

TE HQ FILE COPY

August 28, 1981
L-81-375
 DOCK
 NRC REGION
 ATLANTA, GEORGIA
 AUG 30 1981
 2

Mr. James P. O'Reilly, Director, Region II
 Office of Inspection and Enforcement
 U. S. Nuclear Regulatory Commission
 101 Marietta Street, Suite 3100
 Atlanta, Georgia 30303

Dear Mr. O'Reilly:

Re: Turkey Point Units 3 and 4
 Docket Nos. 50-250 & 50-251 /D
Semiannual Radiological Reports

Two copies of the Turkey Point Semiannual Radioactive Effluent Report and Semiannual Environmental Monitoring Report for the period of January 1 through June 30, 1981 are attached. These reports are submitted in compliance with Technical Specification 6.9.4.

Very truly yours,

Robert E. Uhrig
 Vice President
 Advanced Systems & Technology

REU/PLP/ras

Attachments

cc: Director, Office of Inspection and Enforcement (6)
 Director, Office of Nuclear Reactor Regulation (17)
 Harold F. Reis, Esquire

8311030086 810821
 PDR ADCK 05000250
 R PDR

 ER
 1E25
 1/1
 RETROACT
 DOCUMENT
 OFFICIAL COPY

81-253

PEOPLE...SERVING PEOPLE

09650 096 ✓

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

TURKEY POINT UNITS 3 & 4

DOCKET NOS. 50-250, 251.

DADE COUNTY, FLORIDA

1-1-81 TO 6-30-81

PREPARED 8/21/81

1. INTRODUCTION

This report is submitted pursuant to Section 6.9 of the Turkey Point Plant Units 3 & 4 Technical Specifications.

Radiological environmental surveillance for the Turkey Point Plant is conducted in accordance with Section 4.12 of the plant's Technical Specifications. A summary of the samples collected and analyses performed during the period January 1, 1981 through June 30, 1981 is provided in Table 1.

2. THE MONITORING PROGRAM

Period Covered: This reports covers the period from January 1, 1981 through June 30, 1981.

Analytical Responsibility: Environmental radiological monitoring for the Turkey Point Plant is conducted by the State of Florida, Department of Health and Rehabilitative Services (DHRS). All samples are collected and analyzed by DHRS personnel.

Number of Samples: During the period, a total of 807 samples were collected from 35 different locations and analyzed for radioactivity. Table 1 summarizes the highest, lowest and mean results from all sample locations and where applicable the highest, lowest and mean results of the sample locations yielding the highest mean levels. The number of samples

which yielded detectable results is also provided.

Split-Sample Analyses: During the period January 1, 1981 - June 30, 1981, 12 samples were collected for analysis by the DOE in accordance with the DHRS/DOE split-sampling program.

Missing Data: Sample results for Sr^{89} , Sr^{90} in several sample media, as indicated and noted in Table 1, were not available in time for this report. When received these results will be transmitted in a supplemental report. This data is not expected to alter the conclusions in this report.

3. Evaluation of Data

- a) An evaluation of trending graphs for the radiological environmental samples collected in the vicinity of the Turkey Point Plant indicates a continuation in the trend for generally higher than normal levels for air particulate gross-beta results. This trend was first observed and noted in the Environmental Radiological Monitoring Program Summary Report for Turkey Point Units 3 & 4, 7/1/80 to 12/31/80. Additionally, during this period there were observations of ^{95}Zr and ^{106}Ru in some sample media as shown in Table 1. In the process of evaluating these observations it was also noted that similar trends in data were prevalent for air particulate samples collected from other sample locations within the State of Florida during the same period, including the detection of ^{95}Zr and ^{106}Ru from gamma scans of the air particulate samples. For this reason it is concluded that the higher

than normal gross-beta levels in air particulate samples and the detection of ^{95}Zr and ^{106}Ru in the radiological environmental samples around Turkey Point not attributable to the operation of the nuclear units at the Turkey Point Plant.

- b) All of the radiological environmental surveillance data for this period has been evaluated and compared to previous data. Except as noted above, all observations are found to be consistent with values previously reported and evaluated.

4. CONCLUSIONS

The concentration level of any radionuclide reported in TABLE 1 will contribute much less than the maximum permissible limits of individual or population group exposure that could result if there had been a continuous intake of radionuclides having concentration values equal to those permitted by APPENDIX B, TABLE II, 10-CFR-20. Therefore, the operations of Turkey Point Plant Units 3 & 4 are not contributing harmful effects of irreversible damage to either the environment or to the health and safety of individuals or population groups in the regions surrounding Turkey Point Plant.

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250,251LOCATION OF FACILITY Dade County Florida REPORTING PERIOD January 1, 1981-June 30, 1981

Page 1 of 9

Medium or Pathway Sampled	Unit	Analysis for	Number of		Results	All Indicator Locations		Location with Highest Mean			Control Location		Number of Nonroutine Reported Measurements
						Mean ¹⁾	Range ¹⁾	Sample Location	Mean ¹⁾	Range ¹⁾	Mean ¹⁾	Range ¹⁾	
1.1 Air Particulate	pCi/l	Gross β	8	196 ²⁾⁶⁾	196	0.232 (196/196)	0.053-.471	T58-Entrance Road on Site (1 mile-WSW)	0.245 (24/24)	0.054-0.417	0.238 (25/25)	0.060-0.458	
Air Iodine	pCi/l	^{131}I	8	199	25 ³⁾	NA (0/199)	NA	NA	NA	NA	NA	NA	
1.2 Direct Radiation	$\mu\text{Rem/hr}$	γ	11	130 ⁶⁾	130 ⁴⁾ 65 results	5.2 (130/130)	2.1-7.5	T64-Natoma Substation (22 miles-N) Control Sample location	6.4 (12/12)	5.4-7.5	6.4 (12/12)	5.4-7.5	
1.3 Precipitation	pCi/l	Gross β -DS	4	19 ⁶⁾	19	13.1 (16/19)	3.3-38.1	T64-Natoma Substation (22 miles - N) Control Sample location	19.2 (5/5)	10.4-38.1	19.2 (5/5)	10.4-38.1	
		Gross β -UDS			19	8.5 (10/19)	17.0-17.0	T72-Boy Scout Camp (0.5 miles - SW)	17.0 (1/4)	17.0-17.0	7.8 (3/5)	5.5-12.0	
		γ Scan			19	NA (0/19)	NA	NA	NA	NA	NA	NA	
		^3H			19	NA (0/19)	NA	NA	NA	NA	NA	NA	

DS - Dissolved Solids
 UDS - Undissolved Solids
 NA - Not Applicable

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250,251LOCATION OF FACILITY Dade County FloridaREPORTING PERIOD January 1, 1981-June 30, 1981

Page 2 of 9

Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location		Number of Nonroutine Related Measurements
			Number of			Mean ¹⁾	Range ¹⁾	Sample Location Distance and Direction	Mean ¹⁾	Range ¹⁾	Mean ¹⁾	Range ¹⁾	
			Sites	Samples	Results								
2.1 Surface Water													
2.1.1 Estuarine			10	20									
	pCi/l	Y Spectrum			20	NA ⁵⁾ (0/20)	NA	NA	NA	NA	NA	NA	
	pCi/l	³ H			20	NA (0/20)	NA	NA	NA	NA	NA	NA	
	pCi/l	⁸⁹ Sr			20	NA (0/20)	NA	NA	NA	NA	NA	NA	
	pCi/l	⁹⁰ Sr			20	NA (0/20)	NA	NA	NA	NA	NA	NA	
2.1.2 Cooling Canal System			2	12 ²⁾									
	pCi/l	Y Spectrum			12	NA ⁵⁾ (0/12)	NA	NA	NA	NA	NA	NA	
	pCi/l	³ H			12	4200 (12/12)	3100- 5600	T-84-Cooling Canal South of Bridge (0 miles - SSR)	4200 (6/6)	3600- 5600	NA	NA	
	pCi/l	⁸⁹ Sr			12	NA (0/12)	NA	NA	NA	NA	NA	NA	
	pCi/l	⁹⁰ Sr			12	NA (0/12)	NA	NA	NA	NA	NA	NA	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250,251LOCATION OF FACILITY Dade County FloridaREPORTING PERIOD January 1, 1981-June 30, 1981

