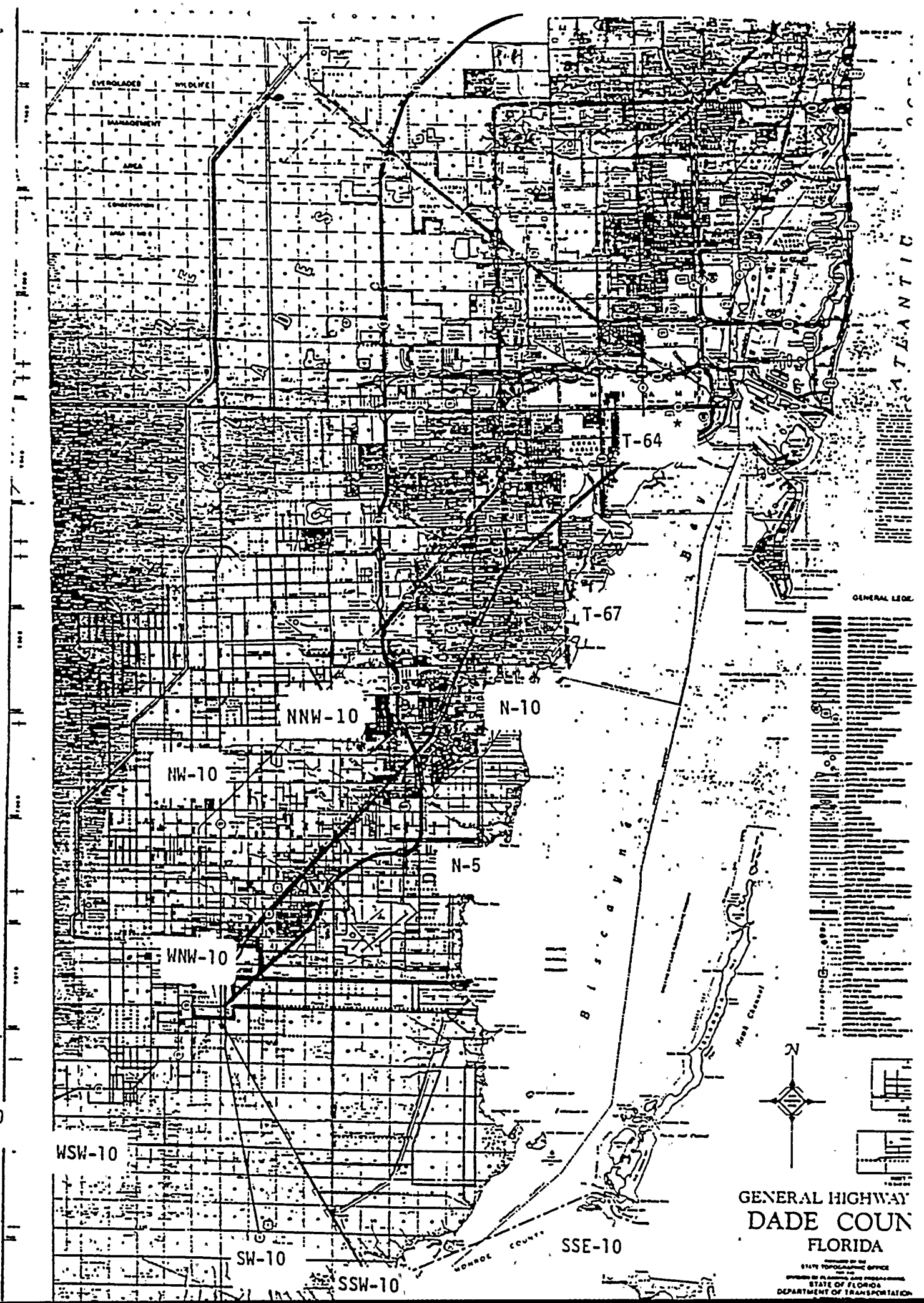
PATHWAY: INGESTION
SAMPLES COLLECTED: CRUSTACEA AND FISH
SAMPLE COLLECTION FREQUENCY: SEMI-ANNUALLY

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

SAMPLES COLLECTED: BROAD LEAF VEGETATION
SAMPLE COLLECTION FREQUENCY: MONTHLY

Location Name	Direction Sector	Approximate Distance (miles)	Description
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
Control:			
T-67	N, NNE	13-18	Near Biscayne Bay, Vicinity of Cutler Park, North to Matheson Hammock Park


NW-5
T-57
N-1
T-51
W/
WNW-5
T-41
NNW-1
T-58
NW/
WNW-1
TURKEY
POINT
PLANT
T-40
T-42
W-1
T-72
VACANT
SW/
SSW-1
SSE/
S-1
COOLING
WATER
CANALS
VACANT
SSW/
SW-5
TURKEY POINT PLANT
COOLING WATER CANALS
S-5
VACANT
VACANT
SOUTH DADE
T-81
CARD SOUND
CARD SOUND ROAD
LEVEE
DADE COUNTY
MONROE COUNTY
BISCAYNE BAY


T-64
T-67
NNW-10
N-10
NW-10
N-5
WNW-10
W-10
WSW-10
SW-10
SSW-10
SSE-10
ATLANTIC
Biscayne
GENERAL HIGHWAY
DADE COUN
FLORIDA
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

1990
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT, UNITS 3 & 4

ATTACHMENT B

RADIOLOGICAL SURVEILLANCE OF

FLORIDA POWER AND LIGHT COMPANY'S

TURKEY POINT SITE

1990

First Quarter, 1990

Second Quarter, 1990

Third Quarter, 1990

Fourth Quarter, 1990

RADIOLOGICAL SURVEILLANCE OF FLORIDA POWER AND LIGHT COMPANY'S TURKEY POINT SITE

First Quarter, 1990

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

First Quarter, 1990

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
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			
4.b.1 Broadleaf Vegetation	Monthly	3	9
			Total: 201

* - Includes NRC split samples.

