ATI Environmental, Inc.
Midwest Laboratory
700 Landwehr Road • Northbrook, IL 60062-2310
ph. (847) 564-0700 • fax (847) 564-4517

MONTHLY PROGRESS REPORT
to
FIRST ENERGY CORPORATION

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
FOR THE
PERRY NUCLEAR POWER PLANT

Reporting Period: January-December, 2015

Prepared and Submitted by
ENVIRONMENTAL, INC.,
MIDWEST LABORATORY

Project Number: 8033

Reviewed and
Approved _____ Date _____

B. Grob, M.S.
Laboratory Manager

Distribution: J. Burnett
R. Leidy, Ohio Department of Health
B. Mechenbier, Lake County Health Department

LIST OF TABLES

1.0 INTRODUCTION

The following constitutes the current 2015 Monthly Progress Report for the Radiological Environmental Monitoring Program conducted at the Perry Nuclear Power Plant in Perry, Ohio. Results of completed analyses are presented in the attached tables.

The data obtained in the program were within ranges previously encountered and to be expected in the environmental media sampled.

All concentrations, except gross beta, are decay corrected to the time of collection. Airborne iodine is decay corrected to the midpoint of the collection period.

Table 1. Direct Radiation (TLDs), Quarterly Exposure.
Units: mR/91 days

	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Date Placed	01-12-15	04-03-15	07-02-15	10-02-15
Date Removed	04-03-15	07-02-15	10-02-15	01-05-16
E-1	9.7 ± 1.2	13.1 ± 0.9	12.0 ± 1.2	10.7 ± 1.5
E-3	10.5 ± 0.8	12.6 ± 0.9	11.6 ± 0.8	10.7 ± 1.0
E-4	12.5 ± 0.7	13.5 ± 0.9	13.0 ± 0.9	11.0 ± 0.9
E-5	9.7 ± 1.2	8.7 ± 0.5	10.0 ± 0.9	10.9 ± 0.6
E-6	12.5 ± 1.2	10.0 ± 0.7	12.8 ± 1.1	8.0 ± 0.7
E-7	11.8 ± 0.7	11.2 ± 0.7	10.0 ± 0.7	9.5 ± 1.0
E-8	11.6 ± 0.7	10.0 ± 0.9	11.6 ± 0.9	9.0 ± 0.9
E-9	10.1 ± 0.6	11.3 ± 0.7	9.2 ± 0.6	10.6 ± 0.7
E-10	9.0 ± 0.8	11.1 ± 0.7	10.9 ± 0.7	9.8 ± 1.1
E-11	13.9 ± 1.0	10.1 ± 0.6	14.7 ± 0.9	13.1 ± 1.0
E-12	10.7 ± 0.8	14.4 ± 1.3	13.0 ± 0.8	13.5 ± 1.2
E-13	11.1 ± 1.0	11.3 ± 0.7	10.7 ± 0.9	9.6 ± 0.8
E-14	8.3 ± 0.7	13.2 ± 0.5	9.0 ± 0.7	11.3 ± 0.9
E-15	5.9 ± 0.6	12.2 ± 0.5	6.7 ± 0.6	10.1 ± 0.7
E-21	14.7 ± 0.7	16.0 ± 0.5	15.6 ± 0.8	14.7 ± 0.9
E-23	12.5 ± 0.9	16.5 ± 0.6	13.8 ± 0.8	15.1 ± 0.9
E-24	13.0 ± 0.9	10.8 ± 0.9	12.8 ± 0.7	11.1 ± 1.1
E-29	13.1 ± 0.8	17.0 ± 0.8	14.8 ± 0.7	15.1 ± 1.0
E-30	12.0 ± 0.6	16.1 ± 0.7	14.2 ± 0.7	14.5 ± 0.8
E-31	12.5 ± 1.0	12.5 ± 0.7	14.7 ± 0.9	10.4 ± 0.9
E-33	17.7 ± 1.0	12.1 ± 0.7	19.0 ± 0.8	16.3 ± 0.9
E-35	10.8 ± 0.6	15.0 ± 0.5	11.7 ± 0.7	10.9 ± 0.7
E-36	14.7 ± 0.7	11.7 ± 0.5	14.5 ± 1.7	10.4 ± 0.6
E-53	12.3 ± 0.7	10.9 ± 0.7	14.2 ± 0.9	9.8 ± 1.0
E-54	11.7 ± 1.1	10.8 ± 0.4	12.2 ± 0.9	8.2 ± 0.7
E-55	12.5 ± 1.6	13.3 ± 1.0	13.2 ± 1.4	11.8 ± 1.1
E-56	11.2 ± 0.6	13.3 ± 0.6	11.7 ± 0.5	11.0 ± 0.8
E-57	11.6 ± 0.7	13.7 ± 0.9	13.2 ± 0.8	11.2 ± 1.1
E-58	8.7 ± 0.6	11.5 ± 0.6	10.4 ± 0.6	9.1 ± 0.6
Mean ± s.d.	11.6 ± 2.3	12.5 ± 2.1	12.5 ± 2.4	11.3 ± 2.2
E-Control 1	5.5 ± 1.0	6.9 ± 0.7	6.6 ± 0.9	5.1 ± 0.9
E-Control 2	6.8 ± 0.6	6.8 ± 0.4	7.1 ± 0.7	5.0 ± 0.7

Table 1. Direct Radiation (TLDs), Quarterly Exposure.
Units: mR/91 days

	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Date Placed	01-12-15	04-03-15	07-02-15	10-02-15
Date Removed	04-03-15	07-02-15	10-02-15	01-05-16
Q-1	9.1 ± 1.1	12.6 ± 1.2	13.2 ± 1.6	12.7 ± 1.0
Q-3	12.7 ± 0.5	8.3 ± 1.1	11.3 ± 0.6	8.5 ± 1.2
Q-4	14.1 ± 0.7	12.4 ± 1.1	13.6 ± 0.6	12.6 ± 1.1
Q-5	9.4 ± 0.6	12.4 ± 1.1	9.0 ± 0.8	12.5 ± 1.0
Q-6	13.7 ± 1.0	14.0 ± 1.0	12.0 ± 0.7	14.1 ± 0.9
Q-7	15.0 ± 0.5	14.7 ± 1.0	14.4 ± 0.6	14.7 ± 0.9
Q-8	10.5 ± 0.5	10.3 ± 1.0	10.1 ± 0.6	10.2 ± 0.8
Q-9	14.3 ± 0.9	9.4 ± 1.1	13.5 ± 0.8	10.1 ± 0.8
Q-10	12.2 ± 0.8	12.1 ± 1.4	12.7 ± 0.7	12.0 ± 1.1
Q-11	13.1 ± 1.2	13.3 ± 1.0	13.2 ± 1.1	14.3 ± 0.9
Q-12	13.1 ± 0.4	11.2 ± 1.2	13.1 ± 0.7	12.0 ± 0.9
Q-13	10.4 ± 0.3	10.9 ± 1.1	10.3 ± 0.5	11.0 ± 1.1
Q-14	12.8 ± 1.1	15.3 ± 1.1	12.6 ± 0.6	14.9 ± 1.1
Q-15	12.9 ± 0.8	10.1 ± 1.0	12.7 ± 0.5	9.3 ± 0.8
Q-21	11.3 ± 0.4	11.4 ± 1.2	12.4 ± 0.6	11.5 ± 1.2
Q-23	12.0 ± 1.2	15.4 ± 1.5	12.9 ± 0.9	15.7 ± 1.8
Q-24	13.5 ± 1.4	12.3 ± 1.0	13.2 ± 1.3	12.3 ± 0.8
Q-29	18.1 ± 0.7	15.6 ± 1.3	18.5 ± 0.7	15.7 ± 1.2
Q-30	15.1 ± 0.6	11.5 ± 1.0	15.3 ± 0.6	12.7 ± 0.8
Q-31	15.9 ± 0.8	15.1 ± 1.0	17.5 ± 0.9	15.4 ± 0.8
Q-33	14.0 ± 0.6	19.8 ± 1.3	14.9 ± 0.8	19.3 ± 1.3
Q-35	13.2 ± 0.4	9.3 ± 1.0	12.9 ± 0.5	9.6 ± 0.9
Q-36	16.8 ± 0.6	13.8 ± 0.9	17.2 ± 0.8	15.9 ± 0.9
Q-53	13.5 ± 0.5	11.9 ± 1.0	15.1 ± 0.5	12.5 ± 1.1
Q-54	14.0 ± 1.0	13.4 ± 1.0	13.6 ± 0.6	13.2 ± 0.8
Q-55	13.5 ± 1.0	10.4 ± 1.1	14.9 ± 0.6	10.9 ± 1.1
Q-56	13.7 ± 0.8	14.7 ± 1.1	14.0 ± 0.7	14.6 ± 1.1
Q-57	13.4 ± 1.6	11.1 ± 1.0	14.5 ± 1.3	11.4 ± 0.8
Q-58	8.0 ± 0.6	11.5 ± 1.0	9.3 ± 0.6	11.0 ± 1.0
Mean ± s.d.	13.1 ± 2.2	12.6 ± 2.4	13.4 ± 2.2	12.8 ± 2.4
Q-Control 1	6.6 ± 0.3	5.8 ± 0.9	7.3 ± 0.5	5.3 ± 0.8
Q-Control 2	6.5 ± 0.6	7.1 ± 1.0	6.8 ± 0.6	6.8 ± 0.8

Table 1. Direct Radiation (TLDs), Annual Exposure.
Units: mR/365 days

	2015
Date Placed	10-02-15
Date Removed	01-05-16
A-1	53.8 ± 2.9
A-3	53.7 ± 2.0
A-4	60.8 ± 2.3
A-5	52.8 ± 1.9
A-6	54.8 ± 2.0
A-7	48.4 ± 2.1
A-8	50.4 ± 1.9
A-9	50.3 ± 3.3
A-10	50.1 ± 1.7
A-11	62.1 ± 5.1
A-12	54.8 ± 1.6
A-13	54.7 ± 2.7
A-14	51.1 ± 2.4
A-15	58.3 ± 3.4
A-21	63.4 ± 3.5
A-23	59.3 ± 2.0
A-24	53.8 ± 2.9
A-29	68.6 ± 2.9
A-30	60.9 ± 2.0
A-31	66.6 ± 2.2
A-33	71.2 ± 3.8
A-35	49.5 ± 2.2
A-36	62.9 ± 4.2
A-53	52.1 ± 3.4
A-54	58.4 ± 4.1
A-55	57.1 ± 4.1
A-56	53.6 ± 3.0
A-57	70.8 ± 5.7
A-58	55.5 ± 1.9
Mean ± s.d.	57.2 ± 6.4
A-Control 1	22.7 ± 1.4
A-Control 2	27.3 ± 1.6

Table 2. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: P-1

Units: pCi/m^3

Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.0075	0.050			0.0075	0.050
01-09-15	725	0.030 ± 0.002	< 0.005	07-08-15	485	0.023 ± 0.003	< 0.009
01-15-15	525	0.036 ± 0.003	< 0.009	07-15-15	485	0.023 ± 0.003	< 0.012
01-22-15	581	0.030 ± 0.003	< 0.012	07-22-15	485	0.023 ± 0.004	< 0.011
01-29-15	589	0.022 ± 0.003	< 0.004	07-29-15	485	0.026 ± 0.004	< 0.013
02-06-15	646	0.022 ± 0.003	< 0.006	08-05-15	492	0.026 ± 0.004	< 0.009
02-12-15	502	0.034 ± 0.003	< 0.008	08-13-15	518	0.019 ± 0.003	< 0.005
02-19-15	589	0.029 ± 0.003	< 0.008	08-19-15	424	0.043 ± 0.004	< 0.010
02-26-15	566	0.048 ± 0.003	< 0.007	08-26-15	464	0.014 ± 0.003	< 0.012
				09-02-15	480	0.046 ± 0.004	< 0.012
03-04-15	529	0.039 ± 0.004	< 0.012				
03-12-15	650	0.028 ± 0.003	< 0.008	09-09-15	536	0.059 ± 0.004	< 0.007
03-19-15	628	0.021 ± 0.003	< 0.009	09-16-15	485	0.029 ± 0.004	< 0.014
03-26-15	580	0.026 ± 0.003	< 0.008	09-23-15	477	0.041 ± 0.004	< 0.006
04-02-15	589	0.020 ± 0.003	< 0.010	09-30-15	467	0.034 ± 0.004	< 0.008
1Q 2015	Mean ± s.d.	0.030 ± 0.008	< 0.012	3Q 2015	Mean ± s.d.	0.031 ± 0.013	< 0.014
04-09-15	582	0.020 ± 0.003	< 0.005	10-07-15	467	0.018 ± 0.003	< 0.008
04-16-15	541	0.025 ± 0.003	< 0.010	10-15-15	657	0.026 ± 0.003	< 0.006
04-22-15	464	0.021 ± 0.004	< 0.006	10-21-15	502	0.023 ± 0.003	< 0.006
04-29-15	542	0.010 ± 0.002	< 0.005	10-28-15	578	0.024 ± 0.003	< 0.004
05-06-15	534	0.018 ± 0.003	< 0.008	11-04-15	593	0.026 ± 0.003	< 0.011
05-13-15	532	0.028 ± 0.004	< 0.012	11-11-15	566	0.027 ± 0.003	< 0.004
05-21-15	609	0.022 ± 0.003	< 0.004	11-18-15	579	0.047 ± 0.004	< 0.006
05-28-15	538	0.022 ± 0.003	< 0.007	11-25-15	570	0.021 ± 0.003	< 0.008
06-03-15	471	0.014 ± 0.003	< 0.006	12-02-15	581	0.028 ± 0.003	< 0.006
06-10-15	523	0.019 ± 0.003	< 0.009	12-09-15	574	0.057 ± 0.004	< 0.005
06-18-15	586	0.019 ± 0.003	< 0.004	12-16-15	587	0.042 ± 0.003	< 0.008
06-24-15	419	0.023 ± 0.004	< 0.009	12-23-15	563	0.027 ± 0.003	< 0.019
07-01-15	504	0.018 ± 0.003	< 0.005	12-30-15	572	0.020 ± 0.003	< 0.011
2Q 2015	Mean ± s.d.	0.020 ± 0.005	< 0.012	4Q 2015	Mean ± s.d.	0.030 ± 0.012	< 0.019
				Cumulative Average		0.028	

