

WISCONSIN ELECTRIC

POWER COMPANY

POINT BEACH NUCLEAR PLANT

UNIT NOS. 1 AND 2

SEMIANNUAL  
MONITORING REPORT

JANUARY, 1993 through JUNE, 1993

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PDR ADOCK 05000266  
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U.S. Nuclear Regulatory Commission  
Docket Nos. 50-266 and 50-301  
Facility Operating License Nos.  
DPR-24 and DPR-27

#### PREFACE

This Semiannual Monitoring Report for the period of January 1, 1993, through June 30, 1993, is submitted in accordance with Point Beach Nuclear Plant Unit Nos. 1 and 2 Technical Specification 15.7.8.4 and filed under Docket Nos. 50-266 and 50-301 for Facility Operation License Nos. DPR-24 and DPR-27, respectively.

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SEMIANNUAL MONITORING REPORT  
January 1, 1993 to June 30, 1993

1.0 RADIOACTIVE LIQUID RELEASES

The total radioactive liquid release, excluding tritium for this reporting period, was  $1.40\text{E}-01$  curies. This included  $5.75\text{E}-2$  curies in processed radioactive waste and primary coolant system letdown,  $1.91\text{E}-04$  curies in Unit 1 steam generator blowdown,  $8.22\text{E}-02$  curies in Unit 2 steam generator blowdown and  $1.98\text{E}-04$  curies in retention pond effluent.

The total tritium release for this reporting period was  $2.09\text{E}+02$  curies. This included  $2.05\text{E}+02$  curies in processed radioactive waste and primary coolant system letdown,  $2.01\text{E}-02$  curies in Unit 1 steam generator blowdown,  $2.82\text{E}+00$  curies in Unit 2 steam generator blowdown and  $7.60\text{E}-01$  curies in retention pond effluent.

1.1 Circulating Water Radionuclide Release Summary

1.1.1 Releases During Current Reporting Period

Radioactive liquid releases via the circulating water discharge are summarized by individual source and total curie released on a monthly basis and presented in Table 1-1. Table 1-1 also contains the comparison between the annual Appendix I dose limits for liquid discharges and the corresponding highest doses calculated according to the ODCM using the semiannual isotopic composition of the liquid discharge listed in Table 1-2.

1.1.2 Additions to Previous Semiannual Monitoring Report

The following information was not available at the time of the previous report preparation and should be added to Table 1-1 of the Semiannual Monitoring Report for July 1, 1992, through December 31, 1992.

	<u>DEC</u>	<u>6-MONTH TOTAL</u>
Total Activity Released (Ci)		
Gross Alpha	<MDA	$9.4\text{E}-06$
Strontium	$5.4\text{E}-05$	$2.6\text{E}-04$
Average Diluted Discharge Concentration ( $\mu\text{Ci/cc}$ )		
Gross Alpha	<MDA	
Strontium	$1.1\text{E}-14$	

TABLE 1-1

ISOTOPIC COMPOSITION OF CIRCULATING WATER DISCHARGE  
JANUARY 1, 1993 THROUGH JUNE 30, 1993

	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>TOTAL</u>
Total Activity Released (Ci)							
Gamma Scan	9.97E-03	9.62E-03	6.92E-02	1.21E-02	1.95E-02	1.98E-02	1.40E-01
Gross Alpha	1.6 E-07	1.9 E-07	4.36E-06	<MDA	(1)	(1)	(1)
Tritium	1.78E+01	3.83E+01	2.93E+01	9.63E+01	2.17E+01	5.33E+00	2.09E+02
Strontium	1.4 E-06	5.55E-06	1.1 E-06	<MDA	(1)	(1)	(1)
Total Volumes Released (Gal)							
Processed Waste	4.14E+04	6.21E+04	6.47E+04	1.64E+05	8.39E+04	3.69E+04	4.53E+05
(U1) Steam Generator Blowdown	3.57E+06	3.22E+06	3.19E+06	(2)	4.37E+06	3.45E+06	1.78E+07
(U2) Steam Generator Blowdown	3.55E+06	3.24E+06	3.62E+06	4.03E+06	3.84E+06	3.45E+06	2.17E+07
Retention Pond	2.83E+06	2.30E+06	2.60E+06	2.93E+06	2.77E+06	2.48E+06	1.59E+07
Miscellaneous Releases		9.99E+03					9.99E+03
Total	9.99E+06	8.83E+06	9.47E+06	7.13E+06	1.11E+07	9.42E+06	5.59E+07
Volume of Dilution Water (Gal)							
	8.75E+09	7.90E+09	8.80E+09	1.04E+10	1.52E+10	1.47E+10	6.58E+10
Average Diluted Discharge Concentration (uCi/cc)							
Gross Gamma	3.01E-10	3.22E-10	2.08E-09	3.09E-10	3.39E-10	3.56E-10	
Gross Alpha	4.8 E-15	6.4 E-15	1.31E-13	<MDA	(1)	(1)	
Tritium	5.38E-07	1.28E-06	8.80E-07	2.46E-06	3.75E-07	9.59E-08	
Strontium	4.2 E-14	1.85E-13	3.3 E-14	<MDA	(1)	(1)	
Maximum Discharge Concentration During Release Period (uCi/cc)							
Gross Gamma	4.62E-10	6.29E-10	2.77E-08	7.80E-10	6.91E-10	1.43E-09	
Tritium	3.91E-05	3.66E-05	5.05E-05	5.39E-05	2.2 E-05	3.88E-06	
Comparison of semiannual effluent doses to annual Appendix I dose limits							
	Annual Limit (mrem)		Highest Calculated Dose (mrem)				
	6 whole body		7.61E-03 (adult)				
	20 any organ		1.01E-02 (teen liver)				