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.

TURKEY POINT TECHNICAL SPECIFICATIONS SAMPLING

First Quarter, 1990

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

Each result is the average net response of two dosimeters.

Sample Site	Deployment 12-19-89 Collection 03-13-90
N-1	6.5 ± 0.3
N-5	6.2 ± 0.3
N-10	5.6 ± 0.3
NNW-1	6.4 ± 0.3
NNW-10	6.5 ± 0.3
NW/WNW-1	5.1 ± 0.3
NW-5	5.5 ± 0.3
NW-10	7.8 ± 0.4
W/WNW-5	4.8 ± 0.3
WNW-10	6.5 ± 0.3
W-1	5.3 ± 0.3
W-10	7.0 ± 0.4
WSW-10	5.1 ± 0.3
SW/SSW-1	5.1 ± 0.3
SW-10	5.1 ± 0.3
SSW/SW-5	6.0 ± 0.3
SSW-10	6.1 ± 0.3
S-5	5.6 ± 0.3
S-10	6.2 ± 0.3
SSE/S-1	5.4 ± 0.3
SSE-10	5.0 ± 0.3

Notes:

(A) These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been completed.

(B) Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.

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

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
01-02-90	<0.02	<0.02	<0.02	<0.02	<0.02
01-09-90	<0.02	<0.02	<0.02	<0.02	<0.02
01-16-90	<0.03	<0.03	<0.03	<0.03	<0.03
01-23-90	<0.02	<0.02	<0.02	<0.02	<0.02
01-30-90	<0.02	<0.02	<0.02	<0.02	<0.02
02-06-90	<0.02	<0.02	<0.02	<0.02	<0.02
02-13-90	<0.03	<0.03	<0.03	<0.03	<0.03
02-20-90	<0.02	<0.03	<0.02	<0.02	<0.02
02-28-90	<0.03	<0.03	<0.03	<0.03	<0.03
03-06-90	<0.03	<0.03	<0.03	<0.02	<0.03
03-13-90	<0.02	<0.02	<0.02	<0.02	<0.02
03-19-90	<0.04	<0.04	<0.03	<0.03	<0.04
03-26-90	<0.03	<0.03	<0.03	<0.03	<0.03

2.b AIR PARTICULATES - GROSS BETA - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
01-02-90	0.014 ± 0.002	0.012 ± 0.002	0.008 ± 0.002	0.012 ± 0.002	0.015 ± 0.002
01-09-90	0.009 ± 0.002	0.007 ± 0.002	0.004 ± 0.001	0.008 ± 0.002	0.007 ± 0.002
01-16-90	0.019 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.009 ± 0.002	0.016 ± 0.002
01-23-90	0.006 ± 0.002	0.005 ± 0.002	0.006 ± 0.002	0.007 ± 0.002	0.008 ± 0.002
01-30-90	0.007 ± 0.002	0.003 ± 0.001	0.006 ± 0.002	0.004 ± 0.001	0.008 ± 0.002
02-06-90	0.005 ± 0.001	0.006 ± 0.002	*0.004 ± 0.001	0.004 ± 0.001	0.003 ± 0.001
02-13-90	0.006 ± 0.002	0.007 ± 0.002	*0.005 ± 0.001	0.004 ± 0.001	0.005 ± 0.002
02-20-90	0.007 ± 0.002	0.009 ± 0.002	*0.006 ± 0.002	0.006 ± 0.002	0.006 ± 0.002
02-28-90	0.012 ± 0.002	0.010 ± 0.002	*0.010 ± 0.002	0.009 ± 0.002	0.009 ± 0.002
03-06-90	0.008 ± 0.002	0.008 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.008 ± 0.002
03-13-90	0.012 ± 0.002	0.011 ± 0.002	0.015 ± 0.002	0.010 ± 0.002	0.013 ± 0.002
03-19-90	0.004 ± 0.002	0.006 ± 0.002	0.004 ± 0.002	0.006 ± 0.002	0.007 ± 0.002
03-26-90	0.013 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.014 ± 0.002
Means:	0.009 ± 0.001	0.009 ± 0.001	0.008 ± 0.001	0.008 ± 0.001	0.009 ± 0.001

* - NRC split samples.

