Consumers Energy

A CMS Energy Company

Big Rock Point Nuclear Plant
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General Manager

April 11, 2007

10 CFR 50, Appendix I, IV.B.2
10 CFR 50, Appendix I, IV.B.3
10 CFR 50, Appendix I, IV.C
10 CFR 50.36(b)

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

DOCKETS 50-155 AND 72-043 – LICENSE DPR-6 - BIG ROCK POINT PLANT – ANNUAL RADIOACTIVE ENVIRONMENTAL REPORT FOR THE PERIOD OF JANUARY 1, 2006 – DECEMBER 31, 2006

In accordance with the Big Rock Point Defueled Technical Specifications Section 6.6.2, attached (Attachment 1) is the Annual Radioactive Environmental Report for the period of January 1, 2006 to December 31, 2006. This report includes summaries, interpretations, and statistical evaluation of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided is consistent with the objectives outlined in the Offsite Dose Calculation Manual and Sections IV.B.2, IV.B.3, and IV.C Appendix I 10 CFR 50 and 10 CFR 50.36(b).

Kurt M. Haas
Site General Manager

cc: Administrator, Region III, USNRC
NRC Decommissioning Inspector, Big Rock Point
NRC NMSS Project Manager – James Shepherd
US Army Corp of Engineers – Detroit District

ATTACHMENT

IE25
NMSS01

ATTACHMENT 1

Big Rock Point
Dockets 50-155 and 72-043

April 11, 2007

BIG ROCK POINT RADIOACTIVE ENVIRONMENTAL REPORT

January 1, 2006 - December 31, 2006

54 pages

Big Rock Point Annual Radiological Environmental Operating Report
January to December 2006

I. Introduction

The 2006 Big Rock Point Annual Radiological Environmental Operating Report provides a summary and data interpretation of the Big Rock Point Radiological Environmental Monitoring Program (REMP) as conducted during the 2006 reporting period. Reporting requirements are detailed in the Big Rock Point Defueled Technical Specifications 6.7.2, and Offsite Dose Calculation Manual (ODCM) Section III, Subsection 2.0.

The Big Rock Point Nuclear Plant ceased power operations in August 1997. During 2006 site decommissioning activities were completed. Activities included final removal of all underground structures and utilities, demobilization of all remaining site equipment, facilities and personnel. Open land areas were backfilled, contoured and seeded. The concluding site activity was the Final Status Survey which concluded that the former Big Rock Point Nuclear Plant met the radiological criteria for unrestricted use in accordance with 10 CFR 20.1402[1].

Big Rock Point's Defueled Technical Specifications no longer contain requirements for the REMP; rather, this program is now contained in the Big Rock Point ODCM Section III. The radiological environmental monitoring sampling requirements are greatly reduced when compared to the plant's operating period. A land use census is no longer required for Big Rock Point. Use of an assumed garden and milk animal at the site boundary in the downwind sector of highest D/Q, per ODCM Section II, Table 1.4, is conservative with respect to any actual garden and milk locations.

Tables 1, 2 and 3 provide a summary of 2006 BRP REMP sample requirements and results. Detailed sample station identification and location information can be found in Enclosure B. Well water, lake water intake/discharge, sediment, and fish samples were evaluated using data means comparisons against an appropriate control location (if available) and BRP ODCM limits. There are no remaining 2006 laboratory sample analyses pending completion for inclusion into this report.

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1 Letter from the US NRC dated January 8, 2007, Release of land from Part 50 License for Unrestricted Use

The 2006 BRP ISFSI dry fuel storage facility environmental monitoring requirements pursuant to 10 CFR Part 72.44(d)(3) were submitted to the NRC in a letter dated February 2, 2007.

II. Discussion and Interpretation of Results

A. TLDs - Gamma Dose

The Big Rock Point gamma dose assessment program consists of 13 TLD locations: four on-site TLDs (locations 1-ST, 14-G, 15-H, and 17-K), six site boundary TLDs (locations 9-A, 10-B, 11-C, 12-D, 13-F, 16-J), and three control TLDs, 10.5 to 50 miles out, (locations 5-PT, 6-BC, 7-TR). Environmental gamma doses are measured quarterly and annually by placement of two TLD badges per designated location. Enclosure B provides a description and diagrams for TLD locations.

For 2006 the average quarterly gamma readings were:

12.4 millirem for the onsite TLDs;
11.9 millirem for the site boundary TLDs, and
15.6 millirem for the control TLD locations.

The average of the annual gamma readings in 2006 were:

46.6 millirem for the onsite TLDs,
43.8 millirem for the site boundary TLDs, and
56.2millirem for the control TLD locations.

The onsite quarterly TLD mean and the onsite annual TLD mean measured in 2006 are less than that of 2005; this is due to completion of plant decommissioning activities and the removal of the last remaining source term. Site boundary and offsite control TLDs are consistent with 2005 Annual Radiological Environmental Operating Report and historical data.

A statistical evaluation was completed comparing 2006 offsite control TLD data to site boundary TLD data. The site boundary TLD mean, although lower than the offsite control mean, is not statistically different than the offsite control TLD mean.

Each TLD badge contains a 4-zone $CaSO_4$ phosphor wafer (the wafer also includes an additional backup/reserve read-out zone). Sensitivity for the multi-zone TLDs are 1.0 millirem with a linear response to 1000 rem.

B. Air Samples

The Big Rock Point Radiological Environmental Monitoring Program no longer requires airborne surveillance be conducted.

C. Milk

The Big Rock Point Radiological Environmental Monitoring Program no longer requires milk samples be collected.

D. Lake Water

The site did not withdraw any lake water during 2006 and no liquid batch releases occurred during the reporting period, no lake water samples were required.

Groundwater and surface water from site dewatering activities is detained for sediment control during decommissioning activities. Sampling of this water prior to release for gamma isotopes and tritium is performed as a precautionary measure. All composite water sample analyses were less than established minimum detectable activity levels for gamma isotopes. Composite sample tritium value is 1729 pCi/L for the retention pond releases in 2006. Precautionary sampling of the detained water during release is consistent with the ODCM requirement for semiannual lake water sample collection near the site (see Enclosure A).

E. Well Water

The BRP ODCM requires semiannual sampling of the site drinking water well with analysis for tritium and gamma isotopes. A final well water sample was collected in May, shortly there after the well was abandoned in accordance with State of Michigan Department of Environmental Quality requirements. The analyses did not detect any tritium or gamma isotopes in the well water sample.

F. Groundwater Monitoring Wells

Big Rock Point ODCM requires semiannual sampling of six site groundwater monitoring wells, with analysis for tritium and gamma isotopes. Big Rock Point had up to 22 monitoring wells available for sampling. Nine original groundwater monitoring wells were installed in 1994; additional monitoring wells were installed in 2002 and 2003 for the purpose of groundwater characterization. All available wells were sampled on a quarterly basis; however, decommissioning activities conducted during 2006 did render some of the monitoring wells unavailable for sampling. Following required

sampling, all groundwater monitoring wells were abandoned in 2006 in accordance with the Big Rock Point License Termination Plan.

A total of 38 monitoring well samples were collected and analyzed in 2006. All gamma isotopic results were less than detectable. Tritium was detected above the LLD in 10 of the samples at a mean of 1804 pCi/L. Historically MW-5 and MW-6 typically have shown the highest detectable tritium concentrations. The mean value for MW-5 and MW-6 is 1668 pCi/L, slightly lower than the 2005 corresponding mean value of 4850 pCi/L for the same well locations. All monitoring well samples collected in 2006 were below the reporting criteria of 20,000 pCi/L.

Each well water sample consists of a one-gallon grab sample. This sample is sent to Environmental Inc. Midwest Laboratory for analysis. No treatment of the water samples with a preservative is necessary.

G. Drinking Water

Collection of drinking water samples, other than the plant's drinking water supply well (see Section E), is no longer required by the BRP Radiological Environmental Monitoring Program.

H. Crops

The collection of food crops/vegetation samples is not required by the BRP Radiological Environmental Monitoring Program.

I. Sediment

A total of six individual sediment samples were collected from four locations during 2006. Sediment samples locations are the lakeshore adjacent to the former discharge channel (1-ST), 1/4 mile south of discharge (24-STS), 1/4 mile north of discharge (25-STN), and the Ludington control station (26-LP, 115 miles SSW). The BRP ODCM requirement for sampling where clarified water enters the lake is met by sample collected adjacent to the former discharge location due to the proximity of these two locations (approximately 100 yard distance).

Evaluation of the sediment analytical results was based on data mean comparisons between the BRP samples and the Ludington control samples and the BRP ODCM reporting limits. Gross beta was detected in all six indicator samples with a mean value of 19.2 pCi/g. Cs-137 was detected in five indicator samples with a mean of 0.17 pCi/g. Co-60 was not detected in any of the indicator samples. Both Cs-137 and Co-60 levels continued to decrease during 2006, consistent with corresponding decommissioning

sediment analyses conducted in previous years (1997-2006). Neither Cs-137 nor Co-60 was detected in control samples.

No BRP ODCM reporting levels or action levels were exceeded during 2006.

Sediment samples are collected in one-liter quantities and obtained a few yards off-shore. No treatment of the samples with a preservative is necessary prior to shipment to Environmental Inc. Midwest Laboratory.

J. Fish

The BRP Radiological Environmental Monitoring Program requires that either one fish or invertebrate (crayfish) sample is collected semi-annually at the location where detained water enters the lake. Fish samples were collected from this location in June and September. Control samples were taken from the Ludington location. Radionuclide analyses results are listed in Table 2 for these samples. The September fish sample indicated the presence of Cs-137 at less than one-quarter of the required LLD. Gross beta, which originates primarily from naturally-occurring background radionuclides, is not required by the Big Rock Point ODCM for fish samples.

No BRP ODCM reporting levels were exceeded nor were any special or supplemental analyses required during 2006.

One liter quantities of frozen fish are sent to Environmental Inc. Midwest Laboratory for analysis.

K. Crayfish

No crayfish samples were collected in 2006.

L. Aquatic Biota

The collection/analysis of aquatic biota (algae and periphyton) is no longer required for the Big Rock Point Radiological Environmental Monitoring Program.

M. Broad Leaf Vegetation

The collection/analysis of broad leaf vegetation is no longer required in the Big Rock Point Radiological Environmental Monitoring Program.

III. Assessment of Big Rock Point's Operational Environmental Impact

Review and comparison of the 2006 Big Rock Point radiological environmental monitoring data to previous operational and pre-operational data continues to show that all trending parameters analyzed support the conclusion that operation and decommissioning activities at the former Big Rock Point Nuclear plant have had minimal environmental impact. Additionally, 2006 Big Rock Point environmental monitoring data was incorporated into the Final Status Survey Report which demonstrated that the site met the requirements of 10 CFR 20.1402, Radiological Criteria for Unrestricted Use.

Table 1. Sampling and Analysis Summary

Medium	Description	Location(s)	Type of Analysis	Number of Samples Collected	Frequency of Analysis
TLD	Continuous	1-ST, 5-PT, 6-BC, 7-TR, 9A-17K	Gamma isotopic	49 11	Quarterly Annual [a]
Lake Water	1 gallon composite	1-ST	Tritium, Gamma isotopic	0	Semiannual
Well Water	1 gallon grab/composite	Site Well	Tritium, Gamma isotopic	1	Semiannual
Monitoring Wells [b]	1 gallon grab	MW 1-9	Tritium, Gamma isotopic	10	Semiannual
Sediment	Grab	1-ST, 24-STS, 25-STN, 26-LP	Gamma Isotopic	6	Semiannual
Fish [c]	Grab	1-ST Discharge	Gamma Isotopic	2	Semiannual

Table Notes

[a] Only quarterly TLD's are required per Big Rock Point ODCM
[b] Tritium and gamma isotopic analysis for a minimum of 6 monitoring wells, semi-annually
[c] BRP ODCM requires one fish or crayfish sample semiannually

Table 2. Sample Data Summary [a]

Medium or Pathway Sampled (Units)	Analyses Evaluated Versus Total Number Analyses Performed		Lower Limit of Detection (LLD) [b]	All Indicator Locations Mean [c] (Range)		All Control Locations Mean [c] (Range)		Nonroutine Measure-ments
Direct Radiation:								
TLD - Onsite (mR)	TLD (quarterly) [d]	25/28	1.0	13/16	12.4 (10.7-18.4)	12/12	15.6 (11.1-22.8)	None
	TLD (annual)	2/4	1.0	2/4	46.6 (43.4-49.7)	3/3	56.2 (41.6-78)	None
TLD - Site Boundary (mR)	TLD (quarterly) [d]	36/36	1.0	24/24	11.9 (9.4-14.7)	12/12	15.6 (11.1-22.8)	None
	TLD (annual)	9/9	1.0	6/6	43.8 (38.2-52.6)	3/3	56.2 (41.6-78)	None
Waterborne:								
Lake Water (pCi/L)	*Sample not collected*							
Well Water (pCi/L)	Tritium	1/1	500.0	0/1	LLD	N/A	N/A	None
	Gamma Isotopic	1/1	15.0-30.0	0/1	LLD	N/A	N/A	None
Groundwater Monitoring Wells (pCi/L)	Tritium	38/38	500.0	10/38	1804 (1095-3023)	N/A	N/A	None
	Gamma Isotopic	38/38	15.0-30.0	0/38	LLD	N/A	N/A	None
Lake Sediment:								
Sediment (pCi/g dry)	Gross Beta	6/6	1.0	6/6	19.2 (10.8-26.3)	1/1	LLD	None
	Cs-137	6/6	0.18	5/6	0.17 (0.03-0.30)	1/1	LLD	None

Table 2. Sample Data Summary [a]

Medium or Pathway Sampled (Units)	Analyses Evaluated Versus Total Number Analyses Performed		Lower Limit of Detection (LLD) [b]	All Indicator Locations Mean [c] (Range)		All Control Locations Mean [c] (Range)		Nonroutine Measure-ments
Biota:								
Fish [e] (pCi/g wet)	Gamma Isotopic (Cs-137)	2/2	0.15	1/2	0.032 NA	2/2	LLD	None
Crayfish [e] (pCi/g wet)	*Samples not collected*							

Table Notes:

[a] Values for sample locations with the greatest annual mean are provided in Table 3.
[b] Nominal LLD as defined in the Big Rock Point Offsite Dose Calculation Manual Section I, Table I.H-3 and vendor analytical capabilities.
[c] Mean and range data reported are based upon detectable measurements.
[d] Quarterly TLD results are normalized for 91 days net.
[e] Sample requirements are either one fish or invertebrate sample semiannually

Table 3. Reporting Results Greatest Mean Sampling Location

Medium	Type of Analysis	Location	High	Low	Mean
TLD - Onsite	TLD (Quarterly) [a]	17-K	18.4	12.1	13.8
(mR)	TLD (Annual)	17-K	---	---	49.7
TLD - Site Boundary	TLD (Quarterly) [a]	12-E	12.7	14.6	13.9
(mR)	TLD (Annual)	12-E	---	---	52.6
Lake Water (pCi/L)	No sample collected				
Well Water	Tritium	LLD			
(pCi/L)	Gamma Isotopic	LLD			
Groundwater	Tritium	MW-5 Near shoreline, North side	3023	2719	2891
Monitoring Wells	Gamma Isotopic	LLD			
(pCi/L)					
Sediment	Gross Beta	25-STN	22.56	20.08	21.32
(pCi/g dry)	Cs-137	1-ST	0.30	0.03	0.16
Fish [b]	Gamma Isotopic	1-ST	---	---	0.03
(pCi/g wet)	(Cs-137)				
Crayfish [b]	No samples collected				
(pCi/g wet)					

Table Notes

[a] Quarterly TLD results are normalized for 91 days net.
[b] Sample requirements are either one fish or invertebrate sample semiannually

Enclosures

A. Sample Collection Anomalies

B. Big Rock Point Environmental Sample Schedule and Sample Location Maps

C. Radiological Environmental Monitoring Program Data as provided by Environmental, Inc. Midwest laboratory, Northbrook, IL.

