Entergy

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May 14, 2009

10 CFR 50, Appendix I
Technical Specification 5.6.2

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

Subject: 2008 Radiological Environmental Operating Report

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Dear Sir or Madam:

Entergy Nuclear Operations, Inc. is submitting the enclosed Radiological Environmental Operating Report for the Palisades Nuclear Plant. This report was prepared in accordance with the requirements of 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, IV.C, and Technical Specification 5.6.2. The period covered by the enclosed report is January 1, 2008, through December 31, 2008.

This letter contains no new commitments and no revision to existing commitments.

Sincerely,

tad/bed

Enclosure: Radiological Environmental Operating Report

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ENCLOSURE

RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
JANUARY 1, 2008, THROUGH DECEMBER 31, 2008

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I. INTRODUCTION

The Radiological Environmental Operating Report provides a summary and data interpretation of the Palisades Nuclear Plant (PNP) Radiological Environmental Monitoring Program, as conducted during the 2008 reporting period. This report was prepared in accordance with the requirements of 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, IV.C, and Technical Specification 5.6.2.

Detailed sample station identification and location information can be found in Chemistry Procedure CH 6.10, "Palisades Environmental Monitoring Program." CH 6.10 is included as Attachment 3. The results of all environmental samples collected are evaluated as follows:

A. Air iodine and particulate and thermoluminescent dosimetry (TLD) data were statistically evaluated at the 95% confidence level. The data were compared against two criteria. The first criterion is the statistical difference, which indicates whether the sample results from near sites are greater than those from control sites, and whether or not the difference is significant (e.g., statistical "T-Test" of indicator vs. control results).

   If the T-Test concludes that the control and indicator populations are statistically different and the indicator populations are higher, then the evaluation level (twice the statistical difference) is computed. This is the minimum difference in the population means for which a corresponding difference in sample means will exceed the statistical difference with 95% confidence. If the evaluation level is exceeded, then correlation of the results with effluent releases is performed.

B. If a sufficient number of positive sample results were available (e.g., >1 control and > 1 indicator) then well water, lake water, sediment, fish, and other aquatic biota samples were evaluated using data mean comparisons and the PNP Offsite Dose Calculation Manual (ODCM), Appendix A, reporting limits.

II. NON-ROUTINE REPORTS

Non-routine reportable events did not occur during this reporting period.

III. DISCUSSION AND INTERPRETATION OF RESULTS

A. Air Samples

There were 260 air samples collected and analyzed for gross beta and I-131. Air iodine/particulate samples are collected weekly from five air-sampling locations. Air is metered into the sampling unit at an

approximate one cubic foot per minute flow rate through a 47-mm air filter (air particulate) and an air iodine cartridge. Both filters are in-line with each other and housed within the same filter holder. Weekly samples were sent to Environmental, Inc., Midwest Laboratory for analysis.

Analysis of the airborne particulate sample data, between the four near-site indicator locations and the control location, demonstrated no statistical difference. The mean values of gross beta results for indicator and control locations were 0.030 pCi/m^3 and 0.029 pCi/m^3, respectively. Indicator location PR5 had the highest annual mean for gross beta results at 0.031 pCi/m^3. No trends in gross beta results are discernable when compared to previous years' sample results.

All I-131 activity results were below the Minimum Detectable Activity (MDA) levels.

B. Lake Water (Surface Water)

Palisades' lake water inlet, South Haven Municipal Raw and Ludington lake water inlet water samples were collected daily and combined into monthly composite samples. One gallon of Palisades Lake-In (1-ST) and Ludington Lake-in (32-LP) and two gallons of South Haven Municipal Raw (25-SH) were sent to Environmental, Inc., Midwest Laboratory for analysis each month. No treatment of the water samples with preservative is required. Thirty-six monthly lake water composite samples collected from the three locations and were analyzed for gross beta and tritium.

No statistical difference was found between the indicator and the control location samples and no PNP ODCM Appendix A reporting limits were exceeded. The gross beta mean values for the indicator and control locations were 1.55 pCi/L and 1.54 pCi/L, respectively. Tritium was not detected any indicator or control samples. There is no ODCM reporting level for gross beta; if gross beta activity is >10 pCi/L, then gamma analysis is required.

C. Drinking Water

Water samples from South Haven Municipal Water System (25-SH Treated), and Ludington Lake-in (32-LP), were collected daily and combined into separate monthly composite samples. (The South Haven Treated is obtained at the PNP site.) One gallon of the Ludington Lake-in and South Haven treated samples (twenty-four total) were sent to Environmental, Inc., Midwest Laboratory for beta and tritium analysis. No treatment of water samples with preservative is required.

No statistical difference was found in the beta results between the indicator and the control location samples and no ODCM Appendix A reporting limits were exceeded. The gross beta mean values for the indicator and control locations were 2.09 pCi/L and 1.54 pCi/L, respectively. Tritium was not detected in any indicator or control samples.

D. Milk

Two one-gallon quantities of raw milk (grab sample) are obtained per sample location per month from dairy milk holding tanks. Each sample quantity is treated with a sodium bisulfate preservative prior to being sent to Environmental, Inc., Midwest Laboratory for analysis.

Thirty six monthly milk samples were collected from three dairy farms (stations 26-JH, 28-DC and 29-WS).

No milk analysis identified activity above the minimum detectable level, with the exception of naturally occurring potassium-40.

E. TLDs - Gamma Dose

Environmental gamma doses are measured quarterly by placement of TLDs at each designated location. Each TLD badge contains a 4-zone Calcium Sulfate ($CaSO_4$) wafer (the wafer includes an additional backup/reserve readout zone). Sensitivity for the multi-zone TLDs is 10 millirem, with a linear response of 0.1 millirem to 1000 rem.

The PNP gamma assessment program consists of 29 locations. There is a total of 16 inner ring TLDs, including one on-site, nine near-site and six steam generator storage facility locations. There are ten outer ring TLD locations (1.0 to 5.5 miles out) and three control TLDs (30 to 55 miles out). A 30^{th} TLD is placed in a lead storage cave (location number 22), and is used as a control for in-transit dose monitoring and subtraction.

There were 116 TLDs collected and analyzed during 2008. The one on-site TLD location (1-ST) serves as an individual reference TLD; however, it was evaluated along with the inner ring (site boundary) TLDs in the statistical evaluation.

The TLD data evaluations were performed by comparing the inner ring TLDs (site boundary locations 1, 13-21 and 33-38), and the outer ring TLDs (locations 2-9, 23 and 24), against the control TLD locations (10, 11, 12).

For 2008, the quarterly average gamma readings (mR) were Inner Ring – 12.0, Outer Ring – 14.2 and Control – 15.2

The highest average dose was observed at outer ring station number 11, (35 miles East) with a dose of 17.1 mrem.

Statistical analysis demonstrated that inner ring vs. control TLDs were two different populations. However, the control mean was greater than the inner ring mean and further evaluation was not done. There was no statistical difference between the outer ring and control populations. No trends are discernable when comparing inner ring with outer ring and control TLD results. Overall, outer ring TLD mean results are consistently higher than inner ring TLD mean results, and control station TLD mean results are slightly higher than outer ring mean results. (The likely reason for the lower results seen for the site perimeter locations is that these TLDs are placed in wooded areas and thus shielded to some degree from cosmic background radiation.)

F. Crops

Food crop samples are collected when available, and in season. Two principal area crops, apples and blueberries, were collected. Approximately 1 kg of sample is placed in a sealable plastic bag for shipment to Environmental, Inc., Midwest Laboratory. No special treatment of the samples with a preservative is necessary.

Three crop samples were collected. Blueberries and apples were collected at indicator station 4-JS (3.5 miles SE), and blueberries at a control station located in the least prevalent wind direction, approximately 11 miles NNE.

No crop analysis identified activity above the Minimum Detectable Activity for either I-131 or gamma emitters.

G. Sediment

Sediment samples are collected semi-annually from each designated location. No treatment of the samples with a preservative is necessary prior to shipment to Environmental, Inc., Midwest Laboratory.

Four sediment samples were collected from two locations. Two were obtained from Palisades, 30-STN (0.5 miles north of discharge), and two from the Ludington Control Station (32-LP).

The first semi-annual control sample showed Cs-137 activity of 0.037 pCi/g. No other sediment samples showed any gamma activity.

H. Fish

Fish samples are collected semi-annually. Samples consist of two species of commercially and/or recreational important species near the plant discharge area. Control samples are obtained in an area not influenced by plant discharge are collected. Each one-liter quantity of fish sample is prepared for shipment to Environmental, Inc., Midwest Laboratory. Each sample is frozen for preservation.

Nine fish samples were collected from two locations. Five indicator samples were obtained from Palisades (1-ST discharge) and four control samples were obtained from Ludington Station (32-LP).

Cs-137 was the only gamma emitter detected and was seen in one indicator and two control samples. The indicator value was 0.029 pCi/g and the control average was 0.040 pCi/gm. No trends are discernable when compared to previous years' sample results. The ODCM reporting limit for Cs-137 is 2000 pCi/kg (2 pCi/gm).

I. Broad Leaf Vegetation

No broad leaf vegetation samples were collected from the surrounding PNP environs during 2008. The collection of broad leaf vegetation samples serves as a backup and/or alternative sampling medium in case any milk sampling location(s) become(s) unavailable.

J. Non-Routine Samples

There were no non-routine environmental samples collected during this reporting period.

K. Gaseous and Liquid Radwaste Effluent Composite Samples

Both the gaseous and liquid radwaste effluent composite samples are collected monthly and sent to Teledyne Brown for analysis. No special sample treatment with a preservative is required prior to laboratory analysis. The liquid effluent composite sample is based on a specific amount of sample collected, per total batch volume release. The gaseous radwaste effluent weekly composite sample results are based on analyzing weekly stack gas filters.

Although not a direct reporting component in the PNP Annual Radiological Environmental Operating Report, results of the gaseous and liquid monthly radwaste effluent composite samples are evaluated against overall environmental trending data. This evaluation is the basis for

determining isotopic dispersion and deposition patterns within the surrounding environs of PNP. All gaseous and liquid effluent results are compared to the PNP ODCM, Appendix A, reporting levels. All isotopic lower limits of detection (LLDs) were met.

IV. ASSESSMENT OF PALISADES OPERATION ENVIRONMENTAL IMPACT

In reviewing the 2008 PNP radiological environmental monitoring data, and comparing it to previous operational and pre-operational data, all trending parameters continue to indicate that the operation of PNP has minimal environmental impact. Most isotopic activity is at environmental background levels. Evidence of an overall environmental isotopic buildup (attributable to plant effluents) remains negligible as well. In most instances, sample analytical results were below previously established environmental background levels.

Table HP 10.4-1
Sampling and Analysis Summary

Name of Facility	Palisades Nuclear Plant	Docket No	50-255
Location of Facility (County, State)	Van Buren, Michigan	Reporting Period	Jan 1, 2008 to Dec 31, 2008

Medium	Collection Description	Location	Number of Samples Collected	Type of Analysis	Frequency of Analysis
Air	Continuous at approx 1 cfm	Stations 4, 5, 8, 9 and 10	260	Gross Beta, I-131	Weekly
Lake Water	1 gallon composite	Lake Intake and South Haven Raw	24	Gross Beta, Tritium	Monthly
Lake Water - Control	1 gallon composite	Ludington Lake In	12	Gross Beta, Tritium, Sr-89 and Sr-90	Monthly
Drinking Water	1 gallon composite	South Haven Municipal	12	Gross Beta, Tritium	Monthly
Well Water	2 gallons grab	Three sites adjacent to Interim Steam Generator Storage Facility	9*	Gross Beta, Tritium	Quarterly
Milk	2 gallons grab	Shine Farm, D Carpenter & J Hay Dairy Farms	36	Gamma isotopic, I-131 and other isotopic	Monthly
TLD	Continuous	Inner Ring, Outer Ring, Controls	116	Gamma dose	Quarterly
Food Products	Grab	J Sarno and Control	3	Gamma isotopic and I-131	At time of harvest
Sediment	Grab	Discharge 1/2 mile north of Palisades and Ludington Control	4	Gamma isotopic	Semiannually
Fish	Grab	Discharge and Control	9	Gamma isotopic	Semiannually
Broadleaf Vegetation	Grab	NA - no samples taken			

*S/G storage facility well sampling was discontinued in 4th quarter 2008

Table HP 10.4-2
Sample Data Summary

Name of Facility	Palisades Nuclear Plant	Docket No	50-255
Location of Facility (County, State)	Van Buren, Michigan	Reporting Period	Jan 1, 2008 to Dec 31, 2008

Medium or Pathway Sampled (Unit of Measure)	Type/Total Number of Analyses Performed	Lower Limit of Detection [a] (LLD)	Indicator Locations Mean (f)[b] Range[b]	Greatest Mean Name Distance & Direction	Greatest Mean Mean (f)[b] Range[b]	Control Locations Mean (f)[b] Range[b]	Number of Reportable Occurrences
Air Particulates (pCi/m3)	I-131 260	0.03	<LLD	--	--	<LLD	0
	Gross ß 260	0.01	0.029 (208/208) 0.014 - 0.064	5PR Covert 3.5 mi ESE	0.031 (52/52) 0.015 - 0.050	0.029 (52/52) 0.014 - 0.047	0
Lake Water (pCi/L)	Gross ß 36	4.0	1.55 (24/24) 0.6 - 2.9	South Haven Raw SH-25 5½ miles N	1.73 (12/12) 0.6 - 2.9	1.54 (12/12) 0.9 - 2.8	0
	Tritium 36	500	(0/24) <LLD	--	--	(0/12) <LLD	0
Drinking Water (pCi/ml)	Gross ß 24	4.0	2.09 (12/12) 1.1 - 3.2	South Haven Treated	2.09 (12/12) 1.1 - 3.2	1.54 (12/12) 0.9 - 2.8	0
	Tritium 24	500	(0/12) <LLD	--	--	(0/12) <LLD	0
Milk (pCi/L)	γ Spec 36 I-131 Cs-137 Other Gamma	 1.0 18.0 15.0	 <LLD <LLD <LLD	 -- -- --	 -- -- --	 <LLD (0/36) <LLD (0/36) <LLD (0/36)	 0 0 0
Inner Ring TLD (Gamma mR)	Gamma Dose 76	10.0	12.0(64/64) 9.7 - 16.2	Kalamazoo ST-11 35 miles E	17.1 (4/4) 15.2 - 19.9	14.1 (12/12) 9.7 - 16.2	0
Outer Ring (Gamma mR)	Gamma Dose 52	10.0	14.2 (40/40) 11.5 - 18.4	Kalamazoo ST-11 35 miles E	17.1 (4/4) 15.2 - 19.9	14.1 (12/12) 9.7 - 16.2	0

Medium or Pathway Sampled (Unit of Measure)	Type/Total Number of Analyses Performed	Lower Limit of Detection [a] (LLD)	Indicator Locations Mean (f)[b] Range[b]	Greatest Mean Name Distance & Direction	Greatest Mean Mean (f)[b] Range[b]	Control Locations Mean (f)[b] Range[b]	Number of Reportable Occurrences
Food Crops (pCi/gm wet)	I-131 3	0.06	<LLD (0/2)	--	--	<LLD (0/1)	0
	• Spec 3	0.05 - 0.10	<LLD (0/2)	--	--	<LLD (0/1)	0
Sediment (pCi/gm dry)	• Spec 4	0.05 to 0.18	<LLD (0/2)	Ludington 125 miles N	0.037 0.037 - 0.037	0.037 (1/2) 0.037 - 0.037	0
Fish	• Spec 9	0.10 to 0.26	0.029 (1/5) 0.029 - 0.029	Ludington 125 miles N	0.040 (2/4) 0.032 - 0.483	0.040 (2/4) 0.032 - 0.048	0

a Nominal Lower Limit of Detection (LLD) as defined in table notation c of Table E-3

b Mean and range based on detectable measurements only. Fraction of detectable measurements at specific locations is indicated in parenthesis (f)

Table HP 10.4-3
Greatest Mean Sampling Location

Medium or Pathway Sampled (unit of measurement)	Type of Analysis	Location	High	Low	Mean
Air (pCi/m3)	I-131	NA	NA	NA	NA
	Gross Beta	5PR	0.050	0.015	0.031
Lake Water (pCi/L)	Gross Beta	25-SH SHRAW	2.9	0.6	1.73
	Tritium	NA	NA	NA	NA
Drinking Water (pCi/L)	Gross Beta	25-SH Treated	3.2	1.1	2.09
	Tritium	NA	NA	NA	NA
Milk (pCi/L)	I-131	NA	NA	NA	NA
	Cs-137	NA	NA	NA	NA
	Other gamma	NA	NA	NA	NA
Inner Ring TLD (gamma mR)	Quarterly	ST-11 KZ	19.9	15.2	17.1
Outer Ring TLD (gamma mR)	Quarterly	ST-11 KZ	19.9	15.2	17.1
Crops (pCi/g wet)	I-131	NA	NA	NA	NA
	Other Gamma	NA	NA	NA	NA
Sediment pCi/gm dry)	Gamma Emitters	Ludington	0.037	0.037	0.037
Fish (pCi/gm wet)	Gamma Emitters	Ludington	0.048	0.032	0.040
Broadleaf Vegetation	Gross Beta Cs-137 Other Gamma	NA - no samples taken			

ATTACHMENT 1
SAMPLE COLLECTION ANOMOLIES

Sample Affected	Location	Date	Problem	Evaluation
None				

ATTACHMENT 2
2008 PNP LAND USE CENSUS

The attached tables are the results of the PNP Land Use Census conducted on September 24, 2008. Table 10.11-1 references the distance from PNP to the nearest residence, garden (greater than 500 square feet), beef cattle, dairy cattle, and goat per meteorological sector. Table 10.11-2 identifies the locations of the nearest residence, garden, beef/dairy cattle and goats within a five (5) mile radius of PNP per meteorological sector. Table 10.11-3 lists the critical receptor locations used to calculate offsite doses by the GASPAR computer program.

2008 PNP LAND USE CENSUS
Table 10.11-1

Distance to the nearest residence, garden, dairy/beef cattle, and goat in each sector.

Sector	Residence	Garden	Beef Cattle	Dairy Cow	Goat
NNE	1.5 mi	1.7 mi	> 5 mi	> 5 mi	> 5 mi
NE	1.5 mi	1.7 mi	> 5 mi	> 5 mi	> 5 mi
ENE	1.2 mi	2.3 mi	> 5 mi	> 5 mi	> 5 mi
E	1.7 mi	2.1 mi	> 5 mi	> 5 mi	> 5 mi
ESE	0.99 mi	> 5 mi	> 5 mi	> 5 mi	> 5 mi
SE	0.90 mi	1.49 mi	4.3 mi	> 5 mi	> 5 mi
SSE	0.80 mi	>5 mi	> 5 mi	> 5 mi	> 5 mi
S	0.72 mi	4.2 mi	> 5 mi	> 5 mi	> 5 mi
SSW	0.49 mi	> 5 mi	> 5 mi	> 5 mi	> 5 mi

Air Sample Stations
Sector – South, Distance – 1.55 miles
Sector – East, Distance – 0.12 miles

2008 PNP LAND USE CENSUS
Table 10.11-2

Nearest Locations per Sector within 5 Miles

Sector	Location Description	Item	Distance from Plant (miles)
NNE	20275 Fire Lane Q	Residence	1.5
NNE	SW corner of 20th and O fire lane	Garden	1.7
NE	Ruggles Road, State Park Manager	Residence	1.5
NE	Blue Start Hwy, Box 133 (East side of highway)	Garden	1.7
ENE	24th Ave, at dead end next to I-196	Residence	1.2
ENE	28th Avenue, 0.1 miles E of 75th St.	Garden	2.3
E	26263 76th Street	Residence.	1.7
E	25100 75th Street	Garden	2.1
ESE	77401 28th Avenue	Residence	0.99
SE	77555 28th Avenue	Residence	0.90
SE	77 ½ St., 0.3 mile N of 32nd Ave, East side of street	Garden	1.49
SE	36th Avenue, 0.8 miles east of M-140	Cattle	4.3
SSE	29th Avenue, Palisades Park	Residence	0.80
S	29th Avenue, Palisades Park	Residence	0.72
S	78th Street 0.5 mile North of CR 376 west side of road	Garden	4.2
SSW	29th Ave, Palisades Park, on beach	Residence	0.49

2008 PNP LAND USE CENSUS
Table 10.11-3

Critical Receptor Items

Sector	Distance (miles)	Item	X/Q (sec/m^3)	D/Q (1/m^2)
SSE	0.48	Site Boundary	2.51E-6	2.11E-8
SSW	0.49	Residence	1.30E-6	5.89E-9
SE	1.49	Garden	3.77E-7	3.01E-9
SE	4.3	Beef Cattle	7.97E-8	4.65E-10

No dairy cattle are within the five mile radius of PNP.

Based on PNP five-year composite meteorological data, 2003 -2007.

ATTACHMENT 3

CHEMISTRY PROCEDURE CH 6.10
"RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM"

25 Pages Follow

Procedure No CH 6.10
Revision 0
Effective Date12/31/08

PALISADES NUCLEAR PLANT
HEALTH PHYSICS PROCEDURE

TITLE: RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Approved: JBBurnett / 12/29/08
Procedure Sponsor **Date**

Process Applicability Exclusion ☒

New Procedure/Revision Summary:

Specific Changes

DRN-08-02338 - New Chemistry Procedure that incorporates contents of HP 10.1, HP 10.10 and HP 6.52

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM

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TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM

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ATTACHMENTS

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM

INFORMATION USE
• **Procedure should be available, but not necessarily at the work location.** • **Procedure may be performed from memory.** • **User remains responsible for procedure adherence.**

1.0 PURPOSE

This procedure provides instructions for collection of environmental samples in support of the Radiological Environmental Monitoring Program (REMP) as required by the Offsite Dose Calculation Manual (ODCM). In addition to the ODCM required samples, additional required sampling is listed.