2.b AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m^3)

First Quarter, 1990

Sample Site	Be-7	K-40	Cs-134	Cs-137
T51	0.100 ± 0.008	<0.012	<0.0007	<0.0006
T57	0.106 ± 0.008	0.011 ± 0.004	<0.0008	<0.0007
T58	0.106 ± 0.009	<0.012	<0.0009	<0.0007
T64	0.102 ± 0.008	<0.013	<0.0007	<0.0006
T72	0.113 ± 0.009	<0.015	<0.0008	<0.0007

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	01-11-90	<150	350 ± 30	<2	<7	<2	<3	<6	<5	<7	<3	<3	<5
	02-19-90	<130	330 ± 40	<4	<9	<5	<5	<10	<7	<9	<5	<4	<6
	03-19-90	<160	340 ± 40	<3	<10	<4	<5	<7	<6	<8	<4	<3	<8
T67	01-11-90	<150	250 ± 40	<4	<10	<4	<3	<7	<8	<11	<4	<5	<7
	02-19-90	<130	240 ± 40	<3	<10	<4	<5	<9	<6	<9	<3	<4	<9
	03-19-90	<160	210 ± 40	<4	<11	<4	<8	<11	<8	<9	<3	<3	<6
T81	01-12-90	220 ± 50	360 ± 50	<4	<11	<4	<4	<9	<9	<9	<5	<4	<8
	02-19-90	910 ± 60	390 ± 40	<4	<14	<4	<4	<10	<5	<8	<4	<4	<7
	03-19-90	<180	380 ± 50	<3	<12	<5	<4	<8	<9	<9	<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 Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Others
T42	01-11-90	<130	430 ± 80	<11	<14	<12	<12	Ra-226: 721 ± 25
T67	01-10-90	<210	1650 ± 140	<12	<16	<15	36 ± 7	Ra-226: 298 ± 24 Th-232: 100 ± 27 U-238: 1010 ± 110
T81	01-12-90	300 ± 50	490 ± 90	<10	<12	<14	<11	Ra-226: 615 ± 22 Th-232: 135 ± 46

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226
T67	01-10-90	1840 ± 120	<9	<27	<10	<13	<23	<11	<8	156 ± 9
T81	01-26-90	2060 ± 170	<16	<51	<19	<20	<37	<20	<19	500 ± 32

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226
T67	03-29-90	2150 ± 120	<9	<28	<12	<12	<25	<9	<11	24 ± 7
T81	01-26-90	3090 ± 200	<16	<45	<18	<15	<39	<17	18 ± 8	116 ± 12

4.b.1 BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
T40	01-11-90	820 ± 60	3850 ± 150	<14	<10	<10
	02-19-90	490 ± 60	4590 ± 200	<15	<12	24 ± 6
	03-19-90	630 ± 60	5150 ± 200	<15	<13	24 ± 7
T41	01-11-90	990 ± 70	3760 ± 160	<18	<10	177 ± 10
	02-19-90	560 ± 70	3570 ± 170	<15	<12	141 ± 10
	03-19-90	650 ± 60	2760 ± 130	<12	<9	93 ± 7
T67	01-11-90	700 ± 60	4240 ± 180	<19	<11	<13
	02-19-90	970 ± 70	2290 ± 140	<16	<11	40 ± 7
	03-19-90	1200 ± 70	2620 ± 150	<11	<10	<12

RADIOLOGICAL SURVEILLANCE OF FLORIDA POWER AND LIGHT COMPANY'S TURKEY POINT SITE

Second Quarter, 1990

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

Second Quarter, 1990

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
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			
4.b.1 Broadleaf Vegetation	Monthly	3	10*
			Total: 195

* - Includes NRC split samples.

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 <u>not</u> 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.

TURKEY POINT TECHNICAL SPECIFICATIONS SAMPLING

Second Quarter, 1990

1. DIRECT RADIATION - TLD's - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployment Collection 03-13-90 06-13-90
N-1	6.6 ± 0.3
N-5	5.8 ± 0.3
N-10	5.5 ± 0.3
NNW-1	5.8 ± 0.3
NNW-10	5.9 ± 0.3
NW/WNW-1	4.9 ± 0.3
NW-5	5.3 ± 0.3
NW-10	7.6 ± 0.4
W/WNW-5	4.9 ± 0.3
WNW-10	6.5 ± 0.3
W-1	5.2 ± 0.3
W-10	6.8 ± 0.4
WSW-10	4.9 ± 0.3
SW/SSW-1	4.7 ± 0.2
SW-10	4.8 ± 0.3
SSW/SW-5	5.8 ± 0.3
SSW-10	5.6 ± 0.3
S-5	4.9 ± 0.3
S-10	5.4 ± 0.3
SSE/S-1	4.9 ± 0.3
SSE-10	4.8 ± 0.3

Notes:

(A) These results have been determined with the assumption that fading is negligible, although detailed testing to confirm this has not been completed.

(B) Testing to confirm compliance with NRC Reg. Guide 4.13 and ANSI N545-1975 performance standards has not been completed.