D. Environmental, Inc. Midwest laboratory EPA Interlaboratory Comparison Program Results

E. Data Graphs

1. Mean Quarterly TLDs, Big Rock Point 1997-2006
2. Groundwater Monitoring Well Mean Tritium Concentration, Big Rock Point 1997-2006
3. Sediment Mean Gross Beta, Big Rock Point 1997-2006
4. Sediment Mean Total Gamma Activity, Big Rock Point 1997-2006
5. Fish & Crayfish Mean Total Gamma Activity, Big Rock Point 1997-2006

Big Rock Point
Annual Radiological Environmental Operation Report
January through December 2006

Enclosure A: Sample Collection Anomalies

Enclosure A

Sample Collection Anomalies

Sample Type Affected	Location	Date	Problem Description	Evaluation
TLD	BRP-01	3rd Quarter	Quarterly TLD lost in field	TLD lost during building removal/demolition; remaining onsite TLD readings were utilized for analysis and were consistent with previous years data
TLD	BRP-01	3rd Quarter	Annual TLD lost in field	Same as above
TLD	BRP-14	3rd Quarter	Quarterly TLD lost in field	TLD lost during site restoration activities; remaining onsite TLD readings were utilized for analysis and were consistent with previous years data
TLD	BRP-14	3rd Quarter	Annual TLD lost in field	Same as above
TLD	BRP-01	4th Quarter	TLD not placed in field	TLD was not placed in designated field location after loss of 3rd quarter TLD; remaining onsite TLD readings were utilized for analysis and were consistent with previous years data

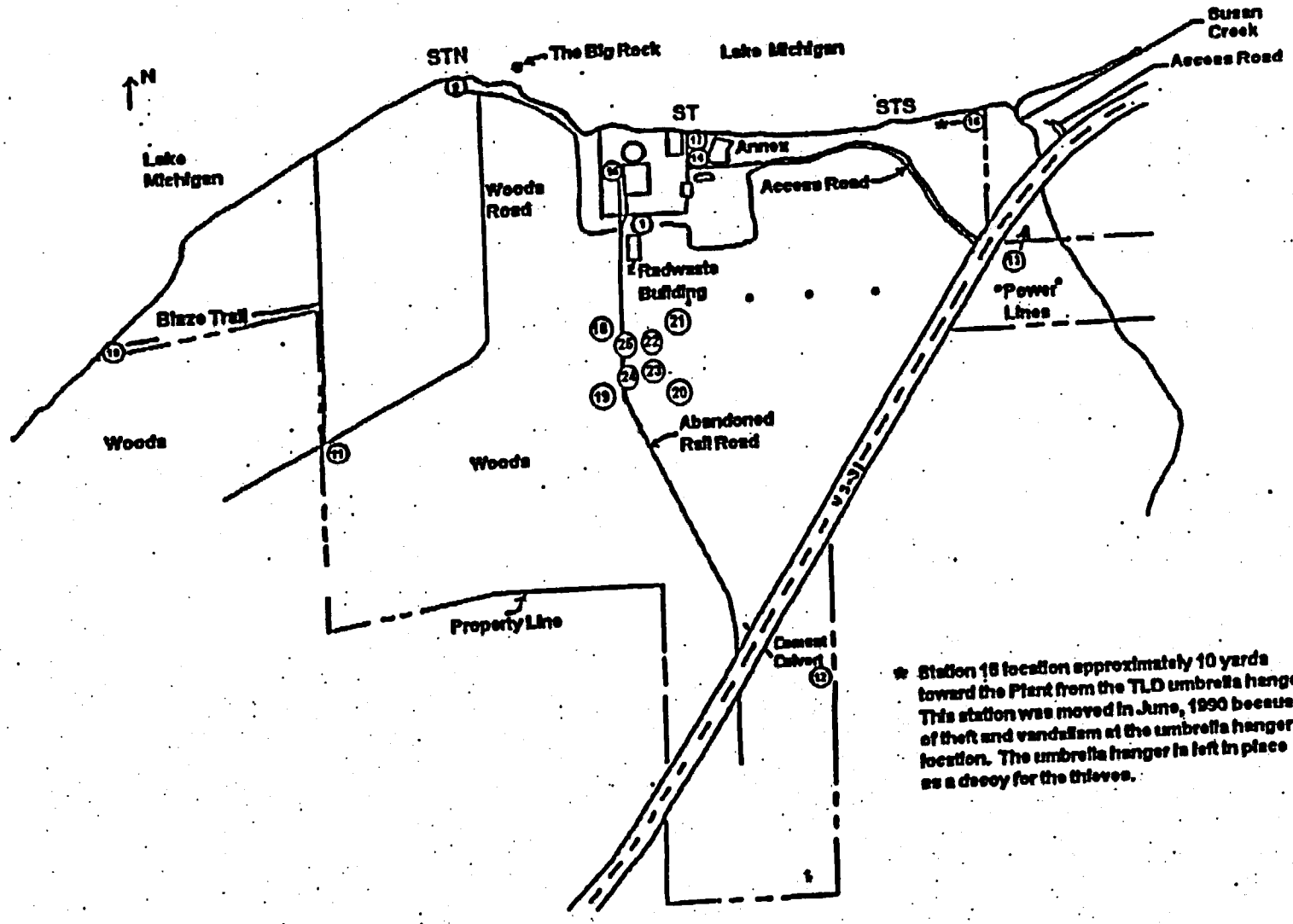
Big Rock Point
Annual Radiological Environmental Operation Report
January through December 2006

Enclosure B: Big Rock Point Environmental Sample Schedule
and Sample Location Maps

TABLE 1-1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

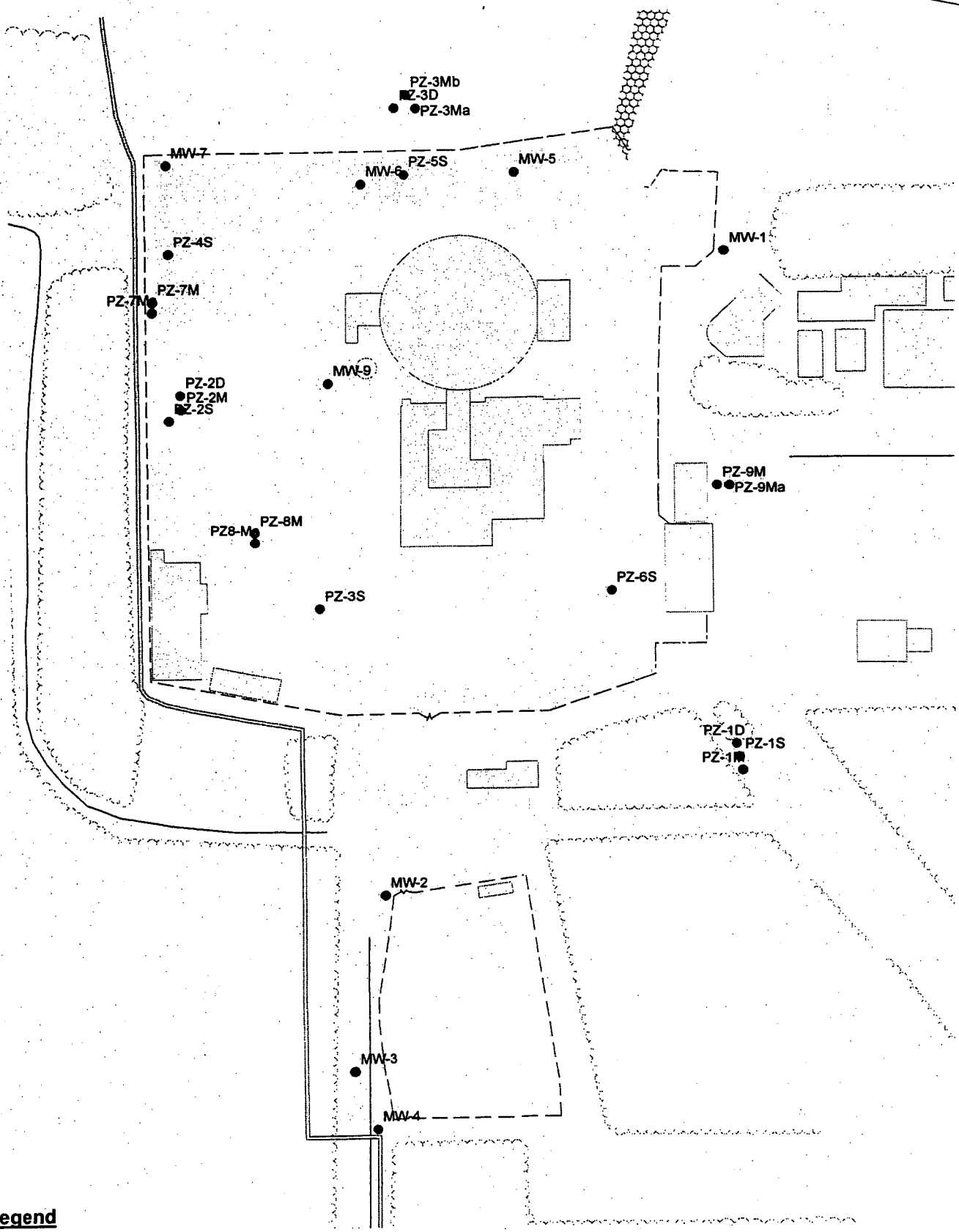
Exposure Pathway and/or Sample	Number of Representative Samples and Sample Locations [a]	Sampling and Collection Frequency	Type and frequency of Analysis
1. Direct Radiation [b]	21 monitoring stations either with two or more TLDs or one instrument for measuring and recording dose rate continuously, placed as follows [d]: a) Miscellaneous site locations (4) b) A ring of stations (6) at or near the Site boundary c) Balance of stations (3) placed to serve as control stations d) Outside perimeter of ISFSI (4) e) ISFSI protected area fence line (4)	Quarterly	Gamma dose quarterly
2. Waterborne			
a. Lake	1 sample near site	Semiannual (grab)	Tritium and gamma isotopic [d]
b. Well (drinking) and groundwater monitoring wells	1 sample from Site well, if in use, and 1 sample from minimum of 6 monitor wells	Semiannual (grab) Semiannual (grab)	Tritium and gamma isotopic semiannually
3. Biota			
a. Marine	1 fish or invertebrate sample where clarified, detained water enters lake	Semiannual (grab) Apr-Nov	Gamma Isotopic Semiannually
4. Lake Sediment			
a. Shoreline	1 sample where clarified, detained water enters lake	Semiannual (grab) Apr-Nov	Gamma Isotopic Semiannually
b. Shoreline	1 sample each side of 4.a (above), within ~½ mile	Semiannual (grab) Apr-Nov	Gamma Isotopic Semiannually

Big Rock Point
Environmental Sample Location Map



* Station 16 location approximately 10 yards toward the Plant from the TLD umbrella hanger. This station was moved in June, 1990 because of theft and vandalism at the umbrella hanger location. The umbrella hanger is left in place as a decoy for the thieves.

Groundwater Sample Well Locations
Big Rock Point Restoration Project



Legend

- Monitoring Wells

Big Rock Point
Annual Radiological Environmental Operation Report
January through December 2006

Enclosure C: Radiological Environmental Monitoring Program Data

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MONTHLY PROGRESS REPORT
TO
CONSUMERS ENERGY COMPANY
JACKSON, MICHIGAN

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
FOR
BIG ROCK NUCLEAR GENERATING PLANT

PREPARED AND SUBMITTED
BY
ENVIRONMENTAL INCORPORATED MIDWEST LABORATORY

Project Number: 8022

Reporting Period: January - December, 2006

Reviewed and
Approved by _____ Date 01-26-2007

B. Grob, M.S.
Laboratory Manager

Distribution: Kenneth E. Pallagi (1 copy)

TABLE OF CONTENTS

Section

List of Tables iii

1 INTRODUCTION iv

2 LISTING OF MISSED SAMPLES v

Appendices

A Interlaboratory Comparison Program Results A-1

B Data Reporting Conventions B-1

C Special Analyses C-1

LIST OF TABLES

No.		Page
1.	Gamma Radiation, as measured by TLDs, Quarterly Exposure	1-1
2.	Gamma Radiation, as measured by TLDs, Annual Exposure	2-1
3.	Lake Water, Inlet and Discharge	3-1
4.	Water, Ludington Controls	4-1
5.	Well Water	5-1
6.	Fish	6-1
7	Crayfish	7-1
8.	Bottom Sediments	8-1
9.	Reactor Effluent Samples	
9.1	Liquid Radwaste	9.1-1
9.2	Stack Filters	9.1-2

1.0 INTRODUCTION

The following constitutes a final 2006 Progress Report for the Radiological Environmental Monitoring Program conducted at the Consumers Power Company, Big Rock Nuclear Generating Plant. Results of completed analyses are presented in the attached tables.

All concentrations, except gross alpha and gross beta, are decay corrected to the time of collection.