Table 2. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: P-3

Units: pCi/m^3

Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.0075	0.050			0.0075	0.050
01-09-15	868	0.031 ± 0.002	< 0.004	07-08-15	561	0.020 ± 0.003	< 0.008
01-15-15	617	0.031 ± 0.003	< 0.008	07-15-15	561	0.015 ± 0.003	< 0.010
01-22-15	678	0.032 ± 0.003	< 0.010	07-22-15	561	0.017 ± 0.003	< 0.009
01-29-15	668	0.021 ± 0.002	< 0.003	07-29-15	561	0.017 ± 0.003	< 0.011
02-06-15	531	0.028 ± 0.003	< 0.007	08-05-15	574	0.027 ± 0.003	< 0.008
02-12-15	662	0.035 ± 0.003	< 0.006	08-13-15	576	0.015 ± 0.003	< 0.005
02-19-15		NS[a]		08-19-15	568	0.033 ± 0.003	< 0.008
02-26-15	874	0.064 ± 0.003	< 0.005	08-26-15	569	0.012 ± 0.003	< 0.010
				09-03-15	643	0.038 ± 0.003	< 0.009
03-04-15	606	0.038 ± 0.003	< 0.011				
03-12-15	742	0.025 ± 0.003	< 0.007	09-09-15	522	0.048 ± 0.004	< 0.007
03-20-15	763	0.021 ± 0.002	< 0.007	09-16-15	541	0.024 ± 0.003	< 0.013
03-26-15	579	0.024 ± 0.003	< 0.008	09-23-15	584	0.030 ± 0.003	< 0.005
04-02-15	662	0.015 ± 0.003	< 0.009	09-30-15	540	0.030 ± 0.003	< 0.007
1Q 2015	Mean ± s.d.	0.030 ± 0.012	< 0.011	3Q 2015	Mean ± s.d.	0.025 ± 0.011	< 0.013
04-09-15	663	0.016 ± 0.003	< 0.004	10-07-15	493	0.018 ± 0.003	< 0.008
04-16-15	591	0.017 ± 0.003	< 0.010	10-15-15	678	0.026 ± 0.003	< 0.006
04-22-15	524	0.015 ± 0.003	< 0.005	10-21-15	512	0.024 ± 0.003	< 0.006
04-29-15	565	0.007 ± 0.002	< 0.004	10-28-15	610	0.022 ± 0.003	< 0.004
05-06-15	575	0.016 ± 0.003	< 0.008	11-04-15	604	0.022 ± 0.003	< 0.011
05-13-15	588	0.023 ± 0.003	< 0.011	11-11-15	567	0.026 ± 0.003	< 0.004
05-20-15	559	0.022 ± 0.003	< 0.004	11-18-15	124	0.054 ± 0.012	< 0.030 [b]
05-28-15	648	0.018 ± 0.003	< 0.006	11-25-15	573	0.023 ± 0.003	< 0.008
06-03-15	521	0.012 ± 0.003	< 0.005	12-02-15	35	0.065 ± 0.037	< 0.092 [c]
06-10-15	558	0.017 ± 0.003	< 0.008	12-09-15	560	0.055 ± 0.004	< 0.005
06-18-15	674	0.018 ± 0.002	< 0.003	12-16-15	435	0.041 ± 0.004	< 0.011
06-24-15	493	0.020 ± 0.003	< 0.008	12-23-15	557	0.026 ± 0.003	< 0.023
07-01-15	549	0.012 ± 0.003	< 0.005	12-30-15	584	0.019 ± 0.003	< 0.011
2Q 2015	Mean ± s.d.	0.016 ± 0.004	< 0.011	4Q 2015	Mean ± s.d.	0.032 ± 0.016	< 0.092
				Cumulative Average		0.026	

[a] "NS" = No sample; see Table 2.0, Listing of Missed Samples.

[b] No reason given for low volume.

[c] I-131 result above required LLD due to low volume. No reason given for low volume.

Table 2. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: P-4

Units: pCi/m^3

Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.0075	0.050			0.0075	0.050
01-09-15	665	0.031 ± 0.003	< 0.005	07-08-15	449	0.027 ± 0.004	< 0.010
01-15-15	472	0.030 ± 0.003	< 0.010	07-15-15	449	0.017 ± 0.003	< 0.011
01-22-15	532	0.031 ± 0.003	< 0.013	07-22-15	449	0.022 ± 0.003	< 0.010
01-29-15	533	0.020 ± 0.003	< 0.004	07-29-15	449	0.026 ± 0.003	< 0.011
02-06-15	538	0.022 ± 0.003	< 0.007	08-05-15	556	0.026 ± 0.003	< 0.008
02-12-15	543	0.034 ± 0.003	< 0.007	08-13-15	522	0.016 ± 0.003	< 0.005
02-19-15	544	0.034 ± 0.003	< 0.009	08-19-15	522	0.035 ± 0.004	< 0.009
02-26-15	527	0.051 ± 0.004	< 0.008	08-26-15	526	0.015 ± 0.003	< 0.010
				09-02-15	549	0.040 ± 0.004	< 0.010
03-04-15	480	0.039 ± 0.004	< 0.014				
03-12-15	583	0.029 ± 0.003	< 0.009	09-09-15	538	0.052 ± 0.004	< 0.007
03-19-15	545	0.022 ± 0.003	< 0.010	09-16-15	523	0.027 ± 0.003	< 0.013
03-26-15	528	0.026 ± 0.003	< 0.009	09-23-15	540	0.036 ± 0.004	< 0.005
04-02-15	537	0.016 ± 0.003	< 0.011	09-30-15	526	0.028 ± 0.003	< 0.007
1Q 2015	Mean ± s.d.	0.030 ± 0.009	< 0.014	3Q 2015	Mean ± s.d.	0.028 ± 0.010	< 0.013
04-09-15	528	0.018 ± 0.003	< 0.006	10-07-15	532	0.017 ± 0.003	< 0.007
04-16-15	549	0.020 ± 0.003	< 0.010	10-15-15	681	0.026 ± 0.003	< 0.006
04-22-15	460	0.018 ± 0.003	< 0.006	10-21-15	522	0.023 ± 0.003	< 0.006
04-29-15	538	0.008 ± 0.002	< 0.005	10-28-15	602	0.026 ± 0.003	< 0.004
05-06-15	541	0.018 ± 0.003	< 0.008	11-04-15	596	0.024 ± 0.003	< 0.011
05-13-15	544	0.025 ± 0.003	< 0.012	11-11-15	561	0.027 ± 0.003	< 0.004
05-21-15	599	0.022 ± 0.003	< 0.004	11-18-15	620	0.041 ± 0.003	< 0.006
05-28-15	467	0.024 ± 0.004	< 0.009	11-25-15	585	0.022 ± 0.003	< 0.008
06-03-15	426	0.014 ± 0.004	< 0.007	12-02-15	540	0.028 ± 0.003	< 0.006
06-10-15	513	0.015 ± 0.003	< 0.009	12-09-15	542	0.061 ± 0.004	< 0.005
06-18-15	630	0.018 ± 0.003	< 0.004	12-16-15	548	0.042 ± 0.004	< 0.008
06-24-15	447	0.023 ± 0.004	< 0.008	12-23-15	524	0.032 ± 0.004	< 0.015
07-01-15	495	0.015 ± 0.003	< 0.006	12-30-15	532	0.021 ± 0.003	< 0.012
2Q 2015	Mean ± s.d.	0.018 ± 0.005	< 0.012	4Q 2015	Mean ± s.d.	0.030 ± 0.012	< 0.015
				Cumulative Average		0.027	

Table 2. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: P-5

Units: pCi/m^3

Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.0075	0.050			0.0075	0.050
01-09-15	718	0.032 ± 0.003	< 0.005	07-08-15	563	0.019 ± 0.003	< 0.008
01-15-15	510	0.034 ± 0.003	< 0.010	07-15-15	563	0.017 ± 0.003	< 0.011
01-22-15	552	0.034 ± 0.003	< 0.012	07-22-15	563	0.024 ± 0.003	< 0.009
01-29-15	573	0.022 ± 0.003	< 0.004	07-29-15	563	0.025 ± 0.003	< 0.011
02-06-15	557	0.024 ± 0.003	< 0.007	08-05-15	558	0.027 ± 0.003	< 0.008
02-12-15	523	0.035 ± 0.003	< 0.008	08-13-15	568	0.015 ± 0.003	< 0.005
02-19-15	577	0.031 ± 0.003	< 0.008	08-19-15	538	0.038 ± 0.004	< 0.008
02-26-15	540	0.049 ± 0.004	< 0.008	08-26-15	535	0.014 ± 0.003	< 0.010
				09-02-15	547	0.044 ± 0.004	< 0.010
03-04-15	491	0.042 ± 0.004	< 0.013				
03-12-15	603	0.029 ± 0.003	< 0.009	09-09-15	542	0.056 ± 0.004	< 0.007
03-19-15	561	0.019 ± 0.003	< 0.010	09-16-15	489	0.026 ± 0.004	< 0.014
03-26-15	538	0.029 ± 0.003	< 0.009	09-23-15	478	0.037 ± 0.004	< 0.006
04-02-15	547	0.019 ± 0.003	< 0.011	09-30-15	470	0.032 ± 0.004	< 0.008
1Q 2015	Mean ± s.d.	0.031 ± 0.009	< 0.013	3Q 2015	Mean ± s.d.	0.029 ± 0.012	< 0.014
04-09-15	548	0.019 ± 0.003	< 0.005	10-07-15	459	0.020 ± 0.003	< 0.008
04-16-15	580	0.019 ± 0.003	< 0.010	10-15-15		NS[a]	
04-22-15	487	0.017 ± 0.003	< 0.006	10-21-15	509	0.024 ± 0.003	< 0.006
04-29-15	564	0.007 ± 0.002	< 0.004	10-28-15	581	0.022 ± 0.003	< 0.004
05-06-15	578	0.018 ± 0.003	< 0.008	11-04-15	568	0.027 ± 0.003	< 0.011
05-13-15	580	0.026 ± 0.003	< 0.011	11-11-15	530	0.023 ± 0.003	< 0.004
05-21-15	646	0.022 ± 0.003	< 0.003	11-18-15	104	0.057 ± 0.014	< 0.036 [b]
05-28-15	579	0.022 ± 0.003	< 0.007	11-25-15	519	0.024 ± 0.003	< 0.009
06-03-15	500	0.014 ± 0.003	< 0.006	12-02-15	337	0.028 ± 0.005	< 0.010
06-10-15	564	0.019 ± 0.003	< 0.008	12-09-15	546	0.060 ± 0.004	< 0.005
06-18-15	655	0.017 ± 0.002	< 0.003	12-16-15	405	0.043 ± 0.005	< 0.011
06-24-15	489	0.022 ± 0.003	< 0.008	12-23-15	524	0.031 ± 0.004	< 0.012
07-01-15	563	0.014 ± 0.003	< 0.005	12-30-15	557	0.022 ± 0.003	< 0.011
2Q 2015	Mean ± s.d.	0.018 ± 0.005	< 0.011	4Q 2015	Mean ± s.d.	0.032 ± 0.014	
				Cumulative Average		0.027	

[a] "NS" = No sample; see Table 2.0, Listing of Missed Samples.