2.0 REFERENCES

2.1 SOURCE DOCUMENTS

2.1.1 Reg Guide 4.15(7)

2.1.2 10CFR50, Appendix I

2.1.3 Palisades Administrative Procedure 7.08, "Palisades Radiological Environmental Monitoring Program"

2.1.4 Offsite Dose Calculation Manual (ODCM)

2.1.5 Branch Technical Position (Revision 1, 1979), "Radiological Portion of the Environmental Monitoring Program"

2.1.6 NRC IE Bulletin 80-10, “Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment”

2.2 REFERENCE DOCUMENTS

2.2.1 Palisades ODCM, Appendix A, Sections III.J, IV.C, and Tables E-1 and E-2

2.2.2 Entergy Procedure EN-AD-103, "Document Control and Records Management Programs"

2.3 COMMITMENTS

2.3.1 CMT 022011097, IE Bulletin 80-10 Response - "Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment"

2.3.2 CMT 032011144, IE Bulletin 80-10 Response - "Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment"

3.0 PREREQUISITES

None

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Any revisions to this procedure shall be reviewed against Palisades ODCM Specifications to verify compliance to all requirements.

4.2 Deviations from the required sampling schedule shall be documented in the Annual Radiological Environmental Operating Report.

4.3 Every effort shall be made to complete corrective action on malfunctioning sampling equipment prior to the end of the next sampling period.

4.4 If it is not possible to obtain the required samples, suitable alternative media and locations shall be substituted within 30 days.

4.5 Samples shall be collected, prepared, and shipped for analysis in a timely manner to ensure detection requirements are met. Other specific handling precautions for sample media are indicated in Section 5.0 as required.

4.6 Any deviation in the Radiological Environmental Monitoring Program including missing samples, unusual analytical results, elevated LLDs, etc, shall be investigated, evaluated, corrected, and documented.

4.7 If an air sampling unit is discovered not operating, attempt to find the cause and repair. If this cannot be done, replace applicable component and document on air sample collection data sheet.

4.8 Calibrate airflow meters annually.

4.9 Change out airflow meters prior to the expiration of calibration dates.

4.10 Ensure trees and bushes in the vicinity of air sampler locations are removed, along with any branches extending over the top of the sampler. The goal is to keep every station away from the drip line (with the exception of station 9, which has an existing canopy 50 feet above the station).

4.11 In the event that the Radiological Environmental Monitoring Programs sampling are not substantially conducted as described in Palisades ODCM Appendix A, Specification III.J, or an unusual or important event occurs from Plant operation that causes a significant environmental impact or affects a potential environmental impact, a report shall be submitted to the NRC within 30 days.

5.0 PROCEDURE

INFORMATION USE
• **Procedure should be available, but not necessarily at the work location.** • **Procedure may be performed from memory.** • **User remains responsible for procedure adherence.**

5.1 LAKE-IN WATER SAMPLE COLLECTION – DAILY CMT 032011144

5.1.1 Fill a 500 ml sample bottle from water downstream of "bio-box" located in the screen house.

5.1.2 Add the sample to the composite container.

5.1.3 Package and ship samples per Attachment 4.

5.2 DRINKING WATER SAMPLE COLLECTION – DAILY

5.2.1 Obtain a 500 ml sample from any potable water sink.

5.2.2 Add the sample to the monthly sample container.

5.2.3 Package and ship samples per Attachment 4.

5.3 ENVIRONMENTAL AIR SAMPLE COLLECTION – WEEKLY

5.3.1 Open protective cover at air sample station.

5.3.2 Determine "As Found Leakage" by blocking air flow and checking air flow meter for movement.

a. If no leakage, then mark N in As Found Leakage column on Air Sample Data Sheet.

b. If leakage is indicated, then mark Y in "As Found Leakage" column, determine cause and repair.

5.3.3 Record the Flow Meter Cal Due Date, Removed Date, Removed Time and Removed Meter Reading (ft^3).

5.3.4 Remove sampler assembly and replace with new loaded assembly.

5.3.5 Determine "As Left Leakage" by blocking assembly inlet to form a seal and checking air flow meter for movement.

a. If no leakage, then mark N in As Left Leakage column on ASD Sheet.

b. If leakage is indicated, then determine cause and repair.

5.3.6 Collect the removed sampler assembly and close the protective cover.

5.3.7 Proceed to the next station and continue process.

5.3.8 After completing air sample change out, complete the following for each sampler assembly:

a. Remove particulate filter and place in glassine envelope.

b. Place filter envelope and charcoal cartridge in labeled zip-lock bag

c. Clean out any residue or moisture buildup in sampler head.

d. Check condition of O-rings, replace if necessary.

5.3.9 Calculate and record sample volume for each air sample station.

a. If volume is less than 5000 ft^3, then notify REMP/RETS analyst.

5.3.10 Record the Installed Date and Installed Meter Reading onto next week's ASD sheet for each air sample station.

5.3.11 Place new particulate filter (fuzzy side out) and charcoal cartridge in sampler assembly and screw on cap.

5.3.12 Package and ship samples per Attachment 4.

5.3.13 Label new air sample packages for following week.

5.4 SOUTH HAVEN RAW WATER SAMPLE COLLECTION – MONTHLY

NOTE: Water treatment plant personnel add approximately 300 ml of raw water per day to sample containers.

5.4.1 Prepare two 1-gallon containers labeled "SHRAW," "PAL," month and year.

5.4.2 Drop off containers at the South Haven Municipal Water Treatment Plant.

5.4.3 Pick up previous month's 1-gallon containers.

5.4.4 Package and ship samples per Attachment 4.

5.5 BROADLEAF VEGETATION SAMPLE COLLECTION – MONTHLY

5.5.1 Obtain 1 kg (2.2 lbs) samples of three different kinds of broadleaf vegetation in each in the South and SSE sectors.

a. Vegetation should be an annual variety.

5.5.2 Obtain 1 kg (2.2 lbs) samples of the similar broadleaf vegetation 15 – 30 km (9.3 to 18.6 miles) distant in the NNE sector.

5.5.3 Obtain samples monthly when available.

5.5.4 Package and ship samples per Attachment 4.

5.6 ENVIRONMENTAL TLD COLLECTION – QUARTERLY

5.6.1 Upon receipt of TLDs from the laboratory contractor, inventory all TLDs and place in lead cave.

NOTE: Remove field TLDs from the lead cave only for delivery to their proper locations. All control TLDs remain in the lead cave throughout the entire exposure period.

5.6.2 Change-out TLDs at each sample location.

5.6.3 For any missing TLDs, then:

a. Search immediate area.

b. If lost TLD is found, collect it and perform standard change out procedure.

c. If lost TLD is not found, post the new TLD in proper location.

5.6.4 Store collected field TLDs in lead cave along with control TLDs until ready for mailing to laboratory contractor.

5.6.5 Transportation control TLDs (Shield TLDs) are to be stored in a special lead shield provided by laboratory contractor after the field TLDs are posted.

5.6.6 Package and ship samples per Attachment 4.

5.7 PLANT AIR SAMPLE COLLECTION – QUARTERLY CMT 0220011097

5.7.1 Obtain 1-liter air samples from Air Receiver Tanks T-8A, 8B and 8C.

5.7.2 Count samples for 2000 seconds on MCA.

5.8 SEPTIC SYSTEM SAMPLE COLLECTION – QUARTERLY

5.8.1 Obtain a 1 liter liquid sample from sanitary system septic tank.

5.8.2 Count sample for 2000 seconds on MCA.

5.8.3 Package and ship samples per Attachment 4.

5.9 FISH SAMPLE COLLECTION – IN SEASON

5.9.1 Precautions

a. At least one individual in the collection party is required to have Michigan Department of Environmental Quality (MDEQ) Cultural and Scientific Fish Collectors Permit if gill net is used.

b. If logistical problems prevent use of a boat to set gill nets from the lake side of Palisades, then the nets can be set offshore from the site boundary (by wading). Notify Security prior to using offshore wading method for beach access.

5.9.2 Notify district MDEQ Fisheries biologist prior to sample collection

5.9.3 Collect samples twice during the season of greatest abundance (typically May through October) as follows:

a. Collect at least two species of commercially and/or recreationally important fish in the vicinity of the Plant discharge area and the same species in an area not influenced by the Plant discharge (eg, Ludington Pump Storage Plant). One liter of flesh should be collected for each species caught for analysis accuracy.

b. Normally fish will be collected first from the vicinity of the discharge, then the same species at Ludington control station.

5.9.4 Label all containers with sample type, location, and date.

5.9.5 Package and ship samples per Attachment 4.

5.10 SEDIMENT SAMPLE COLLECTION - SEMIANNUALLY

5.10.1 Collect a 1-liter sediment samples semiannually 1/2 mile north of discharge.

5.10.2 Label containers with sample type, location, and date.

5.10.3 Package and ship samples per Attachment 4.

5.11 FOOD PRODUCT SAMPLE COLLECTION – YEARLY

5.11.1 Obtain one sample each of approximately 1 kg each of blueberries and apples.

5.11.2 Label containers with sample type, location, and date.

5.11.3 Package and ship samples per Attachment 4.

5.12 MISCELLANEOUS SAMPLES

5.12.1 Ludington - Control Lake-In daily composite samples are collected daily and shipped to Palisades monthly.

5.12.2 Package and ship samples per Attachment 4.

5.13 MONTHLY SAMPLE COLLECTION VERIFICATION

5.13.1 Attachment 6, "REMP Sample Collection Checklist," may be used to track collection of Environmental Samples.

5.13.2 Verify that the indicated number and type of samples required by the ODCM were collected.

a. Document any unusual collection conditions or missing samples.

5.13.3 Verify that a minimum of 5000 ft^3 (142 m^3) of air sample volume was obtained to ensure that analytical Lower Limit of Detection (LLD) requirements are met.

a. Evaluate, correct and document any significant deviations.

5.13.4 Identify new locations for obtaining replacement samples and add them to the Radiological Environmental Monitoring Program (REMP) within thirty (30) days if milk or fresh leafy vegetable samples become unavailable from one or more of the sample locations. The specific locations from which samples were unavailable may then be deleted from the monitoring program. Identify the cause(s) of sample unavailability and list the new location(s) for obtaining replacement samples in the next Annual Radiological Environmental Operating Report.

5.14 REVIEW OF SAMPLE ANALYSIS RESULTS

5.14.1 The sample analysis results should be reviewed by the REMP/RETS Analyst upon receipt of the analyses from the laboratory contractor.

5.14.2 Compare the monthly analytical results to the appropriate ODCM requirements (Attachment 7) to verify the following:

a. The required analyses were performed.

b. Any results exceeding the action level shall be checked against ODCM Specification reporting requirements.

c. LLD sensitivity levels were reached. If sample LLDs are not reached, evaluate and document contributing factors.

d. The action taken if either isotopic action levels and/or NRC reporting levels are exceeded.

e. Any specific types of evaluation required.

f. Any action related to unusual or missing sample results.

5.15 SPECIAL REPORT

5.15.1 Prepare and submit to the NRC (within 30 days) a special report identifying the following, if the level of radioactivity as a result of Plant effluents in an environmental sampling medium at a specified location exceeds Palisades ODCM, Appendix A, Table E-2, reporting levels when averaged over any calendar quarter.

a. The cause(s) for exceeding the limit(s).

b. Corrective action(s) taken to reduce radioactive effluents.

5.15.2 The NRC Special Report shall be submitted if more than one (1) of the radionuclides listed in the specifications (Palisades ODCM, Appendix A, Table E-2) are detected in an environmental sample medium and:

$$\frac{\text{Concentration (1)}}{\text{Reporting Level (1)}} + \frac{\text{Concentration (2)}}{\text{Reporting Level (2)}} + \ldots \geq 1.0$$

The quarterly sum of fractions calculation shall be completed within 90 days of end of quarter.

5.15.3 If radionuclides other than those listed in the specifications (Palisades ODCM, Appendix A, Table E-2) are detected and are the result of Plant effluents, the NRC Special Report shall be submitted if the potential annual dose to a member of the public is equal to or greater than the calendar year limits specifications (Palisades ODCM, Appendix A, III.H, III.C, and III.D). An NRC Special Report is not required if the measured level of radioactivity is not the result of Plant effluents. The condition shall be reported and described in the Annual Radiological Environmental Operating Report.

Under all conditions, any radiological environmental surveillance sample possessing sufficient isotopic activity above the action level where an action level is listed in Attachment 2 but still below ODCM reporting requirements shall be evaluated. If no action level is listed in Attachment 2, any isotopic activity trending up shall be evaluated.

6.0 ATTACHMENTS AND RECORDS

6.1 ATTACHMENTS

6.1.1 Attachment 1, "Environmental Sample Collection Schedule"

6.1.2 Attachment 2, "REMP Sample Locations"

6.1.3 Attachment 3, "Sample Shipment Identification"

6.1.4 Attachment 4, "Sample Packaging and Shipment"

6.1.5 Attachment 5, "Environmental Air Sample Data Sheet"

6.1.6 Attachment 6, "REMP Sample Collection Checklist"

6.1.7 Attachment 7, "REMP Analytical Requirements"

6.2 RECORDS

6.2.1 Records generated by this procedure shall be filed in accordance with Entergy Procedure EN-AD-103, "Document Control and Records Management Programs."

7.0 SPECIAL REVIEWS

None

ENVIRONMENTAL SAMPLE COLLECTION SCHEDULE

Sample	Number of Samples and Locations	Sample Type	Collection/Analysis Frequency
Airborne Particulates and Iodines	4 within a 10 km radius 1 at 25 – 89 km distant	Continuous at approximately 1 cfm	Weekly
Drinking Water	1 – South Haven Municipal – Raw	Daily 300 sample collection to obtain a two one-gallon composites	Monthly
Drinking Water	1 – Plant drinking water	Daily 500 sample collection to obtain a one-gallon composite	Monthly
Lake Surface	1 – Lake In, Screen-house downstream of "bio-box"	Daily 500 sample collection to obtain a one-gallon composite	Monthly
Lake Surface	1 – Control at Ludington	Daily composite to obtain one-gallon sample	Monthly
Sediment	Sediment – ½ mile north of plant	One-liter grab	Semi-annually
Food Products	1 sample each of blueberries and apples	1 kg grab sample	At time of harvest
Food Products	1 sample each of three different kinds of broadleaf vegetation in two sectors near plant boundary 1 – sample of each of similar broadleaf vegetation 15 – 30 km distant (9 to 18 miles)	1 kg grab samples	Monthly when available
Fish	2 – location in vicinity of plant discharge 2 – Ludington Control	One-liter of fish flesh from two different species. Obtain same species from control location (if available)	Twice in season

ENVIRONMENTAL SAMPLE COLLECTION SCHEDULE

Sample	Number of Samples and Locations	Sample Type	Collection/Analysis Frequency
TLD	9 – General vicinity of Site Boundary 9 – Within 12 km radius 3 – Control Stations	Continuous	Quarterly
Waste Water	1 – septic system	1 liter grab	Quarterly
Plant Air	3 – T-8A, B & C	1 liter grab	Quarterly

REMP SAMPLE LOCATIONS

Station	Code		Location	Air Part. and Iodine	Lake Water	Milk	Food Products	Sediment	TLD	Fish
*1	ST	Palisades Nuclear Plant	Onsite, on tree near nw corner of bag crew bldg.		X				X	
1	ST	Palisades Nuclear Plant	½ mile north of plant on shoreline					X		
1	ST	Palisades Nuclear Plant	Plant discharge area							X
2	TH	RR 3 Coloma, MI 5.6 miles S	TLD located on Becht Road, west side on post, 50 yards south of 48th Ave.						X	
3	HS	76182 48th Ave Covert, MI 5.8 miles SSE	Along 48th Ave, 1/4 mile west of 76th St. In barnyard 50 yds off north side of road.						X	
4	JS	36197 M-140 Hwy Covert, MI 3-1/2 miles SE	Just north of Arellannos fruit stand, in grape arbor.				X		X	
4	JS	36th Avenue, ½ miles east of M-140	South side of road	X						
5	PR	72723 CR 378 Covert, MI 3-1/2 miles ESE	Along CR 378, 3/4 mile east of M-140, 30 ft off north side of road. TLD located at Paul Rood residence; on tree in back yard just past driveway.	X					X	
6	RB	RR 3 South Haven, MI 4-1/2 miles NE	Along 12th Ave (CR 384), turn nw past maple grove, go 1/4 mile located in orchard on north side of road.						X	
7a	SN21	Emergency Siren 21 4.1 miles NNE	On Monroe Blvd, at corner of 76th and 11th Street.						X	
8	SP	State Park 1 mile N	Onsite along the dump road, north of Plant. One mile from main gate. Near State Park boundary, on side of road as road turns west.	X					X	
9	TP	Covert Township Park 1.5 miles SSW	Along 32nd Ave, 1/4 mile west of Blue Star Hwy. 5 ft off south side of road. TLD located at end of road, at entrance to residence on beach, attached to emergency siren SN38.	X					X	
10	GR	Grand Rapids, MI 55 miles NNE	Grand Rapids Service Center, in storage area. Air sample on west side near shed. Control TLD 100 feet north of air sample station.	X					X	

REMP SAMPLE LOCATIONS

Station	Code		Location	Air Part. and Iodine	Lake Water	Milk	Food Products	Sediment	TLD	Fish
11	KZ	Kalamazoo, MI 35 miles E	Kalamazoo Service Center, in parking area on post in SE corner Control TLD.						X	
12	DG	58399 Wilbur Road, Dowagiac, MI 30 miles SSE	TLD located on pole appx 20 yards from road, NE of house.						X	
13	ST	Perimeter of Palisades NNE	Past #8 along dirt road. Proceed west up dune path at right of containment test structure. At first crest, turn north and proceed up adjacent hill to #13 at top (approx 50 yds from crest). Near State Park fence line.						X	
14	ST	Perimeter of Palisades NE	25 yards of east of Station #34 between State Park and DFS Building.						X	
15	ST	Perimeter of Palisades E	North along Blue Star Hwy, 0.75 miles from access road, 10 ft off west side of road.						X	
16	ST	Perimeter of Palisades E	North along Blue Star Hwy, 0.4 miles from access road, 50 ft off west side of road.						X	
17	ST	Perimeter of Palisades ESE	Along access road, 25 yds south of southern power line, 15 yds off east side of road.						X	
18	ST	Perimeter of Palisades SE	20 yds from access road along south road. 40 yds off south road.						X	
19	ST	Perimeter of Palisades SSE	0.2 miles along south road from access road, 30 ft off north side of road.						X	
20	ST	Perimeter of Palisades S	0.4 miles along south road from access road, 20 ft off south side of road.						X	
21	ST	Perimeter of Palisades SSW	0.7 miles along south road from access road, just past top of hill. Near Lake Michigan Bluff.						X	

REMP SAMPLE LOCATIONS

Station	Code		Location	Air Part. and Iodine	Lake Water	Milk	Food Products	Sediment	TLD	Fish
22	PW	Palisades Warehouse	Control TLD in lead cave.						X	
23	SN19	Emergency Siren 19 3 miles ENE	On CR 380.						X	
24	SN26	Emergency Siren 26 6 miles E	On 67th Street.						X	
25	SH	South Haven, MI 5-1/2 miles NNE	South Haven Water Treatment Plant.		X					
30	STN	1/2 mile N of discharge						X		
32	LP	Ludington Pumped Storage 125 Miles N			X					X
45	CV	Alternate Control Air Sample Station	10 miles NNE of Plant	X						

SAMPLE SHIPMENT IDENTIFICATION

Palisades

Location	Type	Date	Amount	Remarks
South Haven	Raw Water	Monthly Composite -	2 Gallons	
Lake In	Lake Water	Monthly Composite -	1 Gallon	
Plant Drinking Water	Domestic Water	Monthly Composite -	1 Gallon	
Ludington - Lake	Control Sample	Monthly Composite -	1 Gallon	
½ mile N of Plant	Sediment		1 Liter	
Sanitary Wastewater	Wastewater		1 liter	
Palisades Perimeter	Vegetation		6 kg	
Control	Vegetation		3 kg	
Arellannos Market	Blueberries		1 kg	
Arellannos Market	Apples		1 kg	
Palisades	Fish			
Control	Fish			

SAMPLE PACKAGING AND SHIPMENT

1. Label samples clearly as to their contents.

2. Seal liquid sample containers with tape to prevent leakage.

3. Use sufficient packing material to avoid sample container damage during shipment.

4. Package air filters in glassine or plastic envelopes.

5. For TLD shipments, ensure that vendor's shipment instructions are followed.

6. Ship samples to vendor laboratory with minimal delay after collection so as to avoid elevated analytical levels of detection.

7. Record sample information on Attachment 3, "Sample Shipment Identification," or Attachment 5, "Environmental Air Sample Data Sheet," or per vendor's instructions as applicable. Include form with shipment.