(1) Information unavailable at time of report preparation.

(2) Unit 1 refueling shutdown from March 27, 1993 to May 6, 1993.

Note: Dissolved noble gases detected in liquid effluents are included in airborne release totals

RETS = Radiological Effluent Technical Specifications.



TABLE 1-2

ISOTOPIC COMPOSITION OF CIRCULATING WATER DISCHARGES  
JANUARY 1, 1993 THROUGH JUNE 30, 1993

NUCLIDES RELEASED	JAN (Curies)	FEB (Curies)	MAR (Curies)	APR (Curies)	MAY (Curies)	JUN (Curies)	TOTAL (Curies)
Tritium	1.78E+01	3.82E+01	2.93E+01	9.63E+01	2.17E+01	5.33E+00	2.09E+02
I-131	9.71E-05	3.18E-04	6.67E-04	1.37E-04	4.75E-04	3.13E-04	2.01E-03
I-132	<MDA	1.09E-05	3.19E-04	3.63E-04	1.02E-03	6.04E-04	2.32E-03
I-133	1.58E-03	1.80E-03	2.38E-03	2.51E-03	3.22E-03	3.64E-03	1.51E-02
I-134	<MDA	2.60E-06	1.03E-04	1.11E-05	1.73E-04	1.54E-04	4.44E-04
I-135	<MDA	2.01E-05	9.46E-05	1.08E-04	6.05E-04	6.24E-04	1.45E-03
F-18	6.65E-03	5.82E-03	5.18E-03	6.27E-03	8.59E-03	7.02E-03	3.95E-02
Na-24	<MDA	3.09E-06	1.19E-04	2.43E-05	3.02E-04	2.09E-04	6.57E-04
Cr-51	<MDA	<MDA	2.22E-03	<MDA	3.76E-05	<MDA	2.26E-03
MN-56	<MDA	5.51E-06	<MDA	6.64E-05	3.90E-05	2.27E-04	3.38E-04
Co-57	<MDA	<MDA	<MDA	3.84E-05	<MDA	<MDA	3.84E-05
Co-58	3.21E-05	2.30E-05	7.48E-05	5.28E-05	5.37E-05	2.86E-05	2.65E-04
Co-60	6.11E-05	3.55E-05	1.69E-04	1.76E-04	1.28E-04	1.49E-04	7.19E-04
Zn-69m	<MDA	<MDA	4.82E-06	<MDA	<MDA	<MDA	4.82E-06
Sr-92	<MDA	<MDA	5.17E-06	<MDA	<MDA	<MDA	5.17E-06
Tc-99m	<MDA	<MDA	<MDA	<MDA	2.42E-06	6.49E-05	6.73E-05
Zr-97	<MDA	<MDA	<MDA	<MDA	8.08E-06	<MDA	8.08E-06
Ag-110m	7.02E-05	6.34E-05	1.93E-04	2.50E-04	2.68E-04	3.35E-04	1.18E-03
Sb-125	<MDA	<MDA	5.29E-02	1.23E-05	<MDA	<MDA	5.29E-02
Te-132	<MDA	<MDA	1.21E-04	3.83E-06	<MDA	<MDA	1.25E-04
Cs-134	2.38E-04	5.34E-04	1.98E-03	9.26E-04	2.09E-03	3.04E-03	8.81E-03
Te-131m	<MDA	1.82E-04	9.79E-05	<MDA	<MDA	<MDA	2.80E-04
Cs-137	1.24E-03	8.14E-04	2.58E-03	1.17E-03	2.55E-03	3.16E-03	1.15E-02
Cs-138	<MDA	<MDA	<MDA	<MDA	<MDA	4.94E-05	4.94E-05
Ce-141	<MDA	<MDA	<MDA	<MDA	<MDA	3.51E-05	3.51E-05
Ce-144	<MDA	<MDA	<MDA	<MDA	<MDA	2.00E-04	2.00E-04
Sr-89	<MDA	4.25E-06	<MDA	<MDA	(1)	(1)	(1)
Sr-90	1.4 E-06	1.3 E-06	1.1 E-06	<MDA	(1)	(1)	(1)

(1) Information unavailable at time of report preparation.