[b] No reason given for low volume.

Table 2. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: P-6
Units: pCi/m^3
Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.0075	0.050			0.0075	0.050
01-08-15	582	0.038 ± 0.003	< 0.006	07-08-15	523	0.021 ± 0.003	< 0.009
01-15-15	574	0.033 ± 0.003	< 0.009	07-15-15	523	0.019 ± 0.003	< 0.011
01-22-15	570	0.030 ± 0.003	< 0.012	07-22-15	523	0.023 ± 0.003	< 0.010
01-29-15	588	0.023 ± 0.003	< 0.004	07-29-15	523	0.028 ± 0.004	< 0.012
02-06-15	639	0.025 ± 0.003	< 0.006	08-05-15	510	0.023 ± 0.003	< 0.009
02-12-15	506	0.035 ± 0.003	< 0.008	08-13-15	536	0.020 ± 0.003	< 0.005
02-19-15	589	0.033 ± 0.003	< 0.008	08-19-15	446	0.048 ± 0.004	< 0.010
02-26-15	576	0.055 ± 0.004	< 0.007	08-26-15	471	0.017 ± 0.003	< 0.012
				09-02-15	496	0.047 ± 0.004	< 0.011
03-04-15	518	0.039 ± 0.004	< 0.013				
03-12-15	626	0.031 ± 0.003	< 0.008	09-09-15	562	0.064 ± 0.004	< 0.006
03-20-15	656	0.022 ± 0.003	< 0.008	09-16-15	539	0.029 ± 0.003	< 0.013
03-26-15	505	0.027 ± 0.003	< 0.009	09-23-15	541	0.040 ± 0.004	< 0.005
04-02-15	556	0.014 ± 0.003	< 0.011	09-30-15	548	0.031 ± 0.003	< 0.007
1Q 2015	Mean ± s.d.	0.031 ± 0.010	< 0.013	3Q 2015	Mean ± s.d.	0.032 ± 0.014	< 0.013
04-09-15	565	0.017 ± 0.003	< 0.005	10-07-15	534	0.019 ± 0.003	< 0.007
04-16-15	609	0.014 ± 0.003	< 0.009	10-15-15	628	0.027 ± 0.003	< 0.007
04-22-15	437	0.018 ± 0.004	< 0.006	10-21-15	469	0.023 ± 0.004	< 0.007
04-29-15	534	0.008 ± 0.002	< 0.005	10-28-15	536	0.026 ± 0.003	< 0.004
05-06-15	540	0.018 ± 0.003	< 0.008	11-04-15	554	0.026 ± 0.003	< 0.012
05-13-15	536	0.027 ± 0.003	< 0.012	11-11-15	535	0.026 ± 0.003	< 0.004
05-21-15	595	0.020 ± 0.003	< 0.004	11-18-15	533	0.040 ± 0.004	< 0.007
05-28-15	514	0.025 ± 0.003	< 0.008	11-25-15	551	0.023 ± 0.003	< 0.008
06-03-15	416	0.020 ± 0.004	< 0.007	12-02-15	548	0.028 ± 0.003	< 0.006
06-10-15	482	0.019 ± 0.003	< 0.009	12-09-15	544	0.059 ± 0.004	< 0.005
06-18-15	595	0.019 ± 0.003	< 0.004	12-16-15	551	0.042 ± 0.004	< 0.008
06-24-15	440	0.020 ± 0.004	< 0.008	12-23-15	525	0.031 ± 0.004	< 0.017
07-01-15	524	0.014 ± 0.003	< 0.005	12-30-15	560	0.023 ± 0.003	< 0.011
2Q 2015	Mean ± s.d.	0.018 ± 0.005	< 0.012	4Q 2015	Mean ± s.d.	0.030 ± 0.011	< 0.017
				Cumulative Average		0.028	

Table 2. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: P-7

Units: pCi/m^3

Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.0075	0.050			0.0075	0.050
01-09-15	679	0.037 ± 0.003	< 0.005	07-08-15	522	0.016 ± 0.003	< 0.009
01-15-15	478	0.037 ± 0.004	< 0.010	07-15-15	522	0.016 ± 0.003	< 0.011
01-22-15	530	0.035 ± 0.003	< 0.013	07-22-15	522	0.013 ± 0.003	< 0.010
01-29-15	529	0.027 ± 0.003	< 0.004	07-29-15	522	0.021 ± 0.003	< 0.012
02-06-15	558	0.030 ± 0.003	< 0.007	08-05-15	449	0.023 ± 0.004	< 0.010
02-12-15	408	0.045 ± 0.004	< 0.010	08-13-15	500	0.014 ± 0.003	< 0.006
02-19-15	485	0.046 ± 0.004	< 0.010	08-19-15	446	0.031 ± 0.004	< 0.009
02-26-15	577	0.065 ± 0.004	< 0.007	08-26-15	463	0.014 ± 0.003	< 0.012
				09-02-15	474	0.046 ± 0.004	< 0.012
03-04-15	542	0.049 ± 0.004	< 0.012				
03-12-15	680	0.035 ± 0.003	< 0.008	09-09-15	576	0.054 ± 0.004	< 0.006
03-19-15	627	0.024 ± 0.003	< 0.009	09-16-15	529	0.030 ± 0.004	< 0.013
03-26-15	609	0.030 ± 0.003	< 0.008	09-23-15	538	0.038 ± 0.004	< 0.005
04-02-15	621	0.025 ± 0.003	< 0.009	09-30-15	534	0.028 ± 0.003	< 0.007
1Q 2015	Mean ± s.d.	0.037 ± 0.012	< 0.013	3Q 2015	Mean ± s.d.	0.026 ± 0.013	< 0.013
04-09-15	618	0.022 ± 0.003	< 0.005	10-07-15	532	0.015 ± 0.003	< 0.007
04-16-15	567	0.015 ± 0.003	< 0.010	10-15-15	565	0.035 ± 0.003	< 0.007
04-22-15	473	0.010 ± 0.003	< 0.006	10-21-15	402	0.033 ± 0.004	< 0.008
04-29-15	545	0.006 ± 0.002	< 0.005	10-28-15	565	0.026 ± 0.003	< 0.004
05-06-15	545	0.016 ± 0.003	< 0.008	11-04-15	592	0.024 ± 0.003	< 0.011
05-13-15	542	0.020 ± 0.003	< 0.012	11-11-15	561	0.025 ± 0.003	< 0.004
05-21-15	623	0.017 ± 0.003	< 0.003	11-18-15	579	0.037 ± 0.003	< 0.006
05-28-15	547	0.016 ± 0.003	< 0.007	11-25-15	563	0.026 ± 0.003	< 0.008
06-03-15	476	0.011 ± 0.003	< 0.006	12-02-15	577	0.026 ± 0.003	< 0.006
06-10-15	532	0.013 ± 0.003	< 0.008	12-09-15	574	0.055 ± 0.004	< 0.005
06-18-15	609	0.017 ± 0.003	< 0.004	12-16-15	572	0.041 ± 0.004	< 0.008
06-24-15	443	0.016 ± 0.003	< 0.008	12-23-15	546	0.027 ± 0.003	< 0.020
07-01-15	544	0.013 ± 0.003	< 0.005	12-30-15	566	0.016 ± 0.003	< 0.011
2Q 2015	Mean ± s.d.	0.015 ± 0.004	< 0.012	4Q 2015	Mean ± s.d.	0.030 ± 0.011	< 0.020
				Cumulative Average		0.027	

Table 2. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: P-35

Units: pCi/m^3

Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.0075	0.050			0.0075	0.050
01-08-15	589	0.036 ± 0.003	< 0.008	07-08-15	522	0.021 ± 0.003	< 0.010
01-15-15	573	0.036 ± 0.003	< 0.006	07-15-15	522	0.019 ± 0.003	< 0.008
01-22-15	565	0.033 ± 0.003	< 0.013	07-22-15	522	0.021 ± 0.003	< 0.009
01-29-15	588	0.023 ± 0.003	< 0.009	07-29-15	522	0.025 ± 0.003	< 0.006
02-06-15	646	0.028 ± 0.003	< 0.013	08-05-15	559	0.023 ± 0.003	< 0.014
02-12-15	497	0.035 ± 0.003	< 0.026	08-13-15	535	0.019 ± 0.003	< 0.000
02-19-15		NS[a]		08-19-15	446	0.038 ± 0.004	< 0.014
02-26-15	1122	0.043 ± 0.002	< 0.007	08-26-15	528	0.014 ± 0.003	< 0.008
				09-02-15	542	0.042 ± 0.004	< 0.014
03-04-15	528	0.046 ± 0.004	< 0.010				
03-12-15	627	0.030 ± 0.003	< 0.008	09-09-15	537	0.054 ± 0.004	< 0.008
03-19-15	583	0.023 ± 0.003	< 0.008	09-16-15	520	0.026 ± 0.003	< 0.013
03-26-15	552	0.026 ± 0.003	< 0.008	09-23-15	539	0.031 ± 0.003	< 0.011
04-02-15	547	0.019 ± 0.003	< 0.010	09-30-15	531	0.029 ± 0.003	< 0.008
1Q 2015	Mean ± s.d.	0.032 ± 0.008	< 0.026	3Q 2015	Mean ± s.d.	0.028 ± 0.011	< 0.014
04-09-15	563	0.018 ± 0.003	< 0.009	10-07-15	537	0.018 ± 0.003	< 0.011
04-16-15	587	0.017 ± 0.003	< 0.008	10-15-15	764	0.022 ± 0.002	< 0.006
04-22-15	472	0.017 ± 0.003	< 0.008	10-21-15	601	0.021 ± 0.003	< 0.006
04-29-15	544	0.007 ± 0.002	< 0.013	10-28-15	541	0.018 ± 0.003	< 0.009
05-06-15	543	0.015 ± 0.003	< 0.011	11-04-15	573	0.023 ± 0.003	< 0.012
05-13-15	543	0.029 ± 0.003	< 0.015	11-11-15	557	0.022 ± 0.003	< 0.012
05-21-15	628	0.020 ± 0.003	< 0.008	11-18-15	584	0.029 ± 0.003	< 0.009
05-28-15	554	0.021 ± 0.003	< 0.012	11-25-15	579	0.020 ± 0.003	< 0.007
06-03-15	484	0.013 ± 0.003	< 0.008	12-02-15	545	0.023 ± 0.003	< 0.012
06-10-15	538	0.016 ± 0.003	< 0.009	12-09-15	549	0.048 ± 0.004	< 0.013
06-18-15	615	0.019 ± 0.003	< 0.007	12-16-15	553	0.034 ± 0.003	< 0.007
06-24-15	456	0.018 ± 0.003	< 0.021	12-23-15	527	0.024 ± 0.003	< 0.017
07-01-15	545	0.014 ± 0.003	< 0.011	12-30-15	573	0.019 ± 0.003	< 0.009
2Q 2015	Mean ± s.d.	0.017 ± 0.005	< 0.021	4Q 2015	Mean ± s.d.	0.025 ± 0.008	< 0.017
				Cumulative Average		0.025	

[a] "NS" = No sample; see Table 2.0, Listing of Missed Samples.