Page 3 of 9

Page 5 of 9

Medium or Pathway Sampled	Unit	Analysis for	Number of		All Indicator Locations		Location with Highest Mean			Control Location		Number of Nonroutine Reports Measurements	
							Sample Location	Mean ¹⁾	Range ¹⁾	Mean ¹⁾	Range ¹⁾		
			Sites	Samples	Results	Mean ¹⁾							Range ¹⁾
2.1.3 Fresh Water Drainage Canal	pCi/l	³ H	2	12	12	440 (4/12)	340-600	T75-Fla. City Canal at Old Salinity Dam (1 mile WNW)	440 (4/6)	340-600	NA	NA	
	pCi/l	Gross β-DS			12	164 (11/12)	3.0-370	T75-Fla City Canal at Old Salinity Dam (1 mile WNW)	300 (6/6)	230-370	NA	NA	
	pCi/l	Gross β UDS			12	6.4 (1/12)	6.4-6.4	T75-Fla City Canal at Old Salinity Dam (1 mile WNW)	6.4 (1/6)	6.4-6.4	NA	NA	
2.2 Potable Well Water	pCi/l	³ H	3	6	6	NA (0/6)	NA	NA	NA	NA	NA	NA	
	pCi/l	Gross β-DS			6	9.7 (5/6)	4.7-14.0	T57-Dolan's from (4 miles NW)	12.5 (2/2)	11.0-14.0	NA	NA	
	pCi/l	Gross β UDS			6	(0/6)	NA	NA	NA	NA	NA	NA	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4

DOCKET NO. 50-250,251

LOCATION OF FACILITY Dade County Florida

REPORTING PERIOD January 1, 1981-June 30, 1981

Page 4 of 9

Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location		Number of Nonroutine Measurements
			Number of					Sample Location					
			Sites	Samples	Results	Mean ¹⁾	Range ¹⁾		Distance and Direction	Mean ¹⁾	Range ¹⁾	Mean ¹⁾	
2.3 Ground Water Wells	pCi/l	Y Spectrum	6	12	12	NA ⁵⁾ (0/12)	NA	NA	NA	NA	NA	NA	
	pCi/l	³ H			12	960 (7/12)	330-2800	T92-Well G24A (4 miles - SSW)	1910 (2/2)	1012-2800	NA	NA	
	pCi/l	⁸⁹ Sr			6 ⁶⁾	NA (0/6)	NA	NA	NA	NA	NA	NA	
	pCi/l	⁹⁰ Sr			6 ⁶⁾	NA (0/6)	NA	NA	NA	NA	NA	NA	
<u>Sediment</u>													
3.1 Cooling Canal Sediment			2	4									
	pCi/kg	Y Spectrum ⁶⁰ Co			4	880 (4/4)	230-1620	T85 - Cooling Canal West of 90° Bend (0 miles - SW)	920 (2/2)	230-1620	NA	NA	
	pCi/kg	⁹⁵ Zr			4	120 (2/4)	70-180	T-85 - Cooling Canal West of 90° Bend (0 miles - SW)	180 (1/2)	180	NA	NA	
	pCi/kg	Others			4	NA ⁵⁾ (0/4)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁸⁹ Sr			2 ⁶⁾	NA (0/2)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁹⁰ Sr			2 ⁶⁾	NA (0/2)	NA	NA	NA	NA	NA	NA	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250,251LOCATION OF FACILITY Dade County FloridaREPORTING PERIOD January 1, 1981-June 30, 1981

Page 5 of 9

Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location		Number of Out-Reported Measurements
			Sites	Number of Samples	Results	Mean ¹⁾	Range ¹⁾	Sample Location Distance and Direction	Mean ¹⁾	Range ¹⁾	Mean ¹⁾	Range ¹⁾	
3.2 Estuarine Sediment	pCi/kg	γ Spectrum	7	7	7	NA ⁵⁾ (0/7)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁸⁹ Sr			7	NA (0/7)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁹⁰ Sr			7	NA (0/7)	NA	NA	NA	NA	NA	NA	
<u>Aquatic Biota</u>													
4.1 Crustacea ^{a)}	pCi/kg	γ Spectrum	6	6	6	NA ⁵⁾ (0/6)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁸⁹ Sr			0 ⁶⁾	NA	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁹⁰ Sr			0 ⁶⁾	NA	NA	NA	NA	NA	NA	NA	
<u>4.2 Fish b)c) (Carnivore)</u>													
	pCi/kg	γ Spectrum	7	7 ²⁾	7	NA ⁵⁾ (0/7)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁸⁹ Sr			2 ⁶⁾	NA (0/2)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁹⁰ Sr			2 ⁶⁾	NA (0/2)	NA	NA	NA	NA	NA	NA	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250,251LOCATION OF FACILITY Dade County FloridaREPORTING PERIOD January 1, 1981-June 30, 1981

Page 6 of 9

Medium or Pathway Sampled	Unit	Analysis for	Number of		Results	All Indicator Locations		Location with Highest Mean			Control Location (a)		Number of Nonroutine Requested Measurements
						Mean ¹⁾	Range ¹⁾	Sample Location Distance and Direction	Mean ¹⁾	Range ¹⁾	Mean ¹⁾	Range ¹⁾	
Fish Herbivore ^{d)}	pCi/kg	Y Spectrum	6	6	6	NA ⁵⁾ (0/6)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁸⁹ Sr			0 ⁶⁾	NA	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁹⁰ Sr			0 ⁶⁾	NA	NA	NA	NA	NA	NA	NA	
4.3 Turtle Grass			6	6									
	pCi/kg	Y Spectrum ⁹⁵ Zr			6	230 (5/6)	110-490	T81-Card Sound (6 miles - S)	490 (1/1)	490	NA	NA	
	pCi/kg	Others			6	NA ⁵⁾ (0/6)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁸⁹ Sr			5 ⁶⁾	NA (0/5)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁹⁰ Sr			5 ⁶⁾	NA (0/5)	NA	NA	NA	NA	NA	NA	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250,251

LOCATION OF FACILITY Dade County Florida

REPORTING PERIOD January 1, 1981-June 30, 1981

Page 7 of 9

Medium or Pathway Sampled	Unit	Analysis for	Number of					Location with Highest Mean			Control Location		Number of Routine Reported Measurements
			Sites	Samples	Results	All Indicator Locations		Sample Location	1)	1)	Mean ¹⁾	Range ¹⁾	
4.3 Sponges			6	6									
	pCi/kg	Y Spectrum ¹⁰⁶ Ru			6	460 (2/6)	410-520	T93-Pelican Bank (1.5 miles - E)	520 (1/1)	520	NA	NA	
	pCi/kg	⁹⁵ Zr			6	230 (3/6)	90-510	T93-Pelican Bank (1.5 miles - E)	510 (1/1)	510	NA	NA	
	pCi/kg	¹⁴⁴ Ce			6	1100 (1/6)	1100	T94-Pumpkin Key (8 miles - SSE)	1100 (1/1)	1100	NA	NA	
	pCi/kg	¹⁴⁰ Ba			6	130 (1/6)	130	T95-Long Arsenicker (4 miles - SSE)	130 (1/1)	130	NA	NA	
	pCi/kg	Others			6	NA ⁵⁾ (0/6)	NA	NA	NA	NA	NA	NA	
Terrestrial Biota													
5.2.1 Small Animal			1	1									
	pCi/kg	Y Spectrum ¹³⁷ Cs			1	170 (1/1)	170	T56-Entrance Road on site (1 mile WSW)	170 (1/1)	170	NA	NA	
	pCi/kg	Others			1	NA ⁵⁾ (0/1)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁸⁹ Sr			1	NA (0/1)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁹⁰ Sr			1	NA (0/1)	NA	NA	NA	NA	NA	NA	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250,251