All samples were collected within the scheduled period unless noted otherwise in the Listing of Missed Samples.

BIG ROCK

2.0 LISTING OF MISSED SAMPLES

Sample Type	Location	Expected Collection Date	Reason
TLD	BR-01	10-06-03	TLD missing in field.
TLD	BR-14	10-06-03	TLD missing in field.
TLD (A)	BR-01	01-04-07	TLD missing in field.
TLD (A)	BR-14	01-04-07	TLD missing in field.

Table 1. Gamma radiation, as measured by TLDs, quarterly exposure.
Units: mR/91 days[a]

	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Date Placed	01-05-06	04-06-06	07-06-06	10-05-06
Date Removed	04-06-06	07-06-06	10-06-06	01-04-07
Intransit (mR)	1.3 ± 0.3	5.0 ± 0.3	1.8 ± 0.3	3.2 ± 0.3
BRP-01 (ST) (Onsite)	11.6 ± 0.6	11.7 ± 1.2	ND[b]	6.1 ± 0.4 [c]
BRP-05 (PT) (Control)	11.1 ± 0.4	11.6 ± 0.4	12.0 ± 0.5	12.6 ± 0.7
BRP-06 (BC) (Control)	14.1 ± 0.4	13.4 ± 0.8	14.4 ± 0.5	15.0 ± 0.6
BRP-07 (TR) (Control)	17.9 ± 0.5	19.8 ± 0.8	22.0 ± 0.7	22.8 ± 0.8
BRP-09 (Site Boundary)	11.1 ± 0.3	11.2 ± 0.5	12.0 ± 0.4	12.1 ± 0.5
BRP-10 (Site Boundary)	10.5 ± 0.4	10.1 ± 0.5	10.9 ± 0.6	11.2 ± 0.5
BRP-11 (Site Boundary)	12.4 ± 0.4	12.2 ± 0.6	13.7 ± 0.4	13.2 ± 0.6
BRP-12 (Site Boundary)	12.7 ± 0.6	13.6 ± 1.0	14.7 ± 0.4	14.6 ± 0.7
BRP-13 (Site Boundary)	11.4 ± 0.4	12.2 ± 0.6	12.7 ± 0.6	12.8 ± 0.6
BRP-14 (G) (Onsite)	14.4 ± 0.7	11.3 ± 0.8	ND[b]	11.7 ± 0.6
BRP-15 (H) (Onsite)	11.3 ± 0.5	11.1 ± 0.4	10.7 ± 0.5	11.8 ± 1.2
BRP-16 (J) (Site Boundary)	9.4 ± 0.4	9.6 ± 0.5	9.9 ± 0.4	10.3 ± 0.5
BRP-17 (K) (Onsite)	18.4 ± 0.5	12.1 ± 0.4	12.1 ± 0.4	12.5 ± 1.1
BRP-18 (ISFSI-NW)	9.7 ± 0.4	10.1 ± 0.6	10.1 ± 0.5	10.4 ± 0.6
BRP-19 (ISFSI-SW)	12.2 ± 0.5	13.2 ± 0.7	13.8 ± 0.5	13.9 ± 0.8
BRP-20 (ISFSI-SE)	13.3 ± 0.6	12.9 ± 0.7	14.4 ± 0.8	12.9 ± 0.7
BRP-21 (ISFSI-NE)	10.1 ± 0.5	10.5 ± 0.4	10.8 ± 0.5	10.4 ± 0.4
BRP-22 (ISFSI-FNE)	15.7 ± 0.4	15.7 ± 0.6	16.5 ± 0.8	17.1 ± 0.9
BRP-23 (ISFSI-FSE)	33.5 ± 1.2	33.9 ± 1.1	33.6 ± 1.3	34.5 ± 1.0
BRP-24 (ISFSI-FSW)	18.1 ± 0.7	19.2 ± 0.5	18.6 ± 0.6	19.9 ± 0.5
BRP-25 (ISFSI-FNW)	15.7 ± 0.5	15.8 ± 0.4	15.8 ± 0.5	16.4 ± 0.4

[a] Intransit exposure has been subtracted.
[b] "ND" = No data; TLD missing in field.
[c] TLD not placed in field.

Table 2. Gamma radiation, as measured by TLDs, annual exposure.
Units: mR/365 days[a]

	2006
Date Placed	01-05-06
Date Removed	01-03-07
Intransit (mR)	2.0 ± 0.8
BRP-01 (ST) (Onsite)	ND[b]
BRP-05 (PT) (Control)	41.6 ± 1.2
BRP-06 (BC) (Control)	48.9 ± 1.7
BRP-07 (TR) (Control)	78.0 ± 1.4
BRP-09 (Site Boundary)	40.9 ± 1.5
BRP-10 (Site Boundary)	38.9 ± 1.0
BRP-11 (Site Boundary)	48.4 ± 1.8
BRP-12 (Site Boundary)	52.6 ± 1.6
BRP-13 (Site Boundary)	43.8 ± 2.2
BRP-14 (G) (Onsite)	ND[b]
BRP-15 (H) (Onsite)	43.4 ± 1.4
BRP-16 (J) (Site Boundary)	38.2 ± 1.8
BRP-17 (K) (Onsite)	49.7 ± 1.6
BRP-18 (ISFSI-NW)	37.4 ± 1.6
BRP-19 (ISFSI-SW)	51.0 ± 2.1
BRP-20 (ISFSI-SE)	50.5 ± 2.6
BRP-21 (ISFSI-NE)	37.5 ± 1.1
BRP-22 (ISFSI-FNE)	55.6 ± 3.3
BRP-23 (ISFSI-FSE)	132.9 ± 5.4
BRP-24 (ISFSI-FSW)	68.8 ± 1.9
BRP-25 (ISFSI-FNW)	55.3 ± 0.8
Control 1 (Shield)	22.8 ± 1.1
Control 2 (Shield)	23.0 ± 0.9

[a] Intransit exposure has been subtracted.

[b] "ND" = No data; TLD missing.

Table 5.1 Well water, analyses for tritium and gamma emitting isotopes.
Collection: Semiannual
Units: pCi/L

Location	Site Well	
Lab Code	BRWW-3592	
Date Collected	5/27/2006	Req. LLD
H-3	< 129	
Mn-54	< 2.7	15
Fe-59	< 4.5	30
Co-58	< 1.5	15
Co-60	< 2.0	15
Zn-65	< 3.6	30
Zr-Nb-95	< 2.3	15
Cs-134	< 2.5	15
Cs-137	< 1.7	18
Ba-La-140	< 1.5	15

Table 6. Fish, analyses for gross beta and gamma-emitting isotopes.
Collection: Semiannually
Units: pCi/g wet

Location	Discharge		
Lab Code	BRF-4066	BRF-6610	
Date Collected	6/21/2006	9/25/2006	Req. LLD
Sample Type	Sucker	Sucker	
Gross Beta	3.18 ± 0.09	4.28 ± 0.09	
Mn-54	< 0.017	< 0.009	0.13
Fe-59	< 0.039	< 0.027	0.26
Co-58	< 0.018	< 0.015	0.13
Co-60	< 0.015	< 0.009	0.13
Zn-65	< 0.031	< 0.035	0.26
Zr-Nb-95	< 0.022	< 0.019	0.10
Cs-134	< 0.018	< 0.012	0.13
Cs-137	< 0.021	0.032 ± 0.014	0.15

Location	Ludington Pumped Storage Plant (Control)		
Lab Code	PAF-5334	PAF-5335	
Date Collected	8/3/2006	8/3/2006	Req. LLD
Sample Type	Carp	Perch	
Mn-54	< 0.021	< 0.011	0.13
Fe-59	< 0.029	< 0.017	0.26
Co-58	< 0.015	< 0.019	0.13
Co-60	< 0.015	< 0.022	0.13
Zn-65	< 0.054	< 0.044	0.26
Zr-Nb-95	< 0.013	< 0.033	0.10
Cs-134	< 0.013	< 0.021	0.13
Cs-137	< 0.025	< 0.028	0.15

Table 8. Bottom sediment, analyses for gross beta and gamma-emitting isotopes.
Collection: Semiannually
Units: pCi/g dry

Location	1/4 Mile East		1/4 Mile West		
Lab Code	BRBS-4069	BRBS-6608	BRBS-4068	BRBS-6609	
Date Collected	6/5/2006	9/25/2006	6/5/2006	9/25/2006	Req. LLD
Gross Beta	20.08 ± 2.07	22.56 ± 2.32	19.60 ± 1.83	10.75 ± 1.82	
Mn-54	< 0.009	< 0.006	< 0.008	< 0.008	0.08
Fe-59	< 0.016	< 0.020	< 0.033	< 0.007	0.10
Co-58	< 0.006	< 0.008	< 0.010	< 0.010	0.08
Co-60	< 0.018	< 0.011	< 0.014	< 0.006	0.05
Zn-65	< 0.020	< 0.036	< 0.024	< 0.023	0.10
Zr-Nb-95	< 0.008	< 0.010	< 0.014	< 0.009	0.10
Cs-134	< 0.008	< 0.012	< 0.016	< 0.011	0.15
Cs-137	0.23 ± 0.027	< 0.014	0.14 ± 0.026	0.14 ± 0.018	0.18

Location	Discharge		Ludington (Control)	
Lab Code	BRBS-4067	BRBS-6607	PABS-4480	
Date Collected	6/5/2006	9/25/2006	6/16/2006	Req. LLD
Gross Beta	26.30 ± 2.26	15.90 ± 2.28		
Mn-54	< 0.007	< 0.005	< 0.014	0.08
Fe-59	< 0.020	< 0.020	< 0.025	0.10
Co-58	< 0.010	< 0.009	< 0.014	0.08
Co-60	< 0.026	< 0.007	< 0.012	0.05
Zn-65	< 0.019	< 0.014	< 0.042	0.10
Zr-Nb-95	< 0.008	< 0.010	< 0.031	0.10
Cs-134	< 0.011	< 0.009	< 0.017	0.15
Cs-137	0.30 ± 0.023	0.03 ± 0.016	< 0.016	0.18

Table 9.2. Stack Filters, analyses for gross alpha, plutonium-239, strontium-89 and strontium-90.
Collection: Continuous, monthly exchange.
Units: pCi/filter

Location		Big Rock			
Date Collecte	Lab Code	Gross Alpha	Sr-89	Sr-90	Pu-239
Required LLD		10	10	10	10
02-28-06	BRSP -1472	< 0.7	< 4.6	< 2.9	< 0.1

Big Rock Point
Annual Radiological Environmental Operation Report
January through December 2006

Enclosure D: Interlaboratory Comparison Program Results

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APPENDIX A

INTERLABORATORY COMPARISON PROGRAM RESULTS

NOTE: Environmental Inc., Midwest Laboratory participates in intercomparison studies administered by Environmental Resources Associates, and serves as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada. Results are reported in Appendix A. TLD Intercomparison results, in-house spikes, blanks, duplicates and mixed analyte performance evaluation program results are also reported. Appendix A is updated four times a year; the complete Appendix is included in March, June, September and December monthly progress reports only.

October, 2005 through September, 2006

Appendix A

Interlaboratory Comparison Program Results

Environmental, Inc., Midwest Laboratory has participated in interlaboratory comparison (crosscheck) programs since the formulation of it's quality control program in December 1971. These programs are operated by agencies which supply environmental type samples containing concentrations of radionuclides known to the issuing agency but not to participant laboratories. The purpose of such a program is to provide an independent check on a laboratory's analytical procedures and to alert it of any possible problems.

Participant laboratories measure the concentration of specified radionuclides and report them to the issuing agency. Several months later, the agency reports the known values to the participant laboratories and specifies control limits. Results consistently higher or lower than the known values or outside the control limits indicate a need to check the instruments or procedures used.

Results in Table A-1 were obtained through participation in the environmental sample crosscheck program administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada.

The results in Table A-2 list results for thermoluminescent dosimeters (TLDs), via International Intercomparison of Environmental Dosimeters, when available, and internal laboratory testing.

Table A-3 lists results of the analyses on in-house "spiked" samples for the past twelve months. All samples are prepared using NIST traceable sources. Data for previous years available upon request.

Table A-4 lists results of the analyses on in-house "blank" samples for the past twelve months. Data for previous years available upon request.

Table A-5 list results of the in-house "duplicate" program for the past twelve months. Acceptance is based on the difference of the results being less than the sum of the errors. Data for previous years available upon request.

The results in Table A-6 were obtained through participation in the Mixed Analyte Performance Evaluation Program.

Attachment A lists acceptance criteria for "spiked" samples.

Out-of-limit results are explained directly below the result.

Attachment A

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES

LABORATORY PRECISION: ONE STANDARD DEVIATION VALUES FOR VARIOUS ANALYSES[a]

Analysis	Level	One standard deviation for single determination
Gamma Emitters	5 to 100 pCi/liter or kg > 100 pCi/liter or kg	5.0 pCi/liter 5% of known value
Strontium-89[b]	5 to 50 pCi/liter or kg > 50 pCi/liter or kg	5.0 pCi/liter 10% of known value
Strontium-90[b]	2 to 30 pCi/liter or kg > 30 pCi/liter or kg	5.0 pCi/liter 10% of known value
Potassium-40	≥ 0.1 g/liter or kg	5% of known value
Gross alpha	≤ 20 pCi/liter > 20 pCi/liter	5.0 pCi/liter 25% of known value
Gross beta	≤ 100 pCi/liter > 100 pCi/liter	5.0 pCi/liter 5% of known value
Tritium	≤ 4,000 pCi/liter > 4,000 pCi/liter	± 1σ = (pCi/liter) = 169.85 x (known)$^{0.0933}$ 10% of known value
Radium-226,-228	≥ 0.1 pCi/liter	15% of known value
Plutonium	≥ 0.1 pCi/liter, gram, or sample	10% of known value
Iodine-131, Iodine-129[b]	≤ 55 pCi/liter > 55 pCi/liter	6.0 pCi/liter 10% of known value
Uranium-238, Nickel-63[b] Technetium-99[b]	≤ 35 pCi/liter > 35 pCi/liter	6.0 pCi/liter 15% of known value
Iron-55[b]	50 to 100 pCi/liter > 100 pCi/liter	10 pCi/liter 10% of known value
Others[b]	---	20% of known value

[a] From EPA publication, "Environmental Radioactivity Laboratory Intercomparison Studies Program, Fiscal Year, 1981-1982, EPA-600/4-81-004.

[b] Laboratory limit.

TABLE A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)[a].