Note: Dissolved noble gases detected in liquid effluents are included in airborne release totals.

## 1.2 Isotopic Composition of Circulating Water Discharges

### 1.2.1 Releases During Current Reporting Period

The isotopic composition of circulating water discharges during the current reporting period is presented in Table 1-2.

### 1.2.2 Additions to Previous Semiannual Monitoring Report

The following information was not available at the time of report preparation and should be added to Table 1-2 of the Semiannual Monitoring Report for July 1, 1992, through December 31, 1992.

	<u>DEC</u>	<u>6-MONTH TOTAL</u>
Sr-89 (Ci)	<MDA	5.0E-05
Sr-90 (Ci)	5.4E-05	2.1E-04

## 1.3 Subsoil Drain System Releases of Tritium

### 1.3.1 Releases During Current Reporting Period

The releases of tritium via the subsoil drain system during the current reporting period is presented in Table 1-3.

TABLE 1-3

SUBSOIL SYSTEM DRAINS - TRITIUM SUMMARY  
January 1, 1993 through June 30, 1993

<u>First Quarter</u>	<u>S-1</u>	<u>S-3</u>	<u>S-9</u>	<u>S-10</u>	<u>Totals</u>
H-3 (μCi/cc)	<MDA	<MDA	No Sample	<MDA	
Ave. Flow (gpd)	1.49E+04	6.85E+03	No Flow	2.11E+04	
<u>Second Quarter</u>					
H-3 (μCi/cc)	<MDA	<MDA	<MDA	<MDA	
Ave. Flow (gpd)	5.33E+04	2.13E+04	5.89E+03	1.75E+04	
<u>Semiannual Totals</u>					
Total Released (Ci)	<MDA	<MDA	<MDA	<MDA	<MDA
Total Flow (gals)	6.19E+06	2.55E+06	5.36E+05	3.49E+06	1.28E+07

#### 1.4 Land Application of Sewage Sludge

Trace amounts of radionuclides may be land-applied with sewage sludges on various Department of Natural Resources approved Wisconsin Electric Power Company properties surrounding the Point Beach Nuclear Plant in accordance with approved methodologies pursuant to 10 CFR 20.302. No land application of sewage sludge took place between January 1, 1993 and June 30, 1993.

### 2.0 RADIOACTIVE AIRBORNE RELEASES

The release paths contributing to radioactive airborne release totals during this reporting period were the auxiliary building vent stack, drumming area vent stack, gas stripper building vent stack, Unit 1 containment purge stack, Unit 2 containment purge stack, combined air ejector decay duct exhaust and turbine building ventilation exhaust.

There was one gas decay tank released during this reporting period.

#### 2.1 Radioactive Airborne Release Summary

##### 2.1.1 Release During Current Reporting Period

Radioactivity released in airborne effluent for the current reporting period are summarized in Table 2-1. Table 2-1 also contains the comparison of the annual Appendix I dose limits for atmospheric effluents to the highest dose and the noble gas doses calculated using ODCM methodology and the isotopic composition of atmospheric releases identified in Table 2-2.

##### 2.1.2 Additions to Previous Semiannual Monitoring Report

The following information was not available at the time of the last report preparation and should be added to Table 2-1 of the Semiannual Monitoring Report for July 1, 1992 through December 31, 1992.

#### Strontium (Ci)

October	<MDA
November	<MDA
December	<MDA
Total	<MDA

#### 2.2 Isotopic Airborne Releases

##### 2.2.1 Releases During Current Reporting Period

The monthly isotopic airborne releases for the current reporting period are presented in Table 2-2.