LOCATION OF FACILITY Dade County Florida

REPORTING PERIOD January 1, 1981-June 30, 1981

Page 8 of 9

Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location		Number of Route-ported Measurements
			Number of					Sample Location Distance and Direction	1)		Mean ¹⁾	Range ¹⁾	
			Sites	Samples	Results	Mean ¹⁾	Range ¹⁾		Mean	Range			
5.2.2 Food Crops	pCi/kg	γ Spectrum	3	3 ²⁾	3	NA (0/3)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁸⁹ Sr			2 ⁶⁾	NA (0/2)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁹⁰ Sr			2 ⁶⁾	NA (0/2)	NA	NA	NA	NA	NA	NA	
5.2.3 Mangrove Leaves			7	7									
	pCi/kg	γ Spectrum ⁹⁵ Zr			7	740 (7/7)	120-1680	T51-Homestead Bayfront Park (2 miles - N)	1680 (1/1)	1680	NA	NA	
	pCi/kg	¹⁰⁶ Ru			7	520 (2/7)	400-640	T51-Homestead Bayfront Park (2 miles - N)	640 (1/1)	640	NA	NA	
	pCi/kg	Others			7	NA (0/7)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁸⁹ Sr			3 ⁶⁾	NA (0/3)	NA	NA	NA	NA	NA	NA	
	pCi/kg	⁹⁰ Sr			3 ⁶⁾	NA (0/3)	NA	NA	NA	NA	NA	NA	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY Turkey Point Units 3 and 4 DOCKET NO. 50-250,251LOCATION OF FACILITY Dade County FloridaREPORTING PERIOD January 1, 1981-June 30, 1981

Page 9 of 9

Medium or Pathway Sampled	Unit	Analysis for	All Indicator Locations					Location with Highest Mean			Control Location		Number of Nonroutine Reported Measurements
			Number of			Sample Location		Distance and Direction	Mean	Range	Mean ¹⁾	Range ¹⁾	
			Sites	Samples	Results	Mean ¹⁾	Range ¹⁾						
5.3 Soil			7	7									
	pCi/kg	Y Spectrum 137Cs			7	200 (6/7)	100-360	T57-Dolan's Farm (4 miles - NW)	360 (1/1)	360	NA	NA	
	pCi/kg	Others			7	NA ⁵⁾ (0/7)	NA	NA	NA	NA	NA	NA	
	pCi/kg	89Sr			7	NA (0/7)	NA	NA	NA	NA	NA	NA	
	pCi/kg	90Sr			7	NA (0/7)	NA	NA	NA	NA	NA	NA	



Table 1 Notes

Note a) Blue Crab

Note b) Mixed Species

Note c) Jack

Note d) Mullet

Note 1) Numbers in parentheses indicate the ratio of samples which yielded detectable results (e.g. No. of samples with detectable results / No. of samples analyzed)

The mean and range are based upon detectable measurements only.

Note 2) Not including DOE Split Samples.

Note 3) Air iodine filters are analyzed by a weekly composite. Individual counts are made for each location if iodine is detected.

Note 4) Direct radiation results are based on the average net response of two TLD dosimeters. For this period 65 results are reported for 130 dosimeter readings.

Note 5) Excluding ^{40}K and/or ^{226}Ra which are naturally occurring isotopes.

Note 6) Missing Data

<u>Sample</u>	<u>Location/Date</u>	<u>Reason for Missing Data</u>
Air Particulate	T58 1/7/81	Pump Failure
Air Particulate	T72 2/18/81	Particulate Filter Missing
Air Particulate	T56 4/8/81	Particulate Filter Missing
Air Particulate	T56 4/22/81	Particulate Filter Missing
Direct Radiation	T57 3/4/81	Vandalism - TLD's Stolen

6) Continued

<u>Sample</u>	<u>Location/Date</u>	<u>Reason for Missing Data</u>
Precipitation	T52 2/11/81	Insufficient Precipitation
Precipitation	T57 2/11/81	Insufficient Precipitation
Precipitation	T64 1/13/81	Insufficient Precipitation
Precipitation	T72 2/11/81	Insufficient Precipitation
Precipitation	T72 4/15/81	Insufficient Precipitation
Ground Water Well - $^{89}\text{Sr}, ^{90}\text{Sr}$	T87 5/8/81	Analyses Incomplete
Ground Water Well - $^{89}\text{Sr}, ^{90}\text{Sr}$	T88 5/8/81	Analyses Incomplete
Ground Water Well - $^{89}\text{Sr}, ^{90}\text{Sr}$	T89 5/8/81	Analyses Incomplete
Ground Water Well - $^{89}\text{Sr}, ^{90}\text{Sr}$	T90 5/8/81	Analyses Incomplete
Ground Water Well - $^{89}\text{Sr}, ^{90}\text{Sr}$	T91 5/28/81	Analyses Incomplete
Ground Water Well - $^{89}\text{Sr}, ^{90}\text{Sr}$	T92 5/28/81	Analyses Incomplete
Cooling Canal Sediment - $^{89}\text{Sr}, ^{90}\text{Sr}$	T84 4/2/81	Analyses Incomplete
Cooling Canal Sediment - $^{89}\text{Sr}, ^{90}\text{Sr}$	T85 4/2/81	Analyses Incomplete
Crustacea - $^{89}\text{Sr}, ^{90}\text{Sr}$	T59 3/27/81	Analyses Incomplete
Crustacea - $^{89}\text{Sr}, ^{90}\text{Sr}$	T66 3/27/81	Analyses Incomplete
Crustacea - $^{89}\text{Sr}, ^{90}\text{Sr}$	T69 3/27/81	Analyses Incomplete
Crustacea - $^{89}\text{Sr}, ^{90}\text{Sr}$	T94 3/27/81	Analyses Incomplete
Crustacea - $^{89}\text{Sr}, ^{90}\text{Sr}$	T95 3/27/81	Analyses Incomplete
Crustacea - $^{89}\text{Sr}, ^{90}\text{Sr}$	T81 5/14/81	Analyses Incomplete
Fish Carnivore - $^{89}\text{Sr}, ^{90}\text{Sr}$	T66 3/27/81	Analyses Incomplete
Fish Carnivore - $^{89}\text{Sr}, ^{90}\text{Sr}$	T94 1/28/81	Analyses Incomplete
Fish Carnivore - $^{89}\text{Sr}, ^{90}\text{Sr}$	T95 1/29/81	Analyses Incomplete
Fish Carnivore - $^{89}\text{Sr}, ^{90}\text{Sr}$	T81 5/29/81	Analyses Incomplete
Fish Carnivore - $^{89}\text{Sr}, ^{90}\text{Sr}$	T84 5/20/81	Analyses Incomplete

6) Continued

<u>Sample</u>	<u>Location/Date</u>	<u>Reason for Missing Data</u>
Fish Herbivore - ^{89}Sr , ^{90}Sr	T59 2/25/81	Analyses Incomplete
Fish Herbivore - ^{89}Sr , ^{90}Sr	T66 2/25/81	Analyses Incomplete
Fish Herbivore - ^{89}Sr , ^{90}Sr	T69 2/25/81	Analyses Incomplete
Fish Herbivore - ^{89}Sr , ^{90}Sr	T94 2/25/81	Analyses Incomplete
Fish Herbivore - ^{89}Sr , ^{90}Sr	T95 2/25/81	Analyses Incomplete
Fish Herbivore - ^{89}Sr , ^{90}Sr	T81 5/13/81	Analyses Incomplete
Turtle Grass - ^{89}Sr , ^{90}Sr	T81 5/13/81	Analyses Incomplete
Food Crops - ^{89}Sr , ^{90}Sr	T55 2/25/81	Analyses Incomplete
Mangrove Leaves - ^{89}Sr , ^{90}Sr	T71 3/26/81	Analyses Incomplete
Mangrove Leaves - ^{89}Sr , ^{90}Sr	T72 3/26/81	Analyses Incomplete
Mangrove Leaves - ^{89}Sr , ^{90}Sr	T51 4/2/81	Analyses Incomplete
Mangrove Leaves - ^{89}Sr , ^{90}Sr	T86 5/13/81	Analyses Incomplete

