

State of Wisconsin

2010

Point Beach - Kewaunee

Environmental Radioactivity Survey

**Wisconsin Department of Health Services
Division of Public Health
Bureau of Environmental and Occupational Health
Radiation Protection Section
P.O. Box 2659
Madison, Wisconsin 53701**

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State of Wisconsin DHS

2010

Point Beach - Kewaunee Environmental Radioactivity Survey

Introduction

Wisconsin Public Health Statutes 254.41 mandates the Department of Health Services to conduct environmental radiation monitoring around the nuclear power facilities that impact Wisconsin. This environmental monitoring report is for the Point Beach and Kewaunee nuclear generating plants for the calendar year January - December, 2010 and provides a description and results of this environmental monitoring program.

WI DHS Point Beach - Kewaunee Environmental Monitoring Sampling Program

The WI DHS environmental monitoring program consists of the collection of various types of samples from the air, water and terrestrial exposure pathways. The sampling program included samples of air, precipitation, ambient gamma radiation (TLD), surface water, fish, shoreline sediment, soil, milk, well water and vegetation that are collected from selected locations at planned sampling intervals.

Table 1 provides a listing of types of samples collected, collection frequency, sites where samples are collected, the number of samples collected, number of samples that were missed or had sample or analysis deviations and a listing of the required analyses. Table 2 is a listing of sampling sites and includes a description, direction and distance from the monitored power plants. Table 3 provides an explanation of missing samples or non-routine sample analyses. Figure 1 is a map showing the location of environmental sampling sites in relation to the Kewaunee plant and Figure 2 is a map showing the location of environmental sampling sites in relation to the Point Beach plant.

Program Modifications

There were no program modifications for 2010.

Laboratory Services and Quality Assurance

The analysis of the samples is performed under contract with the Wisconsin State Laboratory of Hygiene (WSLH). WSLH maintains a quality assurance program. Analytical procedures provide for routine replicate analyses to verify methods and instrument operation. Traceable sources are used to regularly calibrate the counters and daily performance checks are made between calibrations. In addition, quality control charts are maintained on the counters.

WSLH participates in the Environmental Resource Associates' Proficiency Testing program and has performed satisfactorily over the report period. Proficiency testing results are available from the Wisconsin State Laboratory of Hygiene.

Detection Limits

Detection limits, required by WI DHS, will be expressed as a lower limit of detection (LLD). The required WI DHS LLD as indicated in Table 4 under the heading "LLD" is an "a priori" estimate of the capability for detecting an activity concentration by a given measurement system, procedure, and type of sample. Counting statistics of the appropriate instrument background are used to compute the LLD for each specific analysis. Using 4.66 times the standard deviation (s_b) of the instrument background, the LLD for each specific analysis is defined at the 95% Confidence Level.

The LLD for each radioisotope listed in Table 4 has been calculated from the following equation:

$$LLD = \frac{4.66 s_b}{E * V * 2.22 * Y * S * \exp(-dt)}$$

Where:

LLD	is the "a priori" lower limit of detection as defined above, as picocuries per unit mass or volume,
s_b	is the standard deviation of the background counting rate or of the counting rate of blank sample as appropriate, as counts per minute,
E	is the counting efficiency, as counts per disintegration,
V	is the sample size in units of mass or volume,
2.22	is the number of disintegrations per minute per picocurie,
Y	is the fractional radiochemical yield, when applicable,
S	is the self-absorption correction factor,
d	is the radioactive decay constant for the particular radionuclide, and
t	for environmental samples is the elapsed time between sample collection, or end of the sample collection period, and time of counting.

Typical values for E, V, Y and dt have been used to calculate the LLD.

Reporting of Sample Analysis Results

Results for specific analyses will be reported as either a "less than" (<) value or an actual activity value. The reporting of results in Table 4 under the heading "Range" and in Tables 5-15 are "a posteriori" calculations based on the actual analysis performed using the actual sample values for E, V, Y and dt. Typically the reported "less than" (<) results are lower than the required WI DHS LLD indicating that the required WI DHS LLD has been met.

An actual activity value will be accompanied by an uncertainty term for that analysis. The uncertainty term is a plus or minus counting uncertainty term at the 2 sigma (95%) confidence interval and is printed as (+- or ±). Examples and explanations of data reporting are:

<u>Example</u>	<u>Nuclide</u>	<u>Activity reported</u>
1	^{137}Cs	< 10 pCi/liter
2	^{137}Cs	15 ± 3 pCi/liter

In example 1 we can be 95% confident that the sample activity, if any, is less than the LLD of 10 pCi/liter. In example 2 we can be 95% confident that the actual sample activity is greater than the LLD for that analysis and is between 12 and 18 pCi/liter.

Table 1. Sample collection summary and required analyses for 2010.

Sample Type	Collection and Frequency	Site locations	Number of Samples Collected	Number of Sample Deviations	Required Analyses
air particulate	C/W	1, 4, 7, 8, 17, 18	310	5	GA, GB, GI
air iodine	C/W	4, 17, 18	155	2	GI
precipitation	C/BW	1, 4	12	0	GB, H
TLD	G/Q	T1 – T31	124	0	ambient gamma
surface water	G/M	9, 12a, 17	35	1	GA, GB, GI, Sr, H, I
surface water	G/SA	5, 25	4	0	GA, GB, GI, Sr, H
fish	G/SA	10a	7	0	GI
shoreline sediment	G/A	5, 10a, 12a, 12b, 12c, 25, 26	7	0	GA, GB, GI
vegetation	G/SA	1, 2, 3, 4, 5, 7, 8, 14, 17, 25	20	0	GA, GB, GI
soil	G/SA	1, 2, 3, 4, 5, 7, 8, 14, 17, 25	20	0	GA, GB, GI
well water	G/SA	3, 10b, 11, 12d (2 sites)	10	0	GA, GB, H
milk	G/M	24, 27, 28	36	0	GI, I, Sr

Collection type: C/ = continuous; G/ = grab

Frequency: /W = weekly; /M = monthly; /Q = quarterly; /A = annually; /BW = bi-weekly; /SA = semi-annually

Required analyses: GA = gross alpha; GB = gross beta; GI = gamma isotopic; Sr = strontium; I = iodine; H = tritium

Table 2. WI DHS Point Beach - Kewaunee environmental monitoring sampling sites.

Sample site	Distance and direction (miles)		Location description
	Kewaunee	Point Beach	
PBK-1	5.7 WSW	5.7 WNW	Françar residence
PBK-2	4.9 S	0.7 SSW	Southwest corner property line - Point Beach
PBK-3	4.3 SSW	1.5 W	Two Creeks Town Hall
PBK-4	3.1 S	1.2 NNW	Residence north property line - Point Beach
PBK-5	2.6 S	1.7 NNW	Two Creeks Park; NW corner of property
PBK-6	9.2 S	5.1 SSE	Coast Guard station (discontinued August, 2002)
PBK-7	7.3 SSW	3.3 SSW	WPSC substation, Cty V
PBK-8	0.8 WNW	4.9 N	P Ihlenfeldt farm
PBK-9	4.7 S	0.5 SSE	Point Beach, meteorological tower
PBK-10a	4.2 S	0.1 E	Point Beach, effluent channel
PBK-10b	4.2 S	0.1 E	Point Beach, entrance
PBK-11	3.1 SSW	2.0 NW	Two Creeks International Harvester
PBK-12a	0.1 E	4.2 N	Kewaunee, effluent channel
PBK-12b	0.1 E	4.2 N	Kewaunee, effluent channel, 500 feet N
PBK-12c	0.1 E	4.2 N	Kewaunee, effluent channel, 500 feet S
PBK-12d	0.1 W	4.2 N	Kewaunee, well sites
PBK-14	0.8 W	4.3 N	Nuclear Road – field east of parking lot

Table 2. WI DHS Point Beach - Kewaunee environmental monitoring sampling sites.

Sample site	Distance and direction (miles)		Location description
	Kewaunee	Point Beach	
PBK-15	1.7 SW	3.5 NNW	Jct of Cty BB and Woodside Road (discontinued July, 1996)
PBK-16	3.9 W	6.0 NW	Bruechert residence (discontinued July, 1996)
PBK-17	11.4 NNE	15.6 N	Green Bay Pumping Station - Rostok
PBK-18	0.1 S	4.1 N	Kewaunee, meteorological tower
PBK-19	6.2 SW	3.8 W	W. Funk farm (discontinued in January 2009)
PBK-20	3.2 SSW	2.2 NW	L. Engelbrecht farm (discontinued in September, 2003)
PBK-21	3.0 N	7.3 N	D. Stangel farm (left the dairy business in October, 1999)
PBK-22	10.4 SSW	6.7 SW	Bertler's food stand (discontinued in July, 1998)
PBK-23	4.0 WNW	6.4 NW	Jansky farm (discontinued in July, 1998)
PBK-24	2.6 N	6.9 N	L. Struck farm
PBK-25	7.4 S	3.2 SSE	Manitowoc Public School District Property
PBK-26	8.3 NNE	12.6 N	Kewaunee
PBK-27	3.5 SSW	1.7 NW	R. Barta farm
PBK-28	6.0 S	1.8 SSE	Strutz Farms Inc
PBK-(T1-T8)	4.0 S	0.6 NW	Point Beach ISFSI on outside of perimeter fence
PBK-T9	3.2 S	1.2 NNW	Point Beach north property line, Lakeshore Road
PBK-T10	5.1 S	0.8 SSE	Nuclear Road, 0.6 mile E of Lakeshore Road
PBK-T11	5.1 S	0.9 SSW	Nuclear Road, 0.1 mile E of Lakeshore Road
PBK-T12	5.0 SSW	1.4 WSW	Highway 42, 0.6 mile N of Nuclear Road
PBK-T13	4.0 SSW	1.4 WNW	Highway 42, 0.3 mile N of Tapawingo Road
PBK-T14	3.1 SSW	1.9 NW	Two Creeks Road, 0.1 mile E of Highway 42
PBK-T15	7.6 S	3.3 S	Junction of Lakeshore Road and Ravine Drive
PBK-T16	7.3 SSW	3.3 SW	Cty V, 0.5 mile W of Hwy 42
PBK-T17	5.6 SW	3.8 W	Junction of Saxonbury Road and Tapawingo Road
PBK-T18	3.2 SW	3.3 NW	Zander Road, 0.1 mile W on Tannery Road
PBK-T19	0.7 N	5.0 N	Junction of Sandy Bay Road and Lakeview Road
PBK-T20	1.4 SW	3.4 NNW	Junction of Cty BB and Ratajcsak Lane
PBK-T21	1.3 W	4.5 NNW	Junction of Nuclear Road and Woodside Road
PBK-T22	1.2 NW	5.3 N	Sandy Bay Road, 0.4 mile W of Hwy 42
PBK-T23	4.9 WSW	5.5 NW	Cty B, S of Tisch Mills
PBK-T24	3.8 NW	7.0 NNW	Jct of Norman Road and Cty G
PBK-T25	3.1 NNW	7.2 N	Woodside Road, 0.2 miles S of Old Settlers Road
PBK-T26	3.0 N	7.3 N	Old Settlers Road, 0.1 mile W of Cemetery Road
PBK-T27	17.4 NNE	21.6 NNE	Algoma, S on Hwy 42
PBK-T28	7.2 NNE	11.4 N	Kewaunee, S on Hwy 42
PBK-T29	12.4 S	8.1 SSW	Two Rivers, junction of Hwy 42 and 34th Avenue
PBK-T30	16.0 SSW	11.9 SSW	Manitowoc, Hwy 42, Two Rivers Chamber of Commerce
PBK-T31	8.6 SW	5.6 WSW	Mishicot, Cty V, in front of house #653

Table 3. Missing sample or sample deviation report for 2010.

Sample type	Date	Site	Explanation
air particulate	03/31/10	1	No gross beta data due to power interruption.
air particulate	06/09/10	1	No gross beta data is available as the sample was not received at the WSLH.
air particulate	03/10/10	4	Due to an electrical problem, the air site was not operational for approximately 17 hours at the end of the collection period.
air particulate	03/16/10	4	No gross beta and air iodine data was available. Due to an electrical problem, the air site was not operational for the indicated collection period.
air particulate	06/09/10	7	No gross beta data is available as the sample was not received at the WSLH.
air iodine	03/10/10	4	Due to an electrical problem, the air site was not operational for approximately 17 hours at the end of the collection period.
air iodine	03/16/10	4	No gross beta and air iodine data was available. Due to an electrical problem, the air site was not operational for the indicated collection period.
surface water	December	9	Due to safety concerns, a sample for December was not collected.