TABLE 2-1

RADIOACTIVE AIRBORNE RELEASE SUMMARY  
JANUARY 1, 1993 THROUGH JUNE 30, 1993

	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>TOTAL</u>
Total Noble Gases (Ci): (2)	8.69E-01	7.44E-01	6.69E-01	2.72E+00	1.34E+00	5.55E-01	6.90E+00
Total Radioiodines (Ci):	1.71E-06	2.40E-07	4.54E-05	2.75E-05	1.57E-09	1.27E-06	7.61E-05
Total Particulates (Ci):	4.84E-06	4.49E-06	1.53E-04	3.58E-05	1.91E-05	9.02E-06	2.26E-04
Alpha (Ci):	5.42E-09	3.52E-07	1.17E-07	1.02E-06	3.66E-07	7.17E-07	2.58E-06
Strontium (Ci):	<MDA	<MDA	<MDA	(1)	(1)	(1)	(1)
All Others (Ci):	4.83E-06	4.14E-06	1.53E-04	3.48E-05	1.87E-05	8.30E-06	2.24E-04
Total Tritium (Ci):	8.58E+00	2.67E+01	1.76E+01	8.91E+00	7.46E+00	7.46E+00	7.67E+01
Maximum Hourly Average Release Rate (Curies/Second)	7.15E-07	8.60E-07	8.11E-07	5.14E-04	1.16E-05	7.36E-07	
Comparison of semiannual effluent doses to annual Appendix I dose limits	Annual Dose Limit		Highest Calculated Dose				
particulate	30 mrem/organ		1.63E-02 (child liver)				
noble gas	40 mrad ( $\beta$ air)		8.74E-04				
noble gas	20 mrad ( $\gamma$ air dose)		1.66E-03				
noble gas	30 mrem (skin)		1.10E-03				
noble gas	10 mrem (whole body)		1.96E-03				

(1) Information unavailable at time of report preparation, but values typically do not alter monthly totals.

(2) Includes noble gas contribution from liquid releases.

TABLE 2-2

RADIOACTIVE AIRBORNE RELEASE SUMMARY  
JANUARY 1, 1993 THROUGH JUNE 30, 1993

NUCLIDES RELEASED	JAN (Curies)	FEB (Curies)	MAR (Curies)	APR (Curies)	MAY (Curies)	JUN (Curies)	TOTAL (Curies)
Tritium	8.58E+00	2.67E+01	1.76E+01	8.91E+00	7.46E+00	7.46E+00	7.67E+01
Xe-133	3.56E-01	3.18E-01	3.24E-01	4.51E-01	3.66E-01	3.16E-01	2.13E+00
Kr-85m	5.35E-03	1.43E-03	2.21E-03	7.93E-02	3.01E-02	4.32E-03	1.23E-01
Kr-88	1.28E-02	3.27E-03	5.24E-03	1.73E-01	6.84E-02	8.80E-03	2.72E-01
Xe-133m	8.45E-05	5.50E-05	9.28E-05	6.59E-03	1.96E-03	3.00E-03	1.18E-02
Xe-135	4.04E-02	2.31E-02	2.83E-02	5.19E-01	2.14E-01	3.03E-02	8.55E-01
Xe-138	4.61E-02	1.24E-02	1.99E-02	4.97E-01	2.05E-01	2.94E-02	8.10E-01
Kr-87	1.08E-02	2.84E-03	4.57E-03	1.29E-01	5.03E-02	7.01E-03	2.05E-01
Xe-135m	1.40E-02	3.97E-03	5.87E-03	2.43E-01	7.63E-02	9.45E-03	3.53E-01
Ar-41	3.83E-01	3.79E-01	2.79E-01	4.99E-01	2.78E-01	1.47E-01	1.97E+00
Kr-85	<MDA	<MDA	<MDA	1.21E-01	5.15E-02	<MDA	1.73E-01
Xe-131m	<MDA	<MDA	<MDA	<MDA	<MDA	5.23E-03	5.23E-03
I-131	<MDA	<MDA	1.29E-05	1.46E-06	1.57E-09	1.80E-09	1.44E-05
I-132	2.07E-07	<MDA	3.78E-06	2.55E-06	<MDA	<MDA	6.54E-06
I-133	1.51E-06	2.40E-07	1.95E-05	1.11E-05	<MDA	1.26E-06	3.36E-01
I-135	<MDA	<MDA	9.24E-06	1.24E-05	<MDA	<MDA	2.16E-05
F-18	3.69E-06	1.75E-06	6.81E-06	1.38E-05	<MDA	4.62E-06	3.07E-05
Na-24	<MDA	<MDA	<MDA	1.22E-06	<MDA	<MDA	1.22E-06
Mn-56	<MDA	<MDA	<MDA	1.03E-06	<MDA	<MDA	1.03E-06
Co-57	<MDA	<MDA	<MDA	2.47E-07	<MDA	<MDA	2.47E-07
Co-58	<MDA	<MDA	1.91E-06	<MDA	<MDA	<MDA	1.91E-06
Rb-88	<MDA	<MDA	<MDA	1.52E-06	1.14E-05	2.09E-06	1.50E-05
Te-132	<MDA	<MDA	<MDA	<MDA	4.20E-09	<MDA	4.20E-09
Cs-134	<MDA	2.13E-07	7.43E-05	4.95E-06	<MDA	<MDA	7.95E-05
Cs-137	1.14E-06	2.17E-06	6.89E-05	1.20E-05	<MDA	1.22E-06	8.54E-05
Cs-138	<MDA	<MDA	<MDA	<MDA	7.31E-06	3.73E-07	7.68E-06
Sr-89	<MDA	<MDA	<MDA	(1)	(1)	(1)	(1)
Sr-90	<MDA	<MDA	<MDA	(1)	(1)	(1)	(1)
Alpha	5.42E-09	3.52E-07	1.17E-06	1.02E-06	3.66E-07	7.17E-07	3.63E-6

(1) Information unavailable at time of report preparation, but values typically do not alter monthly totals reported in Table 2-1.