ENVIRONMENTAL AIR SAMPLE DATA SHEET

PALISADES

A/S Station	Installed Date	Installed Meter Reading (ft^3)	As Found Leakage (Y / N)	Flow Meter Cal Due Date	Removed Date	Removed Time	Removed Meter Reading (ft^3)	As Left Leakage (Y / N)	Sample Volume (ft^3)
4JS									
5PR									
8SP									
9TP									
10GR									

Comments _____

_____

_____

_____

Completed By _____ Date _____

REMP SAMPLE COLLECTION CHECKLIST

Month _____ Year _____

	Collected	Shipped
WEEKLY Air Samples Week 1	_____	_____
Week 2	_____	_____
Week 3	_____	_____
Week 4	_____	_____
Week 5	_____	_____
MONTHLY Broadleaf Veg	_____	_____
Lake In	_____	_____
Drinking Water	_____	_____
SHRAW	_____	_____
Ludington Ctrl	_____	_____

REMP SAMPLE COLLECTION CHECKLIST

Year _____

	Collected	Shipped
QUARTERLY		
TLDs		
1Q	_____	_____
2Q	_____	_____
3Q	_____	_____
4Q	_____	_____
Sanitary Wastewater		
1Q	_____	_____
2Q	_____	_____
3Q	_____	_____
4Q	_____	_____
Plant Air		
1Q	_____	
2Q	_____	
3Q	_____	
4Q	_____	
SEMI-ANNUAL		
Sediment		
1	_____	_____
2	_____	_____
Fish – Indicator		
1	_____	_____
2	_____	_____
Fish – Control		
1	_____	_____
2	_____	_____
ANNUAL		
Blueberries	_____	_____
Apples	_____	_____

This form is not required to be retained as a quality record.

REMP ANALYTICAL REQUIREMENTS

Media	Sampling Interval	Required Analysis	LLD	NRC[f] Reporting Levels	Unusual Results[h]	
					Action Level	Action Required
Direct by TLD	Quarterly	Gamma Dose	10 mR			
Air Gaseous	Weekly	I-131	0.07 pCi/m^3	0.9 pCi/m^3	0.2 pCi/m^3	Notify
Air Particulate	Weekly	Gross Beta Gamma[a,j] Cs-134 Cs-137	0.01 pCi/m^3 0.05 pCi/m^3 0.06 pCi/m^3	 10 pCi/m^3 20 pCi/m^3	See note g 5 pCi/m^3 5 pCi/m^3	Notify and perform gamma isotopic.
Water Surface Drinking	Monthly	H-3[i] Gross Beta Gamma[a,j] Mn-54 Fe-59 Co-58 Co-60 Zn-65 Zr-95 Nb-95 Cs-134 Cs-137 BaLa-140 I-131	2000 pCi/L 4 pCi/L 15 pCi/L 30 pCi/L 15 pCi/L 15 pCi/L 30 pCi/L 15 pCi/L 15 pCi/L 15 pCi/L 18 pCi/L 15 pCi/L 1 pCi/L	20,000 pCi/L 1000 pCi/L 400 pCi/L 1000 pCi/L 300 pCi/L 300 pCi/L 400 pCi/L 400 pCi/L 30 pCi/L 50 pCi/L 200 pCi/L 2 pCi/L	1000 pCi/L 10 pCi/L Any gamma ≥30 pCi/L 2 pCi/L	Notify Notify within 24 h if beta ≥10 pCi/L. Perform gamma analysis. Notify Notify
Sediment	Semiannual	Gamma[j] Cs-134 Cs-137	 150 pCi/g 180 pCi/g		Any gamma ≥1 pCi/g	Notify

REMP ANALYTICAL REQUIREMENTS

Media	Sampling Interval	Required Analysis	LLD	NRC[f] Reporting Levels	Unusual Results[h]	
					Action Level	Action Required
Fish	Semiannual	Gamma[j] Mn-54 Fe-59 Co-58 Co-60 Zn-65 Cs-134 Cs-137	 0.13 pCi/g 0.26 pCi/g 0.13 pCi/g 0.13 pCi/g 0.26 pCi/g 0.13 pCi/g 0.15 pCi/g	 30 pCi/g 10 pCi/g 30 pCi/g 10 pCi/g 20 pCi/g 1 pCi/g 2 pCi/g	Any gamma ≥1 pCi/g	Notify
Broad Leaf Vegetation	Monthly when available	I-131 Gamma[j] Cs-134 Cs-137	0.06 pCi/g 0.08 pCi/g 0.08 pCi/g	0.1 pCi/g 1 pCi/g 2 pCi/g	0.1 pCi/g Any gamma ≥1 pCi/g	Notify Notify
Food Products	At time of harvest	Gamma[j] Cs-134 Cs-137	 0.08 pCi/g 0.08 pCi/g	 1 pCi/g 2 pCi/g	Any gamma ≥1 pCi/g	Notify

[a]Supplementary analysis only.
[d]Radioactivity levels may cause LLD levels to be exceeded.
[e]Monthly composite of weekly filters.
[f]Reporting levels per ODCM, Appendix A, Section III.J and Table E-2.
[g]If gross beta activity is greater than or equal to 1 pCi/m^3 or greater than or equal to ten times last years mean of control samples, perform gamma analysis on the individual samples.
[h]Whenever the Unusual Results Action Level is reached or exceeded, the word "Notify" under the Action Required column signifies that the Contract Laboratory performing the analysis is required to notify Palisades.
[i]Not required for South Haven raw water sample.
[j]Gamma isotopic analysis means the identification and quantification of gamma emitting radionuclides that may be attributable to the effluents from the facility.

ATTACHMENT 4

PALISADES FINAL REPORT
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
AS PROVIDED BY ENVIRONMENTAL, INC, MIDWEST LABORATORY

29 Pages Follow

Environmental, Inc.
Midwest Laboratory
an Allegheny Technologies Co.

700 Landwehr Road • Northbrook, IL 60062-2310
(847) 564-0700 fax (847) 564-4517

FINAL REPORT
TO
ENTERGY NUCLEAR
COVERT, MICHIGAN

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
FOR
PALISADES NUCLEAR GENERATING PLANT

PREPARED AND SUBMITTED
BY
ENVIRONMENTAL INCORPORATED MIDWEST LABORATORY

Project Number: 8022

Reporting Period: January-December, 2008

Reviewed and
Approved by _____ Date 02-10-2009

B. Grob, M.S.
Laboratory Manager

Distribution: J. Burnett (1 copy)

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

The following constitutes the final 2008 Monthly Progress Report for the Radiological Environmental Monitoring Program conducted at the Palisades Nuclear Generating Plant. Results of completed analyses are presented in the attached tables.

For all gamma isotopic analyses, spectrum is computer scanned from 80 to 2048 KeV. Specifically included are Mn-54, Fe-59, Co-58, Co-60, Zn-65, Zr-95, Nb-95, I-131, Ba-La-140, Cs-134 and Cs-137. Naturally-occuring gamma-emitters, such as K-40 and Ra daughters, are frequently detected but not listed here. Data listed as "<" are at the 4.66 sigma level, others are 2 sigma.

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.

2.0 LISTING OF MISSED SAMPLES

Sample Type	Location	Expected Collection Date	Reason

PALISADES

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.
Location: 4JS - Covert (3.5 mi. SE)
Units: pCi/m^3
Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.010	0.030			0.010	0.030
01-07-08	312	0.039 ± 0.004	< 0.021	07-07-08	292	0.021 ± 0.004	< 0.011
01-14-08	314	0.028 ± 0.004	< 0.008	07-14-08	300	0.026 ± 0.004	< 0.011
01-21-08	320	0.033 ± 0.004	< 0.015	07-21-08	289	0.038 ± 0.004	< 0.006
01-28-08	314	0.045 ± 0.004	< 0.010	07-28-08	292	0.030 ± 0.004	< 0.029
02-04-08	312	0.033 ± 0.004	< 0.015	08-04-08	292	0.024 ± 0.003	< 0.019
02-11-08	326	0.030 ± 0.003	< 0.009	08-11-08	295	0.026 ± 0.003	< 0.019
02-18-08	306	0.034 ± 0.004	< 0.016	08-18-08	246	0.025 ± 0.004	< 0.013
02-25-08	312	0.028 ± 0.004	< 0.007	08-25-08	297	0.037 ± 0.004	< 0.009
03-03-08	314	0.028 ± 0.004	< 0.014	09-02-08	289	0.034 ± 0.004	< 0.013
03-10-08	314	0.030 ± 0.004	< 0.013	09-08-08	252	0.028 ± 0.004	< 0.007
03-17-08	306	0.029 ± 0.004	< 0.018	09-15-08	258	0.022 ± 0.004	< 0.018
03-24-08	306	0.023 ± 0.004	< 0.007	09-22-08	292	0.032 ± 0.004	< 0.029
03-31-08	309	0.023 ± 0.004	< 0.008	09-29-08	258	0.053 ± 0.005	< 0.009
1st Qtr. Mean ± s.d.		0.031 ± 0.006	< 0.021	3rd Qtr. Mean ± s.d.		0.030 ± 0.009	< 0.029
04-07-08	309	0.032 ± 0.004	< 0.016	10-06-08	300	0.024 ± 0.003	< 0.007
04-14-08	306	0.014 ± 0.003	< 0.006	10-13-08	295	0.030 ± 0.004	< 0.011
04-21-08	306	0.029 ± 0.004	< 0.009	10-20-08	297	0.024 ± 0.003	< 0.023
04-28-08	303	0.034 ± 0.004	< 0.011	10-27-08	297	0.023 ± 0.003	< 0.010
05-05-08	300	0.029 ± 0.004	< 0.019	11-03-08	317	0.040 ± 0.004	< 0.014
05-12-08	218	0.029 ± 0.005	< 0.017	11-10-08	283	0.033 ± 0.004	< 0.014
05-19-08	297	0.021 ± 0.004	< 0.008	11-17-08	309	0.029 ± 0.003	< 0.008
05-27-08	235	0.014 ± 0.004	< 0.012	11-24-08	303	0.025 ± 0.003	< 0.014
06-02-08	255	0.042 ± 0.005	< 0.013	12-01-08	312	0.029 ± 0.003	< 0.017
06-09-08	198	0.025 ± 0.005	< 0.011	12-08-08	309	0.028 ± 0.003	< 0.022
06-16-08	297	0.024 ± 0.004	< 0.013	12-15-08	306	0.032 ± 0.003	< 0.008
06-23-08	195	0.018 ± 0.005	< 0.023	12-22-08	314	0.038 ± 0.004	< 0.010
06-30-08	297	0.023 ± 0.003	< 0.009	12-29-08	309	0.047 ± 0.004	< 0.011
2nd Qtr. Mean ± s.d.		0.026 ± 0.008	< 0.023	4th Qtr. Mean ± s.d.		0.031 ± 0.007	< 0.023
				Cumulative Average		0.030	
				Previous Annual Average		0.030	

PALISADES

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.
Location: 5PR - Covert (3.5 mi. ESE)
Units: pCi/m^3
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Required LLD		0.010	0.030			0.010	0.030
01-07-08	351	0.043 ± 0.004	< 0.019	07-07-08	314	0.022 ± 0.004	< 0.010
01-14-08	351	0.032 ± 0.004	< 0.007	07-14-08	320	0.023 ± 0.003	< 0.010
01-21-08	357	0.038 ± 0.004	< 0.014	07-21-08	309	0.039 ± 0.004	< 0.006
01-28-08	348	0.050 ± 0.004	< 0.009	07-28-08	314	0.029 ± 0.003	< 0.027
02-04-08	334	0.036 ± 0.004	< 0.014	08-04-08	314	0.022 ± 0.003	< 0.018
02-11-08	351	0.034 ± 0.003	< 0.008	08-11-08	320	0.029 ± 0.003	< 0.017
02-18-08	331	0.041 ± 0.004	< 0.014	08-18-08	309	0.026 ± 0.003	< 0.010
02-25-08	337	0.030 ± 0.004	< 0.007	08-25-08	297	0.035 ± 0.004	< 0.009
03-03-08	340	0.038 ± 0.004	< 0.013	09-02-08	312	0.035 ± 0.004	< 0.012
03-10-08	340	0.033 ± 0.004	< 0.012	09-08-08	286	0.030 ± 0.004	< 0.006
03-17-08	334	0.029 ± 0.004	< 0.016	09-15-08	278	0.025 ± 0.003	< 0.016
03-24-08	329	0.027 ± 0.004	< 0.007	09-22-08	337	0.033 ± 0.003	< 0.022
03-31-08	312	0.024 ± 0.004	< 0.008	09-29-08	278	0.047 ± 0.004	< 0.008
1st Qtr. Mean ± s.d.		0.035 ± 0.007	< 0.019	3rd Qtr. Mean ± s.d.		0.030 ± 0.007	< 0.027
04-07-08	303	0.032 ± 0.004	< 0.017	10-06-08	346	0.023 ± 0.003	< 0.010
04-14-08	300	0.019 ± 0.003	< 0.006	10-13-08	283	0.031 ± 0.004	< 0.011
04-21-08	292	0.029 ± 0.004	< 0.009	10-20-08	351	0.022 ± 0.003	< 0.019
04-28-08	295	0.032 ± 0.004	< 0.011	10-27-08	289	0.022 ± 0.003	< 0.010
05-05-08	295	0.031 ± 0.004	< 0.019	11-03-08	371	0.033 ± 0.003	< 0.012
05-12-08	224	0.030 ± 0.005	< 0.017	11-10-08	280	0.034 ± 0.004	< 0.014
05-19-08	317	0.020 ± 0.003	< 0.007	11-17-08	360	0.029 ± 0.003	< 0.007
05-27-08	255	0.015 ± 0.004	< 0.011	11-24-08	300	0.023 ± 0.003	< 0.021
06-02-08	266	0.037 ± 0.005	< 0.013	12-01-08	368	0.029 ± 0.003	< 0.012
06-09-08	221	0.023 ± 0.005	< 0.010	12-08-08	425	0.020 ± 0.002	< 0.016
06-16-08	317	0.024 ± 0.004	< 0.012	12-15-08	238	0.049 ± 0.005	< 0.010
06-23-08	215	0.018 ± 0.005	< 0.021	12-22-08	317	0.038 ± 0.004	< 0.010
06-30-08	320	0.029 ± 0.004	< 0.009	12-29-08	365	0.049 ± 0.004	< 0.009
2nd Qtr. Mean ± s.d.		0.026 ± 0.007	< 0.021	4th Qtr. Mean ± s.d.		0.031 ± 0.010	< 0.021
				Cumulative Average		0.031	
				Previous Annual Average		0.031	

PALISADES

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.
Location: 8SP - State Park (1.0 mi. N)
Units: pCi/m^3
Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.010	0.030			0.010	0.030
01-07-08	379	0.040 ± 0.004	< 0.017	07-07-08	261	0.022 ± 0.004	< 0.012
01-14-08	379	0.027 ± 0.003	< 0.007	07-14-08	263	0.027 ± 0.004	< 0.012
01-21-08	334	0.031 ± 0.004	< 0.015	07-21-08	255	0.048 ± 0.005	< 0.007
01-28-08	280	0.049 ± 0.005	< 0.012	07-28-08	261	0.027 ± 0.004	< 0.032
02-04-08	278	0.029 ± 0.004	< 0.017	08-04-08	255	0.023 ± 0.004	< 0.022
02-11-08	292	0.030 ± 0.004	< 0.010	08-11-08	266	0.029 ± 0.004	< 0.020
02-18-08	278	0.033 ± 0.004	< 0.017	08-18-08	252	0.024 ± 0.004	< 0.012
02-25-08	286	0.028 ± 0.004	< 0.008	08-25-08	266	0.033 ± 0.004	< 0.010
03-03-08	283	0.027 ± 0.004	< 0.015	09-02-08	289	0.035 ± 0.004	< 0.013
03-10-08	283	0.030 ± 0.004	< 0.014	09-08-08	229	0.033 ± 0.004	< 0.008
03-17-08	275	0.030 ± 0.004	< 0.020	09-15-08	263	0.023 ± 0.004	< 0.017
03-24-08	278	0.025 ± 0.004	< 0.008	09-22-08	266	0.030 ± 0.004	< 0.029
03-31-08	283	0.024 ± 0.004	< 0.008	09-29-08	263	0.047 ± 0.005	< 0.009
1st Qtr. Mean ± s.d.		0.031 ± 0.007	< 0.020	3rd Qtr. Mean ± s.d.		0.031 ± 0.008	< 0.032
04-07-08	286	0.028 ± 0.004	< 0.018	10-06-08	272	0.023 ± 0.003	< 0.010
04-14-08	289	0.022 ± 0.004	< 0.006	10-13-08	263	0.028 ± 0.004	< 0.012
04-21-08	283	0.027 ± 0.004	< 0.009	10-20-08	272	0.026 ± 0.004	< 0.025
04-28-08	272	0.019 ± 0.004	< 0.012	10-27-08	272	0.022 ± 0.004	< 0.011
05-05-08	283	0.032 ± 0.004	< 0.020	11-03-08	289	0.037 ± 0.004	< 0.015
05-12-08	207	0.027 ± 0.005	< 0.018	11-10-08	263	0.032 ± 0.004	< 0.015
05-19-08	269	0.018 ± 0.004	< 0.009	11-17-08	283	0.029 ± 0.004	< 0.008
05-27-08	229	0.015 ± 0.004	< 0.012	11-24-08	283	0.024 ± 0.003	< 0.019
06-02-08	221	0.021 ± 0.004	< 0.015	12-01-08	289	0.032 ± 0.004	< 0.021
06-09-08	187	0.023 ± 0.005	< 0.012	12-08-08	280	0.028 ± 0.004	< 0.024
06-16-08	266	0.026 ± 0.004	< 0.015	12-15-08	289	0.035 ± 0.004	< 0.008
06-23-08	193	0.019 ± 0.005	< 0.023	12-22-08	280	0.036 ± 0.004	< 0.011
06-30-08	266	0.023 ± 0.004	< 0.010	12-29-08	283	0.047 ± 0.004	< 0.012
2nd Qtr. Mean ± s.d.		0.023 ± 0.005	< 0.023	4th Qtr. Mean ± s.d.		0.031 ± 0.007	< 0.025
				Cumulative Average		0.029	
				Previous Annual Average		0.028	

[a] LLD not reached due to lower volume.

PALISADES

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.
Location: 9TP - Covert Township Park (1.5 mi. SSW)
Units: pCi/m^3
Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.010	0.030			0.010	0.030
01-07-08	340	0.036 ± 0.004	< 0.019	07-07-08	314	0.023 ± 0.004	< 0.010
01-14-08	337	0.030 ± 0.004	< 0.007	07-14-08	314	0.027 ± 0.004	< 0.010
01-21-08	351	0.039 ± 0.004	< 0.014	07-21-08	312	0.031 ± 0.003	< 0.006
01-28-08	340	0.064 ± 0.005	< 0.010	07-28-08	312	0.029 ± 0.003	< 0.027
02-04-08	337	0.030 ± 0.004	< 0.014	08-04-08	317	0.019 ± 0.003	< 0.017
02-11-08	354	0.030 ± 0.003	< 0.008	08-11-08	314	0.026 ± 0.003	< 0.017
02-18-08	334	0.034 ± 0.004	< 0.014	08-18-08	289	0.024 ± 0.003	< 0.011
02-25-08	343	0.025 ± 0.003	< 0.007	08-25-08	317	0.032 ± 0.004	< 0.008
03-03-08	340	0.030 ± 0.004	< 0.013	09-02-08	334	0.031 ± 0.003	< 0.011
03-10-08	343	0.030 ± 0.004	< 0.012	09-08-08	275	0.030 ± 0.004	< 0.006
03-17-08	334	0.024 ± 0.003	< 0.016	09-15-08	297	0.021 ± 0.003	< 0.015
03-24-08	334	0.026 ± 0.003	< 0.007	09-22-08	320	0.032 ± 0.003	< 0.028
03-31-08	337	0.025 ± 0.004	< 0.007	09-29-08	300	0.049 ± 0.004	< 0.008
1st Qtr. Mean ± s.d.		0.033 ± 0.010	< 0.019	3rd Qtr. Mean ± s.d.		0.029 ± 0.008	< 0.028
04-07-08	312	0.031 ± 0.004	< 0.016	10-06-08	326	0.022 ± 0.003	< 0.012
04-14-08	306	0.017 ± 0.003	< 0.006	10-13-08	317	0.030 ± 0.003	< 0.010
04-21-08	320	0.034 ± 0.004	< 0.008	10-20-08	329	0.024 ± 0.003	< 0.021
04-28-08	314	0.034 ± 0.004	< 0.010	10-27-08	351	0.022 ± 0.003	< 0.008
05-05-08	314	0.032 ± 0.004	< 0.018	11-03-08	351	0.034 ± 0.003	< 0.012
05-12-08	229	0.025 ± 0.004	< 0.016	11-10-08	312	0.031 ± 0.003	< 0.012
05-19-08	309	0.031 ± 0.004	< 0.008	11-17-08	340	0.027 ± 0.003	< 0.007
05-27-08	266	0.017 ± 0.004	< 0.011	11-24-08	337	0.026 ± 0.003	< 0.016
06-02-08	266	0.020 ± 0.004	< 0.013	12-01-08	346	0.030 ± 0.003	< 0.009
06-09-08	227	0.024 ± 0.005	< 0.010	12-08-08	340	0.027 ± 0.003	< 0.020
06-16-08	314	0.027 ± 0.004	< 0.012	12-15-08	340	0.032 ± 0.003	< 0.007
06-23-08	275	0.019 ± 0.004	< 0.016	12-22-08	348	0.034 ± 0.003	< 0.009
06-30-08	317	0.026 ± 0.004	< 0.009	12-29-08	343	0.050 ± 0.004	< 0.010
2nd Qtr. Mean ± s.d.		0.026 ± 0.006	< 0.018	4th Qtr. Mean ± s.d.		0.030 ± 0.007	< 0.021
				Cumulative Average		0.029	
				Previous Annual Average		0.029	

