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Gentlemen:

DOCKETS 50-266 AND 50-301
SEMIANNUAL MONITORING REPORT
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

Enclosed is the Semiannual Monitoring Report for Point Beach Nuclear Plant, Units 1 and 2, for the period July 1, 1993 through December 31, 1993. This report is submitted in accordance with Technical Specification 15.7.8.4.A and contains information regarding plant releases, solid waste shipments, new and spent fuel shipments, environmental monitoring, circulating water system operations, leak testing of sources, and other miscellaneous reportable items from this reporting period. Three copies of this report are provided for your convenience.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Bob Link'.

Bob Link
Vice President
Nuclear Power

DAW/jg

cc: NRC Regional Administrator, Region III
NRC Resident Inspector

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WISCONSIN ELECTRIC

POWER COMPANY

POINT BEACH NUCLEAR PLANT

UNIT NOS. 1 AND 2

SEMIANNUAL
MONITORING REPORT

JULY 1993 through DECEMBER 1993

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 July 1, 1993, through December 31, 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.

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.0	Radioactive Liquid Releases	1
2.0	Radioactive Airborne Releases	5
3.0	Radioactive Solid Waste Shipments	8
4.0	New and Spent Fuel Shipments	9
5.0	Radiological Environmental Monitoring	9
6.0	Nonradioactive Chemical Releases	13
7.0	Circulating Water System Operation	13
8.0	Leak Testing of Radioactive Sources	14
9.0	Miscellaneous Reporting Requirements	14

SEMIANNUAL MONITORING REPORT
July 1, 1993 to December 31, 1993

1.0 RADIOACTIVE LIQUID RELEASES

The total radioactive liquid release, excluding tritium for this reporting period, was 9.20E-02 curies. This included 6.77E-3 curies in processed radioactive waste and primary coolant system letdown, 1.13E-04 curies in Unit 1 steam generator blowdown, 8.48E-02 curies in Unit 2 steam generator blowdown and 2.47E-04 curies in retention pond effluent.

The total tritium release for this reporting period was 2.55E+02 curies. This included 2.53E+02 curies in processed radioactive waste and primary coolant system letdown, 4.71E-02 curies in Unit 1 steam generator blowdown, 1.76E+00 curies in Unit 2 steam generator blowdown and 8.10E-02 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 curies 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 effluent and the corresponding highest doses calculated according to the ODCM using the semiannual and annual isotopic composition of the liquid discharge.

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 January 1, 1993, through June 30, 1993.

	<u>MAY</u>	<u>JUN</u>	<u>6-MONTH TOTAL</u>
Total Activity Released (Ci)			
Gross Alpha	6.4E-08	<MDA	4.8E-06
Strontium	4.3E-06	1.6E-05	2.8E-05
Average Diluted Discharge Concentration (μCi/cc)			
Gross Alpha	1.1E-15	<MDA	
Strontium	7.5E-14	2.8E-13	