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

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
04-03-90	<0.02	<0.02	<0.02	<0.02	<0.02
04-10-90	<0.03	<0.03	<0.03	<0.03	<0.03
04-17-90	<0.02	<0.02	<0.02	<0.02	<0.02
04-24-90	<0.02	<0.02	<0.02	<0.02	<0.02
04-30-90	<0.02	<0.03	<0.03	<0.02	<0.03
05-08-90	<0.02	<0.02	<0.02	<0.02	<0.02
05-14-90	<0.04	<0.04	<0.04	<0.03	<0.03
05-21-90	<0.03	<0.02	<0.03	<0.02	<0.02
05-29-90	<0.02	<0.02	<0.03	<0.02	<0.02
06-05-90	<0.02	<0.02	<0.02	<0.02	<0.02
06-12-90	<0.02	<0.02	<0.02	<0.02	<0.02
06-18-90	<0.02	<0.02	<0.02	<0.02	<0.03
06-26-90	<0.02	<0.03	<0.03	<0.03	<0.03

2.b AIR PARTICULATES - GROSS BETA - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
04-03-90	0.007 ± 0.001	0.008 ± 0.002	0.007 ± 0.001	0.008 ± 0.002	0.007 ± 0.001
04-10-90	0.009 ± 0.002	0.014 ± 0.002	0.012 ± 0.002	0.008 ± 0.002	0.011 ± 0.002
04-17-90	0.010 ± 0.002	0.010 ± 0.002	0.008 ± 0.002	0.009 ± 0.002	0.008 ± 0.002
04-24-90	0.015 ± 0.002	0.012 ± 0.002	0.012 ± 0.002	0.015 ± 0.002	0.014 ± 0.002
04-30-90	0.016 ± 0.002	0.011 ± 0.002	*0.014 ± 0.002	0.011 ± 0.002	0.013 ± 0.002
05-08-90	0.014 ± 0.002	0.013 ± 0.002	*0.012 ± 0.002	0.016 ± 0.002	0.012 ± 0.002
05-14-90	0.007 ± 0.002	0.009 ± 0.002	*0.008 ± 0.002	0.011 ± 0.002	0.008 ± 0.002
05-21-90	0.008 ± 0.002	0.012 ± 0.002	*0.009 ± 0.002	0.012 ± 0.002	0.007 ± 0.001
05-29-90	0.013 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.008 ± 0.001	0.010 ± 0.001
06-05-90	0.011 ± 0.002	0.008 ± 0.002	0.008 ± 0.001	0.010 ± 0.002	0.011 ± 0.002
06-12-90	0.007 ± 0.002	0.005 ± 0.001	0.005 ± 0.001	0.005 ± 0.001	0.009 ± 0.002
06-18-90	0.009 ± 0.002	0.012 ± 0.002	0.007 ± 0.002	0.008 ± 0.002	0.011 ± 0.002
06-26-90	0.010 ± 0.002	0.009 ± 0.002	0.010 ± 0.002	0.008 ± 0.001	0.010 ± 0.002
Means:	0.010 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.010 ± 0.001

* - NRC split samples.

2.b AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m^3)

Second Quarter, 1990

Sample Site	Be-7	K-40	Cs-134	Cs-137
T51	0.103 ± 0.010	<0.018	<0.0013	<0.0008
T57	0.122 ± 0.012	<0.018	<0.0011	<0.0010
T58	0.100 ± 0.010	<0.021	<0.0009	<0.0007
T64	0.090 ± 0.010	<0.015	<0.0012	<0.0010
T72	0.093 ± 0.010	<0.014	<0.0013	<0.0009

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	04-13-90	<150	380 ± 50	<4	<8	<4	<5	<10	<6	<7	<4	<4	<5
	05-11-90	<190	390 ± 50	<3	<8	<4	<5	<10	<8	<7	<4	<5	<5
	06-15-90	<150	380 ± 50	<4	<8	<4	<6	<9	<7	<5	<5	<4	<8
T67	04-13-90	<150	280 ± 40	<4	<11	<4	<4	<11	<7	<7	<4	<4	<4
	05-11-90	<190	330 ± 50	<3	<10	<4	<5	<11	<8	<8	<4	<4	<6
	06-15-90	<150	300 ± 40	<4	<11	<4	<4	<10	<6	<6	<5	<4	<6
T81	04-13-90	<150	450 ± 50	<4	<11	<4	<4	<11	<9	<11	<4	<5	<5
	05-11-90	<190	370 ± 40	<4	<10	<3	<5	<10	<8	<8	<4	<4	<4
	06-15-90	260 ± 50	380 ± 40	<3	<9	<5	<5	<11	<7	<8	<4	<5	<9

(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.

4.b.1 BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
T40	04-13-90	990 ± 70	4620 ± 190	<29	<12	143 ± 10
	*05-11-90	520 ± 40	4660 ± 140	<12	<9	51 ± 5
	06-15-90	240 ± 30	2490 ± 100	<9	<6	22 ± 4
T41	04-13-90	860 ± 80	2900 ± 150	<30	<13	197 ± 11
	05-11-90	550 ± 50	2860 ± 150	<16	<10	106 ± 8
	06-15-90	940 ± 70	2400 ± 130	<13	<9	160 ± 9
T67	04-13-90	1030 ± 80	2870 ± 170	<25	<9	<13
	05-11-90	800 ± 70	5140 ± 200	<19	<14	<13
	06-15-90	620 ± 60	5260 ± 190	<16	<11	24 ± 5

* - NRC split sample.

RADIOLOGICAL SURVEILLANCE OF FLORIDA POWER AND LIGHT COMPANY'S TURKEY POINT SITE

Third Quarter, 1990

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

Third Quarter, 1990

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
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	1
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	9
			Total: 200

* - Includes NRC split samples.