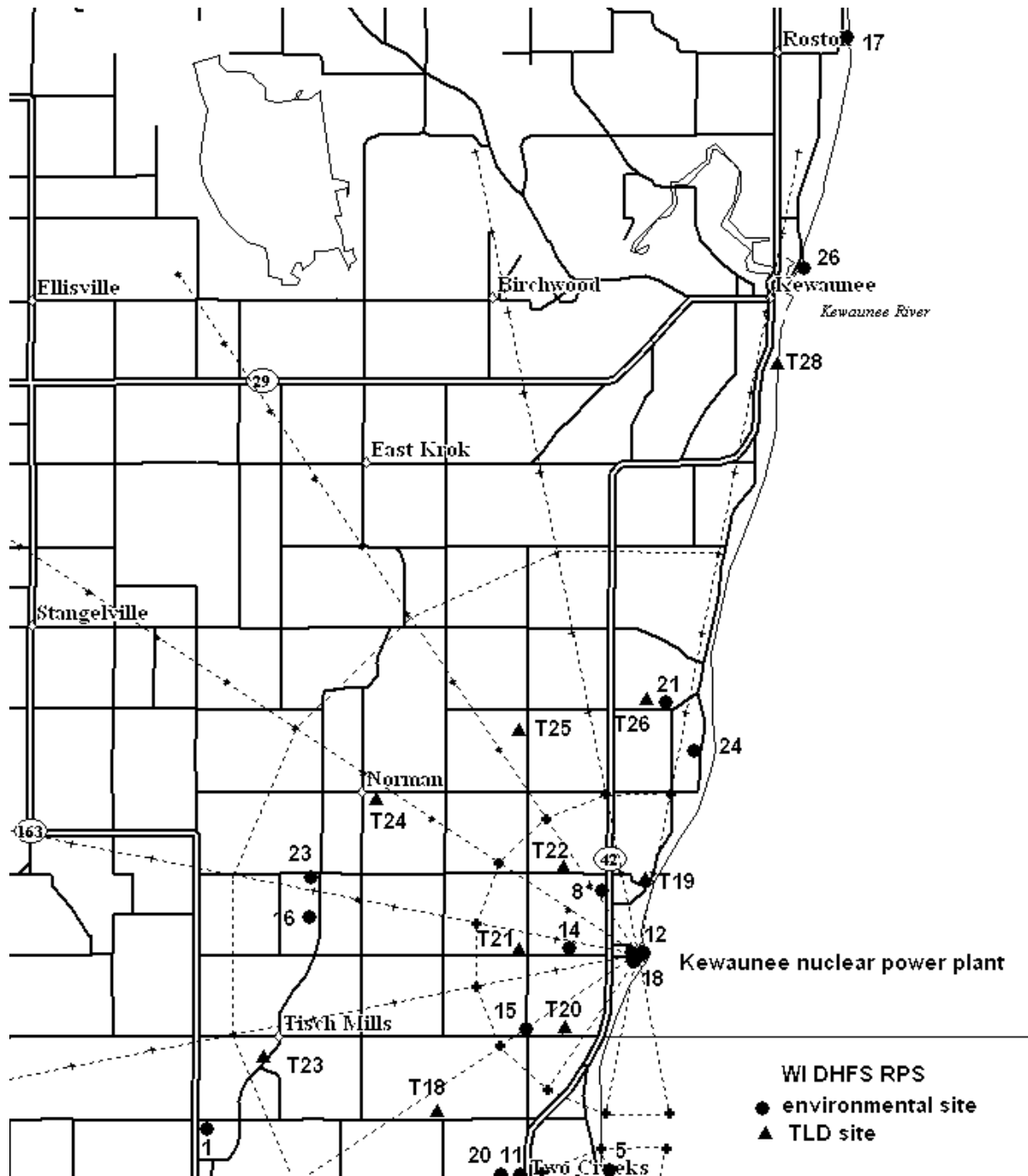


Figure 1. Point Beach - Kewaunee environmental monitoring sampling sites in relation to the Kewaunee plant.

Results and Discussion

Air Particulate

A summary of reported activities by WI DHS for air particulate samples is included in Table 4. Results from the individual sample analyses are listed in Tables 5-6.

From the gross beta activities listed in Table 5, it may be noted that there are no significant differences due to distance from either the Kewaunee or the Point Beach facility. With no significant differences due to distance, an increase in gross beta activity attributable to the Kewaunee or the Point Beach facilities is not evident.

The gamma isotopic analysis of the quarterly air particulate filter composites detected only small amounts of the radioisotopes listed in Table 4. All other radioisotopes were below their respective LLD. Beryllium-7 (^7Be), detected in all composites, is a naturally occurring radioisotope that is constantly produced through nuclear reactions between cosmic rays and nuclei in the atmosphere and is detected in air composites from other areas of the state.

Influence by the Kewaunee or the Point Beach nuclear facility on air quality is not evident from air particulate analysis.

Air Iodine

A summary of reported activities by WI DHS for air iodine samples is included in Table 4. Results from the individual sample analyses are listed in Table 5.

Air iodine measurements were all below the LLD of 0.07 pCi/m^3 .

Ambient Gamma Radiation (TLD)

A summary of reported activities by WI DHS for direct radiation is included in Table 4. Results from the individual sample analyses are listed in Table 7.

Significant differences in exposure were not noticed at different distances from either the Kewaunee or the Point Beach nuclear facilities for sites PBK-T9 through PBK-T31. Excluding the sites around the perimeter of the Point Beach ISFSI (T1 – T8), the average quarterly exposure from the remaining 23 sites was 13.5 ± 1.5 milliroentgens. The average quarterly exposure for 2010 is at background levels and is comparable to other areas within Wisconsin.

Precipitation

A summary of reported activities by WI DHS for precipitation samples is included in Table 4. Results from the individual sample analyses are listed in Table 8.

The gross beta activity in precipitation was within the normal range of activity when compared to previous year's data.

Fish

A summary of reported activities by WI DHS for fish samples is included in Table 4. Results from the individual sample analyses are listed in Table 9.

The fish samples showed no unusual activities. The reported activities for cesium-137 (^{137}Cs) were also detected in previous years and are probably attributable to residual fallout from previous atmospheric nuclear weapons testing.

Shoreline Sediment

A summary of reported activities by WI DHS for shoreline sediment samples is included in Table 4. Results from the individual sample analyses are listed in Table 10.

Analysis of the shoreline samples showed no unusual activities. Naturally occurring potassium-40 (^{40}K) was detected in all samples. The reported activities for cesium-137 (^{137}Cs) were also detected in previous years and are probably attributable to residual fallout from previous atmospheric nuclear weapons testing. Naturally occurring radioisotopes such as radium-226 (^{226}Ra), bismuth-214 (^{214}Bi), lead-214 (^{214}Pb), actinium-228 (^{228}Ac), bismuth-212 (^{212}Bi), lead-212 (^{212}Pb) from the naturally occurring uranium-238 (^{238}U) and thorium-232 (^{232}Th) decay series are commonly detected but have not been quantified or reported.

Surface Water

A summary of reported activities by WI DHS for surface water samples is included in Table 4. Results from the individual sample analyses are listed in Table 11.

From the gamma isotopic analysis all radioisotopes were below their respective LLD. All reported activities for gross beta; gross alpha and tritium (^3H) are at background levels and are comparable to data from previous years. The surface water samples uniformly show activities well below state or federal standards.

Well Water

A summary of reported activities by WI DHS for well water samples is included in Table 4. Results from the individual sample analyses are listed in Table 12.

The well water samples showed no unusual gross alpha and gross beta activities and all activities for tritium (^3H) were less than its LLD. The measured activities are all below state and federal standards.

Milk

A summary of reported activities by WI DHS for milk samples is included in Table 4. Results from the individual sample analyses are listed in Table 13.

The analysis of milk samples detected no unusual activities. Naturally occurring potassium-40 (^{40}K) was detected in all samples. The detected activities for strontium-90 (^{90}Sr), attributable to residual fallout from previous atmospheric nuclear weapons testing, were also detected in previous years at similar activity levels.

Influence by the Kewaunee or Point Beach facilities is not evident in milk samples.

Vegetation

A summary of reported activities by WI DHS for vegetation samples is included in Table 4. Results from the individual sample analyses are listed in Table 14.

Analysis of the vegetation samples showed no unusual activities. The gamma isotopic analysis detected only small amounts of naturally occurring potassium-40 (^{40}K) and beryllium-7 (^7Be) listed in Table 4.

Influence by the Kewaunee or Point Beach facilities in vegetation samples is not evident.

Soil

A summary of reported activities by WI DHS for soil samples is included in Table 4. Results from the individual sample analyses are listed in Table 15.

Analysis of the soil samples showed no unusual activities. Naturally occurring potassium-40 (^{40}K) was detected in all samples. The reported activities for cesium-137 (^{137}Cs) were also detected in previous years and are probably attributable to residual fallout from previous atmospheric nuclear weapons testing. Naturally occurring radioisotopes such as radium-226 (^{226}Ra), bismuth-214 (^{214}Bi), lead-214 (^{214}Pb), actinium-228 (^{228}Ac), bismuth-212 (^{212}Bi), lead-212 (^{212}Pb) from the naturally occurring uranium-238 (^{238}U) and thorium-232 (^{232}Th) decay series are commonly detected but have not been quantified or reported.

Point Beach ISFSI

A summary of reported activities by WI DHS for ambient gamma radiation monitored in the vicinity of the Point Beach Independent Spent Fuel Storage Installation (ISFSI) is included in Table 7.

Ambient gamma exposure levels greater than background, as measured by thermoluminescent dosimeters (TLDs), are apparent at all sites (T1 – T8) that are on the Point Beach ISFSI perimeter fence closest to the ventilated storage casks. An increase in ambient gamma exposure levels at sites T9 - T14 (0.8 – 1.9 miles from the Point Beach ISFSI) or at sites T15 – T31 (greater than 2 miles from the Point Beach ISFSI) was not evident and the ambient gamma exposure levels are consistent with previous years data. The average standard quarterly ambient gamma exposure for 2010 for sites T9 – T31 was 13.5 ± 1.5 milliroentgens and for sites T1 – T8 varied from 19.5 – 67.7 milliroentgens per standard quarter depending on the distance from the storage casks.

Dose to an Average Individual

Federal regulations 10 CFR 20, 10 CFR 50 Appendix I and 40 CFR 190 restrict the annual exposure of the population from all parts of the nuclear fuel cycle, including nuclear power plants. Doses resulting from gaseous and liquid effluent releases from the Point Beach or Kewaunee nuclear generating facilities are less than the limits as stated in these Federal regulations.

The WI DHS limit for permissible levels of radiation exposure from external sources in unrestricted areas is defined in the Wis. Adm. Code section HFS 157.23. Doses resulting from gaseous and liquid effluent releases from the Point Beach or Kewaunee nuclear generating facilities are less than the limits as stated in Wis. Adm. Code section HFS 157.23.

References

State of Wisconsin, Wisconsin Administrative Code, HFS 157.23

State of Wisconsin, "FINAL ENVIRONMENTAL IMPACT STATEMENT, Point Beach Nuclear Power Plant Plant Projects Proposed by Wisconsin Electric Power Company, Temporary Storage of Spent Nuclear Fuel in Dry Casks, PSC Docket 6630-CE-197, Unit 2 Steam Generator Replacement, PSC Docket 6630-CE-209, AUGUST 1994".

U.S. Environmental Protection Agency, Environmental Radiation Requirements for Normal Operations of Activities in the Uranium Fuel Cycle, EPA 520/4-76-016, 40 CFR Part 190, November 1976.

U.S. Nuclear Regulatory Commission, Title 10, Part 20.

U.S. Nuclear Regulatory Commission, Title 10, Part 50, Appendix I.

Table 4. Sample activity summary for the Point Beach - Kewaunee environmental monitoring program.