### 2.2.2 Additions to Previous Semiannual Monitoring Report

The following information was not available at the time of previous report preparation and should be added to Table 2-2 of the Semiannual Monitoring Report, covering the period July 1, 1992, through December 31, 1992.

	<u>Sr-89 (Ci)</u>	<u>Sr-90 (Ci)</u>
October	<MDA	<MDA
November	<MDA	<MDA
December	<MDA	<MDA
Totals	<MDA	<MDA

### 3.0 RADIOACTIVE SOLID WASTE SHIPMENTS

Solid wastes shipped for burial during this reporting period were as follows:

<u>DATE OF SHIPMENT TO BURIAL</u>	<u>VOLUME (CUBIC FEET)</u>	<u>TOTAL ACTIVITY (Curies)</u>	<u>BURIAL SITE</u>
2/22/93	2.60 (1,2)	1.30E-03	Barnwell, SC
3/12/93	73.27 (1,2)	7.62E-02	Barnwell, SC
5/17/93	77.00 (1,2)	1.57E-02	Barnwell, SC
5/25/93	86.00 (1,2)	4.64E-02	Barnwell, SC
5/20/93	69.61 (1,2)	1.10E-02	Barnwell, SC
5/25/93	15.00 (1,2)	1.20E-03	Barnwell, SC
5/17/93	95.44 (1,2)	1.27E-02	Barnwell, SC
5/25/93	7.50 (1,2)	1.00E-04	Barnwell, SC
6/23/93	16.44 (1)	1.80E-03	Barnwell, SC
6/16/93	13.80 (1,2)	8.00E-04	Barnwell, SC
6/16/93	23.10 (1,2)	2.10E-03	Barnwell, SC
6/24/93	102.87 (1,2)	2.00E-01	Barnwell, SC
6/24/93	103.35 (1,2)	7.82E-02	Barnwell, SC
6/16/93	12.10 (1,2)	7.00E-04	Barnwell, SC
TOTAL	698.08	4.49E-01	

- (1) Dry Active Waste
- (2) Scrap Metal

### 4.0 NEW AND SPENT FUEL SHIPMENTS AND RECEIPTS

During this reporting period, a total of 28 new fuel assemblies were received from Westinghouse Electric Corporation for Unit 1. The new fuel assemblies received for Unit 1 were used for the Spring 1993 refueling.

There were no spent fuel shipments made from Point Beach Nuclear Plant during this reporting period.

### 5.0 RADIOLOGICAL ENVIRONMENTAL MONITORING

#### 5.1 Introduction

The results in this Semiannual Report are presented in the new format which was initiated with the January - June 1992 Report. Results are reported directly as measured, including negative and zero values. This eliminates the distortion of the results and long-term trends which occurs when the LLD is used to censor results that are below the LLD. This reporting convention follows that recommended in Health Physics Society Committee Report HPSR-1 (1980) released as document EPA 520/1-80-012.

The REMP results are presented in Table 5.1. This table contains the following information:

Sample: the type of the sample medium  
Description: the type of measurement  
LLD: the a priori lower limit of detection  
N: the number of samples analyzed  
Low: the lowest measured value  $\pm$  its associated 2 $\sigma$  counting error  
Average: the average value  $\pm$  the standard deviation of N samples  
High: the highest measured value  $\pm$  its associated 2 $\sigma$  counting error  
Units: the units of measurement

Additional information also is presented in Table 5.1. Not all of the results in Table 5.1 are required by the PBNP radiological effluent technical specifications (RETS). Non-RETS items and values are noted by an asterisk (\*). For certain analyses, an LLD which is lower than that required by RETS is used. For these analyses, both LLDs are listed with the RETS LLD given in parentheses. Occasionally, anomalous results are obtained which lie well outside of the range of expected values. If, upon investigation, these values are found not to be the result of PBNP operations they will not be listed in the table. In this case, the highest reported value will be footnoted and the omitted value discussed in the narrative portion of this section. Blank values have not been subtracted from the results presented in Table 5.1.

## 5.2 Discussion

Radiological environmental monitoring conducted at the Point Beach Nuclear Plant from January 1, 1993 through June 30, 1993 consisted of air filters, milk, lake water, well water, soil, fish, shoreline sediments, algae, vegetation, and TLDs.

All TLD results for the reporting period were within the normal range. Site E-12, located on the discharge flume pier continues to exhibit some of the lowest values.