PALISADES

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.
Location: 10GR - Grand Rapids (55 mi. NNE)
Units: pCi/m^3
Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131	
Required LLD		0.010	0.030			0.010	0.030	
01-10-08	343	0.031 ± 0.004	< 0.011	07-09-08	289	0.027 ± 0.004	< 0.017	
01-17-08	300	0.033 ± 0.004	< 0.023	07-16-08	286	0.025 ± 0.003	< 0.009	
01-23-08	266	0.036 ± 0.005	< 0.018	07-23-08	286	0.033 ± 0.004	< 0.045	a
01-31-08	337	0.041 ± 0.004	< 0.021	07-30-08	292	0.030 ± 0.004	< 0.029	
02-06-08	261	0.029 ± 0.004	< 0.016	08-06-08	289	0.028 ± 0.003	< 0.029	
02-13-08	303	0.037 ± 0.004	< 0.024	08-13-08	286	0.018 ± 0.003	< 0.017	
02-20-08	300	0.034 ± 0.004	< 0.012	08-20-08	295	0.030 ± 0.004	< 0.014	
02-27-08	297	0.023 ± 0.004	< 0.022	08-28-08	252	0.028 ± 0.004	< 0.024	
				09-03-08	337	0.039 ± 0.004	< 0.009	
03-05-08	300	0.030 ± 0.004	< 0.021					
03-13-08	351	0.033 ± 0.004	< 0.023	09-10-08	303	0.021 ± 0.003	< 0.023	
03-19-08	252	0.023 ± 0.004	< 0.013	09-17-08	300	0.038 ± 0.004	< 0.030	
03-26-08	300	0.023 ± 0.004	< 0.012	09-24-08	295	0.036 ± 0.004	< 0.012	
04-02-08	295	0.025 ± 0.004	< 0.026	10-01-08	275	0.045 ± 0.004	< 0.012	
1st Qtr. Mean ± s.d.		0.031 ± 0.006	< 0.024	3rd Qtr. Mean ± s.d.		0.030 ± 0.007	< 0.045	
04-09-08	300	0.028 ± 0.004	< 0.009	10-08-08	326	0.021 ± 0.003	< 0.015	
04-16-08	312	0.015 ± 0.003	< 0.013	10-15-08	297	0.033 ± 0.004	< 0.035	b
04-23-08	286	0.034 ± 0.004	< 0.017	10-22-08	297	0.021 ± 0.003	< 0.015	
04-30-08	300	0.030 ± 0.004	< 0.029	10-29-08	303	0.023 ± 0.003	< 0.022	
05-07-08	297	0.029 ± 0.004	< 0.019	11-05-08	300	0.044 ± 0.004	< 0.020	
05-14-08	303	0.019 ± 0.003	< 0.012	11-13-08	346	0.033 ± 0.003	< 0.008	
05-21-08	297	0.017 ± 0.003	< 0.015	11-19-08	263	0.024 ± 0.003	< 0.026	
05-28-08	292	0.014 ± 0.003	< 0.019	11-26-08	306	0.027 ± 0.003	< 0.023	
				12-03-08	317	0.030 ± 0.003	< 0.033	c
06-04-08	295	0.020 ± 0.004	< 0.012					
06-11-08	297	0.022 ± 0.004	< 0.020	12-10-08	309	0.031 ± 0.003	< 0.012	
06-18-08	280	0.019 ± 0.004	< 0.024	12-17-08	317	0.031 ± 0.003	< 0.016	
06-25-08	300	0.021 ± 0.003	< 0.014	12-23-08	272	0.043 ± 0.004	< 0.020	
07-02-08	283	0.024 ± 0.004	< 0.017	12-30-08	303	0.047 ± 0.004	< 0.013	
2nd Qtr. Mean ± s.d.		0.022 ± 0.006	< 0.029	4th Qtr. Mean ± s.d.		0.031 ± 0.009	< 0.035	
				Cumulative Average		0.028		
				Previous Annual Average		0.029		

[a] LLD not reached due to age of sample (received 08-07-08).
[b] LLD not reached due to age of sample (received 10-29-08).
[c] LLD not reached due to age of sample (received 12-17-08).

PALISADES

Table 2. Gamma radiation, as measured by TLDs, quarterly exposure.
Units: mR/91 days[a]

	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Date Placed	01-02-08	04-01-08	07-01-08	10-06-08
Date Removed	04-02-08	07-01-08	10-06-08	01-06-09
Intransit (mR)	2.8 ± 0.3	1.8 ± 0.5	3.5 ± 0.3	3.2 ± 0.6
ST-01	10.3 ± 0.5	12.1 ± 0.5	10.9 ± 0.8	15.3 ± 1.5
ST-02	14.3 ± 0.7	16.1 ± 0.8	17.3 ± 0.9	18.4 ± 1.0
ST-03	12.5 ± 0.4	13.6 ± 0.6	14.1 ± 0.4	15.8 ± 0.6
ST-04	14.0 ± 1.1	14.5 ± 0.6	15.9 ± 1.0	16.6 ± 0.7
ST-05	13.0 ± 0.4	14.3 ± 0.5	14.7 ± 0.4	17.0 ± 0.6
ST-06	13.0 ± 0.7	12.6 ± 0.5	14.3 ± 0.5	15.5 ± 1.1
ST-07A	11.8 ± 0.6	11.7 ± 0.5	12.4 ± 0.4	14.7 ± 1.0
ST-08	11.9 ± 0.5	12.8 ± 0.6	12.7 ± 0.4	15.8 ± 0.7
ST-09	11.5 ± 0.5	12.6 ± 0.5	12.5 ± 0.4	15.4 ± 0.6
ST-10	14.7 ± 0.7	14.7 ± 0.5	13.4 ± 0.4	18.0 ± 0.7
ST-11	16.1 ± 0.9	17.2 ± 0.5	15.2 ± 0.6	19.9 ± 1.0
ST-12	11.8 ± 0.5	13.5 ± 0.6	12.6 ± 0.4	15.6 ± 0.7
ST-13	11.3 ± 0.6	11.5 ± 0.5	11.7 ± 0.6	14.2 ± 0.6
ST-14	10.0 ± 0.4	10.3 ± 0.5	10.0 ± 0.5	12.6 ± 0.6
ST-15	10.5 ± 0.7	11.0 ± 0.5	11.0 ± 0.8	13.8 ± 0.6
ST-16	9.7 ± 0.9	11.0 ± 0.5	10.2 ± 1.0	14.1 ± 1.2
ST-17	10.3 ± 0.4	10.9 ± 0.7	11.0 ± 0.3	13.6 ± 1.0
ST-18	11.5 ± 0.4	12.0 ± 0.6	12.2 ± 0.4	14.8 ± 0.6
ST-19	11.3 ± 0.4	12.3 ± 0.5	12.6 ± 0.4	14.7 ± 0.6
ST-20	11.0 ± 0.4	12.3 ± 0.5	12.0 ± 0.4	14.8 ± 0.7
ST-21	11.4 ± 0.3	11.4 ± 0.8	12.1 ± 0.3	13.8 ± 0.8
ST-22	7.4 ± 0.6	6.5 ± 0.5	7.0 ± 0.5	8.1 ± 0.6
ST-23	12.4 ± 0.6	13.1 ± 0.5	13.3 ± 0.6	15.9 ± 0.6
ST-24	12.8 ± 0.5	14.3 ± 0.6	14.6 ± 0.7	17.1 ± 0.7
ST-33	10.6 ± 0.6	11.2 ± 0.6	11.2 ± 0.6	13.7 ± 0.8
ST-34	11.0 ± 0.4	11.3 ± 0.6	11.3 ± 0.4	13.8 ± 0.6
ST-35	13.2 ± 0.4	13.4 ± 0.8	13.6 ± 0.4	16.2 ± 1.0
ST-36	10.8 ± 0.5	11.4 ± 0.7	11.2 ± 0.4	14.0 ± 0.8
ST-37	11.3 ± 0.7	11.7 ± 0.7	11.7 ± 0.6	14.3 ± 0.8
ST-38	10.4 ± 0.6	11.5 ± 0.7	10.5 ± 0.5	14.0 ± 0.7
Mean ± s.d.	11.7 ± 1.7	12.4 ± 2.0	12.4 ± 2.0	15.1 ± 2.1
Control 1	6.5 ± 0.5	6.9 ± 0.6	6.2 ± 0.4	7.1 ± 0.7
Control 2	6.6 ± 0.4	6.7 ± 0.6	6.3 ± 0.4	7.0 ± 0.7

[a] Intransit exposure has been subtracted.

PALISADES

Table 3. Lake Water, analyses for gross beta and tritium.
Collection: Monthly composites of daily collections.
Units: pCi/L

Location		Intake	
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
01-31-08	PALW -521	2.6 ± 0.8	< 117
02-29-08	PALW -948	1.1 ± 0.5	< 157
03-31-08	PALW -1370	1.0 ± 0.5	< 177
04-30-08	PALW 2297,8	1.2 ± 0.3	< 154
05-31-08	PALW -3050	1.1 ± 0.6	< 169
06-30-08	PALW -3606	0.9 ± 0.5	< 151
07-31-08	PALW 4242,3	1.3 ± 0.4	< 150
08-31-08	PALW -4893	0.9 ± 0.5	< 143
09-30-08	PALW -6064	0.8 ± 0.5	< 161
10-31-08	PALW -6584	2.3 ± 0.9	< 145
11-30-08	PALW -7033	< 1.9	< 140
12-31-08	PALW -7364	2.0 ± 1.0	< 133

Lake Water, analysis for gross beta and tritium.
Collection: Monthly composites of daily collections.
Units: pCi/L

Location		South Haven Municipal System (Raw)	
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
01-31-08	PALW -523	< 1.8	< 117
02-29-08	PALW -950	1.1 ± 0.5	< 157
03-31-08	PALW -1401	0.6 ± 0.3	< 156
04-30-08	PALW 2321,2	1.3 ± 0.4	< 154
05-31-08	PALW -2903	2.4 ± 1.0	< 172
06-30-08	PALW -3372	1.7 ± 0.6	< 143
07-31-08	PALW 4221,2	1.1 ± 0.4	< 150
08-31-08	PALW -4855	0.9 ± 0.5	< 148
09-30-08	PALW -5576	1.9 ± 1.0	< 145
10-31-08	PALW -6446	2.9 ± 0.7	< 149
11-30-08	PALW -7035	2.8 ± 1.1	< 140
12-31-08	PALW -7550	2.3 ± 1.0	< 159

PALISADES

Table 4. Well water, analyses for gross beta and tritium.
Collection: Monthly composites of daily collections.
Units: pCi/L

Location	South Haven Municipal System (Treated)		
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
01-31-08	PAWW -524	2.6 ± 1.0	< 117
02-29-08	PAWW -951	1.1 ± 0.5	< 157
03-31-08	PAWW -1369	< 0.9	< 177
04-30-08	PAWW -2300	1.1 ± 0.4	< 154
05-31-08	PAWW -3051	1.1 ± 0.5	< 172
06-30-08	PAWW -3608	< 0.9	< 151
07-31-08	PAWW -4245	< 2.2	< 150
08-31-08	PAWW -4895	< 0.8	< 143
09-30-08	PAWW -6066	< 1.0	< 161
10-31-08	PAWW -6586	2.9 ± 0.9	< 145
11-30-08	PAWW -7036	2.6 ± 1.0	< 140
12-31-08	PAWW -7366	3.2 ± 1.1	< 133

PALISADES

Table 5. Well water, analyses for gross beta and tritium.
Collection: Quarterly
Units: pCi/L

Location	Site Well #14		
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
03-18-08	PAWW -1125	4.4 ± 1.3	< 172
06-17-08	PAWW -3052	3.2 ± 0.8	< 169
09-11-08	PAWW -4904	2.7 ± 1.0	< 162

Location	Site Well #15		
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
03-18-08	PAWW -1126	8.1 ± 1.0	< 172
06-17-08	PAWW 3053,4	4.8 ± 0.6	< 169
09-11-08	PAWW -4905	1.5 ± 1.0	< 162

NOTE: Gamma isotopic analysis required if gross beta exceeds 10 pCi/L. Results listed in Appendix C.

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Table 5. Well water, analyses for gross beta and tritium.
Collection: Quarterly
Units: pCi/L

Location	Site Well #16		
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
03-18-08	PAWW -1127	5.9 ± 1.2	< 172
06-17-08	PAWW -3055	2.6 ± 0.7	< 169
09-11-08	PAWW -4896	3.3 ± 0.7	< 142

NOTE: Gamma isotopic analysis required if gross beta exceeds 10 pCi/L. Results listed in Appendix C.

PALISADES

Table 6. Water, Ludington controls, analyses for gross beta, tritium and strontium.
Collection: Monthly composites of daily collections.
Units: pCi/L

Location		Ludington (Lake In)			
Date Collected	Lab Code	Gross Beta	H-3	Sr-89	Sr-90
Required LLD		4.0	500	5.0	1.0
02-06-08	PALW -522	1.4 ± 0.7	< 117	< 0.6	< 0.6
03-05-08	PALW -949	0.9 ± 0.5	< 157	< 0.7	< 0.6
04-01-08	PALW -1371	1.3 ± 0.5	< 177	< 0.6	< 0.6
05-01-08	PALW -2299	1.0 ± 0.4	< 154	< 0.6	< 0.6
06-03-08	PALW -3087	2.5 ± 1.0	< 169	< 0.7	< 0.6
07-01-08	PALW -3607	1.1 ± 0.6	< 151	< 0.9	< 0.6
08-04-08	PALW -4244	1.0 ± 0.5	< 150	< 0.9	< 0.6
09-02-08	PALW -4894	< 0.9	< 143	< 0.7	< 0.6
10-01-08	PALW -6065	1.4 ± 0.6	< 161	< 0.8	< 0.5
11-03-08	PALW -6585	< 1.4	< 145	< 1.0	< 0.5
12-02-08	PALW -7034	2.0 ± 0.9	< 140	< 0.9	< 0.5
01-05-09	PALW -7365	2.8 ± 1.0	< 133	< 0.5	< 0.5

Table 8. Milk, analyses for iodine-131 and gamma emitting isotopes,
Collection: Monthly

Location		JH - Joseph Hay Farm				
Date	Lab	Concentration (pCi/L)				
Collected	Code	I-131	K-40	Cs-134	Cs-137	Ba-La-140
Required LLD		1.0	-	15.0	18.0	15.0
01-08-08	PAMI -60	< 0.3	1296 ± 108	< 3.1	< 3.1	< 3.1
02-12-08	PAMI -519	< 0.2	1321 ± 108	< 2.4	< 3.5	< 2.7
03-11-08	PAMI -946	< 0.3	1319 ± 108	< 3.2	< 3.4	< 2.4
04-08-08	PAMI -1398	< 0.3	1316 ± 102	< 2.6	< 3.6	< 3.5
05-13-08	PAMI -2324	< 0.3	1291 ± 117	< 2.8	< 3.9	< 2.5
06-10-08	PAMI -2901	< 0.3	1336 ± 101	< 2.1	< 3.4	< 2.5
07-08-08	PAMI -3370	< 0.3	1338 ± 108	< 2.7	< 4.0	< 2.9
08-12-08	PAMI -4219	< 0.2	1281 ± 98	< 2.5	< 2.7	< 2.3
09-09-08	PAMI -4853	< 0.3	1378 ± 99	< 2.8	< 3.7	< 4.3
10-14-08	PAMI -5574	< 0.2	1467 ± 108	< 2.7	< 2.4	< 1.8
11-11-08	PAMI -6444	< 0.3	1453 ± 111	< 3.2	< 3.4	< 1.1
12-09-08	PAMI -6907	< 0.3	1461 ± 107	< 2.6	< 3.5	< 2.0

Location		DC - Danny Carpenter Farm				
Date	Lab	Concentration (pCi/L)				
Collected	Code	I-131	K-40	Cs-134	Cs-137	Ba-La-140
Required LLD		1.0	-	15.0	18.0	15.0
01-08-08	PAMI -59	< 0.4	1394 ± 116	< 3.5	< 4.2	< 3.2
02-12-08	PAMI -518	< 0.2	1285 ± 106	< 3.9	< 4.1	< 1.6
03-11-08	PAMI -945	< 0.2	1239 ± 104	< 3.8	< 2.5	< 1.7
04-08-08	PAMI -1399	< 0.3	1233 ± 97	< 3.1	< 3.9	< 3.1
05-13-08	PAMI -2323	< 0.3	1322 ± 105	< 4.1	< 3.2	< 1.4
06-10-08	PAMI -2900	< 0.2	1295 ± 104	< 4.0	< 2.2	< 2.0
07-08-08	PAMI -3369	< 0.2	1087 ± 94	< 2.7	< 3.4	< 2.7
08-12-08	PAMI -4218	< 0.2	1000 ± 86	< 2.9	< 3.0	< 2.3
09-09-08	PAMI -4852	< 0.2	1011 ± 73	< 2.2	< 2.3	< 4.0
10-14-08	PAMI 5572,3	< 0.3	1417 ± 74	< 2.8	< 3.1	< 1.8
11-11-08	PAMI -6443	< 0.3	1254 ± 110	< 2.7	< 3.1	< 2.8
12-09-08	PAMI -6906	< 0.3	1229 ± 98	< 2.8	< 3.7	< 1.9

Table 8. Milk, analyses for iodine-131 and gamma emitting isotopes,
Collection: Monthly

Location		WS - William Shine Farm				
Date	Lab	Concentration (pCi/L)				
Collected	Code	I-131	K-40	Cs-134	Cs-137	Ba-La-140
Required LLD		1.0	-	15.0	18.0	15.0
01-08-08	PAMI -61	< 0.4	1326 ± 112	< 3.5	< 3.8	< 5.3
02-12-08	PAMI -520	< 0.2	1510 ± 93	< 2.5	< 3.0	< 3.4
03-11-08	PAMI -947	< 0.3	1595 ± 116	< 2.7	< 3.8	< 2.1
04-08-08	PAMI -1400	< 0.3	1399 ± 121	< 4.0	< 4.1	< 1.7
05-13-08	PAMI -2325	< 0.4	1488 ± 127	< 3.1	< 3.5	< 2.2
06-10-08	PAMI -2902	< 0.3	1313 ± 101	< 2.8	< 3.7	< 1.9
07-08-08	PAMI -3371	< 0.3	1273 ± 97	< 2.1	< 2.2	< 2.2
08-12-08	PAMI -4220	< 0.2	1181 ± 86	< 2.7	< 2.6	< 1.9
09-09-08	PAMI -4854	< 0.3	1333 ± 72	< 2.0	< 2.6	< 4.3
10-14-08	PAMI -5575	< 0.2	1377 ± 106	< 3.3	< 2.8	< 4.2
11-11-08	PAMI -6445	< 0.3	1207 ± 110	< 3.7	< 2.7	< 1.3
12-09-08	PAMI -6908	< 0.3	1544 ± 118	< 3.4	< 4.4	< 4.8

Table 9. Food Crops, analyses for gross beta and gamma-emitting isotopes.
Collection: Semiannually, at the time of harvest.
Units: pCi/g wet

Location	Indicator		
Lab Code	PAVE-4247	PAVE-5726	
Date Collected	8/12/2008	10/13/2008	Req. LLD
Sample Type	Blueberries	Apples	
Mn-54	< 0.004	< 0.013	0.08
Fe-59	< 0.012	< 0.024	0.10
Co-58	< 0.005	< 0.015	0.08
Co-60	< 0.006	< 0.012	0.05
Zn-65	< 0.004	< 0.019	0.10
Zr-Nb-95	< 0.003	< 0.015	0.10
I-131	< 0.011	< 0.035	0.06 [a]
Cs-134	< 0.004	< 0.015	0.08
Cs-137	< 0.006	< 0.013	0.08

[a] Required for broadleaf vegetation only.

Table 9. Food Crops, analyses for gross beta and gamma-emitting isotopes.
Collection: Semiannually, at the time of harvest.
Units: pCi/g wet

Location	Control Station	
Lab Code	PAVE-4246	
Date Collected	8/10/2008	Req. LLD
Sample Type	Blueberries	
Mn-54	< 0.006	0.08
Fe-59	< 0.011	0.10
Co-58	< 0.004	0.08
Co-60	< 0.005	0.05
Zn-65	< 0.006	0.10
Zr-Nb-95	< 0.004	0.10
I-131	< 0.015	0.06 [a]
Cs-134	< 0.006	0.08
Cs-137	< 0.006	0.08

[a] Required for broadleaf vegetation only.