Table 3. Airborne particulates, analyses for gamma-emitting isotopes.
Collection: Quarterly Composite
Units: pCi/m^3

Location	PE-1				
Quarter	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Req. LLD
Lab Code	PEAP- 1985	PEAP- 3966	PEAP- 6035	PEAP- 7438	
Vol. (m^3)	7697	6846	6268	7389	
Be-7	0.059 ± 0.010	0.057 ± 0.011	0.084 ± 0.011	0.058 ± 0.008	-
Co-58	< 0.0003	< 0.0007	< 0.0005	< 0.0005	-
Co-60	< 0.0003	< 0.0005	< 0.0004	< 0.0003	-
Cs-134	< 0.0005	< 0.0006	< 0.0005	< 0.0005	0.037
Cs-137	< 0.0003	< 0.0005	< 0.0005	< 0.0004	0.045
Location	PE-3				
Lab Code	PEAP- 1986	PEAP- 3967	PEAP- 6036	PEAP- 7439	
Vol. (m^3)	8252	7509	7386	6332	
Be-7	0.058 ± 0.009	0.057 ± 0.008	0.064 ± 0.009	0.049 ± 0.009	-
Co-58	< 0.0002	< 0.0004	< 0.0005	< 0.0005	-
Co-60	< 0.0004	< 0.0003	< 0.0005	< 0.0003	-
Cs-134	< 0.0004	< 0.0004	< 0.0004	< 0.0005	0.037
Cs-137	< 0.0004	< 0.0003	< 0.0004	< 0.0003	0.045
Location	PE-4				
Lab Code	PEAP- 1987	PEAP- 3968	PEAP- 6037	PEAP- 7440	
Vol. (m^3)	7027	6739	6598	7386	
Be-7	0.059 ± 0.010	0.062 ± 0.010	0.083 ± 0.011	0.052 ± 0.007	-
Co-58	< 0.0004	< 0.0003	< 0.0004	< 0.0004	-
Co-60	< 0.0004	< 0.0004	< 0.0003	< 0.0004	-
Cs-134	< 0.0004	< 0.0006	< 0.0005	< 0.0004	0.037
Cs-137	< 0.0004	< 0.0003	< 0.0005	< 0.0002	0.045
Location	PE-5				
Lab Code	PEAP- 1988	PEAP- 3969	PEAP- 6038	PEAP- 7441	
Vol. (m^3)	7292	7332	6976	5640	
Be-7	0.051 ± 0.009	0.063 ± 0.008	0.073 ± 0.011	0.046 ± 0.012	-
Co-58	< 0.0002	< 0.0004	< 0.0004	< 0.0003	-
Co-60	< 0.0004	< 0.0003	< 0.0004	< 0.0003	-
Cs-134	< 0.0005	< 0.0004	< 0.0005	< 0.0005	0.037
Cs-137	< 0.0003	< 0.0003	< 0.0005	< 0.0005	0.045

Table 3. Airborne particulates, analyses for gamma-emitting isotopes.
Collection: Quarterly Composite
Units: pCi/m^3

Location	PE-6				
Quarter	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Req. LLD
Lab Code	PEAP- 1989	PEAP- 3971	PEAP- 6039	PEAP- 7442	
Vol. (m^3)	7486	6788	6742	7068	
Be-7	0.075 ± 0.011	0.067 ± 0.008	0.088 ± 0.013	0.057 ± 0.010	-
Co-58	< 0.0003	< 0.0003	< 0.0006	< 0.0006	-
Co-60	< 0.0004	< 0.0002	< 0.0003	< 0.0003	-
Cs-134	< 0.0004	< 0.0005	< 0.0005	< 0.0005	0.037
Cs-137	< 0.0004	< 0.0004	< 0.0004	< 0.0003	0.045
Location	PE-7				
Lab Code	PEAP- 1990	PEAP- 3972	PEAP- 6040	PEAP- 7443	
Vol. (m^3)	7323	7065	6629	7194	
Be-7	0.073 ± 0.010	0.056 ± 0.007	0.070 ± 0.012	0.049 ± 0.010	-
Co-58	< 0.0002	< 0.0002	< 0.0004	< 0.0006	-
Co-60	< 0.0004	< 0.0003	< 0.0003	< 0.0003	-
Cs-134	< 0.0005	< 0.0004	< 0.0006	< 0.0003	0.037
Cs-137	< 0.0004	< 0.0004	< 0.0003	< 0.0005	0.045
Location	PE-35				
Lab Code	PEAP- 1991	PEAP- 3973	PEAP- 6041	PEAP- 7444	
Vol. (m^3)	7417	7072	6825	7484	
Be-7	0.068 ± 0.010	0.056 ± 0.010	0.087 ± 0.010	0.049 ± 0.009	-
Co-58	< 0.0003	< 0.0004	< 0.0003	< 0.0006	-
Co-60	< 0.0004	< 0.0004	< 0.0003	< 0.0004	-
Cs-134	< 0.0005	< 0.0005	< 0.0004	< 0.0006	0.037
Cs-137	< 0.0004	< 0.0005	< 0.0005	< 0.0007	0.045

Table 4. Lake water, analyses for gross beta and gamma emitting isotopes.

Location: P-28 Collection: Monthly composites Units: pCi/L

Lab Code	PELW- 489	PELW- 805	PELW- 1303	PELW- 2129	
Start Date	12-29-14	01-29-15	02-26-15	03-26-15	Req. LLD
End Date	01-29-15	02-26-15	03-26-15	04-30-15	
Gross beta	2.6 ± 0.8	2.5 ± 1.0	1.9 ± 1.0	1.5 ± 0.6	3.0
Mn-54	< 3.3	< 1.2	< 2.3	< 2.0	11
Fe-59	< 6.2	< 2.3	< 3.7	< 5.0	22
Co-58	< 4.0	< 1.2	< 1.5	< 2.0	11
Co-60	< 3.6	< 0.8	< 1.9	< 2.4	11
Zn-65	< 5.2	< 1.6	< 3.0	< 4.0	22
Zr-95	< 5.3	< 2.4	< 3.1	< 3.4	22
Nb-95	< 2.8	< 1.3	< 3.1	< 3.8	11
Cs-134	< 3.9	< 1.1	< 2.3	< 3.1	11
Cs-137	< 3.9	< 1.4	< 1.8	< 1.7	13
Ba-140	< 23.4	< 8.8	< 16.9	< 10.7	45
La-140	< 4.6	< 3.0	< 2.5	< 2.9	11

Lab Code	PELW- 2764	PELW- 3360	NS [a]
Start Date	04-30-15	05-28-15	-
End Date	05-28-15	06-29-15	07-30-15
Gross beta	1.7 ± 0.6	1.0 ± 0.6	-
Mn-54	< 2.3	< 2.2	-
Fe-59	< 3.0	< 2.6	-
Co-58	< 2.2	< 2.5	-
Co-60	< 1.7	< 2.6	-
Zn-65	< 3.2	< 5.7	-
Zr-95	< 5.6	< 3.1	-
Nb-95	< 3.2	< 2.2	-
Cs-134	< 3.1	< 3.1	-
Cs-137	< 2.8	< 3.2	-
Ba-140	< 25.8	< 13.2	-
La-140	< 6.0	< 3.1	-

[a] No sample available, see Table 2.0, Listing of Missed Samples.

Table 4. Lake water, analyses for gross beta and gamma emitting isotopes.

Location: P-34 Collection: Monthly composites Units: pCi/L

Lab Code	PELW- 490	PELW- 806	PELW- 1304	PELW- 2130	
Start Date	12-29-14	01-29-15	02-26-15	03-26-15	Req. LLD
End Date	01-29-15	02-26-15	03-26-15	04-30-15	
Gross beta	2.2 ± 0.7	1.7 ± 0.9	2.1 ± 0.9	1.2 ± 0.5	3.0
Mn-54	< 3.4	< 2.1	< 0.9	< 1.2	11
Fe-59	< 9.2	< 5.4	< 2.7	< 4.5	22
Co-58	< 5.4	< 2.6	< 1.2	< 2.8	11
Co-60	< 4.0	< 2.5	< 0.9	< 2.0	11
Zn-65	< 6.3	< 2.5	< 1.8	< 2.5	22
Zr-95	< 7.8	< 4.3	< 1.9	< 4.7	22
Nb-95	< 4.9	< 3.0	< 1.8	< 2.4	11
Cs-134	< 4.5	< 3.0	< 1.1	< 2.8	11
Cs-137	< 5.1	< 2.7	< 1.3	< 3.0	13
Ba-140	< 30.3	< 16.3	< 11.2	< 12.8	45
La-140	< 6.7	< 3.4	< 4.1	< 2.0	11

Lab Code	PELW- 2765	PELW- 3361	PELW- 4335	PELW- 4787	
Start Date	04-30-15	05-28-15	06-29-15	07-30-15	
End Date	05-28-15	06-29-15	07-30-15	08-27-15	
Gross beta	1.0 ± 0.5	1.1 ± 0.5	1.2 ± 0.6	< 0.9	3.0
Mn-54	< 2.6	< 1.5	< 2.9	< 1.1	11
Fe-59	< 5.3	< 6.0	< 4.9	< 3.2	22
Co-58	< 1.2	< 2.1	< 2.6	< 1.6	11
Co-60	< 2.0	< 2.3	< 1.6	< 0.9	11
Zn-65	< 2.6	< 4.2	< 2.7	< 2.4	22
Zr-95	< 4.5	< 4.8	< 5.6	< 1.5	22
Nb-95	< 3.9	< 2.2	< 3.0	< 2.6	11
Cs-134	< 2.8	< 3.3	< 3.3	< 1.3	11
Cs-137	< 3.0	< 2.1	< 3.6	< 1.2	13
Ba-140	< 28.0	< 14.6	< 16.5	< 23.9	45
La-140	< 4.0	< 2.4	< 10.4	< 4.0	11

Lab Code	PELW- 5351	PELW- 6279	PELW- 6715	PELW- 7247	
Start Date	08-27-15	09-25-15	10-29-15	11-25-15	
End Date	09-25-15	10-29-15	11-25-15	12-30-15	
Gross beta	2.3 ± 0.6	2.6 ± 1.0	1.3 ± 0.6	1.0 ± 0.5	3.0
Mn-54	< 3.3	< 2.8	< 2.4	< 2.1	11
Fe-59	< 3.9	< 5.1	< 6.4	< 4.5	22
Co-58	< 1.5	< 1.7	< 3.0	< 2.5	11
Co-60	< 2.2	< 1.8	< 1.3	< 3.1	11
Zn-65	< 2.2	< 2.9	< 3.2	< 3.0	22
Zr-95	< 4.6	< 3.9	< 4.8	< 6.2	22
Nb-95	< 2.0	< 4.4	< 3.6	< 4.7	11
Cs-134	< 3.5	< 2.4	< 3.0	< 3.7	11
Cs-137	< 2.2	< 2.9	< 3.7	< 3.5	13
Ba-140	< 18.3	< 41.2	< 21.5	< 29.2	45
La-140	< 3.9	< 3.9	< 6.0	< 2.7	11

Table 4. Lake water, analyses for gross beta and gamma emitting isotopes.

Location: P-36 Collection: Monthly composites Units: pCi/L

Lab Code	PELW- 491	PELW- 807	PELW- 1305	PELW- 2131	
Start Date	12-29-14	01-29-15	02-26-15	03-26-15	Req. LLD
End Date	01-29-15	02-26-15	03-26-15	04-30-15	
Gross beta	1.7 ± 0.8	1.1 ± 0.4	2.7 ± 1.0	1.4 ± 0.6	3.0
Mn-54	< 3.2	< 2.5	< 1.2	< 2.5	11
Fe-59	< 7.0	< 3.8	< 2.6	< 3.3	22
Co-58	< 4.1	< 2.3	< 0.8	< 1.4	11
Co-60	< 3.0	< 3.0	< 1.0	< 1.7	11
Zn-65	< 3.6	< 1.9	< 2.0	< 3.0	22
Zr-95	< 4.2	< 5.5	< 2.3	< 4.3	22
Nb-95	< 2.2	< 2.5	< 1.3	< 1.5	11
Cs-134	< 3.7	< 2.4	< 1.0	< 2.5	11
Cs-137	< 4.3	< 1.6	< 1.1	< 2.6	13
Ba-140	< 22.0	< 15.7	< 12.3	< 12.4	45
La-140	< 4.2	< 1.4	< 2.7	< 1.7	11

Lab Code	PELW- 2766	PELW- 3362	PELW- 4336	PELW- 4788	
Start Date	04-30-15	05-28-15	06-29-15	07-30-15	
End Date	05-28-15	06-29-15	07-30-15	08-27-15	
Gross beta	1.0 ± 0.5	< 0.9	0.9 ± 0.5	1.0 ± 0.5	3.0
Mn-54	< 2.5	< 3.1	< 1.4	< 0.7	11
Fe-59	< 4.7	< 6.3	< 5.6	< 3.3	22
Co-58	< 1.7	< 2.2	< 3.0	< 1.3	11
Co-60	< 1.9	< 1.3	< 2.7	< 1.1	11
Zn-65	< 3.5	< 4.9	< 5.3	< 2.1	22
Zr-95	< 5.6	< 2.8	< 5.3	< 2.4	22
Nb-95	< 3.0	< 2.8	< 5.1	< 1.8	11
Cs-134	< 2.8	< 3.2	< 3.5	< 1.3	11
Cs-137	< 2.7	< 3.1	< 2.8	< 0.8	13
Ba-140	< 44.0	< 16.8	< 37.1	< 15.5	45
La-140	< 5.2	< 2.3	< 7.3	< 6.0	11

Lab Code	PELW- 5352	PELW- 6280	PELW- 6717	PELW- 7248	
Start Date	08-27-15	09-25-15	10-29-15	11-25-15	
End Date	09-25-15	10-29-15	11-25-15	12-30-15	
Gross beta	1.1 ± 0.5	2.0 ± 0.9	1.4 ± 0.6	1.0 ± 0.5	3.0
Mn-54	< 3.9	< 1.7	< 2.1	< 2.2	11
Fe-59	< 3.6	< 5.3	< 3.3	< 5.3	22
Co-58	< 3.6	< 3.0	< 2.8	< 2.5	11
Co-60	< 2.0	< 1.6	< 2.3	< 2.6	11
Zn-65	< 4.7	< 2.1	< 4.4	< 3.3	22
Zr-95	< 4.9	< 5.2	< 5.3	< 5.5	22
Nb-95	< 3.0	< 3.8	< 3.0	< 3.5	11
Cs-134	< 4.2	< 2.3	< 3.1	< 3.1	11
Cs-137	< 3.0	< 2.2	< 3.1	< 2.3	13
Ba-140	< 15.7	< 35.8	< 28.8	< 26.5	45
La-140	< 6.2	< 7.3	< 7.1	< 2.7	11

Table 4. Lake water, analyses for gross beta and gamma emitting isotopes.