TABLE 1-1

ISOTOPIC COMPOSITION OF CIRCULATING WATER DISCHARGE
JULY 1, 1993 THROUGH DECEMBER 31, 1993

	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>TOTAL</u>
Total Activity Released (Ci)							
Gamma Scan	1.81E-02	1.76E-02	2.11E-02	7.87E-03	1.37E-02	1.36E-02	9.20E-02
Gross Alpha	1.7 E-07	6.6 E-08	2.0 E-07	2.0 E-07	(1)	(1)	(1)
Tritium	3.64E+01	6.25E+01	5.66E+01	2.58E+01	2.63E+01	4.74E+01	2.55E+02
Strontium	1.1 E-05	4.0 E-06	6.8 E-05	2.8 E-06	(1)	(1)	(1)
Total Volumes Released (Gal)							
Processed Waste	5.54E+04	8.69E+04	1.05E+05	1.76E+05	9.44E+04	5.72E+04	5.75E+05
(U1) Steam Generator Blowdown	3.53E+06	3.56E+06	3.37E+06	3.52E+06	3.18E+06	3.54E+06	2.07E+07
(U2) Steam Generator Blowdown	3.56E+06	3.56E+06	2.88E+06	3.97E+05	4.17E+06	3.59E+06	1.81E+07
Retention Pond	2.92E+06	2.90E+06	2.82E+06	2.51E+06	3.00E+06	2.71E+06	1.69E+07
Total	1.01E+07	1.01E+07	9.18E+06	6.60E+06	1.04E+07	9.90E+06	5.63E+07
Volume of Dilution Water (Gal)							
	1.51E+10	1.52E+10	1.47E+10	1.56E+10	1.43E+10	1.34E+10	8.83E+10
Average Diluted Discharge Concentration ($\mu\text{Ci}/\text{cc}$)							
Gross Gamma	3.20E-10	3.06E-10	3.79E-10	1.33E-10	2.52E-10	2.68E-10	
Gross Alpha	3.0 E-15	1.1 E-15	3.4 E-15	3.4 E-15	(1)	(1)	
Tritium	6.39E-07	1.09E-06	1.01E-06	4.37E-07	4.85E-07	9.33E-07	
Strontium	2.0 E-13	6.9 E-14	1.0 E-12	4.8 E-14	(1)	(1)	
Maximum Discharge Concentration During Release Period ($\mu\text{Ci}/\text{cc}$)							
Gross Gamma	4.60E-09	1.50E-09	2.89E-09	1.68E-09	4.47E-10	4.98E-10	
Tritium	4.39E-05	4.27E-05	3.16E-05	2.60E-05	2.09E-05	4.16E-05	
Comparison of liquid effluent doses to annual Appendix I dose limits							
	Annual Limit (mrem)		January-June Highest Total Calculated Dose (mrem)		January-December Highest Total Calculated Dose (mrem)		
	6 (whole body)		7.61E-03 (adult)		1.74E-02 (adult)		
	20 (any organ)		1.01E-02 (teen liver)		2.30E-02 (teen liver)		

(1) Information unavailable at time of report preparation.

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

TABLE 1-2

ISOTOPIC COMPOSITION OF CIRCULATING WATER DISCHARGES
JULY 1, 1993 THROUGH DECEMBER 31, 1993

NUCLIDES RELEASED	JUL (Curies)	AUG (Curies)	SEP (Curies)	OCT (Curies)	NOV (Curies)	DEC (Curies)	TOTAL (Curies)
Tritium	3.64E+01	6.25E+01	5.66E+01	2.58E+01	2.63E+01	4.74E+01	2.55E+02
I-131	8.71E-05	9.99E-05	7.90E-04	2.27E-04	<MDA	1.84E-04	1.38E-03
I-132	8.35E-04	8.66E-04	1.39E-03	<MDA	<MDA	<MDA	3.09E-03
I-133	3.54E-03	3.36E-03	3.17E-03	<MDA	1.54E-03	2.81E-03	1.44E-02
I-134	6.63E-05	2.41E-04	1.98E-04	<MDA	<MDA	<MDA	5.05E-04
I-135	<MDA	1.11E-03	1.74E-03	<MDA	<MDA	<MDA	2.85E-03
F-18	8.55E-03	7.57E-03	5.75E-03	<MDA	9.38E-03	1.04E-02	4.17E-02
Na-24	<MDA	1.20E-05	<MDA	<MDA	<MDA	<MDA	1.20E-05
MN-56	1.60E-04	<MDA	<MDA	<MDA	<MDA	<MDA	1.60E-04
Co-58	2.48E-05	<MDA	8.38E-06	4.53E-05	3.72E-05	2.62E-05	1.42E-04
Co-60	3.15E-04	2.84E-05	4.73E-05	1.21E-04	6.22E-05	2.73E-05	6.01E-04
Nb-97	1.99E-05	<MDA	<MDA	1.44E-05	<MDA	<MDA	3.43E-05
Zr-97	8.77E-05	<MDA	1.30E-05	1.32E-05	5.92E-06	<MDA	1.20E-04
Tc-99m	<MDA	<MDA	<MDA	<MDA	1.21E-04	<MDA	1.21E-04
Ru-103	<MDA	<MDA	<MDA	3.47E-06	<MDA	<MDA	3.47E-06
Ag-110m	2.52E-03	4.49E-04	5.85E-04	7.33E-04	3.05E-04	1.49E-04	4.74E-03
Sb-125	<MDA	<MDA	1.27E-05	6.93E-06	8.73E-06	9.54E-06	3.79E-05
Cs-134	8.71E-04	1.14E-03	3.68E-03	3.27E-03	1.04E-03	<MDA	1.00E-02
Cs-137	1.11E-03	2.00E-03	3.37E-03	3.44E-03	1.18E-03	1.33E-05	1.11E-02
Ba-139	4.52E-05	7.20E-04	<MDA	<MDA	<MDA	<MDA	7.65E-04
Sr-89	<MDA	3.1 E-06	<MDA	2.1 E-06	(1)	(1)	(1)
Sr-90	1.5 E-06	8.6 E-07	6.8 E-05	7.3 E-07	(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 January 1, 1993, through June 30, 1993.