Table 10. Fish, analyses for gross beta and gamma-emitting isotopes.
Collection: Semiannually
Units: pCi/g wet

Location	Discharge				
Lab Code	PAF-2490,1	PAF-2492	PAF-2493	PAF-2494	
Date Collected	5/16/2008	5/1/2008	5/1/2008	5/1/2008	Req. LLD
Sample Type	Sheephead	Lake Trout	Coho Salmon A	Coho Salmon B	
Mn-54	< 0.015	< 0.018	< 0.035	< 0.009	0.13
Fe-59	< 0.037	< 0.050	< 0.081	< 0.052	0.26
Co-58	< 0.019	< 0.015	< 0.027	< 0.014	0.13
Co-60	< 0.013	< 0.014	< 0.026	< 0.010	0.13
Zn-65	< 0.027	< 0.044	< 0.076	< 0.012	0.26
Zr-Nb-95	< 0.018	< 0.029	< 0.059	< 0.028	0.10
Cs-134	< 0.006	< 0.019	< 0.035	< 0.011	0.13
Cs-137	0.029 ± 0.016	< 0.025	< 0.045	< 0.010	0.15

Location	Ludington Pumped Storage Plant (Control)				
Lab Code	PAF-4193	PAF-5718	PAF-5719	PAF-5720	
Date Collected	8/1/2008	10/16/2008	10/16/2008	10/16/2008	Req. LLD
Sample Type	Yellow Perch	Coho	Yellow Perch	Drum	
Mn-54	< 0.017	< 0.008	< 0.009	< 0.008	0.13
Fe-59	< 0.041	< 0.025	< 0.020	< 0.022	0.26
Co-58	< 0.017	< 0.006	< 0.010	< 0.006	0.13
Co-60	< 0.017	< 0.015	< 0.011	< 0.009	0.13
Zn-65	< 0.025	< 0.011	< 0.016	< 0.018	0.26
Zr-Nb-95	< 0.027	< 0.010	< 0.007	< 0.014	0.10
Cs-134	< 0.013	< 0.011	< 0.013	< 0.007	0.13
Cs-137	< 0.020	< 0.014	0.032 ± 0.017	0.048 ± 0.017	0.15

Location	Ludington Pumped Storage Plant (Control)
Lab Code	PAF-5721
Date Collected	10/16/2008
Sample Type	Lake Trout
Mn-54	< 0.008
Fe-59	< 0.019
Co-58	< 0.007
Co-60	< 0.014
Zn-65	< 0.019
Zr-Nb-95	< 0.006
Cs-134	< 0.007
Cs-137	< 0.018

Table 11. Bottom sediment, analyses for gamma-emitting isotopes.
Collection: Semiannually
Units: pCi/g dry

Location	Palisades North Property		
Lab Code	PABS-3090	PABS-7041	
Date Collected	6/5/2008	11/26/2008	Req. LLD
Mn-54	< 0.012	< 0.022	0.08
Fe-59	< 0.025	< 0.077	0.10
Co-58	< 0.010	< 0.022	0.08
Co-60	< 0.009	< 0.015	0.05
Zn-65	< 0.027	< 0.042	0.10
Zr-Nb-95	< 0.014	< 0.035	0.10
Cs-134	< 0.008	< 0.014	0.15
Cs-137	< 0.009	< 0.019	0.18

Location	Ludington Control		
Lab Code	PABS-5724[a]	PABS-5725	
Date Collected	6/30/2008	10/16/2008	Req. LLD
Mn-54	< 0.022	< 0.023	0.08
Fe-59	< 0.147	< 0.054	0.10
Co-58	< 0.060	< 0.024	0.08
Co-60	< 0.017	< 0.016	0.05
Zn-65	< 0.066	< 0.054	0.10
Zr-Nb-95	< 0.146	< 0.015	0.10
Cs-134	< 0.017	< 0.017	0.15
Cs-137	0.037 ± 0.020	< 0.017	0.18

[a] Some LLDs not reached due to age of sample (received 10-20-08).

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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, 2007 through September, 2008

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:

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

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.

APPENDIX C

SPECIAL ANALYSES

PALISADES

Appendix C: Monitoring Wells, analysis for tritium
Units: pCi/L

Location	MW-1	
Date Collected	Lab Code	H-3
Required LLD		500
03-18-08	PAWW- 1222	< 172
05-19-08	PAWW- 2458	298 ± 87

Location	MW-2	
Date Collected	Lab Code	H-3
Required LLD		500
03-18-08	PAWW- 1223	539 ± 108
05-19-08	PAWW- 2459	1671 ± 134
11-24-09	PAWW- 7037	808 ± 107

Location	MW-3		MW-3A	
Date Collected	Lab Code	H-3		
Required LLD		500		500
03-18-08	PAWW- 1224	12184 ± 323		
05-19-08	PAWW- 2460	8707 ± 266		
11-24-09	PAWW- 7038	21580 ± 407	PAWW- 7039	< 140

PALISADES

Appendix C: Monitoring Wells, analysis for tritium
Units: pCi/L

Location		MW-4
Date Collected	Lab Code	H-3
Required LLD		500
03-18-08	PAWW- 1225	< 172
05-19-08	PAWW- 2461	< 148

Location	MW-5		MW-11	
Date Collected	Lab Code	H-3		
Required LLD		500		
03-18-08	PAWW- 1226	< 172		
05-19-08	PAWW- 2462,3	182 ± 58		
11-24-08			PAWW- 7040	8395 ± 260

Location		Septic
Date Collected	Lab Code	H-3
Required LLD		500
09-26-08	PAWW- 7043	160 ± 82
12-12-08	PAWW- 7042	147 ± 81

PALISADES

Appendix C: Special samples, analysis for gamma isotopic and tritium
Units: pCi/L

Location	Stormwater	Sewer System	Stormwater[a]	Stormwater
Lab Code	PAW-3088	PAW-3089	PAW-6069	PAW-7044
Collection Date	6/3/2008	6/5/2008	9/29/2008	12/11/2008
H-3	< 169	334 ± 98	557 ± 119	< 140
Mn-54	< 1.5	< 2.9	< 4.1	< 3.3
Fe-59	< 3.7	< 1.8	< 8.6	< 7.0
Co-58	< 2.9	< 2.8	< 4.3	< 4.1
Co-60	< 1.8	< 1.8	< 4.1	< 3.6
Zn-65	< 4.3	< 2.6	< 5.1	< 5.1
Zr-Nb-95	< 1.8	< 3.6	< 7.5	< 4.8
Cs-134	< 2.5	< 2.1	< 3.6	< 3.8
Cs-137	< 2.2	< 3.0	< 3.9	< 3.2
Ba-La-140	< 8.7	< 4.9	< 19.1	< 7.6

[a] LLD for Ba-La-140 not reached due to age and size (1 liter) of sample.

ATTACHMENT 5

ENVIRONMENTAL, INC, MIDWEST LABORATORY, INTERLABORATORY COMPARISON PROGRAM RESULTS

19 Pages Follow

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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.

January, 2008 through December, 2008

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 lists REMP specific analytical results from 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. Complete analytical data for duplicate analyses is available upon request.

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

Results in Table A-7 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 Environmental Measurement Laboratory Quality Assessment Program (EML).

Attachment A lists the laboratory precision at the 1 sigma level for various analyses. The acceptance criteria in Table A-3 is set at ± 2 sigma.

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	$\pm 1\sigma$ = $169.85 \times (\text{known})^{0.0933}$ 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 pCi/liter 10% of known value
Uranium-238, Nickel-63[b] Technetium-99[b]	≤ 35 pCi/liter > 35 pCi/liter	6 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	Analysis	Concentration (pCi/L) Laboratory Result[b]	ERA Result[c]	Control Limits	Acceptance
STW-1148	03/24/08	Sr-89	50.6 ± 2.4	60.4	48.6 - 68.2	Pass
STW-1148	03/24/08	Sr-90	42.4 ± 1.4	39.2	28.8 - 45.1	Pass
STW-1149	03/24/08	Ba-133	56.9 ± 5.4	58.3	48.3 - 64.3	Pass
STW-1149	03/24/08	Co-60	73.9 ± 1.6	76.6	68.9 - 86.7	Pass
STW-1149	03/24/08	Cs-134	50.2 ± 1.9	46.6	37.4 - 51.3	Pass
STW-1149	03/24/08	Cs-137	97.7 ± 2.2	102.0	91.8 - 115.0	Pass
STW-1149	03/24/08	Zn-65	109.9 ± 5.8	106.0	95.4 - 126.0	Pass
STW-1150	03/24/08	Gr. Alpha	43.7 ± 7.5	50.8	26.5 - 63.7	Pass
STW-1150	03/24/08	Gr. Beta	36.4 ± 1.8	51.4	35.0 - 58.4	Pass
STW-1151	03/24/08	I-131	29.3 ± 1.4	28.7	23.9 - 33.6	Pass
STW-1152	03/24/08	Ra-226	15.0 ± 1.1	15.3	11.4 - 17.6	Pass
STW-1152	03/24/08	Ra-228	18.4 ± 1.8	17.0	11.4 - 20.4	Pass
STW-1152	03/24/08	Uranium	23.4 ± 1.3	24.6	19.8 - 27.6	Pass
STW-1153	03/24/08	H-3	12551.0 ± 207.0	12000.0	10400.0 - 13200.0	Pass
STW-1154	07/07/08	Sr-89	24.9 ± 3.5	28.7	20.4 - 35.3	Pass
STW-1154	07/07/08	Sr-90	39.7 ± 0.5	40.0	29.4 - 46.0	Pass
STW-1155	07/07/08	Ba-133	45.0 ± 1.2	46.6	38.1 - 51.8	Pass
STW-1155	07/07/08	Co-60	24.9 ± 3.0	25.7	22.3 - 31.0	Pass
STW-1155	07/07/08	Cs-134	90.4 ± 5.3	93.2	76.6 - 102.0	Pass
STW-1155	07/07/08	Cs-137	57.1 ± 2.8	54.6	49.1 - 62.9	Pass
STW-1155	07/07/08	Zn-65	102.9 ± 7.3	98.8	88.9 - 118.0	Pass
STW-1156	07/07/08	Gr. Alpha	24.8 ± 1.6	30.7	15.7 - 40.0	Pass
STW-1156	07/07/08	Gr. Beta	23.9 ± 0.9	25.8	16.1 - 33.7	Pass
STW-1157	07/07/08	Ra-226	8.0 ± 0.6	8.1	6.1 - 9.5	Pass
STW-1157	07/07/08	Ra-228	7.7 ± 0.8	7.4	4.7 - 9.5	Pass
STW-1157	07/07/08	Uranium	11.2 ± 0.3	11.3	8.9 - 13.0	Pass
STW-1164	10/06/08	Sr-89	42.2 ± 3.2	48.7	38.2 - 56.1	Pass
STW-1164	10/06/08	Sr-90	35.4 ± 1.2	33.6	24.6 - 38.8	Pass
STW-1165	10/06/08	Ba-133	56.9 ± 1.0	63.5	52.8 - 69.9	Pass
STW-1165	10/06/08	Co-60	47.6 ± 1.3	49.1	44.2 - 56.6	Pass
STW-1165	10/06/08	Cs-134	26.4 ± 4.0	25.6	19.7 - 28.4	Pass
STW-1165	10/06/08	Cs-137	24.3 ± 0.7	25.6	21.6 - 31.2	Pass
STW-1165	10/06/08	Zn-65	72.0 ± 2.9	68.6	61.2 - 83.0	Pass
STW-1166	10/06/08	Gr. Alpha	24.2 ± 4.8	26.9	13.6 - 35.5	Pass
STW-1166	10/06/08	Gr. Beta	32.6 ± 1.0	38.0	25.1 - 45.5	Pass
STW-1167	10/06/08	I-131	29.0 ± 0.3	28.1	23.4 - 33.0	Pass
STW-1168	10/06/08	Ra-226	15.0 ± 1.0	16.1	12.0 - 18.4	Pass
STW-1168	10/06/08	Ra-228	16.0 ± 1.0	14.1	9.4 - 17.1	Pass
STW-1168	10/06/08	Uranium	47.8 ± 2.0	50.3	40.8 - 55.9	Pass
STW-1169	10/06/08	H-3	2357.0 ± 66.0	2220.0	1830.0 - 2460.0	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.

TABLE A-2. Crosscheck program results; Thermoluminescent Dosimetry, (TLD, $CaSO_4$: Dy Cards).

Lab Code	Date	Description	mR Known Value	mR Lab Result ± 2 sigma	Control Limits	Acceptance
Environmental, Inc.						
2008-1	6/16/2008	40 cm.	30.23	33.87 ± 1.17	21.16 - 39.30	Pass
2008-1	6/16/2008	50 cm.	19.35	23.13 ± 0.57	13.55 - 25.16	Pass
2008-1	6/16/2008	60 cm.	13.44	16.25 ± 1.10	9.41 - 17.47	Pass
2008-1	6/16/2008	70 cm.	9.87	10.39 ± 0.52	6.91 - 12.83	Pass
2008-1	6/16/2008	80 cm.	7.56	7.44 ± 0.51	5.29 - 9.83	Pass
2008-1	6/16/2008	90 cm.	5.97	5.80 ± 1.04	4.18 - 7.76	Pass
2008-1	6/16/2008	100 cm.	4.84	4.32 ± 0.43	3.39 - 6.29	Pass
2008-1	6/16/2008	120 cm.	3.36	2.69 ± 0.15	2.35 - 4.37	Pass
2008-1	6/16/2008	150 cm.	2.15	2.05 ± 0.69	1.51 - 2.80	Pass
2008-1	6/16/2008	180 cm.	1.49	1.23 ± 0.80	1.04 - 1.94	Pass
Environmental, Inc.						
2008-2	11/17/2008	30 cm.	63.05	73.10 ± 1.84	44.14 - 81.97	Pass
2008-2	11/17/2008	40 cm.	35.46	40.80 ± 2.30	24.82 - 46.10	Pass
2008-2	11/17/2008	50 cm.	22.7	24.10 ± 0.58	15.89 - 29.51	Pass
2008-2	11/17/2008	60 cm.	15.76	15.98 ± 0.55	11.03 - 20.49	Pass
2008-2	11/17/2008	60 cm.	15.76	19.49 ± 0.93	11.03 - 20.49	Pass
2008-2	11/17/2008	70 cm.	11.58	11.97 ± 0.54	8.11 - 15.05	Pass
2008-2	11/17/2008	75 cm.	10.09	9.45 ± 0.28	7.06 - 13.12	Pass
2008-2	11/17/2008	80 cm.	8.87	9.30 ± 0.18	6.21 - 11.53	Pass
2008-2	11/17/2008	90 cm.	7.01	7.19 ± 0.43	4.91 - 9.11	Pass
2008-2	11/17/2008	90 cm.	7.01	6.84 ± 0.42	4.91 - 9.11	Pass
2008-2	11/17/2008	100 cm.	5.67	5.47 ± 0.19	3.97 - 7.37	Pass
2008-2	11/17/2008	110 cm.	4.69	3.98 ± 0.27	3.28 - 6.10	Pass
2008-2	11/17/2008	120 cm.	3.94	3.09 ± 0.21	2.76 - 5.12	Pass
2008-2	11/17/2008	120 cm.	3.94	3.12 ± 0.34	2.76 - 5.12	Pass
2008-2	11/17/2008	150 cm.	2.52	2.55 ± 0.12	1.76 - 3.28	Pass
2008-2	11/17/2008	150 cm.	2.52	2.24 ± 0.08	1.76 - 3.28	Pass
2008-2	11/17/2008	180 cm.	1.75	1.36 ± 0.08	1.23 - 2.28	Pass

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

Lab Code [b]	Date	Concentration (pCi/L)[a]				
		Analysis	Laboratory results 2s, n=1 [c]	Known Activity	Control Limits [d]	Acceptance
SPW-111	1/14/2008	Tc-99	32.20 ± 0.85	32.34	20.34 - 44.34	Pass
SPW-298	1/31/2008	Ni-63	213.55 ± 3.07	212.58	148.81 - 276.35	Pass
W-11708	1/17/2008	Ra-226	11.34 ± 0.43	12.69	8.88 - 16.50	Pass
SPW-711	2/25/2008	U-238	33.56 ± 1.74	41.70	29.19 - 54.21	Pass
SPAP-881	3/11/2008	Cs-134	19.29 ± 1.53	20.09	10.09 - 30.09	Pass
SPAP-881	3/11/2008	Cs-137	114.04 ± 3.03	113.90	102.51 - 125.29	Pass
SPAP-883	3/11/2008	Gr. Beta	54.56 ± 0.12	51.64	41.31 - 72.30	Pass
SPMI-885	3/11/2008	Sr-90	45.93 ± 1.60	45.13	36.10 - 54.16	Pass
SPW-887	3/11/2008	Sr-90	38.82 ± 1.60	45.13	36.10 - 54.16	Pass
SPW-889	3/11/2008	H-3	67325.00 ± 725.00	67384.00	53907.20 - 80860.80	Pass
SPAP-2674	3/11/2008	Gr. Beta	53.57 ± 0.13	51.40	41.12 - 71.96	Pass
W-31808	3/18/2008	Gr. Alpha	19.51 ± 0.40	20.08	10.04 - 30.12	Pass
W-31808	3/18/2008	Gr. Beta	47.20 ± 0.42	45.67	35.67 - 55.67	Pass
SPMI-885	3/24/2008	Cs-134	40.93 ± 1.55	39.69	29.69 - 49.69	Pass
SPMI-885	3/24/2008	Cs-137	61.36 ± 2.82	56.91	46.91 - 66.91	Pass
SPW-887	3/24/2008	Cs-134	40.68 ± 1.44	39.69	29.69 - 49.69	Pass
SPW-887	3/24/2008	Cs-137	58.52 ± 2.93	56.91	46.91 - 66.91	Pass
SPW-1282	4/2/2008	U-238	41.30 ± 1.78	41.70	29.19 - 54.21	Pass
W-40308	4/3/2008	Ra-226	15.17 ± 0.50	12.69	8.88 - 16.50	Pass
SPW-5580	4/7/2008	H-3	211.02 ± 7.71	240.00	0.00 - 806.46	Pass
SPW-1562	4/8/2008	Ra-228	28.93 ± 2.09	30.51	21.36 - 39.66	Pass
SPW-1560	4/10/2008	Tc-99	29.74 ± 0.84	32.34	20.34 - 44.34	Pass
SPW-1621	4/16/2008	Fe-55	27205.80 ± 982.90	28370.00	22696.00 - 34044.00	Pass
W-51508	5/15/2008	Gr. Alpha	24.01 ± 0.41	20.08	10.04 - 30.12	Pass
W-51508	5/15/2008	Gr. Beta	47.97 ± 0.41	45.68	35.68 - 55.68	Pass
SPAP-2673	6/2/2008	Cs-134	17.39 ± 1.32	18.60	8.60 - 28.60	Pass
SPAP-2673	6/2/2008	Cs-137	106.82 ± 3.42	113.30	101.97 - 124.63	Pass
SPF-2745	6/2/2008	Cs-134	0.34 ± 0.02	0.37	0.22 - 0.52	Pass
SPF-2745	6/2/2008	Cs-137	2.06 ± 0.04	2.27	1.36 - 3.18	Pass
SPMI-2677	6/3/2008	Cs-137	53.99 ± 6.15	56.66	46.66 - 66.66	Pass
SPMI-2677A	6/3/2008	I-131	26.64 ± 0.59	28.58	16.58 - 40.58	Pass
SPW-2677	6/3/2008	Cs-134	40.30 ± 3.35	37.21	27.21 - 47.21	Pass
SPW-2677	6/3/2008	I-131(G)	25.92 ± 4.48	28.58	18.58 - 38.58	Pass
SPMI-2679	6/3/2008	Cs-134	35.02 ± 2.93	37.21	27.21 - 47.21	Pass
SPMI-2679	6/3/2008	Cs-137	58.49 ± 6.05	56.66	46.66 - 66.66	Pass
SPMI-2679	6/3/2008	I-131(G)	25.30 ± 4.97	28.58	18.58 - 38.58	Pass
SPMI-2679A	6/3/2008	I-131	30.37 ± 0.50	28.58	16.58 - 40.58	Pass
SPVE-2681	6/3/2008	I-131(G)	1.11 ± 0.06	0.95	0.57 - 1.33	Pass
SPW-2683	6/2/2008	Ni-63	2151.70 ± 10.22	2119.30	1483.51 - 2755.09	Pass
SPW-2685	6/2/2008	H-3	64927.20 ± 704.80	66540.80	53232.64 - 79848.96	Pass
SPW-2689	6/2/2008	C-14	4405.40 ± 15.21	4742.00	2845.20 - 6638.80	Pass

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

Lab Code	Date	Concentration (pCi/L)[a] Analysis	Laboratory results 2s, n=1[b]	Known Activity	Control Limits[c]	Acceptance
W-81408	8/14/2008	Ra-226	12.98 ± 0.35	12.69	8.88 - 16.50	Pass
SPW-1562	8/14/2008	Ra-228	29.09 ± 2.46	30.51	21.36 - 39.66	Pass
SPW-81808	8/18/2008	U-238	42.59 ± 1.96	41.70	29.19 - 54.21	Pass
W-81808	8/18/2008	Gr. Alpha	21.36 ± 0.42	20.08	10.04 - 30.12	Pass
W-81808	8/18/2008	Gr. Beta	49.33 ± 1.01	45.68	35.68 - 55.68	Pass
W-112008	11/20/2008	Gr. Alpha	20.13 ± 0.40	20.08	10.04 - 30.12	Pass
W-112008	11/20/2008	Gr. Beta	48.28 ± 0.42	45.60	35.60 - 55.60	Pass
SPAP-6839	12/5/2008	Cs-134	15.39 ± 2.72	15.68	5.68 - 25.68	Pass
SPAP-6839	12/5/2008	Cs-137	111.45 ± 9.85	112.00	100.80 - 123.20	Pass
SPAP-6841	12/5/2008	Gr. Beta	49.26 ± 0.12	50.72	40.58 - 71.01	Pass
SPW-6843	12/5/2008	C-14	19377.50 ± 55.27	23708.00	14224.80 - 33191.20	Pass
SPW-6845	12/5/2008	Fe-55	7068.30 ± 692.30	6028.00	4822.40 - 7233.60	Pass
SPW-6847	12/5/2008	Tc-99	37.71 ± 1.33	32.34	20.34 - 44.34	Pass
SPW-6849	12/5/2008	Ni-63	232.56 ± 3.26	211.34	147.94 - 274.74	Pass
SPW-6851	12/5/2008	H-3	63664.00 ± 8745.00	64674.00	51739.20 - 77608.80	Pass
SPF-6859	12/5/2008	Cs-134	0.63 ± 0.02	0.63	0.38 - 0.88	Pass
SPF-6859	12/5/2008	Cs-137	2.35 ± 0.01	2.24	1.34 - 3.14	Pass
SPW-7059	12/19/2008	Sr-90	49.19 ± 2.62	44.33	35.46 - 53.20	Pass
SPMI-7061	12/19/2008	Sr-90	39.39 ± 2.19	44.33	35.46 - 53.20	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 established from the precision values listed in Attachment A of this report, adjusted to ± 2σ.