Location: P-59 Collection: Monthly composites Units: pCi/L

Lab Code	NS [a]	NS [a]	NS [a]	PELW- 2132	
Start Date	-	-	-	03-26-15	Req. LLD
End Date	01-29-15	02-26-15	03-26-15	04-30-15	
Gross beta	-	-	-	< 0.8	3.0
Mn-54	-	-	-	< 2.6	11
Fe-59	-	-	-	< 6.8	22
Co-58	-	-	-	< 2.2	11
Co-60	-	-	-	< 1.5	11
Zn-65	-	-	-	< 3.6	22
Zr-95	-	-	-	< 3.3	22
Nb-95	-	-	-	< 3.1	11
Cs-134	-	-	-	< 2.4	11
Cs-137	-	-	-	< 2.7	13
Ba-140	-	-	-	< 13.2	45
La-140	-	-	-	< 3.1	11

Lab Code	PELW- 2767	PELW- 3363	PELW- 4338	PELW- 4791	
Start Date	04-30-15	05-28-15	06-29-15	07-30-15	
End Date	05-28-15	06-29-15	07-30-15	08-27-15	
Gross beta	1.2 ± 0.6	1.0 ± 0.5	1.0 ± 0.5	1.5 ± 0.6	3.0
Mn-54	< 2.1	< 3.3	< 2.9	< 1.0	11
Fe-59	< 4.7	< 3.4	< 5.6	< 2.3	22
Co-58	< 2.1	< 2.8	< 2.7	< 1.2	11
Co-60	< 2.1	< 2.0	< 2.8	< 0.8	11
Zn-65	< 3.0	< 5.9	< 3.1	< 2.2	22
Zr-95	< 5.1	< 6.0	< 5.6	< 2.3	22
Nb-95	< 2.8	< 1.6	< 4.2	< 1.6	11
Cs-134	< 2.2	< 3.4	< 2.6	< 1.2	11
Cs-137	< 2.0	< 2.8	< 2.8	< 0.8	13
Ba-140	< 26.1	< 19.3	< 26.6	< 15.0	45
La-140	< 3.9	< 2.7	< 3.2	< 4.3	11

Lab Code	PELW- 5354	PELW- 6283	PELW- 6719	PELW- 7250	
Start Date	08-27-15	09-25-15	10-29-15	11-25-15	
End Date	09-25-15	10-29-15	11-25-15	12-30-15	
Gross beta	0.9 ± 0.5	2.1 ± 0.9	1.7 ± 0.6	0.9 ± 0.5	3.0
Mn-54	< 2.7	< 1.8	< 2.2	< 2.4	11
Fe-59	< 3.3	< 7.2	< 5.7	< 6.0	22
Co-58	< 2.4	< 2.8	< 2.8	< 1.9	11
Co-60	< 2.8	< 1.7	< 1.9	< 1.9	11
Zn-65	< 3.3	< 4.5	< 3.0	< 4.0	22
Zr-95	< 4.9	< 3.9	< 2.1	< 4.4	22
Nb-95	< 4.5	< 4.4	< 2.7	< 1.9	11
Cs-134	< 3.4	< 2.6	< 2.3	< 2.8	11
Cs-137	< 3.9	< 2.8	< 2.8	< 3.2	13
Ba-140	< 17.1	< 33.9	< 18.0	< 21.7	45
La-140	< 3.6	< 4.9	< 4.2	< 4.3	11

[a] No sample available, shoreline inaccessible.

Table 4. Lake water, analyses for gross beta and gamma emitting isotopes.

Location: P-60 Collection: Monthly composites Units: pCi/L

Lab Code	NS [a]	NS [a]	NS [a]	PELW- 2133	
Start Date	-	-	-	03-26-15	Req. LLD
End Date	01-29-15	02-26-15	03-26-15	04-30-15	
Gross beta	-	-	-	2.6 ± 1.0	3.0
Mn-54	-	-	-	< 3.1	11
Fe-59	-	-	-	< 6.7	22
Co-58	-	-	-	< 3.1	11
Co-60	-	-	-	< 1.5	11
Zn-65	-	-	-	< 3.2	22
Zr-95	-	-	-	< 6.5	22
Nb-95	-	-	-	< 3.0	11
Cs-134	-	-	-	< 4.0	11
Cs-137	-	-	-	< 4.3	13
Ba-140	-	-	-	< 21.6	45
La-140	-	-	-	< 3.6	11

Lab Code	PELW- 2768	PELW- 3365	PELW- 4339	PELW- 4792	
Start Date	04-30-15	05-28-15	06-29-15	07-30-15	
End Date	05-28-15	06-29-15	07-30-15	08-27-15	
Gross beta	2.4 ± 0.8	1.3 ± 0.6	1.6 ± 0.6	1.1 ± 0.6	3.0
Mn-54	< 2.4	< 2.4	< 1.2	< 1.3	11
Fe-59	< 7.2	< 4.5	< 5.3	< 2.9	22
Co-58	< 3.3	< 1.8	< 1.0	< 1.6	11
Co-60	< 3.0	< 1.2	< 1.9	< 0.6	11
Zn-65	< 3.7	< 1.9	< 5.8	< 2.4	22
Zr-95	< 5.9	< 3.6	< 5.0	< 2.4	22
Nb-95	< 3.9	< 2.7	< 3.0	< 2.0	11
Cs-134	< 3.5	< 2.3	< 2.2	< 1.2	11
Cs-137	< 3.6	< 2.2	< 3.5	< 1.3	13
Ba-140	< 18.6	< 15.8	< 34.0	< 13.7	45
La-140	< 4.4	< 1.5	< 10.6	< 5.1	11

Lab Code	PELW- 5355	PELW- 6284	PELW- 6720	PELW- 7251	
Start Date	08-27-15	09-25-15	10-29-15	11-25-15	
End Date	09-25-15	10-29-15	11-25-15	12-30-15	
Gross beta	1.7 ± 0.6	< 1.8	< 1.0	< 0.9	3.0
Mn-54	< 2.1	< 1.7	< 2.7	< 3.9	11
Fe-59	< 3.4	< 4.4	< 5.7	< 5.5	22
Co-58	< 2.3	< 2.3	< 3.4	< 4.8	11
Co-60	< 2.5	< 2.1	< 1.2	< 3.8	11
Zn-65	< 3.9	< 3.2	< 2.4	< 7.4	22
Zr-95	< 4.7	< 4.8	< 3.1	< 7.0	22
Nb-95	< 2.1	< 3.4	< 2.6	< 3.9	11
Cs-134	< 3.4	< 2.2	< 3.2	< 4.5	11
Cs-137	< 2.9	< 2.2	< 3.0	< 2.6	13
Ba-140	< 11.8	< 42.0	< 19.1	< 28.7	45
La-140	< 5.6	< 5.4	< 6.2	< 10.4	11

[a] No sample available, shoreline inaccessible.

Table 4. Lake water, analyses for gross beta and gamma emitting isotopes.

Location: P-39 [a] Collection: Monthly composites Units: pCi/L

Lab Code	PELW- 4337	PELW- 4790	PELW- 5353	PELW- 6282	
Start Date	06-29-15	07-30-15	08-27-15	09-25-15	Req. LLD
End Date	07-30-15	08-27-15	09-25-15	10-29-15	
Gross beta	1.0 ± 0.5	0.9 ± 0.5	1.1 ± 0.5	< 1.7	3.0
Mn-54	< 3.5	< 1.3	< 1.9	< 2.8	11
Fe-59	< 3.9	< 3.4	< 3.7	< 5.3	22
Co-58	< 2.6	< 1.3	< 1.8	< 2.3	11
Co-60	< 1.9	< 1.4	< 2.5	< 2.6	11
Zn-65	< 2.6	< 2.3	< 3.8	< 5.5	22
Zr-95	< 3.5	< 1.8	< 5.9	< 4.2	22
Nb-95	< 2.7	< 2.0	< 1.9	< 4.2	11
Cs-134	< 2.9	< 1.4	< 3.7	< 2.2	11
Cs-137	< 1.4	< 1.0	< 3.8	< 2.5	13
Ba-140	< 27.6	< 22.7	< 18.7	< 28.4	45
La-140	< 4.3	< 4.5	< 5.4	< 4.2	11

Lab Code	PELW- 6718	PELW- 7249
Start Date	10-29-15	11-25-15
End Date	11-25-15	12-30-15
Gross beta	1.4 ± 0.6	1.2 ± 0.5
Mn-54	< 1.7	< 2.5
Fe-59	< 6.5	< 4.4
Co-58	< 1.2	< 2.0
Co-60	< 2.4	< 3.1
Zn-65	< 1.7	< 4.2
Zr-95	< 4.2	< 5.9
Nb-95	< 3.4	< 2.6
Cs-134	< 2.2	< 3.3
Cs-137	< 2.1	< 3.1
Ba-140	< 21.1	< 15.6
La-140	< 4.2	< 2.8

[a] New location replacing PE-28.

Table 4. Lake Water, analysis for tritium.
Collection: Quarterly composites of monthly collections.
Units: pCi/L

Required limit of detection: 1500 pCi/L

Location	P-28			
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	PELW- 1312	PELW- 3519	NS[a]	NS[a]
H-3	< 147	< 147		
Location	**P-34**			
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	PELW- 1313	PELW- 3520	PELW- 5652	PELW- 7295
H-3	< 148	< 147	< 152	< 146
Location	**P-36**			
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	PELW- 1314	PELW- 3521	PELW- 5653	PELW- 7296
H-3	< 147	< 147	< 152	< 146
Location[b]	**P-39**			
			3rd Qtr.	4th Qtr.
			PELW- 5654	PELW- 7297
			< 152	< 146
Location	**P-59**			
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	NA [c]	PELW- 3522	PELW- 5655	PELW- 7298
H-3		< 147	< 152	< 146
Location	**P-60**			
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	NA [c]	PELW- 3523	PELW- 5656	PELW- 7299
H-3		< 147	< 152	< 145

[a] "NS" = No sample; see Table 2.0, Listing of Missed Samples.

[b] New location replacing PE-28.

[c] No sample available, shoreline frozen.

Table 5. Milk, analyses for iodine-131 and gamma-emitting isotopes.
Collection: Semimonthly during grazing season, monthly at other times.