	<u>MAY</u>	<u>JUN</u>	<u>6-MONTH TOTAL</u>
Sr-89 (Ci)	2.2E-06	<MDA	6.5E-06
Sr-90 (Ci)	2.1E-06	1.6E-05	2.2E-05

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
July 1, 1993 through December 31, 1993

<u>Third Quarter</u>	<u>S-1</u>	<u>S-3</u>	<u>S-9</u>	<u>S-10</u>	<u>Totals</u>
H-3 (μ Ci/cc)	<MDA	<MDA	<MDA	<MDA	
Ave. Flow (gpd)	4.82E+03	2.74E+03	7.08E+01	1.97E+04	
<u>Fourth Quarter</u>					
H-3 (μ Ci/cc)	<MDA	<MDA	No Sample	<MDA	
Ave. Flow (gpd)	2.39E+03	1.25E+03	No Flow	1.45E+04	
<u>Semiannual Totals</u>					
Total Released (Ci)	<MDA	<MDA	<MDA	<MDA	<MDA
Total Flow (gals)	6.63E+05	3.67E+05	6.51E+03	3.14E+06	4.18E+06

1.4 Land Application of Sewage Sludge

The Wisconsin Department of Natural Resources has approved the land-application of sewage sludges on various Wisconsin Electric Power Company properties surrounding the Point Beach Nuclear Plant. These sewage sludges, which may contain trace amounts of radionuclides, are applied in accordance with methodologies approved on January 13, 1988, pursuant to 10 CFR 20.302. The amounts discharged in the sewage during this reporting period are presented in Table 1-4.

TABLE 1-4

SEWAGE SLUDGE LAND APPLICATIONS July 1, 1993 through December 31, 1993

<u>Date of Application</u>	<u>Gallons</u>	<u>Site</u>	<u>Activity Released (Ci)</u>
July 13, 1993	14,100	PB-02	<MDA
November 30, 1993	5,800	PB-02	<MDA

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 were two 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 organ 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 January 1, 1993 through June 30, 1993.

	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>6-MONTH TOTAL</u>
Strontium (Ci)	4.38E-08	4.53E-08	4.38E-08	1.33E-07

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
 JULY 1, 1993 THROUGH DECEMBER 31, 1993

	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>TOTAL</u>
Total Noble Gases (Ci): (1)	5.67E-01	5.49E-01	1.49E+00	2.17E-01	2.16E-01	1.87E-01	3.23E+00
Total Radioiodines (Ci):	1.32E-09	5.51E-06	2.43E-05	9.38E-05	7.79E-06	2.17E-06	1.34E-04
Total Particulates (Ci):	3.08E-07	1.23E-05	8.81E-05	1.45E-02	3.32E-05	4.38E-05	1.47E-02
Alpha (Ci):	3.08E-07	<MDA	4.88E-07	1.11E-06	4.67E-07	3.31E-05	3.55E-05
Strontium (Ci):	<MDA	<MDA	<MDA	(2)	(2)	(2)	(2)
All Others (Ci):	<MDA	1.23E-05	8.76E-05	1.45E-02	3.27E-05	1.07E-05	1.47E-02
Total Tritium (Ci):	4.68E+00	1.78E+01	7.45E+00	1.69E+01	1.01E+01	9.39E+00	6.63E+01
Maximum Hourly Average Release Rate (Curies/Second)	5.73E-07	5.55E-07	9.01E-05	2.06E-05	2.12E-06	1.02E-07	
Comparison of effluent doses to Appendix I limits							
<u>Category</u>	<u>Annual Dose Limit</u>		<u>January-June Calculated Dose</u>			<u>January-December Calculated Dose</u>	
particulate	30 mrem/organ		1.63E-02 (child liver)			5.35E-01 (child liver)	
noble gas	40 mrad (β air)		8.74E-04			1.22E-03	
noble gas	20 mrad (γ air dose)		1.66E-03			2.25E-03	
noble gas	30 mrem (skin)		1.10E-03			1.49E-03	
noble gas	10 mrem (whole body)		1.96E-03			2.67E-03	