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 - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployment 06-12-90 Collection 09-19-90
N-1	6.4 ± 0.3
N-5	6.0 ± 0.3
N-10	5.5 ± 0.3
NNW-1	6.3 ± 0.3
NNW-10	6.1 ± 0.3
NW/WNW-1	4.9 ± 0.3
NW-5	5.5 ± 0.3
NW-10	7.6 ± 0.4
W/WNW-5	4.8 ± 0.3
WNW-10	6.4 ± 0.3
W-1	5.1 ± 0.3
W-10	6.5 ± 0.3
WSW-10	4.5 ± 0.2
SW/SSW-1	4.6 ± 0.2
SW-10	4.7 ± 0.2
SSW/SW-5	5.8 ± 0.3
SSW-10	5.9 ± 0.3
S-5	5.1 ± 0.3
S-10	6.0 ± 0.3
SSE/S-1	5.7 ± 0.3
SSE-10	4.9 ± 0.3

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

Collection Date	Sample Site				
	T51	T57	T58	T64	T72
07-03-90	<0.03	<0.03	<0.03	<0.03	<0.03
07-10-90	<0.02	<0.02	<0.02	<0.02	<0.02
07-18-90	<0.02	<0.02	<0.02	<0.02	<0.02
07-23-90	<0.03	<0.03	<0.03	<0.03	<0.03
07-31-90	<0.02	<0.02	<0.02	<0.02	<0.02
08-07-90	<0.03	<0.03	<0.03	<0.03	<0.03
08-14-90	<0.02	<0.03	<0.03	<0.02	<0.02
08-22-90	<0.03	<0.03	<0.03	<0.03	<0.03
08-28-90	<0.04	<0.04	<0.04	<0.04	<0.04
09-04-90	<0.03	<0.03	<0.03	<0.03	<0.03
09-11-90	<0.03	<0.03	<0.03	<0.03	<0.03
09-18-90	<0.02	<0.02	<0.02	<0.02	<0.02
09-24-90	<0.02	<0.03	<0.03	<0.02	<0.02

2.b AIR PARTICULATES - GROSS BETA - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
07-03-90	0.010 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.009 ± 0.002
07-10-90	0.008 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.007 ± 0.002	0.012 ± 0.002
07-18-90	0.010 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.011 ± 0.002	0.011 ± 0.002
07-23-90	0.009 ± 0.002	<0.007	<0.006	0.009 ± 0.002	0.009 ± 0.002
07-31-90	0.010 ± 0.002	0.010 ± 0.002	0.009 ± 0.002	0.011 ± 0.002	0.011 ± 0.002
08-07-90	0.011 ± 0.002	0.012 ± 0.002	*0.007 ± 0.002	0.012 ± 0.002	0.008 ± 0.002
08-14-90	0.007 ± 0.002	0.009 ± 0.002	*0.008 ± 0.002	0.009 ± 0.002	0.007 ± 0.002
08-22-90	0.015 ± 0.002	0.013 ± 0.002	*0.017 ± 0.002	0.014 ± 0.002	0.014 ± 0.002
08-28-90	0.013 ± 0.002	0.013 ± 0.002	*0.009 ± 0.002	0.009 ± 0.002	0.011 ± 0.002
09-04-90	0.006 ± 0.002	0.006 ± 0.002	0.004 ± 0.002	0.007 ± 0.002	0.004 ± 0.001
09-11-90	0.009 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.011 ± 0.002
09-18-90	0.007 ± 0.002	0.011 ± 0.002	0.008 ± 0.002	0.011 ± 0.002	0.013 ± 0.002
09-24-90	0.006 ± 0.002	0.005 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.010 ± 0.002
Means:	0.009 ± 0.001	0.011 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.010 ± 0.001

* - NRC split samples.

2.b AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m^3)

Third Quarter, 1990

Sample Site	Be-7	K-40	Cs-134	Cs-137
T51	0.081 ± 0.008	<0.016	<0.0006	<0.0007
T57	0.074 ± 0.007	0.011 ± 0.004	<0.0007	<0.0007
T58	0.093 ± 0.007	<0.021	<0.0007	<0.0009
T64	0.079 ± 0.006	<0.017	<0.0008	<0.0006
T72	0.083 ± 0.008	<0.014	<0.0008	<0.0007

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	07-11-90	<170	360 ± 50	<4	<11	<4	<5	<9	<8	<6	<5	<3	<5
	08-20-90	<120	340 ± 40	<4	<9	<4	<3	<8	<7	<5	<4	<3	<5
	09-19-90	<130	230 ± 40	<4	<8	<4	<4	<9	<7	<5	<4	<4	<5
T67	07-13-90	<170	300 ± 40	<3	<8	<4	<4	<10	<6	<7	<4	<4	<3
	08-17-90	<120	250 ± 40	<4	<10	<3	<5	<11	<7	<7	<4	<4	<6
	09-18-90	<130	290 ± 40	<4	<11	<4	<5	<7	<6	<7	<5	<4	<8
T81	07-11-90	140 ± 60	430 ± 40	<4	<9	<4	<4	<7	<8	<8	<5	<5	<7
	08-16-90	130 ± 40	230 ± 40	<4	<9	<4	<4	<12	<6	<6	<5	<5	<6
	09-12-90	<140	410 ± 40	<5	<11	<4	<5	<8	<8	<12	<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 SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Ra-226	Th-232
T42	07-11-90	280 ± 50	350 ± 80	<11	<11	<10	<9	655 ± 14	76 ± 18
T67	07-12-90	610 ± 70	800 ± 100	<15	<15	<12	29 ± 7	427 ± 13	124 ± 17
T81	07-11-90	270 ± 50	220 ± 70	<7	<11	<11	<8	476 ± 12	84 ± 13

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
T67	08-10-90	1740 ± 170	<19	<36	<16	<16	<37	<15	<19	169 ± 14	62 ± 24
T81	08-07-90	1860 ± 160	19 ± 5	<54	<19	<18	<45	<21	<18	1174 ± 21	117 ± 25

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
T67	Third quarter attempts to collect this sample were not successful. Efforts continue.										
T81	08-08-90	1870 ± 540	<48	<117	<40	<63	<116	<49	42 ± 16	ND	ND

ND - Non-detectable.