Sample type (units)	LLD	Number of samples ^a	Analysis	Range
air particulate (pCi/m ³)	0.005	310 / 310	gross beta gamma isotopic	0.008 - 0.049
	0.020	24 / 24	Be-7	0.051 – 0.176
	0.002	24 / 0	Mn-54	< 0.0007
	0.002	24 / 0	Co-58	< 0.0007
	0.005	24 / 0	Fe-59	< 0.0015
	0.002	24 / 0	Co-60	< 0.0009
	0.005	24 / 0	Zn-65	< 0.0015
	0.002	24 / 0	Nb-95	< 0.0008
	0.005	24 / 0	Zr-95	< 0.0012
	0.002	24 / 0	Ru-103	< 0.0006
	0.015	24 / 0	Ru-106	< 0.0047
	0.020	24 / 0	I-131	< 0.0029
	0.002	24 / 0	Cs-134	< 0.0007
	0.002	24 / 0	Cs-137	< 0.0006
	0.030	24 / 0	Ba-140	< 0.0050
	0.020	24 / 0	La-140	< 0.0020
	0.002	24 / 0	Ce-141	< 0.0011
0.005	24 / 0	Ce-144	< 0.0031	
air iodine (pCi/m ³)	0.07	155 / 0	I-131	< 0.041
surface water (pCi/liter)	3.0	39 / 24	gross beta (sol)	< 2.4 – 3.7
	3.0	39 / 3	gross beta (insol)	< 3.3 – 3.7
	3.0	39 / 2	gross alpha (sol)	< 2.5 – 2.3
	3.0	39 / 6	gross alpha (insol)	< 2.5 – 4.2
	300	16 / 0	H-3	< 210
	1.5	20 / 0	I-131	< 0.5
	2.0	16 / 0	Sr-89	< 1.7
	1.0	16 / 3	Sr-90	< 0.4 – 0.3
			gamma isotopic	
	15	39 / 0	Mn-54	< 10
	15	39 / 0	Co-58	< 11
	30	39 / 0	Fe-59	< 19
	15	39 / 0	Co-60	< 12
	30	39 / 0	Zn-65	< 24
	15	39 / 0	Nb-95	< 11
	30	39 / 0	Zr-95	< 19
	15	39 / 0	I-131	< 15
	15	39 / 0	Cs-134	< 12
	15	39 / 0	Cs-137	< 12
60	39 / 0	Ba-140	< 44	
15	39 / 0	La-140	< 15	

Table 4. Sample activity summary for the Point Beach - Kewaunee environmental monitoring program.

Sample type (units)	LLD	Number of samples ^a	Analysis	Range
fish (pCi/kg wet)	800	7 / 7	gamma isotopic K-40	1530 – 3610
	50	7 / 0	Mn-54	< 13
	60	7 / 0	Co-58	< 14
	130	7 / 0	Fe-59	< 27
	70	7 / 0	Co-60	< 15
	130	7 / 0	Zn-65	< 28
	50	7 / 0	Nb-95	< 13
	100	7 / 0	Zr-95	< 20
	50	7 / 0	Cs-134	< 13
	60	7 / 5	Cs-137	< 14 - 93
shoreline sediment (pCi/kg dry)	6000	7 / 7	gross beta	6870 - 15800
	15000	7 / 0	gross alpha	< 11200
			gamma isotopic K-40	4430 – 9090
	800	7 / 7		
	60	7 / 0	Mn-54	< 19
	90	7 / 0	Co-58	< 16
	600	7 / 0	Fe-59	< 35
	90	7 / 0	Co-60	< 20
	300	7 / 0	Zn-65	< 38
	100	7 / 0	Nb-95	< 19
	200	7 / 0	Zr-95	< 34
	80	7 / 0	Cs-134	< 17
	80	7 / 3	Cs-137	< 26 – 31
vegetation (pCi/kg wet)	6000	20 / 0	gross alpha	< 5630
	4000	20 / 20	gross beta	4770 - 11300
			gamma isotopic Be-7	< 300 – 3590
	600	20 / 14		
	2000	20 / 20	K-40	3480 – 6050
	90	20 / 0	Mn-54	< 44
	100	20 / 0	Co-58	< 46
	200	20 / 0	Fe-59	< 96
	100	20 / 0	Co-60	< 54
	250	20 / 0	Zn-65	< 104
	100	20 / 0	Nb-95	< 49
	200	20 / 0	Zr-95	< 86
	80	20 / 0	I-131	< 75
	80	20 / 0	Cs-134	< 44
	90	20 / 0	Cs-137	< 54
	350	20 / 0	Ba-140	< 197
100	20 / 0	La-140	< 59	

Table 4. Sample activity summary for the Point Beach - Kewaunee environmental monitoring program.

Sample type (units)	LLD	Number of samples ^a	Analysis	Range
soil (pCi/kg dry)	6000	20 / 20	gross beta	16300 - 33900
	13000	20 / 16	gross alpha	< 11300 – 30400
			gamma isotopic	
	800	20 / 20	K-40	11700 – 22900
	60	20 / 0	Mn-54	< 35
	90	20 / 0	Co-58	< 29
	600	20 / 0	Fe-59	< 69
	90	20 / 0	Co-60	< 35
	300	20 / 0	Zn-65	< 71
	100	20 / 0	Nb-95	< 34
	250	20 / 0	Zr-95	< 55
	80	20 / 0	Cs-134	< 27
	80	20 / 20	Cs-137	111 - 620
milk (pCi/liter)	1.0	36 / 14	Sr-90	< 0.7 – 1.1
	1.5	21 / 2	I-131	< 0.5 – 0.9
			gamma isotopic	
	500	36 / 36	K-40	1000 - 1530
	15	36 / 0	Mn-54	< 14
	15	36 / 0	Co-58	< 14
	40	36 / 0	Fe-59	< 26
	15	36 / 0	Co-60	< 15
	40	36 / 0	Zn-65	< 38
	15	36 / 0	Nb-95	< 14
	40	36 / 0	Zr-95	< 22
	15	36 / 0	I-131	< 15
	15	36 / 0	Cs-134	< 14
	15	36 / 0	Cs-137	< 14
	60	36 / 0	Ba-140	< 51
15	36 / 0	La-140	< 15	
well water (pCi/liter)	3.0	10 / 4	gross beta	< 2.7 – 3.7
	5.0	10 / 4	gross alpha	< 5.5 – 14.8
	300 ^b	10 / 0	H-3	< 210
precipitation (nCi/m ²)	1.5 ^b	12 / 8	gross beta	< 0.25 – 0.52
	300 ^b	12 / 0	H-3	< 30.5
ambient radiation (mR/Std Qtr)	1.0 ^c	124 / 124	exposure	9.0 – 67.7

a - Number of analyses / number of analyses detected above the WI DHS MDC.
b - MDC activities expressed in units of pCi/liter.
c - mR/TLD

Table 5. WI DHS air particulate gross beta and air iodine (I-131) analysis results from the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/m³

Site: PBK-1

collection date	volume m ³	air particulate	collection date	volume m ³	air particulate
01/06/10	547	0.022 +- 0.002	07/07/10	498	0.017 +- 0.002
01/13/10	524	0.025 +- 0.003	07/13/10	431	0.016 +- 0.003
01/20/10	541	0.039 +- 0.003	07/21/10	568	0.015 +- 0.002
01/27/10	541	0.017 +- 0.002	07/28/10	511	0.016 +- 0.002
02/03/10	538	0.026 +- 0.003	08/04/10	488	0.021 +- 0.003
02/10/10	531	0.019 +- 0.002	08/12/10	571	0.021 +- 0.002
02/17/10	531	0.011 +- 0.002	08/18/10	428	0.020 +- 0.003
02/24/10	528	0.017 +- 0.002	08/25/10	498	0.020 +- 0.003
03/04/10	573	0.018 +- 0.002	09/01/10	508	0.024 +- 0.003
03/11/10	515	0.025 +- 0.003	09/08/10	531	0.013 +- 0.002
03/17/10	425	0.018 +- 0.003	09/15/10	504	0.009 +- 0.002
03/24/10	515	0.018 +- 0.002	09/22/10	521	0.017 +- 0.002
03/31/10 *a			09/29/10	514	0.015 +- 0.002
1st Qtr			3rd Qtr		
mean +- s.d.		0.021 +- 0.007	mean +- s.d.		0.017 +- 0.004
04/07/10	502	0.020 +- 0.003	10/06/10	518	0.012 +- 0.002
04/14/10	499	0.013 +- 0.002	10/13/10	514	0.021 +- 0.003
04/21/10	499	0.015 +- 0.002	10/21/10	597	0.016 +- 0.002
04/29/10	573	0.014 +- 0.002	10/27/10	455	0.023 +- 0.003
05/05/10	428	0.016 +- 0.003	11/03/10	531	0.012 +- 0.002
05/12/10	499	0.011 +- 0.002	11/10/10	551	0.021 +- 0.002
05/19/10	486	0.012 +- 0.002	11/17/10	524	0.028 +- 0.003
05/26/10	489	0.020 +- 0.003	11/23/10	458	0.022 +- 0.003
06/02/10	489	0.014 +- 0.002	12/01/10	607	0.021 +- 0.002
06/09/10 *b			12/08/10	544	0.015 +- 0.002
06/16/10	501	0.008 +- 0.002	12/15/10	524	0.026 +- 0.003
06/23/10	483	0.012 +- 0.002	12/21/10	455	0.027 +- 0.003
06/30/10	495	0.014 +- 0.002	12/29/10	607	0.009 +- 0.002
2nd Qtr			4th Qtr		
mean +- s.d.		0.014 +- 0.003	mean +- s.d.		0.019 +- 0.006

a - No gross beta data due to power interruption.

b - No gross beta data is available as the sample was not received at the SLH.

Table 5. WI DHS air particulate gross beta and air iodine (I-131) analysis results from the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/m³

Site: PBK-4

collection date	volume m ³	air particulate	air iodine	collection date	volume m ³	air particulate	air iodine
01/05/10	729	0.020 +- 0.002	< 0.013	07/06/10	683	0.013 +- 0.002	< 0.014
01/13/10	764	0.022 +- 0.002	< 0.016	07/14/10	663	0.015 +- 0.002	< 0.011
01/18/10	454	0.043 +- 0.003	< 0.017	07/19/10	426	0.015 +- 0.003	< 0.015
01/25/10	647	0.018 +- 0.002	< 0.013	07/26/10	594	0.015 +- 0.002	< 0.026
02/01/10	648	0.019 +- 0.002	< 0.014	08/02/10	616	0.015 +- 0.002	< 0.012
02/10/10	828	0.020 +- 0.002	< 0.013	08/11/10	784	0.023 +- 0.002	< 0.015
02/15/10	468	0.012 +- 0.002	< 0.017	08/16/10	436	0.017 +- 0.003	< 0.012
02/22/10	646	0.015 +- 0.002	< 0.014	08/23/10	622	0.018 +- 0.002	< 0.011
03/01/10	644	0.015 +- 0.002	< 0.013	08/30/10	607	0.022 +- 0.002	< 0.019
03/10/10 *a	769	0.020 +- 0.002	< 0.009	09/08/10	779	0.014 +- 0.002	< 0.012
03/16/10 *b	29			09/13/10	436	0.009 +- 0.002	< 0.016
03/22/10	537	0.017 +- 0.002	< 0.014	09/20/10	620	0.011 +- 0.002	< 0.015
03/29/10	637	0.017 +- 0.002	< 0.011	09/27/10	631	0.018 +- 0.002	< 0.010
1st Qtr				3rd Qtr			
mean +- s.d.		0.020 +- 0.008	< 0.014	mean +- s.d.		0.016 +- 0.004	< 0.014
04/05/10	627	0.019 +- 0.002	< 0.010	10/04/10	628	0.016 +- 0.002	< 0.013
04/14/10	812	0.014 +- 0.002	< 0.007	10/13/10	814	0.019 +- 0.002	< 0.009
04/19/10	448	0.014 +- 0.003	< 0.017	10/18/10	438	0.015 +- 0.003	< 0.024
04/26/10	636	0.015 +- 0.002	< 0.009	10/25/10	625	0.019 +- 0.002	< 0.018
05/03/10	633	0.012 +- 0.002	< 0.016	11/01/10	636	0.014 +- 0.002	< 0.018
05/12/10	818	0.011 +- 0.002	< 0.012	11/10/10	801	0.022 +- 0.002	< 0.007
05/17/10	441	0.008 +- 0.002	< 0.009	11/15/10	448	0.019 +- 0.003	< 0.016
05/24/10	620	0.016 +- 0.002	< 0.010	11/22/10	633	0.030 +- 0.002	< 0.024
06/01/10	666	0.014 +- 0.002	< 0.008	11/29/10	616	0.020 +- 0.002	< 0.011
06/09/10	663	0.009 +- 0.002	< 0.010	12/08/10	792	0.019 +- 0.002	< 0.013
06/14/10	427	0.010 +- 0.003	< 0.028	12/14/10	400	0.036 +- 0.004	< 0.017
06/21/10	587	0.008 +- 0.002	< 0.019	12/20/10	525	0.028 +- 0.003	< 0.026
06/28/10	585	0.015 +- 0.002	< 0.021	12/28/10	729	0.010 +- 0.002	< 0.016
2nd Qtr				4th Qtr			
mean +- s.d.		0.013 +- 0.003	< 0.014	mean +- s.d.		0.021 +- 0.007	< 0.016

*a - Due to an electrical problem, the air site was not operational for approximately 17 hours at the end of the collection period.

*b - No gross beta and air iodine data was available. Due to an electrical problem, the air site was not operational for the indicated collection period.