(1) Includes noble gas contribution from liquid releases.

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

TABLE 2-2

 RADIOACTIVE AIRBORNE RELEASE SUMMARY
 JULY 1, 1993 THROUGH DECEMBER 31, 1993

NUCLIDES RELEASED	JUL (Curies)	AUG (Curies)	SEP (Curies)	OCT (Curies)	NOV (Curies)	DEC (Curies)	TOTAL (Curies)
Tritium	4.68E+00	1.78E+01	7.45E+00	1.69E+01	1.01E+01	9.39E+00	6.63E+01
Xe-133	1.86E-01	1.57E-01	8.33E-01	1.03E-01	5.78E-02	2.32E-02	1.36E+00
Kr-85m	5.09E-03	7.18E-03	1.50E-02	4.07E-06	2.13E-03	1.52E-03	3.09E-02
Kr-88	1.18E-02	1.64E-02	3.47E-02	1.08E-05	5.41E-03	3.27E-03	7.16E-02
Xe-133m	3.85E-04	2.93E-04	4.72E-03	<MDA	7.25E-05	2.37E-03	7.84E-03
Xe-135	3.42E-02	4.39E-02	8.43E-02	2.03E-05	1.13E-02	6.91E-03	1.81E-01
Xe-138	3.71E-02	4.61E-02	9.28E-02	4.79E-05	2.30E-02	1.33E-02	2.12E-01
Kr-87	9.18E-03	1.30E-02	2.66E-02	1.02E-05	5.47E-03	3.00E-03	5.73E-02
Xe-135m	1.18E-02	1.57E-02	2.89E-02	1.63E-05	8.03E-03	4.48E-03	6.89E-02
Ar-41	1.35E-01	1.88E-01	1.82E-01	1.14E-01	1.03E-01	1.29E-01	8.51E-01
Kr-85	1.36E-01	6.12E-02	1.83E-01	<MDA	<MDA	<MDA	3.80E-01
Xe-131m	<MDA	<MDA	1.11E-03	<MDA	<MDA	<MDA	1.11E-03
I-131	1.32E-09	4.73E-07	1.06E-05	9.38E-05	2.11E-06	4.51E-07	1.07E-04
I-132	<MDA	7.76E-07	2.21E-06	<MDA	<MDA	4.26E-07	3.41E-06
I-133	<MDA	2.11E-06	6.71E-06	<MDA	5.68E-06	1.30E-06	1.58E-05
I-134	<MDA	6.13E-07	<MDA	<MDA	<MDA	<MDA	6.13E-07
I-135	<MDA	1.54E-06	4.75E-06	<MDA	<MDA	<MDA	6.29E-06
F-18	<MDA	2.78E-06	3.77E-06	<MDA	1.71E-05	1.06E-05	3.43E-05
Na-24	<MDA	<MDA	<MDA	<MDA	2.01E-06	<MDA	2.01E-06
Co-58	<MDA	<MDA	<MDA	3.74E-04	<MDA	<MDA	3.74E-04
Co-60	<MDA	<MDA	1.20E-06	5.92E-04	3.13E-11	<MDA	5.93E-04
Rb-88	<MDA	8.09E-06	1.32E-06	<MDA	<MDA	<MDA	9.41E-06
Cs-134	<MDA	7.38E-07	3.89E-05	6.74E-03	6.66E-06	<MDA	6.79E-03
Cs-137	<MDA	6.55E-07	4.05E-05	6.75E-03	6.93E-06	<MDA	6.80E-03
Cs-138	<MDA	<MDA	1.94E-06	<MDA	9.17E-08	1.12E-07	2.14E-06
Sr-89	<MDA	<MDA	<MDA	(1)	(1)	(1)	(1)
Sr-90	<MDA	<MDA	<MDA	(1)	(1)	(1)	(1)
Alpha	3.08E-07	<MDA	4.88E-07	1.11E-06	4.67E-07	3.31E-05	3.55E-05

(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 January 1, 1993, through June 30, 1993.