Lab Code	Date	Concentration (pCi/L)				
		Analysis	Laboratory Result[b]	ERA Result[c]	Control Limits	Acceptance
STW-1072	11/15/05	Sr-89	20.6 ± 0.4	19.0	10.3 - 27.7	Pass
STW-1072	11/15/05	Sr-90	15.0 ± 0.3	16.0	7.3 - 24.7	Pass
STW-1073	11/15/05	Ba-133	31.8 ± 1.8	31.2	22.5 - 39.9	Pass
STW-1073	11/15/05	Co-60	85.0 ± 1.4	84.1	75.4 - 92.8	Pass
STW-1073	11/15/05	Cs-134	37.2 ± 2.1	33.9	25.2 - 42.6	Pass
STW-1073	11/15/05	Cs-137	27.8 ± 0.7	28.3	19.6 - 37.0	Pass
STW-1073	11/15/05	Zn-65	109.0 ± 1.0	105.0	86.8 - 123.0	Pass
STW-1074 [d]	11/15/05	Gr. Alpha	41.1 ± 1.2	23.3	13.2 - 33.4	Fail
STW-1074	11/15/05	Gr. Beta	42.7 ± 0.5	39.1	30.4 - 47.8	Pass
STW-1075	11/15/05	I-131	20.5 ± 0.6	17.4	12.2 - 22.6	Pass
STW-1076	11/15/05	Ra-226	7.8 ± 0.6	8.3	6.2 - 10.5	Pass
STW-1076 [e]	11/15/05	Ra-228	5.5 ± 0.6	3.5	2.0 - 5.0	Fail
STW-1076	11/15/05	Uranium	15.5 ± 0.3	16.1	10.9 - 21.3	Pass
STW-1077	11/15/05	H-3	12500.0 ± 238.0	12200.0	10100.0 - 14300.0	Pass
STW-1078	01/16/06	Sr-89	49.9 ± 3.5	50.2	41.5 - 58.9	Pass
STW-1078	01/16/06	Sr-90	31.5 ± 1.5	30.7	22.0 - 39.4	Pass
STW-1079	01/16/06	Ba-133	86.5 ± 4.1	95.0	78.6 - 111.0	Pass
STW-1079	01/16/06	Co-60	96.3 ± 4.1	95.3	86.6 - 104.0	Pass
STW-1079	01/16/06	Cs-134	22.6 ± 3.0	23.1	14.4 - 31.8	Pass
STW-1079	01/16/06	Cs-137	109.0 ± 5.9	111.0	101.0 - 121.0	Pass
STW-1079	01/16/06	Zn-65	198.0 ± 11.2	192.0	159.0 - 225.0	Pass
STW-1080	01/16/06	Gr. Alpha	10.8 ± 1.4	9.6	1.0 - 18.3	Pass
STW-1080	01/16/06	Gr. Beta	56.9 ± 1.9	61.9	44.6 - 79.2	Pass
STW-1081	01/16/06	Ra-226	4.3 ± 0.4	4.6	3.4 - 5.8	Pass
STW-1081	01/16/06	Ra-228	7.1 ± 1.8	6.6	3.7 - 9.5	Pass
STW-1081	01/16/06	Uranium	20.7 ± 0.5	22.1	16.9 - 27.3	Pass
STW-1088	04/10/06	Sr-89	29.0 ± 1.8	32.4	23.7 - 41.1	Pass
STW-1088	04/10/06	Sr-90	8.7 ± 1.0	9.0	0.3 - 17.7	Pass
STW-1089	04/10/06	Ba-133	10.3 ± 0.4	10.0	1.3 - 18.7	Pass
STW-1089	04/10/06	Co-60	114.0 ± 2.8	113.0	103.0 - 123.0	Pass
STW-1089	04/10/06	Cs-134	41.9 ± 1.4	43.4	34.7 - 52.1	Pass
STW-1089	04/10/06	Cs-137	208.0 ± 1.1	214.0	195.0 - 233.0	Pass
STW-1089	04/10/06	Zn-65	154.0 ± 0.8	152.0	126.0 - 178.0	Pass
STW-1090	04/10/06	Gr. Alpha	13.4 ± 1.1	21.3	12.1 - 30.5	Pass
STW-1090	04/10/06	Gr. Beta	27.7 ± 2.1	23.0	14.3 - 31.7	Pass
STW-1091	04/10/06	I-131	22.0 ± 0.3	19.1	13.9 - 24.3	Pass
STW-1092	04/10/06	H-3	7960.0 ± 57.0	8130.0	6720.0 - 9540.0	Pass
STW-1092	04/10/06	Ra-226	2.9 ± 0.4	3.0	2.2 - 3.8	Pass
STW-1092	04/10/06	Ra-228	20.9 ± 1.2	19.1	10.8 - 27.4	Pass
STW-1092	04/10/06	Uranium	68.6 ± 3.4	69.1	57.1 - 81.1	Pass

TABLE A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)[a].

Lab Code	Date	Concentration (pCi/L)				
		Analysis	Laboratory Result[b]	ERA Result[c]	Control Limits	Acceptance
STW-1094	07/09/02	Sr-89	15.9 ± 0.7	19.7	11.0 - 28.4	Pass
STW-1094	07/09/02	Sr-90	24.3 ± 0.4	25.9	17.2 - 34.6	Pass
STW-1095	07/09/02	Ba-133	94.9 ± 8.9	88.1	72.9 - 103.0	Pass
STW-1095	07/09/02	Co-60	104.0 ± 1.8	99.7	91.0 - 108.0	Pass
STW-1095	07/09/02	Cs-134	48.7 ± 1.3	54.1	45.4 - 62.8	Pass
STW-1095[f]	07/09/02	Cs-137	236.0 ± 3.0	238.0	217.0 - 259.0	Pass
STW-1095	07/09/02	Zn-65	126.0 ± 8.0	121.0	100.0 - 142.0	Pass
STW-1096	07/09/02	Gr. Alpha	10.9 ± 1.0	10.0	1.3 - 18.6	Pass
STW-1096	07/09/02	Gr. Beta	9.7 ± 0.4	8.9	0.2 - 17.5	Pass
STW-1097	07/09/02	Ra-226	11.0 ± 0.5	10.7	7.9 - 13.5	Pass
STW-1097	07/09/02	Ra-228	12.2 ± 0.8	10.7	6.1 - 15.3	Pass
STW-1097	07/09/02	Uranium	43.4 ± 0.1	40.3	33.3 - 47.3	Pass

[a] Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing in drinking water conducted by Environmental Resources Associates (ERA).

[b] Unless otherwise indicated, the laboratory result is given as the mean ± standard deviation for three determinations.

[c] Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination) and control limits as provided by ERA.

[d] The original samples were calculated using an Am-241 efficiency. The samples were spiked with Th-232. Samples were recounted and calculated using the Th-232 efficiency. Results of the recount: 27.01 ± 2.35 pCi/L.

[e] Decay of short-lived radium daughters contributed to a higher counting rate. Delay of counting for 100 minutes provided better results. The reported result was the average of the first cycle of 100 minutes, the average of the second cycle counts was 4.01 pCi/L

TABLE A-2. Crosscheck program results; Thermoluminescent Dosimetry, (TLD, CaSO4: Dy Cards).

Lab Code	Date	Description	mR Known Value	mR Lab Result ± 2 sigma	Control Limits	Acceptance
Environmental, Inc.						
Environmental, Inc.						
2005-2	9/12/2005	30 cm	54.84	59.30 ± 2.66	38.39 - 71.29	Pass
2005-2	9/12/2005	60 cm	13.71	17.55 ± 1.30	9.60 - 17.82	Pass
2005-2	9/12/2005	75 cm	8.77	8.24 ± 0.38	6.14 - 11.40	Pass
2005-2	9/12/2005	90 cm	6.09	5.94 ± 0.49	4.26 - 7.92	Pass
2005-2	9/12/2005	90 cm	6.09	5.93 ± 0.37	4.26 - 7.92	Pass
2005-2	9/12/2005	120 cm	3.43	3.42 ± 0.18	2.40 - 4.46	Pass
2005-2	9/12/2005	150 cm	2.19	1.71 ± 0.14	1.53 - 2.85	Pass
2005-2	9/12/2005	150 cm	2.19	1.87 ± 0.27	1.53 - 2.85	Pass
2005-2	9/12/2005	180 cm	1.52	1.58 ± 0.99	1.06 - 1.98	Pass
Environmental, Inc.						
2006-1	6/5/2006	30 cm	54.81	70.73 ± 0.69	38.37 - 71.25	Pass
2006-1	6/5/2006	60 cm	13.70	16.71 ± 1.89	9.59 - 17.81	Pass
2006-1	6/5/2006	60 cm	13.70	16.69 ± 0.94	9.59 - 17.81	Pass
2006-1	6/5/2006	90 cm	6.09	6.57 ± 0.82	4.26 - 7.92	Pass
2006-1	6/5/2006	120 cm	3.43	3.65 ± 0.22	2.40 - 4.46	Pass
2006-1	6/5/2006	120 cm	3.43	3.09 ± 0.33	2.40 - 4.46	Pass
2006-1	6/5/2006	150 cm	2.19	2.35 ± 0.38	1.53 - 2.85	Pass
2006-1	6/5/2006	150 cm	2.19	1.98 ± 0.10	1.53 - 2.85	Pass
2006-1	6/5/2006	180 cm	1.52	1.56 ± 0.26	1.06 - 1.98	Pass

TABLE A-3. In-House "Spike" Samples

Lab Code [b]	Date	Analysis	Concentration (pCi/L)[a] Laboratory results 2s, n=1 [c]	Known Activity	Control Limits [d]	Acceptance
SPW-6019	10/24/2005	Tc-99	547.99 ± 6.69	539.22	377.45 - 700.99	Pass
SPF-6293	11/4/2005	Cs-134	941.30 ± 44.10	886.00	797.40 - 974.60	Pass
SPF-6293	11/4/2005	Cs-137	2570.40 ± 105.30	2400.00	2160.00 - 2640.00	Pass
SPAP-6309	11/7/2005	Cs-134	41.24 ± 1.91	44.03	34.03 - 54.03	Pass
SPAP-6309	11/7/2005	Cs-137	114.03 ± 5.01	120.24	108.22 - 132.26	Pass
SPAP-6311	11/7/2005	Gr. Beta	505.60 ± 7.36	455.00	364.00 - 637.00	Pass
SPW-6451	11/10/2005	H-3	77126.00 ± 747.00	76749.00	61399.20 - 92098.80	Pass
W-120105	12/1/2005	Gr. Alpha	25.16 ± 0.45	20.08	10.04 - 30.12	Pass
W-120105	12/1/2005	Gr. Beta	74.58 ± 0.81	65.73	55.73 - 75.73	Pass
SPW-7440	12/30/2005	Cs-134	42.67 ± 4.22	42.03	32.03 - 52.03	Pass
SPW-7440	12/30/2005	Cs-137	61.19 ± 7.20	59.91	49.91 - 69.91	Pass
SPMI-7442	12/31/2005	Cs-134	40.41 ± 5.66	42.03	32.03 - 52.03	Pass
SPMI-7442	12/31/2005	Cs-137	60.05 ± 7.80	59.91	49.91 - 69.91	Pass
SPW-301	1/20/2006	Fe-55	2700.10 ± 70.00	2502.50	2002.00 - 3003.00	Pass
SPAP-1224	3/7/2006	Cs-134	37.13 ± 3.70	39.52	29.52 - 49.52	Pass
SPAP-1224	3/7/2006	Cs-137	118.25 ± 8.97	119.30	107.37 - 131.23	Pass
SPAP-1224	3/7/2006	Gr. Beta	520.32 ± 7.42	455.00	364.00 - 637.00	Pass
SPW-1228	3/7/2006	H-3	70891.00 ± 719.00	75394.00	60315.20 - 90472.80	Pass
SPW-1230	3/7/2006	Cs-134	38.58 ± 2.10	39.51	29.51 - 49.51	Pass
SPW-1230	3/7/2006	Cs-137	59.44 ± 4.51	59.65	49.65 - 69.65	Pass
SPMI-1232	3/7/2006	Cs-134	41.20 ± 1.33	39.51	29.51 - 49.51	Pass
SPMI-1232	3/7/2006	Cs-137	57.82 ± 3.96	59.65	49.65 - 69.65	Pass
W-30906	3/9/2006	Gr. Alpha	24.24 ± 0.47	20.08	10.04 - 30.12	Pass
W-30906	3/9/2006	Gr. Beta	63.79 ± 0.48	65.73	55.73 - 75.73	Pass
SPW-2750	4/27/2006	Ni-63	116.00 ± 2.49	100.00	60.00 - 140.00	Pass
SPW-2869	5/1/2006	Fe-55	19473.00 ± 188.00	23332.00	18665.60 - 27998.40	Pass
SPAP-2871	5/1/2006	Cs-134	33.97 ± 1.10	37.50	27.50 - 47.50	Pass
SPAP-2871	5/1/2006	Cs-137	114.44 ± 2.81	118.90	107.01 - 130.79	Pass
SPW-2875	5/1/2006	H-3	71057.00 ± 730.20	75394.00	60315.20 - 90472.80	Pass
STSO-3155	5/1/2006	Co-60	7950.80 ± 67.29	7750.00	6975.00 - 8525.00	Pass
STSO-3155	5/1/2006	Cs-134	12.49 ± 0.13	11.59	1.59 - 21.59	Pass
STSO-3155	5/1/2006	Cs-137	14.10 ± 0.12	11.63	1.63 - 21.63	Pass
SPAP-2873	5/2/2006	Gr. Beta	1724.80 ± 4.51	1744.00	1395.20 - 2441.60	Pass
SPF-3183	5/10/2006	Cs-137	2.47 ± 0.03	2.38	1.43 - 3.33	Pass
SPF-3183	5/10/2006	Cs-134	0.73 ± 0.01	0.74	0.44 - 1.04	Pass
SPW-3460	5/26/2006	C-14	4009.60 ± 14.43	4741.00	2844.60 - 6637.40	Pass
W-60606	6/6/2006	Gr. Alpha	21.94 ± 0.46	20.08	10.04 - 30.12	Pass
W-60606	6/6/2006	Gr. Beta	58.17 ± 0.49	65.73	55.73 - 75.73	Pass