Collection Date	Lab Code	Concentration (pCi/L)					
		I-131	Cs-134	Cs-137	Ba-140	La-140	K-40
Required LLD (pCi/L)		0.8	11	13	45	11	-
P-18							
01-05-15	ND[a]	-	-	-	-	-	-
02-02-15	ND[a]	-	-	-	-	-	-
03-03-15	ND[a]	-	-	-	-	-	-
04-06-15	PEMI- 1496	< 0.3	< 2.4	< 2.5	< 13.1	< 3.3	1350 ± 81
04-20-15	PEMI- 1821	< 0.4	< 4.2	< 2.9	< 34.3	< 7.1	1690 ± 119
05-04-15	PEMI- 2315	< 0.4	< 3.1	< 3.7	< 36.6	< 4.0	1923 ± 114
05-21-15	PEMI- 2578	< 0.5	< 3.4	< 3.4	< 14.8	< 2.5	1900 ± 127
06-01-15	PEMI- 2843	< 0.4	< 3.7	< 3.2	< 20.5	< 3.2	1837 ± 132
06-15-15	PEMI- 3026	< 0.3	< 3.6	< 4.1	< 18.5	< 3.2	1767 ± 118
07-06-15	PEMI- 3495	< 0.2	< 3.5	< 4.1	< 28.6	< 7.1	1745 ± 104
07-20-15	PEMI- 4022	< 0.5	< 3.6	< 4.2	< 20.9	< 2.6	1902 ± 141
08-03-15	ND[a]	-	-	-	-	-	-
08-17-15	ND[a]	-	-	-	-	-	-
09-08-15	ND[a]	-	-	-	-	-	-
09-21-15	ND[a]	-	-	-	-	-	-
10-05-15	ND[a]	-	-	-	-	-	-
10-19-15	ND[a]	-	-	-	-	-	-
11-02-15	ND[a]	-	-	-	-	-	-
12-07-15	ND[a]	-	-	-	-	-	-
P-19							
01-05-15	PEMI- 27	< 0.2	< 2.8	< 3.2	< 15.7	< 2.0	1322 ± 93
02-02-15	PEMI- 492	< 0.5	< 3.1	< 4.2	< 18.0	< 2.8	1211 ± 105
03-03-15	PEMI- 927	< 0.5	< 3.1	< 2.5	< 28.2	< 6.2	1253 ± 89
04-06-15	PEMI- 1497	< 0.5	< 3.3	< 3.2	< 31.9	< 5.7	1196 ± 88
04-20-15	PEMI- 1822	< 0.3	< 3.4	< 3.0	< 33.3	< 6.8	1226 ± 100
05-04-15	PEMI- 2316	< 0.4	< 3.7	< 2.8	< 30.4	< 6.3	1313 ± 102
05-21-15	PEMI- 2579	< 0.5	< 3.2	< 3.0	< 17.0	< 3.2	1390 ± 106
06-01-15	PEMI- 2844	< 0.4	< 3.6	< 3.0	< 14.2	< 2.2	1277 ± 107
06-15-15	PEMI- 3028	< 0.4	< 3.9	< 4.5	< 23.9	< 2.4	1346 ± 119
07-06-15	PEMI- 3496	< 0.2	< 3.1	< 1.9	< 27.5	< 3.3	1323 ± 99
07-20-15	PEMI- 4023	< 0.5	< 3.3	< 3.1	< 21.4	< 6.7	1372 ± 113
08-03-15	PEMI- 4308	< 0.2	< 3.9	< 2.3	< 17.5	< 2.5	1284 ± 110
08-17-15	PEMI- 4565	< 0.3	< 3.1	< 2.7	< 36.7	< 8.1	1360 ± 95
09-08-15	PEMI- 4972	< 0.4	< 3.7	< 3.8	< 44.9	< 6.3	1356 ± 112
09-21-15	PEMI- 5237	< 0.5	< 3.5	< 3.7	< 35.5	< 5.2	1358 ± 98
10-05-15	PEMI- 5616	< 0.3	< 3.6	< 3.0	< 34.5	< 3.1	1212 ± 97
10-19-15	PEMI- 6055	< 0.3	< 2.9	< 2.6	< 21.4	< 4.0	1372 ± 86
11-02-15	PEMI- 6351	< 0.3	< 1.3	< 1.7	< 18.8	< 2.2	1364 ± 42
12-07-15	PEMI- 6943	< 0.3	< 3.2	< 2.6	< 15.6	< 3.8	1349 ± 104

[a] ND = No data, no milk available.

Table 5. Milk, analyses for iodine-131 and gamma-emitting isotopes (continued).
Collection: Semimonthly during grazing season, monthly at other times.

Collection Date	Lab Code	Concentration (pCi/L)					
		I-131	Cs-134	Cs-137	Ba-140	La-140	K-40
Required LLD	(pCi/L)	0.8	11	13	45	11	-
P-51							
01-05-15	PEMI- 28	< 0.4	< 3.1	< 3.0	< 10.8	< 5.1	1336 ± 94
02-02-15	PEMI- 493	< 0.4	< 4.4	< 4.9	< 31.6	< 5.2	1405 ± 125
03-03-15	PEMI- 928	< 0.5	< 3.0	< 1.8	< 17.7	< 3.5	1346 ± 86
04-06-15	PEMI- 1498	< 0.4	< 2.9	< 2.6	< 27.3	< 1.8	1330 ± 88
04-20-15	PEMI- 1823	< 0.4	< 3.3	< 3.2	< 24.6	< 3.5	1349 ± 112
05-04-15	PEMI- 2317	< 0.4	< 3.1	< 2.6	< 35.7	< 8.1	1418 ± 86
05-21-15	PEMI- 2580	< 0.3	< 3.6	< 4.1	< 17.4	< 2.8	1310 ± 113
06-01-15	PEMI- 2845	< 0.5	< 3.5	< 3.7	< 11.5	< 1.8	1362 ± 113
06-15-15	PEMI- 3029	< 0.3	< 3.9	< 2.2	< 20.5	< 2.0	1341 ± 110
07-06-15	PEMI- 3497	< 0.5	< 3.3	< 3.1	< 28.7	< 5.7	1343 ± 104
07-20-15	PEMI- 4024	< 0.3	< 3.3	< 4.2	< 13.8	< 2.9	1284 ± 101
08-03-15	PEMI- 4309	< 0.5	< 3.5	< 3.5	< 19.0	< 3.0	1323 ± 102
08-17-15	PEMI- 4566	< 0.4	< 3.2	< 2.8	< 34.8	< 4.6	1362 ± 97
09-08-15	PEMI- 4973	< 0.4	< 3.2	< 3.4	< 44.2	< 5.8	1308 ± 91
09-21-15	PEMI- 5238	< 0.4	< 2.8	< 3.3	< 22.1	< 3.6	1303 ± 86
10-05-15	PEMI- 5617	< 0.3	< 1.3	< 0.9	< 15.4	< 6.3	717 ± 35
10-19-15	PEMI- 6056	< 0.4	< 3.5	< 3.8	< 35.5	< 8.2	1440 ± 105
11-02-15	PEMI- 6352	< 0.3	< 1.2	< 1.5	< 13.2	< 3.5	1371 ± 41
12-07-15	PEMI- 6944	< 0.5	< 3.3	< 3.8	< 13.0	< 6.7	1445 ± 108

[a] ND = No data, no milk available.

Table 7. Food Products, analyses for gamma emitting isotopes.

Collection: Monthly — Units: pCi/kg wet

Location: P-2

Lab Code	PEVE- 4038	PEVE- 4039	PEVE- 4040	PEVE- 4041	
Date Collected	07-21-15	07-21-15	07-21-15	07-21-15	Req. LLD
Sample Type	Beet Greens	Collard Greens	Turnip Greens	Swiss Chard	
Be-7	< 105	< 91	311 ± 146	249 ± 80	-
K-40	3374 ± 249	3937 ± 232	5100 ± 353	5772 ± 315	-
Co-58	< 8.4	< 9.0	< 10.3	< 10.4	-
Co-60	< 8.1	< 7.8	< 7.5	< 9.7	-
I-131	< 18.7	< 19.4	< 35.6	< 31.3	45
Cs-134	< 8.1	< 7.3	< 10.3	< 9.1	45
Cs-137	< 9.6	< 7.9	< 12.7	< 10.4	60

Lab Code	PEVE- 4572	PEVE- 4573	PEVE- 4574	PEVE- 4575
Date Collected	08-18-15	08-18-15	08-18-15	08-18-15
Sample Type	Japanese Greens	Collard Greens	Turnip Greens	Swiss Chard
Be-7	< 112	< 101	256 ± 96	329 ± 92
K-40	2793 ± 243	3274 ± 326	3874 ± 330	3871 ± 284
Co-58	< 9.4	< 11.2	< 6.3	< 9.3
Co-60	< 6.4	< 8.1	< 5.4	< 6.0
I-131	< 26.4	< 15.7	< 22.6	< 28.4
Cs-134	< 8.5	< 12.9	< 10.3	< 8.2
Cs-137	< 12.2	< 12.8	< 9.9	< 10.2

Lab Code	PEVE- 5160	PEVE- 5161	PEVE- 5162	PEVE- 5163
Date Collected	09-16-15	09-16-15	09-16-15	09-16-15
Sample Type	Japanese Greens	Collard Greens	Turnip Greens	Swiss Chard
Be-7	719 ± 82	< 93	743 ± 149	609 ± 151
K-40	3817 ± 164	3602 ± 255	5516 ± 393	4814 ± 379
Co-58	< 7.4	< 8.5	< 11.6	< 13.3
Co-60	< 5.6	< 5.8	< 13.6	< 7.6
I-131	< 16.7	< 29.0	< 39.2	< 42.5
Cs-134	< 6.0	< 8.5	< 10.7	< 12.1
Cs-137	< 7.6	< 6.6	< 9.9	< 14.5

Lab Code	PEVE- 6057	PEVE- 6058	PEVE- 6059
Date Collected	10-20-15	10-20-15	10-20-15
Sample Type	Collard Greens	Turnip Greens	Swiss Chard
Be-7	< 129	684 ± 131	454 ± 146
K-40	4429 ± 336	4189 ± 284	6013 ± 467
Co-58	< 9.7	< 8.0	< 7.4
Co-60	< 10.2	< 4.5	< 12.1
I-131	< 31.2	< 41.5	< 43.8
Cs-134	< 10.1	< 8.9	< 13.8
Cs-137	< 13.4	< 9.9	< 12.5

Table 7. Food Products, analyses for gamma emitting isotopes.

Collection: Monthly — Units: pCi/kg wet

Location: P-16

Lab Code	PEVE- 4042	PEVE- 4043	PEVE- 4044	PEVE- 4045	
Date Collected	07-21-15	07-21-15	07-21-15	07-21-15	Req. LLD
Sample Type	Beet Greens	Collard Greens	Swiss Chard	Turnip Greens	
Be-7	150 ± 74	< 94	185 ± 70	239 ± 107	-
K-40	4658 ± 243	3979 ± 250	6263 ± 242	5279 ± 327	-
Co-58	< 7.9	< 5.9	< 8.3	< 7.2	-
Co-60	< 7.0	< 8.1	< 8.1	< 9.4	-
I-131	< 20.0	< 25.9	< 22.7	< 35.9	45
Cs-134	< 6.1	< 8.8	< 7.3	< 9.3	45
Cs-137	< 7.5	< 9.9	< 7.8	< 10.4	60

Lab Code	PEVE- 4576	PEVE- 4577	PEVE- 4578	PEVE- 4580
Date Collected	08-18-15	08-18-15	08-18-15	08-18-15
Sample Type	Japanese Greens	Collard Greens	Swiss Chard	Turnip Greens
Be-7	< 108	< 83	209 ± 98	< 117
K-40	4197 ± 312	3539 ± 289	4137 ± 251	3294 ± 270
Co-58	< 10.4	< 7.5	< 8.1	< 9.7
Co-60	< 7.3	< 9.2	< 8.6	< 7.9
I-131	< 32.9	< 19.5	< 20.9	< 21.0
Cs-134	< 9.0	< 7.4	< 7.9	< 10.4
Cs-137	< 9.4	< 6.1	< 7.0	< 13.3

Lab Code	PEVE- 5164	PEVE- 5165	PEVE- 5166	PEVE- 5167
Date Collected	09-16-15	09-16-15	09-16-15	09-16-15
Sample Type	Japanese Greens	Collard Greens	Swiss Chard	Turnip Greens
Be-7	402 ± 157	300 ± 113	363 ± 107	400 ± 109
K-40	3459 ± 327	3655 ± 277	4238 ± 298	3561 ± 274
Co-58	< 7.0	< 5.9	< 10.1	< 7.6
Co-60	< 11.4	< 6.7	< 10.2	< 6.9
I-131	< 33.6	< 24.3	< 24.2	< 15.8
Cs-134	< 12.0	< 9.1	< 9.4	< 7.7
Cs-137	< 13.5	< 7.1	< 6.7	< 8.9

Lab Code	PEVE- 6060	PEVE- 6061	PEVE- 6062
Date Collected	10-20-15	10-20-15	10-20-15
Sample Type	Collard Greens	Swiss Chard	Turnip Greens
Be-7	370 ± 127	572 ± 181	746 ± 131
K-40	4486 ± 344	5723 ± 367	6511 ± 437
Co-58	< 6.2	< 8.8	< 14.5
Co-60	< 10.7	< 8.9	< 12.9
I-131	< 28.0	< 32.6	< 43.9
Cs-134	< 11.1	< 12.3	< 13.3
Cs-137	< 6.9	< 12.0	< 16.5

Table 7. Food Products, analyses for gamma emitting isotopes.