RADIOACTIVE EFFLUENT RELEASE DATA

JANUARY 1981 THROUGH JUNE 1981

SUBMITTED BY
NUCLEAR CHEMISTRY DEPARTMENT
TURKEY POINT PLANT
FLORIDA POWER & LIGHT COMPANY

DISTRIBUTION

A. J. GOULD (3)
D. W. HAASE
J. K. HAYS
J. L. DANEK
E. R. LAPIERRE
R. L. LOGSDON
J. S. WADE
R. J. FRECHETTE



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

SEMIANNUAL REPORT OF RADIOACTIVE EFFLUENT RELEASES, PTP UNITS 3 & 4 1/81 - 6/81

Introduction

All liquid and airborne discharges to the environment during this reporting period were analyzed in accordance with Technical Specification requirements. The minimum frequency of analysis as required by Safety Guide 21 was met or exceeded.

Liquid Releases

Aliquots of representative pre-release samples were either isotopically analyzed for gamma emitting isotopes on a multichannel analyzer, or evaporated and analyzed for gross beta-gamma activity in a 2 π gas flow proportional counter. The efficiency of the gas flow proportional counter is adjusted so that the activity determined by gross beta-gamma analysis approximates the isotopic activities determined by gamma spectrum analysis and selected beta determinations, exclusive of tritium and dissolved gases.

The above procedure was followed for all releases from the waste disposal system and for secondary system batch releases. Frequent periodic sampling and analysis were used to conservatively estimate the quantity of radioactivity released via the steam generator blowdown system.

The following comments will aid in the interpretation and evaluation of the liquid release data presented in Table 1, pages 1 through 7.

1. The reported values in Table 1, page 1, include in their computation the quantity of radioactivity released from both the waste disposal system and the secondary system. The secondary system releases occurred when contaminated water was blown down from the steam generators during primary to secondary leakage conditions, or when the generators were drained for repair or refueling. Activity that entered the plant storm drain system was also included in the secondary system activity released and in the total activity released.
2. The reported values in Table 1, pages 2 and 3 are the total quantities of radioactivity for individual nuclides released from the waste disposal system and the secondary system together. The values in Table 1, pages 4 and 5 are for the waste disposal system only and page 6 is for the secondary system only.



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

3. During primary to secondary leakage, release of several short-lived nuclides from the secondary system occurs. These short-lived nuclides are not generally detected in batch released from the waste disposal system due to the long holdup time of processed water. Only those isotopes that were detected in the secondary system releases were reported. All non-detectable isotopes are listed as (--).
4. Weekly and monthly composite samples for the waste disposal system were prepared to give proportional weight to each liquid release made during the designated period of accumulation. The composites were analyzed for gamma emitting isotopes on a multichannel analyzer attached to a high resolution Ge(Li) detector, and for Sr-89 and Sr-90, using a chemical separation and subsequent beta determination with a 2π gas flow proportional counter. Tritium was determined by use of liquid scintillation techniques and gross alpha radioactivity was determined by use of a 2π gas flow proportional counter. All concentrations for radioactivity determined from analysis of a composite were multiplied by the total represented volume of the liquid waste released to determine the total quantity of each isotope and of gross alpha activity released during the compositing period.
5. At least one representative batch of liquid effluent from the waste disposal system was analyzed monthly for dissolved fission and activation gases by use of gamma spectrum analysis. The resulting isotope concentrations were multiplied by the total volume released for the month in order to estimate the total dissolved gases released. If more than one batch of effluent was analyzed, the concentrations were weighted in an appropriate manner. The results are totaled on a monthly basis in Table I, page 7. Dissolved gases, if any, from secondary system releases were determined from the samples of the individual releases. Isotopic concentrations were multiplied by the volume released to determine the quantity of radiogas nuclides released.
6. Representative samples of secondary system batch releases were analyzed individually for gamma emitting isotopes. Analysis of a representative composite for tritium was made for releases which occurred due to primary to secondary leakage.



7. The applicable limit for release of radioactive material in liquid waste is five curies per quarter excluding tritium and dissolved gases.

Airborne Releases

Airborne releases to the atmosphere occurred from: release of gas decay tanks, the instrument bleedline, containment purges, and the secondary system during conditions of primary to secondary leakage. The techniques employed in determining the radioactivity in airborne releases are:

- a) Gamma spectrum analysis for fission and activation gases,
- b) Removal of particulate material by filtration and subsequent gamma-spectrum analysis, Sr-89-90 determination, gross alpha analysis, and gross beta-gamma analysis,
- c) Absorption of halogen radionuclides on a charcoal filter and subsequent gamma-spectrum analysis, and
- d) Condensation of water vapor in a gas sample followed by analysis for tritium using liquid scintillation techniques.

All sporadic gas releases from the plant which were not accounted for by the above methods were conservatively estimated as curies of Xe-133 equivalent by use of the plant vent process monitor recorder chart and the current calibration curve for the monitor.

The maximum rated capacity for the hogging jets and the maximum measured flow rate for the condenser air ejectors, and an estimate of the rate of exhaust from the atmospheric dumps were used to conservatively estimate the airborne releases from the secondary system whenever applicable.

The following comments will aid in the interpretation and evaluation of the airborne release data presented in Table II.

1. Calculation of total radioactivity of noble gases, I-131, and particulates is based upon detectable radionuclides only.
2. The applicable limit for release of total radioactive materials in gaseous waste is 0.012 Ci/sec when averaged over the calendar quarter. The percent of the applicable limit for total gaseous release was computed as follows:

$$\% \text{ of Limit} = \frac{\text{Total curies released in gaseous waste during quarter} \times 100\%}{(.012 \text{ Ci/sec}) (\text{Seconds in quarter})}$$

3. The applicable limit for the release of I-131 and particulate radionuclides with half-lives greater than eight days in airborne waste is:

$$\sum \frac{Q_i}{MPC_i} \leq 10,000 \frac{m^3}{sec}, \text{ where } Q_i = \text{release rate of } i^{th} \text{ nuclide, Ci/sec}$$

and MPC_i = maximum permissible concentration of the i^{th} nuclide, Ci/m^3

The release rate, Q_i , was determined by dividing the total activity released in Ci, for the i^{th} nuclide ($t_{1/2} > 8d$), during the calendar quarter by the seconds in the quarter.

MPC_i values were obtained from 10CFR20, Appendix B, Table II, Column 1. The MPC chosen was the most conservative value of either the soluble or insoluble MPC for each isotope.

The percent of applicable limit was determined as follows:

$$\% \text{ of limit} = \frac{\sum \frac{Q_i}{MPC_i} \times 100\%}{10,000 m^3 / sec}$$

4. The maximum gaseous release rate for each month is listed in Table II, page 1, under Section A, Line 3. The applicable limit for maximum allowable release rate is $6.7 E+04 \mu Ci/sec$, average over one hour.
5. All values reported in Table II, pages 2 and 3, include the particulate, gaseous, and halogen activity released from the containments during purging, auxiliary building (leakage from pumps, valves, etc), the gas waste disposal system and the secondary system during conditions of primary to secondary system leakage.. If a minimum detectable activity value was not calculated for an isotope, it will be listed as (--).