	<u>APRIL</u>	<u>MAY</u>	<u>JUNE</u>	<u>6-MONTH TOTALS</u>
Sr-89 (Ci)	<MDA	<MDA	<MDA	<MDA
Sr-90 (Ci)	4.38E-08	4.53E-08	4.38E-08	1.33E-07

2.2.3 Corrections to previous Semiannual Monitoring Report

Total airborne I-133 was incorrectly reported as 3.36E-01 curies. The correct total is 3.36E-05 curies.

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>
7/02/93	6.54 (1)	7.00E-04	Barnwell, SC
7/15/93	26.97 (1)	1.74E-02	Barnwell, SC
7/19/93	3.00 (1)	6.7E-02	Barnwell, SC
8/02/93	4.47 (1)	4.00E-04	Barnwell, SC
8/02/93	7.50 (1,2)	1.92E-02	Barnwell, SC
8/12/93	102.08 (1,2)	8.00E-04	Barnwell, SC
10/06/93	97.50 (3)	3.22E+00	Barnwell, SC
10/13/93	36.21 (1,2)	5.00E-03	Barnwell, SC
10/15/93	38.30 (3)	1.18E+00	Barnwell, SC
10/28/93	81.72 (1,2)	1.89E-02	Barnwell, SC
11/02/93	120. (4)	2.37E+02	Barnwell, SC
11/12/93	7.50 (1,2)	7.00E-04	Barnwell, SC
11/22/93	9.00 (1,2)	0.00E+00	Barnwell, SC
11/22/93	15.00 (1,2)	3.00E-04	Barnwell, SC
11/29/93	18.20 (1)	1.03E-02	Barnwell, SC
11/30/93	70.00 (1)	3.51E-02	Barnwell, SC
12/03/93	31.30 (1)	1.59E-02	Barnwell, SC
12/06/93	7.50 (1,2)	2.00E-04	Barnwell, SC
12/07/93	22.50 (1,2)	1.80E-03	Barnwell, SC
12/09/93	113.37 (1,2)	9.60E-03	Barnwell, SC
12/10/93	7.50 (1,2)	2.00E-04	Barnwell, SC
12/10/93	15.00 (1,2)	3.30E-05	Barnwell, SC
12/15/93	31.40 (1)	1.72E-02	Barnwell, SC
12/18/93	97.18 (1,2)	5.63E-02	Barnwell, SC
12/21/93	132.50 (1,2)	7.90E-03	Barnwell, SC
12/21/93	31.50 (1,2)	1.40E-03	Barnwell, SC
12/21/93	19.10 (1,2)	1.00E-03	Barnwell, SC
12/29/93	28.42 (1,2)	1.45E-01	Barnwell, SC
TOTAL	1181.16	241.78	

- (1) Dry Active Waste
- (2) Scrap Metal
- (3) Evaporator Concentrates
- (4) Bead Resin

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 2. The new fuel assemblies received for Unit 2 were used for the Fall 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 <u>a priori</u> lower limit of detection
N:	the number of samples analyzed
Low:	the lowest measured value \pm its associated 2σ counting error
Average:	the average value \pm the standard deviation of N samples
High:	the highest measured value \pm its associated 2σ 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 July 1, 1993 through December 31, 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, 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 with four of the ten H-3 results being either less than the typical blank results of 72.9 ± 99.1 pCi/l or otherwise not statistically different from zero. Tritium, in addition to being a naturally occurring radionuclide also is produced by water-cooled reactors such as PBNP.

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) whose $\pm 2\sigma$ error does not overlap zero occur for several radionuclides.