TABLE A-3. In-House "Spike" Samples

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory results 2s, n=1[b]	Known Activity	Control Limits[c]	Acceptance
SPW-3988	6/16/2006	Cs-134	35.56 ± 1.40	36.00	26.00 - 46.00	Pass
SPW-3988	6/16/2006	Cs-137	60.23 ± 2.72	59.27	49.27 - 69.27	Pass
SPW-3988	6/16/2006	I-131(G)	94.01 ± 4.38	99.30	89.30 - 109.30	Pass
SPW-3988	6/16/2006	Sr-89	52.40 ± 4.23	58.16	46.53 - 69.79	Pass
SPW-3988	6/16/2006	Sr-90	45.35 ± 1.95	41.21	32.97 - 49.45	Pass
SPMI-3990	6/16/2006	Cs-134	35.52 ± 5.05	36.00	26.00 - 46.00	Pass
SPMI-3990	6/16/2006	Cs-137	56.78 ± 3.86	59.27	49.27 - 69.27	Pass
SPMI-3990	6/16/2006	I-131(G)	95.04 ± 5.05	99.30	89.30 - 109.30	Pass
SPMI-3991	6/16/2006	I-131	96.55 ± 0.87	99.30	79.44 - 119.16	Pass
SPW-4356	7/5/2006	I-131	80.88 ± 1.09	77.23	61.78 - 92.68	Pass
W-90506	9/5/2006	Gr. Alpha	23.11 ± 0.45	20.08	10.04 - 30.12	Pass
W-90506	9/5/2006	Gr. Beta	65.01 ± 0.51	65.73	55.73 - 75.73	Pass
SPAP-6950	9/30/2006	Cs-134	28.93 ± 1.56	32.65	22.65 - 42.65	Pass
SPAP-6950	9/30/2006	Cs-137	116.62 ± 2.97	117.75	105.98 - 129.53	Pass
SPAP-6952	9/30/2006	Gr. Beta	52.96 ± 0.14	53.50	42.80 - 74.90	Pass
SPW-6954	9/30/2006	Cs-134	63.29 ± 8.24	65.30	55.30 - 75.30	Pass
SPW-6954	9/30/2006	Cs-137	60.41 ± 7.53	58.87	48.87 - 68.87	Pass
SPMI-6956	9/30/2006	Cs-134	69.26 ± 4.85	65.31	55.31 - 75.31	Pass
SPMI-6956	9/30/2006	Cs-137	61.35 ± 7.62	58.87	48.87 - 68.87	Pass

[a] Liquid sample results are reported in pCi/Liter, air filters(pCi/filter), charcoal (pCi/m^3), and solid samples (pCi/g).

[b] Laboratory codes as follows: W (water), MI (milk), AP (air filter), SO (soil), VE (vegetation), CH (charcoal canister), F (fish).

[c] Results are based on single determinations.

[d] Control limits are based on Attachment A, Page A2 of this report.

NOTE: For fish, Jello is used for the Spike matrix. For Vegetation, cabbage is used for the Spike matrix.

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis[b]	Concentration (pCi/L)[a]		
				Laboratory results (4.66σ)		Acceptance
				LLD	Activity[c]	Criteria (4.66 σ)
SPW-6020	water	10/24/2005	Tc-99	4.81	-1.75 ± 2.90	10
SPF-6294	Fish	11/4/2005	Cs-134	18.60		100
SPF-6294	Fish	11/4/2005	Cs-137	12.99		100
SPAP-6310	Air Filter	11/7/2005	Cs-134	3.23		100
SPAP-6310	Air Filter	11/7/2005	Cs-137	3.86		100
SPAP-6312	Air Filter	11/7/2005	Gr. Beta	1.22	-0.64 ± 0.64	3.2
W-120105	water	12/1/2005	Gr. Alpha	0.05	0.033 ± 0.04	1
W-120105	water	12/1/2005	Gr. Beta	0.15	-0.043 ± 0.11	3.2
SPMI-7419	Milk	12/22/2005	Co-60	7.24		10
SPMI-7419	Milk	12/22/2005	Cs-137	5.61		10
SPMI-7419	Milk	12/22/2005	I-131(G)	10.96		20
SPW-7421	water	12/22/2005	Co-60	2.43		10
SPW-7421	water	12/22/2005	Cs-137	3.12		10
SPW-7441	water	12/30/2005	Cs-134	4.25		10
SPW-7441	water	12/30/2005	Cs-137	1.63		10
SPMI-7443	Milk	12/30/2005	Cs-134	4.74		10
SPMI-7443	Milk	12/30/2005	Cs-137	8.53		10
SPW-302	water	1/20/2006	Fe-55	1061.00	-91 ± 637.30	1000
SPAP-1225	Air Filter	3/7/2006	Gr. Beta	1.16	-0.512 ± 51.20	3.2
SPW-1231	water	3/7/2006	Cs-134	2.71		10
SPW-1231	water	3/7/2006	Cs-137	2.05		10
w-30906	water	3/9/2006	Gr. Alpha	0.04	0.005 ± 0.03	1
w-30906	water	3/9/2006	Gr. Beta	0.08	-0.016 ± 0.05	3.2
SPW-2751	water	4/27/2006	Ni-63	1.48	0.37 ± 0.91	20
SPW-2868	water	5/1/2006	Fe-55	18.07	4.33 ± 11.27	1000
SPW-2874	water	5/1/2006	H-3	166.00	-8.3 ± 86.90	200
SPAP-2872	Air Filter	5/2/2006	Gr. Beta	1.18	-3.65 ± 0.64	3.2
SPF-3154	Fish	5/10/2006	Cs-134	0.02		100
SPF-3154	Fish	5/10/2006	Cs-137	0.01		100
SPW-3461	water	5/26/2006	C-14	10.20	-7.9 ± 5.20	200
w-60606	water	6/6/2006	Gr. Alpha	0.05	0.013 ± 0.04	1
w-60606	water	6/6/2006	Gr. Beta	0.16	-0.044 ± 0.11	3.2
SPW-3989	water	6/16/2006	Cs-134	3.00		10
SPW-3989	water	6/16/2006	Cs-137	3.65		10
SPW-3989	water	6/16/2006	I-131	0.21	0.045 ± 0.14	0.5
SPW-3989	water	6/16/2006	I-131(G)	8.34		20
SPW-3989	water	6/16/2006	Sr-89	0.54	0.005 ± 0.45	5
SPW-3989	water	6/16/2006	Sr-90	0.58	-0.079 ± 0.26	1

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis[b]	Concentration (pCi/L)[a]		
				Laboratory results (4.66σ)		Acceptance
				LLD	Activity[c]	Criteria (4.66 σ)
SPMI-3991	Milk	6/16/2006	Cs-134	4.42		10
SPMI-3991	Milk	6/16/2006	Cs-137	3.88		10
SPMI-3991	Milk	6/16/2006	I-131	0.28	-0.22 ± 0.19	0.5
SPMI-3991	Milk	6/16/2006	I-131(G)	3.76		20
SPMI-3991	Milk	6/16/2006	Sr-89	0.61	-0.25 ± 0.76	5
SPMI-3991	Milk	6/16/2006	Sr-90	0.52	0.88 ± 0.34	1
w-90506	water	9/5/2006	Gr. Alpha	0.06	0.00 ± 0.04	1
w-90506	water	9/5/2006	Gr. Beta	0.16	0.05 ± 0.11	3.2
SPAP-6949	Air Filter	9/30/2006	Cs-134	0.89		100
SPAP-6949	Air Filter	9/30/2006	Cs-137	0.91		100
spap-6952	Air Filter	9/30/2006	Gr. Beta		-0.002 ± 0.00	3.2
spW-6953	water	9/30/2006	Cs-134	3.91		10
spW-6953	water	9/30/2006	Cs-137	5.61		10
SPMI-6955	Milk	9/30/2006	Cs-134	2.86		10
SPMI-6955	Milk	9/30/2006	Cs-137	2.39		10
SPMI-6955	Milk	9/30/2006	I-131	9.98		0.5

[a] Liquid sample results are reported in pCi/Liter, air filters(pCi/filter), charcoal (pCi/charcoal canister), and solid samples (pCi/g).

[b] I-131(G); iodine-131 as analyzed by gamma spectroscopy.

[c] Activity reported is a net activity result. For gamma spectroscopic analysis, activity detected below the LLD value is not reported

[d] Low levels of Sr-90 are still detected in the environment. A concentration of (1-5 pCi/L) in milk is not unusual.

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
G-5526, 5527	10/3/2005	Be-7	4.03 ± 0.62	4.07 ± 0.80	4.05 ± 0.51	Pass
G-5526, 5527	10/3/2005	Gr. Beta	8.10 ± 0.30	8.80 ± 0.40	8.41 ± 0.24	Pass
G-5526, 5527	10/3/2005	K-40	4.93 ± 0.67	6.00 ± 0.72	5.47 ± 0.49	Pass
CF-5547, 5548	10/5/2005	K-40	15.40 ± 0.73	15.63 ± 0.92	15.51 ± 0.59	Pass
DW-5583, 5584	10/5/2005	H-3	205.00 ± 83.00	243.00 ± 85.00	224.00 ± 59.40	Pass
VE-5721, 5722	10/10/2005	Gr. Alpha	0.07 ± 0.05	0.08 ± 0.06	0.08 ± 0.04	Pass
VE-5721, 5722	10/10/2005	Gr. Beta	5.09 ± 0.15	5.00 ± 0.16	5.05 ± 0.11	Pass
VE-5721, 5722	10/10/2005	K-40	4.27 ± 0.43	4.20 ± 0.34	4.23 ± 0.27	Pass
CF-5695, 5696	10/11/2005	Be-7	2.70 ± 0.37	2.80 ± 0.34	2.75 ± 0.25	Pass
CF-5695, 5696	10/11/2005	K-40	11.79 ± 0.86	13.11 ± 0.68	12.45 ± 0.55	Pass
LW-6129, 6130	10/11/2005	Gr. Beta	1.34 ± 0.25	1.85 ± 0.29	1.59 ± 0.19	Pass
LW-6129, 6130	10/11/2005	H-3	304.35 ± 95.31	369.23 ± 97.88	336.79 ± 68.31	Pass
DW-50844, 5	10/11/2005	Gr. Beta	5.30 ± 1.50	4.20 ± 1.40	4.75 ± 1.03	Pass
LW-5748, 5749 [b]	10/12/2005	Gr. Beta	1.09 ± 0.25	1.89 ± 0.28	1.49 ± 0.19	Fail
AP-6485, 6486	10/20/2005	Be-7	0.10 ± 0.03	0.09 ± 0.03	0.09 ± 0.02	Pass
SWU-6156, 6157	10/25/2005	Gr. Beta	4.69 ± 1.34	4.18 ± 1.34	4.44 ± 0.95	Pass
VE-6186, 6187	10/26/2005	K-40	2.90 ± 0.49	2.83 ± 0.51	2.87 ± 0.35	Pass
LW-6203, 6204	10/27/2005	Gr. Beta	2.92 ± 0.62	3.09 ± 0.66	3.01 ± 0.45	Pass
SO-6270, 6271	10/28/2005	Cs-137	0.33 ± 0.03	0.34 ± 0.04	0.33 ± 0.03	Pass
SO-6270, 6271	10/28/2005	Gr. Beta	26.85 ± 2.78	22.25 ± 2.41	24.55 ± 1.84	Pass
SO-6270, 6271	10/28/2005	K-40	13.67 ± 0.74	14.02 ± 0.76	13.85 ± 0.53	Pass
TD-6320, 6321	11/1/2005	H-3	444202 ± 1770	446633 ± 1775	445418 ± 1253	Pass
SO-6605, 6606	11/11/2005	Gr. Beta	18.22 ± 2.23	18.47 ± 2.22	18.35 ± 1.57	Pass
CF-6509, 6510	11/14/2005	K-40	0.85 ± 0.14	0.99 ± 0.22	0.92 ± 0.13	Pass
SW-6638, 6639	11/22/2005	I-131	0.95 ± 0.35	0.67 ± 0.31	0.81 ± 0.23	Pass
SO-6887, 6888	11/22/2005	Gr. Alpha	6.80 ± 2.92	10.27 ± 3.26	8.53 ± 2.19	Pass
SO-6887, 6888	11/22/2005	Gr. Beta	19.27 ± 2.16	18.43 ± 2.21	18.85 ± 1.54	Pass
SO-6887, 6888	11/22/2005	K-40	14.29 ± 1.11	13.78 ± 0.78	14.03 ± 0.68	Pass
SWT-6721, 6722	11/29/2005	Gr. Beta	0.98 ± 0.31	0.87 ± 0.31	0.93 ± 0.22	Pass
VE-6775, 6776	11/29/2005	Gr. Beta	12.75 ± 0.28	13.16 ± 0.21	12.96 ± 0.18	Pass
LW-6743, 6744	11/30/2005	Gr. Beta	3.19 ± 0.47	2.50 ± 0.44	2.85 ± 0.32	Pass
DW-51023, 4	12/2/2005	Gr. Alpha	0.55 ± 1.40	2.21 ± 1.31	1.38 ± 0.96	Pass
F-7076, 7077	12/14/2005	Gr. Beta	2.63 ± 0.28	2.38 ± 0.25	2.50 ± 0.19	Pass
F-7076, 7077	12/14/2005	K-40	1.75 ± 0.44	1.61 ± 0.31	1.68 ± 0.27	Pass
MI-7097, 7098	12/14/2005	K-40	1298.10 ± 113.10	1346.00 ± 101.40	1322.05 ± 75.95	Pass
MI-7097, 7098	12/14/2005	Sr-90	0.43 ± 0.36	0.78 ± 0.38	0.61 ± 0.26	Pass
WW-7187, 7188	12/14/2005	Gr. Beta	1.16 ± 0.60	2.03 ± 0.72	1.60 ± 0.47	Pass
SWT-7282, 7283	12/27/2005	Gr. Beta	1.62 ± 0.37	1.85 ± 0.38	1.74 ± 0.27	Pass
AP-7466, 7467	1/3/2006	Be-7	0.053 ± 0.015	0.057 ± 0.011	0.055 ± 0.009	Pass
AP-7513, 7514	1/3/2006	Be-7	0.033 ± 0.008	0.036 ± 0.008	0.035 ± 0.006	Pass
AP-7555, 7556	1/3/2006	Be-7	0.053 ± 0.007	0.054 ± 0.008	0.053 ± 0.005	Pass
MI-154, 155	1/10/2006	K-40	1254.20 ± 87.75	1369.60 ± 102.80	1311.90 ± 67.58	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
MI-217, 218	1/11/2006	K-40	1258.00 ± 118.00	1313.00 ± 98.00	1285.50 ± 76.69	Pass
MI-217, 218	1/11/2006	Sr-90	1.27 ± 0.37	0.92 ± 0.33	1.10 ± 0.25	Pass
MI-287, 288	1/17/2006	K-40	1383.10 ± 110.90	1457.80 ± 119.10	1420.45 ± 81.37	Pass
MI-287, 288	1/17/2006	Sr-90	0.74 ± 0.38	0.94 ± 0.37	0.84 ± 0.27	Pass
WW-314, 315	1/19/2006	Gr. Beta	9.21 ± 1.72	11.52 ± 1.93	10.37 ± 1.29	Pass
WW-314, 315	1/19/2006	H-3	168.64 ± 94.94	210.12 ± 96.51	189.38 ± 67.69	Pass
SWt-577, 578	1/31/2006	Gr. Beta	3.06 ± 0.66	3.68 ± 0.64	3.37 ± 0.46	Pass
SWU-598, 599	1/31/2006	Gr. Beta	2.03 ± 0.39	1.97 ± 0.40	2.00 ± 0.28	Pass
SWU-598, 599	1/31/2006	H-3	260.10 ± 98.20	134.10 ± 93.50	197.10 ± 67.80	Pass
F-3311, 3312 [c]	2/9/2006	Gr. Beta	4.12 ± 0.14	3.82 ± 0.13	3.97 ± 0.10	Fail
F-3311, 3312	2/9/2006	K-40	2.68 ± 0.37	2.76 ± 0.39	2.72 ± 0.27	Pass
SW-780, 781	2/14/2006	Gr. Alpha	4.09 ± 1.52	3.22 ± 1.37	3.66 ± 1.03	Pass
SW-780, 781	2/14/2006	Gr. Beta	5.91 ± 0.90	5.89 ± 0.92	5.90 ± 0.64	Pass
DW-934, 935	2/17/2006	I-131	0.35 ± 0.22	0.31 ± 0.25	0.33 ± 0.16	Pass
DW-1024, 1025	2/24/2006	I-131	0.24 ± 0.26	0.53 ± 0.24	0.39 ± 0.18	Pass
MI-1078, 1079	3/1/2006	Sr-90	1.42 ± 0.39	1.30 ± 0.62	1.36 ± 0.37	Pass
F-1357, 1358	3/10/2006	Gr. Beta	3.77 ± 0.07	3.71 ± 0.07	3.74 ± 0.05	Pass
F-1357, 1358	3/10/2006	K-40	2.46 ± 0.32	2.32 ± 0.44	2.39 ± 0.27	Pass
MI-1469, 1470	3/14/2006	K-40	1396.30 ± 120.80	1335.60 ± 113.80	1365.95 ± 82.98	Pass
CF-1538, 1539	3/21/2006	K-40	13.66 ± 0.81	13.97 ± 0.68	13.81 ± 0.53	Pass
WW-1583, 1584	3/22/2006	Gr. Beta	7.66 ± 0.73	8.87 ± 0.75	8.26 ± 0.52	Pass
DW-1955, 1956	3/27/2006	Gr. Beta	2.25 ± 0.60	3.15 ± 0.59	2.70 ± 0.42	Pass
MI-1760, 1761	3/29/2006	K-40	1271.00 ± 89.00	1378.00 ± 113.00	1324.50 ± 71.92	Pass
AP-2603, 2604	3/29/2006	Be-7	0.067 ± 0.015	0.056 ± 0.010	0.062 ± 0.009	Pass
E-1997, 1998	4/3/2006	Gr. Beta	1.82 ± 0.07	1.87 ± 0.07	1.85 ± 0.05	Pass
E-1997, 1998	4/3/2006	K-40	1.28 ± 0.15	1.24 ± 0.21	1.26 ± 0.13	Pass
AP-2818, 2819	4/3/2006	Be-7	0.06 ± 0.01	0.06 ± 0.01	0.06 ± 0.01	Pass
SWU-2863, 2864	4/3/2006	Gr. Beta	3.20 ± 1.26	4.77 ± 1.30	3.99 ± 0.91	Pass
SS-2389, 2390	4/11/2006	Gr. Beta	10.53 ± 0.96	9.38 ± 0.84	9.96 ± 0.64	Pass
SS-2389, 2390	4/11/2006	K-40	5.51 ± 0.42	5.79 ± 0.40	5.65 ± 0.29	Pass
dw-2773, 2774	4/21/2006	I-131	0.74 ± 0.23	0.53 ± 0.40	0.63 ± 0.23	Pass
SL-2932, 2933	5/1/2006	Be-7	1.28 ± 0.19	1.27 ± 0.17	1.28 ± 0.13	Pass
SL-2932, 2933	5/1/2006	Gr. Beta	6.09 ± 0.33	5.65 ± 0.31	5.87 ± 0.23	Pass
SL-2932, 2933	5/1/2006	K-40	3.13 ± 0.41	3.09 ± 0.36	3.11 ± 0.27	Pass
BS-3103, 3104	5/1/2006	Gr. Beta	8.27 ± 1.46	9.03 ± 1.59	8.65 ± 1.08	Pass
BS-3103, 3104	5/1/2006	K-40	6288.20 ± 585.20	5643.70 ± 599.80	5965.95 ± 418.99	Pass
MI-3037, 3038	5/2/2006	K-40	1238.90 ± 98.59	1301.00 ± 103.90	1269.95 ± 71.62	Pass
MI-3037, 3038	5/2/2006	Sr-90	1.76 ± 0.42	1.48 ± 0.42	1.62 ± 0.29	Pass
MI-3124, 3125	5/9/2006	K-40	1032.30 ± 91.12	1103.60 ± 120.50	1067.95 ± 75.54	Pass
SW-3145, 3146	5/9/2006	Gr. Alpha	4.85 ± 1.68	4.12 ± 1.62	4.48 ± 1.17	Pass
SW-3145, 3146	5/9/2006	Gr. Beta	8.94 ± 1.46	9.14 ± 1.36	9.04 ± 1.00	Pass
MI-3236, 3237	5/10/2006	K-40	1412.40 ± 119.10	1427.90 ± 127.70	1420.15 ± 87.31	Pass