YEAR 1981

NUCLEAR CHEMISTRY PROCEDURE NC-3
PREPARATION OF THE MONTHLY "PRELIMINARY REPORT ON RADIOACTIVE RELEASES" AND THE
"RADIOACTIVE EFFLUENT RELEASES" PORTION OF THE SEMIANNUAL OPERATING REPORT

PAGE 1

TABLE I
Report of Radioactive Effluents: Liquid

A. TOTAL Radioactivity (β-γ)		January	February	March	April	May	June
1. Total Release	(mCi)	1.12 E+01	6.21 E+00	2.72 E+01	2.10 E+01	1.85 E+01	1.32 E+01
2. Avg Concentration During Releases	(μCi/ml)	4.2 E-11	2.9 E-11	1.8 E-10	1.9 E-10	9.3 E-11	7.6 E-11
3. Avg Concentration for Month	(μCi/ml)	3.7 E-11	2.3 E-11	1.6 E-10	1.3 E-10	8.4 E-11	7.4 E-11
4. Max Concentration Released	(μCi/ml)	6.8 E-10	9.5 E-10	4.0 E-09	1.3 E-08	1.6 E-09	1.8 E-09
5. Percent of Technical Specification Limit for Total Activity Released	(%)	8.9 E-01			1.1 E+00		
B. Tritium							
1. Total Release	(Ci)	2.80 E+01	2.91 E+01	3.52 E+01	5.29 E+01	2.92 E+01	2.12 E+01
2. Avg Concentration During Releases	(μCi/ml)	1.0 E-07	1.4 E-07	2.3 E-07	4.7 E-07	1.5 E-07	1.2 E-07
3. Avg Concentration for Month	(μCi/ml)	9.2 E-08	1.1 E-07	2.1 E-07	3.2 E-07	1.3 E-07	1.2 E-07
C. Dissolved Noble Gas							
1. Total Release	(mCi)	2.59 E+01	5.83 E+01	2.51 E+01	1.37 E+01	3.39 E+00	1.18 E+00
2. Avg Concentration During Releases	(μCi/ml)	9.6 E-11	2.8 E-10	1.7 E-10	1.2 E-10	1.7 E-11	6.8 E-12
3. Avg Concentration for Month	(μCi/ml)	8.5 E-11	2.2 E-10	1.5 E-10	8.3 E-11	1.5 E-11	6.6 E-12
D. Gross Alpha Radioactivity							
1. Total Release	(mCi)	($<6.5 \text{ E-09}$)	($<9.0 \text{ E-09}$)	($<8.0 \text{ E-09}$)	($<6.6 \text{ E-09}$)	($<1.6 \text{ E-08}$)	($<4.5 \text{ E-09}$)
2. Avg Concentration During Releases	(μCi/ml)	($<2.4 \text{ E-20}$)	($<4.2 \text{ E-20}$)	($<5.3 \text{ E-20}$)	($<5.9 \text{ E-20}$)	($<8.0 \text{ E-20}$)	($<2.6 \text{ E-20}$)
3. Avg Concentration for Month	(μCi/ml)	($<2.1 \text{ E-20}$)	($<3.4 \text{ E-20}$)	($<4.8 \text{ E-20}$)	($<4.0 \text{ E-20}$)	($<7.3 \text{ E-20}$)	($<2.5 \text{ E-20}$)
E. Volumes							
1. Vol of Liquid Waste to Discharge	(Liters)	2.85 E+07	1.16 E+07	1.67 E+07	1.26 E+07	3.98 E+07	1.15 E+07
2. Vol of Dilution Water During Rel	(Liters)	2.69 E+11	2.12 E+11	1.51 E+11	1.12 E+11	1.99 E+11	1.73 E+11
3. Vol of Dilution Water for Month	(Liters)	3.03 E+11	2.68 E+11	1.68 E+11	1.66 E+11	2.20 E+11	1.79 E+11

NOTE: Numbers in parenthesis represent maximum sensitivity in μCi/ml.

YEAR 1981

NUCLEAR CHEMISTRY PROCEDURE NC-3
 PREPARATION OF THE MONTHLY "PRELIMINARY REPORT ON RADIOACTIVE RELEASES" AND THE
 "RADIOACTIVE EFFLUENT RELEASES" PORTION OF THE SEMIANNUAL OPERATING REPORT

PAGE 2

TABLE I
 Report of Radioactive Effluents: Liquid - Total

Isotope	Unit	January	February	March	April	May	June
Ag-110m	mCi	(<4.1 E-08)	(<3.1 E-08)	(<4.9 E-08)	1.11 E-01	2.07 E-02	2.38 E-02
Ba-140	mCi	(<8.6 E-08)	(<8.2 E-08)	(<1.1 E-07)	(<3.2 E-07)	(<2.9 E-07)	(<2.8 E-07)
Ce-144	mCi	(<1.3 E-07)	(<1.2 E-07)	(<1.4 E-07)	(<1.6 E-07)	1.52 E-01	(<2.2 E-07)
Co-57	mCi	(<1.6 E-08)	(<1.6 E-08)	(<1.7 E-08)	(<2.1 E-08)	3.62 E-03	(<2.8 E-08)
Co-58	mCi	1.09 E+00	1.31 E-01	4.80 E+00	2.49 E+00	5.44 E-01	6.92 E-01
Co-60	mCi	7.6 E+00	2.34 E+00	7.53 E+00	4.48 E+00	6.2 E+00	2.71 E+00
Cr-51	mCi	(<1.7 E-07)	(<1.7 E-07)	9.13 E-01	1.58 E+00	9.35 E-02	(<4.1 E-07)
Cs-134	mCi	6.44 E-01	8.03 E-01	4.84 E+00	2.69 E+00	5.48 E-01	8.78 E-01
Cs-137	mCi	1.19 E+00	1.37 E+00	6.60 E+00	3.28 E+00	9.29 E-01	1.09 E+00
F-18	mCi	--	--	--	5.7 E-01	3.70 E+00	3.29 E+00
I-131	mCi	5.34 E-01	1.04 E+00	1.29 E+00	2.11 E+00	1.14 E+00	3.06 E-01
I-132	mCi	--	--	--	8.1 E-02	8.73 E-01	8.65 E-01
I-133	mCi	--	4.09 E-01	3.90 E-01	1.78 E+00	2.63 E+00	2.48 E+00
I-134	mCi	--	--	--	--	2.53 E-01	1.53 E-01
I-135	mCi	--	--	--	--	7.08 E-01	1.00 E-01
La-140	mCi	(<1.2 E-08)	(<6.0 E-09)	(<1.2 E-08)	(<3.9 E-06)	(<4.3 E-07)	(<3.0 E-07)
Mn-54	mCi	1.75 E-01	(<2.4 E-08)	1.36 E-01	6.39 E-02	4.79 E-02	4.5 E-02
Na-24	mCi	--	1.11 E-01	--	1.07 E+00	4.41 E-01	3.99 E-01

NOTE: Numbers in parenthesis represent maximum sensitivity in $\mu\text{Ci/ml}$.

NUCLEAR CHEMISTRY PROCEDURE NC-3
 PREPARATION OF THE MONTHLY "PRELIMINARY REPORT ON RADIOACTIVE RELEASES" AND THE
 "RADIOACTIVE EFFLUENT RELEASES" PORTION OF THE SEMIANNUAL OPERATING REPORT

YEAR 1981

PAGE 3

TABLE I
 Report of Radioactive Effluents: Liquid - Total

Isotope	Unit	January	February	March	April	May	June
Nb-95	mCi	(<2.3 E-08)	(<1.9 E-08)	1.77 E-01	3.87 E-01	9.76 E-02	5.14 E-02
Ru-103	mCi	(<2.2 E-08)	(<2.1 E-08)	4.01 E-02	(<4.7 E-08)	(<6.5 E-08)	(<5.7 E-08)
Sb-124	mCi	(<2.2 E-08)	(<1.5 E-08)	1.69 E-01	(<3.8 E-08)	1.37 E-02	4.08 E-02
Sb-125	mCi	(<6.7 E-08)	(<6.6 E-08)	8.41 E-02	(<9.9 E-08)	3.02 E-02	5.04 E-02
Sr-89	mCi	4.7 E-03	3.29 E-03	9.98 E-02	7.28 E-02	9.1 E-03	1.16 E-02
Sr-90	mCi	7.1 E-03	3.99 E-03	4.77 E-03	(<2.9 E-09)	(<3.2 E-09)	(<2.6 E-09)
Zr-95	mCi	(<3.8 E-08)	(<3.3 E-08)	8.24 E-02	2.55 E-01	4.98 E-02	3.62 E-02
Total	mCi	1.12 E+01	6.21 E+00	2.72 E+01	2.10 E+01	1.85 E+01	1.32 E+01