Collection: Monthly — Units: pCi/kg wet

Location: P-18

Lab Code	PEVE- 4581	PEVE- 4582	PEVE- 4583	PEVE- 5169
Date Collected	08-18-15	08-18-15	08-18-15	09-16-15
Sample Type	Turnip Greens	Collard Greens	Swiss Chard	Turnip Greens
Be-7	249 ± 119	< 89	516 ± 191	717 ± 181
K-40	5547 ± 328	4180 ± 277	9638 ± 586	7858 ± 474
Co-58	< 10.1	< 10.2	< 17.4	< 12.7
Co-60	< 12.4	< 8.1	< 12.9	< 17.9
I-131	< 17.7	< 30.2	< 31.8	< 41.9
Cs-134	< 8.9	< 8.3	< 17.2	< 12.2
Cs-137	< 9.8	< 8.7	< 19.0	< 13.6

Lab Code	PEVE- 5170
Date Collected	09-16-15
Sample Type	Collard Greens
Be-7	381 ± 182
K-40	4787 ± 385
Co-58	< 6.2
Co-60	< 10.7
I-131	< 33.2
Cs-134	< 12.9
Cs-137	< 8.3

Table 7. Food Products, analyses for gamma emitting isotopes.

Collection: Monthly — Units: pCi/kg wet

Location: P-20

Lab Code	PEVE- 4046	PEVE- 4047	PEVE- 4048	PEVE- 4049	
Date Collected	07-21-15	07-21-15	07-21-15	07-21-15	Req. LLD
Sample Type	Beet Greens	Collard Greens	Swiss Chard	Turnip Greens	
Be-7	406 ± 108	< 140	517 ± 160	375 ± 148	-
K-40	4976 ± 263	5453 ± 383	8049 ± 439	6125 ± 378	-
Co-58	< 5.0	< 9.9	< 15.7	< 11.1	-
Co-60	< 5.4	< 11.1	< 13.2	< 8.8	-
I-131	< 14.9	< 32.2	< 36.9	< 39.2	45
Cs-134	< 8.0	< 12.9	< 12.7	< 10.9	45
Cs-137	< 7.4	< 11.4	< 11.1	< 12.1	60

Lab Code	PEVE- 4584	PEVE- 4585	PEVE- 4586	PEVE- 5171
Date Collected	08-18-15	08-18-15	08-18-15	09-16-15
Sample Type	Japanese Greens	Collard Greens	Turnip Greens	Swiss Chard
Be-7	< 138	< 93	< 95	464 ± 184
K-40	3860 ± 317	5066 ± 318	6631 ± 325	8360 ± 550
Co-58	< 8.9	< 7.8	< 7.6	< 20.9
Co-60	< 10.0	< 9.9	< 6.9	< 9.6
I-131	< 22.0	< 28.2	< 19.2	< 39.1
Cs-134	< 11.4	< 8.5	< 7.6	< 15.6
Cs-137	< 11.4	< 8.1	< 9.3	< 12.2

Lab Code	PEVE- 5172	PEVE- 5173	PEVE- 6064	PEVE- 6065
Date Collected	09-16-15	09-16-15	10-20-15	10-20-15
Sample Type	Collard Greens	Turnip Greens	Collard Greens	Turnip Greens
Be-7	< 103	265 ± 116	< 122	387 ± 110
K-40	6256 ± 394	6554 ± 373	5688 ± 397	6470 ± 388
Co-58	< 12.8	< 8.5	< 8.6	< 9.7
Co-60	< 7.1	< 9.8	< 7.0	< 11.6
I-131	< 44.6	< 33.2	< 27.7	< 37.3
Cs-134	< 10.3	< 7.2	< 12.3	< 10.0
Cs-137	< 11.4	< 8.7	< 9.8	< 8.7

Table 7. Food Products, analyses for gamma emitting isotopes.

Collection: Monthly — Units: pCi/kg wet

Location: P-37

Lab Code	PEVE- 4050	PEVE- 4051	PEVE- 4587	PEVE- 4588	
Date Collected	07-21-15	07-21-15	08-18-15	08-18-15	Req. LLD
Sample Type	Beet Greens	Swiss Chard	Collard Greens	Turnip Greens	
Be-7	274 ± 113	< 87	< 111	< 109	-
K-40	5634 ± 311	3634 ± 222	2818 ± 268	3402 ± 281	-
Co-58	< 7.7	< 8.8	< 8.0	< 8.1	-
Co-60	< 9.1	< 9.1	< 9.7	< 11.1	-
I-131	< 26.2	< 23.0	< 24.6	< 23.9	45
Cs-134	< 9.6	< 7.7	< 11.5	< 9.8	45
Cs-137	< 9.5	< 6.8	< 12.8	< 8.5	60

Lab Code	PEVE- 5174	PEVE- 5175	PEVE- 5176	PEVE- 6066
Date Collected	09-16-15	09-16-15	09-16-15	10-20-15
Sample Type	Turnip Greens	Japanese Greens	Collard Greens	Turnip Greens
Be-7	305 ± 127	295 ± 87	< 119	682 ± 144
K-40	6056 ± 442	3835 ± 281	3243 ± 303	6440 ± 362
Co-58	< 8.6	< 9.6	< 14.1	< 15.2
Co-60	< 6.5	< 7.9	< 11.6	< 7.3
I-131	< 40.3	< 34.5	< 37.7	< 42.5
Cs-134	< 14.1	< 9.7	< 10.1	< 9.8
Cs-137	< 14.6	< 9.9	< 11.4	< 7.7

Lab Code	PEVE- 6067	PEVE- 6068
Date Collected	10-20-15	10-20-15
Sample Type	Japanese Greens	Collard Greens
Be-7	609 ± 153	< 116
K-40	5443 ± 375	5042 ± 328
Co-58	< 7.7	< 12.1
Co-60	< 7.1	< 7.5
I-131	< 44.0	< 38.9
Cs-134	< 12.4	< 10.3
Cs-137	< 10.3	< 7.5

Table 7. Food Products, analyses for gamma emitting isotopes.

Collection: Monthly — Units: pCi/kg wet

Location: P-70

Lab Code	PEVE- 4052	PEVE- 4053	PEVE- 4589	PEVE- 4590	
Date Collected	07-21-15	07-21-15	08-18-15	08-18-15	Req. LLD
Sample Type	Beet Greens	Swiss Chard	Japanese Greens	Swiss Chard	
Be-7	419 ± 134	520 ± 154	273 ± 101	783 ± 142	-
K-40	7860 ± 401	8001 ± 415	5133 ± 308	12725 ± 464	-
Co-58	< 14.1	< 11.0	< 10.4	< 9.0	-
Co-60	< 11.7	< 12.5	< 5.9	< 8.7	-
I-131	< 33.5	< 24.4	< 12.7	< 13.6	45
Cs-134	< 11.8	< 11.0	< 9.8	< 10.4	45
Cs-137	< 8.8	< 12.2	< 10.2	< 11.3	60

Lab Code	PEVE- 4591	PEVE- 5177	PEVE- 5178	PEVE- 5179
Date Collected	08-18-15	09-16-15	09-16-15	09-16-15
Sample Type	Collard Greens	Japanese Greens	Turnip Greens	Collard Greens
Be-7	< 109	647 ± 126	662 ± 173	< 114
K-40	5483 ± 347	4795 ± 346	6060 ± 407	4498 ± 302
Co-58	< 6.2	< 13.7	< 7.3	< 5.8
Co-60	< 10.2	< 7.8	< 9.0	< 7.7
I-131	< 20.5	< 32.9	< 32.8	< 37.9
Cs-134	< 9.3	< 9.2	< 11.9	< 9.4
Cs-137	< 8.4	< 9.3	< 11.8	< 8.8

Lab Code	PEVE- 6069	PEVE- 6070	PEVE- 6072	PEVE- 6073
Date Collected	10-20-15	10-20-15	10-20-15	10-20-15
Sample Type	Japanese Greens	Turnip Greens	Collard Greens	Swiss Chard
Be-7	1008 ± 137	656 ± 110	237 ± 97	1169 ± 178
K-40	5645 ± 280	4758 ± 310	4763 ± 268	7373 ± 423
Co-58	< 8.8	< 11.1	< 8.3	< 12.7
Co-60	< 6.7	< 5.5	< 6.1	< 9.4
I-131	< 37.4	< 27.2	< 32.8	< 40.9
Cs-134	< 7.5	< 9.3	< 6.9	< 13.5
Cs-137	< 7.4	< 7.4	< 7.2	< 9.6

Table 9. Fish, analyses for gamma emitting isotopes.

Collection: Annually Units: pCi/kg wet

Location	P-25				
Lab Code	PEF- 3201	PEF- 3202	PEF- 3203	PEF- 3204	
Date Collected	06-05-15	06-05-15	06-05-15	06-05-15	Req. LLD
Sample Type	Catfish	Walleye	Freshwater Drum	Smallmouth Bass	
K-40	837 ± 306	1159 ± 344	1202 ± 437	1511 ± 339	-
Mn-54	< 18.9	< 13.6	< 15.1	< 23.6	94
Fe-59	< 61.9	< 51.0	< 121.6	< 49.9	195
Co-58	< 16.6	< 19.2	< 25.5	< 14.7	97
Co-60	< 9.9	< 14.7	< 15.7	< 12.1	97
Zn-65	< 29.4	< 27.5	< 31.8	< 40.7	195
Cs-134	< 17.9	< 16.1	< 27.2	< 17.3	97
Cs-137	< 16.8	< 19.6	< 34.8	< 20.5	112

Location	P-25		
Lab Code	PEF- 5191	PEF- 5192	
Date Collected	09-15-15	09-15-15	Req. LLD
Sample Type	White Bass	Walleye	
K-40	585 ± 212	751 ± 258	-
Mn-54	< 16.6	< 17.0	94
Fe-59	< 43.3	< 54.2	195
Co-58	< 19.0	< 25.2	97
Co-60	< 10.6	< 16.9	97
Zn-65	< 24.6	< 39.8	195
Cs-134	< 14.4	< 19.0	97
Cs-137	< 15.6	< 15.3	112

Table 9. Fish, analyses for gamma emitting isotopes.

Collection: Annually Units: pCi/kg wet

Location	P-32				
Lab Code	PEF- 3205	PEF- 3206	PEF- 3207	PEF- 3208	
Date Collected	06-05-15	06-05-15	06-05-15	06-05-15	Req. LLD
Sample Type	Walleye	White Perch	Freshwater Drum	Smallmouth Bass	
K-40	1889 ± 347	1299 ± 356	1138 ± 319	1439 ± 504	-
Mn-54	< 18.7	< 21.5	< 12.5	< 23.8	94
Fe-59	< 40.8	< 88.9	< 58.9	< 74.2	195
Co-58	< 22.6	< 17.5	< 22.2	< 27.7	97
Co-60	< 6.6	< 16.0	< 9.3	< 12.7	97
Zn-65	< 19.9	< 23.4	< 31.0	< 52.1	195
Cs-134	< 15.3	< 27.4	< 22.7	< 30.1	97
Cs-137	< 19.6	< 24.3	< 15.6	< 27.1	112

Location	P-32				
Lab Code	PEF- 5193	PEF- 5194	PEF- 5195	PEF- 5196	
Date Collected	09-15-15	09-15-15	09-15-15	09-15-15	Req. LLD
Sample Type	Walleye	Tiger Musky	White Bass	Channel Catfish	
K-40	< 1272	1188 ± 306	< 769	786 ± 291	-
Mn-54	< 65.1	< 19.2	< 41.4	< 22.7	94
Fe-59	< 184.3	< 45.3	< 94.6	< 59.7	195
Co-58	< 94.2	< 26.5	< 45.1	< 19.6	97
Co-60	< 42.1	< 21.1	< 28.6	< 14.1	97
Zn-65	< 96.0	< 22.1	< 68.2	< 27.8	195
Cs-134	< 76.8	< 18.4	< 52.2	< 17.6	97
Cs-137	< 67.5	< 19.5	< 46.7	< 12.7	112

Table 11. Sediments, analyses for gamma emitting isotopes.

Collection: Semiannually Units: pCi/kg dry

Location	P-64		
Lab Code	PEBS- 2668	PEBS- 5188	
Date Collected	05-07-15	09-16-15	Req. LLD
K-40	2268 ± 270	9693 ± 510	-
Co-58	< 16.0	< 24.4	50
Co-60	< 6.6	< 9.6	40
Cs-134	< 10.1	< 9.2	112
Cs-137	< 6.1	< 10.2	135

Location	P-66		
Lab Code	PEBS- 2669	PEBS- 3342	
Date Collected	05-07-15	06-29-15	Req. LLD
K-40	6423 ± 397	6854 ± 462	-
Co-58	< 17.7	< 13.0	50
Co-60	< 4.4	< 9.5	40
Cs-134	< 12.1	< 9.0	112
Cs-137	< 14.2	< 9.3	135

Location	P-66	
Lab Code	PEBS- 5190	
Date Collected	09-16-15	Req. LLD
K-40	7272 ± 425	-
Co-58	< 13.2	50
Co-60	< 12.0	40
Cs-134	< 13.5	112
Cs-137	< 14.8	135

Appendix D
Corrections to Previous Annual Environmental and Effluent Release Reports

APPENDIX D

Corrections to Previous Annual Environmental and Effluent Release Reports:

There are two corrections to the 2014 Annual Environmental and Effluent Release Report.