The analyses for individual radionuclides in environmental samples does not reveal any unexpected results. Sr-90 continues to persist in milk and water. Cs-137 continues to persist in milk, water, sediment, fish, algae, vegetation, and soil. These radionuclides routinely occur in environmental samples collected around the world. The occurrence of these radionuclides in the environment is attributable to the large scale atmospheric weapons tests of the 1960's, less frequent testing in the 70's and 80's, and to the Chernobyl accident. Tritium concentrations continue to be low.

Measured concentrations of other radionuclides occur as positive and negative values scattered around zero. Although the positive values are usually smaller than their associated error, small, non-zero values (below the associated LLDs) occur for I-131 in milk (1 of 18 samples), I-131, Co-60, Fe-59, and Zr-Nb-95 in water (each 1 of 30 samples). Although the concentration of Zr-Nb-95 in the composite from the discharge flume appears to be a real positive value at  $7.1 \pm 3.6$  pCi/l, this value is not statistically different from typical blank values for this analysis. Blank values for Zr-Nb-95 are  $2.41 \pm 5.02$  and  $1.50 \pm 3.17$  pCi/l. Other values also are comparable to the values obtained for "blanks" so that there would be no statistical difference from zero if blank values were subtracted. Therefore, these results appear to be attributable to statistical variations.



TABLE 5.1  
RADIOLOGICAL ENVIRONMENTAL MONITORING RESULTS

Sample	Description	LLD	N	Low	Average	High	Units
TLD	Environmental Radiation	(*)	54	$0.40 \pm 0.03$	$0.73 \pm 0.11$	$1.02 \pm 0.03$	mR/7days
Air	Gross beta	0.01	154	$0.004 \pm 0.002$	$0.020 \pm 0.009$	$0.048 \pm 0.004$	pCi/m <sup>3</sup>
	Cs-137	0.01(0.06)	12	$-0.0004 \pm 0.0007$	$0.0000 \pm 0.0002$	$0.0004 \pm 0.0005$	pCi/m <sup>3</sup>
	Cs-134	0.05	12	$-0.0003 \pm 0.0006$	$-0.0001 \pm 0.0002$	$0.0004 \pm 0.0006$	pCi/m <sup>3</sup>
	I-131	0.03(0.07)	155	$-0.017 \pm 0.021$	$0.000 \pm 0.005$	$0.015 \pm 0.015$	pCi/m <sup>3</sup>
	Other gamma emitters(*)	0.1(*)	12	$-0.0003 \pm 0.0008$	$0.0002 \pm 0.0003$	$0.0005 \pm 0.0005$	pCi/m <sup>3</sup>
Milk	I-131	0.5	18	$-0.10 \pm 0.13$	$0.08 \pm 0.09$	$0.24 \pm 0.25$	pCi/l
	Sr-89(*)	5(*)	18	$-1.4 \pm 1.1$	$-0.14 \pm 0.55$	$0.7 \pm 1.1$	pCi/l
	Sr-90(*)	1(*)	18	$0.9 \pm 0.4$	$1.41 \pm 0.29$	$1.9 \pm 0.5$	pCi/l
	Cs-134	5(15)	18	$-2.1 \pm 2.2$	$-0.68 \pm 1.05$	$0.3 \pm 1.8$	pCi/l
	Cs-137	5(18)	18	$-1.2 \pm 2.4$	$1.17 \pm 0.97$	$2.7 \pm 2.4$	pCi/l
	Ba-La-140	5(15)	18	$-3.2 \pm 2.5$	$-0.36 \pm 1.55$	$1.8 \pm 2.6$	pCi/l
	Other gamma emitters(*)	15(*)	18	$-1.8 \pm 2.9$	$0.29 \pm 1.15$	$2.2 \pm 2.6$	pCi/l
Lake water	Gross beta	4	30	$1.6 \pm 0.5$	$2.92 \pm 1.19$	$7.9 \pm 0.8$	pCi/l
	I-131	0.5(2)	30	$-0.13 \pm 0.23$	$0.05 \pm 0.10$	$0.29 \pm 0.23$	pCi/l
	Mn-54	10(15)	30	$-1.7 \pm 2.9$	$-0.05 \pm 1.02$	$2.7 \pm 2.7$	pCi/l
	Fe-59	30	30	$-8.7 \pm 8.7$	$+0.95 \pm 3.38$	$6.5 \pm 8.8$	pCi/l
	Co-58	10	30	$-1.7 \pm 2.5$	$-0.04 \pm 0.72$	$1.1 \pm 3.0$	pCi/l
	Co-60	10	30	$-0.9 \pm 1.8$	$0.54 \pm 0.98$	$2.2 \pm 1.8$	pCi/l
	Zn-65	30	30	$-5.1 \pm 4.6$	$-1.12 \pm 2.35$	$2.6 \pm 4.5$	pCi/l
	Zr-Nb-95	15	30	$-4.9 \pm 5.2$	$+0.40 \pm 2.54$	$7.1 \pm 3.6$	pCi/l
	Cs-134	10(15)	30	$-8.5 \pm 2.3$	$+0.95 \pm 1.79$	$1.7 \pm 2.6$	pCi/l
	Cs-137	10(18)	30	$-1.3 \pm 1.8$	$1.07 \pm 1.74$	$7.7 \pm 2.5$	pCi/l
	Ba-La-140	15	30	$-5.3 \pm 6.6$	$+0.59 \pm 2.81$	$6.7 \pm 6.5$	pCi/l
	Other gamma emitters(*)	30(*)	30	$-2.0 \pm 3.0$	$+0.22 \pm 1.12$	$3.1 \pm 3.0$	pCi/l
	H-3	500(3000)	10	$102 \pm 93$	$165 \pm 46$	$250 \pm 164$	pCi/l
	Sr-89(*)	5(*)	10	$-0.8 \pm 0.8$	$-0.13 \pm 0.39$	$0.4 \pm 0.7$	pCi/l
	Sr-90(*)	1(*)	10	$0.3 \pm 0.3$	$0.52 \pm 0.13$	$0.7 \pm 0.4$	pCi/l
Algae	Gross beta	0.25	2	$4.33 \pm 0.27$	$4.94 \pm 0.86$	$5.55 \pm 0.37$	pCi/g
	Co-58	0.25	2	$-0.021 \pm 0.033$	$-0.007 \pm 0.021$	$0.008 \pm 0.028$	pCi/g
	Co-60	0.25	2	$+0.012 \pm 0.030$	$0.017 \pm 0.007$	$0.022 \pm 0.029$	pCi/g
	Cs-134	0.25	2	$-0.057 \pm 0.029$	$-0.039 \pm 0.026$	$-0.020 \pm 0.027$	pCi/g
	Cs-137	0.25	2	$0.028 \pm 0.030$	$0.042 \pm 0.020$	$0.056 \pm 0.031$	pCi/g