NOTE: Numbers in parenthesis represent maximum sensitivity in $\mu\text{Ci/ml}$,

NUCLEAR CHEMISTRY PROCEDURE NC-3
 PREPARATION OF THE MONTHLY "PRELIMINARY REPORT ON RADIOACTIVE RELEASES" AND THE
 "RADIOACTIVE EFFLUENT RELEASES" PORTION OF THE SEMIANNUAL OPERATING REPORT

TABLE I
 Report of Radioactive Effluents: Liquid - Waste Disposal System

Isotope	Unit	January	February	March	April	May	June
Ag-110m	mCi	(<4.1 E-08)	(<3.1 E-08)	(<4.9 E-08)	1.11 E-01	2.07 E-02	2.38 E-02
Ba-140	mCi	(<8.6 E-08)	(<8.2 E-08)	(<1.1 E-07)	(<3.2 E-07)	(<2.9 E-07)	(<2.8 E-07)
Ce-144	mCi	(<1.3 E-07)	(<1.2 E-07)	(<1.4 E-07)	(<1.6 E-07)	1.52 E-01	(<2.2 E-07)
Co-57	mCi	(<1.6 E-08)	(<1.6 E-08)	(<1.7 E-08)	(<2.1 E-08)	3.62 E-03	(<2.8 E-08)
Co-58	mCi	9.12 E-01	1.31 E-01	4.10 E+00	2.33 E+00	5.44 E-01	6.92 E-01
Co-60	mCi	1.88 E+00	5.77 E-01	4.57 E+00	3.14 E+00	9.82 E-01	1.71 E+00
Cr-51	mCi	(<1.7 E-07)	(<1.7 E-07)	9.13 E-01	1.58 E+00	9.35 E-02	(<4.1 E-07)
Cs-134	mCi	4.17 E-01	3.16 E-01	4.42 E-01	1.87 E-01	1.02 E-01	3.34 E-01
Cs-137	mCi	7.91 E-01	4.75 E-01	8.58 E-01	2.86 E-01	1.79 E-01	7.94 E-01
I-131	mCi	1.59 E-01	(<2.2 E-08)	3.51 E-01	(<9.9 E-08)	(<5.2 E-08)	(<6.8 E-08)
La-140	mCi	(<1.2 E-08)	(<6.0 E-09)	(<1.2 E-08)	(<3.9 E-06)	(<4.3 E-07)	(<3.0 E-07)
Mn-54	mCi	9.35 E-02	(<2.4 E-08)	1.36 E-01	6.39 E-02	4.79 E-02	4.5 E-02
Nb-95	mCi	(<2.3 E-08)	(<1.9 E-08)	1.77 E-01	3.87 E-01	9.76 E-02	5.14 E-02
Ru-103	mCi	(<2.2 E-08)	(<2.1 E-08)	4.01 E-02	(<4.7 E-08)	(<6.5 E-08)	(<5.7 E-08)
Sb-124	mCi	(<2.2 E-08)	(<1.5 E-08)	1.69 E-01	(<3.8 E-08)	1.37 E-02	4.08 E-02
Sb-125	mCi	(<6.7 E-08)	(<6.6 E-08)	8.41 E-02	(<9.9 E-08)	3.02 E-02	5.04 E-02
Sr-89	mCi	4.7 E-03	3.29 E-03	9.98 E-02	7.28 E-02	9.1 E-03	1.16 E-02
Sr-90	mCi	7.1 E-03	3.99 E-03	4.77 E-03	(<2.9 E-09)	(<3.2 E-09)	(<2.6 E-09)

NOTE: Numbers in parenthesis represent maximum sensitivity in $\mu\text{Ci/ml}$.

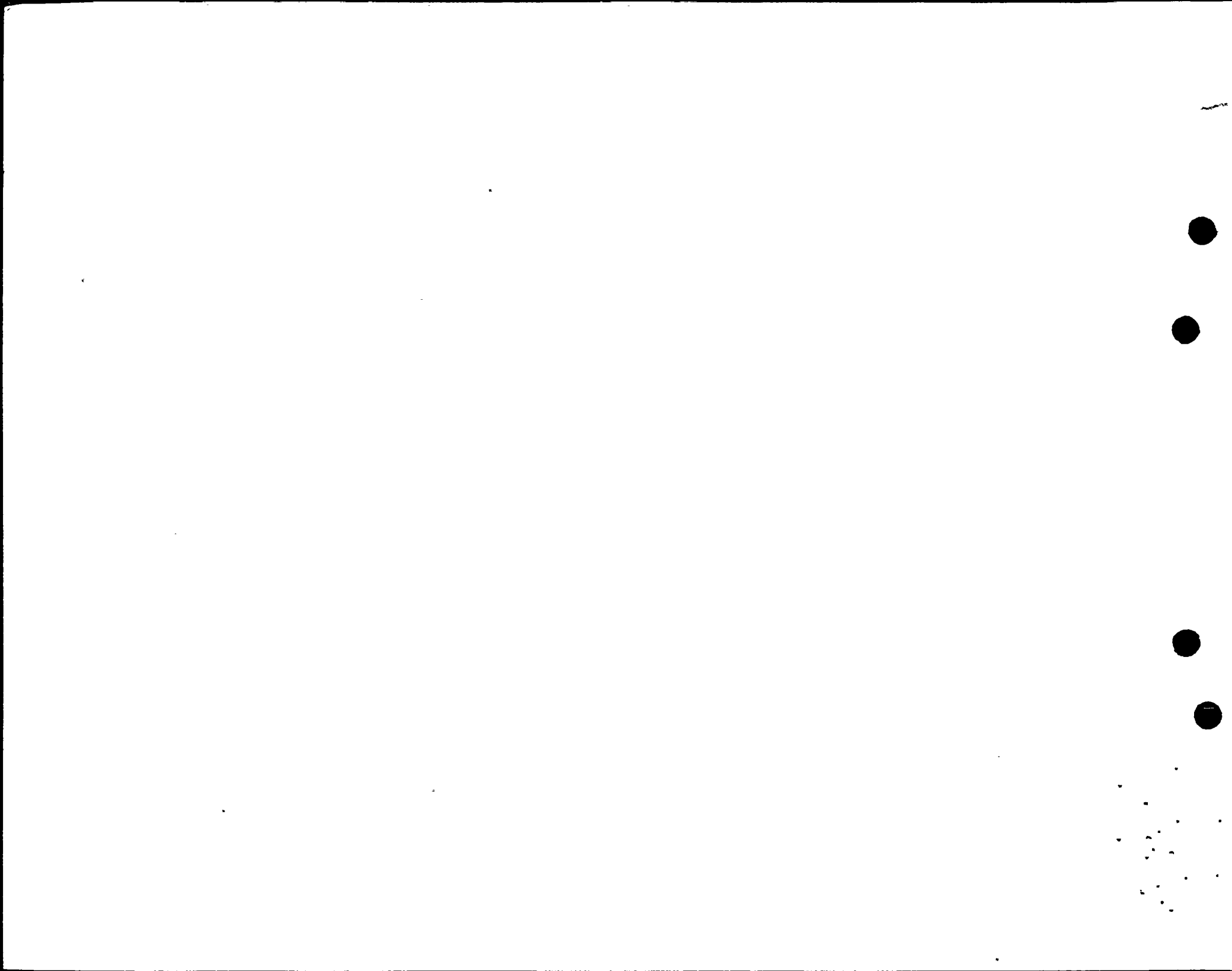
YEAR 1981

PAGE 5

TABLE I

Total

NOTE: Numbers in parenthesis represent maximum sensitivity in $\mu\text{Ci/ml}$.