4.b.1 BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
T40	07-13-90	1200 ± 80	4450 ± 180	<16	<11	270 ± 13
	08-17-90	1210 ± 80	4110 ± 180	<14	<13	51 ± 8
	09-18-90	2130 ± 100	4560 ± 190	<16	<12	42 ± 8
T41	07-13-90	1160 ± 70	2470 ± 140	<13	<10	252 ± 12
	08-17-90	1070 ± 70	2530 ± 140	<11	<10	153 ± 10
	09-19-90	1740 ± 80	3180 ± 140	<15	<9	75 ± 7
T67	07-13-90	1330 ± 80	1730 ± 120	<14	<12	264 ± 13
	08-17-90	1280 ± 80	1970 ± 140	<15	<10	372 ± 15
	09-18-90	740 ± 70	1530 ± 110	<17	<9	329 ± 13

RADIOLOGICAL SURVEILLANCE OF FLORIDA POWER AND LIGHT COMPANY'S TURKEY POINT SITE

Fourth Quarter, 1990

Office of Radiation Control

Florida Department of Health
and Rehabilitative Services

TURKEY POINT SITE

Technical Specifications Sampling

Fourth Quarter, 1990

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	21	42
2. Airborne			
2.a Air Iodines	Weekly	5	65
2.b Air Particulates	Weekly	5	69*
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	1	1
4.b Food Products			
4.b.1 Broadleaf Vegetation	Monthly	3	10*
			Total: 196

* - Includes NRC split samples.

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 - (micro-R/hour)

Each result is the average net response of two dosimeters.

Sample Site	Deployment Collection 09-19-90 12-18-90
N-1	6.5 ± 0.3
N-5	5.8 ± 0.3
N-10	5.6 ± 0.3
NNW-1	5.9 ± 0.3
NNW-10	6.2 ± 0.3
NW/WNW-1	5.1 ± 0.3
NW-5	5.6 ± 0.3
NW-10	7.3 ± 0.4
W/WNW-5	4.7 ± 0.2
WNW-10	6.1 ± 0.3
W-1	5.0 ± 0.3
W-10	6.3 ± 0.3
WSW-10	4.7 ± 0.2
SW/SSW-1	4.5 ± 0.2
SW-10	4.5 ± 0.2
SSW/SW-5	5.5 ± 0.3
SSW-10	5.7 ± 0.3
S-5	5.0 ± 0.3
S-10	5.4 ± 0.3
SSE/S-1	5.2 ± 0.3
SSE-10	4.8 ± 0.3

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

Collection Date	Sample Site T51	T57	T58	T64	T72
10-02-90	<0.03	<0.03	<0.03	<0.03	<0.03
10-09-90	<0.03(A)	<0.03(B)	<0.03	<0.03	<0.03
10-15-90	<0.04(C)	<0.04(D)	<0.04	<0.04	<0.04
10-23-90	<0.02	<0.02	<0.02	<0.02	<0.02
10-30-90	<0.03	<0.03	<0.03	<0.03	<0.03
11-05-90	<0.05	<0.05	<0.05	<0.05	<0.05
11-14-90	<0.02	<0.02	<0.02	<0.02	<0.02
11-20-90	<0.04	<0.04	<0.04	<0.04	<0.04
11-26-90	<0.02	<0.02	<0.03	<0.02	<0.02
12-03-90	<0.02	<0.02	<0.02	<0.02	<0.02
12-12-90	<0.05	<0.05	<0.05	<0.04	<0.05
12-18-90	<0.03	<0.03	<0.04	<0.03	<0.03
12-26-90	<0.04	<0.04	<0.04	<0.04	<0.04

(A) - Electrical power was out at the end of this sample due to storms. The equipment is estimated to have run for 165 hours out of the 168 total hours for this sampling interval.

(B) - Electrical power was out at the end of this sample due to storms. The equipment is estimated to have run for 166 hours out of the 169 total hours for this sampling interval.

(C) - Electrical power was out at the start of this sample due to storms. The equipment is estimated to have run for 134 hours out of the 143 total hours for this sampling interval.

(D) - Electrical power was out at the start of this sample due to storms. The equipment is estimated to have run for 135 hours out of the 143 total hours for this sampling interval.