Table 5. WI DHS air particulate gross beta and air iodine (I-131) analysis results from the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/m³

Site: PBK-7

collection date	volume m ³	air particulate	collection date	volume m ³	air particulate
01/06/10	463	0.028 +- 0.003	07/07/10	454	0.017 +- 0.002
01/13/10	454	0.029 +- 0.003	07/13/10	388	0.016 +- 0.003
01/20/10	457	0.042 +- 0.003	07/21/10	518	0.017 +- 0.002
01/27/10	419	0.021 +- 0.003	07/28/10	449	0.016 +- 0.003
02/03/10	523	0.023 +- 0.003	08/04/10	455	0.023 +- 0.003
02/10/10	482	0.022 +- 0.003	08/12/10	520	0.021 +- 0.003
02/17/10	485	0.012 +- 0.002	08/18/10	386	0.022 +- 0.003
02/24/10	489	0.018 +- 0.003	08/25/10	442	0.019 +- 0.003
03/04/10	544	0.019 +- 0.002	09/01/10	520	0.021 +- 0.003
03/11/10	482	0.026 +- 0.003	09/08/10	610	0.010 +- 0.002
03/17/10	406	0.021 +- 0.003	09/15/10	595	0.010 +- 0.002
03/24/10	495	0.016 +- 0.002	09/22/10	602	0.011 +- 0.002
03/31/10	489	0.018 +- 0.003	09/29/10	606	0.014 +- 0.002
1st Qtr			3rd Qtr		
mean +- s.d.		0.023 +- 0.007	mean +- s.d.		0.017 +- 0.004
04/07/10	485	0.021 +- 0.003	10/06/10	609	0.011 +- 0.002
04/14/10	482	0.015 +- 0.002	10/13/10	595	0.017 +- 0.002
04/21/10	475	0.013 +- 0.002	10/21/10	692	0.017 +- 0.002
04/29/10	544	0.016 +- 0.002	10/27/10	520	0.024 +- 0.002
05/05/10	361	0.018 +- 0.003	11/03/10	476	0.011 +- 0.002
05/12/10	461	0.013 +- 0.003	11/10/10	498	0.026 +- 0.003
05/19/10	437	0.009 +- 0.002	11/17/10	484	0.031 +- 0.003
05/26/10	437	0.019 +- 0.003	11/23/10	420	0.023 +- 0.003
06/02/10	451	0.016 +- 0.003	12/01/10	560	0.021 +- 0.002
06/09/10 *a			12/08/10	508	0.014 +- 0.002
06/16/10	451	0.008 +- 0.002	12/15/10	495	0.027 +- 0.003
06/23/10	462	0.010 +- 0.003	12/21/10	428	0.029 +- 0.003
06/30/10	440	0.016 +- 0.002	12/29/10	581	0.010 +- 0.002
2nd Qtr			4th Qtr		
mean +- s.d.		0.015 +- 0.004	mean +- s.d.		0.020 +- 0.007

*a - No gross beta data is available as the sample was not received at the WSLH.

Table 5. WI DHS air particulate gross beta and air iodine (I-131) analysis results from the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/m³
 Site: PBK-8

collection date	volume m ³	air particulate	collection date	volume m ³	air particulate
01/05/10	548	0.026 +- 0.003	07/06/10	620	0.012 +- 0.002
01/12/10	552	0.025 +- 0.003	07/13/10	548	0.016 +- 0.002
01/19/10	554	0.049 +- 0.003	07/20/10	527	0.017 +- 0.002
01/26/10	538	0.021 +- 0.002	07/27/10	554	0.019 +- 0.002
02/02/10	449	0.030 +- 0.003	08/03/10	530	0.018 +- 0.002
02/08/10	487	0.024 +- 0.003	08/10/10	546	0.025 +- 0.003
02/16/10	631	0.011 +- 0.002	08/17/10	559	0.020 +- 0.002
02/23/10	575	0.016 +- 0.002	08/24/10	535	0.019 +- 0.002
03/02/10	543	0.017 +- 0.002	08/30/10	471	0.024 +- 0.003
03/09/10	578	0.022 +- 0.002	09/07/10	634	0.015 +- 0.002
03/16/10	562	0.019 +- 0.002	09/14/10	556	0.009 +- 0.002
03/23/10	570	0.017 +- 0.002	09/21/10	551	0.015 +- 0.002
03/30/10	580	0.018 +- 0.002	09/28/10	546	0.017 +- 0.002
1st Qtr			3rd Qtr		
mean +- s.d.		0.023 +- 0.009	mean +- s.d.		0.017 +- 0.004
04/05/10	500	0.020 +- 0.003	10/05/10	548	0.015 +- 0.002
04/13/10	652	0.013 +- 0.002	10/12/10	548	0.020 +- 0.002
04/20/10	567	0.015 +- 0.002	10/19/10	570	0.017 +- 0.002
04/26/10	493	0.018 +- 0.003	10/25/10	476	0.023 +- 0.003
05/04/10	642	0.015 +- 0.002	11/02/10	669	0.012 +- 0.002
05/10/10	495	0.010 +- 0.002	11/09/10	577	0.021 +- 0.002
05/18/10	660	0.010 +- 0.002	11/16/10	539	0.031 +- 0.003
05/25/10	564	0.018 +- 0.002	11/23/10	563	0.027 +- 0.003
05/31/10	469	0.016 +- 0.003	11/30/10	577	0.021 +- 0.002
06/08/10	620	0.011 +- 0.002	12/07/10	582	0.015 +- 0.002
06/15/10	535	0.009 +- 0.002	12/14/10	590	0.029 +- 0.003
06/22/10	543	0.010 +- 0.002	12/20/10	485	0.028 +- 0.003
06/28/10	453	0.016 +- 0.003	12/28/10	639	0.010 +- 0.002
2nd Qtr			4th Qtr		
mean +- s.d.		0.014 +- 0.004	mean +- s.d.		0.021 +- 0.007

Table 5. WI DHS air particulate gross beta and air iodine (I-131) analysis results from the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/m ³							
Site: PBK-17							
collection date	volume m ³	air particulate	air iodine	collection date	volume m ³	air particulate	air iodine
01/08/10	717	0.021 +- 0.002	< 0.018	07/09/10	520	0.016 +- 0.002	< 0.014
01/15/10	546	0.038 +- 0.003	< 0.019	07/16/10	526	0.014 +- 0.002	< 0.023
01/22/10	565	0.026 +- 0.003	< 0.022	07/23/10	531	0.016 +- 0.002	< 0.016
01/29/10	564	0.018 +- 0.002	< 0.033	07/30/10	528	0.014 +- 0.002	< 0.020
02/05/10	557	0.024 +- 0.003	< 0.016	08/06/10	527	0.025 +- 0.003	< 0.022
02/12/10	550	0.016 +- 0.002	< 0.019	08/13/10	526	0.018 +- 0.002	< 0.016
02/19/10	546	0.013 +- 0.002	< 0.025	08/20/10	534	0.018 +- 0.002	< 0.022
02/26/10	538	0.018 +- 0.002	< 0.023	08/27/10	528	0.018 +- 0.002	< 0.026
03/05/10	547	0.020 +- 0.002	< 0.021	09/03/10	526	0.021 +- 0.003	< 0.020
03/11/10	485	0.026 +- 0.003	< 0.022	09/10/10	537	0.011 +- 0.002	< 0.024
03/18/10	532	0.022 +- 0.003	< 0.023	09/17/10	533	0.014 +- 0.002	< 0.023
03/26/10	618	0.016 +- 0.002	< 0.008	09/24/10	534	0.016 +- 0.002	< 0.014
04/01/10	481	0.021 +- 0.003	< 0.021	10/01/10	534	0.017 +- 0.002	< 0.018
1st Qtr				3rd Qtr			
mean +- s.d.		0.021 +- 0.006	< 0.021	mean +- s.d.		0.017 +- 0.004	< 0.020
04/09/10	609	0.017 +- 0.002	< 0.015	10/08/10	542	0.015 +- 0.002	< 0.019
04/16/10	541	0.018 +- 0.002	< 0.022	10/15/10	533	0.017 +- 0.002	< 0.023
04/23/10	542	0.009 +- 0.002	< 0.017	10/22/10	546	0.016 +- 0.002	< 0.026
04/29/10	471	0.016 +- 0.003	< 0.020	10/29/10	537	0.021 +- 0.002	< 0.014
05/07/10	610	0.012 +- 0.002	< 0.023	11/05/10	542	0.012 +- 0.002	< 0.016
05/13/10	478	0.013 +- 0.002	< 0.020	11/11/10	603	0.021 +- 0.002	< 0.020
05/21/10	611	0.011 +- 0.002	< 0.017	11/19/10	612	0.026 +- 0.002	< 0.027
05/28/10	529	0.014 +- 0.002	< 0.017	11/24/10	409	0.020 +- 0.003	< 0.038
06/04/10	528	0.011 +- 0.002	< 0.029	12/03/10	701	0.022 +- 0.002	< 0.017
06/11/10	530	0.008 +- 0.002	< 0.026	12/10/10	559	0.016 +- 0.002	< 0.021
06/18/10	528	0.008 +- 0.002	< 0.027	12/17/10	570	0.026 +- 0.003	< 0.020
06/25/10	528	0.014 +- 0.002	< 0.019	12/22/10	400	0.027 +- 0.003	< 0.041
07/02/10	536	0.010 +- 0.003	< 0.018	12/29/10	555	0.009 +- 0.002	< 0.027
2nd Qtr				4th Qtr			
mean +- s.d.		0.012 +- 0.003	< 0.021	mean +- s.d.		0.019 +- 0.006	< 0.024

Table 5. WI DHS air particulate gross beta and air iodine (I-131) analysis results from the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/m³

Site: PBK-18

collection date	volume m ³	air particulate	air iodine	collection date	volume m ³	air particulate	air iodine
01/05/10	730	0.021 +- 0.002	< 0.015	07/06/10	723	0.014 +- 0.002	< 0.012
01/13/10	766	0.025 +- 0.002	< 0.015	07/14/10	709	0.015 +- 0.002	< 0.007
01/18/10	455	0.046 +- 0.004	< 0.012	07/19/10	456	0.016 +- 0.003	< 0.014
01/25/10	645	0.019 +- 0.002	< 0.012	07/26/10	619	0.013 +- 0.002	< 0.015
02/01/10	663	0.023 +- 0.002	< 0.013	08/02/10	636	0.018 +- 0.002	< 0.012
02/10/10	839	0.022 +- 0.002	< 0.010	08/11/10	793	0.023 +- 0.002	< 0.011
02/15/10	472	0.012 +- 0.002	< 0.017	08/16/10	443	0.017 +- 0.003	< 0.024
02/22/10	648	0.015 +- 0.002	< 0.014	08/23/10	633	0.018 +- 0.002	< 0.010
03/01/10	648	0.015 +- 0.002	< 0.019	08/30/10	628	0.022 +- 0.002	< 0.019
03/10/10	841	0.022 +- 0.002	< 0.008	09/08/10	821	0.012 +- 0.002	< 0.012
03/16/10	550	0.021 +- 0.002	< 0.012	09/13/10	454	0.010 +- 0.002	< 0.023
03/22/10	544	0.018 +- 0.002	< 0.014	09/20/10	639	0.010 +- 0.002	< 0.020
03/29/10	411	0.027 +- 0.003	< 0.023	09/27/10	637	0.016 +- 0.002	< 0.011
1st Qtr				3rd Qtr			
mean +- s.d.		0.022 +- 0.008	< 0.014	mean +- s.d.		0.016 +- 0.004	< 0.014
04/05/10	641	0.021 +- 0.002	< 0.010	10/04/10	640	0.014 +- 0.002	< 0.011
04/14/10	822	0.013 +- 0.002	< 0.011	10/13/10	837	0.019 +- 0.002	< 0.010
04/19/10	451	0.013 +- 0.003	< 0.013	10/18/10	451	0.014 +- 0.003	< 0.012
04/26/10	642	0.015 +- 0.002	< 0.009	10/25/10	643	0.019 +- 0.002	< 0.012
05/03/10	641	0.015 +- 0.002	< 0.016	11/01/10	646	0.013 +- 0.002	< 0.017
05/12/10	822	0.009 +- 0.001	< 0.007	11/10/10	818	0.021 +- 0.002	< 0.009
05/17/10	445	0.009 +- 0.002	< 0.019	11/15/10	458	0.021 +- 0.003	< 0.013
05/24/10	625	0.016 +- 0.002	< 0.012	11/22/10	647	0.030 +- 0.002	< 0.011
06/01/10	703	0.012 +- 0.002	< 0.010	11/29/10	645	0.019 +- 0.002	< 0.014
06/09/10	726	0.008 +- 0.002	< 0.017	12/08/10	827	0.018 +- 0.002	< 0.013
06/14/10	459	0.008 +- 0.002	< 0.026	12/14/10	565	0.030 +- 0.003	< 0.019
06/21/10	634	0.010 +- 0.002	< 0.018	12/20/10	561	0.028 +- 0.003	< 0.018
06/28/10	622	0.014 +- 0.002	< 0.021	12/28/10	746	0.009 +- 0.002	< 0.007
2nd Qtr				4th Qtr			
mean +- s.d.		0.013 +- 0.004	< 0.015	mean +- s.d.		0.020 +- 0.007	< 0.013