1. This correction adds information regarding the time period when Meteorological Data could not be transferred to the dose assessment program for routine dose calculations.

2. This correction documents an abnormal release via the underdrain system.

Appendix E
Abnormal releases

APPENDIX E

Abnormal Releases

In November 2011, radioactivity was detected in the Nuclear Closed Cooling (NCC) system. The source of this activity is the primary coolant. There is some leakage from the NCC system to Service Water and from there to the environment. Residual activity remains in the NCC system and it is being tracked as an abnormal release.

Low levels of tritium activity have been detected in the underdrain system. The underdrain system flows to the Emergency Service Water basin and from there to the environment. This activity is being tracked as an abnormal release.

The calculated annual doses for the combined abnormal releases were 1.55E-04 mrem whole body and 2.40E-04 mrem organ.

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual
A. Fission and Activation Products (Ci)					
Mn-54	3.32E-05	7.90E-06	6.00E-06	2.90E-06	5.00E-05
Co-58	7.49E-06	<LLD	<LLD	1.94E-05	2.69E-05
Co-60	2.45E-04	3.80E-05	2.22E-05	6.56E-05	3.71E-04
Sn-113	1.86E-08	<LLD	<LLD	<LLD	1.86E-08
Cs-134	8.96E-06	<LLD	<LLD	<LLD	8.96E-06
Cs-137	2.78E-05	<LLD	<LLD	<LLD	2.78E-05
B. Tritium (Ci)	1.46E-02	1.26E-02	1.27E-02	1.27E-02	5.26E-02
C. Noble Gases (Ci)	<LLD	<LLD	<LLD	<LLD	<LLD
D. Gross Alpha (Ci)	<LLD	<LLD	4.27E-07	<LLD	4.27E-07

Appendix F
ODCM Non-Compliances

APPENDIX F

ODCM Non-Compliances

Effluent Monitoring

The Service Water Flow Monitor was out of service from 11/14/14 until 3/6/15. The delay in returning the monitor to service is due to age of the monitor (could not obtain spare parts) and need to procure a new one.

On 12/13/2015 the Liquid Radwaste to Emergency Service Water monitor was declared inoperable due to a missed quarterly channel functional test. This test should have been performed by 9/13/15. The functional test was done on 12/18/15 and the monitor was returned to service. No liquid radwaste discharges were performed during the time frame the monitor was out of service.

Environmental Monitoring

PNPP was unable to obtain all commercially and recreationally important fish species. Per Chemistry Technical Assignment File TAF 14-001, commercially and recreationally important species are defined as yellow perch, walleye, white bass, and small mouth bass. Using gill nets, the fish obtained in June at the PNPP discharge were catfish, walleye, fresh water drum, and small mouth bass. The control samples were white perch, walleye, fresh water drum, and small mouth bass. In September only White Bass and Walleye were obtained at the PNPP discharge and Walleye, Tiger Musky, White Bass and Channel Catfish were obtained at the Control location.

On 2/19/15 environmental air samples at locations #3 and #35 were not obtained due to extreme weather conditions and snow depth. These samples continued to run and were changed out the following week.

On 10/7/15, the environmental air sample at location #4 displayed a lower than expected volume due to controller box failure. Pump was running. The average volume from previous four weeks were used for sample volume. Controller box was replaced.

On 10/15/15 the environmental air sample at location #5 was not obtained due to turbine failure and pump stopping. Turbine was replaced and sampler was returned to service.

On 11/18/15 environmental air samples at locations #3 and #5 were found with low volume due to power loss. When power had returned the pumps failed to restart. The I-131 LLD was achieved.

On 12/2/15 environmental air sample at location #3 were found with low volume due to a power loss. When power had returned the pump failed to restart. Vendor was contacted and PNPP was informed that there was a flaw in some circuit boards which prevented restart when power returned. Circuit boards at locations 3 and 5 were replaced. The I-131 LLD was not achieved.

From January through March 2015, water samples were not obtained at locations #59 and #60 due to the lake being frozen.

Appendix G
ODCM Changes

APPENDIX G
ODCM Changes

There were no changes to the ODCM during this reporting period.

Appendix H
Changes to Process Control Program

APPENDIX H

Process Control Program Changes

Revision 13 to the Process Control Program was issued on 5/27/15. The changes were:

1. Section 3.5 was revised to reflect increased storage capacity inside the Radwaste Storage Area. Newly designed stackable, reusable liners and an engineering evaluation (EER 600663802) which allows liners to be stacked 2 high, increased the storage capacity to 42 total liners with all other materials removed from the area, providing the combined weight of the stacked liners does not exceed 20,625 lbs.

2. Updated PCP Radwaste Process Flow Charts to present a professional appearance.

3. Change topical report reference from OM-42-WS to OM-34-WS

4. Change topical report owner from Vectra Dewatering System to reflect new ownership of Nuclear Packaging Inc.

5. Section 3.5 was revised to reflect the new usage of the WARF/RISB building which agrees with RPI-1301.

6. Section 2.0 added the use of upper fuel pool temporary demineralizers during outages which produce another waste stream and another source of bead resin.

7. Minor grammatical corrections.

8. Changed person to approve procedure to Director of Site Operation.

9. Added term "re-usable liner" wherever the word HIC is located.

10. Changed Appendix A – 1.30 title to MODE/OPERATIONAL CONDITION

11. Appendix A, Item 1-34 added that Perry does not perform solidification of waste however, should this process be required in the future, it will be performed in accordance with Vendor Supplied Procedures.

12. Changed terminology from offsite burial to offsite disposal.

13. Removed definition of HIC from section 1.1.

14. Incorporated new DCS computer system lockout feature for isolating the inlet valve in section 3.1

These changes did not reduce the overall conformance of solidified waste to existing criteria for solid radwastes. The changes to the Process Control Program were reviewed by the Plant Operations Review Committee and found acceptable.

Enclosure B
L-16-151
Corrections to the 2014 PNPP Annual Environmental and Effluent Release Report

METEOROLOGICAL DATA

The Meteorological Monitoring System at PNPP consists of a 60-meter tower equipped with two independent systems for measuring wind speed, wind direction, and temperature at both 10-meter and 60-meter heights. The tower also has instrumentation to measure dew point and barometric pressure. Data is logged from the tower through separate data loggers, and transmitted to a common plant computer. This system compiles the data and calculates a variety of atmospheric parameters, communicates with the Meteorological Information Dose Assessment System (MIDAS), and sends data over communication links to the plant Control Room.

A detailed report of the monthly and annual operation of the PNPP Meteorological Monitoring Program is produced under separate cover. For the period of January 1, 2014 through December 31, 2014, the report substantiates the quality and quantity of meteorological data collected in accordance with applicable regulatory guidance.

From 9/25/14 to 12/9/14 meteorological data could not be transferred to a plant computer for routine effluent dose calculations due to equipment failure. During this time frame default meteorological data was used. Had there been an emergency, however, real-time data was available for dose calculations.

DOSE ASSESSMENT

The maximum concentration for any radioactive release is controlled by the limits set forth in Title 10 of the Code of Federal Regulations, Part 20 (10CFR20). Sampling, analyzing, processing, and monitoring the effluent stream ensures compliance with these concentration limits. Dose limit compliance is verified through periodic dose assessment calculations. Some dose calculations are conservatively performed for a hypothetical individual who is assumed to reside on the site boundary at the highest potential dose location all year. This person, called the "maximum individual", would incur the maximum potential dose from direct exposure (air plus ground plus water), inhalation, and ingestion of water, milk, vegetation, and fish. Because no one actually meets these criteria, the actual dose received by a real member of the public is significantly less than what is calculated for this hypothetical individual.

Dose calculations for this maximum individual at the site boundary are performed for two cases. First, they are performed using data for a 360 degree radius around the plant site (land and water based meteorological sectors); even though some of these sectors are over Lake Erie, which has no permanent residents. The second calculation is performed considering only those sectors around the plant in which people reside (land-based meteorological sectors).

The calculated hypothetical, maximum individual dose values at the site boundary are provided in Table 7. This table considers all meteorological sectors around PNPP and provides either the whole body or worst-case, organ dose values.

Table 7: Maximum Individual Site Boundary Dose, Considering All Sectors

Type of Dose	Organ	Estimated Dose, (mrem)	Limit	% of Limit
Liquid Effluent	Whole body	9.00E-04	3.0E+00	3.0E-02
	Liver	1.03E-03	1.0E+01	1.0E-02
Noble Gas	Air Dose Gamma – mrad	2.13E-02	1.0E+01	2.1E-01
	Air Dose Beta – mrad	3.10E-02	2.0E+01	1.6E-01
Noble Gas	Whole body	1.70E-02	5.0E+00	3.4E-01
	Skin	3.52E-02	1.5E+01	2.3E-01
Particulate & Iodine	Thyroid	5.47E-03	1.5E+01	3.6E-02

The calculated hypothetical, maximum 50-mile radius population dose values at the site boundary are provided in Table 8. This table considers all meteorological sectors around PNPP and provides either the whole body or worst-case, organ dose values.

Table 8: Population Dose, Considering All Sectors out to 50 miles.

	Organ	Estimated Dose (person-rem)
Liquid Effluent	Whole body	1.5E-01
	Thyroid	1.3E-01
Gaseous Effluent	Whole body	1.9E-03
	Thyroid	2.5E-03

APPENDIX E

Abnormal Releases

In November 2011, radioactivity was detected in the Nuclear Closed Cooling (NCC) system. The source of this activity is the Primary Coolant. There is some leakage from the NCC system to Service Water and from there to the environment. The activity released from NCC has been included in the total radioactivity released. Feed and bleed evolutions have occurred throughout the year to reduce the radioactive concentration in NCC and thus reduced the activity released to the environment.

A feedwater venturi leak occurred in January of 2014. Tritium activity was detected in underdrain manholes. Underdrain flows to the Emergency Service Water basin and from there to the environment. The activity was tracked as an abnormal release. Only tritium activity was detected. The leakage to the underdrain system from the venturi leakage stopped in May 2014.

The calculated annual doses for the combined abnormal releases were 1.72E-04 mrem whole body and 3.83E-04 mrem organ.

2014	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual
A. Fission and Activation Products (Ci)					
Na-24	<LLD	<LLD	1.97E-04	<LLD	1.97E-04
Cr-51	<LLD	<LLD	3.96E-04	4.32E-05	4.39E-04
Mn-54	3.34E-07	<LLD	1.50E-04	1.03E-04	2.53E-04
Mn-56	<LLD	<LLD	6.28E-05	<LLD	6.28E-05
Co-58	<LLD	<LLD	6.96E-05	5.54E-05	1.25E-04
Fe-59	<LLD	<LLD	6.35E-05	1.90E-06	6.54E-05
Co-60	6.68E-04	7.44E-05	6.56E-04	5.40E-04	1.94E-03
Zn-65	<LLD	<LLD	2.90E-05	9.79E-06	3.88E-05
Zn-69m	<LLD	<LLD	2.83E-05	<LLD	2.83E-05
Sr-91	<LLD	<LLD	1.08E-05	<LLD	1.08E-05
Y-91m	<LLD	<LLD	1.59E-05	<LLD	1.59E-05
Sr-92	<LLD	<LLD	1.20E-05	<LLD	1.20E-05
Nb-95	<LLD	<LLD	9.74E-06	2.70E-06	1.24E-05
Zr-95	<LLD	<LLD	4.26E-06	7.41E-07	5.00E-06
Tc-99m	<LLD	<LLD	3.91E-06	<LLD	3.91E-06
Ag-110m	<LLD	<LLD	<LLD	2.46E-07	2.46E-07
I-133	<LLD	<LLD	8.39E-07	<LLD	8.39E-07
Cs-134	1.25E-06	2.19E-06	<LLD	<LLD	3.43E-06
Cs-137	2.84E-06	1.09E-05	2.47E-07	<LLD	1.40E-05

2014	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual
Au-199	<LLD	<LLD	6.55E-05	<LLD	6.55E-05
B. Tritium (Ci)	2.12E-02	4.01E-02	2.45E-02	4.29E-03	9.00E-02
C. Noble Gases (Ci)					
Ar-41	<LLD	<LLD	1.76E-06	<LLD	1.76E-06
Xe-133	<LLD	<LLD	4.21E-07	<LLD	4.21E-07
Xe-135	<LLD	<LLD	3.35E-06	<LLD	3.35E-06
D. Gross Alpha (Ci)	1.03E-05	<LLD	<LLD	<LLD	1.03E-05