Most of the "positive" results occur for water samples. Of the thirty (30) measurements of Co-58 concentrations in lake water, two (2) results obtained in August are statistically greater than zero. However, no detectible Co-58 was released from PBNP during the months of July, August, and September. Therefore, these positive results appear to be statistical artifacts. Two (2) of thirty (30) Co-60 results (1.2 ± 0.9 and 2.9 ± 2.1) were greater than zero. However, the subtraction of values obtained from "blanks" (1.2 ± 2.3) would make these results statistically equivalent to zero (0). Zr-Nb-95 (5.7 ± 4.5) also has a positive result in lake water. However, there was no detectible Zr-Nb-95 in PBNP effluent during this reporting period. Furthermore, the subtraction of blank values (2.4 ± 5.0 and 1.5 ± 3.2 pCi/l) would make the results statistically equivalent to zero. Therefore, positive results for Co-60 and Zr-Nb-95 appear to be statistical artifacts.

In milk, one of eighteen results was positive for I-131 (0.17 ± 0.15). However, subtraction of the typical blank value (0.1 ± 0.1) would make this result statistically equal to zero.

5.3 Land Use Census

In accordance with the requirements of Technical Specification 15.7.7.D, a visual verification of animals grazing in the vicinity of the Point Beach Nuclear Plant site boundary was completed in August of 1993 to ensure that the milk sampling locations remain as conservative as practicable. No significant change in the use of pasture lands was noted. Therefore, the existing milk sampling program continues to be acceptable.

5.4 Correction to Previous Report

The average Cs-137 concentration in soil was incorrectly reported as 0.038 ± 0.158 in Table 5.1 in the previous report. The correct value is 0.238 ± 0.158 pCi/g.

TABLE 5.1
RADIOLOGICAL ENVIRONMENTAL MONITORING RESULTS

Sample	Description	LLD	N	Low	Average	High	Units
TLD	Environmental Radiation	(*)	54	0.58 ± 0.03	0.90 ± 0.13	1.29 ± 0.03	mR/7days
Air	Gross beta	0.01	155	0.010 ± 0.002	0.023 ± 0.008	0.049 ± 0.004	pCi/m ³
	Cs-137	0.01(0.06)	12	-0.0005±0.0008	-0.0000±0.0003	0.0005±0.0008	pCi/m ³
	Cs-134	0.05	12	-0.0004±0.0007	-0.0000±0.0002	0.0003±0.0004	pCi/m ³
	I-131	0.03(0.07)	155	-0.0016 ± 0.0017	-0.001 ± 0.007	0.017 ± 0.017	pCi/m ³
	Other gamma emitters(*)	0.1(*)	12	-0.0008±0.0009	0.0001±0.0004	0.0006±0.0005	pCi/m ³
Milk	I-131	0.5	18	-0.20±0.22	0.03 ± 0.10	0.19 ± 0.23	pCi/l
	Sr-89(*)	5(*)	18	-1.8 ± 1.4	-0.2 ± 0.9	1.5 ± 1.5	pCi/l
	Sr-90(*)	1(*)	18	0.9 ± 0.3	1.5 ± 0.4	2.1 ± 0.5	pCi/l
	Cs-134	5(15)	18	-3.0 ± 2.2	-1.2 ± 1.0	0.6 ± 2.6	pCi/l
	Cs-137	5(18)	18	-3.2 ± 2.3	0.4 ± 1.4	2.4 ± 2.2	pCi/l
	Ba-La-140	5(15)	18	-2.0 ± 3.1	-0.3 ± 1.2	2.0 ± 2.6	pCi/l
	Other gamma emitters(*)	15(*)	18	-1.2 ± 2.7	0.6 ± 1.2	2.4 ± 3.0	pCi/l
Lake water	Gross beta	4	30	1.6 ± 0.5	2.7 ± 0.9	5.6 ± 1.0	pCi/l
	I-131	0.5(2)	30	-0.10±0.20	0.10 ± 0.12	0.32 ± 0.33	pCi/l
	Mn-54	10(15)	30	-1.6 ± 2.3	0.2 ± 1.1	2.4 ± 2.7	pCi/l
	Fe-59	30	30	-3.3 ± 7.0	0.1 ± 2.3	5.3 ± 5.5	pCi/l
	Co-58	10	30	-3.2 ± 2.1	0.1 ± 1.7	4.9 ± 4.3	pCi/l
	Co-60	10	30	-2.3 ± 7.7	0.4 ± 1.2	2.9 ± 2.1	pCi/l
	Zn-65	30	30	-6.4 ± 5.3	-1.3 ± 2.9	4.2 ± 5.8	pCi/l
	Zr-Nb-95	15	30	-3.8 ± 4.5	0.1 ± 1.9	5.7 ± 4.5	pCi/l
	Cs-134	10(15)	30	-5.5 ± 2.7	-1.2 ± 1.6	1.2 ± 2.4	pCi/l
	Cs-137	10(18)	30	-3.1 ± 3.6	0.4 ± 1.1	1.9 ± 2.2	pCi/l
	Ba-La-140	15	30	-11.2 ± 11.4	-1.4 ± 3.5	5.6 ± 7.4	pCi/l
	Other gamma emitters(*)	30(*)	30	-2.8 ± 8.8	-0.6 ± 1.0	1.6 ± 16.2	pCi/l
	H-3	500(3000)	10	26 ± 91	106 ± 70	277 ± 105	pCi/l
	Sr-89(*)	5(*)	10	-1.5 ± 1.6	-0.3 ± 0.3	1.5 ± 1.6	pCi/l
	Sr-90(*)	1(*)	10	0.3 ± 0.4	0.9 ± 0.4	1.5 ± 0.5	pCi/l
Algae	Gross beta	0.25	4	0.85 ± 0.12	3.06 ± 1.49	4.04 ± 0.23	pCi/g
	Co-58	0.25	4	-0.024±0.037	-0.004 ± 0.017	0.017 ± 0.022	pCi/g
	Co-60	0.25	4	0.003±0.013	0.012 ± 0.008	0.022 ± 0.028	pCi/g
	Cs-134	0.25	4	-0.037±0.009	-0.018 ± 0.015	-0.002 ± 0.009	pCi/g
	Cs-137	0.25	4	0.031±0.022	0.045 ± 0.011	0.054 ± 0.032	pCi/g