YEAR 1981

NUCLEAR CHEMISTRY PROCEDURE NC-3
 PREPARATION OF THE MONTHLY "PRELIMINARY REPORT ON RADIOACTIVE RELEASES" AND THE
 "RADIOACTIVE EFFLUENT RELEASES" PORTION OF THE SEMIANNUAL OPERATING REPORT

PAGE 6

TABLE I
 Report of Radioactive Effluents: Liquid - Secondary System

Isotope	Unit	January	February	March	April	May	June
Co-58	mCi	1.75 E-01	--	7.01 E-01	1.60 E-01	--	--
Co-60	mCi	5.7 E+00	1.76 E+00	2.96 E+00	1.34 E+00	5.2 E+00	1.00 E+00
Cs-134	mCi	2.27 E-01	4.87 E-01	4.40 E+00	2.50 E+00	4.46 E-01	5.44 E-01
Cs-137	mCi	3.96 E-01	8.95 E-01	5.74 E+00	2.99 E+00	7.50 E-01	2.98 E-01
F- 18	mCi	--	--	--	5.7 E-01	3.70 E+00	3.29 E+00
I- 131	mCi	3.75 E-01	1.04 E+00	9.39 E-01	2.11 E+00	1.14 E+00	3.06 E-01
I- 132	mCi	--	--	--	8.1 E-02	8.73 E-01	8.65 E-01
I- 133	mCi	--	4.09 E-01	3.90 E-01	1.78 E+00	2.63 E+00	2.48 E+00
I- 134	mCi	--	--	--	--	2.53 E-01	1.53 E-01
I-135	mCi	--	--	--	--	7.08 E-01	1.00 E-01
Mn-54	mCi	8.1 E-02	--	--	--	--	--
Na-24	mCi	--	1.11 E-01	--	1.07 E+00	4.41 E-01	3.99 E-01
Total	mCi	7.0 E+00	4.70 E+00	1.51 E+01	1.26 E+01	1.61 E+01	9.44 E+00

NOTE:

Numbers in parenthesis represent maximum sensitivity in $\mu\text{Ci/ml}$.



YEAR 1981

NUCLEAR CHEMISTRY PROCEDURE NC-3
PREPARATION OF THE MONTHLY "PRELIMINARY REPORT ON RADIOACTIVE RELEASES" AND THE
"RADIOACTIVE EFFLUENT RELEASES" PORTION OF THE SEMIANNUAL OPERATING REPORT

PAGE.

TABLE I
Report of Radioactive Effluents: Liquid - Dissolved Gas

Total		January	February	March	April	May	June
Kr-85	mCi	2.05 E+01	9.40 E+00	1.79 E+01	7.8 E+00	(<6.0 E-06)	(<4.3 E-06)
Xe-131m	mCi	(<1.2 E-06)	(<1.3 E-06)	(<1.3 E-06)	(<1.3 E-06)	(<5.3 E-07)	(<5.2 E-07)
Xe-133	mCi	5.39 E+00	4.85 E+01	7.15 E+00	5.85 E+00	3.39 E+00	1.06 E+00
Xe-133m	mCi	(<2.6 E-07)	(<2.8 E-07)	(<2.8 E-07)	(<2.8 E-07)	(<1.2 E-07)	(<1.2 E-07)
Xe-135	mCi	(<2.9 E-08)	3.92 E-01	(<3.0 E-08)	(<3.0 E-08)	(<1.7 E-08)	1.16 E-01
Total	mCi	2.59 E+01	5.83 E+01	2.51 E+01	1.37 E+01	3.39 E+00	1.18 E+00
Waste Disposal System							
Kr-85	mCi	2.05 E+01	9.40 E+00	1.79 E+01	7.8 E+00	(<6.0 E-06)	(<4.3 E-06)
Xe-131 m	mCi	(<1.2 E-06)	(<1.3 E-06)	(<1.3 E-06)	(<1.3 E-06)	(<5.3 E-07)	(<5.2 E-07)
Xe-133	mCi	5.39 E+00	4.85 E+01	7.15 E+00	5.85 E+00	3.39 E+00	1.06 E+00
Xe-133m	mCi	(<2.6 E-07)	(<2.8 E-07)	(<2.8 E-07)	(<2.8 E-07)	(<1.2 E-07)	(<1.2 E-07)
Xe-135	mCi	(<2.9 E-08)	3.92 E-01	(<3.0 E-08)	(<3.0 E-08)	(<1.7 E-08)	1.16 E-01
Secondary System							
Kr-85	mCi	--	--	--	--	--	--
Xe-131 m	mCi	--	--	--	--	--	--
Xe-133	mCi	--	--	--	--	--	--
Xe-133m	mCi	--	--	--	--	--	--
Xe-135	mCi	--	--	--	--	--	--

NOTE: Numbers in parenthesis represent maximum sensitivity in $\mu\text{Ci/ml}$.

NUCLEAR CHEMISTRY PROCEDURE NC-3
 PREPARATION OF THE MONTHLY "PRELIMINARY REPORT ON RADIOACTIVE RELEASES" AND THE
 "RADIOACTIVE EFFLUENT RELEASES" PORTION OF THE SEMIANNUAL OPERATING REPORT

YEAR 1981

PAGE 1

TABLE II
 Report of Radioactive Effluents: Airborne

A. Fission and Activation Gases	January	February	March	April	May	June
1. Total Release (Ci)	5.63 E+02	3.21 E+02	3.08 E+02	2.11 E+02	2.97 E+02	2.78 E+02
2. Avg Release Rate for Period (μCi/sec)	2.3 E+02	1.3 E+02	1.0 E+02	8.8 E+01	9.9 E+01	1.2 E+02
*3. Max Release Rate for Period (μCi/sec)	5.3 E+03	2.1 E+04	2.3 E+04	6.6 E+02	1.6 E+02	2.7 E+02

*Maximum airborne release rate averaged over one hour for each month. Technical Specifications limit is 6.7 E+04 μCi/sec averaged over one hour.

B. Iodine - 131						
1. Total Iodine - 131 (Ci)	5.9 E-04	2.7 E-04	1.5 E-02	5.5 E-04	3.5 E-04	8.3 E-05
2. Avg Release Rate for Period (μCi/sec)	2.5 E-04	1.1 E-04	5.0 E-03	2.3 E-04	1.2 E-04	3.5 E-05

C. Particulates						
1. Particulates (With t _{1/2} >8d) (Ci)	1.36 E-04	2.11 E-05	2.04 E-04	3.37 E-05	3.57 E-05	3.86 E-05
2. Avg Release Rate for Period (μCi/sec)	5.7 E-05	8.8 E-06	6.8 E-05	1.4 E-05	1.2 E-05	1.6 E-05
3. Gross Alpha Radioactivity (Ci)	1.8 E-08	2.3 E-09	1.5 E-08	8.9 E-10	2.3 E-09	1.3 E-08

D. Tritium						
1. Total Release (Ci)	2.78 E-02	1.01 E-01	1.26 E-01	5.64 E-02	1.06 E-01	7.8 E-02
2. Avg Release Rate for Period (μCi/sec)	1.2 E-02	4.2 E-02	4.2 E-02	2.4 E-02	3.5 E-02	3.3 E-02

E. Percent of Applicable Limit	Quarter I	Quarter II
1. Fission and Activation Gases (%)	1.3 E+00	8.3 E-01
2. I-131 and Part (t _{1/2} >8d) (%)	2.0 E-01	1.2 E-02

NOTE: Numbers in parenthesis represent maximum sensitivity in μCi/ml.