Sample	Description	LLD	N	Low	Average	High	Units
Fish	Gross beta(*)	0.5(*)	3	0.30 ± 0.01	1.25 ± 0.89	2.04 ± 0.05	pCi/g
	Mn-54	0.13	3	0.001±0.012	0.004±0.004	0.009±0.011	pCi/g
	Fe-59	0.26	3	-0.018±0.028	-0.007±0.011	0.008±0.030	pCi/g
	Co-58	0.13	3	-0.007±0.014	-0.003±0.003	0.000±0.011	pCi/g
	Co-60	0.13	3	0.003±0.011	0.011±0.006	0.016±0.010	pCi/g
	Zn-65	0.26	3	-0.023±0.020	-0.009±0.012	0.002±0.021	pCi/g
	Cs-134	0.13	3	-0.013±0.009	-0.004±0.006	0.001±0.007	pCi/g
	Cs-137	0.15	3	0.002±0.010	0.015±0.011	0.028±0.010	pCi/g
	Other gamma emitters(*)	0.5(*)	3	-0.004±0.012	-0.002±0.003	+0.002±0.012	pCi/g
Well water	Gross beta	4	2	1.2 ± 1.7	2.3 ± 1.6	3.4 ± 2.2	pCi/l
	I-131	0.5(2)	2	-0.15 ± 0.15	-0.01 ± 0.21	0.14 ± 0.15	pCi/l
	Mn-54	10(15)	2	0.1 ± 2.6	-0.55 ± 0.64	1.0 ± 2.7	pCi/l
	Fe-59	30	2	1.6 ± 4.8	3.80 ± 3.11	6.0 ± 8.1	pCi/l
	Co-58	10	2	-1.1 ± 2.7	-0.85 ± 2.76	2.8 ± 3.1	pCi/l
	Co-60	10	2	-0.7 ± 3.1	0.60 ± 1.84	1.9 ± 2.2	pCi/l
	Zn-65	30	2	-5.5 ± 5.7	-3.75 ± 2.47	-2.0 ± 4.5	pCi/l
	Zr-Nb-95	15	2	-3.3 ± 3.4	1.45 ± 6.72	6.2 ± 5.2	pCi/l
	Cs-134	10(15)	2	-4.7 ± 2.5	-2.55 ± 3.04	-0.4 ± 2.3	pCi/l
	Cs-137	10(18)	2	1.1 ± 2.5	1.75 ± 0.92	2.4 ± 2.9	pCi/l
	Ba-La-140	15	2	-2.4 ± 3.6	-0.95 ± 2.05	0.5 ± 4.8	pCi/l
	Other gamma emitters(*)	30(*)	2	-0.5 ± 2.8	-0.10 ± 0.57	0.3 ± 2.7	pCi/l
	H-3	500	2	-21.4 ± 83.5	-8.9 ± 17.7	3.6 ± 86.2	pCi/l
	Sr-89(*)	5(*)	2	-0.1 ± 0.4	-0.1 ± 0.1	0.0 ± 0.4	pCi/l
	Sr-90(*)	1(*)	2	0.0 ± 0.2	0.1 ± 0.1	0.1 ± 0.2	pCi/l
Soil(*)	Gross beta	2	8	13.12 ± 2.29	23.94 ± 5.92	32.21 ± 3.13	pCi/g
	Cs-137	0.15	8	0.065 ± 0.019	0.038 ± 0.158	0.559 ± 0.068	pCi/g
Shoreline sediment(*)	Gross beta	2	5	5.6 ± 1.2	7.4 ± 1.3	8.8 ± 1.5	pCi/g
	Cs-137	0.15	5	0.028 ± 0.010	0.047 ± 0.017	0.068 ± 0.007	pCi/g
Vegetation	Gross beta(*)	0.25(*)	8	5.1 ± 0.02	6.33 ± 0.93	7.7 ± 6.3	pCi/g
	Cs-134	0.06	8	-0.003±0.009	0.001 ± 0.002	0.005 ± 0.008	pCi/g
	Cs-137	0.08	8	-0.001±0.010	0.013 ± 0.029	0.084 ± 0.017	pCi/g
	I-131	0.06	8	-0.006±0.013	0.002 ± 0.004	0.005 ± 0.024	pCi/g