Sample	Description	LLD	N	Low	Average	High	Units
Fish	Gross beta(*)	0.5(*)	4	2.24 ± 0.07	2.78 ± 0.51	3.44 ± 0.10	pCi/g
	Mn-54	0.13	4	-0.002±0.006	0.001±0.003	0.004±0.006	pCi/g
	Fe-59	0.26	4	-0.007±0.002	-0.001±0.005	0.004±0.002	pCi/g
	Co-58	0.13	4	-0.004±0.008	-0.001±0.002	0.001±0.006	pCi/g
	Co-60	0.13	4	-0.003±0.006	-0.001±0.002	0.002±0.008	pCi/g
	Zn-65	0.26	4	-0.004±0.012	0.001±0.006	0.009±0.012	pCi/g
	Cs-134	0.13	4	-0.006±0.009	-0.002±0.004	0.002±0.015	pCi/g
	Cs-137	0.15	4	0.047±0.014	0.084±0.028	0.115±0.024	pCi/g
	Other gamma emitters(*)	0.5(*)	4	-0.006±0.012	-0.001±0.004	0.003±0.006	pCi/g
Well water	Gross beta	4	2	1.7 ± 2.7	2.3 ± 0.8	2.9 ± 2.1	pCi/l
	I-131	0.5(2)	2	0.16 ± 0.19	0.17 ± 0.01	0.17 ± 0.27	pCi/l
	Mn-54	10(15)	2	-0.2 ± 2.6	0.2 ± 0.6	0.6 ± 1.0	pCi/l
	Fe-59	30	2	-0.7 ± 6.4	-0.7 ± 0.1	-0.6 ± 2.9	pCi/l
	Co-58	10	2	-0.5 ± 2.9	0.3 ± 1.1	1.0 ± 1.2	pCi/l
	Co-60	10	2	0.3 ± 2.9	0.4 ± 0.1	0.5 ± 0.9	pCi/l
	Zn-65	30	2	-8.2 ± 7.0	-5.2 ± 4.2	-2.2 ± 1.9	pCi/l
	Zr-Nb-95	15	2	-0.1 ± 4.3	0.1 ± 0.2	0.2 ± 2.0	pCi/l
	Cs-134	10(15)	2	-8.4 ± 3.3	-4.4 ± 5.7	-0.3 ± 0.8	pCi/l
	Cs-137	10(18)	2	-0.3 ± 0.9	-0.2 ± 0.1	-0.0 ± 0.9	pCi/l
	Ba-La-140	15	2	-0.6 ± 3.9	-0.2 ± 1.1	1.0 ± 5.6	pCi/l
	Other gamma emitters(*)	30(*)	2	-1.2 ± 1.7	-0.2 ± 1.4	0.8 ± 3.0	pCi/l
	H-3	500	2	-57.6 ± 9.5	-47.1 ± 14.9	-36.5 ± 90.2	pCi/l
	Sr-89(*)	5(*)	2	-0.0 ± 0.4	-0.2 ± 0.2	0.3 ± 0.9	pCi/l
Sr-90(*)	1(*)	2	0.0 ± 0.2	0.0 ± 0.0	0.0 ± 0.3	pCi/l	
Soil(*)	Gross beta	2	8	12.66 ± 2.22	23.20 ± 5.78	32.35 ± 3.37	pCi/g
	Cs-137	0.15	8	0.11 ± 0.03	0.42 ± 0.25	0.87 ± 0.04	pCi/g
Shoreline sediment(*)	Gross beta	2	5	3.8 ± 1.2	6.7 ± 2.8	9.9 ± 2.2	pCi/g
	Cs-137	0.15	5	0.032 ± 0.010	0.043 ± 0.009	0.053 ± 0.014	pCi/g
Vegetation	Gross beta(*)	0.25(*)	16	3.4 ± 0.1	4.9 ± 1.0	6.6 ± 0.2	pCi/g
	Cs-134	0.06	16	-0.014±0.012	-0.004 ± 0.006	0.003 ± 0.010	pCi/g
	Cs-137	0.08	16	-0.004±0.009	0.012 ± 0.022	0.086 ± 0.025	pCi/g
	I-131	0.06	16	-0.034±0.038	0.001 ± 0.011	0.013 ± 0.020	pCi/g