2.b AIR PARTICULATES - GROSS BETA - (pCi/m^3)

Collection Date	Sample Site T51	T57	T58	T64	T72
10-02-90	0.013 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.014 ± 0.002	0.015 ± 0.002
10-09-90	(A0.009 ± 0.002	(B0.009 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.008 ± 0.002
10-15-90	(C0.008 ± 0.002	(D0.007 ± 0.002	0.006 ± 0.002	0.007 ± 0.002	0.004 ± 0.002
10-23-90	0.012 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.009 ± 0.002
10-30-90	0.018 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.018 ± 0.002	0.017 ± 0.002
11-05-90	0.014 ± 0.002	0.017 ± 0.002	*0.013 ± 0.002	0.017 ± 0.002	0.011 ± 0.002
11-14-90	0.011 ± 0.001	0.017 ± 0.002	*0.014 ± 0.002	0.013 ± 0.002	0.013 ± 0.002
11-20-90	0.009 ± 0.002	0.012 ± 0.002	*0.014 ± 0.002	0.014 ± 0.002	0.013 ± 0.002
11-26-90	0.015 ± 0.002	0.014 ± 0.002	*0.013 ± 0.002	0.013 ± 0.002	0.016 ± 0.002
12-03-90	0.008 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.010 ± 0.002
12-12-90	0.011 ± 0.002	0.010 ± 0.002	0.012 ± 0.002	0.013 ± 0.002	0.013 ± 0.002
12-18-90	0.011 ± 0.002	0.010 ± 0.002	0.010 ± 0.002	0.008 ± 0.002	0.009 ± 0.002
12-26-90	0.010 ± 0.002	0.006 ± 0.001	0.012 ± 0.002	0.011 ± 0.002	0.011 ± 0.002
Means:	0.011 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.011 ± 0.001

* - NRC split samples.

(A) - Electrical power was out at the end of this sample due to storms. The equipment is estimated to have run for 165 hours out of the 168 total hours for this sampling interval.

(B) - Electrical power was out at the end of this sample due to storms. The equipment is estimated to have run for 166 hours out of the 169 total hours for this sampling interval.

(C) - Electrical power was out at the start of this sample due to storms. The equipment is estimated to have run for 134 hours out of the 143 total hours for this sampling interval.

(D) - Electrical power was out at the start of this sample due to storms. The equipment is estimated to have run for 135 hours out of the 143 total hours for this sampling interval.

2.b AIR PARTICULATES - GAMMA SCANS OF QUARTERLY COMPOSITES - (pCi/m^3)

Fourth Quarter, 1990

Sample Site	Be-7	K-40	Cs-134	Cs-137
T51	0.1016 ± 0.0108	<0.0165	<0.0010	<0.0009
T57	0.0988 ± 0.0108	<0.0152	<0.0008	<0.0008
T58	0.0829 ± 0.0119	<0.0180	<0.0009	<0.0009
T64	0.1141 ± 0.0109	<0.0174	<0.0009	<0.0009
T72	0.0843 ± 0.0127	<0.0191	<0.0009	<0.0009

3.a SURFACE WATER - (pCi/l)

Sample Site	Collection Date	H-3	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
T42	10-15-90	<130	333 ± 40	<5	<10	<4	<5	<9	<7	<8	<5	<4	<6
	11-16-90	<137	219 ± 40	<4	<9	<4	<5	<9	<7	<10	<5	<4	<6
	12-14-90	<136	200 ± 35	<4	<10	<5	<6	<8	<7	<11	<5	<5	<5
T67	10-15-90	<130	308 ± 39	<5	<9	<4	<4	<7	<8	<8	<5	<4	<8
	11-16-90	<175	249 ± 34	<5	<12	<4	<5	<9	<6	<9	<4	<5	<8
	12-14-90	<137	314 ± 34	<4	<10	<4	<4	<8	<8	<12	<5	<5	<6
T81	10-12-90	<140	361 ± 38	<4	<9	<4	<3	<11	<7	<10	<5	<3	<10
	11-16-90	<175	313 ± 40	<4	<10	<4	<4	<8	<8	<10	<4	<4	<8
	12-14-90	121 ± 45	250 ± 42	<4	<11	<5	<5	<8	<7	<11	<5	<4	<6

(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.

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

Sample Site	Collection Date	K-40	Mn-54	Fe-59	Co-58	Co-60
T67	10-08-90	2352 ± 158	<13	<37	<10	<14

Zn-65	Cs-134	Cs-137
<26	<14	<12

4.b.1 BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
T40	10-12-90	2121 ± 109	5190 ± 202	<29	<13	84 ± 9
	*11-16-90	982 ± 68	4204 ± 165	<22	<11	95 ± 8
	12-14-90	569 ± 51	5085 ± 165	<12	<10	30 ± 6
T41	10-12-90	1415 ± 98	3218 ± 162	<26	<14	117 ± 9
	11-16-90	882 ± 67	2808 ± 140	<23	<12	69 ± 7
	12-14-90	1466 ± 81	2301 ± 118	<14	<10	67 ± 7
T67	10-12-90	1580 ± 83	1381 ± 96	<22	<8	270 ± 11
	11-16-90	930 ± 70	2304 ± 122	<21	<11	208 ± 11
	12-14-90	759 ± 65	2494 ± 123	<15	<9	352 ± 13

* - NRC split sample.