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-17	Water	1/3/2008	U-238	0.09	0.01 ± 0.07	1
SPW-112	Water	1/14/2008	Tc-99	4.70	-0.06 ± 2.85	10
W-11408	Water	1/14/2008	Ra-226	0.05	0.05 ± 0.04	1
SPAP-880	Air Filter	3/11/2008	Cs-134	0.91	-	100
SPAP-880	Air Filter	3/11/2008	Cs-137	1.13	-	100
SPW-888	Water	3/11/2008	H-3	159.99	-78.90 ± 80.40	200
W-31808	Water	3/18/2008	Gr. Alpha	0.42	-0.05 ± 0.29	1
W-31808	Water	3/18/2008	Gr. Beta	0.72	0.09 ± 0.51	3.2
SPMI-884	Milk	3/24/2008	Cs-134	2.79	-	10
SPMI-884	Milk	3/24/2008	Cs-137	3.36	-	10
W-40308	Water	4/3/2008	Ra-226	0.04	0.05 ± 0.03	1
SPW-1563	Water	4/8/2008	Ra-228	0.57	0.31 ± 0.30	2
SPW-1561	Water	4/10/2008	Tc-99	4.77	-3.42 ± 2.85	10
SPW-1621	Water	4/16/2008	Fe-55	668.50	-170.70 ± 397.20	1000
SPW-2451	Water	5/22/2008	U-238	0.21	0.35 ± 0.24	1
SPW-2676	Water	6/2/2008	Cs-134	2.03	-	10
SPW-2676	Water	6/2/2008	Cs-134	3.60	-	10
SPW-2676	Water	6/2/2008	Cs-137	2.38	-	10
SPW-2677	Water	6/2/2008	Cs-134	2.78	-	10
SPW-2677	Water	6/2/2008	I-131(G)	3.49	-	20
SPW-2677	Water	6/2/2008	I-131(G)	5.25	-	20
SPF-2744	Fish	6/2/2008	Cs-134	5.48	-	100
SPF-2744	Fish	6/2/2008	Cs-137	4.83	-	100
SPW-2676	Water	6/3/2008	I-131	0.18	0.01 ± 0.11	0.5
SPMI-2678	Milk	6/3/2008	I-131	0.22	0.12 ± 0.15	0.5
SPVE-2680	Vegetation	6/3/2008	I-131(G)	0.01	-	20
SPW-3581	Water	7/14/2008	U-238	0.10	0.13 ± 0.12	1
W-80708	Water	8/7/2008	Gr. Alpha	0.63	-0.02 ± 0.44	1
W-80708	Water	8/7/2008	Gr. Beta	1.43	-0.47 ± 0.99	3.2
W-81408	Water	8/14/2008	Ra-226	0.06	0.14 ± 0.04	1
SPW-1563	Water	8/14/2008	Ra-228	0.79	0.89 ± 0.47	2
SPW-81808	Water	8/18/2008	U-238	0.18	0.04 ± 0.13	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)
W-112008	Water	11/20/2008	Gr. Alpha	0.40	0.02 ± 0.28	1
W-112008	Water	11/20/2008	Gr. Beta	0.75	-0.16 ± 0.52	3.2
SPAP-6838	Air Filter	12/5/2008	Cs-134	1.01	-	100
SPAP-6838	Air Filter	12/5/2008	Cs-137	0.95	-	100
SPAP-6840	Air Filter	12/5/2008	Gr. Beta	0.96	2.69 ± 0.64	3.2
SPW-6842	Water	12/5/2008	C-14	7.79	-3.04 ± 4.05	200
SPW-6844	Water	12/5/2008	Fe-55	715.10	21.70 ± 435.10	1000
SPW-6846	Water	12/5/2008	Tc-99	1.36	-0.47 ± 0.82	10
SPW-6848	Water	12/5/2008	Ni-63	1.94	3.08 ± 1.23	20
SPF-6858	Fish	12/5/2008	Cs-134	1.53	-	100
SPF-6858	Fish	12/5/2008	Cs-137	3.92	-	100
SPW-7058	Water	12/19/2008	Cs-134	2.62	-	10
SPW-7058	Water	12/19/2008	Cs-137	2.39	-	10
SPW-7058	Water	12/19/2008	Sr-90	0.65	-0.28 ± 0.26	1
SPMI-7060	Milk	12/19/2008	Cs-134	2.18	-	10
SPMI-7060	Milk	12/19/2008	Cs-137	3.87	-	10
SPMI-7060	Milk	12/19/2008	I-131(G)	2.80	-	20
SPMI-7060	Milk	12/19/2008	Sr-90	0.53	0.76 ± 0.34	1

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

[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

			Concentration (pCi/L)[a]			
Lab Code	Date	Analysis	First Result	Second Result	Averaged Result	Acceptance
AP-8809, 8810	1/2/2008	Be-7	0.06 ± 0.02	0.06 ± 0.01	0.06 ± 0.01	Pass
CF-42, 43	1/2/2008	Gr. Beta	8.88 ± 0.19	8.99 ± 0.19	8.94 ± 0.13	Pass
CF-42, 43	1/2/2008	K-40	5.08 ± 0.29	5.19 ± 0.30	5.14 ± 0.21	Pass
DW-80020, 80021	1/7/2008	Gr. Alpha	2.28 ± 0.84	1.98 ± 0.86	2.13 ± 0.60	Pass
U-169, 170	1/10/2008	Beta-K40	7.50 ± 5.50	11.70 ± 5.10	9.60 ± 3.75	Pass
SO-8836, 8837	1/14/2008	Cs-137	0.80 ± 0.05	0.75 ± 0.05	0.77 ± 0.03	Pass
SO-8836, 8837	1/14/2008	Gr. Alpha	13.30 ± 4.31	15.58 ± 4.10	14.44 ± 2.98	Pass
SO-8836, 8837	1/14/2008	Gr. Alpha	33.68 ± 3.73	29.21 ± 3.10	31.45 ± 2.43	Pass
SO-8836, 8837	1/14/2008	K-40	12.31 ± 0.74	12.96 ± 0.73	12.64 ± 0.52	Pass
DW-80045, 80046	1/15/2008	Gr. Alpha	2.94 ± 1.13	3.41 ± 1.04	3.17 ± 0.77	Pass
DW-80045, 80046	1/15/2008	Gr. Beta	1.86 ± 0.66	1.36 ± 0.63	1.61 ± 0.45	Pass
MI-138, 139	1/15/2008	K-40	1262.40 ± 81.70	1396.20 ± 154.20	1329.30 ± 87.25	Pass
LW-190, 191	1/16/2008	Gr. Beta	2.85 ± 1.07	1.64 ± 1.02	2.24 ± 0.74	Pass
DW-8008, 8009	1/16/2008	Ra-226	2.77 ± 0.20	3.11 ± 0.22	2.94 ± 0.15	Pass
DW-8008, 8009	1/16/2008	Ra-228	3.95 ± 0.74	3.96 ± 0.77	3.96 ± 0.53	Pass
DW-80057, 80058	1/21/2008	Gr. Alpha	6.77 ± 0.66	7.91 ± 1.73	7.34 ± 0.92	Pass
DW-80057, 80058	1/21/2008	Gr. Beta	13.83 ± 0.97	14.78 ± 1.01	14.31 ± 0.70	Pass
SWU-479, 480	1/29/2008	Gr. Beta	4.49 ± 1.13	3.13 ± 1.14	3.81 ± 0.80	Pass
W-920, 921	2/4/2008	Gr. Beta	4.20 ± 1.30	3.30 ± 1.30	3.75 ± 0.92	Pass
SW-540, 541	2/12/2008	Gr. Alpha	2.75 ± 1.16	4.01 ± 1.18	3.38 ± 0.83	Pass
SW-540, 541	2/12/2008	Gr. Beta	6.46 ± 1.11	6.71 ± 1.03	6.59 ± 0.76	Pass
DW-80155, 80156	2/12/2008	Ra-226	2.55 ± 0.22	2.01 ± 0.16	2.28 ± 0.14	Fail
DW-80155, 80156	2/12/2008	Ra-228	1.86 ± 0.70	1.53 ± 0.67	1.70 ± 0.48	Pass
DW-80165, 80166	2/20/2008	Gr. Alpha	1.51 ± 0.90	0.80 ± 1.05	1.16 ± 0.69	Pass
DW-80166, 80167	2/20/2008	Ra-226	0.40 ± 0.09	0.46 ± 0.09	0.43 ± 0.06	Pass
DW-80166, 80167	2/20/2008	Ra-228	1.44 ± 0.52	1.42 ± 0.57	1.43 ± 0.39	Pass
DW-80166, 80167	2/20/2008	Uranium	0.69 ± 0.25	0.69 ± 0.26	0.69 ± 0.18	Pass
W-1413, 1414	3/3/2008	Gr. Beta	7.50 ± 3.00	3.70 ± 2.60	5.60 ± 1.98	Pass
DW-80189, 80190	3/11/2008	Ra-226	4.41 ± 0.30	4.09 ± 0.25	4.25 ± 0.20	Pass
DW-80189, 80190	3/11/2008	Ra-228	1.99 ± 0.65	2.17 ± 0.66	2.08 ± 0.46	Pass
MI-1006, 1007	3/12/2008	K-40	1451.90 ± 112.80	1409.50 ± 111.40	1430.70 ± 79.27	Pass
MI-1006, 1007	3/12/2008	Sr-90	0.48 ± 0.31	0.97 ± 0.38	0.72 ± 0.24	Pass
DW-80205, 80206	3/14/2008	Gr. Alpha	3.64 ± 0.80	3.39 ± 0.82	3.52 ± 0.57	Pass
DW-80202, 80203	3/14/2008	Ra-226	3.16 ± 0.21	3.00 ± 0.19	3.08 ± 0.14	Pass
DW-80202, 80203	3/14/2008	Ra-228	2.40 ± 1.00	2.07 ± 0.69	2.24 ± 0.61	Pass
DW-80208, 80209	3/14/2008	U-233/4	1.32 ± 0.25	1.29 ± 0.36	1.31 ± 0.22	Pass
SG-1080, 1081	3/18/2008	Pb-214	3.99 ± 0.30	4.15 ± 0.29	4.07 ± 0.21	Pass
SO-1195, 1196	3/18/2008	U-233/4	0.14 ± 0.02	0.14 ± 0.02	0.14 ± 0.01	Pass
SO-1195, 1196	3/18/2008	U-238	0.13 ± 0.02	0.13 ± 0.02	0.13 ± 0.01	Pass
WW-1242, 1243	3/24/2008	Gr. Beta	10.36 ± 1.63	9.06 ± 1.55	9.71 ± 1.13	Pass
AP-1519, 1520	4/2/2008	Be-7	0.07 ± 0.01	0.08 ± 0.01	0.08 ± 0.01	Pass
W-1565, 1566	4/2/2008	Gr. Alpha	0.82 ± 0.64	1.58 ± 0.72	1.20 ± 0.48	Pass
W-1565, 1566	4/2/2008	Gr. Beta	3.73 ± 0.86	5.51 ± 1.09	4.62 ± 0.69	Pass

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

			Concentration (pCi/L)[a]			
Lab Code	Date	Analysis	First Result	Second Result	Averaged Result	Acceptance
DW-80255, 80256	4/8/2008	Ra-226	0.19 ± 0.08	0.28 ± 0.11	0.24 ± 0.07	Pass
DW-80255, 80256	4/8/2008	Ra-228	1.79 ± 0.57	1.32 ± 0.55	1.56 ± 0.40	Pass
DW-80259, 80260	4/8/2008	Gr. Alpha	3.39 ± 0.82	3.62 ± 0.82	3.51 ± 0.58	Pass
DW-80301, 80302	4/11/2008	Ra-226	0.47 ± 0.09	0.47 ± 0.09	0.47 ± 0.06	Pass
DW-80301, 80302	4/11/2008	Ra-228	1.02 ± 0.42	0.82 ± 0.45	0.92 ± 0.31	Pass
SO-1913, 1914	4/15/2008	K-40	12.79 ± 0.73	13.88 ± 0.85	13.34 ± 0.56	Pass
DW-80313, 80314	4/16/2008	Ra-226	3.39 ± 0.22	3.28 ± 0.21	3.34 ± 0.15	Pass
DW-80313, 80314	4/16/2008	Ra-228	4.27 ± 0.72	5.14 ± 0.77	4.71 ± 0.53	Pass
SWU-2087, 2088	4/29/2008	Gr. Beta	2.20 ± 0.60	3.50 ± 0.90	2.85 ± 0.54	Pass
LW-2297, 2298	4/30/2008	Gr. Beta	1.41 ± 0.43	1.02 ± 0.40	1.22 ± 0.30	Pass
LW-2321, 2322	4/30/2008	Gr. Beta	1.33 ± 0.54	1.23 ± 0.54	1.28 ± 0.38	Pass
BS-2063, 2064	5/1/2008	Gr. Beta	13.71 ± 2.06	17.60 ± 2.49	15.66 ± 1.62	Pass
SG-2229, 2230	5/5/2008	Ac-228	26.25 ± 2.70	24.90 ± 2.55	25.58 ± 1.86	Pass
W-2792, 2793	5/5/2008	Gr. Beta	7.20 ± 2.30	7.00 ± 2.50	7.10 ± 1.70	Pass
SG-2229, 2230	5/5/2008	Pb-214	23.28 ± 0.30	23.54 ± 0.33	23.41 ± 0.22	Pass
F-2850, 2851	5/7/2008	Cs-137	3.37 ± 0.21	3.16 ± 0.19	3.27 ± 0.14	Pass
DW-80376, 80377	5/9/2008	Ra-226	0.94 ± 0.13	1.07 ± 0.13	1.01 ± 0.09	Pass
DW-80376, 80377	5/9/2008	Ra-228	2.05 ± 0.57	1.40 ± 0.51	1.73 ± 0.38	Pass
MI-2363, 2364	5/14/2008	K-40	1335.40 ± 111.20	1510.70 ± 124.30	1423.05 ± 83.39	Pass
SG-2752, 2753	5/14/2008	Be-7	264.60 ± 83.90	222.80 ± 93.10	243.70 ± 62.66	Pass
SG-2752, 2753	5/14/2008	Cs-137	64.80 ± 6.00	68.90 ± 5.80	66.85 ± 4.17	Pass
SG-2752, 2753	5/14/2008	Gr. Alpha	19.35 ± 3.48	22.88 ± 4.04	21.12 ± 2.67	Pass
SG-2752, 2753	5/14/2008	Gr. Beta	30.53 ± 2.40	33.31 ± 2.71	31.92 ± 1.81	Pass
SG-2752, 2753	5/14/2008	K-40	9121.90 ± 191.80	9183.70 ± 194.20	9152.80 ± 136.47	Pass
DW-80389, 80390	5/14/2008	Ra-226	2.99 ± 0.36	2.58 ± 0.31	2.79 ± 0.24	Pass
DW-80389, 80390	5/14/2008	Ra-228	2.87 ± 0.68	1.73 ± 0.57	2.30 ± 0.44	Pass
DW-80392, 80393	5/14/2008	Gr. Alpha	19.94 ± 1.30	17.89 ± 1.26	18.92 ± 0.91	Pass
DW-80394, 80395	5/14/2008	U-233/4	2.03 ± 0.27	2.54 ± 0.39	2.29 ± 0.24	Pass
BS-2490, 2491	5/16/2008	Cs-137	6.81 ± 1.20	6.76 ± 1.23	6.78 ± 0.86	Pass
WW-2462, 2463	5/19/2008	H-3	158.61 ± 80.90	205.63 ± 83.06	182.12 ± 57.97	Pass
W-2826, 2827	5/27/2008	Gr. Alpha	3.47 ± 2.23	4.22 ± 2.20	3.84 ± 1.57	Pass
W-2826, 2827	5/27/2008	Gr. Beta	10.67 ± 1.92	9.43 ± 1.76	10.05 ± 1.30	Pass
SG-3378, 3379	6/2/2008	Gr. Alpha	6.51 ± 1.15	7.83 ± 1.32	7.17 ± 0.88	Pass
SG-3378, 3379	6/2/2008	Gr. Beta	16.23 ± 0.95	15.76 ± 1.06	16.00 ± 0.71	Pass
SG-3393, 3394	6/4/2008	Be-7	0.82 ± 0.23	0.66 ± 0.33	0.74 ± 0.20	Pass
SG-3393, 3394	6/4/2008	Cs-137	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01	Pass
SG-3393, 3394	6/4/2008	Gr. Alpha	18.96 ± 3.49	16.96 ± 3.34	17.96 ± 2.42	Pass
SG-3393, 3394	6/4/2008	Gr. Beta	30.01 ± 2.49	30.17 ± 2.56	30.09 ± 1.79	Pass
SG-3393, 3394	6/4/2008	K-40	9.78 ± 0.30	10.00 ± 0.28	9.89 ± 0.21	Pass
LW-2939, 2940	6/12/2008	Gr. Beta	1.46 ± 0.59	1.74 ± 0.59	1.60 ± 0.42	Pass
WW-3053, 3054	6/17/2008	Gr. Beta	4.28 ± 0.83	5.27 ± 0.91	4.77 ± 0.61	Pass
SW-3154, 3155	6/24/2008	Gr. Beta	2.15 ± 1.01	2.79 ± 0.97	2.47 ± 0.70	Pass

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

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
BS-3245, 3246	6/27/2008	Co-60	108.84 ± 44.14	91.10 ± 22.32	99.97 ± 24.73	Pass
BS-3245, 3246	6/27/2008	Cs-137	952.18 ± 52.78	941.56 ± 13.61	946.87 ± 27.25	Pass
XW-1080, 1081	6/30/2008	Fe-55	2.96 ± 0.32	2.71 ± 0.30	2.84 ± 0.22	Pass
XW-3786, 3787	6/30/2008	Fe-55	2.96 ± 0.32	2.71 ± 0.30	2.84 ± 0.22	Pass
G-3274, 3275	7/1/2008	Gr. Beta	7.65 ± 0.24	7.44 ± 0.24	7.55 ± 0.17	Pass
SL-3295, 3296	7/1/2008	Gr. Beta	3.76 ± 0.24	3.64 ± 0.24	3.70 ± 0.17	Pass
AP-3531, 3532	7/1/2008	Be-7	0.10 ± 0.01	0.08 ± 0.01	0.09 ± 0.01	Pass
AP-3663, 3664	7/2/2008	Be-7	0.08 ± 0.01	0.08 ± 0.02	0.08 ± 0.01	Pass
AP-3690, 3691	7/2/2008	Be-7	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01	Pass
W-4333, 4334	7/7/2008	Gr. Beta	7.20 ± 1.90	7.70 ± 1.70	7.45 ± 1.27	Pass
W-4840, 4841	7/7/2008	Gr. Beta	6.70 ± 1.60	6.70 ± 1.80	6.70 ± 1.20	Pass
DW-80415, 80416	7/7/2008	Ra-226	2.81 ± 0.47	2.00 ± 0.34	2.41 ± 0.29	Pass
SG-3964, 3965	7/9/2008	Be-7	1.35 ± 0.23	1.51 ± 0.22	1.43 ± 0.16	Pass
SG-3964, 3965	7/9/2008	Cs-137	0.04 ± 0.01	0.04 ± 0.01	0.04 ± 0.00	Pass
SG-3964, 3965	7/9/2008	Gr. Alpha	23.17 ± 3.39	18.76 ± 3.24	20.97 ± 2.34	Pass
SG-3964, 3965	7/9/2008	Gr. Beta	28.99 ± 2.12	29.25 ± 2.31	29.12 ± 1.57	Pass
SG-3964, 3965	7/9/2008	K-40	6.86 ± 0.19	6.84 ± 0.17	6.85 ± 0.13	Pass
DW-80427, 80428	7/9/2008	Ra-226	3.25 ± 0.24	3.27 ± 0.20	3.26 ± 0.16	Pass
DW-80427, 80428	7/9/2008	Ra-228	2.65 ± 0.67	3.25 ± 0.72	2.95 ± 0.49	Pass
DW-80451, 80452	7/15/2008	Ra-226	1.02 ± 0.10	0.96 ± 0.12	0.99 ± 0.08	Pass
DW-80451, 80452	7/15/2008	Ra-228	1.09 ± 0.62	1.14 ± 0.60	1.12 ± 0.43	Pass
DW-80481, 80482	7/16/2008	Ra-226	1.20 ± 0.13	1.40 ± 0.14	1.30 ± 0.10	Pass
DW-80481, 80482	7/16/2008	Ra-228	1.69 ± 0.68	1.65 ± 0.77	1.67 ± 0.51	Pass
MI-3842, 3843	7/21/2008	K-40	1282.60 ± 108.30	1379.00 ± 111.40	1330.80 ± 77.68	Pass
MI-3892, 3893	7/28/2008	K-40	1371.50 ± 102.90	1501.20 ± 111.80	1436.35 ± 75.97	Pass
DW-4067, 4068	7/29/2008	Gr. Beta	10.46 ± 2.37	14.25 ± 2.78	12.36 ± 1.83	Pass
SWT-4158, 4159	7/29/2008	Gr. Beta	1.58 ± 0.45	1.80 ± 0.47	1.69 ± 0.33	Pass
LW-4221, 4222	7/31/2008	Gr. Beta	1.35 ± 0.56	0.91 ± 0.52	1.13 ± 0.38	Pass
LW-4242, 4243	7/31/2008	Gr. Beta	1.36 ± 0.56	1.18 ± 0.53	1.27 ± 0.38	Pass
VE-4046, 4047	8/4/2008	Be-7	0.77 ± 0.13	0.82 ± 0.19	0.80 ± 0.12	Pass
VE-4046, 4047	8/4/2008	Gr. Beta	8.81 ± 0.36	8.34 ± 0.31	8.58 ± 0.24	Pass
VE-4046, 4047	8/4/2008	K-40	5.17 ± 0.34	5.33 ± 0.42	5.25 ± 0.27	Pass
W-4821, 4822	8/4/2008	Gr. Alpha	1.70 ± 0.80	1.70 ± 0.90	1.70 ± 0.60	Pass
W-4821, 4822	8/4/2008	Gr. Beta	3.90 ± 0.80	3.70 ± 0.90	3.80 ± 0.60	Pass
W-4801, 4802	8/5/2008	Gr. Alpha	4.40 ± 2.40	4.80 ± 2.30	4.60 ± 1.66	Pass
W-4801, 4802	8/5/2008	Gr. Beta	13.20 ± 1.30	14.50 ± 1.40	13.85 ± 0.96	Pass
DW-80522, 80523	8/5/2008	Ra-226	0.50 ± 0.12	0.28 ± 0.12	0.39 ± 0.08	Pass
DW-80522, 80523	8/5/2008	Ra-228	1.23 ± 0.60	1.09 ± 0.57	1.16 ± 0.41	Pass