Table 6. WI DHS gamma isotopic analysis results from the quarterly composites of air particulate filters collected from the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/m ³				
Site: PBK-1	1st quarter	2nd quarter	3 rd quarter	4th quarter
Be-7	0.124 +- 0.006	0.111 +- 0.013	0.065 +- 0.009	0.051 +- 0.007
Mn-54	< 0.0005	< 0.0007	< 0.0005	< 0.0005
Co-58	< 0.0006	< 0.0007	< 0.0003	< 0.0004
Fe-59	< 0.0013	< 0.0015	< 0.0011	< 0.0007
Co-60	< 0.0007	< 0.0006	< 0.0005	< 0.0006
Zn-65	< 0.0010	< 0.0010	< 0.0007	< 0.0008
Nb-95	< 0.0007	< 0.0006	< 0.0005	< 0.0004
Zr-95	< 0.0009	< 0.0010	< 0.0007	< 0.0007
Ru-103	< 0.0004	< 0.0005	< 0.0004	< 0.0004
Ru-106	< 0.0045	< 0.0047	< 0.0037	< 0.0039
I-131	< 0.0015	< 0.0017	< 0.0011	< 0.0007
Cs-134	< 0.0006	< 0.0006	< 0.0004	< 0.0003
Cs-137	< 0.0005	< 0.0005	< 0.0004	< 0.0004
Ba-140	< 0.0035	< 0.0041	< 0.0029	< 0.0023
La-140	< 0.0013	< 0.0019	< 0.0015	< 0.0013
Ce-141	< 0.0006	< 0.0010	< 0.0004	< 0.0004
Ce-144	< 0.0018	< 0.0031	< 0.0015	< 0.0014
Site: PBK-4				
Be-7	0.111 +- 0.005	0.090 +- 0.013	0.076 +- 0.009	0.057 +- 0.007
Mn-54	< 0.0005	< 0.0004	< 0.0003	< 0.0004
Co-58	< 0.0005	< 0.0005	< 0.0004	< 0.0003
Fe-59	< 0.0010	< 0.0010	< 0.0006	< 0.0007
Co-60	< 0.0004	< 0.0006	< 0.0005	< 0.0004
Zn-65	< 0.0008	< 0.0010	< 0.0006	< 0.0009
Nb-95	< 0.0005	< 0.0005	< 0.0004	< 0.0005
Zr-95	< 0.0009	< 0.0006	< 0.0006	< 0.0007
Ru-103	< 0.0006	< 0.0004	< 0.0004	< 0.0004
Ru-106	< 0.0041	< 0.0041	< 0.0021	< 0.0034
I-131	< 0.0019	< 0.0013	< 0.0011	< 0.0013
Cs-134	< 0.0004	< 0.0004	< 0.0004	< 0.0005
Cs-137	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Ba-140	< 0.0036	< 0.0034	< 0.0021	< 0.0028
La-140	< 0.0011	< 0.0014	< 0.0010	< 0.0010
Ce-141	< 0.0010	< 0.0007	< 0.0004	< 0.0008
Ce-144	< 0.0029	< 0.0021	< 0.0012	< 0.0026
Site: PBK-7				
Be-7	0.126 +- 0.007	0.115 +- 0.015	0.091 +- 0.010	0.053 +- 0.007
Mn-54	< 0.0004	< 0.0007	< 0.0004	< 0.0004
Co-58	< 0.0005	< 0.0006	< 0.0004	< 0.0003
Fe-59	< 0.0008	< 0.0013	< 0.0010	< 0.0006
Co-60	< 0.0004	< 0.0009	< 0.0006	< 0.0005
Zn-65	< 0.0010	< 0.0015	< 0.0008	< 0.0009
Nb-95	< 0.0007	< 0.0008	< 0.0005	< 0.0004
Zr-95	< 0.0008	< 0.0012	< 0.0008	< 0.0007
Ru-103	< 0.0006	< 0.0006	< 0.0004	< 0.0004
Ru-106	< 0.0045	< 0.0043	< 0.0038	< 0.0037
I-131	< 0.0019	< 0.0017	< 0.0011	< 0.0010
Cs-134	< 0.0005	< 0.0007	< 0.0004	< 0.0005
Cs-137	< 0.0005	< 0.0004	< 0.0005	< 0.0004
Ba-140	< 0.0042	< 0.0038	< 0.0021	< 0.0021
La-140	< 0.0015	< 0.0019	< 0.0016	< 0.0013
Ce-141	< 0.0006	< 0.0009	< 0.0007	< 0.0004
Ce-144	< 0.0019	< 0.0030	< 0.0022	< 0.0013

Radioisotopes other than those reported were not detected.

Table 6. WI DHS gamma isotopic analysis results from the quarterly composites of air particulate filters collected from the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/m ³				
Site: PBK-8	1st quarter	2nd quarter	3 rd quarter	4th quarter
Be-7	0.176 +- 0.006	0.131 +- 0.010	0.085 +- 0.009	0.068 +- 0.008
Mn-54	< 0.0004	< 0.0004	< 0.0005	< 0.0005
Co-58	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Fe-59	< 0.0009	< 0.0011	< 0.0011	< 0.0011
Co-60	< 0.0004	< 0.0005	< 0.0005	< 0.0005
Zn-65	< 0.0009	< 0.0009	< 0.0011	< 0.0009
Nb-95	< 0.0005	< 0.0006	< 0.0007	< 0.0004
Zr-95	< 0.0008	< 0.0007	< 0.0009	< 0.0008
Ru-103	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Ru-106	< 0.0041	< 0.0039	< 0.0047	< 0.0042
I-131	< 0.0019	< 0.0018	< 0.0017	< 0.0013
Cs-134	< 0.0005	< 0.0005	< 0.0005	< 0.0006
Cs-137	< 0.0004	< 0.0005	< 0.0005	< 0.0006
Ba-140	< 0.0032	< 0.0033	< 0.0034	< 0.0032
La-140	< 0.0011	< 0.0012	< 0.0012	< 0.0010
Ce-141	< 0.0009	< 0.0010	< 0.0009	< 0.0009
Ce-144	< 0.0029	< 0.0029	< 0.0028	< 0.0027
Site: PBK-17				
Be-7	0.112 +- 0.005	0.113 +- 0.010	0.064 +- 0.008	0.058 +- 0.007
Mn-54	< 0.0005	< 0.0004	< 0.0004	< 0.0004
Co-58	< 0.0005	< 0.0004	< 0.0003	< 0.0004
Fe-59	< 0.0008	< 0.0009	< 0.0010	< 0.0008
Co-60	< 0.0005	< 0.0005	< 0.0005	< 0.0004
Zn-65	< 0.0009	< 0.0007	< 0.0007	< 0.0007
Nb-95	< 0.0007	< 0.0004	< 0.0004	< 0.0005
Zr-95	< 0.0010	< 0.0007	< 0.0007	< 0.0008
Ru-103	< 0.0006	< 0.0004	< 0.0004	< 0.0005
Ru-106	< 0.0042	< 0.0025	< 0.0036	< 0.0034
I-131	< 0.0029	< 0.0018	< 0.0013	< 0.0013
Cs-134	< 0.0004	< 0.0003	< 0.0005	< 0.0005
Cs-137	< 0.0005	< 0.0004	< 0.0004	< 0.0005
Ba-140	< 0.0050	< 0.0033	< 0.0032	< 0.0029
La-140	< 0.0011	< 0.0016	< 0.0020	< 0.0013
Ce-141	< 0.0011	< 0.0005	< 0.0005	< 0.0008
Ce-144	< 0.0031	< 0.0014	< 0.0013	< 0.0028
Site: PBK-18				
Be-7	0.119 +- 0.006	0.106 +- 0.008	0.075 +- 0.008	0.055 +- 0.007
Mn-54	< 0.0003	< 0.0003	< 0.0005	< 0.0003
Co-58	< 0.0005	< 0.0003	< 0.0005	< 0.0003
Fe-59	< 0.0006	< 0.0008	< 0.0009	< 0.0005
Co-60	< 0.0003	< 0.0004	< 0.0003	< 0.0004
Zn-65	< 0.0008	< 0.0007	< 0.0008	< 0.0007
Nb-95	< 0.0006	< 0.0005	< 0.0005	< 0.0004
Zr-95	< 0.0009	< 0.0007	< 0.0008	< 0.0006
Ru-103	< 0.0005	< 0.0005	< 0.0005	< 0.0003
Ru-106	< 0.0038	< 0.0032	< 0.0033	< 0.0029
I-131	< 0.0016	< 0.0019	< 0.0013	< 0.0009
Cs-134	< 0.0003	< 0.0004	< 0.0004	< 0.0003
Cs-137	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Ba-140	< 0.0015	< 0.0035	< 0.0033	< 0.0022
La-140	< 0.0014	< 0.0009	< 0.0013	< 0.0011
Ce-141	< 0.0005	< 0.0008	< 0.0008	< 0.0004
Ce-144	< 0.0018	< 0.0025	< 0.0027	< 0.0010

Radioisotopes other than those reported were not detected.

Table 7. WI DHS TLD network for the Point Beach – Kewaunee environmental monitoring program.

Date Placed:	01/06/10	04/08/10	07/07/10	10/05/10
Date Removed:	04/08/10	07/07/10	10/05/10	01/05/11
Days in the Field:	92	90	90	92

Individual quarterly date is reported as : mR / Standard Quarter + 2 sigma counting error.

TLD sites located at the Point Beach ISFSI.

1	24.9 +- 1.7	26.3 +- 1.3	27.5 +- 2.4	28.9 +- 1.8
2	59.5 +- 4.0	57.5 +- 3.2	63.9 +- 4.1	63.4 +- 4.1
3	25.0 +- 1.5	23.9 +- 1.7	28.7 +- 1.2	27.2 +- 1.3
4	19.5 +- 1.1	19.6 +- 0.7	21.7 +- 1.5	21.7 +- 0.7
5	17.5 +- 0.5	17.8 +- 0.8	20.3 +- 0.6	19.9 +- 0.8
6	34.7 +- 1.3	37.0 +- 2.3	42.3 +- 1.2	41.5 +- 1.8
7	57.6 +- 1.3	57.3 +- 1.2	67.7 +- 1.7	60.6 +- 1.2
8	25.7 +- 1.2	24.9 +- 1.3	30.0 +- 1.1	27.5 +- 1.6
Quarterly average +- s.d.	33.1 +- 16.5	33.0 +- 16.1	37.8 +- 18.6	36.3 +- 17.1

TLD sites, excluding sites 1-8, that are located 0 – 2 miles from either the Point Beach or the Kewaunee facility.

9	11.5 +- 0.7	11.6 +- 0.9	14.5 +- 0.7	13.2 +- 0.9
10	12.6 +- 0.5	14.2 +- 1.1	16.0 +- 0.8	15.8 +- 0.9
11	11.8 +- 0.5	12.4 +- 0.7	15.4 +- 0.8	14.0 +- 0.7
12	11.3 +- 0.5	12.6 +- 0.7	14.9 +- 0.6	13.6 +- 1.0
13	11.2 +- 0.8	12.8 +- 0.8	15.4 +- 1.0	14.3 +- 0.8
14	13.0 +- 0.5	12.7 +- 0.7	15.1 +- 0.7	14.1 +- 0.9
19	13.3 +- 0.7	12.7 +- 1.1	15.5 +- 0.8	14.2 +- 1.0
20	12.2 +- 0.6	12.7 +- 0.7	15.7 +- 0.8	14.0 +- 0.6
21	12.0 +- 0.7	13.8 +- 0.6	16.3 +- 0.8	16.0 +- 1.3
22	15.0 +- 0.8	15.9 +- 1.0	18.6 +- 0.8	17.7 +- 0.8
Quarterly average +- s.d.	12.4 +- 1.2	13.1 +- 1.2	15.7 +- 1.1	14.7 +- 1.4

TLD sites that are located 2 – 5 miles from either the Point Beach or the Kewaunee facility.

15	13.2 +- 0.6	13.1 +- 0.9	16.2 +- 0.9	14.7 +- 1.1
16	11.3 +- 1.0	10.9 +- 0.6	13.0 +- 1.1	12.4 +- 0.5
17	12.9 +- 0.9	12.2 +- 1.0	15.8 +- 1.1	14.0 +- 0.6
18	13.0 +- 0.5	15.5 +- 0.6	17.5 +- 0.6	17.0 +- 0.7
23	14.0 +- 0.6	13.8 +- 1.0	17.7 +- 0.8	15.2 +- 0.9
24	10.9 +- 0.7	11.1 +- 0.8	13.4 +- 1.1	12.5 +- 0.7
25	14.8 +- 0.8	13.3 +- 0.9	18.5 +- 1.9	14.8 +- 0.6
26	12.2 +- 0.5	13.1 +- 1.1	15.1 +- 0.7	14.6 +- 1.1
Quarterly average +- s.d.	12.8 +- 1.3	12.9 +- 1.5	15.9 +- 2.0	14.4 +- 1.5

TLD sites that are located greater than 5 miles from either the Point Beach or the Kewaunee facility.