## 6.0 NONRADIOACTIVE CHEMICAL RELEASES

### 6.1 Scheduled Chemical Waste Releases\*

Scheduled chemical waste releases to the circulating water system from January 1, 1993, to June 30, 1993, included 5.65E+06 gallons of neutralized wastewater. The wastewater contained 7.63E+02 pounds of suspended solids and 4.03E+05 pounds of dissolved solids.

- \* Scheduled chemical waste releases are based on the average analytical results obtained from sampling a representative number of neutralizing tanks.

### 6.2 Miscellaneous Chemical Waste Releases\*

Miscellaneous chemical waste releases from the retention pond (based on effluent analyses) to the circulating water for January 1, 1993, to June 30, 1993, included 1.59E+07 gallons of clarified wastewater. The wastewater contained 1.59E+03 pounds of suspended solids.

- \* Miscellaneous chemical waste released directly to the circulating water, based on amount of chemicals used for January 1, 1993, to June 30, 1993, included 8.40E+04 pounds of sodium bisulfite and 2.46E+04 pounds of sodium hypochlorite.

## 7.0 CIRCULATING WATER SYSTEM OPERATION

The circulating water system operation during this reporting period for periods of plant operation is described in Table 7-1.

TABLE 7-1

CIRCULATING WATER SYSTEM OPERATION  
January 1, 1993 to June 30, 1993

		<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>
Average Volume Cooling Water Discharge (Million gal/day)**	U1	282.2	282.2	274.7*	*	435.3*	489.6
	U2	282.2	282.2	283.5	345.3	491.9	486.6
Average Cooling Water Intake Temperature (Degrees F)	U1	37	37	36*	*	47*	49
	U2	37	37	36	40	47	49
Average Cooling Water Discharge Temperature (Degrees F)	U1	70	70	67*	*	65*	68
	U2	72	72	69	67	67	70
Average Ambient Lake Temperature (Degrees F)		34	34	35	39	44	47

(\*Unit 1 refueling shutdown from March 27, 1993 to May 6, 1993)

(\*\*For days with cooling water discharge flow)

## 8.0 LEAK TESTING OF RADIOACTIVE SOURCES

During this reporting period, all applicable sealed radioactive sources were leak tested in accordance with Technical Specification 15.4.12. Leak test results were all  $<0.005 \mu\text{Ci}$ .

## 9.0 MISCELLANEOUS REPORTING REQUIREMENTS

### 9.1 Revisions to the PBNP Office Dose Calculation Manual (ODCM) and Process Control Program (PCP)

No revisions were made to either the Environmental Manual or the PCP during this reporting period. The ODCM, which was revised and submitted to the NRC at the end of the last reporting period, took effect on January 1, 1993.

### 9.2 Interlaboratory Comparison Program

The analytical laboratory contracted to perform the radioanalyses of the PBNP environmental samples participated in the EPA Interlaboratory Comparison Program during this reporting period.

### 9.3 Deviations from Specified Environmental Sample Types, Locations, and Frequencies

Three air samples, two (2) particulate and one (1) iodine, were missed during this reporting period.

### 9.4 Summary of Unachievable Specified Environmental LLDs

All LLDs listed in Table 15.7.7-2 of the PBNP Technical Specifications were achieved during this sampling period.

### 9.5 Special Circumstances

No special circumstances report regarding operation of the explosive gas monitor for the waste gas holdup system was needed during this reporting period.