TABLE A-5. In-House "Duplicate" Samples

			Concentration (pCi/L)[a]			
Lab Code	Date	Analysis	First Result	Second Result	Averaged Result	Acceptance
F-3422, 3423	5/19/2006	H-3	8175.00 ± 252.00	8268.00 ± 253.00	8221.50 ± 178.54	Pass
G-3491, 3492	5/24/2006	Gr. Beta	8.89 ± 0.18	9.03 ± 0.19	8.96 ± 0.13	Pass
G-3491, 3492	5/24/2006	K-40	5.60 ± 0.71	6.30 ± 0.78	5.95 ± 0.53	Pass
SO-3539, 3540	5/24/2006	Gr. Beta	19.57 ± 1.99	18.98 ± 1.91	19.27 ± 1.38	Pass
SO-3539, 3540	5/24/2006	K-40	12.55 ± 0.89	11.49 ± 0.59	12.02 ± 0.53	Pass
WW-3751, 3752	5/25/2006	Gr. Beta	9.85 ± 0.79	8.96 ± 0.74	9.41 ± 0.54	Pass
F-3617, 3618	5/30/2006	K-40	2.42 ± 0.38	2.53 ± 0.37	2.47 ± 0.27	Pass
SL-3641, 3642	6/1/2006	Be-7	1.41 ± 0.19	1.31 ± 0.27	1.36 ± 0.17	Pass
SL-3641, 3642	6/1/2006	Gr. Beta	5.03 ± 0.18	5.30 ± 0.19	5.17 ± 0.13	Pass
SL-3641, 3642	6/1/2006	K-40	2.21 ± 0.26	2.14 ± 0.37	2.18 ± 0.23	Pass
MI-3886, 3887	6/12/2006	K-40	1424.20 ± 118.20	1318.80 ± 110.50	1371.50 ± 80.90	Pass
VE-3949, 3950	6/13/2006	Gr. Alpha	0.13 ± 0.06	0.16 ± 0.07	0.15 ± 0.05	Pass
VE-3949, 3950	6/13/2006	Gr. Beta	4.53 ± 0.19	4.47 ± 0.18	4.50 ± 0.13	Pass
VE-3949, 3950	6/13/2006	K-40	6.02 ± 0.66	5.33 ± 0.66	5.67 ± 0.47	Pass
BS-4016, 4017	6/13/2006	Co-60	0.18 ± 0.03	0.15 ± 0.03	0.16 ± 0.02	Pass
BS-4016, 4017	6/13/2006	Cs-137	1.97 ± 0.09	2.01 ± 0.09	1.99 ± 0.06	Pass
BS-4016, 4017	6/13/2006	K-40	11.03 ± 0.76	10.45 ± 0.78	10.74 ± 0.54	Pass
MI-3992, 3993	6/14/2006	K-40	1358.50 ± 166.40	1395.80 ± 122.70	1377.15 ± 103.37	Pass
LW-4175, 4176	6/16/2006	H-3	482.11 ± 90.25	397.50 ± 86.88	439.81 ± 62.63	Pass
W-4130, 4131	6/21/2006	H-3	401.50 ± 87.85	236.28 ± 80.89	318.89 ± 59.71	Pass
AV-4330, 4331	6/26/2006	K-40	1717.10 ± 244.30	1893.10 ± 223.30	1805.10 ± 165.49	Pass
SWU-4489, 4490	6/27/2006	Gr. Beta	1.70 ± 0.38	1.93 ± 0.38	1.82 ± 0.27	Pass
AP-4909, 4910	6/29/2006	Be-7	0.11 ± 0.01	0.11 ± 0.02	0.11 ± 0.01	Pass
AP-4952, 4953	6/29/2006	Be-7	0.08 ± 0.02	0.10 ± 0.02	0.09 ± 0.01	Pass
AP-4930, 4931	7/3/2006	Be-7	0.08 ± 0.02	0.07 ± 0.01	0.08 ± 0.01	Pass
E-4399, 4400	7/5/2006	Gr. Beta	1.85 ± 0.05	1.85 ± 0.05	1.85 ± 0.04	Pass
E-4399, 4400	7/5/2006	K-40	1.25 ± 0.19	1.24 ± 0.18	1.25 ± 0.13	Pass
G-4420, 4421	7/5/2006	Be-7	0.82 ± 0.20	0.61 ± 0.14	0.72 ± 0.12	Pass
G-4420, 4421	7/5/2006	Gr. Beta	13.20 ± 0.40	14.00 ± 0.40	13.60 ± 0.28	Pass
G-4420, 4421	7/5/2006	K-40	9.96 ± 0.44	10.06 ± 0.82	10.01 ± 0.47	Pass
DW-60432, 60433	7/6/2006	Gr. Alpha	3.24 ± 1.35	2.49 ± 1.33	2.87 ± 0.95	Pass
DW-60514, 60515	7/10/2006	Gr. Alpha	3.70 ± 1.12	3.09 ± 1.16	3.40 ± 0.81	Pass
DW-60449, 60450	7/11/2006	Gr. Alpha	6.87 ± 1.26	4.77 ± 1.09	5.82 ± 0.83	Pass
MI-4599, 4600	7/12/2006	K-40	1403.50 ± 118.80	1330.40 ± 116.50	1366.95 ± 83.20	Pass
MI-4599, 4600	7/12/2006	Sr-90	0.59 ± 0.34	0.70 ± 0.35	0.65 ± 0.24	Pass
MI-4667, 4668	7/12/2006	K-40	1286.60 ± 92.62	1358.60 ± 158.40	1322.60 ± 91.75	Pass
LW-4823, 4824	7/14/2006	Gr. Beta	1.75 ± 0.60	2.51 ± 0.59	2.13 ± 0.42	Pass
DW-60502, 60503	7/19/2006	Gr. Alpha	16.27 ± 2.49	21.41 ± 3.21	18.84 ± 2.03	Pass
DW-60526, 60527	7/21/2006	Gr. Alpha	14.06 ± 1.82	15.57 ± 1.77	14.82 ± 1.27	Pass
DW-60539, 60540	7/21/2006	Gr. Alpha	5.09 ± 0.95	6.23 ± 1.05	5.66 ± 0.71	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
MI-5125, 5126	7/25/2006	K-40	1480.60 ± 118.30	1402.60 ± 120.80	1441.60 ± 84.54	Pass
DW-60609, 60610	7/26/2006	Gr. Alpha	1.00 ± 1.10	2.70 ± 1.30	1.85 ± 0.85	Pass
DW-60621, 60622	7/31/2006	Gr. Alpha	3.70 ± 1.00	1.90 ± 0.80	2.80 ± 0.64	Pass
SL-5265, 5266	8/1/2006	Be-7	1.10 ± 0.46	1.38 ± 0.52	1.24 ± 0.35	Pass
SL-5265, 5266	8/1/2006	Be-7	0.10 ± 0.03	0.16 ± 0.03	0.13 ± 0.02	Pass
SL-5265, 5266	8/1/2006	Gr. Beta	4.41 ± 0.41	3.46 ± 0.57	3.94 ± 0.35	Pass
SL-5265, 5266	8/1/2006	K-40	1.19 ± 0.52	0.87 ± 0.52	1.03 ± 0.37	Pass
VE-5286, 5287	8/1/2006	Be-7	1.21 ± 0.30	1.32 ± 0.20	1.27 ± 0.18	Pass
VE-5286, 5287	8/1/2006	Gr. Beta	9.67 ± 0.35	9.37 ± 0.35	9.52 ± 0.25	Pass
VE-5286, 5287	8/1/2006	K-40	6.25 ± 0.81	6.50 ± 0.48	6.38 ± 0.47	Pass
SW-5383, 5384	8/8/2006	Gr. Alpha	3.24 ± 1.35	2.94 ± 1.35	3.09 ± 0.96	Pass
SW-5383, 5384	8/8/2006	Gr. Beta	4.86 ± 0.86	5.46 ± 0.87	5.16 ± 0.61	Pass
SW-5971, 5972	8/8/2006	H-3	119.90 ± 78.14	144.41 ± 79.23	132.15 ± 55.64	Pass
DW-5480, 5481	8/11/2006	H-3	169.08 ± 85.52	133.65 ± 83.96	151.36 ± 59.92	Pass
DW-60645, 60646	8/15/2006	Gr. Alpha	10.41 ± 1.78	10.97 ± 1.85	10.69 ± 1.28	Pass
W-5602, 5603	8/16/2006	H-3	2118.79 ± 151.55	2181.82 ± 153.09	2150.30 ± 107.71	Pass
DW-60634, 60635	8/18/2006	Gr. Alpha	12.99 ± 1.84	9.67 ± 1.61	11.33 ± 1.22	Pass
DW-60634, 60635	8/18/2006	Gr. Beta	10.51 ± 1.33	8.61 ± 1.18	9.56 ± 0.89	Pass
MI-5793, 5794	8/22/2006	K-40	1264.00 ± 115.00	1377.00 ± 121.00	1320.50 ± 83.47	Pass
SWU-6150, 6151	8/29/2006	Gr. Beta	1.84 ± 0.28	1.81 ± 0.28	1.82 ± 0.20	Pass
DW-60657, 60658	8/29/2006	Gr. Alpha	2.33 ± 0.80	2.90 ± 0.78	2.62 ± 0.56	Pass
DW-60695, 60696	9/11/2006	Gr. Alpha	3.93 ± 1.17	4.62 ± 1.12	4.28 ± 0.81	Pass
DW-60715, 60716	9/19/2006	Gr. Alpha	1.30 ± 1.00	2.23 ± 1.01	1.77 ± 0.71	Pass

Note: Duplicate analyses are performed on every twentieth sample received in-house. Results are not listed for those analyses with activities that measure below the LLD.