27	10.4 +- 0.4	9.4 +- 0.8	12.2 +- 0.6	10.8 +- 1.0
28	11.8 +- 0.8	11.1 +- 0.7	14.7 +- 0.8	12.4 +- 0.8
29	10.6 +- 0.5	10.1 +- 0.9	12.7 +- 0.6	11.3 +- 0.8
30	12.5 +- 0.6	12.4 +- 0.6	14.8 +- 0.6	14.0 +- 0.6
31	10.8 +- 0.5	9.0 +- 0.7	13.0 +- 0.8	10.7 +- 0.9
Quarterly average +- s.d.	11.2 +- 0.9	10.4 +- 1.4	13.5 +- 1.2	11.8 +- 1.4

Table 8. WI DHS analysis results for precipitation samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of nCi/m²

monthly composite sample

Collection	inches	gross beta	tritium
01/20/10	1.54	0.15 +- 0.05	< 7.2
02/17/10	1.08	0.07 +- 0.03	< 5.0
03/17/10	0.58	0.10 +- 0.02	< 2.7
04/28/10	4.08	< 0.25	< 21.8
05/19/10	2.65	0.18 +- 0.11	< 14.1
06/23/10	6.64	< 0.40	< 30.5
07/21/10	4.41	0.21 +- 0.16	< 20.5
08/18/10	2.85	< 0.17	< 13.2
09/22/10	2.64	< 0.10	< 12.1
10/27/10	2.66	0.19 +- 0.08	< 12.2
11/23/10	0.24	0.14 +- 0.02	< 1.1
12/21/10	2.63	0.52 +- 0.06	< 12.1

Table 9. WI DHS analysis results for fish samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/kilogram (wet)

Collection date:	03/16/10	03/16/10	08/25/10	11/04/10
Type:	white fish	brown trout	lake trout	whitefish
gamma isotopic				
K-40	3400 +- 300	2800 +- 300	1500 +- 300	3000 +- 600
Mn-54	< 9	< 12	< 7	< 13
Co-58	< 10	< 13	< 6	< 14
Fe-59	< 21	< 22	< 14	< 27
Co-60	< 9	< 15	< 10	< 15
Zn-65	< 22	< 25	< 16	< 28
Nb-95	< 10	< 13	< 7	< 11
Zr-95	< 17	< 19	< 14	< 20
Cs-134	< 9	< 13	< 8	< 11
Cs-137	< 14	30 +- 5	< 12	35 +- 11

Collection date:	11/04/10	11/04/10	11/04/10
Type:	brook trout	lake trout	salmon
gamma isotopic			
K-40	3610 +- 600	2700 +- 500	2800 +- 500
Mn-54	< 9	< 8	< 8
Co-58	< 8	< 8	< 9
Fe-59	< 15	< 16	< 17
Co-60	< 9	< 10	< 11
Zn-65	< 16	< 23	< 19
Nb-95	< 8	< 9	< 10
Zr-95	< 14	< 14	< 16
Cs-134	< 9	< 7	< 9
Cs-137	93 +- 12	35 +- 14	49 +- 11

Radioisotopes other than those reported were not detected

Table 10. WI DHS analysis results for shoreline sediment samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/kilogram (dry)

Collection date:	08/31/10	08/30/10	08/31/10	
Site	PBK-5	PBK-6	PBK-10a	
gross alpha	< 11200	< 11200	< 11200	
gross beta	8500 +- 3000	7800 +- 3000	7600 +- 3000	
gamma isotopic				
K-40	6200 +- 1300	5400 +- 1100	7200 +- 1400	
Mn-54	< 15	< 13	< 13	
Co-58	< 14	< 12	< 14	
Fe-59	< 35	< 28	< 25	
Co-60	< 15	< 14	< 18	
Zn-65	< 33	< 35	< 32	
Nb-95	< 14	< 15	< 13	
Zr-95	< 23	< 22	< 24	
Cs-134	< 14	< 12	< 11	
Cs-137	< 20	< 22	20 +- 11	

Collection date:	08/31/10	08/31/10	08/31/10	08/31/10
Site	PBK-12a	PBK-12b	PBK-12c	PBK-26
gross alpha	< 11200	< 11200	< 11200	< 11200
gross beta	8100 +- 3000	10000 +- 3100	15800 +- 3300	6900 +- 3000
gamma isotopic				
K-40	4400 +- 1200	9100 +- 1800	5300 +- 1100	6300 +- 1300
Mn-54	< 15	< 15	< 19	< 13
Co-58	< 15	< 10	< 16	< 11
Fe-59	< 27	< 33	< 35	< 22
Co-60	< 15	< 18	< 20	< 11
Zn-65	< 33	< 36	< 38	< 25
Nb-95	< 17	< 12	< 19	< 9
Zr-95	< 30	< 26	< 34	< 20
Cs-134	< 14	< 12	< 17	< 10
Cs-137	< 25	31 +- 13	31 +- 17	< 26

Naturally occurring radioisotopes such as radium-226 (²²⁶Ra), bismuth-214 (²¹⁴Bi), lead-214 (²¹⁴Pb), actinium-228 (²²⁸Ac), bismuth-212 (²¹²Bi), lead-212 (²¹²Pb) from the naturally occurring uranium-238 (²³⁸U) and thorium-232 (²³²Th) decay series are commonly detected but have not been quantified or reported.

Radioisotopes other than those reported were not detected.

Table 11. WI DHS analysis results for surface water samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/liter						
PBK-9; Point Beach meteorological tower						
Collection date:	01/13/10	02/11/10	03/12/10	04/16/10	05/13/10	06/16/10
gross alpha-sol	< 2.1	< 2.1	< 1.4	< 2.5	< 2.2	< 1.7
gross beta-sol	< 1.9	2.8 +- 1.3	3.7 +- 0.7	2.8 +- 1.3	2.3 +- 1.3	2.3 +- 1.4
gross alpha-insol	1.1 +- 0.8	< 1.0	< 1.0	< 1.3	< 1.2	2.7 +- 1.1
gross beta-insol	< 1.8	< 1.8	< 1.7	< 2.3	< 2.4	3.7 +- 1.5
I-131		< 0.1	< 0.1	< 0.1	< 0.1	
H-3 *a			< 180			< 180
Sr-89 *a			< 0.9			< 1.7
Sr-90 *a			< 0.4			< 0.4
gamma isotopic						
Mn-54	< 7	< 10	< 9	< 7	< 5	< 9
Co-58	< 8	< 9	< 8	< 6	< 7	< 8
Fe-59	< 12	< 14	< 17	< 16	< 12	< 17
Co-60	< 9	< 9	< 10	< 8	< 7	< 8
Zn-65	< 17	< 24	< 19	< 14	< 15	< 17
Nb-95	< 8	< 9	< 8	< 9	< 8	< 9
Zr-95	< 12	< 12	< 14	< 13	< 12	< 13
I-131	< 8	< 8	< 14	< 10	< 7	< 13
Cs-134	< 8	< 8	< 9	< 6	< 9	< 9
Cs-137	< 7	< 10	< 9	< 8	< 7	< 9
Ba-140	< 26	< 29	< 36	< 29	< 31	< 35
La-140	< 9	< 12	< 9	< 9	< 15	< 10
Collection date:	07/13/10	08/11/10	09/15/10	10/14/10	11/18/10	* b
gross alpha-sol	< 2.0	< 2.2	< 2.1	< 1.3	< 1.9	
gross beta-sol	2.9 +- 1.1	2.5 +- 0.9	1.7 +- 1.1	1.6 +- 0.7	< 2.0	
gross alpha-insol	2.7 +- 1.9	< 1.5	1.8 +- 1.2	< 1.4	< 1.4	
gross beta-insol	< 2.6	< 2.4	< 1.5	< 1.5	< 2.5	
I-131	< 0.2	< 0.2				
H-3 *a			< 180			< 180
Sr-89 *a			< 1.1			< 0.7
Sr-90 *a			0.3 +- 0.1			< 0.3
gamma isotopic						
Mn-54	< 7	< 8	< 9	< 3	< 3	
Co-58	< 7	< 8	< 8	< 3	< 3	
Fe-59	< 15	< 15	< 18	< 5	< 5	
Co-60	< 9	< 8	< 10	< 3	< 3	
Zn-65	< 15	< 16	< 17	< 5	< 5	
Nb-95	< 7	< 10	< 11	< 3	< 3	
Zr-95	< 14	< 14	< 19	< 5	< 5	
I-131	< 12	< 11	< 13	< 4	< 4	
Cs-134	< 8	< 9	< 10	< 3	< 3	
Cs-137	< 7	< 9	< 9	< 3	< 3	
Ba-140	< 34	< 33	< 44	< 11	< 10	
La-140	< 15	< 11	< 13	< 3	< 3	

*a - Analysis is performed on a quarterly composite.

*b - Due to safety concerns, a sample for December was not collected.

Radioisotopes other than those reported were not detected.

Table 11. WI DHS analysis results for surface water samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/liter

PBK-12a; Kewaunee effluent channel

Collection date:	01/04/10	02/01/10	03/01/10	04/01/10	05/03/10	06/01/10
gross alpha-sol	< 1.5	< 1.9	< 2.0	< 2.4	< 2.0	< 1.7
gross beta-sol	2.0 +- 1.0	< 1.9	2.4 +- 1.3	2.4 +- 1.3	1.9 +- 1.2	< 1.9
gross alpha-insol	< 1.1	< 0.8	< 0.9	< 1.2	< 1.2	< 1.1
gross beta-insol	< 1.8	< 1.8	< 1.7	< 2.3	< 2.3	< 2.4
I-131		< 0.2	< 0.3	< 0.3	< 0.2	
H-3 *			< 180			< 210
Sr-89 *			< 0.9			< 1.2
Sr-90 *			< 0.3			< 0.3
gamma isotopic						
Mn-54	< 7	< 5	< 8	< 9	< 8	< 9
Co-58	< 7	< 7	< 7	< 7	< 8	< 9
Fe-59	< 13	< 12	< 18	< 15	< 15	< 13
Co-60	< 8	< 8	< 11	< 8	< 9	< 9
Zn-65	< 15	< 16	< 15	< 17	< 16	< 17
Nb-95	< 8	< 9	< 7	< 8	< 9	< 9
Zr-95	< 13	< 9	< 14	< 15	< 15	< 16
I-131	< 11	< 14	< 13	< 14	< 15	< 12
Cs-134	< 8	< 6	< 10	< 6	< 8	< 8
Cs-137	< 7	< 5	< 9	< 7	< 9	< 11
Ba-140	< 30	< 34	< 33	< 29	< 40	< 35
La-140	< 8	< 14	< 12	< 13	< 13	< 11
Collection date:	07/01/10	08/02/10	09/01/10	10/04/10	11/01/10	12/01/10
gross alpha-sol	< 2.0	< 2.0	< 2.2	< 2.3	< 1.8	< 1.9
gross beta-sol	1.9 +- 0.7	< 1.9	3.3 +- 1.3	2.0 +- 1.2	2.2 +- 1.3	< 2.0
gross alpha-insol	< 1.3	< 1.3	< 1.7	< 1.4	< 1.2	< 1.3
gross beta-insol	< 2.4	< 2.4	< 1.5	< 1.4	< 2.4	< 2.5
I-131	< 0.5	< 0.4				< 0.4
H-3 *			< 180			< 180
Sr-89 *			< 1.3			< 0.9
Sr-90 *			0.2 +- 0.1			< 0.3
gamma isotopic						
Mn-54	< 6	< 8	< 7	< 10	< 9	< 8
Co-58	< 6	< 8	< 8	< 8	< 8	< 7
Fe-59	< 13	< 17	< 16	< 19	< 13	< 17
Co-60	< 7	< 8	< 8	< 12	< 10	< 11
Zn-65	< 14	< 18	< 15	< 19	< 15	< 19
Nb-95	< 7	< 9	< 9	< 9	< 8	< 9
Zr-95	< 11	< 11	< 15	< 16	< 15	< 11
I-131	< 13	< 9	< 15	< 13	< 12	< 11
Cs-134	< 7	< 9	< 8	< 9	< 10	< 9
Cs-137	< 7	< 8	< 9	< 11	< 2	< 7
Ba-140	< 32	< 35	< 42	< 36	< 34	< 37
La-140	< 10	< 14	< 14	< 13	< 9	< 9

* - Analysis is performed on a quarterly composite.

Radioisotopes other than those reported were not detected.