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

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
DW-80531, 80532	8/5/2008	Gr. Alpha	18.90 ± 1.86	17.80 ± 1.96	18.35 ± 1.35	Pass
DW-80534, 80535	8/5/2008	Ra-226	3.01 ± 0.18	3.33 ± 0.18	3.17 ± 0.13	Pass
DW-80534, 80535	8/5/2008	Ra-228	2.24 ± 0.59	2.12 ± 0.59	2.18 ± 0.42	Pass
SG-4584, 4585	8/6/2008	Be-7	7.11 ± 0.20	7.44 ± 0.37	7.27 ± 0.21	Pass
SG-4584, 4585	8/6/2008	Cs-137	0.05 ± 0.01	0.04 ± 0.01	0.04 ± 0.00	Pass
SG-4584, 4585	8/6/2008	K-40	7.88 ± 10.18	8.02 ± 0.21	7.95 ± 5.09	Pass
SG-4584, 4585	8/6/2008	Ra-226	3.94 ± 0.18	3.74 ± 0.22	3.84 ± 0.14	Pass
SG-4573, 4574	8/13/2008	Gr. Alpha	240.72 ± 8.74	251.53 ± 9.56	246.13 ± 6.48	Pass
SG-4573, 4574	8/13/2008	Gr. Beta	201.60 ± 4.28	206.88 ± 4.71	204.24 ± 3.18	Pass
SG-4584, 4585	8/13/2008	Gr. Alpha	14.07 ± 3.10	12.97 ± 3.04	13.52 ± 2.17	Pass
SG-4584, 4585	8/13/2008	Gr. Beta	22.08 ± 2.36	23.02 ± 2.34	22.55 ± 1.66	Pass
DW-80547, 80548	8/13/2008	Gr. Alpha	3.33 ± 1.11	3.88 ± 1.07	3.61 ± 0.77	Pass
DW-80551, 80552	8/13/2008	U-233/4	2.57 ± 0.48	2.13 ± 0.46	2.35 ± 0.33	Pass
DW-80553, 80554	8/13/2008	Ra-226	0.92 ± 0.14	1.21 ± 0.17	1.07 ± 0.11	Pass
DW-80553, 80554	8/13/2008	Ra-228	2.20 ± 0.61	1.64 ± 0.56	1.92 ± 0.41	Pass
DW-80566, 80567	8/20/2008	Ra-226	1.10 ± 0.11	1.10 ± 0.10	1.10 ± 0.07	Pass
DW-80566, 80567	8/20/2008	Ra-228	2.01 ± 0.58	1.74 ± 0.58	1.88 ± 0.41	Pass
VE-4647, 4648	8/27/2008	K-40	1.97 ± 0.17	2.00 ± 0.21	1.99 ± 0.14	Pass
SL-4690, 4691	9/2/2008	Gr. Beta	2.28 ± 0.25	2.35 ± 0.24	2.32 ± 0.17	Pass
ME-4732, 4733	9/2/2008	Gr. Beta	2.86 ± 0.09	2.70 ± 0.09	2.78 ± 0.06	Pass
ME-4732, 4733	9/2/2008	K-40	2.44 ± 0.37	2.82 ± 0.51	2.63 ± 0.32	Pass
SG-5180, 5181	9/3/2008	Be-7	15.50 ± 0.43	15.54 ± 0.38	15.52 ± 0.29	Pass
SG-5180, 5181	9/3/2008	Cs-137	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01	Pass
SG-5180, 5181	9/3/2008	Gr. Alpha	18.74 ± 3.33	17.61 ± 3.15	18.18 ± 2.29	Pass
SG-5180, 5181	9/3/2008	Gr. Beta	29.19 ± 2.10	28.49 ± 2.15	28.84 ± 1.50	Pass
SG-5180, 5181	9/3/2008	K-40	8.55 ± 0.32	8.11 ± 0.27	8.33 ± 0.21	Pass
SG-5187, 5188	9/3/2008	Be-7	6.18 ± 0.54	5.90 ± 0.77	6.04 ± 0.47	Pass
SG-5187, 5188	9/3/2008	K-40	7.16 ± 0.60	7.29 ± 0.60	7.23 ± 0.42	Pass
SG-5193, 5194	9/3/2008	Gr. Alpha	5.80 ± 1.30	7.00 ± 1.50	6.40 ± 0.99	Pass
SG-5193, 5194	9/3/2008	Gr. Beta	15.60 ± 1.10	15.60 ± 1.10	15.60 ± 0.78	Pass
DW-4871, 4872	9/5/2008	I-131	1.15 ± 0.27	1.16 ± 0.31	1.16 ± 0.21	Pass
VE-5022, 5023	9/10/2008	K-40	1.27 ± 0.14	1.11 ± 0.06	1.19 ± 0.08	Pass
DW-5337, 5338	9/10/2008	Gr. Beta	3.00 ± 1.07	2.19 ± 1.05	2.60 ± 0.75	Pass
WW-4977, 4978	9/17/2008	Gr. Beta	3.71 ± 1.10	2.32 ± 1.11	3.01 ± 0.78	Pass
BS-5088, 5089	9/19/2008	K-40	10493 ± 607	10299 ± 470	10396 ± 384	Pass
DW-80584, 80585	9/19/2008	U-233/4	3.01 ± 0.52	2.44 ± 0.47	2.73 ± 0.35	Pass
DW-80584, 80585	9/19/2008	U-238	0.70 ± 0.25	0.27 ± 0.18	0.49 ± 0.15	Pass
DW-80579, 80580	9/25/2008	Gr. Alpha	10.69 ± 1.31	12.84 ± 1.51	11.77 ± 1.00	Pass
DW-80579, 80580	9/25/2008	Ra-226	3.13 ± 0.22	2.89 ± 0.21	3.01 ± 0.15	Pass
DW-80579, 80580	9/25/2008	Ra-228	3.03 ± 0.73	1.98 ± 0.69	2.51 ± 0.50	Pass
G-5389, 5390	10/1/2008	Be-7	1.49 ± 0.32	1.36 ± 0.28	1.43 ± 0.21	Pass
G-5389, 5390	10/1/2008	Gr. Beta	10.86 ± 0.24	11.18 ± 0.25	11.02 ± 0.17	Pass
G-5389, 5390	10/1/2008	K-40	7.42 ± 0.67	8.06 ± 0.63	7.74 ± 0.46	Pass

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

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
AP-5814, 5815	10/1/2008	Be-7	0.08 ± 0.01	0.08 ± 0.01	0.08 ± 0.01	Pass
SG-6111, 6112	10/6/2008	Gr. Alpha	9.34 ± 1.82	8.95 ± 1.67	9.15 ± 1.24	Pass
SG-6111, 6112	10/6/2008	Gr. Beta	17.46 ± 1.46	18.86 ± 1.35	18.16 ± 0.99	Pass
DW-80592, 80593	10/7/2008	Gr. Alpha	2.30 ± 1.14	1.57 ± 0.88	1.94 ± 0.72	Pass
DW-80594, 80595	10/7/2008	Ra-228	1.41 ± 0.55	1.22 ± 0.50	1.32 ± 0.37	Pass
DW-80650, 80651	10/8/2008	Gr. Alpha	1.30 ± 0.86	0.12 ± 0.79	0.71 ± 0.58	Pass
DW-80650, 80651	10/8/2008	Gr. Beta	2.92 ± 0.69	3.03 ± 0.64	2.98 ± 0.47	Pass
DW-80629, 80630	10/13/2008	Ra-226	3.12 ± 0.18	2.87 ± 0.17	3.00 ± 0.12	Pass
DW-80629, 80630	10/13/2008	Ra-228	2.71 ± 0.80	3.28 ± 0.81	3.00 ± 0.57	Pass
DW-80663, 80664	10/13/2008	Gr. Alpha	5.91 ± 1.70	3.14 ± 1.44	4.53 ± 1.11	Pass
MI-5572, 5573	10/14/2008	K-40	1391.00 ± 97.39	1443.90 ± 110.60	1417.45 ± 73.68	Pass
MI-5603, 5604	10/14/2008	K-40	1412.80 ± 109.30	1413.80 ± 110.50	1413.30 ± 77.71	Pass
DW-80676, 80677	10/20/2008	Gr. Alpha	12.20 ± 1.48	11.87 ± 1.54	12.04 ± 1.07	Pass
DW-80676, 80677	10/20/2008	Ra-226	5.04 ± 0.25	5.10 ± 0.25	5.07 ± 0.18	Pass
DW-80676, 80677	10/20/2008	Ra-228	5.87 ± 0.86	6.98 ± 0.95	6.43 ± 0.64	Pass
SW-80687, 80688	10/22/2008	Gr. Alpha	3.42 ± 1.03	2.98 ± 1.01	3.20 ± 0.72	Pass
DW-80729, 80730	10/30/2008	Gr. Alpha	8.40 ± 1.45	7.76 ± 2.00	8.08 ± 1.24	Pass
DW-80729, 80730	10/30/2008	Gr. Beta	16.94 ± 1.45	15.41 ± 1.37	16.18 ± 1.00	Pass
DW-80738, 80739	10/31/2008	U-233/4	2.94 ± 0.50	3.06 ± 0.63	3.00 ± 0.40	Pass
DW-80747, 80748	10/31/2008	Ra-226	0.60 ± 0.09	0.50 ± 0.08	0.55 ± 0.06	Pass
DW-80747, 80748	10/31/2008	Ra-228	1.33 ± 0.59	1.38 ± 0.60	1.36 ± 0.42	Pass
BS-6271, 6272	11/3/2008	Gr. Beta	12.26 ± 1.69	13.78 ± 1.84	13.02 ± 1.25	Pass
SS-6593, 6594	11/19/2008	K-40	12.35 ± 0.57	13.10 ± 0.76	12.73 ± 0.48	Pass
MI-7046, 7047	12/16/2008	K-40	1380.10 ± 109.80	1477.30 ± 98.32	1428.70 ± 73.69	Pass
DW-80698, 80699	12/23/2008	Ra-226	3.13 ± 0.22	3.21 ± 0.23	3.17 ± 0.16	Pass
DW-80698, 80699	12/23/2008	Ra-228	5.48 ± 0.91	5.86 ± 0.93	5.67 ± 0.65	Pass
SW-7281, 7282	12/30/2008	Gr. Beta	0.87 ± 0.54	1.35 ± 0.54	1.11 ± 0.38	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).

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

Lab Code[c]	Date	Concentration[b] Analysis	Laboratory result	Known Activity	Control Limits[d]	Acceptance
STW-1137	01/01/08	Am-241	1.27 ± 0.06	1.23	0.86 - 1.60	Pass
STW-1137	01/01/08	Co-57	23.80 ± 0.60	22.80	16.00 - 29.60	Pass
STW-1137	01/01/08	Co-60	8.60 ± 0.50	8.40	5.88 - 10.92	Pass
STW-1137[e]	01/01/08	Cs-134	-0.021 ± 0.10	0.00	-1.00 - 1.00	Pass
STW-1137[e]	01/01/08	Cs-137	0.00 ± 0.10	0.00	-1.00 - 1.00	Pass
STW-1137	01/01/08	Fe-55	32.60 ± 11.60	36.50	25.60 - 47.50	Pass
STW-1137	01/01/08	H-3	515.10 ± 12.70	472.00	330.00 - 614.00	Pass
STW-1137	01/01/08	Mn-54	12.90 ± 0.80	12.10	8.50 - 15.70	Pass
STW-1137	01/01/08	Ni-63	29.50 ± 2.30	30.70	21.50 - 39.90	Pass
STW-1137	01/01/08	Pu-238	0.60 ± 0.06	0.73	0.51 - 0.95	Pass
STW-1137	01/01/08	Pu-239/40	0.019 ± 0.015	0.01	0.00 - 1.00	Pass
STW-1137	01/01/08	Sr-90	12.00 ± 1.50	11.40	7.98 - 14.82	Pass
STW-1137	01/01/08	Tc-99	9.40 ± 1.70	11.20	7.80 - 14.60	Pass
STW-1137	01/01/08	U-233/4	3.37 ± 0.20	3.63	2.54 - 4.72	Pass
STW-1137	01/01/08	U-238	3.63 ± 0.21	3.74	2.62 - 4.86	Pass
STW-1137	01/01/08	Zn-65	16.90 ± 1.40	16.30	11.40 - 21.20	Pass
STW-1138	01/01/08	Gr. Alpha	0.96 ± 0.14	1.40	0.00 - 2.80	Pass
STW-1138	01/01/08	Gr. Beta	2.30 ± 0.15	2.43	1.22 - 3.65	Pass
STAP-1139	01/01/08	Co-57	3.90 ± 0.07	3.55	2.49 - 4.62	Pass
STAP-1139	01/01/08	Co-60	1.43 ± 0.07	1.31	0.92 - 1.70	Pass
STAP-1139	01/01/08	Cs-134	2.59 ± 0.16	2.52	1.76 - 3.28	Pass
STAP-1139	01/01/08	Cs-137	3.05 ± 0.12	2.70	1.89 - 3.51	Pass
STAP-1139	01/01/08	Mn-54	0.43 ± 0.58	0.00	0.00 - 1.00	Pass
STAP-1139	01/01/08	Pu-238	0.080 ± 0.016	0.11	0.07 - 0.14	Pass
STAP-1139	01/01/08	Pu-239/40	0.12 ± 0.02	0.11	0.08 - 0.15	Pass
STAP-1139	01/01/08	Sr-90	1.30 ± 0.27	1.55	1.08 - 2.01	Pass
STAP-1139[e]	01/01/08	U-233/4	0.43 ± 0.03	0.22	0.15 - 0.28	Fail
STAP-1139[e]	01/01/08	U-238	0.44 ± 0.03	0.23	0.16 - 0.29	Fail
STAP-1139	01/01/08	Zn-65	2.36 ± 0.18	2.04	1.43 - 2.65	Pass
STAP-1140	01/01/08	Gr. Alpha	0.11 ± 0.03	0.35	0.00 - 0.70	Pass
STAP-1140	01/01/08	Gr. Beta	0.34 ± 0.04	0.29	0.14 - 0.43	Pass
STVE-1141	01/01/08	Co-57	8.30 ± 0.18	6.89	4.82 - 8.96	Pass
STVE-1141	01/01/08	Co-60	3.03 ± 0.13	2.77	1.94 - 3.60	Pass
STVE-1141	01/01/08	Cs-134	6.53 ± 0.29	6.28	4.40 - 8.16	Pass
STVE-1141	01/01/08	Cs-137	3.90 ± 0.19	3.41	2.39 - 4.43	Pass
STVE-1141	01/01/08	Mn-54	5.43 ± 0.21	4.74	3.32 - 6.16	Pass
STVE-1141	01/01/08	Zn-65	0.033 ± 0.10	0.00	0.00 - 1.00	Pass

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

Lab Code[c]	Date	Concentration [b] Analysis	Laboratory result	Known Activity	Control Limits [d]	Acceptance
STSO-1142	01/01/08	Co-57	483.00 ± 3.00	421.00	295.00 - 547.00	Pass
STSO-1142	01/01/08	Co-60	3.00 ± 0.80	2.90	0.00 - 5.00	Pass
STSO-1142	01/01/08	Cs-134	896.50 ± 7.40	854.00	598.00 - 1110.00	Pass
STSO-1142	01/01/08	Cs-137	624.40 ± 4.10	545.00	382.00 - 709.00	Pass
STSO-1142	01/01/08	Mn-54	667.20 ± 3.80	570.00	399.00 - 741.00	Pass
STSO-1142	01/01/08	Ni-63	536.00 ± 15.50	640.00	448.00 - 832.00	Pass
STSO-1142	01/01/08	Pu-238	78.60 ± 4.80	72.80	51.00 - 94.60	Pass
STSO-1142	01/01/08	Pu-239/40	89.10 ± 4.50	90.10	63.10 - 117.10	Pass
STSO-1142	01/01/08	U-233/4	134.41 ± 5.40	142.00	99.00 - 185.00	Pass
STSO-1142	01/01/08	U-238	139.00 ± 5.50	148.00	104.00 - 192.00	Pass
STSO-1142	01/01/08	Zn-65	0.093 ± 0.91	0.00	0.00 - 1.00	Pass
STSO-1158	08/01/08	Am-241	57.73 ± 4.78	69.10	48.40 - 89.80	Pass
STSO-1158	08/01/08	Co-57	353.02 ± 2.01	333.00	233.00 - 433.00	Pass
STSO-1158	08/01/08	Co-60	151.99 ± 1.58	145.00	102.00 - 189.00	Pass
STSO-1158	08/01/08	Cs-134	499.72 ± 2.65	581.00	407.00 - 755.00	Pass
STSO-1158	08/01/08	Cs-137	2.54 ± 0.25	2.80	0.00 - 5.00	Pass
STSO-1158	08/01/08	K-40	643.94 ± 15.50	570.00	399.00 - 741.00	Pass
STSO-1158	08/01/08	Mn-54	452.14 ± 2.96	415.00	291.00 - 540.00	Pass
STSO-1158	08/01/08	Ni-63	803.09 ± 17.01	760.00	532.00 - 988.00	Pass
STSO-1158	08/01/08	Pu-238	0.12 ± 0.54	0.00	0.00 - 5.00	Pass
STSO-1158	08/01/08	Pu-239/40	60.88 ± 5.89	55.60	38.90 - 72.30	Pass
STSO-1158	08/01/08	Sr-90	1.95 ± 2.04	0.00	0.00 - 5.00	Pass
STSO-1158 [f]	08/01/08	Tc-99	337.00 ± 17.30	335.00	235.00 - 436.00	Pass
STSO-1158	08/01/08	U-238	315.67 ± 11.29	303.00	212.00 - 394.00	Pass
STSO-1158	08/01/08	Zn-65	0.10 ± 2.04	0.00	0.00 - 5.00	Pass
STVE-1159	08/01/08	Co-57	8.52 ± 0.23	7.10	5.00 - 9.20	Pass
STVE-1159	08/01/08	Co-60	5.08 ± 0.19	4.70	3.30 - 6.10	Pass
STVE-1159	08/01/08	Cs-134	5.26 ± 0.18	5.50	3.90 - 7.20	Pass
STVE-1159	08/01/08	Cs-137	0.01 ± 0.14	0.00	0.00 - 1.00	Pass
STVE-1159	08/01/08	Mn-54	6.39 ± 0.28	5.80	4.10 - 7.50	Pass
STVE-1159	08/01/08	Zn-65	7.73 ± 0.45	6.90	4.80 - 9.00	Pass

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

Lab Code[c]	Date	Concentration[b] Analysis	Laboratory result	Known Activity	Control Limits[d]	Acceptance
STW-1162[g]	08/01/08	Am-241	0.20 ± 0.06	0.00	0.00 - 0.10	Fail
STW-1162	08/01/08	Co-57	0.03 ± 0.16	0.00	0.00 - 5.00	Pass
STW-1162	08/01/08	Co-60	11.27 ± 0.23	11.60	8.10 - 15.10	Pass
STW-1162	08/01/08	Cs-134	17.93 ± 0.52	19.50	13.70 - 25.40	Pass
STW-1162	08/01/08	Cs-137	23.72 ± 0.43	23.60	16.50 - 30.70	Pass
STW-1162	08/01/08	Fe-55	43.36 ± 16.81	46.20	32.30 - 60.10	Pass
STW-1162	08/01/08	H-3	385.15 ± 8.93	341.00	239.00 - 443.00	Pass
STW-1162	08/01/08	Mn-54	13.87 ± 0.37	13.70	9.60 - 17.80	Pass
STW-1162[h]	08/01/08	Ni-63	10.77 ± 2.01	0.00	0.00 - 5.00	Fail
STW-1162[f]	08/01/08	Pu-238	0.33 ± 0.06	0.50	0.40 - 0.70	Fail
STW-1162	08/01/08	Pu-239/40	0.14 ± 0.15	0.00	0.00 - 0.20	Pass
STW-1162	08/01/08	Sr-90	6.49 ± 1.12	6.45	4.52 - 8.39	Pass
STW-1162[i]	08/01/08	Tc-99	1.80 ± 0.62	3.76	2.63 - 4.89	Fail
STW-1162	08/01/08	U-233/4	3.33 ± 0.18	3.44	2.41 - 4.47	Pass
STW-1162	08/01/08	U-238	3.38 ± 0.18	3.55	2.49 - 4.62	Pass
STW-1162	08/01/08	Zn-65	17.64 ± 0.61	17.10	12.00 - 22.20	Pass
STW-1163	08/01/08	Gr. Alpha	0.08 ± 0.04	0.00	0.00 - 0.56	Pass
STW-1163	08/01/08	Gr. Beta	0.12 ± 0.05	0.00	0.00 - 1.85	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).