[a] Results are reported in units of pCi/L, except for air filters (pCi/Filter), food products, vegetation, soil, sediment (pCi/g).

[b] Recount of W-5748, 2.38 ± 0.85 pCi/L Averaged result; 2.14 ± 0.45 pCi/L

[c] 200 minute count time or longer, resulting in lower error.

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)[a].

Lab Code[c]	Date	Analysis	Concentration [b] Laboratory result	Known Activity	Control Limits [d]	Acceptance
STVE-1082	01/01/06	Co-57	10.40 ± 0.20	8.58	6.00 - 11.15	Pass
STVE-1082	01/01/06	Co-60	5.00 ± 0.20	4.52	3.16 - 5.88	Pass
STVE-1082	01/01/06	Cs-134	0.20 ± 0.20	0.00	0.00 - 0.50	Pass
STVE-1082	01/01/06	Cs-137	3.40 ± 0.20	3.07	2.15 - 4.00	Pass
STVE-1082	01/01/06	Mn-54	6.90 ± 0.20	6.25	4.37 - 8.12	Pass
STVE-1082	01/01/06	Sr-90	1.40 ± 0.20	1.56	1.09 - 2.03	Pass
STVE-1082	01/01/06	Zn-65	11.10 ± 0.50	9.80	6.86 - 12.74	Pass
STSO-1083	01/01/06	Co-57	762.90 ± 12.70	656.29	459.40 - 853.18	Pass
STSO-1083	01/01/06	Co-60	504.90 ± 3.10	447.10	312.97 - 581.23	Pass
STSO-1083[e]	01/01/06	Cs-134	0.00 ± 0.00	0.00	0.00 - 0.00	Pass
STSO-1083	01/01/06	Cs-137	406.50 ± 3.70	339.69	237.78 - 441.60	Pass
STSO-1083	01/01/06	K-40	719.20 ± 18.40	604.00	422.80 - 785.20	Pass
STSO-1083	01/01/06	Mn-54	415.60 ± 4.80	346.77	242.74 - 450.80	Pass
STSO-1083	01/01/06	Ni-63	261.40 ± 14.70	323.51	226.46 - 420.56	Pass
STSO-1083	01/01/06	Zn-65	783.40 ± 7.00	657.36	460.15 - 854.57	Pass
STAP-1084	01/01/06	Gr. Alpha	0.26 ± 0.02	0.36	0.00 - 0.72	Pass
STAP-1084	01/01/06	Gr. Beta	0.51 ± 0.03	0.48	0.24 - 0.72	Pass
STAP-1085	01/01/06	Co-57	4.32 ± 0.10	4.10	2.87 - 5.32	Pass
STAP-1085	01/01/06	Co-60	2.24 ± 0.16	2.19	1.53 - 2.84	Pass
STAP-1085	01/01/06	Cs-134	2.96 ± 0.19	2.93	2.05 - 3.81	Pass
STAP-1085	01/01/06	Cs-137	2.64 ± 0.20	2.53	1.77 - 3.29	Pass
STAP-1085	01/01/06	Sr-90	0.77 ± 0.21	0.79	0.55 - 1.03	Pass
STAP-1085	01/01/06	Zn-65	3.94 ± 0.44	3.42	2.40 - 4.45	Pass
STW-1086	01/01/06	Am-241	1.29 ± 0.05	1.30	0.91 - 1.69	Pass
STW-1086	01/01/06	Co-57	177.10 ± 1.00	166.12	116.28 - 215.96	Pass
STW-1086	01/01/06	Co-60	158.30 ± 1.00	153.50	107.45 - 199.55	Pass
STW-1086	01/01/06	Cs-134	96.40 ± 1.50	95.10	66.57 - 123.63	Pass
STW-1086[e]	01/01/06	Cs-137	0.00 ± 0.00	0.00	0.00 - 0.00	Pass
STW-1086	01/01/06	Fe-55	102.50 ± 18.10	129.60	90.72 - 168.48	Pass
STW-1086	01/01/06	H-3	956.60 ± 16.50	952.01	666.41 - 1238.00	Pass
STW-1086	01/01/06	Mn-54	335.30 ± 2.20	315.00	220.50 - 409.50	Pass
STW-1086	01/01/06	Ni-63	62.90 ± 3.60	60.34	42.24 - 78.44	Pass
STW-1086	01/01/06	Pu-238	0.96 ± 0.07	0.91	0.70 - 1.30	Pass
STW-1086[e]	01/01/06	Pu-239/40	0.00 ± 0.00	0.01	0.00 - 0.00	Pass
STW-1086	01/01/06	Sr-90	12.80 ± 1.60	13.16	9.21 - 17.11	Pass
STW-1086	01/01/06	Tc-99	22.30 ± 1.20	23.38	16.37 - 30.39	Pass
STW-1086	01/01/06	U-233/4	2.02 ± 0.12	2.09	1.46 - 2.72	Pass
STW-1086	01/01/06	U-238	2.03 ± 0.12	2.17	1.52 - 2.82	Pass
STW-1086	01/01/06	Zn-65	249.50 ± 3.40	228.16	159.71 - 296.61	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)[a].

		Concentration [b]				
Lab Code[c]	Date	Analysis	Laboratory result	Known Activity	Control Limits [d]	Acceptance
STW-1087	01/01/06	Gr. Alpha	0.59 ± 0.10	0.58	0.00 - 1.16	Pass
STW-1087	01/01/06	Gr. Beta	1.69 ± 0.07	1.13	0.56 - 1.70	Pass

[a] Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the Department of Energy's Mixed Analyte Performance Evaluation Program, Idaho Operations office, Idaho Falls, Idaho.

[b] Results are reported in units of Bq/kg (soil), Bq/L (water) or Bq/total sample (filters, vegetation) as requested by the

[c] Laboratory codes as follows: STW (water), STAP (air filter), STSO (soil), STVE (vegetation).

[d] MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP.

[e] Included in the MAPEP as a false positive.

APPENDIX B

DATA REPORTING CONVENTIONS

Data Reporting Conventions

1.0. All activities, except gross alpha and gross beta, are decay corrected to collection time or the end of the collection period.

2.0. Single Measurements

Each single measurement is reported as follows: $x \pm s$

where: x = value of the measurement;

s = 2s counting uncertainty (corresponding to the 95% confidence level).

In cases where the activity is less than the lower limit of detection L, it is reported as: <L,

where L = the lower limit of detection based on 4.66s uncertainty for a background sample.

3.0. Duplicate analyses

3.1 Individual results: For two analysis results; $x_1 \pm s_1$ and $x_2 \pm s_2$

Reported result: $x \pm s$; where $x = (1/2)(x_1 + x_2)$ and $s = (1/2)\sqrt{s_1^2 + s_2^2}$

3.2. Individual results: $<L_1$, $<L_2$ Reported result: <L, where L = lower of L_1 and L_2

3.3. Individual results: $x \pm s$, <L Reported result: $x \pm s$ if $x \geq L$; <L otherwise.

4.0. Computation of Averages and Standard Deviations

4.1 Averages and standard deviations listed in the tables are computed from all of the individual measurements over the period averaged; for example, an annual standard deviation would not be the average of quarterly standard deviations. The average $\bar{x}$ and standard deviation s of a set of n numbers $x_1, x_2 \ldots x_n$ are defined as follows:

$$\bar{x} = \frac{1}{n} \Sigma x \qquad s = \sqrt{\frac{\Sigma (x - \bar{x})^2}{n-1}}$$

4.2 Values below the highest lower limit of detection are not included in the average.

4.3 If all values in the averaging group are less than the highest LLD, the highest LLD is reported.

4.4 If all but one of the values are less than the highest LLD, the single value x and associated two sigma error is reported.

4.5 In rounding off, the following rules are followed:

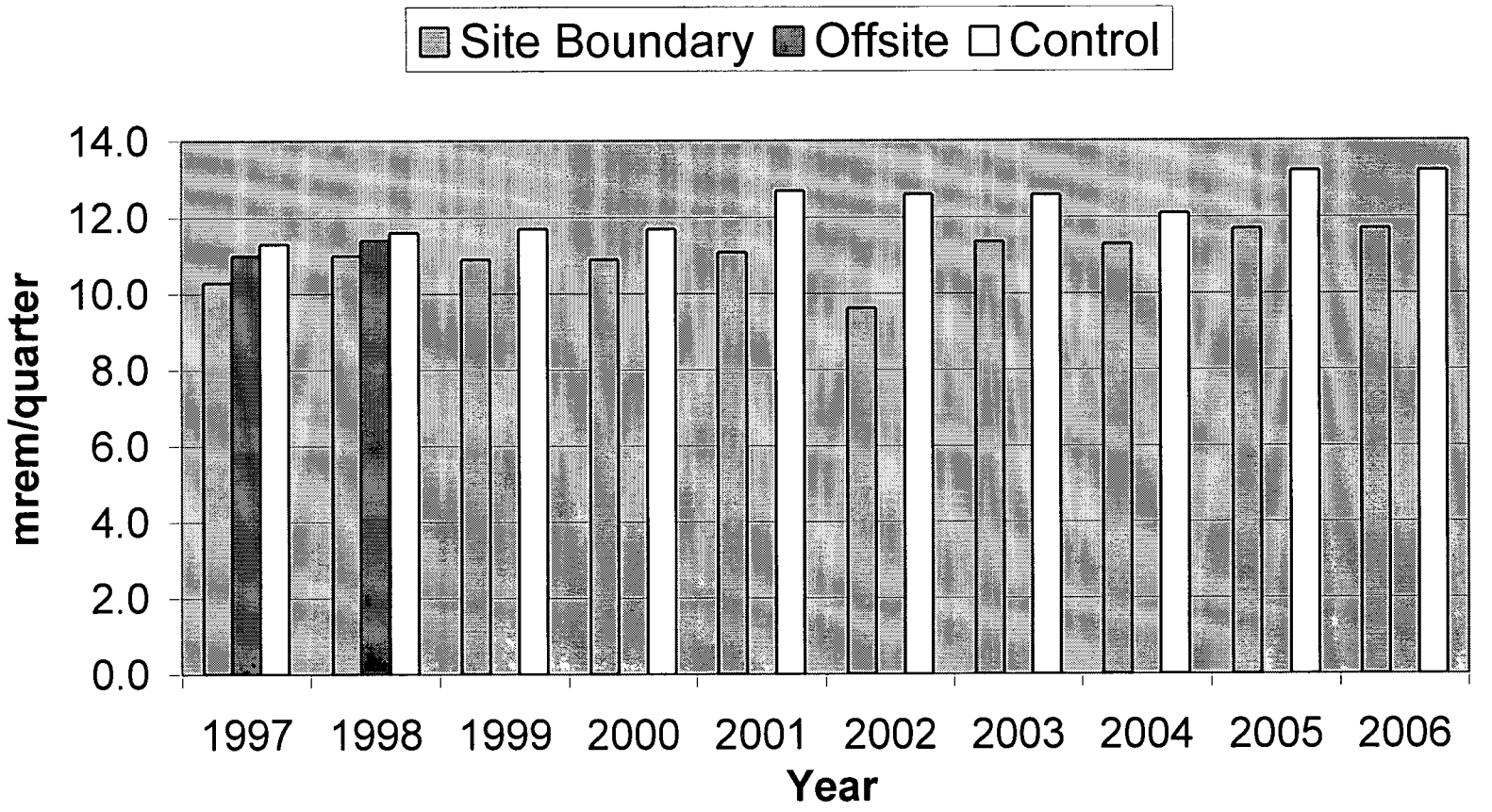
4.5.1. If the number following those to be retained is less than 5, the number is dropped, and the retained number s are kept unchanged. As an example, 11.443 is rounded off to 11.44.

4.5.2. If the number following those to be retained is equal to or greater than 5, the number is dropped and the last retained number is raised by 1. As an example, 11.445 is rounded off to 11.45.