Table 11. WI DHS analysis results for surface water samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/liter

PBK-17; Green Bay Water Utility - Rostok

Collection date:	01/04/10	02/01/10	03/01/10	04/05/10	05/03/10	06/07/10
gross alpha-sol	< 1.4	< 1.8	< 2.0	< 2.0	< 1.9	< 1.7
gross beta-sol	< 1.5	< 1.9	2.8 +- 1.3	2.8 +- 1.3	< 1.9	< 1.9
gross alpha-insol	< 1.0	< 0.8	< 0.9	< 1.2	< 1.2	< 1.1
gross beta-insol	< 1.8	< 1.8	< 1.7	< 2.3	< 2.3	< 2.4
I-131		< 0.2	< 0.3	< 0.2	< 0.2	
H-3 *			< 180			< 210
Sr-89 *			< 1.0			< 1.0
Sr-90 *			< 0.3			< 0.3
gamma isotopic						
Mn-54	< 7	< 5	< 8	< 9	< 8	< 10
Co-58	< 6	< 5	< 8	< 7	< 6	< 8
Fe-59	< 14	< 14	< 14	< 13	< 10	< 16
Co-60	< 8	< 7	< 10	< 7	< 7	< 9
Zn-65	< 15	< 13	< 16	< 14	< 10	< 18
Nb-95	< 8	< 7	< 7	< 5	< 7	< 7
Zr-95	< 15	< 10	< 15	< 12	< 11	< 11
I-131	< 9	< 12	< 8	< 8	< 7	< 9
Cs-134	< 9	< 7	< 8	< 8	< 8	< 8
Cs-137	< 10	< 6	< 5	< 8	< 8	< 9
Ba-140	< 28	< 38	< 25	< 28	< 26	< 28
La-140	< 8	< 12	< 9	< 7	< 8	< 13
Collection date:	07/13/10	08/02/10	09/07/10	10/04/10	11/01/10	12/06/10
gross alpha-sol	2.3 +- 1.3	< 1.7	< 2.2	< 2.4	< 1.7	< 1.6
gross beta-sol	2.5 +- 0.8	< 2.2	1.9 +- 1.1	< 1.6	1.9 +- 1.2	< 2.4
gross alpha-insol	< 1.3	< 1.8	< 1.2	1.8 +- 1.1	< 1.2	< 1.1
gross beta-insol	< 2.4	< 3.3	< 1.5	< 1.3	< 2.4	< 2.2
I-131	< 0.2	< 0.3				< 0.3
H-3 *			< 180			< 180
Sr-89 *			< 1.2			< 0.8
Sr-90 *			0.2 +- 0.1			< 0.3
gamma isotopic						
Mn-54	< 8	< 9	< 10	< 9	< 2	< 10
Co-58	< 8	< 7	< 7	< 9	< 2	< 9
Fe-59	< 15	< 14	< 13	< 14	< 4	< 14
Co-60	< 9	< 9	< 11	< 10	< 3	< 11
Zn-65	< 16	< 14	< 16	< 18	< 5	< 18
Nb-95	< 7	< 7	< 7	< 7	< 2	< 10
Zr-95	< 13	< 15	< 11	< 12	< 3	< 16
I-131	< 10	< 9	< 7	< 9	< 2	< 12
Cs-134	< 9	< 8	< 7	< 9	< 2	< 10
Cs-137	< 8	< 8	< 5	< 8	< 2	< 10
Ba-140	< 31	< 29	< 26	< 27	< 8	< 33
La-140	< 7	< 9	< 11	< 9	< 3	< 11

* - Analysis is performed on a quarterly composite.

Radioisotopes other than those reported were not detected.

Table 11. WI DHS analysis results for surface water samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/liter

	PBK-5	PBK-25	PBK-5	PBK-25
Collection date:	06/02/10	06/02/10	08/31/10	08/31/10
gross alpha-sol	< 2.0	< 1.9	< 1.7	1.6 +- 1.2
gross beta-sol	< 2.0	2.4 +- 1.3	1.9 +- 1.1	< 1.6
gross alpha-insol	< 1.3	< 1.2	< 2.5	4.2 +- 2.4
gross beta-insol	< 2.5	< 2.4	2.1 +- 1.2	1.8 +- 1.1
H-3	< 210	< 210	< 180	< 180
Sr-89	< 0.7	< 0.7	< 1.3	< 1.3
Sr-90	< 0.3	< 0.3	< 0.3	< 0.3
gamma isotopic				
Mn-54	< 9	< 5	< 8	< 9
Co-58	< 8	< 7	< 11	< 9
Fe-59	< 14	< 14	< 17	< 17
Co-60	< 9	< 12	< 12	< 10
Zn-65	< 15	< 18	< 22	< 15
Nb-95	< 8	< 10	< 9	< 7
Zr-95	< 15	< 16	< 17	< 16
I-131	< 12	< 10	< 14	< 11
Cs-134	< 9	< 10	< 11	< 12
Cs-137	< 8	< 10	< 11	< 12
Ba-140	< 36	< 33	< 41	< 31
La-140	< 10	< 15	< 11	< 13

Radioisotopes other than those reported were not detected.

Table 12. WI DHS analysis results for well water samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/liter

	PBK-3	PBK-10	PBK-11	PBK-12d N	PBK-12d S
Collection date:	06/01/10	04/16/10	06/02/10	06/02/10	06/02/10
gross alpha	< 2.6	< 4.8	< 2.4	< 5.5	6.8 +- 3.5
gross beta	< 2.4	< 1.8	< 1.7	3.2 +- 0.7	3.7 +- 0.7
H-3	< 210	< 210	< 210	< 210	< 210
Collection date:	08/30/10	10/14/11	08/31/10	08/31/10	08/31/10
gross alpha	< 2.3	3.1 +- 1.4	< 2.1	5.4 +- 2.4	14.8 +- 2.4
gross beta	< 2.7	1.3 +- 0.7	< 2.6	< 1.2	3.5 +- 0.8
H-3	< 180	< 180	< 180	< 180	< 180

Table 13. WI DHS analysis results for milk samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/liter

PBK-28; Strutz farm

Collection date:	01/13/10	02/10/10	03/10/10	04/14/10	05/12/10	06/09/10
I-131		< 0.2	< 0.4	< 0.5	< 0.2	
Sr-90	< 0.7	< 0.6	< 0.5	< 0.5	0.7 +- 0.3	0.6 +- 0.3
gamma isotopic						
K-40	1290 +- 120	1480 +- 110	1480 +- 150	1420 +- 160	1430 +- 150	1290 +- 130
Mn-54	< 6	< 8	< 10	< 10	< 9	< 6
Co-58	< 6	< 8	< 10	< 10	< 8	< 8
Fe-59	< 10	< 20	< 18	< 23	< 18	< 13
Co-60	< 6	< 10	< 11	< 12	< 11	< 10
Zn-65	< 14	< 18	< 22	< 24	< 20	< 18
Nb-95	< 8	< 7	< 10	< 11	< 7	< 8
Zr-95	< 10	< 11	< 17	< 19	< 12	< 11
I-131	< 10	< 8	< 11	< 14	< 8	< 7
Cs-134	< 5	< 8	< 11	< 9	< 10	< 8
Cs-137	< 7	< 9	< 10	< 10	< 9	< 8
Ba-140	< 32	< 26	< 36	< 42	< 30	< 31
La-140	< 11	< 9	< 9	< 14	< 14	< 7
Collection date:	07/14/10	08/11/10	09/08/10	10/13/10	11/10/10	12/08/10
I-131	< 0.3	< 0.3				0.9 +- 0.3
Sr-90	< 0.5	< 0.6	< 0.6	0.7 +- 0.4	< 0.4	< 0.6
gamma isotopic						
K-40	1300 +- 300	1300 +- 300	1400 +- 300	1300 +- 300	1200 +- 300	1300 +- 300
Mn-54	< 11	< 9	< 9	< 8	< 11	< 8
Co-58	< 10	< 8	< 8	< 7	< 8	< 11
Fe-59	< 26	< 20	< 19	< 23	< 19	< 15
Co-60	< 12	< 12	< 10	< 11	< 15	< 10
Zn-65	< 38	< 17	< 19	< 17	< 30	< 20
Nb-95	< 14	< 8	< 10	< 9	< 11	< 9
Zr-95	< 17	< 10	< 11	< 11	< 18	< 12
I-131	< 9	< 9	< 9	< 14	< 10	< 8
Cs-134	< 12	< 9	< 8	< 8	< 11	< 8
Cs-137	< 13	< 9	< 9	< 11	< 11	< 7
Ba-140	< 50	< 23	< 33	< 40	< 38	< 25
La-140	< 14	< 11	< 13	< 9	< 13	< 12

Radioisotopes other than those reported were not detected.

Table 13. WI DHS analysis results for milk samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/liter

PBK-24; Struck farm

Collection date:	01/13/10	02/10/10	03/10/10	04/14/10	05/12/10	06/09/10
I-131		< 0.2	< 0.4	< 0.2	< 0.2	
Sr-90	0.7 +- 0.4	< 0.7	< 0.6	0.6 +- 0.3	0.7 +- 0.3	1.0 +- 0.4
gamma isotopic						
K-40	1240 +- 120	1480 +- 90	1380 +- 140	1190 +- 150	1300 +- 140	1090 +- 120
Mn-54	< 7	< 6	< 9	< 8	< 11	< 5
Co-58	< 6	< 7	< 9	< 10	< 9	< 6
Fe-59	< 9	< 13	< 18	< 17	< 21	< 14
Co-60	< 7	< 6	< 12	< 8	< 12	< 9
Zn-65	< 12	< 14	< 18	< 18	< 25	< 16
Nb-95	< 7	< 7	< 10	< 11	< 12	< 9
Zr-95	< 11	< 10	< 18	< 18	< 20	< 14
I-131	< 11	< 6	< 12	< 9	< 10	< 8
Cs-134	< 6	< 5	< 11	< 10	< 9	< 9
Cs-137	< 6	< 5	< 10	< 8	< 9	< 7
Ba-140	< 24	< 19	< 39	< 39	< 31	< 29
La-140	< 5	< 8	< 10	< 15	< 12	< 9

Collection date:	07/14/10	08/11/10	09/08/10	10/13/10	11/10/10	12/08/10
I-131	< 0.3	< 0.3				< 0.5
Sr-90	< 0.5	< 0.5	< 0.7	1.1 +- 0.4	< 0.5	0.9 +- 0.4
gamma isotopic						
K-40	1100 +- 300	1300 +- 300	1400 +- 400	1400 +- 300	1000 +- 300	1400 +- 300
Mn-54	< 9	< 10	< 11	< 8	< 14	< 14
Co-58	< 10	< 11	< 14	< 10	< 11	< 11
Fe-59	< 18	< 20	< 26	< 20	< 24	< 23
Co-60	< 14	< 15	< 13	< 9	< 13	< 11
Zn-65	< 24	< 23	< 24	< 22	< 23	< 29
Nb-95	< 9	< 13	< 14	< 8	< 10	< 13
Zr-95	< 19	< 21	< 21	< 14	< 20	< 22
I-131	< 12	< 14	< 11	< 13	< 14	< 12
Cs-134	< 11	< 14	< 14	< 9	< 13	< 12
Cs-137	< 11	< 11	< 12	< 8	< 11	< 14
Ba-140	< 38	< 48	< 38	< 33	< 42	< 47
La-140	< 13	< 13	< 11	< 9	< 14	< 14

Radioisotopes other than those reported were not detected.