YEAR 1981

NUCLEAR CHEMISTRY PROCEDURE NC-3
 PREPARATION OF THE MONTHLY "PRELIMINARY REPORT ON RADIOACTIVE RELEASES" AND THE
 "RADIOACTIVE EFFLUENT RELEASES" PORTION OF THE SEMIANNUAL OPERATING REPORT

PAGE 2

TABLE II
 Airborne Releases - Particulates

Isotope	Unit	January	February	March	April	May	June
Ba-140	Ci	(<1.0 E-13)	(<5.2 E-14)	(<1.5 E-13)	(<1.9 E-13)	(<2.1 E-13)	(<1.8 E-13)
Co-58	Ci	9.4 E-06	1.1 E-06	5.0 E-05	1.3 E-05	9.0 E-06	3.7 E-06
Co-60	Ci	1.0 E-04	4.9 E-06	9.9 E-05	8.3 E-06	1.6 E-05	2.9 E-05
Cr-51	Ci	(<1.6 E-13)	(<9.7 E-14)	3.8 E-05	(<3.0 E-13)	2.4 E-06	(<2.7 E-13)
Cs-134	Ci	5.3 E-06	9.2 E-07	1.4 E-06	3.1 E-06	(<7.3 E-14)	3.8 E-07
Cs-137	Ci	1.3 E-05	1.0 E-05	7.0 E-06	4.6 E-06	3.9 E-06	4.7 E-06
I-131	Ci	2.5 E-06	(<1.2 E-14)	4.1 E-06	(<4.1 E-14)	(<4.8 E-14)	(<3.1 E-14)
La-140	Ci	(<1.5 E-14)	(<1.3 E-14)	(<5.4 E-14)	(<1.1 E-13)	(<1.5 E-13)	(<6.6 E-14)
Mn-54	Ci	3.5 E-06	(<1.7 E-14)	(<4.3 E-14)	1.5 E-06	4.0 E-07	3.4 E-07
Nb-95	Ci	(<4.5 E-14)	(<2.7 E-14)	2.6 E-06	2.2 E-06	3.2 E-06	(<5.5 E-14)
Ru-103	Ci	(<2.8 E-14)	(<1.4 E-14)	(<3.9 E-14)	(<5.0 E-14)	2.6 E-07	(<3.5 E-14)
Sb-125	Ci	1.3 E-06	(<3.3 E-14)	(<9.1 E-14)	(<1.1 E-13)	(<1.4 E-13)	(<1.0 E-13)
Sr-89	Ci	1.2 E-06	4.1 E-06	1.5 E-06	9.3 E-07	5.2 E-07	4.2 E-07
Sr-90	Ci	3.8 E-08	3.8 E-08	1.4 E-07	4.7 E-08	5.2 E-08	5.8 E-08
Total	Ci	1.36 E-04	2.11 E-05	2.04 E-04	3.37 E-05	3.57 E-05	3.86 E-05

NOTE: Numbers in parenthesis represent maximum sensitivity in $\mu\text{Ci/ml}$.

YEAR 1981

NUCLEAR CHEMISTRY PROCEDURE NC-3
PREPARATION OF THE MONTHLY "PRELIMINARY REPORT ON RADIOACTIVE RELEASES" AND THE
"RADIOACTIVE EFFLUENT RELEASES" PORTION OF THE SEMIANNUAL OPERATING REPORT

PAGE 3

TABLE II
Airborne Releases - Gaseous

Fission and Activation Gases		January	February	March	April	May	June
Isotope	Unit						
Ar-41	Ci	7.35 E-01	6.97 E+00	5.96 E-01	2.5 E-01	3.07 E-01	3.07 E-01
Kr-85	Ci	4.01 E-01	7.65 E-01	3.31 E-01	1.55 E-01	1.52 E-01	5.70 E-01
Kr-85m	Ci	2.33 E-02	6.0 E-02	1.30 E-02	1.5 E-02	8.56 E-03	1.50 E-02
Kr-87	Ci	(<1.5 E-06)	(<1.5 E-05)	(<1.8 E-06)	(<3.5 E-06)	(<2.9 E-06)	(<8.9 E-07)
Kr-88	Ci	8.8 E-05	(<7.8 E-06)	1.2 E-05	(<3.1 E-06)	(<3.3 E-06)	(<9.1 E-07)
Xe-131m	Ci	1.98 E-01	1.34 E-01	1.79 E-01	1.07 E+00	3.32 E-01	6.06 E-01
Xe-133	Ci	5.60 E+02	3.11 E+02	3.05 E+02	2.09 E+02	2.95 E+02	2.76 E+02
Xe-133m	Ci	4.75 E-01	9.10 E-01	1.21 E+00	3.23 E-01	3.32 E-01	3.64 E-01
Xe-135	Ci	6.82 E-01	8.52 E-01	6.31 E-01	2.02 E-01	2.71 E-01	3.07 E-01
Xe-135m	Ci	9.52 E-02	(<3.4 E-05)	(<4.9 E-06)	(<2.4 E-05)	(<3.4 E-06)	(<3.4 E-06)
Xe-138	Ci	(<1.7 E-06)	(<4.8 E-05)	(<1.2 E-05)	(<5.8 E-05)	(<5.8 E-06)	(<7.1 E-06)
Total	Ci	5.63 E+02	3.21 E+02	3.08 E+02	2.11 E+02	2.97 E+02	2.78 E+02

Halogens (Gaseous)		January	February	March	April	May	June
Isotope	Unit						
I-131	Ci	5.9 E-04	2.7 E-04	1.5 E-02	5.5 E-04	3.5 E-04	8.3 E-05
I-133	Ci	4.9 E-04	7.3 E-04	3.4 E-03	2.6 E-04	5.2 E-04	2.4 E-04
I-135	Ci	(<8.4 E-14)	(<1.3 E-13)	(<1.3 E-13)	2.2 E-04	3.7 E-05	5.0 E-06
Br-82	Ci	(<3.4 E-14)	4.6 E-04	4.1 E-05	1.7 E-05	3.5 E-04	1.7 E-04
Total	Ci	1.08 E-03	1.46 E-03	1.8 E-02	1.05 E-03	1.26 E-03	5.0 E-04

Note: Numbers in parenthesis represent maximum sensitivity in $\mu\text{Ci/ml}$.

TURKEY POINT PLANT

RADIOACTIVE WASTE REPORT

JAN 1, 1981 to JUNE 30, 1981

<u>Date of Shipment</u>	<u>Curies</u>	<u>Cu. Ft.</u>	<u>Disposition</u>
1-06-81	0.214	852	Buried in Barnwell, SC
1-14-81	0.612	1100	"
1-20-81	0.242	550	"
1-29-81	12.2	85	"
2-10-81	0.423	1100	"
2-24-81	0.314	1100	"
3-17-81	0.482	1100	"
3-24-81	1.61	170	"
3-26-81	3.219	170	"
4-17-81	6.71	85	"
4-20-81	0.1557	1050	"
4-23-81	4.27	85	"
4-27-81	10.8	150	"
5-06-81	0.0507	1050	"
5-19-81	10.0	150	"
5-19-81	2.7	150	"
5-30-81	1.93	170	"
6-03-81	7.93	85	"
6-11-81	9.150	85	"
6-15-81	2.29	100	"
6-17-81	0.2445	1050	"
6-21-81	2.092	170	"
6-22-81	0.00174	562.5	Buried in Richland, Washington
6-22-81	0.00254	555	"
6-22-81	0.00164	570	"
6-23-81	0.00086	555	"
6-23-81	0.00137	562.5	"
6-23-81	0.000855	555	"
6-23-81	0.563	170	Buried in Barnwell, SC
6-24-81	0.00099	555	Buried in Richland, Washington
6-24-81	0.00092	532.5	"
6-25-81	0.000951	532.5	"
6-25-81	0.008835	525	Buried in Barnwell, SC

33 Shipments

78.2226 Ci. 16,282 Cu. Ft.

On site as of July 1, 1981:

13.895 Ci. 2,965 Cu. Ft.