6.0 NONRADIOACTIVE CHEMICAL RELEASES

6.1 Scheduled Chemical Waste Releases*

Scheduled chemical waste releases to the circulating water system from July 1, 1993, to December 31, 1993, included 5.95E+06 gallons of neutralized wastewater. The wastewater contained 5.82E+02 pounds of suspended solids and 4.28E+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 July 1, 1993, to December 31, 1993, included 1.69E+07 gallons of clarified wastewater. The wastewater contained 1.62E+03 pounds of suspended solids.

* Miscellaneous chemical waste released directly to the circulating water, based on amount of chemicals used from July 1, 1993, to December 31, 1993, included 9.93E+04 pounds of sodium bisulfite and 4.42E+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
July 1, 1993 to December 31, 1993

		<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
Average Volume Cooling Water Discharge (Million gal/day)**	U1	489.7	489.6	491.1	503.4	476.6	432.8
	U2	485.7	489.6	474.1*	267.8*	477.2	436.5
Average Cooling Water Intake Temperature (Degrees F)	U1	55	60	54	48	42	39
	U2	55	60	54*	44*	42	39
Average Cooling Water Discharge Temperature (Degrees F)	U1	74	79	72	66	61	60
	U2	76	81	74*	52*	61	61
Average Ambient Lake Temperature (Degrees F)		52	57	51	46	41	37

(*Unit 2 refueling shutdown from September 25, 1993 to October 30, 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, the ODCM, or the PCP during this reporting period.

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

During this reporting period, a deviation from the sampling frequency specified in Table 15.7.7-1 of the Technical Specifications occurred at site E-01 when power was lost to the air sampler at site E-01 for one week. Power was lost when trenching for the fiber optics cable cut the power cable to the site. As a result, no air particulate and radioiodine air samples were obtained during that time period. Deviations pursuant to equipment malfunctions are permitted pursuant to 15.7.7.A.2.

In order to prevent reoccurrence, the location of power lines to the site have been updated on controlled drawings. Also, CHAMPS and the Master Data Book have been updated.

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.