Table 13. WI DHS analysis results for milk samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/liter

PBK-27; R. Barta farm

Collection date:	01/13/10	02/10/10	03/10/10	04/14/10	05/12/10	06/09/10
I-131		< 0.2	< 0.4	< 0.2	< 0.2	
Sr-90	< 0.6	< 0.7	0.5 +- 0.3	< 0.5	< 0.4	0.6 +- 0.3
gamma isotopic						
K-40	1200 +- 130	1400 +- 100	1420 +- 130	1370 +- 140	1350 +- 150	1380 +- 140
Mn-54	< 6	< 9	< 6	< 8	< 10	< 7
Co-58	< 7	< 9	< 6	< 8	< 10	< 7
Fe-59	< 16	< 19	< 12	< 13	< 14	< 17
Co-60	< 9	< 9	< 8	< 7	< 14	< 8
Zn-65	< 16	< 21	< 13	< 12	< 18	< 15
Nb-95	< 8	< 9	< 6	< 8	< 9	< 7
Zr-95	< 12	< 13	< 11	< 13	< 15	< 12
I-131	< 11	< 10	< 7	< 8	< 8	< 8
Cs-134	< 8	< 8	< 6	< 8	< 11	< 9
Cs-137	< 7	< 9	< 5	< 7	< 12	< 7
Ba-140	< 28	< 30	< 24	< 28	< 30	< 30
La-140	< 15	< 8	< 9	< 13	< 14	< 9
Collection date:	07/14/10	08/11/10	09/08/10	10/13/10	11/10/10	12/08/10
I-131	< 0.3	< 0.3				0.7 +- 0.4
Sr-90	0.5 +- 0.3	< 0.6	< 0.5	0.9 +- 0.4	< 0.5	0.9 +- 0.5
gamma isotopic						
K-40	1500 +- 300	1500 +- 300	1300 +- 300	1200 +- 300	1200 +- 300	1500 +- 300
Mn-54	< 14	< 10	< 13	< 13	< 14	< 13
Co-58	< 10	< 6	< 12	< 14	< 14	< 10
Fe-59	< 20	< 16	< 26	< 18	< 24	< 20
Co-60	< 14	< 10	< 14	< 11	< 11	< 15
Zn-65	< 25	< 23	< 28	< 33	< 31	< 24
Nb-95	< 12	< 7	< 11	< 10	< 12	< 11
Zr-95	< 17	< 11	< 19	< 18	< 21	< 16
I-131	< 15	< 9	< 14	< 15	< 14	< 14
Cs-134	< 12	< 6	< 13	< 13	< 11	< 13
Cs-137	< 14	< 6	< 14	< 13	< 14	< 14
Ba-140	< 47	< 31	< 43	< 51	< 48	< 39
La-140	< 13	< 13	< 9	< 13	< 11	< 13

Radioisotopes other than those reported were not detected.

Table 14. WI DHS analysis results for vegetation samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/kilogram (wet)

Site:	PBK-1	PBK-2	PBK-3	PBK-4	PBK-5
Collection date:	06/01/10	06/01/10	06/01/10	06/01/10	06/02/10
gross alpha	< 3010	< 3400	< 3000	< 3200	< 2600
gross beta	6600 +- 1000	9500 +- 1100	4800 +- 900	5600 +- 1000	7900 +- 900
gamma isotopic					
Be-7	380 +- 90	< 250	320 +- 60	< 170	< 240
K-40	4300 +- 400	6000 +- 1000	3500 +- 400	4300 +- 400	5600 +- 500
Mn-54	< 20	< 23	< 23	< 19	< 30
Co-58	< 20	< 25	< 24	< 17	< 23
Fe-59	< 42	< 51	< 35	< 38	< 53
Co-60	< 24	< 27	< 24	< 26	< 32
Zn-65	< 42	< 45	< 48	< 45	< 59
Nb-95	< 18	< 25	< 19	< 18	< 23
Zr-95	< 34	< 41	< 37	< 32	< 39
I-131	< 24	< 75	< 20	< 26	< 29
Cs-134	< 21	< 22	< 15	< 21	< 28
Cs-137	< 22	< 24	< 22	< 23	< 27
Ba-140	< 70	< 151	< 65	< 75	< 106
La-140	< 28	< 39	< 35	< 23	< 22

Site:	PBK-7	PBK-8	PBK-14	PBK-17	PBK-25
Collection date:	06/01/10	06/01/10	06/01/10	06/02/10	06/02/10
gross alpha	< 3400	< 3500	< 3200	< 2500	< 3800
gross beta	8000 +- 1100	6800 +- 1100	5900 +- 1000	5100 +- 800	4800 +- 1100
gamma isotopic					
Be-7	350 +- 80	280 +- 70	< 240	< 170	< 300
K-40	5500 +- 500	5000 +- 500	5200 +- 500	4400 +- 400	3500 +- 400
Mn-54	< 21	< 18	< 25	< 20	< 32
Co-58	< 21	< 16	< 22	< 14	< 25
Fe-59	< 47	< 45	< 48	< 38	< 60
Co-60	< 24	< 23	< 26	< 21	< 36
Zn-65	< 51	< 42	< 50	< 46	< 53
Nb-95	< 19	< 20	< 23	< 18	< 31
Zr-95	< 31	< 37	< 49	< 23	< 39
I-131	< 24	< 21	< 38	< 18	< 28
Cs-134	< 17	< 22	< 29	< 16	< 35
Cs-137	< 18	< 15	< 31	< 20	< 31
Ba-140	< 76	< 68	< 83	< 52	< 85
La-140	< 6	< 31	< 15	< 23	< 46

Radioisotopes other than those reported were not detected.

Table 14. WI DHS analysis results for vegetation samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/kilogram (wet)					
Site:	PBK-1	PBK-2	PBK-3	PBK-4	PBK-5
Collection date:	08/30/10	08/30/10	08/30/10	08/30/10	08/31/10
gross alpha	< 5600	< 4100	< 4200	< 4100	< 2700
gross beta	11300 +- 1800	6500 +- 1200	6100 +- 1200	7800 +- 1300	7800 +- 900
gamma isotopic					
Be-7	3600 +- 500	1200 +- 300	1700 +- 400	2100 +- 300	300 +- 170
K-40	5200 +- 1200	5200 +- 1100	4500 +- 1000	5800 +- 1200	6100 +- 1100
Mn-54	< 30	< 35	< 40	< 19	< 28
Co-58	< 37	< 36	< 27	< 27	< 20
Fe-59	< 49	< 67	< 65	< 70	< 47
Co-60	< 47	< 42	< 22	< 41	< 29
Zn-65	< 66	< 70	< 87	< 77	< 50
Nb-95	< 33	< 37	< 28	< 30	< 27
Zr-95	< 64	< 60	< 47	< 46	< 50
I-131	< 33	< 42	< 33	< 29	< 32
Cs-134	< 33	< 33	< 35	< 29	< 28
Cs-137	< 33	< 38	< 30	< 36	< 27
Ba-140	< 103	< 121	< 116	< 81	< 102
La-140	< 41	< 33	< 47	< 36	< 27
Site:	PBK-7	PBK-8	PBK-14	PBK-17	PBK-25
Collection date:	08/30/10	08/31/10	08/31/10	08/31/10	08/31/10
gross alpha	< 4900	< 2500	< 3800	< 3900	< 4700
gross beta	6500 +- 1400	9300 +- 900	5100 +- 1100	6800 +- 1200	6800 +- 1300
gamma isotopic					
Be-7	2100 +- 400	600 +- 200	1900 +- 300	900 +- 300	2000 +- 500
K-40	4200 +- 1000	4900 +- 1000	4000 +- 900	4100 +- 900	3900 +- 1000
Mn-54	< 29	< 29	< 31	< 30	< 44
Co-58	< 32	< 31	< 36	< 23	< 46
Fe-59	< 57	< 48	< 59	< 65	< 96
Co-60	< 41	< 32	< 39	< 31	< 54
Zn-65	< 62	< 58	< 71	< 69	< 104
Nb-95	< 26	< 26	< 31	< 26	< 49
Zr-95	< 49	< 43	< 55	< 48	< 86
I-131	< 29	< 33	< 37	< 25	< 59
Cs-134	< 27	< 28	< 33	< 29	< 44
Cs-137	< 26	< 28	< 32	< 32	< 54
Ba-140	< 115	< 104	< 128	< 84	< 197
La-140	< 37	< 44	< 43	< 33	< 59

Radioisotopes other than those reported were not detected.

Table 15. WI DHS analysis results for soil samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/kilogram (dry)					
Site:	PBK-1	PBK-2	PBK-3	PBK-4	PBK-5
Collection date:	06/01/10	06/01/10	06/01/10	06/01/10	06/02/10
gross alpha	11700 +- 8300	30400 +- 10600	16600 +- 9000	14000 +- 8600	18900 +- 9300
gross beta	18600 +- 3300	32500 +- 3800	32600 +- 3700	29400 +- 3700	30400 +- 3700
gamma isotopic					
K-40	15300 +- 1500	18700 +- 1900	22900 +- 2300	17900 +- 1800	17600 +- 1800
Mn-54	< 24	< 35	< 26	< 21	< 30
Co-58	< 19	< 23	< 25	< 20	< 29
Fe-59	< 54	< 69	< 62	< 45	< 66
Co-60	< 24	< 30	< 25	< 22	< 32
Zn-65	< 59	< 66	< 66	< 50	< 67
Nb-95	< 25	< 27	< 27	< 19	< 25
Zr-95	< 34	< 51	< 48	< 32	< 40
Cs-134	< 22	< 27	< 22	< 17	< 24
Cs-137	195 +- 15	138 +- 17	148 +- 14	150 +- 18	173 +- 19
Site:	PBK-7	PBK-8	PBK-14	PBK-17	PBK-25
Collection date:	06/01/10	06/01/10	06/01/10	06/02/10	06/02/10
gross alpha	24300 +- 9900	12900 +- 8500	11000 +- 8200	< 10900	11100 +- 8300
gross beta	30400 +- 3700	30900 +- 3700	27900 +- 3600	18900 +- 3300	22700 +- 3400
gamma isotopic					
K-40	20300 +- 2000	20800 +- 2100	20600 +- 2000	14800 +- 1500	14300 +- 1400
Mn-54	< 29	< 25	< 21	< 20	< 17
Co-58	< 24	< 21	< 22	< 20	< 17
Fe-59	< 64	< 59	< 44	< 56	< 44
Co-60	< 32	< 28	< 25	< 31	< 22
Zn-65	< 71	< 71	< 53	< 59	< 50
Nb-95	< 28	< 30	< 22	< 26	< 20
Zr-95	< 55	< 46	< 32	< 40	< 31
Cs-134	< 27	< 25	< 19	< 23	< 18
Cs-137	132 +- 18	234 +- 18	184 +- 16	620 +- 30	510 +- 20

Naturally occurring radioisotopes such as radium-226 (^{226}Ra), bismuth-214 (^{214}Bi), lead-214 (^{214}Pb), actinium-228 (^{228}Ac), bismuth-212 (^{212}Bi), lead-212 (^{212}Pb) from the naturally occurring uranium-238 (^{238}U) and thorium-232 (^{232}Th) decay series are commonly detected but have not been quantified or reported.

Radioisotopes other than those reported were not detected.

Table 15. WI DHS analysis results for soil samples collected for the Point Beach – Kewaunee environmental monitoring program.

Measurements in units of pCi/kilogram (dry)					
Site:	PBK-1	PBK-2	PBK-3	PBK-4	PBK-5
Collection date:	08/30/10	08/30/10	08/30/10	08/30/10	08/31/10
gross alpha	< 11200	22100 +- 9800	19500 +- 9500	12900 +- 8600	13400 +- 8700
gross beta	20900 +- 3400	29400 +- 3600	30800 +- 3800	27800 +- 3600	24300 +- 3600
gamma isotopic					
K-40	12800 +- 2500	21000 +- 4100	19700 +- 3800	18400 +- 3600	16800 +- 3300
Mn-54	< 25	< 26	< 29	< 22	< 28
Co-58	< 22	< 23	< 23	< 19	< 24
Fe-59	< 53	< 63	< 69	< 52	< 56
Co-60	< 26	< 25	< 26	< 23	< 35
Zn-65	< 65	< 54	< 71	< 54	< 70
Nb-95	< 27	< 27	< 34	< 19	< 32
Zr-95	< 42	< 42	< 51	< 33	< 45
Cs-134	< 23	< 23	< 26	< 17	< 23
Cs-137	270 +- 30	160 +- 30	140 +- 40	180 +- 30	140 +- 40
Site:	PBK-7	PBK-8	PBK-14	PBK-17	PBK-25
Collection date:	08/30/10	08/31/10	08/31/10	08/31/10	08/31/10
gross alpha	22700 +- 10000	< 11300	14700 +- 8900	26200 +- 10300	< 11200
gross beta	33900 +- 3800	29700 +- 3700	25400 +- 3600	18000 +- 3300	16300 +- 3300
gamma isotopic					
K-40	22400 +- 4300	20600 +- 4000	20900 +- 4000	12100 +- 2400	11700 +- 2300
Mn-54	< 22	< 21	< 27	< 25	< 12
Co-58	< 22	< 21	< 25	< 22	< 15
Fe-59	< 51	< 52	< 60	< 57	< 38
Co-60	< 22	< 21	< 29	< 25	< 20
Zn-65	< 57	< 52	< 68	< 60	< 40
Nb-95	< 20	< 19	< 28	< 26	< 17
Zr-95	< 33	< 34	< 43	< 49	< 27
Cs-134	< 20	< 16	< 23	< 24	< 15
Cs-137	110 +- 40	230 +- 30	130 +- 30	310 +- 50	320 +- 30

Naturally occurring radioisotopes such as radium-226 (²²⁶Ra), bismuth-214 (²¹⁴Bi), lead-214 (²¹⁴Pb), actinium-228 (²²⁸Ac), bismuth-212 (²¹²Bi), lead-212 (²¹²Pb) from the naturally occurring uranium-238 (²³⁸U) and thorium-232 (²³²Th) decay series are commonly detected but have not been quantified or reported.

Radioisotopes other than those reported were not detected.