1990
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
TURKEY POINT PLANT, UNITS 3 & 4

ATTACHMENT C

RESULTS FROM THE INTERLABORATORY

COMPARISON PROGRAM 1990

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

January through June, 1990

Media	Nuclide	Collection Mon	Day	Yr	EPA Known	Units	Normal. Range	Mean of Analyses	N.D.K.	Action Level
FILTER	Alpha	03	30	90	5	pCi/F	0.118	5.33	0.12	
FILTER	Beta	03	30	90	31	pCi/F	0.118	28.33	-0.92	
FILTER	Cs-137	03	30	90	10	pCi/F	0.000	11.00	0.35	
FILTER	Sr-90	03	30	90	10	pCi/F	0.788	8.33	-1.92	
MILK	I-131	04	27	90	99	pCi/L	0.354	98.00	-0.17	
MILK	Cs-137	04	27	90	24	pCi/L	0.000	25.00	0.35	
MILK	K	04	27	90	1550	mg/L	0.379	1536.67	-0.30	
MILK	Sr-89	04	27	90	23	pCi/L	0.000	22.00	-0.35	
MILK	Sr-90	04	27	90	23	pCi/L	0.000	21.00	-0.69	
WATER	Alpha	01	26	90	12	pCi/L	0.118	10.33	-0.58	
WATER	Alpha	05	11	90	22	pCi/L	0.492	15.67	-1.83	
WATER	Beta	01	26	90	12	pCi/L	0.000	12.00	0.00	
WATER	Beta	05	11	90	15	pCi/L	0.236	19.00	1.39	
WATER	Co-60	02	09	90	15	pCi/L	0.118	15.67	0.23	
WATER	Co-60	06	08	90	24	pCi/L	0.118	25.67	0.58	
WATER	Zn-65	02	09	90	139	pCi/L	0.211	139.67	0.08	
WATER	Zn-65	06	08	90	148	pCi/L	0.197	153.00	0.58	
WATER	Ru-106	02	09	90	139	pCi/L	0.464	138.00	-0.12	
WATER	Ru-106	06	08	90	210	pCi/L	0.056	206.00	-0.33	
WATER	Ba-133	02	09	90	74	pCi/L	0.169	73.00	-0.25	
WATER	Ba-133	06	08	90	99	pCi/L	0.295	96.33	-0.46	
WATER	Cs-134	02	09	90	18	pCi/L	0.118	17.33	-0.23	
WATER	Cs-134	06	08	90	24	pCi/L	0.000	24.00	0.00	
WATER	Cs-137	02	09	90	18	pCi/L	0.236	18.00	0.00	
WATER	Cs-137	06	08	90	25	pCi/L	0.118	25.67	0.23	
WATER	H-3	02	23	90	4976	pCi/L	0.225	5143.33	0.58	
WATER	H-3	06	22	90	2933	pCi/L	0.165	3033.33	0.49	
WATER	Sr-89	01	12	90	25	pCi/L	0.236	21.33	-1.27	
WATER	Sr-89	05	04	90	7	pCi/L	0.118	7.67	0.23	
WATER	Sr-90	01	12	90	20	pCi/L	0.394	18.33	-1.92	
WATER	Sr-90	05	04	90	7	pCi/L	0.000	7.00	0.00	

NOTES:

Normal.: Normalized range. As defined in "Environmental Radioactivity Range 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.

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

July through December, 1990

Media	Nuclide	Collection Mon	Day	Yr	EPA Known	Units	Normal. Range	Mean of Analyses	N.D.K.	Action Level
FILTER	Alpha	08	31	90	10	pCi/F	0.236	12.33	0.81	
FILTER	Beta	08	31	90	62	pCi/F	0.118	59.33	-0.92	
FILTER	Cs-137	08	31	90	20	pCi/F	0.000	22.00	0.69	
FILTER	Sr-90	08	31	90	20	pCi/F	0.473	15.33	-1.62	
MILK	I-131	09	28	90	58	pCi/L	0.295	58.33	0.10	
MILK	Cs-137	09	28	90	20	pCi/L	0.236	21.00	0.35	
MILK	K	09	28	90	1700	mg/L	0.188	1744.33	0.90	
MILK	Sr-89	09	28	90	16	pCi/L	1.345	21.00	1.73	
MILK	Sr-90	09	28	90	20	pCi/L	0.709	8.67	-3.93	1
WATER	Alpha	09	21	90	10	pCi/L	0.000	10.00	0.00	
WATER	Beta	09	21	90	10	pCi/L	0.000	14.00	1.39	
WATER	Co-60	10	05	90	20	pCi/L	0.118	21.33	0.46	
WATER	Zn-65	10	05	90	115	pCi/L	0.197	119.00	0.58	
WATER	Ru-106	10	05	90	151	pCi/L	0.630	153.67	0.31	
WATER	Ba-133	10	05	90	110	pCi/L	0.054	105.67	-0.68	
WATER	Cs-134	10	05	90	12	pCi/L	0.118	11.33	-0.23	
WATER	Cs-137	10	05	90	12	pCi/L	0.236	13.00	0.35	
WATER	H-3	10	19	90	7203	pCi/L	0.255	5656.33	-3.72	2
WATER	I-131	08	10	90	39	pCi/L	0.098	40.67	0.48	

NOTES:

Normal.: Range — 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: Erroneously over estimated chemical recovery of strontium carrier.
Corrective Action: Try to improve purity of isolated strontium carrier.

(2) Cause: Incorrect counting efficiency used in calculation.
Corrective Action: Double check all parameters used in the calculation.