Big Rock Point
Annual Radiological Environmental Operation Report
January through December 2006

Enclosure E: Data Graphs

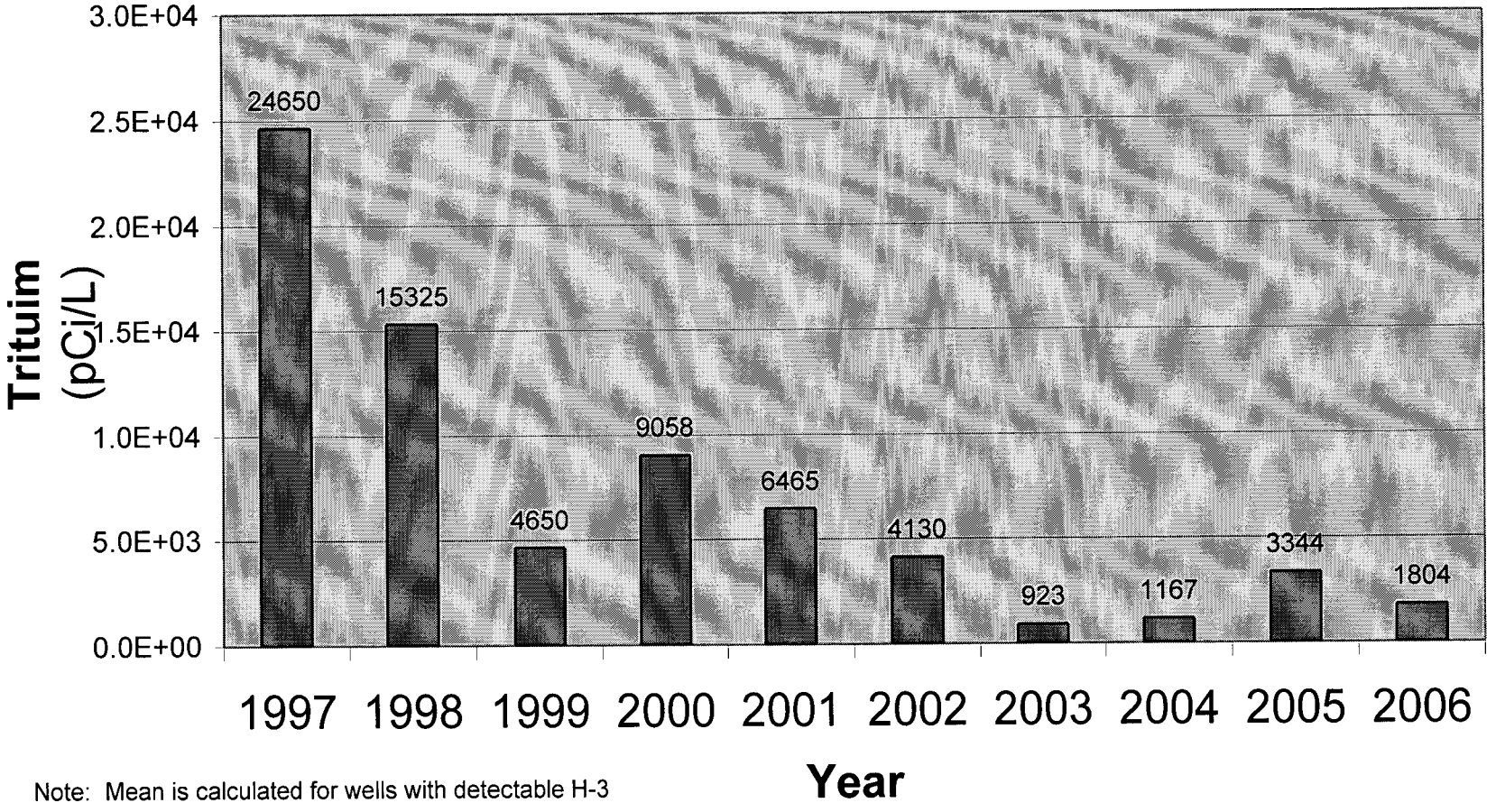
Mean Quarterly TLDs
Big Rock Point 1997 - 2006



Note: Offsite TLDs eliminated in 1999.

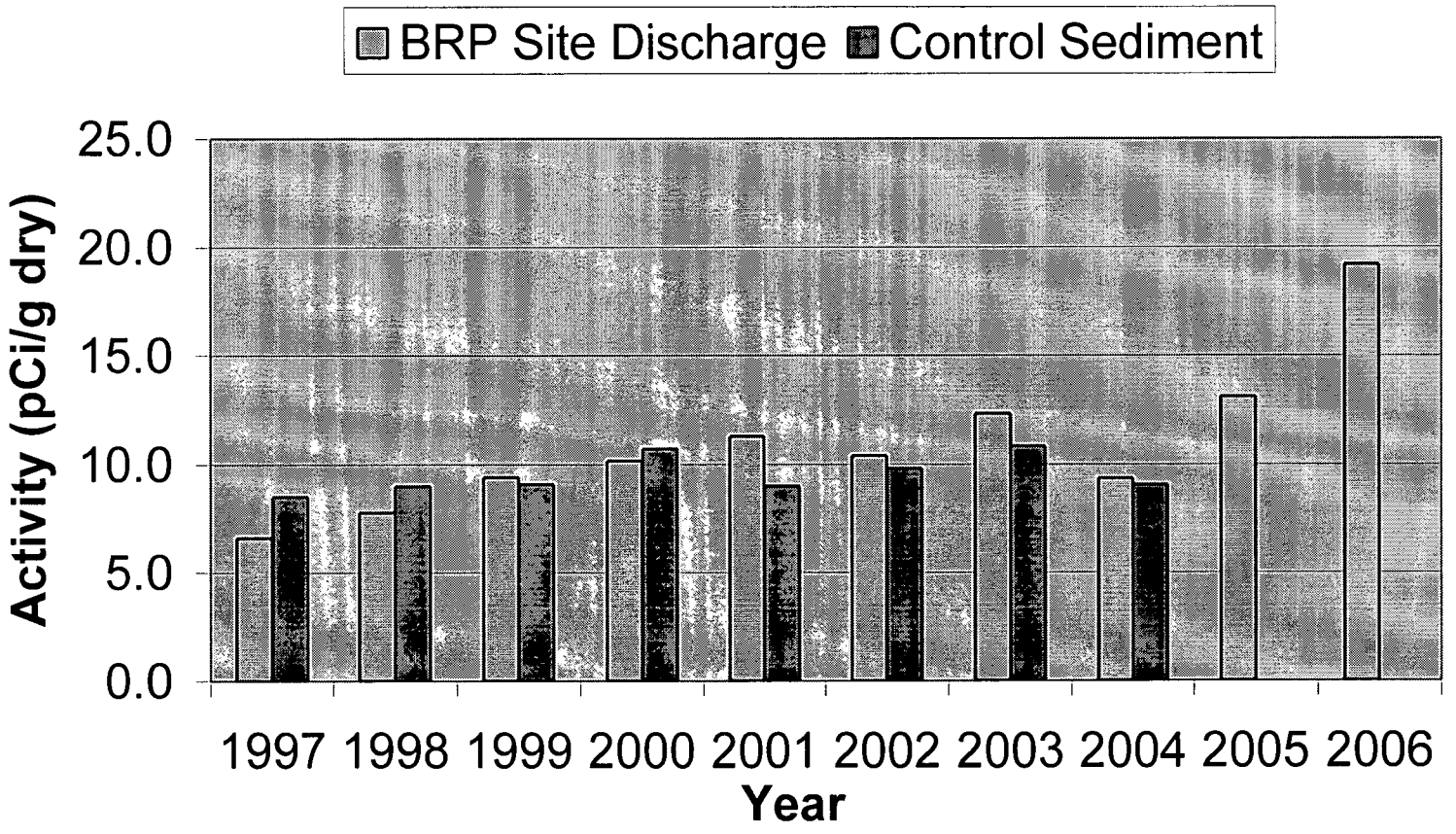
Groundwater Monitoring Well Mean Trituim Concentration

Big Rock Point 1997 - 2006

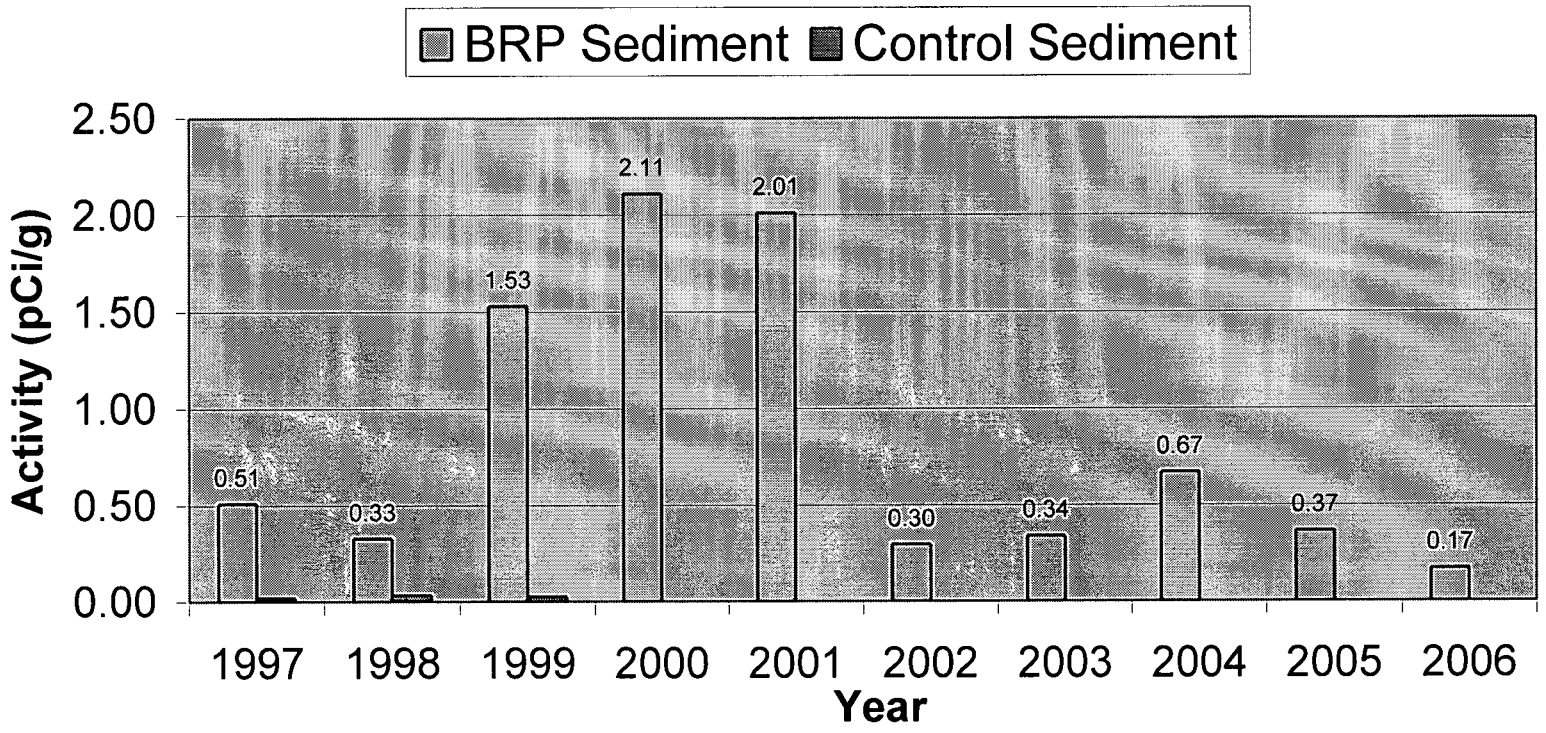


Note: Mean is calculated for wells with detectable H-3

Sediment Mean Gross Beta
Big Rock Point 1997 - 2006



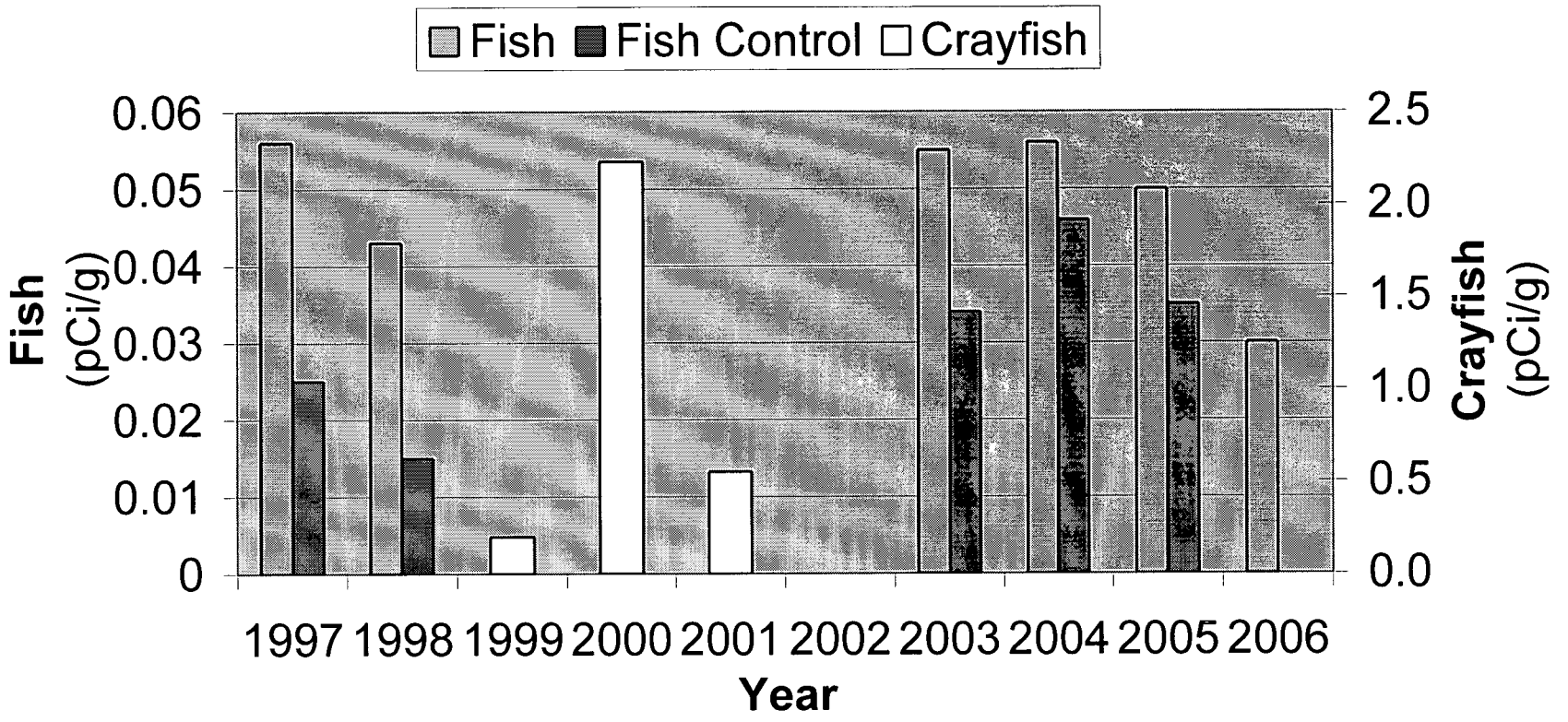
Sediment Mean Total Gamma Activity
Big Rock Point 1997-2006



Notes:
1. Zero values for control location were below detectable concentration.
2. Total gamma activity is sum of Cs-137, Mn-54 and Co-60 means.

Fish & Crayfish Mean Total Gamma Activity

Big Rock Point 1997 - 2005



Notes:

1. Total gamma activity is sum of Cs-137, Mn-54 and Co-60 means
2. Fish indicator and control samples int 2002 showed no detectable gamma isotopes.
3. Crayfish samples not collected in 2002 to 2004; fish samples not collected in 1999 to 2001