[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] The results of a repeat analysis were still unacceptable. A spiked air filter was prepared (known activity 4.17 pCi/filter) to verify the methodology; results of the spike analysis were acceptable, 4.64 pCi/filter.

[f] Corrected result. An error in calculation was found.

[g] Included in the testing series as a "false positive". Result of reanalysis, 0.04 ± 0.01 Bq/L.

[h] Included in the testing series as a "false positive". Result of reanalysis, 3.78 ± 2.03 Bq/L.

[i] The reason for the deviation is unknown. Result of the original sample recount: 0.47 ± 0.07 Bq/L. The analysis was then repeated from the beginning. Result of reanalysis: 0.51 ± 0.07 Bq/L.

[j] The lower result was due to a higher than average background count used in the calculation. Average background result:, 4.11 ± 0.6

TABLE A-7. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)[a].

Lab Code [b]	Date	Analysis	Concentration (pCi/L) Laboratory Result [c]	ERA Result [d]	Control Limits	Acceptance
STAP-1143	03/24/08	Am-241	60.48 ± 3.52	50.1	29.3 - 69	Pass
STAP-1143	03/24/08	Co-60	650.72 ± 3.00	730.0	565.0 - 912	Pass
STAP-1143	03/24/08	Cs-134	467.50 ± 5.53	523.0	341.0 - 647	Pass
STAP-1143	03/24/08	Cs-137	1375.90 ± 25.41	1450.0	1090.0 - 1900	Pass
STAP-1143	03/24/08	Fe-55	145.60 ± 28.94	241.0	106.0 - 375	Pass
STAP-1143 [e]	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10	Pass
STAP-1143	03/24/08	Pu-238	53.65 ± 1.54	46.8	32.1 - 62	Pass
STAP-1143	03/24/08	Pu-239/40	70.44 ± 3.11	64.1	46.5 - 83	Pass
STAP-1143	03/24/08	Sr-90	157.60 ± 7.70	152.0	66.9 - 236	Pass
STAP-1143	03/24/08	U-233/4	62.15 ± 3.41	66.7	42.0 - 99	Pass
STAP-1143	03/24/08	U-238	64.11 ± 3.29	66.2	42.4 - 94	Pass
STAP-1143	03/24/08	Uranium	128.40 ± 3.29	136.0	69.5 - 216	Pass
STAP-1143	03/24/08	Zn-65	889.90 ± 15.90	872.0	604.0 - 1210	Pass
STAP-1144	03/24/08	Gr. Alpha	13.08 ± 1.09	8.8	4.6 - 13	Pass
STAP-1144	03/24/08	Gr. Beta	99.90 ± 3.09	92.2	56.8 - 135	Pass
STSO-1145	03/24/08	Ac-228	1269.02 ± 36.81	1180.0	757.0 - 1660	Pass
STSO-1145	03/24/08	Am-241	1268.50 ± 85.80	1230.0	735.0 - 1580	Pass
STSO-1145	03/24/08	Bi-212	1407.10 ± 56.64	1360.0	357.0 - 2030	Pass
STSO-1145	03/24/08	Bi-214	2145.50 ± 305.63	1790.0	1100.0 - 2570	Pass
STSO-1145	03/24/08	Co-60	5219.70 ± 90.30	5130.0	3730.0 - 6890	Pass
STSO-1145	03/24/08	Cs-134	5427.30 ± 102.94	5640.0	3630.0 - 6790	Pass
STSO-1145	03/24/08	Cs-137	6346.60 ± 201.80	6010.0	4600.0 - 7810	Pass
STSO-1145	03/24/08	K-40	11052.70 ± 181.80	11000.0	7980.0 - 14900	Pass
STSO-1145 [e]	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10	Pass
STSO-1145	03/24/08	Pb-212	1198.20 ± 96.58	1080.0	697.0 - 1520	Pass
STSO-1145	03/24/08	Pb-214	2253.30 ± 291.60	2020.0	1210.0 - 3010	Pass
STSO-1145	03/24/08	Sr-90	6407.00 ± 277.00	5360.0	1940.0 - 8750	Pass
STSO-1145	03/24/08	Th-234	2421.80 ± 321.00	2030.0	644.0 - 3870	Pass
STSO-1145 [f]	03/24/08	U-233/4	1227.93 ± 91.52	2050.0	1240.0 - 2580	Fail
STSO-1145	03/24/08	U-238	1319.90 ± 48.81	2030.0	1240.0 - 2580	Pass
STSO-1145	03/24/08	Uranium	2592.00 ± 140.50	4180.0	2380.0 - 5640	Pass
STSO-1145	03/24/08	Zn-65	2936.20 ± 73.50	2660.0	2110.0 - 3570	Pass

TABLE A-7. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)[a].

Lab Code [b]	Date	Analysis	Concentration (pCi/L) Laboratory Result [c]	ERA Result [d]	Control Limits	Acceptance
STVE-1146	03/24/08	Am-241	1261.50 ± 73.90	1260.0	718.0 - 1730	Pass
STVE-1146	03/24/08	Cm-244	1152.50 ± 57.44	1200.0	591.0 - 1870	Pass
STVE-1146	03/24/08	Co-60	912.41 ± 13.59	888.0	600.0 - 1280	Pass
STVE-1146	03/24/08	Cs-134	1547.70 ± 38.81	1540.0	882.0 - 2130	Pass
STVE-1146	03/24/08	Cs-137	1163.80 ± 20.62	1100.0	807.0 - 1530	Pass
STVE-1146	03/24/08	K-40	22186.00 ± 339.40	24600.0	17700.0 - 34800	Pass
STVE-1146 [e]	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10	Pass
STVE-1146	03/24/08	Sr-90	3825.90 ± 140.66	4130.0	2310.0 - 5480	Pass
STVE-1146	03/24/08	U-233/4	2753.30 ± 227.90	3070.0	2110.0 - 4070	Pass
STVE-1146	03/24/08	U-238	2697.10 ± 143.20	3050.0	2140.0 - 3850	Pass
STVE-1146	03/24/08	Uranium	5586.10 ± 455.20	6260.0	4300.0 - 8080	Pass
STVE-1146	03/24/08	Zn-65	1676.80 ± 43.00	1430.0	1030.0 - 1960	Pass
STW-1147	03/24/08	Am-241	97.56 ± 1.02	90.9	62.0 - 124	Pass
STW-1147	03/24/08	Co-60	1430.00 ± 33.33	1420.0	1240.0 - 1680	Pass
STW-1147	03/24/08	Cs-134	730.18 ± 33.39	751.0	555.0 - 862	Pass
STW-1147	03/24/08	Cs-137	1947.80 ± 13.80	1990.0	1690.0 - 2380	Pass
STW-1147	03/24/08	Fe-55	1422.70 ± 172.16	2080.0	1210.0 - 2780	Pass
STW-1147 [e]	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10	Pass
STW-1147	03/24/08	Pu-238	144.16 ± 4.54	135.0	102.0 - 168	Pass
STW-1147	03/24/08	Pu-239/40	82.16 ± 2.50	80.7	62.4 - 100	Pass
STW-1147	03/24/08	Sr-90	512.03 ± 43.37	512.0	325.0 - 684	Pass
STW-1147	03/24/08	U-233/4	74.40 ± 1.20	81.0	61.0 - 104	Pass
STW-1147	03/24/08	U-238	75.10 ± 1.35	80.3	61.3 - 100	Pass
STW-1147	03/24/08	Uranium	152.10 ± 2.55	165.0	119.0 - 220	Pass
STW-1147	03/24/08	Zn-65	708.90 ± 29.00	694.0	588.0 - 865	Pass
STW-1120	03/19/07	Uranium	339.60 ± 10.66	391.0	282.0 - 521	Pass
STW-1120	03/19/07	Zn-65	2009.00 ± 36.40	1910.0	1600.0 - 2410	Pass

[a] Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the Environmental Measurements Laboratory Quality Assessment Program (EML).

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

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

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

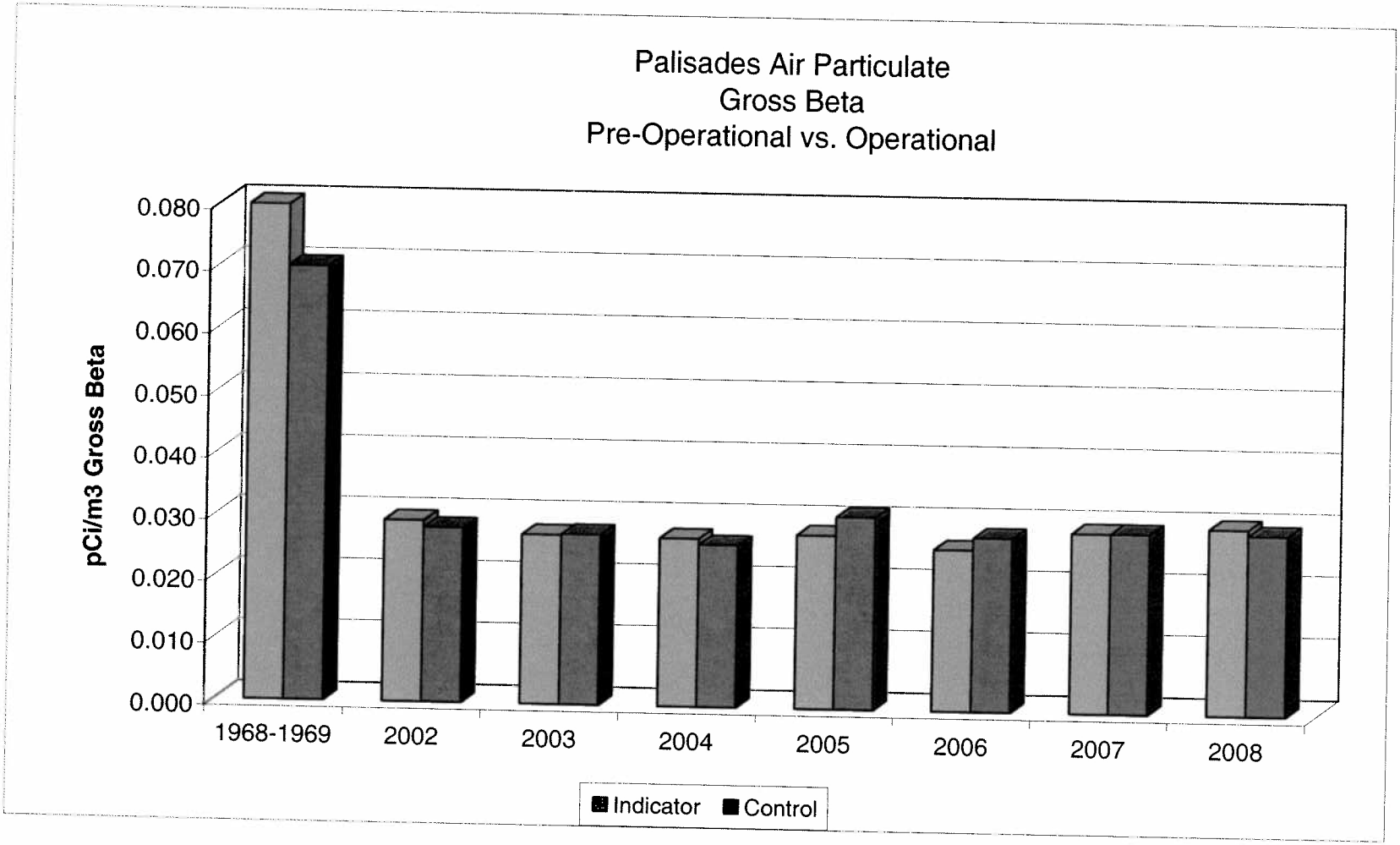
[e] Included in the testing series as a "false positive". No activity expected.

[f] The analysis was repeated by leaching and total dissolution methods. Total dissolution yielded results within expected range. Results of the reanalysis: U-233,4 1655 ± 95 pCi/kg. U-238 1805 ± 97 pCi/kg.

ATTACHMENT 6

DATA GRAPHS

3 Pages Follow


Palisades Air Particulate
Gross Beta
Pre-Operational vs. Operational
pCi/m3 Gross Beta
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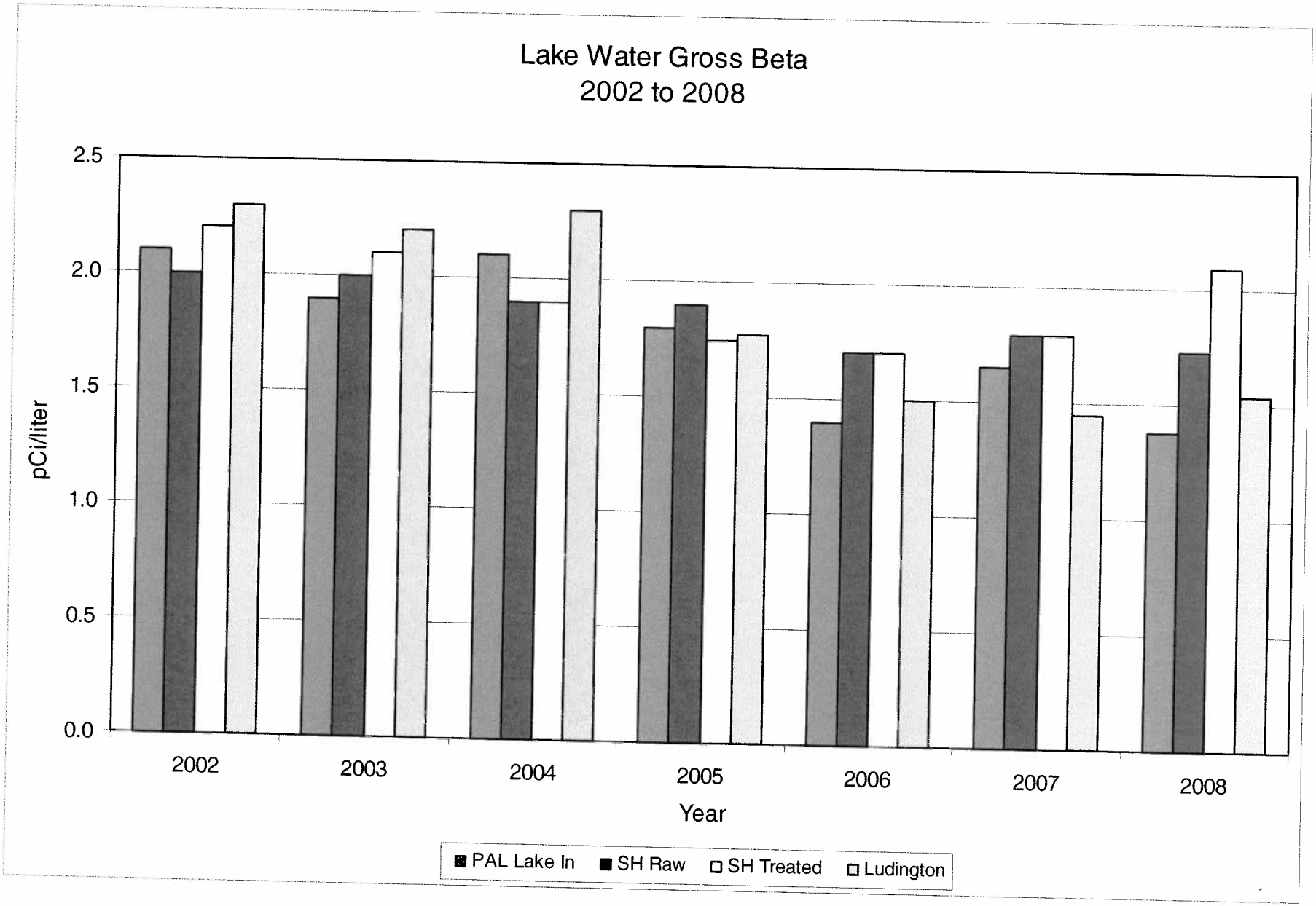
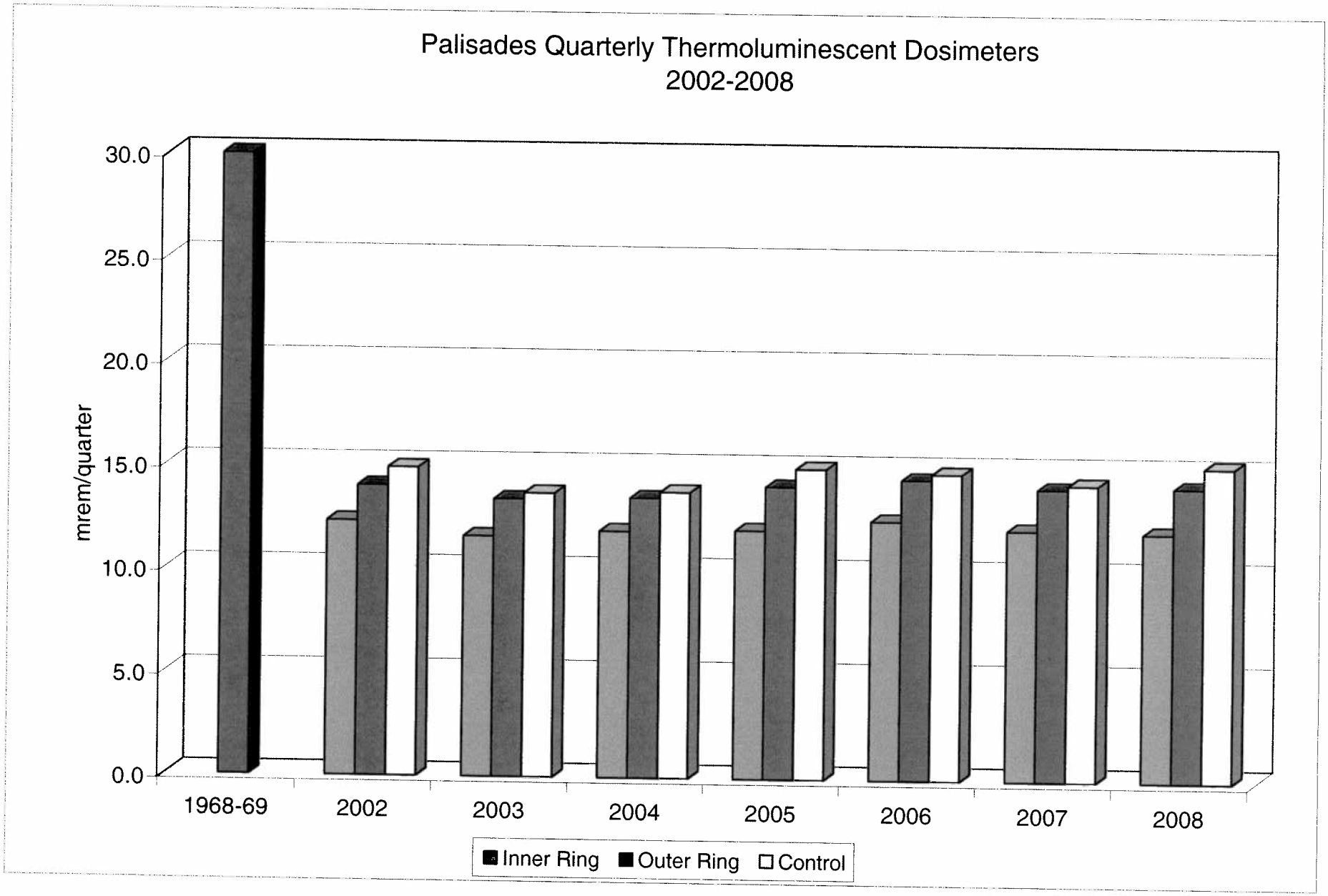
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
1968-1969
2002
2003
2004
2005
2006
2007
2008
Indicator
Control


Lake Water Gross Beta
2002 to 2008
2.5
2.0
1.5
1.0
0.5
0.0
pCi/liter
2002
2003
2004
2005
2006
2007
2008
Year
PAL Lake In
SH Raw
SH Treated
Ludington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2002-2008
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30.0
25.0
20.0
15.0
10.0
5.0
0.0
1968-69
2002
2003
2004
2005
2006
2007
2008
Inner Ring
Outer Ring
Control